

COMPRESSOR^{Two}Tech

PORTABLE SCOPE HELPS DIAGNOSE ENGINE PROBLEMS WITHOUT DISASSEMBLY

Borescope Allows Visual Inspection of Internal Components



■ **Right** The portable Lenox Autoscope borescope weighs 1.5 lb. (680 g) and measures 15 in. (38.1 cm) long. It uses a 3X magnification system that relays images to the viewer through a series of lenses within its stainless steel probe to deliver a 90° field of view.

Below A Jiro technician uses an Autoscope to inspect a Cat 3306NA engine used to drive a Mycom 160-VLRD screw compressor in a Jiro Portable 7400 Series package. He has removed the spark plug to gain access.



■ **Right** This trailer-mounted, portable 3500 Series compressor package is representative of Jiro's line. It features a Cat 3304NA driving a Mycom 160-FMG screw compressor, and is ready for shipment to join Jiro's U.S. rental fleet.



Service technicians from JIRO Compression, Ltd. of Stettler, Alberta, Canada, use a portable, battery-powered optical diagnosis instrument, originally developed for inspecting automobile engines, to help them detect problems and increase cost efficiency. The technicians use borescopes weighing 1.5 lb. (680 g) and measuring 15 in. (38.1 cm) long to visually inspect, without disassembly, internal components of compressor drivers at numerous compressor installations under their care.

The scopes, manufactured by Lenox Instrument Company in Trevose, Pennsylvania, U.S.A., and sold under the Autoscope brand, illuminate, magnify and allow technicians to view otherwise-inaccessible locations from close-up. They use a 3X magnification system that relays images to the viewer through a series of lenses within its stainless steel probe. The side-viewing Autoscope has a 90° field of view.

"We visually observe damaged pistons, scored liners, burnt valves or other defects, which is really

equivalent to a local compression check on the engines," said John Peterson, service manager at Jiro's field office in Drumheller, Alberta. "We can tell customers right away, without removing the head, what the problem is and how long their downtime would be for fixing it."

Technicians can insert the borescope's 8 mm (0.315 in.) tip of the probe through a spark plug hole. A very bright high-intensity quartz halogen bulb at the tip provides five watts of light that fully illuminates valve seats and other areas and allows them to inspect a cylinder without performing a compression test or disassembling the engine. Inspection can be performed through an injector port on diesel engines.

"In the past, we mainly relied on compression tests in our inspections. If there was low compression in one of the cylinders, we would end up pulling the head to inspect whether there was a head failure. Depending on the engine's hours of service, we might also find a scored piston and liner," Peterson explained.

"Now, with an Autoscope, we view cylinder components without the manual disassembly. This shows us exactly what the problems are, saving from a half to a full day. We can check all the cylinders, see how many are damaged, and order all the parts at the same time. The entire advanced diagnosis procedure saves us and our customers a lot of time. We know what we need before we tear down the engine and install new components," he said.

"The Autoscope also allows us to more frequently check engine condition," Peterson said. "Rather than doing a routine head change at 15,000 hours, we can easily observe valve recession and the condition of cylinders at shorter intervals. A customer may

have budgeted for an overhaul with a head change, but we might find they can run another year before major work."

JIRO has purchased 10 Autoscoopes over the past year. "Almost every service technician now carries this scope in his truck," Peterson said.

The scope uses three standard C-cell batteries. Its cylindrical battery pack can also function as a handle, which can be attached to the scope or connected by a 6.5 ft. (1.98 m) extension cord. This eliminates having to carry a power supply in a separate box.

"It's very, very portable," Peterson said. "When you're walking around an engine and climbing up on stuff, you don't have to carry this other power supply like a lot of other borescope devices. I sometimes just stick the battery pack in my shirt pocket, with a cord running to the borescope wand. We use the Autoscoopes mainly for the engines, and sometimes for inspecting the interiors of smaller vessels like inlet separators."

JIRO Compression is a division of En Source, and services many customers, including PanCanadian Energy, which sells to the Trans-Canada pipeline.

"I previously used Autoscoopes for three or four years when I was with Pan Canadian," Peterson says. "When I joined JIRO, they only had one Autoscope, which everyone shared. Now every service technician will carry them. Lenox is fantastic to deal with and the borescopes have been reliable."

Lenox Instrument Co. has been marketing borescopes since 1921, and now manufactures a wide range of rigid and flexible versions of the instrument. The company manufactures high-temperature TV systems for monitoring conditions inside boilers and furnaces. ■