

Cummins Marine Overview



Who is Cummins Inc.?



Who is Cummins Inc.



- ◆ Cummins Inc. is organized into four business units:
 - Engine Business
 - Power Generation
 - Filtration and others
 - International Distributor Business



Marine Overview



Cummins Marine - Charleston, SC

- ◆ **Established as a Division of Cummins, Inc. in 1992**
- ◆ **Worldwide Focus / 100% dedicated to Commercial Marine**
- ◆ **Global responsibilities for Marine Business Leadership / Engineering & Customer Engineering / Sales / Customer Support**
- ◆ **Resources and support of Cummins, Inc. Engineering and support functions**
- ◆ **Facilities include Cad Stations / Marine Test Cells / Prototype Centers**

Commercial HHP/Aux. Organization Chart



Marine

Geoff Conrad
General Manager

Kwamie Green
Accounting Support / Special
Projects

Dennis Spriggs - Financing

Roger Clark – Marketing Controller

Rachel Bridges - Marketing Consultant

John Yancone
Application
Engineering Leader

Randy Busing
HHP/ Aux AE

Jim Wakenell
Aux AE

Flash Kinloch
Electronics / Controls
Engineer

Diana D. Cobb
AE Tech

Open
HHP/ Aux AE –
CABO

Leo Schertz
NA Marine Manager

Jackie Collins
Sales Support

Washington
Maurojorge
CLA Marine
Manager

Jon Hill
HHP / AUX
Service Leader

Michael Drew
NA – HHP / Aux
Service Manager

Bruce Hallex
HHP / Aux
Technician

Open
HHP / Aux Service
Manager – C ABO

John C King
Certification
Engineer

Eddie Brown
Certification
Technician

Simon Tandy
C ABO Marine
Manager

Richard Payne
C ABO Marine
Technical
Manager

Denise Rimmer
Marine Genset
Business
Manager

Cummins Marine Ratings



◆ Continuous Duty

- Use in applications requiring uninterrupted service at full power
- Unlimited hours per year

◆ Heavy Duty

- Continuous use in variable load applications
- Limited to full power 8 out of every 10 hrs
- Reduced power operations must be at or below 200 rpm of rated
- Use in applications that operate 5,000 hrs per year.

Cummins Marine Ratings



◆ Medium Continuous Duty

- Variable load applications limited to full power for 6 out of 12 hrs
- Reduced power operations must be at or below 200 rpm of rated
- Use in applications that operate 3,000 hrs per year

◆ Intermittent Rating

- Limited to full power 2 out of every 8 hrs
- Reduced power operations must be at or below 200 rpm of rated
- Use in applications that operate 1,500 hrs per year

2002-2003 Marine Successes

- **High Speed Ferries - 70% penetration**

- ~ Continued success with KV's, West Coast, East Coast, Growing to Florida



- **Pushboats and Tugs - 40% penetration**

- ~ Established in 2nd largest tow fleet
- ~ Continued growth Med size fleets
- ~ First triple screw QSK19
- ~ Continued growth in ship assist markets



2002-2003 Marine Successes

- **Fast Supply/ Crewboats - 75% penetration**

- ~ K50's Launched into Crewboat market
- ~ Most installed Hp in a single application worldwide

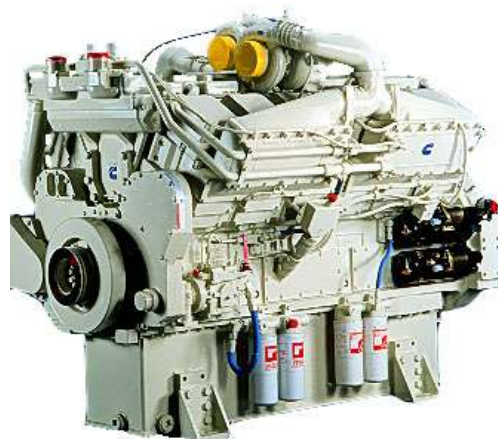


- **OSV's 145-165' - 60% penetration**
 - ~ Dominance in this size segment with K38's
- **PSV's- >200' - First installations**
 - ~ Have received orders for a total of 48 vessels with QSK60's since 2002

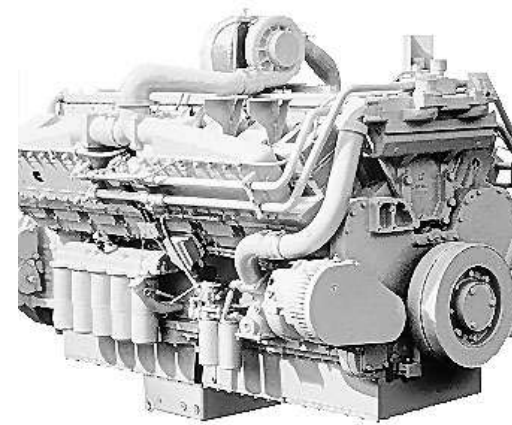
Propulsion Products



K19



K38



K50



QSK19



QSK60

Auxiliary Products

Auxiliaries

6B

6C

QSM11

K19

KV38

KV50

QSK60



HHP Plants



Seymour, Indiana

- ◆ Cummins Industrial Center - K19/QSK19
- ◆ 380,839 sq ft
- ◆ ISO 9001 (Bureau Veritas Quality International)
- ◆ ISO 14001 (Bureau Veritas Quality International)
- ◆ Marine Society Type Approvals - 9
- ◆ U.S. Military - various commendations



Daventry, England

- Daventry Engine Plant
- K38/50 QSK45/60/78
- 264,023 sq ft
- Queens Award for Export, latest 2002
- ISO 9002- (Lloyds Quality Approval)
- ISO14001- (Lloyds Quality Approval)
- Marine Society Type Approvals - 9

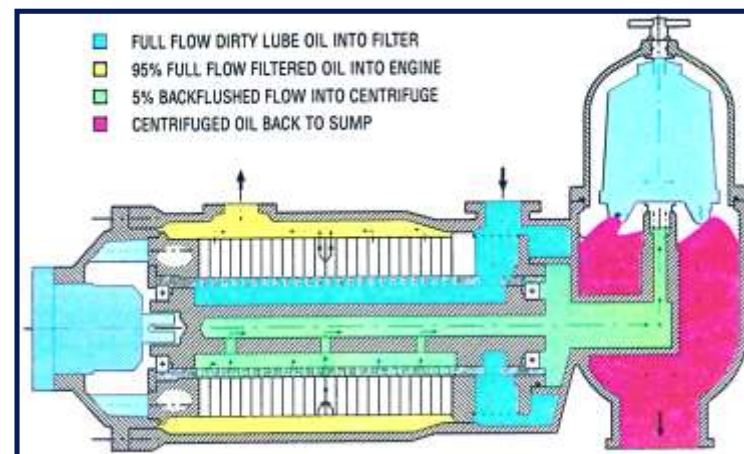
K/KV Product Features

- ◆ 500 – 2000 hp
- ◆ I-6, 12V and 16V configuration – 19, 38 & 50 liter displacement
- ◆ K19 built in Seymour, IN
- ◆ KV's built in Daventry, UK
- ◆ Engines are type approved by 9 different societies
- ◆ Keel-cooled or heat exchanger
- ◆ PRE-LUBE Electric Starter Motors
- ◆ CENTRY Electronics
- ◆ ELIMINATOR filter (KV)
- ◆ CENTINEL advanced oil management system

- ◆ Allows better vessel response
- ◆ ABS Approved
- ◆ Helps improve:
 - Productivity
 - Performance
- ◆ Engine diagnostic capabilities help you troubleshoot problems
- ◆ Allows the use of electronic type throttles (4-20mA and voltage)

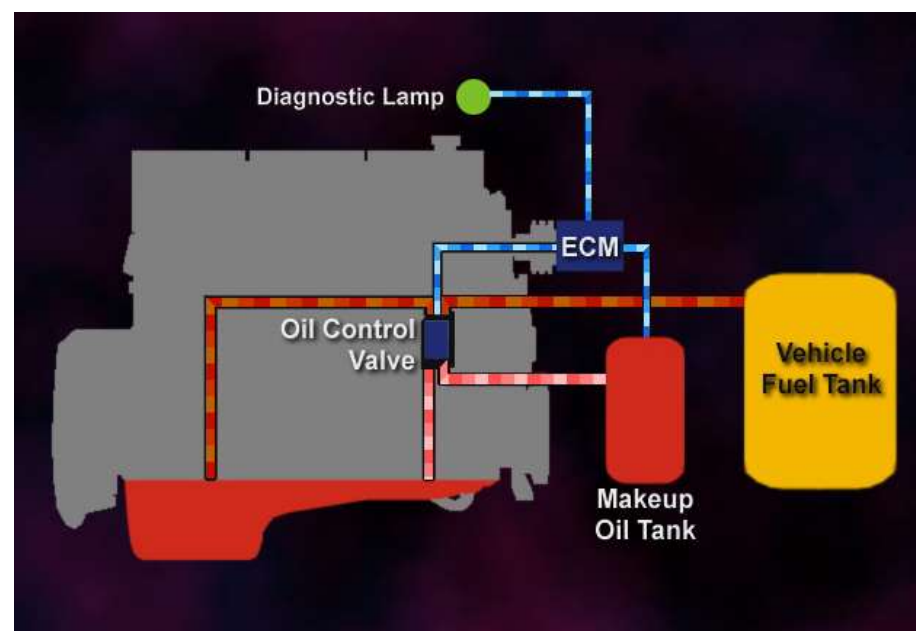
ELIMINATOR Oil Filter

- ◆ Engine mounted lube oil filter assembly
- ◆ Eliminates
 - Disposable filter costs
 - Labor connected with disposable filters
 - Disposable filter waste
- ◆ Automatic, self-cleaning filter system
- ◆ Runs on pressure generated by the flow of oil
- ◆ Clean main filter discs at O/H
- ◆ Payback? ~2 yrs



CENTINEL Oil Management System

- ◆ Sophisticated oil burn system
- ◆ Mixes oil into fuel return (1:300)
- ◆ Regulated by engine duty cycle
- ◆ Approved by the US EPA
- ◆ Extends oil drain intervals to 4,000 hours
- ◆ Enhanced engine protection
- ◆ Allows more engine uptime
- ◆ Many customers are using Centinal along with Eliminator



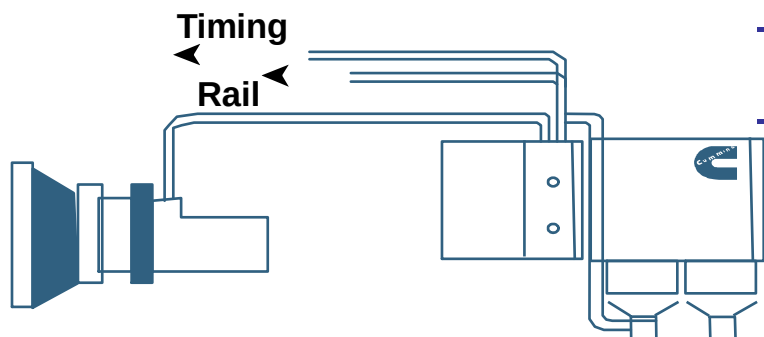
QSK19 Product Features



- ◆ In-line 6 cylinder, 19 liter displacement
- ◆ 660 – 800 hp
- ◆ Built in Seymour, IN
- ◆ Quantum System electronics featuring HPI fuel system
- ◆ Low profile design to ease repower installation
- ◆ Excellent fuel consumption
- ◆ Shares popular features with K19, but with 10% more power on continuous ratings
- ◆ Single loop LTA (low temperature aftercooling) cooling system

HPI Fuel System

Two Common Rails

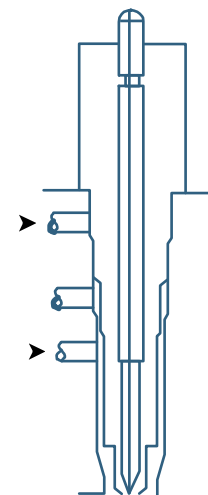


- Timing
- Fuel Quantity/Metering

- Simple, Reliable Design
- No High-Pressure Joints
- Continuously Variable Timing
- Optimized Combustion Process
- High Injection Pressure
- Full Authority Electronics

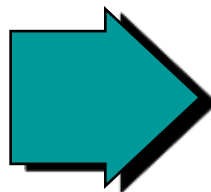


Timing
Drain <
Rail



HPI Fuel System

Variable Timing
Results
in these
Improvements



- ◆ Emissions
- ◆ Fuel Economy
- ◆ Cold Starting
- ◆ White Smoke
- ◆ Black Smoke
- ◆ Durability
- ◆ Allows Higher Torque Rise
- ◆ Improved Transient Response

QSK60 Features and Benefits



QSK60 Features



- ◆ V-16 cylinder, 60 liter displacement
- ◆ 2000 - 2300 hp; 1500-1825 Kwe
- ◆ Designed for high-hour, high load factor applications
- ◆ Marine agency certified
- ◆ Quantum System electronics featuring HPI fuel system – similar to QSK19 system
- ◆ Minimum mid-life maintenance required
- ◆ Proven in demanding Industrial and Power Gen applications (over 3000 units in service since 1999)

Monitoring Options from Cummins

◆ ED-2 Electronic Display

- Display and alarms for engine controller

◆ Engine Panel

- Display and alarms for specific separate engine monitoring sensors
- Engine room and wheelhouse

◆ Digital Display Panel

- Display and alarms for up to 200 sensors
- Includes fault indications from engine controller
- Engine room and wheel house
- Type approved



Cummins PowerCare- Parts



- ◆ Provide parts, service, and information for over 6,200,000 Cummins engines in service worldwide; Approximately 80,000 part numbers for new and 3,000 for ReCon
- ◆ Cover all markets, all segments for Cummins customers
- ◆ Memphis Warehouse-650,000 square feet
- ◆ Employ approximately 2200 people

Certified Application Engineers



- ◆ All Cummins Distributors worldwide must have marine certified capability around Application and Installation.
- ◆ This person is the front line point of contact for all questions on application & installation.
- ◆ Annual training is conducted to maintain a high level of quality and awareness.
- ◆ Policy dictates that all applications are reviewed and sea trialed for conformance with Cummins Installation Guidelines.

Qualified Marine Technicians

- ◆ Marine HHP Training Center located in Morgan City, LA
- ◆ Ongoing extensive worldwide training to certify marine mechanics.
- ◆ Focused on troubleshooting, repair, and rebuild.
- ◆ Mechanics are continually evaluated to maintain a high level of quality and service capability.
- ◆ Customer training is available at the Marine HHP Training Center

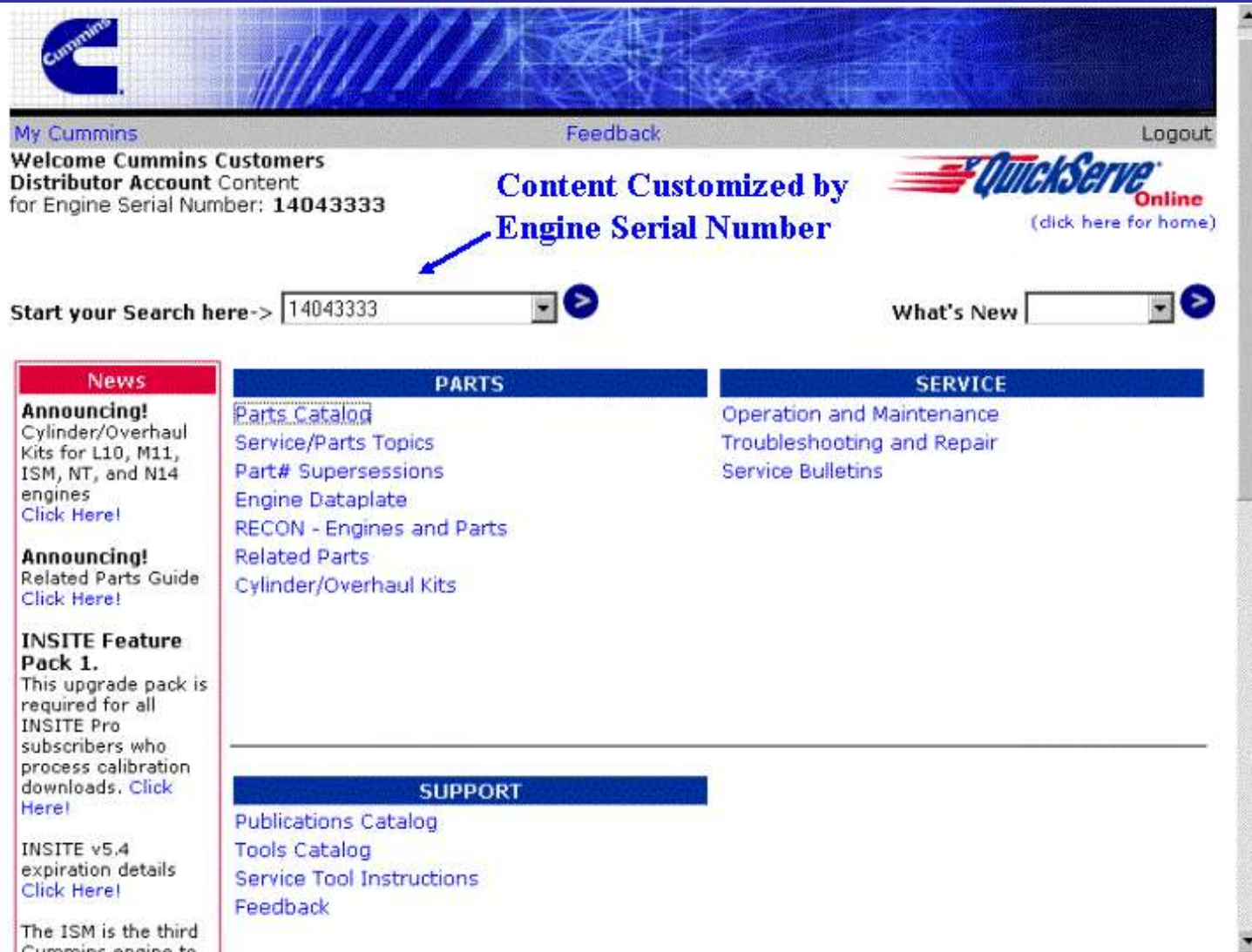


QuickServe Online- Fleets/End Users



- ◆ Contains parts and service information
- ◆ ESN specific information
- ◆ Service available Online (<http://quickservice.cummins.com>)
 - Netscape (v4.05 or higher)
 - Internet Explorer (v4.0 or higher)
- ◆ Contact your local distributor for subscription information

QuickServe Online- Fleets/End Users



Cummins

My Cummins Feedback Logout

Welcome Cummins Customers
Distributor Account Content
for Engine Serial Number: **14043333**

Content Customized by Engine Serial Number

QuickServe Online
(click here for home)

Start your Search here-> 

What's New 

News	PARTS	SERVICE
Announcing! Cylinder/Overhaul Kits for L10, M11, ISM, NT, and N14 engines Click Here!	Parts Catalog	Operation and Maintenance
Announcing! Related Parts Guide Click Here!	Service/Parts Topics	Troubleshooting and Repair
INSITE Feature Pack 1. This upgrade pack is required for all INSITE Pro subscribers who process calibration downloads. Click Here!	Part# Supersessions	Service Bulletins
INSITE v5.4 expiration details Click Here!	Engine Dataplate	
The ISM is the third Cummins engine to	RECON - Engines and Parts	
	Related Parts	
	Cylinder/Overhaul Kits	

SUPPORT

[Publications Catalog](#)
[Tools Catalog](#)
[Service Tool Instructions](#)
[Feedback](#)

QuickServe Online- Fleets/End Users



The screenshot shows the Cummins QuickServe Online interface. At the top, there's a header with the Cummins logo and navigation links like 'My Cummins', 'Feedback', and 'Logout'. Below this, a welcome message for a distributor account is displayed for engine serial number 14043333. The 'QuickServe Online' logo is also present with a link to the home page. The main section displays 'Base Engine Information' for the specified serial number, listing various details such as shop order number, plant, build date, and model name. At the bottom, there are interactive buttons for 'View Option List' and a search function for the engine serial number.

Basic Engine Data and Parts Searches

Engine Serial Number = 14043333

Base Engine Information

Serial Number	14043333
Shop Order #	SO76197
Plant	CEP - Columbus
Build Date	29 Oct 2002
Shop Order Date	25 Oct 2002
Customer Number	01950
Fuel Pump Part #	4088507
Fuel Pump Caliber	P221
Film Card	SS
Engine Config #	D103004BB21
CPL #	CPL8287
Model Name	ISX 450ST

• [View Option List](#)

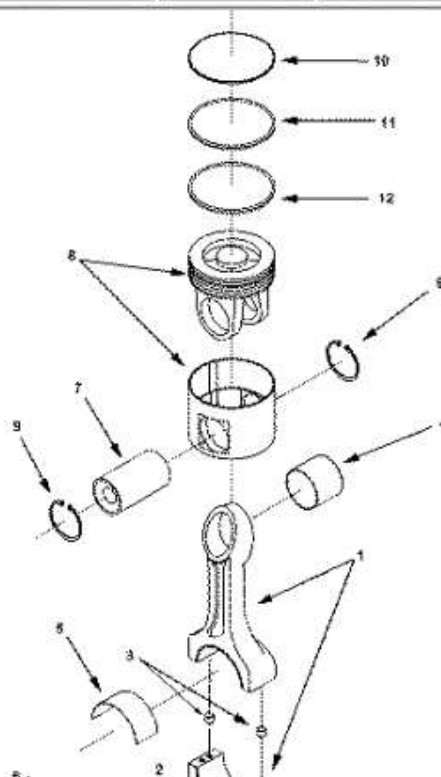
• Search ESN: 14043333 for Description: [➤](#)

QuickServe Online- Fleets/End Users

Welcome Cummins Customers
Distributor Account Content
for Engine Serial Number: 14043333

QuickServe
Online
(click here for home)

Option Number: PP10194 Group: 01.05 Graphic: pp100go Search: |



**Assembly
Graphics**

QuickServe Online- Fleets/End Users

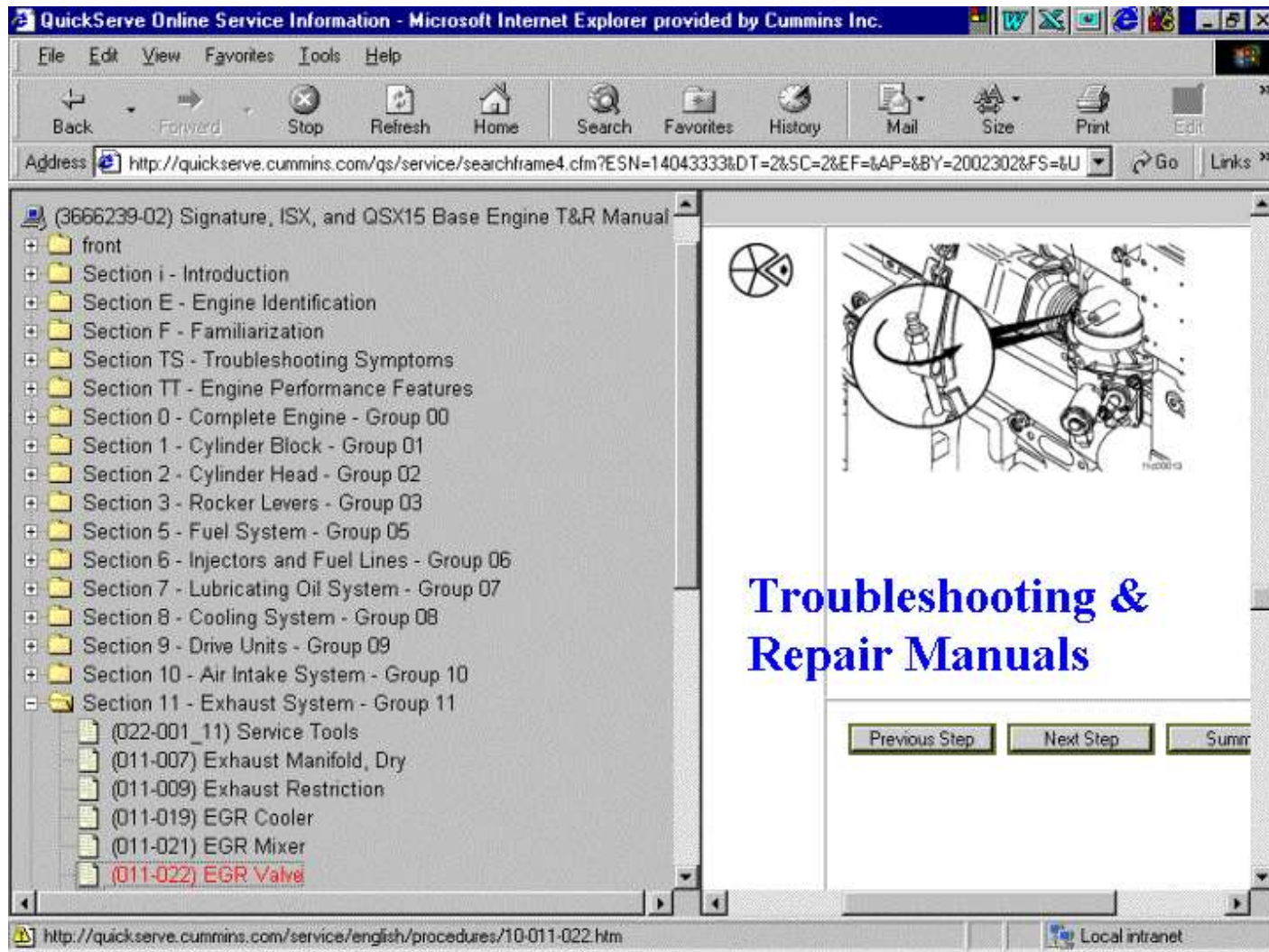
Option	4-Sale	Part Name	Remarks
PP10194		Engine Piston	Engine piston

Ref No	Part Number			4-Sale	Part Name	Req	Remarks
	PP10194	S	ADD	N	Engine Piston		Engine piston
				Y			CPL: 8287,8288.
	4059429	S	ADD	N	Rod, Engine Connecting	6	
1	4059449	S	ADD	N	Rod, Engine Connecting	6	
2	3678574	S	ADD	Y	Screw, Connecting Rod Cap	4	
3	3678739	S	ADD	Y	Dowel, Ring	2	
4	4059448	S	ADD	N	Bushing	6	
5	4059447	S	ADD	N	Bearing, connecting Rod	6	
6	3682166	S	ADD	N	Bearing, Connecting Rod	6	
7	4059363	S	ADD	Y	Pin, Piston	6	
8	4101477	S	ADD	N	Piston, Engine	6	
9	3064305	S	ADD	Y	Ring, Retaining	12	
10	3683008	S	ADD	N	Ring, Compression Piston	6	
11	3681078	S	ADD	N	Ring, Compression Piston	6	
12	3682398	S	ADD	N	Ring, Oil Piston	6	
				N			

**Service
Parts List**

**Link to Part
Supersession**

QuickServe Online- Fleets/End Users



QuickServe Online- Fleets/End Users

Section 6 - I...

Section 7 - L...

Section 8 - C...

(022-001_

(008-002)

(008-003)

(008-006)

(008-009)

(008-013)

(008-014)

(008-016)

(008-017)

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(008-036)

(008-038)

(008-040)

(008-042)

(008-045)

(008-047)

(008-049)

(008-062)

(008-080)

(008-082)

(008-088)

(008-089)

Section 9 - [

Section 10 -

Section 11 -

(022-001_

(011-007)

Refer to Procedure [Coolant Recommendations and Specifications](#) at the beginning of this section.



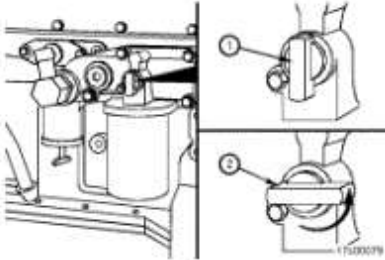
Repair Procedures Updated Real Time


00x0038

Next Step

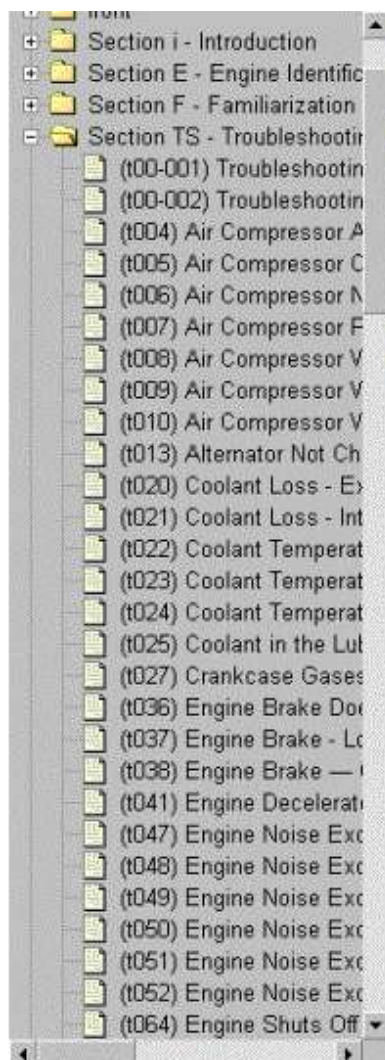
An on/off valve is provided to prevent coolant leakage while changing the coolant filter.

With the valve in the ON position (1), the coolant flows to and from the coolant filter. In the OFF position (2), the coolant flow is cut off to and from the coolant filter.


17500079

Previous Step Next Step

QuickServe Online- Fleets/End Users



[View Related Topic](#)

Alternator Not Charging or Insufficient Charge

This is symptom tree t013

Cause	Correction
Battery cables or connections are loose, broken, or corroded (excessive resistance)	Check the battery cables and connections. Refer to Procedure 013-009.

OK
↓

Troubleshooting Trees

Batteries have failed	Check the condition of the batteries, replace if necessary. Refer to Procedure 013-007 and the OEM service manual.
-----------------------	--

OK
↓

QuickServe Online- Fleets/End Users

QuickServe Search Results - Netscape

File Edit View Go Communicator Help

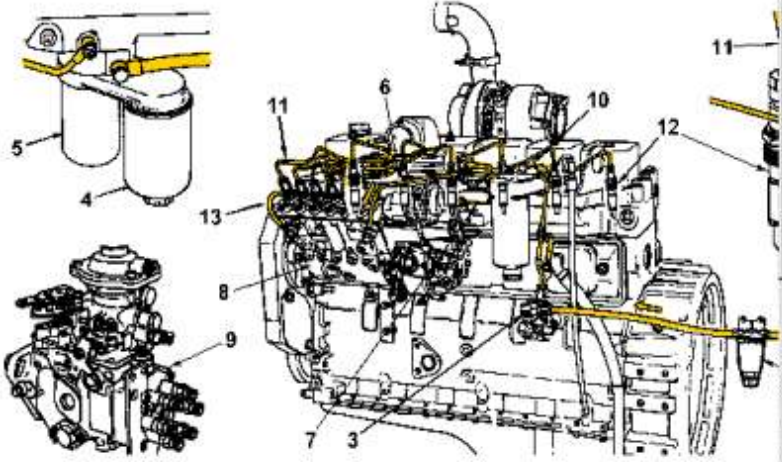
Back Forward Reload Home Search Netscape Print Security Stop

[QuickServe Online](#) [Back to Manual List](#)

- Section 1 - Cylinder Block - Group 01
- Section 2 - Cylinder Head - Group 02
- Section 3 - Rocker Levers - Group 03
- Section 4 - Cam Followers/Tappets - Group 04
- Section 5 - Fuel System - Group 05
 - AFC Assembly - General Information
 - Cold Start Timing Advance System (KSE)
 - Cold Start Timing Advance System (KSE)
 - Cold Start Timing Advance System (KSE)
 - Engine Fuel Heater, Electric
 - Flow Diagram, Fuel System**
 - Fuel Consumption - Measure
 - Fuel Flow - Pressure Test
 - Fuel Injection Pump, Inline Split Port Type
 - Fuel Injection Pump, Rotary
 - Fuel Injection Pumps, In-Line

System Diagrams

Flow Diagram, Fuel System

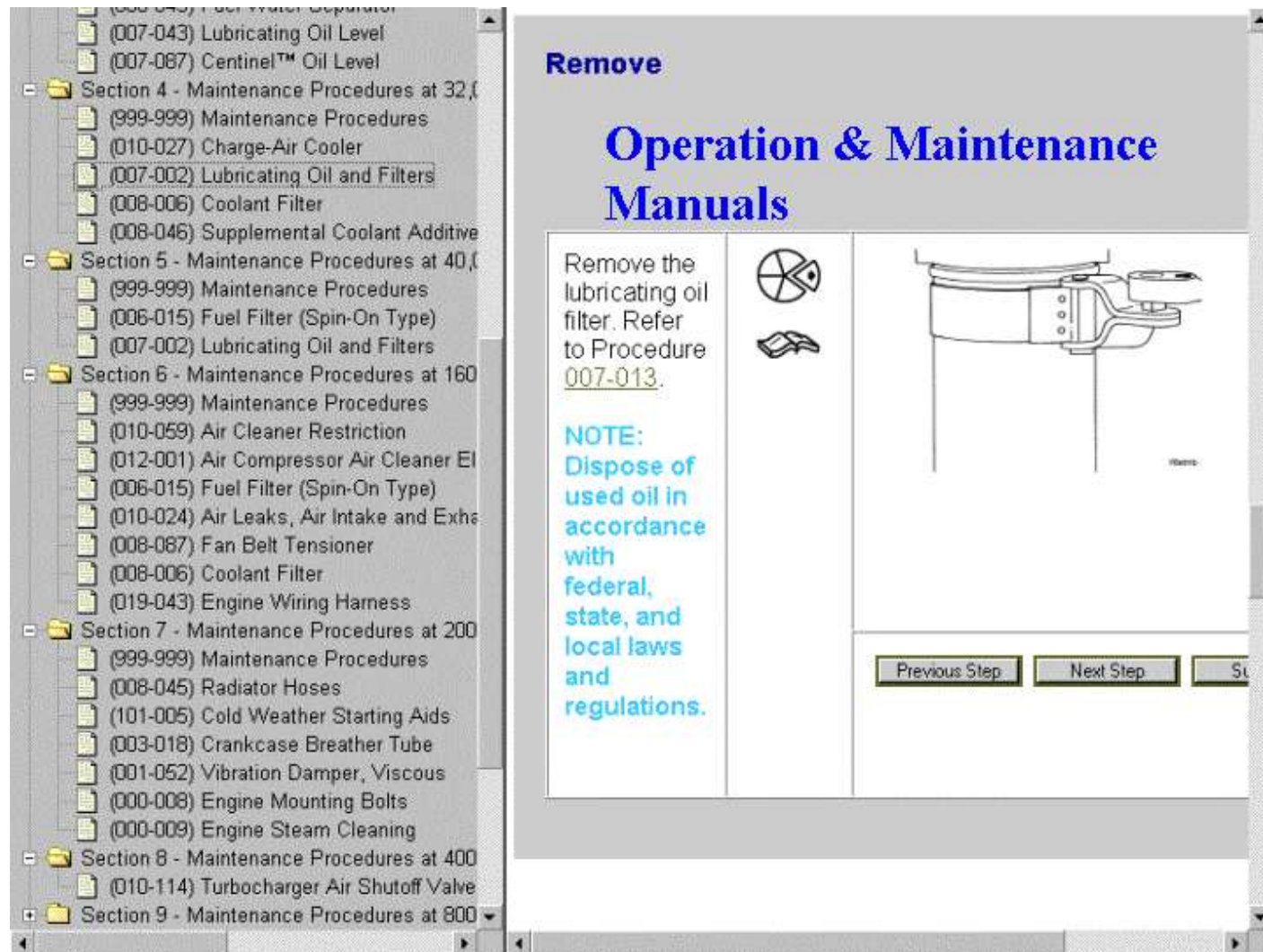


The diagram illustrates the fuel system components and their interconnections. It includes a fuel supply tank, prefilter, fuel lift pump, fuel/water separator, fuel filter, low-pressure fuel line, turbocharger boost control line, and a Bosch P7100 injection pump. The diagram is labeled with numbers 1 through 13, corresponding to the legend below.

1. Fuel from supply tank
2. Prefilter or screen
3. Fuel lift pump
4. Fuel/water separator
5. Fuel filter
6. Low-pressure fuel line
7. Turbocharger boost control line
8. Bosch® P7100 injection pump
9. Fuel injection pump, inline split port type
10. Fuel injection pump, rotary
11. Fuel injection pumps, in-line
12. Fuel injection pumps, in-line
13. Fuel injection pumps, in-line

Document: Done

QuickServe Online- Fleets/End Users



The screenshot displays the Cummins QuickServe Online interface. On the left is a tree view of maintenance procedures, with 'Section 7 - Maintenance Procedures at 200' expanded. The main content area is titled 'Remove Operation & Maintenance Manuals'. It contains a text instruction: 'Remove the lubricating oil filter. Refer to Procedure 007-013.' Below this is a 'NOTE' in blue text: 'Dispose of used oil in accordance with federal, state, and local laws and regulations.' To the right of the text are two icons: a pie chart and a wrench. Further right is a line drawing of a lubricating oil filter. At the bottom of the main content area are three buttons: 'Previous Step', 'Next Step', and 'Start'.

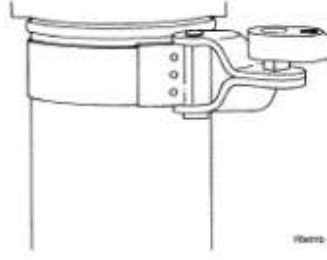
Remove

Operation & Maintenance Manuals

Remove the lubricating oil filter. Refer to Procedure [007-013](#).

NOTE:
Dispose of used oil in accordance with federal, state, and local laws and regulations.



[Previous Step](#) [Next Step](#) [Start](#)

QuickServe Online- Fleets/End Users

QuickServe Online

Engine Serial Number: 14043333

Service Bulletins

- (3379001) Fuels for Cummins
- (3379009) Operation of Diesel
- (3666005) Dynamometer a
- (3666052) Camshaft Reuse
- (3666132) Cummins Coola
- (3666456) QSK19 Hot Star
- (3810340) Cummins Engin
- (3810493) CHARGE AIR C
- (4021378) Multiplexing Tro

QuickServe Online

Service Bulletin Number	Date
3379001-07	01-OCT-2002

Design Application	Market Application
All	All



Service Bulletin

Fuels for Cummins Engines

Introduction

This bulletin covers information about fuels for Cummins engines. The purpose of this bulletin is to help the user understand proper fuel selection, and problems associated with fuel.

Diesel Fuel

Diesel fuel performs three major functions in a Cummins diesel engine.

1. It supplies all the energy for the engine.
2. It cools and lubricates the precision parts of the engine's fuel pump and injectors.
3. It enables emissions controlled engines to meet regulated emissions levels.

Service Bulletins

QuickServe Online- Fleets

Topic Number	Revision Level	Planned Mailpack Date	Group Number
03T7-2		MAY 2003 ←	07
Expiration Date (U.S. and Canada)		Expiration Date (International)	
Engine Family		Fuel System	
Signature, ISX, QSX15 Signature, ISX, QSX15		Signature, ISX, QSX15 Signature, ISX CM870	
Design Application		Market Application	
All		All	
CPL	Engine Serial Number Range		
	From	To	

**Service Part
Topics**



Service/Parts Topics

Real Time Updates

Procedures 007-007 and 007-037

Publications Affected by This Service Parts Topic				
Engine	Operation and Maintenance	Troubleshooting and Repair	Shop	Other

Maintenance requirements

◆ Daily

- Fluid checks
- Clean seawater strainer
- Check engine fault codes

◆ Weekly

- Check air cleaner restriction indicator (change if necessary)

◆ 250 hrs/ 6 months

- Change engine oil if not using Chart Method or CENTINAL
- Change all canister type filters
- Inspect belts and check tension
- Check cooling system additives

Maintenance requirements

- ◆ 1500 Hrs/ 1 yr
 - Adjust valves and injectors (first interval only)
 - Grease front engine support (QSKV/KV only)
 - Check and replace hoses as required
 - Check batteries
 - Tighten mounting bolts
 - Measure crankshaft end clearance
 - Check heat exchanger zincs
 - Clean/ replace crankcase breather element
 - Clean ELIMINATOR centrifuge
- ◆ 4000 hrs
 - Change oil (if using CENTINAL)

Maintenance requirements

- ◆ 6000 Hrs/ 2 years
 - Clean and calibrate injectors and fuel pump
 - Inspect
 - ◆ Turbocharger
 - ◆ Vibration damper
 - ◆ Coolant pump(s)
 - ◆ Seawater pump
 - Clean and flush cooling system (if using fully formulated coolants, you will not need to clean/flush until 9000 hrs/ 2 yrs)

Maintenance requirements



◆ Coolant treatment

- Recent trends in material uses has created need for updated coolant requirements
- Cummins now recommends the use of fully formulated premixed coolants
- For water systems Cummins requires minimum 25% anti-freeze and elevated SCA (Supplemental Coolant Additives) for proper corrosion protection. (50% anti-freeze needed for freeze protection)
- Recent comparisons between customers that have run fully formulated coolant vs. straight water cooling systems showed lower intake manifold temperatures which has led to lower cylinder temperatures and longer engine life

Questions ?