

No. 23-603 HOMECRAFT 6" ARBOR HEAD

Operating and Maintenance Instructions

The Delta Homecraft 6" Arbor Head is a unit on which general grinding, brushing and buffing can be easily done. It is handy for use in the home workshop.

Under the item No. 23-603, the customer receives a head casting with two press fitted porous bronze bushings, 2 inch arbor pulley, arbor and No. 284 V-belt. Additional accessories for grinding and buffing work, available when ordered extra, are the left and right grinding units, grinding wheels, wire wheels, fiber brush wheel, buffing wheel, buffing kit, buffing compounds and a 3 inch motor pulley.

Complete directions for adjusting the arbor head and performing all common grinding and buffing operations are contained in these instructions.

Refer to the photographs, drawings and Table 1 to identify the parts mentioned in the following instructions.

MOUNTING BRUSHING AND BUFFING WHEELS

Wire, fiber (tampico) and cloth wheels can be mounted between the sets of flanges on the arbor head. The left-hand shaft extension is long enough to permit a 1 inch wheel to be mounted between the flanges. The right-hand shaft extension is long enough to permit a 2 $\frac{1}{4}$ inch wheel to be mounted between the flanges. Tighten the arbor flanges firmly against the wheels. Refer to Figs. 2, 4 and 5.

MOUNTING GRINDING WHEELS

Grinding wheels should be mounted on this unit in conjunction with the wheel guard units.

To mount the left and right grinding wheel guard units on the arbor head, first fasten the wheel guards on the sides of the head casting. Use the hexagon head cap screws with the steel washers through the slotted holes of the wheel guards and screw them into the rear side holes of the head casting. Tighten these cap screws by hand to hold them in the approximate position.

Replace the sets of standard flanges on the arbor head with the wheel flanges which come with each grinding unit. Mount the grinding wheels between these flanges and tighten the special hexagon jam nuts until the inner flanges bear against the shoulders of the arbor. Do not use excessive pressure when tightening the arbor flanges against the grinding wheels since this may cause wheel breakage.

It is good practice to remove any dust, dirt or grease from the arbor flanges before clamping a grinding wheel, to prevent runout on the wheels.

Adjust the wheel guards to clear the edges of the grinding wheels uniformly and tighten the hexagon head cap screws firmly.

Mount the tool rests by threading the remaining hexagon head cap screws through the slotted holes



Fig. 1. Delta Homecraft 6" Arbor Head.

and into the forward side holes of the arbor head. Adjust each tool rest so it comes within 1/16 inch of the grinding wheel and slightly below center. Re-adjust to maintain this relation as the wheel is worn to a smaller diameter. Refer to Figs. 2 and 6.

LUBRICATION

The spindle of the arbor head rotates in two porous bronze bushings which are press fitted into the sides of the head casting. These bushings hold approximately 30 per cent of their volume in oil, by the oil seeping into the voids of the bushing material.

These bushings have been saturated with oil before assembling the arbor head, consequently they will run a considerable length of time without adding lubrication. We suggest frequently oiling these bushings by removing the round head machine screws from the top of the projecting shoulders of the head casting. The oil holes are drilled through the housing but not through the porous bronze bushings.

Since these bushings are porous the oil is allowed to seep slowly through the bushing material replacing the oil which may have been lost from the bushing. By

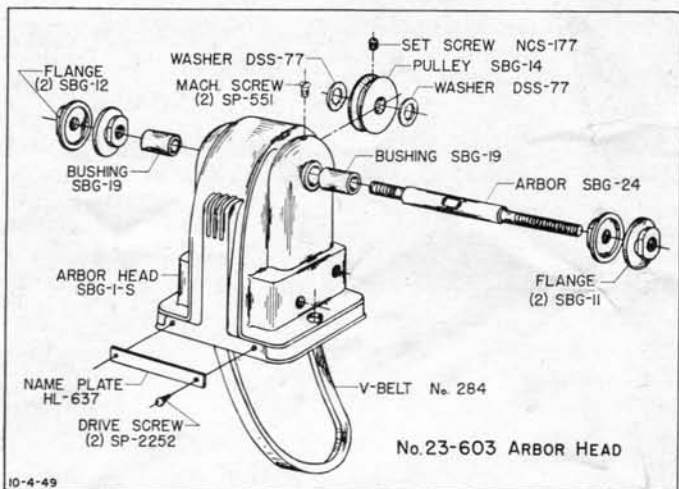


Fig. 2.

filling the oil holes to the top, it has been found that it takes approximately one day for the oil in this hole to seep down through the bushing. This seepage will be somewhat faster when the arbor head is run continuously, due to the higher temperature of the bushings. By allowing the oil to seep through the porous bronze bushings instead of having the bushing drilled for oiling it is possible to prevent the entrance of grit and abrasive material from entering the bushings and cause excessive wear.

We suggest using a good grade of SAE 20 oil which is suitable for this arbor head. With this type of lubrication there may be a slight amount of oil leakage from these bushings. This leakage of oil will permit dust particles, abrasive particles and steel chips to adhere to the head casting. We suggest wiping an excessive leakage of oil from the sides of the arbor head to avoid any possibility of any grit from entering the porous bronze bushings. Refer to Fig. 2.

GRINDING WHEELS

We have selected two general purpose grinding wheels of medium size grains to do all types of work in the home workshop. No. 3101 6 inch grinding wheel is a coarse type vitrified wheel which has a number 46 grit. No. 3102 6 inch grinding wheel is a fine type vitrified wheel which has a number 60 grit. It must be remembered that these particular grades of wheels may not be the type of grinding wheel most suitable for grinding all materials. Generally, when grinding soft materials the practice has been to use a hard wheel, and when grinding hard materials to use a soft wheel.

After a grinding wheel has become worn to approximately one-half its diameter we suggest replacing it with a new wheel. It is possible for a wheel to become out of balance as it wears down to a smaller diameter due to unequal density at various points within the wheel.

GRINDING WHEEL SPEEDS

The maximum safe speed for operating the Nos. 3101 and 3102 grinding wheels is 3450 rpm. This speed is obtained by using a $\frac{1}{4}$ or $\frac{1}{3}$ hp motor with 60 cycle current and 1725 rpm, which will run the 6 inch grinding wheel at 5400 surface feet per minute. Do not run these grinding wheels over the maximum safe speed of 3450 rpm, to avoid danger to the operator by having a wheel burst while in operation.

Since 5400 surface feet per minute is the maximum safe speed for the above grinding wheels, it may be found that this speed is not the correct speed for each type of tool grinding.

Grinding at the maximum wheel speed may generate an extreme amount of heat. This heat may be great enough to draw the temper from the tool. When grinding a sharp edge on woodworking tools, it may be found that the fine edge on the tool is unable to absorb the heat generated fast enough. We suggest to the Homecraftsman, when grinding his own woodworking tools—take light cuts in one direction only across the face of the grinding wheels.

CARE OF GRINDING WHEELS

Always keep in mind that grinding wheels are precision made tools and in order for them to be efficient their cutting edges must be kept sharp. It is equally important that the grinding wheel be properly balanced.

When a wheel becomes loaded, one in which the face of the wheel has particles of metal, plastics, etc., being ground adhering to its surface so the pores on the face of the wheel are filled it leaves no room for clearance.

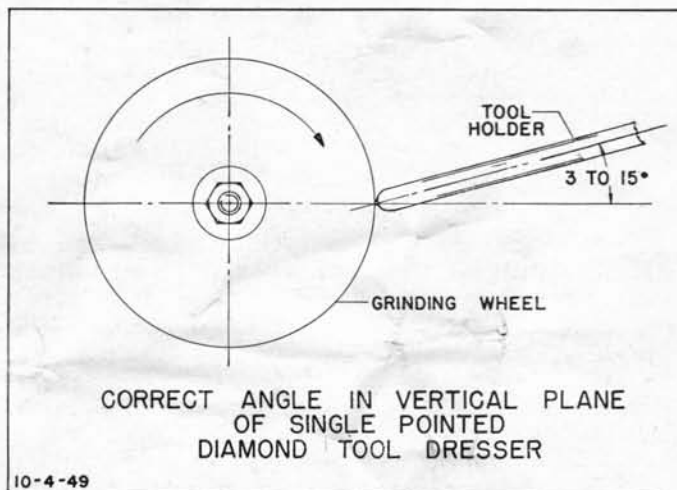


Fig. 3

For the wheel to cut improperly it is not necessary that all the pores between the cutting particles on the wheel face be filled. A number of pieces of metal, etc., on the face of the wheel prevents it from cutting into the work and will cause an excessive generation of heat. If this condition exists we suggest redressing the wheel.

When a wheel becomes glazed, its cutting particles have become dulled or worn down even with the bond. The bond in this case is so hard that it does not wear away fast enough to allow the cutting particles to escape when dulled. Continued operation with a glazed wheel results in increased smoothness of the wheel face and decreases its cutting action. If this condition exists we suggest redressing the wheel.

As soon as a grinding wheel wears there is a possibility that it may become out of round. This condition causes excessive vibration or hammering effect when the machine is being operated, and prevents the tool from being properly held in place. When this condition exists we suggest redressing the wheel.

Truing a wheel is the removal of material from the grinding surface so the wheel runs absolutely true. Dressing a wheel is the operation of cleaning or opening up the pores on the surface of a wheel.

When truing a wheel always take light cuts across the face of the grinding wheel. Taking heavy cuts only increases the generation of heat in the diamond stone by its cutting friction and may cause it to crack.

We suggest the No. 3121 diamond pointed wheel dresser for truing and dressing up grinding wheels. If the diamond becomes over heated by taking too heavy a cut when truing or dressing wheels, never cool it with water. Never strike the diamond tipped wheel dresser against the sides of a grinding wheel, since it is possible to crack a diamond in this manner. A diamond is a very hard brittle substance.

The diamond pointed dressing tool should always drag against the face of the wheel to prevent damaging the stones or gouging the wheel. When truing the face of a straight wheel, the tool should be set on the radius of the wheel and then tilted until the axis of the tool forms approximately 3 to 15 degrees above a line intersecting the axis. Refer to Fig 3.

When a wheel has become worn, tapered, or convex bring the diamond in contact with the highest point, since there may be excessive penetration and consequent damage to the diamond point.

Truing and dressing grinding wheels should be done at normal operating speed.

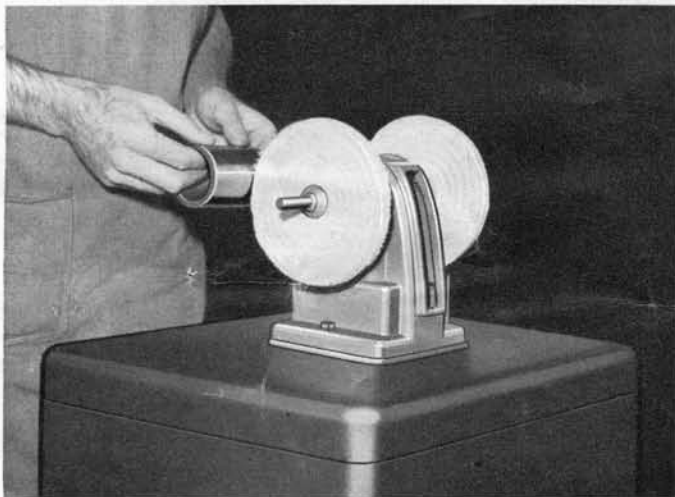


Fig. 4. Removing rust and tarnish from castings and other items around the home.

BRUSHING

To prepare the work for buffing operations wire and fiber (tampico) wheels are usually used. In final operations brushing produces a smooth even finish blending in the wheel marks of any previous polishing operations.

Wire brushes are usually used only on metals. They do not remove deep scratches, pits or blemishes. Instead, they do perform more of a peening operation very similar to a very fine sandblast, but results in a much brighter finish than sandblasting. In the sheet metal trade, wire brushes are used for finishing operations and producing a satin finish. For bright wire finishing we have selected a fine wire brush No. 3114 which is 6 inches in diameter. When a matte type finish is desired, we suggest using No. 3113 which is a heavier wire brush and is 6 inches in diameter.

The fiber (tampico) wheel No. 3115 is usually used after wire brushing. It leaves the surface ideal for buffing operations.



Fig. 5. Buffing gold, silver, sterling and other precious metal cups, etc., to a bright luster.

BUFFING

Buffing is the practice of producing a smooth, uniform and lustrous surface by means of a revolving flexible buff which has been "charged" with a buffing compound in contact with the work. Buffing consists of two separate operations known as, "cutting down" and "coloring." Cutting down is removing the major imperfections in the surface of the material to be buffed by using a buffing compound. Coloring is producing a higher or brighter surface finish by using a milder buffing compound.

We have selected a fine cloth buffing wheel No. 4005 which is $\frac{1}{2}$ inch wide by 6 inches in diameter. This wheel is suitable for all operations commonly done in the home workshop. When applying a buffing compound use it sparingly on the face of the revolving wheel and then buff the work by lightly pressing against the wheel. Repeat applying the buffing compound as needed. Rake the buffing wheel with a sharp

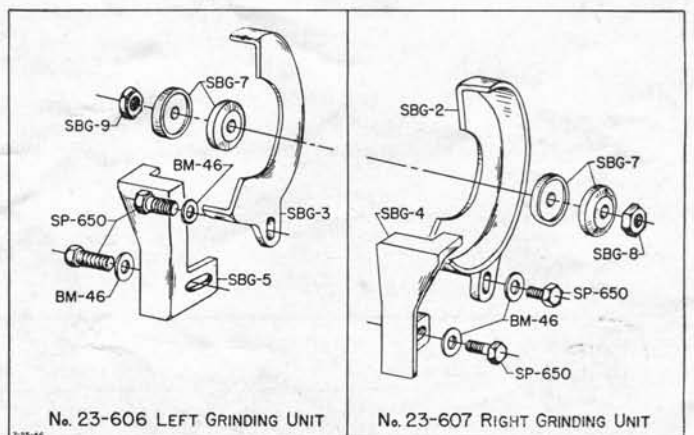


Fig. 6

instrument such as a screw driver or an old file, before changing from one compound to another. We suggest using a different cloth wheel for each buffing compound used.

The No. 4007, buffing compound, is red in color and can be used on gold, silver, sterling and all other precious metals to a bright luster.

The No. 4008, buffing compound, is white in color and can be used on nickel, chromium, iron, stainless steel, cast brass and aluminum to a bright luster.

The No. 4009, buffing compound, is black in color and can be used on articles where an extra sharp cutting action is necessary such as removing rust, scale, and tarnish from tools, cast iron or steel and many other articles.

The No. 4010 buffing compound is brown in color and can be used on articles of aluminum, brass, copper, pewter, wood, plastics, painted surfaces, horn and hard rubber to a bright luster.

If it is found that the work tends to tear the abrasive away the buffing wheel is operating at too low a speed. If the speed is too high the buff will be burned. Holding

the work against the buffing wheel with too much pressure tends to throw the work out of the hands of the operator. Too much pressure will also result in an excess amount of abrasive material being used and the excess compound may smut the work and prevent abrasive action.

On a good buffing wheel the buff should stand out straight from the axis of the spindle and it should be circular and evenly balanced. Trueness of diameter and accuracy of balance are two essentials to the best type of work. Other important features of a buffing wheel are fullness of weight, fullness of the count of disks and uniformity of material. A buff usually cuts best when it is run at a speed which makes it stand out stiffly. Refer to Figs. 4 and 5.

CHANGING V-BELT

Remove the arbor from the head casting to install a new V-belt. Take off both tool rests and wheels, loosen the set screw in the drive pulley, and remove the nut and flanges from one side of the arbor by slipping it out of its bearings from the opposite side. Refer to Fig. 2.

Table 1. REPLACEMENT PARTS

IMPORTANT: Give both the Part Number and the Description of each item when ordering from this list; also the Serial Number of the machine on which the parts are to be used.

Part No.	Description	Number Required	Part No.	Description	Number Required
NO. 23-603 ARBOR HEAD					
DSS-77	Special 5/8" Fiber Washer, 1 1/4" O.D. x 1/8" Thick	2	SP-650	3/8-16 x 7/8" Hexagon Head Cap Screw	2
HL-637	Name Plate, Homecraft, 1/2 x 4", Horizontal	1	No. 23-607 Grinding Unit, Right		
NCS-177	Special 1/4-28 x 1/4" Headless Set Screw	1	BM-46	Special 2 5/8" Steel Washer, 5/16" O.D. x 1/8" Thick	2
SBG-1-S	Arbor Head, with Bushings	1	SBG-2	Wheel Guard, Right	1
SBG-11	Arbor Flange, 1/2-24 Thread, with Flats	2	SBG-4	Tool Rest, Right	1
SBG-12	Arbor Flange, 1/2" - 24 L.H. Thread, with Flats	2	SBG-7	Wheel Flange, 1/2" I.D., 1 3/4" O.D. x 3/8" Thick	2
SBG-14	2" Arbor Pulley, 5/8" Bore, Tapped 1/4"-28	1	SBG-8	Special 1/2"-24 Hexagon Jam Nut, 5/16" Thick	1
SBG-19	Porous Bronze Bushing, 9/8" I.D., 3/4 x 1 1/2"	2	SP-650	3/8-16 x 7/8" Hexagon Head Cap Screw	2
SBG-24	Arbor, 5/8 x 9 13/16", 1/2"-24 R. and L. Hand Threads	1	Wheels (1/2" Bore)		
No. 284	V-Belt, 30 1/2" Outside Circumference	1	No. 3101	6" Grinding Wheel, 1/2" Wide, #46 Grit	1
SP-551	#10-32 x 1/4" Round Head Machine Screw	2	No. 3102	6" Grinding Wheel, 1/2" Wide, #60 Grit	1
SP-2252	#2 x 3/16" Drive Screw	2	No. 3113	6" Wire Wheel, Coarse	1
ACCESSORIES					
No. 5300	3" Motor Pulley, with Set Screw (Specify 1/2, 5/8 or 3/4" Bore)	1	No. 3114	6" Wire Wheel, Fine	1
No. 5400	4" Motor Pulley, with Set Screw (Specify 1/2, 5/8 or 3/4" Bore)	1	No. 3115	6" Fiber Brush	1
No. 23-606 Grinding Unit, Left					
BM-46	Special 2 5/8" Steel Washer, 1 5/16" O.D. x 1/8" Thick	2	No. 4005	6" Buffing Wheel, 1/2" Wide	1
SBG-3	Wheel Guard, Left	1	Buffing Compounds		
SBG-5	Tool Rest, Left	1	No. 4003	Buffing Kit, No. 4004 Buffing Compounds and No. 4005 Buffing Wheel	1
SBG-7	Wheel Flange, 1/2" I.D., 1 3/4" O.D. x 3/8" Thick	2	No. 4004	Buffing Compounds, Box of 4 Bars	1
SBG-9	Special 1/2"-24 Hexagon Jam Nut, 5/16" Th., L.H. Thd.	1	No. 4007	Red Compound, 1 lb. Bar, for Precious Metals	1
			No. 4008	White Compound, 1 lb. Bar, for Nickel, etc.	1
			No. 4009	Black Compound, 1 lb. Bar, for Removing Rust	1
			No. 4010	Brown Compound, 1 lb. Bar, for Brass, etc.	1

CONSULT YOUR DELTA DEALER FOR PRICES OF REPLACEMENT PARTS, ACCESSORIES AND TOOLS TO FACILITATE HANDLING WE SUGGEST ORDERING ALL PARTS THROUGH YOUR DELTA DEALER

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