

Caterpillar Rating Definitions



It is very important to be aware of how each individual boat will be operating prior to selecting the engine. This must be accomplished so that the engine rating can match the application. Ratings should be applied on the basis of vessel operation, as well as on the type of boat and the design of the vessel's hull. Vessel descriptions such as work boat, pilot boat, or ferry boat; and hull design such as displacement semi-displacement, or planing hull should not be used alone to define the engine rating or the power demands that may be placed on the engine. More than one rating could apply to each of these descriptions when viewed alone.

Choosing the proper rating depends on a number of operational factors, including the maximum power that is required, how the engine is operated during a typical cycle, and how many hours that the engine is operated per year. Caterpillar has developed a marine engine rating system that explains and simplifies the process. Listed below are descriptions of Caterpillar's engine ratings.

Ratings for 3500 and smaller engines are based on SAE J1228 standard conditions of 29.61 inHG (100kPa) and 77° F (25° C). These ratings also apply at ISO3046/1, ISO8665, DIN6271, and BS5514 conditions of 29.61 inHG (100 kPa), 81° F (27° C), and 60% relative humidity.

Fuel rates are based on fuel oil of 35° API [60° F (16° C)] gravity having an LHV of 18,390 BTU/LB (42,780 kJ/kg) when used at 85° F (29° C) and weighing 7.001 lbs./U.S. gal (838.9 g/liter).

Ratings for 3600 engines are based on SAE J1229 standard conditions of 29.61 inHG (100kPa) and 77° F (25° C). These ratings also apply at ISO3046/1, ISO8665, DIN6271, and BS5514 standard reference conditions. Ratings also meet classification society maximum temperature requirements of 113° F (45° C) temperature to turbo and 90° F (32° C) seawater temperature without de-rate.

Fuel consumption is based on ISO3046/1 with +5% tolerance at rated power for fuel having an LHV of 18,390 BTU/LB (42,780 kJ/kg) when used at 85° F (29° C) and weighing 7.001 lbs./U.S. gal (838.9 g/liter). Includes engine mounted fresh water and lube oil pumps. SFOC without pumps, 2% less.

Additional ratings may be available for specific customer requirements. Consult your Caterpillar Representative for details.

Marine Engine Rating Guidelines



Continuous "A" Rating

% Load Factor	% Time at Rated Speed	Rated RPM	Cruise RPM	Typical Time at Full Load	Typical Hours/Year
80 to 100	up to 100	N/A	N/A	No Limit	5,000 to 8,000

The continuous or "A" rating has been developed for heavy-duty service in vessels such as freighters, tugboats, bottom drag trawlers, and deep river towboats when the engine is operated at rated load and speed up to 100% of the time without interruption or load cycling.



Medium Duty "B" Rating

% Load Factor	% Time at Rated Speed	Rated RPM	Cruise RPM	Typical Time at Full Load	Typical Hours/Year
40 to 80	up to 80	1200 1800 2100 2400	1150 1700 1900 2000	10 Hours out of 12 Hours	3,000 to 5,000

Vessels that utilize the medium duty "B" rating are typically mid-water trawlers, purse seiners, crew and supply boats, ferries, and towboats where locks, sandbars, and curves dictate frequent slowing, and engine load and

speed are constant with some cycling.



Intermittent "C" Rating

% Load Factor	% Time at Rated Speed	Rated RPM	Cruise RPM	Typical Time at Full Load	Typical Hours/Year
20 to 80	up to 50	1330 1800 2100 2300 2400	1200 1600 1900 2100 2200	6 Hours out of 12 Hours	2,000 to 4,000

Vessels that move out and back at higher speeds such as ferries and fish boats (i.e. lobster, crawfish, and tuna boats) offshore service boats, and displacement hull yachts and short trip coastal freighters where engine load and speed are cyclical are positioned in the intermittent or "C" rating.



Patrol Craft "D" Rating

%Load Factor	% Time at Rated Speed	Rated RPM	Cruise RPM	Typical Time at Full Load	Typical Hours/Year
up to 50	up to 16	2100 2300 2600	1800 2000 2200	2 Hours out of 12 Hours	1,000 to 3,000

The "D" or patrol craft rating is utilized by planing hull vessels such as offshore patrol boats, customs boats, police boats, and some fish and fire boats. This rating is also used for bow and stern thrusters.





High Performance "E" Rating

% Load Factor	% Time at Rated Speed	Rated RPM	Cruise RPM	Typical Time at Full Load	Typical Hours/Year
up to 30	up to 8	2100 2200 2300 2800	1800 1900 1900 2400	1/2 an Hour out of 6 Hours	250 to 1,000

Planing hull vessels are generally categorized as high performance "E" rating craft. These vessels include most pleasure craft, harbor patrol boats, harbor master boats, and some fish and patrol boats.