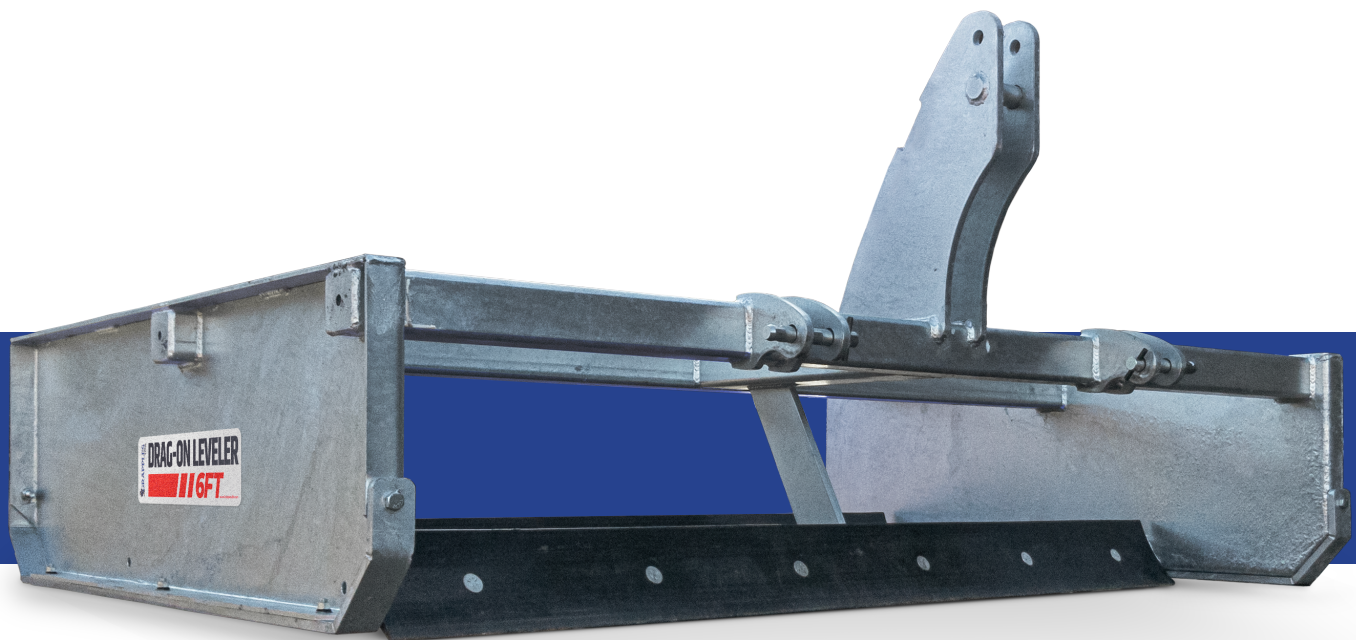




DRAG-ON ROAD LEVELER

Operator's Manual



LEVEL THE PLAYING FIELD.

CHECKLIST

PRE-DELIVERY

Inspect the leveler / grader thoroughly after assembly to be certain it is set up properly before delivering it to the customer. It is the purchaser and/or operator's responsibility to...

- Read and understand the information contained in this manual.
- Operate, lubricate, assemble and maintain the equipment in accordance with all instructions and safety procedures in this manual.
- Inspect the equipment and replace or repair any parts that are damaged or worn which under continued operation would cause damage, wear to other parts, or cause a safety hazard.

- Return the equipment or parts to the authorized Grapples N' More dealer, from where it was purchased, for service, or replacement of defective parts that are covered by warranty.

(Grapples N' More may inspect equipment or parts before warranty claims are honored.)

- Payment of all costs incurred by the dealer for traveling to or transporting the equipment for warranty inspection and or claims.

I have thoroughly instructed the buyer on the above described equipment, the review included the Operator's Manual content, equipment care, adjustments and safety information.

Date: _____

Dealer's Rep Signature: _____

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, and safe operations.

Date: _____

Owner's Signature: _____

The SAFETY ALERT SYMBOL indicates that there is a potential hazard to personal safety involved and extra safety precautions must be taken. When you see this symbol on your machine or in this manual, be alert and carefully read the message that follows it.

⚠ DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

⚠ 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. It may also be used to alert against unsafe practices.

READ MANUAL PRIOR TO INSTALLATION:

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance.

OPERATION

FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).

READ AND UNDERSTAND ALL SAFETY STATEMENTS:

Read all safety decals and safety statements in all manuals prior to operating or working this equipment. Know and obey all OSHA regulations, local laws, and any other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.

KNOW YOUR EQUIPMENT:

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts.

Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

To avoid accident or injury, do not allow anyone to operate this equipment without proper instructions. Any person who operates this equipment must be instructed in and be capable of the safe operations of the unit, its attachments, and all controls.

Do not let anyone operate the machine and leveler without proper instruction.

Operate leveler only from operator's seat. Avoid excessive rate or drop.

Keep children and others away when you operate machine.

Always lower the blade to the ground and stop engine before getting off the tractor.

Look carefully behind tractor for children before you back up.

⚠ CAUTION
DO NOT allow children to operate tractor.

⚠ DANGER
Do not tow anything with the leveler.

⚠ DANGER
Do not allow riders on blade at any time. Do not stand or ride in or on leveler.

⚠ CAUTION
Before you drive tractor, raise leveler to full height.

Avoid working near the edges of any deep ditches or trenches.

⚠ WARNING
(1) Do not use leveler as a battering ram. (2) Remove any obstacles from leveler path. (3) Travel slowly over rough ground. (4) When you drive with the leveler on a road or highway, use accessory lights and safety alert devices. (5) Before you leave the tractor, lower the leveler to the ground. (6) Inspect leveler carefully.

⚠ WARNING
PROTECT AGAINST FLYING DEBRIS:
Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

SAFETY SECTION

LOWER OR SUPPORT RAISED EQUIPMENT:

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

DO NOT MODIFY MACHINE OR ATTACHMENTS:

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protection Structure) or FOPS.

(Falling Object Protective Structure equipment or device. Any must be authorized in writing by the manufacturer.)

⚠ WARNING

SAFELY MAINTAIN AND REPAIR EQUIPMENT:

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.

⚠ WARNING

SAFELY OPERATE EQUIPMENT:

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Operate only from the operator's station. Always use the seat belt if the prime mover has a ROPS. Do not use a seat belt if there is not ROPS. Check the seat belt daily and replace if frayed or damaged.

- Specified lift capacities must not be exceeded. See loader specifications.
- An operator must not use drugs or alcohol, which can change their alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not they can safely operate equipment.
- Never use any of these attachments for a work platform or personnel carrier.
- Always check locking pins before tilting or operating any attachment.
- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the prime mover's engine running, or with this attachment in a raised position.
- Before exiting the prime mover, lower the attachment to the ground, apply brakes, turn off the prime mover's engine, and remove the key.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue contact your supervisor or safety coordinator for an explanation.
- Do not alter or remove any safety feature.

⚠ WARNING

TRANSPORTING ALL ATTACHMENTS:

- Drive slowly over rough ground and on slopes.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc, to prevent accidents. Check local government regulations that may affect you.

- Do not drive close to ditches, excavations, etc; a cave in could result.
- Avoid sudden starts and stops while traveling up or downhill. Avoid parking on a slope. Slow down on sharp turns and slopes to prevent loss of control. Avoid slopes when surface is wet, slippery grass or soil. Be careful when changing directions on slopes.
- Use extra care when loading or unloading unit onto trailer or truck. NEVER secure rods or linkages on unit that could be damaged when transporting.
- Do not smoke when refueling. Allow room in the gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

MAINTENANCE

DANGER

Never work without safety blocks.

WARNING

Lower leveler to lowest possible position before working on the equipment.

Keep hands, feet, and clothing away from cutting edges.

Keep tractor and leveler in good operating condition and all safety devices in place.

Periodically tighten all bolts and nuts and check that all cotter pins are properly installed to ensure leveler is in a safe condition.

MAINTAINING ALL ATTACHMENTS

- Before working on this machine, drive to a level area, lower implement (or if working underneath, raise and block securely), shut off the engine, set the brakes, and remove the ignition keys.
- Never work under the equipment unless it is blocked securely.
- Keep all persons away from the operator control area while performing any adjustments, service, or maintenance.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from your dealer or from the manufacturer.

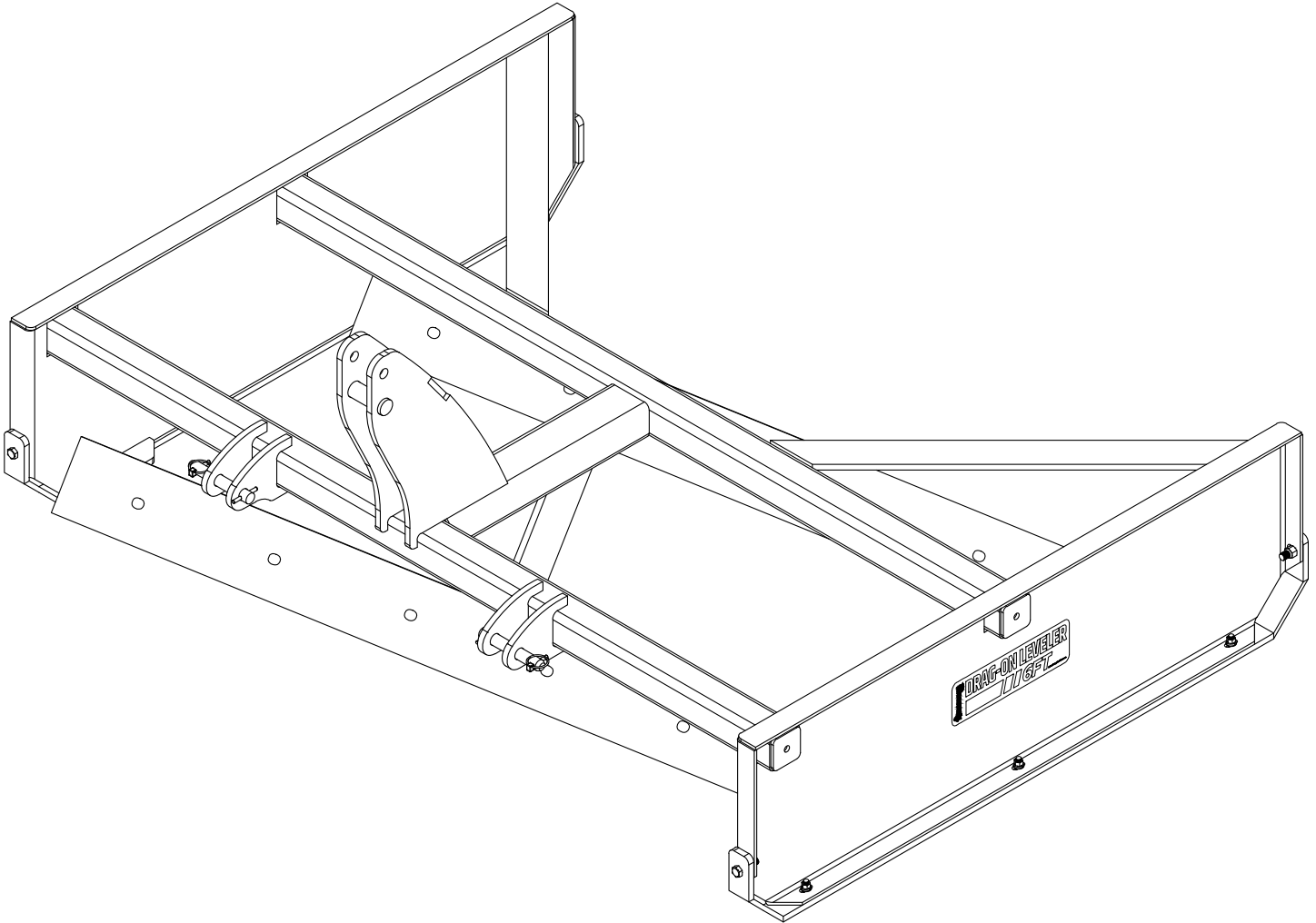
STORAGE SAFETY

- Store the unit in an area away from human activity. Do not permit children to play on or around the stored unit.
- Make sure all parked machines are on a hard, level surface and engage all safety devices. Storage location should be level and solid to make connecting and un-connecting to prime mover easy.
- If blocking is used, make sure it is solid and secure before leaving area.

MOST ACCIDENTS OCCUR BECAUSE OF NEGLIGENCE OR CARELESSNESS. AVOID NEEDLESS ACCIDENTS BY FOLLOWING ALL OF THE SAFETY PRECAUTIONS LISTED BELOW.

GENERAL SAFETY PRECAUTIONS

- Machinery should be operated only by those who are responsible and are authorized to do so.
- Stop the engine, lower all equipment, lock the brakes, and remove the ignition key before dismounting from the skid steer or tractor.
- Never stand between the tractor and the attachment while power unit is being connected to the attachment.
- Loose fitting clothing should not be worn to avoid catching on various parts.
- Detach attachment in area where children normally do not play.
- When performing adjustments or maintenance on an attachment, first lower it to the ground or block it securely at a workable height.
- Only a qualified operator should be permitted on power unit when in operation; no riders allowed.
- Make certain everyone is in the clear before starting power unit or raising or lowering equipment.
- Operate the power unit and attachment only while seated in the driver's seat.
- Reduce speed when transporting mounted attachments to avoid bouncing and momentary loss of steering control.
- A heavy load can cause instability of the power unit. Use extreme care during road travel. Slow down on turns and watch out for bumps. Power unit may need counterweights to counter-balance the weight of the attachment.
- Reduce speed on hillsides or curves so there is no danger of tipping.
- Avoid driving too close to the edge of ditches or drop-offs.
- Do not transport implement on public roads without reflectors and slow moving vehicle emblem in daylight and with approved warning lights at night and other periods of poor visibility.
- Keep work area clear of all debris. Never assume an area is clear. ALWAYS CHECK.
- Check to make certain there are no buried utilities in the work area before starting work.
- Keep alert and watch the front as well as the rear when working with the attachment.



REPLACING SAFETY SIGNS

1. Clean the area of application with nonflammable solvent.
2. Wash the same area with soap and water.
3. Allow the surface to fully dry.
4. Remove the backing from the safety sign exposing the adhesive surface.
5. Apply the safety sign back to its original location.
6. Smooth out any bubbles.

Helpful Hints: (1) Decals adhere to a warm surface better than a cold surface. (2) Applying heat (from a hairdryer) will greatly improve your ability to remove a damaged decal before preparing the surface for installation of a new one.

ASSEMBLY SECTION

TRACTOR REQUIREMENTS

Tractor horsepower should be within the range noted below. Tractors outside the horsepower range should not be used.

Required Horsepower Rating: **Maximum 40HP**
Hitch Type: **3-point Cat. 1 | Quick Attach**

⚠ DANGER

TO AVOID SERIOUS INJURY OR DEATH:

A crushing hazard exists while connecting and disconnecting the implement. Keep people and animals away while backing up to the implement or pulling away from the implement. Do not operate hydraulic controls while a person or animal is directly behind the power machine or near the implement.

⚠ WARNING

TO AVOID SERIOUS INJURY OR DEATH:

Lightweight tractors with rear attached implements may need weights added to the front to maintain steering control. Consult your tractor Operator's Manual to determine weight requirements and maximum limitations.

BEFORE YOU START

Make sure the intended power machine conforms to the requirements provided on this page. Read and understand the operator's manual for your leveler. An understanding of how it works will aid in the assembly and setup of your leveler.

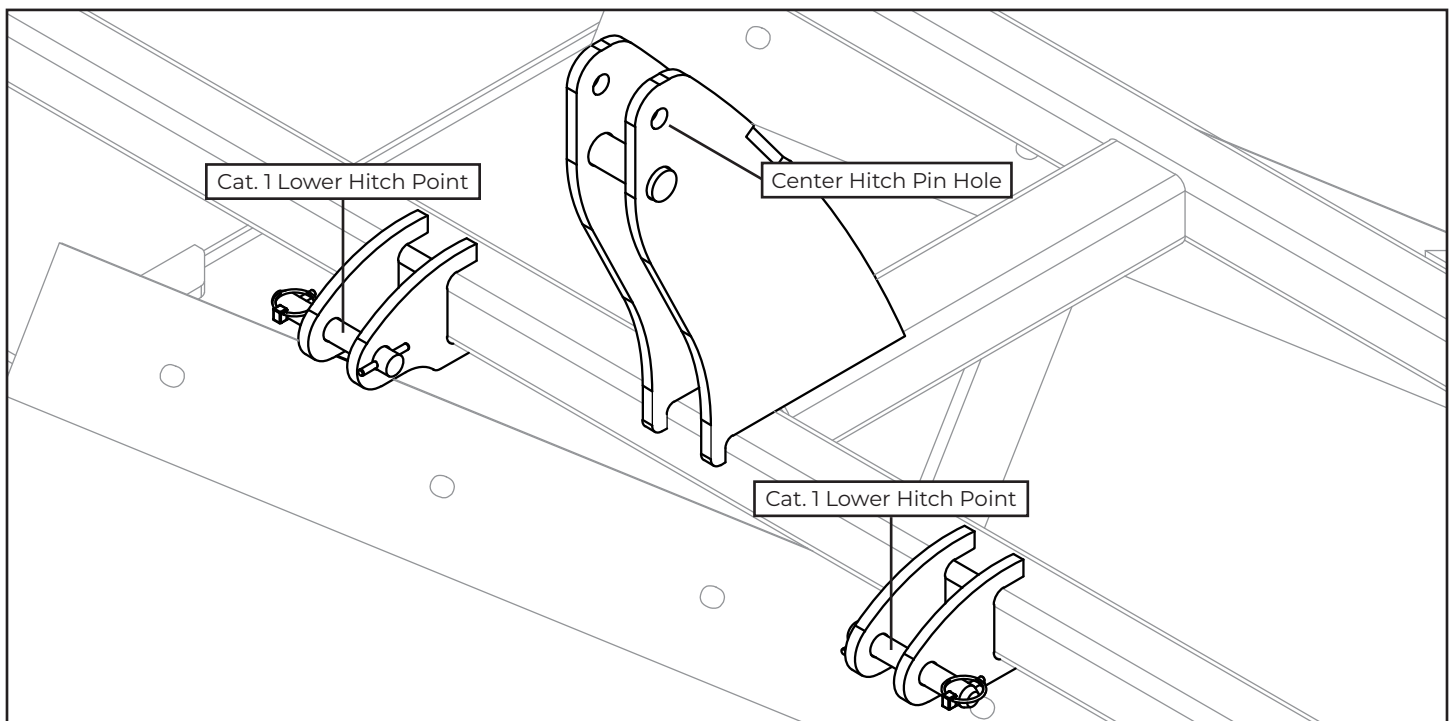
3-POINT HOOK UP

A 3-point Category I hitch is required for this implement. The lower arms of the 3-point hitch must be stabilized to prevent side-to-side movement. Most tractors have sway blocks or adjustable chains for this purpose.

1. Category I tractors will have 7/8" dia. holes in the lower hitch links and 3/4" dia. in the top link.
2. Slowly back tractor up to the leveler while using the tractor's 3-point hydraulic control to align lower hitch arm holes with lower hitch holes.
3. Engage tractor park brake, shut tractor engine off, and remove key before dismounting from tractor.

It may be necessary to start tractor and slowly raise the 3-point hitch about 1" -2" to align center link with the center hitch pin hole.

4. Connect top center link to upper pivot hitch using clevis pin and hairpin cotter.
5. Ensure that the lower hitch arms are stabilized to prevent excessive side movement.
6. Return to the tractor and slowly operate controls up and down to check for clearance between leveler frame, tractor tires, and tractor drawbar. Move drawbar if it interferes with the leveler.



This unit is designed for a wide range of applications: it may be used for smoothing, grading, scraping, leveling, clearing, and landscaping to name a few.

The safe operation of this unit is the responsibility of the operator who must be properly trained and qualified. Operators should be familiar with the cutting edge, the prime mover, and all safety practices before starting operation. Make sure all operators have read the Owner's/Operator Manual and are familiar with the instructions and the safety rules of operation.

All reference to left, right, front, or rear are given from the operator's position, facing the direction of forward travel.

TRACTOR SIZE

The leveler may be mounted on any wheeled tractor of maximum 40HP drawbar rating or tractor weight up to 4000lbs.

RAISING AND LOWERING LEVELER

Push tractor level forward to lower leveler. Pull level to rear to raise leveler.

Lower leveler to desired operating position. Lift depth stop lever and move it against control lever. Push depth stop lever down to lock it.

The leveler will then return to the same depth each time it is lowered.

LEVELING AND SCRAPING

To level, make shallow cuts. Move loose dirt into low areas.

When scraping or excavating, determine depth of cut by ground conditions and length of cut needed to fill the box.

BACKFILLING

Level equipment front-to-rear by adjusting tractor center link. Push dirt with rear cutting edge.

TRACTOR ADJUSTMENTS

See your tractor operator's manual for the following:

Drawbar: Put drawbar in short position.

Leveling: Level cutting edge side-to-side using tract lift link. Level front-to-rear by turning tractor center link.

Rate to Drop: Adjust rate-to-drop so it is enough to be safe.

Sway Control: Adjust anti-sway chains on 3-point hitch to prevent leveler from swaying.

Float: Adjust draft links for lateral float to allow leveler to float over objects or uneven ground.

REVERSING OR REPLACING CUTTING EDGE

CAUTION

Before you work on cutting edge:

- **Put blocks (or stands) under frame**
- **Lower scraper onto blocks**
- **Replace damage or missing hardware**

Remove bolts from cutting edge.

Reverse or replace cutting edge.

Fasten cutting edge with bolts.

STORING THE SCRAPER

Ideally store leveler in a dry place on a hard surface.

Protect leveler from ground moisture (blocks).

Clean box and frame.

Replace worn or damaged parts.

Tighten loose hardware.

Apply touch-up paint to prevent rust.

Put a protective cover over leveler if you store it.

TRANSPORTING

WARNING

TO AVOID SERIOUS INJURY OR DEATH:

- When traveling on roadways, transport in such a way that other vehicles may pass you safely. Use accessory lights, clean reflectors, and a slow moving vehicle sign that is visible from the back to warn operators in other vehicles of your presence. Always comply with all federal, state, and local laws.

OPERATING & MAINTENANCE SECTION

- Make sure implement does not block tractor's Slow Moving Vehicle (SMV) sign when transporting on a public road. If operators in vehicles approaching from the back cannot easily see the sign, then install one on the implement that is visible to warn of your presence.
 - Select a safe ground speed that will allow adequate control of steering and stopping. Never exceed 20mph (32 km/h) with attached equipment. Rough terrain requires slower speed.
 - Reduce ground speed when turning and leaving enough clearance to avoid making contact with obstacles such as buildings, trees, fences, etc.
1. Select a safe ground speed when transporting from one area to another. Maximum transport speed for the leveler is 20mph. **DO NOT EXCEED.**
 2. Be sure to reduce tractor ground speed when turning; leave enough clearance so the leveler does not contact obstacles such as buildings, trees, or fences.
 3. Select a safe ground travel speed when transporting from one area to another.
 4. When traveling on roadways, transport in such a way that faster moving vehicles may pass you safely.
 5. When traveling over rough or hilly terrain, shift tractor to a lower gear.

GENERAL OPERATING INSTRUCTIONS

Lower your leveler until the left and right end skid shoes are firmly in contact with the ground, then begin driving forward. Your scraper blades should immediately begin grading or shaving off high spots on the surface and allowing dirt or aggregate material to flow under the blades to fill in low spots.

The lower the blades are, the more aggressive the cutting and grading action will be. Depending on your blade depth and surface conditions, a build up may occur between the blades. Simply raise the leveler slightly with the 3-point hitch control lever and allow excess material to flow out under the blades in an even and level fashion.

MAINTENANCE

It is important to maintain proper servicing for the longevity of any implement. Through careful inspection and routine maintenance, you can avoid costly downtime and repair.

Be sure to check all bolts after using the unit for several hours to be sure they are tight. Replace any worn, damaged, illegible safety labels by obtaining new labels from your Grapples N' More dealer.



DANGER

TO AVOID SERIOUS INJURY OR DEATH:

Make adjustments to the implement after it has been properly attached to a tractor and secured with solid non-concrete supports in the up position. Never work around or under equipment supported by hydraulics. Hydraulics can drop equipment instantly if controls are actuated or if hydraulic lines burst even when power to hydraulics is shut off.



WARNING

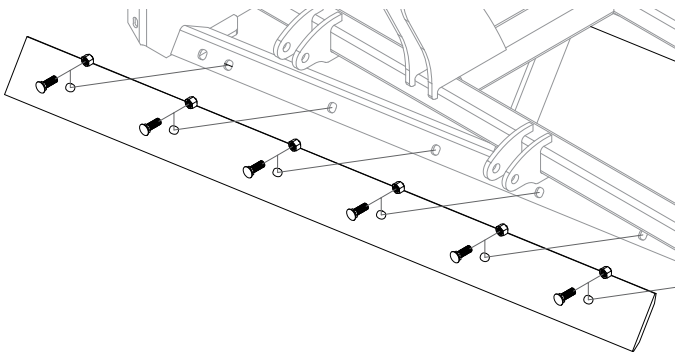
TO AVOID SERIOUS INJURY OR DEATH:

- Allow only persons to perform maintenance on this implement who have been properly trained in its safe operation.
- Make sure controls are all in the neutral position or park before starting the power machine.
- Always shut tractor down before servicing, adjusting, cleaning, or maintaining equipment.
- Perform scheduled maintenance. Check for loose hardware, missing parts, broken parts, structural cracks, and excessive wear. Make repairs before putting the implement back into service.
- Do not alter implement or replace parts on the implement with other brands. Other brands may not fit properly or meet OEM (Original Equipment Manufacturer) specifications. They can weaken the integrity and impair the safety, function, performance, and life of the implement. Replace parts only with genuine OEM parts.
- Always keep your body extremities out from under the cutting blades while removing, installing, and adjusting them. It is possible for the cutting blades to fall causing injury to your body.

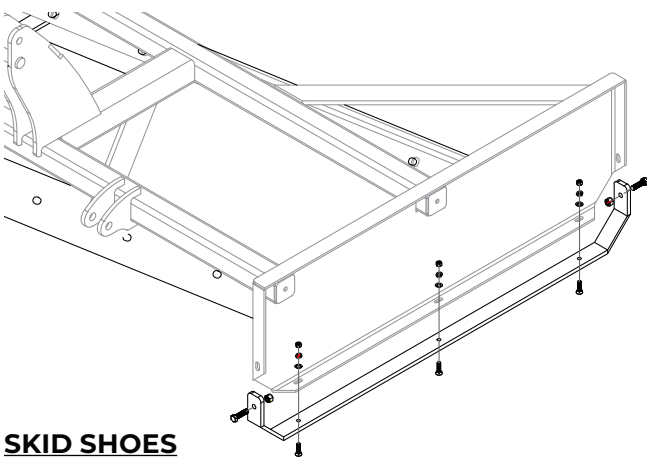
GENERAL INFORMATION

Your attachment was designed to be almost maintenance free. Little effort is needed to keep it in top condition. It is, however, important to follow these procedures to get full performance and longevity out of the equipment.

IMPORTANT: When replacing parts, use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories and/or other damages as a result of their use.

**CUTTING BLADES**

The cutting blades have (2) cutting edges. Unbolt blades and turn them over when bottom edges wear out. Inspect the 5/8" plow bolts and nuts for wear and replace as needed. Reattach blades and tighten to the correct torque. Replace cutting blades when both edges are worn out.

**SKID SHOES**

Skid shoes should be inspected at the beginning of each season and replaced when material thickness is less than 1/4" at any point. The skid shoe may be turned around to extend its wear if one is wearing faster than the other.

Contact your local Grapples N' More dealer when replacing skid shoe components.

Replace or turn around skid shoe as instructed:

1. Raise leveler 3" or more off the ground and place support blocks underneath equipment. Make sure support blocks are positioned so they will not interfere with skid shoe replacement.
2. Lower leveler onto support blocks, place tractor in park, set park brakes, shut tractor engine off, and remove switch key.
3. Remove 1/2" hex bolts, 3/8" plow bolts, all accompanying nuts and washers, and skid shoe from leveler.
4. Bolts, nuts, and washers should be inspected for wear and replaced if necessary.
5. Turn old skid shoe around or install new skid shoe to the leveler with accompanying hardware. Tighten to the correct torque.
6. Raise scraper up and remove support blocks.

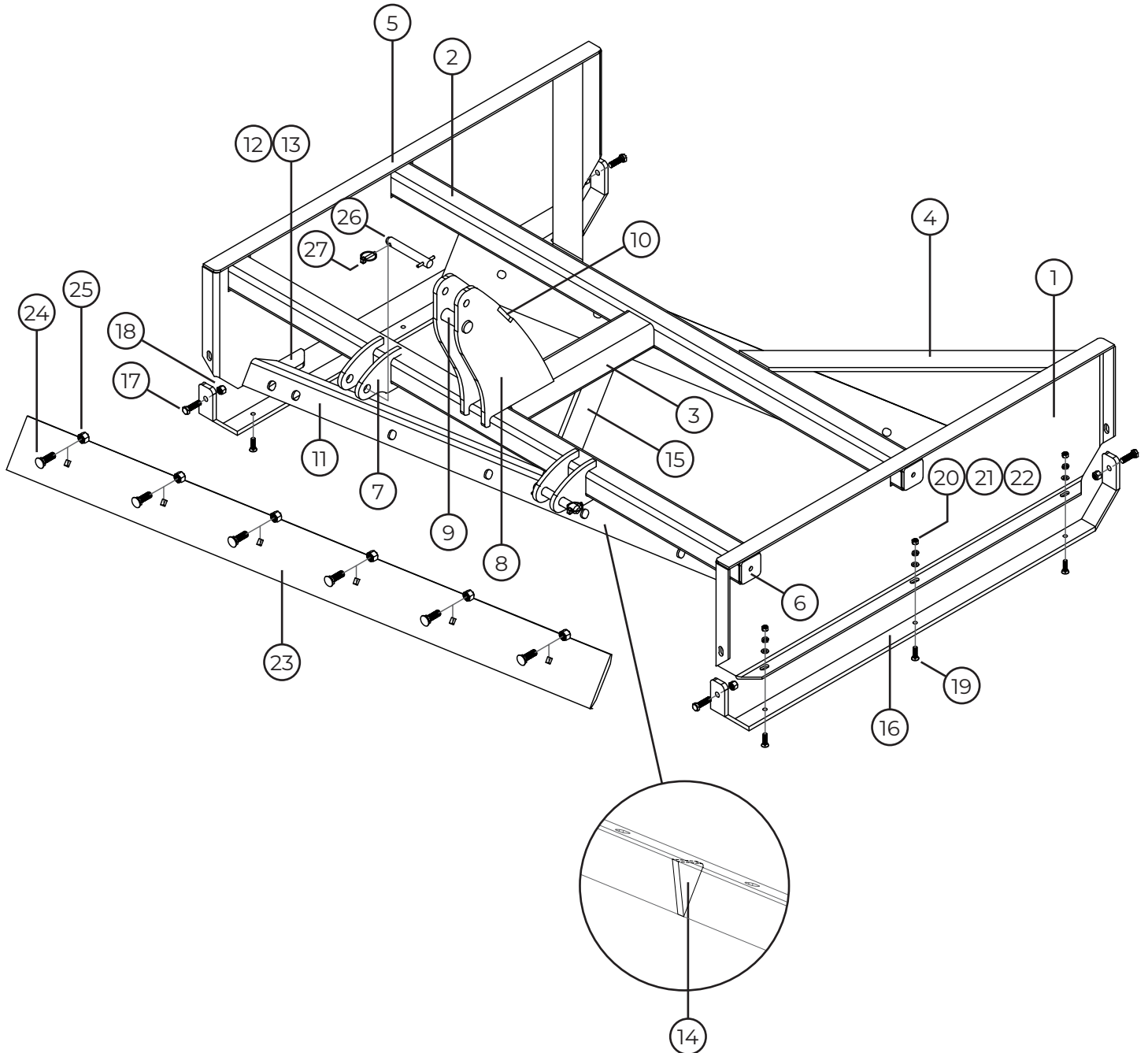
LONG-TERM STORAGE

Clean, inspect, service, and make necessary repairs to the implement when storing it for long periods and at the end of the season. This will help ensure the unit is ready for field use the next time you hook up to it.

1. Clean off any dirt and grease that may have accumulated on the leveler. Scrape off compacted dirt from the bottom of the frame and then wash surface thoroughly with a garden hose.
2. Inspect leveler for loose, damaged, or worn parts and adjust or replace as needed.
3. Replace all damaged or missing decals.
4. Store leveler on a level surface in a clean, dry place. Inside storage will reduce maintenance and make for a longer scraper life.

To ensure that your leveler maintains a proper outer protective coating, galvanizing spray may be applied in areas where the outer galvanized layer has been worn down.

6' DRAG-ON LEVELER PARTS LIST



6' DRAG-ON LEVELER PARTS LIST

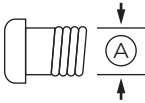
ITEM	QTY.	DESCRIPTION
1.....	2.....	Side Plate
2.....	2.....	Cross Brace Tubing
3.....	1.....	Center Brace Tubing
4.....	2.....	H-Frame Brace
5.....	2.....	Side Cap Plate
6.....	4.....	Tubing Cap Plate
7.....	4.....	Hitch Lug
8.....	2.....	A-Frame
9.....	1.....	A-Frame Pin
10.....	1.....	A-Frame Brace
11.....	2.....	Cutting Edge Mount Angle
12.....	2.....	Cutting Edge Mount Gusset (L)
13.....	2.....	Cutting Edge Mount Gusset (R)
14.....	1.....	Center Mount Angle Gusset
15.....	1.....	H-Frame Gusset
16.....	2.....	Side Plate Skid
17.....	4.....	1/2" x 1-3/4" Hex Bolt
18.....	4.....	1/2" Locknut
19.....	6.....	3/8" x 1-1/2" Plow Bolt
20.....	6.....	3/8" Hex Nut
21.....	6.....	3/8" Split Lock Washer
22.....	6.....	3/8" Washer
23.....	2.....	Cutting Blade
24.....	12.....	5/8" x 2" Plow Bolt
25.....	12.....	5/8" Locknut
26.....	2.....	Link Pin
27.....	2.....	Lynch Pin

SPECIFICATION SHEET

Working Width	71-1/2"
Overall Width	75-1/2"
Tractor HP Requirement	40 Horsepower maximum
Unit Weight	Working Width
Overall Length	59-1/4"
Overall Height	33-15/16"
Side Panel Height	16"
Side Panel Length	55-5/8"
Side Panel Thickness	1/4" x 3" x 3" cross beams
Beam Construction	1/4" x 3" x 4" center beam
Skid Shoe Dimension	1/2" x 2 x 56-3/4"
Cutting Edges	(2) 1/2" x 6" high carbon heat treated blades that are reversible and replaceable.
Cutting Edge Placement	(2) parallel grading blades positioned at a 10 degree grading angle with 30" spacing between leading edges.
Hitch Type	Category I 3 - point hitch / Category I Quick Hitch compatible
Finish	Galvanized layer of protection to prevent rusting and wear, and provide product longevity.

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 2
(no dashes)

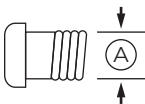


SAE Grade 5
(3 radial dashes)



SAE Grade 8
(6 radial dashes)

Ⓐ 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



Metric
Grade 8.8



Metric
Grade 10.9

Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				Ⓐ 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



TOUGH. STRONG. DURABLE.
MADE IN THE USA.
