

# **AUTOMATIC MAGNETIC PARTICLE INSPECTION OF ENGINE CRANKSHAFTS**



This equipment is for the automatic magnetic particle inspection of auto engine crankshafts. See the reverse of this brochure.

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**Simultaneous multi-directional magnetising.**

**Dramatically reduces test and inspection times.**

**Increases component throughput rate.**

**Increases test sensitivity in all directions.**

**Improves test integrity.**

**Convenient and easy to operate.**

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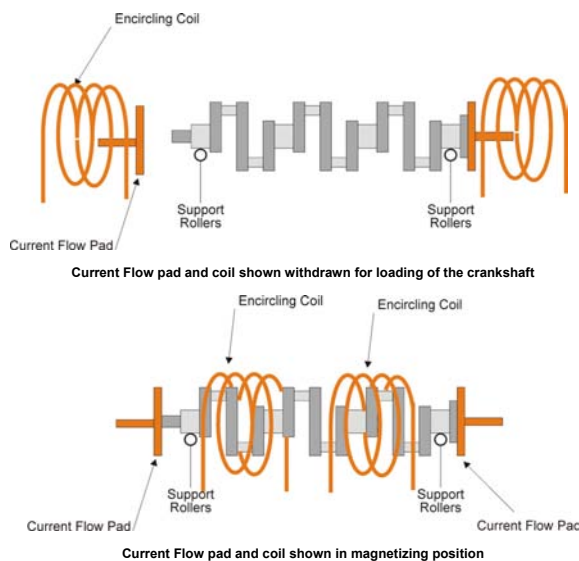
In common with many other automotive engine and safety critical components crankshafts are subjected to an MPI test as part of a general production quality control process. The object being to identify any crankshafts which suffer from surface or slightly sub-surface cracks as a result of production processes.

Since the vast majority of such pieces are crack free it is essential that the inspection process is simple and rapid to support production rates and yet sufficiently sensitive to reveal any defects which may be present.

## Magnetising Scheme

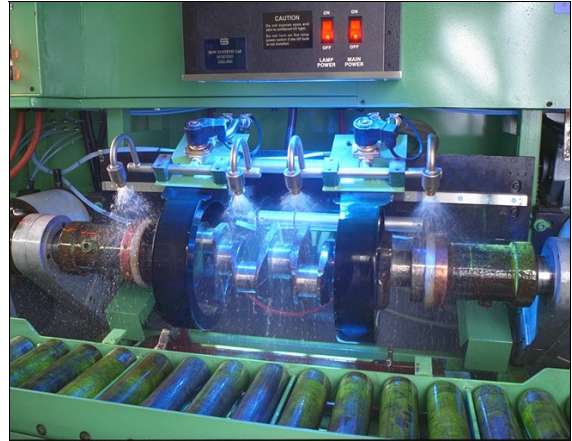
Multi-direction magnetising is used, which has the advantage that only one magnetising process is necessary to reveal all defects regardless of their orientation on the surface and therefore only one examination of the part is necessary to determine whether or not there are any defect indications. Thus MPI is a single secure operation in the production process.

In this particular application the two primary field directions necessary for the rotating vector field are for circular magnetising - current flow, and for longitudinal magnetising - two encircling coils.



Ink application is part of the automatic sequence and is controlled by valves within the spray heads. The system ensures that the indicating particles are in the correct suspension as soon as the inking sequence starts. Ink agitation is continuous right up to the spray nozzles.

Since machines of this nature deal with subjects of a limited range of dimensions it is not necessary that magnetising parameters be routinely adjusted once determined and set these are fixed.

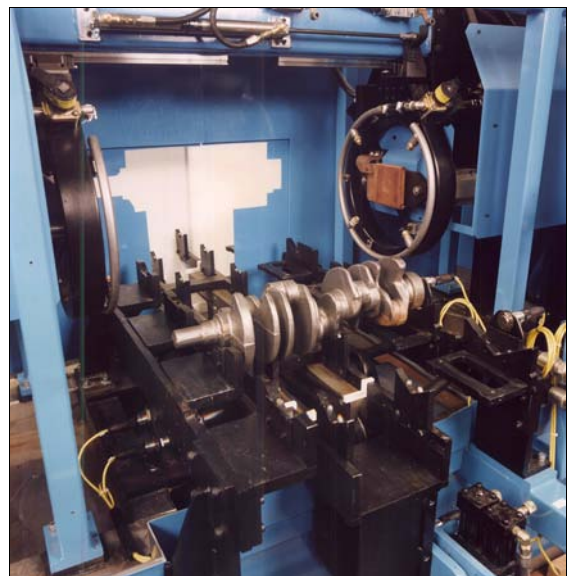


This also applies to other testing parameters in the automatic sequence including shot duration, ink application timing, demagnetising etc. However, versions are available which permit external adjustment.

All functions of the magnetising/inking system are monitored and in the event of non-fulfillment of required values the machine will shut down and a warning given.

## Mechanical Handling Systems

Equipments are designed and made to suit existing production line transfer systems. In the system illustrated crankshafts are transported around the production area on un-driven roller conveyors. For ease of movement individual crankshafts are supported on a special flat bottom cradle.



Where as other systems use a walking beam to transport the crankshaft through the system, as shown on the front of this brochure, and above.