

USE CASE

OBJECT DETECTION OF HEAD AND VALVE GASKETS



CLIENT/INDUSTRY BACKGROUND

The client manufactures and assembles automotive parts like gearbox, engine, clutch, etc.

A gasket is a mechanical seal that fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression

PROBLEM

- Ensuring the presence of gasket perfectly between the cylinder head and the engine block is time-consuming
- Defect on gaskets are being missed out causing compression problems

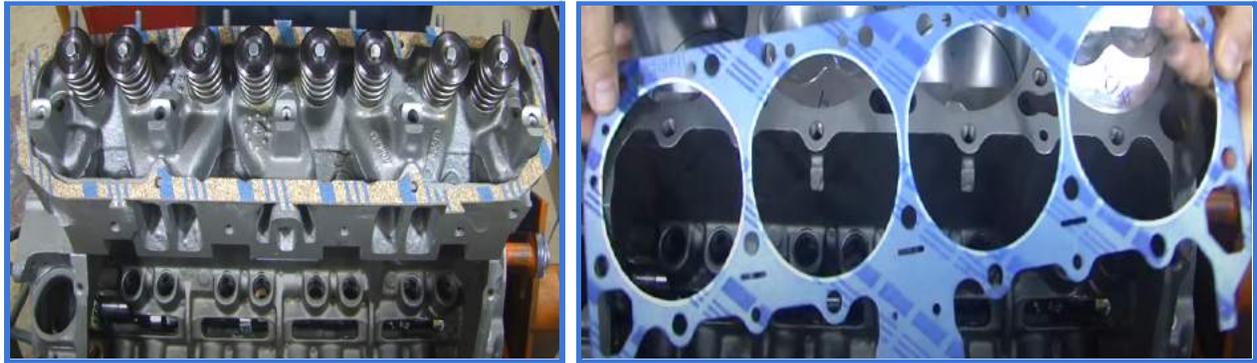
PROBLEM IMPLICATIONS

- The absence of the seal in the engine cylinder block will lead to a low compression ratio and efficiency would be reduced.
- The absence of a gasket seal in the cylinder head will lead to oil leakage that may cease the engine.
- Dissatisfaction in customers

CLIENT REQUIREMENTS

To automate the inspection presence of two different types of oil seals(gasket) on the engine cylinder block with the help of machine vision.

ENGINE HEAD AND CYLINDER OIL SEAL



CURRENT PROCESS

The inspection is being carried out by operators manually.

- Due to manual intervention, it takes 4-5 seconds for a complete inspection
- Manual inspection results in a false acceptance rate of up to 9 percent

BUSINESS IMPACT

1. Decrease in customer's equipment efficiency
2. Increase in Cost Of Quality(COQ)
3. Increase labor and training costs

SOLUTION USING MACHINE VISION AND AI

A camera or set of cameras with appropriate illumination is set up to identify the defects on the workpiece. Images are captured and sent to the software (Qualitas EagleEye® Platform) cloud where the training is done using DL algorithms. Once the program is trained, real-time object and defect detection take place, based on which the results are sent to PLC to take action.

IMAGES

QEP(QUALITAS EAGLE-EYE® PLATFORM)ANNOTATED IMAGES



CONCLUSION

POC(Proof Of Concept) is conducted that shows the accuracy is increased up to 98 percent that leads to eliminating the human interference. Cost Of Quality, labor, and training can be significantly reduced. The system has the potential to inspect within 1 second. False acceptance is reduced to 2 percent or less.



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