

# 10"-12" Tapering Tool Assembly & Operating Instructions

When fiberglass pipe is cut, the cut end must be tapered before bonding on a fitting or pipe. This tool was designed to cut a one (1) degree taper on 10" and 12" diameter pipe. Refer to NOV Fiber Glass Systems Products Matched Taper Joint Installation for complete instructions.

## Setting The Tool For The Proper Taper

1. Clamp pipe that has been tapered at the factory into position. To prevent damage to the pipe, protect it from metal surfaces with two 180 degree sections of the same size pipe. (See Fig. 1.) If possible, clamp the pipe at least two feet from the end of the pipe to prevent the pipe from becoming oval.

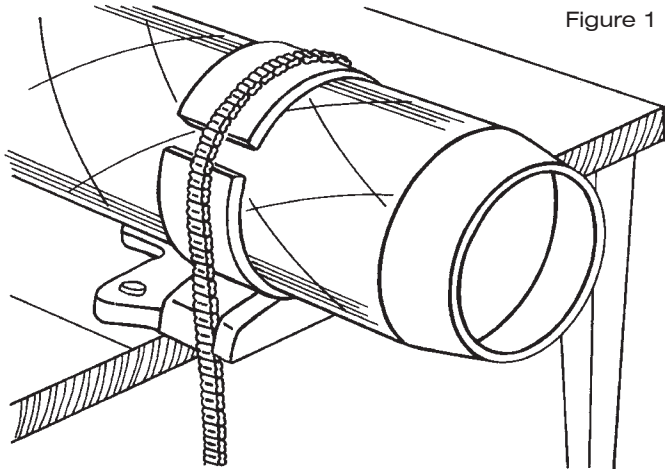


Figure 1

2. Insert the tool into a piece of pipe with a factory taper. Be sure the end of the pipe does not extend past the cutting blade. (See Fig. 2.)

3. Tighten the mandrel expansion bolt with the 3 3/8" hex key wrench provided in the kit. This bolt expands the expanding sleeve inside the pipe. It should be tight enough to prevent the expanding sleeve from turning inside the pipe.

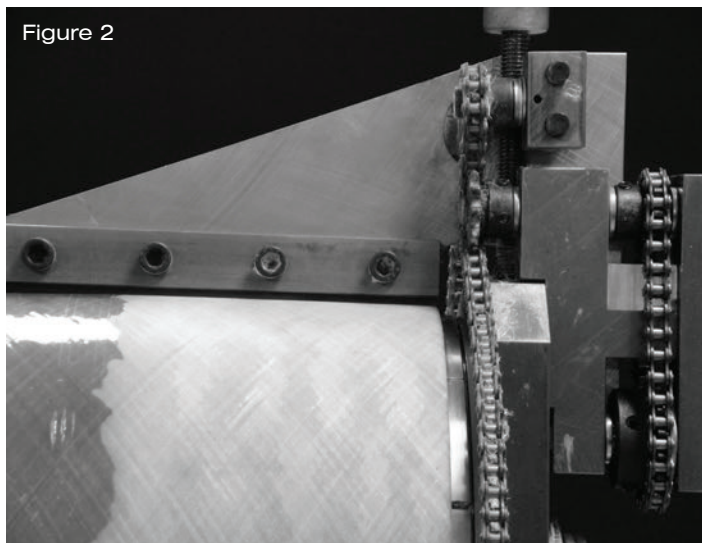


Figure 2

**Note:** The general purpose of the large hex nut is to hold all rotating members against the fixed part of the tool. Tighten if rotating parts are not making contact with the sprocket plate. Loosen only if the tool is extremely hard to turn when there is no pipe in the tool. The large hex nut should be torqued to 30 ft. •lbs. Be sure to loosen the set screw before adjusting the hex nut.

4. The blade holder should be at the bottom point of rotation to insert and adjust the blade. (Refer to Fig. 3.)

5. Back off the cutting head feed knob to allow for blade insertion.

6. Insert the blade with the wide side of the blade facing the blade holder. Be sure the raised portion of the blade holder presses against the blade. Place blade in slot. Be sure the blade extends past the end of the pipe but does not touch the sprocket plate.

7. Be sure the blade is resting properly in the slot.

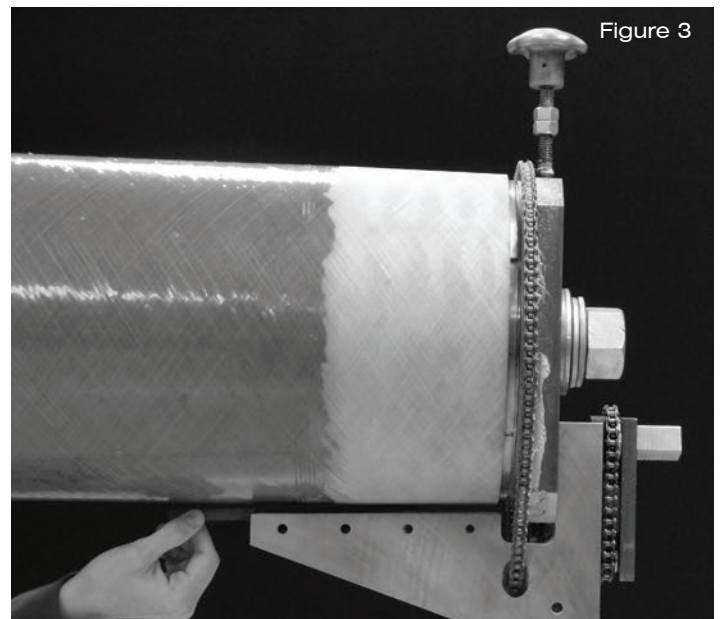


Figure 3

8. Tighten the blade holder with four socket head cap screws.
9. Rotate the tapering tool 180 degrees until the cutting head is at the top of rotation.
10. Tighten the cutting head feed knob until the blade makes light uniform contact with the factory taper. If the blade does not make uniform contact, check setting of blade. (See Fig. 4.)

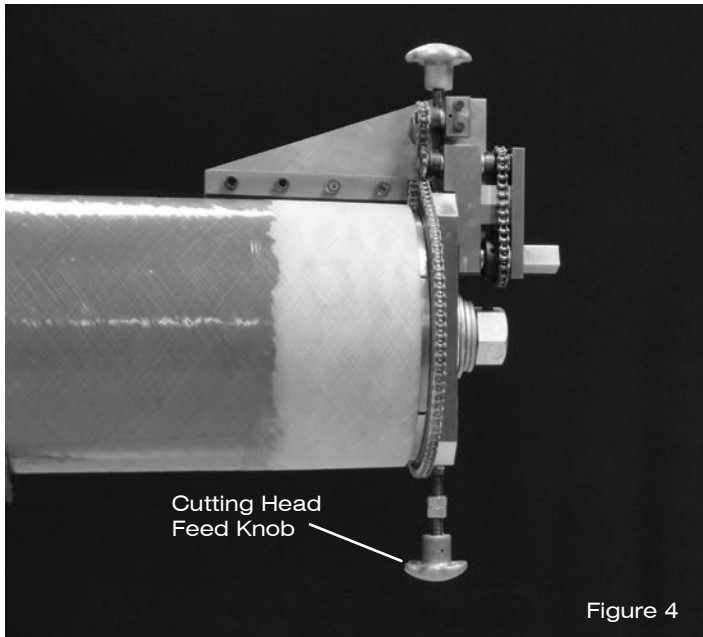


Figure 4

11. To set depth of cut, tighten the two  $\frac{1}{2}$ -13 UNC lock nuts on the cutting head feed knob until they are tight against the control knob assembly.
12. Loosen the cutting head feed knob to raise the cutting head. Raise the cutting head with the knob opposite the cutting head feed knob.
13. The tool now should be set for proper tapering and may be removed from the pipe by loosening the mandrel expansion bolt.

**Note:** After the mandrel expansion bolt is loose, tap the hex key wrench with a hammer to release the expanding mandrel.

#### Making Field Tapers On Untapered Pipe

14. Clamp pipe to be tapered into position. Protect it with two 180 degree sections of the same size pipe to prevent damage to the pipe. If possible, clamp the pipe at least two feet from the end of the pipe to prevent the pipe from becoming oval.
15. Insert the tool that has been preset into the pipe to be tapered. The small shoulder on the sprocket plate should butt against the end of the pipe.
16. Make sure the blade is not touching the pipe by retracting the cutting head.
17. A power source may now be connected to the  $\frac{15}{16}$ " square shaft. (See Fig. 5.) The crank handle provided in the tool kit may be used for manual power.

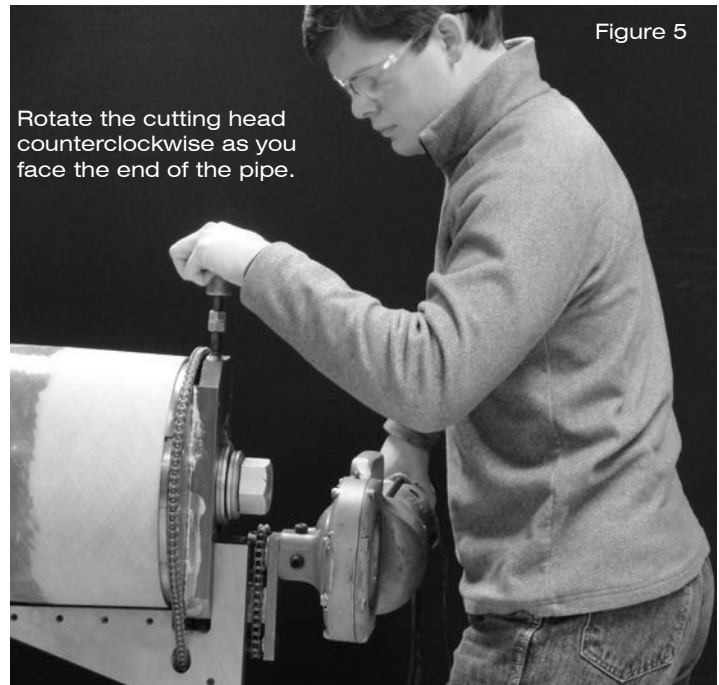


Figure 5

18. Check for high spots on the pipe by making one complete revolution of the tool with the blade at least  $\frac{1}{4}$ " from the surface of the pipe.
19. All tapering must be done with the cutting head moving counterclockwise as you face the pipe. (See Fig. 5.)
20. When tapering, loosen the cutting head retracting knob the same amount as the cutting head feed knob on each revolution.
21. Begin cutting very slowly while the tool is rotating by turning the cutting head feed knob. Allow at least one revolution between adjustments to prevent overloading of the tool at high spots on the pipe.
22. Once the blade is cutting a full 360 degrees, you may increase the cutting speed. **DO NOT FORCE CUT.**
23. The taper is completed when the two lock nuts are against the control knob assembly. Make two or three additional revolutions to ensure proper clean up. Continue rotating the tool as the blade is slowly retracted until it no longer makes contact with the pipe. Remove the tool by backing off the mandrel expansion bolt on the center of the tapering tool. Loosen the bolt only enough to remove the tool. Do not remove the bolt. When the bolt is loose, tap the hex key wrench with a hammer to pop the expanding mandrel loose.
 

**Note:** If the mandrel expansion bolt is too loose, the expanding mandrel slots will not align with the expanding mandrel sleeve alignment pins. This will prevent proper expansion of the tool on future tapers.
24. Compare the field taper to the factory taper used to set the tool. Use a factory bell as a gauge (a sleeve coupling works best). Use the same bell to check the factory taper and field taper.
25. Slide the bell on the factory spigot that was used to set the tool, and tap on lightly. Be sure the taper is seated properly. (See Fig. 7.)



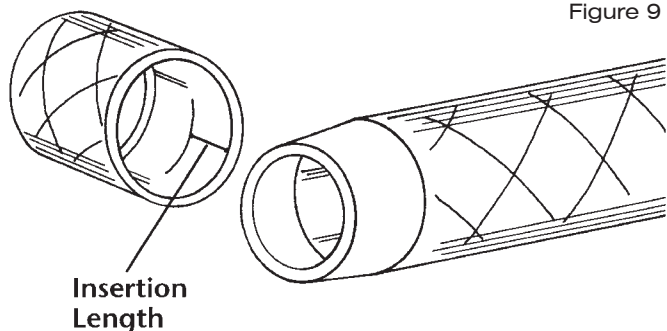


Figure 9

**Note:** Refer to Matched Taper Joint Instructions, for close tolerance plumbing instructions.

#### TAPERING SHORT NIPPLES

33. Weld a length of 2" steel pipe to a 2" 150 lb. steel flange. Bolt the steel flange to the end plate (four threaded holes in end plate). Slip the nipple to be tapered over the 2" steel pipe and onto the mandrel. Clamp the steel pipe in a vise. The steel pipe will hold the mandrel, and the mandrel will hold the nipple while tapering. (See Fig. 10.)

34. Set up the tool as shown and follow steps 14 through 32.

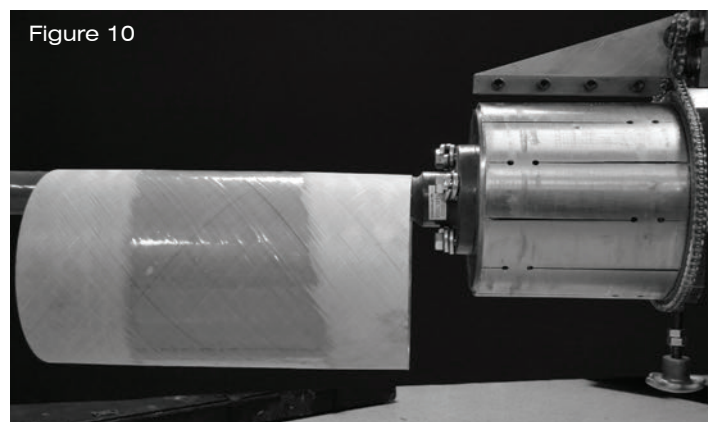


Figure 10

#### Field Stripping The Machine

35. Remove the short chain on the chain drive assembly by removing the connecting link chain.

36. Remove the socket head cap screws in the chain drive assembly plate of the chain drive assembly. The 10" tool has one socket head cap screw, and the 12" tool has two socket head cap screws.

37. Lift off the chain drive assembly plate with the drive shaft and drive sprocket.

38. Remove the set screw in the drive sprocket, and remove the drive sprocket from the drive shaft.

39. Remove the drive shaft from the chain drive assembly plate.

40. Remove the long chain on the sprocket plate by removing connecting link in chain. (Be sure to note route of chain around small sprockets and through cutting head for reassembly.)

41. Remove tension block and springs.

42. Loosen set screw and remove socket head cap screw on tension block, and remove sprocket from tension block.

43. Remove two socket head cap screws from assembly block, and remove assembly block from control knob assembly.

44. Remove set screws from the two sprockets on the assembly block, and remove sprockets from the shaft.

45. Remove the shaft from the assembly block.

46. Unscrew the cutting head feed knob from the control knob assembly.

47. Tilt the tool so the cutting head feed knob extension (short extension) will fall out.

48. Unscrew the cutting head retracting knob from the control knob assembly.

49. Tilt the tool so the cutting head retracting knob extension (long extension) will fall out.

50. Remove the set screw from the large hex nut in the center of the tool.

51. Remove the large hex nut.

52. Remove the two tension washers, one steel washer, and one brass washer from the sprocket shaft. Note how the tension washers are mated upon removal.

53. With a screwdriver, remove the spring between the brass bushing on the sprocket shaft and control knob assembly.

54. Remove the brass bushing from the sprocket shaft.

55. Remove the tapering tool blade and blade holder from the cutting head.

56. The control knob assembly with the cutting head attached may now be removed from the sprocket shaft.

57. Remove the two socket head cap screws from the cutting head.

58. Drive out the aligning pin from the cutting head and control knob assembly. At this point, all sprockets, shafts, bushings, and bearing surfaces on the bottom of the control knob assembly can be replaced.

59. Remove the mandrel expansion bolt from the center of the sprocket shaft.

60. Lift off the sprocket plate and shaft assembly.

61. Remove the expanding mandrel sleeve.

#### Reassembling The Machine

62. Place the end plate on flat surface with the shaft socket in vertical position.

63. Place the expanding mandrel sleeve on the end plate. The two "U" shaped alignment slots should be at the top of the expanding mandrel sleeve.

64. Place the sprocket plate and shaft assembly on the expanding mandrel sleeve, being sure to align the expanding mandrel sleeve alignment pins with the "U" shaped alignment slots in the expanding mandrel sleeve.

65. Insert the mandrel expansion bolt down through the center of the sprocket plate shaft, and screw into the end plate.

66. Tighten the mandrel expansion bolt several turns to secure this assembly.

67. Attach the cutting head securely to the control knob assembly with the aligning pin and two socket head cap screws.

68. Replace the control knob assembly on the sprocket shaft.

69. Replace the brass bushing over the sprocket shaft and into the control knob assembly.

70. Replace the spring between the control knob assembly and the brass bushing. (Be sure to install the spring on the cutting head side of the bushing.)

71. Replace the cutting head retracting knob (long extension).

72. Replace the cutting head retracting knob assembly. Screw the shaft in all the way, and align the spring so the shaft extension goes through the spring.

73. Replace the cutting head feed knob (short extension).

74. Replace the cutting head feed knob.

75. Replace the brass washer on the sprocket shaft.

76. Replace the steel washer on the sprocket shaft.

77. Replace the two tension washers on the sprocket shaft.

**Note:** Install tension washers so that only the outer edges meet.

78. Replace the large hex nut. (This nut should only be tight enough to hold the control knob assembly against the sprocket plate when tapering, without a gap between the parts, but loose enough for moving parts to turn freely.)

79. Replace the set screw in the large hex nut.

80. Replace the 1/2" shaft through the assembly block.

81. Replace the two small sprockets on the 1/2" shaft. (Be sure the key stock is installed and the set screws are tight to hold the part in position.)

82. Attach the assembly block securely to the control knob assembly with two socket head cap screws.

83. Place the drive shaft through the chain drive assembly plate.

84. Install the drive sprocket on the drive shaft. (Be sure the key stock is in place and the set screw tight to keep parts in position.)

85. Install the chain drive assembly plate to the assembly block. (Work slowly to align both shafts in bushings.)

86. Replace the tension block springs.

87. Replace tension block with sprocket attached.

88. Replace long chain.

89. Replace short chain.

90. Replace blade holder.

91. The tapering tool should now be ready to be set for field tapering.

**Note:** Be sure that all sprockets are aligned. If they are not aligned, it will cause excess wear on the sprockets and chain.

**Note:** Keep all parts well lubricated.

#### Maintenance Hints For 10" & 12" Tool

92. Lubrication: Use any good lubricant on the moving parts. Lubrication should be frequent to prevent rusting or binding of the moving parts.

93. Feed the cutting head and blade slowly. Rapid feed may break the chain or other parts of the drive assembly.

94. Do not overtighten the mandrel expansion bolt. Overtightening will strip the threads on the bolt or in the end plate. Also, overtightening could cause a double taper or varying taper angle.

95. Check the position of the expanding sleeve if the tool will not insert into the pipe. Refer to the Reassembling the Machine section for positioning of the sleeve.

**Note:** If, after checking this, the tool still will not insert easily into the pipe, remove the expanding sleeve and reshape the split sections on each end of the sleeve with a hammer, going around the sleeve several times. When finished, be sure that the ends of the split sections are flush and one does not protrude above the section next to it.

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#### North America

17115 San Pedro Ave. Suite 200  
San Antonio, Texas 78232 USA  
Phone: 210 477 7500

#### South America

Avenida Fernando Simoes  
Recife, Brazil 51020-390  
Phone: 55 31 3501 0023

#### Europe

P.O. Box 6, 4190 CA  
Geldermalsen, The Netherlands  
Phone: 31 345 587 587

#### Asia Pacific

No. 7A, Tuas Avenue 3  
Jurong, Singapore 639407  
Phone: 65 6861 6118

#### Middle East

P.O. Box 17324  
Dubai, UAE  
Phone: 971 4881 3566

[www.fgspipe.com](http://www.fgspipe.com) • [fgspipe@nov.com](mailto:fgspipe@nov.com)

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