Oliver of Adrian, Inc.

OLIVER MODEL 600/700 DRILL POINTER
MAINTENANCE AND ADJUSTMENT OF THE CHUCK

The following are preliminary instructions to the maintenance or service people. From past experience we have found that many times the service man is called because the drills are not performing satisfactorily. The first thought of most everyone is that the trouble is in the drill grinder and usually they think it is in the chuck. We generally find the trouble is elsewhere. There are many things that will cause a drill to produce oversize holes or to dull quickly. We will cite a few examples and we suggest you check these possibilities before attempting to do anything to the chuck.

Drills may be out of index, the web may be off center or a combination of both. A drill that is bent will cause a poor point. The tools may have the wrong point angle for the material being drilled. The drills may be ground with an improper chisel point angle or may even be ground with incorrect clearance. Figure 15, page 4 shows the method used to check a drill to see if the web is on center. Place the drill on a surface plate and measure from the surface plate to the lower end of the chisel point. Then turn the drill 180 degrees to see if both sides measure the same. Drills with the web out of center have one flute shallower than the other. The shallow flute should be ground out either by hand or on the Oliver Drill Point Thinner designed for this purpose until both flutes measure the same depth at the point of the drill.

Figure 16, page 4 shows a method used to determine if a drill is out of index. Place the drill on a surface plate and measure one-half the drill diameter from the surface plate to the lip at the outer end of the cutting edge. Hold or clamp the drill in this position and measure to see that both lips measure the same. Any out of index condition can be corrected on the Oliver Drill Point Thinner. A drill can be checked for straightness by rolling it on a surface plate. There is also some misunderstanding among users of drills as to how close the hole will come to the size of the drill. Oversize holes may be caused by spring in the drill press table or spindle, method of holding, too great a chisel angle, etc.

A Drill Checking Gage complete with dial indicator for accurately comparing the grind on each cutting lip is produced as a standard product of Oliver of Adrian. We would be pleased to submit details and a quotation at your request on this particular checking gage.

Check to see if the drills are ground properly for the material being drilled. We send a chart with each machine illustrating suggested included angles and clearance settings. This guide should be hung near the machine so that the operator can grind the proper points on the various drills. We ask that the service man check these various items before working on the chuck. Many times the service man spends hours working on the chuck and finds nothing wrong, only to discover later that the difficulty was in the grinding of the drill or in the geometry of the drill itself.

SERVICING THE CHUCK

This chuck will require some attention and care because of the conditions under which it is operated. The wearing parts of this chuck are hardened steel. There is a greasing system built in so when grease is forced in, it pushes grit out. There should be a little grease forced into the chuck daily. When greasing the chuck, make sure the jaws are open to their limit. If grease is forced in when the chuck jaws are in the closed position, it will fill the cavity in the chuck and it will be almost impossible to open the jaws because of excessive grease. If it is determined that the trouble is in the chuck, it can be adjusted and centered. This chuck is a scroll type and the wear in the parts can be adjusted and the centering can be done without taking the chuck apart. Follow the instructions closely.

Figure 8, page 5 is a cross section of the chuck and bearing assembly. Above the cross section is a top view of the various chuck parts. Figure 7, page 6 is an isometric drawing showing the chuck and bearing assembly. First, we recommend greasing the chuck with the jaws open to their limit. Run the chuck jaws in and out to the extreme positions several times. This will work an adequate supply of grease into all the working parts of the chuck.

Before making an adjustment of the chuck, check the toe-in of the sub jaws, #6225 or #6226. Place a round bar in the chuck and just barely bring the jaws down to the bar until contact is made. This contact will be at the front end of the jaws only. If contact does not happen in this manner, an adjustment of screws "AA", Figure 7 must be made. To take up the wear of the chuck end wise or in line with the length of the drill, it will be necessary to tighten the four center screws "AA" to accomplish the necessary toe-in so that the jaws will grip at the front end. The four outer screws "AA" can be taken up for excessive wear, however, under normal circumstances, too much pressure should not be applied since this would eliminate the possibility of toeing-in on the front end of the jaws. These are self-locking screws and care should be taken not to get them too tight since the chuck jaws will then be difficult to move. They <u>should</u> move with tension. To take up the wear sideways, loosen lock screw "BB" and then tighten up on screw "CC". Check the movement of the jaws and get this adjustment as tight as possible while still being able to move the chuck jaws. Tighten lock screw "BB".

To center the chuck make certain the surfaces, where the sub jaws contact the chuck jaws, are clean. We suggest first using chuck sub-jaws #6225, Figure 8. Clean the sub jaws and bolt them in place. The screws holding the jaws want to be tightened up firm but not forced too tightly. Loosen "DD" screws, Figure 7, one at a time until all eight are loose. Next, tighten each of the eight screws but only until the first contact is made. Do not fasten them firmly. There are four centering screws #6227.

Place a ground arbor approximately 1" in diameter in the chuck and let it extend toward the grinding wheel about 1-1/2". Make sure the arbor is long enough so the center can be used in the back end. Tighten the arbor in the chuck while centering the back end. Mount a dial indicator in a convenient area so the

indicator point can touch the arbor in about the same location as the point of a drill would be. Move the chuck to the extreme left side of the carriage when centering. Be sure the chuck bearing is fastened down tight to the carriage.

The usual procedure when checking a cylindrical surface is to immediately find the high point. The steps outlined below should be followed very carefully.

First, take a reading on the arbor to find the location of the high point. If the high point happens to be in line with either set of #6227 adjusting screws, only one adjustment procedure will be required. Two screws #6227, Figure 7, page 6, are in line with the chuck jaws and the other set of screws are at right angles to this position. If the high point is in line with one of the screws, simply loosen one screw #6227 on the low side and tighten the opposite screw #6227 on the high side until the high point found on the indicator reading has been reduced to standard tolerances.

If the high point is not in line with either set of screws #6227, then it will be necessary to make an adjustment by using all four screws. If the high point is found to be located between two sets of screws, loosen the two #6227 screws found on the opposite or low side and tighten up on the #6227 screws found on the high side. The adjustment for each of the screws will not always be of an identical amount because the error might not be of identical relationship in each distance from the two screws involved. Usually it takes two or three adjustments to get the chuck centered. At the factory, the differential is maintained at less than .002".

Never tighten the #6227 screws down too much. If these screws are completely drawn down, they will tighten the shell of the chuck against the O.D. of the chuck scroll #6201. This will cause the chuck to operate with difficulty or may even lock the scroll so it cannot be turned. When the chuck is centered, tighten all of the "DD" screws. We suggest at this point you loosen each #6227 screw and tighten it just enough so it will not drop or work out. Actually, these screws are not needed once the chuck is centered.

On Figure 7 you will find eight set screws indicated as "HH". Beneath these screws will be found a tungsten carbide insert that rides against the scroll. The carbide inserts are designed to lengthen the life of the chuck. Set screws "HH" should be tightened against the carbide insert but pressure should be at an absolute minimum since excessive force would lock up the chuck.

It is usually advisable to check both sets of sub jaws. Remove the #6225 sub jaws, Figure 8, page 5, and put in the #6226 sub jaws. Make sure there is no grit or dirt under the sub jaw before it is bolted in place. Put a 2" or 2-1/4" arbor in the chuck and follow the same procedure as described before. If the sub jaws have not been reground, the two arbors should check very close to the same reading on the indicator. However, if the sub jaws are worn, they may need regrinding and we recommend the two sub jaws be sent back to the factory for this operation. If you attempt to grind these sub jaws in your own plant, we must warn you that both sides of both jaws must be ground straight and true. The thickness from end to end must be exactly the same within .0002" and the

thickness on both sides on both jaws must be the same within .0005". These sub jaws are case hardened and if too much stock is ground off, or if the pieces are heated too much in grinding, the sub jaws will be soft and will not stay accurate very long.

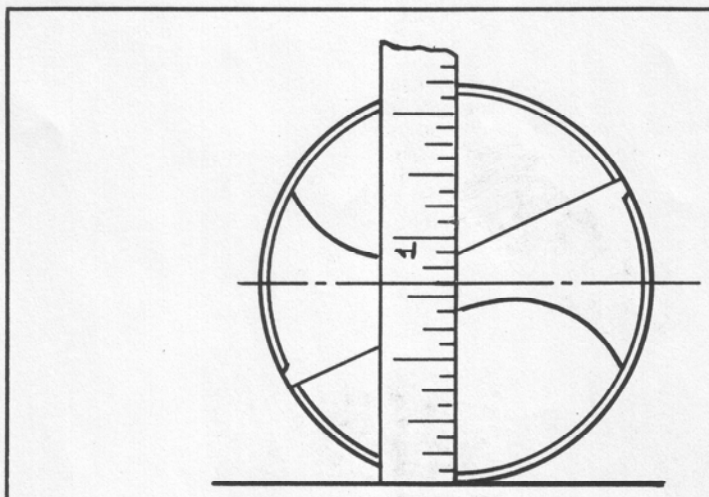


FIG. 15

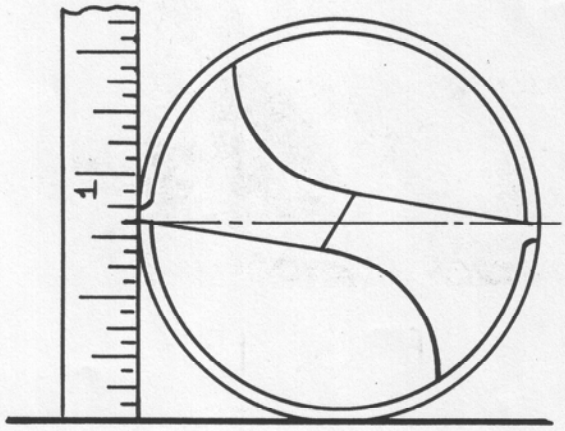
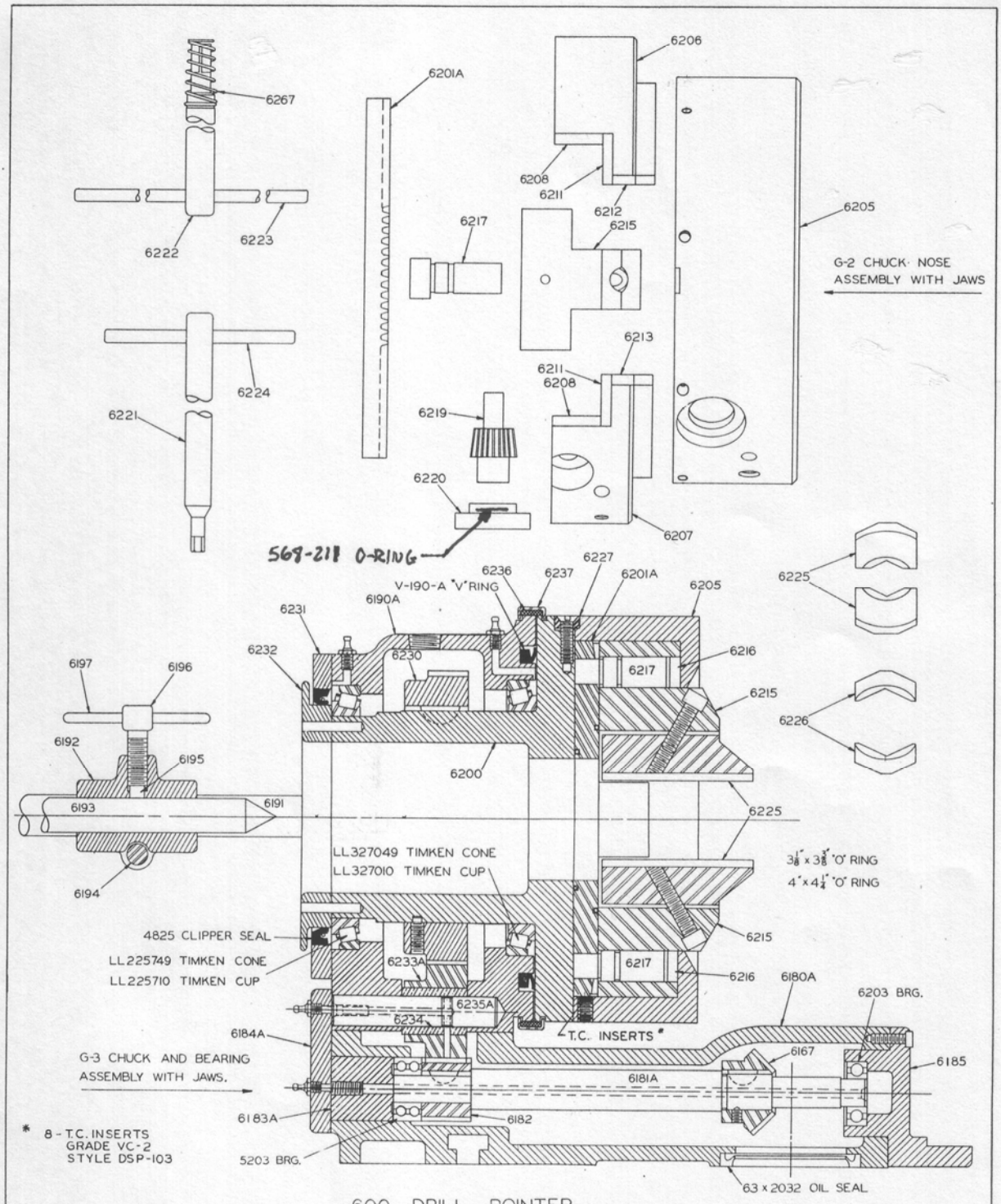


FIG. 16



600 DRILL POINTER
CHUCK ASSEMBLY
FIG. 8

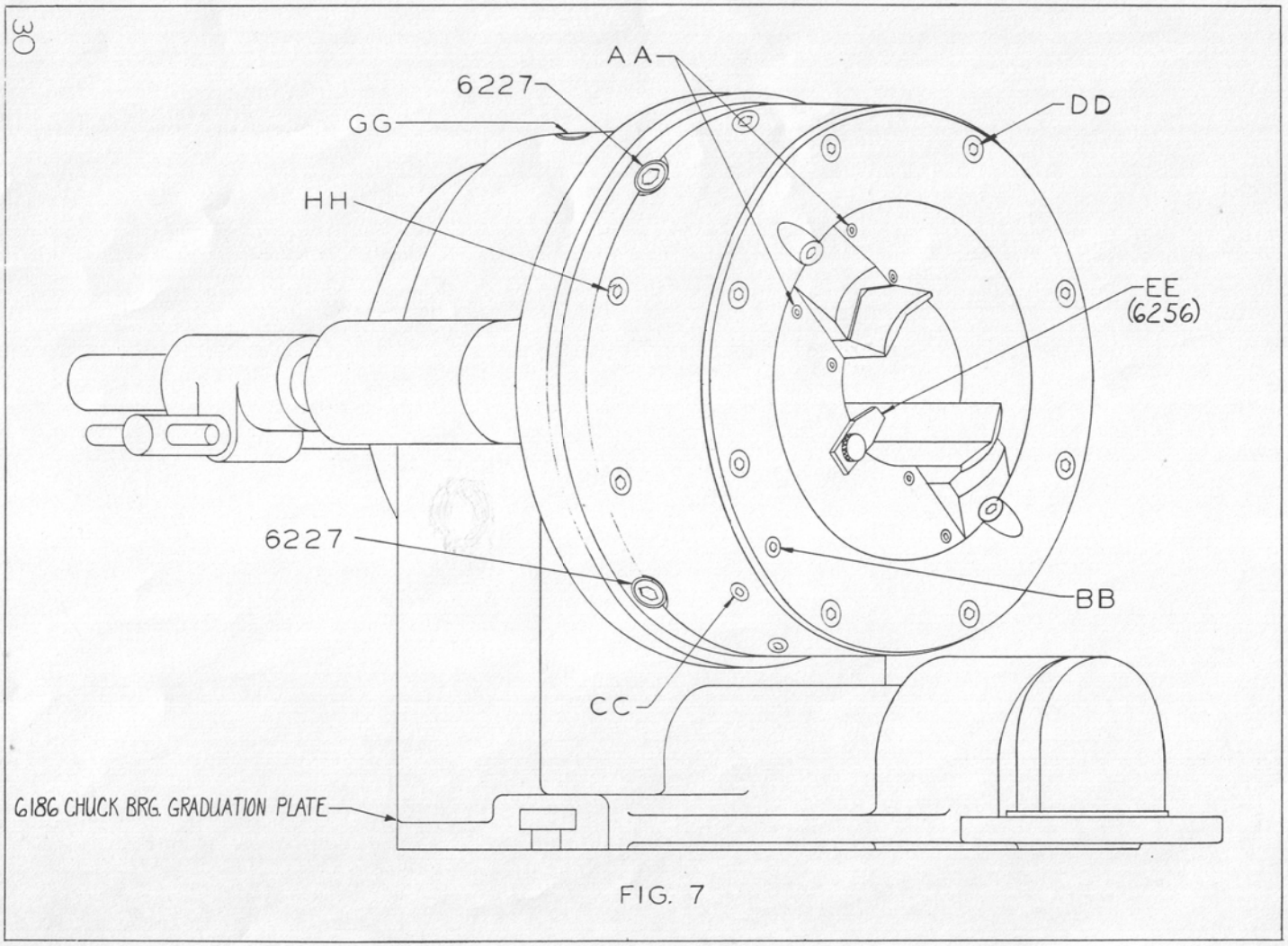

AA
6227
GG
DD
HH
EE
(6256)
6227
BB
CC
6186 CHUCK BRG. GRADUATION PLATE

FIG. 7