



# 11" Integral Bearing Swivel Cutter Head Installation FA44634F Instruction No. 050065A

The swivel cutter head is the upsizing tool between the pilot tube adapter and the lead thrust casing for hard ground use over 35 blow count. The cutter head allow pilot tubes to remain stationary while the cutting teeth rotate through ground at a full 12.5" OD cut. The spoils are removed using the standard Akkerman augers and casings to the launch shaft. The cutter head is equipped with fluid ports at the cutter bit reducing cutting torque through lubrication.



***Use the procedure on the following pages to assure proper swivel cutter head installation with the GBM 240A, 308A and 339A frames.***

This procedure allows the pilot tubes to be removed while continuing to supply jetting water pressure to the swivel cutter head. Though, there must be enough jetting hose and space in the reception shaft to remove three or four pilot tubes before the jetting supply must be shut down.

#### REQUIREMENTS:

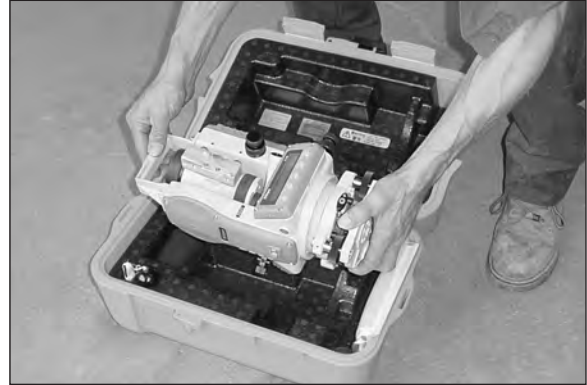
- Must have a minimum of 16 gpm @ 1,000 psi jetting water pressure.
- Must use full length augers and casings:  
11" - 1 meter

## 11" Integral Bearing Swivel Cutter Head Installation

### NOTICE

Though the photos in this procedure depict the latching frame, this procedure also applies to the single stage frame.

1. Remove guidance system from shaft and store in protective case.



2. (Latching Frame Only) Remove two travel stop brackets in rear of frame.

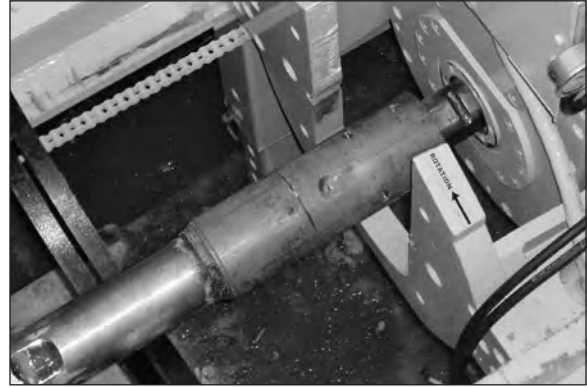


3. If not already removed, remove the drive adapter swivel from gear box.

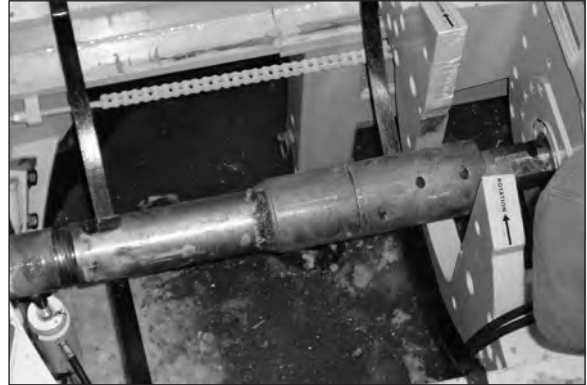


## 11" Integral Bearing Swivel Cutter Head Installation

4. Insert the pilot tube adapter into the gear box.



5. With the last pilot tube locked into the make-up tool, thread the adapter into the pilot tube by rotating the adapter in the CW direction with the drive rotation control, while advancing the gear box assembly with the travel motor control (latching frame) or thrust cylinder control (single stage frame).



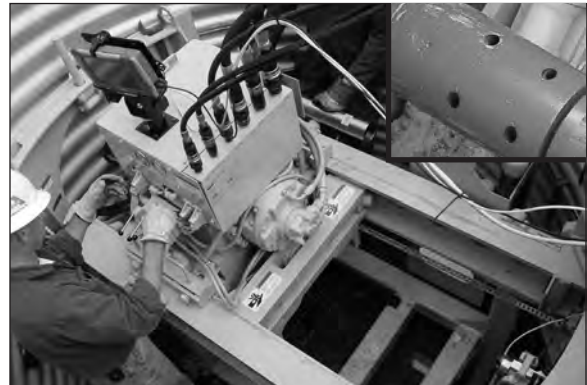
6. Continue to tighten the connection to 1,000 psi (2,000 ft-lb) torque as shown on the gear box cover pressure gauge.

7. Release make-up tool.

8. Advance adapter into ground until there is enough room to pin the pilot tube adapter to the swivel cutter head.

### NOTICE

For ease of installing the swivel cutter head, you may need to rotate the pilot tube adapter to be sure the four pin holes are in the vertical (up and down) position (see inset).



9. Move the gear box assembly to the back of the GBM frame to allow enough room for the swivel cutter head by using:

(latching frame) travel motor control and then lock both latching pins into frame with the hydraulic latching control, or  
(single stage frame) the thrust cylinder control.

10. Remove the make-up tool.



*(continued on next page)*

## 11" Integral Bearing Swivel Cutter Head Installation

11. In the reception shaft, remove steering head.

a. Remove set screw.



b. Drive out pins.



c. Remove pins.



d. Remove steering head.



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## 11" Integral Bearing Swivel Cutter Head Installation

12. Once the steering head adapter reaches the reception shaft, each joint must be loosened with the breakout tool.

Hook up the breakout tool as follows:

Clean the areas around the oil ports. Install base end cylinder hose to port A and rod end cylinder hose to port B.

Selector Position:

Port A - Extend

Port B - Retract

**⚠ WARNING** Electrical shock hazard could cause severe injury or death.

Be sure the breakout tool power unit, plug and receptacle (must be three-pronged) are properly grounded and dry before plugging in and during operation.

Plug the breakout tool into 120 VAC outlet. If an extension cord is necessary, you must use a three-prong grounded extension cord.

13. Use the pilot tube scraper to remove mud from steering head adapter (shown) and pilot tubes.

14. Remove steering head adapter. Install cap on steering head adapter. To remove pilot tubes, follow procedure in steps 42 - 61.



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## 11" Integral Bearing Swivel Cutter Head Installation

15. Once steering head adapter is removed, in reception shaft, route jetting hose through the center of the pilot tubes to the launch shaft.



16. Install casing thrust adapter to thrust plate with two 3/4 x 2 in. bolts and washers for 11" casings.



31. Lower dirt bucket into shaft.



*(continued on next page)*

## 11" Integral Bearing Swivel Cutter Head Installation

**⚠ 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, the boom and load can fall instantly.

Do not stand or walk under a load.



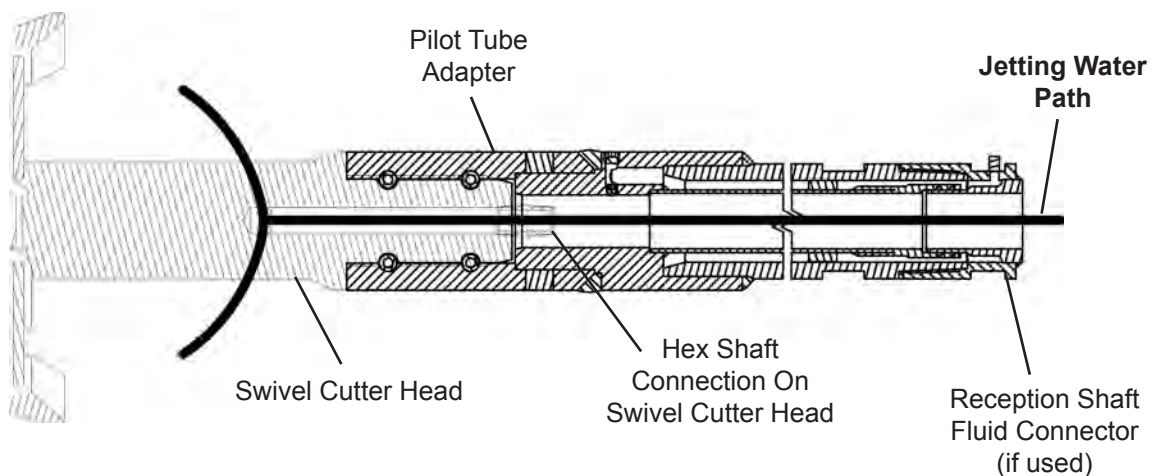
17. Lower cutter head assembly into launch shaft.

**NOTICE** Install safety chain assembly or auger pin to auger to secure auger into cutter head assembly. For proper installation of safety chain, refer to Installing Safety Chain Assembly/ Casing Auger Pin To Auger & Casing in the Operator's Manual. Also, use a properly rated pipe tong or nylon strap to handle the cutter head assembly and casings.



18. Connect jetting hose to hex shaft connection (as shown) on swivel cutter head.

**NOTICE** Fluid connector not used.



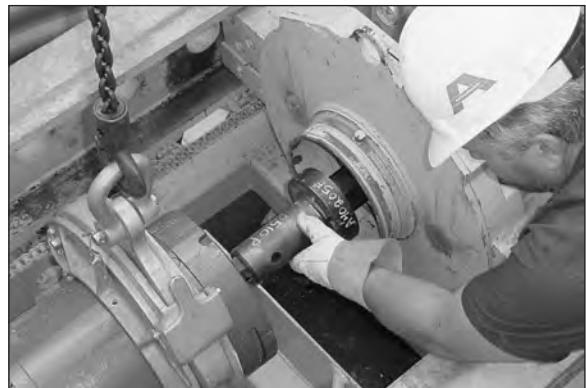
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## 11" Integral Bearing Swivel Cutter Head Installation

19. Install swivel cutter head to pilot tube adapter and secure with four spiral pins.



20. Install auger drive adapter onto auger shaft.



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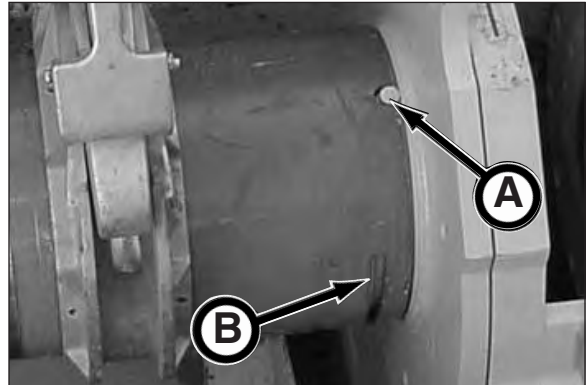
## 11" Integral Bearing Swivel Cutter Head Installation

21. Align and engage auger drive adapter with the hex opening in gear box using the drive rotation control and frame travel motor control.



22. Using hoist, align notches in cutter head casing with top alignment guide (A) and bottom alignment guide (not shown) on thrust plate.

**NOTICE** If pulling back of pipe will be required, install keepers into cutter head assembly lead casing and casing thrust adapter (B), and bolt the auger drive adapter to the gear box and the auger shaft.



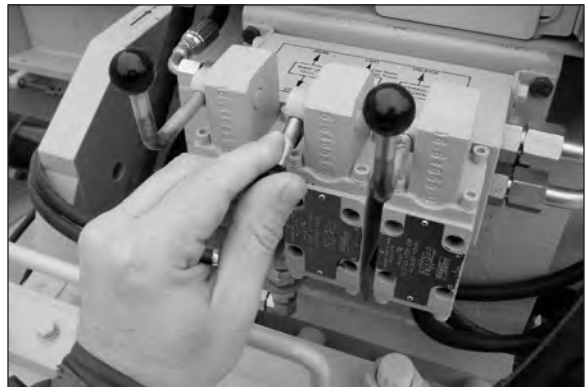
**WARNING** Flying sparks and debris from torching operation can cause severe injury. Approved personal protection must be worn while torching opening into shaft.

23. Cut an opening in the shaft large enough for the swivel cutter head, thrust casings, and product pipe to pass through.



24. Move drilling drive speed selector to the LSHT (Low Speed High Torque) position.

**NOTICE** The rotational working pressure is a maximum pressure of 5,000 psi (34.474 mPa). Typically normal operation is between 3,000 psi (20.684 mPa) and 4,000 psi (27.579 mPa).



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## 11" Integral Bearing Swivel Cutter Head Installation

### NOTICE

- Jetting to the cutter bit needs to be on at all times while advancing the cutter bit to prevent plugging (as shown) of the cutter head.
- Vary water volume if excessive amount of water to spoils ratio is experienced.

### IMPORTANT:

**Once cutter head is plugged, it will be difficult, and may require excavation to the cutter head, to clear the plugging. DO NOT PLUG CUTTER HEAD.**



25. Test the jetting pump water supply to the cutter bit of the swivel cutter head. The jetting requires 16 gpm @ 1,000 psi.



26. Advance the swivel cutter head assembly with jetting water on, by extending the thrust cylinders with the thrust cylinder control and rotate the augers in the clockwise direction with drive rotation control.

(Latching Frame Only) Relatch latching pins as needed.

### NOTICE

Be sure latching pins are completely engaged into frame holes before jacking.



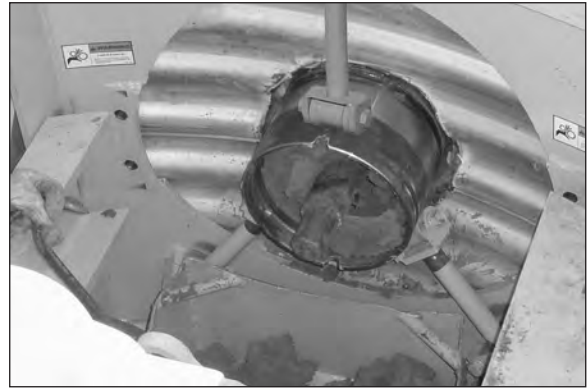
27. With jetting on, continue to advance the swivel cutter head assembly the full length of the frame.

*(continued on next page)*



## 11" Integral Bearing Swivel Cutter Head Installation

28. Before retracting gear box, adjust the three roller brackets to casing by loosening clamp, slide roller into position, and retighten clamp. The rollers will support the casing while the gear box is retracted.
29. Move the gear box assembly to the back of the GBM frame using the frame travel motor until the latching mechanism is locked (latching frame only).
30. Turn off jetting during the process of positioning the next casing/auger in the jacking frame. Failure to do so may cause over-excavation.



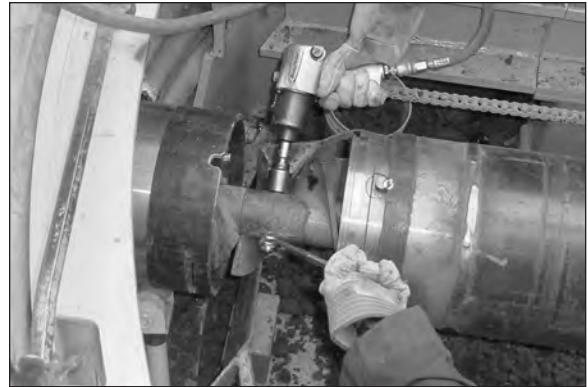
**⚠ WARNING** Moving parts or the mishandling of parts can cause severe personal injury. Handle parts carefully to avoid crushing and pinch point hazards.

31. Lower thrust casing/auger into launch shaft.

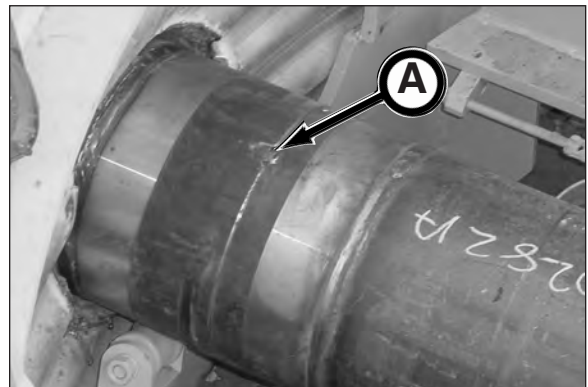
**NOTICE** Install safety chain assembly or auger pin to auger to secure auger into casing. For proper installation of safety chain, refer to Installing Safety Chain Assembly/Casing Auger Pin To Auger & Casing in the Operator's Manual. Also, use a properly rated pipe tong or nylon strap to handle the casings.



32. Slide the thrust casing auger onto the end of the cutter head assembly auger shaft.
33. With the auger flighting lined up, attach the auger ends with one 3/4 x 4 in. bolt and nylock nut. Tighten the nut so the end of the nut is flush with the end of the bolt. Do not overtighten.



34. Advance the casing to the cutter head assembly casing and align with alignment guides in the 12 o'clock (A) and 6 o'clock positions.



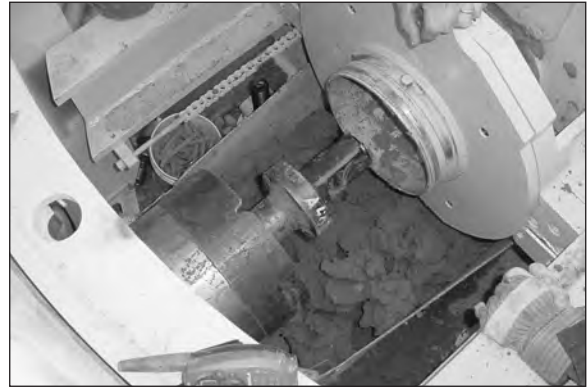
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35. Install four casing joint keepers at the 2 o'clock, 4 o'clock, 8 o'clock, and 10 o'clock positions to lock the casings together.

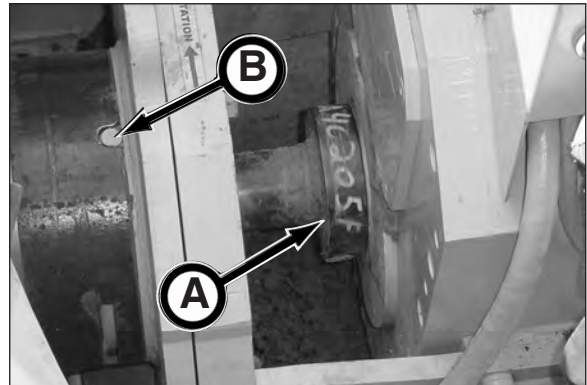


36. Remove auger drive adapter from gear box and insert onto casing auger shaft.



37. Align the auger drive adapter (A) into the gear box while aligning the notches in the casings with the alignment guides (B) on thrust plate using the drive rotation control and travel motor control or thrust cylinder control

**NOTICE** If pulling back of pipe will be required, place keepers into casing and casing thrust adapter.

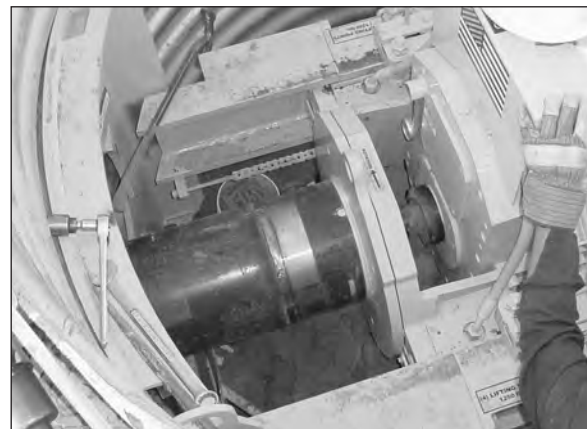


38. Advance the casing/auger with the thrust cylinder control and the drive rotation (CW) control.

**NOTICE** Jetting MUST BE ON while advancing casing.

**NOTICE** With the addition of each section of casing/auger, a section of pilot tube will be removed in the reception shaft. Refer to procedure starting with step 42.

*(continued on next page)*



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39. Periodically empty the dirt bucket.



40. Replace dirt bucket.



41. Continue to add casings and augers until all pilot tubes are removed from reception shaft.



### **NOTICE**

Regularly secure frame to the shaft while pushing the casings using the shaft tensioners and load binders (latching frame only) on GBM. Securing the frame to the shaft will keep the frame properly aligned with the pipe line.

*(continued on next page)*



## 11" Integral Bearing Swivel Cutter Head Installation

42. Once the pilot tubes reach the reception shaft, each joint must be loosened with the breakout tool.

Hook up the breakout tool as follows:  
Clean the areas around the oil ports. Install base end cylinder hose to port A and rod end cylinder hose to port B.

Selector Position:  
Port A - Extend  
Port B - Retract

**⚠ WARNING** Electrical shock hazard could cause severe injury or death. Be sure the breakout tool power unit, plug and receptacle (must be three-pronged) are properly grounded and dry before plugging in and during operation.

Plug the breakout tool into 120 VAC outlet. If an extension cord is necessary, you must use a three-prong grounded extension cord.



43. Use the pilot tube scraper to remove mud from the pilot tubes.



44. Install cap on pilot tube threads.



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## 11" Integral Bearing Swivel Cutter Head Installation

45. Place jaw insert on notches on back pilot tube.



46. With the cylinder retracted, slide the breakout tool onto the pilot tube and over the previously installed jaw insert from step 44 as shown.

### NOTICE

The cylinder side of the breakout tool is deeper than the other side. This allows the breakout tool to slide over both jaw inserts when loosening the pilot tube joints.



47. Slide other jaw insert on notches of the front pilot tube.



48. Slide breakout tool over both jaw inserts.

### NOTICE

You may have to extend or retract the cylinder to line up the jaw insert teeth with the breakout tool gear teeth.

*(continued on next page)*



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49. Move the control lever to port A to extend the cylinder.



50. Extend cylinder by depressing the switch on the remote controller.



### **NOTICE**

The rocker switch on the pump unit can also be used to control the cylinder.



51. Continue to extend the cylinder until the joint is loosened. You should be able to hear and feel a “snap” when the joint is loosened.

52. Release switch on controller.

*(continued on next page)*



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53. Once the joint is loosened, move the control lever to port B.



54. Slightly retract the cylinder until the breakout tool can be slide towards the launch shaft.

55. Remove the front jaw insert.



56. Slide the breakout tool towards the end of the tube and remove the back jaw insert.

57. Slide the breakout tool towards the launch shaft for the next joint removal.

*(continued on next page)*



## 11" Integral Bearing Swivel Cutter Head Installation

### NOTICE

To increase productivity, providing there is enough room in the reception shaft, remove three to four pilot tubes before shutting down jetting supply and removing jetting hose from pilot tubes. Pilot tube threads **MUST** be kept clean.

58. Remove the pilot tube and jetting hose, and immediately install a plug on the end of the pilot tube to prevent dirt from entering pilot tube.

### NOTICE

Before using pilot tubes on next project, be sure pilot tubes are clean and inspect pilot tube threads. Refer to section 9, Periodic Maintenance in the Operator's Manual for proper procedure.

59. Place pilot tube(s) into pilot tube rack.



60. Once jetting hose is removed from pilot tube, install a cap on the end of next pilot tube to be removed.



61. Continue to remove pilot tubes as they reach the reception shaft. Place the pilot tubes in the pilot tube racks.



*(continued on next page)*

## 11" Integral Bearing Swivel Cutter Head Installation

62. Once the pilot tube adapter reaches the reception shaft, remove the pilot tube adapter by removing four spiral pins from the pilot tube adapter and the swivel cutter head.



63. Advance swivel cutter head with thrust casings until it reaches the reception shaft.

64. Once the swivel cutter head can be removed from the reception shaft, remove the keepers from the swivel cutter head and lead casing.

### **NOTICE**

Using a hoist to keep the cutter head in line with the pipe line, remove bottom keepers first, otherwise the weight of the casing and auger will make it difficult to remove the bottom keepers once the top keepers are removed.



65. Slide the swivel cutter head casing to gain access to the auger connection.

*(continued on next page)*



## 11" Integral Bearing Swivel Cutter Head Installation

66. (Use only if product pipe is the same OD as casing) Place spacer between thrust plate and auger. Push the auger forward with the drilling cylinder control to gain access to the auger connections in the reception shaft for removal.

**NOTICE** If using PCH or other upsizing tool, leave hex shaft exposed; that is, no spacer required.



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## 11” Integral Bearing Swivel Cutter Head Installation

67. In the reception shaft, remove the cutter head auger by removing the auger bolt and nut that was installed in the launch shaft (back bolt as shown). Replace auger into the cutter head assembly casing.



**⚠ WARNING** Auger may fall out of casing and cause severe injury or death if cutter head assembly tips or hits an obstruction.

68. Install safety chain assembly to auger to secure auger into cutter head assembly. For proper installation of safety chain, refer to Installing Safety Chain Assembly/Casing Auger Pin To Auger & Casing in the Operator's Manual.
69. Remove the cutter head assembly with auger from reception shaft.
70. Proceed to “Three Step Method: Installing Product Pipe” in this section, subsection Installing Product Pipe in the Operator's Manual.

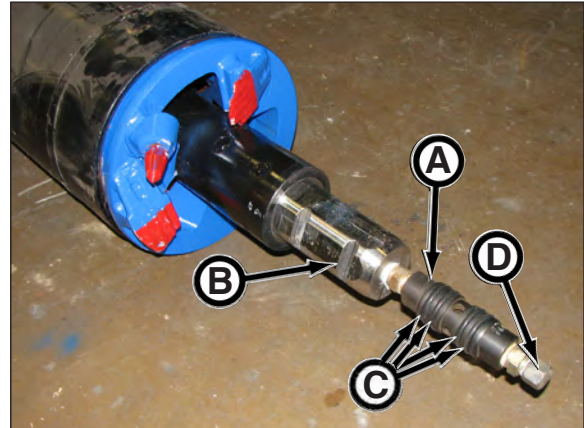


**NOTICE** There is an alternative jetting fluid supply option. This option requires that the jetting water supply **MUST** be shut off before removing pilot tubes.

**Alternative Option**

With this option, the jetting water pressure must be shut off before removing pilot tubes.

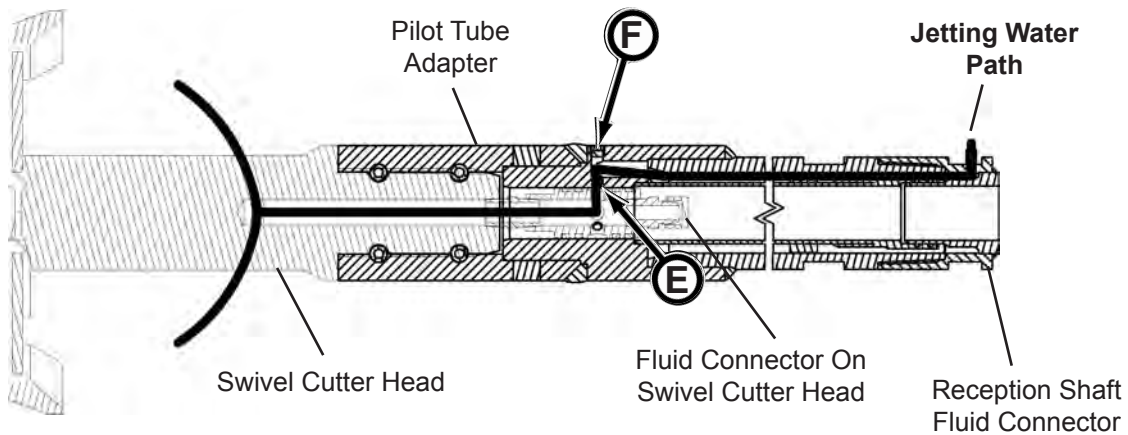
1. Connect fluid connector (A) to hex shaft (B) on swivel cutter head. Be sure o-rings (C) are in good condition (if nicked or cut, replace o-rings) and seated in its proper location. The jetting is supplied through the annular space of the pilot tube.
2. The end adapter must to be capped (D).



3. Install Swivel Cutter Head to pilot tube adapter.



4. The pilot tube adapter must have the 1/8 NPT port (E) open and the 1/4 NPT port (F) plugged.



*(Alternative Option continued on next page)*

## 11" Integral Bearing Swivel Cutter Head Installation

### *Alternative Option (continued)*

5. Install the four spiral pins to secure swivel cutter head to the pilot tube adapter.



6. Install fluid connector on the pilot tube in reception shaft.



7. Connect hose from jetting pump to fluid connector.



8. Test the jetting pump water supply to the cutter bit of the swivel cutter head. The jetting requires 16 gpm @ 1,000 psi.

*(Alternative Option continued on next page)*



## 11" Integral Bearing Swivel Cutter Head Installation

### **Alternative Option (continued)**

9. When removing pilot tubes in reception shaft, stop forward advancement, and turn off jetting supply. Once pilot tube is removed, follow steps 6 through 9.



10. Advance swivel cutter head with thrust casings until it reaches the reception shaft. Remove pilot tube adapter from swivel cutter head by removing four spiral pins.



### **NOTICE**

- Jetting to the cutter bit needs to be on at all times while advancing the cutter bit to prevent plugging (as shown) of the cutter head.
- Vary water volume if excessive amount of water to spoils ratio is experienced.

### **IMPORTANT:**

**Once cutter head is plugged, it will be difficult, and may require excavation to the cutter head, to clear the plugging. DO NOT PLUG CUTTER HEAD.**



Please contact your Akkerman After Market Support representative if you have any questions.



Akkerman Inc. • 58256 266th Street • Brownsdale, MN USA 55918  
Phone: (507) 567-2261 • Toll Free: (800) 533-0386 • Fax: (507) 567-2605  
email: [akk@akkerman.com](mailto:akk@akkerman.com) • web site: [www.akkerman.com](http://www.akkerman.com)