INSTALLATION & MAINTENANCE MANUAL

6.63” Disc Cutters

FA48890F

Publication No. 050169A

Rev. No. 220811 R230810

© Akkerman Inc. 2022, 2023
All Rights Reserved

Akkerman Inc. 58256 266th Street Brownsdale, MN 55918
Phone: 507-567-2261 Fax: 507-567-2605 email: akk@akkerman.com

SERVICE • RELIABILITY • INNOVATION

Introduction

This manual contains safety, installation and maintenance information for your disc cutters. You must read and understand this manual and your tunneling equipment operation manuals before you operate and maintain this equipment. Keep this manual with your equipment at all times. Additional copies of this manual may be purchased from the Akkerman Aftermarket Support Department, or downloaded from the Akkerman web site at www.akkerman.com.

The contractor is responsible for the overall safety program on the job site. Use this manual as a part of the safety program.

The use of second rate parts could affect the efficient performance of the disc cutters. ALWAYS use genuine Akkerman parts.

Understand safety signal words, DANGER, WARNING, CAUTION, SAFETY INSTRUCTIONS, and NOTICE. When you see these words in this manual or on safety decals mounted on your equipment, follow the safety message to avoid personal injury and/or property damage.

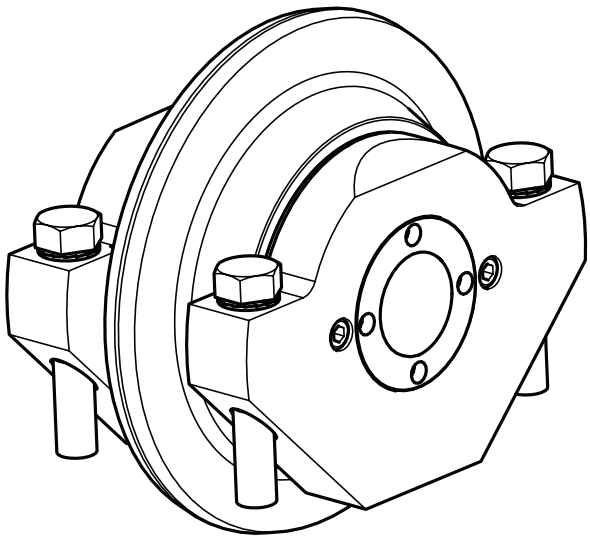
⚠DANGER Indicates an extremely hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠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.

SAFETY INSTRUCTIONS Usually consists of individual messages stating procedures or actions that must be followed for the safe operation of a product.

NOTICE Identifies potential property damage and important installation, operator, or maintenance information.



Akkerman 6.63” Disc Cutters

The disc cutters mounted on the cutter head, front loaded, can cut through hard and abrasive rock.

If you find any errors with this manual or know of ways to improve procedures, please let us know.
Mail your suggestions to: ATTN: Technical Publications
Akkerman Inc, 58256 266th Street, Brownsdale, MN 55918

Akkerman Inc. reserves the right to improve its product without notice or obligation.

NOTES

Contents

Safety 1
- Be Alert For Safety Information 1-1
- Read Operator's Manual 1-1
- Wear Protective Clothing 1-1
- Fire Prevention 1-2
- Welding Safety 1-2
- Unauthorized Welding 1-3
- Lockout Tagout Power Before Servicing 1-3
- Practice Safe Maintenance 1-3
- Beware of Suspended Loads 1-4
- Avoid Pinch Points 1-4
- Regularly Clean/Inspect Equipment 1-4
- Keep Job Site Clean & Organized 1-5
- Slippery When Wet 1-5
- No Smoking In Tunnel 1-5
- Recycle Waste 1-5

Terminology 2

Installation 3
- Installing Disc Cutter Assembly 3-1

Pre-Start Inspection 4

Lubricants 5

Periodic Maintenance..... 6
- Lockout Tagout Power Before Servicing 6-1
- Avoid Pinch Points 6-1
- Welding Safety 6-1
- Maintenance Charts 6-2
  - Prior To Each Drive Launch 6-2
  - Completion Of Each Drive 6-3
- Maintenance Procedures 6-4
  - Prior To Each Drive Launch 6-4
    - Check & Purge Cutter Grease 6-4
    - Inspect Disc Cutter Tooling 6-5
    - Inspect Gage Disc Cutter Wear 6-5
    - Inspect Face Disc Cutter Wear 6-6
    - Check Cutter Mounting Hardware..... 6-6
    - Clean Cutter 6-7
    - Clean Cutter Housing 6-7
    - Installing Disc Cutters 6-8
  - Completion Of Each Drive 6-9
    - Inspect Disc Cutter Tooling 6-9
    - Clean Cutter 6-9
    - Clean Cutter Housing 6-9

Storage 7
- Preparing For Storage 7-1
- Removing From Storage 7-1

Troubleshooting 8

Specifications 9
- General Specifications 9-1
- Torque Chart 9-2

Safety Data Sheets 10

Warranty 11

Index 12

NOTES

Safety

BE ALERT FOR SAFETY INFORMATION

When you see this safety alert symbol on your equipment or in this manual, be alert to the possibility of personal injury or property damage.

Read all safety information.

Keep safety decals clean and in good condition. Replace missing or damaged safety decals.

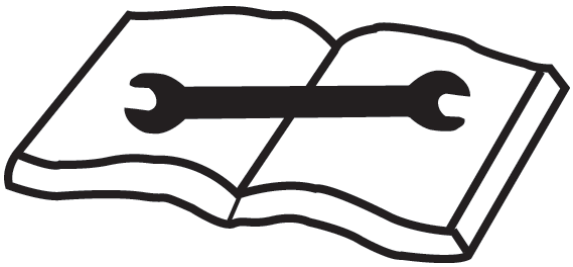
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

READ OPERATOR'S MANUAL

⚠WARNING Unsafe operation or maintenance can cause severe injury or death.

Read and understand this Maintenance Manual and your Akkerman equipment Operator's Manual before operating or servicing this equipment.

Any unauthorized modifications will void the warranty.



WEAR PROTECTIVE CLOTHING

Wear OSHA approved protective clothing, such as hard hat, gloves, safety goggles, earmuffs or ear plugs, face shield, welding helmet, welding apron, and steel-toed boots, when operating and servicing this equipment.

Wear reasonably close fitting clothing and remove jewelry before working on or near this equipment. This will help prevent the danger of catching them in moving parts or controls.

FIRE PREVENTION

⚠CAUTION Fires can cause injury or property damage.

Keep equipment clean. Remove all debris from equipment.

Hot slags or sparks while welding can cause fires. Remove all combustible materials away from work area.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

WELDING SAFETY

Before welding, read and understand all safety precautions in your welding equipment manuals.

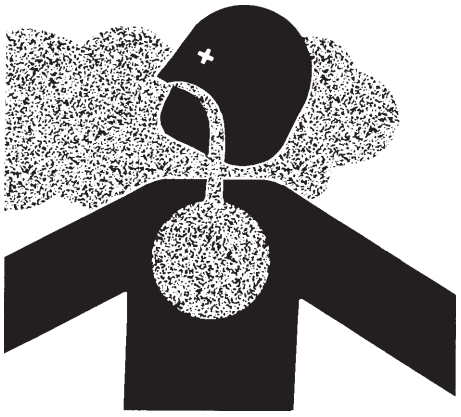
⚠WARNING Electric shock can kill.

Do not touch live electrical parts. Wear dry, flameproof, insulated gloves and clothing to protect your hands, body, and head from work and ground.

Be sure the proper size ground cable is connected to the work piece as close to the work area as possible.

Always ground the power supply by connecting a ground wire between the power supply and an approved electrical ground.

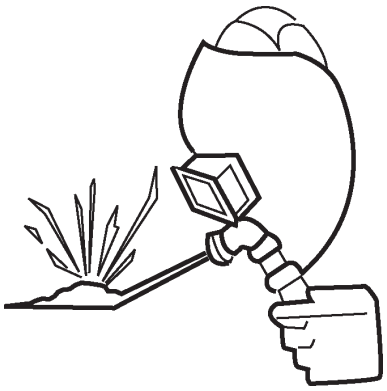
Do not coil or loop cable around parts of the body.



⚠WARNING Breathing fumes and gases can cause serious injury or death.

Keep your head out of fumes.

Use proper ventilation or exhaust fans to remove fumes from breathing zone.

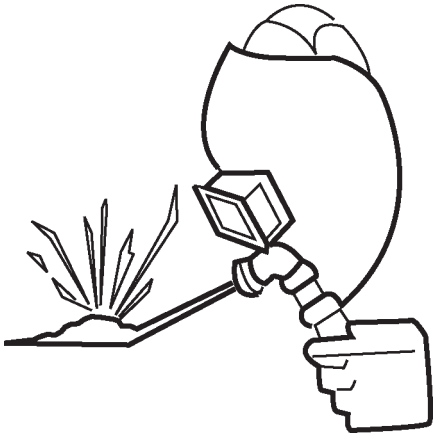


⚠WARNING Arc rays can cause serious injury.

Wear a welding helmet with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc.

Warn bystanders not to watch the arc.

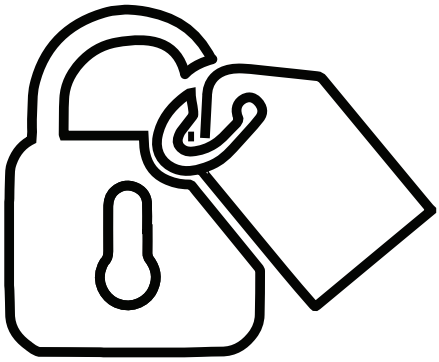
UNAUTHORIZED WELDING



⚠WARNING Unauthorized welding can cause structural failure resulting in possible injury or death.

Do not weld on any structural member. Unauthorized welding or repair will void the warranty.

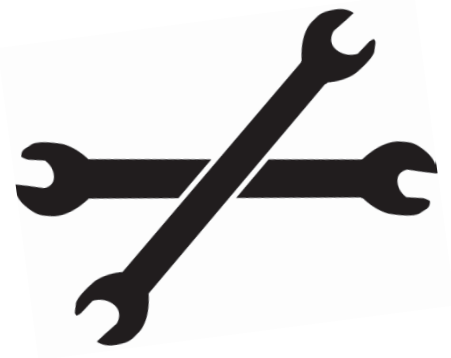
LOCKOUT TAGOUT POWER BEFORE SERVICING



⚠WARNING Failure to lockout tagout power before servicing can cause severe personal injury or death.

LOCKOUT TAGOUT power before performing any maintenance.

PRACTICE SAFE MAINTENANCE



⚠WARNING Unexpected equipment movement may cause serious personal injury.

LOCKOUT TAGOUT power before performing any maintenance.

Shut down equipment before making repairs, adjustments, or removing obstructions.

Only trained and qualified personnel should perform any maintenance or repairs.

Keep the area around the equipment clean and dry when performing maintenance.

Do not service the machine while it is in motion.

Replace worn or damaged parts. Remove grease, oil, or debris buildup.

BEWARE OF SUSPENDED LOADS

⚠WARNING Suspended loads may fall and cause severe personal injury or death.

If a hydraulic hose from the boom of a crane or excavator breaks, or the chain or cable from the boom breaks, the boom and/or load can fall instantly.

Do not enter area under or around a load.

AVOID PINCH POINTS

⚠WARNING Moving parts or the mishandling of parts can cause severe injury.

Keep hands and legs away from moving parts.

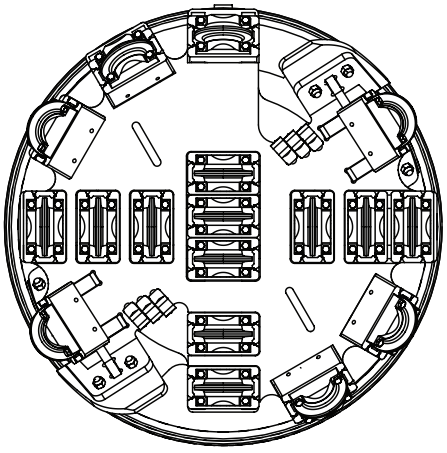
Watch your fingers, hands and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

REGULARLY CLEAN AND INSPECT EQUIPMENT

Remove any grease, oil, or debris buildup to avoid potential injury or equipment damage.

Inspect equipment for damage. If damaged, repair or replace immediately.



KEEP JOB SITE CLEAN AND ORGANIZED

⚠WARNING Tripping can cause serious personal injury.

Be sure to keep job site clean and organized.

SLIPPERY WHEN WET

⚠WARNING Slips and falls can cause serious personal injury.

Ensure firm footing in wet or slippery conditions.

Replace skid-resistant material if it is damaged or missing to prevent slips and falls.

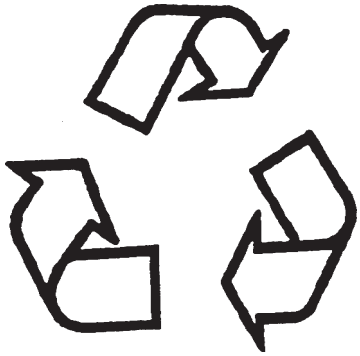
Remove any buildup of grease, oil, or debris.

NO SMOKING IN TUNNEL

⚠WARNING Smoking in shaft or tunnel could cause an explosion if combustible gases are present.

Do not smoke in shaft or tunnel.

RECYCLE WASTE



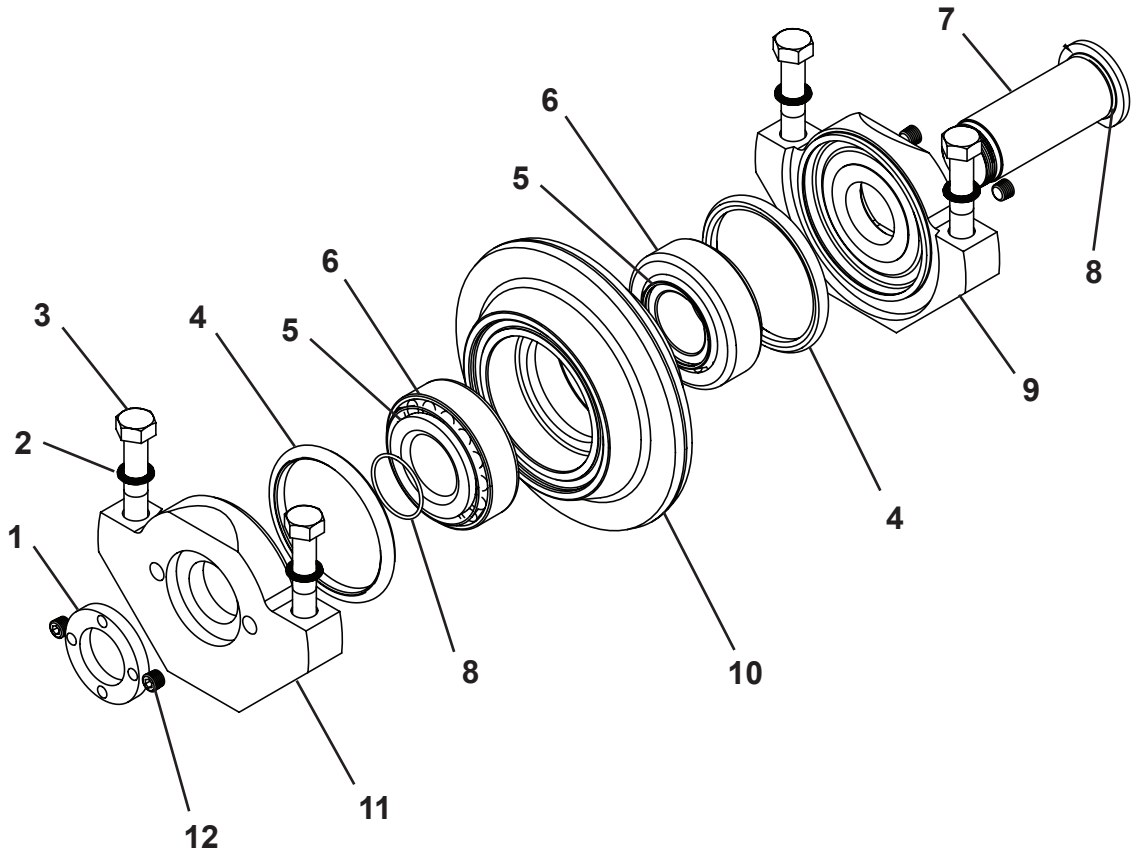
Follow local, state, federal, and international regulations when recycling or disposing of waste. Waste includes fluids/oil, fuel, filters, coolant, and batteries.

Use leakproof containers when draining fluids/oil. Do not pour waste on the ground, down a drain, or into any water source.

NOTES

Terminology

DISC CUTTER 6.63”



1. Disc Cutter Nut (A48895P)
2. Lock Washer-Nord 1/2” (P0043-003)
3. Mounting Bolt (P0001-08-011B)
   Hex 1/2 UNC x 2.75 Grade 9
4. Mechanical Seal (P0088-230)
5. Tapered Roller Bearing Cone (P0065-302)
6. Tapered Roller Bearing Cup (P0065-301)
7. Disc Cutter Shaft (A48892P)
8. Oring (P0085-028)
9. Disc Cutter End Plate (A48893P)
10. Disc Cutter 6.63” (A48891P)
11. Disc Cutter End Plate (A48894P)
12. Plug (P0300-144)

NOTES

Installation

INSTALLING DISC CUTTER ASSEMBLY

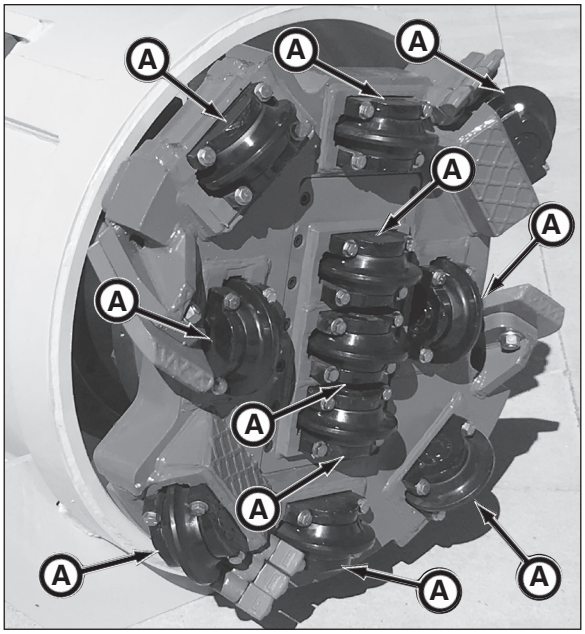
The disc cutter assembly (FA48890F) must be properly torqued using a gradual, three pass criss cross tightening sequence so the bolts can evenly carry the load. Failure to follow the procedure below may result in disc cutter failure.

DO NOT install a disc cutter assembly if:

- Signs of lubricant leakage around disc cutter and end plates.
- Disc cutter has flat spots or polished marks.
- Disc cutter is cracked, shows signs of chipping or other excessive wear.
- Disc cutter cannot rotate.
- While rotating disc cutter, there are areas of high and low resistance.
- One hand can rotate disc cutter.
- Rotating disc cutter with two hands with high resistance.

IMPORTANT: When disc cutters are installed on cutterhead, the “D” shaped end (A) of the shaft should point towards the outside of the cutterhead and nut should be towards the inside of the cutterhead. Failure to do so may cause premature failure.

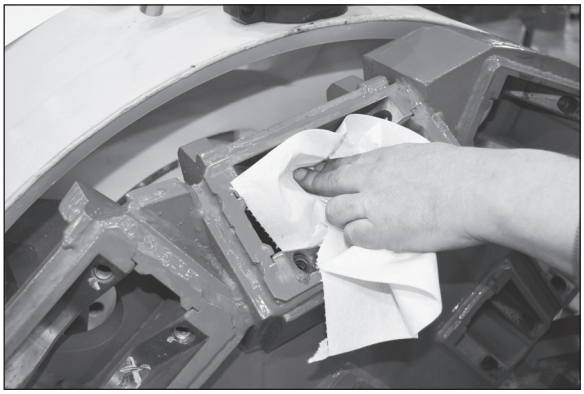
For the center disc cutters, the center line of the cutterhead will determine the placement of the “D” shaped end of the cutter.



Placement of “D” Shaped End (A) of Cutter Shaft

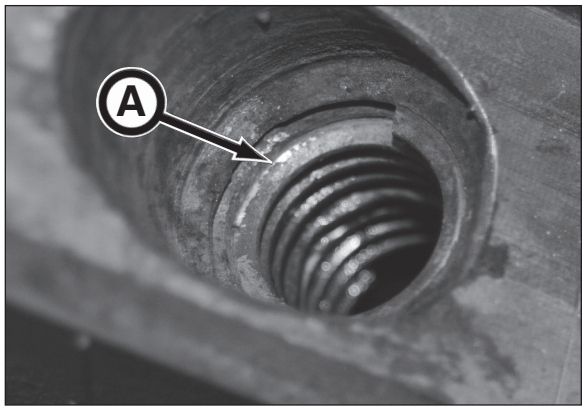
1. Clean disc cutter pocket area.

2. Check and remove any debris.

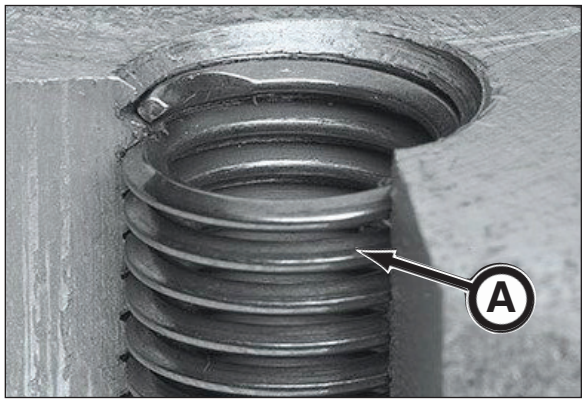


(Continued on next page)

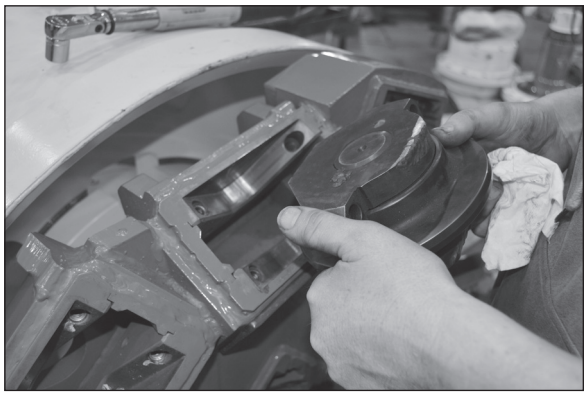
3. Make sure Heli-Coil® insert (A) is one thread down from top of tapped hole. If not, the Heli-Coil must be replaced. Contact your Akkerman Aftermarket Support representative for more information.



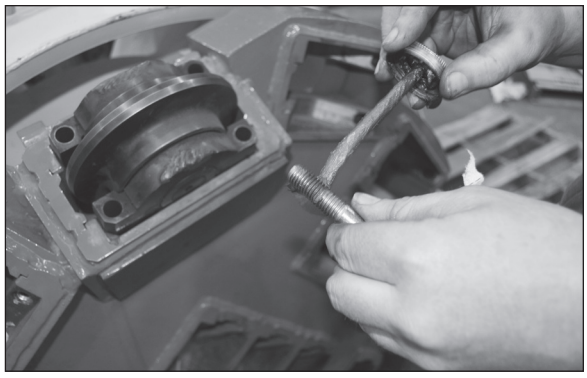
NOTICE Due to Heli-Coil design, you will not be able to hand tighten bolt completely.



4. Install disc cutter assembly into pocket. Be sure it is fully seated into pocket.

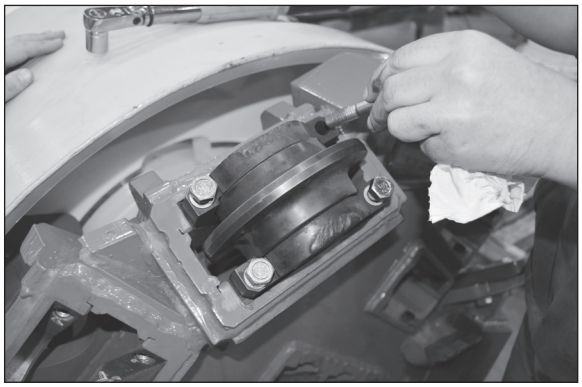


5. Apply anti-sieze compound on bolt threads.



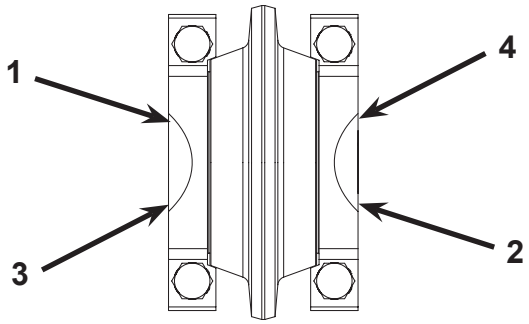
(Continued on next page)

6. Install and hand tighten bolts with 1/2 Nord-Lock washer on assembly.



7. Snug up the bolts to assembly, **DO NOT TORQUE BOLTS.**

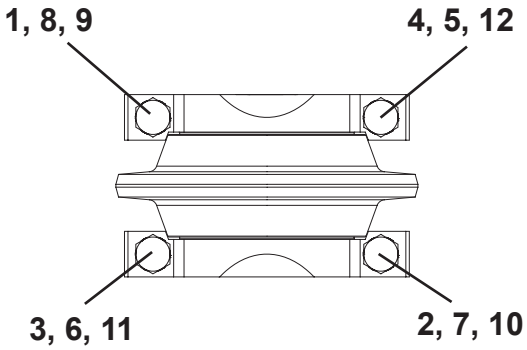
8. To fully seat the disc cutter assembly, use a dead blow hammer at an angle to the hard facing surfaces in a criss cross pattern as shown.



(Continued on next page)

9. Using a calibrated torque wrench, torque bolts in a gradual criss cross tightening sequence in three passes at approximately 30%, 60% and 100% of the final torque value of 94 ft-lb (127 N·m) (lubricated):

- ***First Pass 30 ft-lb torque:*** follow pattern 1, 2, 3 and 4
- ***Second Pass 60 ft-lb torque:*** follow pattern 5, 6, 7 and 8
- ***Third & Final Pass 94 ft-lb torque:*** follow pattern 9, 10, 11 and 12



10. **Final Torque Check**

Launch disc cutter head with full disc cutter assembly engagement and then advance an additional 18 in. (457 mm). Then pullback and recheck the torque [94 ft-lb (127 N·m) (lubricated)] on all bolts. If bolts are warn, damaged or do not hold torque, the bolts and nord-lock washers must be replaced with new.

RBU Shown

Pre-Start Inspection

⚠WARNING Do not operate this equipment until you read, study, and understand this manual, your other Akkerman tunneling equipment operation manuals and any other support equipment manuals. A daily inspection of the equipment must be performed to prevent severe personal injury or death and equipment damage.

The contractor is fully responsible for the safety of all personnel on the job site.

Check with the contractor that all site preparation requirements are in place. Be sure to comply with all OSHA regulations, such as: an active safety program is in practice, a confined space permit (if needed) is issued, personal protective equipment is being worn; flammable, combustible, and hazardous materials are properly stored; and a lockout tagout procedure is in place.

Use the following checklist ✓ as a guide for your disc cutter launch pre-start inspection.

	1. Read and understand this manual and your tunneling equipment operation manuals.
	2. Contractor is responsible for all personnel to wear proper protective equipment on the job site. Replace equipment if defective.
	3. Keep job site clean and organized.
	4. Be sure equipment is properly maintained.
	5. Check cutters for damage. If disc cutter is cracked, flat spots, shows signs of chipping or other excessive wear, the disc cutter must be replaced.
	6. Purge grease from disc cutter and replace with clean, fresh BioGrease HD 1 grease before each launch.
	7. Visually inspect bolts and lock washers for damage. Be sure to replace with identical hardware.
	8. Inspect each cutter for leakage. If leakage is found, the cutter must be replaced or repaired.
	9. Check for loose or missing hardware. Replace damaged or missing hardware.
	10. Check that each cutter rotates by hand with considerable resistance. If not, the cutter must be repaired or replaced.
	11. Replacement cutters MUST be stored in a cool location and out of direct sunlight otherwise the grease may expand and damage the seals.

NOTES

Lubricants

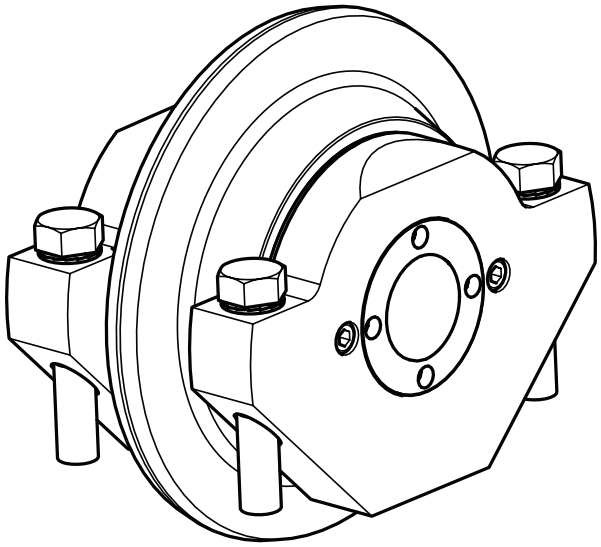
NOTICE Use of inferior lubricants can affect the efficient performance of your disc cutters. Always use high quality lubricants as specified in this section.
Refer to Section 5, Periodic Maintenance for proper lubrication procedure and maintenance intervals.

GREASE

The disc cutter assembly is factory lubricated with BioBlend BioGrease HD 1 lithium grease.

The BioGrease HD 1 grease is a special high temperature, high performance, lithium grease.

Use BioGrease HD 1 grease or equivalent when lubricating the disc cutter bearings.



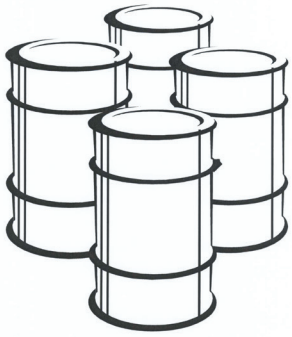
NOTICE Grease fitting is used only for lubricating the cutter. The grease fitting MUST be replaced with drain plug before mounting cutter to cutter head.

NOTICE When the cutters are fully filled with grease, a small amount of air must be added to the cutter to allow for grease expansion created during operation (refer to section 5. Periodic Maintenance). In addition, the cutters MUST be stored in a cool location, out of direct sunlight, otherwise the grease may expand and damage the seals.

STORING LUBRICANTS

Your equipment can operate at maximum performance only if clean lubricants are used. Use clean containers to handle all lubricants.

Lubricants should be stored in an area protected from dust, moisture, and other contaminates.



NOTES

Periodic Maintenance

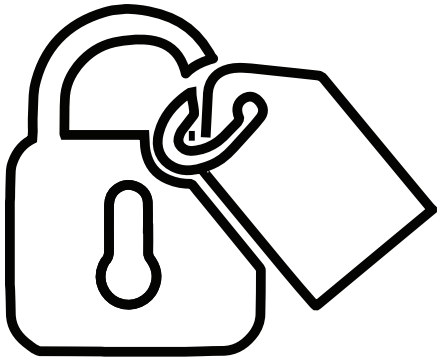
⚠WARNING Review the Safety section in this manual before performing maintenance. Failure to do so, could cause severe injury or death.

The requirements for lubrication and maintenance are shown on the maintenance charts in this section. Intervals of maintenance are based on normal operating conditions. If operating under more difficult conditions, use a shorter time interval between maintenance.

LOCKOUT TAGOUT POWER BEFORE SERVICING

⚠WARNING Severe personal injury or death can result from unexpected machine movement.

LOCKOUT TAGOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout tagout will prevent accidents and save lives. Performing lockout tagout will also prevent the equipment from moving unexpectedly.



AVOID PINCH POINTS

⚠WARNING Moving parts or the mishandling of parts can cause severe injury.

Keep hands and legs away from moving parts.

Handle parts carefully to avoid crushing and pinch point hazards.

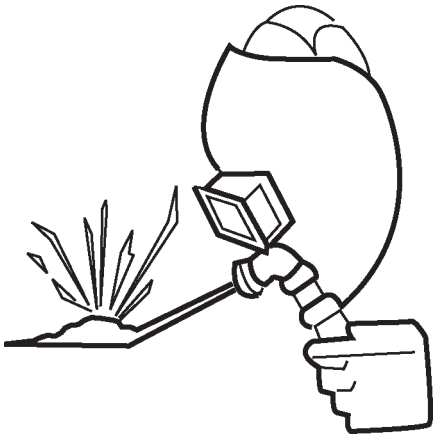
WELDING SAFETY

Before welding, read and understand your welding equipment operation manual including all safety precautions.

Wear proper gloves, clothing, and welding helmet with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc.

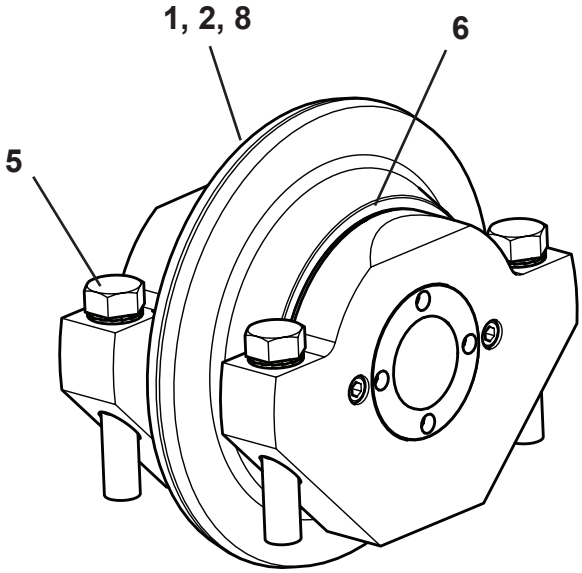
Make sure the welding machine frame is grounded, that neither terminal of the welding generator is bonded to the frame, and that all electrical connections are properly secured. The ground connection must be attached firmly to the work.

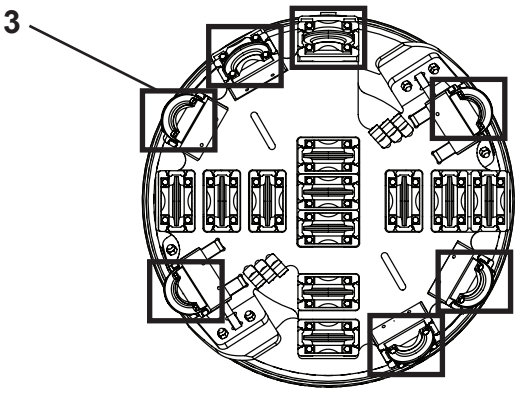
Keep welding cables dry and free of oil or grease. Keep cables in good condition.



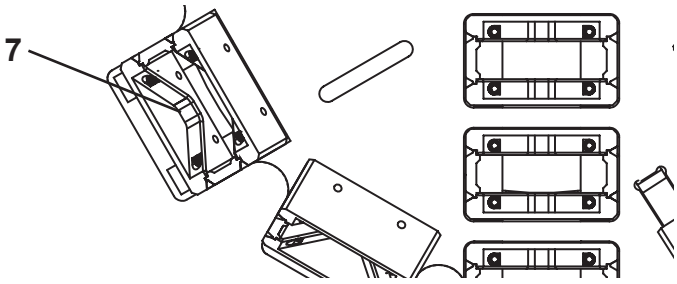
MAINTENANCE CHARTS - DISC CUTTERS

NOTICE Use the item number in the chart to refer to the detailed maintenance procedures starting on page 6-4.

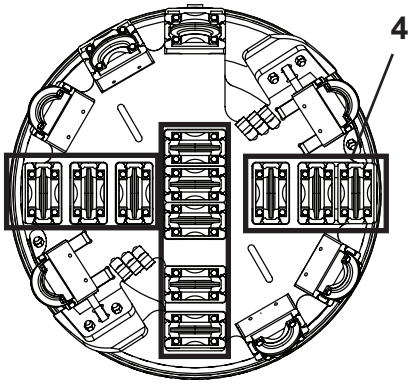




Gage Disc Cutter Locations



Cutterhead

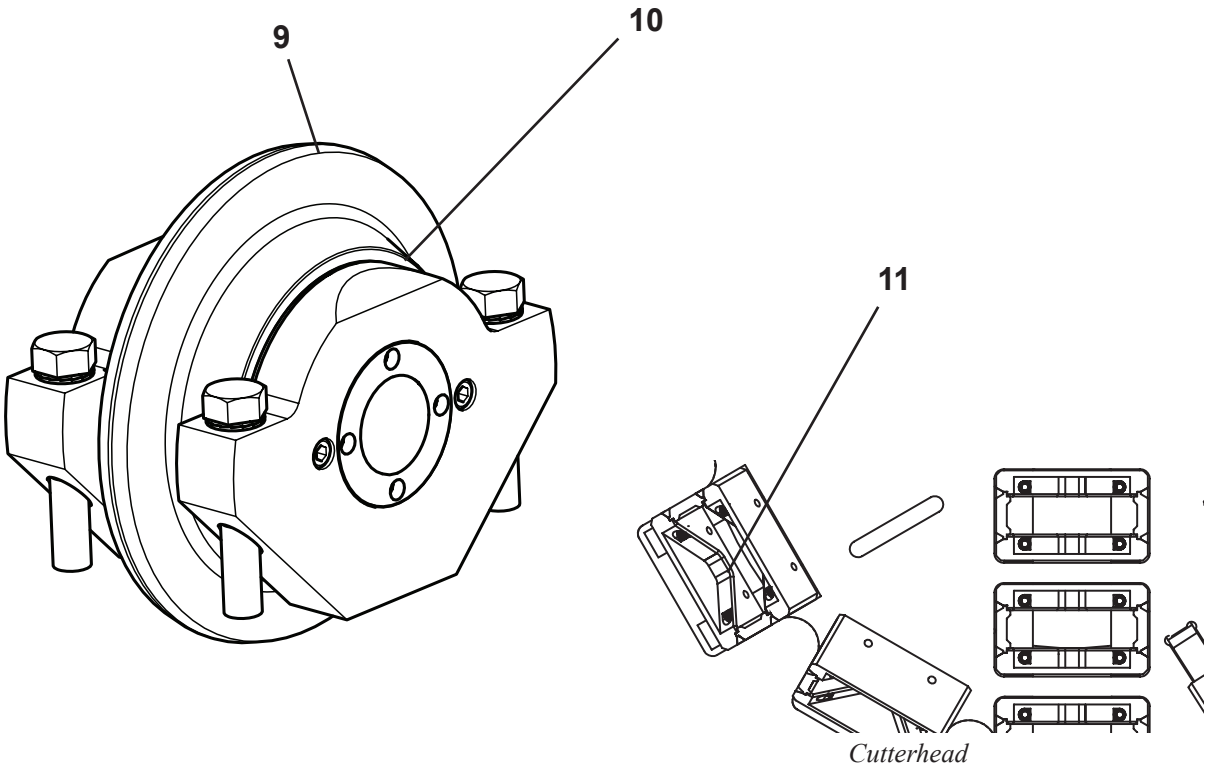


Face Disc Cutter Locations

PRIOR TO EACH DRIVE LAUNCH

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
1.	Disc Cutter	Check & Purge	Purge grease, refill.	BioGrease HD1
2.	Disc Cutters	Inspect		
3.	Gage Disc Cutter	Tooling Wear	Max. wear dia. limit: .5 in. (13 mm)	
4.	Face Disc Cutter	Tooling Wear	Max. wear dia. limit: 1.0 in. (25 mm)	
5.	Disc Cutter Hardware	Visually Check	94 ft-lb (127 N·m) (lube)	Torque Wrench
6.	Disc Cutter	Clean		
7.	Cutter Housing	Thoroughly Clean	Free of sharp edges & foreign matter. Check for wear.	
8.	Disc Cutter	Installation	94 ft-lb (127 N·m) (lube)	Torque Wrench

NOTICE Use the item number in the chart to refer to the detailed maintenance procedures starting on page 6-9.



Cutterhead

COMPLETION OF EACH DRIVE

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
9.	Disc Cutters	Inspect		
10.	Disc Cutter	Clean		
11.	Cutter Housing	Thoroughly Clean	Free of sharp edges & foreign matter. Check for wear.	

PRIOR TO EACH DRIVE LAUNCH

1. CHECK & PURGE CUTTER GREASE

Before each launch, each disc cutter (A) must be removed and the grease on the inside of the cutter must be checked and purged with fresh grease.

a. On one side of the disc cutter, remove plug (B) and take a small sampling of the grease on the inside of the cutter.
If the sampling shows evidence of water, dirt, metal, dark black, burnt smell from the grease or if there is a large void of air on the inside of the disc cutter, the disc cutter must be rebuilt or replaced with new.

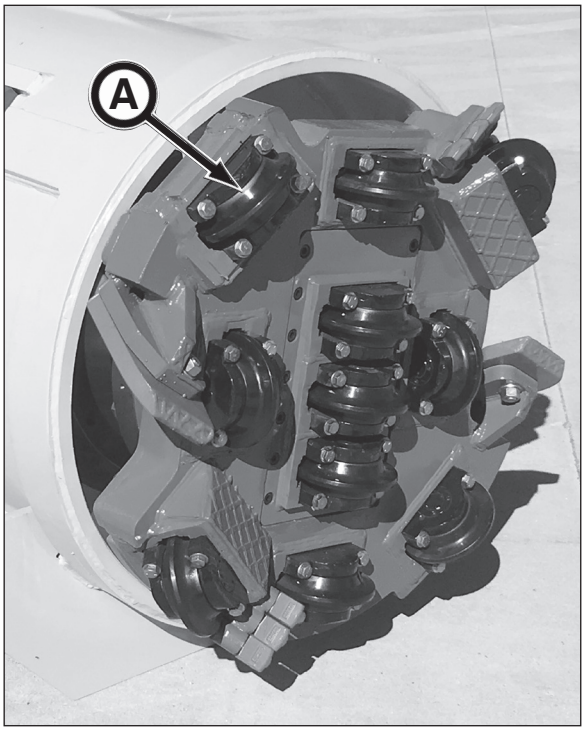
b. On one side of the disc cutter, remove plug (if not already performed in step a) and install a grease fitting. On the other side of the disc cutter, remove both plugs. Pump fresh BioGrease HD 1 grease or equivalent until the old grease is purged out of the open ports.

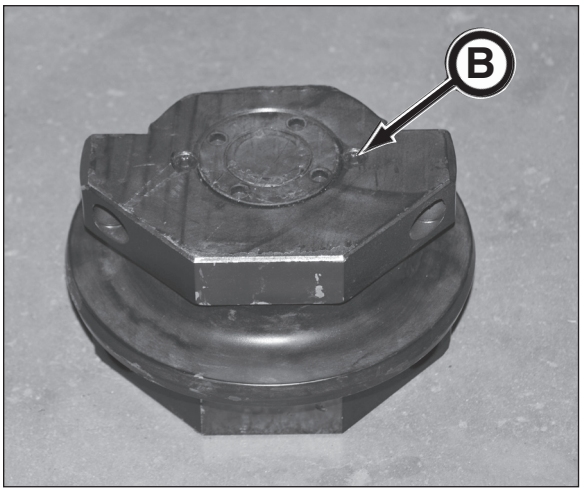
c. After purging grease through disc cutter disc, a small amount of air must be added to the cutter to allow for grease expansion created during cutter operation. Add air to the cutter to only remove a maximum of 1/2 to 1 tsp of grease.

d. Remove grease fitting and replace all plugs.

e. Dispose of grease properly.

NOTICE The cutters should be stored in a cool location, out of direct sunlight.

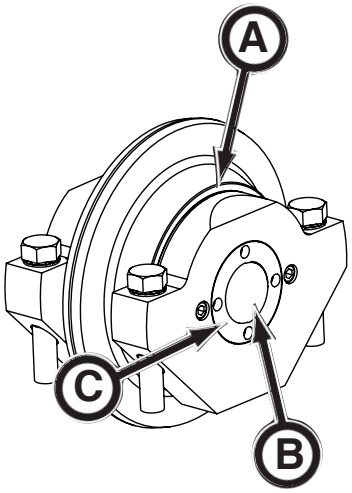




2. INSPECT DISC CUTTER TOOLING

Inspect disc cutters as follows:

1. Check for signs of lubricant leakage from around the cutter end plates and disc cutter (A). If leakage is found, DO NOT install the cutter. The cutter MUST be repaired or replaced before mounting onto cutter head.
2. Inspect disc cutter shaft (B) and nut (C) for damage. If damaged, replace with new disc cutter.
3. If any flat spots or polished marks are visible on the cutter, this is an indication that the cutter is skidding, and is most likely a result of a damaged bearing. Install a new cutter to replace any cutter with polished or flat spots.
4. If a disc cutter is cracked, shows signs of chipping or other excessive wear, the disc cutter must be replaced.
5. If the mounting bolts are worn or damaged, replace with new.



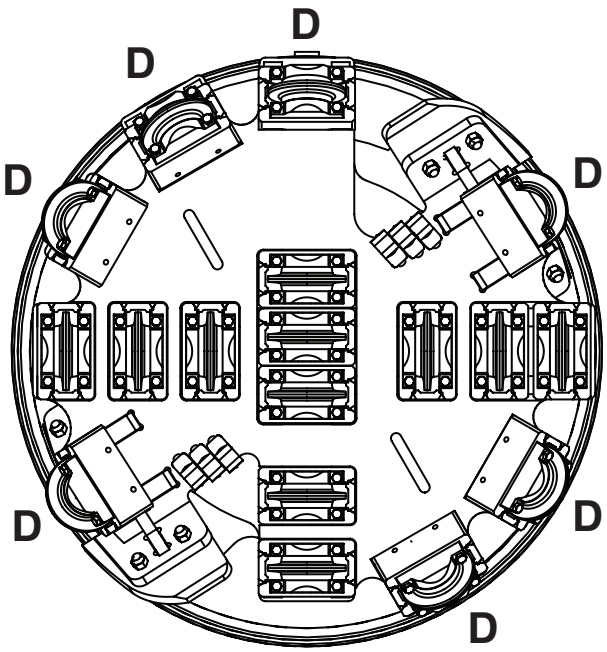
3. INSPECT GAGE DISC CUTTER TOOLING WEAR

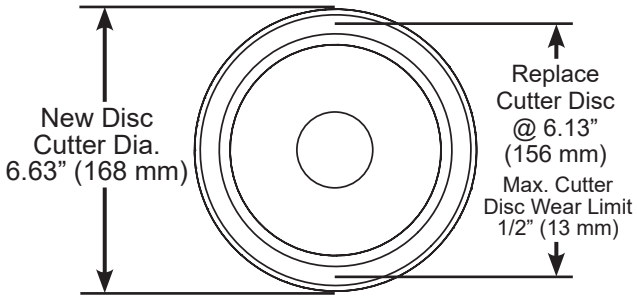
The new FA48890F disc cutters are 6.63 in. (168 mm) diameter.

All gage profile cutters (D) have a maximum cutter disc wear limit of 1/2 in. (13 mm). At the maximum disc cutter wear limit, the disc cutter diameter will be 6.13 in. (156 mm).

The gage profile disc cutters MUST be replaced with new disc cutters when the disc cutter diameter wears to 6.13 in. (156 mm).

The worn gage disc cutters can be used in the face disc cutter locations (refer to item 4 below for face disc cutter wear limit requirements) until the face disc cutter maximum wear limit is met.





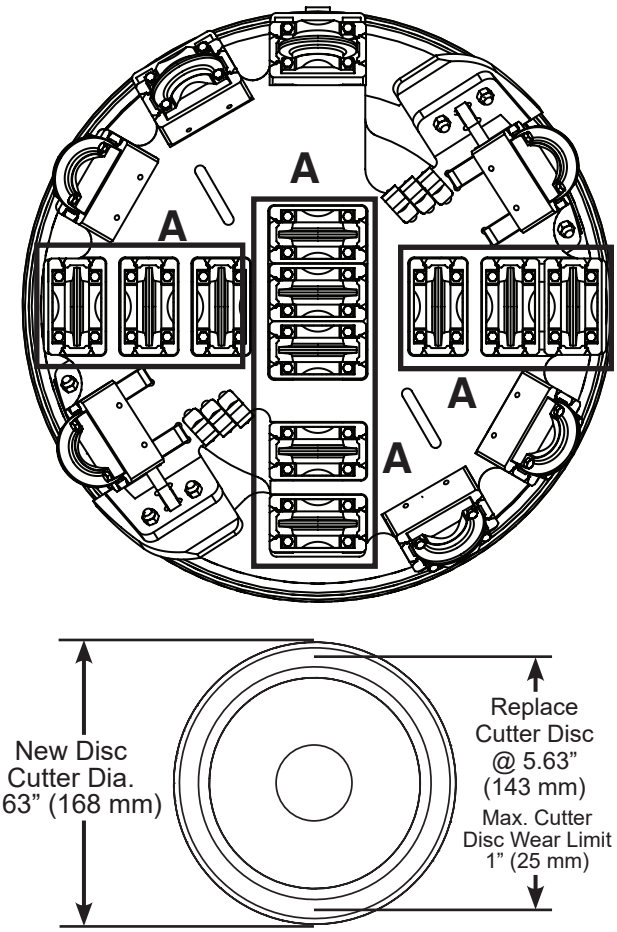
Gage Disc Cutter Maximum Wear Limit

4. INSPECT FACE DISC CUTTER TOOLING WEAR

The new FA48890F disc cutters are 6.63 in. (168 mm) diameter.

All face disc cutters (A) have a maximum cutter disc wear limit of 1 in. (25 mm). At the maximum disc cutter wear limit, the disc cutter diameter will be 5.63 in. (143 mm).

The face disc cutters MUST be replaced with new disc cutters when the disc cutter diameter wears to 5.63 in. (143 mm).



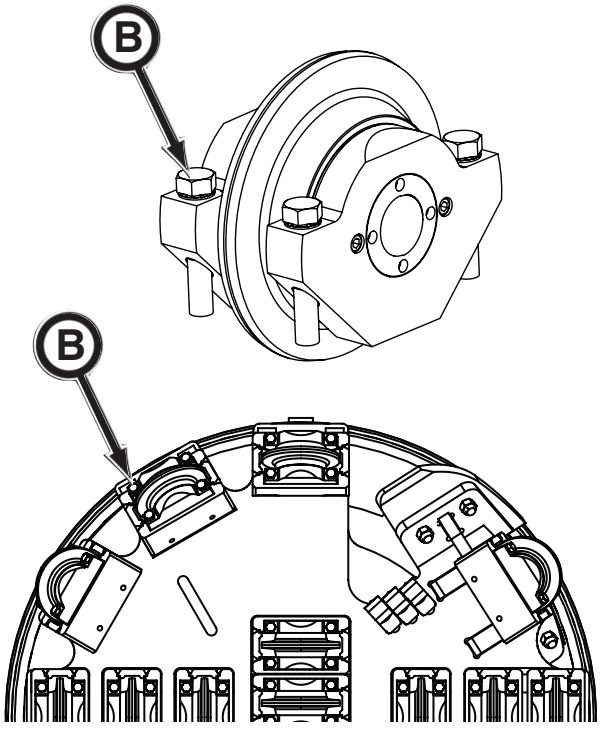
Face Disc Cutter Maximum Wear Limit

5. CHECK DISC CUTTER MOUNTING HARDWARE

Visually check all disc cutter mounting hardware.

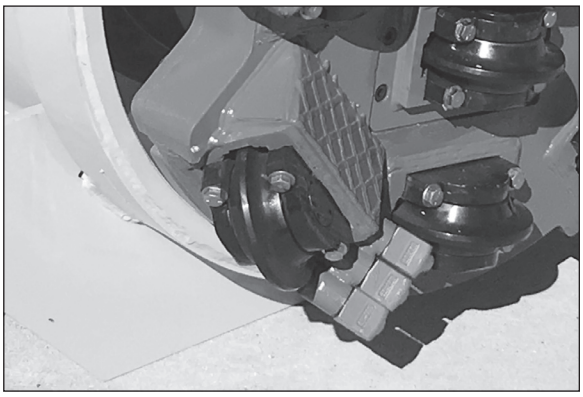
If loose or damaged, replace hardware with new nord lock washers and bolts.

Tighten disc cutter mounting bolts (B) to 94 ft-lb (127 N·m) (lubricated) torque.



6. CLEAN CUTTER

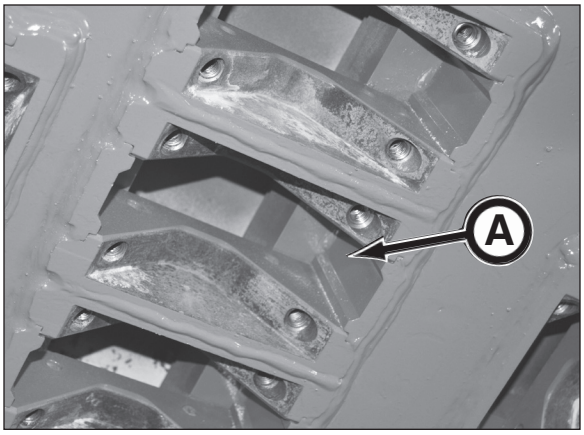
Completely clean the cutter externally including the grooves between the disc cutter and mount. If debris is allowed to dry in these areas, it will be difficult to rotate the disc cutter resulting in failure.



7. CLEAN CUTTER HOUSING

1. When the disc cutters are removed, thoroughly clean the cutter housing (A). Be sure the housing area is clean and free of any sharp edges, protrusions and other foreign matter.

2. Inspect the housing and mounts for excessive wear. Repair or replace as needed.



8. INSTALLING DISC CUTTERS

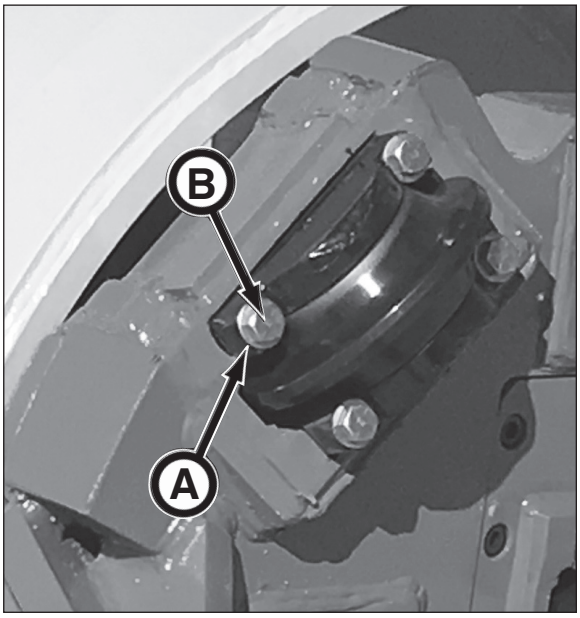
For proper disc cutter installation, refer to Installing Disc Cutter Assembly in section 3, Installation.

When installing new, repaired or rebuilt disc cutters, ALWAYS replace with new hardware.

- PN: P0043-003 (A)
  WASHER, Nord Lock 1/2

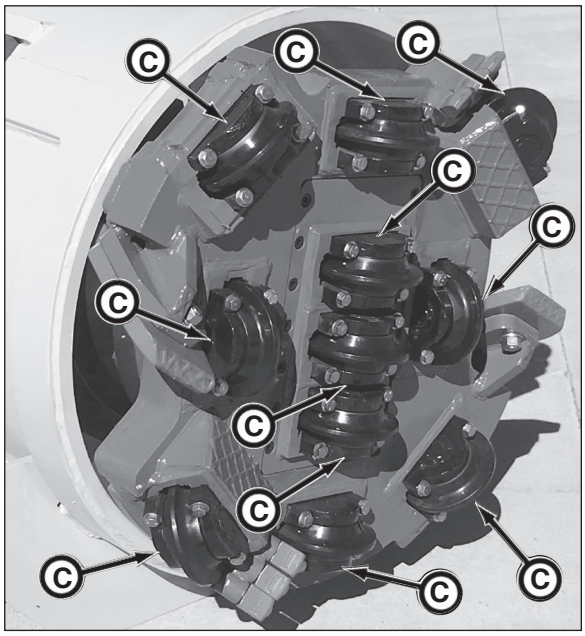
- PN: P0001-08-011B (B)
  SCREW, Hex Head Cap
  1/2 UNC x 2.75 Grade 9 Zinc

The disc cutter assembly MUST be fully seated and hardware tightened to proper torque in a gradual, three pass criss-cross tightening sequence as detailed in Section 3, Installation.



IMPORTANT: When disc cutters are installed on cutterhead, the “D” shaped end (C) of the shaft should point towards outside of the cutterhead and nut should be towards inside of the cutterhead. Failure to do so may cause premature failure.

For the center disc cutters, the center line of the cutterhead will determine the placement of the “D” shaped end of the cutter.

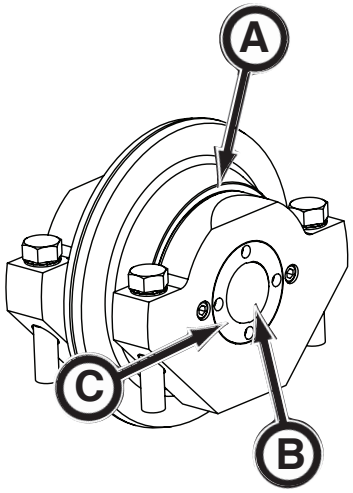


Placement of “D” Shaped End (C) of Cutter Shaft

COMPLETION OF EACH DRIVE

9. INSPECT DISC CUTTER TOOLING

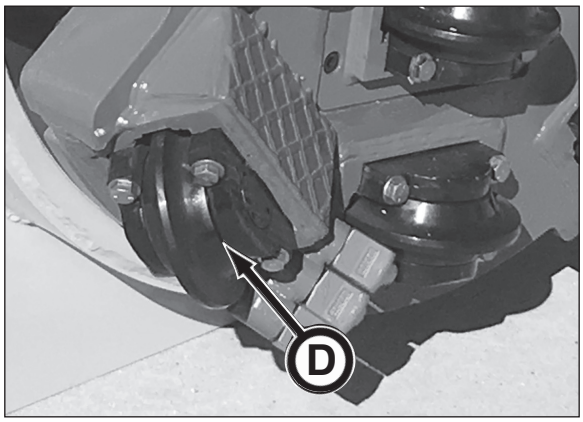
Inspect disc cutters as follows:



1. Check for signs of lubricant leakage from around the cutter end plates and disc cutter (A). If leakage is found, DO NOT install the cutter. The cutter MUST be repaired or replaced before mounting onto cutter head.
2. Inspect disc cutter shaft (B) and nut (C) for damage. If damaged, replace with new disc cutter.
3. If any flat spots or polished marks are visible on the cutter, this is an indication that the cutter is skidding, and is most likely a result of a damaged bearing. Install a new cutter to replace any cutter with polished or flat spots.
4. If a disc cutter is cracked, shows signs of chipping or other excessive wear, the disc cutter must be replaced.
5. The disc cutter should rotate by hand with considerable resistance. If it does not rotate, a bearing may be worn or damaged. Replace bearing.
6. If the mounting bolts are worn or damaged, replace with new.

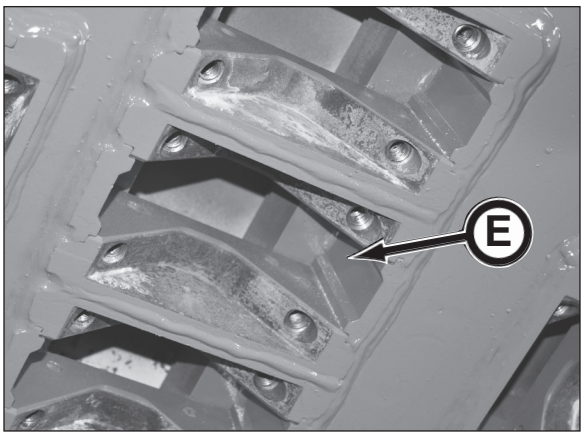
10. CLEAN CUTTER

Completely clean the cutter externally including the grooves between the disc cutter and mount (D). If debris is allowed to dry in these areas, it will be difficult to rotate the disc cutter resulting in failure.



11. CLEAN CUTTER HOUSING

1. Be sure the housing (E) area is clean and free of any sharp edges, protrusions and other foreign matter.
2. Inspect the housing and mounts for excessive wear. Repair or replace as needed.



NOTES

Storage

PREPARING FOR STORAGE

1. Repair worn or damaged parts.

2. Wash all equipment thoroughly.

3. Repaint equipment where necessary.

4. Inspect each cutter for leaks. If leaks appear, the cutter must be repaired or replaced.

5. Check to be sure each cutter rotates by hand with considerable resistance. If not, the cutter must be repaired or replaced.

6. Store machine and additional disc cutters under cover and out of the weather in a ventilated area. Always store cutters away from heat and out of direct sunlight. Otherwise the grease may expand and damage the seals.

7. If machine and cutters will be stored for a long period of time, it is recommended that the cutter lubricant be removed and replaced with fresh lubricant.

REMOVING FROM STORAGE

1. Clean equipment thoroughly.

2. Inspect cutters for leaks. Repair or replace as necessary.

3. Check to be sure each cutter rotates by hand with considerable resistance. If not, the cutter must be repaired or replaced.

4. If the cutter head or cutters have been stored for a long period of time, the lubricant in the cutters must be replaced with fresh lubricant.

5. Perform the cutter maintenance as described in Section 5, Periodic Maintenance.

6. Be sure to keep all extra cutters under cover and out of the weather in a ventilated area. Always store cutters away from heat and out of direct sunlight. Otherwise the grease may expand and damage the seals.

7. Review this manual and your Akkerman tunneling equipment operation manuals before operating the equipment.

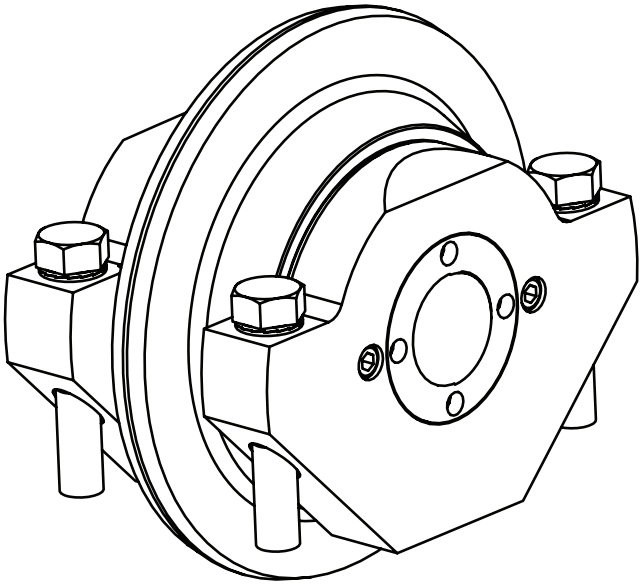
NOTES

Troubleshooting

Problem	Cause	Solution
Disc cutters have flat spots or polished marks on the cutting surface.	Bearing is worn or damaged.	Replace bearing and/or cutter. Contact your Akkerman Aftermarket Support Representative for bearing replacement.
There is end play or slack between the shaft and end plate, or a loose or rough feel when turning the cutter in its mount.	The disc cutter shaft nut was not properly tightened.	Check for cutter damage. Tighten shaft nut.
	Mounting bolts not properly tightened.	Check for cutter damage. Tighten bolts to 94 ft-lb torque.
	Bearing is worn or damaged.	Replace bearing. Contact your Akkerman Aftermarket Support Representative for bearing replacement.
Cutter will not turn.	Bearing is worn or damaged.	Replace bearing. Contact your Akkerman Aftermarket Support Representative for bearing replacement.
Signs of leakage from the seal area.	Faulty seal.	Replace seal. Contact your Akkerman Aftermarket Support Representative for seal replacement.
No lubrication is visible through the drain plugs.	Drain plug(s) is missing.	Flush and fully lubricate the cutter and replace drain plug(s).
	Faulty seal.	Replace seal. Contact your Akkerman Aftermarket Support Representative for seal replacement.
The mounting bolts cannot be properly tightened.	Debris in cutter housing or bolt hole.	Remove debris and replace mounting bolts and lock washers with new.
Newly lubricated cutters are leaking.	Grease in cutter expanded and ruptured the seals at one or both end plates.	Cutters must be stored in a cool location, out of direct sunlight. Contact your Akkerman Aftermarket Support Representative for repair.

NOTES

Specifications



Cutting Diameter	6.63 in. (168 mm)
Weight (approx.)	23 lbs. (10 kg)
Radial Thrust Capacity (Nominal)	5 Ton

Akkerman Inc. reserves the right to improve its products without notice or obligation.

TORQUE CHART

Use these torque values as a guideline when tightening hardware unless otherwise specified in this manual.

Lubricated Coarse UNC Threads Grade 8 Fasteners			Lubricated Fine UNF Threads Grade 8 Fasteners		
Bolt Size	**Torque ft. lbs.**	**(N·m)**	**Bolt Size**	**Torque ft. lbs.**	**(N·m)**
1/4 - 20	10	(14)	1/4 - 28	11	(15)
5/16 - 18	20	(27)	5/16 - 24	22	(30)
3/8 - 16	35	(47)	3/8 - 24	39	(53)
7/16 - 14	56	(76)	7/16 - 20	62	(84)
1/2 - 13	85	(115)	1/2 - 20	96	(130)
9/16 - 12	123	(167)	9/16 - 18	137	(186)
5/8 - 11	170	(231)	5/8 - 18	192	(260)
3/4 - 10	301	(408)	3/4 - 16	336	(456)
7/8 - 9	450	(610)	7/8 - 14	500	(678)
1 - 8	680	(922)	1 - 12	740	(1003)
1-1/8 - 7	960	(1302)	1-1/8 - 12	1030	(1397)
1-1/4 - 7	1360	(1844)	1-1/4 - 12	1500	(2034)
1-1/2 - 6	2360	(3200)	1-1/2 - 12	2660	(3607)

Lubricated Threads Metric Class 12.9 Fasteners			Dry Threads Metric Class 12.9 Fasteners		
Bolt Size	**Torque ft. lbs.**	**(N·m)**	**Bolt Size**	**Torque ft. lbs.**	**(N·m)**
M6	11.5	(15)	M6	14.5	(19)
M8	28	(37)	M8	35	(47)
M10	55	(75)	M10	70	(95)
M12	95	(130)	M12	120	(165)
M14	150	(205)	M14	190	(260)
M16	240	(320)	M16	300	(400)
M18	325	(440)	M18	410	(560)
M20	460	(625)	M20	580	(800)
M22	625	(850)	M22	800	(1075)

Safety Data Sheets

The Federal Occupational, Safety, and Health Administration (OSHA) Standard 29 CFR 1910.1200, require that specific safety data sheets (SDS) be available to employees before operating this equipment. This may include information on substances contained in this equipment such as fuel and gear lubricant.

Akkerman Inc. will provide, at no cost, SDS which apply to its product line. Simply contact your Akkerman Aftermarket Support representative for a copy.

To ensure a prompt response to your SDS request, include your return address (including zip or postal code) and the equipment's model numbers and serial numbers with your request.

NOTES

Warranty

Akkerman warrants that all equipment manufactured by it be free from defects due to workmanship or material when normally used and serviced for a period of 90 days from the date of shipment by Akkerman. Normal wear and tear to the equipment, including, but not limited to, wear on the cutter face tooling, hydraulic filters, augers, casings, slurry line and seals is not covered by this warranty. Akkerman does not warrant that the equipment meets the requirements of any particular safety code or rule governing equipment classification. If the Customer has questions about local safety codes, rules or ordinances, authorities local to the project should be consulted.

In order to be considered as a potential warranty claim, the component in question must be returned to Akkerman (freight prepaid) for factory inspection and analysis, and determination of warranty applicability. No warranty is provided for electronics or electrical components of any kind. The validity of all warranty claims are subject to the discretion and determination of the Akkerman Aftermarket Support Department. All such determinations are final.

NOTES

Index

C

Calibrated torque wrench 3-3
Check disc cutter mounting hardware 6-6
Check & purge cutter grease 6-4
Clean and inspect equipment 1-4
Clean cutter 6-7, 6-9
Clean cutter housing 6-7, 6-9
Completion of each drive 6-3
Completion of each drive
  maintenance chart 6-3
  maintenance procedures 6-9
Confined space 4-1
Contents iii
Criss cross tightening sequence 3-1, 3-3

D

Daily inspection 4-1
Dead blow hammer 3-3
Disc cutters, installing 3-1, 6-8
Disc cutters
  completion of each drive 6-3, 6-9
  prior to each drive launch 6-2, 6-4
Disc cutter troubleshooting 8-1

F

Final pass 3-3
Final torque check 3-3
Fire prevention 1-2
First pass 3-3
Full disc cutter assembly engagement 3-3

G

Grease 5-1

H

Hammer, dead blow 3-3
Heli-coil 3-1

I

Inspect disc cutter tooling 6-5, 6-9
Inspect face disc cutter tooling wear 6-6
Inspect gage disc cutter tooling wear 6-5
Inspection, pre-start 4-1
Installation 3-1
Installing disc cutter assembly 3-1
Installing disc cutters 6-8
Introduction i

L

Lockout tagout power 1-3, 6-1
Lubricants 5-1
Lubricants, storing 5-1

M

Maintenance charts
  completion of each drive 6-3
  prior to each drive launch 6-2
Maintenance, periodic 6-1
Maintenance procedures,
  completion of each drive 6-9
  prior to each drive launch 6-4

N

No smoking in tunnel 1-5

P

Periodic maintenance 6-1
Pinch points 1-4, 6-1
Practice safe maintenance 1-3
Preparing for storage 7-1
Pre-start inspection 4-1
Prior to each drive launch 6-4
Prior to each drive launch
  maintenance chart 6-2
  maintenance procedures 6-4
Protective clothing 1-1
Purge cutter grease 6-4

R

Recycle waste 1-5
Removing from storage 7-1

S

Safety 1-1
Safety data sheets 10-1
Safety information 1-1
Safety program 4-1
Second pass 3-3
Slippery when wet 1-5
Specifications 9-1
Storage 7-1
Storing lubricants 5-1
Suspended loads 1-4

T

Terminology 2-1
Third pass 3-3
Tightening sequence, criss cross 3-1, 3-3
Torque chart 9-2
Torque check, final 3-3
Torque wrench, calibrated 3-3
Troubleshooting 8-1

U

Unauthorized welding 1-3

W

Warranty 11-1
Welding safety 1-2
Welding safety 6-1

NOTES