

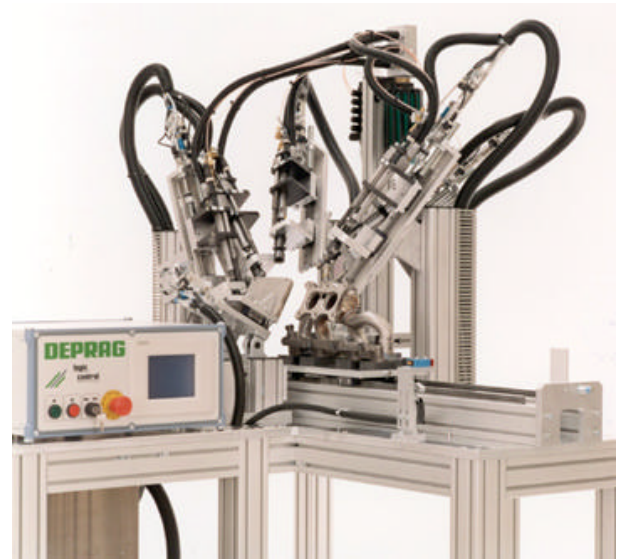
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Analysis Unit for Audi Exhaust Manifolds



In operation, the robot places an exhaust manifold, with the motor-flange down, into the part fixture. The manifold is located on two dowel pins, and two lateral clamps secure it. Using rod-less cylinders, the slide table moves the part fixture into the test location. Each of the construction units is lowered in sequence, and its arbor is engaged with the threads. When the predetermined depth has been reached, the reverse port of the spindle is activated, and the arbor is backed off of the thread. If the predetermined depth is not reached, or if the clutch disengages, the error is reported at the master controller and displayed on the console. Once the cycle is complete, the slide-table returns the part fixture to the base position, and the clamps release. The robot then picks up the completed part and moves it to the next station.

The second machine was built for Gillet, a company that makes exhaust manifolds for Audi. In Gillet's process, the header pipes are automatically welded to the manifold by robots. This occasionally damages the threads on the manifold. Our machine is designed for integration into Gillet's existing assembly station, for the purpose of checking each thread for distortion. There are five threads involved, two female M8, one male M18, and two male M22.



The DEPRAG unit is equipped with 5 construction units mounted with remote-reversible screwdriver spindles Model # 346-520-31U. Each spindle has a self-aligning chuck with a thread verification arbor instead of a bit. This arbor is engaged with the threads to be checked. If the screwdriver clutch, which is set to disengage at 1 - 2 Nm (9 - 19 inch pounds), does not torque-out before the predetermined depth is reached, the respective thread is acceptable. The framework of this machine is extruded aluminum profile, and supports the slide-table with the part fixture, the profile stands for the construction units, the LC172 controller with display panel, and the mounting plate for the valve bank and air manifolds.