

Assembly & Operating Instructions for 8"-16" Grinding Tapering Tool

When fiberglass pipe is cut, the cut end must be tapered before bonding on a fitting or pipe. This tool is designed to cut a 1° taper on 8"-16" diameter pipe. Refer to **Manual F6000** for complete installation instructions.

The tool is semi-automatic and self-feeds by tilting the grind mechanism into the pipe. This feeding mechanism is linked to the pipe rotating mechanism, and the tool requires only selecting the proper mandrel size and setting the correct depth of taper.

Materials Needed

The following material must be provided by the contractor or shop using the tool:

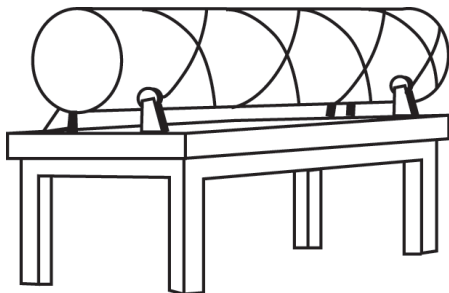
1. 110-120 volt AC power source

If an extension cord is required, ensure that the length does not exceed the maximum length given in the table for the wire size being used.

Wire Size (AWG)	Extension Cord Length	
	Suggested Length (Ft)	Maximum Length (Ft)
12	20	22
10	30	36
8	50	57

2. A set of adjustable roller stands or table-mounted rollers with plastic or hard rubber wheels so that long lengths of pipe may rotate during tapering operation. (See Fig. 1.)

3. A torque-arm to prevent the tool from rotating (a piece of 1" pipe and a stand or block—see Fig. 2).



4. A stand to support the tool when tapering short lengths of pipe. This can be two pieces of 1" pipe (on 2-ft. centers), welded or clamped to a workbench or other suitable framework. The 1" pipe must be long enough so the grinding drum motor will clear the workbench.

5. Ear plugs for operators.

Note: Ear plugs are recommended for the person operating the tool. Noise level is 90 db outdoors, and may be higher in some indoor areas.

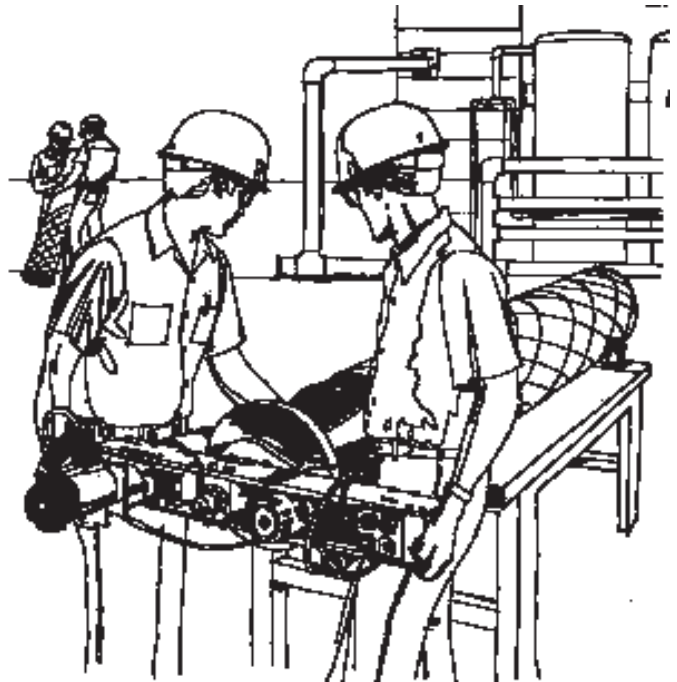


Figure 2

www.fgspipe.com

2700 West 65th Street
Little Rock, Arkansas 72209
Phone: 1 (501) 618-2256

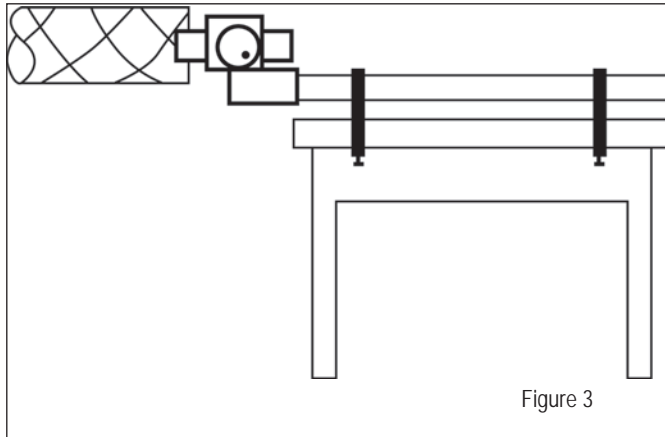
25 S. Main Street
Sand Springs, Oklahoma 74063
1 (918) 245-6651

NOV Fiber Glass Systems

SET-UP INSTRUCTIONS

6. The tool may be mounted on a sturdy workbench or may be inserted into the pipe end to be tapered, depending on the job requirements. The two drawings below (Figs. 3 and 4) show two possible configurations.

7. For short pieces of pipe, the tool can be table mounted using parallel steel pipe (on 2-ft. centers), clamped to the table or workbench. (See Fig. 3.)



8. For long pieces of pipe, the unit may be inserted into the pipe end as shown in Fig. 4. Two adjustable supporting stands or table-mounted rollers with hard rubber wheels will be used to support the pipe.

Once the mounting is accomplished, the tool may be set as follows:

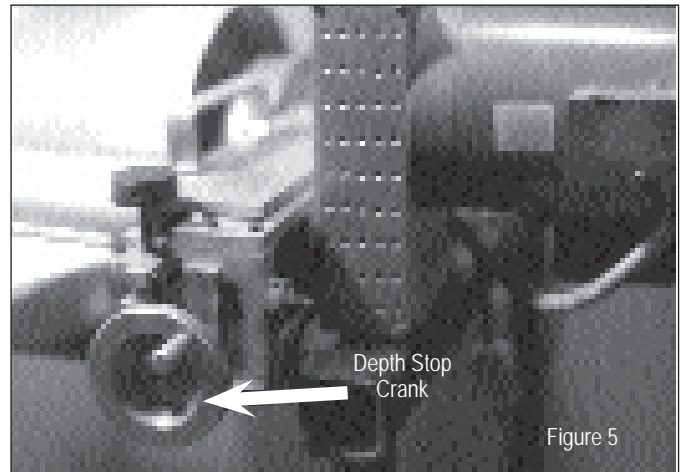
10. Use the depth stop crank (see Fig. 5) to set the approximate depth stop. There are match marks on the slide and rail. The rail is marked for 8", 10", 12", 14", and 16" pipe. Use these settings as a guide only.

11. Turn the grinder feed knob to the START position. Match the arrow on the knob to the arrow on top of the tool housing (see Fig. 6). This moves the grinding drum to the maximum open position.

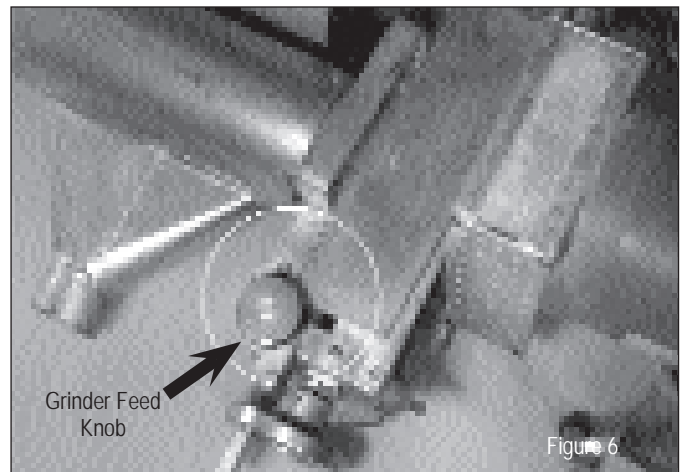
12. Select the mandrel size and assemble the tool. (See Figs. 7 and 8.) Figure 7 shows the mandrel set for short nipples. Figure 8 shows the standard mandrel assembly. The standard mandrel assembly is used for everything except short nipples.



13. Extend the stop bar until it is about 1/4" past the leading edge of the grinding drum and mark its location. This becomes the reference point for making standard tapers.



14. Slide a piece of pipe with a factory taper onto the tool. Wiggle the pipe as necessary to align the mandrels. Slide the pipe onto the mandrels until the pipe end contacts the stop bar (see Fig. 9), then pull back about 1/4".



This prevents bending the bar when the mandrels are tightened. If no factory taper is available, refer to paragraph no. 67 for setting the tool according to minimum effective bond length. **CAUTION:** Use this method only when it is impossible to obtain a factory taper.

15. Tighten the mandrel knob (see Fig. 9) to expand the mandrels. The pipe should contact the stop bar when the mandrels are tight. If the pipe does not contact the depth stop when mandrels are expanded, readjust the pipe until it does contact the stop bar. **DO NOT OVERTIGHTEN.** Lift slightly before expanding the mandrels.

16. Turn the grinder feed knob until the grinding drum is closest to the factory taper. (FINISH position of the knob is approximately 180 degrees from START position.) If the

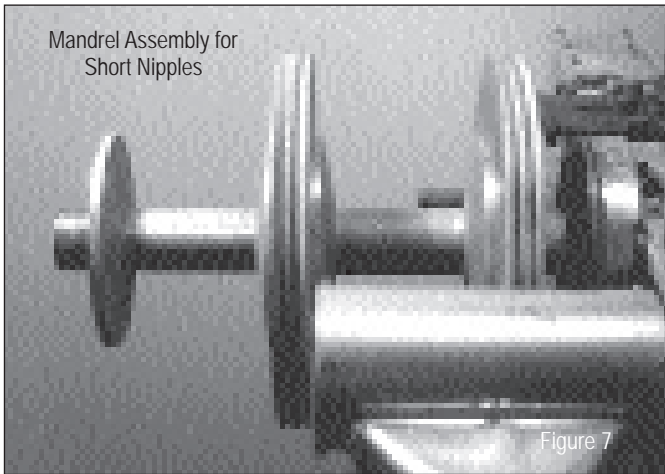


Figure 7

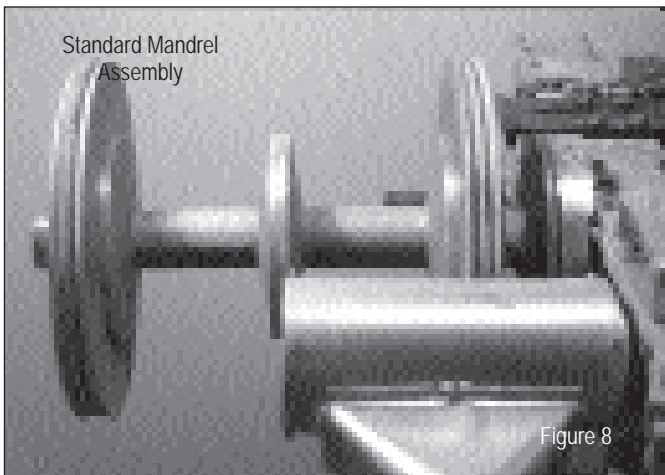


Figure 8

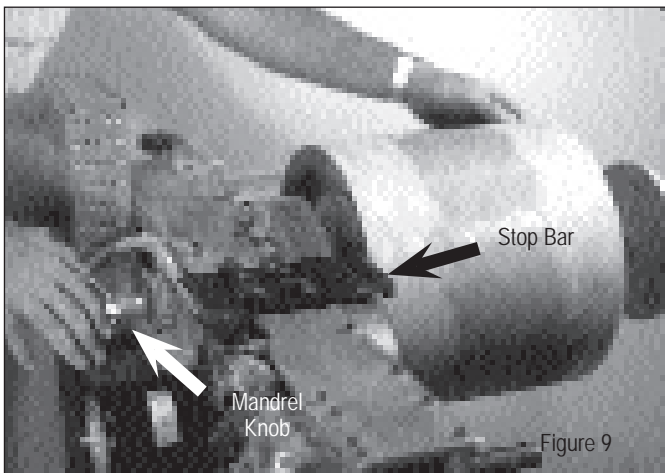


Figure 9

grinding drum hits the taper, use the depth stop crank to move it away from the pipe (turn counterclockwise). The grinding drum should be closest to the taper with the arrow on the grinder feed knob pointing approximately 180 degrees from START. (See Fig. 10.)

17. Use the depth stop crank to bring the grinding drum into light contact with the factory taper. (See Fig.

11.) Turn counterclockwise to move away from the pipe and clockwise to move closer to the pipe.

18. Once the depth stop crank is set, lock it with the thumb screw under the crank.

19. Turn the grinder feed knob to the START position, and remove the factory-tapered pipe.

20. Make sure there is no trash or dirt inside the pipe or any burrs on the mandrels to scratch the inside diameter (I.D.) of the pipe.

21. Slide a piece of untapered pipe onto the tool. Wiggle the pipe as necessary to align the mandrels.



Figure 10

Slide the pipe on the mandrels until the pipe end contacts the stop bar, then pull the pipe back approximately $\frac{1}{4}$ ". This prevents bending the stop bar when the mandrels are tightened.

22. Tighten the mandrel knob to expand the mandrels. (See Fig. 12.) Lift slightly to align the mandrels. The

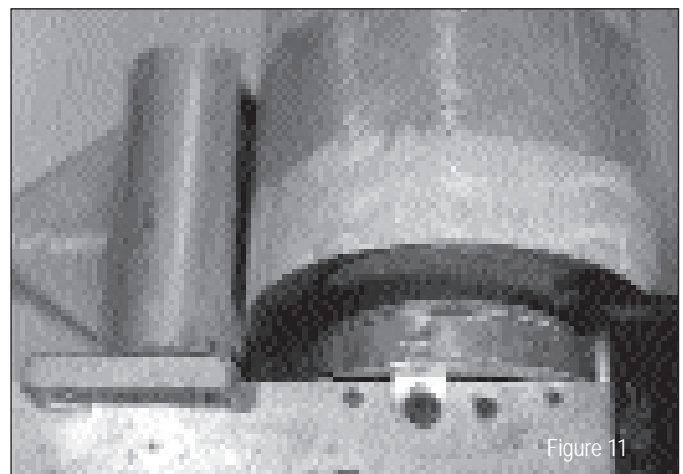


Figure 11

pipe should contact the stop bar when the mandrels are tight. If the pipe is cut unevenly, the long side of the pipe should touch the stop bar. DO NOT OVERTIGHTEN.

Expanding the mandrels slightly before lifting may help to align the tool. Plug the tool into 110V outlet.

23. Connect the vacuum cleaner to the grinding drum cover. Plug the vacuum cleaner into the 110V outlet on the tool. The vacuum must be used during all grinding operations, or the tool mechanism will load up with dust, causing binding of moving parts and excessive wear. Turn the vacuum on.

24. Move the stop bar back from the end of the pipe. Start the grinder motor by turning the switch labeled GRIND and allow it to reach speed. The grinding drum should not be in contact with the pipe at this time.

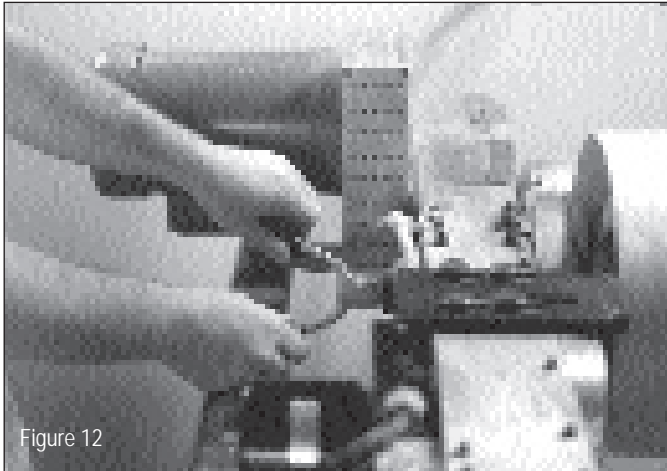


Figure 12

25. Start the mandrel drive mechanism by turning the switch labeled DRIVE. Tilt the grinding drum toward the pipe by turning the grinder feed knob (see Fig. 14) one click at a time until it begins to cut lightly. (CAUTION: ADVANCE THE KNOB SLOWLY TO AVOID BINDING ON HIGH SPOTS ON THE PIPE OUTSIDE DIAMETER (O.D.). DO NOT FORCE CUT.) When the grinding drum makes contact with the pipe, let the automatic feed take over.

26. When the grinding drum is no longer cutting, it will automatically begin to back away from the pipe. You may now turn the grinder feed knob back to the START position.

27. Turn the GRIND switch OFF; this will stop the grinder motor. Turn the DRIVE switch OFF, which will stop pipe rotation. Turn the vacuum off.

28. Reset the stop bar to the location marked in paragraph no. 13.

29. Separate the pipe from the tool by loosening the mandrel knob. Loosen only enough to assure separation of pipe from the mandrel.

30. Refer to Figure 13. 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.) 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.

31. Mark the inside of the bell at the end of the pipe. (Mark all the way around the end to check for “cocking” of the spigot.) If it is impossible to reach into the bell, mark the O.D. of the spigot end. Then, remove the spigot and measure the insertion length.

32. If it is difficult to separate this joint, lightly tap on the joint with a 2 x 4 or a rubber hammer. Do not use a metal hammer.

33. Slide the same bell onto the field taper. Tap on to make sure the joint is seated correctly.

34. Inspect the end of the pipe inside the bell. A gap all the way around the circumference indicates that the taper angle is too steep and is not acceptable.

35. Mark the inside of the bell at the end of the pipe. If it is impossible to reach into the bell, mark the O.D. of the spigot end. Then, remove the spigot and measure the insertion length.

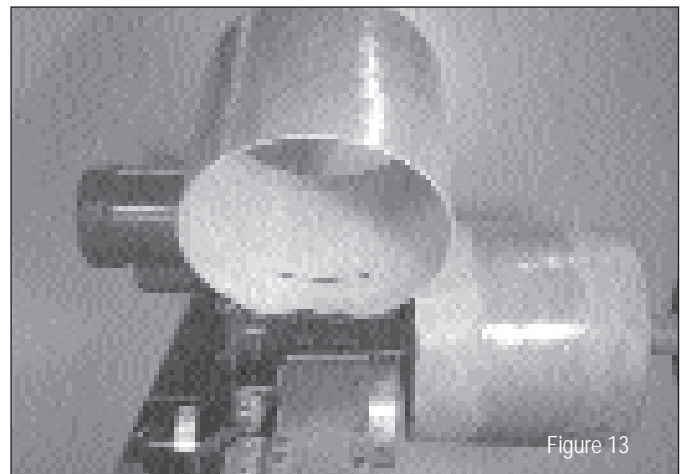


Figure 13

36. Compare the insertion lengths. If the two insertion lengths are within $\frac{1}{8}$ " of each other, the depth stop crank is set correctly. If the difference is greater than this, especially if the field taper inserts deeper, the depth stop must be readjusted (see paragraph nos. 13 through 18).

37. If depth of cut correction is needed, proceed as follows: To readjust the depth of cut, use the depth stop crank. Turn clockwise to increase or counterclockwise to decrease the depth of cut. Take up the slack in the crank when attempting fine adjustments.

Note: One complete revolution of the depth stop crank will change the diameter by 0.100", and each hole on the depth stop crank will change the diameter by 0.0125".

38. If the tool requires adjusting, cut off approximately two inches of the taper and retaper with the adjusted tool.

39. Check this taper (paragraph nos. 30 through 36). Repeat adjustments until the tool is cutting correctly.

40. Visually check the tapered end of the pipe for gross differences in edge thickness. If such a difference exists, it indicates that the tool is not centered in the pipe. Refer back to paragraph no. 15. Lift or adjust stands to correct this condition.

Note: Minor variations in edge thickness may be the result of slight ovality in pipe. This is acceptable and cannot be corrected by tool adjustment.

41. If the grinding drum begins to load up, soak the dirty drum in solvent, such as trichloroethylene.

Solvent containers may be under pressure. Use caution when removing inner seals, especially in warm weather. Use eye protection. Trichloroethylene is not classified as flammable; however, concentrated vapors can be ignited. When using this solvent, do not smoke or use near an open flame. Use with adequate ventilation. Refer to the warning label on each container for additional information.


A light wire brushing may be necessary to remove all the loading. The tool should be reset after the grinding drum has been replaced.

42. If the pipe rotating mechanism should bog down, check alignment of pipe rollers and supports.

IF THE TAPER ANGLE REQUIRES CORRECTION, PROCEED AS FOLLOWS:

43. Normally, the taper angle is preset at the factory. Angle adjustments are difficult to make in the field; therefore, the angles should not be changed unless it is definitely out of tolerance.

44. Use the depth stop crank to set the approximate depth stop. There are match marks on the slide and rail. The rail is marked for 8", 10", 12", 14", and 16" pipe. These settings are to be used as a guide only.

 45. Turn the grinder feed knob to the START position. Match the arrow on the knob to the arrow on top of the tool housing. This moves the grinding drum to the maximum open position.

46. Select the mandrel size and assemble the tool.

47. Make sure there is no trash inside the pipe or any burrs on the mandrels to scratch the pipe I.D.

48. Slide a piece of pipe with a factory taper onto the tool. Wiggle the pipe as necessary to align the mandrels. Slide the pipe on the mandrel until the pipe end contacts the stop bar, then pull the pipe back approximately $\frac{1}{4}$ ". This prevents bending the bar when the mandrels are tightened.

49. Tighten the mandrel knob to expand the mandrels. Lift slightly to centralize the mandrels. The pipe should contact the stop bar when the mandrels are tight. DO NOT OVERTIGHTEN. Expanding the mandrels slightly before lifting may help to align the tool.

50. Turn the grinder feed knob until the grinding drum is closest to the factory taper. (FINISH position of the knob is approximately 180 degrees from the START position.) If

the grinding drum hits the taper, use the depth stop crank to move it away from the pipe (turn counterclockwise). The grinding drum should be closest to the taper with the arrow on the grinder feed knob pointing approximately 180 degrees from START.

51. Use the depth stop crank to bring the grinding drum into light contact with the factory taper. Turn counterclockwise to move away from the pipe and clockwise to move closer.

52. Loosen the lock nut holding the knurled knob on the back of the tool. (See Fig. 14.) DO NOT LOOSEN SET SCREW ON KNURLED KNOB.

53. Turn the knob clockwise to decrease or counterclockwise to increase the angle. Note: The depth stop may have to be changed to make these adjustments.

54. Adjust the knurled knob until the grinding drum angle matches the factory taper. Then, reset the depth stop.

55. If depth of cut correction is needed, follow paragraph nos. 16 through 18. Turn clockwise to increase or counterclockwise to decrease the depth of cut. Take up slack in the crank when attempting fine adjustments.

56. If the tool requires adjusting, cut off approximately two inches of the taper, and retaper with the adjusted tool.

57. Check this taper (paragraph nos. 30 through 36). Repeat adjustments until the tool is cutting correctly.

58. Recheck the angle after making an adjustment. Repeat the setting procedure until the tool is cutting correctly.

ALTERNATE METHOD FOR SETTING TAPER ANGLE

59. Use a 6" deep throat ball anvil micrometer to check the taper angle.

60. The taper angle should be 1 degree. Up to $1\frac{1}{4}$ degree is acceptable. The factory tolerance for spigots is 1 degree $\pm \frac{1}{4}$ degree - 000.

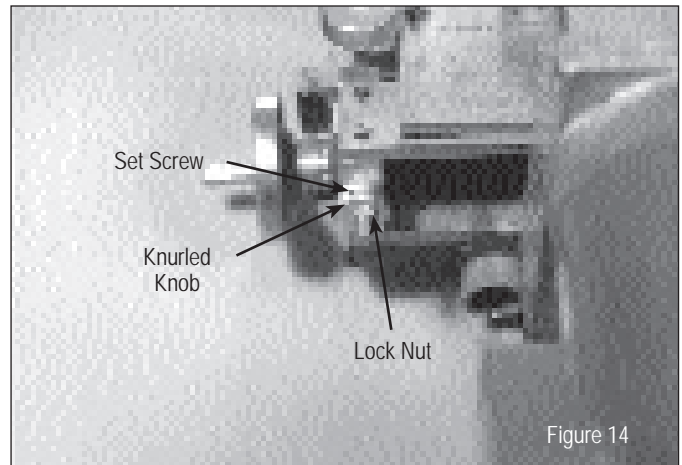


Figure 14

61. To measure the angle, first draw a straight line lengthwise on the spigot.

62. Use a rule and make four marks, 1" apart, starting near the feather edge of the spigot. (See Fig. 15.)

Note: In some pipe sizes, it will only be possible to make three marks.

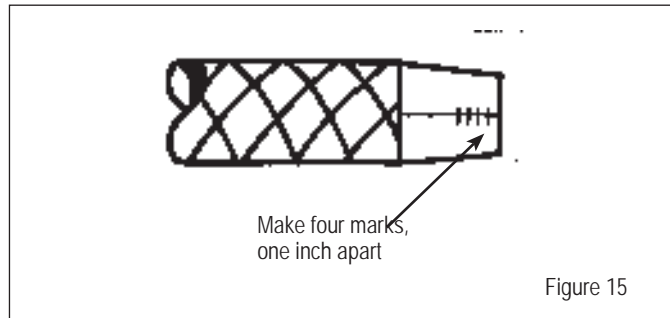
63. At each mark, measure the thickness with the micrometer. The difference between two adjacent marks (1" apart) will be 0.017" if the taper is 1 degree. The maximum allowable difference is 0.022" (1 1/4 degrees). Take readings at all marks; the difference between any two adjacent readings should fall in the range of 0.017" to 0.022". Check the taper angle as described above at three places equally spaced around the spigot.

64. If the taper requires correction, one revolution of the knurled adjustment knob will change the angle by 0.003 of an inch per inch.

65. Recheck the angle after making an adjustment. Repeat the setting procedure until the tool is cutting correctly.

66. The depth stop will have to be reset after changing the taper angle (paragraph nos. 16 through 18).

67. If a factory taper is not available, you must be sure that the minimum effective bond length in Table 1 for the given diameter is achieved. To achieve a good bond length, taper so that the minimum taper length is equal to the minimum effective bond length. Then insert the spigot,



which must insert into the bell at least equal to the minimum effective bond length in Table 1.

Because of O.D. and I.D. manufacturing tolerance on pipe, an exact insertion length cannot be specified. A greater effective bond length is acceptable and will produce a stronger joint. However, the spigot must not be allowed to bottom out in the bell. This is achieved by keeping the spigot at least two wet make-up dimensions (see Table 2) from the bottom of the bell. These measurements must be remade for each joint. The wet make-up dimension is the added insertion achieved by adding adhesive to the dry joint and the force required to lock the joint.

The "minimum effective bond length" method of setting up a tapering tool should only be used if there is no factory taper available. If possible, use a factory taper to set the 8"-16" grinding tapering tool.

TAPERING SILVER STREAK® PIPE WITH THE 8"-16" GRINDING TAPERING TOOL

Because of the larger O.D. on SILVER STREAK pipe, the grinding operation must be done in two, and sometimes three, stages when using the 8"-16" grinding tapering tool. Read this bulletin all the way through to become familiar with the tool before following the instructions below:

68. Follow the steps in paragraph nos. 1 through 20.

69. Slide untapered pipe onto the mandrel until there is just enough clearance for the grinding drum to turn without touching the pipe. Pull back 1/4" and tighten the mandrel knob.

70. Turn the grinder motor on (switch labeled GRIND). Be sure the pipe is not touching the grinding drum. Turn the vacuum cleaner on. Be sure that the vacuum is plugged into a separate circuit from the grinding tool. When both are on the same circuit, it can overload the grinder and possibly blow a fuse. The vacuum must be used during all grinding operations to keep the dust down and to prevent excessive wear on the grinder.

71. Start the mandrel drive (switch labeled DRIVE), and slowly move the grinding drum into the pipe by turning the grinder feed knob one click at a time until it begins to cut lightly. (See Fig. 14.) (CAUTION: ADVANCE THE KNOB SLOWLY TO AVOID BINDING ON HIGH SPOTS OF THE O.D.) When the grinding drum makes contact with the pipe, let the automatic feed take over.

Table 1

Minimum Effective Bond Length	
Pipe Size (inches)	Bond Length (inches)
8	2
10	2 1/8
12	2 1/2
14	3
16	3 1/2

72. When the grinding drum is no longer cutting, it will automatically back away from the pipe. You may return the grinder feed knob to the START position by hand. Turn the grinder switch off first, then the mandrel drive switch.

Table 2

Approximate Wet Make-up Dimension	
Pipe Size (inches)	Wet Make-up Dimension (inches)
8	3/8
10 & 12	5/8
14	3/4
16	1

73. Loosen the mandrel knob and move the pipe in until there is just enough clearance for the grinding drum to turn without touching the pipe. If the pipe has clearance all the way to the stop bar, then complete the steps in paragraph nos. 21 through 42. If the pipe will not go to the stop bar without touching the grinding drum, then repeat the steps in paragraph nos. 70 through 73 until it does.

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