CHAPTER 3
INSTALLATION, CALIBRATION, MAINTENANCE

GENERAL

This chapter presents standard installation and check out procedures that must be done when installing an 8.6 or 8.7 balancer. Although these machines have been set up at the factory and were compliant with manufacturing standards when they were shipped, changes may occur during shipment that are beyond the control of the manufacturer or shipper. Following these procedures exactly will ensure that the balancer will perform as designed following installation.

INSTALLATION PROCEDURES

SELECTION OF MACHINE TYPE

Enter [G67/G67]. The display will show either JBC 8.6 or JBC 8.7. JBC 8.6 machines have automatic parameter entry for distance to the wheel and diameter of the wheel. JBC 8.7 balancers add automatic parameter entry for wheel width. Press the [G46] button to change the display to the correct machine model being installed. Press STOP to exit.

C codes controlling spin characteristics will set to normal factory settings. These C codes may be altered to change the characteristics of the machine if necessary. A complete list of C codes and the machine functions they control is given in Chapter 2.

DANGEROUSLY HIGH VOLTAGES EXIST WITHIN THESE MACHINES. USE THE ‘ONE HAND RULE’ WHEN SERVICING!

RISK OF ENTANGLEMENT KEEP YOURSELF, CLOTHING AND TEST EQUIPMENT CLEAR OF MOVING PARTS! ENTANGLEMENT IN MOVING PARTS CAN CAUSE SEVERE INJURY.

IMPORTANT!

DO NOT TURN OFF POWER WHILE MAKING ADJUSTMENTS AFTER COMPLETING THE FOLLOWING PROCEDURES THE DATA MUST BE STORED IN THE COMPUTER MEMORY SO THEY WILL BE RETAINED WHEN POWER IS SWITCHED OFF.
RIM DISTANCE GAUGE ADJUSTMENT JBC 8.6 / 8.7 SERIES

1. Enter code 200. With the gauge in the rest position the left display must read between 0.12 - 0.25.

   If adjustment is necessary, turn off power, remove the gauge lever, display housing and weight tray. Reassemble the display housing. Replace the gauge lever and turn power on. Loosen the nut and change the position of the slotted potentiometer shaft in the center of the distance gauge pulley until the left display shows between 0.12 - 0.25. Re-tighten nut.

2. With the display indicating between 0.12 and 0.25, press G99. The right display will change to ‘2’.

3. SET GAUGE RESPONSE LINEARITY, METHOD 1:

   Measure 65mm on one leg of a square and mark it with indelible ink, a scribe, or suitable tool. Remove the gauge finger. Hold the unmarked edge of the square against the wheel contact surface of the Basic Centering adapter. Extend the Distance Gauge arm to the right so the flat where the gauge finger is normally mounted reaches the 65mm mark. Note the left display reading. Place the square aside. Extend the Distance Gauge arm so the left reading equals the reading noted. Hold the gauge arm at that point and press G99.

SET GAUGE RESPONSE LINEARITY, METHOD 2:

Remove the gauge finger. Hold a straight edge against the wheel contact surface of the Basic Centering adapter. Measure the distance in mm from the wheel contact side of the straight edge to the flat surface of the distance gauge (where the gauge finger mounts) in the rest position. Record this measurement and subtract 25. This remainder will be used in step 2.

   Example: Measured distance = 185mm
   Remaining = 160mm

2. Slide the distance gauge out until the distance gauge scale reads the Remainder found during Step 3. Hold the gauge at this position. Press G99.

RIM DIAMETER GAUGE ADJUSTMENT JBC 8.6 / 8.7 SERIES

1. Using the 14mm wrench supplied, remove the Basic Centering Device from the shaft. Place a heavy rubber band around the shaft housing and the distance/diameter gauge finger as shown in the diagram below.
2. ENTER [G67] [G56] [G49] [G67].

3. SET THE CENTER POINT.

✓ The left display is a voltage reading corresponding to the setting of the rim diameter gauge potentiometer. This must be 2.50 ± 0.10.

✓ To adjust, first loosen the nut at the center of the gear. Hold the gear, and using a screwdriver, change the position of the slotted potentiometer shaft until the left display reading equals 2.50 ± 0.10. Tighten the nut and recheck the readings.

Remove the rubber band, remount the basic centering device, and mount a steel wheel onto the machine.

4. SET LINEARITY.

✓ Place the gauge finger upwards against the rim where counterbalancing weights mount (as if making a normal measurement). Hold in this position and press [G99].

✓ Place the gauge finger downwards against the rim (where counterbalancing weights would mount). Hold in this position and press [G67].

5. Store these readings in memory by pressing [G67] [G49] [G48] [G67], then [G49] and [G51] together. The machine will sound a single tone (recognizing the key press) then a three tone sequence (acknowledging registry of the readings). Reassemble the machine.

*Fine adjustment to compensate for mechanical tolerances is made using C18C.*
RIM WIDTH GAUGE ADJUSTMENT, JBC 8.7 ONLY

NOTE: distance gauge (C81C) adjustments must be made before adjustments are made to the rim width gauge.

1. Enter G82.

2. The left display shows the voltage output of the rim width potentiometer. The right display shows which adjustment step the technician is currently doing. At home position (right limit position) the voltage must read between 0.12 and 0.25 volts. If adjustment is necessary, remove the housing cover by removing 3 screws and sliding the cover plate off. Locate the potentiometer. Loosen the retaining nut. Using a screwdriver, change the position of the potentiometer shaft in the center of the gear until the left display shows between 0.12 and 0.25 volts. Tighten nut and recheck the reading with the gauge arm at rest.

3. With display reading between 0.12 and 0.25, press G99.

4. Fully extend the distance gauge to the right and move the rim width gauge as far as possible to the left toward the distance gauge. See illustration below. Note: the gauges will not touch. Press G67. This completes C82C adjustment.

5. Store these readings in memory by pressing C10G, then and G together.

*Fine adjustment to compensate for mechanical variances is made using C19C.*
C18C – Makes electronic corrections of wheel rim diameter measurements.
C19C – Makes electronic corrections of wheel rim width measurements.

Procedures for both codes are similar. An explanation of the process follows.

1. Mount a wheel on the machine.

2. Enter C18C then press the diameter button, for diameter corrections.
   or
   Enter C19C then press the width button, for rim width corrections.

3. Measure wheel with an appropriate gauge, or take the dimensions from the wheel itself. Hold the distance / diameter gauge against the wheel. The actual measured value to the nearest 0.1" is displayed in the left hand display.

4. Enter the difference between the actual rim dimension and the value in the left hand display by typing in the change required to make the reading correct in inches (max. 9.9”). If the measured value needs to be decreased, enter the value then press the static / dynamic button to change the sign (a minus sign will appear in front of the entered value). The value entered will be displayed in the right hand display.

5. After correction(s) have been entered, press \[ \text{G67} \] to accept. The correction entered will immediately be added to or subtracted from the reading in the left-hand display.

6. Press STOP to clear the C code. Store these readings in memory by pressing \[ \text{G67/G49/G48/G67} \], then \[ \text{G49} \] and \[ \text{G51} \] together.

7. Check to see verify that the gauges measure the wheel correctly.

See example on the following page.

Example: Corrections for a width gauge, which gives a 4.5" measurement 4.5" on a 6" rim.

Enter \[ \text{G67/G49/G57/G67} \]. Hold the gauge against rim. The left hand display will show 4.5. To adjust, enter the difference between the actual rim width (6.0") and the measured width (4.5") in the left hand display. In this example, the difference is 6" - 4.5" = 1.5". Press \[ \text{G49/G46/G53} \] then press \[ \text{G67} \] (1.5 will appear in the right hand display). The value in the left-hand display is now 6.0. Press \text{STOP}. This change must be stored in the permanent memory using C10C. Measure a rim to see if gauges measure correctly.

Notes:
1. All gauges must be calibrated using C80C, C81C and C82C codes as before.
2. Any offsets entered using C18C or C19C may be nullified by entering
   ✓ C18C, then pressing the rim diameter button.
   ✓ C19C, then pressing the rim width button.
3. Any code may be cancelled by pressing the \text{STOP} button.
4. If power is cycled OFF and ON before storing results with C10C, NO CHANGES WILL BE MADE TO THE WAY THE BALANCER READS OR CALCULATES!
READOUT ADJUSTMENT (BASIC CALIBRATION)

Basic calibration is done at the factory. However, it is recommended that the basic calibration and shaft zeroing be done at the customer’s location after the machine has been physically installed and following completion of C80C, C81C, and C82C (8.7 balancers). Repeating basic calibration at the customer’s location assures precision accuracy and will result in a high degree of customer satisfaction with the balancer performance.

1. Mount a wheel (steel wheel preferred). Enter rim width, distance and diameter.

2. Balance the wheel to less than 1.0 ounce imbalance in each plane.

3. Select a test weight between 3 and 4 ounces. NOTE: the weight used to calibrate these balancers should be from the customer’s stock of weights, and must be in good condition (not trimmed, used, or with a loose clip). The weight should have both ounce and gram designations imprinted on it. This weight amount will be entered in grams during the calibration process.


5. Press START. The machine will run through a cycle. The left-hand display will show 1 (step 1) while the unit spins. The display will change to 2 (step 2) at the end of the spin.

6. Enter the weight of the test weight in grams and press /G99. The display will change to 3 (step 3).

7. Attach the test weight on the left side of the wheel, press START. The balancer will spin. At the end of the spin, the display will change to 4 (step 4).

8. Remove the test weight from the left and install it on the right side. Press START. The balancer will spin. At the end of the spin, the display will change to 5 (step 5).

9. Remove the wheel and wing nut, pressure cup, cone and spacer ring. Leave only the threaded sleeve and backing plate on the balancer shaft. Press START. The display will change to 6 (step 6).

10. Thread the calibration weight into the wheel adapter backing plate. Press START. This completes the C83C basic calibration procedure.

Doing Basic Calibration erases any value which may have been stored in memory to compensate for shaft imbalance. Following completion of C83C, the shaft must be balanced using C84C.
CAUTION
IF ERROR CODE E34, E35, OR E36 APPEARED DURING C83C BASIC CALIBRATION, THE CAUSE OF THE ERROR MUST BE FOUND AND CORRECTED BEFORE STORING THE NEW READINGS IN MEMORY. TO REVERT TO ORIGINAL CALIBRATION FACTORS, SIMPLY PRESS STOP TO EXIT THE CALIBRATION PROCEDURE AND TURN THE MACHINE OFF WITHOUT SAVING THE CALIBRATION FACTORS.

SHAFT BALANCE PROCEDURE

1. Remove the wheel and wheel adapter including the cones, threaded sleeve and adapter backing plate.


3. Press START. The machine will spin, calculating the imbalance inherent in the shaft and bearing assembly.

Store these readings in memory by pressing G67/G49/G48/G67, then G49 and G51 together.

THEORY OF OPERATOR CALIBRATION

This procedure is intended to allow the user to "fine tune" the balancer calibration. This may be used by the service technician as well, if only a slight readjustment to readout accuracy is required.

During the last two steps of Basic Calibration (C83C procedure), known imbalance forces are created with and without a Calibration Weight attached to the Basic Centering device. These imbalance forces are measured as an output voltage from each transducer. The Calibration weight is threaded into the Basic Centering device and is spun at a known distance and diameter relative to each transducer. The shaft is then spun without the weight in place and voltages are again measured. This information is stored on a EEPROM located on the Interface PCB.

Completing operator calibration requires two spins, one with and one without the calibration weight attached to the Basic Centering device. This is similar to the final two steps of Basic Calibration. The computer compares the voltage readings taken with those stored during Basic Calibration. If necessary, the stored readings are adjusted so the balancer will again equal the accuracy level it originally was capable of immediately following installation. If the balancer is not calibrated by the operator for a long time, the divergence of the new readings compared to the original stored values may be too great to be stored, and an error, E15, may occur. See Appendix A for an explanation of E15.
OPERATOR CALIBRATION PROCEDURE

1. Without a wheel on the balancer remove cones, spacers, wingnut, and pressure cup from the adapter. Leave only the threaded shaft and faceplate attached to the balancer shaft. The Calibration Weight is threaded into the left rear wall of the balancer chassis.

2. Enter 0140. Press START. The balancer shaft will spin. During this spin, the left display will show CAL 1.

3. Thread the calibration weight into the Basic Centering device backing plate. Press START. The balancer shaft will again spin. During this spin, the left display will show CAL 2.

4. At the completion of calibration the machine will stop and emit three beeps. Operator Calibration is completed. Remove the Calibration Weight from the centering device and store it at the rear of the balancer.