Introducing the latest two-cycle design innovation from Maruyama Manufacturing Co.

High
Efficiency
Recirculator
Engine

The Future is H.E.R.E. ™

Photo's of prototype engine

General Specifications

- Three engine displacements
- Standard Walbro Rotary Valve Carburetor
- Variable ignition timing through CDI Ignition System
- Enclosed, high efficiency transfer ports

Data based on prototype engine test results

Emission Reduction, Fuel Economy and Performance Benefits

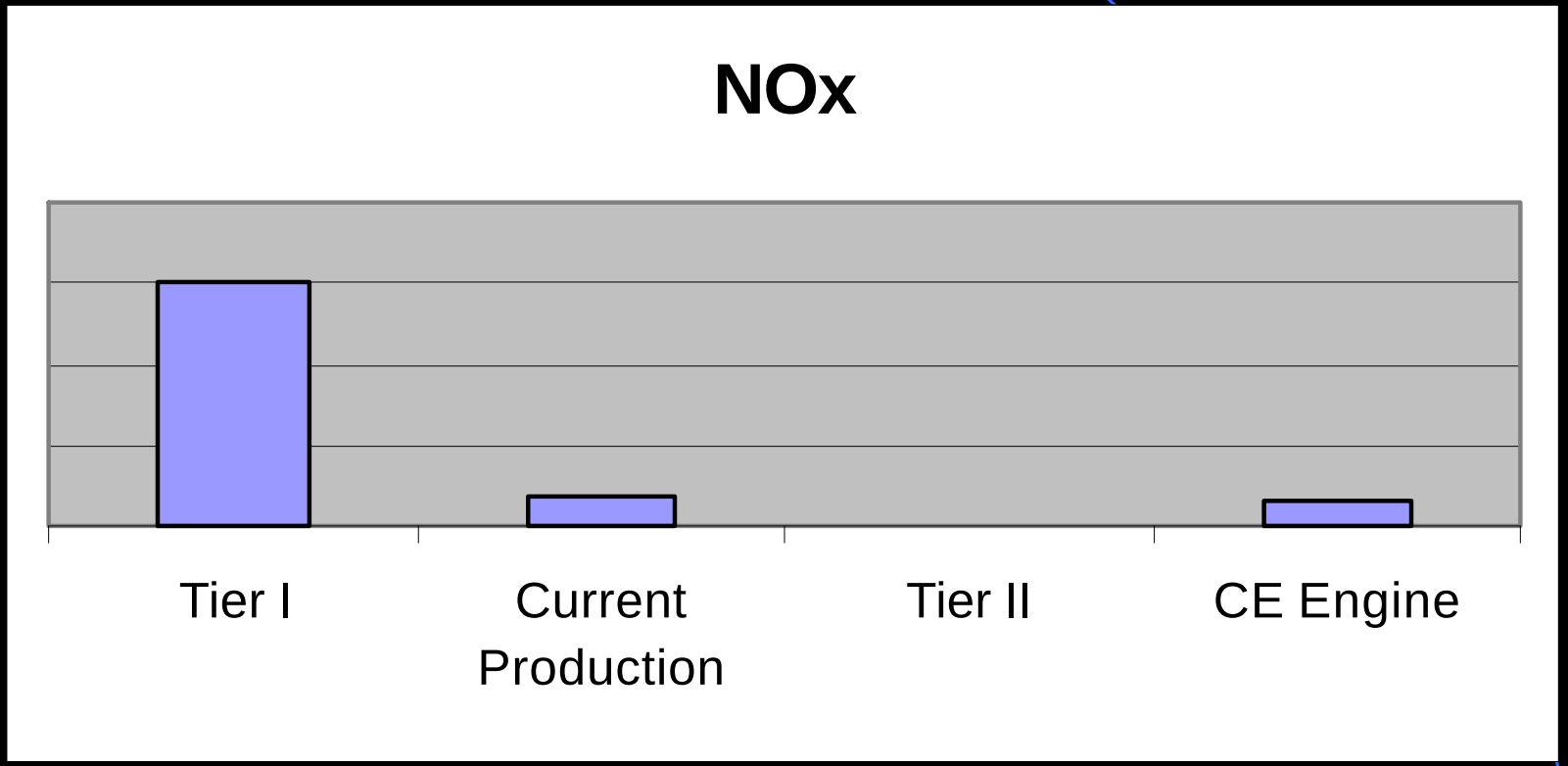
As Compared to Existing Tier 1 Two-cycle Engine

Emission Reduction Percentage Parts Per Million

- CO 53% Down
- THC 50% Down
- NOx 16% Up (value remains under Tier II regulations)

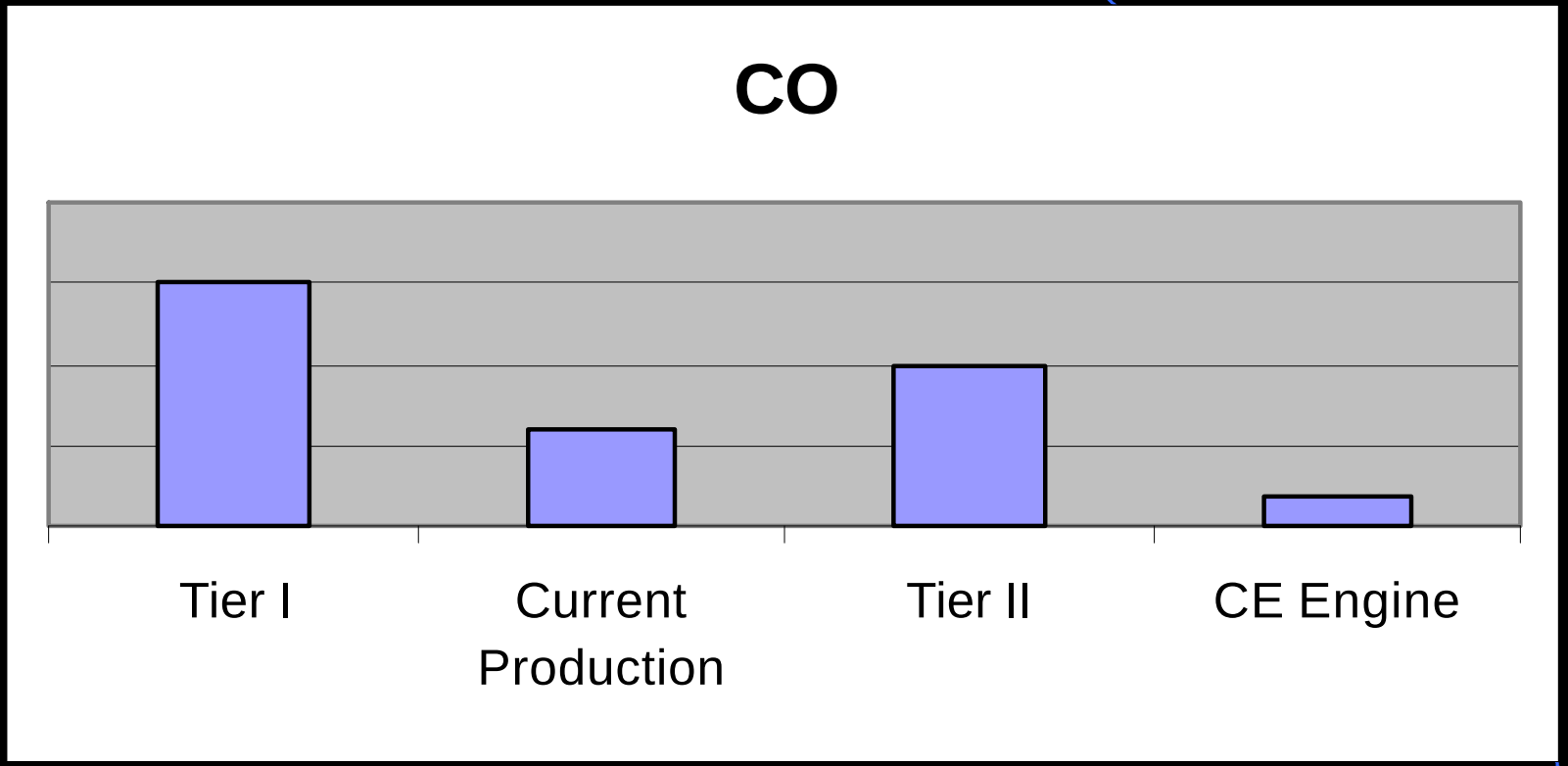
Data based on prototype engine test results

NOx Reduction
Grams per Horsepower Hour



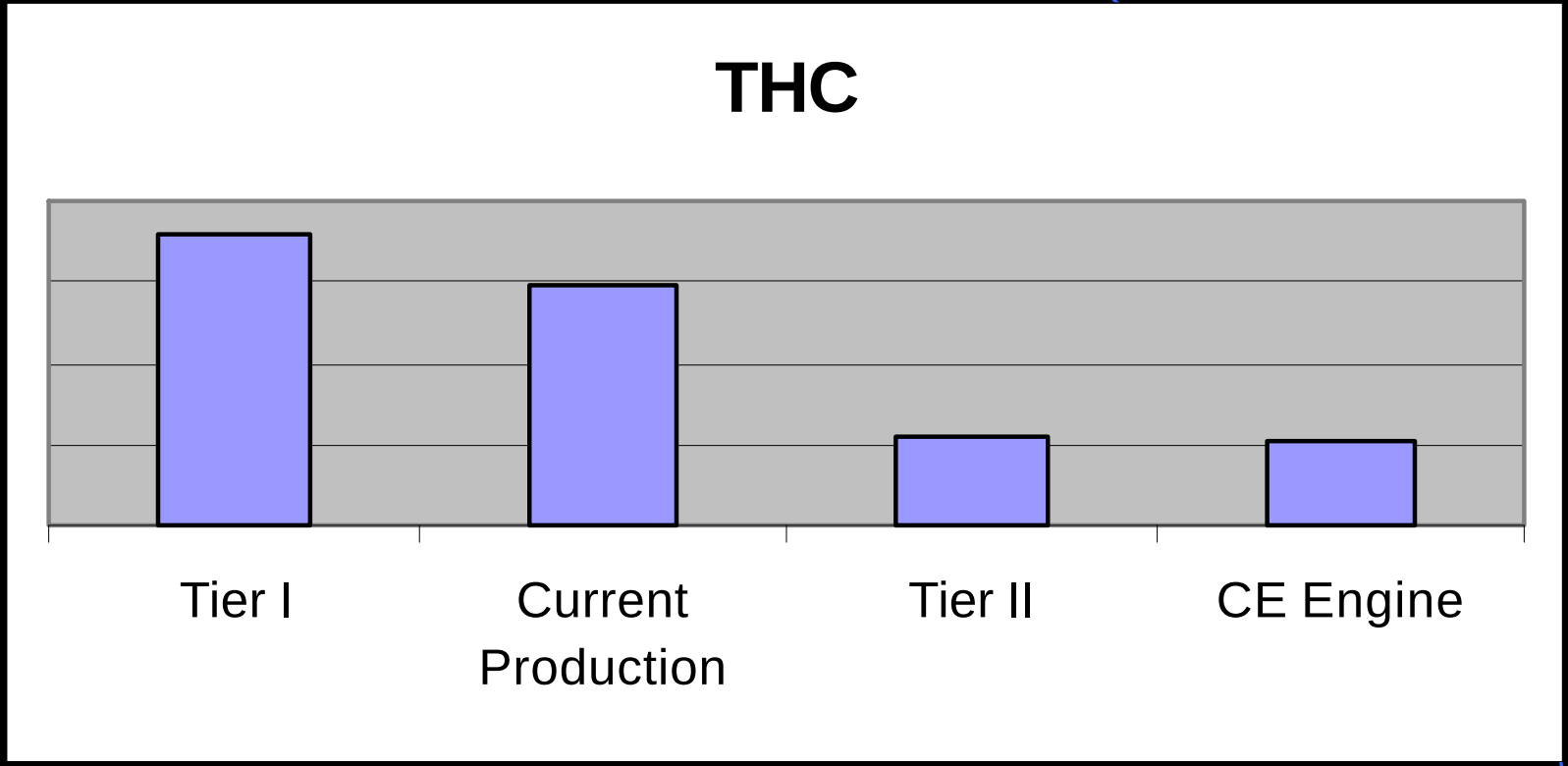
Data based on prototype engine test results

CO Reduction
Grams per Horsepower Hour



Data based on prototype engine test results

THC Reduction
Grams per Horsepower Hour



Data based on prototype engine test results

Fuel Economy and Horsepower

- Fuel consumption 40% Down
- Horsepower 23% Up

Data based on prototype engine test results

Operational Cycles of a Conventional Two-Cycle

- Intake
- Transfer
- Compression
- Ignition
- Exhaust

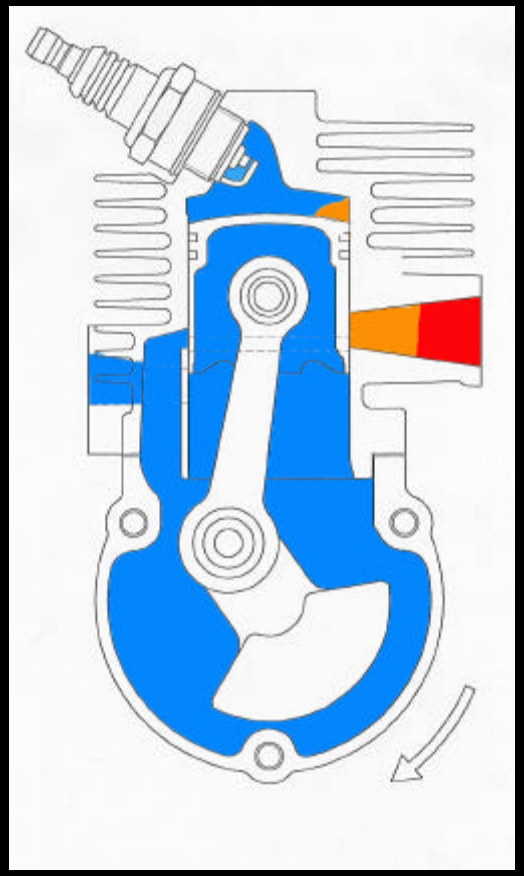
Data based on prototype engine test results

Operational Cycles of a Recirculator Two-Cycle

- Intake
- Recirculator Event
- Transfer
- Compression
- Ignition
- Exhaust

Data based on prototype engine test results

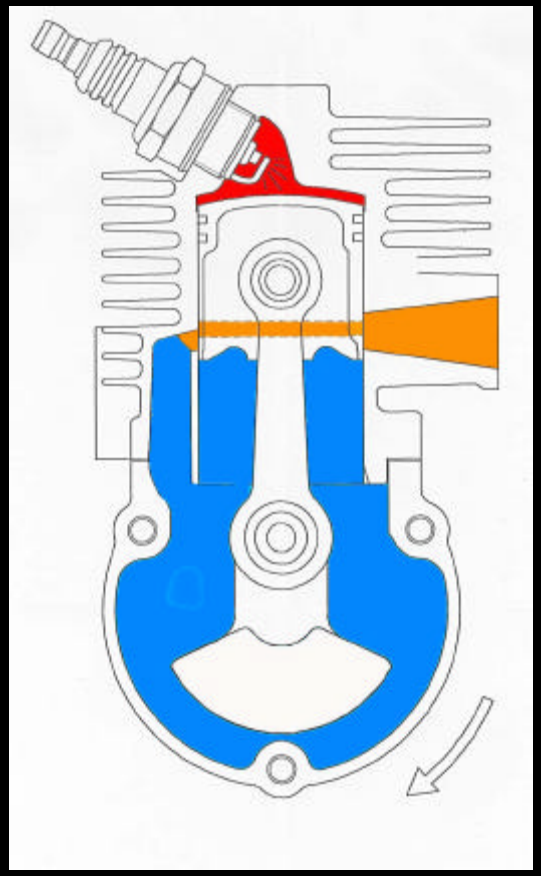
Intake



- Fuel/ air mixture is drawn into crankcase as the piston travels upwards in the cylinder

Data based on prototype engine test results

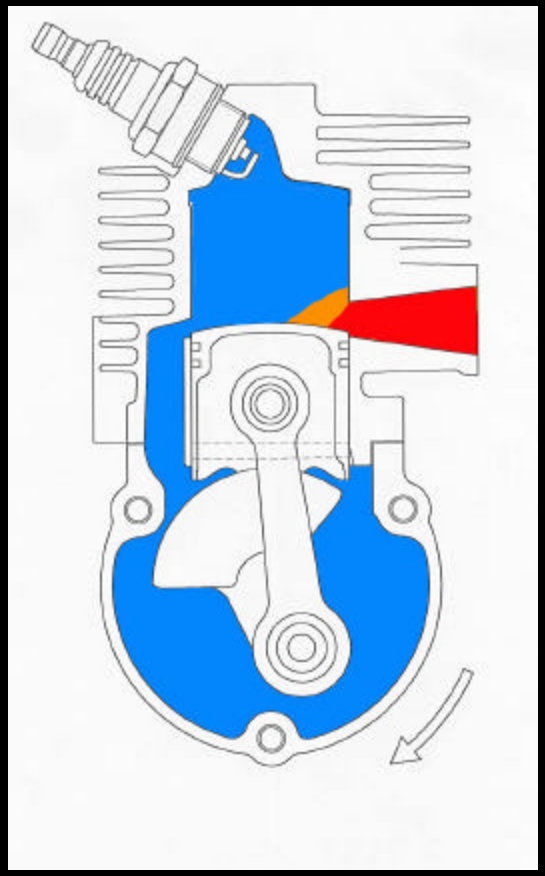
Recirculator Event



- Recirculator Port opens at Top Dead Center
- Pressurized Exhaust gasses are introduced to incoming fuel/ air charge at the transfer port

Data based on prototype engine test results

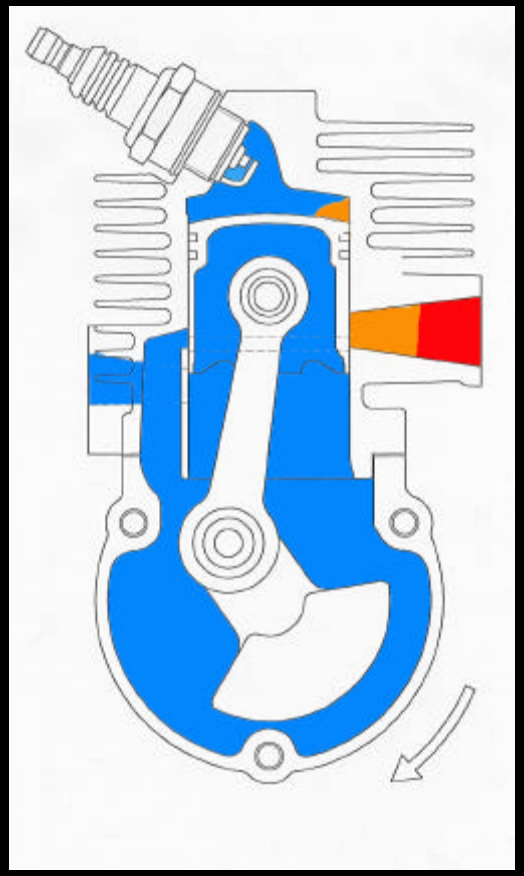
Transfer



- Small amount of exhaust gas creates a barrier between intake and exhaust charges
- Incoming fuel/ air mixture is drawn into the combustion chamber as the piston travels down

Data based on prototype engine test results

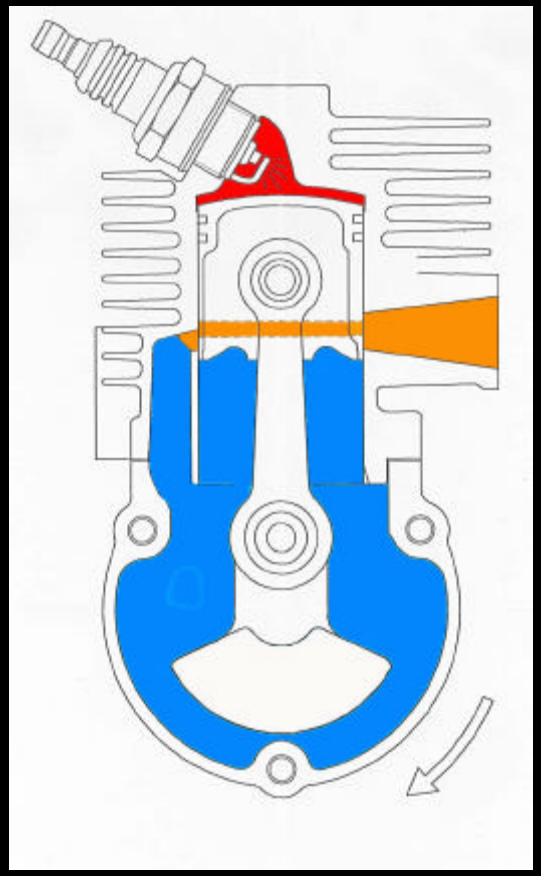
Compression



- Fuel mixture is compressed

Data based on prototype engine test results

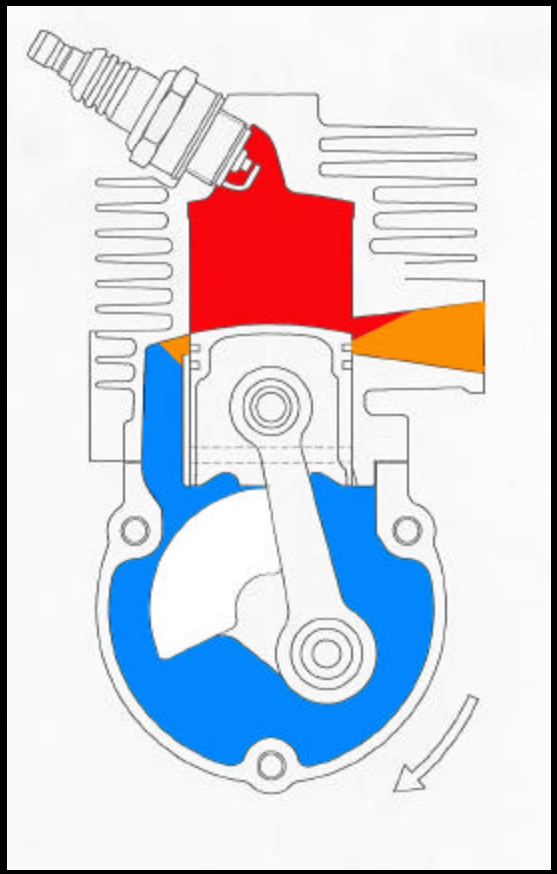
Ignition



- Fuel mixture is ignited and power stroke begins

Data based on prototype engine test results

Exhaust



- Burned fuel mixture exits combustion chamber through exhaust port

Data based on prototype engine test results

Key Benefits of the Recirculator Two-Cycle

- Retains proven and durable engine design
- No additional expensive or complicated components
- Maintains benefits of conventional two-cycle engine
- Reduces harmful emissions in excess of 50% when compared to conventional two-cycle

Data based on prototype engine test results

Thank You!