

APPENDIX D-4

BENEFICIARY ELIGIBLE MITIGATION ACTION CERTIFICATION

**State of Connecticut
Round 1 November 14, 2019
Commercial Marine Vessels**

APPENDIX D-4
Beneficiary Eligible Mitigation Action Certification

BENEFICIARY ELIGIBLE MITIGATION ACTION CERTIFICATION

Beneficiary The State of Connecticut

Lead Agency Authorized to Act on Behalf of the Beneficiary The Connecticut Department of Energy & Environmental Protection
(Any authorized person with delegation of such authority to direct the Trustee delivered to the Trustee pursuant to a Delegation of Authority and Certificate of Incumbency)

Action Title:	Commercial Marine Vessels Diesel Mitigation Project
Beneficiary's Project ID:	Commercial Marine Vessels Replacement Round 1
Funding Request No.	<i>(sequential)</i> 4
Request Type: (select one or more)	<input checked="" type="checkbox"/> Reimbursement <input type="checkbox"/> Advance <input type="checkbox"/> Other (specify): _____
Payment to be made to: (select one or more)	<input type="checkbox"/> Beneficiary <input checked="" type="checkbox"/> Other (specify): <u>Grant Recipient</u>
Funding Request & Direction (Attachment A)	<input type="checkbox"/> Attached to this Certification <input checked="" type="checkbox"/> To be Provided Separately

SUMMARY

Eligible Mitigation Action	<input checked="" type="checkbox"/> Appendix D-2 item (specify): <u>Commercial Marine Vessels</u>
Action Type	<input type="checkbox"/> Item 10 - DERA Option (5.2.12) (specify and attach DERA Proposal):
Explanation of how funding request fits into Beneficiary's Mitigation Plan (5.2.1): See Attached	
Detailed Description of Mitigation Action Item Including Community and Air Quality Benefits (5.2.2): See Attached	
Estimate of Anticipated NOx Reductions (5.2.3): See Attached	
Identification of Governmental Entity Responsible for Reviewing and Auditing Expenditures of Eligible Mitigation Action Funds to Ensure Compliance with Applicable Law (5.2.7.1): The Connecticut Department of Energy & Environmental Protection (DEEP)	
Describe how the Beneficiary will make documentation publicly available (5.2.7.2). See Attached	
Describe any cost share requirement to be placed on each NOx source proposed to be mitigated (5.2.8). See Attached	
Describe how the Beneficiary complied with subparagraph 4.2.8, related to notice to U.S. Government Agencies (5.2.9). See Attached	

If applicable, describe how the mitigation action will mitigate the impacts of NOx emissions on communities that have historically borne a disproportionate share of the adverse impacts of such emissions (5.2.10).
See Attached

ATTACHMENTS
(CHECK BOX IF ATTACHED)

- Attachment A Funding Request and Direction.
- Attachment B Eligible Mitigation Action Management Plan Including Detailed Budget and Implementation and Expenditures Timeline (5.2.4).
- Attachment C Detailed Plan for Reporting on Eligible Mitigation Action Implementation (5.2.11).
- Attachment D Detailed cost estimates from selected or potential vendors for each proposed expenditure exceeding \$25,000 (5.2.6). [Attach only if project involves vendor expenditures exceeding \$25,000.]
- Attachment E DERA Option (5.2.12). [Attach only if using DERA option.]
- Attachment F Attachment specifying amount of requested funding to be debited against each beneficiary's allocation (5.2.13). [Attach only if this is a joint application involving multiple beneficiaries.]


CERTIFICATIONS

By submitting this application, the Lead Agency makes the following certifications:

1. This application is submitted on behalf of Beneficiary The State of Connecticut, and the person executing this certification has authority to make this certification on behalf of the Lead Agency and Beneficiary, pursuant to the Certification for Beneficiary Status filed with the Court.
2. Beneficiary requests and directs that the Trustee make the payments described in this application and Attachment A to this Form.
3. This application contains all information and certifications required by Paragraph 5.2 of the Trust Agreement, and the Trustee may rely on this application, Attachment A, and related certifications in making disbursements of trust funds for the aforementioned Project ID.
4. Any vendors were or will be selected in accordance with a jurisdiction's public contracting law as applicable. (5.2.5)
5. Beneficiary will maintain and make publicly available all documentation submitted in

support of this funding request and all records supporting all expenditures of eligible mitigation action funds subject to applicable laws governing the publication of confidential business information and personally identifiable information. (5.2.7.2)

DATED: 11/18/19



Paul E. Farrell

Director of Air Planning

Department of Energy & Environmental Protection

[LEAD AGENCY]

for

The State of Connecticut

[BENEFICIARY]

APPENDIX D-4 – Supplemental Information Beneficiary Eligible Mitigation Action Certification

Beneficiary: State of Connecticut

Lead Agency: Department of Energy and Environmental Protection

In support of funding request No. 4 – Commercial Marine Vessels

Appendix D-4-Summary

Explanation of how funding request fits into Beneficiary’s Mitigation Plan (5.2.1):

The State of Connecticut (State), pursuant to the 2018 Mitigation Plan, filed with Wilmington Trust (WT) on April 26, 2018, outlined a protocol for the selection of commercial marine vessels replacement and repower projects, including ferries, tugs and shorepower for ocean going vessels, to protect the state's air quality and the health of vulnerable populations. The primary goal of the State’s 2018 Mitigation Plan is to improve and protect ambient air quality by selecting and implementing eligible mitigation projects that will (1) achieve significant and sustained cost effective reductions in Nitrogen Oxide (NO_x) emissions, (2) support statewide energy, environmental and economic development goals and (3) reduce impacts on environmental justice and other impacted communities.

Commercial marine vessels emitted 1664 tons or 4.2% of all mobile sources nitrogen oxides (NO_x) emissions in the State during 2014. The funding identified in the 2018 Mitigation Plan (mitigation funding or mitigation funds) will provide the State an opportunity to mitigate the impact of excess NO_x emissions associated with commercial marine vessels. Funding this request allows the replacement of four propulsion engines and two auxiliary generator sets on the M/V Cecilia Ann, which will have immediate and long-lasting benefits for Connecticut's air quality.

Detailed Description of Mitigation Action Item Including Community and Air Quality Benefits (5.2.2):

The purpose of this project is for Block Island Express, LLC (Block Island Express) to repower the M/V Cecilia Ann by replacing its four existing Tier-1 compliant propulsion engines and two existing Tier-1 auxiliary generator sets with 2018 or 2019 EPA certified Tier-3 engines. The existing Tier 1 engines are higher emitting and will be replaced with more efficient engines. The project will also require new gearboxes, keel coolers, engine controls and engine management systems. The M/V Cecilia Ann provides year round passenger ferry service between New London, CT and Block Island, RI. Because of technology advances on the new engines, the project will significantly enhance local air quality around the two ports by reducing engine emissions and will improve engine efficiency by decreasing fuel consumption. It is important to note that these ports and the marine traffic they experience are part of a transportation corridor that parallels Connecticut’s coastline and includes both highway and rail traffic. Decreasing air pollutants in this heavily-travelled corridor leads to improved ambient air quality and human health in communities located in nonattainment areas, areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden. Such communities are often located along transportation corridors such as these. Significant health benefits accrue from reduced public exposure to diesel particulate matter, which the U.S. Environmental Protection Agency (EPA) has classified as a likely human carcinogen. Decreasing the number of work and school days lost to asthma, chronic obstructive pulmonary disease (COPD) and other health conditions aggravated by air pollution benefits the local economy.

The reduction in emissions of the ozone precursor, NO_x, will be a benefit in a state that is in nonattainment with the 2008 and 2015 National Ambient Air Quality Standards for 8-Hour Ozone (NAAQS) and in an area of the state that has been disproportionately impacted by air pollution from diesel vehicles and marine port activity. In addition, the new engine technology will increase operating efficiency and reduce greenhouse gas emissions.

The expected benefits of the commercial marine vessel repower of the M/V Cecelia Ann include tons of pollution reduced or avoided over the lifetime of the engines, specifically NO_x and GHGs. Net reduction in gallons of diesel fuel used and reduced public exposure to diesel particulate matter, which EPA has classified as a likely carcinogen. Additionally, the marine engine repower project is expected to improve ambient air quality and health in communities located in nonattainment areas, in areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy, and the welfare of residents in such communities.

Estimate of Anticipated NO_x Reductions (5.2.3):

The estimated emissions were calculated using the EPA's Diesel Emissions Quantifier (DEQ.) The anticipated NO_x emissions reductions from the commercial marine vessels mitigation project is 25.50 tons per year (tpy) and lifetime NO_x emissions reduction from this group is 28.48 tpy. It should be noted that [recent studies](#) indicate that the actual lifetime for marine engines is nearly twice the default value used by EPA; therefore, the emissions benefits for marine repowers could be much higher.

Describe how the Beneficiary will make documentation publicly available (5.2.7.2):

Complete information and documentation will be posted on DEEP's Volkswagen incentive program website at: www.ct.gov/deep/vw; promotional materials will also be posted and cross-linked on DEEP's Diesel Grants and Funding page at: https://www.ct.gov/deep/cwp/view.asp?a=2684&q=322100&deepNav_GID=1619 and on its [Drive Clean CT](#) Facebook Page.

Describe any cost share requirement to be placed on each NO_x source proposed to be mitigated (5.2.8):

Connecticut's 2018 Mitigation Plan outlines that diesel mitigation funds will provide for non-government owned eligible ferries, tugs and shorepower for oceangoing vessels:

- Up to 40% of the cost of a repower with new diesel or alternate fueled (e.g., CNG, propane, hybrid) engines, including the costs of installation of the engines for ferries or tugs,
- Up to 60% of the cost of a repower with new all-electric engines, including the costs of installation of the engines and associated charging infrastructure; and
- Up to 25% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation and power distribution components.

The Block Island Express, LLC (Block Island Express) was selected for the first round of the commercial marine mitigation project to repower the M/V Cecelia Ann by replacing its four existing Tier-1 compliant propulsion engines and two existing Tier-1 auxiliary generator sets with 2018 or 2019 EPA certified Tier-3 engines. A total of \$971,720 has been allocated from trust funds for the commercial marine vessel replacement mitigation project. Block Island Express was awarded 40% of the cost of the new marine engines, which results in a 60% applicant cost share.

Describe how the Beneficiary complied with subparagraph 4.2.8, related to notice to U.S. Government Agencies (5.2.9):

On February 22, 2018, within 30 days of the State being named a Beneficiary, the Connecticut Department of Energy and Environmental Protection (DEEP), the State's Lead Agency as designated in accordance with the requirements specified in Appendix D-3, contacted, by U.S. Post and electronic mail, the U.S. Departments of Agriculture and Interior, as specified in subparagraph 4.2.8, plus the Bureau of Indian Affairs, the Defense Department and Bureau of Prisons, all of which have lands in the state.

If applicable, describe how the mitigation action will mitigate the impacts of NO_x emissions on communities that have historically borne a disproportionate share of the adverse impacts on such emissions (5.2.10):

The reduction of NO_x from the replacement/repower of commercial marine vessels will improve air quality and protect human health across the state, especially in environmental justice and other underserved communities. The repower of the M/V Cecelia Ann has the potential to positively impact air quality in environmental justice communities because the ferry operates in a distressed municipality. According to the Connecticut Department of Economic Community Development (DECD) the City of New London is the most distressed municipality in the state. Project benefits will originate at the ferry landing at 2 Ferry Street in New London, CT. The exhaust emissions from the Block Island Ferry have disproportionately negative impacts on the local population's air quality due to the proximity of the population and the fact that ports generally experience a disproportionate quantity of air pollution from diesel fleets, including marine vessels. Populations that live and work in near proximity to the ferry terminals as well as passengers will benefit from this project by the direct reduction of ozone precursor and particulate matter emissions.

Major transportation corridors, including I-95, I-84 and I-91 and the rail lines that parallel them, connect New England with the rest of the United States. Barges, ships and ferries are also critical elements of the region's transportation sector. Transportation activity generates air pollution that, along with other upwind sources, negatively impacts air quality and public health in Connecticut. DEEP's criteria for evaluating and selecting projects for funding specifically address location in environmental justice communities, which are characterized, in part, by disproportionate air pollution impacts, and nearness to diesel transportation hubs, including ports, rail yards and highways.

**ELIGIBLE MITIGATION ACTION MANAGEMENT PLAN INCLUDING DETAILED
BUDGET AND IMPLEMENTATION AND EXPENDITURES TIMELINE**

ATTACHMENT B

**PROJECT MANAGEMENT PLAN
PROJECT SCHEDULE AND MILESTONES
COMMERCIAL MARINE VESSELS CATEGORY**

Project Management Plan– Project Schedule and Milestones

Milestone	Date
Connecticut submitted its beneficiary form to US District Court, CA Northern District and to the Trustee	October 2017
Connecticut certified as a Designated Beneficiary under the VW Trust	January 29, 2018
Connecticut submitted its final mitigation plan to Wilmington Trust (the Trustee).	April 26, 2018
Request for Round 1 Proposals Announced	May 30, 2018
DEEP Informational Webinar	June 19, 2018
Request for Round 1 Proposals Closing - Application Deadline	July 31, 2018
Round 1 Awards Selected and Notification sent to Awardees/Recipients	November 13, 2018
Recipients enter into Contracts, Purchase Orders	CY 2019, Q3
Marine Engines Delivered	CY 2019, Q4
Recipients submit proof of destruction and scrappage documentation	CY 2020, Q1
DEEP Receives all required invoices and documentation	Upon completion but no later than March 30, 2020
DEEP reviews, requests corrections if necessary, certifies project completion, and provides reimbursement.	CY2020, Q2
DEEP reports to Trustee on status of and expenditures with Mitigation Actions completed and underway	Within 6 months of first disbursement; January 30 and July 30 thereafter

Project Budget

Budget Category	Total Approved Project Budget	Share of Total Budget Funded by the Trust	Cost Share Paid by Recipient
Equipment Expenditure			
Block Island Express	\$2,429,300	\$971,720	\$1,457,580
Project Totals			
Percentage of Total Project Cost	100%	40%	60%
DEEP Administrative ¹	\$145,758.00	\$145,758.00	\$0
Project Totals with DEEP Administrative	\$2,575,058.00	\$1,117,478.00	\$1,457,580

¹Subject to Appendix D-2 15% administrative cap

PROJECTED TRUST ALLOCATIONS

	2017	2018	2019 - 2020
1. Anticipated Annual Project Funding Request to be paid through the Trust	\$0	\$0	\$971,720.00
2. Anticipated Annual Cost Share	\$0	\$0	\$1,457,580.00
3. Anticipated Total Project Funding by Year (line 1 plus line 2)	\$0		\$2,429,300.00
4. Cumulative Trustee Payments Made to Date Against Cumulative Approved Beneficiary Allocation	\$0	\$0	\$0
5. Current Beneficiary Project Funding to be paid through the Trust (line 1)	\$0	\$0	\$971,720.00
6. Total Funding Allocated to Beneficiary, inclusive of Current Action by Year (line 4 plus line 5)	\$0	\$0	\$971,720.00
7. Beneficiary Share of Estimated Funds Remaining in the Trust	\$0	\$0	\$52,351,609.32
8. Net Beneficiary Funds Remaining in Trust, net of cumulative Beneficiary Funding Actions (line 7 minus line 6)	\$0	\$0	\$51,379,889.32

ATTACHMENT B-1

ELIGIBLE MITIGATION ACTION MANAGEMENT PLAN FOR BLOCK ISLAND EXPRESS

Eligible Mitigation Action Management Plan

Purpose: The purpose of this project is for Block Island Express, LLC (Block Island Express) to repower the M/V Cecelia Ann by replacing its four existing Tier-1 compliant propulsion engines and two existing Tier-1 auxiliary generator sets, as specified in Appendix A, with 2018 or 2019 EPA certified Tier-3 engines, as specified in Appendix B. The project will also require new gearboxes, keel coolers, engine controls and engine management systems. The M/V Cecelia Ann provides year round passenger ferry service between New London, CT and Block Island, RI. Because of technology advances on the new engines, the project will enhance local air quality around the the two ports by reducing engine emissions. The reduction in emissions of the ozone precursor, nitrogen oxides, will be a benefit in a state that is in nonattainment with the National Ambient Air Quality Standards for Ozone and in an area of the state that has been disproportionately impacted by air pollution from diesel vehicles and marine port activity.

Block Island Express shall be responsible for all phases of the project including project management services and materials as needed to complete this project. Completion of the project shall include documentation of the scrappage of the replaced engines.

Project Title: *Repower of the M/V Cecelia Ann*

Description: Following the approval of this Eligible Mitigation Action Management Plan (Plan), Block Island Express shall begin providing the services outlined in this Plan, and continue to provide services through the completion of the project, which will be no later than March 31, 2020.

1. Funding

The Connecticut Department of Energy and Environmental Protection (DEEP) is granting a maximum of \$971,720 in 2018 Volkswagen NOx Mitigation Trust funding to Block Island Express, the grantee. Block Island Express has agreed to contribute an estimated additional \$1,457,580 to the above referenced project through a combination of cash and in kind services, bringing the estimated total value of the project to \$2,429,300. Payment is contingent upon documentation of the completion of the tasks outlined in this Plan.

2. Work Tasks

The Plan is summarized according to the following three tasks:

Task 1: Planning and Procurement

Task 2: Marine Engine Purchase, Delivery, Installation, and Completion of Project

Task 3: Provide Updates and Information for Semi-Annual and Other Reports as Required

Task 1: Planning and Procurement

Block Island Express shall conduct the project, provide oversight and track project progress. To ensure timely completion of the project, Block Island Express shall include, in this Plan, a work plan with a schedule of expected target dates, milestones, responsible parties and completion dates to

achieve specific tasks and accomplishments during the budget and project period. The schedule must be approved by DEEP and Block Island Express.

Block Island Express may use their own procurement processes to identify possible vendors for the purchase of the new engines and shipyard for installation. However, those procurement procedures must reflect all applicable Federal, State and local laws, rules and regulations. The requirements for accessing VW Trust funds require the submission of detailed cost estimates from selected or potential vendors for each proposed expenditure exceeding \$25,000. This is described in Section 5.2 of the Environmental Mitigation Trust Agreement for State Beneficiaries (Mitigation Trust Agreement) between Connecticut, as a State Beneficiary, and Wilmington Trust, which is attached as Appendix D.

Task 1 Deliverables:

- Approved work plan with project timeline/schedule
- Estimates or proposals from potential vendors and shipyards
- Summary of criteria used for selecting vendor(s) and shipyard
- Name and address of vendor(s) and shipyard selected
- Copy of purchase order(s) issued for new engines and to the shipyard for installation
- Documentation of down payments or other up-front payments made for the project

Task 2: Marine Engine Purchase, Delivery, Installation, and Completion of Project

After selecting a vendor and issuing a purchase order for the new engines, Block Island Express will track the progress of the manufacturing and installation of the new engines in the M/V Cecelia Ann.

Block Island Express shall render the replaced engines inoperable, in accordance with Mitigation Trust Agreement requirements for scrappage under the VW grant. Disabling the engine consists of cutting, drilling, or punching a three inch by three inch (3" x 3") hole in the engine block.

Block Island Express shall provide documentation that the engines have been scrapped. Block Island Express shall submit to DEEP an invoice for payment, along with confirmation that the project has been completed.

Task 2 Deliverables:

- Documentation of delivery of engines for M/V Cecelia Ann
- Invoice from vendor for delivered engines and documentation of payment to vendor
- Invoice from shipyard for installation of new engines
- Completed copy of Certificate of Engine/Chassis Destruction (See Appendix C)
- Required photographic scrappage documentation for replaced engines, at a minimum, must include:
 - Engine installed on vessel;
 - Engine label;
 - Engine block, prior to hole;

- Engine block, after hole; and
- Other pictures as needed
- Confirmation that the project is completed and that the engines are operating satisfactorily for their intended use and that sea trials have been completed
- An invoice to DEEP for reimbursement under the grant

Task 3: Provide Updates and Information for Semi-Annual and Other Reports as Required

Block Island Express shall provide DEEP with status updates to be included in DEEP’s semi-annual reports to Wilmington Trust. Semi-annual progress updates will be requested before the 1st of the month following the end of each half year (i.e., July 1, 2019, and January 1, 2020). Follow-up status reports may be requested after March of 2020. Block Island Express will also contribute material necessary for a final report to Wilmington Trust upon completion of the project, which shall be no later than March 31, 2020.

Items to be provided may include, but will not be limited to:

- Environmental results;
- Work plan accomplishments;
- Challenges encountered during planning and implementation;
- Emissions reductions;
- Budgetary issues, including funds expended;
- Public relations activities;
- Technical and identification information for vehicles and engines; and
- Jobs preserved or created.

Task 3 Deliverables:

- Status Updates for Semi-annual Reports
- Any required material for Final Report

3. VW Mitigation Trust Grant Conditions

Block Island Express commits to comply with the conditions listed in the Mitigation Trust Agreement, between DEEP and Wilmington Trust, which is attached as Appendix D.

4. Submission of Materials

For the purposes of this Plan, all correspondence, summaries, reports, products, requests and invoices shall be submitted to:

Louis Corsino (Assigned Project Manager)
 Department of Energy and Environmental Protection
 Bureau of Air Management
 79 Elm Street
 Hartford, CT 06106-5127
 E-Mail: louis.corsino@ct.gov

5. Schedule of Tasks & Payments

Payments by the Commissioner shall allow for use of funds to meet allowable financial obligations incurred in conjunction with this Project and shall be scheduled as follows, provided that the total sum of all payments shall not exceed 40% of the total project cost with a maximum cap of \$971,720.

Task & Deliverables	Task Delivery Date	Estimated Budget		
		VW Funds	Block Island Express Cost-Share	Project Total
1. Planning & Procurement <ul style="list-style-type: none"> Approved work plan with project timeline/schedule Estimates or proposals from potential equipment vendors Summary of criteria used for selecting vendor(s) Name and address of vendor(s) selected 	January - February 2019	\$0	\$0	\$0
<ul style="list-style-type: none"> Copy of Purchase Order(s) issued for new engines/equipment Documentation of down payments or other up-front payments made for the project Naval architect begin vessel modification drawings 	March - May 2019	\$0	\$300,000	\$300,000
<ul style="list-style-type: none"> Vessel modifications drawings complete Shipyard installation RFP released Summary of criteria used for selecting shipyard Name and address of shipyard selected Copy of Purchase Order issued for shipyard Documentation of down-payment, as applicable, for shipyard 	June – August 2019	\$0	\$0	\$0
2. Delivery of New Engines, Scrappage of Replaced Engines, Completion of Project <ul style="list-style-type: none"> Documentation of delivery of engines Invoice from the vendor for delivered engines and documentation of payment to vendor Invoice from shipyard for installation of new engines 	March 2020	\$0	\$1,157,580	\$1,157,580
<ul style="list-style-type: none"> Completed copy of Certificate of Engine Destruction Required photographic scrappage documentation for replaced engines Confirmation that the project is completed and that the engines are operating satisfactorily for their intended use and that sea trials have been completed An invoice to DEEP for reimbursement under the grant 	March 31, 2020	\$971,720	-\$971,720	\$0
4. Provide Updates and Information for Semi-Annual and Other Reports <ul style="list-style-type: none"> Status Update for First Semi-Annual Report Status Update for Second Semi-Annual Report Status Update for Third Semi-Annual Report Status Update for Fourth Semi-Annual Report. Status Update for Fifth Semi-Annual Report. Required material for Final Report (upon completion but no later than 3/31/20) 	07/01/19 01/01/20 07/01/20 01/01/21 07/01/21 03/31/20	\$0	\$0	\$0
Total:		\$971,720	\$1,457,580	\$2,429,300

Payment for each task referenced above cannot exceed the budgeted amount for each task. Total Payment shall not exceed 40% of the total project cost with a maximum cap of \$971,720, which shall constitute full and complete compensation from the DEEP for the replacement of four existing Tier-1 compliant propulsion engines and two existing Tier-1 auxiliary generator sets on the M/V Cecelia Ann. The total sum of all payments shall not exceed total funds committed by DEEP.

Payment is contingent upon completion of the tasks outlined in this Plan and providing documentation of compliance with the Mitigation Trust Agreement, between DEEP and Wilmington Trust, which is attached as Appendix D.

6. Extensions/Amendments

Formal written amendment of the agreement is required for changes to the terms and conditions specifically stated in the original agreement and any prior amendments.

Time extensions may be granted, under certain circumstances, upon request. **Otherwise, the Project must be completed by March 31, 2020.**

Signature,
Block Island Express, LLC
Authorized Representative

Typed Name



Adam Wronowski

1/25/19

Date

Signature,
DEEP Assigned Project
Manager

Typed Name



Louis J. Corsino III

1/30/19

Date

Appendix A: Eligible Engines to be Replaced on M/V Cecelia Ann

Engine Type	Engine Make	Engine Model	Engine Model Year	Engine Serial Number
Propulsion	Cummins	KTA38	2003	33153341
Propulsion	Cummins	KTA38	2003	33153327
Propulsion	Cummins	KTA38	2003	33153361
Propulsion	Cummins	KTA38	2003	33153359
Auxiliary	Cummins	6CTA8.3-D	2011	73325119
Auxiliary	Cummins	6CTA8.3-D	2011	73325495

Appendix B: Replacement Engine Specifications

Note: Initial specifications for replacement engines below is preliminary based on the initial grant application and may change once actual vendor selection is completed.

Engine Type	Engine Make	Engine Model	Engine Model Year
Propulsion	Cummins	QSK38	2018 or 2019
Propulsion	Cummins	QSK38	
Propulsion	Cummins	QSK38	
Propulsion	Cummins	QSK38	
Auxiliary	Cummins	QSB7	
Auxiliary	Cummins	QSB7	

ATTACHMENT C

**DETAILED PLAN FOR REPORTING ON ELIGIBLE MITIGATION ACTION
IMPLEMENTATION**

ATTACHMENT C

DETAILED PLAN FOR REPORTING ON ELIGIBLE MITIGATION ACTION IMPLEMENTATION

The Connecticut Department of Energy and Environmental Protection (DEEP) will provide detailed reporting on the Diesel Emissions Mitigation Trust project in two ways:

1. Timely updates to DEEP's Volkswagen (VW) Settlement Information Webpage, and
2. Connecticut's semiannual reporting obligation to Wilmington Trust (the "Trustee")

DEEP maintains a webpage that has been designed to support public access to information relative to the VW Settlement and DEEP's administration of mitigation funds so as to implement the program in an openly and transparent manner. DEEP's VW Settlement Information webpage and all supporting information and documentation can be found at: <https://www.ct.gov/deep/vw>. Timely updates to the webpage as well as direct outreach via email to those who have requested notification will inform the general public on project solicitations, and project status including when the projects identified herein have been completed.

Subparagraph 5.3 of the Environmental Mitigation Trust Agreement for State Beneficiaries details Connecticut's Reporting Obligations" "For each Eligible Mitigation Action, no later than six months after receiving its first disbursement of Trust Assets, and thereafter no later than January 30 (for the preceding six-month period of July 1 to December 31) and July 30 (for the preceding six-month period of January 1 to June 30) of each year, each Beneficiary shall submit to the Trustee a semiannual report describing the progress implementing each Eligible Mitigation Action during the six-month period leading up to the reporting date (including a summary of all costs expended on the Eligible Mitigation Action through the reporting date). Such reports shall include a complete description of the status (including actual or projected termination date), development, implementation, and any modification of each approved Eligible Mitigation Action. Beneficiaries may group multiple Eligible Mitigation Actions and multiple sub-beneficiaries into a single report. These reports shall be signed by an official with the authority to submit the report for the Beneficiary and must contain an attestation that the information is true and correct and that the submission is made under penalty of perjury. To the extent a Beneficiary avails itself of the DERA Option described in Appendix D-2, that Beneficiary may submit its DERA Quarterly Programmatic Reports in satisfaction of its obligations under this Paragraph as to those Eligible Mitigation Actions funded through the DERA Option. The Trustee shall post each semiannual report on the State Trust's public-facing website upon receipt."

DEEP shall, in the semiannual report following the Trustee's initial disbursement of funds as directed by DEEP, describe the progress implementing this Eligible Mitigation Action that will include a summary of all costs expended on the Eligible Mitigation action through the reporting date. The report will also include a complete description of the status, development, implementation (including project schedule and milestone updates), and any modification to the projects under this Eligible Mitigation Action.

ATTACHMENT D

**DETAILED COST ESTIMATES FROM SELECTED OR POTENTIAL VENDORS FOR EACH
PROPOSED EXPENDITURE EXCEEDING \$25,000**

ATTACHMENT D

**DETAILED COST ESTIMATES FROM SELECTED OR POTENTIAL VENDORS FOR EACH
PROPOSED EXPENDITURE EXCEEDING \$25,000**

Block Island Express Repower Mitigation Project (Attachment D-1)

Engine Type	Engine Make	Engine Model	Model year (MY)	Fuel	Cost
Propulsion	Cummins	QSK38	2018 or 2019	Diesel	\$207,619.00
Propulsion	Cummins	QSK38	2018 or 2019	Diesel	\$207,619.00
Propulsion	Cummins	QSK38	2018 or 2020	Diesel	\$207,619.00
Propulsion	Cummins	QSK38	2018 or 2020	Diesel	\$207,619.00
Auxiliary	Cummins	QSB7	2018 or 2019	Diesel	\$41,875.00
Auxiliary	Cummins	QSB7	2018 or 2019	Diesel	\$41,875.00
Total					\$914,226.00

See attached vendor cost estimate for Block Island Express.

ATTACHMENT D-1

VENDOR ESTIMATE FOR BLOCK ISLAND EXPRESS



08/14/17

Dear Cross Sound Ferry Service,

Thank you for requesting this proposal. Cummins Sales and Service appreciates this opportunity. We are pleased to offer our experience and resources to ensure these projects go smoothly and on time. Cummins is close by and has highly skilled technicians and in house engineering. Please contact me anytime with questions or requests.

Proposal includes:

New London

Option 1. Two Cummins Tier 3 QSK38 1300hp @ 1800rpm Marine diesel engines. Continuous Duty rated unlimited hours at full power.

Option 2. Two Twin Disc MG540 Marine gears. Continuous duty rated 1,582hp @ 1800rpm

Option 3 A/B. Two 125Kw Cummins Newage generator sets

Option 4. One Twin Disc EC300 control system, five stations

Option 5. Cummins QSK38 Encompass extended warranty

Henlopen

Option 6A/B. Two 200Kw Cummins Newage generator sets

Cummins will negotiate terms and conditions in good faith.
We did receive (addendum_1.)

EPA certificates of conformity are attached.

Cummins Sales and Service DUNS number 966671179

Machinery to be delivered to the owners preferred location On the East Coast.

Cummins Sales and Service will support the project with verification of installation, start-up, commissioning and sea trials. Cummins Sales and Service will facilitate and work with North Atlantic on a USCG approved DVTP and QFMA for the engines and control system.

Cummins Sales and Service Local Service Contacts

Cummins Sales and Service

914 Cromwell Ave,

Rocky Hill, CT 06067

(860) 529-7474

Danny Seaver, service manager 781-751-1233

Steve Allen, Dedham branch manager 781-751-1229

Parts counter hours 7:00am to 10:30pm

Cummins Northeast

100 Allied Drive

Dedham, MA 02026



Referenced projects
Passenger vessels

Circle Line, New York NY
LOA 165'
600 passengers
2016, 2017
Gladding-Hearn build
Hull number 414, 415, (416 still in construction)
2 x QSK38 1300hp@1800rpm
2 x ZF W3355 marine gears
ZF Electronic control system

Boston Harbor Cruises
LOA 110'
Repower PV Aurora 2016
400 passengers
3 x KTA38 1300hp@1800rpm

Hy-Line Cruises
LOA 153'
493 passengers
Grey Lady IV, High Speed Catamaran. 2016
4 x QSK60 2200hp@1800rpm
4 X TD MGX 61500
2 X QSB7 DM Generators sets 125Kw

Proposer, Authorized to negotiate and direct questions to:

Will Collins
Territory Manager
Cummins Sales and Service
100 Allied Drive
Dedham, MA 20206
781-801-1772 / Cell 401-339-4004

A handwritten signature in black ink, appearing to read 'Will Collins', written over a horizontal line.

08/14/17



Sales and Service

Engine Quotation

Will Collins Marine Sales Manager
 100 Allied Drive Dedham, MA 02026
 781-801-1772 will.collins@cummins.com

DATE: 08/14/17
 Quotation #: 081417wcQSK
 Estimated delivery: see notes
 Quotation valid until: 120 days
 Job Name: New London
 Terms: with approval
 Freight: delivered

To Cross Sound Ferry Services
 2 Ferry St
 New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
2	MARI00332	Cummins QSK38-M1 1300HP@1800RPM FR60071	\$207,619	\$415,238
	AP0628600	Marine Cert. EPA, Propulsion Tier 3		
	CE0600600	ENGINE COOLING SYSTEM Keel Cooled		
	EA0603000	Engine to CIB Harness (C Command) 10M		
	EM0610900	Trunnion only		
	FF0626500	Fuel filter Stage 1: 3 elements Stage 2: 3 filter		
	FH0606100	FLYWHEEL HOUSING SAE#0 / Dry		
	FW0607400	FLYWHEEL SAE # 0		
	LF0609500	Venturi Spin On / 3		
	OB0635900	OIL FILL ARRANGEMENT Left Bank #4 Cylinder		
	OP0612800	Deep pan High Oil Pan Capacity: 166 L [44 gal.]		
	SD0602000	ENGINE MONITORING - C Command Monitoring System		
	SK0603600	ARRANGEMENT, SHIPPING Shipping skid		
	SS0609400	PAINT Marine Gray		
	TB0612300	TURBOCHARGER ARRANGEMENT Rear out		
	WF0606700	Corrosion inhibitor in filter 30 units / Qty. 2		
	AC0613200	AIR CLEANER Fleetguard/AF4552M; Qty. 2		
	FS6074	WIF SENSOR AND WIRING HARNESS		
	EA0602200	EXTENSION HARNESS CIB to ERP Harness 3ft		
	EE0606700	ALTERNATOR Delco Remy/33 SI-455 24V/100A		
	EG0601700	Engine Room Panel (ERP) and display		
	EG0601800	Instrument Panel - Control Panel (CP) / Qty. 1		
	EG0602100	Electronic Digital Display (ED-3) / Qty. 1		
	standard	ENGINE PERFORMANCE TEST Standard engine test		
	LT0609600	LITERATURE O&M Manual Engine Parts Catalog		
	ST0617600	STARTING MOTOR Dual Electric		
	WI0605000	WATER INLET CONNECTION flexible connection		
	WO0610500	WATER OUTLET straight Flexible connection		
	XS0611200	EXHAUST OUTLET - Flex Bellows 387.4 mm [15.25 in.]		
	CH0600500	Coolant heater (2) 24 V / 4kW		
	SD0602300	Marine gear oil pressure sensor and 13 ft ext harness		
	CSS	Marine gear oil temperature sensor and off engine gauge		
	CSS	Lube oil drain lines with valves 3/4NPT		
	CSS	Engine Lube oil		
	Services	Delivery - East Coast Torsional vibration analysis Verification of installation and sea trial Start-up and commissioning Engine prep install lube oil		
				\$415,238



Sales and Service

Gear Quotation

Will Collins Marine Sales Manager
 100 Allied Drive Dedham, MA 02026
 781-801-1772 will.collins@cummins.com

DATE: 08/14/17
Quotation #: 081417wc TD
Estimated delivery: see notes
Quotation valid until: 120 days
Job Name: New London
Terms: with approval
Freight: delivered

To Cross Sound Ferry Services
 2 Ferry St
 New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
2		Twin Disc Marine Transmission MG540 1.93:1 SAE housing #0 Input coupling - CFR-HD Selector - GP Valve Heat exchanger Fresh water Lube oil	\$101,395	\$202,790
	Services	Delivery - East Coast Install lube oil, start-up and commissioning Verification of installation and sea trial		
				\$202,790



Sales and Service

Controls Quotation

Will Collins Marine Sales Manager
100 Allied Drive Dedham, MA 02026
781-801-1772 will.collins@cummins.com

DATE: 08/14/17
Quotation #: 081417wc CTR
Estimated delivery: see notes
Quotation valid until: 120 days
Job Name: New London
Terms: with approval
Freight: delivered

To Cross Sound Ferry Services
2 Ferry St
New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
1		Twin Disc Electronic Control system EC300 control system (5) stations (5) displays and alarms All harnesses and components 4 days onsite support DVTP/QFM witness testing and documentation	36,688	36,688
				\$36,688



Sales and Service

Generator Quotation

Will Collins Marine Sales Manager
 100 Allied Drive Dedham, MA 02026
 781-801-1772 will.collins@cummins.com

DATE: 08/14/17
Quotation #: 081417wc 125
Estimated delivery: see notes
Quotation valid until: 120 days
Job Name: New London
Terms: with approval
Freight: delivered

To Cross Sound Ferry Services
 2 Ferry St
 New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
2		Cummins QSB7-D(M) 125kw diesel marine generator 7L, In-line six cylinder, EPA Tier 3, turbocharged and aftercooled diesel fueled engine Keel cooled Water cooled exhaust manifold 4" dry exhaust elbow with flange Engine lube oil cooler 24 volt starter and alternator Dry type air cleaner Front engine mount Fabricated structural steel skid Vibration isolators between engine and skid Spin on oil and fuel filter Oil pan and dipstick Fuel pump, Lube oil-pump Water cooled turbocharger Basler DGC2020 Controller Panel mounted Basler DGC2020 Repeater panel with 100' harness Panel is setup to flush mount to customer dash SAE #2 Flywheel and flywheel housing 4" flex connection with gaskets Neck and cap for mounting on customer expansion tank Racor 1000MAM10 primary fuel/water separator WIF sensor and 10 ft harness, loose / customer mounted Wilcox demister mounted – Open system	\$35,042	\$70,083
2		Newage generator, Model UCM274G1L, rated 125kw, 208 volt, 3Ø, 60hz, PMG excitation, 90°C/50°C MX341 automatic voltage regulator IP23 louvers and 120 VAC space heater Delivery - East Coast Verification of installation and sea trial Start-up and commissioning Engine prep install lube oil	\$6,071	\$12,143
				\$82,226



Sales and Service

Generator Quotation

Will Collins Marine Sales Manager
 100 Allied Drive Dedham, MA 02026
 781-801-1772 will.collins@cummins.com

DATE: 08/14/17
Quotation #: 081417wc 200
Estimated delivery: see notes
Quotation valid until: 120 days
Job Name: New London
Terms: with approval
Freight: delivered

To Cross Sound Ferry Services
 2 Ferry St
 New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
2		Cummins QSB7-D(M) 200kw diesel marine generator 7L, In-line six cylinder, EPA Tier 3, turbocharged and aftercooled diesel fueled engine Keel cooled Water cooled exhaust manifold 4" dry exhaust elbow with flange Engine lube oil cooler 24 volt starter and alternator Dry type air cleaner Front engine mount Fabricated structural steel skid Vibration isolators between engine and skid Spin on oil and fuel filter Oil pan and dipstick Fuel pump, Lube oil pump Water cooled turbocharger Basler DGC2020 Controller Panel mounted Basler DGC2020 Repeater panel with 100' harness Panel is setup to flush mount to customer dash SAE #2 Flywheel and flywheel housing 4" flex connection with gaskets Neck and cap for mounting on customer expansion tank Racor 1000MAM10 primary fuel/water separator WIF sensor and 10 ft harness, loose / customer mounted Wilcox demister mounted - Open system	\$35,042	\$70,083
2		Newage generator, Model UCI274K1L, rated 200kw, 208 volt, 3Ø, 60hz, PMG excitation, 90 °C/50 °C MX341 automatic voltage regulator IP23 louvers and 120 VAC space heater Delivery - East Coast Verification of installation and sea trial Start-up and commissioning Engine prep install lube oil	\$6,833	\$13,667
				\$83,750



Sales and Service

Accessory Quotation

Will Collins Marine Sales Manager
 100 Allied Drive Dedham, MA 02026
 781-801-1772 will.collins@cummins.com

DATE: 08/14/17
Quotation #: 081417wc Acc
Estimated delivery: see notes
Quotation valid until: 120 days
Job Name: New London
Terms: with approval
Freight: delivered

To Cross Sound Ferry Services
 2 Ferry St
 New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
2		DURAMAX Keel Cooler QSK38 Circuit: Jacket Water ASY SC-412PF-81 SC-412PF-81 Engine Make: Cummins Model No: QSK38 T3 1,400 hp 1,044 kw 1,800 rpm 1 knots Maximum Sea Water Temperature: 85° F Antifreeze % Used: 50 Sizing No: SC4501.101 EST Weight: 230 Lbs ea	7,485	14,970
2		DURAMAX Keel Cooler QSK38 Circuit: Aftercooler & Gear ASY SC-418PFDP-138 SC-418PFDP-138 Gear: MG540 Engine Make: Cummins Model No: QSK38 T3 1,400 hp 1,044 kw 1,800 rpm 1 knots Maximum Sea Water Temperature: 85° Antifreeze % Used: 50 Sizing No: SC4501.201 EST Weight: 450 Lbs ea	14,000	28,000
4		Generator Spark arrestor silencer 5" Critical grade muffler 49550U 35dBA attenuation	780	3,120
				\$46,090



Sales and Service

Notes

Will Collins Marine Sales Manager
 100 Allied Drive Dedham, MA 02026
 781-801-1772 will.collins@cummins.com

DATE: 08/14/17
 Quotation #: 081417wc note
 Estimated delivery: see notes
 Quotation valid until: 120 days
 Job Name: New London
 Terms: with approval
 Freight: delivered

To Cross Sound Ferry Services
 2 Ferry St
 New London, CT 06320

Qty	OPTION	DESCRIPTION	PRICE ea.	PRICE
	options	Rear engine mounts - pair (Recommended)	\$1,875	
		Twin Disc gear mounts - pair	1,054	
		Custom exhaust connection single to dual exhaust	quote	
		Custom design for above	n/c	
		C-Command Elite monitoring / control panels	8,619	
		Eliminator self cleaning lube oil filter	15,484	
		Sentinel burn and replace oil change system	1,349	
	notes	engine control panel & monitoring at helm included engine control panel & monitoring in ER included QSK38 cooling system is dual circuit QSK38 exhaust system single top out		
	not included	Monitoring / control panels at remote stations Stage zero fuel filtration Plumbing between keel coolers and engines Coolant Marine society certifications		
	lead times	Engines - 16 weeks Gears 24 weeks Controls 4 weeks Generators 8 weeks Coolers and mufflers - 8 weeks		
	Engines	Standard Warranty One year unlimited hours		
	Generators	One year unlimited hours		
	Marine gears	One year unlimited hours		
	Controls	One year unlimited hours		
	Engines	Optional Extended Warranty 3 Years / 10,000 Hours (1+2=3yr)	\$18,075	
	Aux drives	3 Years / unlimited Hours (1+2=3yr)	\$1,600	
	Tax	Machinery pricing does not include sales tax		

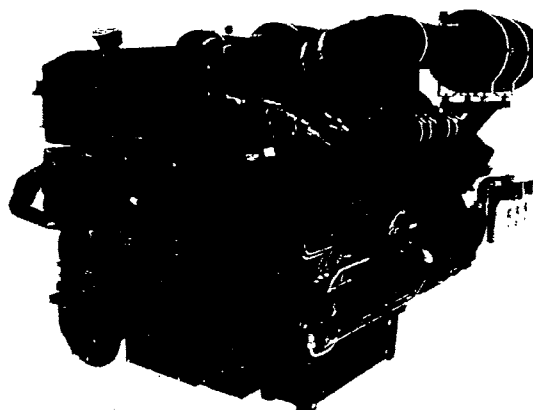


QSK38

Marine Propulsion and Auxiliary Engines
for Commercial and Recreational Applications

General Specifications

Configuration	V-12 cylinder, 4-stroke diesel
Aspiration	Turbocharged / Aftercooled
Displacement	38 L (2300 in ³)
Bore & Stroke	159 X 159 mm (6.25 X 6.25 in)
Rotation	Counterclockwise facing flywheel
Fuel System	High Pressure Common Rail



Product Dimensions and Weight

Overall Length	mm (in)	2282.4	(89.86)
Length of Block	mm (in)	1546.9	(60.90)
Overall Width	mm (in)	1573.4	(61.95)
Overall Height	mm (in)	2241.8	(88.26)
Weight	kg (lb)	4850	(10,692)

Dimensions and weight may vary based on selected engine configuration.

Power Ratings

Engine Model	Output Power			Engine Speed RPM	Rating Definition	Fuel Consumption		Emissions			
	kW	MHP	BHP			Rated Speed L/hr (gal/hr)	ISO* L/hr (gal/hr)	IMO	EPA	EU	RCD
Variable Speed											
QSK38-M1	746	1014	1000	1800	Continuous	191.7 (50.6)	143.9 (38.0)	2	3	—	—
QSK38-M1	746	1014	1000	1800	Continuous	185.6 (49.0)	136.6 (36.1)	2	—	3a	—
QSK38-M1	969	1318	1300	1600	Continuous	247.4 (65.3)	183.6 (48.5)	2	3	—	—
QSK38-M1	969	1318	1300	1600	Continuous	235.8 (62.3)	169.9 (44.9)	2	—	3a	—
QSK38-M1	969	1318	1300	1800	Continuous	247.6 (65.4)	182.8 (48.3)	2	3	—	—
QSK38-M1	969	1318	1300	1800	Continuous	248.4 (65.6)	170.8 (45.1)	2	—	3a	—
QSK38-M1	1044	1420	1400	1600	Heavy Duty	251.3 (66.4)	181.3 (47.9)	2	—	3a	—
QSK38-M1	1044	1420	1400	1800	Heavy Duty	271.4 (71.7)	194.4 (51.4)	2	3	—	—
QSK38-M1	1044	1420	1400	1800	Heavy Duty	261.2 (69.0)	182.3 (48.2)	2	—	3a	—
QSK38-M1	1044	1420	1400	1900	Heavy Duty	265.4 (70.1)	194.4 (51.4)	2	3	—	—
QSK38-M1	1044	1420	1400	1900	Heavy Duty	257.5 (68.0)	183.5 (48.5)	2	—	3a	—
Fixed Speed											
QSK38-DM1	984	1338	1320	1500 (50 Hz)	Prime Power	234.3 (61.9)	124.6 (32.9)	2	—	3a	—
QSK38-DM1	1044	1420	1400	1800 (60 Hz)	Prime Power	262.6 (69.4)	144.2 (38.1)	2	3	—	—
QSK38-DM1	1044	1420	1400	1800 (60 Hz)	Prime Power	252.5 (66.7)	135.8 (35.9)	2	—	3a	—

* Average fuel consumption based on ISO 8178 E3 Standard Test Cycle (variable speed models) and ISO 8178 D2 Standard Test Cycle (fixed speed models)

TECHNOLOGY THAT TRANSFORMS

QSK38

Marine Propulsion and Auxiliary Engines for Commercial and Recreational Applications

Features and Benefits

Engine Design – Reliable base engine uses common components from the proven K19, K38 and K50 engines. A new cast-iron, ductile single-piece piston with nitride-coated rings and hardened cylinder liner provides excellent durability and long life

Fuel System – Modular Common Rail Fuel System features a simplified design which provides constant high injection pressure regardless of engine speed or load condition. Benefits include low noise and vibration for quiet operation, idle stability and low-end torque

Cooling System – Two-pump, two-loop, low temperature aftercooling maximizes efficiency and improves performance. Engine-mounted titanium plate heat exchanger provides superior durability with minimal maintenance requirements

Exhaust System – Dry-shielded exhaust manifold and turbocharger. Vertical or horizontal exhaust connections available for installation flexibility

Air System – Turbocharger optimized for vessel operating conditions and safety. Mounted or remote marine grade air cleaner with replaceable canister reduces maintenance cost

Lubrication System – Standard capacity 151 L (40 gal) and high capacity 204 L (54 gal) marine grade oil pan. Handed Cummins spin-on oil filters available for easy accessibility and servicing

Electronics – 24v Quantum System electronics feature an ECM to monitor operating parameters, while providing diagnostics, prognostics and complete engine protection. Simplified electrical customer interface box for all vessel connections to reduce installation complexity

Certifications – Complies with IMO Tier II, EPA Tier 3 and EU Stage IIIa emissions regulations. Designed to meet the International Association of Classification Societies (IACS) and SOLAS requirements. Consult your local Cummins professional for a complete listing of available class approvals

Optional Equipment

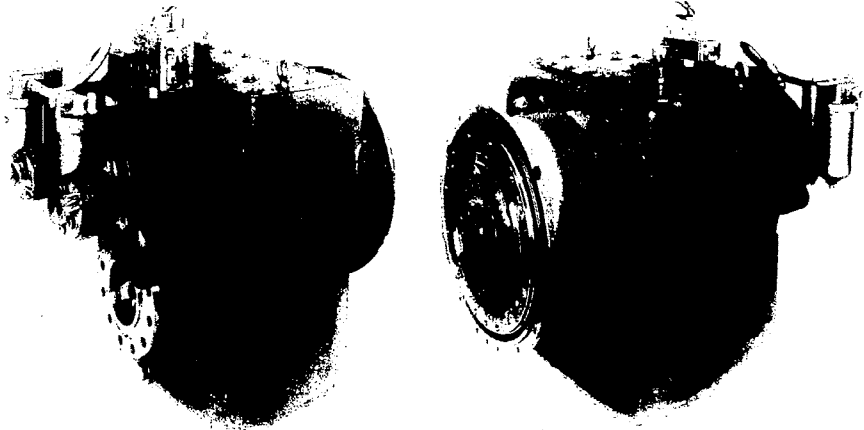
- C Command panels
- ELIMINATOR™ oil filtration system
- Premium coolant hose connections
- Duplex lube oil and fuel filtration
- SAE A or B (keel cooled only) accessory drives
- Front PTO adaptor
- CENTINEL oil management system
- Pre-Lube with QuickEvac
- Air or electric starter
- Rigid or flexible mounting arrangements



Cummins Inc.
4500 Leeds Avenue – Suite 301
Charleston, SC 29405-8539
U.S.A.

Internet: marine.cummins.com

Bulletin 4087438 11/15
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Maximum 1180 kW (1582 hp) @1800 RPM (CONTINUOUS DUTY)**STANDARD EQUIPMENT****MG-540**

Vertical offset, cast iron housing

SAE J617 housing no. 0

Electric GP-valve with manual override

EC050 Profile module

- interface for engagement signals

Oil strainer and oil filter

Companion flange/ bolts set

INPUT RATINGS - KILOWATS (KW) (HORSEPOWER (HP))*For service classification definitions and important notes refer to www.twindisc.com, the Twin Disc Marine Product Guide or contact Twin Disc directly.

Reduction Ratios :1	Intermediate Duty		Medium Duty		Continuous Duty	
	@ 1600 RPM	@ 1800 RPM	@ 1600 RPM	@ 1800 RPM	@ 1600 RPM	@ 1800 RPM
1.93, 2.58, 2.90	1049 kW (1407 hp)	1180 kW (1582 hp)	1049 kW (1407 hp)	1180 kW (1582 hp)	1049 kW (1407 hp)	1180 kW (1582 hp)
			1034 kW (1387 hp)	1163 kW (1560 hp)	1034 kW (1387 hp)	1163 kW (1560 hp)
3.26						
3.91	893 kW (1198 hp)	1011 kW (1356 hp)	864 kW (1159 hp)	972 kW (1303 hp)	864 kW (1159 hp)	972 kW (1303 hp)
4.10, 4.60	1049 kW (1407 hp)	1180 kW (1582 hp)	1049 kW (1407 hp)	1180 kW (1582 hp)	1049 kW (1407 hp)	1180 kW (1582 hp)
5.17	1038 kW (1392 hp)	1168 kW (1566 hp)	1032 kW (1384 hp)	1161 kW (1557 hp)	1032 kW (1384 hp)	1161 kW (1557 hp)
6.18	867 kW (1163 hp)	975 kW (1307 hp)	859 kW (1152 hp)	969 kW (1300 hp)	859 kW (1152 hp)	969 kW (1300 hp)
7.00	766 kW (1027 hp)	895 kW (1200 hp)	762 kW (1022 hp)	895 kW (1200 hp)	762 kW (1022 hp)	895 kW (1200 hp)
7.47	718 kW (963 hp)	808 kW (1084 hp)	715 kW (959 hp)	804 kW (1078 hp)	715 kW (959 hp)	804 kW (1078 hp)

* Ratings shown for use with standard right-hand rotation engines.
Contact Twin Disc for maximum allowable rated engine speed.



Specifications subject to change without prior notice in the interest of continual product improvement.
Contact your local Twin Disc representative for engineering specifications, Survey Society Approvals and Classifications.

Scan QR code to see Twin Disc's entire Marine product line.



OPTIONS

SAE J617 housing no.00

Flexible coupling for 18" flywheel (SAE J620 size 460)

Flexible coupling for 21" flywheel (SAE J620 size 530)

Input hub for freestanding installation

Mechanical control valve

Harness with single point interface to Twin Disc EC300 control system

Oil cooler for raw or fresh water cooling

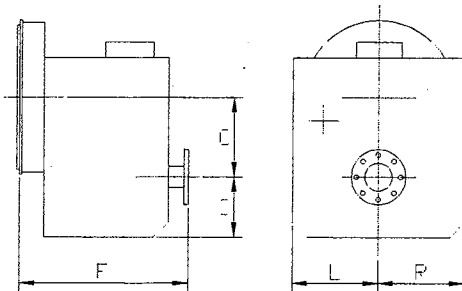
Special companion flange/bolts set for shaft brake application

Monitoring devices to customer's specification

Mounting brackets

Dry weight incl. SAE #0 housing and SAE 460 flexible coupling: 2019 kg

MG-540



C	205 mm (8.08")
S	342 mm (13.45")
F	926 mm (36.47")
L	406 mm (16.00")
R	406 mm (16.00")

For nearly a century, we've been making boats perform better and more reliably. From system-design consultation to application development to in-service support, Twin Disc provides fully integrated propulsion solutions that will optimize your craft's performance, reliability and safety over the years. Bring Twin Disc aboard early in the development process, and you'll enjoy a lifetime of enhanced operating value.

TRANSMISSIONS • ELECTRONIC CONTROLS • EXPRESS JOYSTICK SYSTEM* • SAILDRIVES • EXPRESS POSITIONING* • ARNISON SURFACE DRIVES • MARINE CONTROL DRIVES • ROLLA PROPELLERS • BOW & STERN THRUSTERS • STEERING SYSTEMS • RUDDERS • TRIM TABS



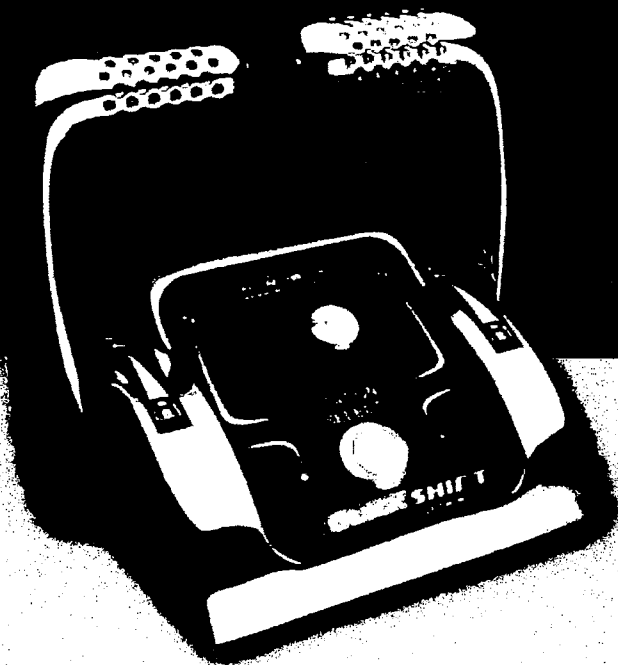
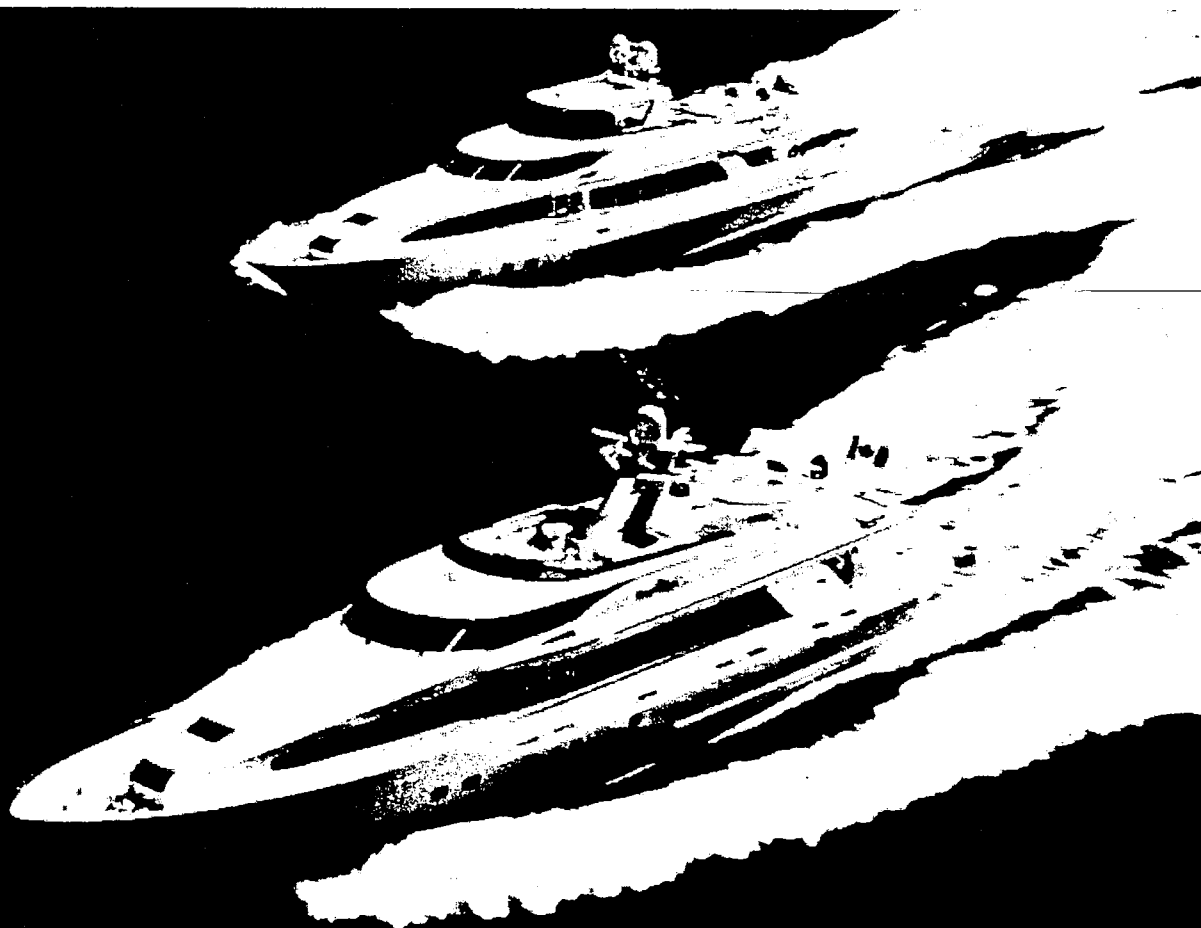
Twin Disc, Incorporated
Racine, Wisconsin 53403 USA
Phone +1-262-638-4000
Fax +1-262-638-4482
www.twindisc.com

Twin Disc, Incorporated reminds users of these products that their safe operation depends on use in compliance with engineering information provided in our catalog. Users are also reminded that safe operation depends on proper installation, operation and routine maintenance and inspection under prevailing conditions. It is the responsibility of users (and not Twin Disc, Incorporated) to provide and install guards or safety devices which may be required by recognized safety standards or by the Occupational Safety and Health Act of 1970 and its subsequent provisions.

United States of America • Australia • Belgium • Canada • China • India • Italy • Singapore • Switzerland

TD-BulletIn-MG-540
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Printed in the USA - 1/2016

TWIN DISC EC300 POWER COMMANDER[®]
MARINE ELECTRONIC PROPULSION CONTROL SYSTEM



**THE ULTIMATE
CONTROL**

VERSATILE

Take precise control of your boat with the Twin Disc EC300 Power Commander® marine electronic propulsion control system. It's designed to interface with all popular electronic engines and transmissions, including the revolutionary new Twin Disc QuickShift® transmission.

The EC300 system is expandable to include Express Joystick System® stations. Additional design-specific versions are available for dynamic positioning and automatic trimming capabilities.

SIMPLE

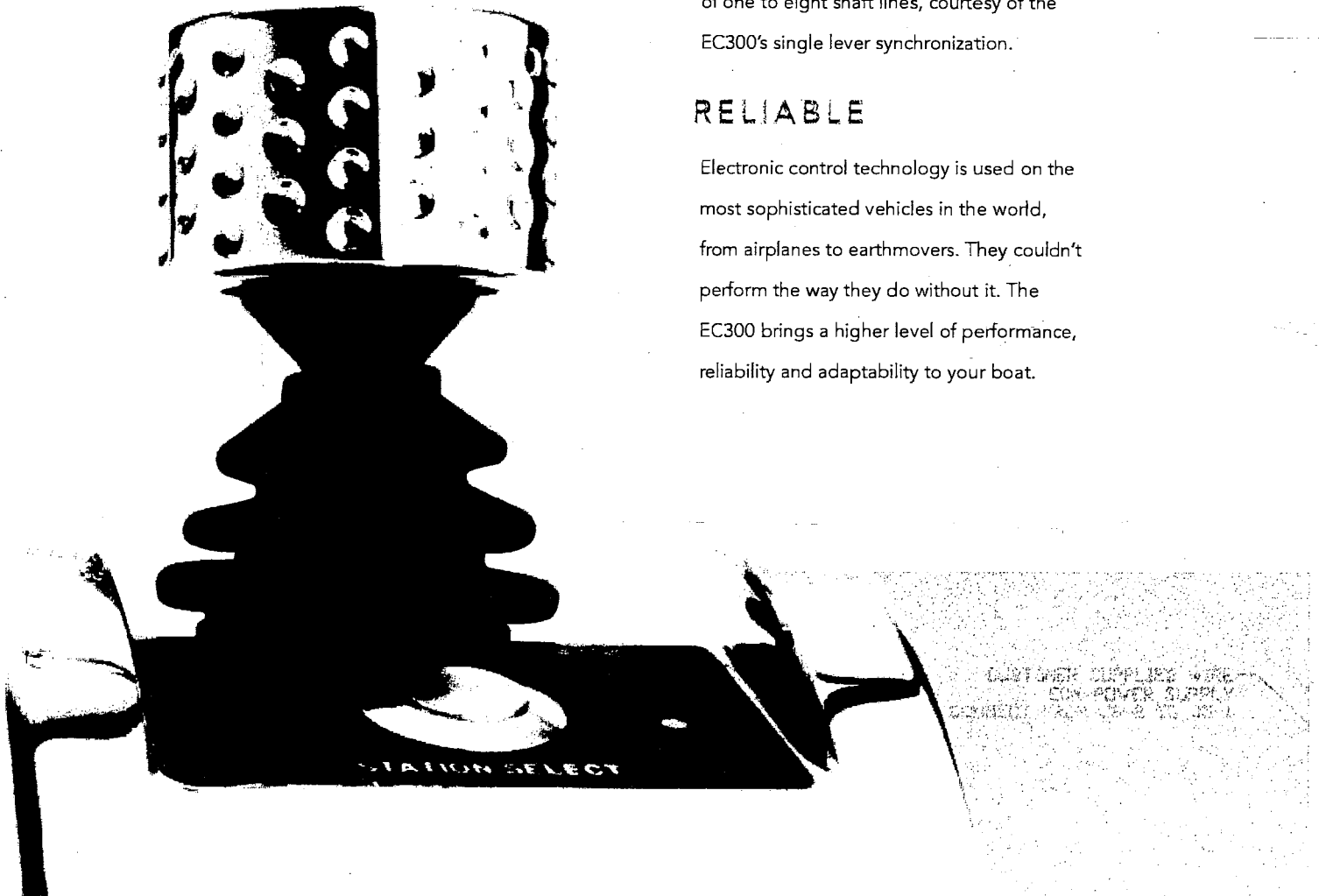
The fly-by-wire concept behind the EC300 makes the system remarkably easy to install on a new boat or retrofit on an older one. Multi-processor computer power makes this system user-friendly from checkout of the initial installation to final and full enjoyment of the control system's capabilities.

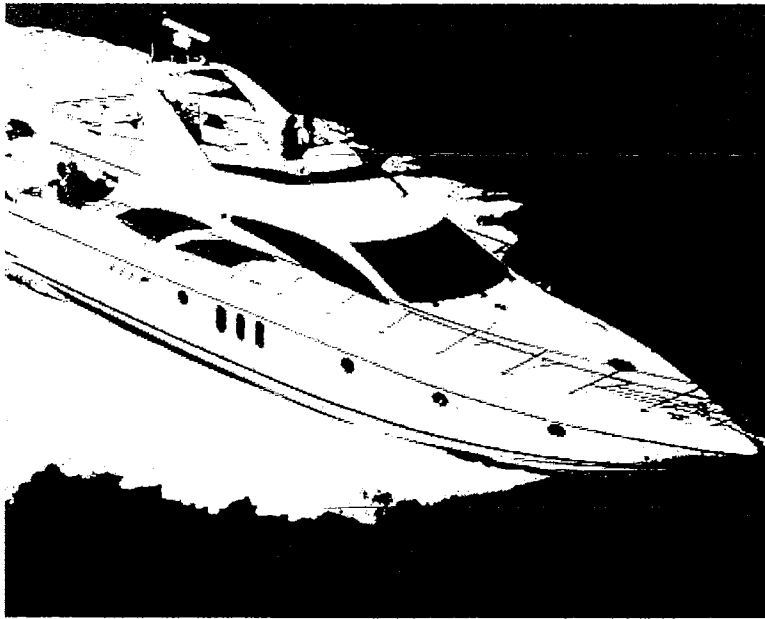
INTUITIVE

This highly sophisticated electronic platform can be easily taught your preferred operating settings, making hunting for a specific "sweet spot" a thing of the past. With literally one finger on one lever, you can control engine and propeller speed of one to eight shaft lines, courtesy of the EC300's single lever synchronization.

RELIABLE

Electronic control technology is used on the most sophisticated vehicles in the world, from airplanes to earthmovers. They couldn't perform the way they do without it. The EC300 brings a higher level of performance, reliability and adaptability to your boat.





COMPATIBLE

While the EC300 system is fully compatible with all popular propulsion options, it has been specifically engineered to operate with the Twin Disc QuickShift transmission and is the only control system approved to operate the QuickShift EXPRESS mode. The fully programmable features of the EC300 combined with the smooth, precise and ultra-fast operation of the QuickShift-

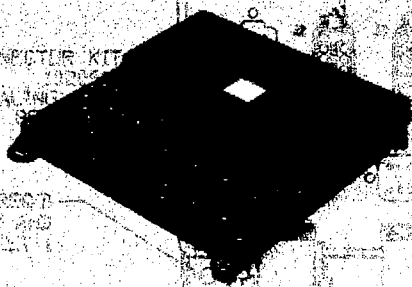
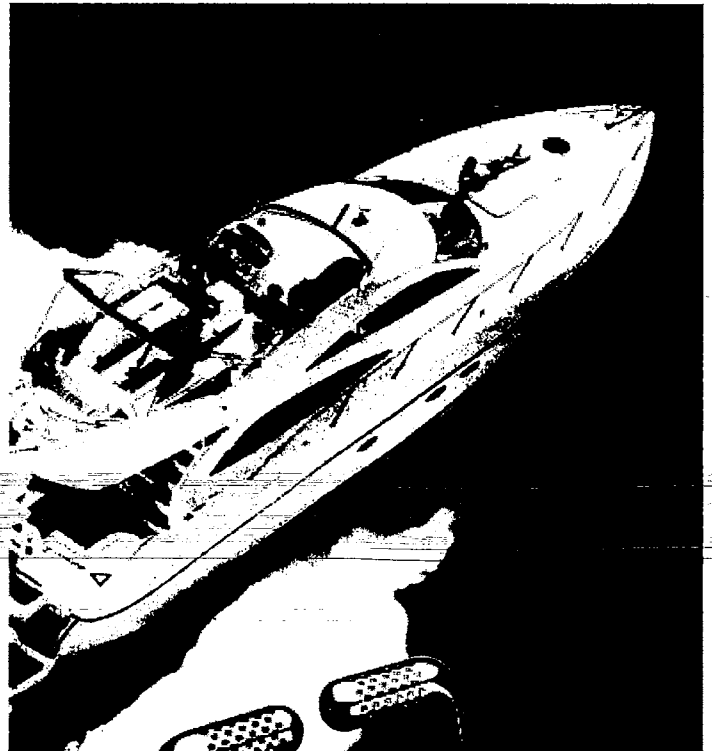
CAPABLE

The EC300 system can easily accommodate multiple drive lines, multiple control head types and up to eight control stations placed at various points around the boat. The system is fully upgradeable to allow future versions to be seamlessly integrated without requiring major component changes. For example, the Express Joystick System (EJS™) is a recent upgrade.

RUGGED

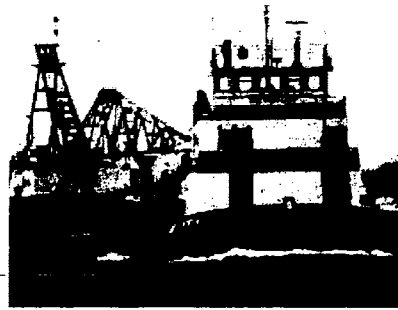
Featuring cast aluminum control boxes with heavy duty stainless steel leverheads, the EC300 system can easily be installed virtually anywhere on your boat. It's built to endure even the harshest conditions.

transmission put ultimate control in your hands.

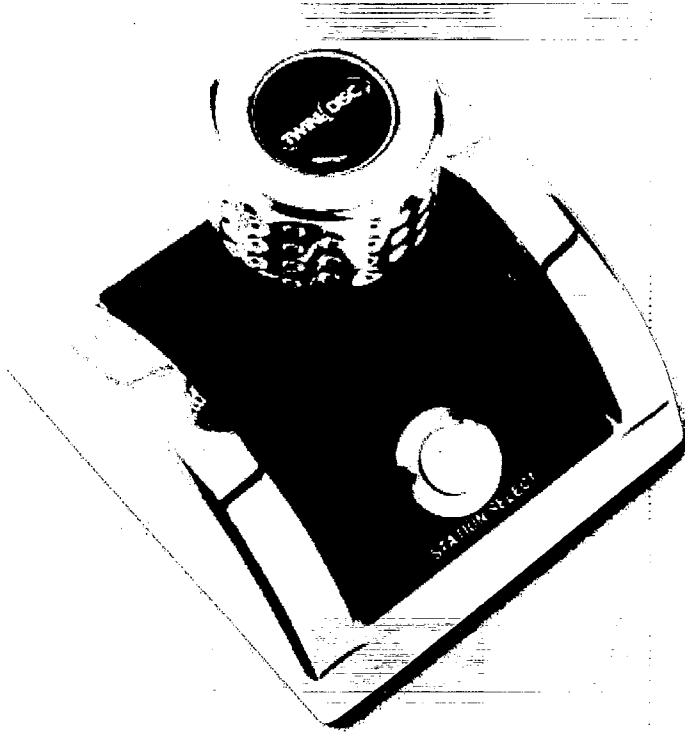


AND MORE

- Programmable features make propulsion re-powering simple because prior system configuration can be downloaded and re-entered on new system
- Simple, robust and easy to use diagnostic system
- J1939 and NMEA2000 coms available for data broadcasting



- Accepts 10 to 30 volt systems
- Operator selectable minimum shaft speeds in Express and Troll-modes
- Software selectable methods for station transfer
- Designed to meet and exceed major classification society standards
- Interactive feature allows easy adjustment of key operating parameters
- Configurable operation of accessories such as PTO, shaft brake and stabilizers



TWIN DISC INCORPORATED
1028 RADNOR STREET
RADNOR, WISCONSIN 53403 USA
WWW.TWINDISC.COM
E0300-A 01/01

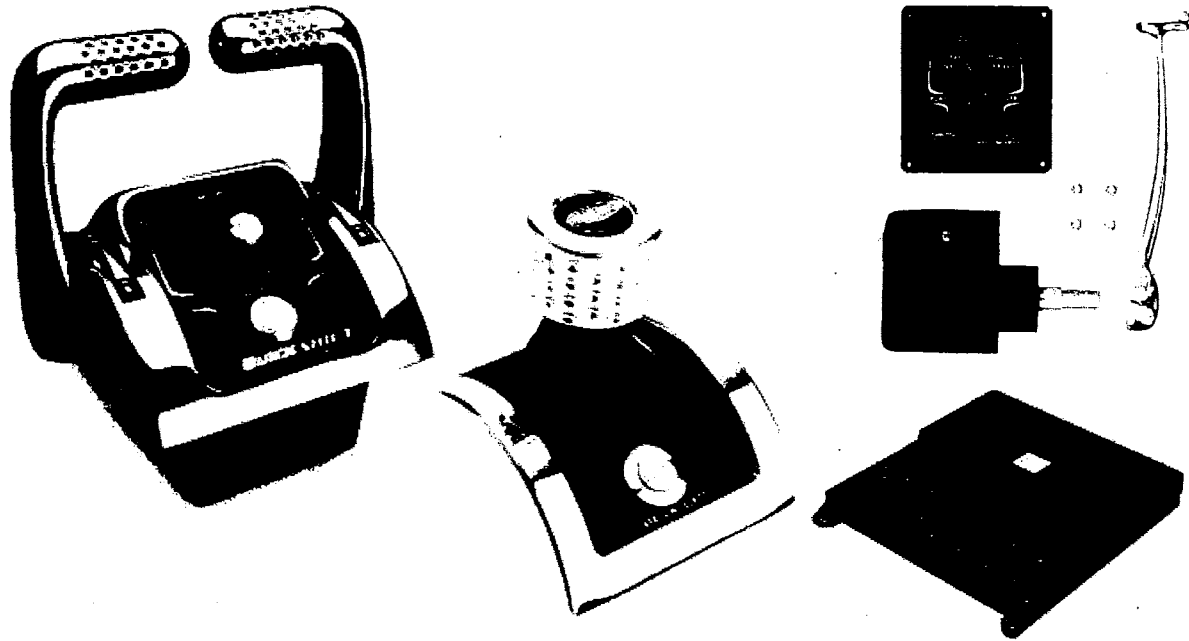


EC300

POWER COMMANDER® ELECTRONIC CONTROLS EXPRESS™ AND EXPRESS JOYSTICK SYSTEM® READY

The EC300 Power Commander® electronic propulsion control system is versatile, rugged and easy to install. The system is designed to interface with all popular electronic engines and transmissions.

For further information on this system, contact your regional Twin Disc dealer or Twin Disc Electronics Group at 1328 Racine Street, Racine, Wisconsin 53403. Telephone: 1-262-638-4000, Fax: 1-262-638-4482 or Email: controls@twindisc.com.



SYSTEM FEATURES

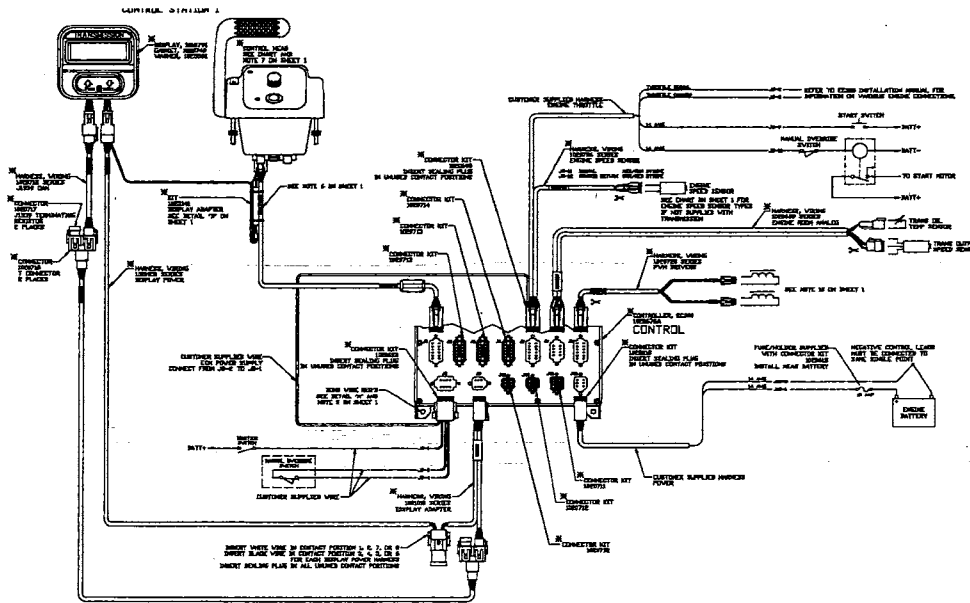
- Selectable station transfer rules
- Allows up to eight control stations
- Individual station active indicators
- Individual neutral status indicators
- 10 to 30 volt system power compatible
- J1939 or NMEA2000 data broadcasting
- Analog and digital control heads available
- Single lever controls for up to eight shaft lines
- System setup via keyboard or upload
- Selectable single or multi-lever synchronization
- Computer- or display-based setup and diagnostics

Contact your local Twin Disc representative for engineering specifications.
Specifications subject to change without prior notice in the interest of continual product improvement.

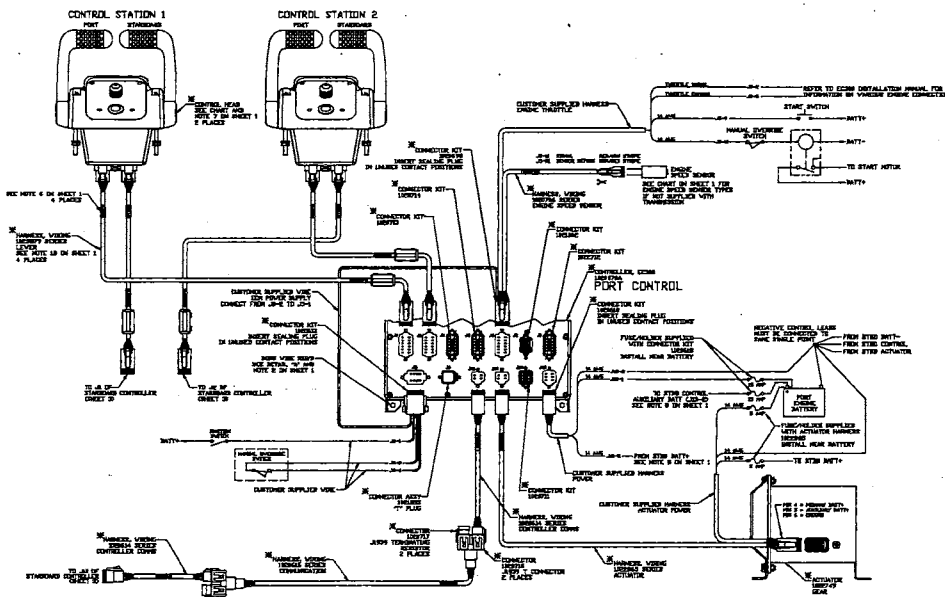


EC300 SCHEMATICS

Single Engine Single Station



Twin Engine Two Station



Twin Disc, Incorporated
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Twin Disc, Incorporated reminds users of these products that their safe operation depends on use in compliance with engineering information provided in our catalog. Users are also reminded that safe operation depends on proper installation, operation and routine maintenance and inspection under prevailing conditions. It is the responsibility of users (and not Twin Disc, Incorporated) to provide and install guards or safety devices which may be required by recognized safety standards or by the Occupational Safety and Health Act of 1970 and its subsequent provisions.

U.S.A. • Australia • Belgium • Canada • China • India • Italy • Singapore • Switzerland

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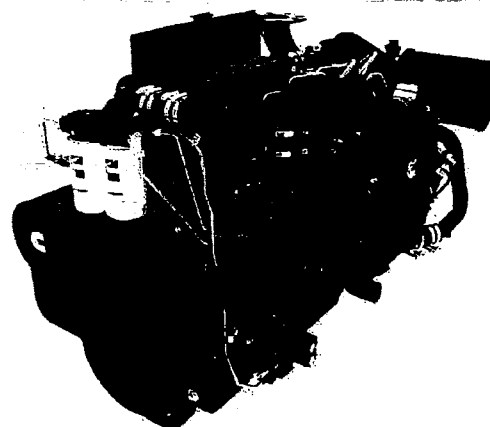


QSB6.7 / QSB7

Marine Propulsion and Auxiliary Engines
for Commercial and Government Applications

General Specifications

Configuration	In-line, 6-cylinder, 4-stroke diesel
Aspiration	Turbocharged / Aftercooled
Displacement	6.7 L (408 in ³)
Bore & Stroke	107 X 124 mm (4.21 X 4.88 in)
Rotation	Counterclockwise facing flywheel
Fuel System	High Pressure Common Rail



Product Dimensions and Weight

Overall Length	mm (in)	1263.8	(49.76)
Length of Block	mm (in)	748.0	(29.45)
Overall Width	mm (in)	910.6	(35.85)
Overall Height	mm (in)	857.0	(33.74)
Weight	kg (lb)	658	(1450)

Dimensions and weight may vary based on selected engine configuration.

Power Ratings

Engine Model	Output Power			Engine Speed RPM	Rating Definition	Fuel Consumption		Emissions			
	kW	MHP	BHP			Rated Speed L/hr (gal/hr)	ISO* L/hr (gal/hr)	IMO	EPA	EU	RCD
Variable Speed											
QSB6.7	169	230	227	3000	Intermittent	47.3 (12.5)	32.2 (8.5)	2	3	3a	—
QSB6.7	184	250	247	2600	Heavy Duty	46.9 (12.4)	33.0 (8.7)	2	3	3a	—
QSB6.7	224	305	301	2600	Continuous	55.6 (14.7)	39.2 (10.4)	2	3	3a	—
QSB6.7	260	354	349	2800	Intermittent	68.1 (18.0)	47.7 (12.6)	2	3	3a	—
QSB6.7	280	380	375	3000	Intermittent	73.9 (19.5)	50.4 (13.3)	2	3	3a	—
QSB6.7	312	425	419	3000	Intermittent	82.2 (21.7)	55.0 (14.5)	2	3	3a	—
QSB6.7	353	480	473	3000	Intermittent	96.2 (25.4)	64.1 (16.9)	2	3	3a	—
QSB6.7	353	480	473	3300	Government	91.9 (24.3)	61.7 (16.3)	2	3	3a	—
QSB6.7	404	550	542	3300	Government	110.2 (29.1)	72.6 (19.2)	2	3	3a	—
Fixed Speed											
QSB7-DM	98	134	132	1800 (60 Hz)	Prime Power	28.1 (7.4)	15.0 (4.0)	—	3	—	—
QSB7-DM	112	152	150	1800 (60 Hz)	Prime Power	31.7 (8.4)	16.6 (4.4)	—	3	—	—
QSB7-DM	122	166	164	1500 (50 Hz)	Prime Power	33.4 (8.8)	17.2 (4.6)	—	3	3a	—
QSB7-DM	130	176	174	1800 (60 Hz)	Prime Power	36.0 (9.5)	18.4 (4.9)	—	3	—	—
QSB7-DM	142	193	190	1800 (60 Hz)	Prime Power	39.2 (10.4)	19.8 (5.2)	2	3	—	—
QSB7-DM	164	223	220	1500 (50 Hz)	Prime Power	46.0 (12.2)	22.7 (6.0)	2	3	3a	—
QSB7-DM	186	254	250	1800 (60 Hz)	Prime Power	51.8 (13.7)	25.2 (6.7)	2	3	—	—
QSB7-DM	210	286	282	1800 (60 Hz)	Prime Power	58.1 (15.4)	28.2 (7.4)	2	3	—	—

* Average fuel consumption based on ISO 8178 E3 Standard Test Cycle (variable speed models) and ISO 8178 D2 Standard Test Cycle (fixed speed models)

TECHNOLOGY THAT TRANSFORMS

QSB6.7 / QSB7

Marine Propulsion and Auxiliary Engines for Commercial and Government Applications

Features and Benefits

Engine Design – Robust engine designed for prime power operation and long life. Metric O-ring seals and edge molded gaskets eliminate fluid leaks. Aluminum pistons for exceptional durability

Fuel System – High Pressure Common Rail electronically-controlled fuel system provides constant high injection pressure regardless of engine speed or load condition. Benefits include low noise and vibration for quiet operation and faster load acceptance

Cooling System – Single loop, low temperature aftercooling eliminates the need for two keel coolers and lowers emissions. Tube and shell heat exchanger designed for superior durability and ease of service with minimal maintenance requirements. Fan drive available for radiator cooled configurations

Exhaust System – Cast water cooled exhaust manifold for lower surface temperatures, safety and improved performance

Air System – Rear engine-mounted water cooled turbocharger from Cummins Turbo Technologies optimized for marine applications

Lubrication System – Standard capacity (18 L [19 quart]) marine grade oil pan, plus a selection of engine mounted and remote lube filters for installation flexibility and ease of maintenance

Electronics – 12v and 24v Quantum System electronics feature a proven ECM to monitor operating parameters such as fuel consumption, duty cycle, engine load and speed, while providing diagnostics, prognostics and complete engine protection. Simplified electrical customer interface box for all vessel connections to reduce installation complexity

Certifications – Complies with U.S. EPA Tier 3 emissions regulations without the use of aftertreatment. Designed to meet the International Association of Classification Societies (IACS) and SOLAS requirements. Consult your local Cummins professional for a complete listing of available class approvals

Optional Equipment

- Front power take-off adapter
- Air and electric starting motors
- Integrated C Command HD panels with a selection of display options available to monitor and maximize operation and performance
- SAE B accessory drive
- Fully integrated type approved alarm and safety system

Cummins is a pioneer in product improvement. Thus specifications may change without notice. Illustrations may include optional equipment.



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DuraCooler™

Patent Pending

Attention:	Richard Sutton	Date:	March 29, 2017	Extension:	108
Company:	Cummins Power Systems	From:	Rishard A Rupp	Checked by:	_____
Address:		Signed:	_____		
City, State, ZIP		Sizing No.	SC4501.101		
Telephone:		File name:			
Fax:		CC:		Rep #	
		Reference Job:	Ferry		

ENGINE INFORMATION

Make and Model:	Cummins QSK38 T3	Circuit:	Jacket Water		
HP, KW & RPM:	1400	BHP	1044 KW @	1800 RPM	
Heat Rejection:	21267	BTU/Min	374 KW		
Fresh Water Pump Flow:	291	GPM	1102 liter/min		
Minimum Hull Speed @ Full Rated Power:	1	Knots			
Temperature to Cooler:	202	°F	94.4 °C		
Temperature from Cooler:	190.8	°F	88.2 °C		
Maximum Sea Water Temperature:	85	°F	29.4 °C		
Antifreeze % Used:	50%				

Recommendation based on the above specifications. PLEASE VERIFY ENGINE DATA before ordering.

Keel Cooler Model	Total Units
SC-412PF-81	1

DuraCooler Drawing: **SC-412PF-81**

Weight Per Cooler, Lbs	230	Pressure Drop ΔPSI per Unit	1.5	Cooler Volume, gal	4.3
Weight Per Cooler, kg	104	Pressure Drop Δbar per Unit	0.10	Cooler Volume, liters	16.3

Caution: Do not exceed 30 psi when pressure testing or operating DuraCooler®.

Note: If a DuraCooler® is used to cool a generator set or any other application where operation may occur at zero knots, it is important that ambient water can freely circulate past the DuraCooler® tubes. The ambient water heated by the DuraCooler® must be free to flow away by means of convection currents to provide a constant source of cool ambient water to the DuraCooler®. To assure the convection current can flow, do not recess the DuraCooler® on the bottom of a vessel unless the mounting surface inclines at least 20° from forward to aft. In addition, if there is any protective shrouding installed around the DuraCooler®, it is especially important that it is constructed so as to not interfere with the free flow of convection currents.

DURAMAX® MARINE PROVIDES THIS SIZING RECOMMENDATION AND SELLS THE DURACOOLER® EXCLUSIVELY IN ACCORDANCE WITH THE DURAMAX® MARINE DURACOOLER® LIMITED WARRANTY AND TERMS AND CONDITIONS OF SALE. A COPY OF THE DURACOOLER® LIMITED WARRANTY AND TERMS AND CONDITIONS OF SALE IS AVAILABLE UPON REQUEST.

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Fax Outside USA: 440-834-4950
Phone: 440-834-5400

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Web: www.duramax-marine.com

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DuraCooler™

Patent Pending

Attention: Richard Sutton Date: March 29, 2017
Company: Cummins Power System From: Richard A Rupp Extension: 108
Address: Signed: _____ Checked by: _____
City, State, ZIP Sizing No. SC4501.201
Telephone: File name: _____
Fax: CC: _____ Rep # _____
Reference Job: Ferry

ENGINE INFORMATION

Make and Model:	Cummins QSK 38 T3	Circuit:	Aftercooler + Gear	
HP, KW & RPM:	1400	BHP	1044 KW @	1800 RPM
Heat Rejection:	19320	BTU/Min	340 KW	
Fresh Water Pump Flow:	148	GPM	560 liter/min	
Minimum Hull Speed @ Full Rated Power:	1	Knots		
Temperature to Cooler:	139.9	°F	59.9 °C	
Temperature from Cooler:	120	°F	48.9 °C	
Maximum Sea Water Temperature:	85	°F	29.4 °C	
Antifreeze % Used:	50%			

Recommendation based on the above specifications. PLEASE VERIFY ENGINE DATA before ordering.

Keel Cooler Model	Total Units
SC-418PFDP-138	1

DuraCooler Drawing: **SC-418PFDP-138**

Weight Per Cooler, Lbs	450	Pressure Drop ΔPSI per Unit	2.8	Cooler Volume, gal	10.4
Weight Per Cooler, kg	204	Pressure Drop Δbar per Unit	0.19	Cooler Volume, liters	39.4

Caution: Do not exceed 30 psi when pressure testing or operating DuraCooler®.

Note: If a DuraCooler® is used to cool a generator set or any other application where operation may occur at zero knots, it is important that ambient water can freely circulate past the DuraCooler® tubes. The ambient water heated by the DuraCooler® must be free to flow away by means of convection currents to provide a constant source of cool ambient water to the DuraCooler®. To assure the convection current can flow, do not recess the DuraCooler® on the bottom of a vessel unless the mounting surface inclines at least 20° from forward to aft. In addition, if there is any protective shrouding installed around the DuraCooler®, it is especially important that it is constructed so as to not interfere with the free flow of convection currents.

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