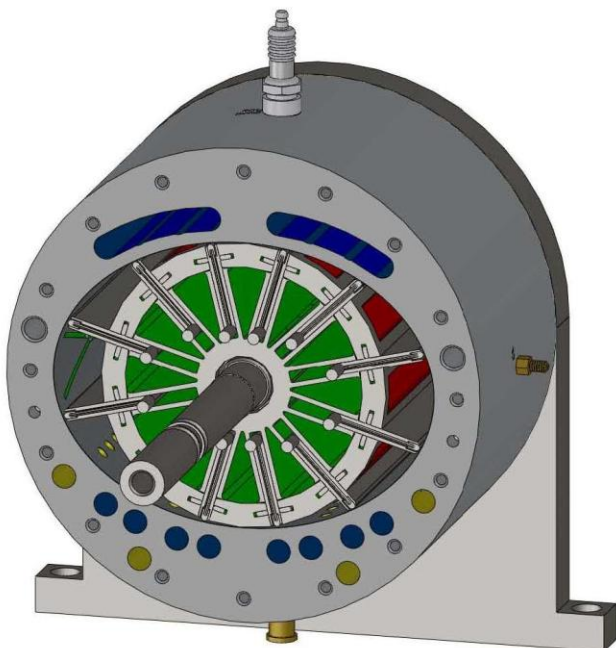


# Circle Ellipse Diesel & Gasoline Engines

U.S. Patent 10,570,739,  
Awarded 25 February 2020

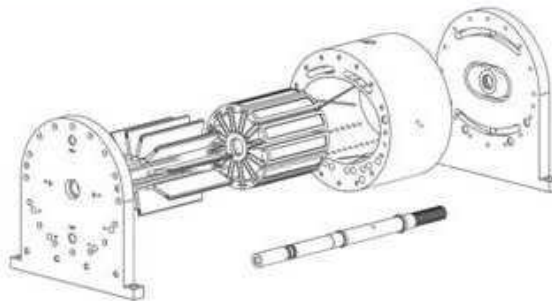


*The Circle Ellipse Engine is shown with end plate removed. Pseudo color used to highlight functions: cooling water (blue), air intake and exhaust (yellow), lubrication (green), and combustion (red)*

**Circle Ellipse Engine Company**  
1124 Lauren Manor Loop  
Ruskin, FL 33570 USA

CircleEllipseEngine.atwebpages.com  
Telephone: +1.440.463.2765

## CE Engine Exploded View



## CE Engine Functional

The Circle Ellipse Engine is Compact, Lightweight, and Vibration Free. It has only five major unique parts (detailed on the right panel). These are the Rotor, Housing, Vanes, End Plates, and Drive Shaft.

The small size & weight are made possible by elimination of pistons, intake and exhaust valves, rocker arms, valve lifters, cam shaft, crank shaft, journal bearings, timing chains & related components.

Because the Circle Ellipse Engine has a combustion event in each section of the rotor EVERY revolution, it delivers the same horsepower as a same displacement reciprocating engine at HALF the RPM. This translates into higher efficiency and significant torque.

All Engine Accessories remain the same – alternator, radiators, water and oil pumps, accessories like power steering, power brakes, air conditioning, etc. Intake air and exhaust products are managed by identical components – filters, converters, and mufflers.

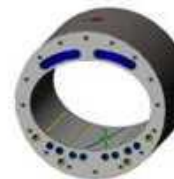
## Major Components / Materials



CE Engine, End Plate Removed. Can be configured as gasoline (spark ignition) Engine or Diesel (compression ignition) Engine, with more steel housing and thicker vanes.



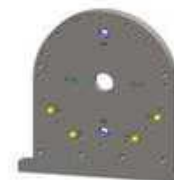
Rotor: AISI 4340 Steel, Normalized. The rotor is partitioned into 12 sections. Each section includes a pair of adjacent vane slots, and face seals to isolate the combustion areas from lubrication and cooling oil.



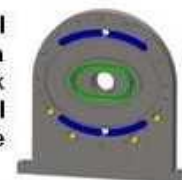
Housing: AISI 4340 Steel, Normalized (Diesel), or 6061-T6 Aluminum (Gasoline). The Housing has passageways for water, oil, air, and exhaust. The elliptical center opening, in conjunction with the round rotor, forms the four events for the Otto-Cycle.



Vanes: M2 Tool Steel, Qty 12. Each pair of adjacent vanes provide opposite walls of combustion chambers. The vane tip is slotted for apex seals, which serve the identical purpose as their counterpart in the Wankel Engine.



End Plate, AISI 4340 Steel. An elliptical track controls radial position of the vanes.



Drive Shaft: AISI 4340 Steel, Normalized. Commercial Rotary Union couples lubrication & cooling oil to inside of rotor.



## CE Engine Specifications: Gasoline Engine Examples

### 2-litre Gasoline Engine (Aluminum Housing)

122	Displacement (cu in)		
246.9	Weight (pounds)		
12x12x10	Dimensions (in)		
432	Torque (lb-ft)		
RPM	Mass Air (lb/min)	Fuel Flow gal/hr	HP
250	1.211	0.750	21
500	2.421	1.500	41
750	3.632	2.250	62
1000	4.842	3.001	82
1250	6.053	3.751	103
1500	7.263	4.501	124
1750	8.474	5.251	144
2000	9.685	6.001	165
2250	10.895	6.751	185
2500	12.106	7.501	206

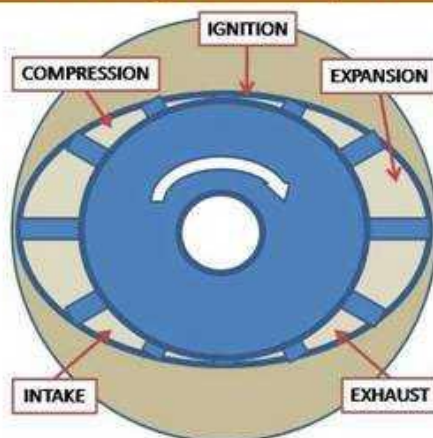
### 7-litre Gasoline Engine (Aluminum Housing)

427	Displacement (cu in)		
665.9	Weight (pounds)		
17x17x15	Dimensions (in)		
1514	Torque (lb-ft)		
RPM	Mass Air (lb/min)	Fuel Flow gal/hr	HP
250	4.237	2.626	72
500	8.475	5.251	144
750	12.712	7.877	216
1000	16.949	10.503	288
1250	21.186	13.128	360
1500	25.424	15.754	432
1750	29.661	18.380	504
2000	33.898	21.005	576
2250	38.136	23.631	648
2500	42.373	26.257	720

## CE Engine Ideal for Applications Where Size & Weight Matter

- Air & exhaust enter/exit like 2-cycle engine
- Vanes reciprocate & partition chambers
- Eliminates valves, pistons, rocker arms, crankshaft, camshaft, & connecting rods
- 12 combustion events every revolution

## CE Engine Otto-Cycle



## CE Engine Design Features

- Elliptical housing inner surface encircles rotor forming variable size chambers for execution of the Otto-Cycle
- Reciprocating radial vanes partition the chambers into 12 sectors
- 12 continuous combustion events every revolution
- Optimal rpm determined by fuel resonance time (approximately 8 milliseconds)
- Seal and coating technology derived from Mazda's implementation of Wankel Engine
- Housing integrates water jacket to ensure thermal stability
- Rotating parts cooled by injecting oil through rotary union section of hollow drive shaft into rotor
- Vane position governed by pin track in end plates
- Oil flow restrictors optimize lubrication of metal seals and minimize oil in combustion
- Major refurbishment cycle is 100,000 hours
- Operating Temp: -40°F to +150°F
- Scalable for any application

## CE Engine Specifications: Diesel Engine Examples

### 5-litre Diesel Engine (All Steel)

305	Displacement (cu in)		
528.7	Weight (pounds)		
15x15x13	Dimensions (in)		
837	Torque (lb-ft)		
RPM	Mass Air (lb/min)	Fuel Flow gal/hr	HP
250	3.026	1.323	40
500	6.051	2.646	80
750	9.077	3.968	120
1000	12.102	5.291	159
1250	15.128	6.614	199
1500	18.153	7.937	239
1750	21.179	9.260	279
2000	24.205	10.583	319
2250	27.230	11.905	359
2500	30.256	13.228	398

### 12-litre Diesel Engine (All Steel)

732	Displacement (cu in)		
1083.7	Weight (pounds)		
20x20x18	Dimensions (in)		
2009	Torque (lb-ft)		
RPM	Mass Air (lb/min)	Fuel Flow gal/hr	HP
250	7.263	3.176	96
500	14.527	6.351	191
750	21.790	9.527	287
1000	29.053	12.703	383
1250	36.317	15.878	478
1500	43.580	19.054	574
1750	50.843	22.229	670
2000	58.107	25.405	765
2250	65.370	28.581	861
2500	72.633	31.756	956

## CE Engine Business Goal and Assignment of Patent Rights

The Circle Ellipse Engine Company seeks a business relationship with an established manufacturer to complete the fabrication and test of the engine, and assignment of patented rights for all applications.