

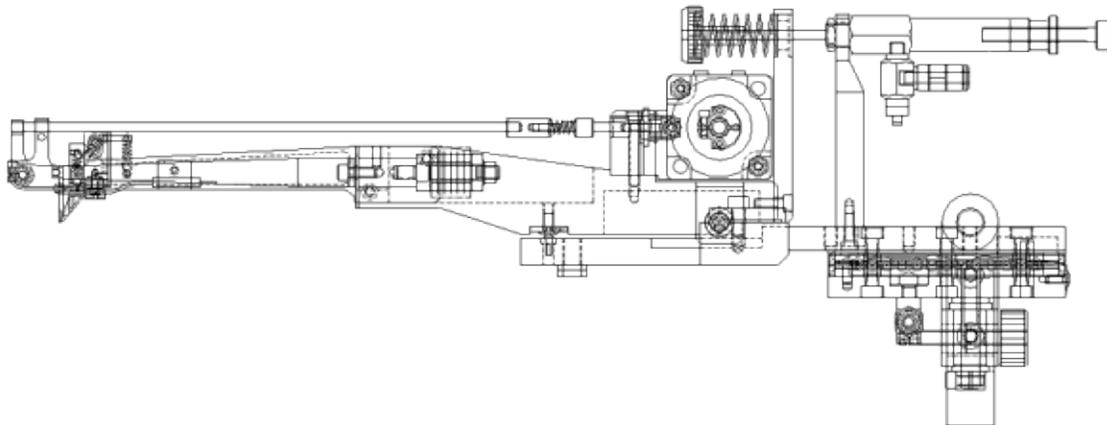
Specifications: Model 7400D Series, Wedge-Wedge Wire Bonders, Manual X-Y-Z

Last revised: 09/19/18 - microscope

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, gold ribbon 0.0005 in. by 0.002 in. through 0.001 in. by 0.010 in. 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.

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 separate specification.

- **Model No. 7603D.** This machine with dedicated deep access (vertical feed) clamps, to accommodate a 3/32" diameter bonding wedge for large ribbon ranging from 0.001 X 0.012 through 0.001 X 0.020-in.

Features available for this Series:

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

Machine Configuration

The microscope recommended for this model is either the Olympus SZ51- with the "Luxuray" LED illuminator #10265. 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 "AvailableNotStocked", then it must be ordered on a separate purchase order.

Services Required

Compressed air, regulated to 50 psig, 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 115 lb. accessorized and crated.