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DUAL CLUTCH TRANSMISSION MODULES END OF LINE TEST LINE



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TRANSMISSION MODULES

Loccioni Mobility has developed a new integrated “turn key” line to perform functional tests for CAM DCT modules of dual clutch transmission systems.

The line is composed of 3 “dual station” benches, for a total of 6 test stations; the coupled stations are independent between them from the functional point of view, sharing just the hydraulic unit which gives them the oil at the right conditions required by the station.

The stations are connected with a belt conveyor, starting, from a loading/unloading station. At the beginning of the process the operator loads a module to be tested over a pallet, and connects the electrical and hydraulic connectors with the relative interfaces of the pallet itself (by means of poka yoke solutions).

When the module is ready, the pallet is driven along the conveyor by means of TAG readers until the first available station, where it is automatically loaded for the functional tests.

The conveyor is also equipped with a laser station, to mark the modules with a datamatrix.

At the end of the process the module can be taken to an unloading station or to a rework branch, where the scraps can be managed with a dedicated process.

HIGHLIGHTS

- > Simulations of modules functioning with the real movement of all the valves and actuators
- > Correct gear coupling testing
- > Possibility to perform the following tests:
 - Purge run-in with vacuum and filling with oil
 - Shifter position, hysteresis and response time
 - Valves leakages
 - Gear actuators stroke and response time

- QPV and PPV valves behaviour
- Relief Valve behaviour

- > Check of pressure and position sensors of the module by means of bench transducers
- > Emptying of the module by means of vacuum system, and filling with automotive oil
- > Use of ECU, and check of communication between ECU and module
- > Flexibility of the system (possibility to perform different procedures, like R&R, tests on reworked modules, manual settings and tests, calibrations, etc)
- > Small dimensions with a very compact layout obtained through a 2 overlap levels conveyor (connected by 2 lifts)

TECHNICAL FEATURES

- > TAK TIME of the line = about 2 min, depending on the quantity of tests required
- > Oil inlet pressure up to about 95 bars (for relief valve flow measurement)
- > Regulated temperature of oil at the inlet = about 60 °C
- > Measurement of flows and little leakages by means of appropriate transducers (valves leakages reaching less than 15 cc/min)
- > Verifications of module pressure and position sensors by means of comparison with station pressure transducers and LVDT
- > Measurement of actuators stroke by means of load cells
- > Conveyor speed = 12 m/min

