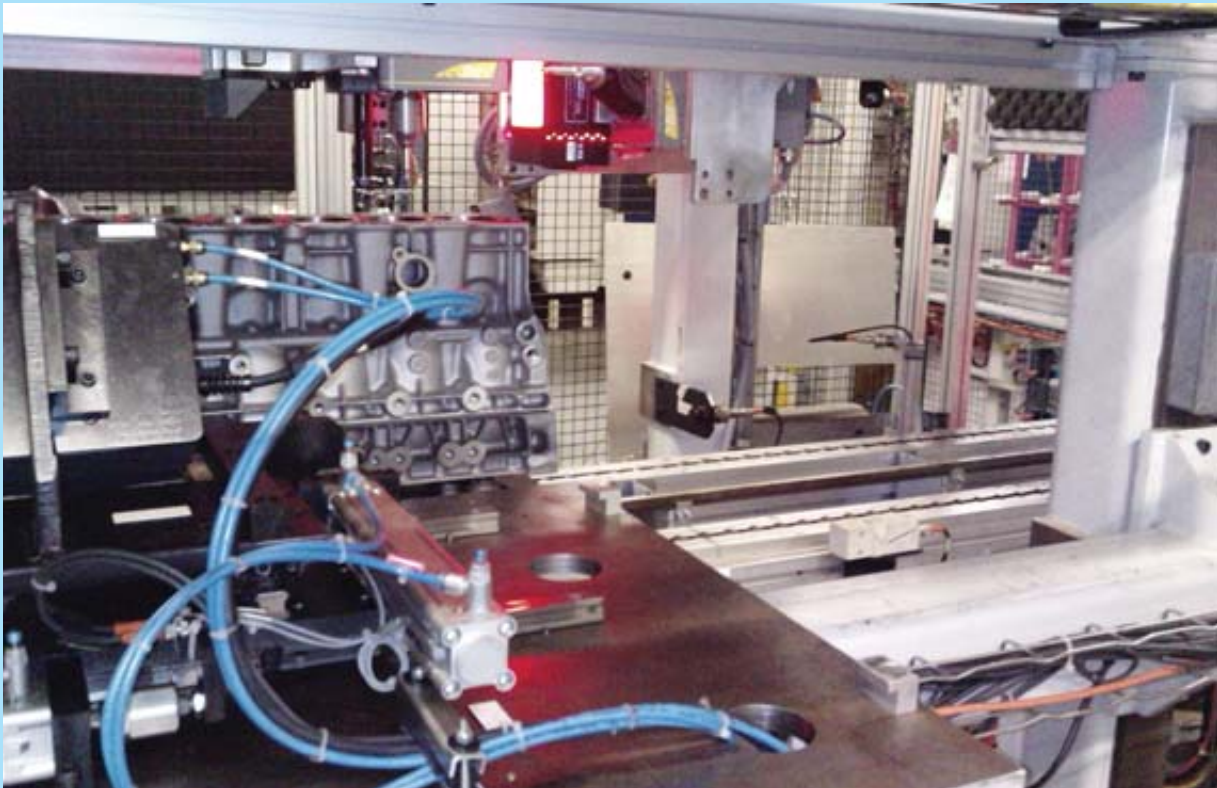


FORD | DATA SHEET VZ09



FORD MOTOR COMPANY APPLICATION STORY



Requirement

Legislative requirements demand that each engine manufactured at the Ford Motor Company in Bridgend, South Wales is marked with human readable characters. The marking is performed by either a pneumatic or electric dot peen marking machine. The information that is to be marked on the engine block is carried in an RFID tag which is fitted within the platen that carries the engine.

When the engine reaches the marking station the tag is read and the information to be marked is passed to the marking machine. The requirement is to provide a machine vision system which will verify that the string marked on the block is correct.

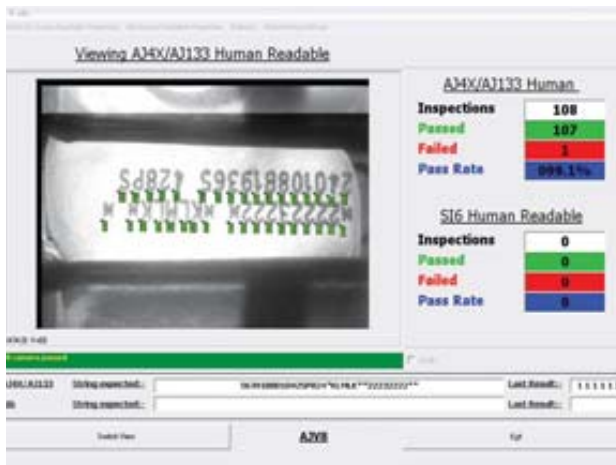
The features that render this complicated are:

- (a) there are three different engine types, the mark is on a different position on each block. The system must be able to automatically inspect any one of the three
- (b) the characters are relatively large and the area which they encompass is large; this renders the image difficult to illuminate in a consistent way
- (c) the finish of the marking area of the engine and the properties of the mark itself vary considerably due to factors particular to this manufacturing process.

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FORD MOTOR COMPANY APPLICATION STORY



Solution

To meet this specification V-viz deployed a PC based machine vision system utilising vision libraries from Stemmer Imaging and a custom user interface for the operators. Two cameras are deployed; both are monochrome VGA cameras and are interfaced to a PCi frame grabber that resides in the PC. An I/O board is also integrated into the PC. The first camera is mounted on an angle beneath the block. It looks up at the marking area, the lighting unit is a Direct On Axis Light (DOAL). The DOAL selected has an aperture of 100mm x 100mm. It is indexed into position by a pneumatic cylinder once the engine block is in place. The second camera is mounted horizontally and also looks through a DOAL unit. In this case both camera and light are indexed into position once the engine is in place. The third part is catered for by indexing the first camera and light in the direction of travel of the engine before indexing them into the inspection position.

Once the camera and light are in position and ready to acquire an image of the engine the PLC on the manufacturing line sends a string, via RS232, to the vision system. This string contains the information that should be marked on the engine. The vision software application that resides on the PC separates this concatenated string into the various fields. The PLC then triggers the vision system (via digital input) to grab an image of the block.

The image data is passed into both custom and off the shelf algorithms. These search the image from left to right and verify not only that the correct characters are marked but that (a) the quality of the character is within an acceptable threshold; (b) the position and spacing of the characters is correct.

When processing is complete the vision system will set a digital output representing the state (pass or fail) of the inspection and will send a string via RS232 to the PLC which will indicate the state of each field that was to be verified.

The user interface displays the statistics and the image of the last inspection. It also allows for automatic saving of failed images for reference and inspection by an engineer.

The display is linked via a KVM switch to two remote displays. If a block fails an inspection then the failed image is automatically shown on the remote display and an indicator lamp illuminates. This prompts the operator to view the image and select either a pass or fail button. This facility allows the operator to override a fail decision made by the vision software if the failure is due (for example) to a big blob of grease obscuring one of the characters.

For any further product information or application details please contact: +44 (0)870 242 2515 www.v-viz.com

About V-viz Ltd

V-viz was established in 2004 as an independent machine vision solution provider and has been successfully supplying and deploying inline machine vision inspection solutions to leading global manufacturing companies ever since. Recognising the value added expertise and experience in machine vision V-viz brings the Company was audited and certified as a Siemens AG "Specialist Machine Vision Solution Partner" in 2008. We are the appointed and exclusive Technology Partner for both Festo GB and Datasensor UK for all machine vision applications.

Providing inline high speed machine vision applications requires a specialist with experience built up over many years and with core competencies in camera technologies, complex illumination techniques, inspection tools and platforms, software, communications, controls and integration.

V-viz prides itself as a proven competent and reliable supplier of integrated machine vision inspection systems and has a rapidly expanding global customer base across Automotive, Food & Beverage, Consumer Goods, Medical Device, Pharmaceutical and Primary Metals.

Making a significant and successful investment in automated inspection requires selecting a vendor whose proven expertise and understanding of applying the technology into a manufacturing environment ensures the success and long term reliability of the solution. By contracting V-viz customers ensure that their investment is adopted successfully, effectively and to the highest possible standards of on-going support.