WEST•BOND®

MODEL 7476D

Manual Wedge Bonder

SERIAL # _____

P.O. # _____

TABLE OF CONTENTS

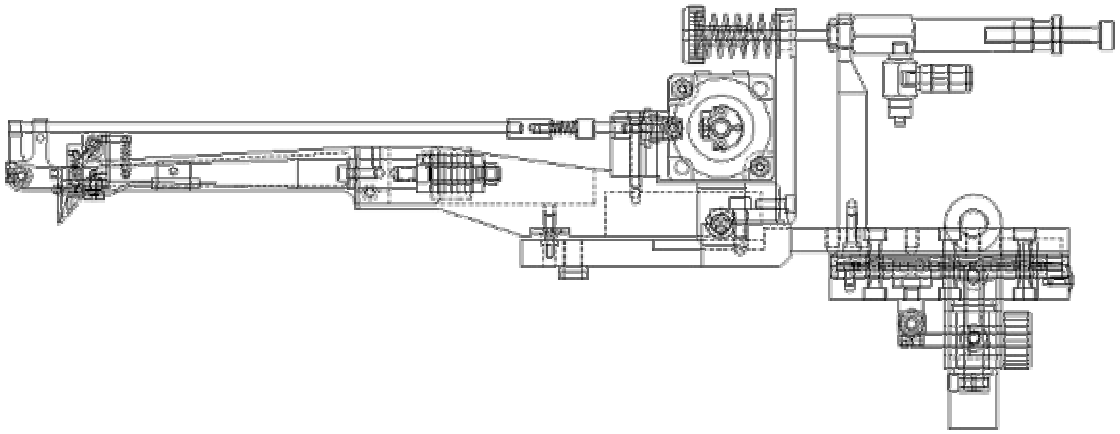
MODEL DESCRIPTION

Model 7400D Series, Wedge-Wedge Wire Bonders, Manual X-Y-Z

Overview

Year 2000 saw the "C" Series finally replace the venerable "A" Series, and now witnesses the transition from "C" to "D". The "C" Series brought forth improvements to the core X-Y-Z manipulator – independently guided and locked axes – but retained the "A" Series tool assembly. Now "D" Series brings across the revolutionary "E" wire clamps and groups them with their drive motor and a full wavelength transducer on a new tool assembly pivoted as before. The X-Y-Z follower mechanism has improved linear ways and accepts the new tool assemblies of the wire bonders as well as other cast-body tool assemblies.

The angled wedge wire bond configuration is shown below.



Application

Machines of this series bond aluminum or gold wires from 0.0007 in. to 0.002 in. diameter, by the wedge-wedge technique using ultrasonic energy to attach aluminum wire at room temperature and adding work piece heat for gold wire. Wire is fed to the work point by two methods selectable by exchange of wire clamps; either diagonally through the heel of the bonding wedge, or vertically down through a hollow wedge. Either allows programmed motions to clamp, break, and feed wire continuously, but requires front-to-back bonding direction

Bond Tool Head Assembly

The all-new tool assembly of this series features wire clamps brought over from "E" Series. The Clamps are air-opened and spring-closed, and have self-contained closure pivots. A separate pivot about an axis located to serve both overhead and angled feed generates the clamp motions along their lines of feed action. To change between angled feed and overhead feed, it is necessary only to exchange the small clamp assemblies and to change the wire drag means. Alignment of clamps to the tool is facilitated by individual adjustments along three axes. Actuation of all clamp motion is by the same spiral cam of an onboard motor. Appropriate clamp motion settings for each method are configured in software and are retained in non-volatile memory. Motions toward the tool are spring-driven, while the more powerful motor drives away from the tool – to ease concerns during set-up.

The ultrasonic transducer is K~Sine Model K~74D-W, 1½ wavelength, operating at a nominal frequency of 63 KHz and with tool length of 0.750-in. dropped 0.656-in.below center. Ultrasonic power supply is K~Sine built-in, five Watts, dual channel.

MODEL DESCRIPTION

Two values of bond force in the overall range of 18 to 90 grams are adjusted at the tool assembly as two preset positions of a compression spring. Either high or low force setting can be programmed for each bond. Initiation of bonding is upon the opening of the firing switch.

The elevation at which to feed new wire is measured from each bond by an optical encoder on the Z Axis. More importantly, this encoder can initiate clamp re-closing to control wire loop arch consistently. Radiant tool heat with panel mounted, constant current control is included.

Mechanical

Throat reach is 5.125-in. from tool home position back to the machine lower panel. Vertical clearance above the work plane with 0.750-in. tool length is 0.438-in. over a reach of 3.750-in. and is 0.188-in. over the balance of reach. This clearance applies for either angled or overhead clamps, except immediately behind the tool for angled. The pivot radius of the tool assembly is the same 8.688-in. extant for West·Bond's history, as is the pivot radius of 12.000-in. of the X-Y-Z manipulator assembly. Range of movement of the tool by manipulator control is 0.563-in. vertically and 0.625-in. in horizontal directions with an 8/1 ratio of mechanical advantage.

The work platform is a bolt-on assembly. An optional adjustable height platform is available as Feature -79.

Preparation of a new end of the wire stock and the threading of that end into the feed hole of a 45? bond tool can be done automatically by machine motions following a simple location of the wire relative to the tool. The method is patented and requires use of special bond tools available from West·Bond.

ESD Protection

Protection against Electrostatic Discharge is implemented by finishing exposed tool assemblies and other moving parts by Electroless Nickel plating, which is conductive; and all exposed painted parts with a powder-coated paint that is dissipative.

Electrical Software and Hardware

Control of machine logic, motor motions, and Ultrasonic energy is programmed to and executed by West·Bond Part No 8100 CPU containing a Motorola 68000 microprocessor and 256 KB of nonvolatile RAM. All machine configuration constants and bond settings are programmable at the machine panel, prompted by a series of "screens" displayed on a 4-line 40-character LCD. Three separate buffers of bond settings for a wire type can be entered and selected during bonding by a selector switch. Each wire type can have approximately 21 stitch bonds, each with its own settings of ultrasonic power and time. All programmed values are displayed during bonding. At "home", various options are enabled.

Definitions of Models of this Series:

- **Model No. 7476D.** This machine with interchangeable wire clamps for bonding by either angled-feed or vertical-feed wedge bond methods.
- **Model No. 7440D.** Insulated Wire Bonder Series, -- see website for specifications.

Features available for this Series:

- **Feature No. 79.** Adjustable height work platform.

MODEL DESCRIPTION

Machine Configuration

The microscope recommended for this series is Nikon SMZ-660 with Luxuray 21-LED shadowless illuminator. Neither microscope nor illuminator is included. One recommended bonding tool is included. All work holders are priced separately. Quite a large number of previously designed special work holders, both heated and unheated, are listed under Products, Workholder Assemblies, on West·Bond's Web Site. Those with Status of "Current" are maintained in stock and can be ordered with machines: This selection covers most needs. If a selection must be made with Status "Available Not Stocked", then it must be ordered on a separate purchase order.

Services Required

Compressed air, regulated to 50 psi, is required. Connection is via 1/4-inch tubing.

Electrical service required is 100-120 VAC, 50-60 Hz, 2 Amps. For 200-240 VAC, an external step-down transformer is required which must be secured by end-user as electrical codes vary from country to country.

Dimensions

Machine size is 22" deep X 19" wide X 12" high, exclusive of microscope, or 18" in height to scope eyepieces. Weight is 60 lb. uncrated, or 95 lb. crated.

FEATURES DESCRIPTION

The specifications define Features that add additional capabilities or utilities to the basic machine models, and cross-reference those models with which the Features may be combined.

Feature -45:Free Furnace Workholder

This furnace is free in the sense that it is not connected to the machine but may be readily inter-changed with the Free Anvil normally used for ultrasonic bonding, giving workpiece heat capability to any machines of the 5K or 7K Series. May also be used with Model 4500B.

This Free Furnace is the approximately the same height and generally is the same shape as the Free Anvil workholders. There is a plastic grip ring around the lower base by which to handle the furnace and a radially projecting push-button for operating the pivoted edge grip lever clamp. Work adapters are one-piece, containing holes for the two cartridge heaters and for the thermocouple, and is assembled above the base on a single stand-off.

This is a basic non-rotating workholder for substrates up to 1.000” (25.4mm) x 1.000” (25.4mm). The work piece is held by means of a mechanical clamp, with a single rail with adjustable backstop from which many variations are derived.

Feature -45D: Free Furnace, for Drop In Adapter

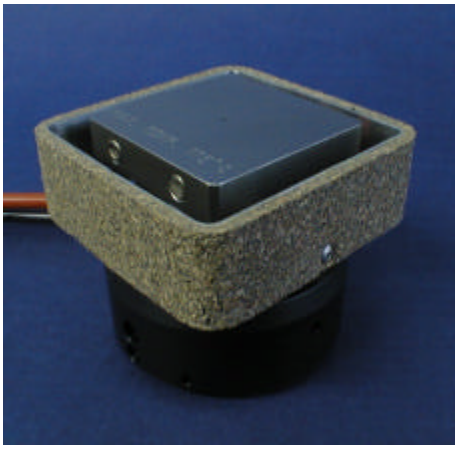
The “D” version of the Feature -45 Free Furnace provides a drop-in type work adapter. The work adapter and workpiece are contained by vacuum.

This Free Furnace is the same height, and generally the same shape, as the Feature -45 Free Furnace. Work adapters are one-piece, and are positioned in the heater plate and held by vacuum. The heater plate contains holes for two cartridge heaters and thermocouple, and is assembled above the base on a single standoff. Adapters are available for a variety of packages.

THIS FREE FURNACE IS LIMITED TO A MAXIMUM OPERATING TEMPERATURE OF 175?C.

FEATURES DESCRIPTION

Feature -45E: Free Furnace, 2”x2” Adapter, Vacuum Hold



The “E” version of the basic -45 Free Furnace modifies the upper portion of the furnace to extend its surface area to 2.000”(50.8mm) x 2.000”(50.8mm). The work piece is held by vacuum that has a 0.250”(6.35mm) x 0.250”(6.35mm) cross pattern, with a 0.0625 diameter vacuum hole. The remaining surface is flat in anticipation of holding substrates up to 2” square. Overall height of the furnace is the same as all other furnaces of the -45 Series.

THIS FREE FURNACE IS LIMITED TO A MAXIMUM OPERATING TEMPERATURE OF 175?C.

Feature -45G: Free Furnace, 2”x2” Adapter, Mechanical Hold

Non-rotating workholder for substrates up to 2.000”(50.8mm) x 2.000”(50.8mm). The “G” version is the same as described under Feature -45E except that the substrate is held in position by mechanical grip with an adjustable backstop rather than by vacuum. All other specifications are the same, including maximum operating temperature.

THIS FREE FURNACE IS LIMITED TO A MAXIMUM OPERATING TEMPERATURE OF 175?C

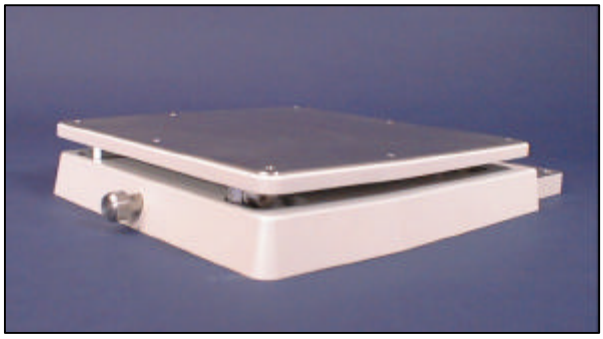
Feature -45J: Free Furnace with Rotating Adapter

A rotating 3.250"(82.55mm) diameter workholder adapter that is used with assembly A-6000-XXX workholder kits. Work piece is held by mechanical clamp, with a adjustable backstop and vacuum. It is designed for use with wedge-wedge type bonders where it is necessary to pre-rotate the workpiece prior to making a wire bond connection. Instead of rotating the entire furnace as with other furnaces of the -45 series. The heater block, thermocouple, heaters and base are held stationary while the adapter is free to rotate by a thumb wheel projecting through the base.

FEATURES DESCRIPTION

Feature –79: Adjustable height work platform

Work Platform with Adjustable Height for variable package thickness. Adjusts through a range of 0.625”(15.875mm), apportioned 0.094”(2.39mm) above and 0.531(13.49mm) below the nominal elevation of 2.688(68.28mm) above the fixed platform surface. Highly recommended for deep access bonding machines.



CAUTIONS

Contained in this section are continuous to be observed during 7476D / 7600C Installation and Operation.

Wiring

All machine wiring has common ground connected to machine chassis and continuous through the power supply, cord and cord plug. Make sure the receptacle for this plug has a good ground connection.

Safety and Comfort

Some ergonomic studies suggest that long periods of repetitive motion may be traced to certain types of physical discomfort leading to possible injury. We have compiled specific instructions herewith to minimize your chances of experiencing carpal tunnel syndrome (CTS), tendonitis, and tenosynovitis.

It is recommended that your work environment be comfortable for your work situation. A carefully planned work environment can actually increase productivity. WEST?BOND recommends that you adopt the following steps for a healthy physical and mental approach to your work.

Exercises

Many motor oil-manufacturing companies that your car engine is most subject to wear and tear when you first start up in the morning often claim it. This is due to the lack of oil on the metal bearing surfaces to offer protection when the car is first started. To a great extent, the same can be said for the tendons and bones and joints they form in your body. In the early morning hours, your body tends to retain fluid from its over night rest, and the first time these tendons and joints are put to usage, there is often a feeling of stiffness and tightness, and when utilized in an abrupt fashion, can often lead to inflammation and at times injury.

Therefore, it is considered appropriate if not mandatory for most people engaged in physical activities such as sports or heavy labor such as construction, to perform a variety of warm-up exercises before beginning their job. We have found the same philosophies and many of these same exercises just as beneficial for those individuals who are placed in a seated position for long periods of time where they utilize primarily their upper extremities, and most importantly, their hands and wrists.

We are therefore, suggesting the following gentle warm-up program to be done by you before leaving for work. Begin by gently tilting your head both to the right and left side, to the point of comfortable tension. Next, tilt your head forward and backward, and lastly, turn your head both to the left and to the right. Each of these positions is taken to the end of their natural range of motion and held for a brief period of time. Do not take any of these movements beyond the point of comfort.

Next, for the shoulders, perform a series of simple, slow, shoulder circles in both a forward and backward direction. Five to ten repetitions in each direction should be enough to warm up the shoulder musculature.

Next, while standing, lift your arms laterally out to the side, away from your body and over your head. Repeat this motion five times. For added benefit, make large, wrist circles with your hands while your arms are overhead.

Lastly, and possibly most importantly, it is important that you carefully flex and extend your wrist prior to beginning your workday. Using the opposite hand to bend the wrist downward does this. This is best done with the arm in a forward position with the elbow straight. To assist in wrist extension, lift your wrist up, using the palm of the opposite hand, pressing against the fingers to assist in lifting the wrist. These stretches are done only to the point of comfortable tension and are repeated with both hands.

These basic exercises will get you off to a good start in the morning and allow your drive to work to be more comfortable and less likely to increase the tension and tightness in your upper back, shoulders and hands.

CAUTIONS

Work Station Exercises

Sometimes it is only when we take breaks at work that we realize how stiff or uncomfortable we have become from working in a seated position. When we concentrate intensely on our work, these types of discomfort often go unnoticed and therefore, we recommend the following exercise program.

After Work Cool-Down Exercises

When you return home from work, it is helpful to relax the hard working muscle groups by repeating your morning exercise program. Many people also find that taking a gentle walk or similar forms of activity provide a nice change of pace from the immobile routine encountered at work. Please check with your physician, however, before beginning any type of exercise program.

Take periodic breaks several times during the work schedule. Gently press your hands against a table, stretch, and hold for several seconds. Stretch and massage your fingers, hands, wrists, and forearms throughout the day. Shake your hands and fingers to relieve any tension and to promote blood flow. Rotate your shoulders forward and backward in a full circle several times daily. Try to use different muscle groups throughout the day, i.e. if sitting for prolonged periods, get up and walk around several times a day.

If you experience pain any time during the operation of your WEST?BOND machine, consult a qualified health professional.

Chair and Table Top

When evaluating your workstation, pay particular attention to those surfaces that come in contact with your wrist and forearms. Sharp edges or hard surfaces should be modified to form a work surface that is comfortable at the point of contact. Reshaping corners and applying a more comfortable softer surface in the work area can be extremely helpful.

The chair should be comfortable and provide firm support to the lumbar region (lower back). The chair should be adjustable in height so that your forearms form approximate right angles with the upper arms while hands rest upon the tabletop. Next, ensure feet rest flat on the floor and, if not, use a footrest that is high enough so that your thighs are reasonably parallel to the floor while seated. During the course of operating your WEST?BOND machine, maintain this recommended posture—any slouching puts unnecessary strain on your back and may weaken muscles over time.

Microscope / Monitor

It is important to look away from the microscope eyepieces and/or monitor frequently. Try to focus on an object about 20 feet away from several seconds. Eyepieces of the microscope should be clean and microscope should be frequently calibrated for parfocal viewing.

CAUTIONS

Micromanipulator

The hand controls on your WEST?BOND machine have been designed for minimal exertion of the hand and fingers. The position of the control knob is purposely set to coincide with a natural rest position of the hand (fetal position). During operation, the operator should rest his/her hand, wrist, and forearm on the tabletop so that the thumb, index and middle fingers gently grip the manipulator knob. With the work piece centered in the microscope, and the tool centered to the optics, usual movement or excursion of the manipulator is usually within plus or minus one-half inch, which is well within natural flexure of the thumb and fingers gripping the control knob. The force required to move the mechanism is somewhat equivalent to pushing a pencil while writing. Following the recommendations set forth in “Exercises” above vastly relieves any perception of muscle fatigue.

The last key point; all these guidelines should be applied to your homework station and home activities, particularly home computers. They should also be applied to video games and your recreational television viewing.

After a long day at work, your body does not need more of the same type of activity when you return home. Remember, diversity of physical activity may well be the simplest and most meaningful recommendation to avoid repetitive stress syndrome such as carpal tunnel syndrome.

INSTALLATION

STEP 1

Remove the accessory box, identify and account for all contents.

v	ITEM	PART NO.	v	ITEM	OPTION
	Manipulator Control Arm	(P/N 8253)		Adjustable Height Platform	(optional)
	Microscope Yoke	(P/N 8280)		Microscope	(optional)
	100 PSI Regulator			Illuminator	(optional)
	90 Degree Clamp Assembly	(P/N 9049)		Illuminator Nut	(optional)
	Tool, Bonding (45 degree)	(P/N 50674)		Work Holder	(optional)
	Tool, Bonding (90 degree)	(P/N 50780)		Check Packing Slip	
	Gauge, Bonding Tool	(P/N 3475.013)			

STEP 2

While still attached to the shipping board, lift 7476D out of box.

CAUTION: DO NOT LIFT BY THE X-Y-Z MANIPULATOR ARM.

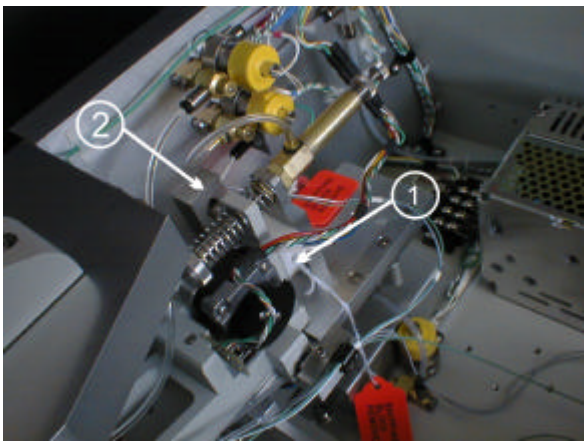
STEP 3

Remove (4 or 6) shipping bolts securing the 7476D to the shipping board.

NOTE! It is suggested to save packing material for use during any future equipment relocation.

-79 Feature

If the machine comes with the adjustable height platform option, take some foam or soft material and place the machine on its side to attach the platform.



STEP 4

Position the 7476D where it will be used.

STEP 5

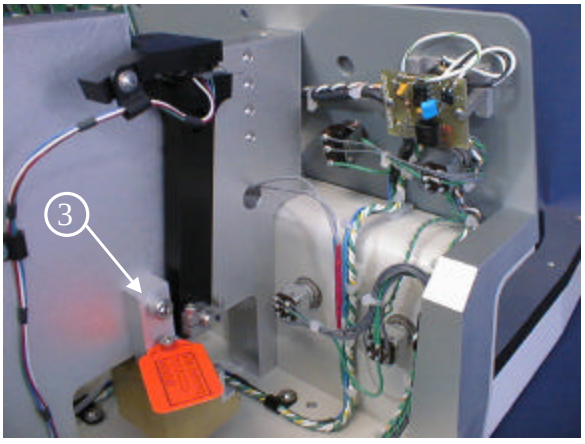
Loosen (2) front screws securing cover, and tilt cover back.

STEP 6

Remove the shipping bracket securing tool head assembly ✍. (1 screw)

STEP 7

Remove the shipping bracket securing tool assembly ✍ to the main plate. (3 Screws)



STEP 8

Remove shipping bracket securing manipulator counterbalance weight ✍ to main plate. (2 Screws)

STEP 9

Remove microscope yoke from accessory box and install.

STEP 10

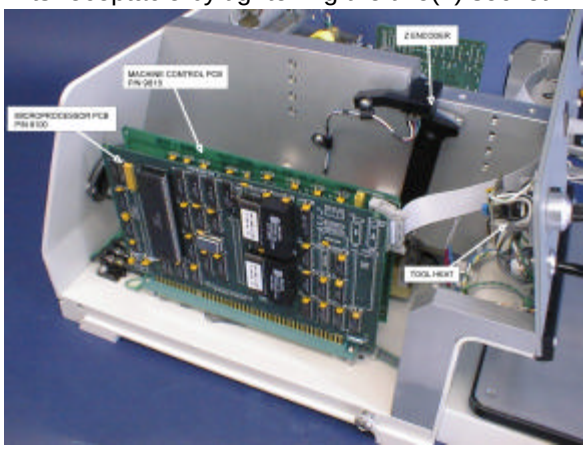
Attach illuminator to microscope. Install microscope. Plug illuminator into front panel receptacle.

FRONT PANEL RECEPTACLE:

For use with K~Sine Illuminators only.

INSTALLATION

STEP 11
Remove Manipulator Arm from accessory box and install in its receptacle by tightening the two(2) socket head cap screws.



STEP 12
Install the Printed Circuit Boards making sure that they are firmly seated and the cable connector to the Machine Control Board is firmly in place.

STEP 13
Locate the compressed air fitting on the rear panel. Secure the regulator to the back panel. Connect a 1/4" O.D. polyethylene line to supply. (50 psi nominal).

STEP 14
The standard 7476D configuration requires electric power of 115 VAC, 50 Hz or 60 Hz. The machine is fused for 1 Amp; the fuse is located on the right rear panel. Alternatively, if machine has been configured for 230 VAC, 50 Hz or 60 Hz, the fuse is ½ Amp.

The 7476D is now ready for operation. Please refer to the next section to understand several important aspects of successful wire bonding with the 7476D.

MACHINE SET-UP

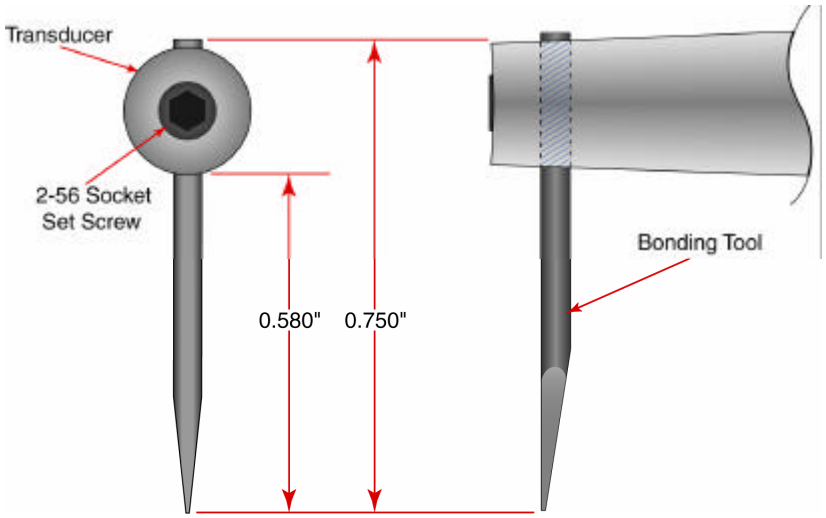
Bond Tool Installation

The choice of bonding tools is instrumental to high quality bonding. The 7476D requires that the shank diameter of the tool be 1/16" and that the length of the tool, for the 45 degree wire feed, should be 0.750". If Tool Assembly No. 9049 has been specified, offering vertical wire feed, then a 0.750" tool length is recommended. A shorter (.625") or a longer (.828") tool may be used for deep access. The Tool Gauge required for proper tool installation is 3475.013

45 DEGREE WIRE FEED (Assembly No. 9048)

DEEP ACCESS WIRE FEED (Assembly No. 9049)

Loosen the transducer set screw and insert the bonding tool through bottom of transducer, It may be helpful to have clamps open when positioning tool. The bonding tool should be positioned according to the drawing below for a good starting position prior to running the Ultrasonic Positioning Utility (UPU)



Ultrasonic Positioning Utility (UPU)

For years the tools position has been determined by a tool gauge to place the bond foot at the design bond point. In continued testing, particularly of the D-Series with longer tools, the realization that there was no one placement that was best for all tools in all conditions.

The Ultrasonic Positioning Utility is to provide an indication of the correct placement for use each time a tool is installed. The UPU consists of a built-in circuit to measure ultrasonic efficiency, and a software routine to display a relative number during tool installation. Maximizing this number numerically shows the effect of different placements until conditions are optimized.

BOND TOOL POSITION SETUP

Press and hold the FEED/OPEN switch in the FEED position. Turn the Machine on. Use the EDIT button to get new readings for tool drop. Move tool up or down to get the highest number possible.
Set tool for maximum reading.

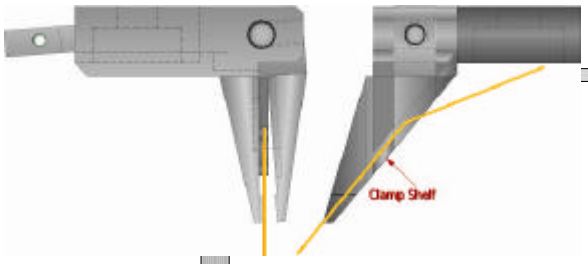
```
  ***** BOND TOOL POSITION SETUP
Change tool extension to maximize value.
Current value = 27        Old value = 21
EDIT = Read new value     FEED = Escape
```

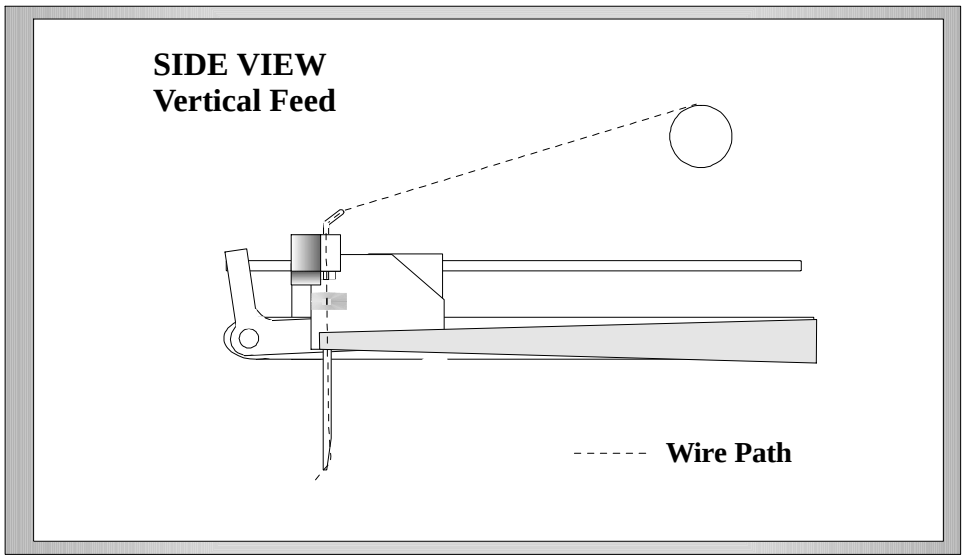
MACHINE SET-UP

Bonding Wire Installation

The 7476D is equipped with a standard 1/2" ball bearing spool mount. Also available is the 2" spool dispenser. Slide the 1/2" spool over the spool mount such that the wire de-spools over the top (counter clock-wise when viewed from the right side). The 2" dispenser will attach to the right side of the microscope mount. Carefully route wire through guides, transducer, clamp and bonding tool. To open clamp, press the FEED / OPEN switch to the right once. To close the clamp or feed more wire through the tool, press the FEED / OPEN switch to the left once. The FEED / OPEN switch is located on the lower left control panel. See below for wire route drawings.

The 45º clamp blades need the wire fed through them to keep the wire from coming out of the clamps during looping. There is a small shelf that the wire needs to pass over before the tool is threaded.

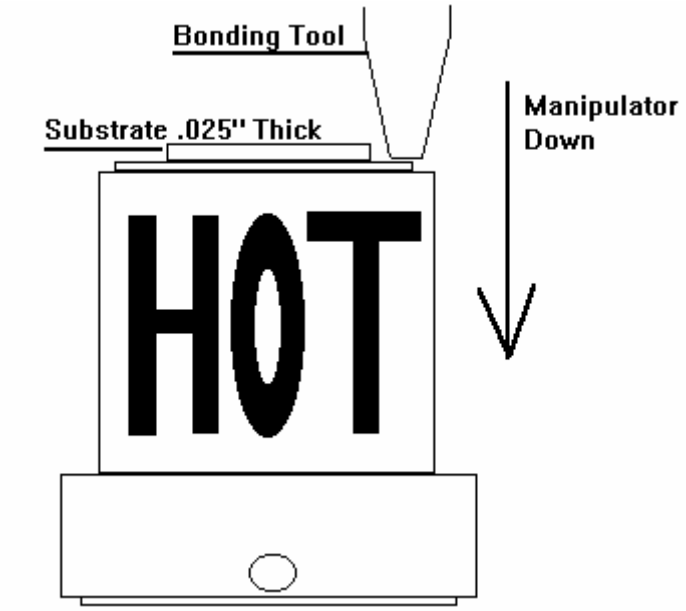




MACHINE SET-UP

Work Platform Adjusting (Feature -79)

The height adjustment of the work platform is critical for quality wire bonding. If the work platform is not adjusted properly, the bonding tool may not be perpendicular to the work surface. To check for proper height adjustment simply compare the height of the surface requiring bonding to the position of the bonding wedge while holding the micromanipulator in its maximum down position. When properly set, the lowest required bonding level should be approximately 20 - 30 mils (635 - 762?m) above the tip of the bonding tool.



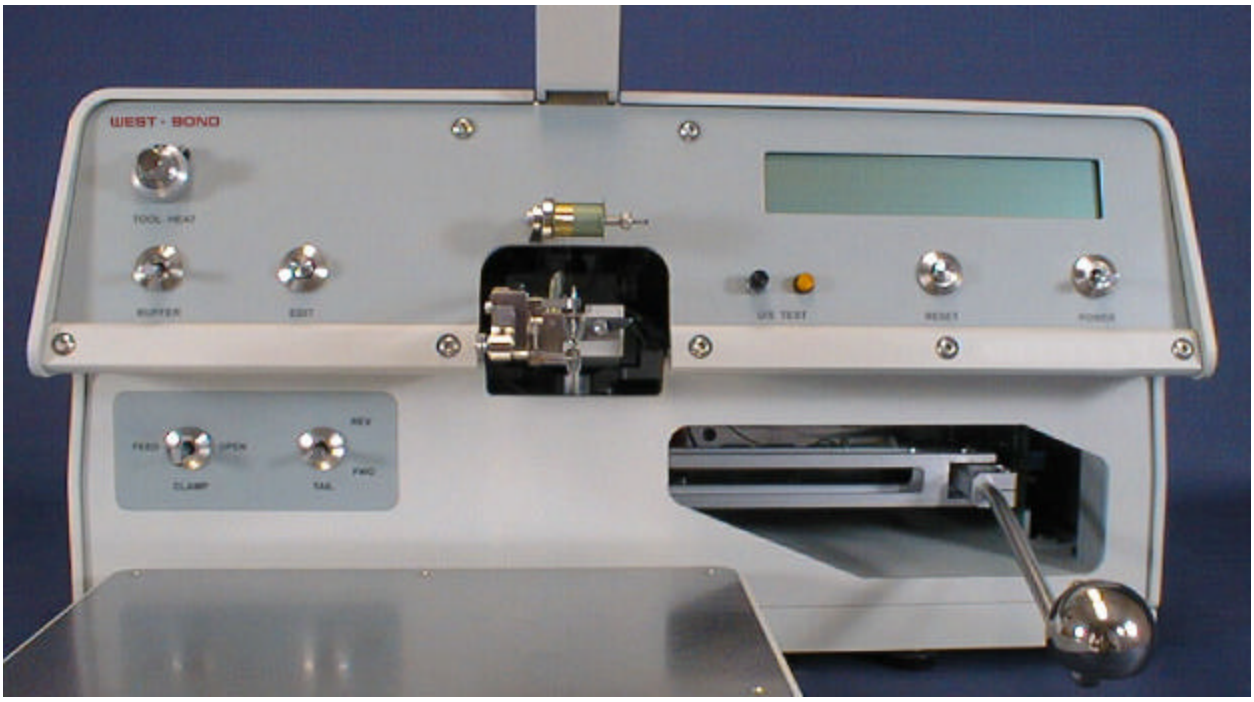
If adjustment to the work platform is required, simply locate the adjustment knob on front edge of the work platform and turn to adjust as required.

OPERATION

The operation of the 7476D has been specifically designed for versatile and dependable operation. The following information will allow the operator to utilize the 7476D to its full potential. This section is specifically directed at operator use and any questions related to PROGRAMMING or TROUBLESHOOTING will be discussed in their respective sections.

Operator Controls

In this section the individual front panel items will be addressed. Programming aspects will be discussed in the Programming section.



POWER Switch
Activates entire 7476D, including the illuminator. Upon power-up, the microprocessor will complete several internal tests and offer failure codes for any problems detected.

RESET Switch
Primarily used as a quick way to exit any sub-menu, even in the programming mode, and return to the bonding mode and “Home” options. In addition, power-up diagnostic tests are repeated whenever RESET is pressed.

EDIT Switch
The operator may enter Bond and Machine Settings Sequence by pressing this button while at the “Home” menu. The selected buffer displayed at the “Home” menu will be the buffer accessed when the EDIT button is pressed. Thus be sure to select the desired buffer number prior to pressing the EDIT button. Once in any of the sub-menu routines, this EDIT switch is used to page through the available menus and options. See Programming.

TEST Switch
This switch allows the operator to test the ultrasonic link to the transducer. The U/S light, next to the switch should illuminate when TEST switch is pressed. The transducer is activated when this switch is pressed. Do not activate this switch for more than 3 seconds at a time. This switch is an excellent way to offer ultrasonic energy to the Bonding Tool while threading.

OPERATION

Operator Controls

U/S Lamp

This light indicates ultrasonic activity. Notice the light will flash during bonding and during any other time that ultrasonic power is used. If this light does not illuminate while the TEST switch is pressed, contact your local service representative or the WEST?BOND factory for advice.

CLAMP Switch

The CLAMP switch performs several functions. To open the wire clamp, push the switch to the right position, labeled OPEN. To close the wire clamp and feed wire through the tool, push the switch to the left position, labeled FEED. Press the switch to the left when the clamp is already closed to activate the clamp through one complete cycle and feed additional wire through the bonding tool. The feed cycles will automatically repeat if the CLAMP switch is held to the left. Hold the CLAMP switch to the right to effect auto-repeating long strokes (Vertical Feed Only).

If the Self-Thread feature has been activated in the Machine Settings sequence, the CLAMP switch will respond as follows: Press the switch to the right to open the clamps and allows the operator to pre-load the special Self-Threading tool. Press the switch to the left to retract the wire clamp, which allows the wire to align itself to the feed-through hole. Press the switch left again to feed the wire through the feed-through hole. Press the switch left now and the clamp will feed wire through the bonding tool.

TAIL Switch

The TAIL switch has been designed for small geometry bonding pads. Although the 7476D tail consistency is excellent, you may occasionally wish to shorten or possibly lengthen a specific tail offering. Bumping the switch up will retract the clamp and shorten the tail. Bumping the switch down will move the clamp forward, offering additional tail. The clamp will not move if it has reached its mechanical limit. This switch is also used to adjust numeric values during the programming of either the bond settings or the machine settings (see *Programming*).

BUFFER Switch

The BUFFER switch is used to change quickly among the three buffers. Buffers will store the Bond Settings for unique packages. (See Programming for these settings).

TOOL HEAT Dial

Turn control knob from zero to activate the Radiant Heater. See the *Options* section for a chart of approximate temperatures for various Tool Heat settings.

OPERATION

Wire Bonding

The actual execution of wire bonding with WEST?BOND's 7476D is rather straightforward. The patented micromanipulator, positioned to the right of the work platform, is directly linked to the tooling head assembly through an 8:1 ratio. This mechanical ratio and sophisticated mechanical link allow the operator to accomplish extremely precise and fine adjustments to the tooling head position.

To produce the first wire bond, simply use the micromanipulator to lower the bonding tool to the bond location and gently touch the tip of the tool to the bond surface. The Work Sensing Firing Switch senses contact of the tool assembly with the actual work surface to activate the ultrasonic energy. If the "Beep On Contact" option has been selected, an audible beep will be heard while the bond is being made. The machine then opens the wire clamp and prepares for bond number two.

After completing the first bond, gently lift the micromanipulator and move the bonding tool through the looping path. When the tool has been lifted to the programmed loop height, an additional beep will be heard. This is only an indicator of the tooling head position. Once the operator has reached the crest of the loop and reverses direction, moving down toward the second bond site, the machine will automatically close the clamp at the programmed distance below the crest. See *Programming* for instructions on changing the loop height indicator and drop-before-clamp distances.

Accomplishing the second bond is a repeat of the first bond sequence. After the terminating bond, the wire clamp will automatically close and pull back to terminate the wire and will then wait until the operator lifts from the terminating bond site before feeding new tail for the next wire.

OPERATION

Basic Operation

The following is an interpretation of the messages displayed by the 7476D during operation. The rectangles on the left represent the LCD and examples of its contents. Additional LCD messages are described in the “Programming and Troubleshooting” sections.

HOME

Bond 1 of 2 Buffer 1 Power: 300 Time: 30 ms EDIT = Bond & Machine settings, 45? feed.	Ready for first bond

BONDING SEQUENCE (Begin by using the X-Y-Z Micromanipulator to touch the tool to the bond pad.)

Bond 1 of 2 Buffer 1 Power: 300 Time: 30 ms Wire clamp is open. Must lift X-Y-Z Micromanipulator.	First bond is complete. Tool is still in contact. User must lift the tool from the bond.
Bond 2 of 2 Buffer 1 Power: 350 Time: 50 ms Wire clamp is open. Proceed to last bond.	Tool is off surface, ready to make second bond
Bond 2 of 2 Buffer 1 Power: 350 Time: 50 ms	Tool has descended, wire clamp has closed; ready for second bond.

NORMAL THREADING SEQUENCE (Begin by pressing CLAMP switch to the right to open clamp.)

Bond 2 of 2 Buffer 1 Power: 350 Time: 50 ms Wire clamp is open. Verifying Clamp Home Limit.	This is briefly seen only if threading for the first time since power-up
Bond 2 of 2 Buffer 1 Power: 350 Time: 50 ms Wire clamp is open. Thread the tool, and press FEED switch.	Terminating bond data is automatically loaded. “Press FEED switch” means press the CLAMP switch to the left.
Bond 2 of 2 Buffer 1 Power: 350 Time: 50 ms Ready to bond off wire tail.	

OPERATION

SELF-THREAD SEQUENCE (Special self-threading tool required.)

SELF-THREAD, Step #1 Wire clamp is open. Position wire in clamp, and press FEED.	"Press FEED" means press the CLAMP switch to the left position, labeled FEED.
SELF-THREAD, Step #2 Wire clamp is closed. Ready to self-thread. Press FEED switch again to pull.	
SELF-THREAD, Step #3 Inching is live. Ready to self-thread. Press FEED switch again to thread. 60	After inching the clamp, the pull stroke will be Adjusted and stored for future use. Bond-off is Unnecessary. Relative whole step position count is displayed in lower right corner.

PROGRAMMING

The following pages demonstrate the expected displays and programmable options of the 7476D. The programmable features are Bond and Machine Settings.

"Bond Settings" options are commonly used by the operator. Here are the options available for programming in this section:

BONDS PER WIRE
ULTRASONIC POWER
ULTRASONIC TIME
    BOND FORCE (This option is skipped if Dual Force is OFF)
LOOP HEIGHT
DROP BEFORE CLAMP (45? Tool only)

"Machine Settings" are items generally used for initial machine setup and are infrequently changed. Options in this section may require some modifications if the application changes significantly. Here are the options available for programming in this section:

WIRE PULL
WIRE TAIL
DUAL FORCE
BEEP UPON CONTACT
MUST LIFT
BOND COUNTER
    RESET BOND COUNTER
    BOND COUNTER LIMIT
ULTRASONIC POWER DURING FEED
SELF-THREAD (45? Tool only)
SOFTWARE VERSION

From the "Home" menu, press the EDIT switch to begin to edit the Bond and Machine Settings Sequence. Then follow the instructions on the LCD.

NOTE! The EDIT button will auto-repeat if held anytime during the Bond and Machine Settings Sequence. Press "FEED" switch anytime to go back one screen, or press "OPEN" switch anytime to go to next screen. It is OK to press RESET to escape the Bond and Machine Settings Sequence.

Model Change / Hidden Menus

During power up of the machine, two menus can be accessed while pressing and holding a switch when turning the machine on.

MODEL CHANGE

Press and hold the TAIL switch in the down position. Turn the machine on. Use the TAIL switch to change the model to the corresponding clamps installed on the machine. Press EDIT to proceed to the main menu.

```
CURRENT MODEL NUMBER IS 7400D
Model 7400D is Wedge Bonder
Model 7600D is Deep-Access Wedge Bonder
REV/FWD=Change Model#      EDIT=Continue
```

PROGRAMMING

BOND TOOL POSITION SETUP

Press and hold the FEED/OPEN switch in the FEED position. Turn the Machine on. Use the EDIT button to get new readings for tool drop. Set tool for maximum reading.

```
  ***** BOND TOOL POSITION SETUP
Change tool extension to maximize value.
Current value = 23        Old value = 22
EDIT = Read new value     FEED = Escape
```

A-MOTOR RESET

Press and hold the EDIT switch. Turn the machine on.
If there is an **ERROR** message contact the factory for assistance.

```
        ***** MOTOR SETUP *****
              == Good! ==

        Press EDIT to continue
```

Bond Settings

The following is a detailed description of the individual menus within the **Bond Settings** sequence. The 7476D has three memory buffers, named BUFFER, each pertaining to one wire type. While at the “Home” menu, use the STITCH switch to select one of the three buffers, and then press the EDIT switch to begin the programming sequence for the selected buffer. The 7476D will not bond while in this mode. To quit editing and resume bonding, the operator can press RESET, or go through the entire edit sequence.

NOTE! The buffer will not change during the edit sequence, even if the BUFFER switch is operated.

BONDS PER WIRE

In this menu, select the number of bonds per wire for the current buffer. The maximum number of bonds per wire is 21. The number may be changed by pressing, “REV” or “FWD” switch.

```
BONDS PER WIRE, Buffer 1
Currently 2              Suggestion: 2
Press “REV” or “FWD” switch to change.
FEED = Prev menu         EDIT = Continue.
```

ULTRASONIC POWER

Specify the ultrasonic power level for a specific bond in this menu. The bond number will be displayed in the upper right position of the display (for example, “Bond 1 of 3”). The power level may be changed by pressing, “REV” or “FWD” switch. Power levels may range from 0 to 999. The suggested power level of 300 is an arbitrary starting point for new applications. Applications vary extensively and may require a substantial deviation from the suggested level.

Recommendation: Set the bond force to an appropriate level for the specific wire size intended for bonding. Adjust the POWER and TIME settings of the 7476D to accomplish a visually correct wire bond. Now evaluate the current ultrasonic levels based on pull-test results and make adjustments accordingly.

NOTE! The bonds are more responsive to a power level increase than to a time increase. A change in time is a gentler way to affect the bond. For a thermocompression bond, set the power to zero.

```
ULTRASONIC POWER, Bond 1 of 2
Currently 250            Suggestion: 300
Press “REV” or “FWD” switch to change.
FEED = Prev option       EDIT = Continue.
```

PROGRAMMING

Bond Settings

ULTRASONIC TIME

Specify the ultrasonic time, in milliseconds, for a specific bond. The bond number will be displayed in the upper right portion of the display (example: "Bond 1 of 3"). The ultrasonic time may be changed by pressing, "REV", or "FWD" switch. The suggested time is "30" and is an arbitrary starting point for new applications. Applications vary extensively and may require a substantial deviation from the suggested level. See the above recommendation in the *Ultrasonic Power* section.

```
ULTRASONIC TIME, Bond 1 of 2
Currently 25              Suggestion: 30
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

COPY OF CHANGES

If a change is made to either the Ultrasonic Power or Time of Bond 1 then the machine will prompt the operator if these values should be copied to the rest of the bonds. This can save setup time if there is a large deviation from the suggested value or there are many bonds to be set that have similar values.

```
                Copy to all bonds:
                    Are you Sure?
                           Down = No,
(U/S Power = 250)          EDIT = Yes.
```

FORCE

Select either the "HIGH" force or the "LOW" force for the specified bond. Press the "REV" or "FWD" switch to change the current setting. The operator may specify the high or low force setting for each and every bond within a wire.

```
Force, Bond 1 of 2
Currently Low           Suggestion: Low
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

NOTE! If the Dual Force option has not been selected in the Machine Settings sequence, then this "Force High/Low" option will not appear, and the "HIGH" force setting will be used for all wire bonds in all buffers. Remember this menu is only for selecting one of two pre-set force levels to be applied to a given wire bond. The number of grams for each of the two force levels is adjusted in the Machine Settings sequence, and cannot vary from buffer to buffer.

LOOP HEIGHT

Use this menu to specify the height at which an audible beep will occur. This beep is designed to assist the operator in producing consistent loop heights. The loop height does not affect any mechanical functions. Press the "REV" or "FWD" switch to increment or decrement the current setting for the desired height, in mils, above the first bond. The equivalent distance in microns is displayed in parentheses. To disable this option set the Loop Height to zero.

```
Loop Height, mils, before Bond 2 of 2
Currently 30 (762u)     Suggestion: 30
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

PROGRAMMING

DROP BEFORE CLAMP (45? Tool only)

Use this menu to specify the distance below the apex of the tool path at which the clamps should close on the wire. After completing the first bond, the clamps will be open allowing the operator to travel upward and back. Once the operator has obtained the crest of the loop and reverses direction, thus beginning the downward descent to the second bond site, the 7476D will begin to count and will automatically close the clamps upon the wire at the specified number of mils below the crest of the tool motion. Press the "REV" or "FWD" switch to increment or decrement the current setting for the drop distance, in mils. Enter zero to keep the clamp open.

```
DROP BEFORE CLAMP, mils, Bond 2 of 2
Currently 10              Suggestion: 10
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

Machine Settings

The following is a detailed description of the individual menus within the **Machine Settings** sequence. The 7476D will not bond while in this mode. To quit editing and resume bonding, the operator can press RESET, or go through the entire edit sequence.

WIRE PULL

This option allows the operator to increase or decrease the distance the clamp blades pull back to break the wire after the terminating bond. The suggested setting, 18 for 45? and 12 for 90?, is displayed on the menu. The numerical selection defines the number of motor steps. Each motor step is equal to 0.000221 inch. To increase the clamp pull stroke, increase the "wire pull" number. Excessive wire pull may cause the wire to become unthreaded. Press the "REV" or "FWD" switch to increment or decrement the current setting for the wire pull.

```
Machine Setup: WIRE PULL, motor steps
Currently 18              Suggestion: 18
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

WIRE TAIL

This option allows the operator to increase or decrease the length of the tail: meaning the wire length offered for view prior to performing the first bond. The suggested setting, 20 for 45? and 24 for 90?, is displayed on the menu. The numerical selection defines the number of motor steps. Each motor step is equal to 0.000221 inch. To increase the tail length, increase the "wire tail" number. Press the "REV" or "FWD" switch to increment or decrement the current setting for the wire tail.

```
Machine Setup: WIRE TAIL, motor steps
Currently 20              Suggestion: 20
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

PROGRAMMING

Machine Settings

DUAL FORCE

This option allows the operator to select the "DUAL FORCE" feature "ON" or "OFF". When the "OFF" selection has been made, the "LOW FORCE" menu will not be displayed and the higher specified force will be applied to all wire bonds. The factory setting is "ON". To change the setting simply press the "REV" or "FWD" switch.

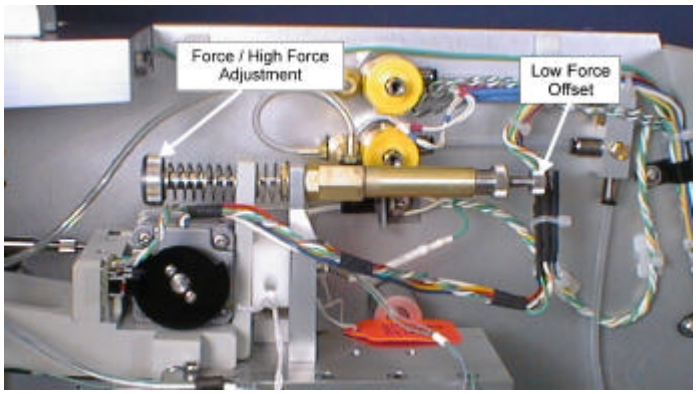
If Dual Force is "ON" the low force will be suggested for the first bond and the high force will be suggested for the consecutive bonds. These are suggestions only. Thus low force or high force may be specified for any bond in any order.

```
Machine Setup: DUAL FORCE (ON/OFF)
Currently ON            Suggestion: OFF
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

CALIBRATE FORCE (High)

This option allows the operator to calibrate the "Force" setting by simply adjusting the force adjustment knob. This High Force knob is located directly behind the tooling head, inside the machine. To increase the bond force, turn the knob counter-clockwise. To decrease the bond force, turn the knob clockwise. Measure the force by placing a gram gauge just in front of the bond tool and lift until the machine beeps. Repeat to verify force is correct.

NOTE! A change in the "HIGH FORCE" setting will also change the low force setting.



CALIBRATE FORCE (Low)

This screen will only be displayed if the operator has selected the "DUAL FORCE" option. Having selected "ON" for the "DUAL FORCE" option, the operator is allowed to calibrate the low force setting while at this menu.

The operator should expect to hear the air cylinder activate when entering this menu. The air cylinder will deactivate when leaving this menu.

REMINDER: This menu is for calibrating or establishing the "LOW FORCE" setting.

To adjust the low force setting, loosen the knurled lock nut and turn the adjustment knob, located behind the high force adjustment. When viewed from the rear of the bonder, counter-clockwise adjustments will reduce the bonding force. Use a gram gauge to measure the force.

```
Machine Setup: CALIBRATE FORCE
  Use force gage to measure Calibration
  Force at the Tool
FEED = Prev option      EDIT = Continue.
```

PROGRAMMING

Machine Settings

BEEP UPON CONTACT

To change the selection of this feature, press the “REV” or “FWD” switch. The audible beep indicator during bonding may be silenced by setting this feature to “OFF”. The suggested setting is “ON”. The “OFF” selection will not terminate beeper operation for loop height indication or during the feed stroke after the last wire bond. Loop height indication can be disabled separately (see *Bond Settings*).

```
Machine Setup: BEEP UPON CONTACT(ON/OFF)
Currently ON              Suggestion: ON
Press “REV” or “FWD” switch to change.
FEED = Prev option      EDIT = Continue.
```

MUST LIFT

To change the selection of this feature, press the “REV” or “FWD” switch. The Must Lift when activated will prompted the operator to lift the tool after the terminating bond before the wire feed stroke. If the Must Lift is Off, then the wire feed stroke will take place a few milliseconds after the terminating bond, regardless of whether the tool is still on the work or not.

```
Machine Setup: MUST LIFT (ON/OFF)
Currently ON              Suggestion: ON
Press “REV” or “FWD” switch to change.
FEED = Prev option      EDIT = Continue.
```

BOND COUNTER

The first menu setting for the Bond Counter is just an ON / OFF selection. Selecting ON will show the Bond Count on the Home Menu screen and will also enable the next two menu items. If OFF is selected the machine will still count the number of bonds that the machine has made but will not display any of this information to the operator, and the following two menus will be skipped going directly to Ultrasonic Power During Feed.

```
Machine Setup: BOND COUNTER (ON/OFF)
Currently ON              Suggestion: ON
Press “UP” or “DOWN” switch to change.
TORCH = Prev option     EDIT = Continue.
```

RESET BOND COUNTER

Using the UP / DOWN Switch will either clear the current Bond Count to Zero (UP) or reset the Bond Count to what is was when entering this menu (DOWN). If the operator leaves this menu after resetting the number to Zero, then the DOWN switch will no longer recover the count.

```
Machine Setup: RESET BOND COUNTER
Bond Counter = 1500
  UP = Reset to Zero    DOWN = Undo
TORCH = Prev option     EDIT = Continue.
```

PROGRAMMING

Machine Settings

BOND COUNTER LIMIT

The Bond Counter Limit will allow the operator to set a maximum number of bonds that a tool can make before the machine gives a warning the tool has exceeded it life and should be replaced. The Maximum Bond Count is 30,000 bonds and is settable in increments of 500.

```
Machine Setup: BOND COUNTER LIMIT
Currently 15000        Suggestion: 25000
Adjust "UP" or "DOWN" switch.
TORCH = Prev option     EDIT = Continue.
```

ULTRASONIC POWER DURING FEED

The ultrasonic power during feed may be changed by pressing, "REV", or "FWD" switch. The 7476D will suggest "0" for a 45? feed tool and "200" for a 90? feed tool. The entered number controls the amount of ultrasonic energy applied to the tool during the feeding of the wire. This ultrasonic energy is critical to assist vertical feed bonding tools. The 45? tools usually does not benefit from ultrasonic during feed.

```
Machine Setup: U/S POWER DURING FEED
Currently 0             Suggestion: 0
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

SELF-THREAD (45? Tool only)

To change the selection of this feature, press the "REV" or "FWD" switch. The suggested setting is "OFF" if you are not sure whether a self-threading tool is installed. A specially designed bonding tool is required to utilize this feature (consult the factory). The 7476D "CLAMP" switch will perform the following sequence if this feature has been selected "ON".

1. Press CLAMP switch to OPEN. Clamp opens and pull back.
2. Press CLAMP switch to FEED. Clamp closes and pull back farther.
3. Press CLAMP switch to FEED. Clamp moves forward to Home position.

Utilizing this feature will require some technique development by the operator. Please feel free to contact your WEST?BOND representative or the factory regarding any difficulties.

```
Machine Setup: SELF-THREAD (ON/OFF)
Currently OFF           Suggestion: 0FF
Press "REV" or "FWD" switch to change.
FEED = Prev option      EDIT = Continue.
```

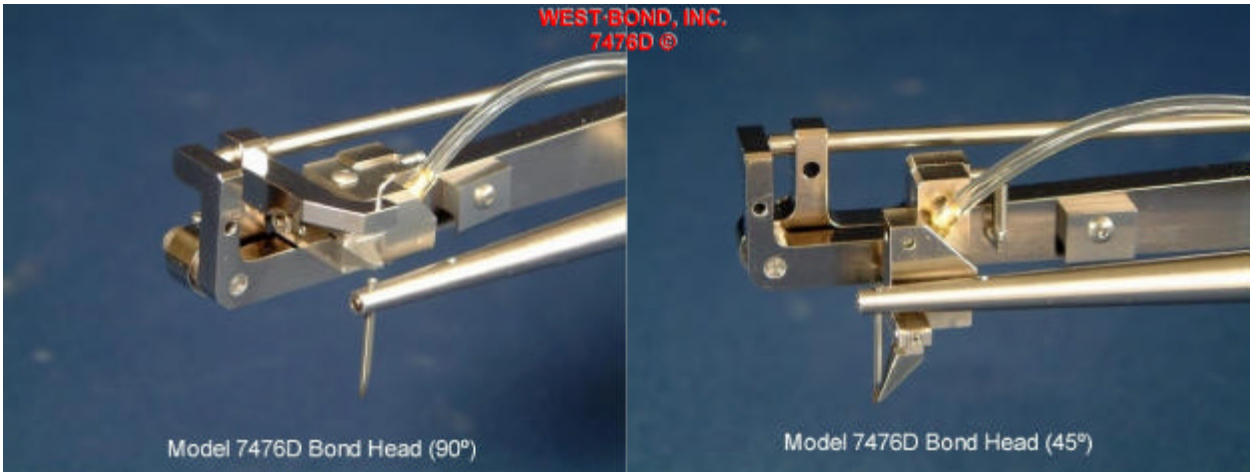
SOFTWARE VERSION

The software version will be displayed here.

```
Model 7400D – Version 1.00
West·Bond, Inc.
   [ END OF BOND & MACHINE SETTINGS ]
                  Press EDIT to escape.
```

TOOL ASSEMBLY CONVERSION

The Model **7476D** Series offers the ability to wire bond with the 45? wire feed tool assembly or the Deep Access wire feed tool assembly. The conversion process from one tool assembly to another should take approximately 5 minutes. Please review the following instructions to insure proper execution of the exchange on our **Model 7476D** Series wire bonder.



1) Remove the Air Line from the Air Clamp Solenoid Inside the Machine.
2) Remove the Socket Head Screw on the left side of the Clamp Assembly. Remove the Clamp Assembly.
3) Reverse Step 2 and replace the Clamp Assembly loosely.
4) Make the Clamp Assembly flush with the mounting bracket on the top and back. Tighten the screw.
5) Replace the Air Line.
6) Change the Model Number to the corresponding clamps.

TROUBLESHOOTING

Typically, bonding problems are related to the application or incorrect parameter selection. If you are experiencing any difficulties, please contact the WEST?BOND customer service department for immediate and personal assistance. The customer service department will then have the opportunity to ask specific questions, which will identify the required solution.

Factory training for all WEST?BOND equipment is available as well as field service assistance. In the event, such service is desired, contact WEST?BOND sales or service departments to schedule an appointment.

Use the section below to maintain a service record on the **7476D**.

DATE	PROBLEM	SOLUTION	TECHNICIAN

The 7476D software performs diagnostic tests of the hardware, software, and stored data.

TROUBLESHOOTING

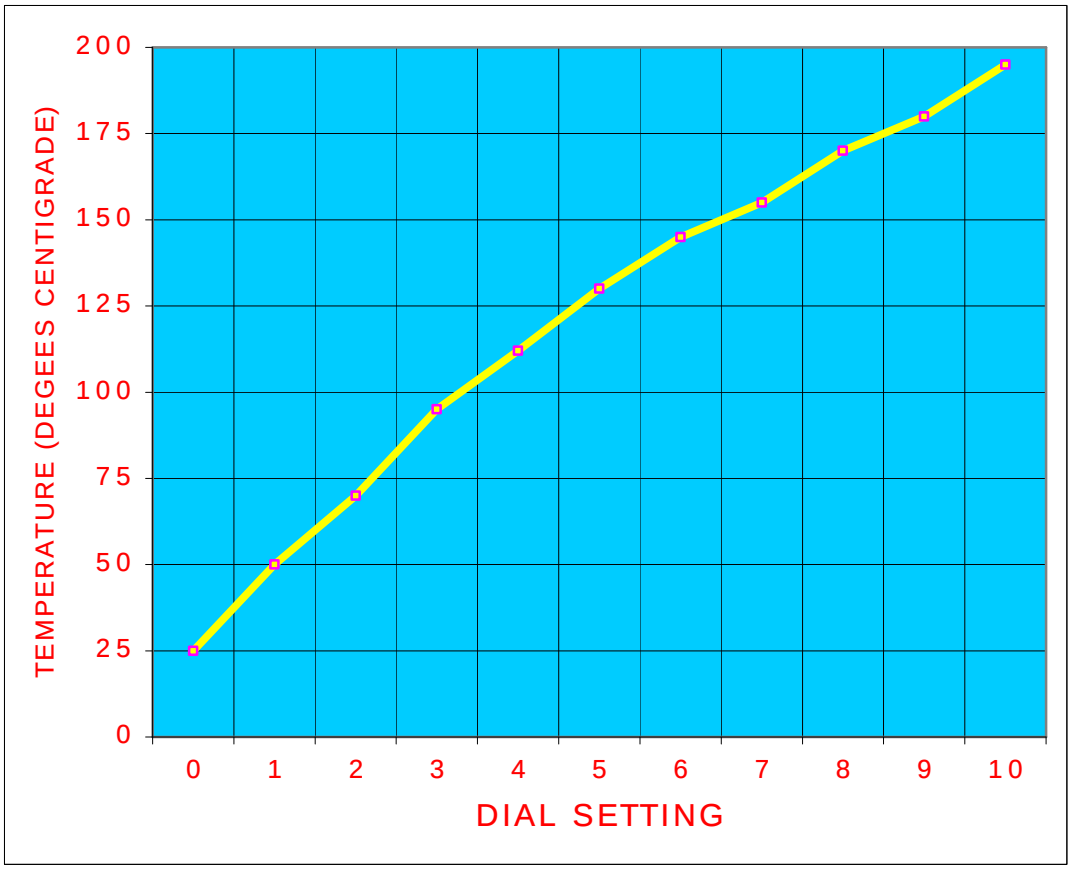
PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Wire bond not sticking or poor bonding performance	1. Parameters improperly set or wrong tool 2. Contaminated or poor parts, materials, or wire 3. Too much drag on wire 4. Too much drag on wire spool mount	1. Fine tune or adjust power, time, force, work heat, or replace tool 2. Clean or try known good parts 3. Check filter drag or mechanical drag set for only slight drag on wire 4. Loosen nut / spring
2. Improper tail, no tail, or losing the wire, not feeding	1. Tail improperly set 2. Too little or no wire drag 3. If machine has -46 feature:	1. Adjust tail 2. Replace filter or adjust as required 3. Too much pull stroke causes wire to come out of tool. Adjust tail. Possible operator error or technique. Tail will vary depending on looping techniques
3. Tailing after last bond (length of wire sticking up in air)	5. Too much tool heat - 44A feature 6. Excessive elongation 7. Not enough gram force to deform wire 8. Wire damage from clamp blades by improper adjustment or burr	5. Lower tool heat 6. Use harder wire 7. Add more bond force 8. Adjust clamp blades to remove any gaps or deburr clamp blades

TECHNICAL INFORMATION

Feature -44a, Radiant Heater For Tool

This machine has been equipped with WEST?BOND Feature -44A, which provides radiant heat for the wedge bonding tool.

The heater temperature is adjusted by the potentiometer located on the upper left side of the front panel, labeled Tool Heat.



MODEL 7476D

2 ½ TURN, 0.750 TOOL LENGTH

NOTE! Temperatures may vary depending upon environment.

SPARE PARTS

Recommended Spare Parts for the 7476D

Part No	Description	Manuf. Name	Manuf. P/N	Rec. Spare
339.002	Pivot Bearing Shaft, 0.6250" Long			1
342	Bar, Tie, Manipulator (order as -8398)			1
572.002	Bracket, Ball Joint (heavy duty)			1
573	Spring, Ball Joint			1
574	Shaft, Ball Joint			1
575	Plate, Ball Joint Backing			1
846	Nut, Spool Tension			1
2057.003	Spring, Compression, Rear (bottom)			1
2363	Thumb Screw, No. 10-32 x 1.50" long			1
2431	Shaft, Tie Bar, .1247" O.D., .625" Long			2
3336	Compression Spring, 0.010" Wire x 0.170" OD x 0.782" Free Length	Superior Springs	A3336	1
3475.008	Gauge, Bonding Tool (Multi-use)			1
4134	Button, Switch			1
4187	PCB, Radiant Heater Control Assembly	K~Sine	4187	1
6307	Dual Force Cylinder Modification, Clippard 3SS-AR-1/2	Clayton Controls	3SSAR-1/2	1
6836	PCB, Photocell Sensor with LED Indicator Assembly	K~Sine	6836	1
8100	PCB, CPU Assembly (replaces P/N 7353)	K~Sine	8100	1
8461	PCB, Firing Switch Contact Assembly	K~Sine	K~8461	1
8526	Shipping Bracket, Manipulator Counterbalance, All 7KC's			1
9011	Piston, Clamp Blade, Model 4500E			1
9258	Wire Drag Tube, Model 7600E			1
9303	Wire Drag Tube, Model 7400E			1
9678	Radiant Heater, Deep Access Tool			1

SPARE PARTS

Part No	Description	Manuf. Name	Manuf. P/N	Rec. Spare
9697	Force Rod, Tool Assembly, Model 7400D			1
9810	PCB, Machine Control, Model 7476D	K~Sine	9810	1
10345	PCB, Ultrasonic Generator, Dual Channel, 4 Watts, Built-in Assembly	K~Sine	10345	1
50006	Ball Bearing, Shielded, Extended Inner Race, 1/8" ID x 1/4" OD	New Hampshire	SR144PPEE	1
50015	Male Connector, 1/8" Tube to No 10-32 Thd, Quick Disconnect	Legris	3171-53-20	1
50034	Solenoid Valve, 12 VDC, 3 Way, Normally Open	Clippard	EVO-3-12	1
50035	Miniature Needle Valve	Clippard	MNV-1	1
50044	Hose Fitting, #10-32 Thd to 1/16" Tube	Clippard	11752-2	1
50055	Switch, Roller Lever	Micro Switch	BZ-2RW82268	1
50056	Pressure Regulating Valve, 0-100 psi, with R07 Mount	Norgren	R07-100-RNKA	1
50062	Switch, Push Button, Single Pole	Micro Switch	1PB16	1
50064	Switch, Momentary Push Button	C & K Components	8121	1
50066	Panel Light, Model 41, Amber	Data Display	41-A5-NAO	1
50068	Ball Bearing, Flanged, Shielded, 3/16" ID x 1/2" OD	New Hampshire		1
50084	Sub-Miniature Hose Barb, #3-56 Thd to 1/16" ID Hose	Clippard	11750-2	1
50103	Ball Bearing, Flanged, 1/4" ID x 1/2" OD	New Hampshire	SFR188PP	1
50111	Ball Bearing, Shielded, Extended Inner, 1/8" ID x 5/16" OD	New Hampshire	SR2-5PPEE	2
50132	Compression Spring, 0.022" Wire x 0.180" OD x 5/8" Free Length	Associated	C0180-022-0620S	1
50153	Extension Spring, 0.045" Wire x 0.360" OD x 1.50" Long	Associated	E0360-045-1500S	1
50235	Optical Encoder Module, Small	Hewlett-Packard	HEDS-9720L50	1
50260	LCD Display, with HDR208SG15 Header	Shelly Associates	SSM44083TGA	1
50287	Linear Bearing,Type R,75mm Long,3mm Dia. Crossed Rollers,Stainless Steel	Schneeberger	R3075RF	4
50406	Multi-Dial, Control Knob	Spectrol	16-1-11	1
50419	Potentiometer, 10 Turn, 0-50K Ohms	Spectrol	534-1-1-503	1
50464	Cord, Power	Belden	17239B8	1
50468	Receptacle, Phone Jack, 6 Contact	Hirose Electric	TM2RG-L66-5S-150	1
50554	Fuse, 1.5 Amp	Littelfuse	31301.5	1
50611	Fuseholder, Panel	Littelfuse	345613A	1
50618	Kit , Hex Allen Wrench Assembly	Holo-Krome	Hex Allen Wrench	1
50832	Switch, Toggle, Chrome Plated Handle (On-None-On)	C & K Components	7101-T2-P-Z-QE	1

SPARE PARTS

Part No	Description	Manuf. Name	Manuf. P/N	Rec. Spare
50833	Switch, Toggle, Chrome Plated Handle (On-On-On)	C & K Components	7211-T2-P-Z-QE	1
50834	Switch, Toggle, Chrome Plated Handle (Mom.-On-Mom.)	C & K Components	7215-T2-P-Z-QE	1
50859	Power Supply, 50 Watt	Volgen Electric Co.	SP50U-0533T	1

WARRANTY

a. Seller warrants to the original Buyer that each new product manufactured by WEST?BOND is free from defects in material and workmanship. Seller's liability hereunder shall be limited to the replacement of any product manufactured by WEST?BOND provided that the defective product is returned within one year from date of invoice to the WEST?BOND factory in Anaheim, California, with transportation charges prepaid. Upon examination by WEST?BOND, a product found defective due to manufacture and not the result of abuse, unauthorized alteration or normal wear, will be replaced. Seller makes no warranty concerning products or accessories not manufactured by WEST?BOND. However, Seller will give all reasonable assistance to Buyer in obtaining from the respective manufacturer whatever adjustment is appropriate under the terms of that manufacturer's own warranty. No product may be returned to the factory without a Return Material Authorization (RMA) number issued by authorized factory personnel.

b. This warranty is in lieu of all other warranties expressed or implied. WEST?BOND expressly disclaims any and all warranties of merchantability and fitness for a particular purpose. No employee, agent or representative of Seller has any authority to obligate Seller beyond that specifically included herein unless agreed to in writing by an authorized officer of Seller.

c. Seller assumes no liability or risk for any special, direct, indirect or consequential damage caused by defective products manufactured by WEST?BOND.

Rev. 4/99

Patent Information

This series machine is covered under the following patents:

5190206	Self-Thread Wedge Bond Tool
5871136	"D" Series – X-Y-Z Micromanipulator with independently guided axes.
5931372	"D" Series Locks – X-Y-Z Micromanipulator with independently guided and independently locked axes.

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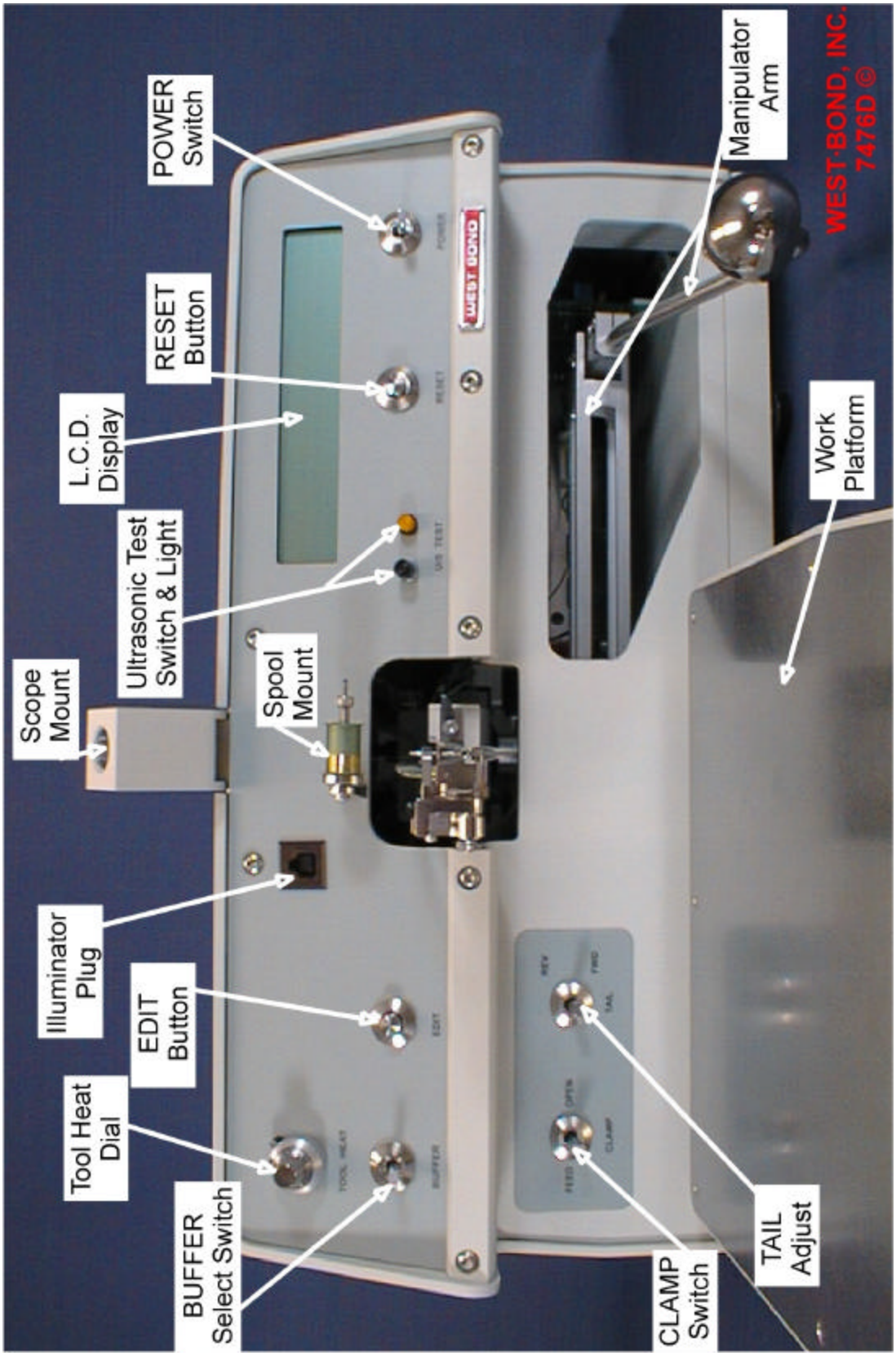
DRAWINGS AND SCHEMATIC

THE FOLLOWING PAGES CONTAIN DRAWINGS AND SCHEMATIC INFORMATION FOR THE 7476D SERIES

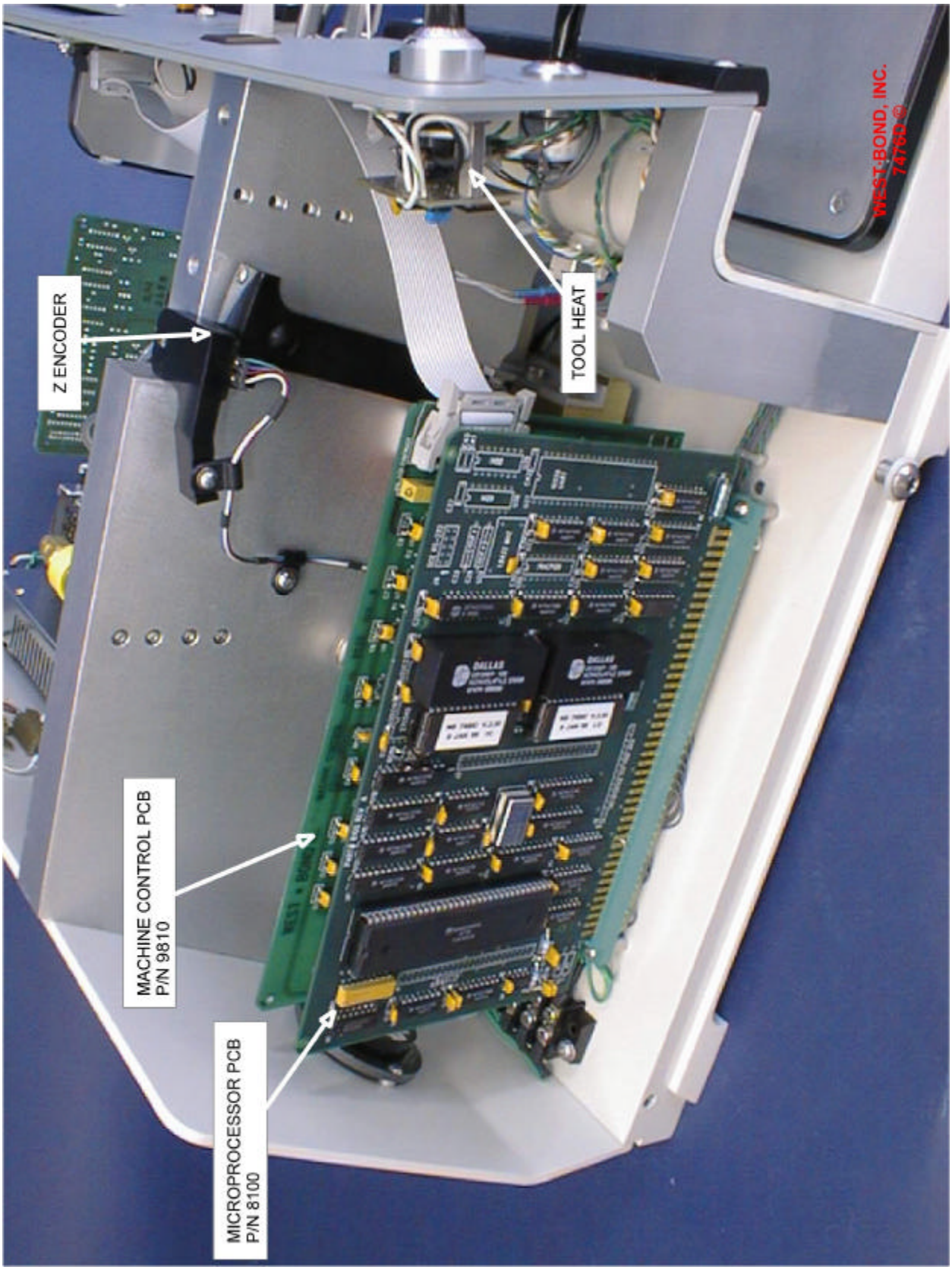
Models 7476D use the following schematics:

CB-4129	Photo Sensor Circuit
CB-4189	Heater Control Circuit
CB-6836	Photo Sensor Circuit
CB-8100-1	Microprocessor Circuit (Board Function Diagram)
CB-8100-2	Microprocessor Circuit (Backplane and Test Points)
CB-8100-3	Microprocessor Circuit (Support Logic)
CB-8100-4	Microprocessor Circuit (Core Logic)
CB-8100-5	Microprocessor Circuit (System Memory)
CB-8100-6	Microprocessor Circuit (I/O Decoding / Console)
CB-8100-7	Microprocessor Circuit (CRU Serial Interface)
CC-9810-1	Machine Control (Power Distribution)
CC-9810-2	Machine Control (CRU Interface Section)
CC-9810-3	Machine Control (CRU Interface Section)
CB-9814	Power Wiring Diagram
CE-9815	System Wiring Diagram
CB-10345	Ultrasonic Generator

DRAWINGS AND SCHEMATIC



DRAWINGS AND SCHEMATIC



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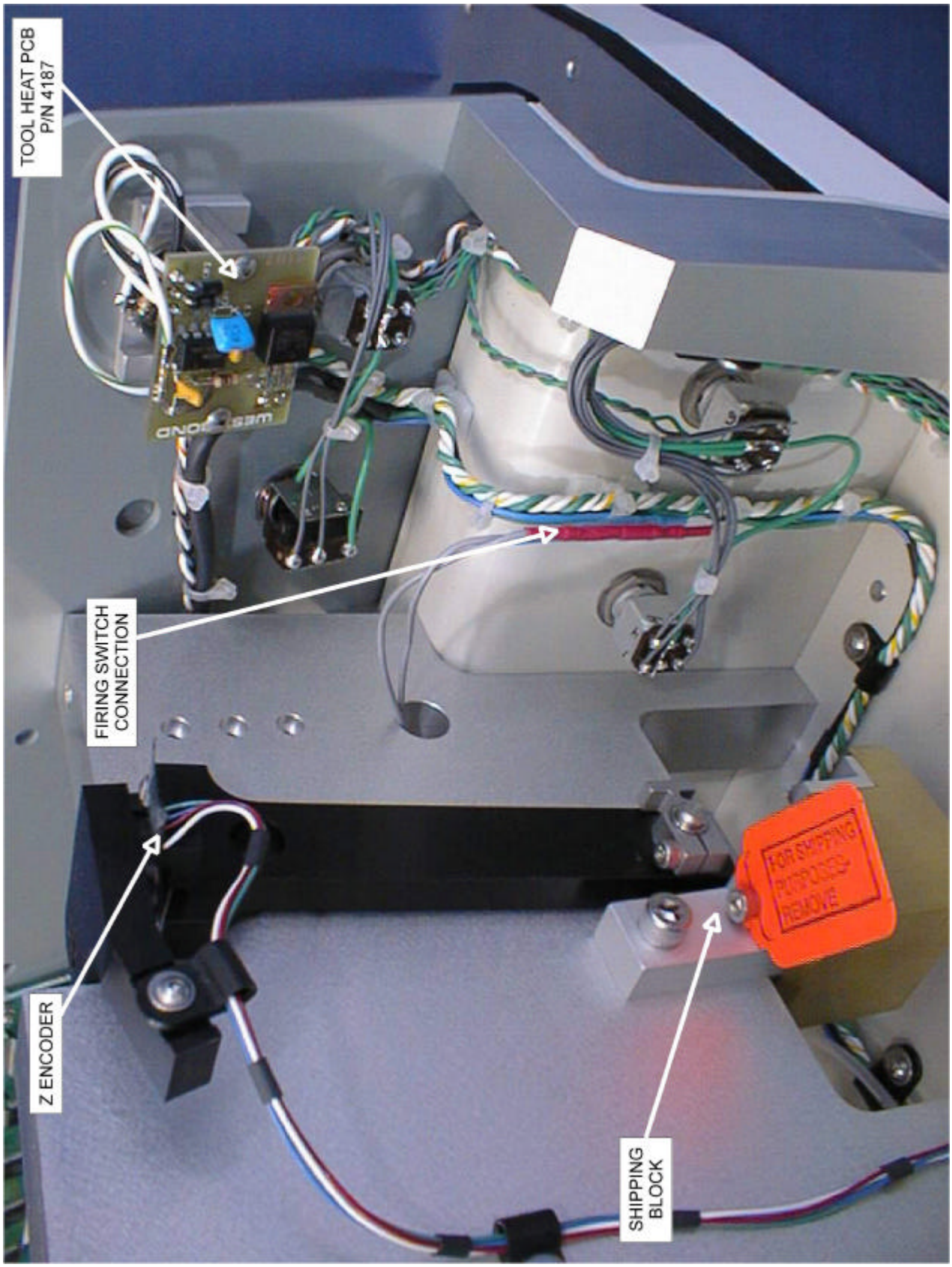

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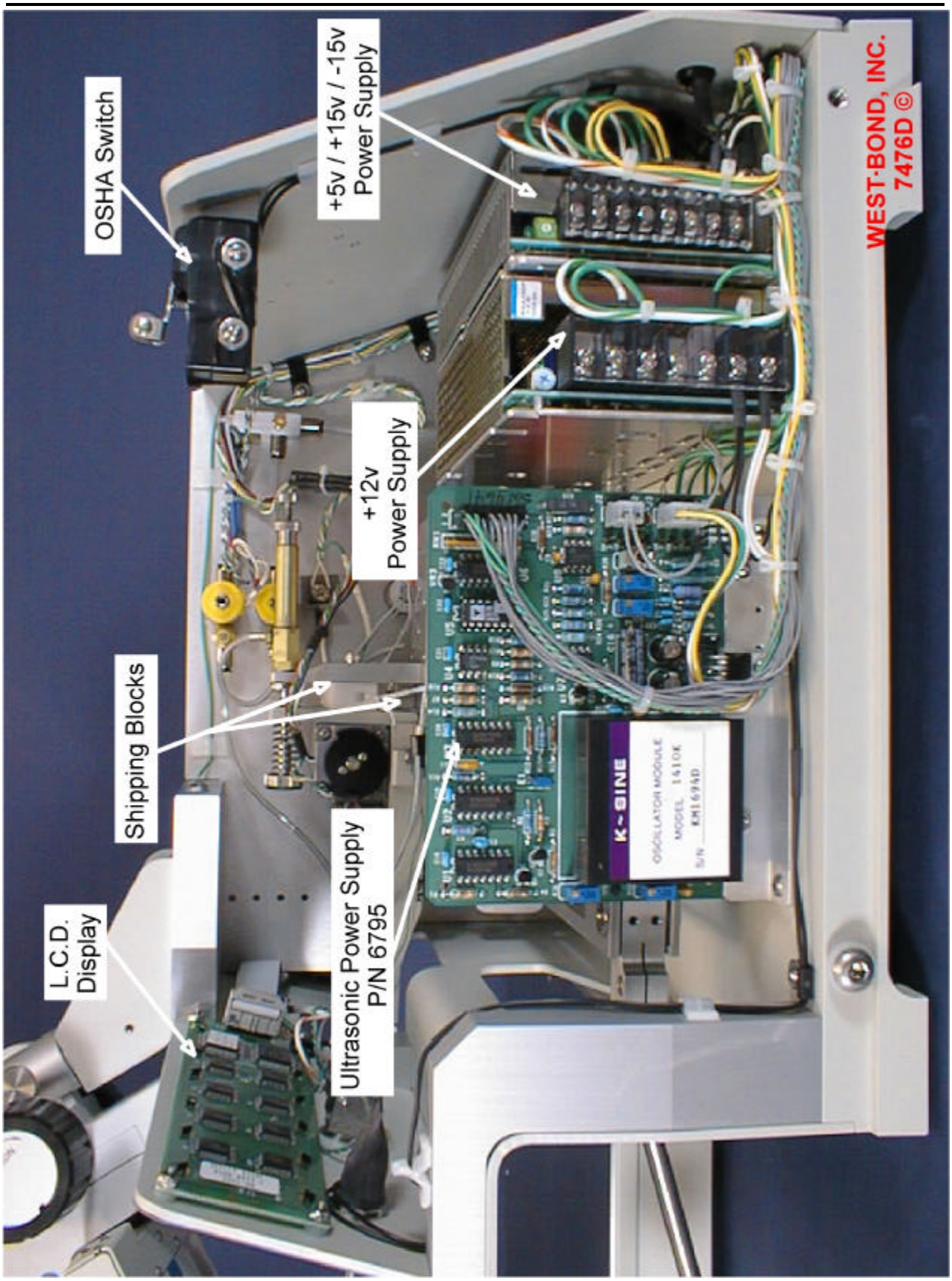
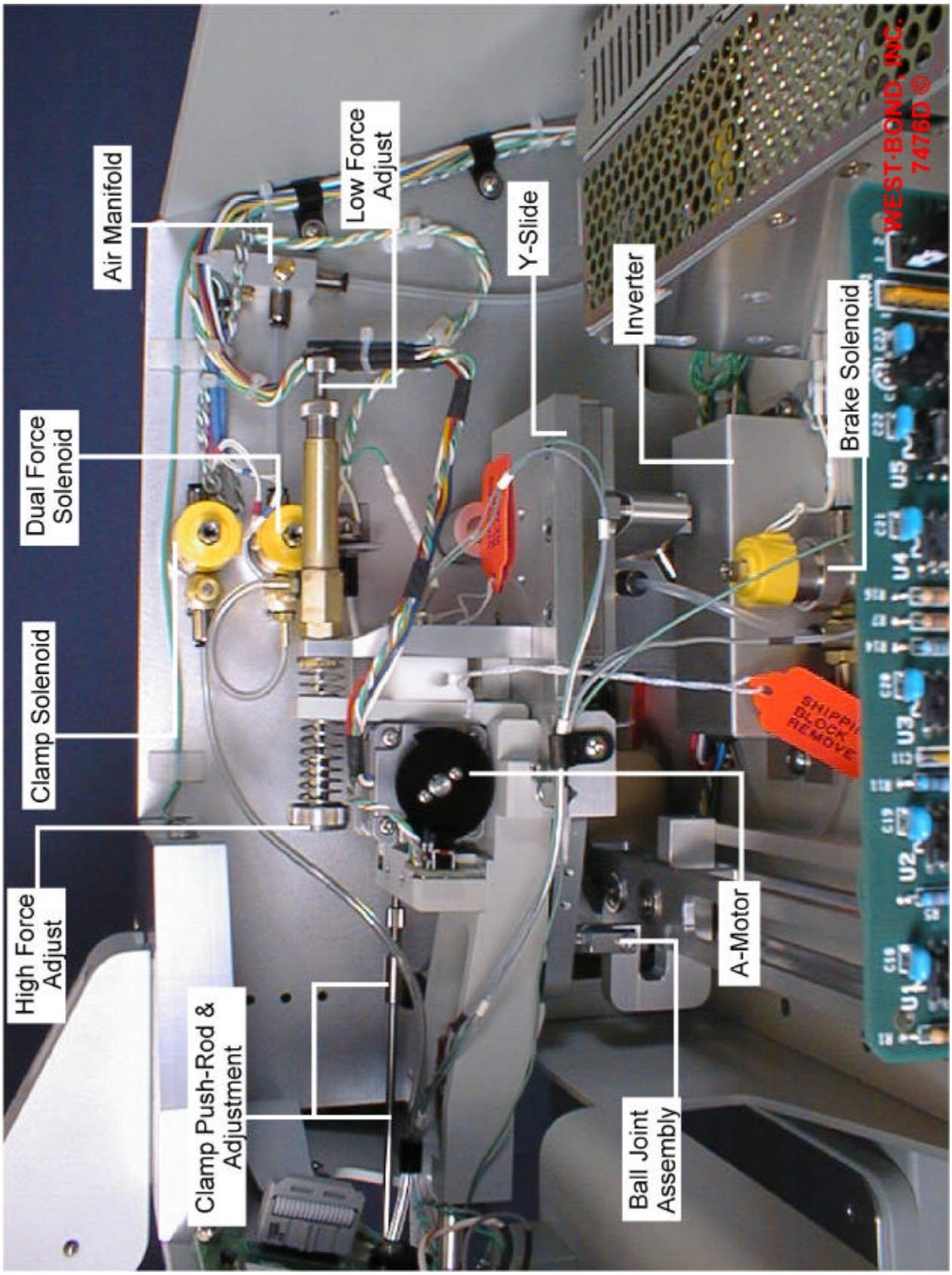


DRAWINGS AND SCHEMATIC



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