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4 pages

Service Bulletin

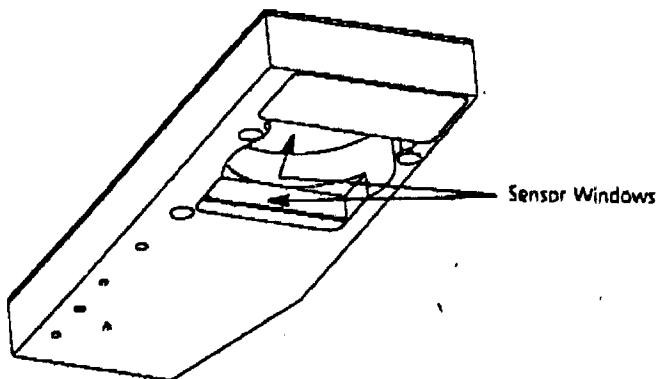
Cleaning High Density LaserAlign™ Sensor Windows

This bulletin provides the procedures for cleaning the windows on your High Density LaserAlign (LAHD) sensor.

LAHD optical windows are exposed and should be treated and cleaned with the same caution used when caring for a high-quality camera lens. Fingerprints and excessive amounts of dust or other residue on these windows will degrade the performance of the sensor. Figure 1 shows the location of the LAHD optical windows.

Note The instructions in this bulletin replace those provided on page 12-2 of the Laser Align Reference manual (p/n 7900176, revision A).

Figure 1: LAHD Optical Windows - Back Side of Sensor

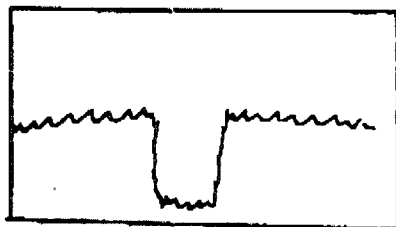


Cleaning Schedule

CyberOptics recommends cleaning the sensor windows once every three months. Under adverse conditions, more often may be necessary. However, more frequent cleaning is discouraged due to the chance of damage to the windows from improper cleaning.

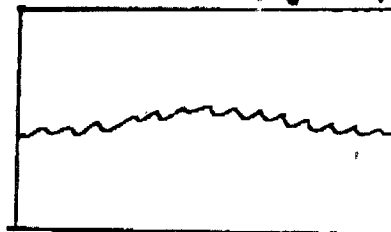
To check Laser optics:

C:\TB\ECH>LA ↵



Shows nozzle.

Pull nozzle up from top:



X.012

07/02/99

-1544

12-349

Laser Align system

The machine installs CYBER OPTIC's LAHD unit which is class 1 laser beam measuring system. During placement travel, the nozzle spins and component sucked is also rotated in the laser beam. The LAHD returns data when the minimum width of the component is obtained and the component rotates further and when it rotates 90 deg after the first minimum was obtained the width and center data are returned again. So using both data offset of component is corrected.

-146

13.023

LAHD can returns accurate data if the first minimum is obtained from narrower side of the component. The configuration of LAHD in ECM's is designed as when component picks up from basic tape feeder, the narrower width can be checked first. If the narrower side can not set as the 1st minimum then set feeder angle as 90 or -90 degrees. This case placement angle is angle in PCB data + angle of feeder.

Usually the laser beam scans the middle portion of the component thickness but leaded component may need to shift scan position depends on the shape of leads. The W value in the part type can offset the position of laser beam.

----- PgDn -----

Setting of Laser Align system

1. Center position of the nozzle.

Attache nozzle on the head and go in teach mode. Press shift+U to raise nozzle several times and press shift+H to measure nozzle position. If display width is approx nozzle dia then note the center value. The value is in millimeter so multiply 100 and input it in k45 first and second values. For example if it is 12.732 then k45 is 1273/1273.

IN PCB PARTS
FB-TEACH.
SHIFT+U = HEAD UP.
U = " ON.
SHIFT+H = VIEW.
UP UNTIL
U=0
TAKE VALUE
EQ U=-129.
K6=129/129
TAKE CTR VALUE
EQ 12.709
K45=1207/1207
DATA LIST OFF
FW AMEND

- 0.9 ①
- 1.25 ②
- 2.00 ③
- 4.00 ④

2. Laser beam height

* The nozzle tip must be set above the laser beam. So go in teach mode and raise nozzle as item 1 above until the width becomes zero and note the U value and input in k6. The first value of k6 is for small chip nozzle and the 2nd value is for large nozzle.

3. Part type

Set proper part type data for Lase Align. Refer F6 part type data.

4. Error code for laser align (displayed at low center of screen)

- 64: No part 67: Can not find min width 300: Pick up error (tomb stone)
- 200: Y dimension exceeds the TS limit.
- 201: X dimension exceeds the TS limit.

END

ALSO IN CONSTANTS
X/Y OFFSET
AT 0, 90, 180, 270

* Eg. Press U until display shows "NO PART", U = -114, then K6 = 114. 9.10/15/c/c x y

If U (K6) is too large, head goes too high, and laser scans under device -> ERROR 64 (NO PART). 129 -

If U (K6) is too small, head does not go high enough, and laser scans the nozzle -> ERROR 300 (TOMBSTONE). 136 -

In Part Type Data, value for YL/E is added to K6, to raise head for scanning body of component at lower position (mm). 136

Normally, laser scans at 1/2 thickness of part (Thk in Part Type list). K6 U=130
K45=1346

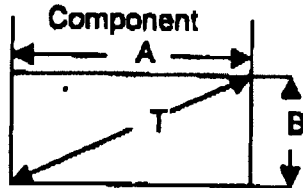


Appendix

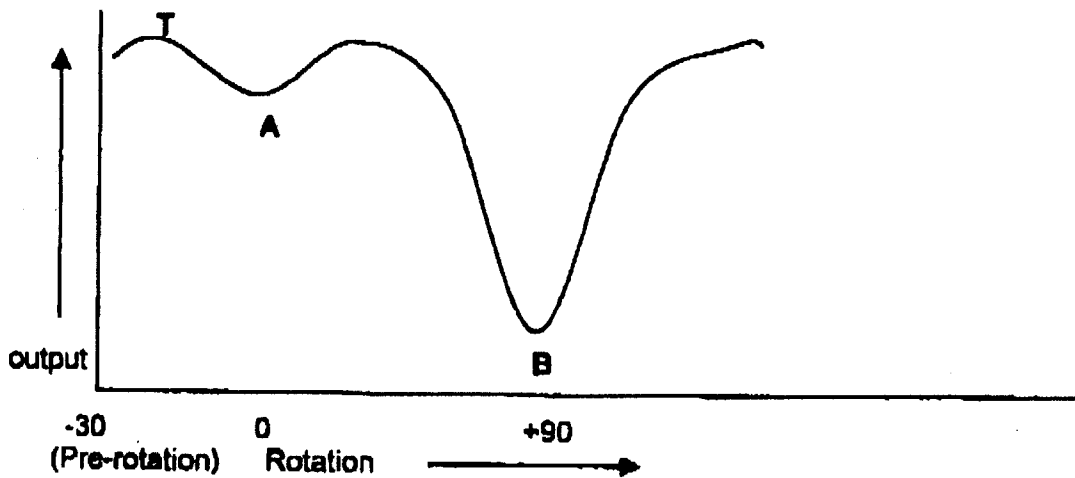
Error 67 or Error 200 25

In our system, component Y dimension in part type is measured first by Laser align system and after rotates 90 degrees X dimension is measured.

Y dimension measurement is done knowing the minimum width rotating component as shown below.



T is the maximum width of the component and A and B are rectangular width of the component. and when the component is rotated in the Laser beam, the out put looks like below chart.



The component is rotated -30 degrees as pre-rotation first and then rotated 120 degrees. Pre rotation is an offset of random angle when the component is picked up so that the first minimum width can be obtained within 90 degrees rotation.

The dip at A is much smaller than the dip at B because T/A ratio is much smaller than T/B. Specially, component corners are rounded the T becomes smaller or B is narrower then the dip at A becomes smaller and some time the dip can not be detected by Laser system and results Error 67 or Error 200 25. This case, simple solution is to exchange A and B, adding 90degrees on feeder data so that when the component is picked up, the orientation changes 90 degrees at 0 angle. Also swap X and Y data in part type so the above example becomes as follows.

```
P# Nzl y1 y2 Scn Ang X Y XLYL/ Thk Iv Rem*****TS***+++
* 2 0 0 0 0 2.9 1.8 .0 .0 1.0 1 CHIP TR 70
```

And add 90 degree on tape feeder data as:

```
Type # X Y A Strk Rem*****
tape 23 285.25 2.58 90.00 300 SOT23
```

Adding 90 degrees on tape feeder data does not affect on placement angle of PCB data.

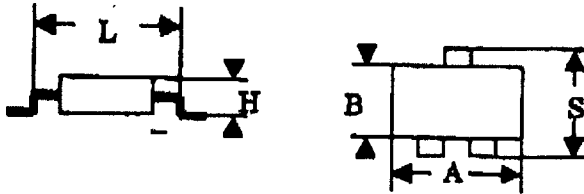
Laser alignment of Transistors

rev1

1. Preparation

a) Transistor data registration

Open part type data and select one line for a transistor. Check transistor(SOT) data from a data book or measure it by scale or using "I" command in teaching mode. You should get following data A,B,L,H and S (S is not used in part type data).



For example SOT23 has following data

A=2.9mm B=1.3mm L=1.8mm H=0.95mm and S=2.4mm

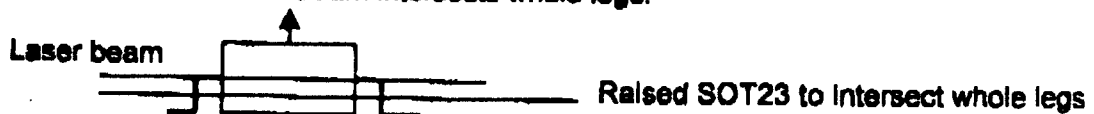
Usually transistor is supplied in tape reel and in the pocket of tape and legs are located at tape edge so in the most of tape feeder configuration of ECM machines A is Y direction and B and L (and S) are X direction of machine X/Y coordinates. So part type data for SOT23 looks like;

```

P#Nzl y1 y2 Scn Ang X Y XL YL/ Thk Iv Rem*****TS*+++
(P# Nzl L# Btm Rgt Lft X Y Pt W Thk Iv Rem*****TS*+++
* 2 0 0 0 0 1.8 2.9 .0 .0 1.0 1 CHIP TR 70
  
```

Note: The second label in the bracket is for vision installed machine.

YL/ (W) is height offset of Laser measurement and usually zero but some case the intersection of laser beam is just border of bent leg you may better to input 0.1 or 0.2 to raise transistor and laser beam intersects whole legs.



b) Nozzle up position check

In teach mode raise nozzle until it reaches the value set in system constant k6 and press Shift+H and Center=0 must be displayed. If OK press / (increment=1) and press U to down nozzle 0.05mm step and press Shift+H to see when Center=**** is displayed and note absolute U value (other word disregard minus sign). System constant k6 first value (for small nozzles) must be set +1 to +5 of this U value.

2. Assembly

Make sure part type is specified correctly in PCB data and run. If error code displayed other than zero, (0=OK)

64: No part or nozzle height is too high

67: Can not find minimum width. Part has no corner or nozzle height is too low and measures nozzle it self (round, no sharp corner. See appendix)

200: Y dimension is out of limit and shows actual measured value. If display shows 200 25 it is the same as error 67 and means the system can not find the minimum width. (See appendix)

210: X dimension is out of limit and shows actual measured value.