Shindaiwa C4 Technology®

After several years of intensive development, Shindaiwa is pleased to introduce our exciting new C4 Technology®. Coupling the best of 2-stroke and 4-stroke engines, this new proprietary technology enables Shindaiwa distributors and dealers to provide their customers 21st Century products today.

Historically, commercial hand-held outdoor equipment has been powered by two-stroke engines. This is because of their excellent power-to-weight, outstanding throttle response, multi-position capability, simple maintenance, and durability.

Over the years products have become even lighter and more powerful. Shindaiwa, in particular, established a leading market position as users became familiar with its equipment. Like BMW cars and Nikon cameras, Shindaiwa products are well known and preferred for their high levels of performance and long-term durability. Second to none, they are bought again and again by satisfied commercial users.

As part of requirements of the U.S. Clean Air Act of 1970 and later revisions, both federal and state regulations were established to dramatically reduce exhaust emission levels of internal combustion engines. Tough standards were set on a selective industry-by-industry basis with initial focus on automotive engines, which historically accounted for the vast majority of air pollution.

Beginning in 1990, standards were set for outdoor power equipment. Set up on a progressively tougher basis, they have presented dramatic engineering challenges. Federal standards scheduled to become effective in 2005 will someday mean the end of 2-stroke engines as we know them today. Similar to outboard motors and dirt bikes which have made the transition from 2-stroke engines to 4-stroke, tomorrow's handheld equipment must be different than today's.

The Right Technology: C4 Technology®

Thus, we moved ahead with development of a unique new engine design featuring use of a supercharger element to increase crankcase pressure. This "Power Boost Chamber" element not only provides for increased power and torque, it also enables the use of standard mixed fuel for engine lubrication. The end result is an engine with the outstanding performance, reduced noise and fuel consumption and extremely low levels of exhaust emission.

More importantly it means users can enjoy light weight multi-positional equipment with excellent performance and no change in fuel or usage patterns. In the course of our work, we have been able to gain patent protection for the supercharging element and do not expect others to be able to offer similar engine designs in the short term.

The Right Application: T2510 C4 Technology®
The focus of our work has been on commercial applications. Unlike other manufacturers who have certified many of their so-called commercial units to the easier 50-hour consumer emission standard, the high-performance C4 Technology® engines fully comply with the tougher 300-hour commercial standard.

Introduced in October 2001, the Shindaiwa T2510 trimmer was the industry’s first 2-stroke/4-stroke hybrid unit. A straight shaft trimmer fitting between our T231 and T261 series, the T2510 continues to be well received by consumer and commercial end-users everywhere.

Work is underway on other professional units and we will roll out a full range of commercial C4 Technology® products during the next few years. We are highly confident that our "2-stroke/4-stroke" C4 Technology® products will continue to gain dealer and end-user praise.

**Shindaiwa C4 Technology®** (Patent Number 4,708,107) October 2001

*Tomorrows Products Today*

**Shindaiwa is pleased to introduce our latest product innovation, C4 Technology®.**

Through the years, landscaping equipment has traditionally been the 2-stroke engine because of its excellent power-to-weight ratio and multi-position capability. Now, the revolutionary C4 Technology® is venturing to change the landscape of handheld outdoor power equipment. Shindaiwa C4 Technology®, a unique cross between 2-stroke and 4-stroke, combines the best of both technologies: Light weight, excellent torque, great throttle response, with all day, all position operation. And now, include Eco-friendly exhaust gas emissions, low noise, and better fuel economy to the equation. C4 Technology® is truly tomorrows products today.

**So why the new technology? And, how does it work?**

To help answer these and other questions, Shindaiwa is providing this information about this new and exciting technology. In addition, we hope to provide you, our valued customer, a peek into the inner-workings of the 2-stroke/4-stroke hybrid engine itself. First, let’s briefly look at the recent history of this important technology.

**History of the 2-Stroke/4-Stroke Hybrid Engine**

First developed in the 1980’s by an inventor in Post Falls, Idaho, the 2-stroke/4-stroke hybrid engine uses proprietary technology that has many mechanical advantages over its 2-stroke cousin. And, because of its many mechanical advantages, the hybrid engine eventually drew the attention of the U.S. Military.

In powering their twin cylinder, ultra-light reconnaissance aircraft, the U.S. Military typically used larger 2-stroke engines simply because of their excellent power-to-weight ratios. However, large 2-stroke engines, with their high fuel consumption, had a non-compatible powerband and proved ineffective for their direct drive, propeller-driven aircraft. For this reason, the Military often modified the 2-stroke...
engine with complicated gear reducing equipment adding considerable weight and cost to the engine assembly.

Fueled with just standard 2-stroke mix, the twin cylinder, 2-stroke/4-stroke hybrid design provided the Military with an engine producing a more conducive powerband for their small aircraft - eliminating the need to add expensive, heavy gear reduction equipment.

Moving up to the Major Leagues

Call it C4 Technology®

C4 Technology® (Compression-Charged Clean Combustion) uses patented technology controlled by Shindaiwa. Our engineers have successfully isolated 1/2 of the twin cylinder hybrid technology and miniaturized it for optimum performance and weight. Shindaiwa C4 Technology® combines the best features of the 2-stroke engine (compactness, power-to-weight ratio, minimum-moving parts), and the 4-stroke engine (precise metering of combustion gases).

With its cylinder ports to transfer fuel/oil mix, the typical 2-stroke engine performs with a power stroke with every two strokes (one revolution of the crankshaft) of the piston. On the other hand, the 4-stroke C4 Technology® engine, with its overhead intake and exhaust valves, uses four strokes of the piston (two revolutions of the crankshaft) for each power stroke. But, without the complexity of a separate lubricating system, which must be frequently checked and monitored to avoid serious engine failure. With Shindaiwa C4 Technology®, its business as usual with our standard 50:1 mix flowing fresh lubricant throughout the engine. No dipstick required!

Shindaiwas C4 Technology® features a unique patented feature called the Power Boost Chamber. This supercharging element helps the engine develop more horsepower and torque compared to traditional 4-stroke engines that do not have the Power Boost Chamber. In multi-position use, an oil pump slinger is ineffective in properly lubricating critical engine parts. In addition, the mechanical slinger tends to reduce overall output and will diminish an engines performance. Again, our C4 Technology® has just a single container for the gas and oil fuel mix no need for an oil pump slinger, separate oil sump, and dipstick!