AirBorn Inc.
Product Technical Bulletin #31

INSTALLATION OF R-SERIES CONNECTORS
WITH PRESS-FIT TERMINATIONS

1. PURPOSE

This purpose of this application note is to assist customers in the proper application of AirBorn's press fit termination connectors to printed wiring boards (PWB)

2. SCOPE

The application procedure described in this document applies only to AirBorn's R-Series connectors with press fit terminations. (e.g. RM422-XXX-871-XXXX)

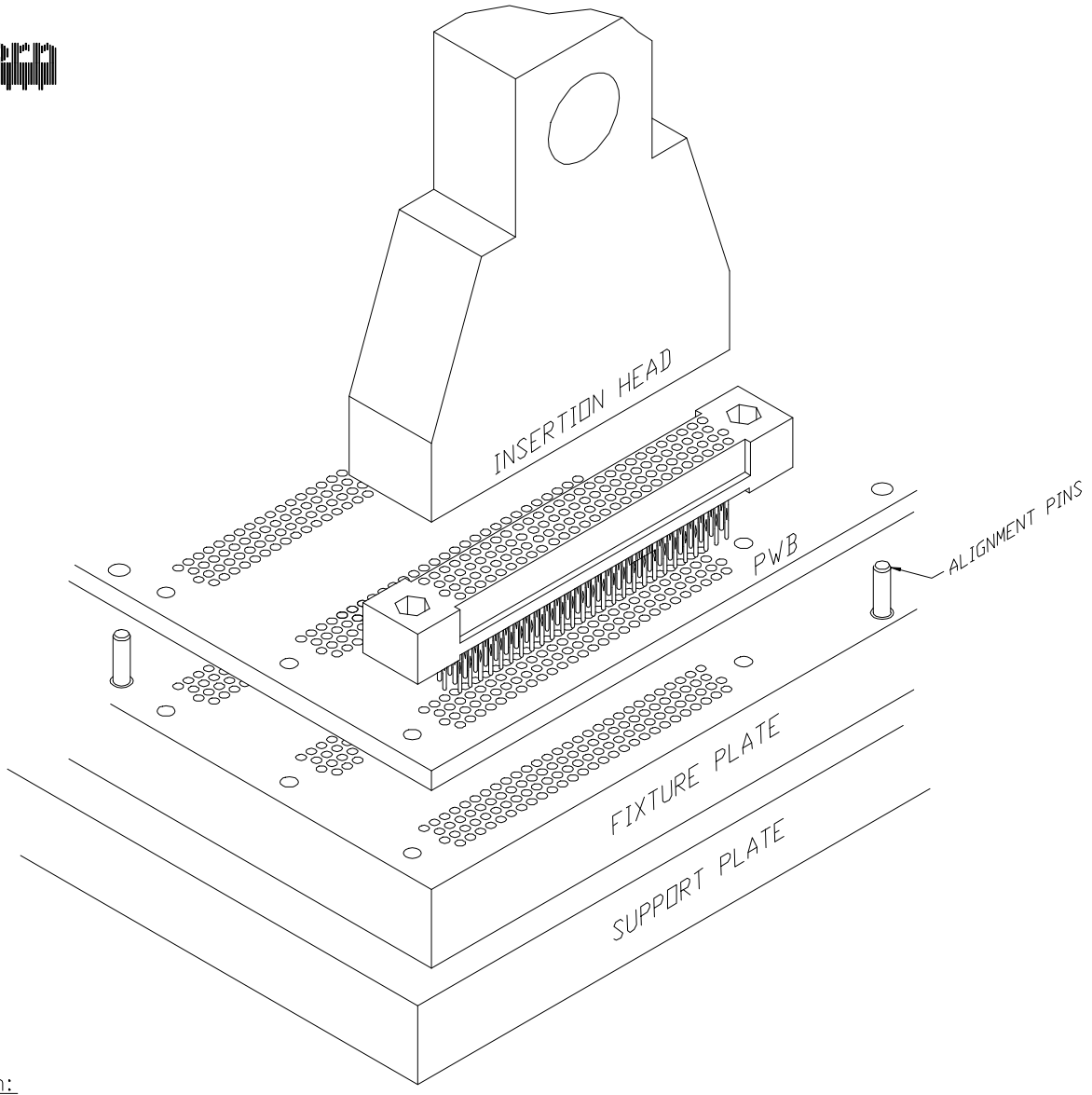
3. SPECIAL TOOLING REQUIRED

No special seating tools are needed to install the AirBorn press fit connectors and all required application fixtures are very simple. Because application fixtures are unique to the PWB on which the connector is to be installed, there may be some special dimensional considerations. AirBorn can provide assistance with design guidelines for customer produced tooling. Contact AirBorn Application Engineering for assistance.

4. STANDARD EQUIPMENT AND FIXTURES

Attachment of press fit connectors to the PWB is accomplished through the use of a press which is capable of generating a large compressive force, a simple seating tool, and a board support fixture. These parts are shown schematically in Figure 1 below which shows an end view of the PWB and a 4-row connector in the press.

PRESS: Attachment of the connectors to the PWB generally requires the use of a hydraulic or pneumatic press. Small connectors can sometimes be pressed into the PWB using a manual press such as an arbor press, but larger connectors are likely to require more force to push them into the board than can easily be generated with a manual press. The press capacity (in tons) can be estimated by dividing the number of connector contacts by 100. For example, assembly of a Rxxx-404 connector with 404 contacts would require a press with a capacity of approximately 4 tons.



Description:

AirBorn's R–series compliant pin (press–fit) assembly tooling consists of a support plate, a fixture plate, an insertion head and a hydraulic, mechanical or pneumatic press.

Support plate: A flat metal plate which is mounted directly to the press base.

Fixture plate: A G10 or phenolic plate which is identical to the PWB drill pattern but is typically .50–1.0" thick. The holes in the fixture plate are clearance holes and should be drilled at ø.038/.042".

Insertion head: A flat–faced metal plate with means for attachment to the ram of the arbor press. The head must be as wide as the connector and should extend the length of the connector.
Note: Hardware is shipped unassembled for all compliant pin connectors so there is not a need for clearance holes for hardware in the insertion head.

Arbor press: Must be capable of exerting a force equal to a minimum of 20 lbs. per contact. The average press–in force per contact is 12–15 lbs. The contact, when fully inserted into the PWB, will be flush with the mating surface of the connector.

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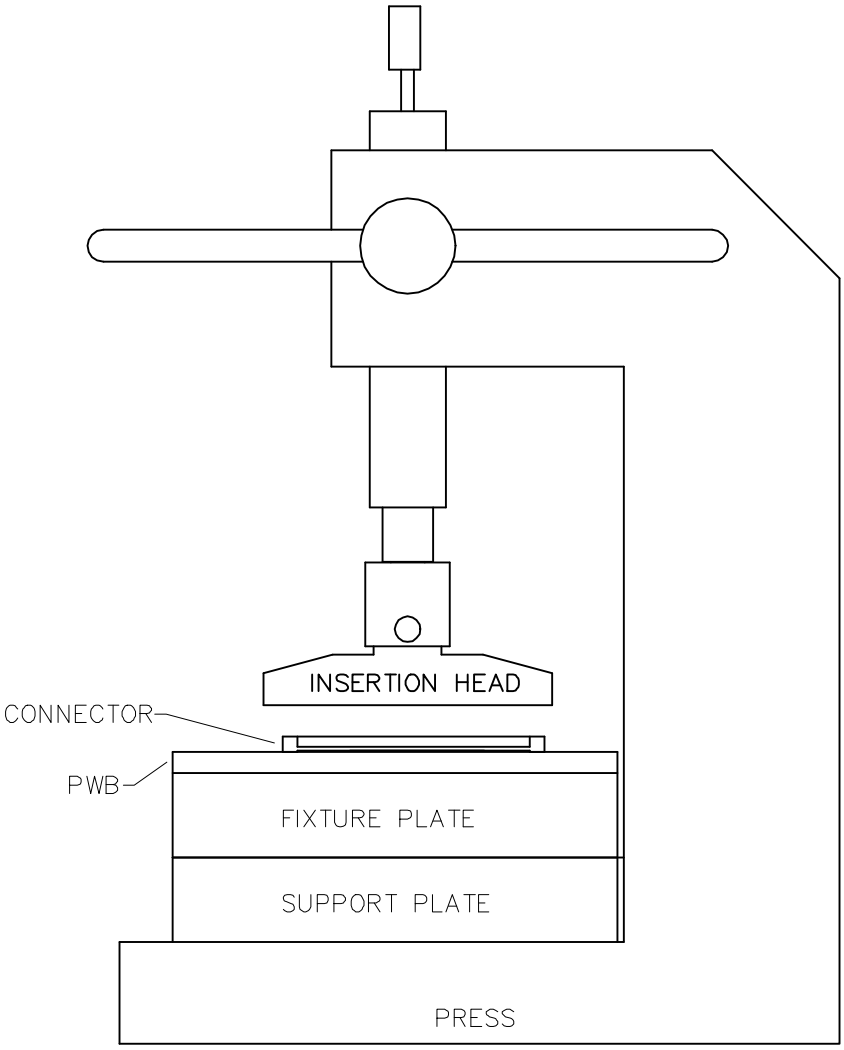

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INSERTION HEAD: The seating tool used for inserting the AirBorn press fit connectors into the PWB is nothing more than a flat metal plate. The insertion head must be large enough to push evenly across the entire mating surface of the connector. The connector contacts sit in the molded housing flush with the mating face of the housing so the insertion head will push not only on the plastic housing but also on the mating end of the contact thereby applying the force necessary to push the termination end into the plated through hole (PTH) in the PWB.

FIXTURE PLATE: The PWB must remain flat during the connector installation process so that all contacts will be inserted to the same depth. This is accomplished through the use of a fixture plate. The fixture plate supports the board from underneath and prevents the board from bowing as a result of the forces applied to the PTHs by the compliant terminations during the insertion process. This fixture plate is typically a duplicate of the PWB being stuffed but in a much thicker material, ordinarily .50-1.0 inch thick. The fixture plate uses the same drill pattern as the PWB but with clearance holes for the ends of the terminations. The clearance holes must allow the termination ends of the pins to protrude through the back side of the PWB while at the same time supporting the board all around the pin. AirBorn recommends a clearance hole of .038/.042 diameter. The fixture plate must also provide clearance for any other components which may already be mounted on the back side of the board at the time the connectors are pressed in place. Typically the fixture plate will be fitted with at least two alignment pins which pick up alignment holes on the PWB in order to center the connector termination holes over the clearance holes in the plate.

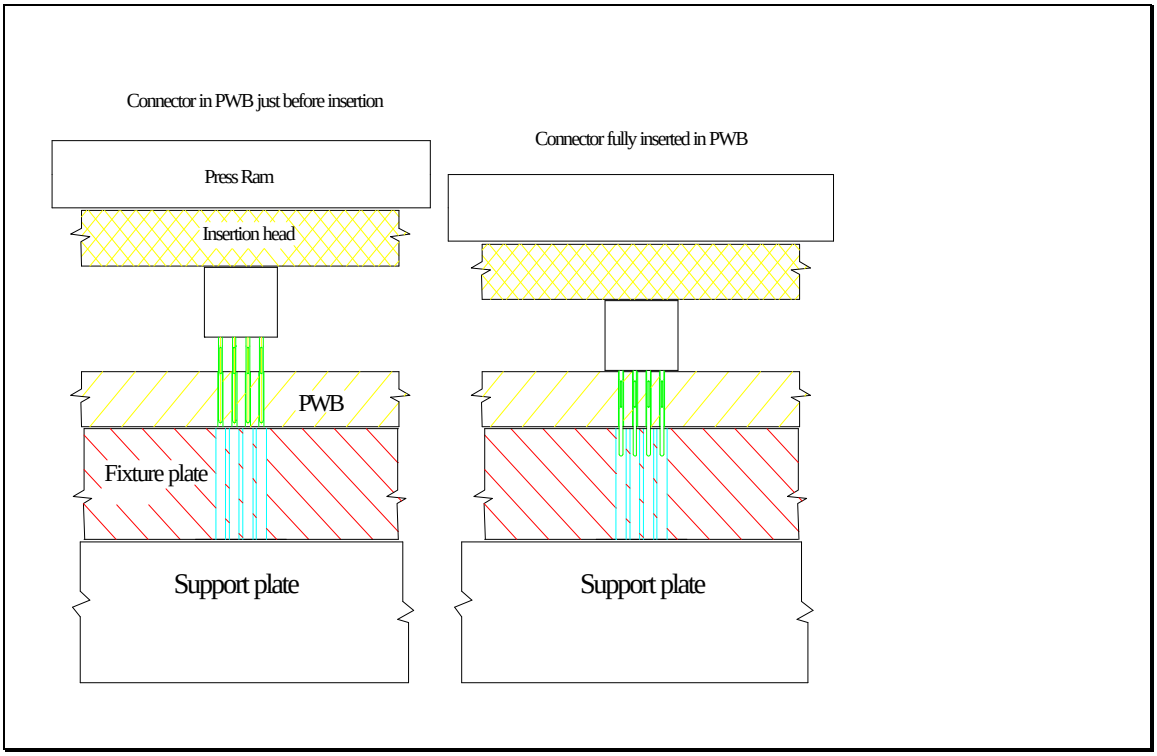


Figure 1: Tooling and fixtures required for installing press-fit connectors

5. INSTALLATION PROCEDURE

a. With the insertion head in the “up” position, locate the fixture plate onto the support plate.

b. Align the tooling holes in the PWB with the alignment pins in the fixture plate and place the PWB on the fixture.

c. Align the connector terminations with the plated through holes and allow the tips of the terminations to slip into the holes until the compliant sections sit at the top of the holes (as shown in the view on the left hand side of Figure 1 above). It may be necessary to push gently downward on the mating face of the connector in order to get the pins this deep into the holes.

d. Check to make sure that the entire connector has been seated to a uniform depth (from end to end) and that it is not leaning to one side.

e. Place the insertion head on top of the connector, being careful to center the tool over the connector.

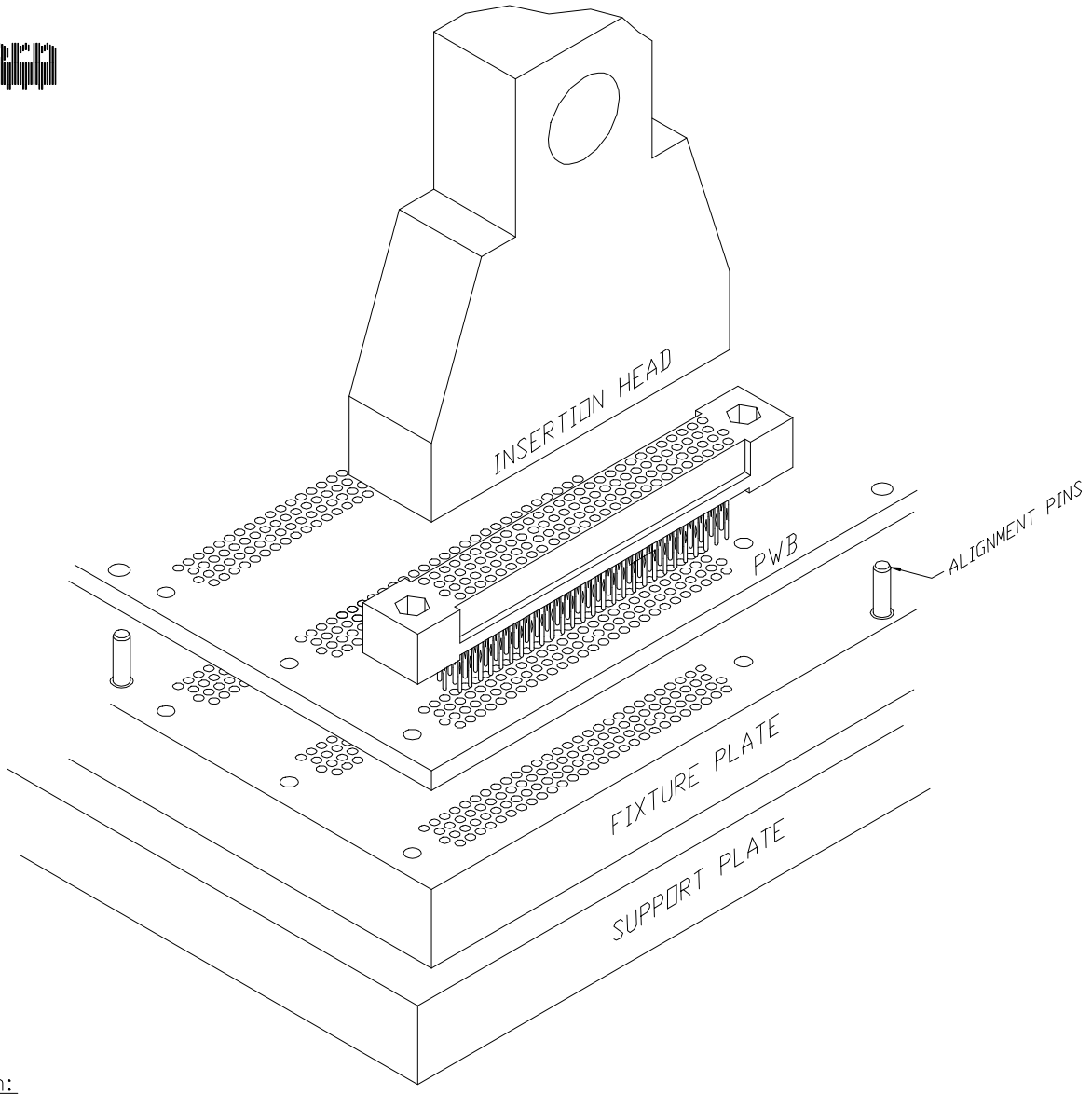
f. Set the stroke of the press so that the closed height is equal to the sum of the thicknesses of the fixture plate, the PWB, the connector housing, and the support plate. This will insure that the terminations are fully seated in the holes while avoiding applying excessive pressure to the connector housing and the PWB.

g. Actuate the press and seat the connector in the PWB.

h. When the connector is fully seated, remove the PWB/connector assembly from the fixture plate and inspect it to assure that:

   - The connector housing is seated uniformly against the PWB (there are no gaps between the bottom of the connector housing and the PWB);
   - The PWB is not bowed;
   - None of the terminations have been bent or otherwise damaged;
   - All of the pins protrude uniformly beyond the bottom surface of the PWB.

- Refer to PTB32 for an isometric representation of the assembly process.



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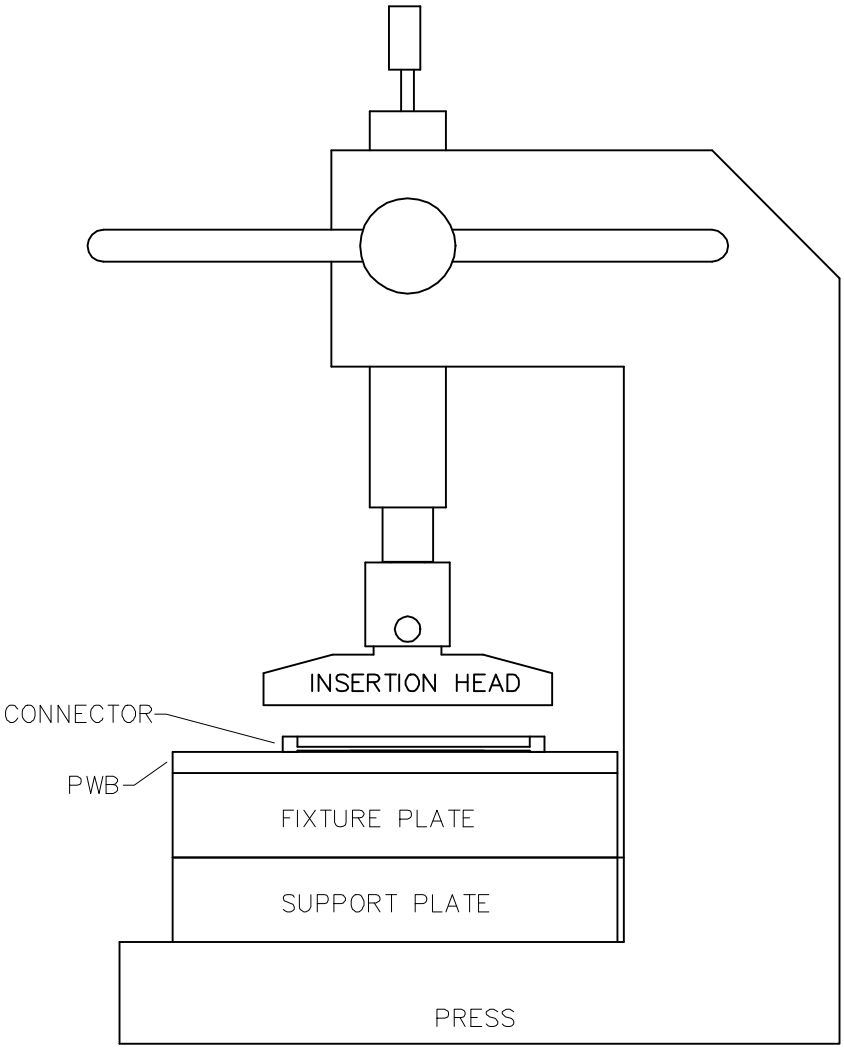

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