



## not only testing at the end of line, but also ....

The complexity of the harnesses in use together with the necessity of the JIT production make us face a new approach to the production and testing methods.

The expert who develops this kind of proceedings has to pursue a double purpose, that is: give the operator any kind of help in order to avoid errors and recognize them since the beginning. In this way the error detected by the tester at the end of line won't spoil the whole production.

This kind of strategy includes simple aids to the phase of assembly, programmable instruments for the guided assembly as well as controls systems during the phase of assembly.

The assembling and testing tables which have been quite used in the past years, are no more used because of their wider harnesses complexity and because of the additional demands of control.

As a matter of fact, the execution of specific tests such as the Push-back, the seal test and so on, makes impossible to fulfil the assembly and testing requirements on the same table.

Today's trend is to re-consider the assembling tables as a mean of production of subassemblies (that is, components of a basic harness).

In a wider strategy that includes the production of a complex harness, spread into several separated modules (to be assembled according to JIT demands), it is useful to go back to the integrated test assembling table.

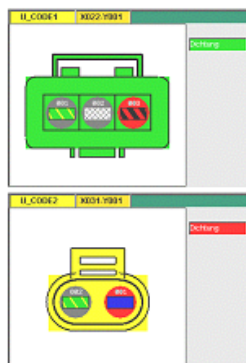
The subassemblies are then produced on a table equipped with operator's guide, electrical test and detection of additional components.

This doesn't exclude the final test on end-of-line tables but it assures that later operations (e.g. welding of cables coming from different subassemblies) can be made on already tested modules (otherwise it wouldn't be possible to restore the damage).

### Assembling and testing tables



### Helps to the insertion



The different applications have allowed us to set many strategies in order to guide and control the insertion operations of the terminals into the connectors' housing.

As already mentioned, this performance can be applied according to different choices previously stated and the relating methods of production.

Those applications already proved, have been tested by different harnesses manufacturers with the purpose to optimize time, get independent from specialized manpower and keep a higher quality standard.

- ↖ Aids through nameplate,
- ↖ Video-aids. They consist of the standard symbols library and it's possible to dynamically define the following: the connector's colour, the detection and the colour of the harness to be inserted into each



housing. A flashing light on the connector's picture indicates the pin to insert.

- ↪ Aids by connector sample and test on the holder. The system allows to exactly locate the housing (just touch the test probe by the cable to be inserted in order to obtain the switching on of the corresponding indicator). The indicator switches off if the cable is correctly inserted.
- ↪ Aids by signal and control on holder (pin illuminated). The plug-in is made by holders belonging to the Autoblock family while the **Uni3 / Uni4** test equipments are used for the guiding.

The applications used for the fixed stationing have been improved in order to adapt to movable assembly tables which are normally fitted up on carousel systems.

The connection problems between the *movable* tables and the *fixed* stationing have been studied and solved.

The electrical test is generally carried out by the end of line stationing. The test for the detection of harnesses components (clips, pass-thru holes, corrugated, etc.) is performed on the assembly tables. Thanks to this operations we can have the following advantages:

- ↪ Operator's guide during the assembly phases
- ↪ Reduction activity on end of line tester.

Example.



## Test on carousel



## Check of harnesses on Carousel accessories



A case of particular importance is represented by the clips and other accessories detection test on a complex harness in JIT production.

It is also requested to partially control, by dividing the carousel equipment in many sections, so to assure that the assembling activities are made in the previously defined area.

A testing label will confirm the positive result of the harnessing, at the end of the job.

It has been developed an infrared communication system able to exchange, among the many carousel tables, the following information:

- ↪ Configuration data of the harness to be assembled (initialization),
- ↪ Relating position of table on carousel (area determination)
- ↪ Result of the performed checks (for label printing).

Each table has some sensors for the presence detection equipped with led in order to point out the requested components and/or existing/absent components.

This feature assures a reduction of rejections caused by forgotten operations which could be detected on final test phase only (too late, unfortunately).

The great variety of performances reached in this field brings SIXTAU to qualify as a reference partner for winning strategies concerning the assembly and test field.

The flexibility of the test equipments belonging to **Uni3 / Uni4** series together with the large range of Autoblock holders series and the experience in this field, allow us to assure the attainment of the goals.

For further information and/or to evaluate the impact of the system into your production reality, please address your requests to the following e-mail:

<mailto:info@sixtau.com>