

OPE EMISSIONS, TECHNOLOGY UPDATE

BY JAY LARSON

The EPA emission standards established for the outdoor power equipment (OPE) industry, and set up in a matrix of progressively tougher compliance levels, has presented engineers with a formidable challenge. At Shindaiwa, we believe the already published 2005 federal standards will simply mean the end of standard 2-cycle engines as we know them today. Similar to outboard motor and the dirt bike industries, which have successfully made the transition from 2-cycle to 4-cycle engines, tomorrow's handheld outdoor power equipment must also change accordingly.

Like many other manufacturers, we had first assumed it would be possible to comply with looming emission standards by simple "enleanment" of standard 2-cycle engines. This essentially means using less fuel to limit the amount of hydrocarbons and other pollutants discharged by the exhaust system. However, with leaner engines operating temperatures dramatically rise and piston and cylinder



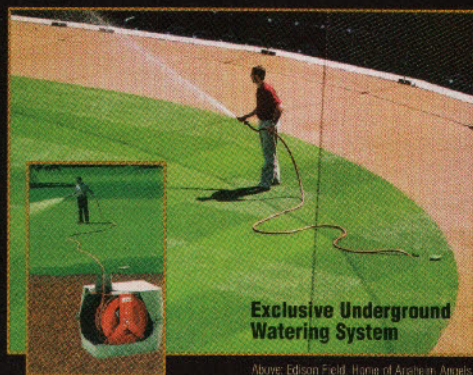
scoring typically become frequent and expensive problems, which is especially true when basic maintenance is less than ideal. During our research and development work we soon verified that the lean burn 2-cycle engines, even those equipped with catalytic converters or similar devices, simply cannot comply with tomorrow's tough emission standards.

Shindaiwa moved ahead with development of a 4-cycle engine design featuring the use of a supercharger element to increase crankcase pressure. This patented "Power Boost Chamber" not only provides increased power and torque, it also enables the use of standard 50:1 fuel mix for all its engine lubrication. In other words, no oil sump or dipstick to worry about!

The end result is the C4 Technology 4-cycle engine that beats the 2005 EPA standard while maintaining light weights and multi-positional capabilities. Shindaiwa plans to rollout a full range of commercial C4 Technology products during the next few years. **ST**

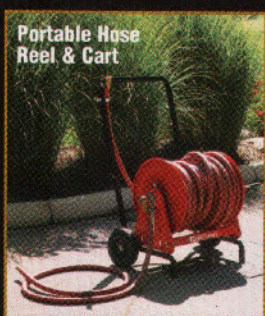
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