



AUT-320

WHEEL BALANCER

Operator's Manual



READ this manual before placing unit in service. KEEP these and other materials delivered with the unit in a binder near the machine for ease of reference by supervisors and operators.

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Revision 10/08

Safety

Operator Protective Equipment

Personal protective equipment helps make tire servicing safer. However, equipment does not take the place of safe operating practices. Always wear durable work clothing during tire service activity. Loose fitting clothing should be avoided. Tight fitting leather gloves are recommended to protect operator's hands when handling worn tires and wheels. Sturdy leather work shoes with steel toes and oil resistant soles should be used by tire service personnel to help prevent injury in typical shop activities. Eye protection is essential during tire service activity. Safety glasses with side shields, goggles, or face shields are acceptable. Back belts provide support during lifting activities and are also helpful in providing operator protection. Consideration should also be given to the use of hearing protection if tire service activity is performed in an enclosed area, or if noise levels are high.

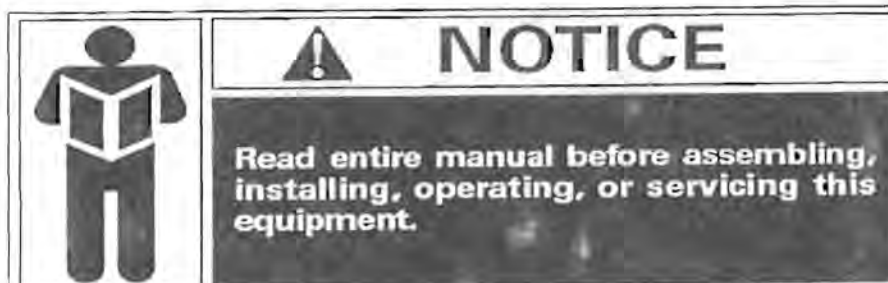
Owner's Responsibility

To maintain machine and user safety, the responsibility of the owner is to read and follow these instructions:

- Follow all installation instructions.
- Make sure installation conforms to all applicable Local, State, and Federal Codes, Rules, and Regulations; such as State and Federal OSHA Regulations and Electrical Codes.
- Carefully check the unit for correct initial function.
- Read and follow the safety instructions. Keep them readily available for machine operators.
- Make certain all operators are properly trained, know how to safely and correctly operate the unit, and are properly supervised.
- Allow unit operation only with all parts in place and operating safely.
- Carefully inspect the unit on a regular basis and perform all maintenance as required.
- Service and maintain the unit only with authorized or approved replacement parts.
- Keep all instructions permanently with the unit and all decals/labels/notices on the unit clean and visible.
- Do not override safety features.



Failure to follow danger, warning, and caution instructions may lead to serious personal injury or death to operator or bystander or damage to property. Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual.



Specifications/Accessories

SPECIFICATIONS TABLE

Item	Description
Electrical Requirements	See the manufacturer's Serial plate
Product Compatibility	For Most Passenger Car And Light Truck Wheels
Maximum Tire Diameter Capacity	31.5" /800mm
Maximum Tire Width Capacity	17" / 430mm
Minimum/ Maximum Rim Diameter Capacity	10"-24"
Minimum/ Maximum Rim Width Capacity	1.5"-20"
Maximum Tire/ Rim Weight Capacity	143Pounds/ 65KG
Balancing Speed	200RPM
Tire/ Rim Balancing Modes	Normal, ALU1, ALU2, ALUs, Static
Spin Time	10 Seconds
Type of Data Entry	Keypad w/L.E.D. Display Indicators
Self-Calibrating Function	Semi-Automatic ,User-Assisted Data Entry (1 st Set-Up ,Or When Desired)
Automatic Start Feature	Starts When Safety Guard is Closed
Brake Type	Automatic
Wheel Stops	At Top
Weight /Length Selections	Ounce And Gram /Inch And Millimeter
Balancing Accuracy	.035 Ounce (1Gram)
Overall Dimensions	52"Wx40"Lx65"H(Safety Guard Open) 52"Wx38"Lx50-1/4"H(Safety Guard Closed)
Standard Accessories	

- Cone A
- Cone B
- Cone C
- Cone D
- Center shaft
- Pliers for weight fitting and removing
- Hub Nut
- Rim Width Calipers

Optional Accessories

- Universal adapter
- Cone set form light truck

Safety

1 SAFETY INSTRUCTION

1.1 GENERAL SAFETY WARNINGS AND PRECAUTIONS

- 1.1.1 **KEEP WORK AREA CLEAN AND DRY.** Cluttered, damp, or wet work areas invite injuries.
- 1.1.2 **KEEP CHILDREN AWAY FROM WORK AREA.** Do not allow children to handle this product.
- 1.1.3 **STORE IDLE EQUIPMENT.** When not in use, tools and equipment should be stored in a dry location to inhibit rust. Always lock up tools and equipment, and keep out of reach of children.
- 1.1.4 **DO NOT USE THIS PRODUCT IF UNDER THE INFLUENCE OF ALCOHOL OR DRUGS.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not attempt to use this product.
- 1.1.5 **USE EYE PROTECTION.** Wear ANSI approved safety impact eyeglasses when using this product. ANSI approved safety impact eyeglasses are available from Harbor Freight Tools.
- 1.1.6 **DRESS SAFELY.** Do not wear loose clothing or jewelry, as they can become caught in moving parts. Wear a protective hair covering to prevent long hair from becoming caught in moving parts. If wearing a long-sleeve shirt, roll sleeves up above elbows.
- 1.1.7 **DO NOT OVERREACH.** Keep proper footing and balance at all times to prevent tripping, falling, back injury, etcetera.
- 1.1.8 **INDUSTRIAL APPLICATIONS MUST FOLLOW OSHA REQUIREMENT.**
- 1.1.9 **STAY ALERT.** Watch what you are doing at all times. Use common sense. Do not use this product when you are tired or distracted from the job at hand.
- 1.1.10 **CHECK FOR DAMAGED PARTS.** Before using this product, carefully check that it will operate properly and perform its intended function. Check for damaged parts and any other conditions that may affect the operation of this product. Replace or repair damaged or worn parts immediately.
- 1.1.11 **REPLACEMENT PARTS AND ACCESSORIES:** When servicing, use only identical replacement parts. Only use accessories intended for use with this product. Approved accessories are available from Harbor Freight Tools.
- 1.1.12 **MAINTAIN THIS PRODUCT WITH CARE.** Keep this product clean and dry for better and safer performance.
- 1.1.13 **MAINTENANCE:** For your safety, service and maintenance should be performed regularly by a qualified technician.
- 1.1.14 **USE THE RIGHT TOOL FOR THE JOB.** Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this tool was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this tool, and do not use this tool for a purpose for which it was not intended.
- 1.1.15 **WARNING:** The warnings, precautions, and instructions discussed in this manual cannot cover all possible conditions and situations that may occur. The operator must understand that common sense and caution are factors, which cannot be built into this product, but must be supplied by the operator.

Safety

1.2 SPECIFIC PRODUCT WARNINGS AND PRECAUTIONS

- 1.2.1 Make sure this machine is used on a dry, flat, level, oil/grease free, concrete surface capable of supporting the weight of the Wheel Balancer, the tire being balanced, and any additional tools and equipment.
- 1.2.2 Before each use, always examine the wheel balancer for structural cracks and bends, damage to the safety guard and electrical wiring, and any other condition that may affect the safe operation of the machine. Do not use the Wheel Balancer even if minor damage appears.
- 1.2.3 Maintain a safe working environment. Keep the work area well lit. Make sure there is adequate surrounding workspace. Always keep the work area free of obstructions, grease, oil, trash, and other debris. Do not use the Wheel Balancer in a damp or wet location. Do not use the Wheel Balancer in areas near flammable chemicals, dusts, and vapors.
- 1.2.4 This wheel balancer is designed for use with most passenger car and light duty truck wheels. Do not attempt to exceed this machine's maximum wheel diameter capacity of 31-1/2" or the maximum wheel width capacity of 20".
- 1.2.5 Prior to beginning a job, make sure the safety guard is in the proper lowered position. do not raise the safety guard until the spinning wheel comes to a complete stop.
- 1.2.6 Always keep hands, fingers, and feet away from the moving parts of the wheel balancer while the machine is in use. Remain clear of the spinning wheel while it is being balanced.
- 1.2.7 Never leave the wheel balancer unattended when it is running. After completing a wheel balancing job, always turn the Power Switch to its "OFF" position, and wait until the machine comes to a complete stop before leaving.
- 1.2.8 Make sure to read and understand all instructions and safety precautions as outlined in the manufacturer's manual for the wheel you are balancing, and the vehicle the wheel is to be used on.
- 1.2.9 Before turning the machine on, make sure tools, tool trays, wheel weights, and all other parts and equipment are removed from the immediately vicinity of the mounted wheel that is to be balanced.
- 1.2.10 Never stand or allow an observer to stand in line with the spinning wheel.
- 1.2.11 The wheel balancer does not come equipped with an electrical power plug. Prior to using, this machine requires the attachment of a grounded, 3-prong, 220 volt, Power Plug to its Power Cord . For your safety, only a qualified, certified electrician should attach the Power Plug onto the Power Cord. Never remove the grounding prong or modify the Plug in any way. Do not use adapter plugs with the Power Plug. To comply with the National Electric Code, and to provide additional protection from the risk of electrical shock, the Power Plug should only be connected to a 220 Volt, 3-hole electrical outlet that is protected by a Ground Fault Circuit Interrupter .
- 1.2.12 If an extension cord (not provided) is used, make sure to use only UL approved cords having the correct gauge and length.
- 1.2.13 Always unplug the wheel balancer from its electrical supply source before performing any inspection, maintenance, or cleaning procedures.

14. **WARNING:** This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code 25249.5 et seq.)
15. **WARNING:** People with pacemakers should consult their physician(s) before using this product. Operation of electrical equipment in close proximity to a heart pacemaker could cause interference or failure of the pacemaker.

UNPACKING

When unpacking, check to make sure all the parts shown on the **Packing Lists** are included. If any parts are missing or broken, please call the distributor as soon as possible.

2 INSTALLATION AND ASSEMBLY INSTRUCTIONS

NOTE: For additional references to the parts listed below, refer to the **Assembly Diagrams** on pages 21 through 25).

2.1 To Determine The Proper Location For The Wheel Balancer:

1. **WARNING:** Make sure this machine is used on a dry, oil/grease free, flat, level **CONCRETE** surface capable of supporting the weight of the Wheel Balancer, the wheel being balanced, and any additional tools and equipment.
2. The Wheel Balancer is designed for indoors use only. Do not install or use the Wheel Balancer outdoors, or in damp or wet locations.
3. Make sure to check the desired location for possible obstructions such as a low ceiling, overhead lines, adequate working area, access ways, exits, etcetera. The Wheel Balancer should be located in an area free of flammable materials and liquids.

2.2 To Mount The Wheel Balancer On A Floor Surface:

1. With assistance, and with the use of a lifting device, stand the Wheel Balancer in its upright position in the desired work location. Use the three, 1/2" machine mounting holes located at the base of the Body as a template to mark the points where three floor anchor holes will be drilled in the floor surface. Then, temporarily remove the Wheel Balancer. (**See Figure B, next page.**)
2. Where previously marked on the concrete floor surface, drill three 1/2" diameter, minimum 4" deep, anchor holes. **NOTE:** Be sure to blow out the cement dust from the drilled holes.
3. Move the Wheel Balancer back to the desired location, and align the three machine mounting holes at the base of the Body with the three previously drilled floor anchor holes. If necessary, level the Wheel Balancer by inserting steel shims between the base of the machine and the concrete floor surface. Do not exceed more than 1/2" thickness of shims.
4. Secure the Wheel Balancer to the concrete floor surface, using three 1/2"

Installation and assembly

diameter concrete anchor bolts of appropriate length, three washers, and three nuts (not provided). (See Figure B.)

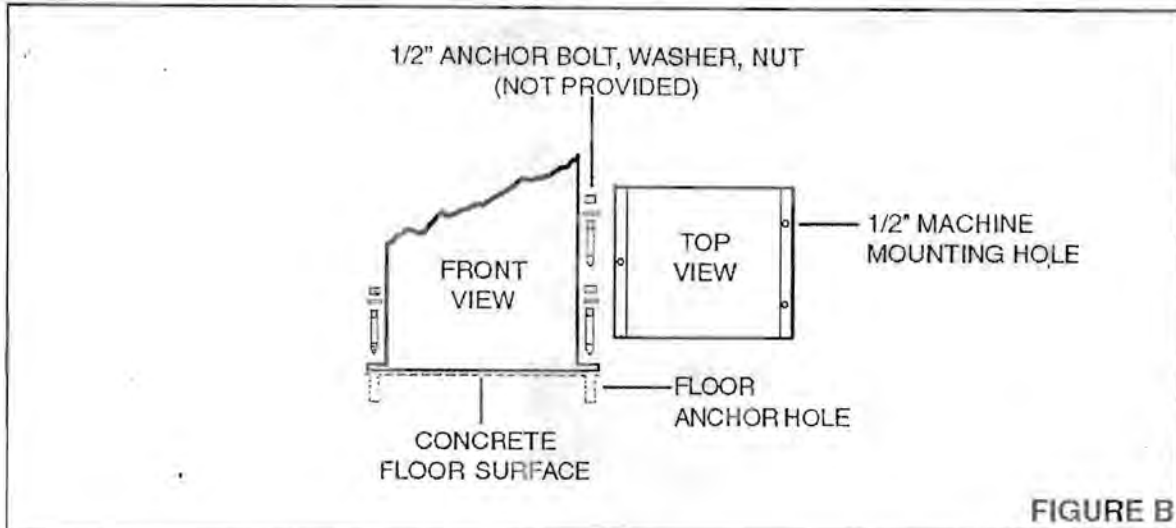


FIGURE B

2.3 To Attach The Safety Guard To The Wheel Balancer:

1. Slide the Sheath onto the Shaft . Align the mounting hole of the Sheath with the rear mounting hole of the Shaft. Then, secure the Sheath to the Shaft, using the Screw
2. Slide the mounting hole of the Safety Guard onto the Shaft . Make sure to position the mounting hole of the Safety Guard against the pre-attached Sheath .
3. Slide the Plastic Lip onto the exposed end of the Shaft . Align the mounting hole of the Plastic Lip with the remaining mounting hole of the Shaft. Then, secure the Plastic Lip to the Shaft, using the Screw . Attaching the Safety Guard to the machine is now completed.
4. The Safety Guard must always be in place while the Wheel Balancer is in operation.

Control Panel

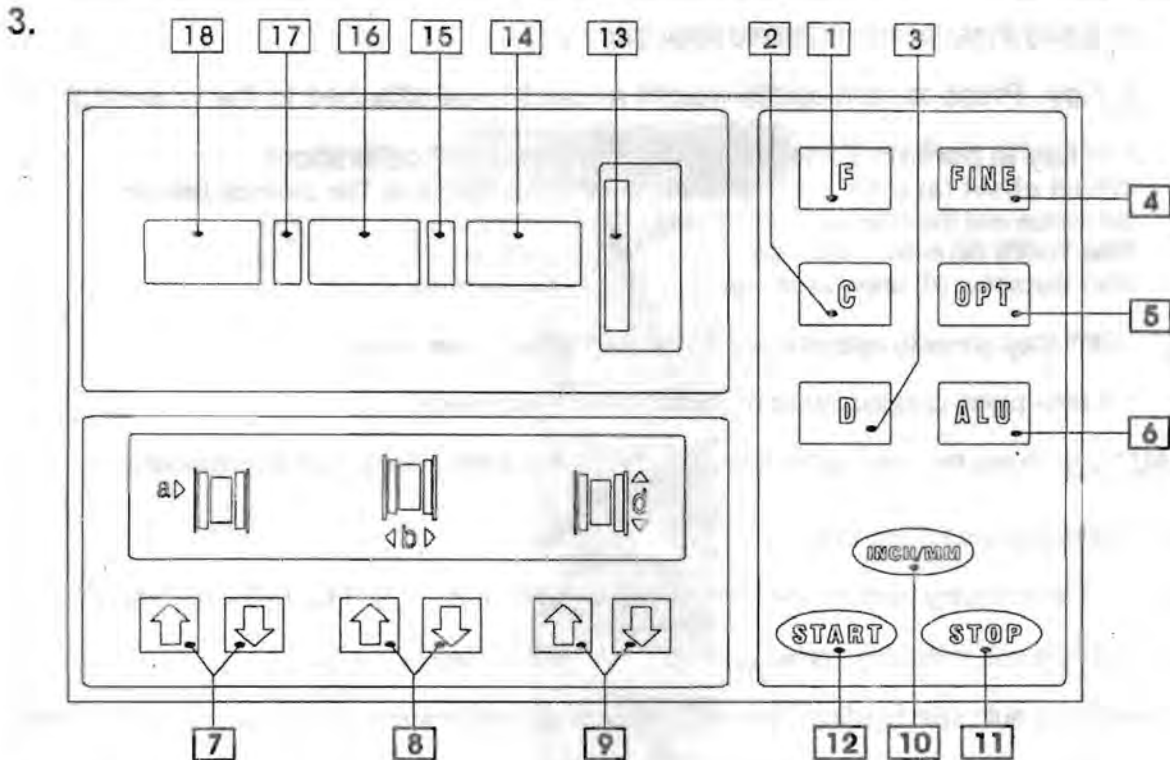


FIGURE 1

3.1 DISPLAYS IDENTIFICATION

- 18** INNER side display window, indicates readings of balancing weight to be attached on Inner side of wheel. Wheel offset value (a) also indicates in this window.
- 14** OUTER side display window, indicates readings of balancing weight to be attached on outer side of wheel. Rim diameter (d) also indicates in this window.
- 17** Weight Position LEDs for INNER side- Full LEDs flash when correct weight position is at top-dead-center.
- 15** Weight Position LEDs for OUTER side- Full LEDs flash when correct weight position is at top-dead-center
- 13** Mode display window-indicates balancing modes and unit modes(INCHES/mm)
- 16** STATIC balancing display window- indicates Static balancing, Rim width is also indicated here.

3.2 KEYPAD- User enters information and selects function using these keys.

- 12** **Start Button** - Press to start a spin cycle.
- 11** **Stop button**- Press to interrupt operating cycle.
- 4** **FINE** key- Press to indicate weight amount reading below 5gram (0.3oz), applicable only after spinning stops

9 **ALU Key**-Press to select desired balancing mode.

7 **C Key**- Press to recalculate weight amount to be attached to the wheel; Or hold this key to perform Calibration (see the chapter of calibration).

1 **Wheel offset (a)** enter keys –press to enter wheel offset a(The distance between the inner rim flange and the edge of the balancer.)

2 **Rim Width (b)** enter keys –press to enter rim width b

3 **Rim diameter (d)** enter keys –press to enter rim diameter d

10 **OPT Key**-press to optimize weight to be attached to the wheel.

8 **F key**- press to select static or dynamic balancing mode.

CAUTION: Press the keys with finger only, NEVER use other hard parts to press keys.

3.3 Function switching keys

3.3.1 The following function switches will be saved to memory and kept after system power off.

1) Gram –Oz unit switching : press and hold the key [F] , then [a↑] or [a↓]

2) Enable the auto spin function(spin automatically started as soon as protective cover put down): press and hold the key [F], then press key [STOP].

3.3.2 The following function switching will not be kept after system power off.

Inch/mm unit switching:

1) for rim width b, press and hold the key [F] , then [b↑] or [b↓]

2) For rim diameter d, press and hold the key [F] , then [d↑] or [d↓]

Remarks: the default unit for each start up of the machine is inch.

3.3.3 Mode switching.

Press key [F] to toggle between modes: Dynamic ↔ Static

Press key [ALU] to toggle between modes: ALU-s→ALU-1→ALU-2→ALU-3→ALU-s

3.3.4 Calibration press and hold the key [F] , then [C]

4 To Mount A Wheel Onto The Balancer

4.1 Connect the Plug (not provided) of the Power Cord (part #519) into a properly grounded, 3-hole, 220 volt, electrical receptacle.

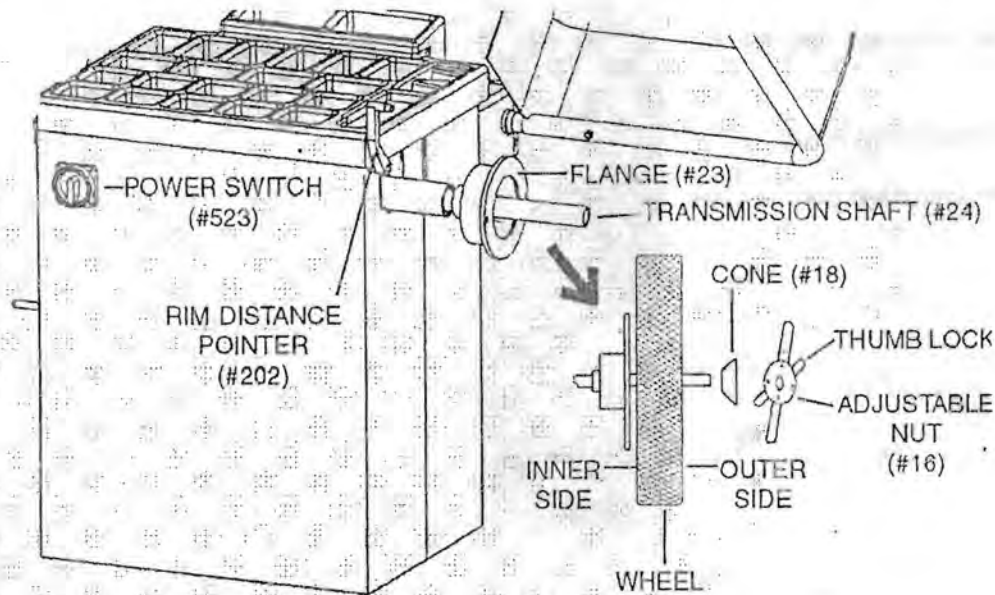
4.2 Raise the Safety Guard (part #504) to its full "UP" position.

4.3 Insert the center hole of the wheel rim (not provided) onto the Transmission shaft (part #24). Make sure to position the inner side of the wheel rim against the Flange (part #23).

4.4 Select the proper size Cone diameter (part #18) that will ensure the wheel rim is tightly secured (no wheel wobble) to the Transmission Shaft. Insert the Cone onto the Transmission Shaft and partially through the center hole of the wheel rim.

Wheel Mounting / Wheel Data Entry

- 4.5 Hold the Adjustable Nut (part #16) with both hands. While doing so, use your thumb to move the Thumb Lock on the Adjustable Nut to the right. While holding the Thumb Lock in position, slide the Adjustable Nut onto the Transmission Shaft (part #24) and firmly against the Cone (part #18). Then, release the Thumb Lock and allow it to lock the wheel rim in place on the Transmission Shaft.



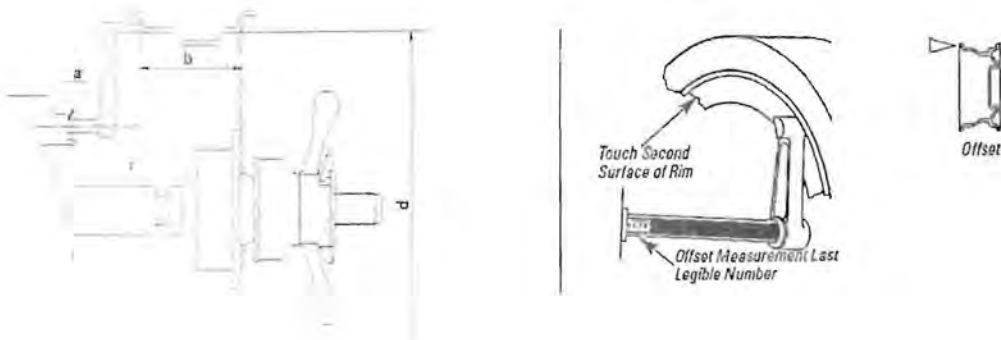
5 Wheel data entry

5.1 Automatic entry

Two type of rim data automatic entries available depends on different type of rims.

- A. Data entry for standard rim.
- B. Data entry for special rim (ALU-s mode)

5.1.1 DATA entry for normal rims



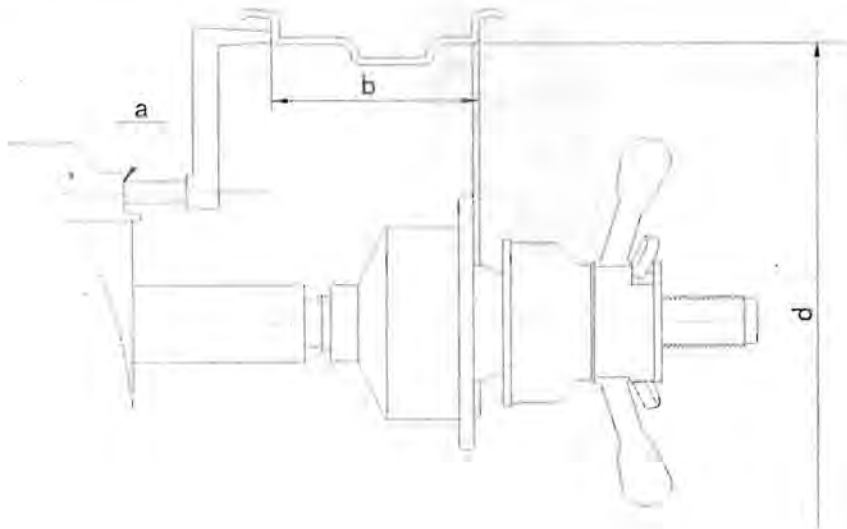
Wheel Data Entry

As shown in the figure , Pull the rim distance pointer out from the side of the balancer, (the display windows go blank during the rim distance pointer moves out) Rotate it until the handle end of the gauge contacts the inner wheel flange. Hold the gauge against the wheel for 2 sec, the system take the measurement automatically and data stores in the memory, [---] indicate in the display windows of INNER (for wheel off set a) and OUTER (for rim diameter d), while middle digit will display a value of default rim width (for instance 5.7). Release the measurement gauge to the home position, the actual value a and d will be displayed on the respective windows. Since the automatic Rim width gauge is not a equipped in the system, the rim width parameter b need to be entered manually by pressing the key pads. Use the Caliper (included) to determine the rim width, as described in section 5.2.1.2.

Note: When entering a data automatically, d (rim diameter) is also determined and entered.

5.2 Manual Data entry.

5.2.1 For standard profile rims.



5.2.1.1 Manual enter wheel offset a

Pull the rim distance pointer out in the same manner as outlined for automatic entry. Hold the gauge against the wheel flange and read the measurement on the gauge. Use the keypad to enter the measurement (by each pressing of the key, 0.5 cm will be added or deducted)

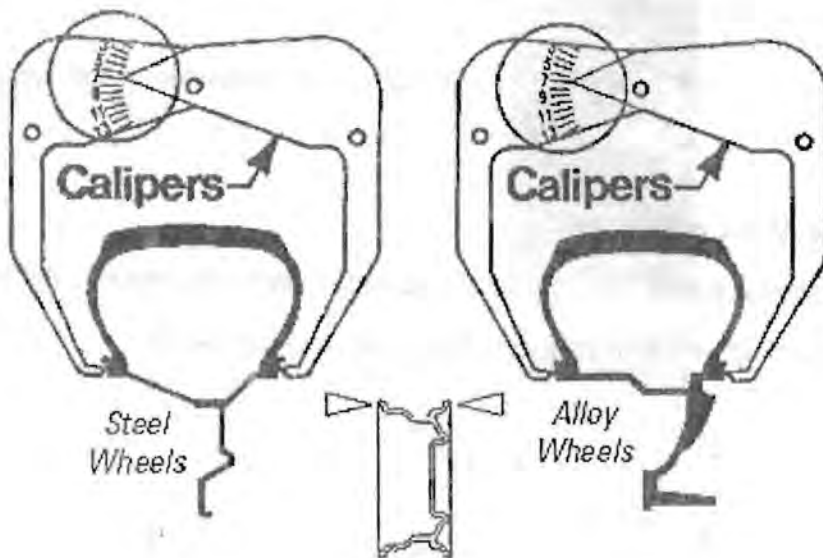
Wheel Data Entry

5.2.1.2 Enter rim width b

Open the calipers wide enough to reach around the tire. Close the calipers so both tips contact the rim flanges. Read the rim width on the calipers. As shown in the following figure. Enter rim width b by using the rim width keys (each pressing value will be added or deducted as following table indicated.)

Table : Value variation for rim width b.

Interval Value variation on display window	Actual rim width variation (inches)
0.2	1/4
0.5	1/2
0.7	3/4



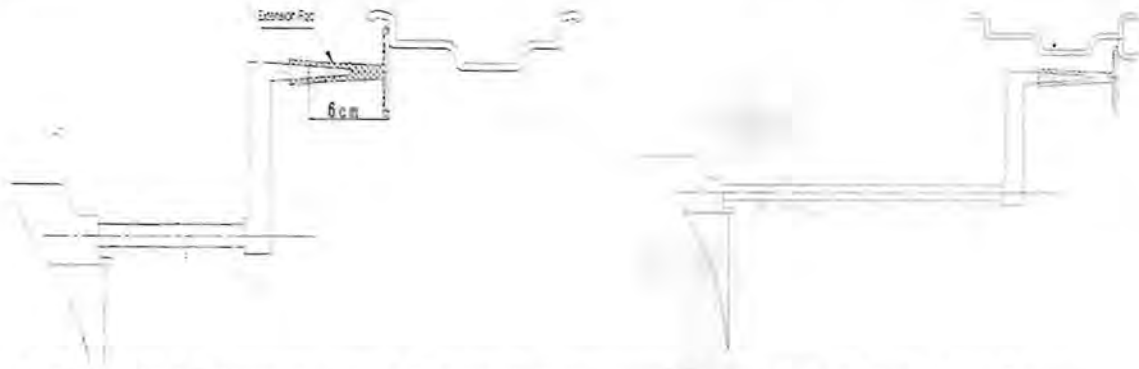
5.2.1.3 Enter rim diameter d.

The rim diameter is indicated on tire side wall, as shown in the following figure. Enter rim diameter d accordingly by using the rim diameter enter keys (each pressing value will be changed by 0.5 inch.)

5.3 Rim data entry with extension rod(6cm)

As shown in the following figures, the extension rod(6cm) is adapted on the rim distance pointer, for application of special profile rims.

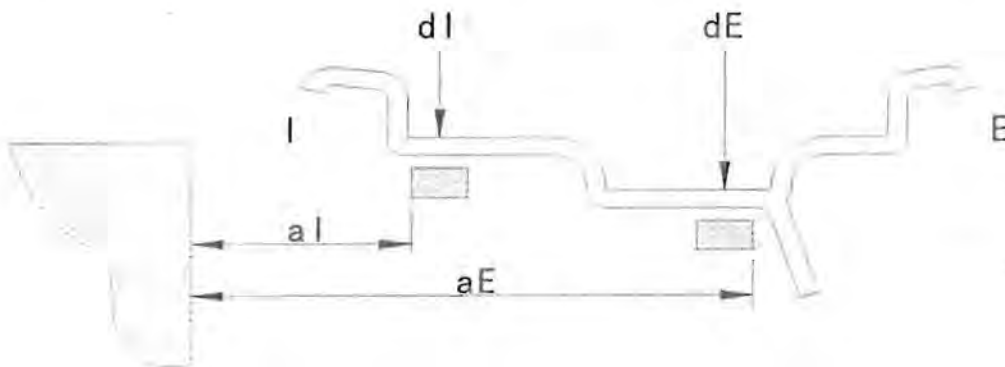
Wheel Data Entry



- 5.3.1 Put extension rod on the rim distance pointer as shown in the above figures.
- 5.3.2 Use the same method mentioned above, take reading from the distance gauge.
- 5.3.3 Release the rim distance pointer to home position, enter the wheel offset a value (a=the above mention reading +6)
- 5.3.4 The procedure to enter rim diameter d and rim width b are described in the section 5.2.1.3.

5.4 Rim data entry for ALU-s mode.

Mode ALU-s for rims with special profile. Press [ALU] key to toggle balancing modes, the corresponding LED of ALU-s light up on the display window on the operation panel.



Refer to the above figure, enter wheel data according to the following procedure.

- 5.4.1 Press key [a↑] [a↓] to change aI value.
- 5.4.2 Press key [b↑] [b↓] to change aE value.
- 5.4.3 Press key [d↑] [d↓] to change dI value.
- 5.4.4 Press and hold key [FINE], then press key [d↑] [d↓] to change dE value.

Note: The default value of dE(default)=dI(default)×0.8, but dE will not changed automatically with the dI value changed.

Calibration

6. Procedure of system calibration

6.1 Balancing calibration

Important: Calibration is needed when: a) First time operation; b) incorrect test result suspected.

The procedure of calibration:

1. Switch on the machine.
2. Put a medium size wheel (13"~15"), 14" wheel is recommended, mount on the shaft and lock it well, input the data of the rim.
3. Press and hold the key [C] and key [D], the display reads: [CAL] [CAL] [CAL], hold the keys until the unbalancing position LEDs light on and blinking, then put down the protective cover, press [start] key.
4. With one spin runs and stops, the display reads: [] [ADD] [100], which tells to add 100g(3.5oz) weight to the outer circumference edge of the rim, do as indicated.
5. Put down the protective cover, press [start], when the cycle of spin finished, the calibration ended with the data memorized in the machine, the display reads: [] [End] [Cal].

6.2 Rim distance pointer calibration

6.2.1 Procedure of wheel offset a calibration.

Press and hold key [STOP] then press key [FINE], until the display reads:

[CAL][P 0][], Pull and hold rim distance pointer on home position "0", press Key [ALU], see the display reads:

[CAL][P15][], Move the rim distance pointer to position "15", then press key [ALU], see the display reads:

[000][000][000], Move the rim distance pointer to home position, end calibration.

6.2.2 Procedure of rim diameter d calibration.

Mount a diameter identifiable rim (14 inch rim is recommended) on the balancer unit as usual method. Press and hold key [STOP] then press key [OPT], see the display reads:

[] [CAL][14.0], (the system default value is 14.0), use the rim diameter entry key to enter the rim value, press key [ALU], see the display reads:

[] [POS][14.0], Move and hold the rim distance pointer to the rim diameter measuring position, press key [ALU], see the display reads:

[000][000][000], Return the rim distance pointer to the home position, end calibration.

Diagnostic

6.3 System self diagnostic program

6.3.1 Sensors and displays diagnostic.

6.3.2 Press and hold key[D], the displays light up one by one from left to right side, after system diagnostic finished, the display reads:

[] [POS] [], Prompts to perform diagnostic procedure for position sensor, turn wheel slightly , ALU-1 LED start blinks, and ALU-2 LED light up in normal way, for each round the wheel turns, the display indicates :

[] [POS] [-0-], It means the position sensor is functioning.

6.3.3 Press key [ALU] again, the display reads:

[0xx] [dIS] [], Where as [0xx] presents wheel offset a value, moving the rim distance pointer changes the display reading. In this step, press and hold key [Stop] and [OPT] to switch to rim diameter d measure diagnostic mode.

6.3.4 Press key [ALU] again, see the display window reads:

[0xx] [dIA] [], Where as [0xx] represents rim diameter d value, moving the rim distance pointer changes the display reading.

6.3.5 Press key [ALU] again, see the display window reads:

[0xx][LAr][], Where as [0xx] represents rim width b value, moving the rim width b rim distance pointer changes the display reading. In this step, press and hold key STOP]+ [b↑]or[b↓] to switch rim width calibration. Note: this function can be activated only when status of <Aut> switched to <ON> in the process of the machine parameter setting procedure described in Chapter 11.6.

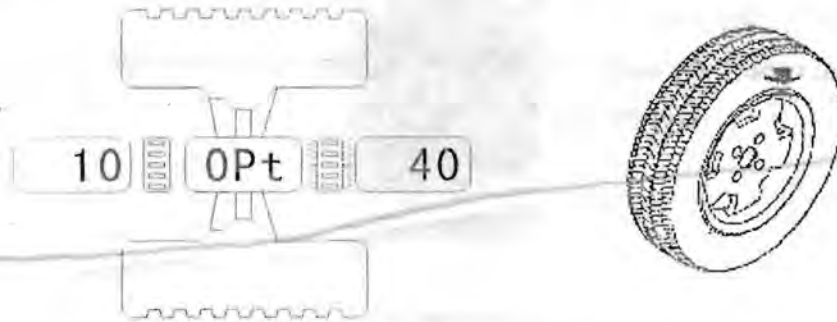
Remarks: During diagnostic on progress, you can quit any time by pressing key [C].

Wheel Balancing

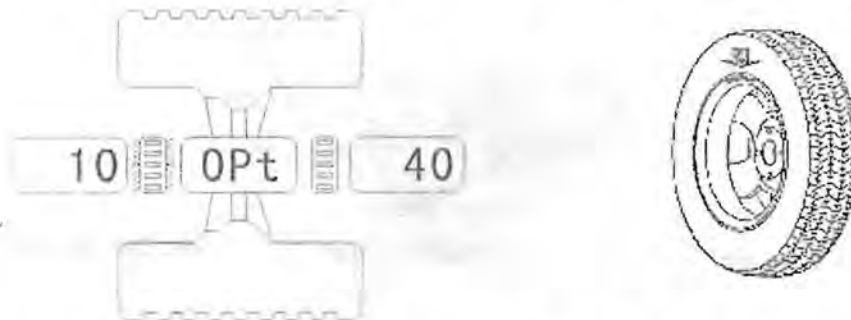
7. Balancing a Wheel.

7.1 Procedure for passenger car wheels and light truck wheels.

- Switch on power, mount the wheel, enter rim data.
- Put down protective cover, press key [START]. The wheel start spinning, and after spin ended, the amount of weights need to attached on the rim will be displayed on the INEER and OUTER display window. Prepare weights as per the displayed value.
- Slightly rotate the wheel counterclockwise, see the Weight Position LEDs for OUTER side- Full LEDs flash when correct weight position is at top-dead-center(12o'clock) .as shown in the following figure. Attach the balance weight on the correct position of the rim.



- Slightly rotate the wheel counterclockwise again, see the Weight Position LEDs for INNER side- Full LEDs flash when correct weight position is at top-dead-center (12o'clock) .as shown in the following figure. Attach the balance weight on the correct posi-



- Put down protective cover, press key [START]. The wheel start spinning, and after spin ended, see the display window of reads: [Gud] [] [Gud], that means balancing cycle is success fully completed.

Normally, the above procedure to reach display reading [Gud] [] [Gud] shall not be more than 3 times.

Wheel Balancing

7.2 Weight Recalculation .

Re-enter rim data, without spinning wheel, press Key [C], the recalculated balancing weights are displayed on the windows.

7.3 To display actual imbalance weight less than 5 gram.

For the reason that the available standard weights interval is 5 gram, increased by every 5 gram, so even after balance weight attached on the rim , there might be weight below 4 gram not balanced, to know how much of it, press key [FINE], the actual imbalance weight remained (1~4 grams) can be indicated. Actually, below 5 gram is acceptable for wheel balancing cases.

7.4 Balancing modes.

Press key [ALU] or [F] to select the desire balance mode, corresponding LED of the mode will be flashed on the display board.

- **Normal mode:** the weight to be attached (clipped on) on edge of both side of the rim, illustrated as following figure.



Normal mode

- **Static mode:** this mode is for Motorcycle wheel or the wheel can not be attached with weight on both sides. Weight location is illustrated in following figure:



Static Mode

- **ALU-1 mode:** Weights to be attached (stuck on) inside the rim, as illustrated in the following figure.



ALU-1 mode

Wheel Balancing

- ALU-2 mode: INNER weight to be attached (clipped on) on the edge of rim, and OUTER weight to be stuck inside the rim. As illustrated in the following figure.



ALU-2 mode

7.5 ALU-s mode.

This mode is for special profiled rims, as introduced in the chapter 5.4. Press [ALU] key to toggle balancing modes, the corresponding LED of ALU-s light up on the display window on the operation panel. Enter rim data as per the procedure of chapter 5.4. then use same procedure of wheel balancing described in chapter 7.1~7.3. Proceed the following procedure to make the result more accurate.

- Press and hold key [STOP] + [ALU], the display reads as follows.



- Pull out the rim distance pointer, reach to the position where the OUTER (INNER) weight to be added. The displays readings are shown as follows.



OUTER weight position display



INNER weight position display

- Hold the rim distance pointer, attach the corresponding weights on the system instructed position.

Remarks: Press and hold the key [STOP] + [ALU] to quit the function any time.

Wheel Balancing

7.6 Split weight program.

7.6.1 Split weight for ALU-s mode.

Mount a wheel on the machine. Select normal mode and enter rim data a, b, and d. Press key [START], after one spin cycle finished, the display reads (for example):

[60] [Opt] [30], Press key [ALU], switch mode to ALU-s; then the display reads:

[65] [Opt] [45], Follow the chapter 5.4, enter rim data of ALU-s mode a1, aE, d1 and dE, then press and hold key [D] +[Opt]; the display reads:

[nr.] [003] [], it indicates to enter number of wheel spoke, press one of the value enter keys [↑] or [↓] to set the spoke number (3~12), for example 5, then press and hold key [D] +[Opt] again; the display reads:

[80] [Opt] [65], press [START] to activate a spin cycle, with the spin finished, the display reads:

[80] [Opt] [60], rotate the wheel till one of the spokes point at 12 o'clock position, hold the wheel, press and hold key [D] +[Opt] again, the display reads:

[80] [SPL] [], the left window indicates the weight to be added on the INNER side of the rim, rotates the wheel slowly, when full LEDs are flashing on the Weight Position LEDs for INNER side, stick 80 grams weight on 12 o'clock position of the rim; rotates again the wheel slowly, until the OUTER position LEDs fully flashed for the 1st time, at this time the display reads:

[80] [SPL] [55], Attach 55 gram weight on the OUTER side 12 o'clock position, rotates again the wheel slowly, until the OUTER position LEDs fully flashed for 2nd time, at this time the display reads:

[80] [SPL] [10], Attach 10 gram weight on the OUTER side 12 o'clock position.

The procedure of ALU-s split weight ended, press key [START] or [OPT] to resume normal mode.

7.6.2 Split weight program for Static mode.

Mount a wheel on the machine. Select normal mode and enter rim data a, b, and d. Press key and hold keys [D]+[OPT], the display reads (for example):

[nr.] [003] [], it indicates to enter number of wheel spoke, press one of the value enter keys [↑] or [↓] to set the spoke number (3~12), for example 5, then press and hold key [D] +[Opt] again; the display reads:

[000] [] [000], press [START] to activate a spin cycle, with the spin finished, press key [F] to switch to static mode, rotates the wheel slowly, till one of the

Wheel Balancing

spoke point at 12 o'clock position, hold the wheel, press and hold the

keys [D]+[Opt] again, the display reads:

[SPL] [] [], rotate the wheel slowly till the INNER position LEDs fully flashed for the 1st time, at this time the display reads:

[SPL] [35] [], Attach 35 gram weight on the 12 o'clock position on the INNER side. Rotates the wheel slowly again, until the INNER position LEDs fully flashed for 2nd time, the display reads:

[SPL] [10] [], Attach 35 gram weight on the 12 o'clock position on the INNER side.

The procedure of STATIC split weight ended, press key [START] to resume normal mode.

8 Optimize balancing function

This function is recommended only when static balancing value over 30 grams, to optimize the balancing and reduce weight to be added.

8. 1 To get the best result, proceed the following procedure carefully.

Press key [OPT], the display reads:

[OPT] [] [], Press [START] to activate a spin cycle, with the spinning finished, the display reads:

[→] [180] [], Where as 180 displayed in the middle means the tire and the rim need to be remounted by 180 degree rotating each other. Before demount the whole wheel from balancer, mark the rim and cone so that the same mounting position can be re-mounted for next operation. Use tire changer to re-mount the tire on the rim by 180 degree rotated each other, fully inflated, and put back the re-mounted wheel on the balancer. Mount on the shaft on the same location of previous cycle, Press key [START], after one spin cycle completed, the display reads:

[80 ←] [45] [], the left window indicates the static balance weight reduction rate after re-mounting tire, in percentage(" ← "=%); the middle window tells the weight to be added after tire remounted, which is: $45 \times (1 - 0.80) = 9$ gram, it means only 9 gram weight needed for balancing the wheel.

Rotate the wheel slowly by hand, till the display indicates as following figure, make a mark on 12 o'clock position of the tire. Name as P_{tyre}.



Again , Rotate the wheel slowly by hand, till the display indicates as following figure, make a mark on 12 o'clock position of the rim. Name as P_{rim}.



Remove the wheel from balancer, use tire changer to re-mount the tire with the rim by matching positions of P_{tyre} and P_{rim}.

As mentioned above, instead of 45 gram, only 9 gram weight needed for balancing the wheel, select a 10 gram weight to put on the wheel.

Trouble shooting / Maintenance

9 Trouble shooting.

Machine failure can be detected and identified by the system, and display on the windows with Err codes. The following table indicates the Err code and the definitions.

ERR code	Definition
Err 1	Rotation signal failure. Possible causes: 1) motor failure; 2) position sensor location error; 3) sensor broken; 4) connector contact error; 5) computer board fail.
Err 2	Wheel spin speed under speed of 60rpm Possible causes : 1) wheel not mounted; 2) Transmission belt improperly mounted.
Err 3	Calculation error, out of range.
Err 4	Spin rotation reversed
Err 5	Protective cover in open position when the [START] key pressed.
Err 7	Calibration error or calibration data loss, recalibrate the system is needed.
Err 8	Calibration error, possible causes: 1) 100 gram weight not added on the wheel during calibration procedure; 2) pickup sensor cable broken or connector failure.
Err 9	Diameter rim distance pointer out of range during calibration. (max diameter of rim is 18")
Err 12	Calculation error during split weight program proceeding.

10 INSPECTION, MAINTENANCE, AND CLEANING

- 10.1 CAUTION:** Always turn the Power Switch to its "OFF" position and unplug the Power Cord from its electrical outlet before performing any inspection, maintenance, or cleaning.
- 10.2 BEFORE EACH USE,** inspect the general condition of the Wheel Balancer. Check for loose screws, loose floor bolts, misalignment or binding of moving parts, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation. If abnormal noise or vibration occurs, have the problem corrected before further use. **Do not use damaged equipment.**
- 10.3 PERIODICALLY,** use a premium quality, lightweight oil to lubricate all moving parts.
- 10.4 TO TIGHTEN OR REPLACE THE PULLEY BELT:** Periodically, it may be necessary to tighten the tension or replace the Pulley Belt. To do so, remove the two Screws on the front and two Screws on the back of the Tool Tray. Empty the Tool Tray of all

Trouble shooting / Maintenance

weights, tools, etc, and remove the Tool Tray from the rest of the machine. Loosen the four Nuts so that the Motor may be moved horizontally forward and backward. To tighten the tension, move the Motor backward until the Pulley Belt is tight to the touch and retighten the four Nuts. To replace the Pulley Belt, move the Motor forward toward the Pulley. Remove the Pulley Belt from the Motor and Pulley, and replace it with a new Pulley Belt. Then, move the Motor backward until the Pulley Belt is tight to the touch and retighten the four Nuts. Attach the Tool Tray back onto the machine, and secure it in place with the two Screws previously removed on the front and two Screws previously removed on the back of the Tool Tray.

- 10.5 **TO REPLACE THE FUSES:** If it becomes necessary to replace the two electrical circuit Fuses, remove the two Screws on the front and two Screws on the back of the Tool Tray. Empty the Tool Tray of all weights, tools, etc., and remove the Tool Tray from the rest of the machine. Remove the two Fuses from the Power Board and replace them with two new Fuses. **NOTE:** Even if only one Fuse is defective, it is recommended to always replace both Fuses at the same time.
- 10.6 With a soft brush, cloth, or vacuum, remove all debris from the Wheel Balancer.
- 10.7 When necessary, wipe with a damp cloth, using a mild detergent or mild solvent.
- 10.8 When storing, keep the Wheel Balancer covered with a clean cloth.

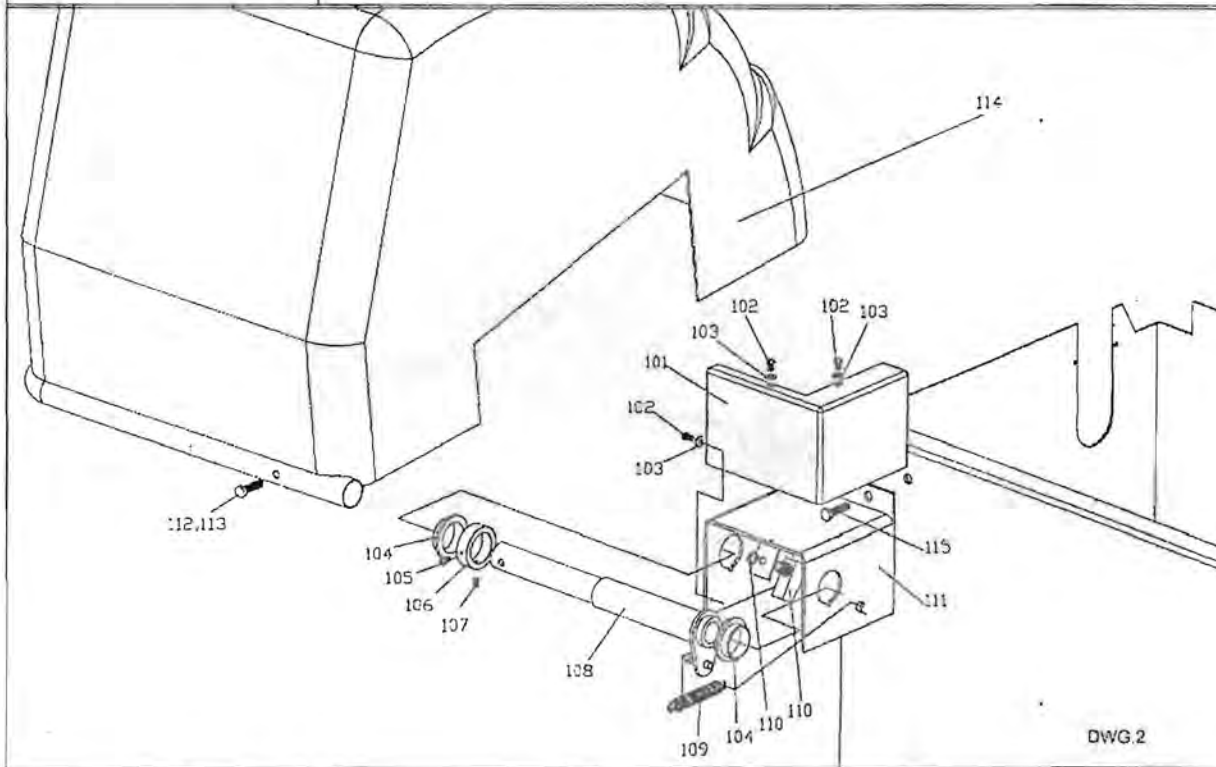
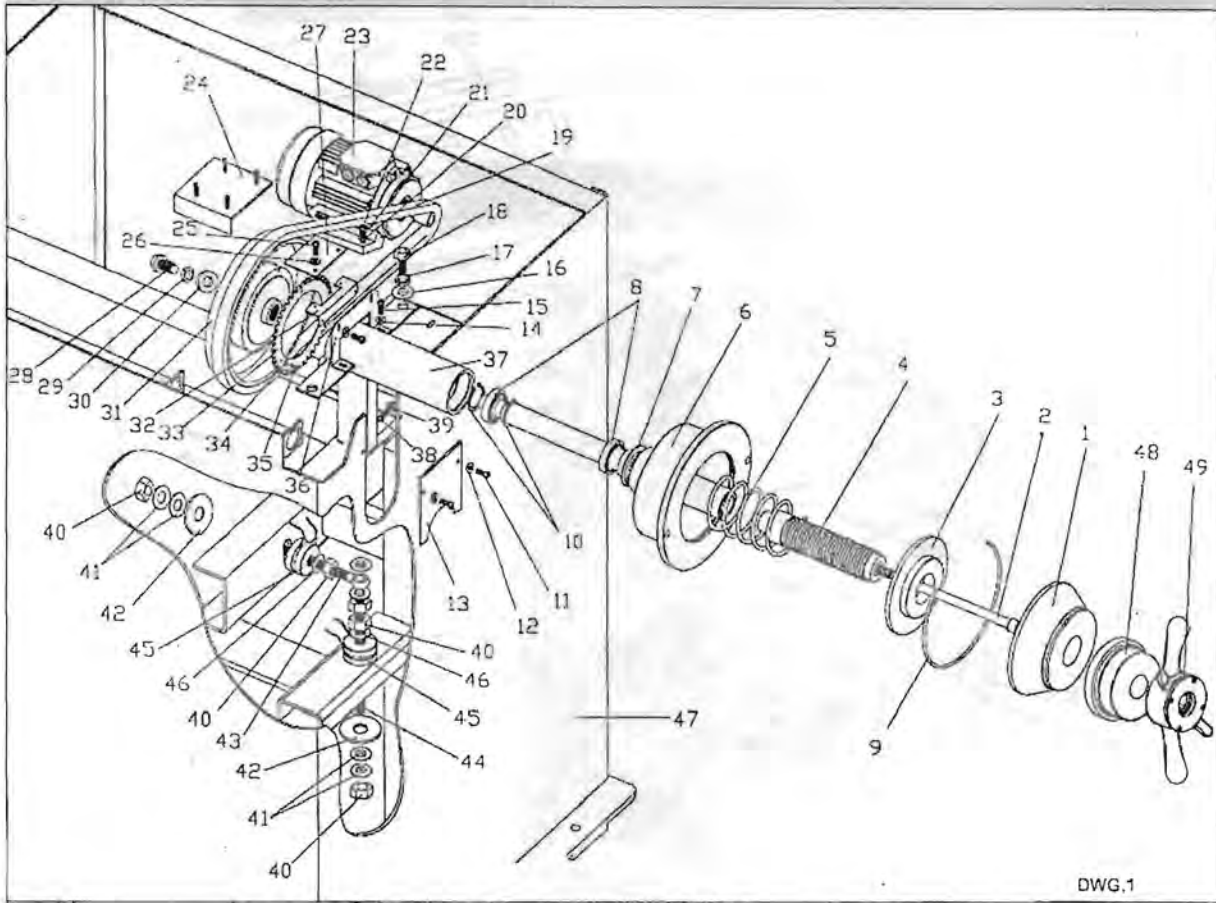
PLEASE READ THE FOLLOWING CAREFULLY

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PART LIST

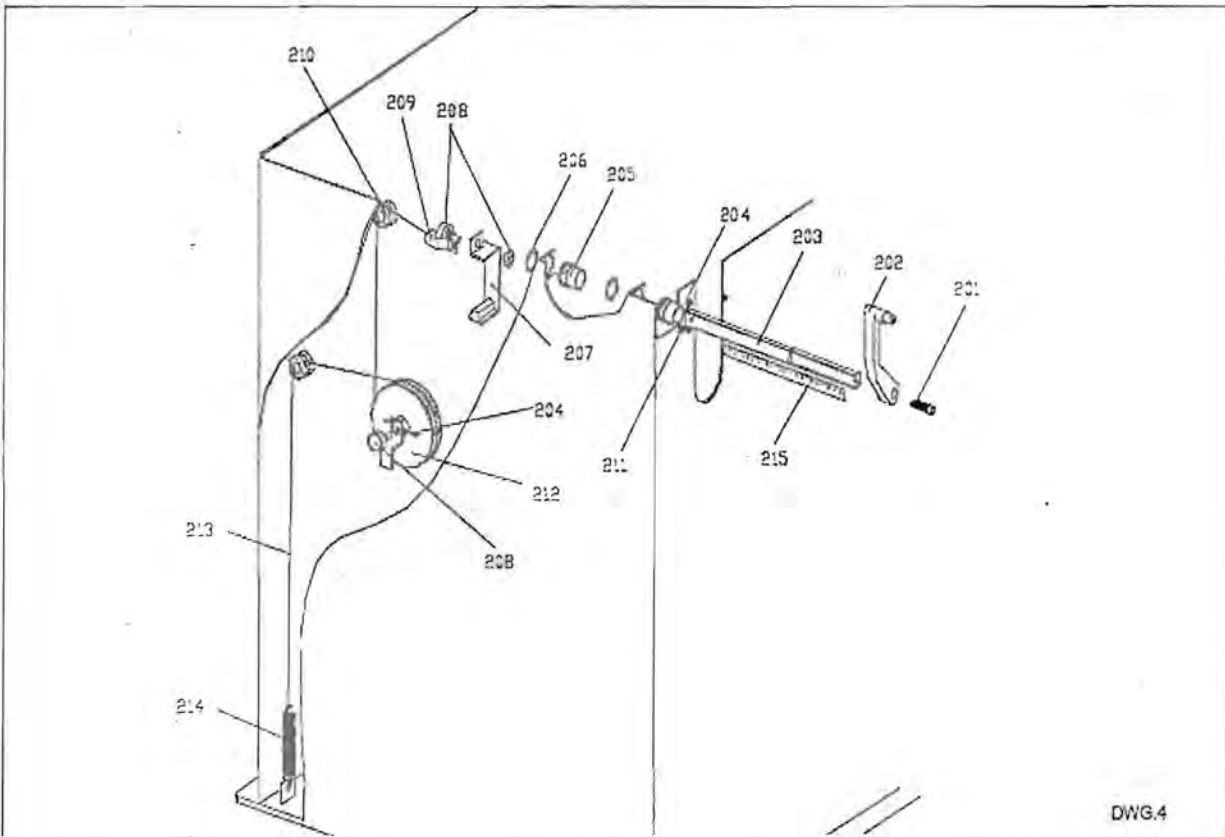
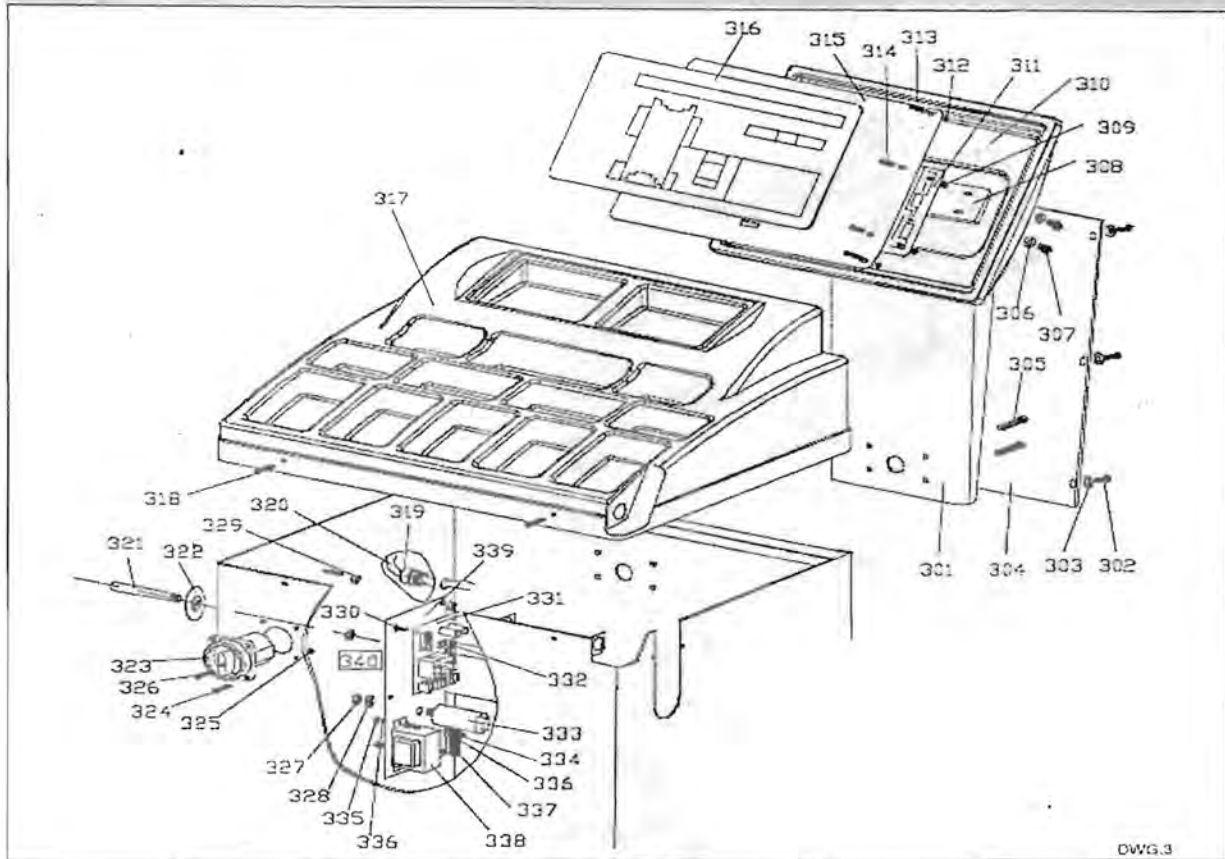
No.	Code	Qt.	Description	No.	Code	Qt.	Description
1	C3110141	4	Cone	112	GB/T 5781	1	Screw M10X55
2	GB/T 70	1	Screw M10X160	113	GB/T 41	1	Nut M10
3	C311010206	1	Plastic lid	114	C3110117	1	Plastic guard
4	C3110145	1	Threaded hub	115	GB/T 5781	3	Screw M10X40
5	C311010207	1	Spring				
6	C311010202	1	Flange	201	GB/T 70	1	Screw M6X15
7	GB/T 893.1	1	Seeger ring $\phi 50$	202	C3110107	1	Handle bar
8	GB/T 276	2	Bearing 6005	203	C3220106	1	Rim distance gauge
9	C311010208	1	Seeger ring $\phi 145$	204	GB/T 77	1	Screw M5X7
10	GB/T 893.1	2	Seeger ring $\phi 25$	205	C3110108	2	Plastic bush
11	GB/T 973	2	Screw M5X7	206	GB/T895.2	2	Seeger ring
12	GB/T 95	2	Washer $\phi 5$	207	C3220127	1	Heavy
13	C3110120	1	Plate	208	457-0-0-203	2	Potentiometer
14	GB/T 95	2	Washer $\phi 4$	209	C3220124	1	Hook
15	GB/T 973	2	Screw M4X10	210	C3220126	2	Block
16	GB/T 95	2	Washer $\phi 10$	211	GB/T 973	1	Screw M5X7
17	GB/T 93	2	Elastic washer $\phi 10$	212	C3220125	1	Pulley
18	GB/T 5781	2	Screw M10X25	213			Ligature
19	GB/T 11544	1	Belt 380J	214	C3220109	1	Spring
20	GB/T 95	4	Washer $\phi 6$	215		1	Graduated strip
21	GB/T 93	4	Elastic washer $\phi 6$				
22	GB/T 41	4	Nut M6	301	C3110111	1	Display support
23	MY7124	1	Complete Motor	302	GB/T 973	4	Screw M5X15
24	C3110123	1	Adjusting plate with screw	303	GB/T 95	4	Washer $\phi 5$
25	GB/T 973	2	Screw M3X6	304	C3110112	1	Rear cover
26	GB/T 95	2	Washer $\phi 3$	305	GB/T 70	4	Screw M6X15
27	C3110203	1	Position pick-up board	306	GB/T 95	4	Washer $\phi 5$
28	GB/T 5781	1	Screw M10X20	307	GB/T 5781	4	Screw M5X15
29	GB/T93	1	Elastic washer $\phi 10$	308	C3110113	1	Fixing plate
30	GB/T 93	1	Washer $\phi 10$	309	GB/T 41	4	Nut M4
31	C311010204	1	Bulley	310	C3110115	1	Display cover
32	C311010209	1	Support	311	C3220205	1	Computer board
33	C311010205	1	Complete toothed ring	312	GB/T 41	4	Nut M4
34	GB/T 95	3	Washer $\phi 3$	313	GB/T 819	4	Screw M4X15
35	GB/T 973	3	Screw M3X5	314	GB/T 819	4	Screw M4X25
36	C311010210	1	Support	315	C3220114	1	Display fixed plate
37	C311010203	1	Shaft bracket	316	C3220204	1	Display panel
38	GB/T 5781	2	Screw M5X35	317	C3110116	1	Head with tools-tray
39	GB/T 41	2	Nut M5	318	GB/T 973	4	Screw M5X15
40	GB/T 41	5	Nut M10	319	C3110206	1	Cable circlip
41	GB/T1972	4	Butterfly washer $\phi 10$	320	RVV		Cable 3X1.5
42	GB/T 96	2	Washer $\phi 10$	321	C3110122	3	Tools hang
43	C3110104	1	Through bolt(V)	322	C3110121	3	Plastic washer
44	C3110105	1	Through bolt(H)	323	EN6097-3	1	Power switch
45	C3110202	2	Sensor assembly	324	GB/T 973	4	Screw M4X15
46	GB/T 95	4	Washer $\phi 10$	325	GB/T 41	4	Nut M4
47	C3110101	1	Body	326	GB/T 973	4	Screw M4X20
48	C3110146	1	Plastic pressure cup	327	GB/T 41	1	Nut M8
49	C3110148	1	Adjusting Nut	328	GB/T 95	1	Washer $\phi 8$
				329	GB/T 41	6	Nut M6
101	C311010306	1	Cover	330	C3110208	4	Nylon spacer for cards
102	GB/T 973	3	Screw M3X10	331	C3110209	1	Power board
103	GB/T 95	3	Washer $\phi 3$	332	C3110210	2	Fuse DM5X20-2A
104	C311010303	2	Plastic lip	333	C3110211	1	Capacitor 30 μ F
105	GB/T 973	1	Screw M5X7	334	GB/T 973	6	Screw M3X10
106	C311010304	1	Sheath	335	GB/T 41	6	Nut M3
107	GB/T73	1	Screw M5X7	336	GB/T 95	12	Washer $\phi 3$
108	C311010301	1	Shaft	337	C3110213	1	Resistor 32 Ω 50W
109	C311010305	1	Spring	338	C3110212	1	Transformer 30W
110	LXW6-11ZL	1	Contact switch	339	C3110214	1	Electric board support
111	C311010302	1	Shaft support	340	C3110201	1	Complete electric board

Assembly Diagram



NOTE: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

Assembly Diagram



NOTE: Some parts are listed and shown for illustration purposes only, and are not