

Stop waiting until the end of the line to find defects

Explore the possibilities with in-process test



Many defects are best found in-process and not at the end of the assembly line. To help illustrate these possibilities on your line, the chart below identifies the areas in engine manufacturing where in-process testing can be done and the probability of identifying certain issues within those sections.

Probability of finding the defect:

- L Low
- M Medium
- H High

	COMPONENT MACHINING AND ASSEMBLY TESTS							FINAL ASSEMBLY TESTS			
	Crank Machining	Con Rod & Piston Rod Machining, Assembly	Cam Assembly	Block Machining	Head Machining	Block Assembly	Head Assembly	Short Block	Long Block	Cold Test	Hot Test
Plugged or undrilled passages.	H							H	L		L
Gaging of notches, improper notch length, depth, nicks, cracks.	M										
Improper connecting rod bearing halves, improper bushing press.		H									
Improper press force and position of lobe, cracked lobe.			H								
Critical TIR dimensions out of spec, porosity in block/casting, blocked ports.				H	H						L
Press of dowels, bearing cap, liner (depth, loose/tight fit). Verify "O" ring.						H					
Valve seat missing, not bottomed out. Under/oversized valve journals.					H		H				L
Correct valve seals, pressed to depth. Cup plug pressed to depth.							H				
Valve spring, keeper assemblies: valves, bent stems, debris, orientation, washers.							H				
Missing component, chain tension, timing. Bearing contamination.							H				
Upside-down valve seat. Improper valve guide.							M	H			
Crankshaft defects (bent, nicked, etc.). Missing main and con rod bearings.								H	L	L	L
Tight bearings/wrong select fit.								M	L		
Reversed connecting rod caps. Missing piston ring(s).								L			
Plugged or undrilled oil passages. Missing, misaligned crankshaft seals. Gasket seal verification.								H	H		M
Piston defects (wrong type, grade, etc.). Cylinder bore defects.								M			
Missing/damaged oil plugs.								H	H	H	H
Tight timing chain, cam/crank timing, lash adjusters.									H		M
Low compression, valve debris, valve rollers off-location.									H	M	
Bent valves, loose spark plug, engine sensors out of spec.									M	M	M
Cam timing, oil pressure, oil level. Timing chain noise, valve train noise.									H	H	H
Fuel system leaks, fuel injector defects (rich/lean, not closing, etc.).									H	H	H
Missing/damaged gaskets, oil system leaks, water system leaks.									H	H	H
EGR, IMCC malfunction, wiring harness shorts/opens.									H	H	M