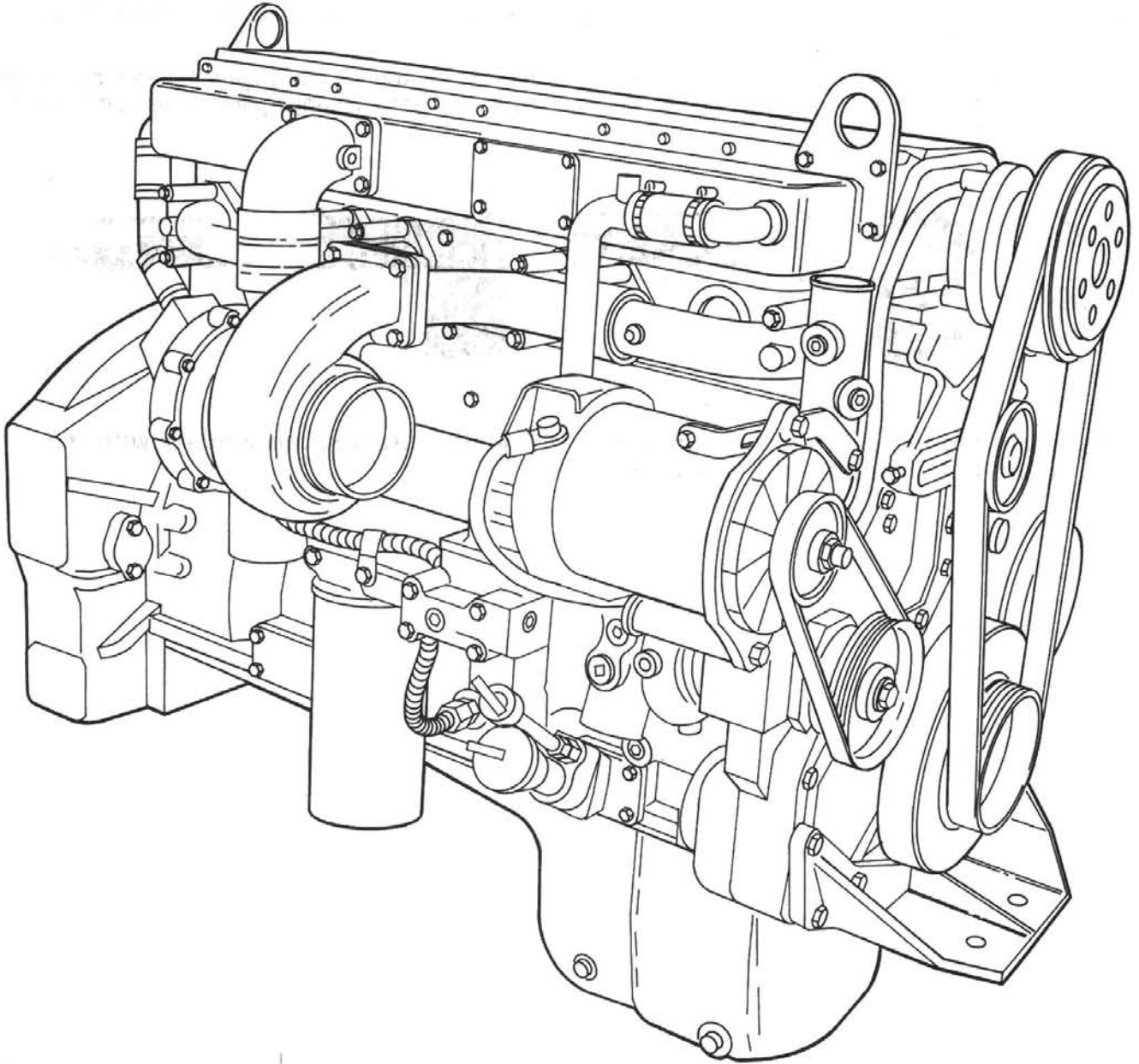




# Operation and Maintenance Manual L10 Series Engines Industrial Models



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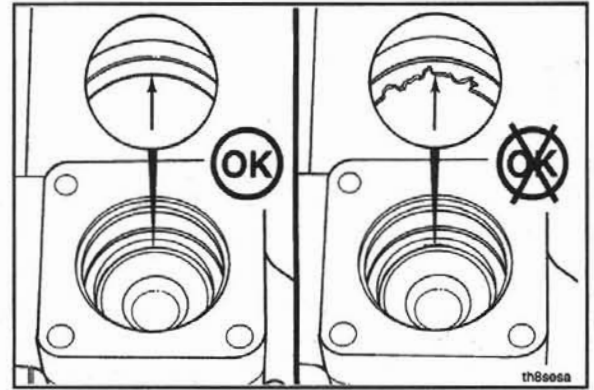


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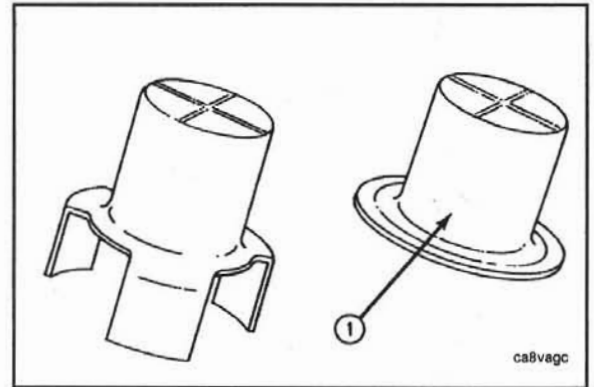
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## Illustrations

The illustrations used in the "Repair Sections" of this manual are intended to give an example of a problem, and to show what to look for and where the problem can be found. Some of the illustrations are "generic" and might **not** look exactly like the engine or parts used in your application. The illustrations can contain symbols to indicate an action required, and an acceptable or **not** acceptable condition.



The illustrations are intended to show repair or replacement procedures. The illustration can differ from your application, but the procedure given will be the same.



Engine Maintenance Schedule (C-2)				
Daily or Intermittent	Every 1,000 km (600,000 in, 1,000 hours or 8 months) (1)	Every 10,000 km (60,000 in, 10,000 hours or 8 years) (2)	Every 100,000 km (600,000 in, 100,000 hours or 8 years) (3)	Every 200,000 km (1,200,000 in, 200,000 hours or 16 years) (3)
<ul style="list-style-type: none"> <li>Check coolant's level</li> <li>Check and bring to correct level - Engine Oil - Oilpan</li> <li>Visually inspect fan</li> <li>Visually inspect engine for damage, wear, loose or missing nuts and correct or record for future action.</li> <li>Check fuelwater separator.</li> </ul>	<ul style="list-style-type: none"> <li>Oil Change</li> <li>Lubricating Oil Filter</li> <li>Check Fan</li> <li>Rebalance engine on Cummins 2 cylinder air compressor if equipped with an air cleaner.</li> <li>Check intake air system and charge air cooler for damage or loose connections.</li> <li>Check engine coolant DCA4 concentration level. Add make-up DCA4 if required.</li> <li>Check air intake system for wear, leaks or damage to parts, hose clamps, and seals.</li> <li>Check air cleaner restriction.</li> <li>Check exhaust heater and clean if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust valves and injectors</li> <li>Strain clean engine</li> <li>Check torque on turbocharger mounting nuts</li> <li>Check torque on engine mounting bolts</li> <li>Replace hoses as required</li> <li>Check shifter/brake and throttle rods if equipped</li> </ul>	<ul style="list-style-type: none"> <li>Clean cooling system and change coolant and antifreeze</li> </ul>	<ul style="list-style-type: none"> <li>Clean and calibrate injectors, fan pump, Air Compressor</li> <li>Fan Clutch</li> <li>Water pump</li> <li>Fan belt</li> <li>Fan idler pulley assembly</li> <li>External Vibration Damper</li> <li>Clean and calibrate CTC hydraulic systems</li> <li>Clean and adjust CTC or control valve.</li> </ul>

NOTE: Refer to the appropriate sections for complete inspection and maintenance procedures.  
 1. The viscosity of and substituting oil filter element can be adjusted based on fuel and oil consumption rates of the engine. See Section V for the Chart Method.  
 2. Follow the manufacturer's recommended maintenance procedures for the starter, alternator, generator, battery, electrical components, engine drain, exhaust drain, air compressor, heat compressor, and fan clutch. Refer to Section C for addresses and telephone numbers.  
 3. At each scheduled maintenance interval, perform all previous checks in addition to the ones specified.

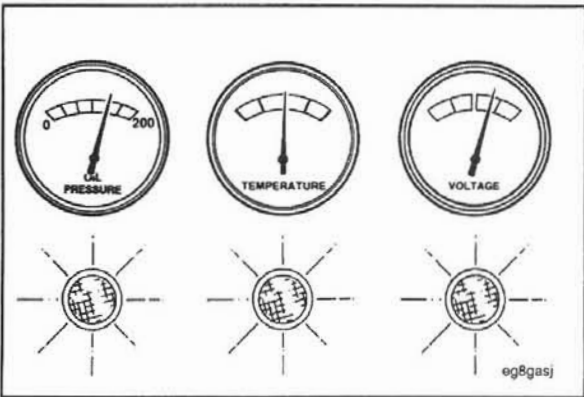
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## General Information

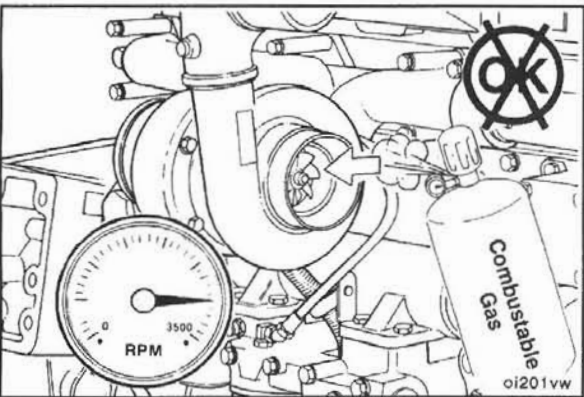
Correct care of your engine will result in longer life, better performance and more economical operation.



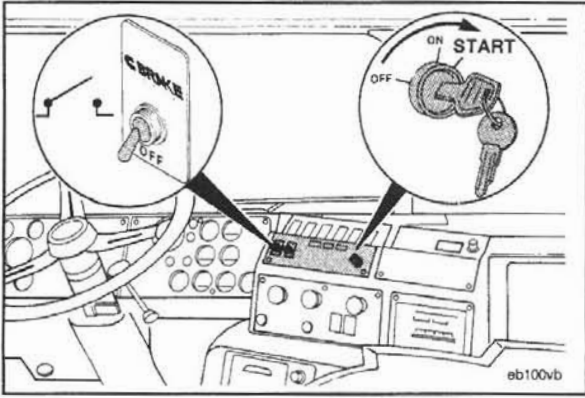
- Follow the daily maintenance checks listed in Maintenance Guidelines, Section 2.



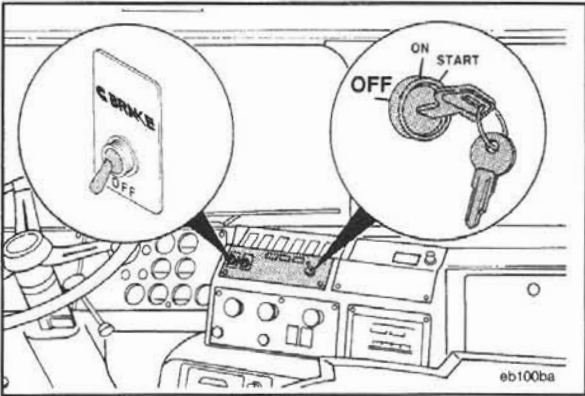
- Check the oil pressure indicators, temperature indicators, warning lights and other gauges daily to make sure they are operational.



**Warning: DO NOT OPERATE A DIESEL ENGINE WHERE THERE ARE OR CAN BE COMBUSTIBLE VAPORS.** These vapors can be sucked through the air intake system and cause engine acceleration and over-speeding, which in turn can destroy the engine and result in a fire, personal injury and extensive property damage. Numerous safety devices are available, such as air intake shutoff devices, to minimize the risk of overspeeding where an engine, due to its application, might operate in a combustible environment, such as due to a fuel spill or gas leak. Remember, Cummins has no way of knowing the use you have for your engine. **THE EQUIPMENT OWNER AND OPERATOR ARE RESPONSIBLE FOR SAFE OPERATION IN A HOSTILE ENVIRONMENT. CONSULT YOUR CUMMINS AUTHORIZED REPAIR LOCATION FOR FURTHER INFORMATION CONCERNING PROTECTION DEVICES SUITABLE FOR YOUR APPLICATION.**



Always start the engine with the engine brake ON/OFF switch in the "OFF" position.

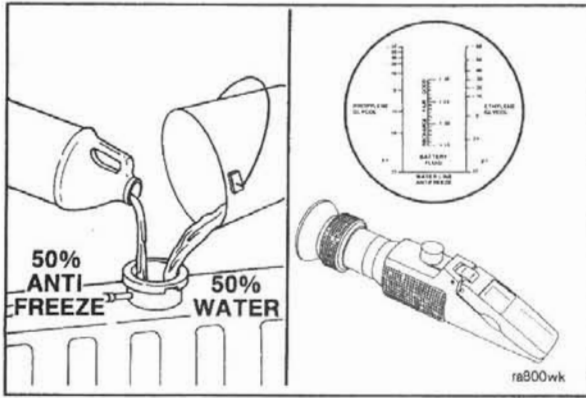


**Caution:** Do not operate the engine if the engine brake will not deactivate. To do so will cause severe engine damage.

If the engine brake will **not** shut off, shut off the engine immediately and contact a Cummins Authorized Repair Location.



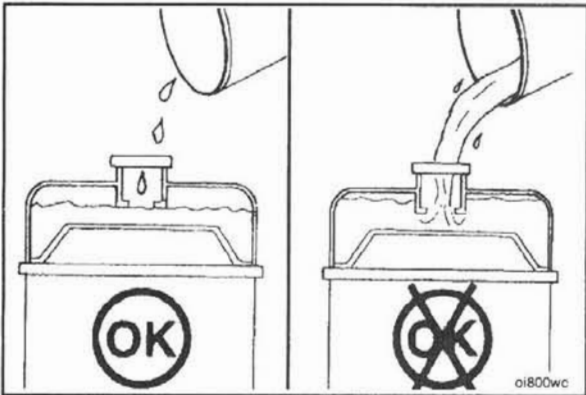
Refer to the manufacturer's maintenance recommendations. A listing of addresses and telephone numbers is provided in Component Manufacturers, Section C, of this manual.



Antifreeze overconcentration reduces freeze protection. Do **not** use more than 68 percent antifreeze or overheating can result. A mixture of low silicate antifreeze and 50 percent water is sufficient for freeze protection to  $-37^{\circ}\text{C}$  [ $-34^{\circ}\text{F}$ ].

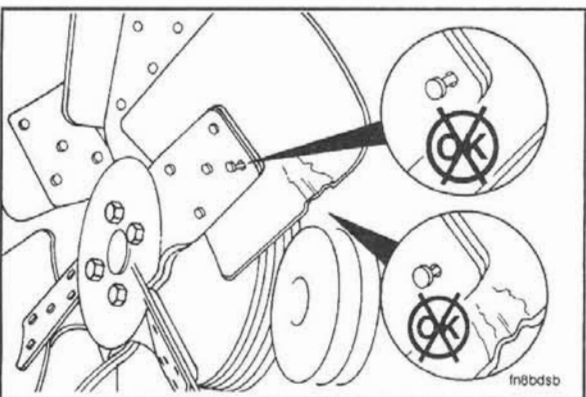
Use ethylene glycol antifreeze year-round to provide freeze point and boil-over protection.

The Fleetguard® refractometer, Part No. CC2800, provides a reliable and easy to read measurement of freeze point protection and glycol (antifreeze) concentration.



Fill the cooling system with coolant to the bottom of the fill neck in the radiator fill or expansion tank.

**NOTE:** Some radiators have two fill necks, both of which **must** be filled when the cooling system is drained.



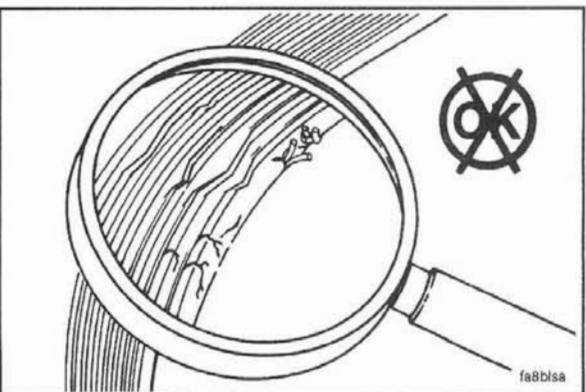
## Cooling Fan

### Inspection

**Warning:** Personal injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blades(s) and cause fan failure.

Rotate the crankshaft by using the accessory drive shaft.

A visual inspection of the cooling fan is required daily. Check for cracks, loose rivets, and bent or loose blades. Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary. Replace any fan that is damaged.



## Belts

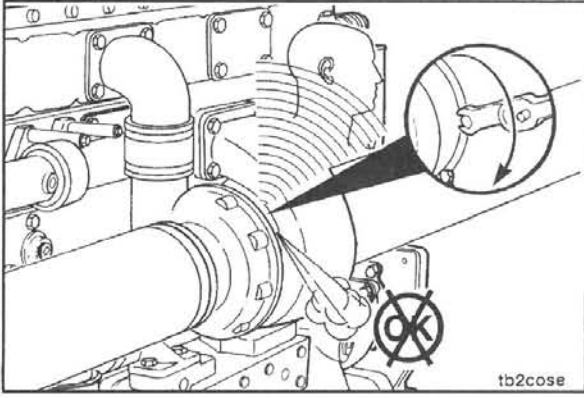
### Inspection



Visually inspect the belts daily. Replace belts that are cracked or frayed. Adjust belts that have a glazed or shiny surface which indicates belt slippage. Correctly installed and tensioned belts will show even pulley and belt wear.

Belt damage can be caused by:

- Incorrect tension
- Incorrect size or length
- Pulley misalignment
- Incorrect installation
- Severe operating environment
- Oil or grease on the belts

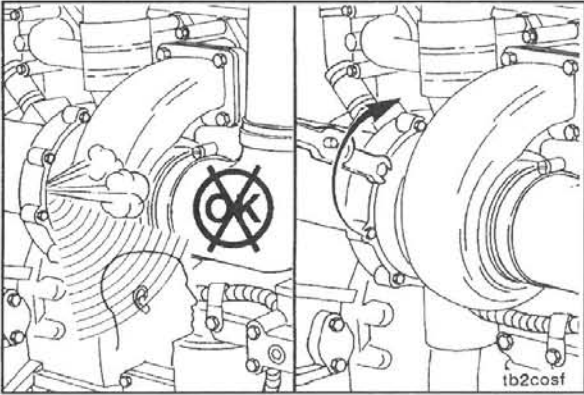


- Turbine housing sealing surface exhaust leak.

Tighten the turbine housing capscrews or v-band clamp nut.

**Torque Value:**

Capscrews	13.6 N•m	[120 in-lb]
V-Band	15.8 N•m	[140 in-lb]

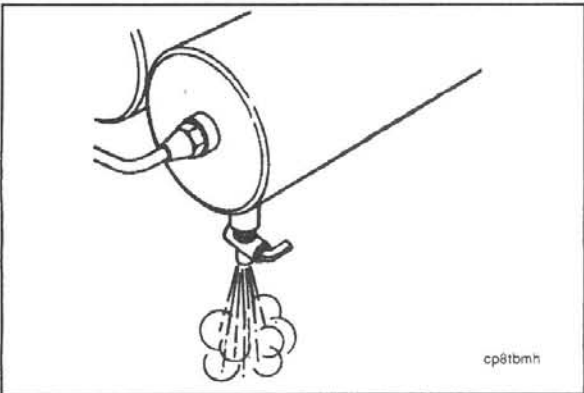


- Compressor housing sealing surface air leak.

Tighten the compressor housing capscrews or v-band clamp nut.

**Torque Value:**

Capscrews	7 N•m	[60 in-lb]
V-Band	8.5 N•m	[75 in-lb]



## Air Tanks

### Draining

Drain the moisture from the air system wet tank weekly.

# Section 6 - Maintenance Procedures at 1500 Hours or 1 Year

## Section Contents

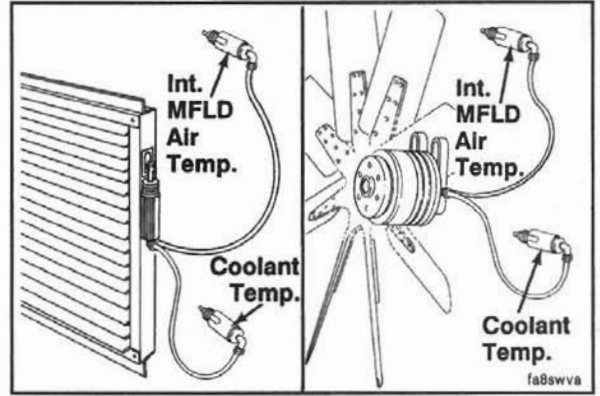
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Jacobs Engine Brake - Adjustment .....	6-9
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## Shutters and Thematic Fan

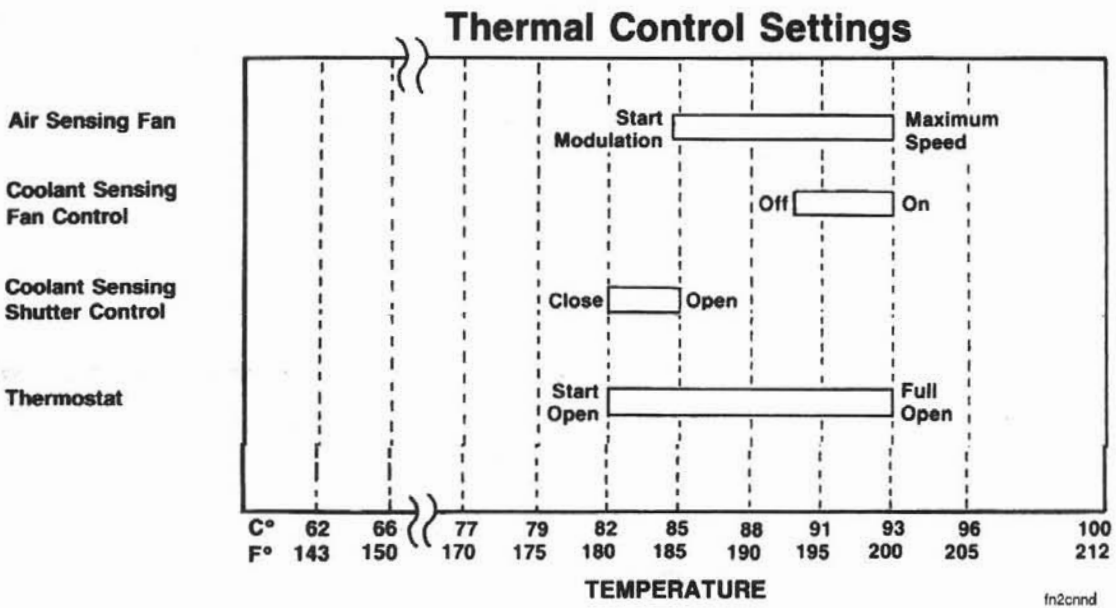
### Checking

Check the shutters and the thematic fan annually.

Shutters and thematic fans **must** operate in the same temperature range as the thermostat with which they are used. Refer to the Thermal Control Settings Graph.



## Thermal Control Settings Graph



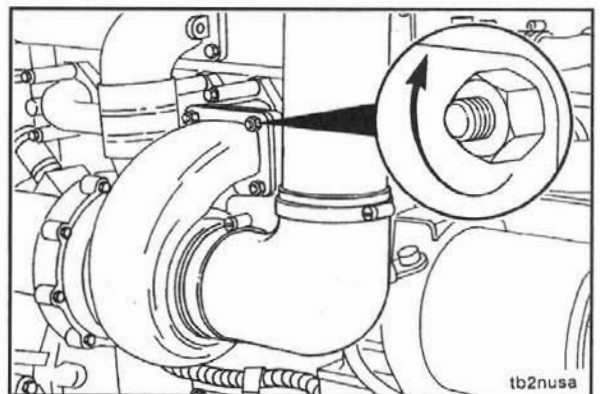
## Turbocharger

### Checking

Check the turbocharger mounting nuts annually.

Tighten the mounting nuts.

**Torque Value:** 61 N•m [45 ft-lb]



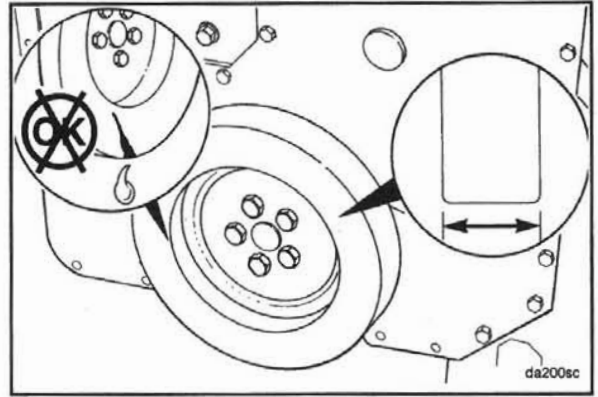
## Vibration Damper

### Inspection

The silicone fluid in the damper will become solid after extended service and will make the damper inoperative. An inoperative damper can cause major engine or drive line failures.

Check the damper for evidence of fluid loss, dents and wobble. Visually inspect the vibration damper thickness for any deformation or raising of the damper front cover plate.

If any variations or deformations are detected, refer to the engine shop manual, Bulletin No. 3810476, for inspection procedures, or to your nearest Cummins Authorized Repair Location.

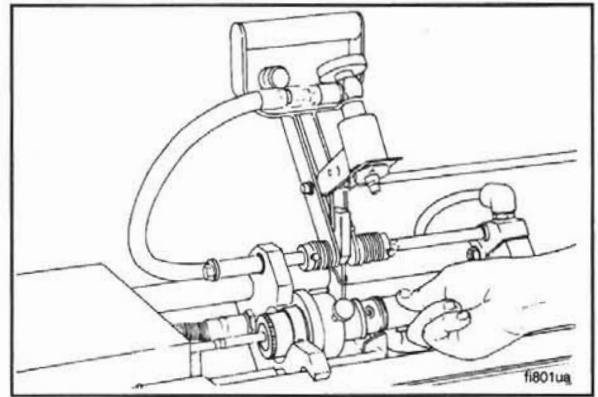


### Injectors

#### Cleaning and Calibration

Every 6000 hours or three (3) years, clean and calibrate the injectors.

Calibration requires special equipment, and **must** be completed at a Cummins Authorized Repair Location.



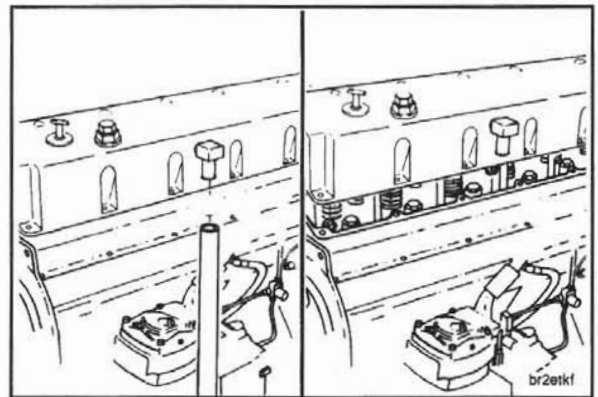
### Removal

To clean and calibrate the injectors, remove them from the engine.

Remove the breather tube and the tube retaining clip.

Remove the 16 capscrews, isolators and spacers from the cover.

Remove the cover and gasket.



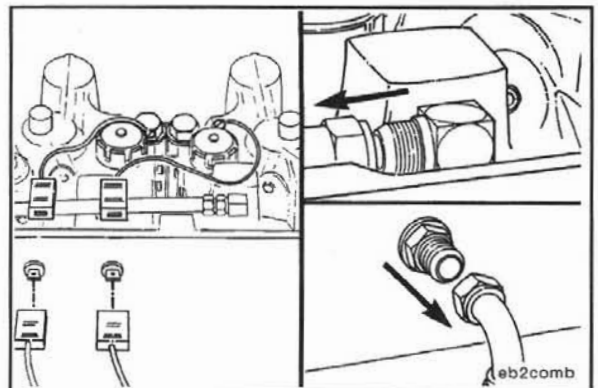
If the engine is equipped with Jacobs® Engine Brakes, the brakes **must** be removed to remove the injectors.

If the engine is **not** equipped with brakes, it is **not** necessary to loosen or remove the rocker lever assemblies. Disregard portions of the following text which refers to brake removal.

Disconnect the two electrical connections from the terminals on the inside and outside of the Jacobs® Brake spacer housing.

Disconnect the oil supply hose connection.

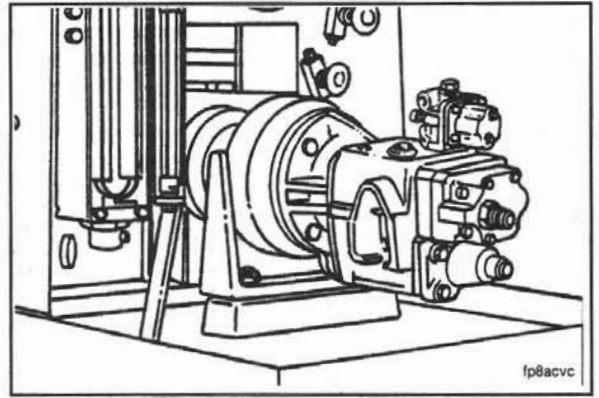
Remove the oil supply hose.



## Fuel Pump - Calibration

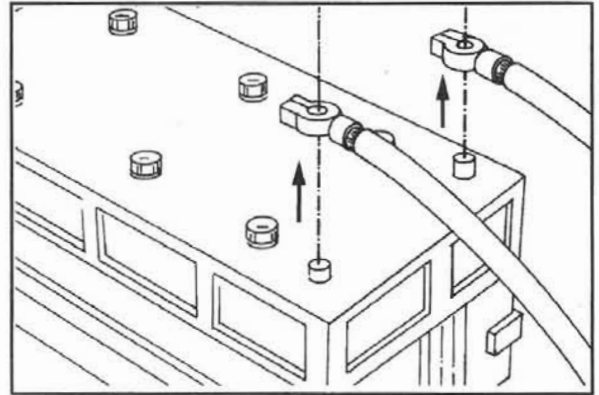
Every 6000 hours or 3 years, clean and calibrate the fuel pump.

Calibration requires special equipment and **must** be completed at a Cummins Authorized Repair Location.

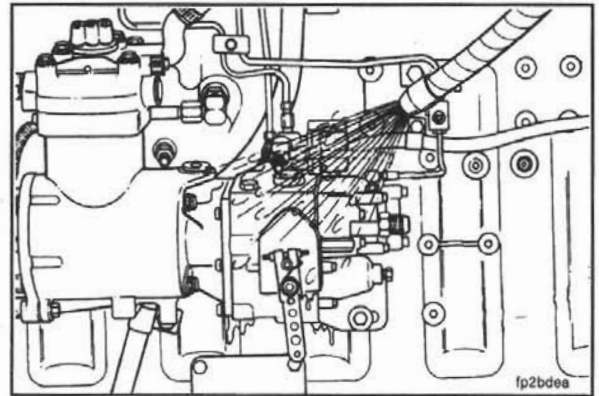


## Removal

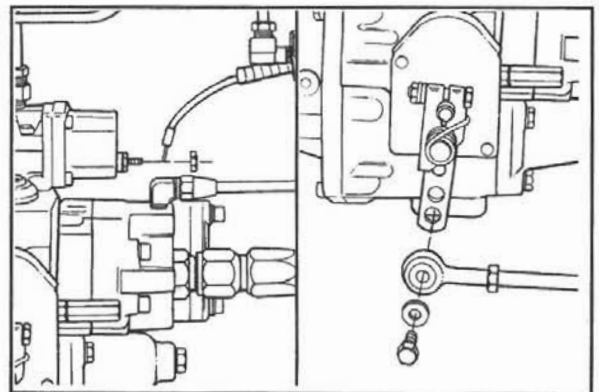
Disconnect the battery cables.



Clean the fuel pump and the surrounding area before removing it from the engine.



Remove the wire to the fuel shutoff valve.  
Remove the linkage from the throttle lever.



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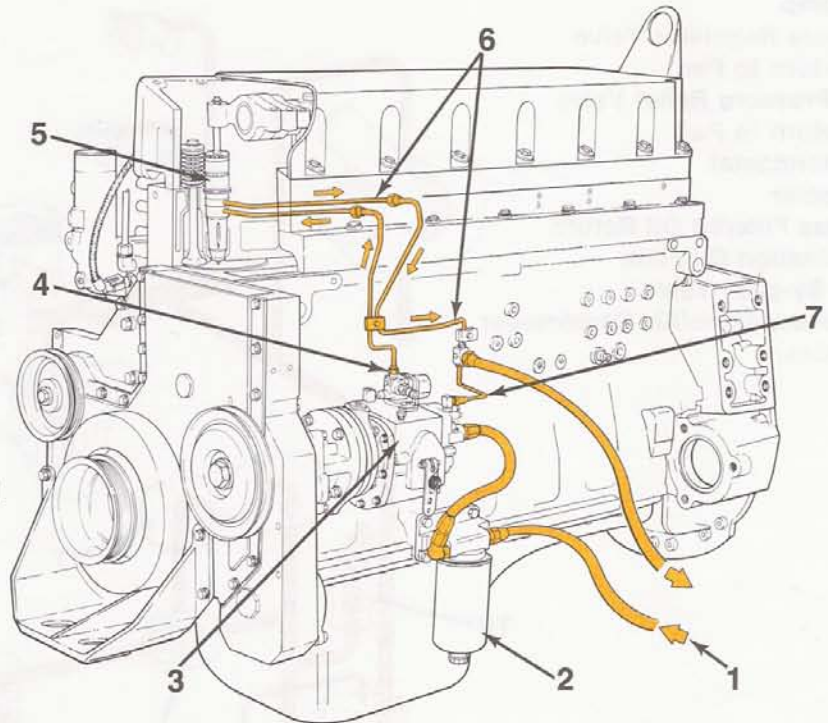
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## Fuel System Flow Diagram

### Fuel System

1. Fuel Inlet Supply
2. Fuel Filter
3. Fuel Pump
4. Fuel to Injectors
5. Injector
6. Fuel Drain Return
7. Gear Pump Cooling Return



### Air Compressor Pumping Excess Lubricating Oil Into Air System

Cause

Corrections

Intake Air Restriction to Air Compressor Excessive (Naturally Aspirated Air Compressor Only)

Replace air compressor air cleaner (if installed). Check engine intake restriction if air compressor inlet is installed in intake piping between air cleaner and turbocharger.

OK



Air Compressor Pumping Time Excessive

Check air compressor duty cycle. Refer to Installation Recommendations - Compressed Air Systems, Bulletin No. 3382886.

OK



Contact an Authorized Repair Facility

### Engine Will Not Shut Off

Cause

Corrections

Fuel Pump Manual Override Open.  
Refer to page E-5.

Check to make sure manual override  
screw is out to maximum travel.

OK

Fuel Pump Shutoff Valve Disc Stuck

Check operation of fuel shutdown  
solenoid.

OK

Fuel Tank Vents Plugged

Remove, clean, or replace vents.

OK

Fuel Drain Line Restricted

Check fuel drain line for loops, crimps,  
or clamped points.

OK

Engine Running on Fumes Drawn into  
Air Intake

Locate and isolate the source of fumes.

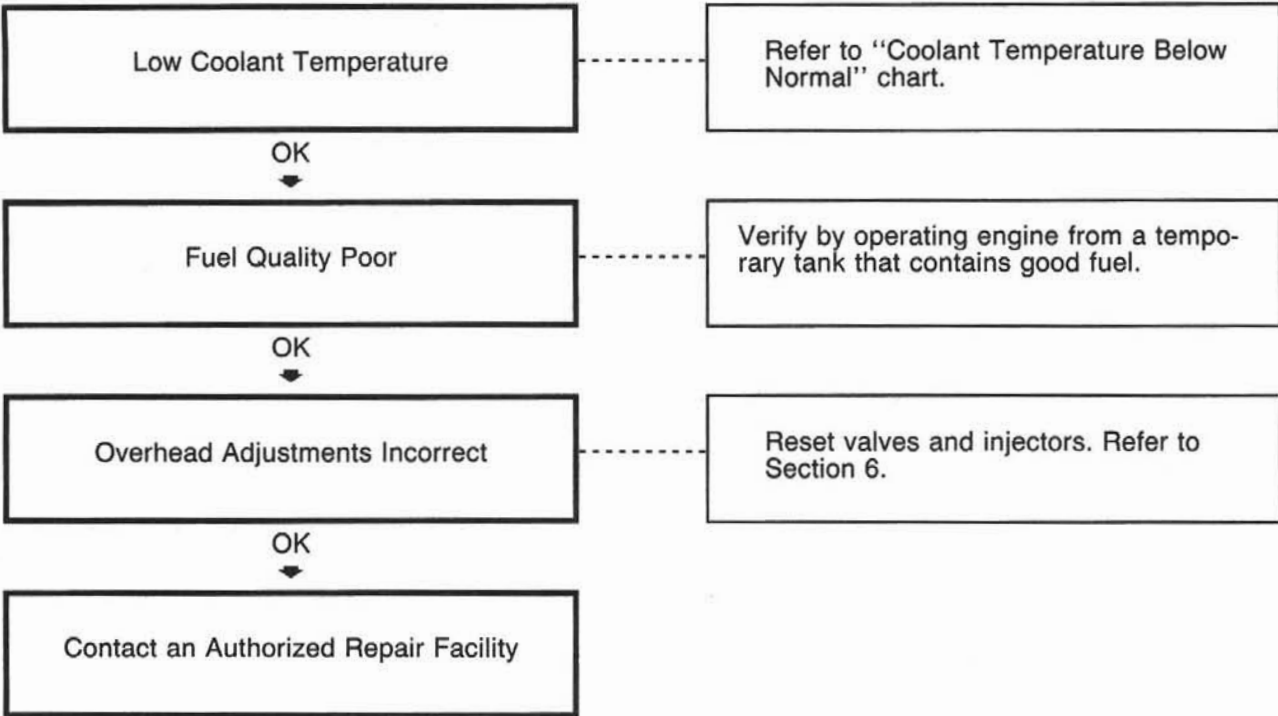
OK

Contact an Authorized Repair Facility

**White Smoke or Rough Running At Idle (After Warmup Period)**

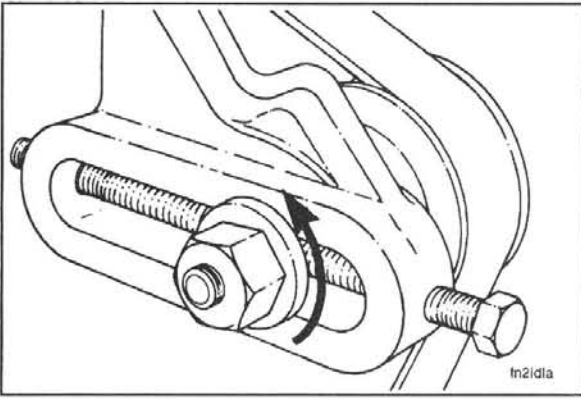
Cause

Corrections



## Fan Hub - Replacement Removal

Loosen the idler pulley shaft locknut.

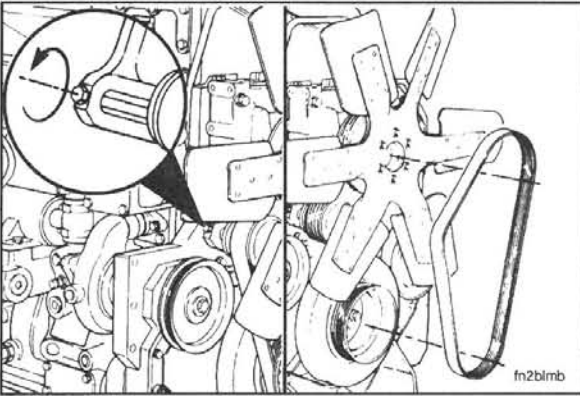


Loosen the adjusting mechanism and move the pulley centers as close as possible.



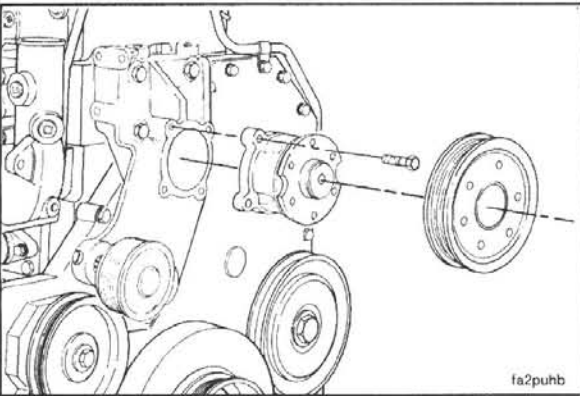
Remove the fan belt.

Remove the fan and fan clutch assembly.



Remove the fan drive pulley.

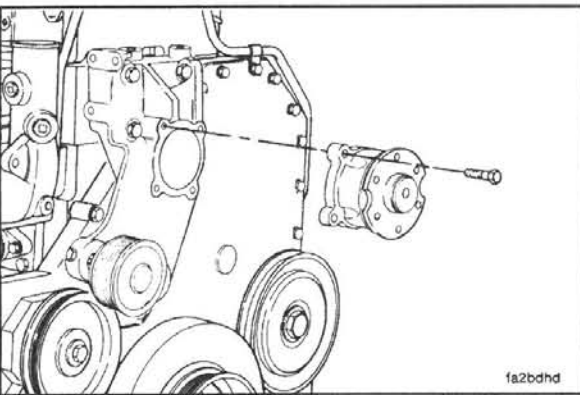
Remove the four capscrews and the fan hub.



## Installation

Install the new fan hub and four capscrews.

**Torque Value:** 47 N•m [35 ft-lb]



Do **not** extend lubricating oil and filter change intervals unless the engine is operating with very low fuel consumption and high oil consumption. Extended oil and filter change intervals will decrease engine life due to factors such as: corrosion, deposits, and wear.

Use the following table to determine the oil drain interval for your application:

<b>USE THE FOLLOWING OIL DRAIN INTERVALS FOR YOUR APPLICATION</b>				
<b>Vehicle/Equip.</b>	<b>KM</b>	<b>MILES</b>	<b>HRS</b>	<b>MOS</b>
Truck Crane	10,000	6,000	250	6
Logging Truck	16,000	10,000	250	6
Mining Truck	N/A	N/A	250	6
Cranes	N/A	N/A	250	6
Backhoe	N/A	N/A	250	6
Dozer	N/A	N/A	250	6
Scraper	N/A	N/A	250	6
Skidder	N/A	N/A	250	6
Fram Tractors	N/A	N/A	250	6
Combines	N/A	N/A	250	6
Irrigation Equip.	N/A	N/A	250	6
Generator Set	N/A	N/A	250	6
Standby Generator	N/A	N/A	250	12
Air Compressor	N/A	N/A	250	6

The following coolant testing devices are available to assist in determining the condition of the coolant:

- CC2626 Coolant Test Kit** – Works with any SCA formulation (Call 1-800-521-4005 if you have this test kit and the color chart does not show the number of units of DCA per gallon of coolant. A new chart will be mailed to you. The new chart will allow you to use your existing test kit with the new service requirements detailed on the reverse side of this paper.)

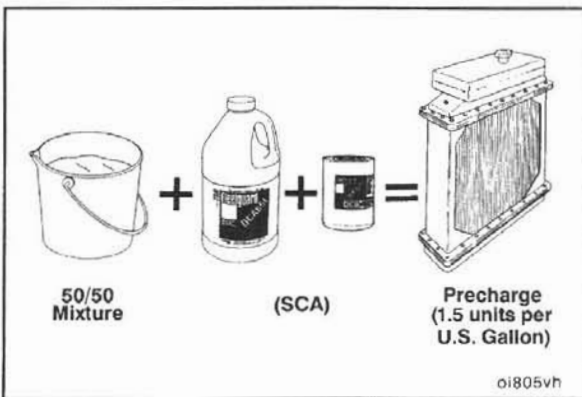
**Probalizer:**

- 3318169S Plug** – Installs on the engine for easy coolant sampling  
**3318168S Cap** – Use with Monitor C bottle to sample coolant  
**CC2706 Monitor C** – Lab analysis of coolant samples

Call the following numbers to get answers to any questions you may have about cooling system maintenance.

**Cummins: 1-800-DIESELS**

**Fleetguard: 1-800-521-4005**



**Coolant Replacement Requirement**

Drain and flush the cooling system after 2 years, 6,000 hours, or 240,000 miles of service. Refill with new **Heavy Duty Coolant** and install the **correct service coolant filter**.

**NOTE:** If the coolant is **not** going to be reused, dispose of used coolant/antifreeze in accordance with federal, state, and local laws and regulations.

## Distributors and Branches - United States

**Alabama****Birmingham Distributor**

Cummins Alabama, Inc.  
2200 Pinson Highway  
P.O. Box 1147  
Birmingham, AL 35201  
Telephone: (205) 841-0421

**Mobile Branch**

Cummins Alabama, Inc.  
1924 Beltline Highway,  
I-65 North  
P.O. Box 2566  
Mobile, AL 36601  
Telephone: (205) 456-2236

**Mobile Onan/Marine Branch**

Cummins Alabama, Inc.  
Cummins/Onan/Power Systems Center  
3422 Georgia Pacific Avenue  
Mobile, AL 36617  
Telephone: (205) 452-6426

**Montgomery Branch**

Cummins Alabama, Inc.  
2325 West Fairview Avenue  
P.O. Box 9271  
Montgomery, AL 36108  
Telephone: (205) 263-2594

**Alaska****Anchorage - (Branch of Seattle)**

Cummins Northwest, Inc.  
2618 Commercial Drive  
Anchorage, AK 99501-3095  
Telephone: (907) 279-7594

**Arizona****Phoenix Distributor and Branch**

Cummins Southwest, Inc.  
2239 North Black Canyon Hwy.  
P.O. Box 6688  
Phoenix, AZ 85005-6688  
Telephone: (602) 252-8021

**Phoenix Generator Branch**

Cummins Southwest, Inc.  
Power Systems Division  
2222 N. 23rd Drive  
Phoenix, AZ 85009  
Telephone: (602) 252-8021

**Tucson Branch**

Cummins Southwest, Inc.  
1912 West Prince Road  
Tucson, AZ 85705  
Telephone: (602) 887-7440

**Arkansas****Little Rock - (Branch of Memphis)**

Cummins Mid-South, Inc.  
6600 Interstate 30  
Little Rock, AR 72209  
Telephone: (Sales): (501) 569-5600  
(Service): (501) 569-5656  
(Parts): (501) 569-5613

**California****San Leandro Distributor**

Cummins West, Inc.  
1601 Aurora Drive  
San Leandro, CA 94577  
Telephone: (510) 351-6101

**Bakersfield Branch**

Cummins West, Inc.  
301 East Fourth Street  
Bakersfield, CA 93307  
Telephone: (805) 325-9404

**Hayward Distribution Center**

Cummins West, Inc.  
788 Sandoval Way  
Hayward, CA 94544  
Telephone: (510) 351-6101

**Los Angeles Distributor**

Cummins Cal Pacific Inc.  
1939 Deere Avenue (Irvine)  
Irvine, CA 92714  
Telephone: (714) 756-8700

**Montebello Branch**

Cummins Cal Pacific Inc.  
1105 South Greenwood Avenue  
Montebello, CA 90640  
Telephone: (213) 728-8111

**Rialto Branch**

Cummins Cal Pacific Inc.  
3061 S. Riverside Avenue  
Rialto, CA 92377  
Telephone: (909) 877-0433

**San Diego Branch**

Cummins Cal Pacific Inc.  
9191 Kearny Villa Court  
San Diego, CA 92123  
Telephone: (619) 278-4160

**San Leandro Branch**

Cummins West, Inc.  
1601 Aurora Drive  
San Leandro, CA 94577  
Telephone: (510) 351-6101

**West Sacramento Branch**

Cummins West, Inc.  
2661 Evergreen Avenue  
West Sacramento, CA 95691  
Telephone: (916) 371-0630

**Colorado****Denver Distributor**

Cummins Power, Inc.  
5100 East 58th Avenue  
Commerce City, CO 80022  
Telephone: (303) 287-0201

**Denver Generator Branch**

Gen Power, Inc.  
5720 Holly Street  
Unit A  
Commerce City, CO 80022  
Telephone: (303) 286-7697

**Grand Junction Branch**

Cummins Power, Inc.  
2380 U.S. Highway 6 & 50  
P.O. Box 339  
Grand Junction, CO 81501  
Telephone: (303) 242-5776

**Greeley Branch**

Cummins Power, Inc.  
250 Sixth Avenue  
Greeley, CO 80631  
Telephone: (303) 351-0448

**Connecticut****Hartford Distributor**

Cummins - Connecticut, Inc.  
260 Murphy Road  
Hartford, CT 06114  
Telephone: (203) 527-9156  
Parts: (203) 525-5606

**Florida****Tampa Distributor**

Cummins Southeastern Power, Inc.  
Corporate Office  
5421 N. 59th Street  
Tampa, FL 33610  
Telephone: (813) 621-7202

**Ft. Myers Branch**

Cummins Southeastern Power, Inc.  
2671 Edison Avenue, Unit #3  
Ft. Myers, FL 33916  
Telephone: (813) 337-1211

**Jacksonville Branch**

Cummins Southeastern Power, Inc.  
2060 West 21st Street  
P.O. Box 12036  
Jacksonville, FL 32209  
Telephone: (904) 355-3437

**Miami Branch**

Cummins Southeastern Power, Inc.  
9900 N.W. 77th Court  
Hialeah Gardens, FL 33016  
Telephone: (305) 821-4200

## Distributors and Branches - New Zealand

### Auckland

Cummins Diesel Sales & Service (NZ)  
Ltd.  
Private Bag 92804  
Penrose, Auckland, New Zealand

Location:  
440 Church Street  
Penrose

Telephone: (64-9) 579-0085

### Branches:

#### Auckland

Cummins Diesel Engines  
Private Bag 92804  
Penrose, Auckland, New Zealand

Location:  
440 Church Street  
Penrose

Telephone: (64-9) 579-0085

#### Christchurch

Cummins Diesel Engines  
P.O. Box 16-149  
Hornby, Christchurch, New Zealand

Location:  
35 Parkhouse Road  
Sockburn, Christchurch

Telephone: (64-3) 348-8170

#### Mt. Maunganui

Cummins Diesel Engines  
P.O. Box 4005  
Mt. Maunganui, New Zealand

Location:  
101 Totara Street  
Mt. Maunganui

Telephone: (64-7) 575-0545

#### Palmerston North

Cummins Diesel Engines  
P.O. Box 9024  
Palmerston North, New Zealand

Location:  
852-860 Tremain Avenue

Telephone: (64-6) 356-2209

**SOUTH AFRICA****Johannesburg**

Propower Pty. Ltd.  
Private Bag X4  
Wendywood 2144  
South Africa

Location:  
13 Eastern Service Road  
Kelvin 2054  
Telephone: (27-11) 444-3225

**SOUTHWEST AFRICA**

-See Namibia

**SPAIN****Madrid**

Cummins Ventas y  
Servicio S.A.  
Torrelaguna, 56  
28027 Madrid, Spain  
Telephone: (34-91) 367-2000/3672404

**SPANISH GUINEA**

-See Spain

**SRI LANKA****Colombo**

Trade Promoters Ltd  
P.O. Box 321  
69, Walukarama Road  
Colombo 3  
Sri Lanka  
Telephone: (94-1) 573927, 574651,  
575005

**SUDAN****Khartoum**

Bittar Engineering Ltd.  
P.O. Box 1011  
Gamhouria Street  
Khartoum, Sudan  
Telephone: (249-11) 70952, 71245, 70306

**SURINAM****Miami (Office in U.S.A.)**

Cummins Southeastern Power, Inc.  
9900 N.W. 77 Court  
Hialeah Gardens, FL 33016  
Telephone: (305) 821-4200

**SWAZILAND**

-See South Africa

**SWEDEN****Stockholm**

SMA Maskin AB  
Aggelundavagen 7  
S-17562 Jarfalla  
Sweden  
Telephone: (46-8) 621-25-00

**SWITZERLAND****Regensdorf**

Robert Aebi AG  
Riedthofstrasse 100  
8105 Regensdorf  
Switzerland  
Telephone: (41-1) 842-5111

**SYRIA****Damascus**

Puzant Yacoubian & Sons  
P.O. Box 3617  
Damascus, Syria

Location:  
Abou Baker El Saddik Street  
Kafar Sousse Square  
Telephone: (963-11) 231547/8/9

**TAHITI, ISLAND OF**

-See French Polynesia

**TAIWAN****Taipei**

Cummins Corporation - Taiwan Branch  
12th Floor, No. 149  
Min-Sheng E. Road, Sec. 2  
Taipei, Taiwan  
Telephone: (886-2) 515-0891

**TANZANIA****Dar es Salaam**

Riddoch Motors 1987 Ltd  
P.O. Box 40040  
Dar es Salaam  
Tanzania

Location:  
92 Kipawa-Pugu Road  
Dar es Salaam  
Telephone: (255-51) 44493, 41140

**THAILAND****Bangkok**

Diethelm & Company Ltd.  
1696 New Petchburi Road  
Bangkok 10310, Thailand  
Telephone: (66-2) 254-4900

**TOGO (and BENIN)****Lome**

Togomat  
B.P. 1641  
Lome, Togo

Location:  
Zone Industrielle CNPPME  
Telephone: (228) 21-23-95

**TONGA, ISLAND OF**

- See South Pacific Regional  
Office - Melbourne

**TRINIDAD and TOBAGO****Miami (Office in U.S.A.)**

Cummins Southeastern Power Inc.  
9900 N.W. 77 Court  
Hialeah Gardens, FL 33016  
Telephone: (305) 821-4200

**TURKEY****Istanbul**

Hamamcioglu Muesseseleri  
Ticaret T.A.S.  
P.K. 136  
80222 Sisli  
Istanbul, Turkey

Location:  
Buyukdere Caddesi, 13/A  
80260 Sisli  
Istanbul, Turkey  
Telephone: (90-1) 231-3406, 234-5123

**UKRAINA**

- See Moscow Regional  
Office - Moscow

**UNITED ARAB EMIRATES****Abu Dhabi**

Technical Oilfield Supplies Centre  
P.O. Box 2647  
Abu Dhabi,  
United Arab Emirates  
Telephone: (971-2) 723863, 723298

**UNITED KINGDOM****Wellingborough**

Cummins Diesel  
Denington Estate  
Wellingborough  
Northants NN8 2QH, England  
Telephone: (44-933) 276231

**UPPER VOLTA**

-See Burkina - Faso

**URUGUAY****Montevideo**

Santaro S.A.  
P.O. Box 379  
Montevideo  
Uruguay

Location:  
Avenida Millan No. 2441  
Telephone: (598-2) 293908

**U.S.S.R.**

-See Moscow Regional  
Office - Moscow

**VATICAN CITY**

-See Italy

**VENEZUELA****Caracas**

Sudimat  
Apartado Postal 1322  
Carmelitas  
Caracas 1010  
Venezuela

Location:  
Final Avenida San Martin  
Urb. la Quebradita  
Caracas 1061  
Telephone: (58-2) 442-6161/2647

**VIETNAM**

-See South and East Asia  
Regional Office - Singapore

## **DURING THE EXTENDED MAJOR COMPONENTS WARRANTY**

Owner is responsible for the cost of all labor needed to repair the Engine, including the labor to remove and reinstall the Engine. When Cummins elects to repair a part instead of replacing it, Owner is not responsible for the labor needed to repair the part.

Owner is responsible for the cost of all parts required for the repair except for the defective Covered Part and any Covered Part damaged by a Warrantable Failure of the defective Covered Part.

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items replaced during repair of a Warrantable Failure.

## **DURING THE BASE ENGINE AND EXTENDED MAJOR COMPONENTS WARRANTIES**

Owner is responsible for the operation and maintenance of the Engine as specified in the applicable Cummins Operation and Maintenance Manual. Owner is also responsible for providing proof that all recommended maintenance has been performed.

Before the expiration of the applicable warranty, Owner must notify a Cummins distributor, authorized dealer or other repair location approved by Cummins of any Warrantable Failure and make the Engine available for repair by such facility. Locations in the United States and Canada are listed in the Cummins Off Highway Authorized Dealer Directory.

Owner is responsible for communication expenses, meals, lodging and similar costs incurred as a result of a Warrantable Failure.

Owner is responsible for non-Engine repairs, "downtime" expenses, cargo damage, fines, all applicable taxes, all business costs and other losses resulting from a Warrantable Failure.

## **Limitations**

Cummins is not responsible for failures or damage resulting from what Cummins determines to be abuse or neglect, including, but not limited to: operation without adequate coolants or lubricants; overfueling; overspeeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the Engine. Cummins is also not responsible for failures caused by incorrect oil or fuel or by water, dirt or other contaminants in the fuel or oil.

For power units and fire pumps (package units), this warranty applies to accessories, except for clutches and filters, supplied by Cummins which bear the name of another company.

Except for power units and fire pumps, this warranty does not apply to accessories which bear the name of another company. This category includes, but is not limited to: alternators, starters, fans, air conditioning compressors, clutches, filters, transmissions, torque converters, steering pumps, and non-Cummins fan drives, engine compression brakes and air compressors.

Cummins Compusave units are covered by a separate warranty.

Before a claim for excessive oil consumption will be considered, Owner must submit adequate documentation to show that consumption exceeds Cummins published standards.

Failures of belts and hoses supplied by Cummins are not covered beyond the first 500 hours or one year of operation, whichever occurs first.

Parts used to repair a Warrantable Failure may be new Cummins parts, Cummins approved rebuilt parts, or repaired parts. Cummins is not responsible for failures resulting from the use of parts not approved by Cummins.

A new Cummins or Cummins-approved rebuilt part used to repair a Warrantable Failure assumes the identity of the part it replaced and is entitled to the remaining coverage hereunder.

**CUMMINS DOES NOT COVER WEAR OR WEAROUT OF COVERED PARTS.**

**CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

**THESE WARRANTIES SET FORTH HEREIN ARE THE SOLE WARRANTIES MADE BY CUMMINS IN REGARD TO THESE ENGINES. CUMMINS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

\* United States includes American Samoa, the Commonwealth of Northern Mariana Islands, Guam, Puerto Rico and the U.S. Virgin Islands.

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