

BEAR[®]

Model 330 Wheel Balancer

Operating Instructions

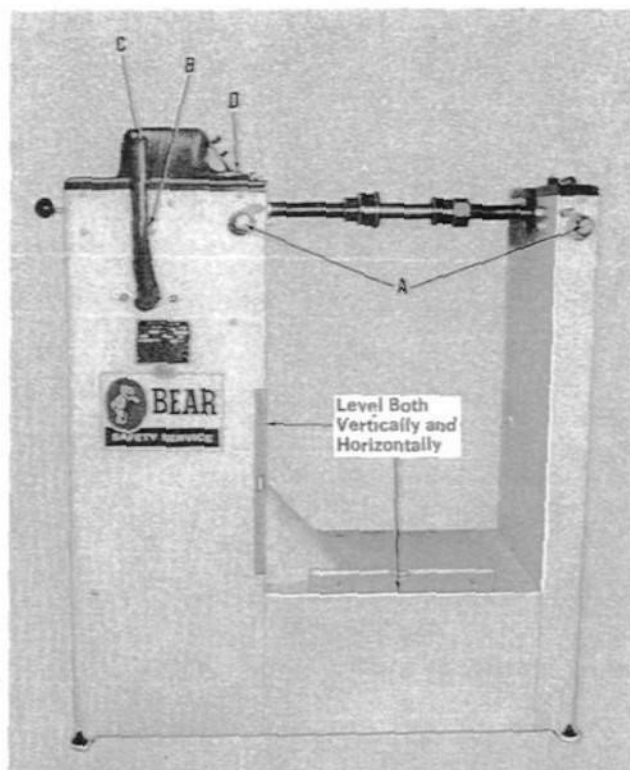


Fig. 1

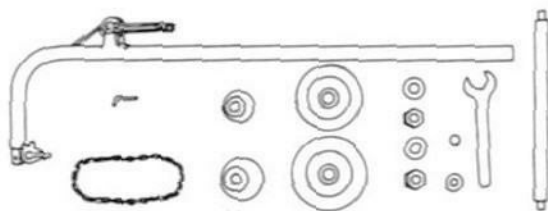


Fig. 2

The Model 330 Wheel Balancer is an off-the-car spin type, static and dynamic balancer. It is equipped with a variable speed pulley which allows for balancing the wheel at any desired speed. By adding the 331 attachments, Fig. 2, it is possible to balance truck and bus wheels.

WHEEL BALANCER INSTALLATION

The balancer should be installed on a reasonably level floor. Check with carpenter's level on cabinet, Fig. 1, and level balancer, both horizontal and vertical, by placing metal shims under the anchor plates. Anchor securely at all four corners. Do not use any resilient material such as rubber, leather, etc., under the machine.

The balancer is shipped with a single phase 220 volt, 60 cycle motor unless 110 volt motor is specified. Make sure that your electric outlet is of the right voltage and cycle.

Clean shipping grease from balancer arbor and bearings. Oil bearings with a few drops of light oil. Install bearing and retainer ring on drive shaft end of arbor.

Check adjustment of indicator dials, A Fig. 1. Install two cones on arbor and mount arbor in balancer as shown. Engage drive shaft, on left side of balancer, into arbor; flip balancer switch "ON," B, Fig. 1, and spin arbor at low speed (speed and brake control handle, C Fig. 1, in vertical position). Indicator dial must be set so that with the pointer directly over the zero circular cross line, no spark will appear on the spark dial, D Fig. 1. (Refer to Adjusting Indicator Dial under Service and Maintenance on page 9 of this manual.)

OPERATING INSTRUCTIONS

Preparation of Wheels

Front Wheels. Remove from car complete with drum and hub, taking out the bearings and leaving the bearing races in the hub. Remove all excess grease from the inside of hub and clean off all mud and dirt. Check tire air pressure and inflate to correct amount. Rear wheels and cars equipped with disc brakes, remove wheel only from car. Clean and properly inflate.

Mounting Wheel on Balancer

1. In installing the balancer arbor in the wheel assembly, adjust the position of the cones so that the wheel will be located approximately in center of the shaft. Drive end of shaft should be on brake drum side except on heavy truck wheels where the wheel must be reversed to place the wheel in the center of the shaft.

For front wheels on passenger cars and light trucks, use the small diameter shaft with proper size cones, Fig. 3.

For rear wheels on passenger cars and light trucks, bolt wheel to backing plate with studs, Fig. 4 or rapid mount adapters, Fig. 5. On six-hole wheel use three studs equally spaced.

For heavy truck wheels, use large diameter shaft and proper size cones or wheel supports, Fig. 6.

2. Tighten arbor hex nuts securely with the two wrenches supplied, so that wheel will not work loose. Place bearing on end of shaft.
3. Be sure that the balancer drive shaft is pulled out before placing wheel in balancer. Passenger car wheels may be lifted into flexing heads on balancer. On truck wheels, use wheel hoist, Fig. 7, to swing wheel into place.
4. Remove any balancing weights that are on the wheel and any stones embedded in the tread.
5. Check to see if wheel is bent. As a guide, lateral runout tolerance should not exceed 1/8".

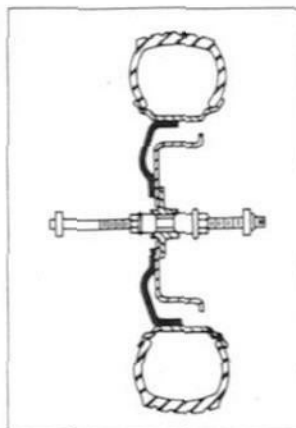


Fig. 3

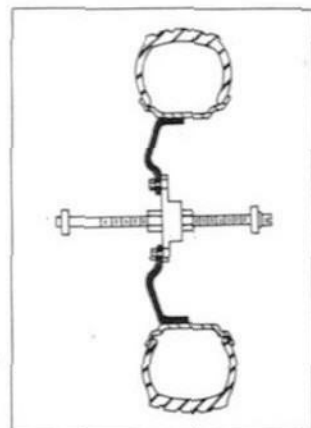


Fig. 4

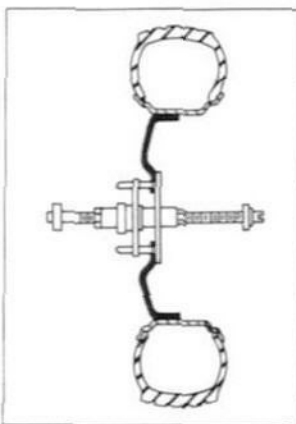


Fig. 5

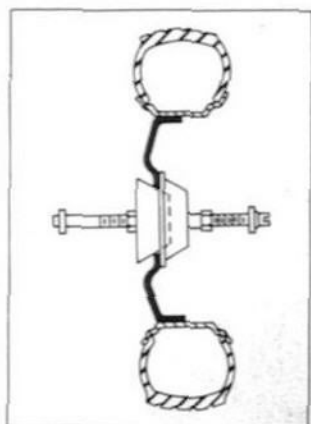


Fig. 6

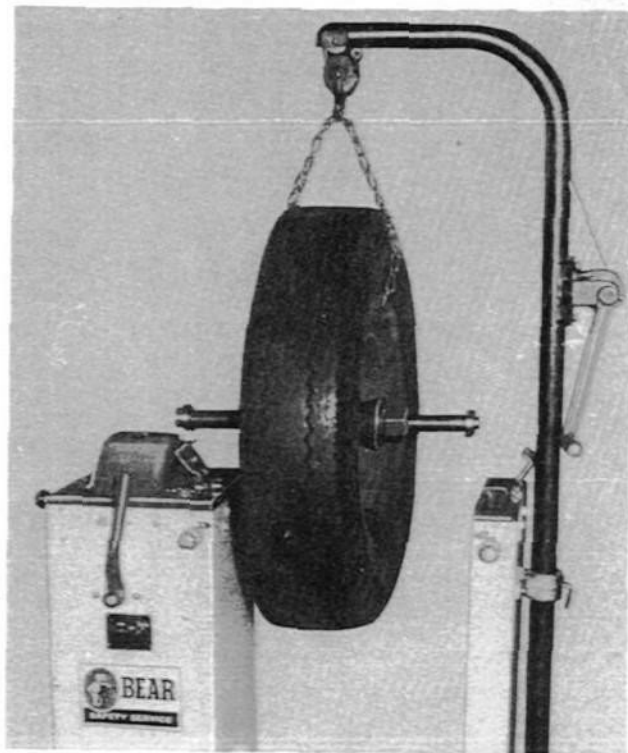


Fig. 7

Static Balance

1. With arbor drive shaft disengaged, allow the wheel to rotate and come to rest, thus locating the light section of tire and wheel which will be at the top. Make a chalk line on the tire at the top, E Fig. 8 (known as the static mark).
2. Engage drive shaft, close and lock bearing covers and spin the wheel at low speed (speed control handle in vertical position, C Fig. 8). Note amount of movement at both flexing heads. Turn off balancer; *stop wheel with brake and disengage shaft.* To brake wheel to a stop, move speed control handle toward the wheel and push firmly. It is assumed in the following illustrations that the left flexing head, F Fig. 8, had the greater amount of motion.
3. Add sufficient static weight, G Fig. 9, at the static mark, E Fig. 9, to exactly balance the assembly.
Note 1: If movement takes place at one flexing head only, place all the static weight on that side of the wheel. If both flexing heads have equal movement, place half the static weight on the inside and half on the outside of the wheel. If one flexing head has more movement than the other, favor the side with the greater movement with a proportionately larger amount of weight.
Note 2: In finding the amount of weight to use for static balance, lightly tap on the weights so that they can be readily removed until the correct weight is obtained.
4. When wheel is in static balance, wheel will stand in either position with static mark toward operator, E Fig. 9 (90 to vertical) or straight up, E Fig. 10. If the wheel stands still with the static mark towards operator but rolls when the static mark is at the top; move the static weight or weights, along the wheel *into the roll*. The wheel must remain stationary in both positions.

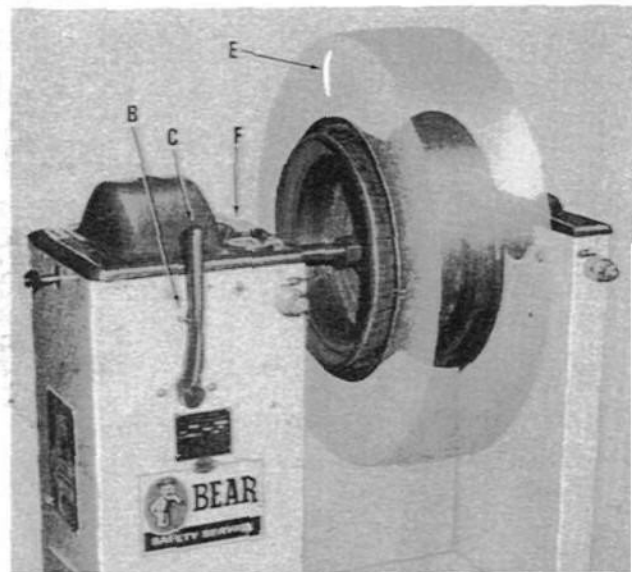


Fig. 8

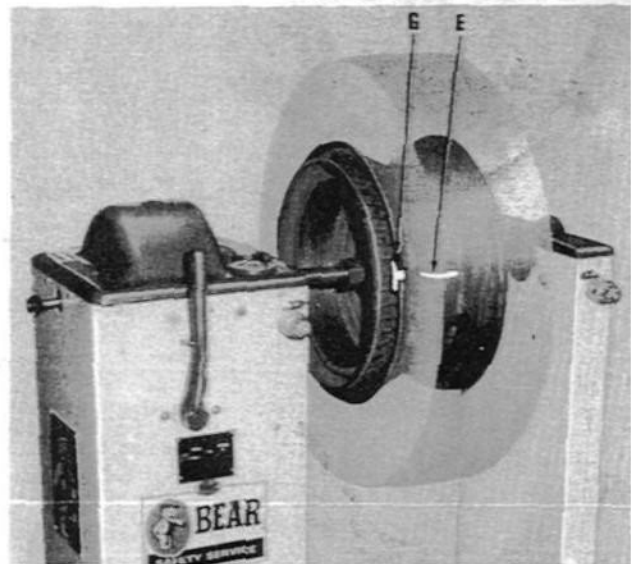


Fig. 9

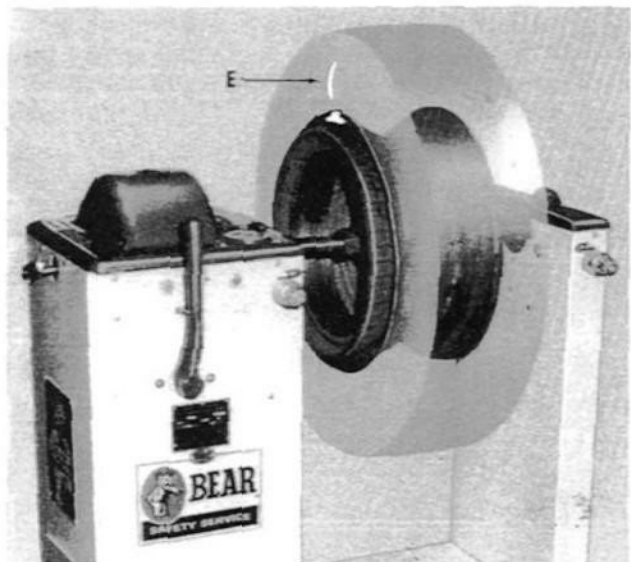


Fig. 10

Dynamic Balance

Dynamic balance means balancing a wheel in motion. A wheel that is dynamically unbalanced results in horizontal oscillations or side to side motion of the wheel assembly. To correct dynamic unbalance requires using two weights of equal size, one weight placed on the indicated side of the wheel, the other weight placed half way around the wheel (180°) on the opposite side.

1. Engage drive shaft; turn on balancer motor and spin the wheel at low speed with handle in vertical position, C Fig. 11.
2. Use indicator dial on side that has the greater flexing motion, A Fig. 11, and adjust dial in, carefully, until number is flashed on spark dial, D Fig. 11. Note number and turn switch, B Fig. 11, to off position; then stop wheel with brake. *Do not disengage drive shaft.*

Note: Sometimes more than one number will flash on the spark dial. Always select the middle number, i.e. Nos. 5, 6 and 7 flashed (from one to the other) on the dial. Select No. 6 for the dynamic weight locating number.

3. Rotate wheel until flasher number shows through window, H Fig. 11.
4. Check position of static weight.
 - a) If static weight is on operator's-side of balancer, G Fig. 12, more weight is needed at the static mark, E Fig. 12.
 - b) If static weight is on the far side of the balancer, G Fig. 13, less weight is needed at the static mark, E Fig. 13.

Note 1: In cases a and b above, adjusting is done by placing a heavier weight on the side required, using a lighter weight on the other side, but always keeping the same total weight. However, if the static weight is all on one side of the wheel and additional weight is required on that side, then any weight added must be counter-balanced by placing an equal amount 180° opposite on the other side of the wheel in order to maintain static balance.

Note 2: Disengage drive shaft and check static balance each time any weights are changed.

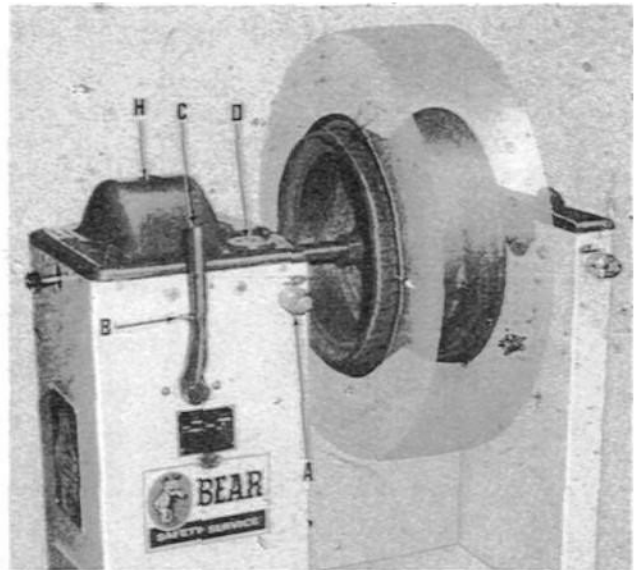


Fig. 11

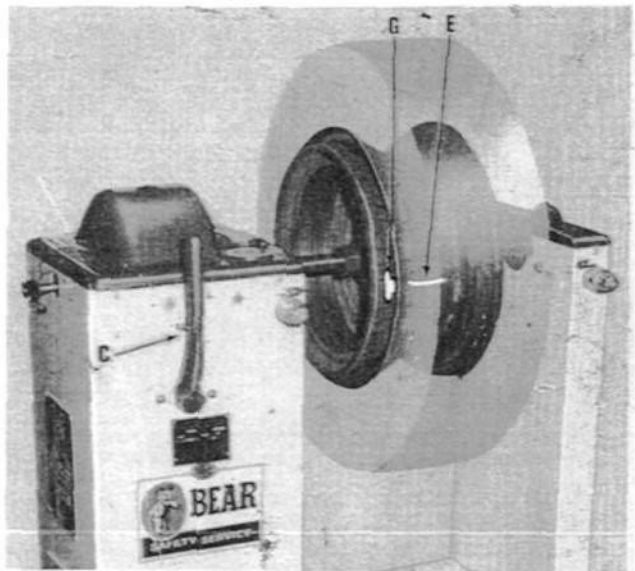


Fig. 12

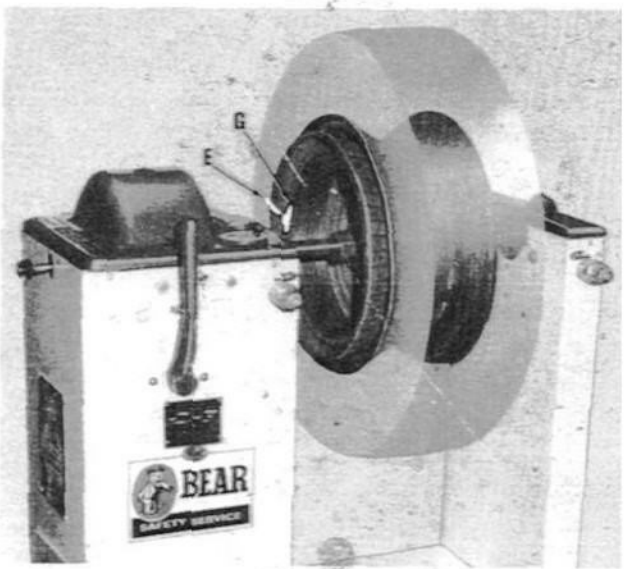


Fig. 13

5. If the static mark is not in the horizontal plane as shown, E Fig. 12, or, E Fig. 13, two dynamic weights of equal size must be added. Add one dynamic weight, I Fig. 14, on the indicated side in line with arrow at indicator dial, A Fig. 14, and the other dynamic weight across the tire half-way around the wheel (180°), I Fig. 14.

In selecting the dynamic weights, judge the amount of weight to the amount of movement at the flexing heads.

6. Now spin the wheel at low speed with handle in vertical position, C Fig. 14, to see if the correct size of dynamic weights were used. Adjust indicator dial and if a number flashes, turn off switch. Stop wheel with brake and rotate the wheel so that the number flashed shows through the window. Check position of dynamic weights:
 - a) If dynamic weight is on the indicated side, increase both dynamic weights equal amounts (use heavier weights).
 - b) If the dynamic weight is on the opposite side, decrease both dynamic weights equal amounts (use lighter weights). Disengage drive shaft and check static balance each time any weights are changed.
 - c) If the dynamic weights are not in horizontal plane of the shaft, it will be necessary to re-adjust the static weight.
7. When wheel is in balance at low speed, there will be no movement at the flexing heads.
8. Then proceed to spin wheel at high speed by moving handle, C Fig. 14, slowly left to horizontal position, J Fig. 15. If there is movement at the flexing heads, use indicator dial on side of greater flexing motion until number is flashed on spark dial. Note number and turn switch off. Stop wheel with brake. Do not disengage drive shaft. Turn wheel so flashed number shows through window, H Fig. 15. Proceed to either (a) (b) paragraph 4, or (a) (b) paragraph 6.
9. Make sure that all weights are firmly attached to the rim before reinstalling wheel on vehicle.

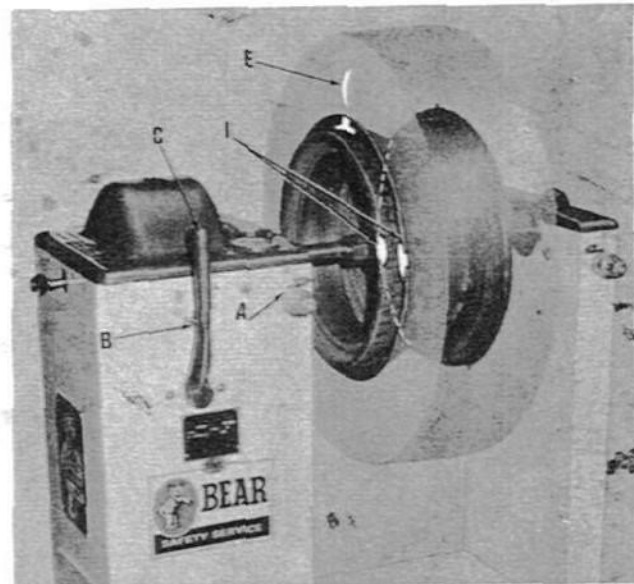


Fig. 14



Fig. 15

Balance Truck Wheels

Follow same wheel balancing procedures as outlined above. However with large, heavy wheels, spin wheels with handle, C Fig. 14, in vertical position only (never move handle to horizontal position).

The Two-Weight Method of Balancing

The two-weight method of balancing wheels differs in that the wheel is balanced dynamically first, then statically. It can be used to balance either conventional wheels using clip-on type weights or magnesium and Sport wheels using *Bear* adhesive-type Sport Weights. Mount wheel securely on arbor using proper backing plate with studs, Fig. 4 or rapid mount adapters, Fig. 5.

Dynamic Balance

1. Engage drive shaft and spin the wheel at low speed, K Fig. 17. Observe flexing motion at ends of Arbor, note end showing the most motion and dynamic balance that side of the wheel first, Fig. 16. Using indicator dial on that side L Fig. 17 adjust dial in carefully until number is flashed on spark dial, M Fig. 17. Do Not disengage drive shaft.
2. Turn wheel until flashed number shows through window, N Fig. 17. Use industrial adhesive tape to temporarily add Sportweight in line with indicator dial arrow, Fig. 18.
3. Spin wheel at low speed again. If flexing still remains on dynamic side, dial in again until number is flashed on spark dial, M Fig. 17. Stop wheel and turn until flashed number shows in window, N Fig. 17. If dynamic weight is less than 90° in either direction from arrow at indicator dial, shift weight slightly toward arrow, O Fig. 19, or add weight, P Fig. 19. If weight is more than 90° from indicator dial arrow, Q Fig. 19, subtract weight.
4. Repeat this step at high speed by moving handle, C Fig. 14, slowly to horizontal position, until all flexing is removed from the shaft on the dynamic side. You are now ready to balance the other side of the wheel statically.

Fig. 16

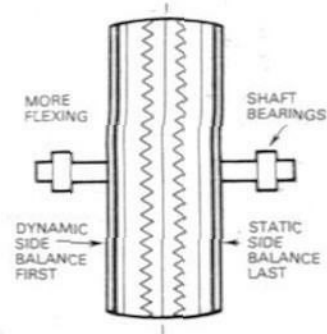


Fig. 17

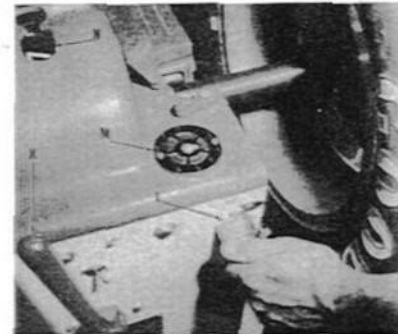


Fig. 18



Fig. 19

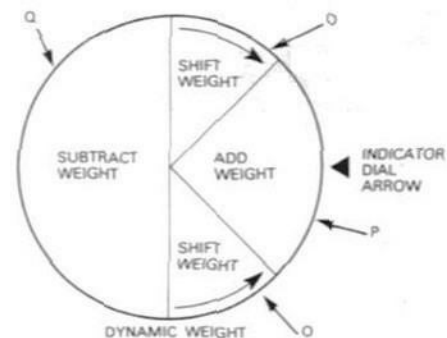


Fig. 20



Static Balance

1. Disengage drive shaft and allow wheel to come to rest, thus locating the light section which will be at the top. Make a chalk line on the tire at the top, Fig. 20. Rotate wheel towards you until static chalk line is at indicator dial arrow, R Fig. 21. Add sufficient static weight, S Fig. 22 to exactly balance the assembly.
2. Rotate wheel until static weight is exactly at the top, Fig. 23. Wheel should remain stationary in this position. If wheel moves, shift static weight into the roll until wheel will remain stationary at the top.
3. Engage drive shaft and spin wheel at high speed by moving handle, B Fig. 14 to horizontal position. There should be no flexing motion at either end of arbor. If flexing is noted, dial in and rework; handling either or both sides as though you are correcting for dynamic unbalance. After each correction, be sure to maintain static balance, Fig. 22 and static position, Fig. 23.

Attaching Sportweight to Wheel

Remove wheel from balancer. Carefully lift one side of adhesive tape so that area where weight is to be permanently affixed is exposed. Use a non-oil base solvent, such as alcohol or acetone, to clean the surface free of dirt and oil, Fig. 24. When surface is clean and dry, remove the paper backing from the adhesive strip of the Sportweight and press firmly into position, Fig. 25. Be sure entire adhesive strip is in contact with wheel surface. Repeat on other side of wheel.

Fig. 21



Fig. 22

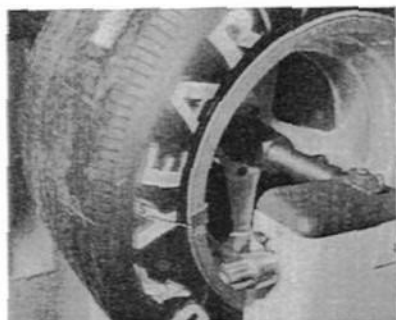


Fig. 23



Fig. 24

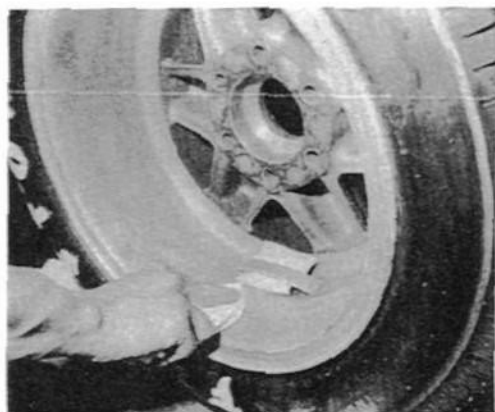


Fig. 25



SERVICE AND MAINTENANCE

Lubrication

With normal use the balancer should be oiled about every sixty days. To oil motor remove the inspection cover between the supports and the plate on the end of the cabinet. To oil the flexing heads, remove the top covers by removing the screws in each corner. Use a light motor oil. A drop of oil should be added to all points of friction and reciprocating parts. A penetrating or light oil should be used on the variable speed pulley. Wheel shaft bearings should be cleaned and re-oiled with a light oil every week.

Cleaning Contact Points

The contact points on the indicator dials and flexing heads must be cleaned regularly. If the points are coated, no spark will be obtained on the spark dial. To clean contact points, remove the top covers of the balancer. If inspection shows that the points are pitted, they should be replaced with new points.

Replacing Drive Belt

Remove top cover and inspection plate on the end of the cabinet. Remove the drive shaft by loosening the screw on the rear of the drive spindle and pull the drive shaft out. Readjust the belt tension after changing belts.

To adjust the belt tension, loosen jam nut against turnbuckle on tension rod and turn right or left to lengthen or shorten. The belt must be fairly tight when the motor is in the lowest position.

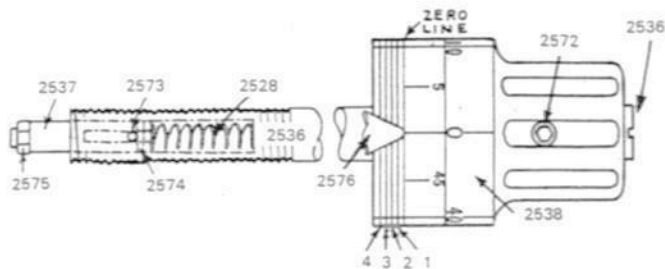


Fig. 26

Adjusting Indicator Dials

To adjust the dials, install two cones on arbor and mount arbor in balancer. Engage drive shaft and spin arbor at low speed. Turn in the left dial until the spark just appears on the spark dial. Loosen screw No. 2572, Fig. 26. Hold shaft No. 2536 with a screwdriver Fig. 26 and turn the dial to a point midway between the 45-0 marks. Have the dial set so that the pointer No. 2576 will be directly over the zero circular cross line, then tighten to the shaft. Turn dial to 0. If set properly, no spark will appear with dial in this position. Back off one turn and adjust the right dial in the same manner.

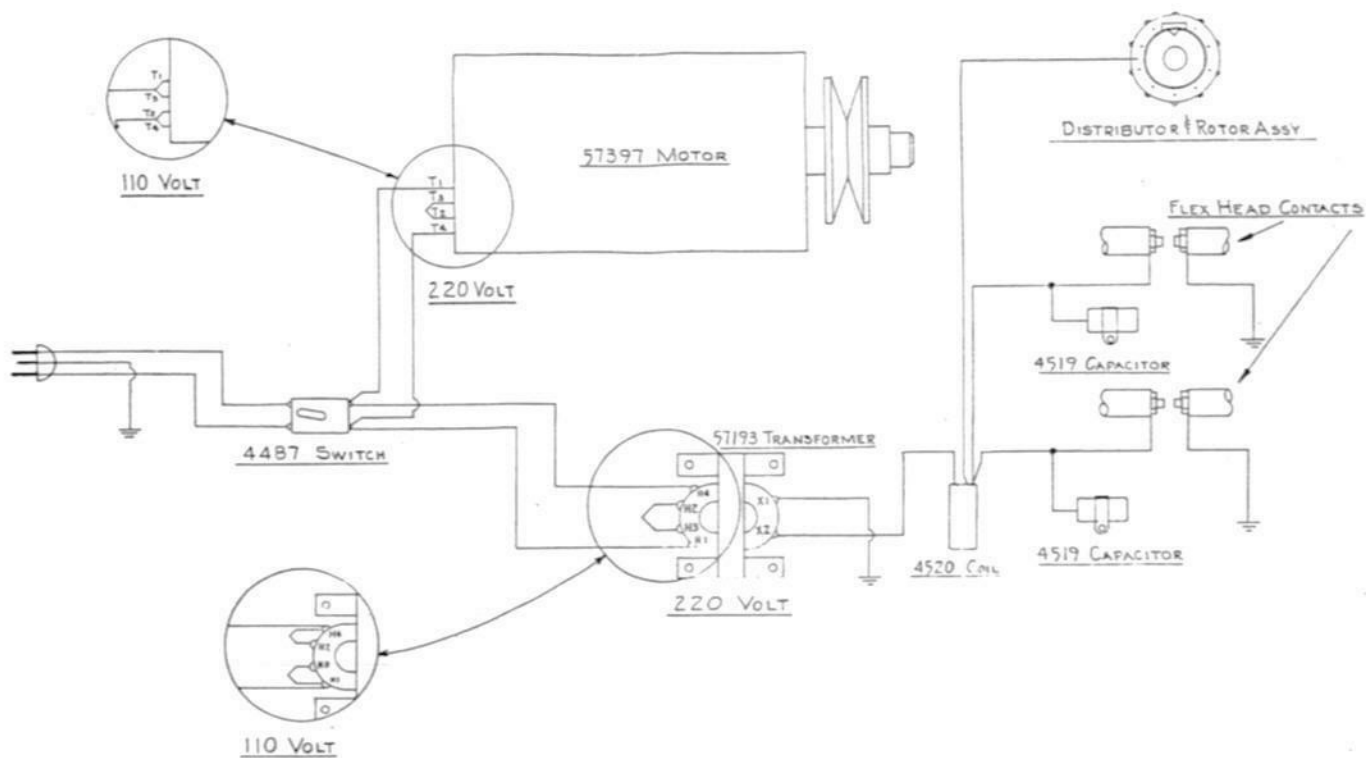


Fig. 27

Wiring

The Bear 330 wheel balancer (catalog #55875) is shipped with a single-phase, 60-cycle, 220-volt motor, unless 110-volt motor is specified (catalog #57998). Field conversion of 55875 to 110-volt is possible. Fig. 16 shows both the 220 and 110-volt connections. 110-volt service requires 30-amp circuit protection.

PRODUCT SERVICE AND PARTS

Service parts, warranty and regular repair service for products are available through a nation-wide system of company-owned Factory Service Centers and independently-owned Authorized Service Centers which are carefully selected by the Automotive Product Service Division.