



## ***Backgrounder***

### **EVINRUDE® E-TEC™ FEATURES, BENEFITS & SPECIFICATIONS**

#### **Inline-2, Inline-3, V4 and V6 models**

Four innovative and distinct features of the Evinrude E-TEC engine technology continue to set its performance apart from current industry offerings to truly make it unique:

- Easy-to-own and operate
- Cleaner and quieter
- Durability, quality and reliability
- Power, Performance and Styling

#### **“Easy- to-Own and Operate”**

**No Adjust Linkage** - On all Evinrude E-TEC outboard engines, the throttle cable simply hooks to the linkage pin. There is only one way the components can be assembled in the factory, which eliminates the need for adjustments made at the factory or at the dealership. Idle speed is controlled by the ECU, not the throttle cable, and the idle speed can be adjusted for the customer by the dealer with diagnostic software. No adjustments, no sync and link at the dealer. The ECU automatically resets the linkage each time the key is turned on.

**300 hours no dealer-scheduled maintenance** – There are no oil changes with this engine, as well as no belts, and no valve or throttle linkage adjustments. This makes Evinrude E-TEC engines easier to maintain than comparable four-stroke engines.

**High capacity alternator** – The high capacity alternator output is significantly higher at low rpm than existing DI and 4-stroke engines. The 60 degree V4 & V6 E-TEC engines have 15 amps of battery charging available at 500 rpm or idle, and 50 amps from 2000 rpm to wide open throttle. The competition often claims higher total (gross) alternator output, but usually will not tell the customer the true (net) amps available for battery charging.

Another aspect in this component is true-battery isolation, which means a battery can be charged separately from the main-cranking battery. In other words, if one battery is completely discharged and the other full, then the alternator will send power to the uncharged battery.

If a boater is looking for battery-isolation, a pigtail splice is available from Evinrude/Johnson Genuine Parts that can be placed into a connector so there is a full 25 amp (net) charging system for each of the two batteries.

**Easy rigging capability** – In today’s large outboard engines, it often takes considerable rigging to bring the cables in and through the motor covers. The Evinrude E-TEC models provide an easier alternative with a more intuitive and simplistic rigging system developed by BRP. Cables are brought in through one location, connected with clamps, and directed up the side of the engine. There, the battery cables and boat connections are all connected in one location. A colored diagram located on the inside of the engine panel guides technicians to properly rig the engine.

**Fuse box** –The engine has one fuse positioned in an easily-accessible location. Some engines use many fuses, which are often difficult to find and change because of inconvenient locations behind other components or wires.

**CAN bus connectivity** – This forward-thinking component is part of every new 60 degree V4 and V6 E-TEC engine, allowing boat builders and boaters to utilize the CAN bus option to choose how the controls are configured.

Today, the percentage of CAN bus users is relatively small (less than 10%). However, the engine does have the open port available on the harness as it is anticipated the usage numbers will increase in the future.

## “Cleaner and Quieter”

### **The E-TEC Signature Sound**

**Air Intake Silencer** - One of the benefits of the E-TEC air intake silencer design is that the intake openings are located high on the silencer cover which prohibits any water that may find its way inside the motor cover from entering the engine.

The air intake silencer has also been designed using CFD (Computational Fluid Dynamics) analysis to create an air box that has a two chamber acoustic-type system that allows air to enter through the back chamber and expand into a large volume. It then contracts itself and moves into a front chamber before it enters the throttle body itself. Designing an air silencer with two large volumes that can contract between each volume without losing power is an important feature. This air box design is beneficial for acoustics and ensures good power.

**Muffler** – The new idle relief system was designed to ensure smooth running, while keeping the exhaust quiet at idle, by eliminating high back pressure inside the engine when the engine is at low speed, and when the water level is high. Evinrude E-TEC outboards send all exhaust straight through the idle relief muffler when the boat is off plane.

BRP also designed the muffler box to be tuned for volume at a low idle speed – 500 rpm. The exhaust sound enters the chamber, bounces off the wall and resonates into the chamber, where the exhaust gas flows, then goes through the grillwork and out the idle relief ports.

**Low Idle Speed** – The 60 degree V4 & V6 E-TEC idles at 500 rpm, while competitive engines run around 700-750 rpm. The slower idle speed provides a distinct advantage for trolling, fuel economy, and docking maneuverability, while keeping sound levels extremely low.

**Idle Air Bypass** – All Evinrude E-TEC outboard engines have closed throttle plates at idle. From idle up to approximately 1500 rpm, air comes through a tube with a metered restrictor instead of the throttle plates which remain closed. When running at higher than 1500 rpm, the air is brought in through the throttle plates. This is a tremendous advantage for low speed sound.

**Quiet Injector Switching** – The injector clicking sound in the moving coil on E-TEC engines has been eliminated. The extreme efficiency of the E-TEC injectors allow the current that is delivered to the injector to be momentarily reversed at low speeds. The reverse pulse dampens the injector coil, and the click is eliminated.

### **CARB 3-Star**

E-TEC engines are well below the CARB (California Air Resources Board) 2008 3-star levels and EU 2006 compliance. The E-TEC Injector reduces time for spray to get to cylinder by 50 percent, which ultimately decreases emissions.

### **Durability, Quality and Reliability**

**Motor Cover** - One of the many E-TEC design elements was the introduction of auxiliary ports where air is allowed to enter the cowling. The E-TEC motor cover has minimal vacuum effect during a following sea at these ports. It also serves as a drain path and is designed so a rush of water can continue its momentum straight out the ports on the top sides of the cover.

Inside the cover, there are air inlets with deflectors that keep out water that may enter the cover flowing through the engine cover, away from the powerhead.

**Spark Plugs and Low Voltage** – The new spark plug used in E-TEC engines now has extended life and greater durability thanks to use of a smaller platinum-tipped rivet rather than a pad. BRP was able to lengthen spark plug life expectancy to 300 hours by reducing the primary voltage from 300 to 200 V in the ignition system, reducing spark plug gap erosion.

**Lubrication System** – These are proven components, providing a compact and efficient package that uses only one oil line running from the tank to the engine. There is no return line in the system. The oil system uses a pressure transducer rather than a pressure switch. This sensor is much smarter than a switch, automatically monitoring oil pressure and adjusting levels accordingly. It can quickly detect any issues in the oil line or system, which immediately puts the engine in the S.A.F.E. mode. In S.A.F.E. mode, an E-TEC engine is capable of running up to five hours with no oil.

**Reed Box** – The new reed box is larger and more efficient than typical direct injection outboards, increasing power and efficiency of the engine while making throttle response smooth.

### **Power, Performance & Unique Styling**

**Fuel Economy** - Superior power and performance is the product of better fuel economy and lighter weight. E-TEC technology utilizes Stratified combustion for unsurpassed fuel economy at low engine speeds and a fuel injector that is more efficient than previous direct injection technologies. With E-TEC, fuel is injected into the combustion chamber for increased efficiency. The exclusive Engine Management Module (EMM) receives constant input from various sensors to provide precise fuel delivery resulting in instant starts, smooth operation, strong performance and excellent fuel efficiency.

The efficiency of the E-TEC direct injection system provides increased horsepower and torque because of the unique design. In an E-TEC engine, there is a power stroke with every revolution of the crankshaft, as opposed to four-stroke engines designed to have a power stroke every-other revolution. More horsepower and torque means greater acceleration and top

speed. High Output (HO) models are available with a high performance gearcase, providing increased performance for tournament fisherman and high-performance boaters.

**Light Weight** - E-TEC outboards are significantly lighter than competitive 4-stroke outboard engines. Less weight means quicker hole shots to get on plane faster and provides superior boat handling.

**Unique Styling** – E-TEC engines are compact but house durable, robust components in a unique design that has a swept back profile and self-aligning hood for easy engine access.

### **Evinrude E-TEC Specs**

<b>V4 Platform</b>	<b>115 hp</b>
<b>Model</b>	<b>115DPL 115DSL 115DPX</b>
<b>Engine Type</b>	V4 60° E-TEC Direct Injection
<b>Shaft Length in (mm) /color</b>	20" / blue 20"/ white 25" / white
<b>Weight lbs (kg)</b>	380 (173)
<b>Bore x stroke in (mm) displacement cu in (cc)</b>	3.6" x 2.588" 91mm x 66mm
<b>Displacement cc/in</b>	1726cc/105.4CI
<b>Trim</b>	Fast Trak™ Trim & Tilt / 75 degrees
<b>Propshaft HP (kW)</b>	115hp @ 5500 RPM
<b>Full Throttle Operating Range</b>	5250 – 5750 rpm
<b>Gear Ratio</b>	20" - 2:1 / 25" - 2.25:1
<b>Fuel Induction</b>	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode
<b>*Alternator Output Available @ Battery</b>	50 amp
<b>Cooling</b>	Pressure and temperature controlled water cooled
<b>Oil Delivery System</b>	E-TEC auto lube
<b>Emissions Rating</b>	CARB 3 Star EU 2006

®, ™ Trademark of Bombardier Recreational Products Inc. or its subsidiaries.

\* Trademark of Bombardier Inc. used under license.

V6 Platform	200 hp	200 hp HO	225 hp	225 hp HO	250 hp
<b>Model</b>	a) E200DPL b) E200DSL c) E200DPX d) E200DCX	E200DHL	a) E225DPL b) E225DPX c) E225DCX d) E225DPZ e) E225DCZ	a) E225DHL b) E225DHX	a) E250DPL b) E250DPX c) E250DCX d) E250DPZ e) E250DCZ
<b>Engine type</b>	V6 90° E-TEC direct injection				
<b>Shaft length in (mm)/color</b>	a) 20" (508) / blue b) 20" (508) / white c) d) 25" (635) / white	20" (508) / blue	a) 20" (508) / blue b) c) 25" (635) / white d) e) 30" (762) / white	a) 20" (508) / blue b) 25" (635) / blue	a)20" (508) / blue b) c) 25" (635) / white d) e) 30" (762) / white
<b>Weight lbs (kg)</b>	a) b) 516 (234) c) d) 524 (238)	509 (231)	a) 516 (234) b) c) 524 (238) d) e) 530 (240)	a) 509 (231) b) 517 (233)	a) 516 (234) b) c) 524 (238) d) e) 530 (240)
<b>Bore x stroke in (mm) Displacement cu in (cc)</b>	3.854 x 2.858 (98 x 73)  200 (3279)				
<b>Starting</b>	Electric	Electric	Electric	Electric	Electric
<b>Trim Method</b>	FasTrak™ Power Trim and Tilt				
<b>Propshaft HP (kW)</b>	200 hp (149.1) @ 5,500 rpm	Factory Tuned for High Performance	225 hp (167.8) @ 5,500 rpm	Factory Tuned for High Performance	250 hp (186.4) @ 5,500 rpm
<b>Full Throttle Operating range</b>	5,000-6,000 rpm				
<b>Gear Ratio</b>	1.85:1	1.85:1 High Speed	1.85:1	1.85:1 High Speed	1.85:1
<b>Fuel Induction</b>	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode				
<b>*Alternator Output Available @ Battery</b>	Variable Voltage Computer Controlled 133 Amp / 1800 watt output w/regulator	Variable Voltage Computer Controlled 133 Amp / 1800 watt output w/regulator	Variable Voltage Computer Controlled 133 Amp / 1800 watt output w/regulator	Variable Voltage Computer Controlled 133 Amp / 1800 watt output w/regulator	Variable Voltage Computer Controlled 133 Amp / 1800 watt output w/regulator
<b>Cooling</b>	Pressure and temperature controlled water cooled				
<b>Oil Delivery System</b>	E-TEC auto lube				
<b>Emissions Rating</b>	EPA, EU CARB 3-Star				

<b>In-Line 2 &amp; 3 Cylinder</b>	<b>40 hp</b>	<b>50 hp</b>	<b>60 hp</b>	<b>75 hp</b>	<b>90 hp</b>
<b>Model</b>	a) E40DPL b) E40DEL c) E40DRL	E50DPL	E60DPL	E75EPL	a) E90DPL b) E90DSL c) E90DPX
<b>Engine type</b>	Inline 2-cylinder E-TEC Direct Injection	Inline 2-cylinder E-TEC Direct Injection	Inline 2-cylinder E-TEC Direct Injection	Inline 3-cylinder E-TEC Direct Injection	Inline 3-cylinder E-TEC Direct Injection
<b>Shaft length in (mm)/color</b>	a) b) c) 20" (508) / blue	20" (508) / blue	20" (508) / blue	20" (508) / blue	a) 20" (508) / blue b) 20" (508) / white c) 25" (635) / white
<b>Weight lbs (kg)</b>	a) 240 (109) b) 230 (104) c) 232 (105)	240 (109)	240 (109)	320 (145)	a) b) 320 (145) c) 326 (148)
<b>Bore x stroke in (mm) Displacement cu in (cc)</b>	3.600 x 2.588 (91 x 66)  52.7 (863)	3.600 x 2.588 (91 x 66)  52.7 (863)	3.600 x 2.588 (91 x 66)  52.7 (863)	3.600 x 2.588 (91 x 66)  79 (1295)	3.600 x 2.588 (91 x 66)  79 (1295)
<b>Starting</b>	a) b) Electric c) Rope	Electric	Electric	Electric	Electric
<b>Trim Method</b>	Power Trim & Tilt	Power Trim & Tilt	Power Trim & Tilt	FasTrak™ Power Trim & Tilt	FasTrak™ Power Trim & Tilt
<b>Propshaft HP (kW)</b>	40 HP (30 kw) @ 5500 RPM	50 HP (37 kw) @ 5750 RPM	60 hp (45 kW) @ 5500 RPM	75 HP (56 kw) @ 5000 RPM	90 HP (67 kw) @ 5000 RPM
<b>Full Throttle Operating range</b>	5000 – 6000 RPM	5500 – 6000 RPM	5500 – 6000 RPM	4500 – 5500 RPM	4500 – 5500 RPM
<b>Gear Ratio</b>	2.67:1	2.67:1	2.67:1	2.0:1	a) b) 2.0:1 c) 2.25:1
<b>Fuel Induction</b>	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode	E-TEC Direct Fuel Injection w/stratified low RPM combustion mode
<b>*Alternator Output Available @ Battery</b>	Variable Voltage Computer Controlled 75 Amp / 1100 watt output w/regulator	Variable Voltage Computer Controlled 75 Amp / 1100 watt output w/regulator	Variable Voltage Computer Controlled 75 Amp / 1100 watt output w/regulator	Variable Voltage Computer Controlled 75 Amp / 1100 watt output w/regulator	Variable Voltage Computer Controlled 75 Amp / 1100 watt output w/regulator
<b>Cooling</b>	Pressure and temperature controlled water cooled				
<b>Oil Delivery System</b>	E-TEC auto lube				
<b>Emissions Rating</b>	EPA, EU CARB 3-Star				