

OPERATION MANUAL

BRC440

Hub Arm Assembly

RTI TECHNOLOGIES, INC.

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Manual P/N 035-80608-00

Table of Contents

1	Introduction	1
2	Safety	2
3	Material List	3
4	Mounting of Hub & Centering Plate Storage Bracket	4
5	Component Storage	5
6	Mounting the Cranks on the Centering Plate	6
7	Mounting Centering Plate to the Wheel Hub	7
8	Preliminary Runout Compensation Adjustment	8
9	Mounting the Hub Arm	10
10	Mounting the Lathe Head	11
11	Attaching the Drive Motor	12
12	Connecting Power	13
13	Final Runout Compensation Adjustment	14
14	Removing Hub Arm Assembly	15

BRC35 Lathe + BRC440 Hub Arm = BRC475

BRC40 + BRC440 Hub Arm = BRC480

1 Introduction

Thank you for your purchase of a Lathe and Hub Arm Assembly. Congratulations on your choice! The BRC Lathe and Hub Arm Assembly is designed to outperform every other comparable hub mounted brake lathe in all respects.

The BRC was designed as a completely new product. The special hub adaption method designed by RTI for the BRC is brand new and substantially improved.

The BRC is designed to be easy to use. Once the unit is mounted to the hub it operates in much the same way as a typical bench mounted lathe. Mounting the unit on the hub of the vehicle requires the axis of the BRC drive be aligned or compensated to the hub axis of the vehicle. The precision of this alignment or compensation for the BRC or any other hub mounted lathe will determine the rotor run out that is finally achieved.

The time to achieve the necessary compensation or alignment of the BRC is minimal. Less than two minutes per wheel to get around 0.002 in. (0.050 mm) of run out and only slightly more time to achieve “near zero” or less an 0.001 in. (0.025 mm) of run out. The BRC hub plate is attached to the hub of the vehicle by means of 3, 4, 5 or 7 special cranks and the compensation is achieved by simply lengthening or shortening the length of these cranks using a dial indicator to determine the correct setting. Minimizing brake rotor run out is an important aspect of modern brake service. Elimination of pedal pulsation issues on wheels with pre-loaded wheel bearings requires less than 0.001 in. (0.025 mm) of run out. If the wheels do not run on pre-loaded wheel bearings, run out of 0.002 in. (0.050 mm) is acceptable.

Running the BRC is simple. It has two spindle speeds and a variable feed rate.

The BRC can be used as a “single pass-one cut” machine. However, RTI recommends a “two pass” machining process with a rough “foundation” cut just deep enough to clean up the rotor and an extra fine finish cut, with a depth of only 0.001 to 0.002 in. (0.025 to 0.05 mm) per side, taking full advantage of the special cutting tool design of the BRC. This two pass technique will not remove any more material than necessary, and even though it may take a few minutes longer, it will result in a more perfect rotor in every respect.

Technical Support
800-468-2321 (Extension 259)

2 Safety

A. Avoid a major injury because of an unexpected start-up!

Be sure that the BRC is not plugged in and supplied with electrical power when the lathe is not operating. This is particularly important when mounting the unit and performing the compensation adjustments. In addition, the BRC has an Emergency Stop button on the spindle drive motor.

B. Avoid a major injury from rotating machinery!

The BRC has a spindle motor with a great deal of power and torque. Do not wear loose clothing that could be entangled in the rotating parts. Be sure that long hair is properly secured so that it can not be entangled in the rotating parts. Do not place any part of your body near the rotating parts of the BRC when in operation. Always be aware of the location of the Emergency Stop button so that the lathe can be stopped immediately.

C. Protect your eyes!

Small metal chips fly off the rotor during machining. Be sure to wear safety glasses at all times when the BRC is in operation. Use the same safety glasses that are required when grinding metal.

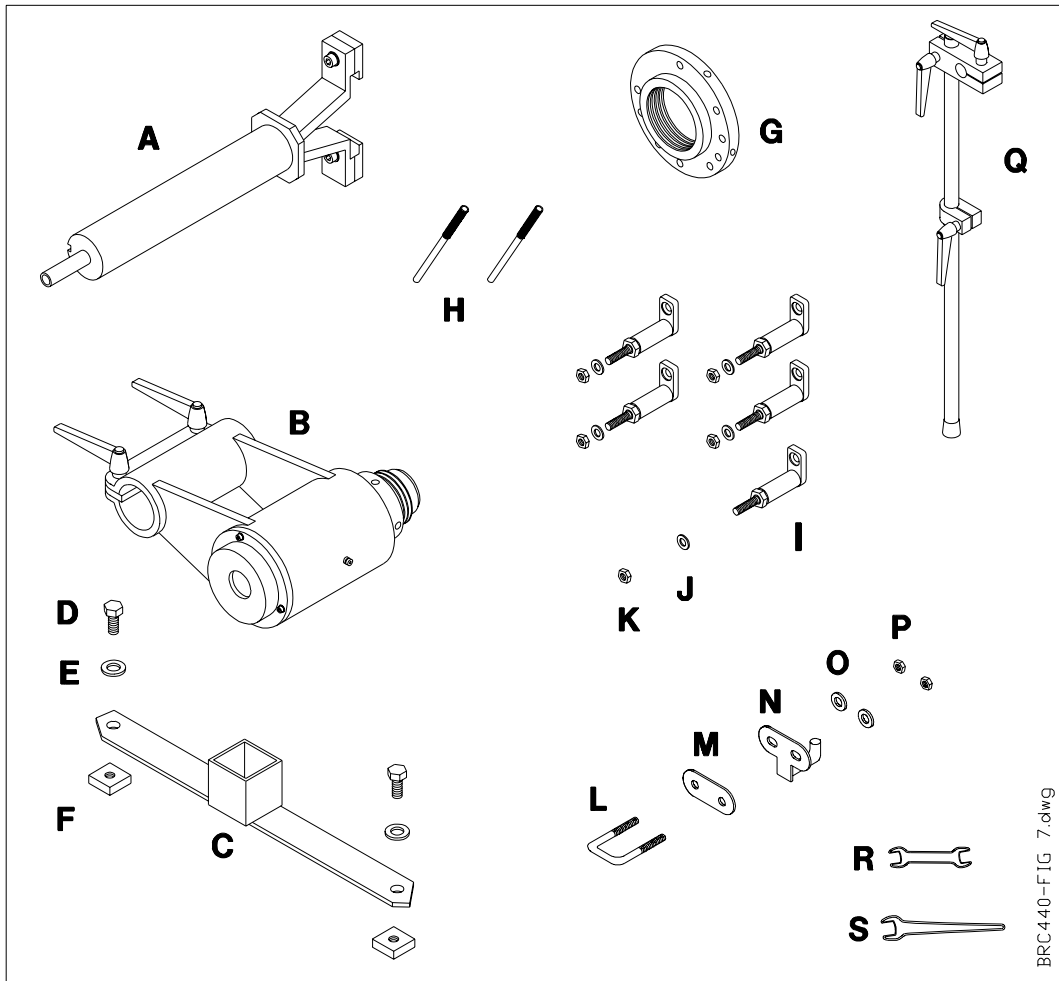
D. Avoid possible electrical shock or unsafe operation!

Like any electrical appliance, never operate the BRC when it is wet, or when you are standing in water. Be sure the receptacle for the electrical plug is a three prong grounded type, that it is the correct voltage for the BRC (110V, 60Hz in the North America), that it is protected by a fuse or circuit breaker with the correct rating (15 Amp maximum in North America), and that it is protected with a Ground Fault Circuit Interrupter (GFCI).

E. Avoid all fire hazards!

If for any reason the lathe spindle is jammed or locked up and stops suddenly, be sure to turn the power off and unplug the lathe immediately, before fixing the cause of the problem.

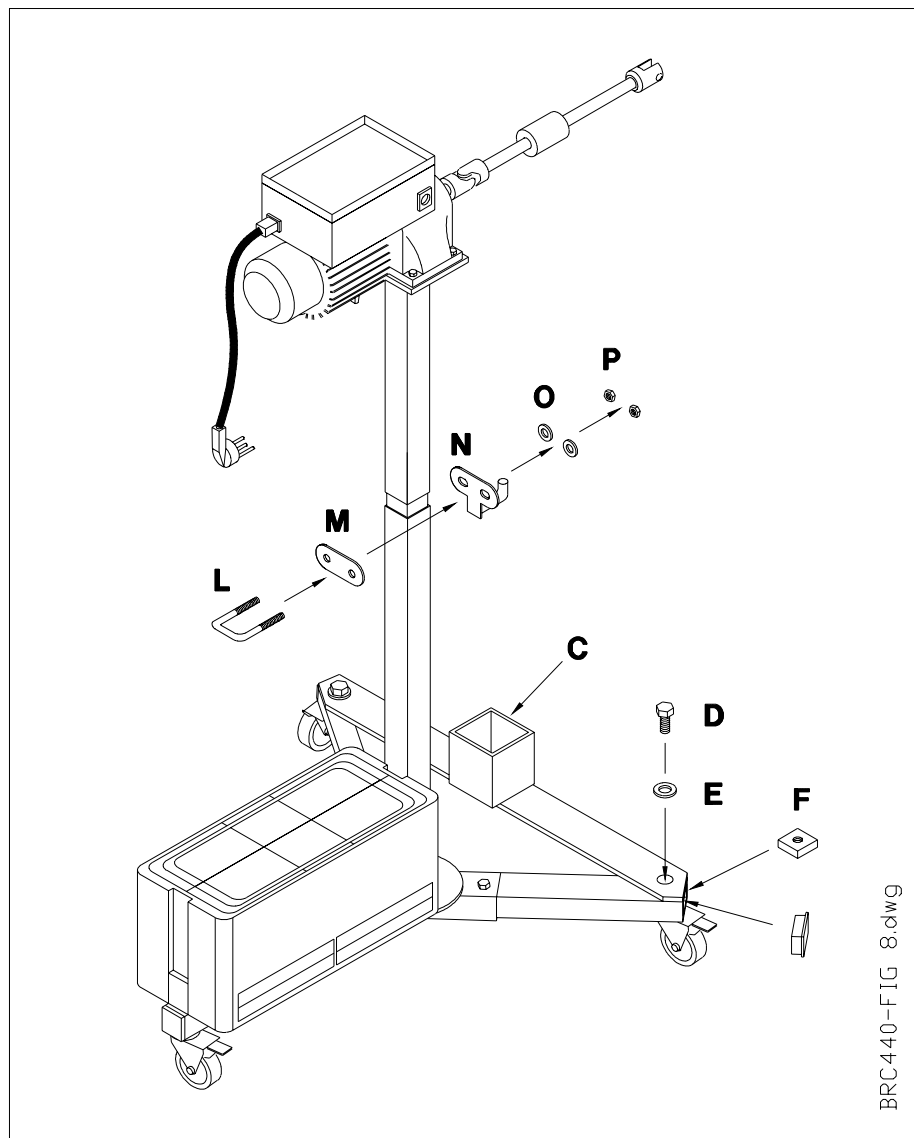
3 Material List



BRC440-FIG 7.dwg

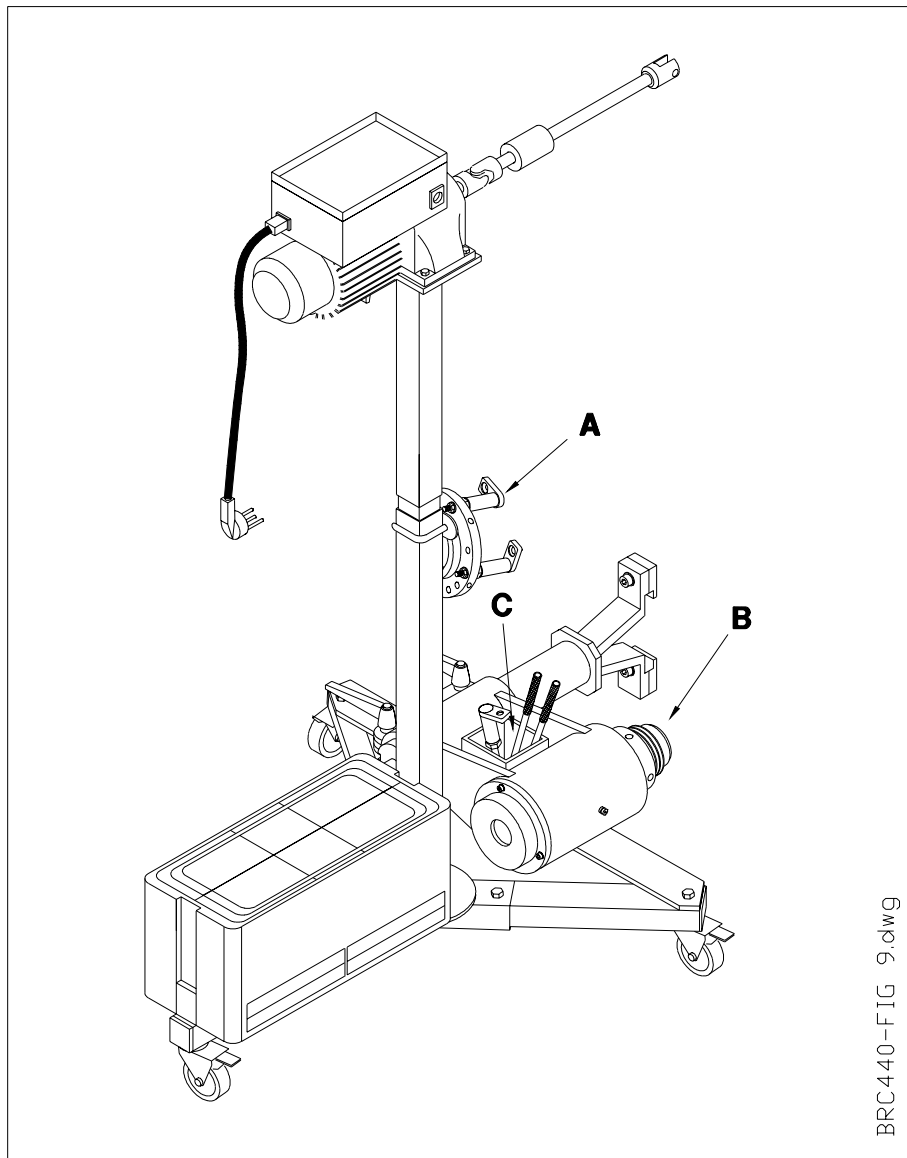
Item	Description	Quantity
A	Arm Assembly	1
B	Hub Assembly	1
C	Storage Bracket - Hub Arm	1
D	Bolt (M10 -1.25 x 15)	2
E	Washer 11mm (ID x 20mm OD)	2
F	Square Nut	2
G	Centering Plate	1
H	Tommy Bar	2
I	Crank - 90mm (Incl. Adjusting Nut)	5
J	Washer (10mm ID x 19mm OD)	5
K	Nut (M10 -1.25)	5
L	U-Bolt	1
M	Rear Plate	1
N	Front Plate	1
O	Washer (8mm ID x 16mm OD)	2
P	Nut (M8 -1.25)	2
Q	Adjustable Support Cane	1
R	Wrench 17 mm & 19 mm	1
S	Wrench 27 mm	1

4 Mounting of Hub & Centering Plate Storage Brackets



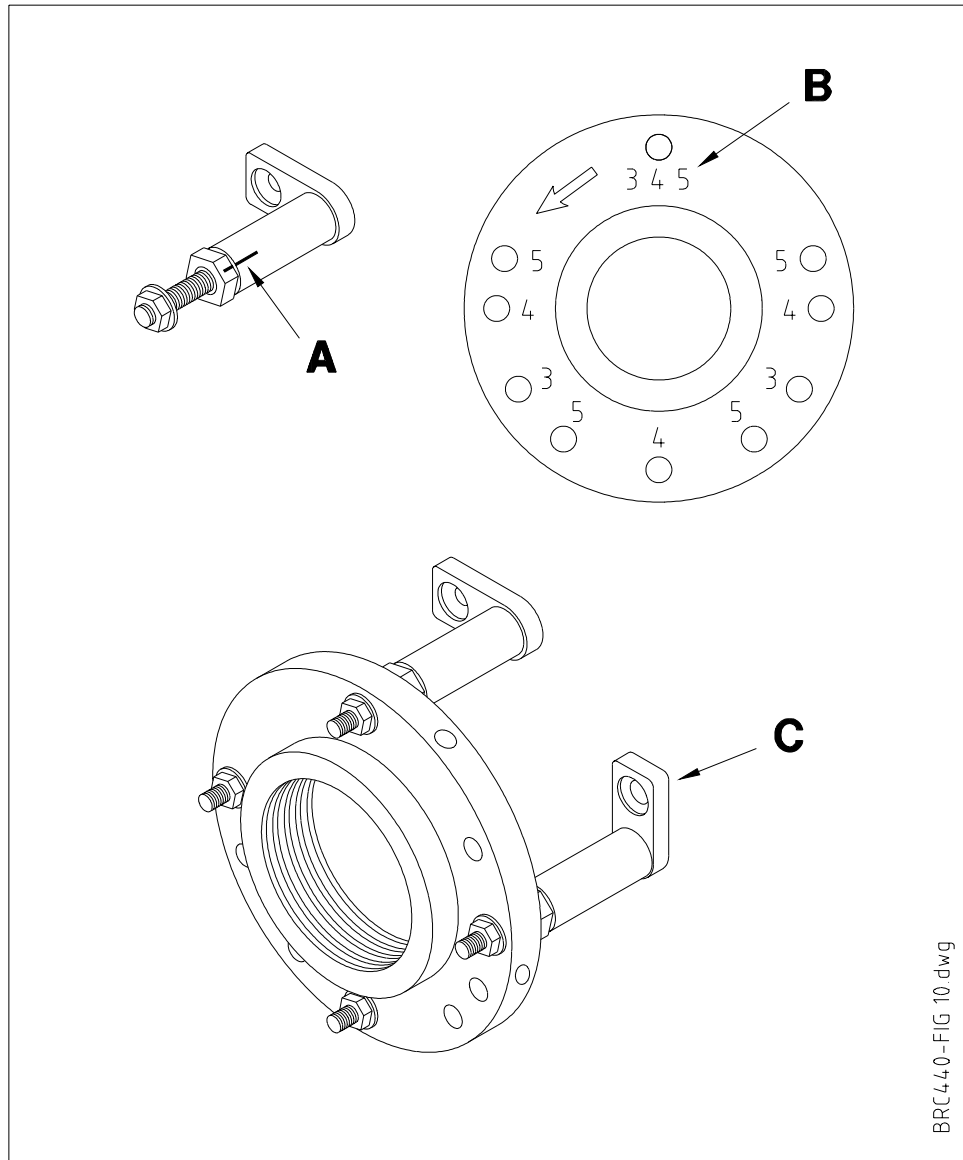
- 4.1 Place Square Nut (F) inside each leg and mount the Hub Arm Storage Bracket (C) using Bolts and Washers (D-E). Position the bracket as shown, noting that the ends are cut to match the angle of each leg. Place plastic end cap into end of legs.
- 4.2 Mount the Centering Plate Bracket (L-M-N-O-P). Position bracket at the top of the lower column of the Drive Stand. The hook should face towards the Hub Arm Storage Bracket (C).

5 Component Storage



- 5.1 Store Centering Plate with Cranks on hook (A).
- 5.2 Store Hub Arm Assembly on bracket (B)
- 5.3 Store Tommy Bars and extra Cranks in box on bracket (C).

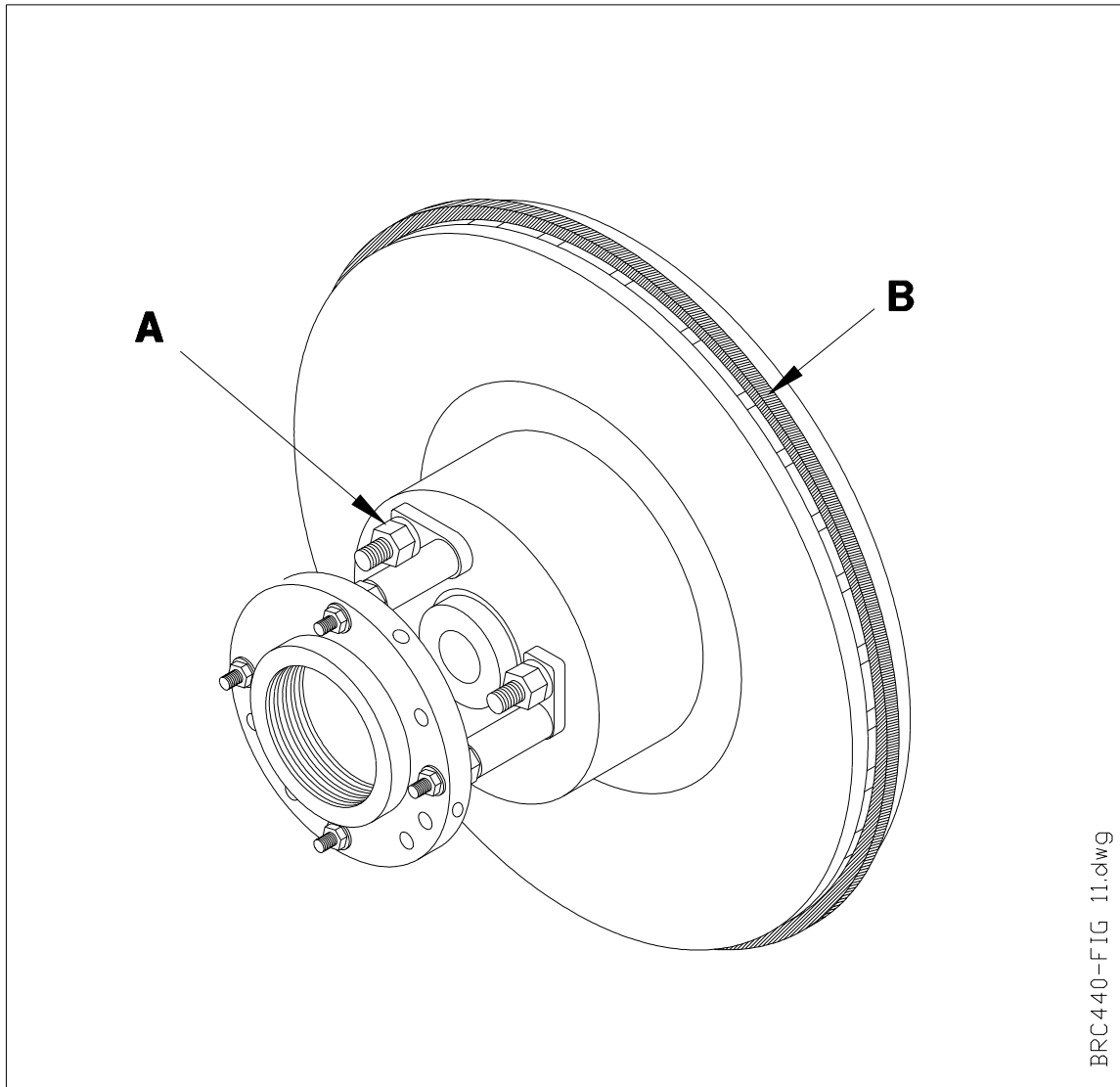
6 Mounting the Cranks on the Centering Plate



- 6.1 A scribe mark (A) is located on each Crank and large nut. Turn the large nut onto the Crank as far as possible, finger tight. The scribe mark should be aligned on the large nut and the barrel of the Crank. Then, loosen the large nut one full turn, once again aligning the scribe marks. Do this on all Cranks.
- 6.2 Numbers (B) are stamped on the Centering Plate next to the holes for mounting the Cranks. Mount four cranks in the holes numbered 4 for a four-lug wheel. Mount five cranks in the holes numbered 5 for a five-lug wheel. Mount three cranks in the holes numbered 3 for a six-lug wheel. Insert the Cranks into the appropriate holes, install the washers, and small nuts. Finger tighten the small nuts.
- 6.3 Position the legs (C) of all the Cranks so they point in the counter-clockwise direction.

BRC440-FIG 10.dwg

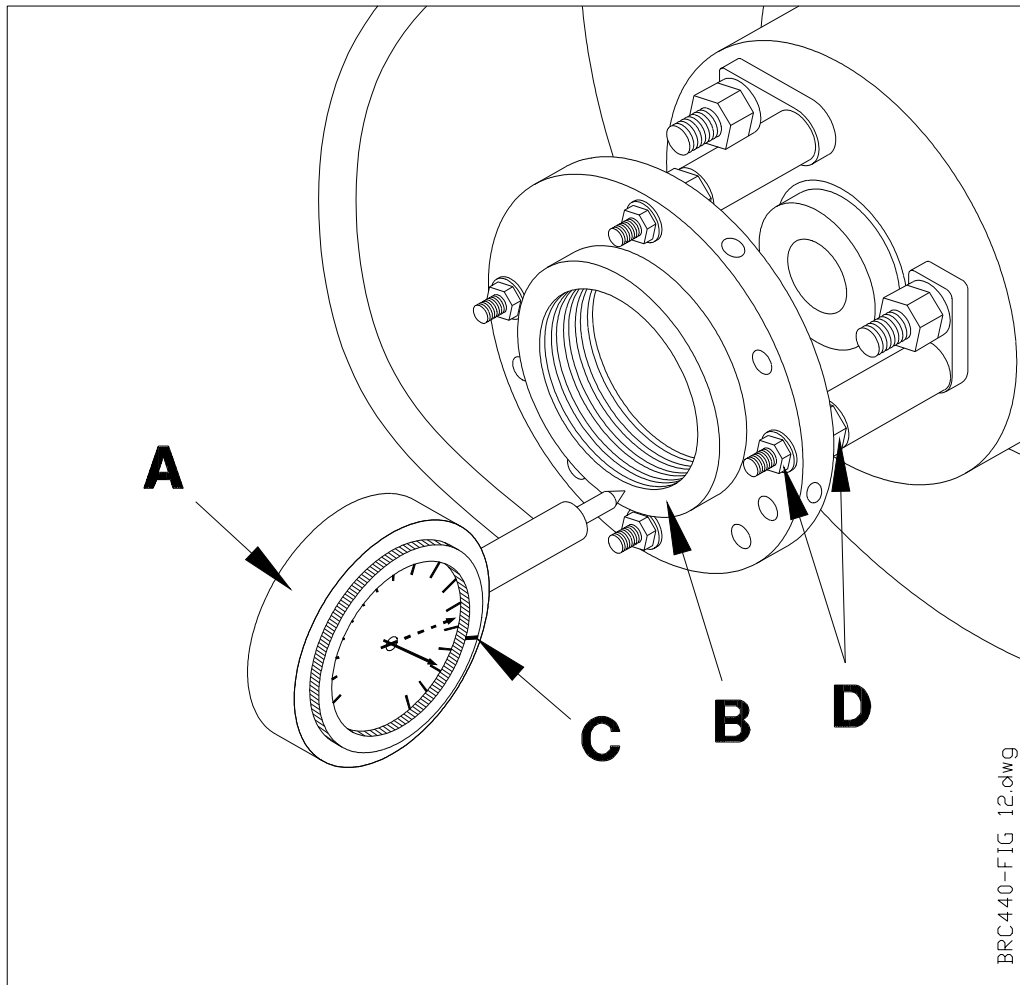
7 Mounting Centering Plate to the Wheel Hub



BRC440-FIG 11.dwg

- 7.1 Place the large holes in the legs of the Cranks over the wheel lugs and install the lug nuts (A) finger tight.
- 7.2 Tighten the lug nuts to the manufacturer's recommended wheel installation torque.
- 7.3 Place the Vibration Dampener Rubber Ring (B - supplied with BRC Lathe Assembly) around the rotor. Other types of vibration dampeners can also be used. It is always important to prevent vibration which could cause unsatisfactory surface finish when cutting the rotor.

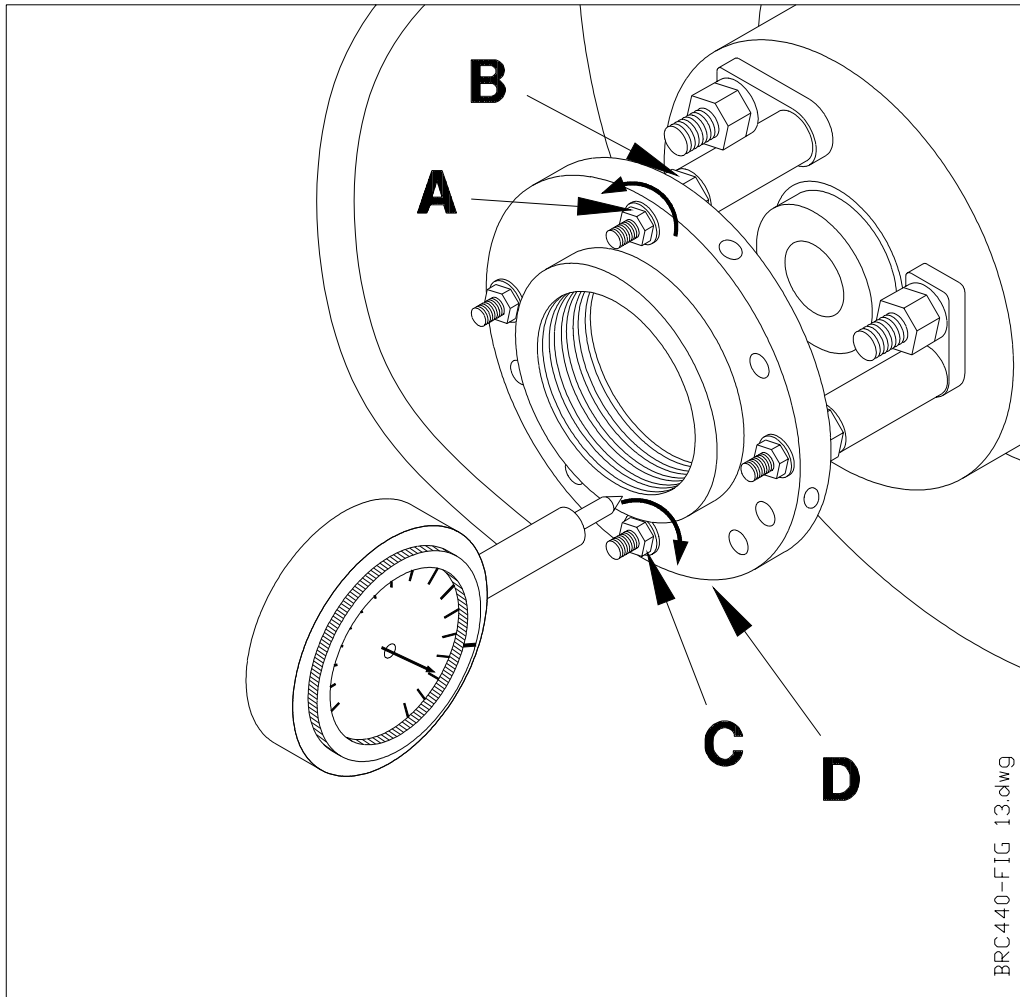
8 Preliminary Runout Compensation Adjustment



- 8.1 Mount a Dial Indicator (A) rigidly on the hub knuckle assembly. The stylus of the Dial Indicator must be in contact with surface B as shown. Lightly tap the Dial Indicator to ensure the needle returns to the same spot to verify it is mounted securely.
- 8.2 Rotate the Centering Plate 360 degrees several times while watching the total swing of the Dial Indicator needle. Set the mark (C) on the bezel of the Dial Indicator to the MIDDLE of this total swing as shown.

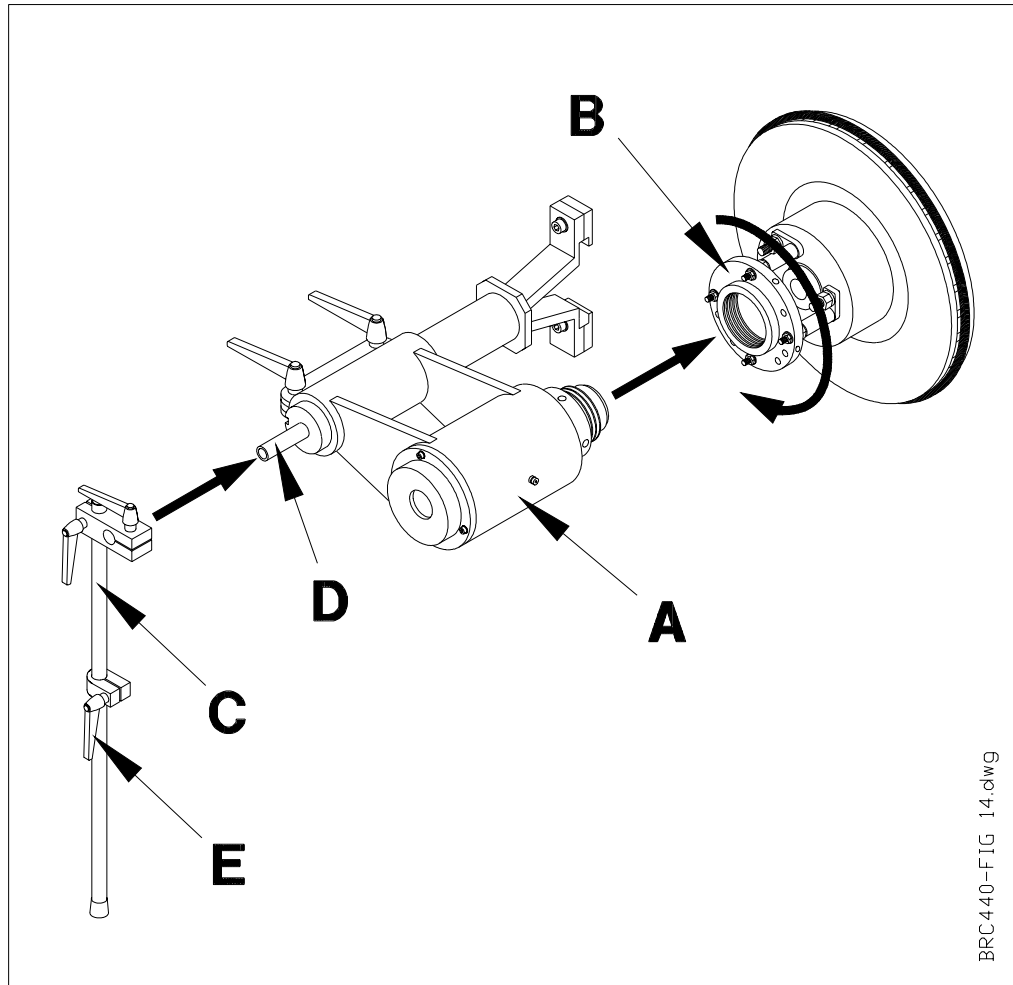
The goal is now to adjust the large and small nuts (D) on the Cranks so that the TOTAL swing of the needle is 0.004 in. (0.1 mm) or less.

8 Preliminary Runout Compensation Adjustment (Continued)



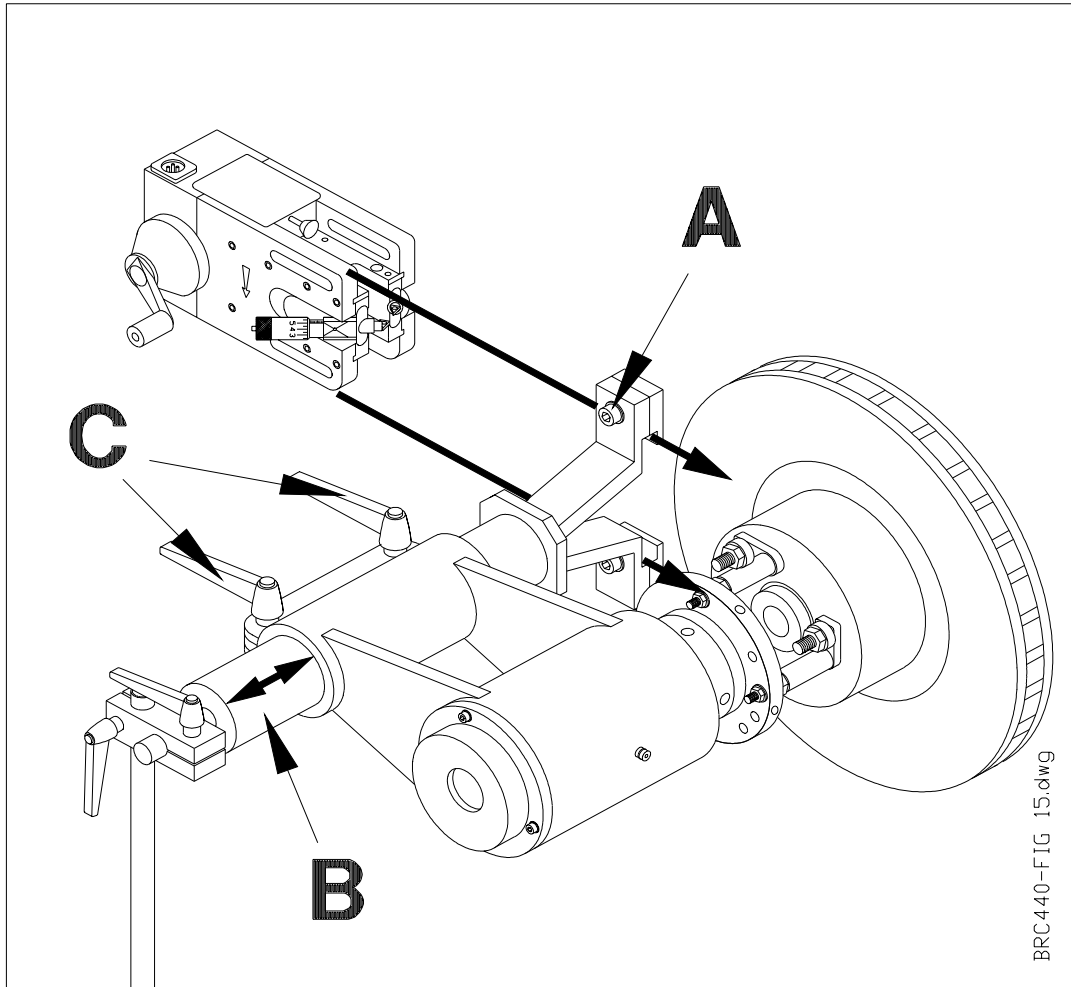
- 8.3 Rotate the Centering Plate until the Dial Indicator needle is at the largest number of the total swing, as shown.
- 8.4 Nuts on the two cranks are next adjusted to move the needle one-half the distance between the present reading and the mark on the bezel.
 - 8.4.1 Slightly turn (1/16 rotation or less) small nut A in direction of arrow.
 - 8.4.2 Tighten large nut B by turning in direction of arrow.
 - 8.4.3 Slightly turn (1/16 rotation) large nut D (not visible) in the direction of arrow.
 - 8.4.4 Tighten small nut C by turning in direction of arrow.
- 8.5 The needle will have moved towards the mark on the bezel, hopefully about one-half the distance from its starting point. Colored bands on the Cranks can be used to keep track of position if the Centering Plate must be turned to aid in adjusting the nuts.
- 8.6 Repeat Steps 8.3 and 8.4 until the TOTAL swing of the needle during a 360 degree rotation of the Centering Plate is 0.004 in. (0.1 mm) or less. Near zero swing will make the final adjustments, after the lathe is mounted, much easier.

9 Mounting the Hub Arm



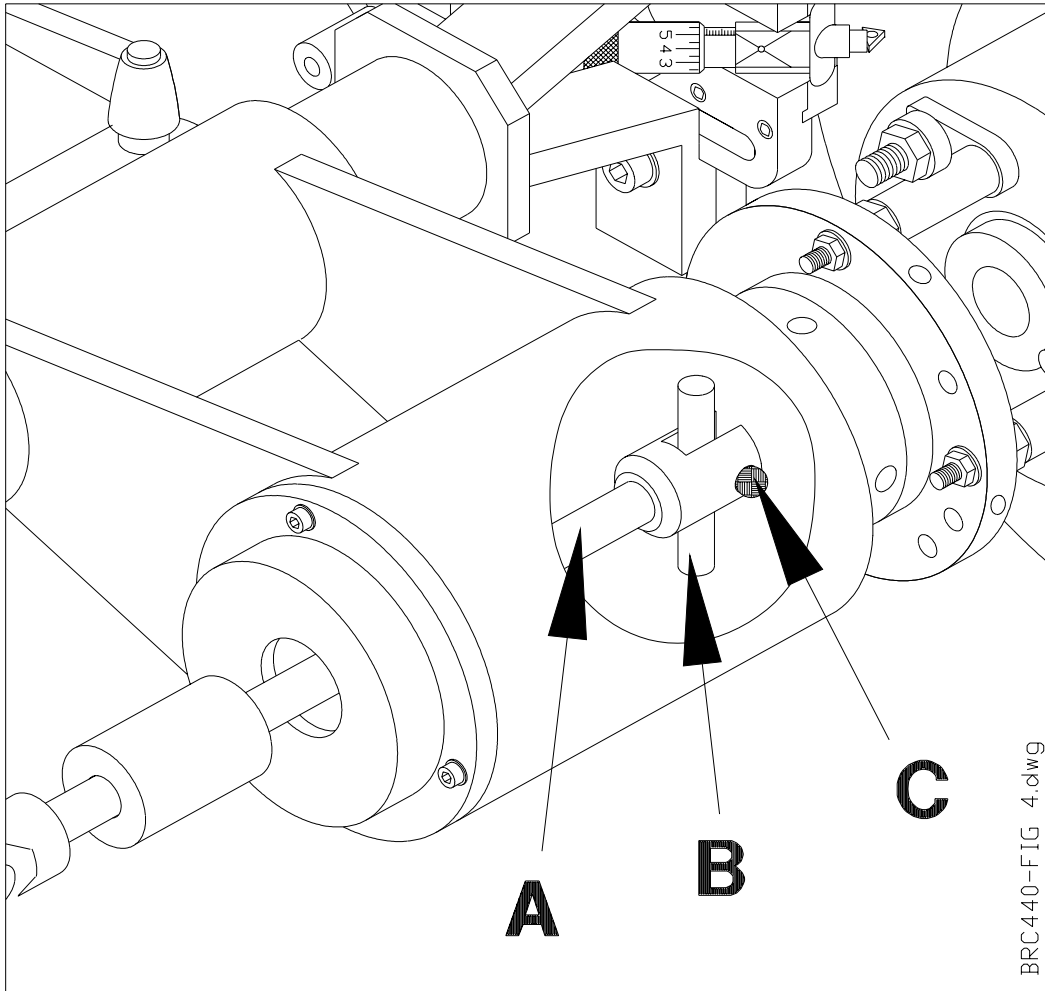
- 9.1 Lift the Hub Arm Assembly (A) and carefully insert the threaded end into the Centering Plate (B). Turn the Centering Plate clockwise as indicated above until just tight. **DO NOT** use the Tommy Bars to tighten.
- 9.2 Slide the Adjustable Support Cane (C) onto the Pin (D). The Hub Arm Assembly can be rotated 360 degrees to allow the best access for cutting the rotor.
- 9.3 Extend the Adjustable Support Cane using Locking Handle (E) to support the Hub Arm Assembly.

10 Mounting the Lathe Head



- 10.1 Loosen Socket Hex Bolts (A) and slide the Lathe Head into the slots as shown above. Finger tighten the Socket Hex Bolts.
- 10.2 Loosen Locking Handles (C) and slide the Tube (B) to center the Lathe Head on the Rotor.
- 10.3 Continue adjusting the Tube (B) and the Lathe Head until the cutting tips are centered on the Rotor.
- 10.4 Check that the Lathe Head is slid in towards the center of the Rotor far enough so the cutting tips will reach the inner diameter of the rotor surface to be cut.
- 10.5 Tighten both Socket Hex Bolts (A) and both Locking Handles (C).

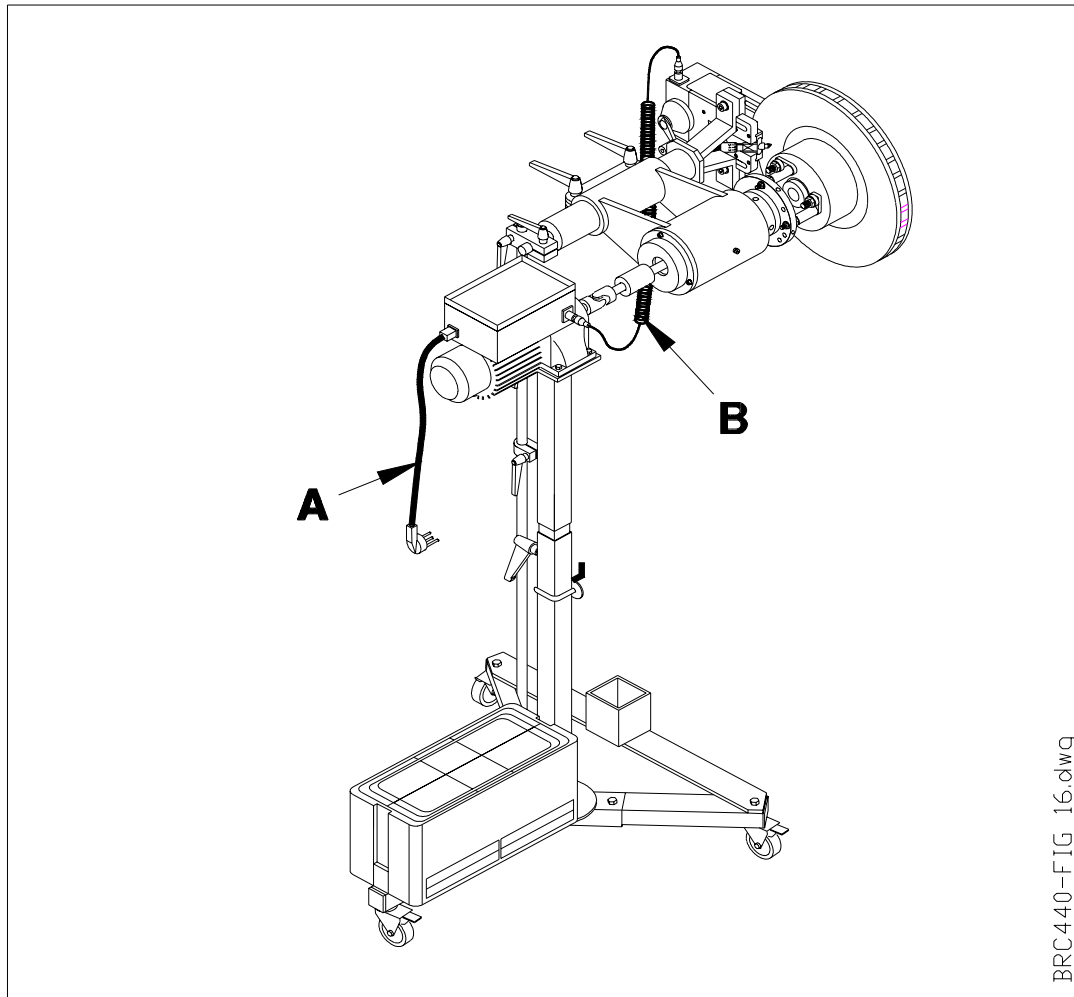
11 Attaching the Drive Motor



Note: The above shows a cut-away of the Hub Arm Assembly to illustrate the connection between the Drive Motor Shaft and the Pin and Ball in the Hub Arm Assembly.

- 11.1 Adjust the Drive Motor Stand so the Motor Shaft (A) is aligned with the hole in the Hub Arm Assembly.
- 11.2 Slide the Shaft (A) of the Drive Motor into the Hub Arm Assembly. It may be necessary to turn the shaft to align the slot in the end fitting with the pin (B) in the Hub Arm Assembly.
- 11.3 Push the Drive Motor Shaft into the Hub Arm Assembly until the Ball (C) is felt snapping into the indent in the fitting on the end of the shaft.

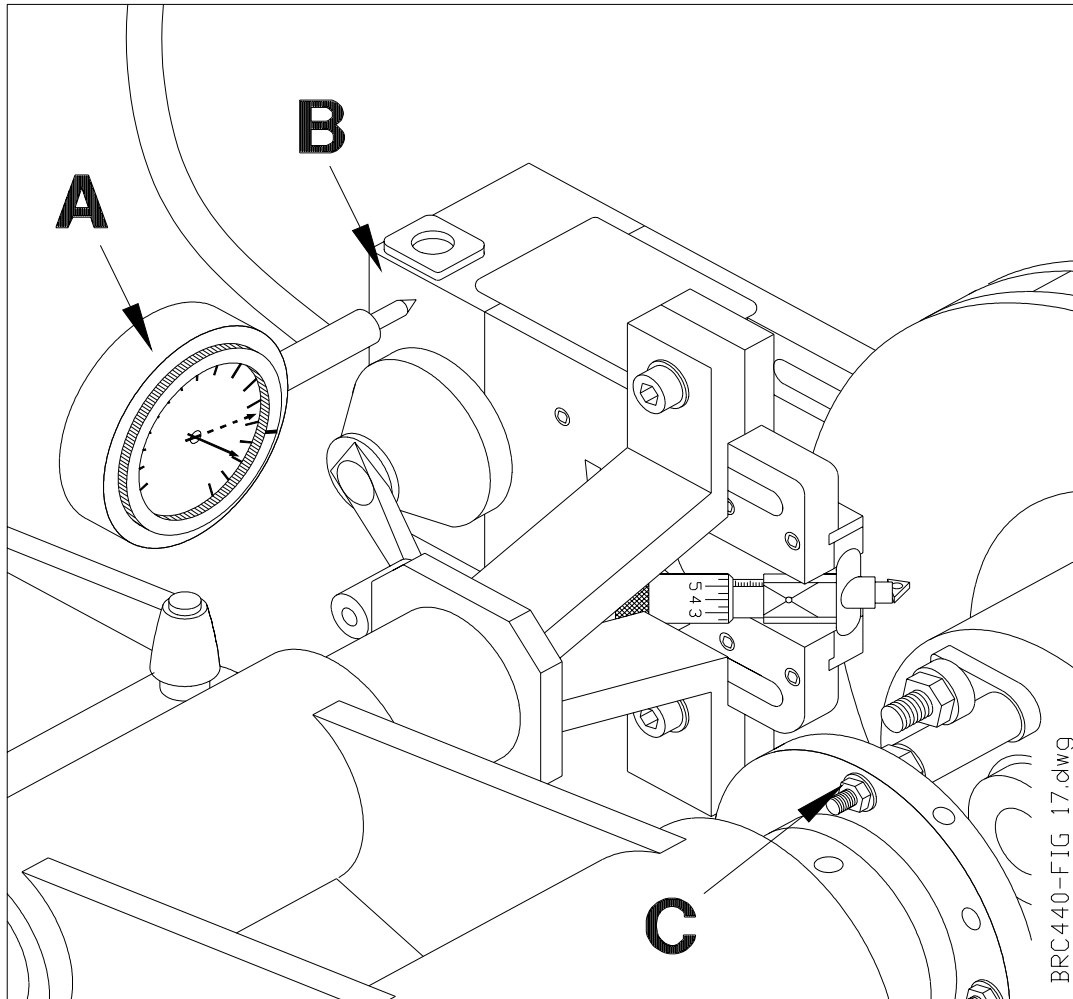
12 Connecting Power



Note: The above shows the completed set-up of the Hub Arm Assembly, Lathe Head, and Drive Motor.

- 12.1 Push in the Emergency Stop Button on the Drive Motor Control Box.
- 12.2 Connect the Power Cord (A) to an appropriately grounded power source.
- 12.3 Connect the Coiled Cord (B) from the socket on the side of the Drive Motor Control to the socket on top of the Lathe Head.

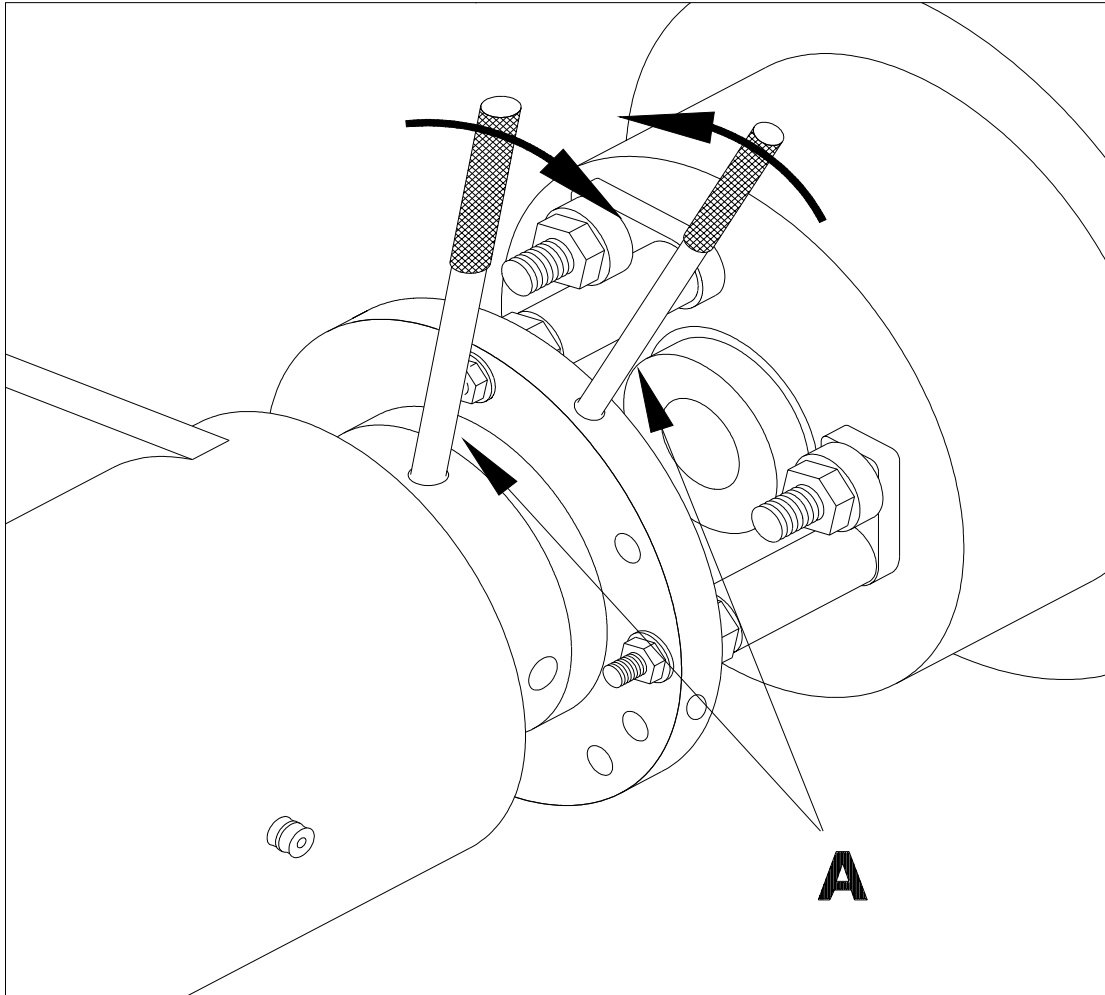
13 Final Runout Compensation Adjustment



- 13.1 Mount a Dial Indicator (A) rigidly on the hub knuckle assembly. The stylus of the Dial Indicator must be in contact with surface B as shown. Lightly tap the Dial Indicator to ensure the needle returns to the same spot to verify it is mounted securely.
- 13.2 Manually rotate the rotor several revolutions and observe the total runout as indicated on the Dial Indicator.
- 13.3 Adjust the large and small nuts (C) as described in Section 8 until the TOTAL swing of the needle is as close to 0.002 in (0.050 mm) as possible.

Refer to the BRC Lathe Operation Manual for instructions on turning rotors.

14 Removing Hub Arm Assembly



- 14.1 Insert Tommy Bars (A) as shown above.
- 14.2 Rotate Tommy Bars as shown to release Hub Arm Assembly from the Centering Plate.