



aseo

T H I N K

C R E A T E

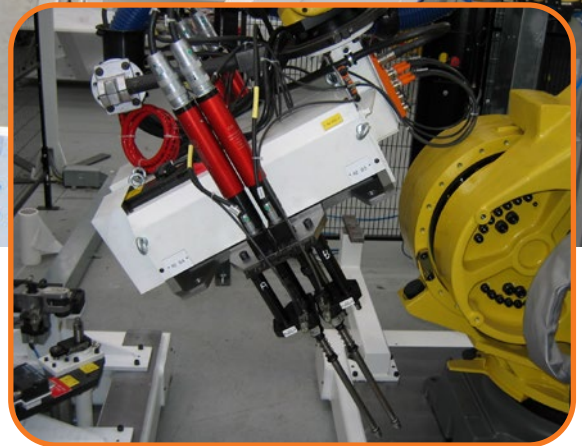
A U T O M A T E

CATALOGUE

GEARBOX ASSEMBLY LINE

MAIN FUNCTION

Assemble gearbox.



DESCRIPTION

Some stations of this line have been carried out with the following duties:

- Automatic positioning thru 90 degrees of gearbox holding adapter. Such operation is carried out by means of an anthropomorphous robot provided with pneumatic pick-up gripper.
- Distribution thru two linear vibrators and automatic tightening of 8 screws retaining gearing housing to gearbox thru robots provided with power runners. Before assembly and tightening, manipulation robot picks up adapter with component for deposit off line on work table which rotates differential.
- Distribution thru two linear vibrators and automatic tightening of 11 screws retaining gearing housing to gearbox thru robots provided with power runners.
- Automatic assembly of balls and springs in gearbox. Automatic plugs tightening thru power runner. Automatic distribution of balls and springs thru cup feeder. Automatic distribution of plugs by means of cup feeder

and linear vibrator.

- Automatic marking and label application on gearbox of information received by PLC thru serial dialogue. Automatic greasing of primary shaft splined part by means of a pneumatic grease supply system. Automatic protection plug assembly on primary shaft thru pusher piston and pneumatic gripper for plug deformation.

Between several stations, transfer of adapter and gearbox group occurs thru pallet line.

Inside each station, handling of adapter and gearbox group is automatically carried out by manipulator robot provided with single or double pneumatic pick-up gripper.

SPECIFICATIONS

ASSEMBLED PARTS

gearing housing to gearbox retaining screws, ball, spring, plug, primary shaft protection plug

POWER SUPPLY

Voltage: 400 Vac (three-phase + ground)

Frequency: 50 Hz

PART TRANSFER SYSTEM

- By means of manipulation robot (inside each station)
- On pallet line (between several stations)

PNEUMATIC POWER SUPPLY

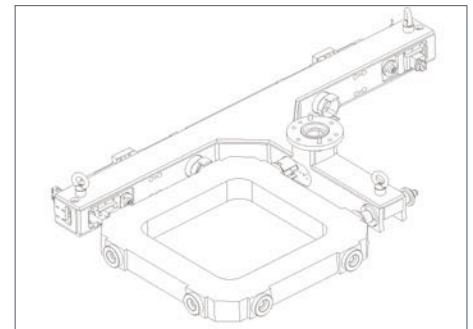
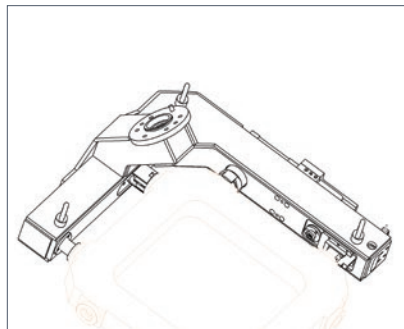
- Operating pressure: 5 bar
- Hourly consumption: 2,5 Nm³/h (op. 999.2)
- 30 Nm³/h (op. 1220)
- 40 Nm³/h (op. 1250)
- 40 Nm³/h (op. 1260)
- 4,5 Nm³/h (op. 1310)
- 2,5 Nm³/h (op. 1410)
- 4 Nm³/h (op. 1510)
- 4 Nm³/h (op. 1730)
- 15 Nm³/h (op. 1780)

SAFETY GUARDS

- Fixed type protections
- Moving type protections provided with a interlock device
- Moving units covering guards
- Emergency push-buttons.



Adapter and gearbox group

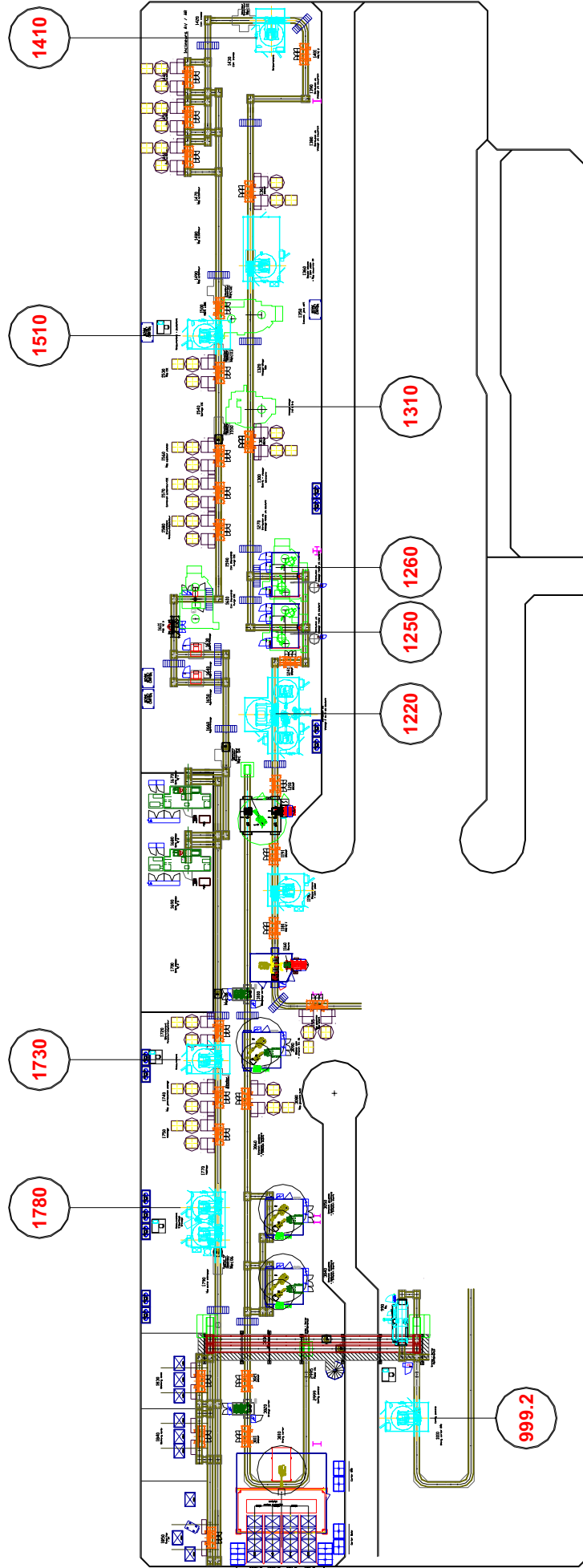


Adapter pick-up grippers

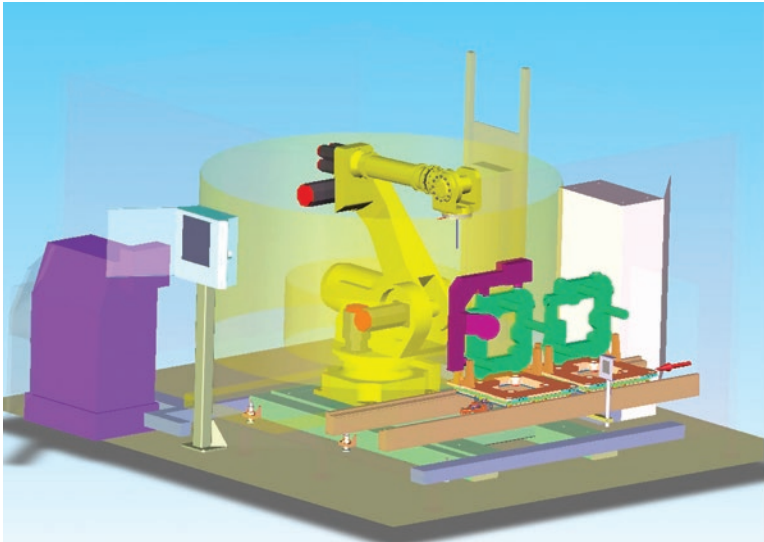
LIST OF STATIONS

STATION	DESCRIPTION	TIPOLOGIA
999.2	Adapter positioning station Automatic	Automatic
1220	Gearing housing to gearbox retaining station Automatic	Automatic
1250	Gearing housing to gearbox retaining station Automatic	Automatic
1260	Gearing housing to gearbox retaining station Automatic	Automatic
1310	1-2, 5-6 and reverse ball holder unit assembly and tightening station Automatic	Automatic
1410	Gearbox and adapter group positioning station Automatic	Automatic
1510	Gearbox and adapter group positioning station Automatic	Automatic
1730	Gearbox and adapter group positioning station Automatic	Automatic
1780	Station for marking, labelling + primary shaft splines greasing + plug fitting	Automatic

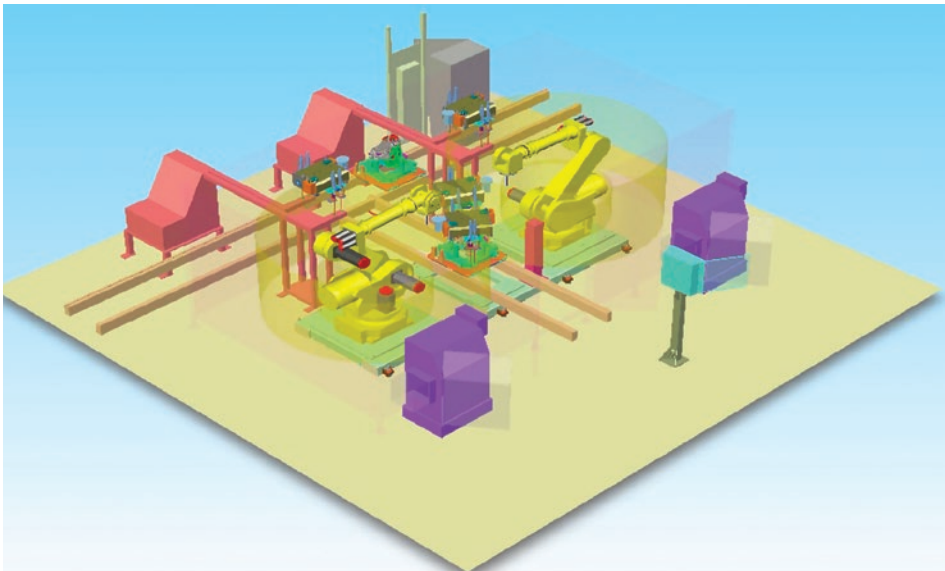
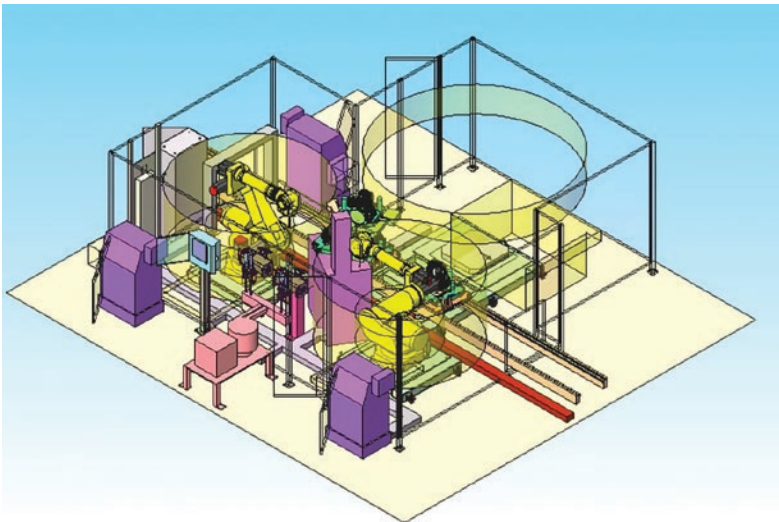
STATIONS DIAGRAM



OP. 999.2 - ADAPTER POSITIONING STATION

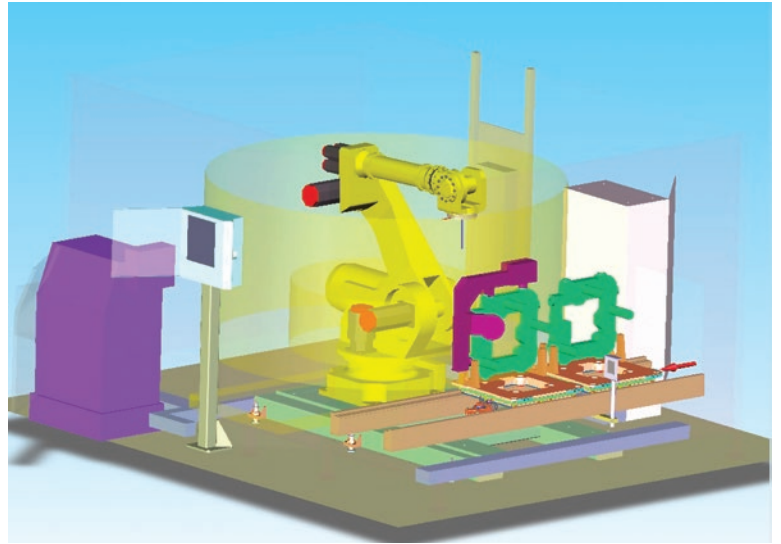


OP. 1220 - GEARING HOUSING TO GEARBOX
RETAINING STATION

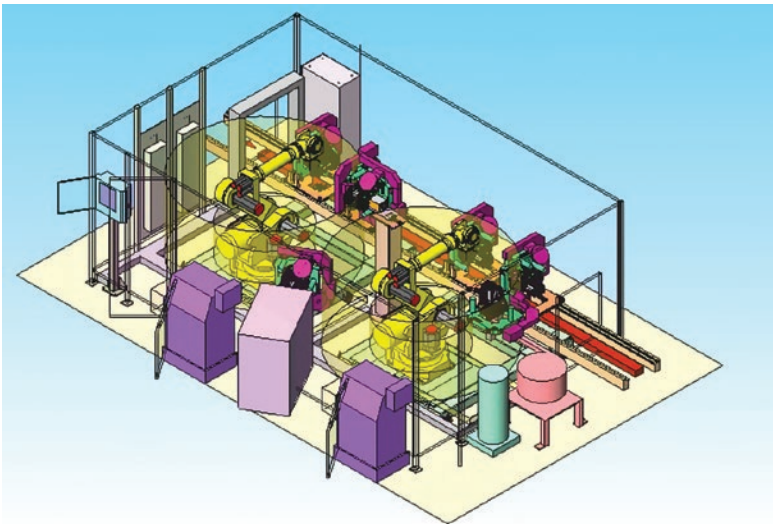


OP. 1250 & OP. 1260 - GEARING
HOUSING TO GEARBOX RETAINING
STATION

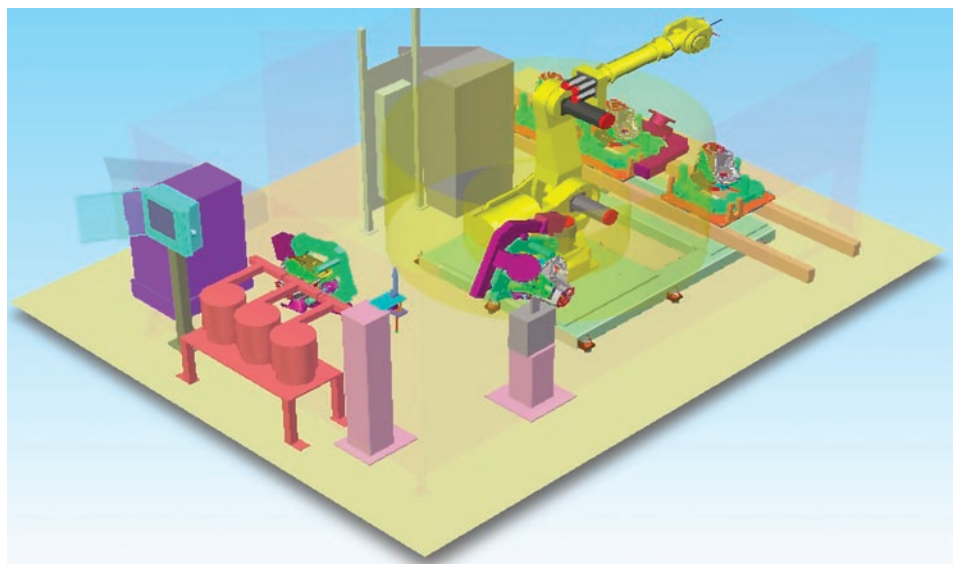
OP. 1410, OP. 1510 & OP. 1730 - GEARBOX AND ADAPTER GROUP POSITIONING STATION



OP. 1780 - STATION FOR MARKING, LABELLING + PRIMARY SHAFT SPLINES GREASING + PLUG FITTING



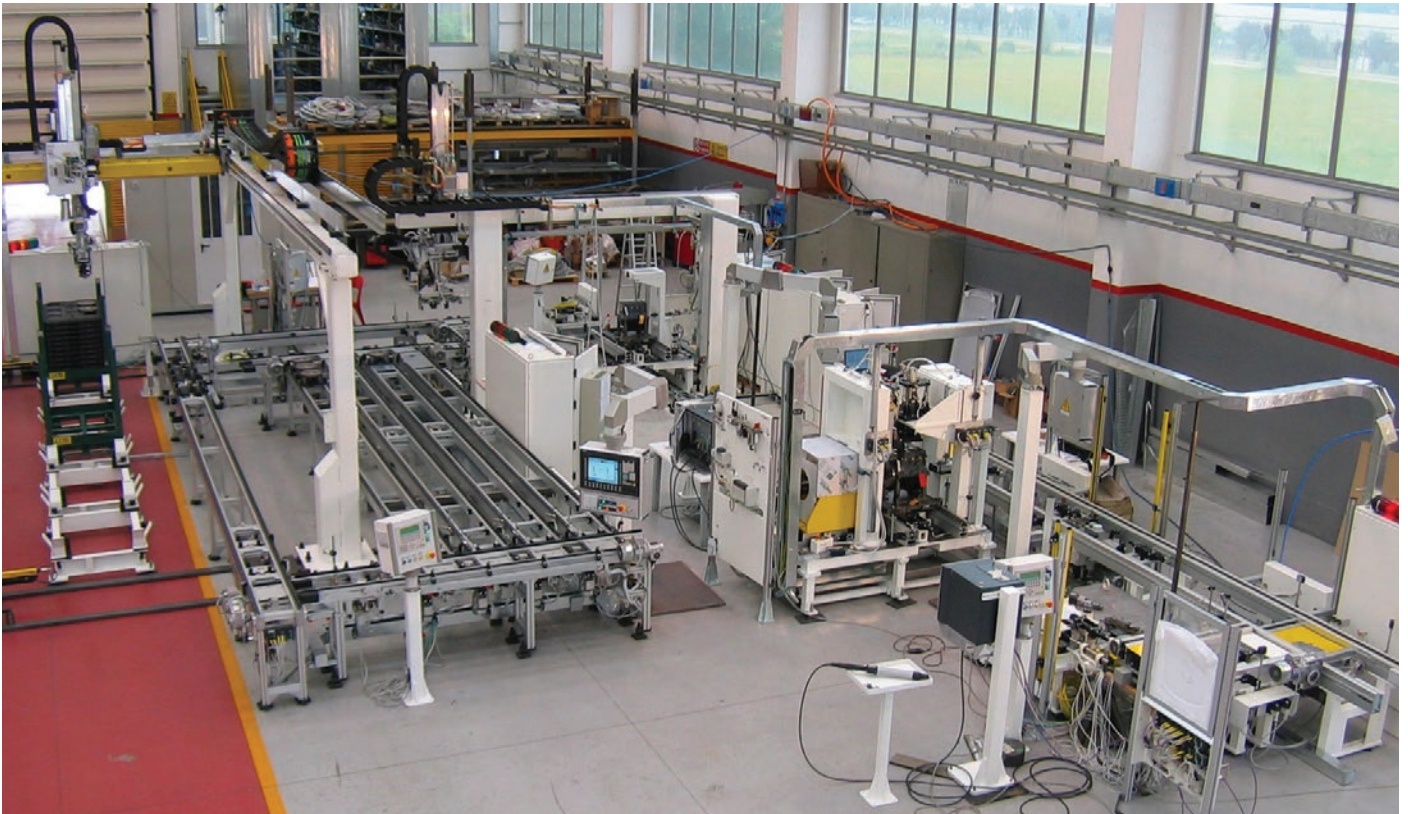
OP. 1310 - 1-2, 5-6 AND REVERSE BALL HOLDER UNIT ASSEMBLY AND TIGHTENING STATION



ENGINE FLYWHEEL ASSEMBLY LINE

MAIN FUNCTION

Assemble the flywheel to the engine, through calibrated tightening of 6 screws.



DESCRIPTION

The flywheels are loaded/unloaded by means of fork trucks in the buffer bays of the working line, into special containers, while the engines are feeding from the working line. By means of an electromechanic gantry, equipped with dedicated gripper, the flywheel is taken up from the container and laid down to the pallets of the interlocking line; there, the flywheel is properly positioned and integrated with a big washer and n°6 screws.

The auxiliary conveyor system, consisting of 4 configuring paths, transfers the flywheel to the picking-up zone.

An automated gantry takes the flywheel up from the pallet, moves to a preset position in face of the engine, and then rotates its gripper through 90°. The flywheel, oriented towards the angular positioning dowel of the driving shaft, is then secured loose by 6 screws, which are partly tightened by the air-powered nutrunners mounted on the gripper.

The engine with its flywheel arrives at the station dedicated to the calibrated tightening of the above mentioned n°6 fastening screws, which are then definitely tightened by powered nutrunners, with 43 Nm driving torque.



SPECIFICATIONS

WORKING CYCLE
SEMI-AUTOMATIC

PART TO BE ASSEMBLED
ENGINE FIRE 8 V

ELECTRIC POWER SUPPLY

Voltage: 500 V a.c.
Frequency: 50 Hz

CYCLE TIME

OP. 790: 12 sec
OP. 820: 16,8 sec
OP.830 : 16,8 sec

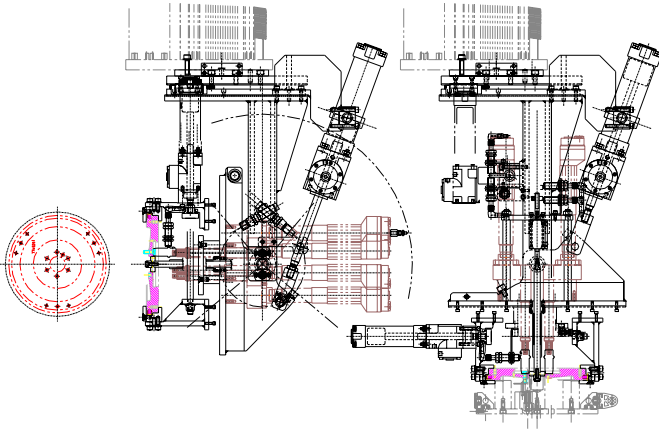
AIR SUPPLY

At 5 bar operating pressure

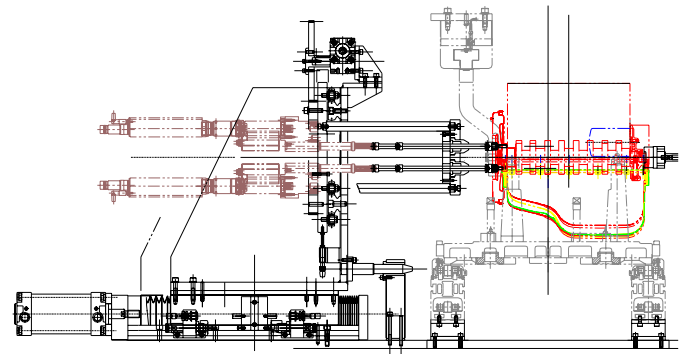
PART TRANSFER SYSTEM

With pallets, on roller line

OP 820 - PARTIAL TIGHTENING



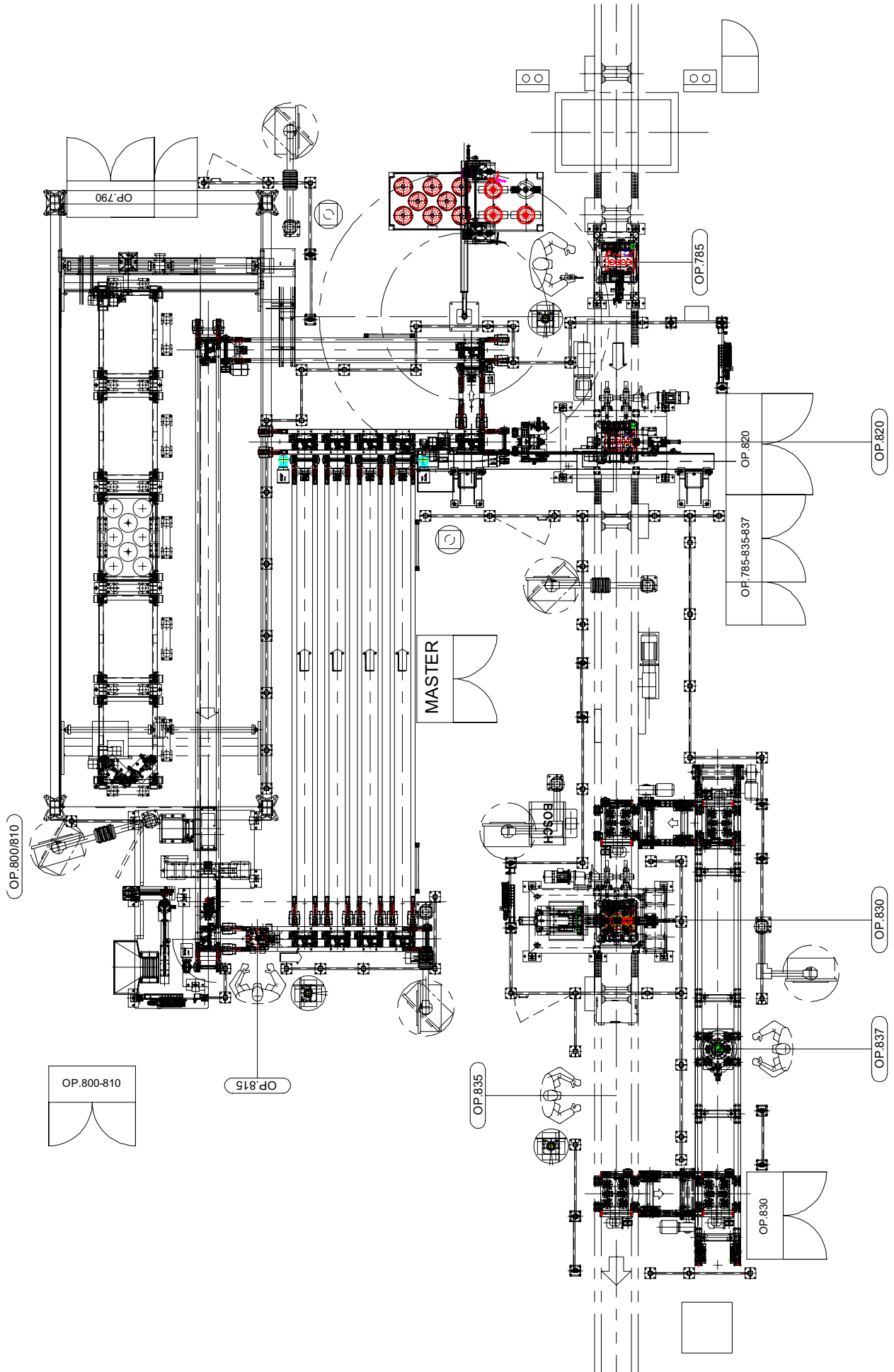
OP 830 - FINAL TIGHTENING



LIST OF STATIONS

STATION	DESCRIPTION	TYPE
790	Flywheel picking-up from container and laying-down to the pallets of the interlocking line	AUTOMATIC
800	Angular orientation of the flywheel	AUTOMATIC
810	Move and assembly of 1 washer to the flywheel (1200 only); blowing feed of 6 screws, which are then inserted to the flywheel	AUTOMATIC
815	Backup op. 790, 800, 810	BACKUP
820	The flywheel, previously oriented and complete with 1 big washer and 6 screws, is picked up by the automated gantry from the pallet feeding out from the 4-path store (paths may be reconfigured). The gantry moves to in face of the engine, its gripper turns 90° and then the flywheel, with orientation towards the angular positioning dowel of the driving shaft, is assembled and partially fastened with 6 screws.	AUTOMATIC
785	Backup op. 820	BACKUP
830	Calibrated tightening of 6 screws for complete fastening of the flywheel	AUTOMATIC
835	Backup op. 830	BACKUP
837	Phase A - Pallet distribution with sorting of rejects in the repair zone through Statec reader Phase B - Display of failures stored in the memory upon the previous operations; manual repair Phase C - Re-entering of pallet with repaired assembly to the main line	REPAIR

STATIONS DIAGRAM



CYLINDER HEAD ASSEMBLY LINE - OP. 40

MAIN FUNCTION

- Valve seats and guides lubrication.
- Intake and exhaust valve seats and guides insertion in cylinder head.
- Cylinder head marking.



The line



Cylinder head - Mercury Marine Motor

DESCRIPTION

Station 40 mainly consists of an arc-welded base supporting pneumatically controlled horizontal slide by means of cylinder for components transfer during load and unload phases.

Cylinder head lubrication and marking points are located beside load / unload station.

Such base carries a two-axes portal provided with part pick-up gripper, equipped with clamping brackets, supports and centralizers.

Gripper permits part angular positioning during work phases.

Mobile frame is fixed on portal for support of 2 Promess opposed presses, with force and position control.

Two supports are fixed on base respectively for valve seats and valve guides insertion fixtures.

Valve seats and guides supply is through Koeberlein supply systems.

SPECIFICATIONS

ASSEMBLED PARTS

Valve seats, valve guides

ELECTRIC POWER SUPPLY

Voltage: 400 V (three-phase + ground)

Frequency: 50 Hz

AIR SUPPLY

Operating pressure: 6 bar

LUBRICATION SYSTEM

Lubrication power unit capacity: 15 l

PART TRANSFER SYSTEM

Horizontal slide, two-axes portal

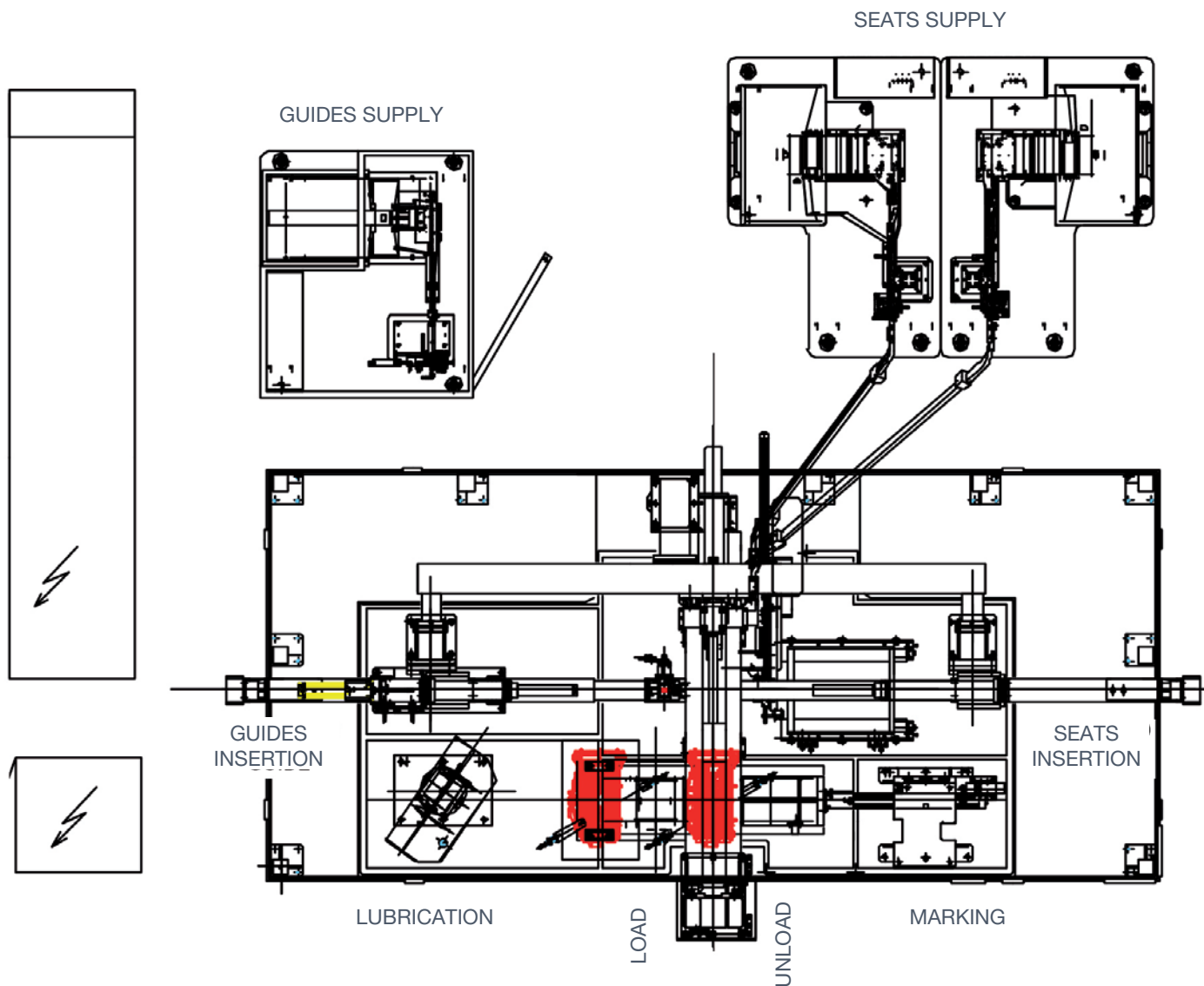
SAFETY GUARDS

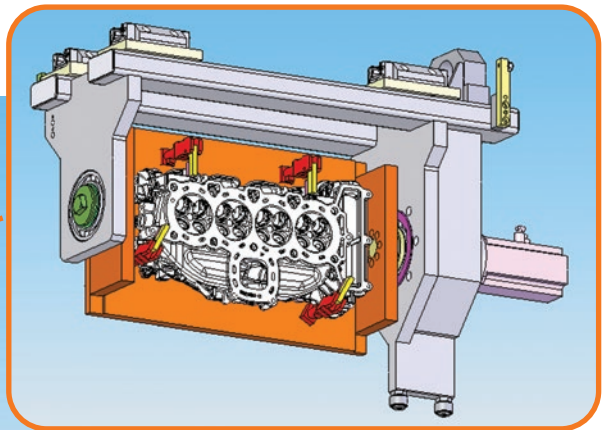
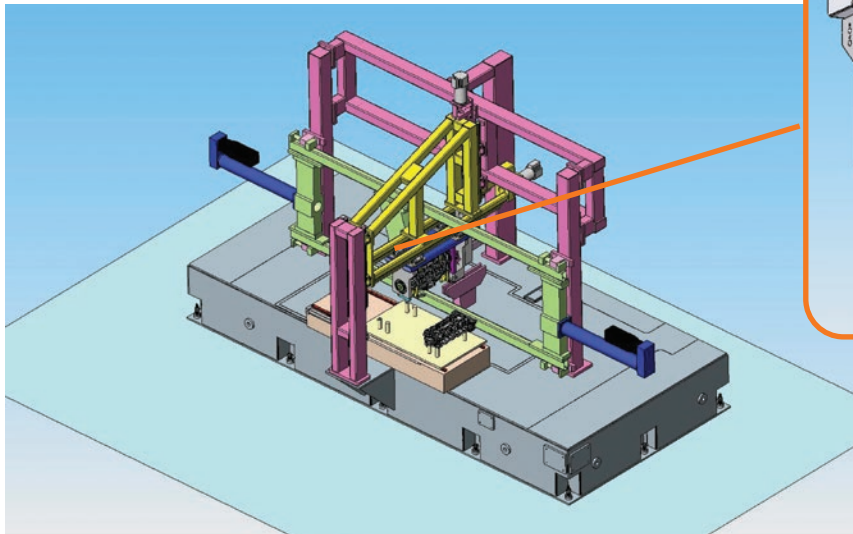
- Fixed type protections
- Moving type protections provided with a interlock device
- Moving units covering guards
- Emergency push-buttons.

LIST OF STATIONS

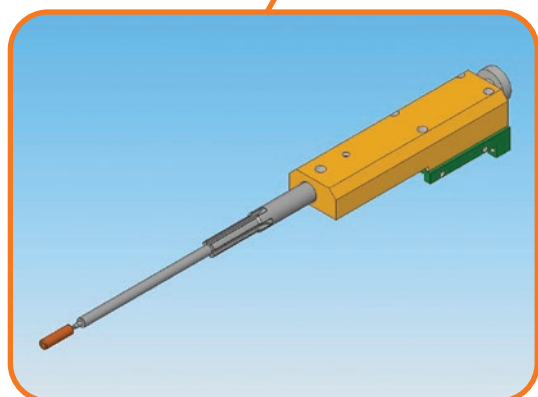
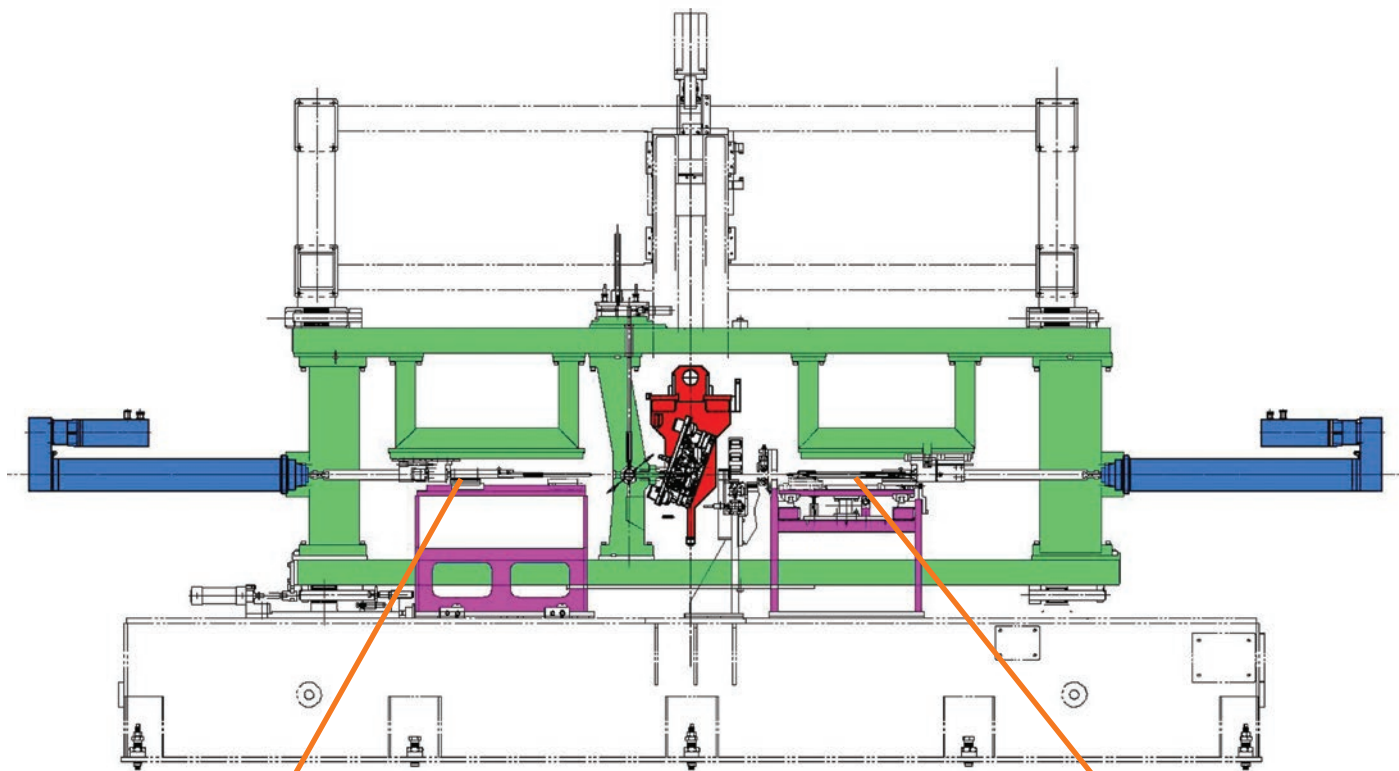
STATION	DESCRIPTION	TYPE
40	Load / unload	AUTOMATIC
40	Lubrication	AUTOMATIC
40	Valve seats insertion	AUTOMATIC
40	Valve guides insertion	AUTOMATIC
40	Marking	AUTOMATIC

STATIONS DIAGRAM

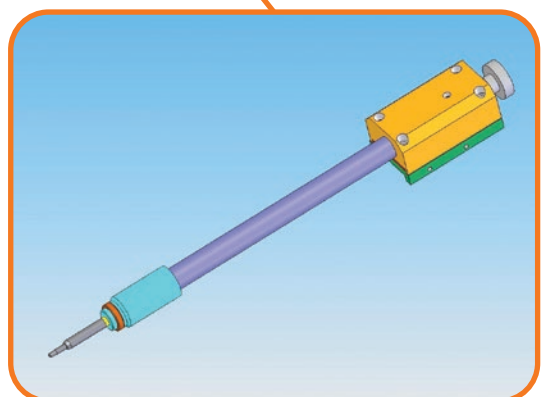




Part pick-up gripper



Valve guides insertion fixture

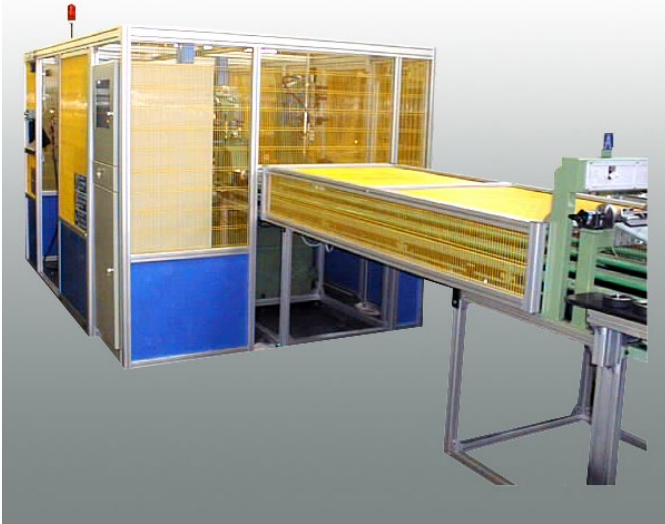


Valve seats insertion fixture

FINAL PISTON TESTING STAND

MAIN FUNCTION

Testing and selection of piston types having diameter between 110 and 150 mm.



DESCRIPTION

On inspection, the workpieces are manually loaded by the operator to the loading conveyor belt at the entry to the system, to be then transferred by the same belt to the machine inside and afterwards to STATION 1 (Piston self-centering and orienting station) towards STATION 4 (Marking station).

The working cycle is completed by the final unloading of the part to exit conveyor belts.

When the pistons get near STATION 1, they are taken up by a loading manipulator, which transfers them from the entry conveyor belt towards the above STATION 1. Here, pistons are positioned and clamped by a special orienting device.

Once the testing is complete, a linear transfer unit, equipped with 4 grippers, handles the pistons parallel to the part feeding direction, moving them through the following stations: STATION 2 (Measuring), STATION 3 (Weighing) and STATION 4 (Marking).

According to the sizes measured and marked on each piston, an unloading manipulator directs the tested parts to one of the three (3) exit conveyor belts, depending of their pertaining class, i.e. Class A, Class B or Class S (S is for rejects).

Downstream each conveyor belt, there is an operator in charge with the manual unloading of the pistons, who every time pushes up one of the three (3) hatches for



Tested part

collection of the worked parts.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: manual loading of pistons on to the entry conveyor belt.

OUT: automatic unloading of pistons from 3 exit conveyor belts.

TIPE OF TESTED PISTONS:
Pistons having diameter between 110 and 150 mm.

CYCLE TIME
~ 15 sec.

OPERAZIONI ESEGUITE SUI PISTONI

STATION 1: pistons self-centering and orienting,

STATION 2: the following measurements are carried out on the pistons:

- Ellipse selection and centering,
- Check of the skirt middle part,
- Check of groove 2,
- Check of the cast iron groove,
- Check of the collar,
- Check of the pin hole,

- Check of quadrature,
- Check of axis-1 height,
- Check of axis-2 height,
- Check of temperature,
- Check of combustion chamber.

STATION 3: piston weighing,

STATION 4: piston marking with measurement identification code.

FUNCTIONING PLANT

Overall dimensions on the ground: 8550 x 3600 x h 2000 mm, weight: ~ 4500 Kgs

INSTALLED POWER (WHOLE SYSTEM):

~ 3 kW.

SAFETY GUARDS

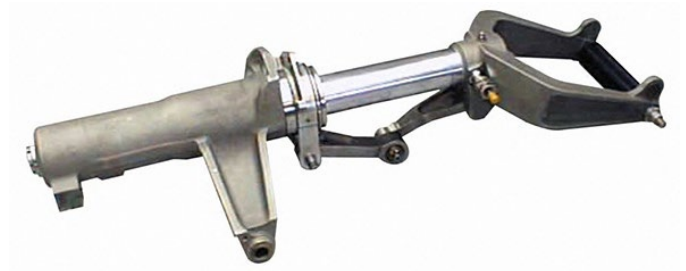
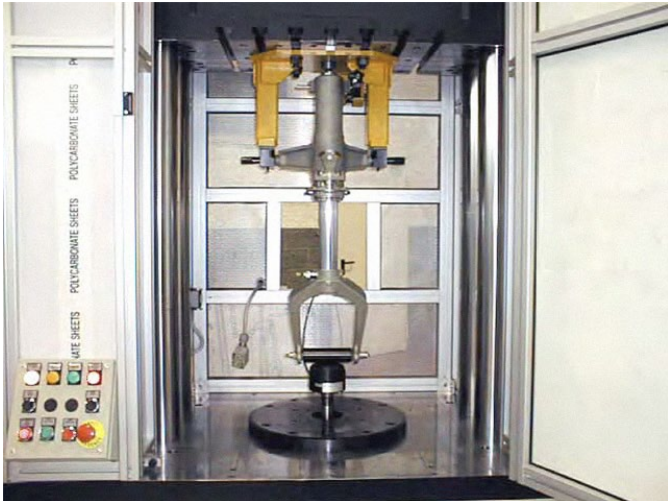
Central machine casing protected by a fence of extruded aluminium alloy section bars, anodised, integrated by panels, 3 mm thick, and steel wire net grating mounted on the above-mentioned section bars; complete with n°2 sliding openings in the front and rear side respectively, equipped with safety microswitches with positive lock.

The exit conveyor belts are protected by a fixed guard of extruded aluminium alloy sections, anodised, integrated by steel wire net gratings mounted on the above-mentioned section bars, protecting the out-feeding pistons.

TENSILE AND COMPRESSION TESTING BENCH

MAIN FUNCTION

Carry out tests of various kinds of devices, for which it is necessary to extrapolate the elastic characteristics in terms of force as a function of moving or other factors.



Tested part

DESCRIPTION

This test bench can also be used for tensile and compressive stress tests, useful e.g. for checking and calibration of load cells. However, it has several fields of application, as:

- Tests of shock absorbers,
- Tests of dampers,
- Fatigue tests of various components,
- Tests for the calibration of force transducers,
- Measurement of specimen hysteresis,
- Measurement of spring features,
- Cyclic life tests.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

FUNCTIONING PLANT

Overall dimensions on the ground: 1540 x 850 x h 3131 mm, weight: ~ 3000 Kgs.

PERFORMANCES AND FEATURES OF THE SELF-BRAKING ELECTRIC MOTOR

Poles: 4.

Power rating: ~ 1.8 kW - 1400 r.p.m.

Rated torque: 1.25 kgm

Breakaway torque: 2.6 kgm.

MAX. LOAD APPLICABLE TO THE TENSILE AND COMPRESSION TESTING BENCH

~ 300 kN (30 tons).

COLUMNS FOR VERTICAL SLIDING OF THE MOBILE CARRIER

Number: 4,

Diameter: 100 mm.

Length: 2375 mm.

SAFETY GUARDS

Structure consisting of aluminium extruded section bars, anodised, and lexan panels, 5 mm thick, entirely surrounding the test bench and protecting its upper part, its internal part where the tests are carried out, and its lower part housing the hydraulic equipment and electric controls.

On the structure front side there are respectively n°1 door for access to the testing zone (upper part) and n°1 door for access to the electric and hydraulic components (lower part); every opening is controlled by safety microswitch with positive lock.

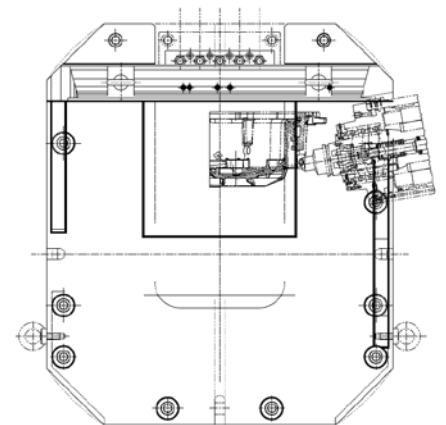
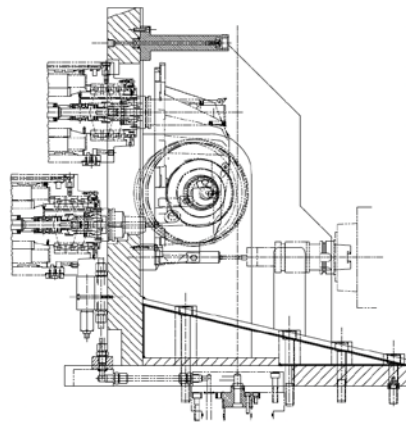
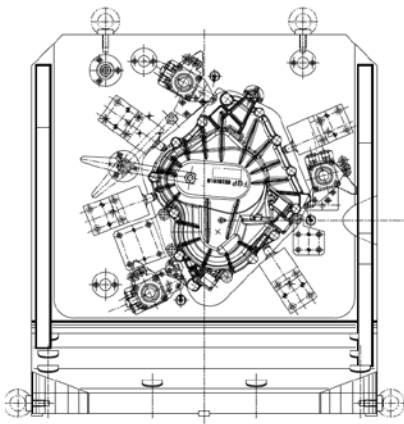
WORKING FIXTURE

MAIN FUNCTION

This is a special work fixture used to centre and clamp the transmission housing (gearbox).



Machined part



DESCRIPTION

These fixtures are installed on a line where specific machining centres, called 1G Modules, carry out certain machining operations on parts properly clamped by the fixtures.

The operator takes the transmission housings by hand and rests them vertically on the (“L”-shaped) supporting angle on the fixture.

Here some special centering devices called “Olive” locate the part that, by means of n.º3 hydraulically-operated clamping brackets, is then firmly clamped to the structure for the machining by the 1G modules.

After machining, the operator unclamps the machined transmission housing and manually unloads it for transfer to the following workstations.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: manual part loading.

OUT: manual part unloading.

TYPE OF WORKPIECE
Transmission housing FGP OPEL – ASPERN.

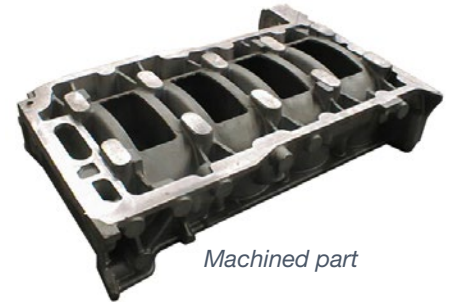
CYCLE TIME
~ 4 sec. (part clamping by the fixture only).

FUNCTIONING SYSTEM
Overall dimensions on the ground: 665 mm x 665mm x h 735 mm.
Weight: ~ 405 Kg.

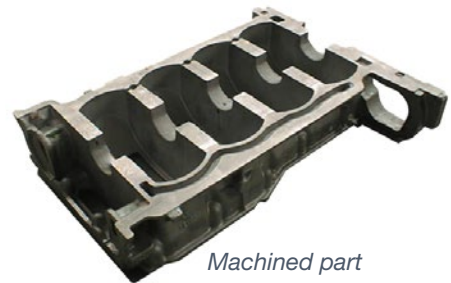
BED PLATE MACHINING ASSEMBLY

MAIN FUNCTION

Carry out two operations: cutting off risers and surface milling the Bed Plate G.M. L850



Machined part



Machined part

DESCRIPTION

This machine can operate over three steps: first, the part is handled by a COMAU anthropomorphic robot that transfers it from the entry conveyor belt to station A, rotating it by 180°.

This station is equipped with a fixture that clamps the Bed Plates and overturns them by 95°. A milling disk, mounted on a platen, which is driven by an electric motor, removes the risers from the surface of the workpiece, on the side opposite to the cylinder block fixing side.

On a second step, the robot takes the Bed Plate up again; then, it rotates the workpiece by 180° and transfers it from fixture A onto the idle fixture, which is located halfway between stations A and B.

The intermediate idle fixture is necessary to cut down the overall cycle time of the machine and to speed up the robot loading and unloading operations on to the fixtures. It also makes it possible to take full advantage of the COMAU unit throughput, since combining speed and precision in the various movements, the unit is able to keep all three of the machine working fixtures fully loaded.

The third and last step is the positioning of the Bed Plate on station B. After the robot takes it from the idle fixture, it transfers it to the right and loads it onto fixture B.

In the same way as for station A, the fixture clamps the Bed Plates and turns them by 95°, to bring them to the correct milling position; here a second moving platen, driven by another electric motor, approaches the workpiece and mills the cylinder block fixing surface by means of 2 cutters, installed assembled on the same platen.

Once this third step is complete, fixture B brings the Bed Plates to horizontal position, and there they are grasped the last time by the robot grippers, overturned by 180° and transferred to the exit conveyor belt.

The exit conveyor belt guides the individual Bed Plates out of the machine, where an operator unloads them by hand.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: Manual feed to the entry conveyor belt.

OUT: manual unloading to the exit conveyor belt.

CYCLE TIME
Hourly output at 100% efficiency = 140 workpieces.

FUNCTIONING SYSTEM

Overall dimensions on the ground: 12450 x 9700 x h 3400 mm.
Weight ~25000 Kg.g.

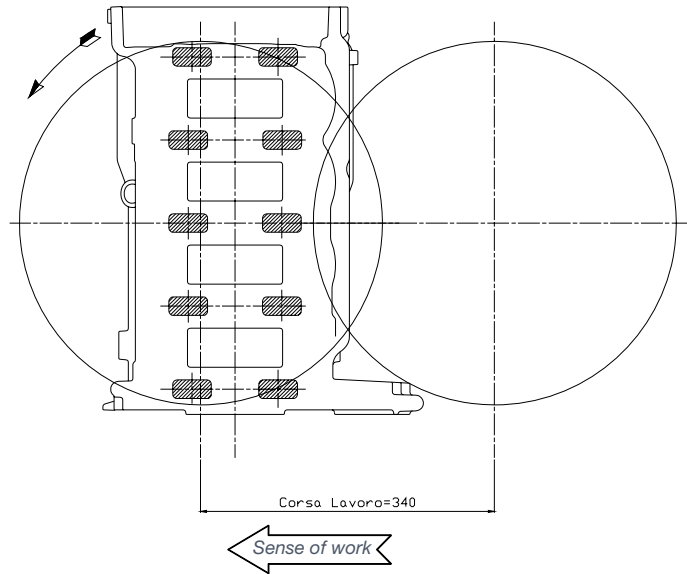
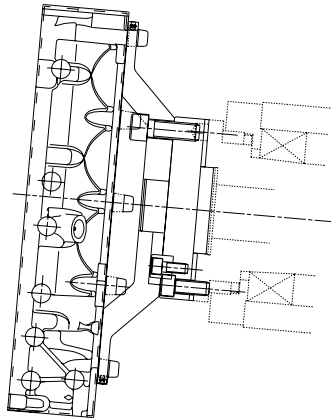
INSTALLED POWER

~ 190 Kw.

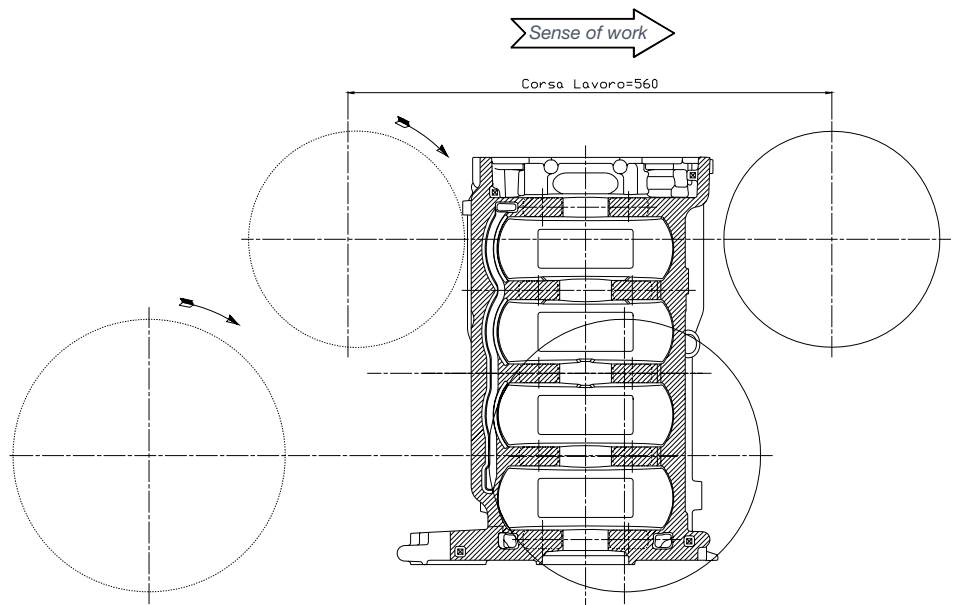
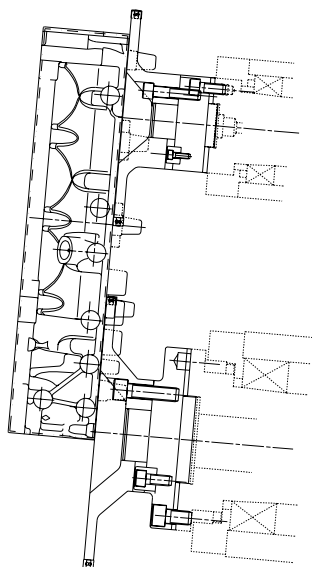
SAFETY GUARDS

Soundproof cabin closed on seven sides (ceiling included), with n°4 doors for access to the working zone

DIAGRAM



STATION A: cutting and milling disk

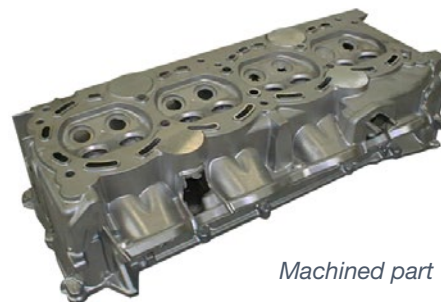
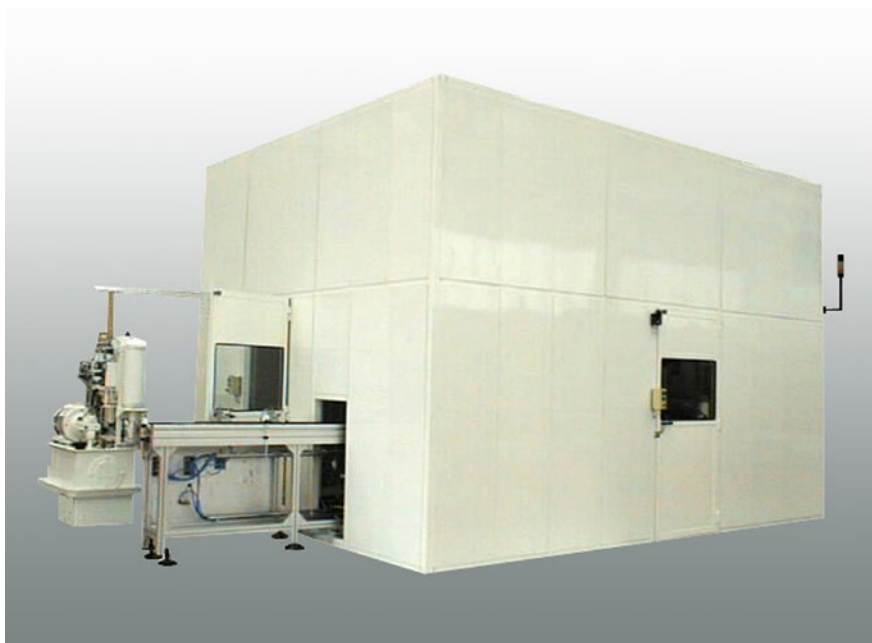


STATION B: cutting and milling disk

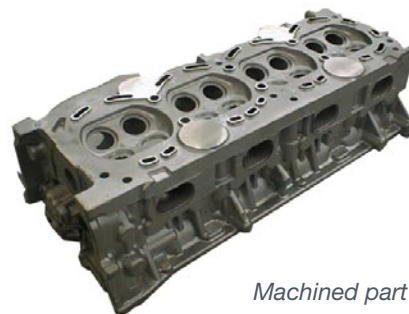
CYLINDER HEAD MACHINING ASSEMBLY

MAIN FUNCTION

Carry out two machining operations, cutting off risers and milling the R.H.-L.H. cylinder head of the Nissan V8.



Machined part



Machined part

DESCRIPTION

An entry conveyor belt transfers the parts into the machine, where a pick-up with two jaws transfers them to the working fixture.

The fixture is equipped with a tilting support, provided with special hydraulic devices on the supporting surface, which clamp the cylinder heads received from the pick-up, tilt them by 95° and bring them to a position for the two cutters installed on the machine.

The cutters are driven by two electric motors, secured to a platen, and their longitudinal movements produce the milling paths, intended respectively for cutting off the risers, and surface milling the cylinder head.

The platen, driven by an electric motor connected to a ball screw, slides on the machine bed by means of guides.

Once machining is performed, the fixture turns over the cylinder head and brings it horizontal again; then, the head is released to allow the pick-up to draw it.

Finally, the machined cylinder head is transferred by the pick-up to the exit conveyor belt and guided out of the machine, where an operator shall unload it by hand to conclude its cycle.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: loading on the entry roller conveyor belt, manual.

OUT: unloading to exit roller conveyor belt, manual.

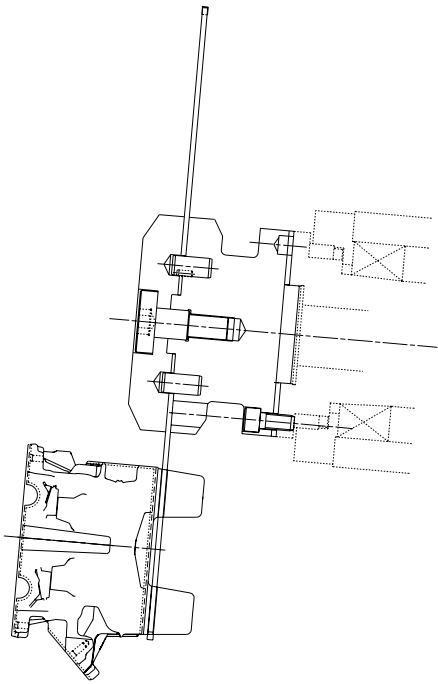
CYCLE TIME
Hourly output at 100% efficiency = 92 workpieces.

FUNCTIONING SYSTEM
Overall dimensions on the ground: 10000 x 4560 x h 4050 mm.
Weight: ~10000 Kgs.

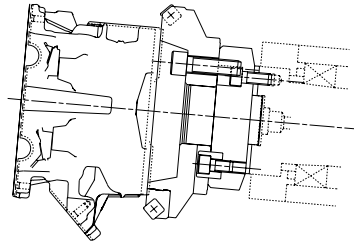
POTENZA INSTALLATA
~ 80 Kw.

SAFETY GUARDS
Soundproof cabin closed on five sides, with n°3 doors for access to the working zone.

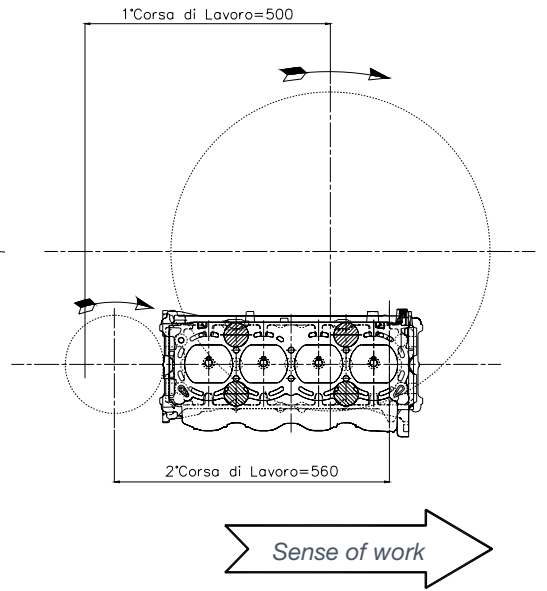
DIAGRAM



Cutting disk



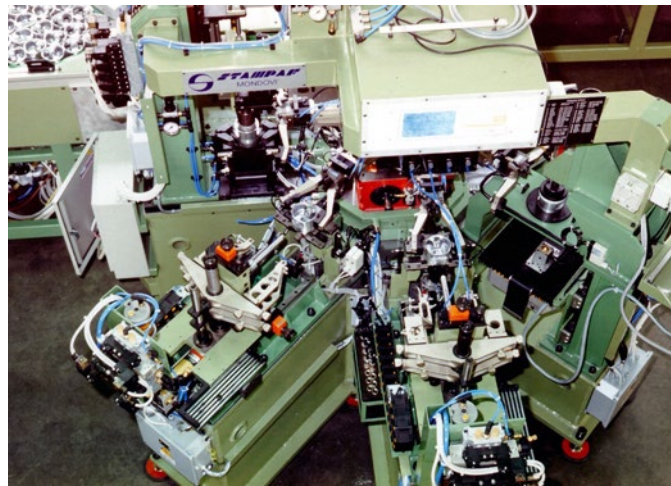
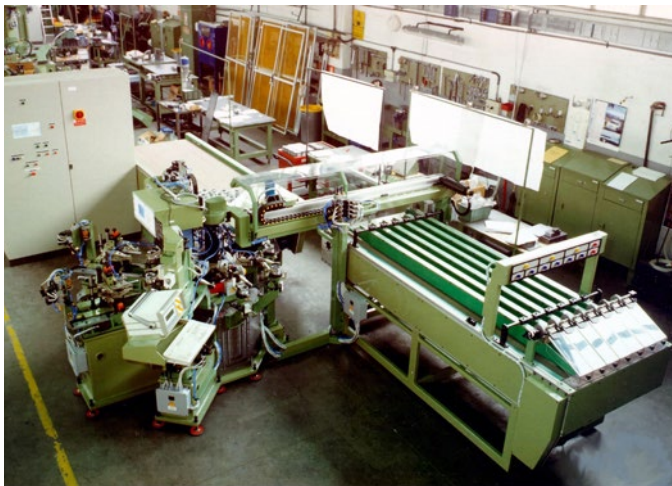
Milling disk



SPECIAL PISTON CHECKING MACHINE

MAIN FUNCTION

Check and select pistons, for use in the automotive industry.



DESCRIPTION

The pistons are placed at random on the entry conveyor belt by an operator, then a special driving belt, mounted crosswise to the belt feed direction, directs the parts toward STATION N°1, where they are buffered, ready to be picked up.

Next, a special device, called a 7-gripper rotary transfer unit, rotates clockwise by 45° and transfers the individual pistons to the 6 workstations of the machine.

Starting from STATION N°1, the transfer unit handles the individual pistons until STATION N°6, where the pistons, that have concluded their inspection cycle, are marked.

Then, the pistons are evacuated by a controlled-axis transfer bar, which directs them into the respective selection channels on the exit conveyor belt (according to the results from the checking performed).

It has been decided that the checking operations had to be carried out through 3 STATIONS, rather than just one, because of the overall dimensions of the parts: the small dimensions of the parts would not physically permit the arrangement of the various measuring devices on a single station, as such arrangement could have jeopardized the accuracy of the testing results.

However, the use of a rotary transfer unit insures a good handling speed between the different stations, therefore also an overall cycle time meeting the customer's requirements.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: manual feed of pistons on loading conveyor belt.

OUT: unloading of manually sorted pistons from the unloading conveyor belt.

TYPE OF CHECKED PISTONS

Pistons with diameter ranging from 70 to 110 mm.
Length of parts ranging from 60 to 120 mm.
Material: aluminium.

CYCLE TIME

~ 12 sec.

HOURLY OUTPUT

~ 300 pcs/hour (at 100% efficiency).

OPERATIONS CARRIED OUT ON THE PISTONS

STATION 1: buffering of pistons,

STATION 2: self-centering and orienting of pistons,

STATION 3: the following measurements are carried out on the pistons:

- check of shell upper part diameter,
- check of collar,
- check of squareness angle,
- check of piston squareness and faceting,
- check of valve seats.

STATION 4: the following measurements are carried out

on the pistons:

- Ø check of ellipse selection and centering,
- check of the pin hole Ø,
- check of shell middle part Ø,
- check of groove Ø,
- check of height, axis 1,
- check of height, axis 2,
- check of temperature.

STATION 5: piston weighing,

STATION 6: piston marking with identification code.

FUNCTIONING PLANT

Overall dimensions on the ground: 8550 x 3600 x h 2000 mm, weight: ~ 4500 Kgs.

INSTALLED POWER (WHOLE SYSTEM)

~ 3 kW.

SAFETY GUARDS

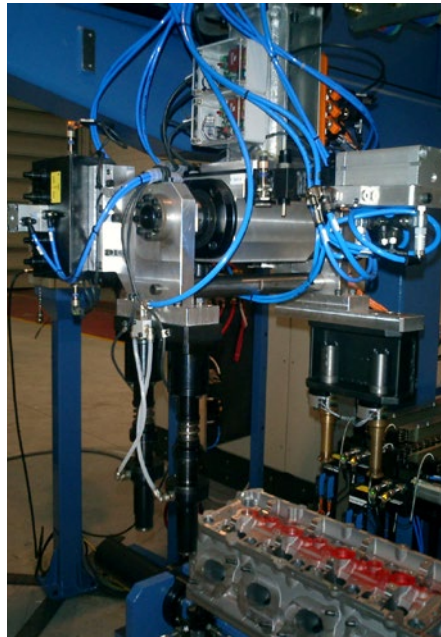
Central machine casing protected by a fence of extruded aluminium alloy section bars, anodised, integrated by panels, 3 mm thick, and steel wire net grating mounted on the above-mentioned section bars; complete with n°2 sliding openings in the front and rear side respectively, equipped with safety microswitches with positive lock.

The exit conveyor belts are protected by a fixed guard of extruded aluminium alloy sections, anodised, integrated by steel wire net gratings mounted on the above-mentioned section bars, protecting the out-feeding pistons.

CYLINDER HEAD ASSEMBLY ISLE

MAIN FUNCTION

- Manual valves assembly and spark plugs pre-tightening in cylinder head suitably located on tilting fixture.
- Automatic spark plugs tightening.
- Automatic combustion chambers tightness check.
- Automatic assembly of the following components on valve axis: washers, exhaust springs, intake springs, half rings, couplings, intakecup, exhaust cup.



DESCRIPTION

Components are assembled by means of SMA special unit. SMA mainly consists of brushless motor for horizontal movement (X), of brushless motor for vertical motion (Y) and grippers unit including 5 tools for components assembly on cylinder head.

Components to be assembled are supplied thru circular vibrators and linear feeders.

Cylinder heads load and unload phases are automatically performed by manipulation robot.

SPECIFICATIONS

ASSEMBLED PARTS

Valves, spark plugs, washers, exhaust springs, intake springs, half rings, couplings, intake cup, exhaust cup.

POWER SUPPLY

Voltage: 400 V (three-phase + ground)
Frequency: 50 Hz

PNEUMATIC POWER SUPPLY

- operating pressure:
6 bar
- momentary consumption:
8 Nm³/h (op. 130)
8 Nm³/h (op. 132)
20 Nm³/h (op. 133)
- hourly consumption:
0,1 Nm³/h (op. 130)
0,1 Nm³/h (op. 132)
2,5 Nm³/h (op. 133)

PART TRANSFER SYSTEM

By means of manipulation robot

SAFETY GUARDS

- Fixed type protections
- Moving type protections provided with a interlock device
- Moving units covering guards;
- Abstract barriers for presence check in work area;
- Emergency push-buttons

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