Monitoring

Liner Condition Camera

CHRIS-MARINE®
LCC

The Chris-Marine Liner Condition Camera (LCC) is used for in situ photography of the cylinder liner walls and piston ring pack in 2-stroke engines.

The photos are used when evaluating cylinder condition parameters such as cleanliness of ring land, size of cylinder wear edge, cylinder honing mark and wave-cut groove extension, black lacquering from corrosive wear and bore polish.

Product features

- The Chris-Marine Liner Condition Camera (LCC) has four cameras documenting the complete liner running surface, exhaust valve, start air valve, lube oil injector area and injector valves, without removing the cylinder cover:

  Cameras 1-3: facing the liner walls in slightly overlapping sectors

  Camera 4: facing upwards toward injectors and exhaust valve

  Cameras 1-4 and LED flashes mounted on the camera unit are triggered with a laser distance sensor to avoid unnecessary data collection and battery energy consumption

  Tablet camera: documents piston ring pack and topland condition

- The LCC unit includes all parts needed for in situ cylinder condition documentation of 2-stroke engines with a bore size from 480 to 980 mm.
- There is no need to remove cylinder cover or exhaust valve housing when using the LCC. Only venting of combustion chamber is necessary, e.g. by opening the indicator valve.
- High-temperature resistant electronic components and batteries allow operation without lowering engine coolant temperature for most engine types.
- Time required: ~15 min per cylinder unit
- With fully charged batteries it is possible to document up to 14 cylinders (subject to number of pictures taken per cylinder).

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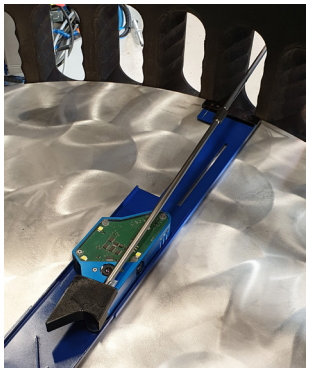
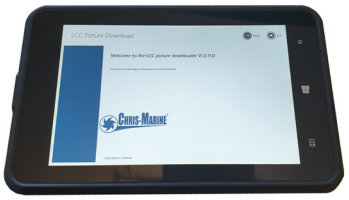
The LCC unit and its base are easily inserted through a scavenge air port.



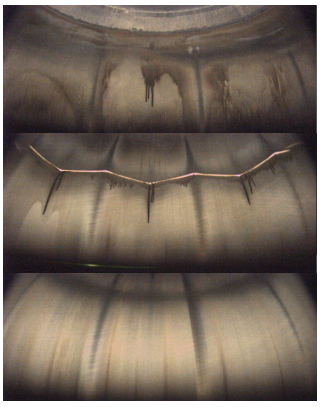
A base ensures accurate positioning of the LCC unit. To insert and extract the LCC unit, a tool is used.



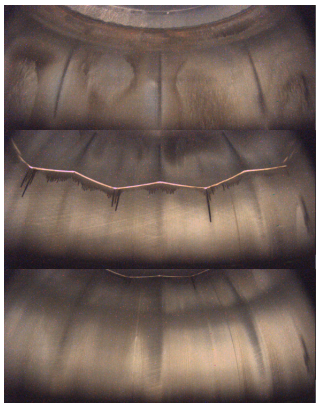
A hand-held tablet, also compatible with the Chris-Marine LDM, is used to collect picture data from the LCC unit. It is also used to take pictures of ring pack and topland.

Inside a cylinder liner

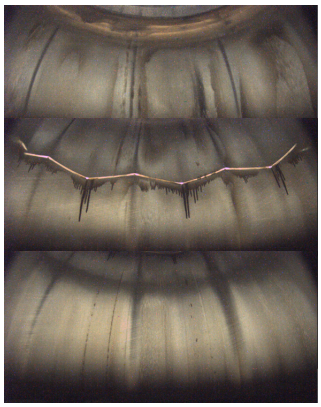
Pictures taken with the Chris-Marine LCC unit and tablet



Camera 1

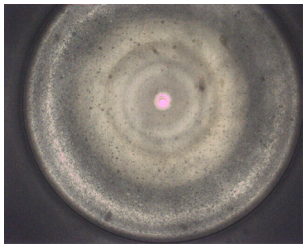


Camera 2



Camera 3

- **Cameras 1 - 3:** facing the liner walls in slightly overlapping sections
- **Camera 4:** facing upwards and covers the cylinder cover with its injectors and exhaust valve
- **Tablet:** piston ring package captured by tablet



Camera 4

Tablet

Technical specifications	
• Weight	550 g (camera unit) 9 kg (complete equipment in storage box)
• Dimensions (L x W x H)	176 x 78 x 33 mm (camera unit) 510 x 310 x 130 mm (storage box)
• Camera resolution	1280 x 1024 pixels per camera (4 cameras included in the camera unit)
• Power supply	Battery operated Charging equipment included
• Batteries	Camera unit: 6 Ni MH batteries with a total capacity of 3.6 Wh Operator's unit: 1 Li Ion battery with a capacity of 29.6 Wh
• Mains supply (chargers)	Camera unit: 100-240 V, 50/60 Hz, 0.35 A Operator's unit: 100-240 V, 50/60 Hz, 0.5 A
• Ambient air temperature (camera unit)	0-85°C
• Cylinder diameter range	480 to 980 mm
• Normal measuring time	15 minutes per cylinder liner

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