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TECHNOLOGIES, INC.

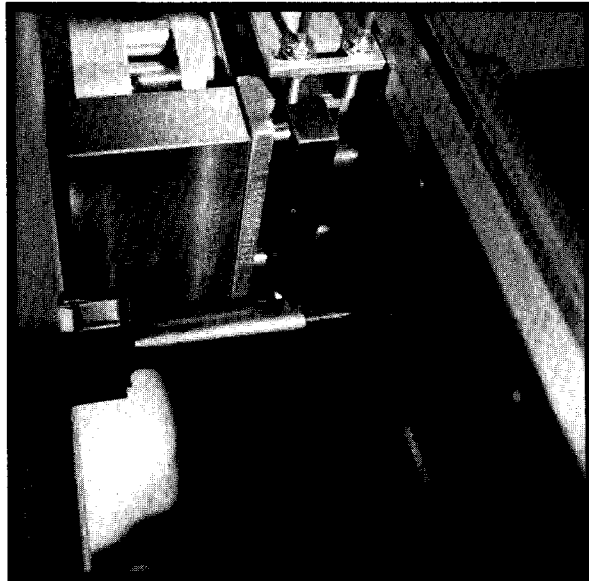
*Industrial Identification/
Traceability Equipment*

Two Customized TMP3000s Provide Fast, Reliable On-Line Marking for Dana Corporation

Dana Corporation in Lima, Ohio manufactures axles and drive train components for heavy trucks. To gain traceability of bearings used in these components, they wanted to mark date codes on the bearing caps. The marking had to take place on-line, before the caps, which travel on two parallel conveyor systems, advance to four automated welding stations where they are attached to the bearings.

It was important that the marking not stop or slow the lines. The conveyors are located 12 to 15 feet above the shop floor, so the marking systems had to run without operator intervention. The steel bearing caps pass through each conveyor at a rate of one every 2½ seconds. The line is pitched at a 26° angle, using gravity to move the caps along the conveyor. The plant operates three shifts a day, so the marking system had to be reliable with low maintenance requirements.

Telesis responded with a design utilizing two identical custom PINSTAMP® TMP3000 Marking Systems, one mounted to each of the conveyors, which included conveying, locating, clamping and marking functions. In order to satisfy Dana's cycle time requirements, each marking system marks two bearing caps during each five second marking cycle. In order to minimize downtime required for installation, Dana supplied two conveyor rails for Telesis to integrate into the two systems prior to shipment.



The TMP3000 Marking Head is mounted on its side to mark two bearing caps every five seconds in the conveyor rail.

Conveying

Each system is equipped with four PLC-controlled stop gates, the first with optic sensors that allow only two bearing caps to pass through per cycle. Telesis wrote a custom program for the PLCs to synchronize the stop gate and feed operations. Two bearing caps are simultaneously pulled into marking position by a pneumatically actuated mechanism. As the two bearing caps are moved into the marking position, all other bearing caps in the conveyor upstream of the marking station are advanced naturally by gravity.

Locating and Clamping

As the bearing caps move into the marking position, hardened steel pins at the third stop gate are inserted through the caps, separating them and precisely positioning them completely immobilized during marking.

Marking

The marking cycle is as follows,

- The single-pin marking head marks the four-character Julian date on the lead bearing cap, then indexes to the second bearing cap and marks it.
- Eight 0.125" high characters are imprinted during each cycle. The date is generated by the standard TMP3000 software and a predetermined marking pattern, so no operator intervention is required.
- After the caps are marked, they advance to the final stop gate where an optic sensor again counts the caps to make sure two caps exit each cycle.
- If the optic sensor does not detect two bearing caps, it automatically shuts the marking systems down. This prevents jamming.
- When the bearing caps exit the marking systems, they advance to the automated welders. The five-second marking cycle is broken down into 1½ seconds for positioning, one second for clamping, and 2½ seconds for marking.

The PLCs and marker controllers are housed in NEMA-rated enclosures mounted on custom stands located on the shop floor.

Telesis' Applications Engineering Team effectively combined technology and teamwork to give Dana what they needed: integrated conveying, indexing, clamping, locating and marking systems that work reliably day in and day out.