



**CUMMINS INC.**  
Columbus, IN 47201  
Marine Performance Curves  
[gce.cummins.com](http://gce.cummins.com)

Basic Engine Model  
**BTA4.5-ME**  
Engine Configuration  
**D323023MX03**

Curve Number:  
**M-97176**  
CPL Code:  
**5653**  
Date:  
**5-Oct-20**

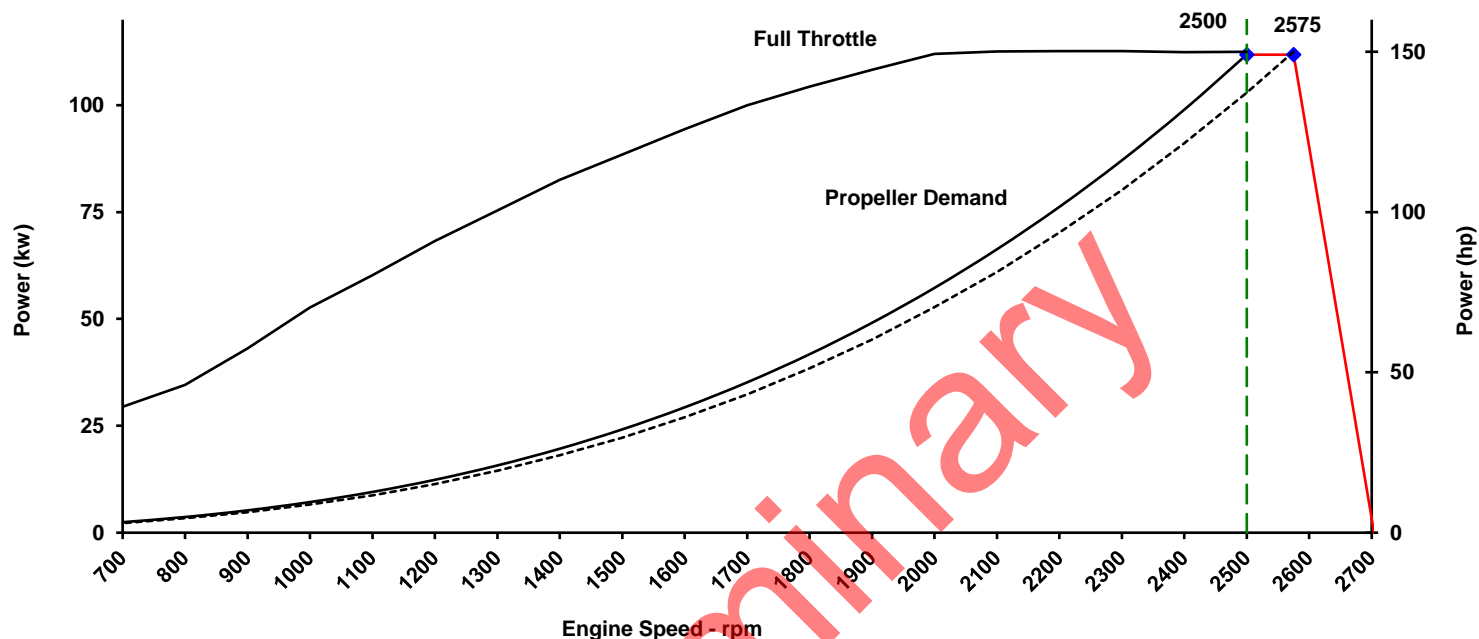
Displacement: **4.5 liter [272 in³]**  
Bore: **107 mm [4.21 in]**  
Stroke: **124 mm [4.88 in]**  
Fuel System: **HPCR**  
Cylinders: **4**

Rated Power: **112 kw [150 bhp]**  
Rated Speed: **2500 rpm**  
Rating Type: **Heavy Duty**  
Aspiration: **Turbocharged**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:

EPA Tier 3 - Model year requirements of the EPA marine regulation (40CFR1042)

EU Stage V - EC Nonroad Mobile Machinery Directive (2016/1628)



Speed	Full Throttle				Propeller Demand				
	Power		Torque		Power		Torque		Fuel Consumption
	kw	(hp)	N·m	(ft·lb)	kw	(hp)	N·m	(ft·lb)	L/hr (gal/hr)
2575	112	(150)	415	(306)					
2500	112	(150)	427	(315)	112	(150.0)	427	(315.1)	31.8 (8.4)
2400	112	(150)	445	(328)	99	(132.7)	394	(290.4)	27.6 (7.3)
2300	112	(150)	465	(343)	87	(116.8)	362	(266.7)	23.9 (6.3)
2200	112	(150)	486	(359)	76	(102.2)	331	(244.0)	20.7 (5.5)
2100	112	(150)	509	(376)	66	(88.9)	301	(222.3)	17.9 (4.7)
1900	108	(144)	541	(399)	49	(65.8)	247	(182.0)	13.3 (3.5)
1700	99	(133)	559	(412)	35	(47.2)	198	(145.7)	9.6 (2.5)
1500	88	(118)	560	(413)	24	(32.4)	154	(113.4)	6.7 (1.8)
1300	75	(100)	550	(406)	16	(21.1)	116	(85.2)	4.6 (1.2)
1200	68	(91)	540	(398)	12	(16.6)	98	(72.6)	3.7 (1.0)
1100	60	(80)	520	(384)	10	(12.8)	83	(61.0)	3.0 (0.8)
1000	52	(70)	500	(369)	7	(9.6)	68	(50.4)	2.4 (0.6)
900	43	(57)	455	(336)	5	(7.0)	55	(40.8)	1.9 (0.5)

**\* Cummins Full Throttle Requirements:**

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- Engines in variable displacement boats (such as pushboats, tugboats, net dragners, etc.) achieve no less than 100 rpm below rated speed at full throttle during a dead push or bollard pull
- Engine achieves or exceeds rated rpm when accelerating from idle to full throttle

Rated Conditions: Ratings are based upon ISO 15550 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%. Values from engine control modules and displayed on instrument panels are not absolute. Tolerance varies, but is generally less than +/-5% when operating within 30% of rated power.

Full Throttle curve represents power at the crankshaft for mature gross engine performance corrected in accordance with ISO 15550. Propeller Curve represents approximate power demand from a typical propeller. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Heavy Duty (HD): Intended for continuous use in variable load applications where full power is limited to eight (8) hours out of every ten (10) hours of operation. Also, reduced power operations must be at or below 200 rpm of the maximum rated rpm. This is an ISO 15550 fuel stop power rating and is for applications that operate 5,000 hours per year or less.

# Propulsion Marine Engine Performance Data

Curve No. M-97176  
 DS: M-97176  
 CPL: 5653  
 DATE: 5-Oct-20

## General Engine Data

Engine Model .....	BTA4.5-ME
Rating Type .....	Heavy Duty
Rated Engine Power .....	112 [150]
Rated Engine Speed .....	2500
Rated Power Production Tolerance .....	5
Rated Engine Torque .....	427 [315]
Peak Engine Torque @ 1400 rpm.....	560 [413]
Brake Mean Effective Pressure .....	1204 [175]
Maximum Allowable Engine Speed .....	2680
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	N.A. [N.A.]
Compression Ratio .....	16.5:1
Piston Speed .....	10.3 [2034]
Firing Order .....	1-3-4-2
Weight (Dry) - Engine Only - Average .....	N.A. [N.A.]

## Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	5%
High Speed Governor Break Point.....	rpm	2575
Default Idle Speed Setting .....	rpm	700
Minimum Idle Speed Setting .....	rpm	650
Normal Idle Speed Variation .....	±rpm	10
High Idle Speed Range Minimum .....	rpm	2500
High Idle Speed Range Maximum .....	rpm	2680

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle.....	l/hr [gal/hr]	21.3 [5.6]
Fuel Consumption at Rated Speed .....	l/hr [gal/hr]	31.8 [8.4]
Maximum Allowable Fuel Supply to Pump Temperature .....	°C [°F]	60.0 [140]
Approximate Fuel Return to Tank Temperature .....	°C [°F]	65.1 [149]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.  
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>

# Propulsion Marine Engine Performance Data

Curve No. M-97176  
 DS: M-97176  
 CPL: 5653  
 DATE: 5-Oct-20

## Air System<sup>1</sup>

Intake Manifold Pressure .....	kPa [in Hg]	182 [54]
Intake Air Flow .....	l/sec [cfm]	198 [420]
Heat Rejection to Ambient .....	kW [Btu/min]	10 [550]

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	l/sec [cfm]	390 [827]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	349 [660]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	509 [948]

## Emissions (in accordance with ISO 8178 Cycle E3)

NO <sub>x</sub> (Oxides of Nitrogen) .....	g/kw·hr [g/hp·hr]	4.60 [3.43]
HC (Hydrocarbons) .....	g/kw·hr [g/hp·hr]	0.30 [0.22]
CO (Carbon Monoxide) .....	g/kw·hr [g/hp·hr]	0.70 [0.52]
PM (Particulate Matter) .....	g/kw·hr [g/hp·hr]	0.09 [0.07]

## Cooling System<sup>1</sup>

Sea Water Pump Specifications .....	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option) .....	kPa [psi]	103 [15]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	120 [17]

## Engines with Low Temperature Aftercooling (LTA )

### Single Loop LTA

Coolant Flow to Cooler (with blocked open thermostat).....	l/min [gal/min]	189 [50]
LTA Thermostat Operating Range (Start to Open) .....	°C [°F]	71 [160]
LTA Thermostat Operating Range (Full Open) .....	°C [°F]	83 [181]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	114 [6500]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

<sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.

<sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.

<sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.

<sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.

<sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.

COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>



**CUMMINS INC.**  
Columbus, IN 47201  
Marine Performance Curves  
[gce.cummins.com](http://gce.cummins.com)

Basic Engine Model  
**BTA4.5-ME**  
Engine Configuration  
**D323023MX03**

Curve Number:  
**M-97161**  
CPL Code:  
**5653**  
Date:  
**5-Oct-20**

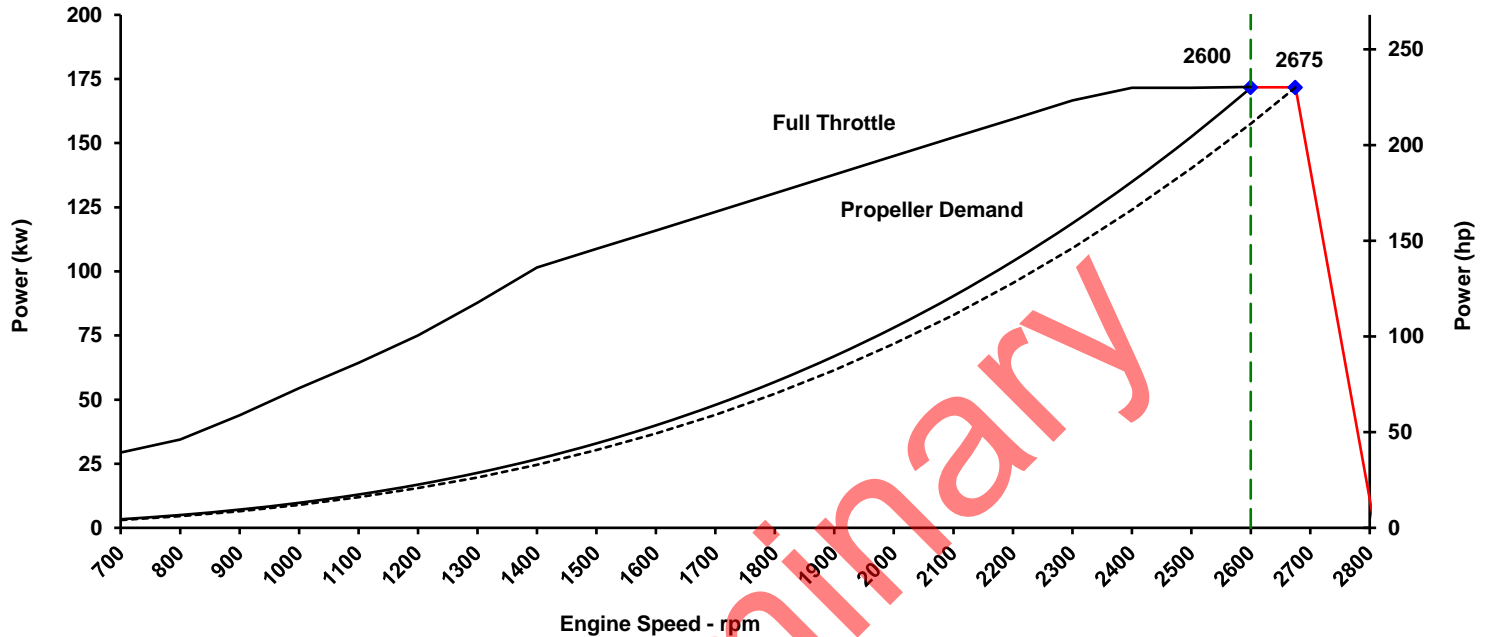
Displacement: **4.5 liter [272 in³]**  
Bore: **107 mm [4.21 in]**  
Stroke: **124 mm [4.88 in]**  
Fuel System: **HPCR**  
Cylinders: **4**

Rated Power: **172 kw [230 bhp]**  
Rated Speed: **2600 rpm**  
Rating Type: **Intermittent Duty**  
Aspiration: **Turbocharged**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:

EPA Tier 3 - Model year requirements of the EPA marine regulation (40CFR1042)

IMO Tier II (Two) NOx requirements of International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



Speed	Full Throttle				Propeller Demand				
	Power		Torque		Power		Torque		Fuel Consumption
	kw	(hp)	N·m	(ft·lb)	kw	(hp)	N·m	(ft·lb)	L/hr (gal/hr)
2675	172	(230)	613	(452)	172	(230.0)	630	(464.6)	46.7 (12.3)
2600	172	(230)	631	(465)	172	(230.0)	630	(464.6)	46.7 (12.3)
2500	171	(230)	655	(483)	154	(206.9)	589	(434.6)	43.1 (11.4)
2400	171	(230)	682	(503)	138	(185.3)	550	(405.5)	38.2 (10.1)
2300	167	(223)	691	(510)	123	(165.2)	511	(377.2)	33.3 (8.8)
2200	159	(214)	691	(510)	109	(146.5)	474	(349.7)	28.9 (7.6)
2000	145	(194)	691	(510)	84	(113.3)	403	(297.4)	21.9 (5.8)
1800	130	(175)	691	(510)	64	(85.2)	337	(248.6)	16.5 (4.4)
1600	116	(155)	691	(510)	46	(62.0)	276	(203.5)	12.1 (3.2)
1400	101	(136)	691	(510)	32	(43.2)	220	(162.2)	8.4 (2.2)
1300	88	(118)	644	(475)	26	(35.4)	194	(143.0)	6.9 (1.8)
1200	75	(101)	597	(440)	21	(28.5)	169	(124.8)	5.6 (1.5)
1100	64	(86)	559	(412)	17	(22.5)	146	(107.6)	4.5 (1.2)
1000	54	(73)	520	(384)	13	(17.4)	124	(91.5)	3.7 (1.0)
900	44	(59)	465	(343)	10	(13.1)	104	(76.5)	2.9 (0.8)

**\* Cummins Full Throttle Requirements:**

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- Engines in variable displacement boats (such as pushboats, tugboats, net dragners, etc.) achieve no less than 100 rpm below rated speed at full throttle during a dead push or bollard pull
- Engine achieves or exceeds rated rpm when accelerating from idle to full throttle

Rated Conditions: Ratings are based upon ISO 15550 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%. Values from engine control modules and displayed on instrument panels are not absolute. Tolerance varies, but is generally less than +/-5% when operating within 30% of rated power.

Full Throttle curve represents power at the crankshaft for mature gross engine performance corrected in accordance with ISO 15550. Propeller Curve represents approximate power demand from a typical propeller. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Intermittent Duty (ID): Intended for intermittent use in variable load applications where full power is limited to two hours out of every eight hours of operation. Also, reduced power operations must be at or below 300 rpm of the maximum rated rpm. This rating is an ISO 15550 fuel stop power rating and is for applications that operate less than 1,500 hours per year.

# Propulsion Marine Engine Performance Data

Curve No. M-97161  
 DS: M-97161  
 CPL: 5653  
 DATE: 5-Oct-20

## General Engine Data

Engine Model .....	BTA4.5-ME
Rating Type .....	Intermittent Duty
Rated Engine Power .....	172 [230]
Rated Engine Speed .....	2600
Rated Power Production Tolerance .....	5
Rated Engine Torque .....	630 [465]
Peak Engine Torque @ 1400 rpm.....	691 [510]
Brake Mean Effective Pressure .....	1775 [257]
Maximum Allowable Engine Speed .....	2707
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	N.A. [N.A.]
Compression Ratio .....	16.5:1
Piston Speed .....	10.7 [2115]
Firing Order .....	1-3-4-2
Weight (Dry) - Engine Only - Average .....	N.A. [N.A.]

## Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	5%
High Speed Governor Break Point.....	rpm	2675
Default Idle Speed Setting .....	rpm	700
Minimum Idle Speed Setting .....	rpm	650
Normal Idle Speed Variation .....	±rpm	10
High Idle Speed Range Minimum .....	rpm	2600
Maximum .....	rpm	2707

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	l/hr [gal/hr]	32.0 [8.5]
Fuel Consumption at Rated Speed .....	l/hr [gal/hr]	46.7 [12.3]
Maximum Allowable Fuel Supply to Pump Temperature .....	°C [°F]	60.0 [140]
Approximate Fuel Return to Tank Temperature .....	°C [°F]	65.1 [149]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.  
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>

# Propulsion Marine Engine Performance Data

Curve No. M-97161  
 DS: M-97161  
 CPL: 5653  
 DATE: 5-Oct-20

## Air System<sup>1</sup>

Intake Manifold Pressure .....	kPa [in Hg]	224 [66]
Intake Air Flow .....	l/sec [cfm]	233 [493]
Heat Rejection to Ambient .....	kW [Btu/min]	12 [660]

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	l/sec [cfm]	516 [1,093]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	407 [765]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	594 [1,101]

## Emissions (in accordance with ISO 8178 Cycle E3)

NO <sub>x</sub> (Oxides of Nitrogen) .....	g/kw·hr [g/hp·hr]	5.00 [3.73]
HC (Hydrocarbons) .....	g/kw·hr [g/hp·hr]	0.20 [0.15]
CO (Carbon Monoxide) .....	g/kw·hr [g/hp·hr]	0.70 [0.52]
PM (Particulate Matter) .....	g/kw·hr [g/hp·hr]	0.06 [0.04]

## Cooling System<sup>1</sup>

Sea Water Pump Specifications .....	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option) .....	kPa [psi]	103 [15]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	120 [17]

## Engines with Low Temperature Aftercooling (LTA )

### Single Loop LTA

Coolant Flow to Cooler (with blocked open thermostat).....	l/min [gal/min]	193 [51]
LTA Thermostat Operating Range (Start to Open) .....	°C [°F]	71 [160]
LTA Thermostat Operating Range (Full Open) .....	°C [°F]	83 [181]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	166 [9458]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.  
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>



**CUMMINS INC.**  
Columbus, IN 47201  
Marine Performance Curves  
[gce.cummins.com](http://gce.cummins.com)

Basic Engine Model  
**BTA4.5-ME**  
Engine Configuration  
**D323023MX03**

Curve Number:  
**M-97176**  
CPL Code:  
**5653**  
Date:  
**5-Oct-20**

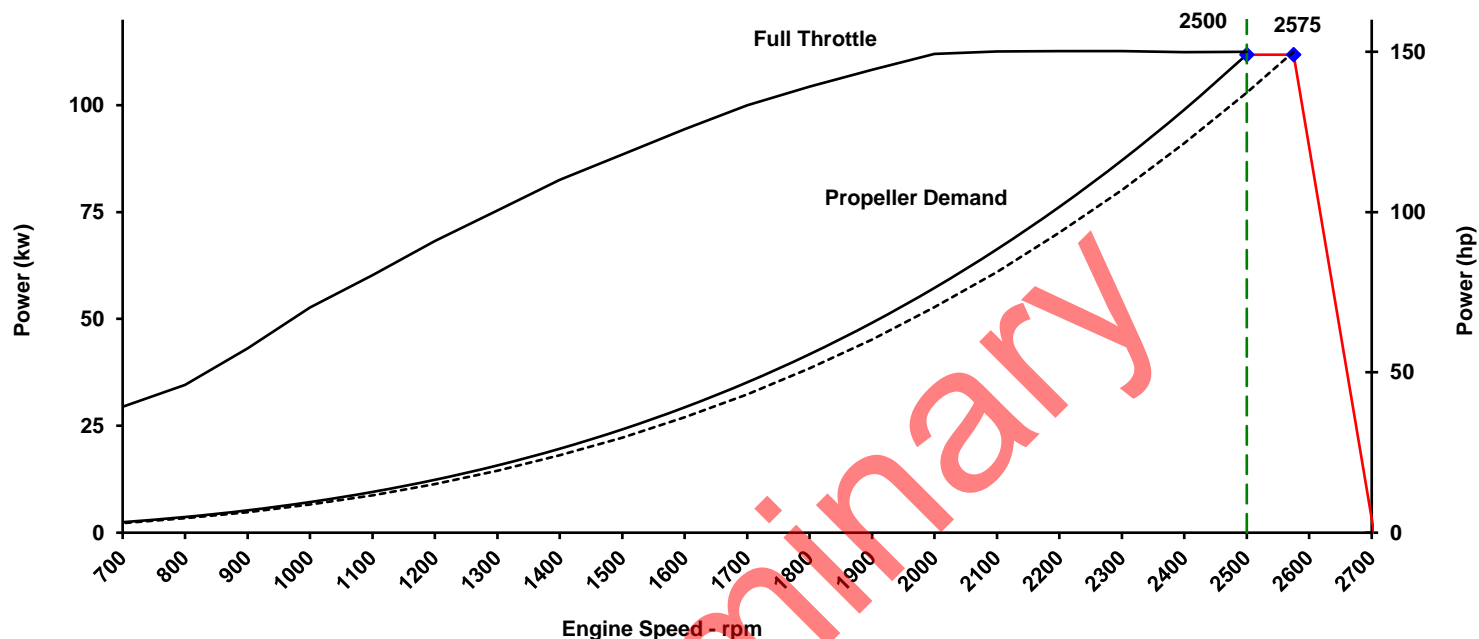
Displacement: **4.5 liter [272 in³]**  
Bore: **107 mm [4.21 in]**  
Stroke: **124 mm [4.88 in]**  
Fuel System: **HPCR**  
Cylinders: **4**

Rated Power: **112 kw [150 bhp]**  
Rated Speed: **2500 rpm**  
Rating Type: **Heavy Duty**  
Aspiration: **Turbocharged**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:

EPA Tier 3 - Model year requirements of the EPA marine regulation (40CFR1042)

EU Stage V - EC Nonroad Mobile Machinery Directive (2016/1628)



Speed	Full Throttle				Propeller Demand				
	Power		Torque		Power		Torque		Fuel Consumption
	kw	(hp)	N·m	(ft·lb)	kw	(hp)	N·m	(ft·lb)	L/hr (gal/hr)
2575	112	(150)	415	(306)	112	(150.0)	427	(315.1)	31.8 (8.4)
2500	112	(150)	427	(315)	99	(132.7)	394	(290.4)	27.6 (7.3)
2400	112	(150)	445	(328)	87	(116.8)	362	(266.7)	23.9 (6.3)
2300	112	(150)	465	(343)	76	(102.2)	331	(244.0)	20.7 (5.5)
2200	112	(150)	486	(359)	66	(88.9)	301	(222.3)	17.9 (4.7)
2100	108	(144)	509	(376)	49	(65.8)	247	(182.0)	13.3 (3.5)
1900	99	(133)	559	(412)	35	(47.2)	198	(145.7)	9.6 (2.5)
1700	88	(118)	560	(413)	24	(32.4)	154	(113.4)	6.7 (1.8)
1500	75	(100)	550	(406)	16	(21.1)	116	(85.2)	4.6 (1.2)
1300	68	(91)	540	(398)	12	(16.6)	98	(72.6)	3.7 (1.0)
1100	60	(80)	520	(384)	10	(12.8)	83	(61.0)	3.0 (0.8)
1000	52	(70)	500	(369)	7	(9.6)	68	(50.4)	2.4 (0.6)
900	43	(57)	455	(336)	5	(7.0)	55	(40.8)	1.9 (0.5)

**\* Cummins Full Throttle Requirements:**

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- Engines in variable displacement boats (such as pushboats, tugboats, net dragger, etc.) achieve no less than 100 rpm below rated speed at full throttle during a dead push or bollard pull
- Engine achieves or exceeds rated rpm when accelerating from idle to full throttle

Rated Conditions: Ratings are based upon ISO 15550 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%. Values from engine control modules and displayed on instrument panels are not absolute. Tolerance varies, but is generally less than +/-5% when operating within 30% of rated power.

Full Throttle curve represents power at the crankshaft for mature gross engine performance corrected in accordance with ISO 15550. Propeller Curve represents approximate power demand from a typical propeller. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg. C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Heavy Duty (HD): Intended for continuous use in variable load applications where full power is limited to eight (8) hours out of every ten (10) hours of operation. Also, reduced power operations must be at or below 200 rpm of the maximum rated rpm. This is an ISO 15550 fuel stop power rating and is for applications that operate 5,000 hours per year or less.



# Propulsion Marine Engine Performance Data

Curve No. M-97176  
 DS: M-97176  
 CPL: 5653  
 DATE: 5-Oct-20

## General Engine Data

Engine Model .....	BTA4.5-ME
Rating Type .....	Heavy Duty
Rated Engine Power .....	112 [150]
Rated Engine Speed .....	2500
Rated Power Production Tolerance .....	5
Rated Engine Torque .....	427 [315]
Peak Engine Torque @ 1400 rpm.....	560 [413]
Brake Mean Effective Pressure .....	1204 [175]
Maximum Allowable Engine Speed .....	2680
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	N.A. [N.A.]
Compression Ratio .....	16.5:1
Piston Speed .....	10.3 [2034]
Firing Order .....	1-3-4-2
Weight (Dry) - Engine Only - Average .....	N.A. [N.A.]

## Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	5%
High Speed Governor Break Point.....	rpm	2575
Default Idle Speed Setting .....	rpm	700
Minimum Idle Speed Setting .....	rpm	650
Normal Idle Speed Variation .....	±rpm	10
High Idle Speed Range Minimum .....	rpm	2500
Maximum .....	rpm	2680

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	l/hr [gal/hr]	21.3 [5.6]
Fuel Consumption at Rated Speed .....	l/hr [gal/hr]	31.8 [8.4]
Maximum Allowable Fuel Supply to Pump Temperature .....	°C [°F]	60.0 [140]
Approximate Fuel Return to Tank Temperature .....	°C [°F]	65.1 [149]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.  
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>



# Propulsion Marine Engine Performance Data

Curve No. M-97176  
 DS: M-97176  
 CPL: 5653  
 DATE: 5-Oct-20

## Air System<sup>1</sup>

Intake Manifold Pressure .....	kPa [in Hg]	182 [54]
Intake Air Flow .....	l/sec [cfm]	198 [420]
Heat Rejection to Ambient .....	kW [Btu/min]	10 [550]

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	l/sec [cfm]	390 [827]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	349 [660]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	509 [948]

## Emissions (in accordance with ISO 8178 Cycle E3)

NO <sub>x</sub> (Oxides of Nitrogen) .....	g/kw·hr [g/hp·hr]	4.60 [3.43]
HC (Hydrocarbons) .....	g/kw·hr [g/hp·hr]	0.30 [0.22]
CO (Carbon Monoxide) .....	g/kw·hr [g/hp·hr]	0.70 [0.52]
PM (Particulate Matter) .....	g/kw·hr [g/hp·hr]	0.09 [0.07]

## Cooling System<sup>1</sup>

Sea Water Pump Specifications .....	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option) .....	kPa [psi]	103 [15]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	120 [17]

## Engines with Low Temperature Aftercooling (LTA )

### Single Loop LTA

Coolant Flow to Cooler (with blocked open thermostat).....	l/min [gal/min]	189 [50]
LTA Thermostat Operating Range (Start to Open) .....	°C [°F]	71 [160]
LTA Thermostat Operating Range (Full Open) .....	°C [°F]	83 [181]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	114 [6500]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

<sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.

<sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.

<sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.

<sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.

<sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.

COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>



**CUMMINS INC.**  
 Columbus, IN 47201  
 Marine Performance Curves  
[gce.cummins.com](http://gce.cummins.com)

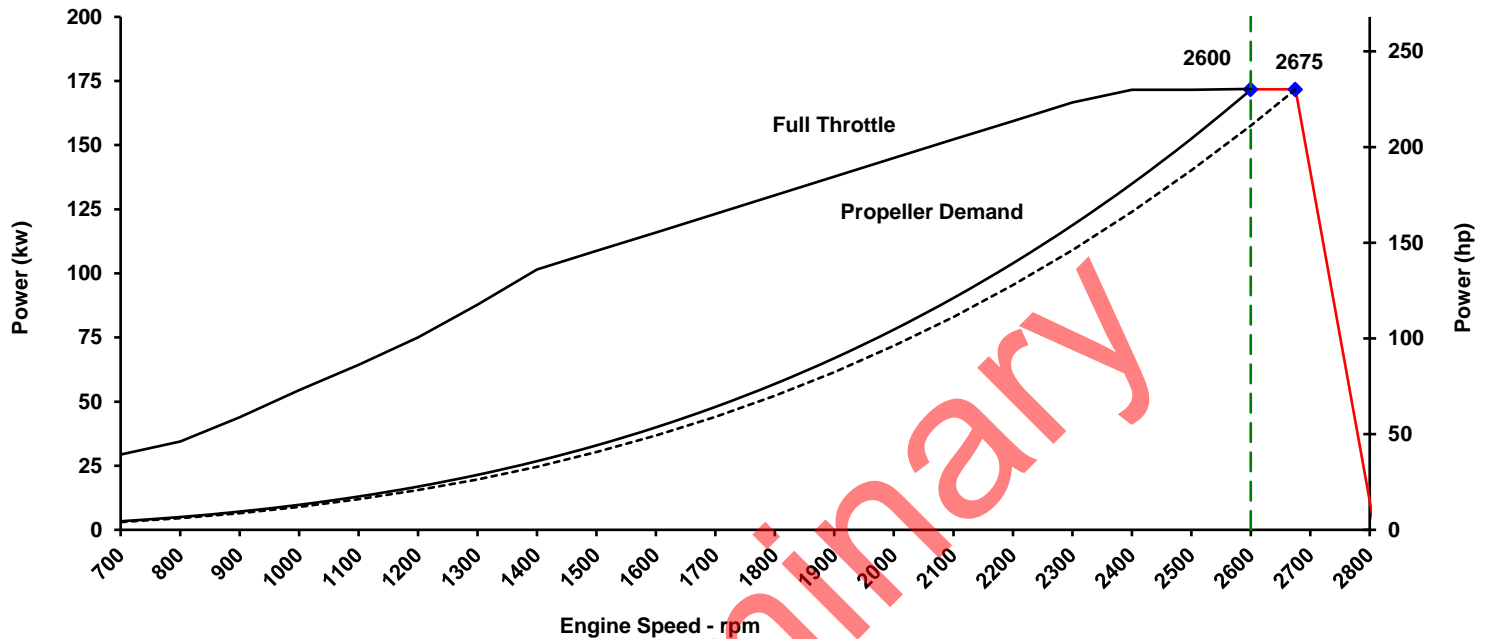
Basic Engine Model  
**BTA4.5-ME**  
 Engine Configuration  
**D323023MX03**

Curve Number:  
**M-97161**  
 CPL Code:  
**5653**  
 Date:  
**5-Oct-20**

Displacement: **4.5 liter [272 in³]**  
 Bore: **107 mm [4.21 in]**  
 Stroke: **124 mm [4.88 in]**  
 Fuel System: **HPCR**  
 Cylinders: **4**

Rated Power: **172 kw [230 bhp]**  
 Rated Speed: **2600 rpm**  
 Rating Type: **Intermittent Duty**  
 Aspiration: **Turbocharged**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:  
 EPA Tier 3 - Model year requirements of the EPA marine regulation (40CFR1042)  
 IMO Tier II (Two) NOx requirements of International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



Speed	Full Throttle				Propeller Demand				
	Power		Torque		Power		Torque		Fuel Consumption
	kw	(hp)	N·m	(ft·lb)	kw	(hp)	N·m	(ft·lb)	L/hr (gal/hr)
2675	172	(230)	613	(452)	172	(230.0)	630	(464.6)	46.7 (12.3)
2600	172	(230)	631	(465)	154	(206.9)	589	(434.6)	43.1 (11.4)
2500	171	(230)	655	(483)	138	(185.3)	550	(405.5)	38.2 (10.1)
2400	171	(230)	682	(503)	123	(165.2)	511	(377.2)	33.3 (8.8)
2300	167	(223)	691	(510)	109	(146.5)	474	(349.7)	28.9 (7.6)
2200	159	(214)	691	(510)	84	(113.3)	403	(297.4)	21.9 (5.8)
2000	145	(194)	691	(510)	64	(85.2)	337	(248.6)	16.5 (4.4)
1800	130	(175)	691	(510)	46	(62.0)	276	(203.5)	12.1 (3.2)
1600	101	(136)	691	(510)	26	(35.4)	194	(143.0)	6.9 (1.8)
1400	88	(118)	597	(440)	17	(22.5)	146	(107.6)	4.5 (1.2)
1300	75	(101)	520	(384)	13	(17.4)	124	(91.5)	3.7 (1.0)
1200	64	(86)	465	(343)	10	(13.1)	104	(76.5)	2.9 (0.8)

**\* Cummins Full Throttle Requirements:**

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- Engines in variable displacement boats (such as pushboats, tugboats, net dragners, etc.) achieve no less than 100 rpm below rated speed at full throttle during a dead push or bollard pull
- Engine achieves or exceeds rated rpm when accelerating from idle to full throttle

Rated Conditions: Ratings are based upon ISO 15550 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%. Values from engine control modules and displayed on instrument panels are not absolute. Tolerance varies, but is generally less than +/-5% when operating within 30% of rated power.

Full Throttle curve represents power at the crankshaft for mature gross engine performance corrected in accordance with ISO 15550. Propeller Curve represents approximate power demand from a typical propeller. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Intermittent Duty (ID): Intended for intermittent use in variable load applications where full power is limited to two hours out of every eight hours of operation. Also, reduced power operations must be at or below 300 rpm of the maximum rated rpm. This rating is an ISO 15550 fuel stop power rating and is for applications that operate less than 1,500 hours per year.

# Propulsion Marine Engine Performance Data

Curve No. M-97161  
DS: M-97161  
CPL: 5653  
DATE: 5-Oct-20

## General Engine Data

Engine Model .....	BTA4.5-ME
Rating Type .....	Intermittent Duty
Rated Engine Power .....	172 [230]
Rated Engine Speed .....	2600
Rated Power Production Tolerance .....	5
Rated Engine Torque .....	630 [465]
Peak Engine Torque @ 1400 rpm.....	691 [510]
Brake Mean Effective Pressure .....	1775 [257]
Maximum Allowable Engine Speed .....	2707
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	N.A. [N.A.]
Compression Ratio .....	16.5:1
Piston Speed .....	10.7 [2115]
Firing Order .....	1-3-4-2
Weight (Dry) - Engine Only - Average .....	N.A. [N.A.]

## Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	5%
High Speed Governor Break Point.....	rpm	2675
Default Idle Speed Setting .....	rpm	700
Minimum Idle Speed Setting .....	rpm	650
Normal Idle Speed Variation .....	±rpm	10
High Idle Speed Range Minimum .....	rpm	2600
High Idle Speed Range Maximum .....	rpm	2707

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	l/hr [gal/hr]	32.0 [8.5]
Fuel Consumption at Rated Speed .....	l/hr [gal/hr]	46.7 [12.3]
Maximum Allowable Fuel Supply to Pump Temperature .....	°C [°F]	60.0 [140]
Approximate Fuel Return to Tank Temperature .....	°C [°F]	65.1 [149]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.  
COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>

# Propulsion Marine Engine Performance Data

Curve No. M-97161  
 DS: M-97161  
 CPL: 5653  
 DATE: 5-Oct-20

## Air System<sup>1</sup>

Intake Manifold Pressure .....	kPa [in Hg]	224 [66]
Intake Air Flow .....	l/sec [cfm]	233 [493]
Heat Rejection to Ambient .....	kW [Btu/min]	12 [660]

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	l/sec [cfm]	516 [1,093]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	407 [765]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	594 [1,101]

## Emissions (in accordance with ISO 8178 Cycle E3)

NO <sub>x</sub> (Oxides of Nitrogen) .....	g/kw·hr [g/hp·hr]	5.00 [3.73]
HC (Hydrocarbons) .....	g/kw·hr [g/hp·hr]	0.20 [0.15]
CO (Carbon Monoxide) .....	g/kw·hr [g/hp·hr]	0.70 [0.52]
PM (Particulate Matter) .....	g/kw·hr [g/hp·hr]	0.06 [0.04]

## Cooling System<sup>1</sup>

Sea Water Pump Specifications .....	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option) .....	kPa [psi]	103 [15]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	120 [17]

## Engines with Low Temperature Aftercooling (LTA )

### Single Loop LTA

Coolant Flow to Cooler (with blocked open thermostat).....	l/min [gal/min]	193 [51]
LTA Thermostat Operating Range (Start to Open) .....	°C [°F]	71 [160]
LTA Thermostat Operating Range (Full Open) .....	°C [°F]	83 [181]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	166 [9458]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS INC.  
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

<http://gce.cummins.com/>