

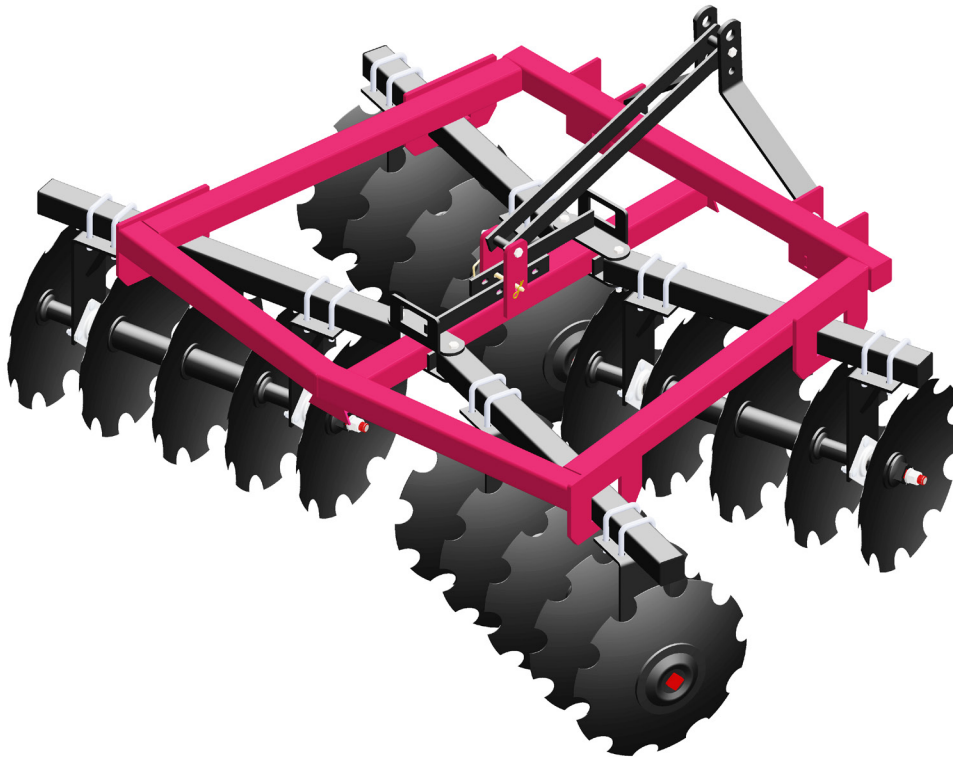


KODIAK
BY PALADIN

OPERATOR'S MANUAL

DISC HARROWS 400 & 500 Series

FOR
(3-POINT HITCH APPLICATIONS)



SERIAL NUMBER: _____

Manual Number: KDK06-0193

MODEL NUMBER: _____

Rev.

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PREFACE

GENERAL COMMENTS

Congratulations on the purchase of your new product! This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

WARNING!  **Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual. Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.**

Unless noted otherwise, right and left sides are determined from the operator's control position when facing the attachment.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operators.

SAFETY ALERT SYMBOL



This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- prime mover type, age, condition, with or without cab enclosure and configuration
- operator training, behavior, stress level
- job site organization, working material condition, environment

Based on the uncertainty of the prime mover, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

NOTE: A list of all Paladin Patents can be found at <http://www.paladinattachments.com/patents.asp>.

SAFETY STATEMENTS



THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



DANGER

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.



WARNING

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.



CAUTION

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.

NOTICE

NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL INJURY.

GENERAL SAFETY PRECAUTIONS

WARNING!



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. **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 on this equipment. Know and obey all OSHA regulations, local laws, and 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.

GENERAL SAFETY PRECAUTIONS

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.

WARNING!



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.

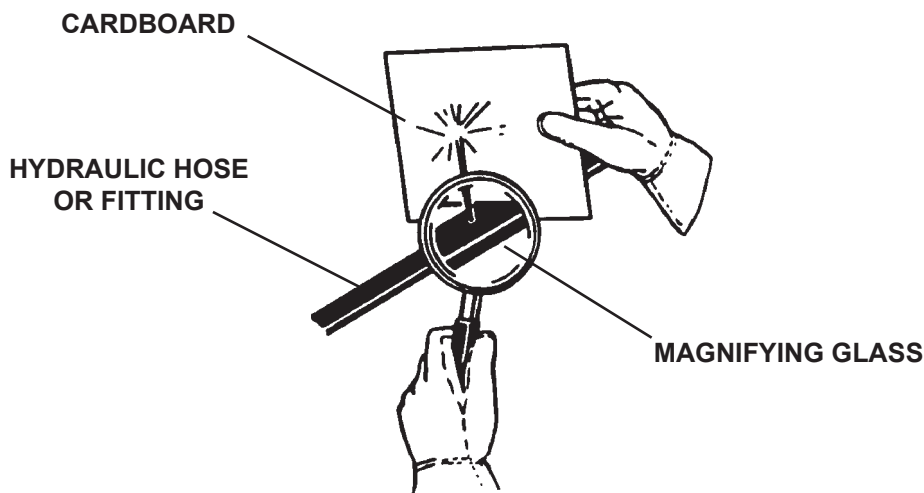
WARNING!



USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS!** **SEE ILLUSTRATION.**



GENERAL SAFETY PRECAUTIONS

WARNING!



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 Protective Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications 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.



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.

- 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 engine running, or with this attachment in a raised position.
- 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.

WARNING!



CALIFORNIA PROPOSITION 65 WARNING

This product may contain a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. www.P65Warnings.ca.gov

EQUIPMENT SAFETY PRECAUTIONS

WARNING!



KNOW WHERE UTILITIES ARE

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

WARNING!



EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

WARNING!



REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

WARNING!



END OF LIFE DISPOSAL

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.



OPERATING THE ATTACHMENT

- Operate only from the operator's station.
- Do not stand between prime mover and attachment during installation.
- Avoid steep hillside operation which could cause the prime mover to overturn. Consult your prime move operator's and safety manuals for maximum incline allowable.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- Do not kick or use your hands to pull at debris that has accumulated on/between the blades. Blades are sharp and inadvertent contact could result in serious injury.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off engine and remove the key.

EQUIPMENT SAFETY PRECAUTIONS



TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When transporting on a trailer: Secure attachment using tie down accessories that are capable of maintaining attachment stability.
- Use extra care when loading or unloading the attachment onto a truck or trailer.
- 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., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.



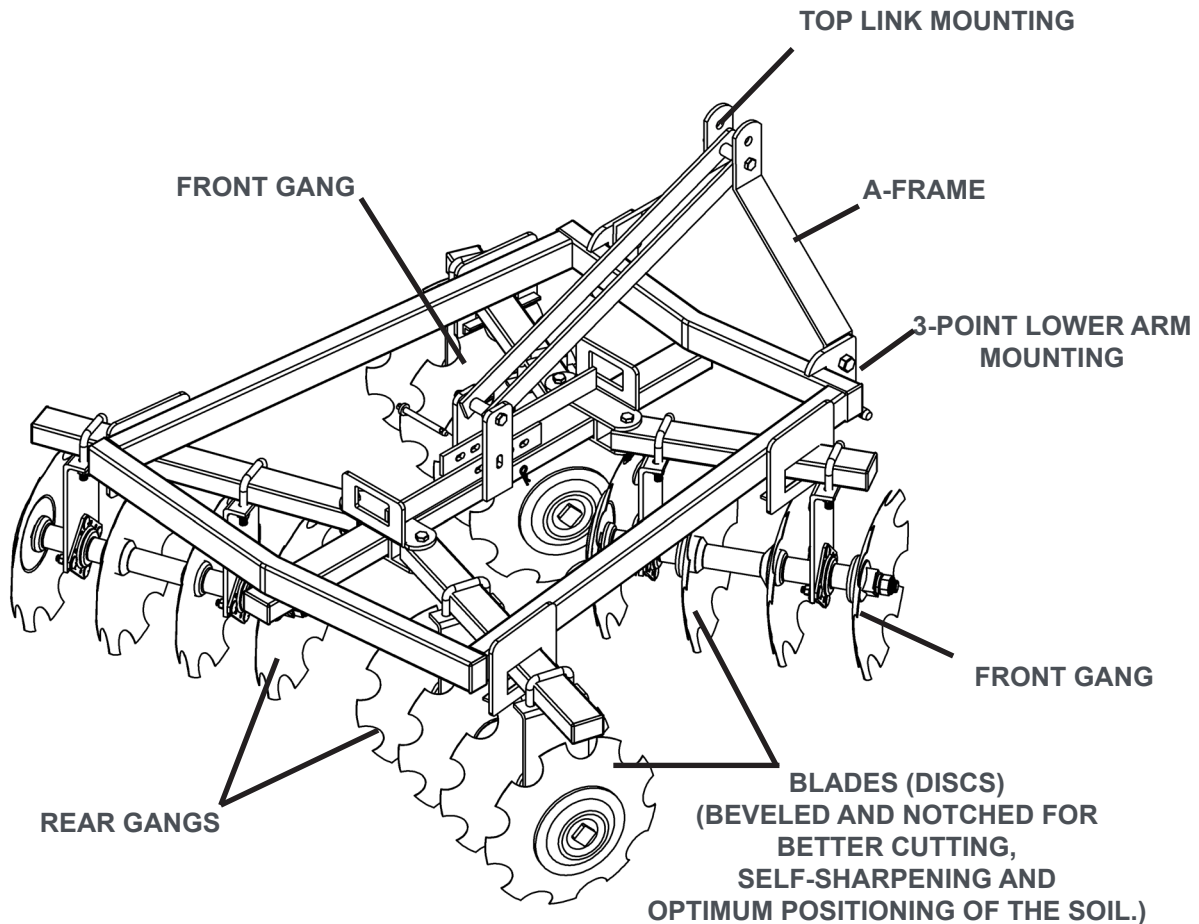
MAINTAINING THE ATTACHMENT

- Before performing maintenance, lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.
- Disc blades are sharp and heavy. Wear gloves when performing maintenance on blades.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator manual's before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from Paladin.
- Never work under a raised attachment unless it is securely blocked.

PREOPERATION

NOMENCLATURE

The purpose of this diagram is to acquaint you with the various names of the Disc Harrow components. This knowledge will be helpful when reading through this manual or when ordering service parts.



GANG: A set of blades (discs) grouped together to work in coordination with each other.

The Disc Harrows are equipped with four gangs. Two “FRONT” gangs are installed with the concavity to the outside and angled forward. These cut into and pulverize the soil while the concavity of the blades are ideal for turning (positioning) the soil. The “REAR” gangs are installed with the concavity to the center and angled back so they gather the material that was turned by the front gangs and level the soil.

INSTALLATION

DANGER!



A crushing hazard exists when installing onto a tractor. Place the tractor in park, set parking brake, shut off engine and remove key before allowing anyone, including the operator, in the area between the tractor and the attachment during installation or detaching the attachment from the tractor. Do not operate the 3-point lift controls while anyone is directly behind the tractor or near the attachment.

GENERAL INFORMATION

The 400 Series Disc Harrows are designed for attaching to a tractor with Cat. I 3-point hitch mounting only while the 500 Series Disc Harrows are designed for attaching to either Cat. I or Cat. II 3-point hitch tractors.

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.
2. Back the tractor to the Disc Harrow aligning the 3-point lower arms with the attachment mounting points.
3. Place the tractor in park, set the parking brake, shut engine off, and remove the key before exiting the prime mover.
4. Connect the attachment to the 3-point hitch lower arms using the pins provided.
5. Remove tractor top link and install onto the attachment A-frame using the capscrew provided.
6. Ensure sway links/chains have been installed to prevent excessive side movement.
7. Verify all mounting procedures have been successfully completed.

NOTICE: After 20 minutes of operation be sure to check the axle nuts due to blades and spacers seating themselves on the axle. See Bolt Torque Specifications.

DETACHING

1. Lower the attachment to the ground, set parking brake, shut engine off, remove the key and exit the prime mover.
2. Unhook top link from attachment A-frame. (Retain pin for re-use).
3. Remove pins securing attachment to lower 3-point hitch arms and carefully remove attachment from lower hitch arms. Reinstall pins for storage.

OPERATION

INTENDED USE:

This unit is designed for seedbed preparation for lawns, gardens, wildlife plots and farm fields. Use in any other way is considered contrary to the intended use.

We recommend getting to know your disc harrow in a safe and cleared area. Become familiar with engine speeds and different ground conditions. Increase engine speed when operating in soft or sandy soil and decrease engine speed when operating in hard ground.

When traveling between work sites, carry the attachment as close to the ground as possible without the blades contacting the surface.

DISC ANGLE

The tandem disc gangs are set up with the front two gangs leading with the outside ends and angled back towards the center. The rear gangs are set up leading with the center and angling back. The gangs have 4 angle adjustments from 10° - 20° on the front gangs and 8° - 17° on the rear gangs.

NOTE: The more angle on the front gangs the deeper more aggressive the cut and the more horsepower required to pull the unit. For a better finish, angle the rear gangs at a lesser angle than the front gangs.

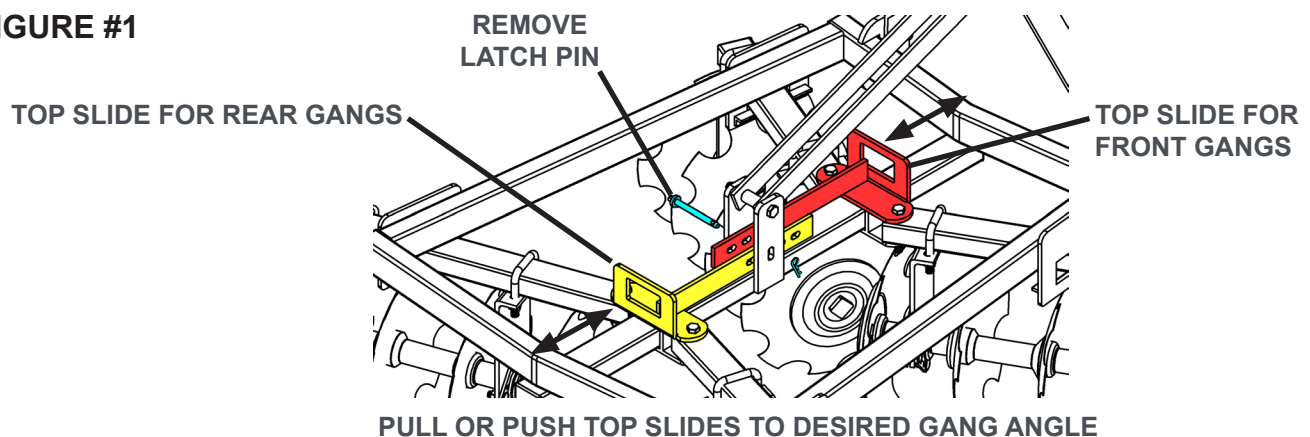
WARNING! Properly block and secure the Disc Harrow off the ground before adjusting the angle. Wear gloves and keep feet out from under blades during all adjustments.



To Adjust Angle: (See Figure #1)

1. With the attachment on a hard level surface, block the disc frame so the blades are off of the ground.
2. Remove latch pin.
3. Push/pull on the front and rear top slides to reach desired angles.
4. Align holes on the top slides and reinstall the latch pin.

FIGURE #1



5. Check the inside blades of the front gangs and verify that the spacing between the blades is as narrow as possible without contacting. The blades on the rear gangs should be centered between the front blades.
6. If center blades are contacting or there is excessive space, re-adjust gang placement on disc harrow arm.

OPERATION

GANG PLACEMENT

There is approximately 4" of adjustment per gang. The front gangs should be spaced with minimal distance between the two center blades while the rear gang blades should be centered between the front blades for optimal performance. Gang adjustments can be made by loosening the U-bolts and sliding the gangs in/out to reach the desired position. Take care that the gangs are equally spaced on both sides and blades are not contacting. Tighten U-bolts after all adjustments have been made.

WARNING! Properly block and secure the Disc Harrow off the ground before adjusting. Wear gloves and keep feet out from under blades during all adjustments.



NOTE: Be sure to torque U-bolt nuts to secure gangs and prevent movement during operation.

DISC LEVELING

The tractor top link is used to adjust/level the disc harrow from front to back while side to side leveling is achieved by adjustment of the tractor's lift arms. The best results are obtained when working with a level attachment.

TRAVEL SPEED

Optimum performance of the Disc Harrow is achieved when traveling 4-5 MPH in most soil conditions. Traveling at a faster speed may cause the front gangs to throw dirt outward to a point where the rear gangs cannot reach the soil to gather it back in and level.

OPERATION

Ground conditions and the finished results will determine front and rear gang angle along with the HP and ground speed required to achieve those results. The gangs have 4 angle adjustments. The more angle the more aggressive the cut and the more HP required.

Achieving your desired results will take a little experimentation with the gang angle and ground speed for different soil conditions. We recommend starting with the rear gangs set at a slightly less angle than the front.

NOTICE: After initial 20 minutes of operation be sure to check the axle nuts due to blades and spacers seating themselves on the axle. After initial start up, check blades (axle nut) for tightness daily before operating. (With the attachment lifted off the ground, strike the blades with a hammer and if you hear a "ting", similar to sound of a tuning fork, the blades are right. If you hear more of a "thud" the blades are loose and the axle nut needs to be tightened.)

NOTE: Do not attempt to disc wet soil as it will build up and stick to the blades. If soil is building up on or sticking to the discs, discontinue operation and wait for the ground to dry.

OPERATION

Remove any trees, limbs, rocks and large debris from the work site.

Once all adjustments have been made you are ready to start. We recommend making a short pass and then stop and inspect the job at hand with the disc harrow still in the operating position (do not raise the attachment before inspecting).

- If there is a “seam” down the center that is uncut; the front gangs are spaced too far apart. Reposition the gangs so the center blades are closer together but not contacting.
- If there is a “valley” down the center; the rear gangs are spaced too far apart. Reposition the rear gangs so the center blades are closer together but not contacting. If this does not correct the issue then lower the rear gangs by lengthening the top link on the tractor.
- If the center not leveling; the rear gangs are spaced too far apart or travel speed is too fast. Reposition the rear gangs so the center blades closer together and adjust travel speed.
- If there is a ridge down the center; the rear gangs are spaced too close or travel speed is too fast. Reposition the rear gangs so the center blades further apart and adjust ground speed. If this does not correct the issue then raise the rear gangs by shortening the top link on the tractor.

NOTE: A steady ground speed is required for optimal performance. Pick a ground speed for your soil condition and then adjust gangs accordingly.

WARNING! Placing weights on the disc frame could cause damage to the frame and VOID warranty.



Once all adjustments have been made you are ready to continue. Be sure to lift the unit at the end of a pass before turning and do not back up with the unit in the ground.

NOTICE: Lift the attachment before traveling in reverse. Never operate the disc in reverse. Machine damage will occur.

NOTE: Lift the attachment before turning. Turning with the disc harrow in the ground will cause extreme side loading on the blades and may cause damage.

NOTICE: Cross ditches and steep slopes at an angle. To prevent disc and/or tractor damage do not travel up and down a ditch or steep slope.

OPERATION

STORAGE

- Clean the unit thoroughly, removing all mud, dirt and grease.
- Inspect for visible signs of wear, breakage or damage. Order any parts required and make the necessary repairs to avoid delays upon removal from storage.
- Tighten loose nuts and capscrews.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

Additional Precautions for Long Term Storage:

- Touch up all unpainted surfaces with paint to avoid rust.


REMOVAL FROM STORAGE:

- Remove cover.
- Wash unit and replace any damage and/or missing parts.

LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components.


- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

WARNING!  **USE LIFTING ACCESSORIES (CHAINS, SLINGS, ROPES, SHACKLES AND ETC.) THAT ARE CAPABLE OF SUPPORTING THE SIZE AND WEIGHT OF YOUR ATTACHMENT. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.**

TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.

WARNING!  **VERIFY THAT ALL TIE DOWN ACCESSORIES (CHAINS, SLINGS, ROPES, SHACKLES AND ETC.) ARE CAPABLE OF MAINTAINING ATTACHMENT STABILITY DURING TRANSPORTING and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.**

OPERATION

TRANSPORTING

Follow all local government regulations that may apply along with recommended tie down points and any equipment safety precautions at the front of this manual when transporting your attachment.

Make sure the disc harrow is in the raised position and blades do not contact the ground before transporting between work sites.

MAINTENANCE

GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

Procedure	Daily (Every 8 Hours)
Check all hardware and tighten if necessary. (See Bolt Torque Specifications)	✓
Replace any missing or damaged bolts or nuts with approved replacement parts.	✓
Replace any missing or damaged blades with approved replacement parts.	✓
Check axle nuts for tightness.	✓

BEARING REPLACEMENT

The whole gang with the damaged bearing will need to be removed from the Disc Harrow to gain access to the bearing.

WARNING! Blades are sharp. Wear gloves and block the gang with damaged bearing, to prevent uncontrolled movement.



1. On a hard level surface, lower the attachment to the ground.
2. Remove the U-bolts securing the two gang stands to the frame.
3. Very carefully lift the attachment and move away from the detached gang.
4. Remove the axle nut and carefully remove the blades, spacers, spools and washers until you have reached the gang stand with the damaged bearing. **NOTE: Keep track of the sequence of the removed parts so they can be reassembled in the same order.**
5. Once you have reached the gang stand with the damaged bearing, replace the old bearing with the new one and torque the carriage bolts securing it to the gang stand.
6. Reassembly the blades, spacers, spools and washers back onto the axle in the same sequence they were removed.
7. Torque axle nut.
8. Lift the attachment and set over the detached gang.
9. Position gang stands on the frame and secure with U-bolts removed in Step #2.

NOTICE: After 20 minutes of operation be sure to re-torque the axle nut due to blades and spacers reseating themselves on the axle.

BLADE REPLACEMENT

The whole gang with the damaged blade will need to be removed from the Disc Harrow to gain access. Follow “Bearing Replacement” instructions until the damaged blade has been reached. Replace blade and reassembly.

MAINTENANCE

BLADE REPLACEMENT

The whole gang with the damaged blade will need to be removed from the Disc Harrow to gain access to the blade.

WARNING! Blades are sharp. Wear gloves and block the gang with damaged blade, to prevent uncontrolled movement.

1. On a hard level surface, lower the attachment to the ground.
2. Remove the U-bolts securing the two gang stands to the frame.
3. Very carefully lift the attachment and move away from the detached gang.
4. Remove the axle nut and carefully remove the blades, spacers, spools and washers until you have reached the damaged blade. **NOTE: Keep track of the sequence of the removed parts so they can be reassembled in the same order.**
5. Replace the damaged blade.
6. Reassembly the blades, spacers, spools and washers back onto the axle in the same sequence they were removed.
7. Torque axle nut.
8. Lift the attachment and set over the detached gang.
9. Position gang stands on the frame and secure with U-bolts removed in Step #2.

NOTICE: After 20 minutes of operation be sure to re-torque the axle nut due to blades and spacers reseating themselves on the axle.

NOTICE:

- *Irregular breaks and chipped or dented edges are caused by contact with rocks, stumps or other solid objects and are not covered under warranty.*
- *Center breakout of the blades are normally caused by loose axle nuts or excessive flexing of the blades and are not covered under warranty.*
- *Straight-line breaks and circular cracks may be caused by defective material and covered under warranty.*

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
SEAM DOWN THE CENTER THAT IS “UNCUT”	Front gangs spaced too far apart.	Reposition the front gangs. (See Gang Placement Instructions)
VALLEY DOWN THE CENTER	Blades not moving enough soil to center.	Reposition the rear gangs. (See Gang Placement Instructions) Increase tractor speed. Lengthen the top link on tractor to tilt rear gangs down.
RIDGE DOWN THE CENTER	Too much soil is being thrown out by the front gangs. Excessive travel speed for soil conditions.	Reduce front gang angle by one position. (See Gang Placement Instructions) Decrease travel speed.
BLADES “CUTTING” INTO AXLE	Axle nut loose.	Inspect axle. Replace if necessary or Torque to specification. (See Bolt Torque Specification)
WILL NOT OPERATE SMOOTHLY	Too much angle for soil conditions.	Decrease angle of front gangs. (See Disc Angle Instructions) Lengthen the top link on tractor to tilt rear gangs down.
WILL NOT PENETRATE SOIL PROPERLY	Not enough angle on front gangs.	Increase angle of front gangs. (See Disc Angle Instructions)
BLADES NOT TURNING	Damaged bearing.	Replace bearing.
BEARINGS “SQUEAKING”	Damaged bearing.	Replace bearing.

BOLT TORQUE SPECIFICATION

GENERAL TORQUE SPECIFICATION TABLES


Use the following charts when determining bolt torque specifications, when special torques are not given. Always use grade 5 or better when replacing bolts.

SAE BOLT TORQUE SPECIFICATIONS


Note: The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Ft-lbs		Newton-Meter		Ft-lbs		Newton-Meter		
Inches	mm	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6,35	8	9	11	12	10	13	14	18	
5/16	7,94	14	17	19	23	20	25	27	34	
3/8	9,53	30	36	41	49	38	46	52	62	
7/16	11,11	46	54	62	73	60	71	81	96	
1/2	12,70	68	82	92	111	94	112	127	152	
9/16	14,29	94	112	127	152	136	163	184	221	
5/8	15,88	128	153	174	207	187	224	254	304	
3/4	19,05	230	275	312	373	323	395	438	536	
7/8	22,23	340	408	461	553	510	612	691	830	
1	25,40	493	592	668	803	765	918	1037	1245	
1-1/8	25,58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31,75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34,93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38,10	1649	1870	2236	2535	2686	3026	3642	4103	


Grade 2



Grade 5






Grade 8



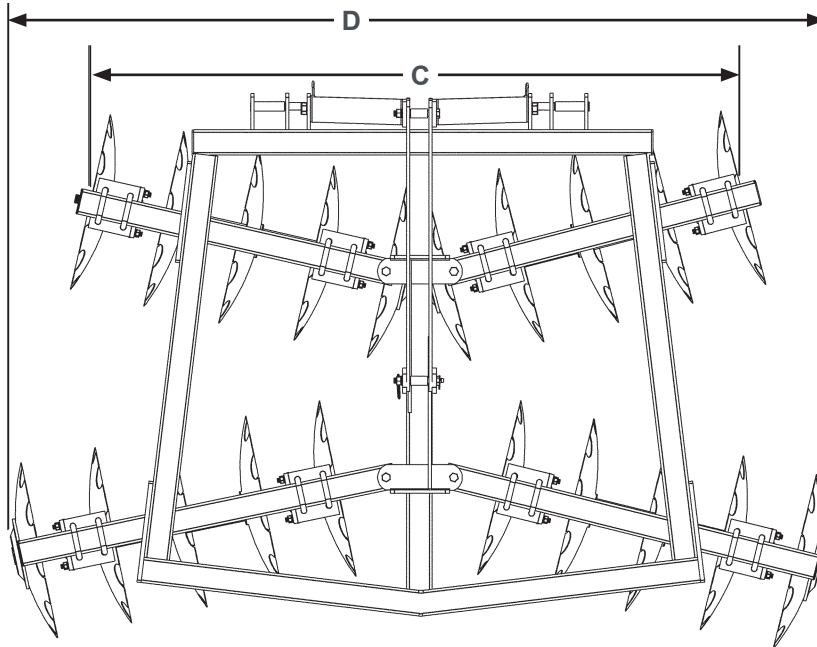
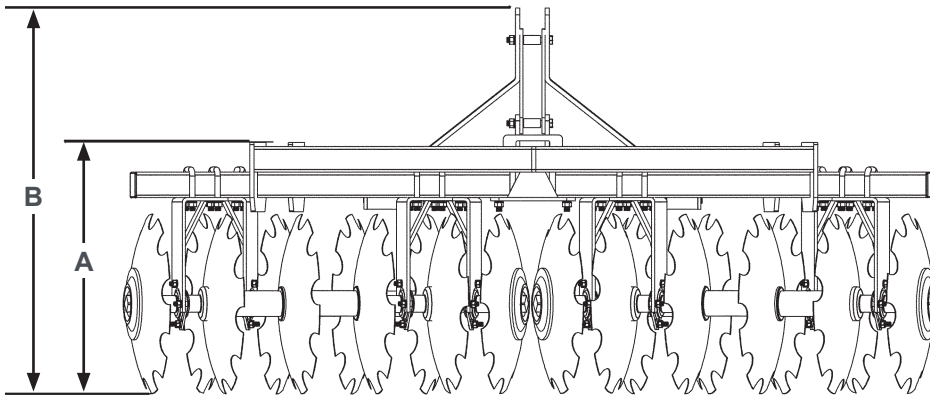
METRIC BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

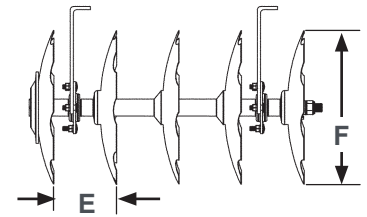
Bolt head identification marks as per grade.		
		

Bolt Size	Grade No.	Pitch (mm)	Ft-lbs	Newton-Meter	Pitch (mm)	Ft-lbs	Newton-Meter
M6	5.6	1,0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1,25	7.2-14	9.8-19	1,0	12-17	16,3-23
	8.8		17-22	23-29,8		19-27	25,7-36,6
	10.9		20-26	27,1-35,2		22-31	29,8-42
M10	5.6	1,5	20-25	27,1-33,9	1,25	20-29	27,1-39,3
	8.8		34-40	46,1-54,2		35-47	47,4-63,7
	10.9		38-46	51,5-62,3		40-52	54,2-70,5
M12	5.6	1,75	28-34	37,9-46,1	1,25	31-41	42-55,6
	8.8		51-59	69,1-79,9		56-68	75,9-92,1
	10.9		57-66	77,2-89,4		62-75	84-101,6
M14	5.6	2,0	49-56	66,4-75,9	1,5	52-64	70,5-86,7
	8.8		81-93	109,8-126		90-106	122-143,6
	10.9		96-109	130,1-147,7		107-124	145-168
M16	5.6	2,0	67-77	90,8-104,3	1,5	69-83	93,5-112,5
	8.8		116-130	157,2-176,2		120-138	162,6-187
	10.9		129-145	174,8-196,5		140-158	189,7-214,1
M18	5.6	2,0	88-100	119,2-136	1,5	100-117	136-158,5
	8.8		150-168	203,3-227,6		177-199	239,8-269,6
	10.9		175-194	237,1-262,9		202-231	273,7-313
M20	5.6	2,5	108-130	146,3-176,2	1,5	132-150	178,9-203,3
	8.8		186-205	252-277,8		206-242	279,1-327,9
	10.9		213-249	288,6-337,4		246-289	333,3-391,6

SPECIFICATIONS



20X20X9 DISC HARROW SHOWN



20X18X7 DISC GANG SHOWN

	400 SERIES			500 SERIES		
DESCRIPTION	16X16X7	16X18X7	20X18X7	20X20X7	20X20X9	24X20X7
A. Height (To Frame)	25"	25"	25"	28"	28"	28"
B. Height (To A-Frame)	42"	42"	42"	45"	45"	45"
C. Width of Cut	54"	56"	72"	72"	80"	80"
D. Overall Width	66"	66"	75"	84"	90"	90"
E. Blade Spacing	7"	7"	7"	7"	9"	7"
F. Blade Diameter	16"	18"	18"	20"	20"	20"
Number of Blades (Discs)	16	16	20	20	20	24
Frame Size	2" X 3"	2" X 3"	2" X 3"	3" X 3"	3" X 3"	3" X 3"
Prime Mover HP Range	20-25	25-35	30-40	35-45	40-55	45-70
Approximate Weight	620#	640#	700#	920#	1010#	1100#
NOTE: These dimensions are approximate and based on medium angle settings. Please take into consideration that the disc gangs are adjustable on the frame so dimensions will vary.						

PARTS

In order to provide you with the most UP-TO-DATE part information, all parts for this attachment have been moved to our website at www.paladinattachments.com/Manuals. Please use these diagrams and parts lists to locate replacement parts.

When servicing your attachment, remember to use only original manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering when contacting the factory, please have the product control number (PCN or C/N) or model and serial number of your product ready to ensure that you receive the correct parts for your specific attachment.

The product control number, model and serial number for your attachment should be recorded in the space provided on the cover of this manual. This information may be obtained from the serial number identification plate located on your attachment.

NOTE: Most daily and emergency parts orders (in stock) received by 10:30 A.M. (Eastern Standard Time) will be shipped UPS Ground the same day received. UPS Next Day orders must be received by 1:30 PM (Eastern Standard Time.)

SERVICE DEPARTMENT

(734) 996-9116

(800) 456-7100

For Fax and E-mail Orders

PLC_Sales@paladinattachments.com

(734) 996-9014

WARRANTY

In order to provide you with the most UP-TO-DATE Warranty information, Paladin Warranty Statement and Warranty Procedures along with Warranty Registration and Claim Forms have been moved to our website at www.paladinattachments.com.