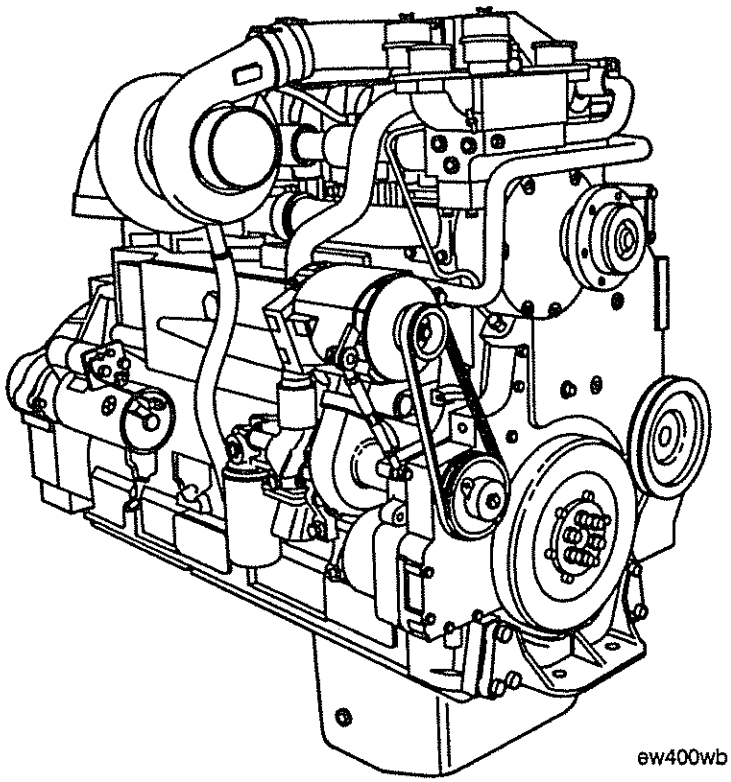
Operation and Maintenance Manual KT19, KTA19, and KTTA19 Engine Series



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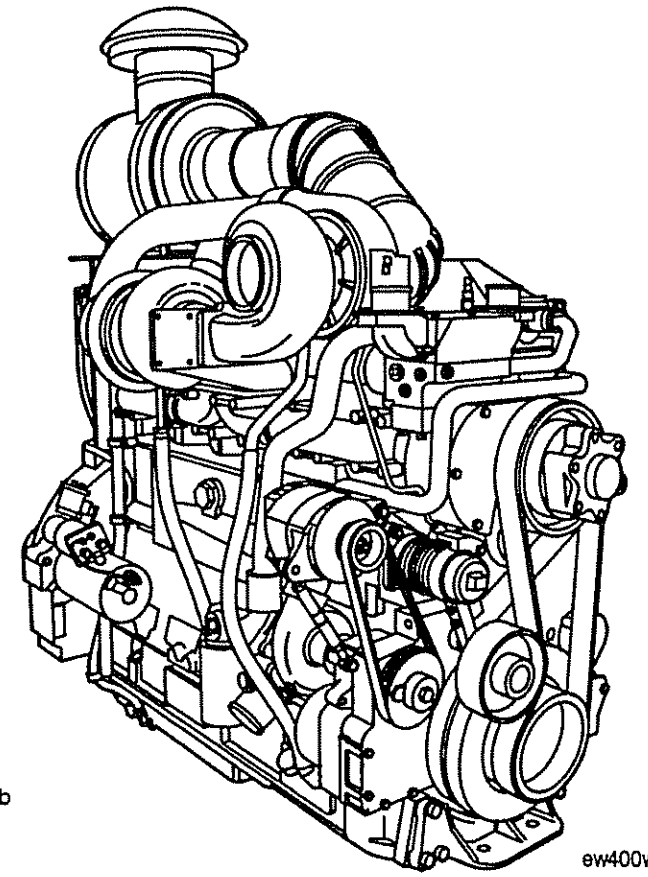

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KTTA19

Bulletin No. 3666013-02
Printed USA 08/94 971

Foreword

This manual contains information for the correct operation and maintenance of your Cummins engine. It also includes important safety information, engine and systems specifications, troubleshooting guidelines, and listings of Cummins Authorized Repair Locations and component manufacturers.

Keep this manual with the equipment. If the equipment is traded or sold, give the manual to the new owner.

The information, specifications, and recommended maintenance guidelines in this manual are based on information in effect at the time of printing. Cummins Engine Company, Inc. reserves the right to make changes at any time without obligation. If you find differences between your engine and the information in this manual, contact your local Cummins Authorized Repair Location.

The latest technology and the highest quality components were used to produce this engine. When replacement parts are needed, we recommend using only genuine Cummins or ReCon® exchange parts. These parts can be identified by the following trademarks:

Note: Warranty information is located in Section W. Make sure you are familiar with the warranty or warranties applicable to your engine.

Table of Contents

Important Reference Numbers

Fill in the part name and number in the blank spaces provided below. This will give you a reference whenever service or maintenance is required.

Engine Model _____

Engine Serial Number _____

Engine Specification Number (Control Parts List) _____

Fuel Pump Part Number _____

Filter Part Numbers:

- Air Cleaner Element _____
- Oil (Full-Flow) _____
- Oil (Bypass) _____
- Fuel _____
- Fuel Water Separator (Marine) _____

Belt Part Numbers _____

_____

_____

_____

_____

Clutch or Marine Gear

- Model _____
- Serial Number _____
- Part Number _____
- Oil Type _____
- Raw Water Pump _____
- Model _____
- Part Number _____

Section i - Introduction

Section Contents

To the Owner and Operator

Preventative maintenance is the easiest and least expensive type of maintenance. Follow the maintenance schedule recommendations outlined in Maintenance Guidelines (Section 2).

Keep records of regularly scheduled maintenance.

Use the correct fuel, oil, and coolant in your engine as specified in Engine Specifications, Section T.

Cummins uses the latest technology and the highest quality components to produce its engines. Cummins recommends using only genuine Cummins parts and ReCon® exchange parts.

Personnel at Cummins authorized repair locations have been trained to provide expert service and parts support. If you have a problem that can **not** be resolved by a Cummins authorized repair location, follow the steps outlined in the Cummins Service Assistance (Section S).

About the Manual

This manual contains information needed to correctly operate and maintain your engine as recommended by Cummins Engine Company, Inc. Additional service literature (Shop Manual, Troubleshooting and Repair Manual, etc.) can be ordered by filling out and mailing the Literature Order Form located in Service Literature, Section L.

This manual does **not** cover vehicle or equipment maintenance procedures. Consult the vehicle or equipment manufacturer for specific maintenance recommendations.

Both metric and U.S. customary values are listed in this manual. The metric value is listed first, followed by the U.S. customary in brackets.

Numerous illustrations and symbols are used to aid in understanding the meaning of the text. Refer to page i-3 through i-6 for a complete listing of symbols and their definitions.

Each section is preceded by a Section Contents to aid in locating information more quickly.

How to Use the Manual

This manual is organized according to the maintenance intervals that are to be performed. A table that states the required intervals and the checks to be made is located in Section 2. Locate the maintenance interval that you are performing and follow all the procedure steps given in that section. In addition, all the previous maintenance interval procedures **must** also be performed.

Keep a record of all the checks and inspections made. A record form for recording date, mileage/kilometer or hours, and what maintenance checks were performed is located in Section 2.

Refer to Section T for a troubleshooting guide to your engine. Follow the Troubleshooting Section Contents for locating and correcting engine problems.

Refer to Section V for specifications recommended by Cummins Engine Company, Inc., for your engine. Specifications and torque values for each engine system are given in that section.

Symbols

The following symbols have been used in this manual to help communicate the intent of the instructions. When one of the symbols appears, it conveys the meaning defined below:

WARNING - Serious personal injury or extensive property damage can result if the warning instructions are **not** followed.

CAUTION - Minor personal injury can result or a part, an assembly, or the engine can be damaged if the caution instructions are **not** followed.

Indicates a **REMOVAL or DISASSEMBLY** step.

Indicates an **INSTALLATION or ASSEMBLY** step.

INSPECTION is required.

CLEAN the part or assembly.

PERFORM a mechanical or time **MEASUREMENT**.

LUBRICATE the part or assembly.

Indicates that a **WRENCH or TOOL SIZE** will be given.

TIGHTEN to a specific torque.

PERFORM an electrical **MEASUREMENT**.

Refer to another location in this manual or another publication for additional information.

The component weighs 23 kg [50 lb] or more. To avoid personal injury, use a hoist or get assistance to lift the component.

Simbolos

Los símbolos siguientes son usados en este manual para clarificar el proceso de las instrucciones. Cuando aparece uno de estos símbolos, su significado se especifica en la parte inferior.

ADVERTENCIA - Serios daños personales o daño a la propiedad puede resultar si las instrucciones de Advertencia **no** se consideran.

PRECAUCION - Daños menores pueden resultar, o de piezas del conjunto o el motor puede averiarse si las instrucciones de Precaución **no** se siguen.

Indica un paso de **REMOCION** o **DESMONTAJE.**

Indica un paso de **INSTALACION** o **MONTAJE.**

Se requiere **INSPECCION.**

LIMPIESE la pieza o el montaje.

EJECUTESE una **MEDICION** mecánica o del tiempo.

LUBRIQUESE la pieza o el montaje.

Indica que se dará una **LLAVE DE TUERCAS** o el **TAMAÑO DE HERRAMIENTA.**

APRIETESE hasta un par torsor específico.

EJECUTESE una **MEDICION** eléctrica.

Para información adicional refiérase a otro emplazamiento de este manual o a otra publicación anterior.

El componente pesa 23 kg [50 lb] o mas. Para evitar dano corporal empleen una cabria u obtengan ayuda para elevar el componente.

Symbole

In diesem Handbuch werden die folgenden Symbole verwendet, die wesentliche Funktionen hervorheben. Die Symbole haben folgende Bedeutung:

WARNUNG - Wird die Warnung **nicht** beachtet, dann besteht erhöhte Unfall- und Beschädigungsgefahr.

VORSICHT - Werden die Vorsichtsmassnahmen **nicht** beachtet, dann besteht Unfall- und Beschädigungsgefahr.

AUSBAU bzw. **ZERLEGEN.**

EINBAU bzw. **ZUSAMMENBAU.**

INSPEKTION erforderlich.

Teil oder Baugruppe **REINIGEN.**

DIMENSION - oder **ZEITMESSUNG.**

Teil oder Baugruppe **ÖLEN.**

WERKZEUGGRÖSSE wird angegeben.

ANZUG auf vorgeschriebenes Drehmoment erforderlich.

Elektrische **MESSUNG DURCHFÜHREN.**

Weitere Informationen an anderer Stelle bzw. in anderen Handbüchern.

Das teil weigt 23 kg [50 lb] oder mehr. Zur vermeidung von koerperverletzung winde benutzen oder hilfe beim heben des teils in anspruch nehmen.

Symboles

Les symboles suivants sont utilisés dans ce manuel pour aider à communiquer le but des instructions. Quand l'un de ces symboles apparaît, il évoque le sens défini ci-dessous:

AVERTISSEMENT - De graves lésions corporelles ou des dommages matériels considérables peuvent survenir si les instructions données sous les rubriques "Avertissement" **ne** sont **pas** suivies.

ATTENTION - De petites lésions corporelles peuvent survenir, ou bien une pièce, un ensemble ou le moteur peuvent être endommagés si les instructions données sous les rubriques "Attention" **ne** sont **pas** suivies.

Indique une opération de **DEPOSE.**

Indique une opération de **MONTAGE.**

L'INSPECTION est nécessaire.

NETTOYER la pièce ou l'ensemble.

EFFECTUER une **MESURE** mécanique ou de temps.

GRAISSER la pièce ou l'ensemble.

Indique qu'une **DIMENSION DE CLE** ou **D'OUTIL** sera donnée.

SERRER à un couple spécifique.

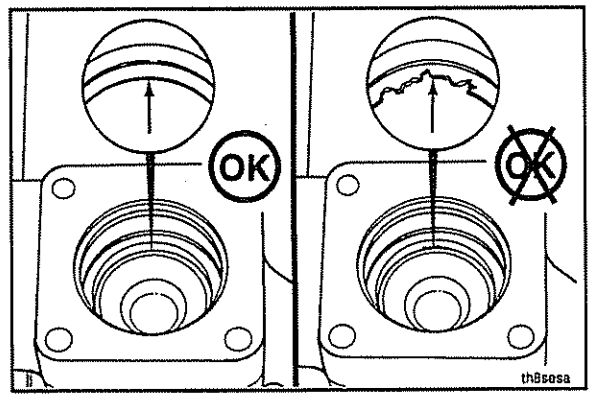
EFFECTUER une **MESURE** électrique.

Se reporter à un autre endroit dans ce manuel ou à une autre publication pour obtenir des informations plus complètes.

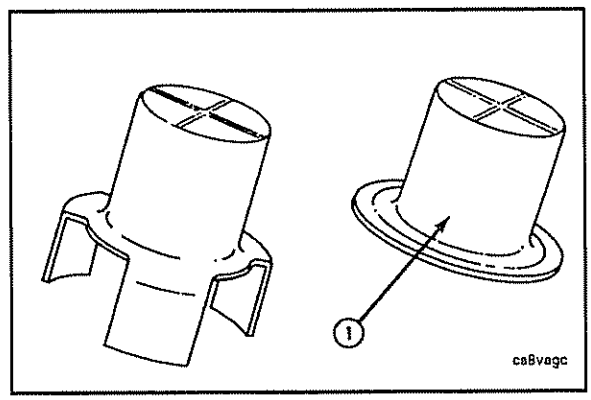
Le composant pese 23 kg [50 lb] ou davantage. Pour eviter toute blessure, employer un appariel de levage ou demander de l'aide pour le soulever.

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.



General Safety Instructions

Important Safety Notice

⚠ WARNING ⚠

Read and understand all of the safety precautions and warnings before performing any repair. This list contains the general safety precautions that **must** be followed to provide personal safety. Special safety precautions are included in the procedures when they apply.

- Make sure the work area surrounding the product is safe. Be aware of hazardous conditions that can exist.
- **Always** wear protective glasses and protective shoes when working.
- Do **not** wear loose-fitting or torn clothing. Remove all jewelry when working.
- Disconnect the battery and discharge any capacitors before beginning any repair work. Disconnect the air starting motor if equipped to prevent accidental engine starting. Put a "Do **Not** Operate" tag in the operator's compartment or on the controls.
- Use ONLY the proper engine barring techniques for manually rotating the engine. Do **not** attempt to rotate the engine by pulling or prying on the fan. This practice can cause serious personal injury, property damage, or damage to the fan blade(s) causing premature fan failure.
- If an engine has been operating and the coolant is hot, allow the engine to cool before you slowly loosen the filler cap and relieve the pressure from the cooling system.
- Do **not** work on anything that is supported ONLY by lifting jacks or a hoist. **Always** use blocks or proper stands to support the product before performing any service work.
- Relieve all pressure in the air, oil, and the cooling systems before any lines, fittings, or related items are removed or disconnected. Be alert for possible pressure when disconnecting any device from a system that utilizes pressure. Do **not** check for pressure leaks with your hand. High pressure oil or fuel can cause personal injury.
- To prevent suffocation and frostbite, wear protective clothing and ONLY disconnect liquid refrigerant (freon) lines in a well ventilated area. To protect the environment liquid refrigerant systems **must** be properly emptied and filled using equipment that prevents the release of refrigerant gas (fluorocarbons) into the atmosphere.
- To avoid personal injury, use a hoist or get assistance when lifting components that weigh 23 kg [50 lb] or more. Make sure all lifting devices such as chains, hooks, or slings are in good condition and are of the correct capacity. Make sure hooks are positioned correctly. **Always** use a spreader bar when necessary. The lifting hooks **must not** be side-loaded.
- Corrosion inhibitor contains alkali. Do **not** get the substance in your eyes. Avoid prolonged or repeated contact with skin. Do **not** swallow internally. In case of contact, immediately wash skin with soap and water. In case of contact, immediately flood eyes with large amounts of water for a minimum of 15 minutes. IMMEDIATELY CALL A PHYSICIAN. KEEP OUT OF REACH OF CHILDREN.
- Naptha and Methyl Ethyl Ketone (MEK) are flammable materials and **must** be used with caution. Follow the manufacturer's instructions to provide complete safety when using these materials. KEEP OUT OF REACH OF CHILDREN.
- To avoid burns, be alert for hot parts on products that have just been turned OFF, and hot fluids in lines, tubes, and compartments.
- **Always** use tools that are in good condition. Make sure you understand how to use them before performing any service work. Use ONLY genuine Cummins or Cummins Recon® replacement parts.
- **Always** use the same fastener part number (or equivalent) when replacing fasteners. Do **not** use a fastener of lessor quality if replacements are necessary.

Definition of Terms

AFC	Air Fuel Control
API	American Petroleum Institute
ASA	Air Signal Attenuator
ASTM	American Society of Testing and Materials
C	Celsius
CARB	California Air Resources Board
C.I.D.	Cubic Inch Displacement
Cm	Centimeter
CPL	Control Parts List
cSt	Centistokes
DCA	Diesel Coolant Additive
E.C.S.	Emission Control System
EPA	Environmental Protection Agency
E.S.N.	Engine Serial Number
F	Fahrenheit
ft-lb	Foot Pound
GVW	Gross Vehicle Weight
Hg	Mercury
HP	Horsepower
HVT	Hydraulic Variable Timing
H_2O	Water
in-lb	Inch Pound
kg	Kilograms
km	Kilometers
km/l	Kilometers per Liter
kPa	Kilopascal
l	Liter
m	Meter
mm	Millimeter
MPa	Megapascal
MPH	Miles Per Hour
MPQ	Miles Per Quart
N•m	Newton-meter
OBC	Outer Base Circle
OEM	Original Equipment Manufacturer
ppm	Parts Per Million
psi	Pounds Per Square Inch
PTD	PT (type D)® (Pressure Timed (type D) Injector
PTG	Pressure Timing Governing
RPM	Revolutions Per Minute
S.A.E.	Society of Automotive Engineers
STC	Step Timing Control
TDC	Top Dead Center
VS	Valve Set

Section E - Engine and Component Identification

Section Contents

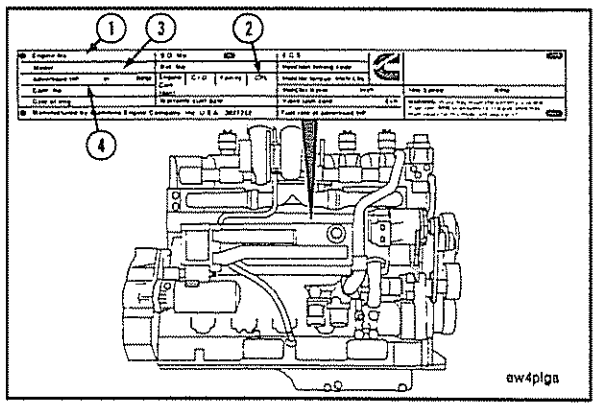
Engine Identification

Cummins Engine Nomenclature

The model name provides the following data:

K T T A 19 - __ (__)

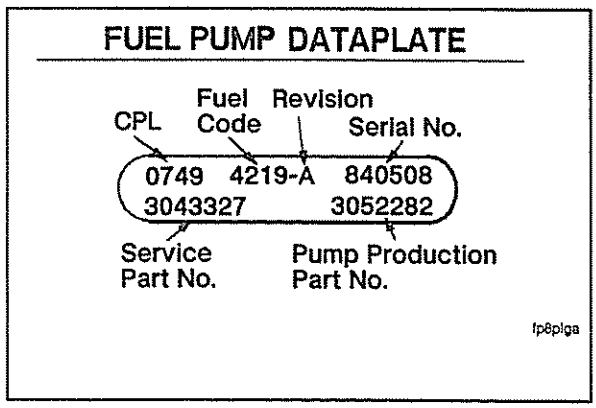
- K = Series (Family of Engines)
- T = Engine is Turbocharged
- T = Engine has Two Turbochargers
- A = Engine is Aftercooled
- 19 = Displacement in Litres
- __ = Application Codes:
  - A = Agricultural
  - C = Construction
  - D = Generator Drive
  - F = Fire Pump
  - G = Generator Set
  - L = Locomotive
  - M = Marine
  - P = Power Unit
  - R = Railcar
  - T = Tactical Military
- (__) = Maximum Brake Horsepower



Engine Dataplate

The engine dataplate shows specific information about your engine. The engine serial number (E.S.N.) (1), Control Parts List (CPL) (2), Model (3), and Horsepower and RPM rating provide information for ordering parts and service needs.

NOTE: The engine dataplate **must not** be changed unless approved by Cummins Engine Company, Inc.



Fuel Pump Dataplate

The fuel pump dataplate is located on the top of the fuel pump. It provides information for fuel pump calibration.

General Specifications

Metric (U.S. Customary)

NOTE: Listed below are general specifications for this engine. Refer to each System Section for additional specifications.

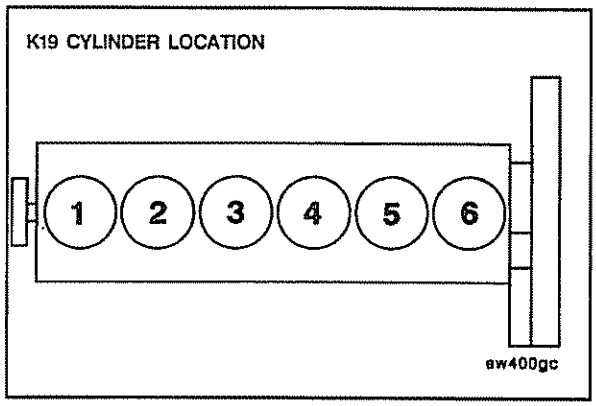
Engine Speed ..... Refer to the fuel pump calibration data for optional speed rating.
Displacement ..... 18.7 liters [1150 C.I.D.]
Bore and stroke ..... 158.75 mm x 158.75 mm [6.25 in x 6.25 in]
Engine Weight
- Dry ..... 1720 kg [3800 lb]
- Wet ..... 1800 Kg [3965 lb]

Firing order 1-5-3-6-2-4
Valve and injector settings:
- Intake valve adjustment ..... 0.36 mm [0.014 in]
- Intake valve limits ..... 0.28 to 0.43 mm [0.011 to 0.017 in]
- Exhaust valve adjustment ..... 0.69 mm [0.027 in]
- Exhaust valve limits ..... 0.60 to 0.76 mm [0.024 to 0.030 in]
- PTD Non-Top Stop injector travel adjustment ..... 7.72 mm [0.304 in]
- PTD Non-Top Stop injector travel limits ..... 7.67 to 7.77 mm [0.302 to 0.306 in]
- HVT Non-Top Stop injector travel adjustment ..... 10.24 mm [0.403 in]
- HVT Non-Top Stop injector travel limits ..... 10.18 to 10.29 mm [0.401 to 0.405 in]
- STC Top Stop injector OBC Method adjustment (in engine) ..... 10 N•m [90 in-lb]
- STC Top Stop injector travel limit (total travel in engine) ..... 10.18 to 10.29 mm [0.401 to 0.405 in]
  - with high lift cam and injectors ..... 12.47 to 12.57 mm [0.491 to 0.495 in]

Compression Ratio:
- KT 15.5:1
- KTA ..... 14.5:1 or 15.5:1
- KTA-C(700) 13.8:1
- KTTA ..... 13.8:1 or 13.9:1

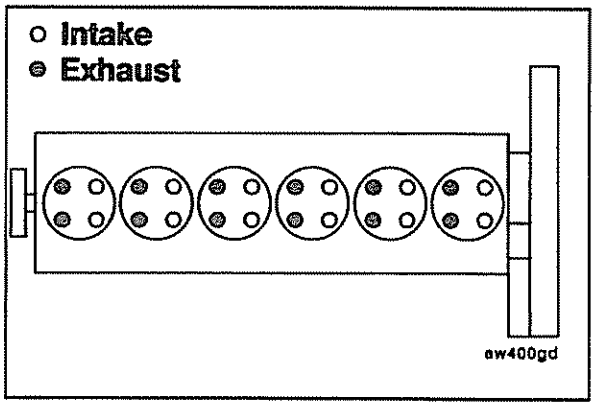
Crankshaft Rotation (viewed from the front of the engine) ..... Clockwise

General Engine Data



Cylinder location and Firing Order:

1-5-3-6-2-4



Intake and **Exhaust** Valve locations.

Air Induction System

Maximum Allowable Intake Restriction (at rated speed and load):

- With Clean Filter Element ..... 380 mm-H_2O [15 in-H_2O]
- With Dirty Filter Element ..... 635 mm-H_2O [25 in-H_2O]

Lubricating Oil System

Oil Pressure, Main Oil Rifle (15W40 oil at 107°C [225°F]):

- (Idle) RPM ..... 138 kPa to 483 kPa [20 psi to 75 psi]
- (Rated) RPM ..... 345 kPa to 517 kPa [50 psi to 75 psi]

Oil Temperature - Maximum ..... 120°C [250°F]

Oil Pan Capacity ..... Refer to Section V

Cooling System

Coolant Capacity (Engine ONLY) ..... 30 Liters [32 U.S. Quarts]

Standard Thermostat Range ..... 80°C to 90°C [175°F to 195°F]

Coolant Pressure Cap (Minimum) ..... 50 kPa [7 psi]

Coolant Temperature
- Minimum Top Tank ..... 70°C [160°F]
- Maximum Top Tank ..... 95°C [203°F]

Exhaust System

Back Pressure - Maximum (at rated speed and load) ..... 75 mm-Hg [3 in-Hg]

Exhaust Pipe Size (Normally Acceptable Inside Diameter)
- KTTA ..... 152 mm [6 inch]
- KTA ..... 127 mm [5 inch]
- KT ..... 127 mm [5 inch]

Fuel System

NOTE: For performance and fuel rate values, refer to the engine data sheet, or the fuel pump code for the particular model involved.

Maximum Allowable Restriction to Pump (at rated power):
- With Clean Filter ..... 100 mm Hg [4 in Hg]
- With Dirty Filter ..... 200 mm Hg [8 in Hg]

Maximum Allowable Return Line Restriction without check valves ..... 63 mm Hg [2.5 in Hg]

Maximum Allowable Return Line Restriction with Check Valves and/or Overhead Tanks ..... 165 mm Hg [6.5 in Hg]

Electrical System

Minimum Recommended Battery Capacity

System Voltage	Ambient Temperatures			
	-18°C (0°F)		0°C (32°F)	
	Cold Cranking Amperes	Reserve Capacity* Amperes	Cold Cranking Amperes	Reserve Capacity* Amperes
12 Volt**	1800	640	1280	480
24 Volt***	900	320	640	240

* **Note:** The number of plates within a given battery size determines reserve capacity. Reserve capacity is the length of time sustained cranking can occur.

** **Note:** Not recommended for K19 Engines.

*** **Note:** CCA ratings are based on two, 12 volt batteries in series.

Batteries (Specific Gravity)

Battery State of Charge	Specific Gravity @ 27°C [80°F]
100%	1.260-1.280
75%	1.230-1.250
50%	1.200-1.220
25%	1.170-1.190
Discharged	1.110-1.130

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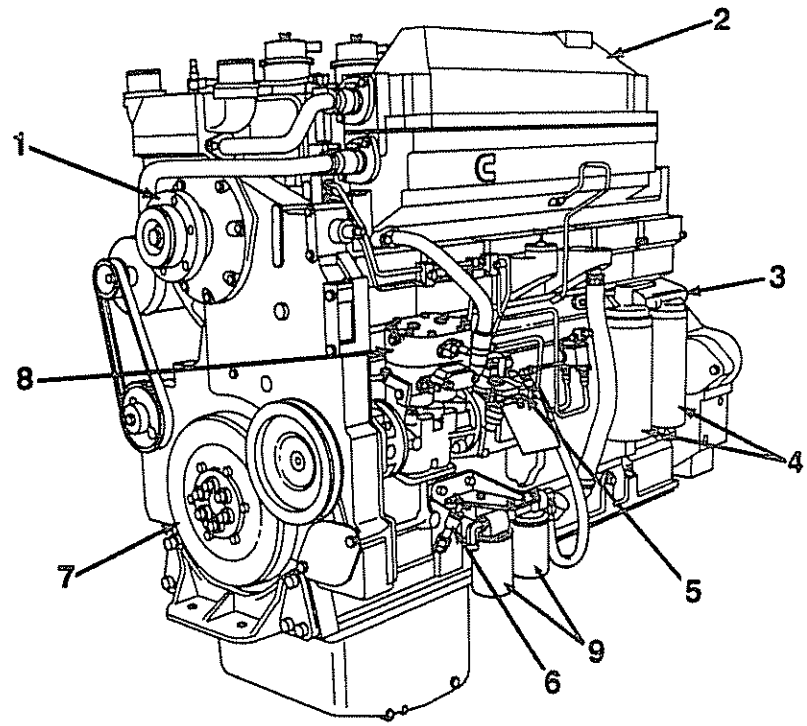
External Engine Components

The illustrations which follow show the locations of the major external engine components, the filters, and other service and maintenance points. Some external components will be at different locations for different engine models.



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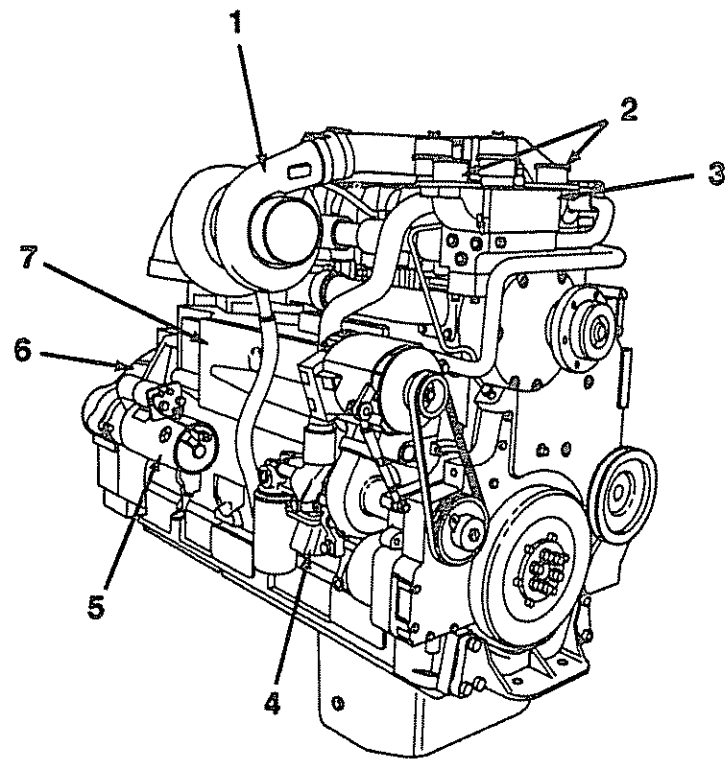
FUEL PUMP SIDE - KTA19

1. Fan Hub (Gear Driven Type)
2. Aftercooler Assembly
3. Bypass Oil Filter Supply
4. Full Flow - Oil Filters
5. Fuel Pump
6. Dipstick
7. Vibration Damper
8. Air Compressor
9. Fuel Filters



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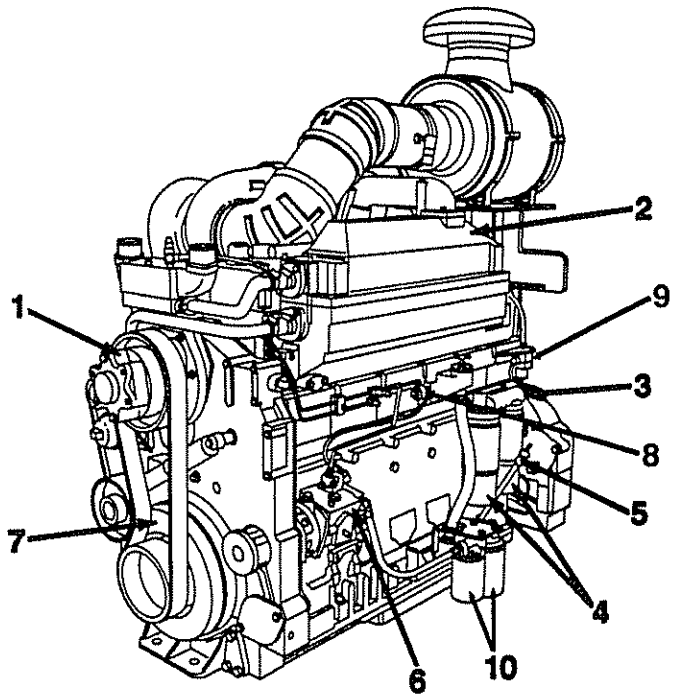
EXHAUST SIDE - KTA19

1. Turbocharger
2. Coolant Outlet
3. Thermostat Housing
4. Coolant Inlet
5. Starting Motor
6. Flywheel Housing
7. Engine Oil Cooler Assembly

FUEL PUMP SIDE - KTTA19

1. Fan Hub (Belt Driven)
2. Aftercooler Assembly
3. Bypass Oil Filter Supply
4. Full Flow - Oil Filters
5. Dipstick
6. Fuel Pump
7. Vibration Damper
8. STC Fuel Pressure Switch
9. STC Oil Control Valve
10. Fuel Filters



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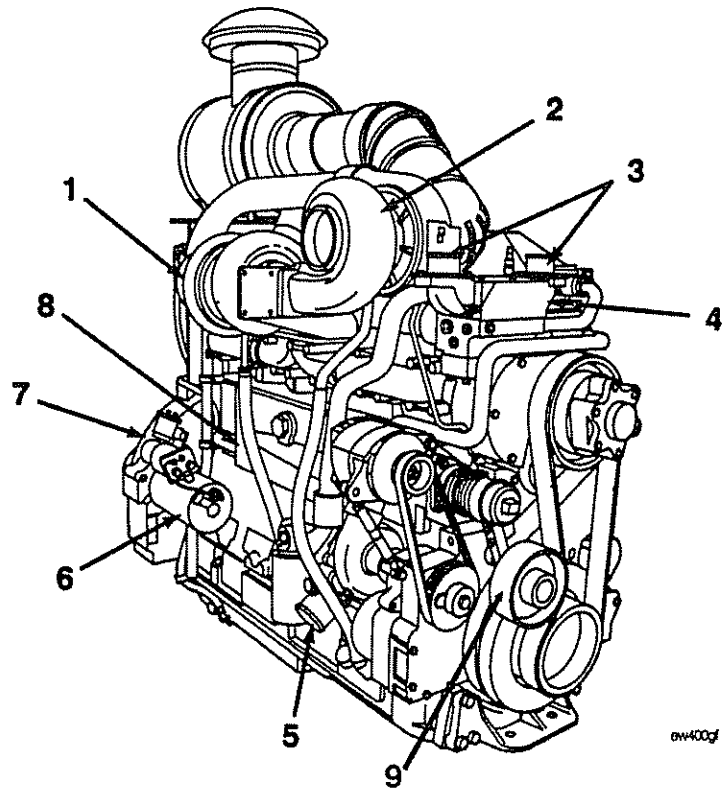
EXHAUST SIDE - KTTA19

1. Turbocharger (High Pressure)
2. Turbocharger (Low Pressure)
3. Coolant Outlet
4. Thermostat Housing
5. Coolant Inlet
6. Starting Motor
7. Flywheel Housing
8. Oil Cooler Assembly
9. Belt Tensioner



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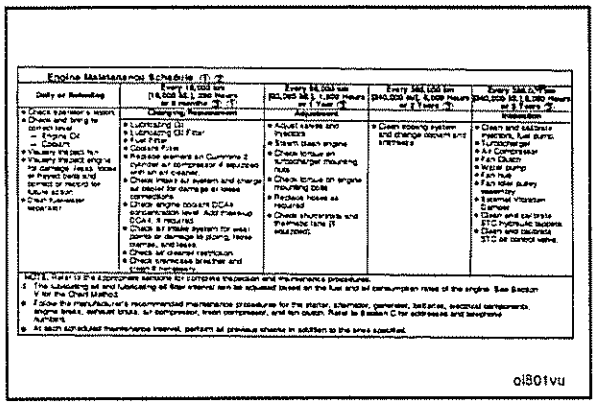
Section 1 - Operating Instructions

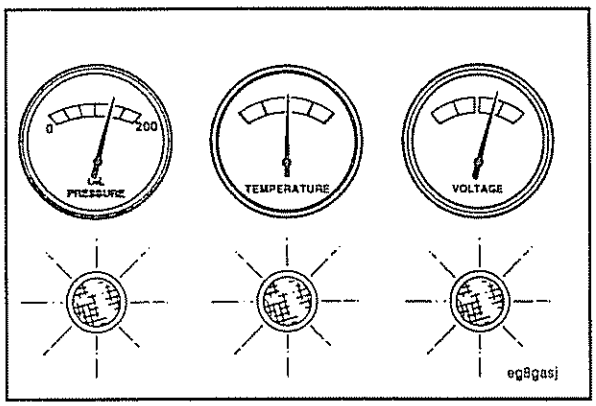
Section Contents



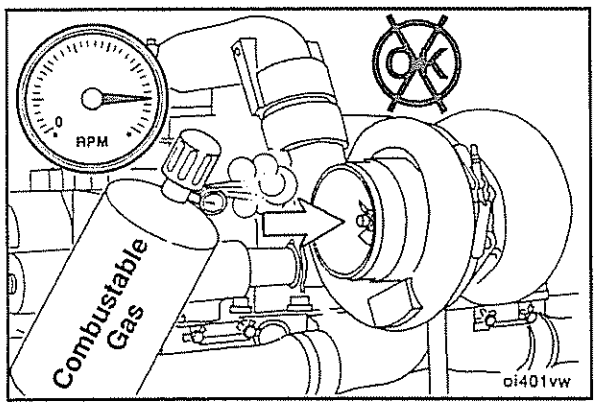
General Information

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

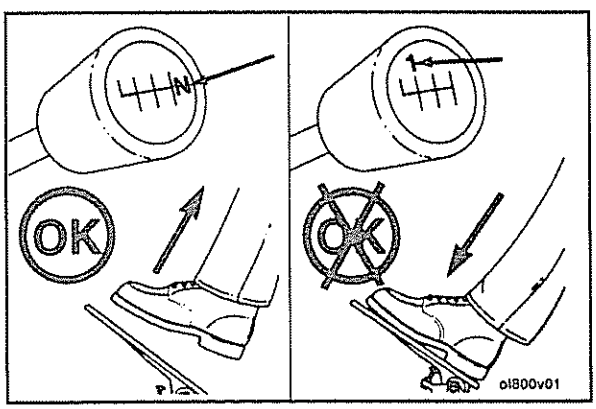
- Follow the daily maintenance checks listed in Maintenance Guidelines, Section 2.



- 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 can result in a fire, an explosion and extensive property damage. Numerous safety devices are available, such as air intake shutoff devices, to minimize the risk of over-speeding 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.



Normal Starting Procedure (Above 0°C [32°F])

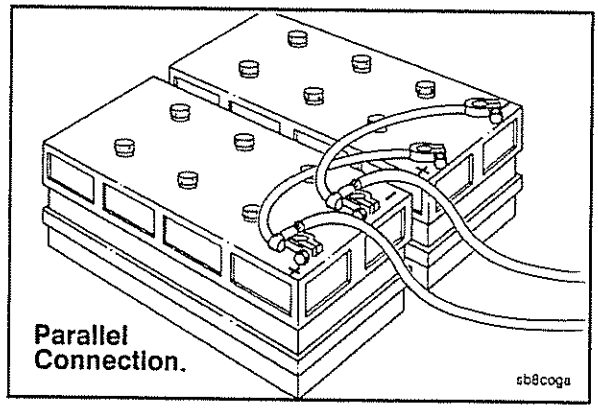
- Disengage the driven unit, or if equipped, put the transmission in neutral.
- Start the engine with the throttle in the idle position.

Engines equipped with Air Starters require a minimum of 480 kPa [70 psi] compressed air pressure.

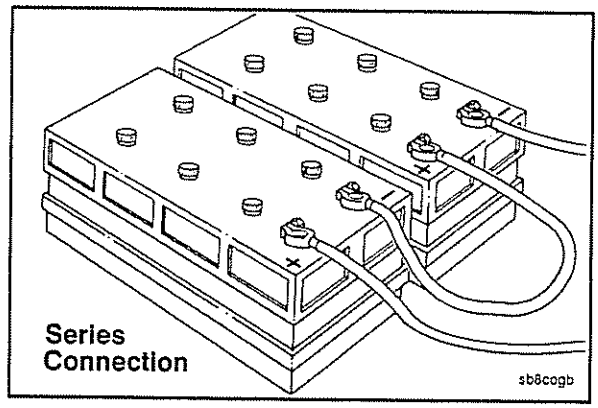
To prevent damage to the starter, do **not** engage the starting motor more than 30 seconds. Wait two (2) minutes between each attempt to start (electrical starting motors only).

Caution: When using jumper cables to start the engine, make sure to connect the cables in parallel: positive (+) to positive (+) and negative (-) to negative (-). When using an external electrical source to start the engine, turn the disconnect switch to the OFF position. Remove the key before attaching the jumper cables.

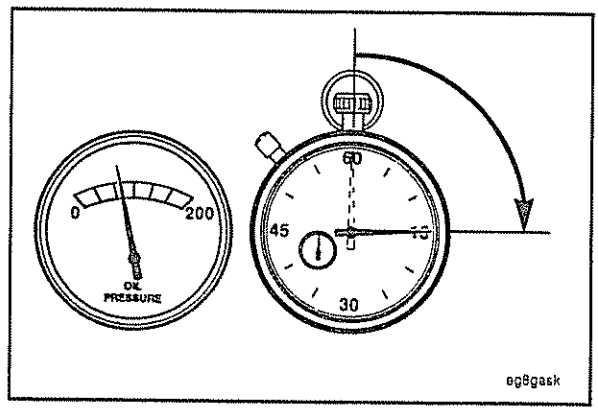
The accompanying illustration shows a typical parallel battery connection. This arrangement doubles the cranking amperage.



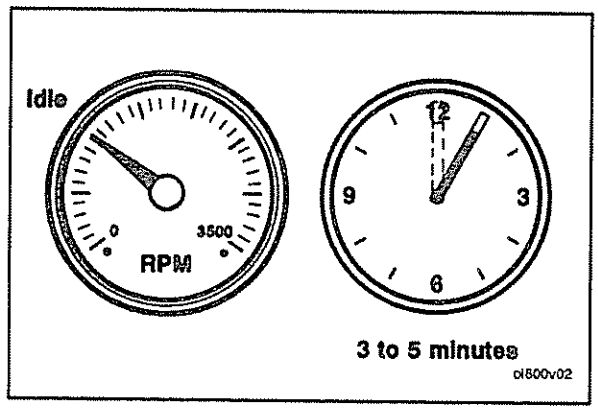
This illustration shows a typical series battery connection. This arrangement, positive to negative, doubles the voltage.

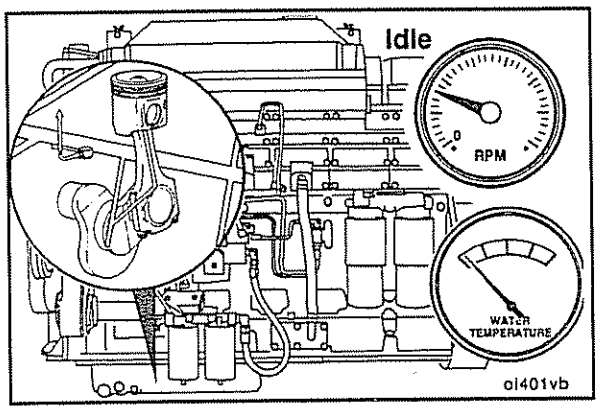


- Engine oil pressure **must** be indicated on the gauge within 15 seconds after starting. If oil pressure is **not** registered within 15 seconds, shut off the engine immediately to avoid engine damage. Confirm the correct oil level in the oil pan.

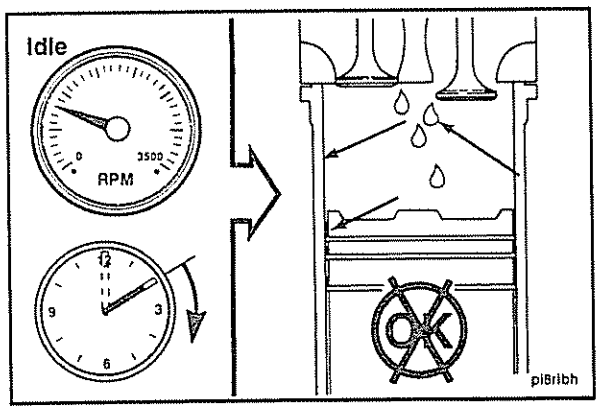


- Idle the engine three (3) to five (5) minutes at approximately 1,000 RPM before operating with a load.

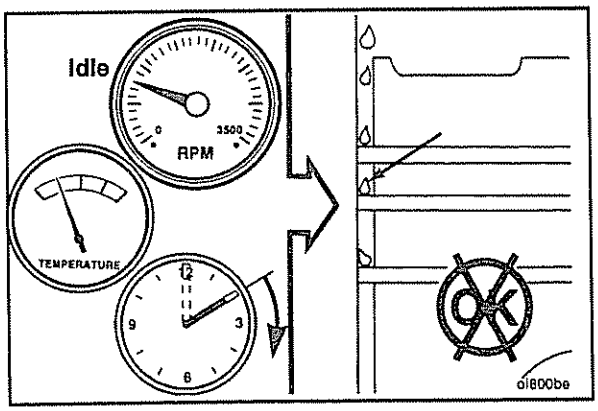




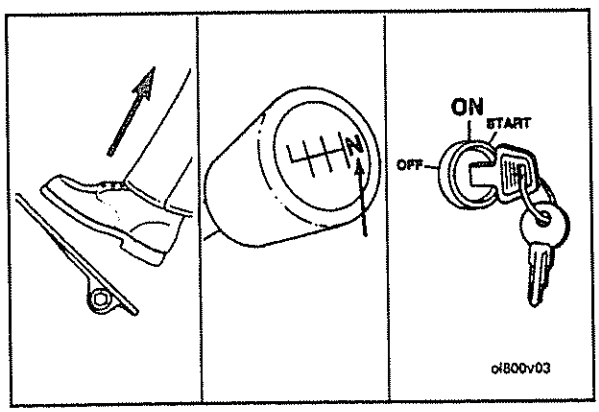
- When starting a cold engine, increase the engine speed (RPM) slowly to provide adequate lubrication to the bearings, and to allow the oil pressure to stabilize.



Do **not** idle the engine for excessively long periods. Long periods of idling, more than 10 minutes, can damage an engine because combustion chamber temperatures drop so low the fuel will **not** burn completely. This will cause carbon to clog the injector spray holes and piston rings, and can cause the valves to stick.



If the engine coolant temperature becomes too low, 60°C [140°F], raw fuel will wash the lubricating oil off the cylinder walls and dilute the crankcase oil; therefore, all moving parts of the engine will **not** receive the correct amount of lubrication.

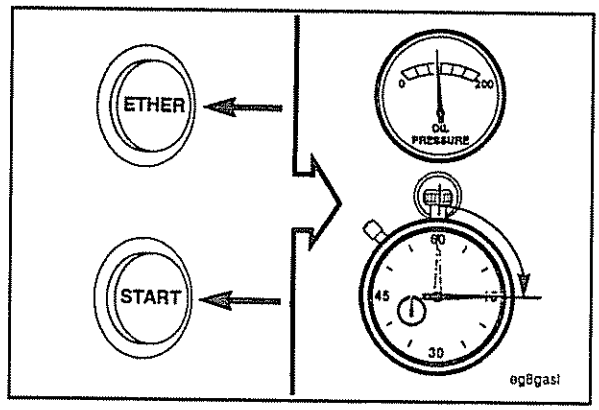


Cold Weather Starting

Using Starting Fluid With Mechanical or Electrical Metering Equipment

- Set the throttle at idle.
- Disengage the driven unit, or if equipped, put the transmission in neutral.
- Activate the switch to open the fuel pump shutoff valve.

- While cranking the engine, inject a metered amount of starting fluid.
- Engine oil pressure **must** be indicated on the gauge within 15 seconds after starting.

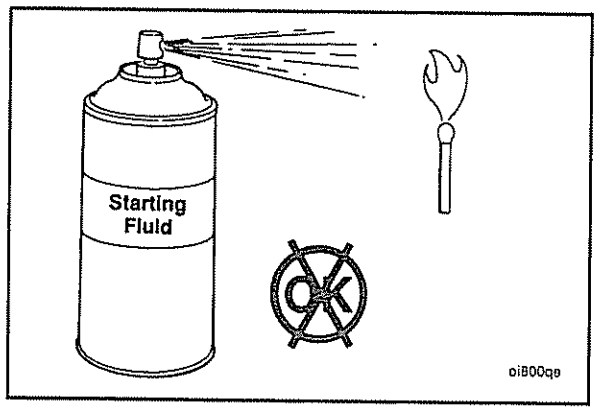


Using Starting Fluid Without Metering Equipment

Warning: Do not use volatile cold starting aids in underground mine or tunnel operations due to the potential of an explosion. Check with the local U.S. Bureau of Mines Inspector for instructions.

Caution: Do not use excessive amounts of starting fluid when starting an engine. The use of too much starting fluid will cause engine damage.

Due to increased safety hazards and potential for engine damage, Cummins Engine Company, Inc. does **NOT** recommend the use of starting fluid without metering equipment.



Cold Weather Engine Operation

Satisfactory performance of a diesel engine operating in low ambient temperature conditions requires modification of the engine, surrounding equipment, operating practices and maintenance procedures. The colder the temperatures encountered, the greater the amount of modification required and yet with the modifications applied, the engines **must** still be capable of operation in warmer climates without extensive changes. The following information is provided to engine owners, operators and maintenance personnel on how the modifications can be applied to get satisfactory performance from their diesel engines.

There are three basic objectives to be accomplished:

1. Reasonable starting characteristics followed by practical and dependable warm-up of the engine and equipment.
2. A unit or installation which is as independent as possible from external influences.
3. Modifications which maintain satisfactory operating temperatures with a minimum increase in maintenance of the equipment and accessories.

If satisfactory engine temperature is **not** maintained, higher maintenance cost will result due to the increased engine wear, poor performance and formation of excessive carbon, varnish and other deposits. Special provisions to overcome low temperatures are definitely necessary, whereas a change to warmer climate normally requires only a minimum of revision. Most of the accessories will be designed in such a way that they can be disconnected so there is little effect on the engine when they are **not** in use.

The two most commonly used terms associated with preparation of equipment for low temperature operation are **Winterization** and **Arctic Specifications.**

Winterization of the engine and/or components so starting and operation are possible in the lowest temperature to be encountered requires:

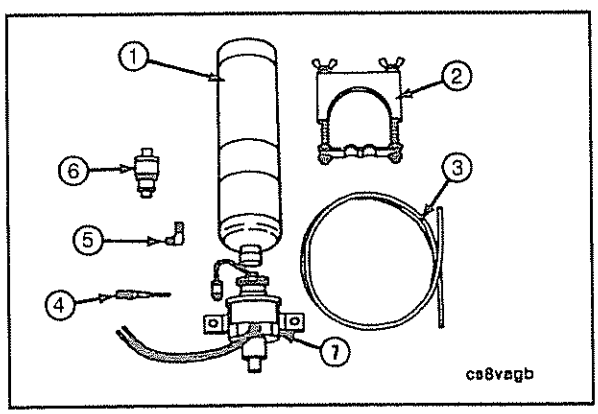
1. Use of correct materials.
2. Proper lubrication, low temperature lubricating oils. Refer to Lubricating Oil Specifications, Section V.
3. Protection from the low temperature air. The metal temperature does **not** change, but the rate of heat dissipation is affected.
4. Fuel of the proper grade for the lowest temperature.
5. Heating to be provided to increase the engine block and component temperature to a minimum of -32°C [-25°F] for starting in lower temperatures.
6. Proper external heating source available.
7. Electrical equipment capable of operating in the lowest expected temperature.

Arctic specifications refer to the design material and specifications of the components necessary for satisfactory engine operation in extreme low temperatures -54°C [-65°F]. Contact Cummins Engine Company, Inc. or the equipment manufacturer to obtain the special items required.

For additional information on cold weather operation, obtain Service Bulletin No. 3379009, Engine Operation in Cold Weather, from the nearest Cummins Distributor or dealer.

It is possible to operate diesel engines in extremely cold environments if they are properly prepared and maintained. The correct lubricants, fuels and coolant **must** be used for the cold weather range for which the vehicle is being operated. Refer to the chart below for recommendations in different operating ranges.

Winterize 0° to -23°C [32° to -10°F]	Winterize -23° to -32°C [-10° to -25°F]	Artic Specifications -32° to -54°C [-25° to -65°F]
Use ethylene glycol antifreeze to protect to -29°C [-20°F]	Use 50 percent ethylene glycol antifreeze, 50 percent water mixture.	Use 60 percent ethylene glycol antifreeze, 40 percent water mixture.
Use multi viscosity oils meeting API, CE/SF specifications.	Use multi viscosity oil meeting API CE/SF specifications.	Use Artic oil meeting API CE/SF specifications.
Fuel to have maximum cloud and pour points 6°C [10°F] lower than ambient temperature in which engine operates.	Fuel to have maximum cloud and pour points 6°C [10°F] lower than ambient temperatures in which engine operates.	Fuel to have maximum cloud and pour points 6°C [10°F] lower than ambient temperature in which engine operates.



Cold Weather Starting Aids

Ether Starting Aids

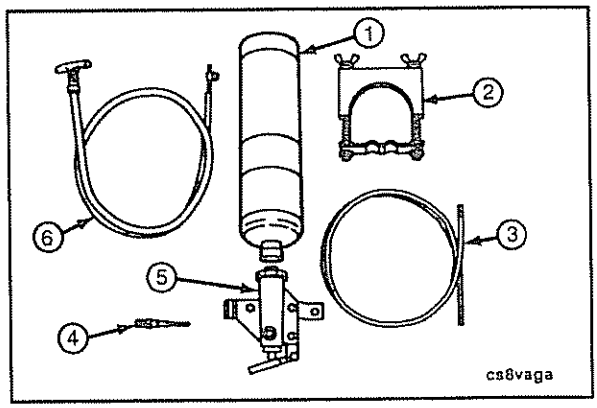
Warning: Starting fluid contains ether and is extremely flammable. Misuse or mishandling can cause an explosion. NEVER handle starting fluid near an open flame. NEVER use starting fluid with a preheater, glow plug, flame thrower or other type of electrical starting equipment. Do NOT breathe the fumes as serious injury to the human respiratory system will result. Fuel oil or volatile fuel cold starting aids are NOT to be used in underground mine or tunnel operations.

Caution: Using too much starting fluid will cause extremely high pressures and detonation in the engine cylinders, resulting in damage to the cylinder parts and bearings. Too much starting fluid can also cause damage from engine overspeed.

Manually Operated Ether Valve

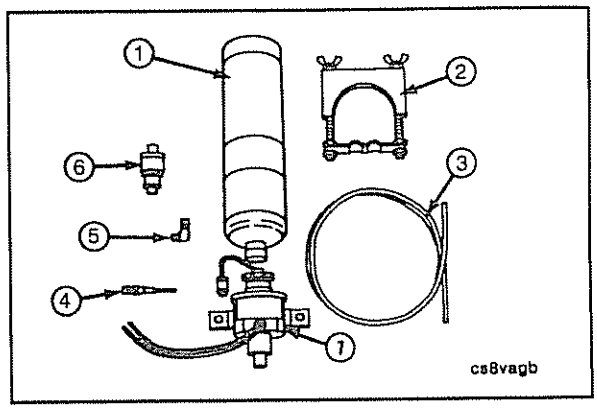
The manually operated ether valve includes the valve body assembly (5), clamp (2), and nylon tube (3). The fuel cylinder (1), atomizer fitting (4) and pull control (6) **must** be ordered separately.

Standard pull or throttle control cables can be used to actuate the manual valve, if desired.



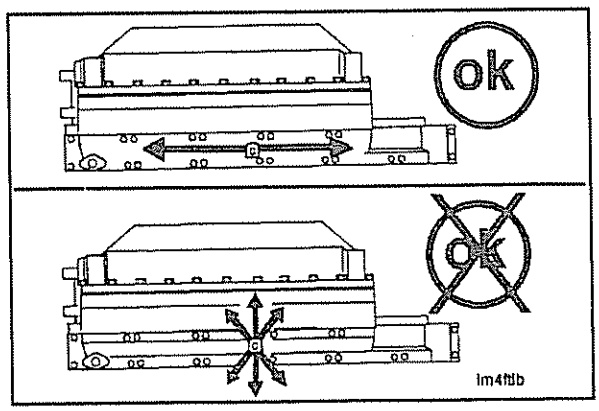
Electrically Operated Ether Valve

The electrically operated ether valve includes the valve body (7), 90 degree elbow (5), clamp (2), push button switch (6), and nylon tube (3). A thermostat is mounted to the cylinder block or coolant passage and stops electrical power to the atomizer solenoid when the engine is warm. See the Parts Catalog for fuel cylinder (1) and fuel atomizer fittings (4). These fittings **must** be ordered separately, as required.

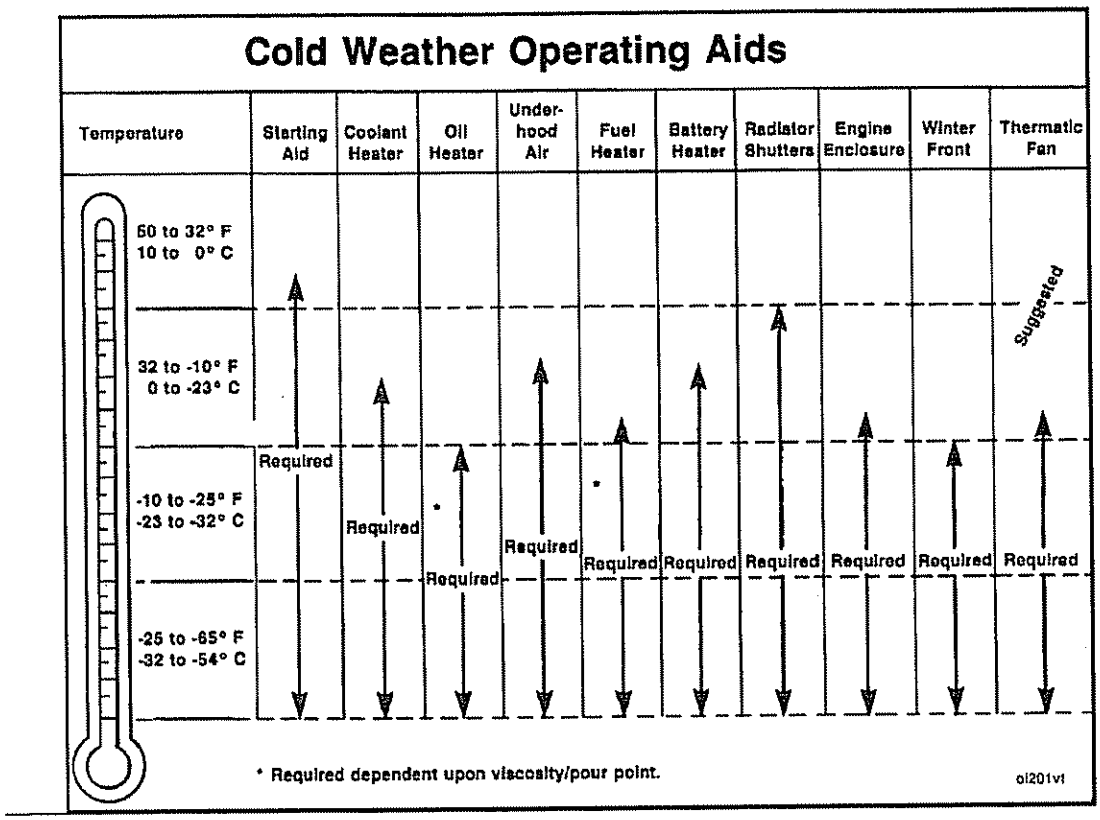


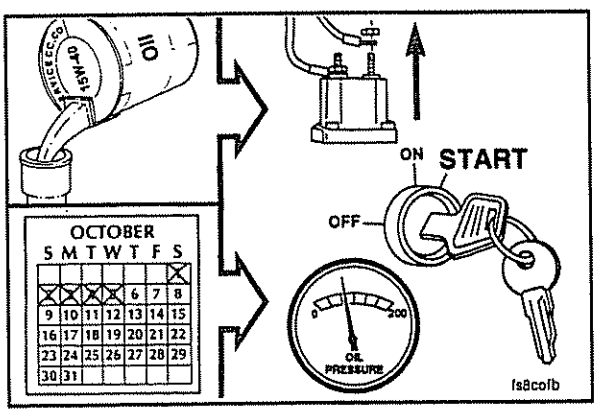
Installation Recommendations

The atomizer fittings **must** be mounted in the engine air intake manifold to provide an equal distribution of starting fuel to each cylinder. The atomizer holes are 180 degrees apart and **must** be mounted so the spray is injected the long way of the manifold. If incorrectly installed, the spray goes crosswise of the manifold.



The following cold weather operating aids are required for cold weather situations:



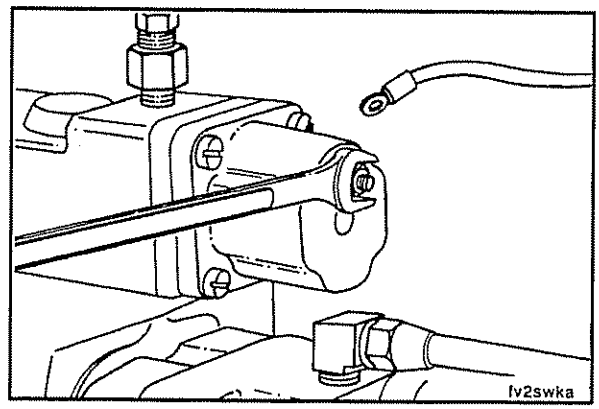


Starting Procedure - After Extended Shutdown or Oil Change

Complete the following steps after each oil change, or after the engine has been shut off for more than five (5) days to make sure the engine receives the correct oil flow through the lubricating oil system:

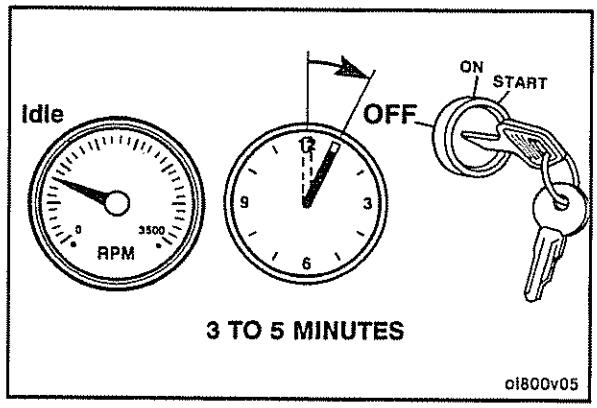
- Disconnect the electrical wire from the fuel pump solenoid valve.
- Rotate the crankshaft, using the starting motor, until oil pressure appears on the gauge or the warning light goes out.

- Connect the electrical wire to the fuel pump solenoid valve.
- Start the engine. Refer to Normal Starting Procedures in this section.



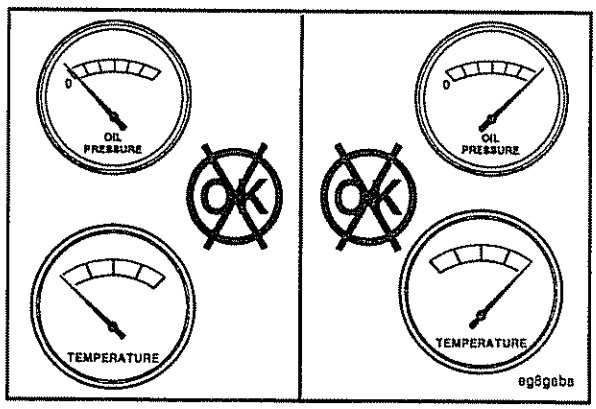
Operating the Engine

- Allow the engine to idle three (3) to five (5) minutes before shutting it off after a full load operation. This allows adequate cool down of pistons, cylinder liners, bearings and turbocharger components.

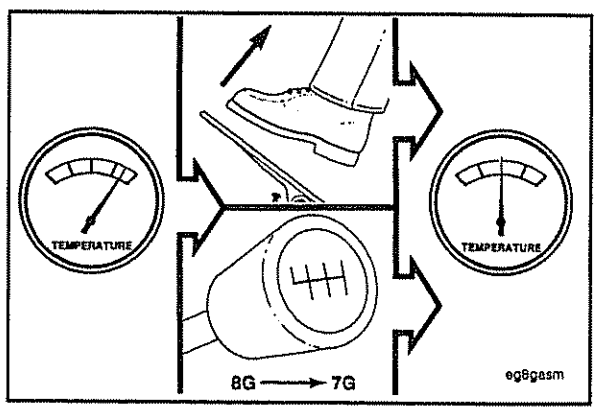


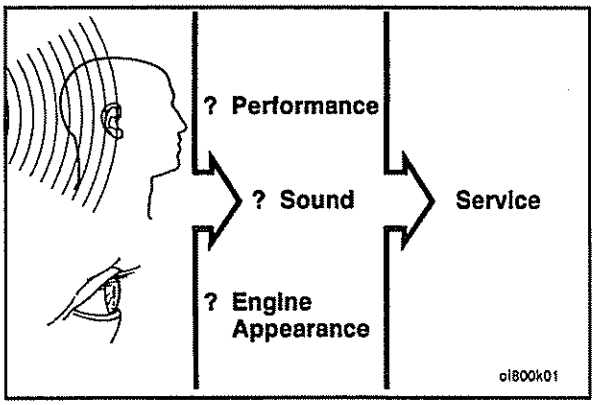
NOTE: Continuous operation with low coolant temperature, below 60°C [140°F], or high coolant temperature, above 100°C [212°F], can damage the engine.

- Monitor the oil pressure and coolant temperature gauges frequently. Refer to Lubricating Oil System Specifications or Cooling System Specifications, Section V, for recommended operating pressures and temperatures. Shut off the engine if any pressure or temperature does **not** meet the specifications.

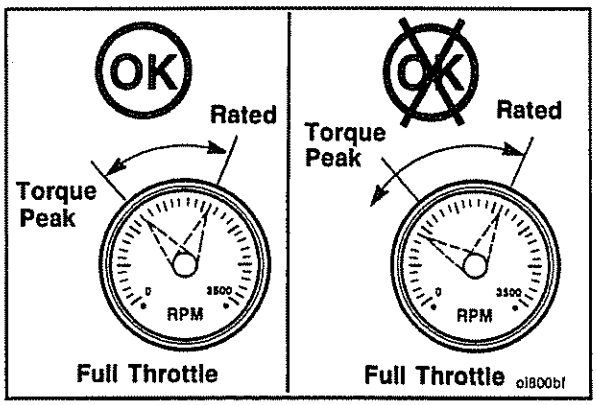


- If an overheating condition starts to occur, reduce the power output of the engine by releasing the throttle pressure or shifting the transmission to a lower gear or both until the temperature returns to normal operating range. If engine temperature does **not** return to normal, shutoff the engine and refer to Troubleshooting, Section T, or contact a Cummins Authorized Repair Location.



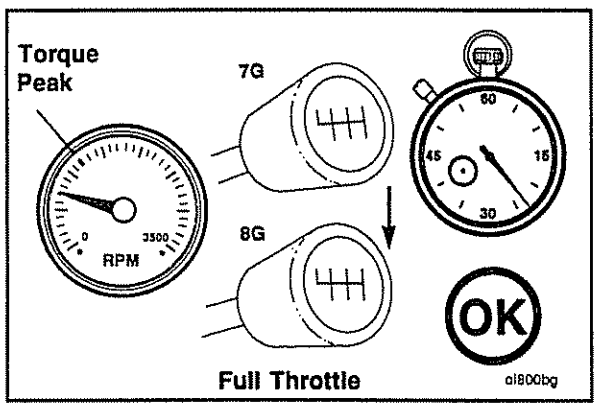


- Most failures give an early warning. Look and listen for changes in performance, sound or engine appearance that can indicate service or engine repair is needed. Some changes to look for are as follows:
  - — Engine misfires
  - — Vibration
  - — Unusual engine noises
  - — Sudden changes in engine operating temperature or pressure
  - — Excessive smoke
  - — Loss of power
  - — An increase in oil consumption
  - — An increase in fuel consumption
  - — Fuel, oil or coolant leaks

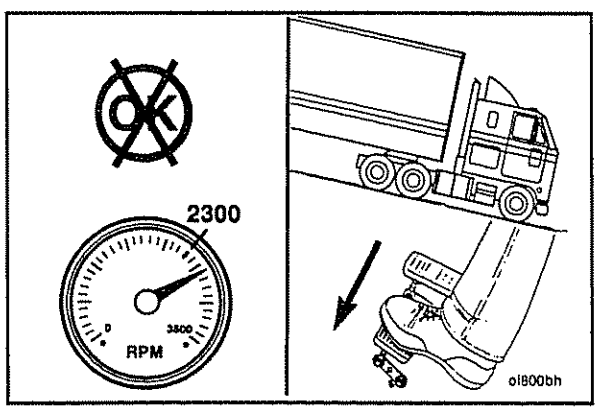


Engine Operating Range

Excessive full throttle operation below peak torque RPM (lugging) will shorten engine life to overhaul, can cause serious engine damage and is considered engine abuse. Cummins engines are designed to operate successfully at full throttle under transient conditions down to peak torque engine speed.



Operation of the engine below peak torque RPM can occur during gear shifting due to the difference of ratios between transmission gears, but engine operation **must not** be sustained more than 30 seconds at full throttle below peak torque RPM.

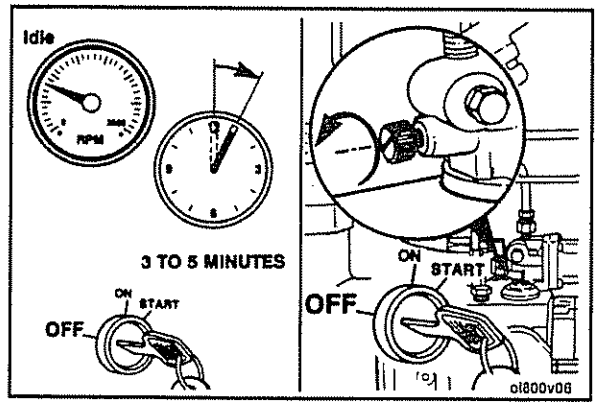


Caution: Operating the engine beyond high idle speed can cause severe engine damage. The engine speed must not exceed 2,400 RPM under any circumstances. When descending a steep grade, use a combination of transmission gears and service brakes to control the vehicle and engine speed.

Caution: To prevent damage to the camshaft and the valve train when using an engine compression brake, do not exceed governed speed.

Engine Shut-down

- Allow the engine to idle three (3) to five (5) minutes after a full load operation before shutting it off. This allows the engine to cool gradually and uniformly.
- Turn the ignition key switch to the OFF position. If the engine fails to stop running, rotate the manual fuel shutoff thumb screw **counterclockwise** to make sure the valve is **not** being held open by the manual override screw.

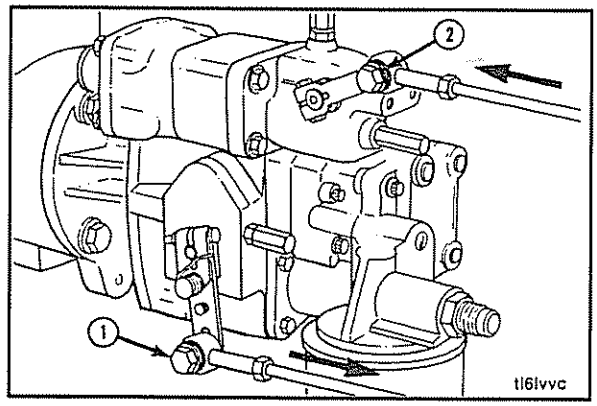


Power Takeoff Application with Variable Speed Controls

The variable speed governor on power takeoff applications is used to control engine speed at the desired RPM.

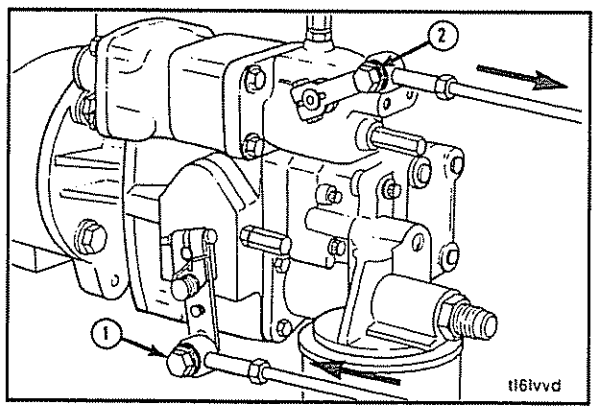
To engage the variable speed governor with the engine idling on standard throttle:

- Put the variable speed control lever (2) in the idle position.
- Lock the standard throttle lever (1) in the full open position.
- Adjust the variable speed control lever (2) to the speed desired.



To return to standard throttle operation:

- Return the standard throttle lever (2) to the idle position.
- Lock the variable speed control lever (1) in the maximum speed position.



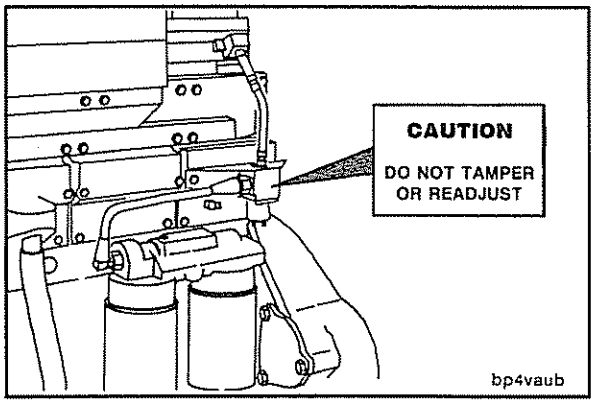
Step Timing Control (STC)

Some engine models are equipped with step timing control (STC). STC allows the engine to operate in advanced injection timing immediately after start-up and light duty engine load conditions, and to return to normal timing during medium and high engine load conditions.

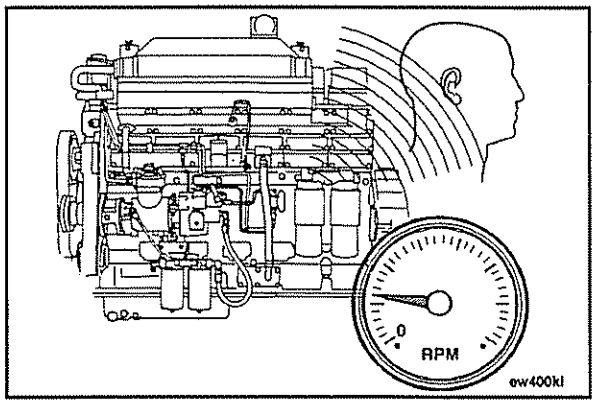
Benefits include:

- Improved cold weather idling characteristics.
- Reduced cold weather white smoke.
- Improved light load fuel economy.

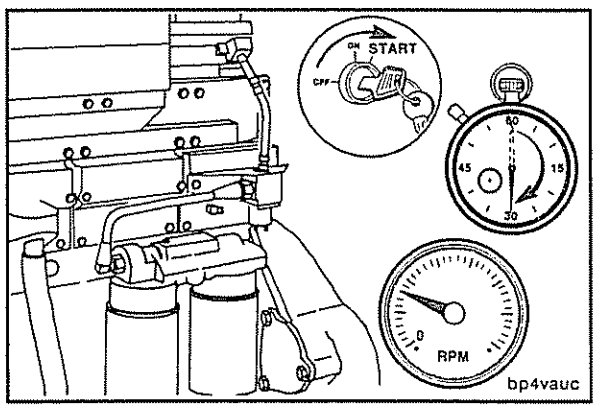
STC	
Advanced	**Normal**
Starting and Light Load	High Load



Do not attempt to bypass or otherwise tamper with the STC oil control valve or plumbing. This will result in the loss of both fuel economy and engine durability. Correct valve operation is necessary to maintain acceptable cylinder pressures and temperatures, and to yield optimal fuel economy during high-load operation. Correct operation is also necessary to control white smoke at idle.



When operating in the advanced mode, a light ticking noise can be noted at the overhead. This sound is normal, and is caused by the actuation of the STC hydraulic tappets during each injection cycle.



For optimal white smoke control on STC-equipped engines, do **not** increase engine speed above idle during engine start-up until sufficient oil pressure reaches the STC tappets to shift all injectors into the advanced timing mode.

Section 2 - Maintenance Guidelines

Section Contents

General Information

Cummins Engine Company, Inc. recommends that the engine be maintained according to the Maintenance Schedule on page 2-3.

If the engine is operating in ambient temperatures consistently below -18°C [0°F] or above 38°C [100°F], perform maintenance at shorter intervals. Shorter maintenance intervals are also required if the engine is operated in a dusty environment or if frequent stops are made. See your Cummins Authorized Repair Location for recommended intervals.

NOTE: Some of these maintenance procedures require special tools or **must** be done by qualified personnel. These procedures are outlined in the specific manuals as follows:

Procedure	Bulletin No.	Description
• Clean and Calibrate the Injectors	3379071	Injector PT Rebuild Manual
• Clean and Calibrate the Injectors	3810313	PT (Type D) STC Injector Shop Manual
• Clean and Calibrate the Fuel Pump	3379084	Fuel Pump (PT Type G) Rebuild and Calibrate
• Repair and Rebuild Components*	3810263-00	K19 Shop Manual

*If your engine is equipped with a component or an accessory **not** manufactured by Cummins Engine Company, Inc., refer to the component manufacturer's maintenance recommendations. A listing of suppliers' addresses and telephone numbers is provided in Component Manufacturers, Section C.

Use the chart provided on page 2-6 as a convenient way to keep a record of maintenance performed.

Tool Requirements

Most of the maintenance operations described in this manual can be performed with common hand tools (S.A.E. wrenches, sockets, and screwdrivers).

The following is a list of special service tools required for some maintenance operations:

Tool Part No.	Description
3375049	Oil Filter Wrench
3376592	Inch Pound Torque Wrench
3376807	Water/Fuel Filter Wrench
3822524	Belt Tension Gauge (Click-Type)
3822525	Belt Tension Gauge (Click-Type)
3822648/3823348	Top Stop Tappet Setting Tool (STC equipped engines only)
ST-1293	Belt Tension Gauge (V-belts)
3823138	Belt Tension Gauge (Poly V-belt)

Refer to the appropriate sections for a description of the tools and how to use them.

Contact your nearest Cummins Authorized Repair Location for the required service tools.

Engine Maintenance Schedule

Maintenance Schedule

Equipment No. _____ Engine Serial No. _____
Mechanic _____ Hours, Calendar _____
Time Spent _____ Check Performed _____
Parts Order No. _____ Date _____

K19 Series Cummins Diesel Engines

Check each operation as performed.

Daily (Section 3)	Weekly (Section 4)	250 Hours or 6 Mos. (Section 5)	1500 Hours or 1 Year (Section 6)	6000 Hours or 2 Years (Section 7)	Other (Section 8)
	Repeat Daily Check	Repeat (Daily/Weekly)	Repeat Previous Intervals	Repeat Previous Intervals	
☐ Check operator's report ☐ Check engine: • Oil Level • Coolant level (If make-up coolant is required, DCA4 concentration must be checked.) ☐ Visually check engine for damage, leaks, loose or frayed belts and listen for unusual noises ☐ Drain water/sediment from fuel tanks and fuel filters ☐ Check/Clean air cleaner precleaner and dust pan ☐ Clean raw water strainer ☐ Check Engine Monitor System	☐ Check air cleaner: • Check piping, hoses, and clamps • Check restriction indicator • Replace air cleaner element as required ☐ Drain air tanks	☐ *Change engine oil ☐ Change filters • Oil full flow • Oil by-pass • Fuel filter • Water filter • Air compressor air cleaner element ☐ Check/Clean • Crankcase breather tube/hose ☐ Check belt tension ☐ Check DCA concentration ☐ Check all belts condition ☐ Check cooling fan condition	☐ Steam clean engine ☐ **Adjust valves and injectors ☐ Check engine protection system ☐ Grease • Fan idler pivot arm • Front engine support ☐ Check/replace hoses as required ☐ Check cold start aids (seasonal) ☐ Check batteries ☐ Tighten mounting bolts ☐ Inspect crankshaft end clearance ☐ Check heat exchanger zinc plugs annually or as required (marine only) ☐ Clean/replace Crankcase breather element	☐ Clean and calibrate injectors and fuel pump ☐ Inspect/check the following assemblies: • Turbocharger • Vibration damper • Air compressor (Cummins/Holset) • Fan hub • Water pump ☐ Clean and flush cooling system ☐ Calibrate engine protection system ☐ Inspect fan idler pulley assembly	☐ +Alternator ☐ +Generator ☐ +Starter ☐ +Air compressor (Non-Cummins) ☐ +Electrical connections ☐ +Batteries ☐ +Fan Shaft Bearings ☐ +Clutch or Marine Gear ☐ +Freon compressor ☐ +Hydraulic governor +On these components follow the manufacturer's recommended maintenance procedure

Note: Under circumstances where hours of operation are not accumulated at a fast rate, use calendar time. In other words, use hours, or calendar time, whichever comes first.

***Cummins Engine Company, Inc., recommends the use of dry type air cleaners.**

* Refer to Section V for an alternate method of determining safe oil drain intervals.

** Cummins has found that engines in most applications will not experience significant valve/injector train wear after an initial adjustment is made at 1500 hours. After this adjustment, it is recommended that the valves and injectors not be adjusted again previous to injector calibration at the 6000 hour or 2 year interval. Because injector train hardware is typically mixed between cylinders during injector replacement, it is recommended to adjust valves and injectors 1500 hours after all injector replacements.

Page References for Maintenance Instructions

For your convenience, listed below are the page numbers that contain specific instructions for performing the maintenance checks listed in the maintenance schedule.

+ Follow the manufacturer's recommended maintenance procedures on these components. Refer to Secton C, Component Manufacturers.

Maintenance Record

Engine Serial No. ____________________ Engine Model ____________________

Owner's Name ____________________ Equipment Name/Number ____________________

Date	Km [Miles], Hours or Time Interval	Actual Km [Miles] or Hours	Maintenance Check Performed	Check Performed By	Comments

Section 3 - Daily Maintenance Procedures

Section Contents

General Information

Preventative maintenance begins with day-to-day awareness of the condition of the engine and its systems.

Before starting the engine, check the oil and coolant levels. Look for:

- Leaks
- Loose or damaged parts
- Worn or damaged belts
- Any change in engine appearance

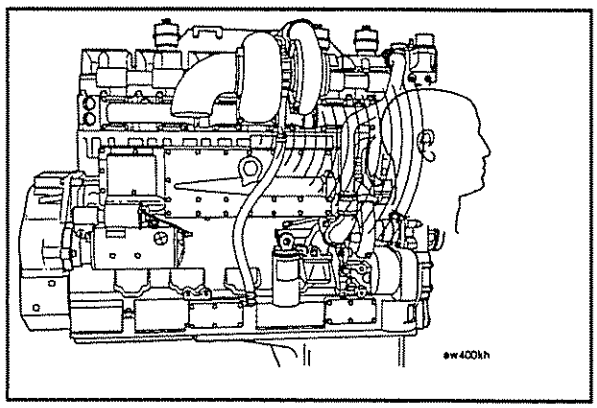
Engine Operation Report

The engine **must** be maintained in top mechanical condition if the operator is to get optimum satisfaction from its use. The maintenance department needs daily running reports from the operator to make necessary adjustments in the time allotted and to make provisions for more extensive maintenance work as the reports indicate the necessity.

Comparison and intelligent interpretation of the daily report along with a practical follow-up action will eliminate most failures and emergency repairs.

Report to the Maintenance Department any of the following conditions:

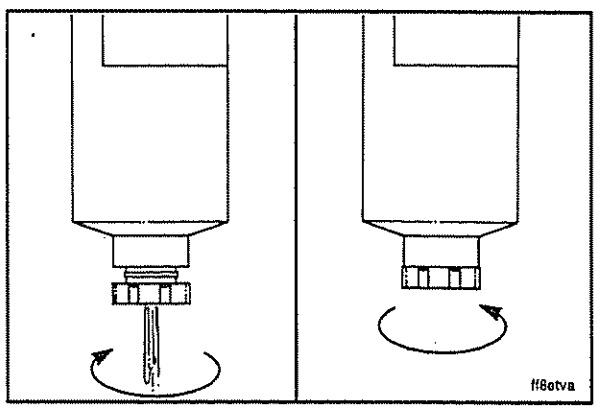
- Low lubricating oil pressure
- Low power
- Abnormal water or oil temperature
- Unusual engine noise
- Excessive smoke
- Excessive use of coolant, fuel or lubricating oil
- Any fuel, coolant or lubricating oil leaks.



Unusual Engine Noise

Check

During the daily maintenance check, listen for any unusual engine noise which can indicate that service is required.



Fuel-Water Separator

Drain

If the engine is equipped with a fuel-water separator, drain the water and sediment from the separator daily.

Shut off the engine. Use your hand to open the drain valve. Turn the valve **counterclockwise** approximately 1- 1/2 to 2 turns until draining occurs. Drain the filter sump of water until clear fuel is visible.

Caution: Do not overtighten the valve. Overtightening can damage the threads.

Turn the valve **clockwise** approximately 1-1/2 to 2 turns to close the drain valve.

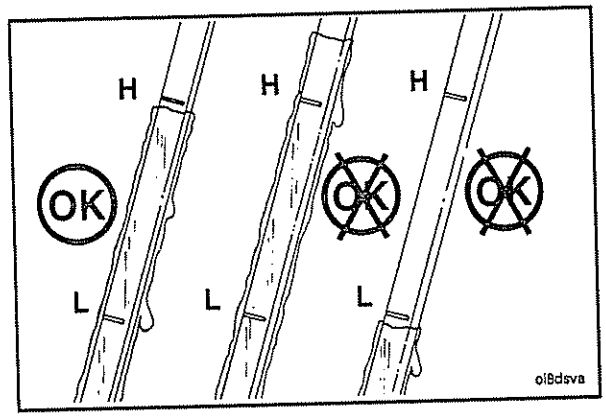
Oil Level

Check

Check the oil level daily.

Never operate the engine with the oil level below the L (Low) mark or above the H (High) mark. Wait at least 5 minutes after shutting off the engine to check the oil. This allows time for the oil to drain to the oil pan.

NOTE: The vehicle **must** be level when checking the oil level to make sure the measurement is correct.



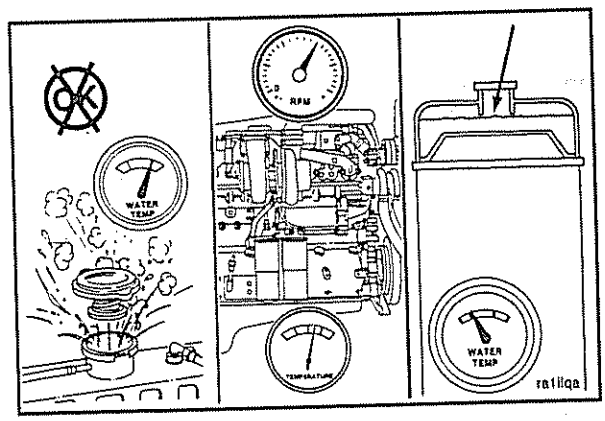
Coolant Level

Check

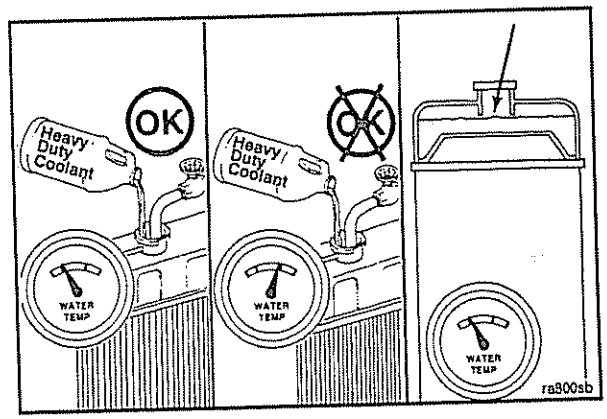
Warning: Do not remove the radiator cap from a hot engine. Wait until the temperature is below 50°C [120°F] before removing the pressure cap. Failure to do so can result in personal injury from heated coolant spray or steam. Remove the filler cap slowly to relieve coolant system pressure.

Caution: Never use a sealing additive to stop leaks in the coolant system. This can result in coolant system plugging and inadequate coolant flow.

The coolant level **must** be checked daily.

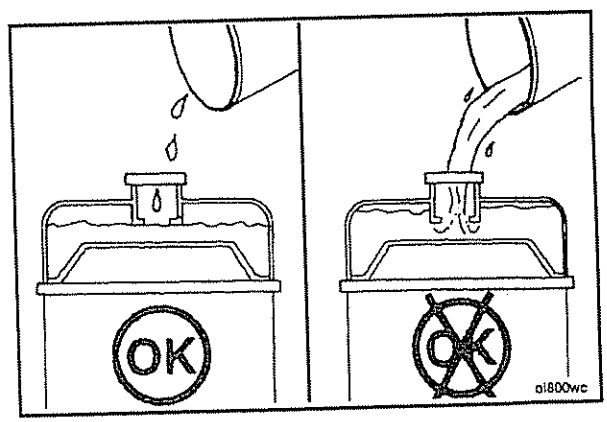


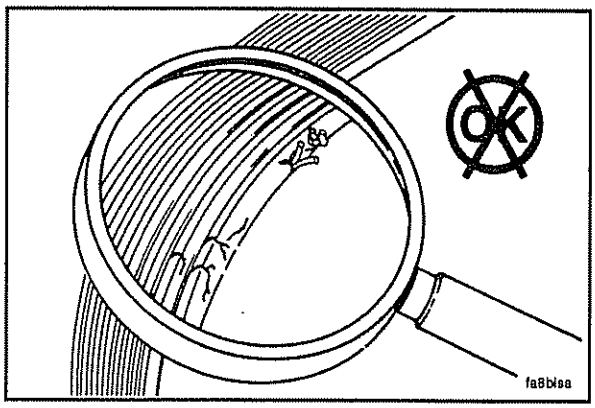
Caution: Do NOT add cold coolant to a hot engine. Engine castings can be damaged. Allow the engine to cool to below 50°C [120°F] BEFORE adding coolant.



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.





Belts

Check

Visually inspect the belts daily. Replace the 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.

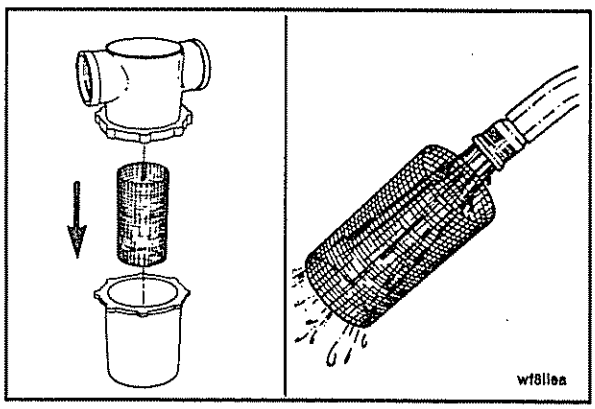
Belt damage can be caused by:

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

Air Cleaner Pre-Cleaner and Dust Pan

Check/Clean

Under extremely dirty conditions an air pre-cleaner can be used. Clean the pre-cleaner jar and dry-type air cleaner dust pans daily or more often, as necessary, depending on operating conditions.

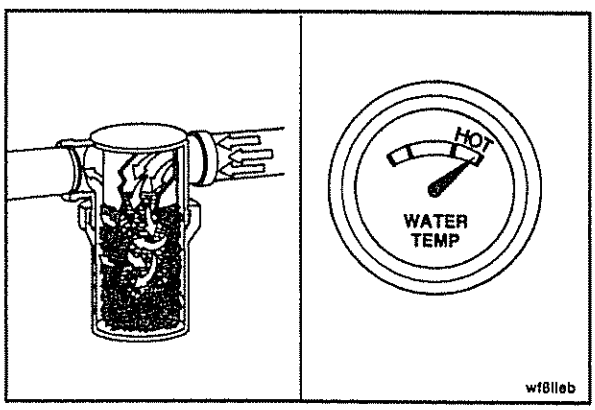


Raw Water Strainer

Clean

This picture illustrates a typical raw water strainer.

Depending on the operating environment, clean the raw water strainer daily or as required. Some units can be operated up to, but **no** longer than 6 months, before cleaning.



Caution: A restricted or clogged strainer will result in hotter than normal, or over heated, engine coolant and marine gear oil temperatures.

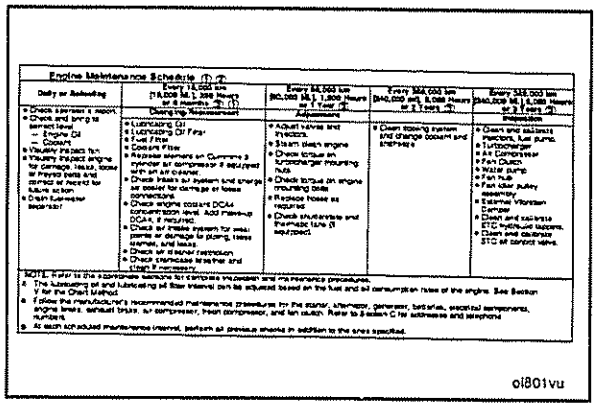
Engine Monitor System

Check

Check the Engine Monitor System daily (push button to test) per the manufacturer's recommendation to verify proper operation.

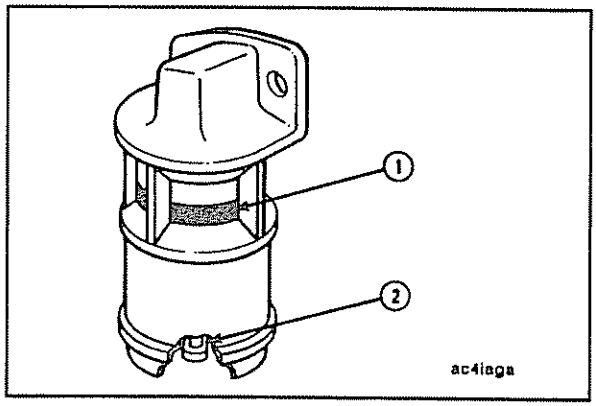
Section 4 - Weekly Maintenance Procedures

Section Contents



General Information

All checks or inspections listed under the daily maintenance interval **must** also be performed at this time in addition to those listed under this maintenance interval.



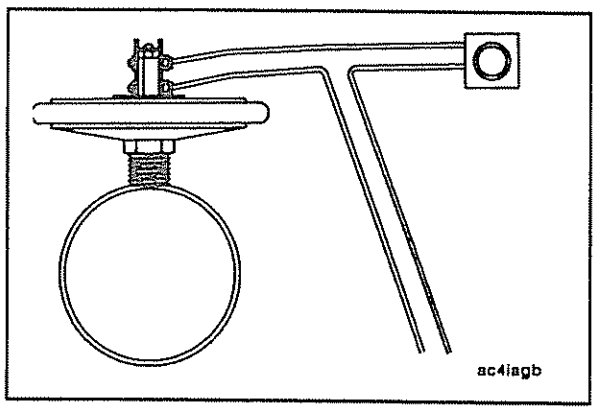
Inlet Air Restriction Indicators

Mechanical Indicator

A mechanical restriction indicator is available to indicate excessive air restriction through a dry-type air cleaner. This instrument can be mounted in the air cleaner outlet or on the vehicle instrument panel. The red flag (1) in the window gradually rises as the cartridge loads with dirt. After changing or replacing the cartridge, reset the indicator by pushing the reset button (2).

Restriction or vacuum indicators are to be installed as close as possible to the turbocharger air inlet in order to obtain a true indication of restrictions.

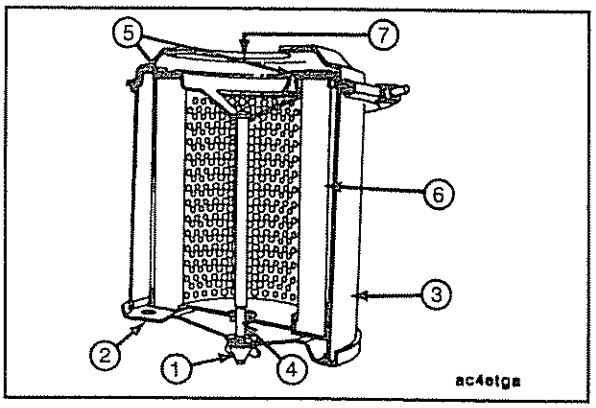
NOTE: Never remove the felt washer from the indicator. The felt washer absorbs moisture.



Vacuum Indicator

Vacuum switches actuate a warning light on the instrument panel when the air restriction becomes excessive.

Air restriction on turbocharged engines **must not** exceed 635 mm [25 inches] or 46 mm [1.8 inches] of mercury under full power conditions.



Air Cleaner Element - Replace

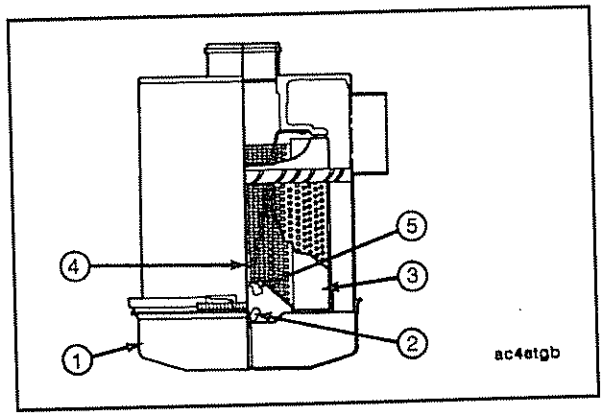
NOTE: The illustrations in this section show typical dry type air cleaner parts. The particular engine parts can vary.

Replace the element if the inlet restriction or vacuum at full power is found to exceed 25 inches of water. Changing filters or breaking the seal on the intake system more than necessary will result in excess dirt in the engine and **must** be avoided.

NOTE: Cummins Engine Co., Inc. does **not** recommend cleaning paper type air cleaner elements.

Elements that have been cleaned several times will finally clog and air flow to the engine will be restricted. After cleaning, check the restriction as previously described. Replace the element if necessary.

Caution: Holes, loose end seals, dented sealing surfaces and other forms of damage render the cleaner inoperative and require immediate element replacement.

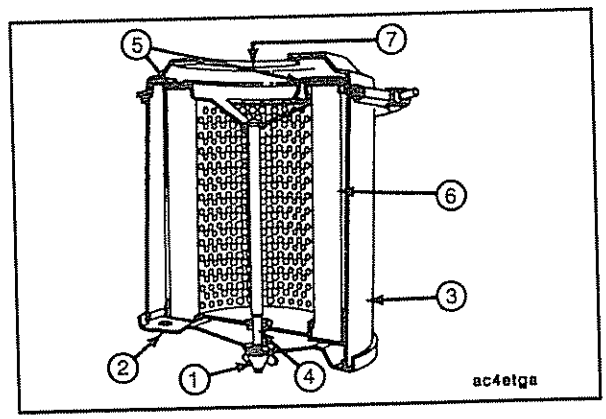


Remove the wing nut (1) that secures the bottom cover (2) to the cleaner housing (3). Remove the cover.

Pull the element (6) down from the center bolt (4).

Caution: Pull the cover and the element straight out when removing them from the housing to avoid damage to the element.

Remove the gasket (5) from the outlet end (7) of the housing.

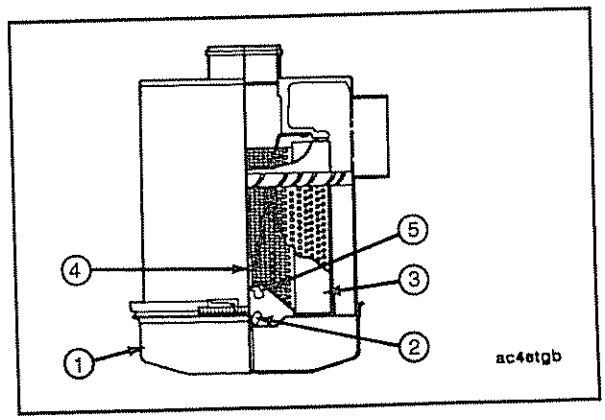


Single - Heavy Duty Dry-Type Element - Replace

Heavy duty air cleaners combine centrifugal cleaning with element filtering before air enters the engines.

Before disassembly, wipe dirt from the cover and the upper portion of the air cleaner. To clean the single types:

Loosen the wing bolt, remove the band securing the dust pan (1).



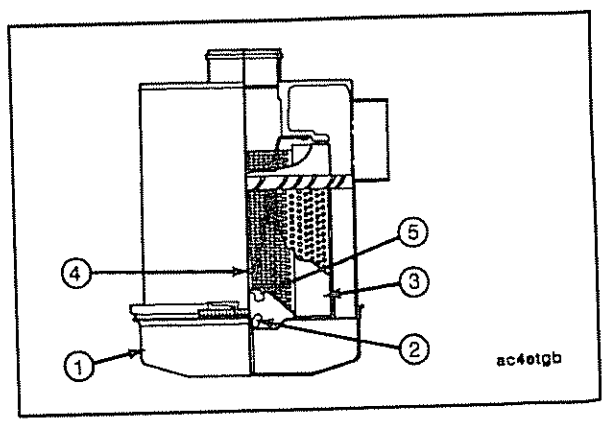
Loosen the wing nut (2). Remove the dust shield (3) from the dust pan (1). Clean the dust pan and shield.

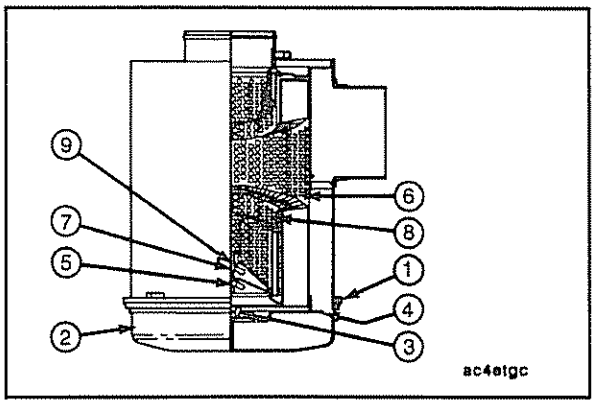
Remove the wing nut (5) that secures the air cleaner primary element in the air cleaner housing. Inspect the rubber sealing washer on the wing nut (4).

Install the new primary element.

Make sure the gasket washer is in place under the wing nut before tightening.

Assemble the dust shield and dust pan again. Position them to the air cleaner housing and secure with the band.



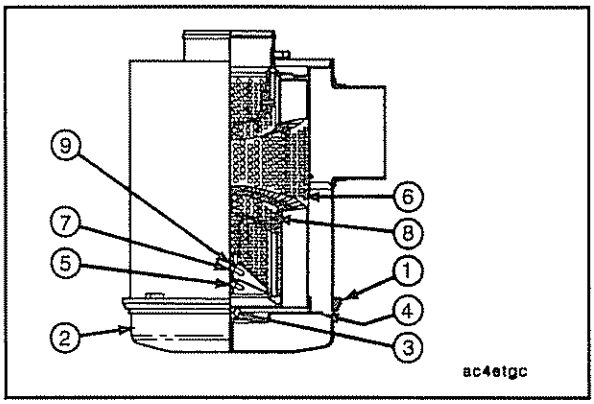


Dual - Heavy Duty Dry-Type Element - Replace

Heavy duty air cleaners combine centrifugal cleaning with element filtering before air enters the engines.

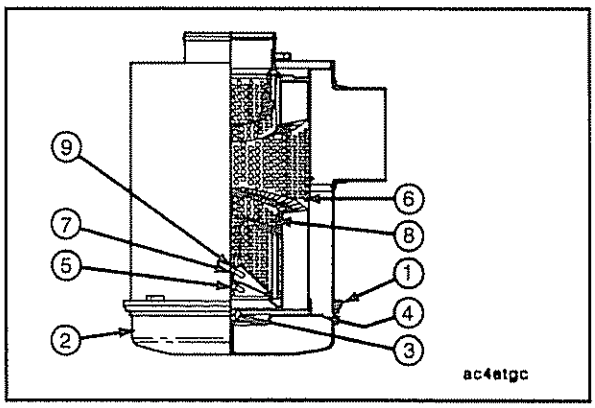
Before disassembly, wipe dirt from the cover and the upper portion of the air cleaner. To clean the dual types:

Loosen the wing bolt (1), remove the band securing the dust pan (2).



Loosen the wing nut (3). Remove the dust shield (4) from the dust pan (2). Clean the dust pan and shield.

Remove the wing nut (5) that secures the air cleaner first stage element (6) in the air cleaner housing. Inspect the rubber sealing washer on the wing nut.



Install the new air cleaner element.

Make sure the gasket washer is in place under the wing nut before tightening.

Assemble the dust shield and dust pan again. Position them to the air cleaner housing and secure with the band.

On the dual element type Cyclopac cleaner:

Check the air restriction indicator. If the air restriction is excessive, disassemble the air cleaner, remove the wing nut (7) and replace the safety element (8).

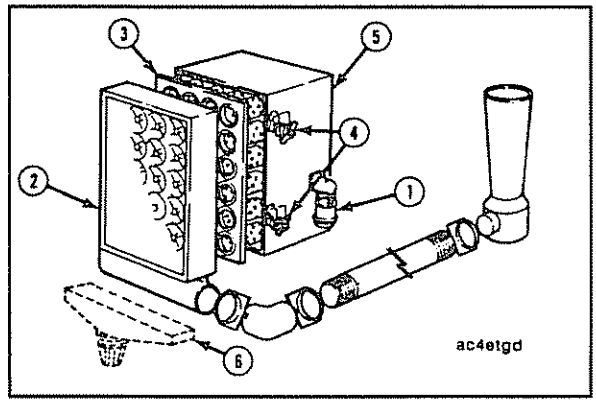
Assemble the air cleaner as described above.

Cartridge Type Element - Clean

Loosen the wing nuts (4) on the air cleaner housing (5) to remove the pre-cleaner panel with the dust bin (6). To remove the pre-cleaner panel (2) equipped with an exhaust aspirator, loosen the U bolt clamp securing the pre-cleaner to the aspirator tubing.

Remove the dirty Pamic cartridge (3), by inserting your fingers in the cartridge opening (loosen all four corners of the cartridge, one at a time) and pulling it straight out.

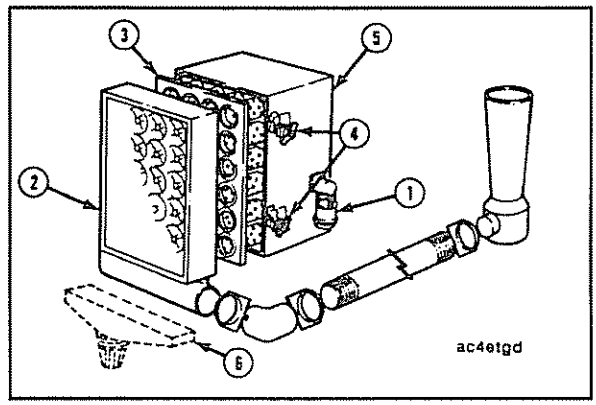
With the larger cartridge, it can be necessary to break the seal along the edges of the cartridge. After the seal has been broken, pull the cartridge straight out and slightly up so the cartridge will clear the sealing frame and edges of the air cleaner housing.



Cleaning and Inspection

Clean the pre-cleaner openings (2) of all soot, oil film and any other objects that can become lodged in the openings. Remove any dust or dirt in the lower portion of the pre-cleaner and aspirator tubing. Inspect the inside of the air cleaner housing for foreign material.

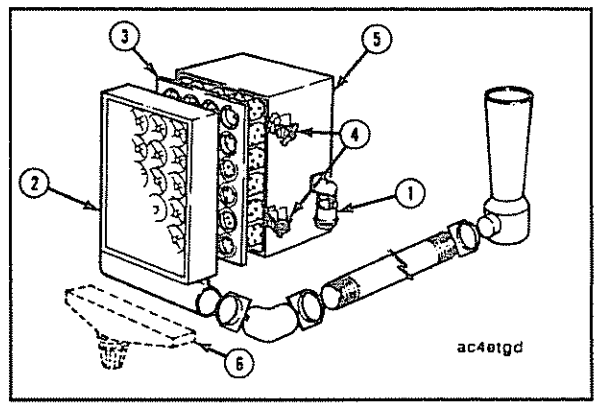
Inspect the dirty cartridge for soot or oil. If there is soot inside the Pamic tubes, check for leaks in the engine exhaust system, exhaust blow-back into the air intake and exhaust from other equipment. If the cartridge appears oily, check for fumes escaping from the crankcase breather. Excessive oil mist shortens the life of any dry-type cartridge. Troubleshooting at this point can appreciably lengthen new cartridge life.



It is **not** recommended to clean and reuse the cartridge. When returned to service, life expectancy of a cleaned cartridge will be only a fraction of the original service life.

Inspect clamps and flexible hose or tubing to make sure all fittings are air tight on cleaners with exhaust aspirators.

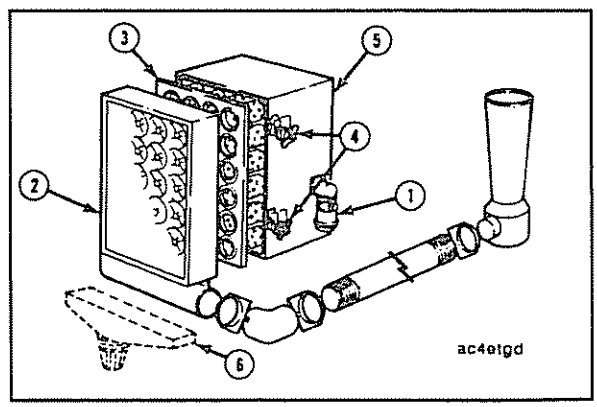
The pre-cleaner dust (6) bin is self-cleaning.

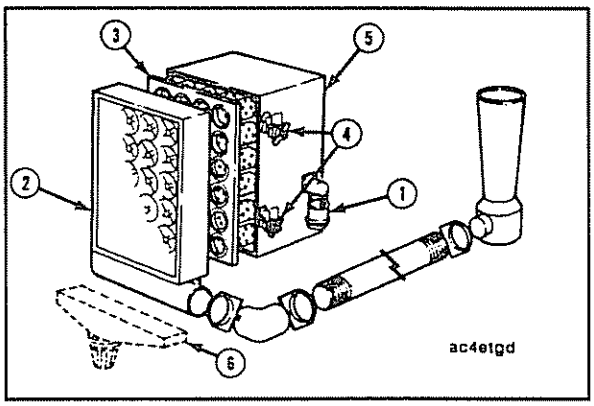


Assembly

Inspect the new filter cartridge for shipping damage before installing.

To install a new cartridge, hold the cartridge (3) in the same manner as when removing it from the housing. Insert the clean cartridge into the housing, avoiding hitting the cartridge tubes against the sealing flange on the edges of the air cleaner housing.

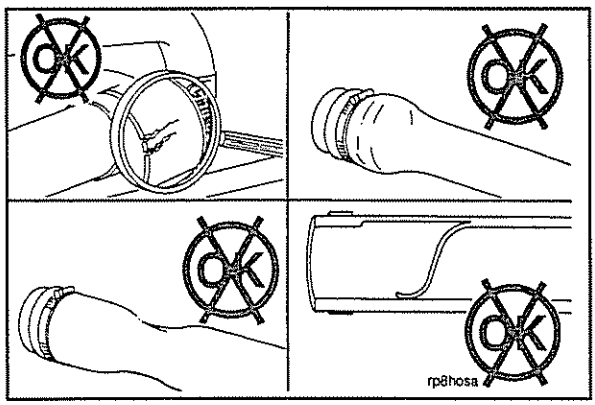




As the cleaner requires no separate gaskets for seals, care **must** be taken when inserting the cartridge to insure a proper seat within the cleaner housing. Firmly press all edges and corners of the cartridge with your fingers to effect a positive air seal against the sealing flange of the housing. The cartridge **must not** be pounded or pressed in the center to seal.

Replace the pre-cleaner panel (2) and tighten the wing nuts (4) by hand. For final tightness turn the wing nuts 1 to 1 1/2 turns with a small adjustable wrench. Do **not** tighten too much. On a pre-cleaner with an exhaust aspirator, assemble the aspirator tube to the pre-cleaner panel and tighten the U bolt.

Care **must** be taken to keep the cleaner face unobstructed.



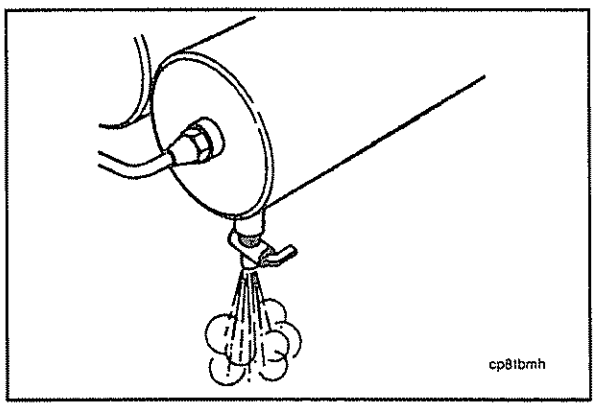
Air Intake Hoses, Pipes, and Clamps

Check

Inspect the intake piping for cracked hoses, loose clamps, or punctures which can damage the engine.

Tighten or replace parts as necessary to make sure the air intake system does **not** leak.

Check for corrosion of the intake system piping under the clamps and hoses. Corrosion can allow corrosive products and dirt to enter the intake system. Disassemble and clean as required.



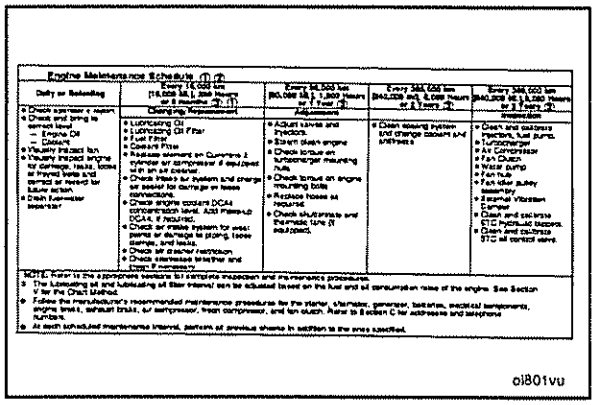
Air Tanks

Drain

Drain the moisture from the air system wet tank weekly.

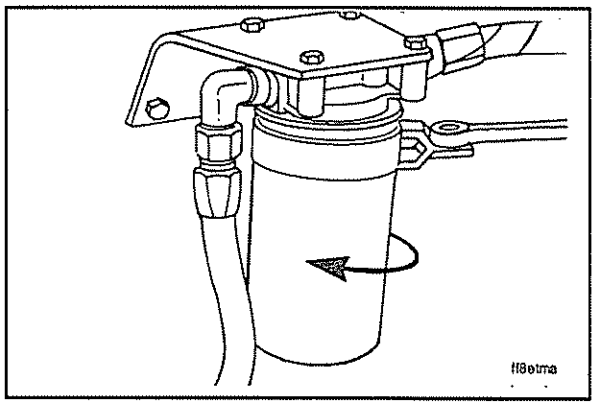
Section 5 - Maintenance Procedures Every 250 Hours or 6 Months

Section Contents



General Information

All checks or inspections listed under the previous maintenance intervals **must** also be performed at this time in addition to those listed under this maintenance interval.



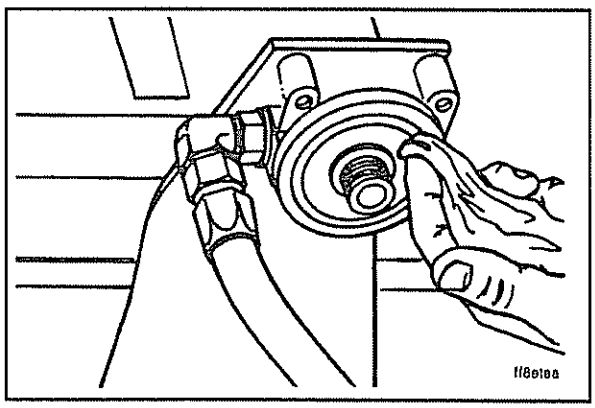
Fuel Filter(s)

Replace

Every 250 hours or 6 months clean the area around the fuel filter head and replace the fuel filter(s).

NOTE: The illustrations in this section show typical parts. The parts on your engine can look slightly different but the instructions given will apply.

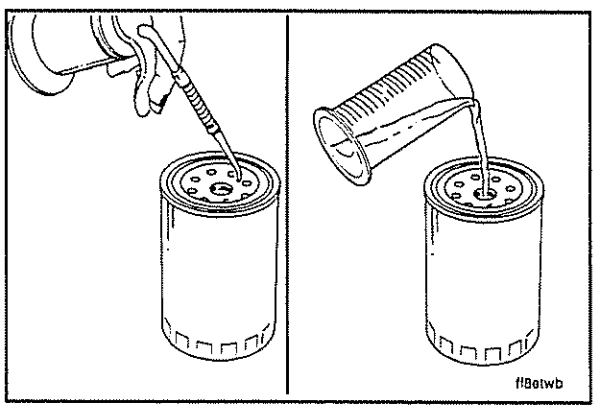
Use a filter wrench, Part No. 3375049, to remove the fuel filter.



Use a clean, lint-free towel and clean the filter head gasket surface.

Use the correct filters for your engine.

Fuel Filter
Cummins Part No. 3315844 (without draincock)
Cummins Part No. 3315847 (with draincock)
Fleetguard® Part No. FF105D (with draincock)
Fleetguard® Part No. FF105 (without draincock)

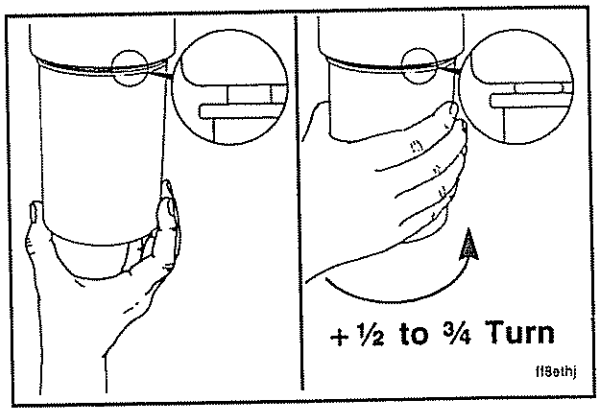


Apply a light film of clean engine oil to the filter gasket surface.

Fill the filter with clean fuel.

Install the filter on the filter head. Tighten the filter until the gasket contacts the filter head surface.

Tighten the filter an additional one-half to three-fourths (1/2 to 3/4) turn after the gasket contacts the filter head surface.



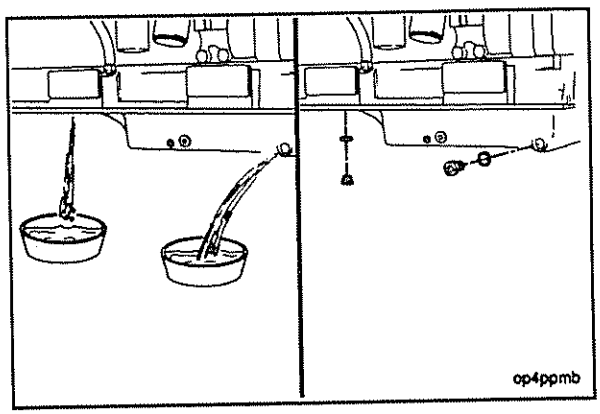
Lubricating Oil and Oil Filter

Change/Replace

Caution: Avoid direct contact of hot oil with your skin. Hot oil can cause personal injury.

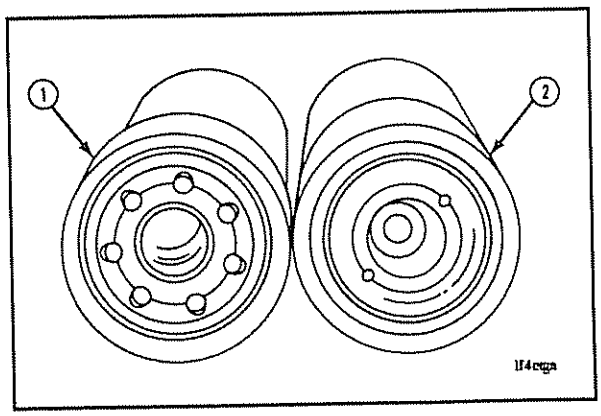
Change the lubricating oil and oil filters at every oil change interval.

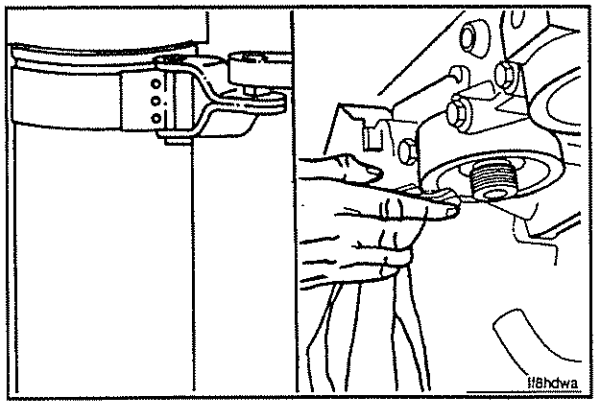
Operate the engine until the water temperature reaches 60°C [140°F]. Shut off the engine. Remove the oil drain plug. Drain the oil immediately to make sure all the oil and suspended contaminates are removed from the engine.



The external appearance of the full flow (1) and the by-pass (2) filters is the same. The accompanying picture identifies the difference between the two filters.

NOTE: The full flow filter contains 1-1/2 16 inch threads. The bypass filter contains 1-3/8 16 inch threads.





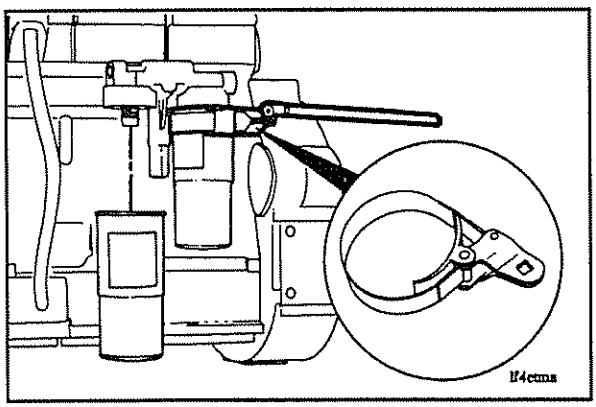
The following illustrations show the full flow oil filter. Use the same procedure when changing the bypass oil filters. Clean the area around the lubricating oil filter head. Clean the gasket surface of the filter head.

NOTE: The o-ring can stick on the filter head. Make sure the o-ring is removed.

Cut all the way around the top of a full flow filter using a pipe cutter or hack saw. Inspect the pleated paper element for metal debris. Metal debris in the filter can reveal impending engine failure. If debris is found, find the reason for the debris and make the needed repairs.

Use an oil filter wrench, Part No. 3375049, or equivalent. Remove the full flow oil filters.

Discard the filters if they are **not** needed for a failure analysis.



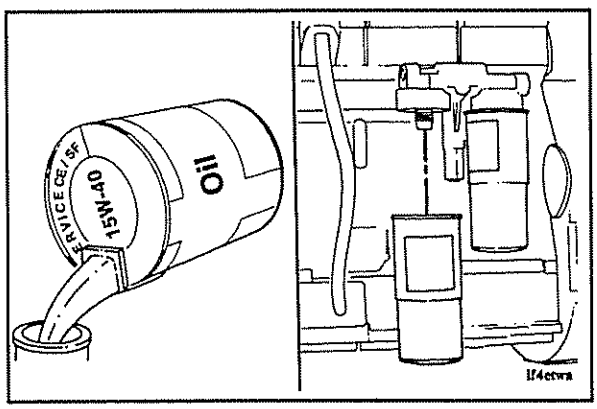
Use the correct oil filter for your engine.

Full Flow Filter (2 required)

Cummins Part No. 3313279
Fleetguard® Part No. LF-670

Bypass Filter

Cummins Part No. 3313283
Fleetguard® Part No. LF-777

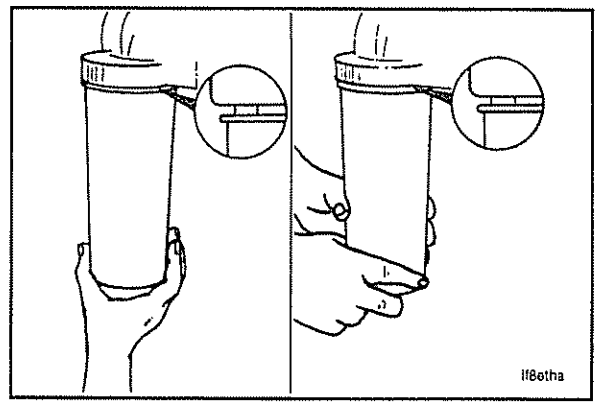


Caution: Fill the oil filters with clean lubricating oil. The lack of lubrication during the delay until the filters are pumped full of oil is harmful to the engine.

Apply a light film of lubricating oil to the gasket sealing surface **before** installing the new filters.

Caution: Mechanical overtightening can distort the threads or damage the filter element seal.

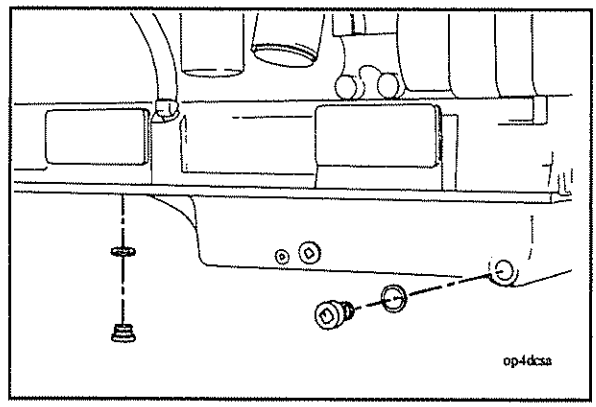
Install the filter as specified by the filter manufacturer. The tightening instructions are normally printed on the outside of the filter.



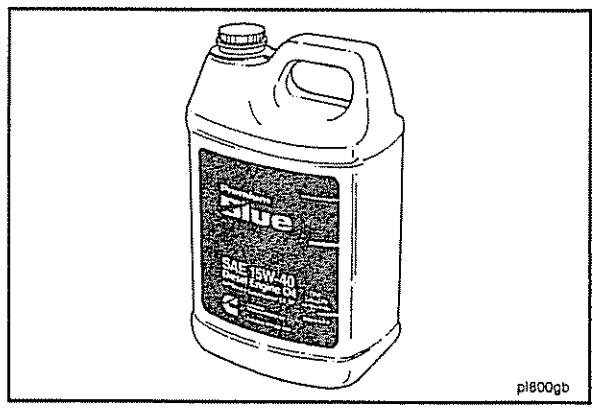
Check and clean the oil drain plug threads and the seal surface.

Install and tighten the oil drain plug.

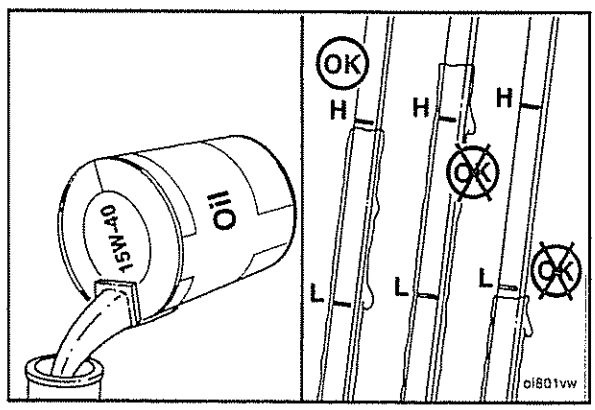
Torque Value: 100 N•m [75 ft-lbs]

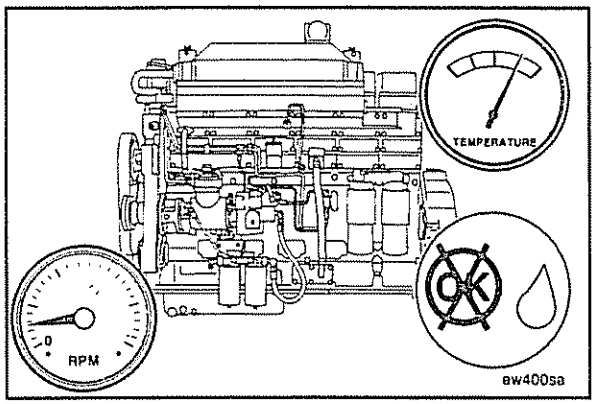


NOTE: Use a high quality 15W-40 multi-viscosity oil such as Cummins Premium Blue, or its equivalent in Cummins engines. Choose the correct oil for your operating climate as outlined in Section V of this manual.



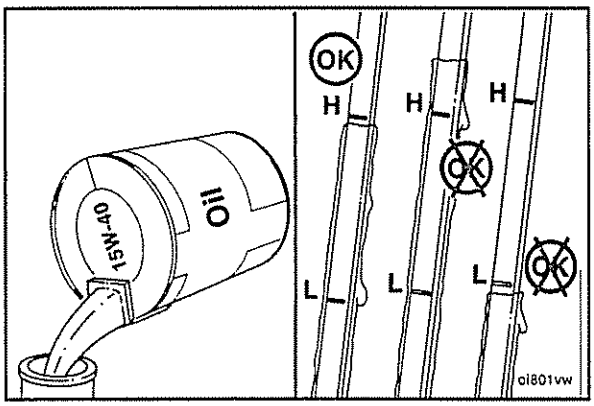
Fill the engine with clean oil to the correct level. Total system capacity including filters is listed in Section V of this manual.





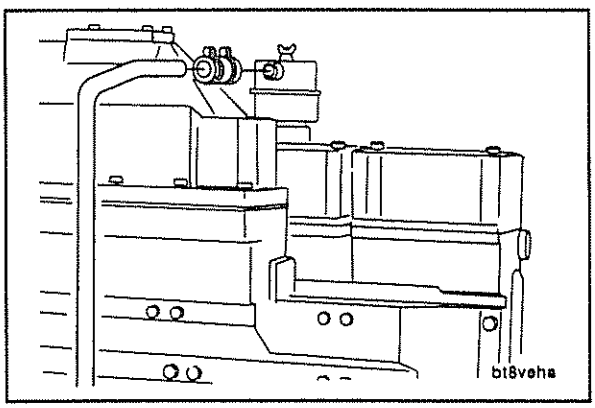
Caution: Before starting the engine, complete the steps given in Starting Procedure After Extended Shutdown in Section 1 to make sure the engine receives correct lubrication. Lack of lubrication will damage the engine.

Operate the engine at idle speed to inspect for leaks at the filters and the drain plug.



Shut off the engine. Wait approximately 5 minutes to let the oil drain from the upper parts of the engine. Check the oil level again.

Add oil as necessary to bring the oil level to the high mark (H) on the dipstick.



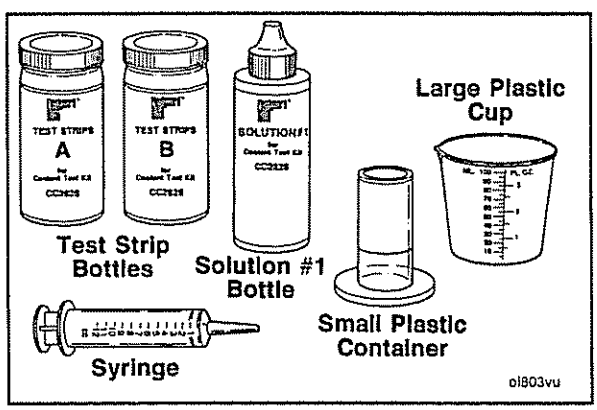
Crankcase Breather Tube/Hose

Check/Clean

Every 250 hours or 6 months, check and clean the crankcase breather tube/hose.

The tube is to be removed and checked internally for obstructions or sludge buildup.

If the tube is blocked, it is to be cleaned to prevent excess crankcase pressure buildup.



Cooling System Additives

Check

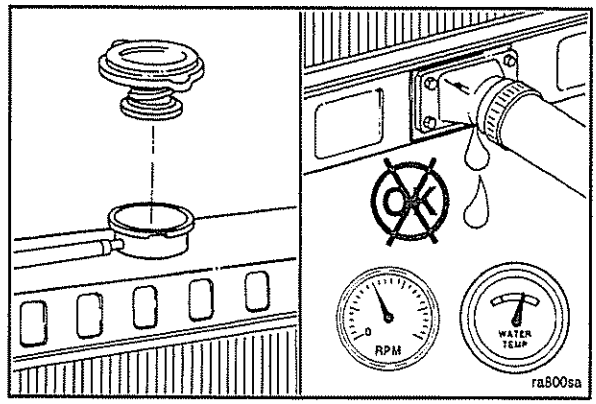
Check the DCA4 concentration level whenever coolant is added to the cooling system between filter changes.

Use Fleetguard® coolant test kit, CC2626, to check the concentration level. Instructions are included with the test kit.

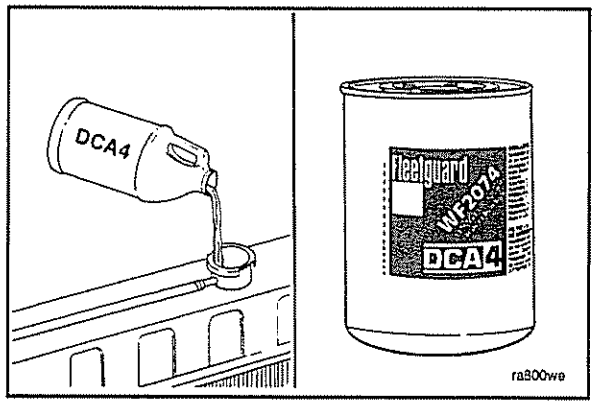
Warning: Check the coolant level ONLY when the engine is stopped. Wait until the coolant temperature is below 50°C [120°F] BEFORE removing the pressure cap. Failure to do so can cause personal injury from heated coolant spray.

Operate the engine and check for coolant leaks.

After the air has been purged from the system, check the coolant level again.

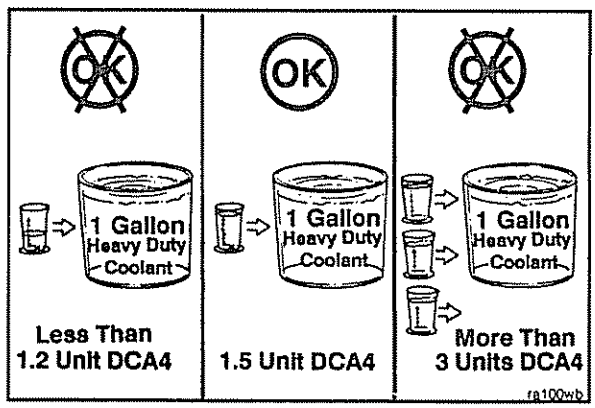


Diesel coolant additives (or equivalent) are used to prevent the buildup of corrosion and scale deposits in the cooling system.

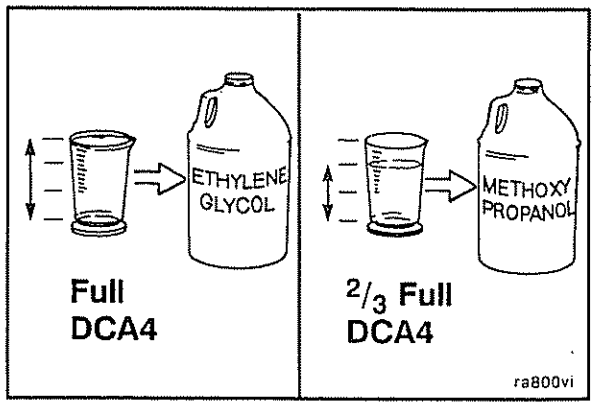


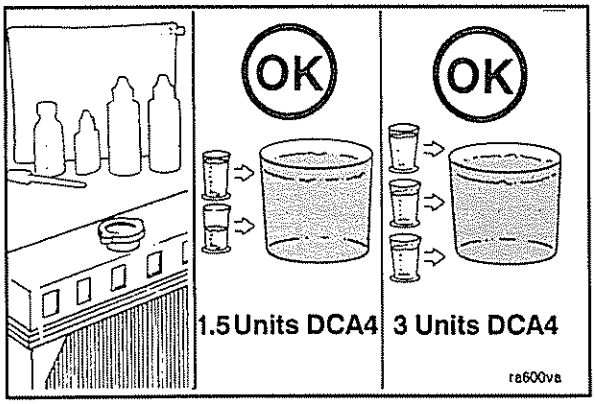
Caution: Under-concentration of coolant additives can result in liner pitting and system corrosion. Over-concentration can result in water pump seal leakage.

The recommended concentration level of supplemental coolant additives is 1.5 per U.S. gallon of coolant. The additive level **must never** drop below 1.2 units or exceed 3 units per U.S. gallon.



NOTE: DCA4 is compatible with all permanent-type antifreeze except Methoxy Propanol. If Methoxy Propanol antifreeze is used, reduce the amount of DCA4 by one-third. This will prevent inhibitor loss due to precipitation, caused by chemical incompatibility.

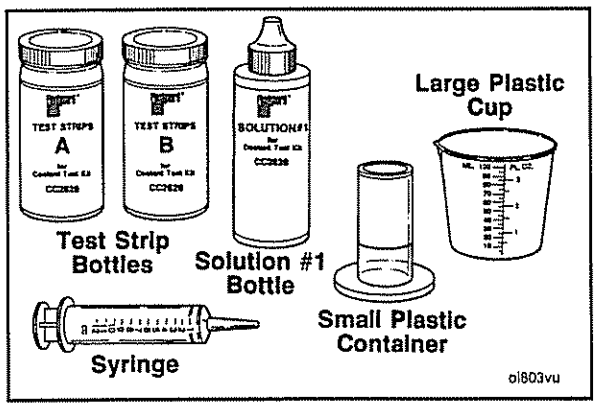




When changing the coolant, the initial DCA4 (or equivalent) concentration **must** be between 1.5 and 3 units per 3.8 liters [1 U.S. gallon] of coolant (initial charge).

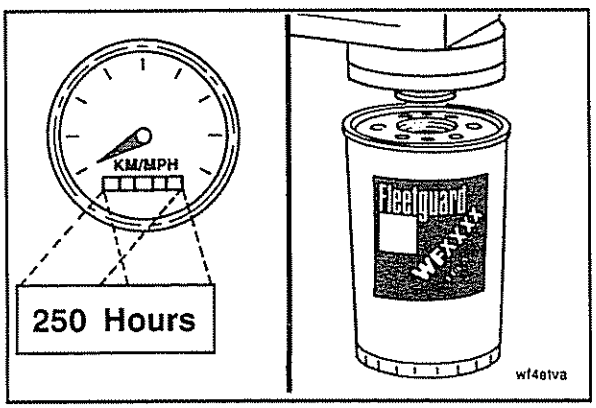
NOTE: The cooling system **must** be clean before adding DCA4 (or equivalent). Refer to Section V for cleaning instructions.

If coolant is added between drain intervals, additional DCA4 (or equivalent) will be required unless the added coolant is percharged with additives as described in this section.



If coolant is added between drain intervals, additional DCA4 (or equivalent) will be required.

Use only coolant test kit, Fleetguard® Part No. CC2626, to check the coolant additive concentration when DCA4 is used.

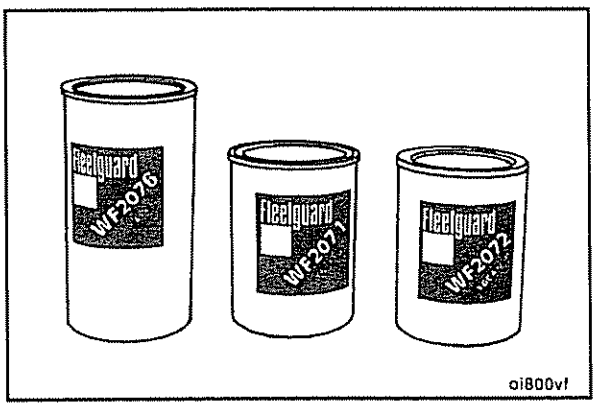


Coolant Filter

Use the correct Fleetguard® coolant filter to maintain the correct DCA4 concentration in the system.

Maintain the correct concentration by changing the service coolant filter at each oil drain interval.

Refer to Fleetguard® DCA4 Service Filters and Liquid Pre-charge in Section V of this manual for further information.



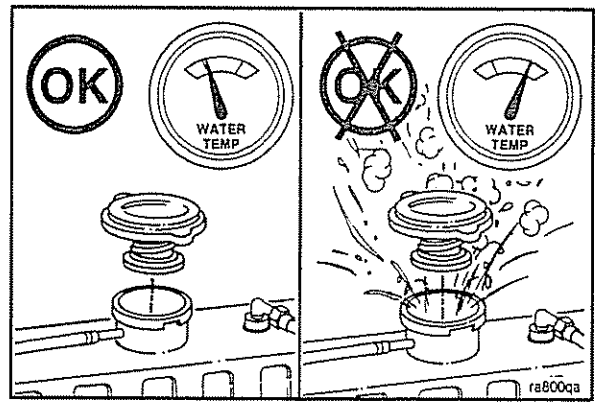
Replace

Change the service coolant filter at every oil and filter change interval.

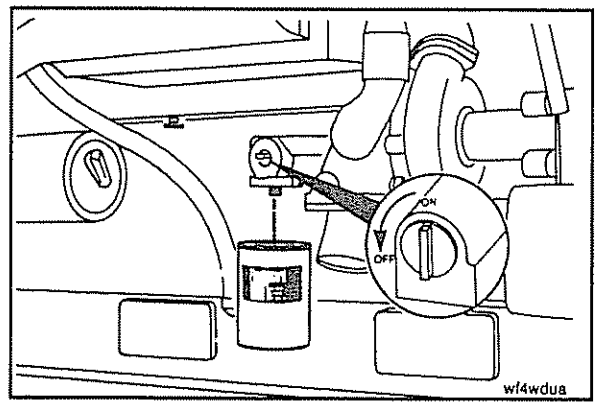
The correct service coolant filter to be used is determined by the total cooling system capacity and other operational factors.

Refer to the DCA4 Maintenance Guide in Section V for the correct filter selection.

Warning: Do NOT remove the radiator cap from a hot engine. Hot steam will cause serious personal injury. Remove the coolant system pressure cap and close the shutoff valve(s), if equipped, before removing the coolant filter. Failure to do so can result in personal injury from heated coolant spray.

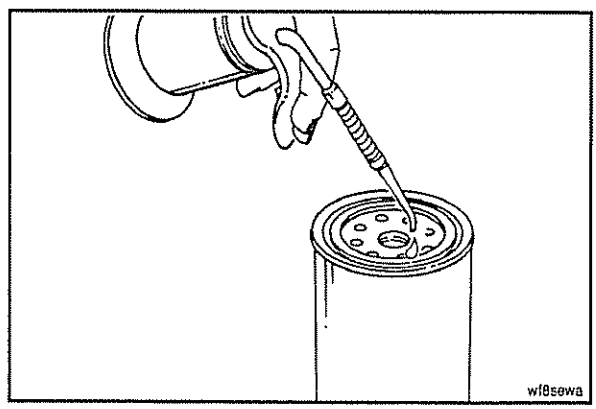


Turn the valve on the filter head to the OFF position. Remove and discard the coolant filter.

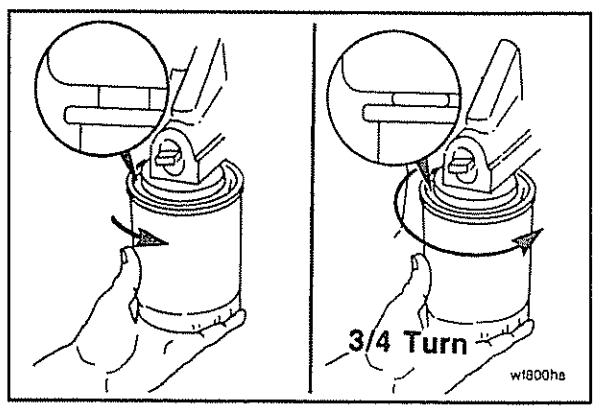


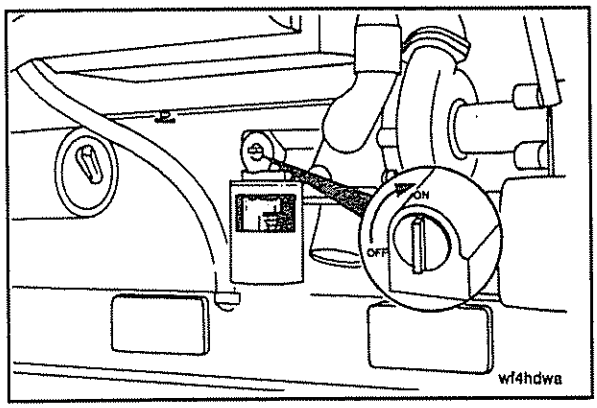
Use engine oil and lubricate the seal on the new filter.

NOTE: Do **not** allow oil to get in the filter, it will adversely affect the DCA.

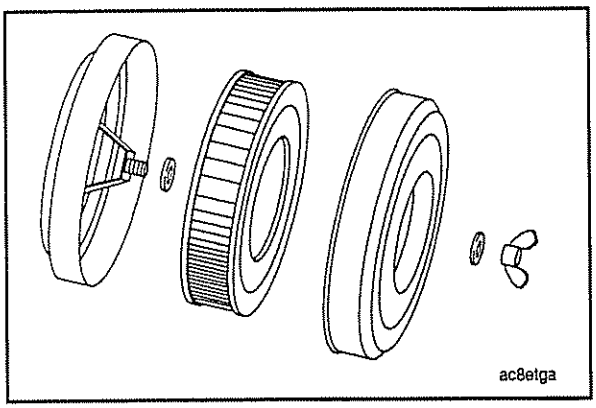


Install the new coolant filter. Turn the filter until the seal touches the filter head. Turn the filter an additional 1/2 to 3/4 of a turn after contact.





Turn the valve to the ON position.

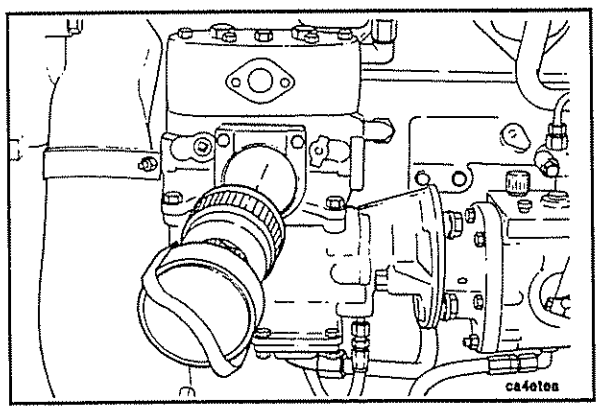


Air Compressor Air Cleaner Element

Cummins Two-Cylinder Only - Replace

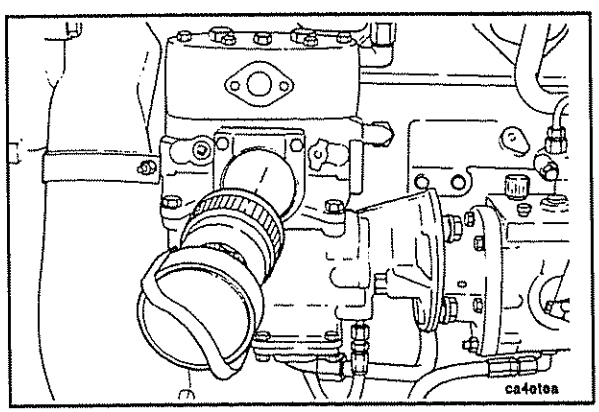
Every 250 hours or 6 months replace the air compressor air cleaner element. Remove the wing nut, the cover, the housing, and the element. Clean the cover and the housing with a clean cloth. Inspect the rubber gasket on the center bolt. Replace if damaged.

Install a new element, Fleetguard® Part No. AF-251 or Cummins Part No. 256837, in the front cover and assemble over the center bolt. Use your fingers to install and tighten the wing nut.



Bendix-Westinghouse Paper Element - Replace

Remove the breather cover and element. Clean by reverse flushing with compressed air. Assemble on the compressor. Discard the element if it is damaged or can **not** be cleaned.



Bendix-Westinghouse Sponge Element - Replace

Remove the breather from the air compressor. Disassemble the breather, wash all metal parts in solvent and blow dry with compressed air. Wash the element in solvent. Remove all solvent from the element. Dip the element in clean engine oil and squeeze excess oil from the element.

NOTE: If other compressors are used, follow the manufacturer's service requirements.

Belt Tension

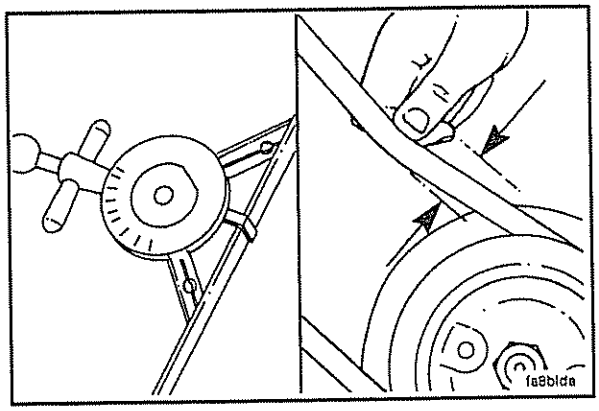
Check

Measure the belt tension in the center span of the pulleys.

Refer to the Drive Belt Tension Chart, Section V, for the correct gauge and tension value for the belt width used.

An alternate method (deflection method) can be used to check belt tension by applying 110 N [25 lbf] force between the pulleys on V-belts. If the deflection is more than one (1) belt thickness per foot of pulley center distance, the belt tension **must** be adjusted.

The tension of the fan belt, the belt driven fan hub shown in Section E, page 8, need **not** be measured. The spring loaded idler used on this design maintains the correct belt tension.



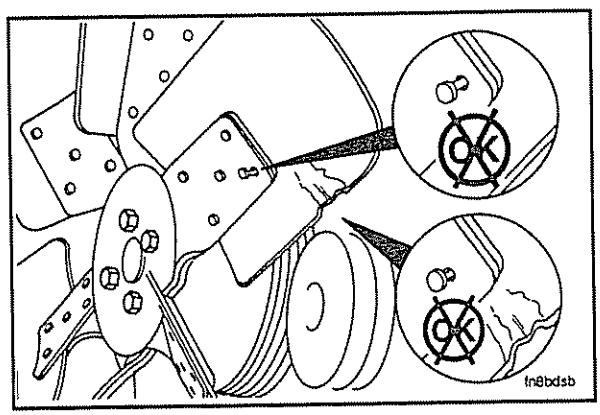
Cooling Fan

Check

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

NOTE: Rotate the crankshaft by using the engine barring gear.

Check the cooling fan every 250 hours or 6 months. 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.

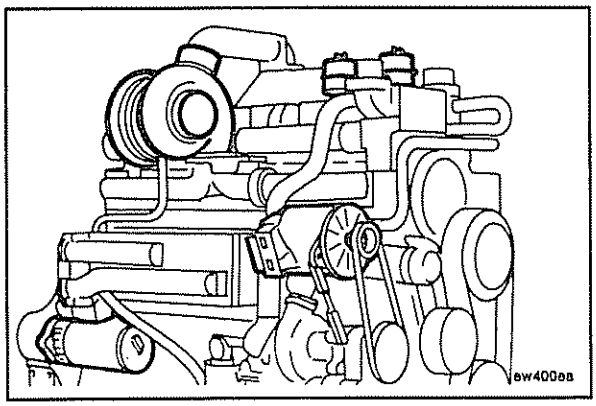


Section 6 - Maintenance Procedures Every 1500 Hours or 1 Year

Section Contents

General Information

All checks or inspections listed under the previous maintenance intervals **must** also be performed at this time in addition to those listed under this maintenance interval.



Steam Clean the Engine

Caution: Cover all engine openings and electrical equipment to prevent water damage.

Steam clean the engine **before** conducting any 1500 hour maintenance. Steam is the best method of cleaning a dirty engine or a piece of equipment. If steam is **not** available, use a solvent to wash the engine.

Protect all electrical components, openings, and wiring from the full force of the cleaner spray nozzle.

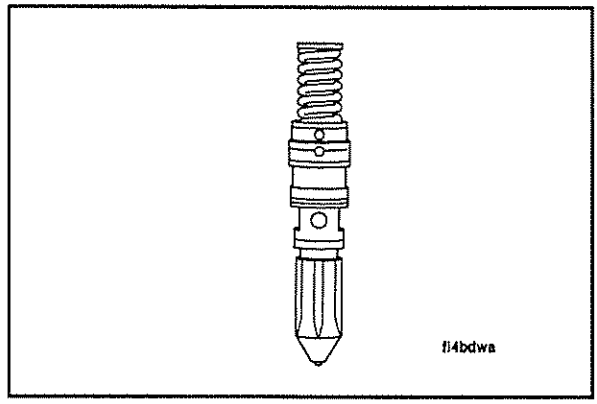
Valve and Injectors

General Information - Checking and Adjustment

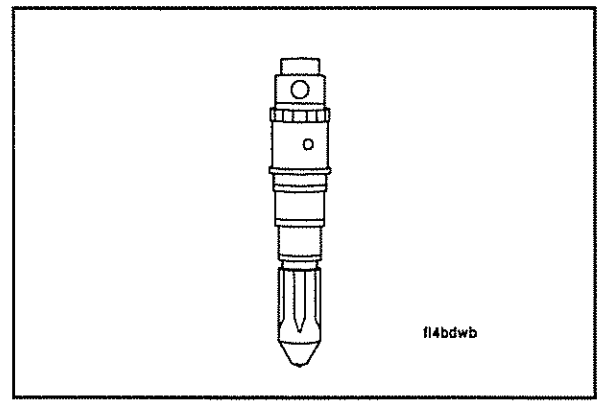
Valves and injectors **must** be correctly adjusted for the engine to operate efficiently. Valve and injector adjustment **must**be performed using the values listed in this section.

Cummins engines in most applications will **not** experience significant valve and injector train wear after an initial adjustment is made at 1500 hours. After this adjustment, Cummins recommends the valves and injectors **not** be adjusted again until the 6000 hour or 2 year injector calibration interval. Because injector train hardware is typically mixed between cylinders during injector replacement, Cummins recommends to adjust valves and injectors 1500 hours after all injector replacements.

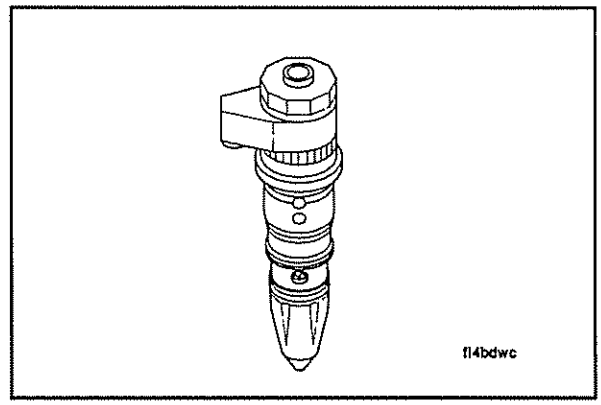
1. Engine firing order 1-5-3-6-2-4.
2. Cylinders are numbered from the front gear cover end of the engine.
3. Two crankshaft revolutions are required to adjust all of the valves and the injectors.
4. One pair of valves and one injector are adjusted at each pulley index mark before rotating the engine to the next index mark.
5. The valves and the injectors on the same cylinder are not adjusted at the same mark.
6. Each cylinder has three rocker levers. The lever nearest to the front of the engine is the exhaust lever.
7. All KTTA19 engines have HVT or STC injectors.
8. KT and KTA19 engines have PT (type D) injectors except for marine engines with 580 or more horsepower and 1988, 1989 KTA-600 Automotive engines,
9. PT (type D) injectors are set by adjusting the plunger travel with a dial indicator.
10. Older HVT inectors and the present STC full top-stop injectors (full top-stop after engine first serial number 37116012) are adjusted by the outer base circle (OBC) method..
11. KTTA19-G/GS/GC-500KW, (CPL1170) uses Premium K high lift STC injectors. High lift, Premium K STC injectors are similar in appearance to full top-stop STC injectors but the injector plunger travel is different. These injectors are adjusted using the OBC method.
12. Instructions for adjusting all types of injectors (PT (type D), HVT, STC, and Premium K STC) are included in the Injector adjust section.



PT (type D) Injector



Early STC (HVT) Injector



Full Top Stop STC Injector
(Premium K injector is similar.)

VALVE AND INJECTOR
ADJUSTMENT LIMITS

STC TOP STOP INJECTOR
10.17 N·m [90 in-lb] OBC Method

	mm	[in]
INTAKE VALVE	0.36	[0.014]
EXHAUST VALVE	0.69	[0.027]

fi6vane

Valves and injectors **must** be correctly adjusted for the engine to operate efficiently. Valve and injector adjustment **must** be performed using the values listed in this section.

Cummins has found that engines in most applications will **not** experience significant valve/injector train wear after an initial adjustment is made at 1500 hours. After this adjustment, it is recommended that the valves and injectors **not** be adjusted again previous to injector calibration at the 6000 hour or 2 year interval. Because injector train hardware is typically mixed between cylinders during injector replacement, it is recommended to adjust valves and injectors 1500 hours after all injector replacements.

VALVE AND INJECTOR
RECHECK LIMITS

STC TOP STOP INJECTOR
10.17 N m [90 in-lb] OBC Method

	mm		[in]
INTAKE VALVE	0.28	MIN	[0.011]
	0.43	MAX	[0.017]
EXHAUST VALVE	0.60	MIN	[0.024]
	0.76	MAX	[0.030]

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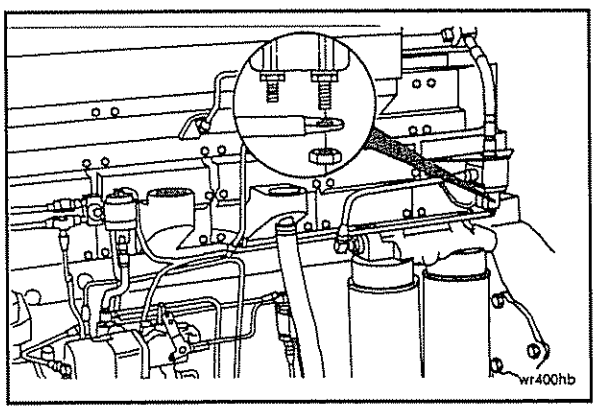
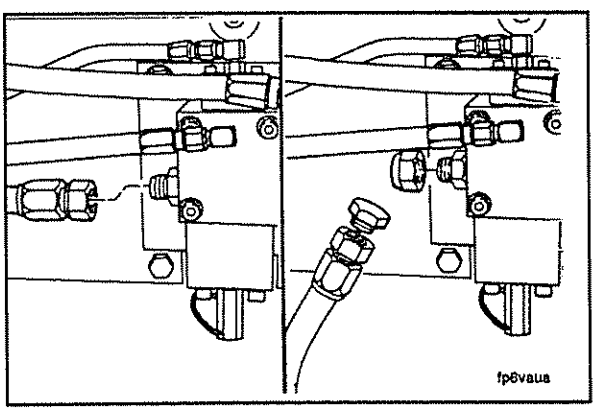
If valve and injector adjustment is checked during troubleshooting or before the recommended maintenance interval, adjustment is **not** required if measurements are within the recheck limits.

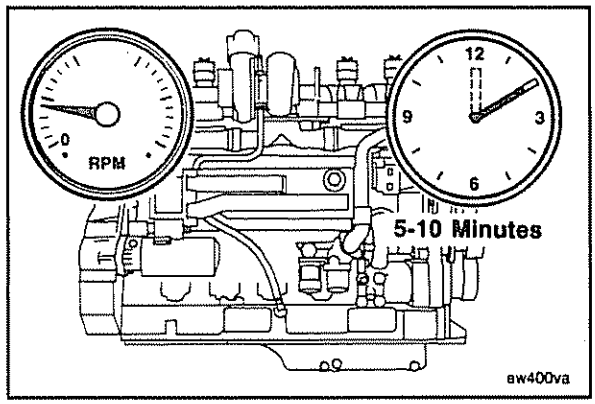


On engines with HVT or STC injectors, remove the wire from the terminal on the oil control valve. This will prevent the engine from going to advance timing.



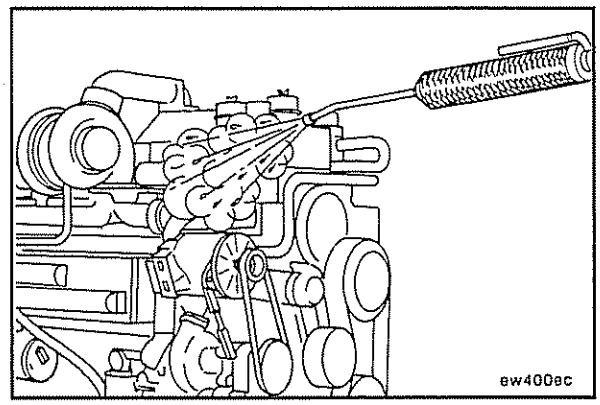
On engines with a hydromechanical STC valve, remove the oil supply hose from the oil control valve. Plug the hose and fitting to prevent the engine from going into advance timing.

Operate the engine at high idle for 5 minutes (in normal timing mode). This will allow all of the oil to pump out of the injector tappets so a correct injector adjustment can be made.

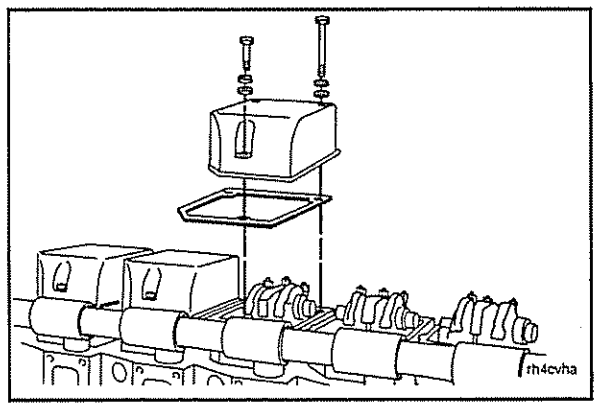


PT (type D) Injector and Valve Set Procedure

If you have **not** previously cleaned the engine, steam clean the engine now to prevent dirt from entering the engine when the valve covers are removed. Refer to Steam Clean the Engine in this section of the manual.

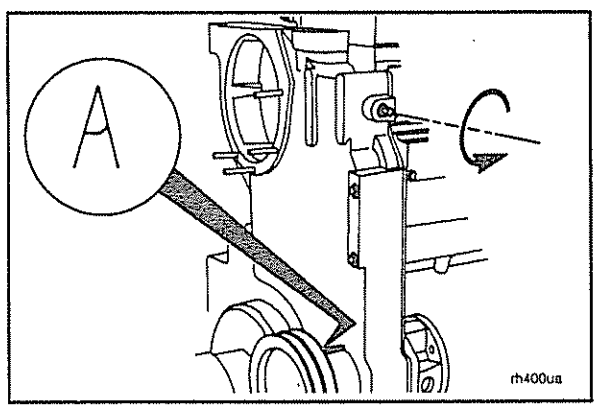


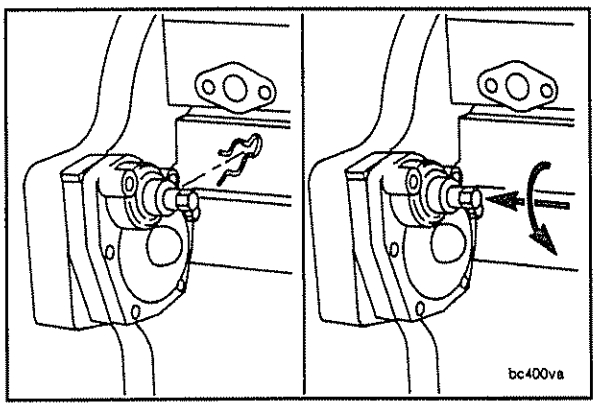
Remove the rocker lever covers and all related components.



NOTE: The barring device shaft turns approximately two revolutions before the engine begins to turn. The device will **not** turn the engine opposite the direction of normal rotation.

Push the shaft in and turn the barring device until the **A** mark on the pulley is aligned with the mark that is cast into the boss for the accessory drive seal on the front gear cover.





On engines with a two-piece front cover,

- remove the clip,
- push the shaft in to engage the gears,
- rotate the device shaft **counterclockwise** to turn the engine in the direction of normal rotation.

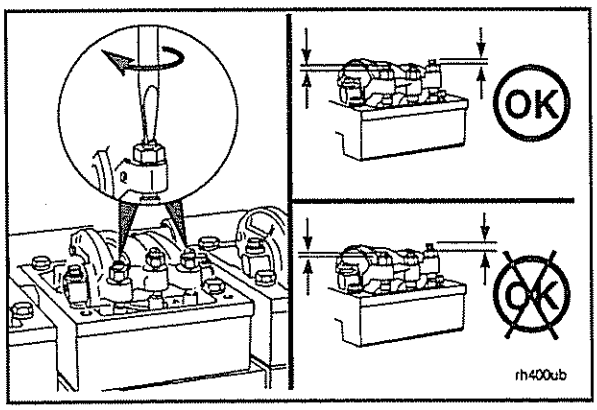
The alignment mark is also on the boss for the accessory drive seal.

If Valve Set Mark Is:	Check Valve Position On:
A	1,6
B	2,5
C	3,4

fi400uz

Determine The Cylinder In Position For Valve Set

The crossheads and valves will be adjusted on the cylinder that has all the valves closed. Use the table to determine the cylinders to check for valve position.



If the rocker lever assemblies have been removed, use this step to determine the cylinder to set.

NOTE: All adjusting screws **must** be loose on all cylinders, and the push rod **must** remain in alignment.

NOTE: Perform this step on both cylinders to be checked.

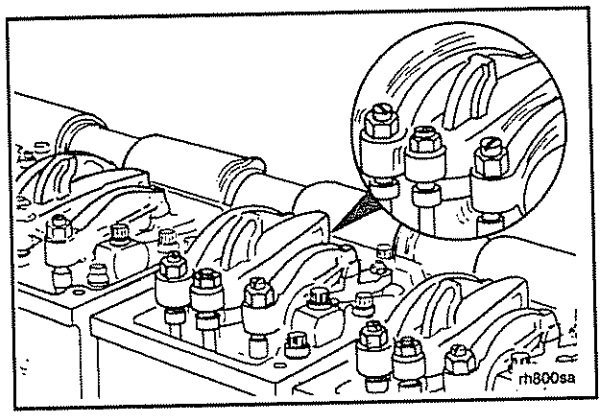
Hold both rocker levers against the crossheads. Turn the adjusting screws until they touch the push rods. Turn the locknuts until they touch the levers.

Compare the height of the adjusting screws above the locknut. The cylinder with the adjusting screws that are nearest to the same height is the cylinder on which the valves are CLOSED.

NOTE: The push rods will be close to the same height above the top of the rocker lever housing on the cylinder that has the valves CLOSED.

NOTE: One engine model, KTTA19-G/GS/GC2 CPL1170, contains a unique camshaft that creates a noticeable difference in the height of the valve adjusting screws. When the valves are properly adjusted on CPL1170 **only**, the exhaust valve adjusting screw will have approximately one thread visable **above** the top of the locknut. The intake valve adjusting screw will have approximately 3 threads visable **above** the top of the adjusting screw.

If the rocker levers have **not** been removed, wiggle the valve rocker levers on the two cylinders in question. The crossheads and valves on the cylinder where both levers feel loose are ready to adjust.



Use the chart to determine the injector that is ready to adjust.

NOTE: Adjustment can begin on any valve set mark.

In our example, assume the **A** mark is aligned and the adjusting screw height indicates that the valves on cylinder No. 2 are closed (ready to set). The chart shows the injector on cylinder No. 4 is ready to adjust.

After adjusting the crossheads, valves, and injector, bar the engine to the **B** set mark. Adjust the crossheads and valves on cylinder No. 4 and adjust the injector on cylinder No. 1.

		Valves Closed On	Set V	Set I
K19	A	1	5	3
PT (type D)	B	5	3	6
	C	3	6	2
	(A)	(6)	(2)	(4)
	B	2	4	1
	C	4	1	5

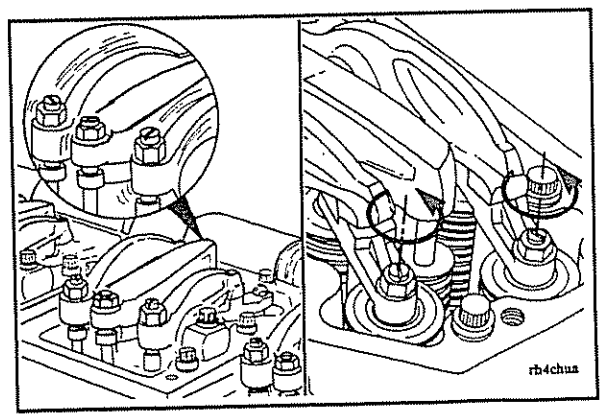
rh400uc

Adjust the Crossheads

NOTE: Crosshead adjustment **must always** be made before attempting to adjust the valves.

Adjust the crossheads on the cylinder that has both valves closed.

Loosen the crosshead adjusting screw locknuts on the intake and exhaust valve crossheads.

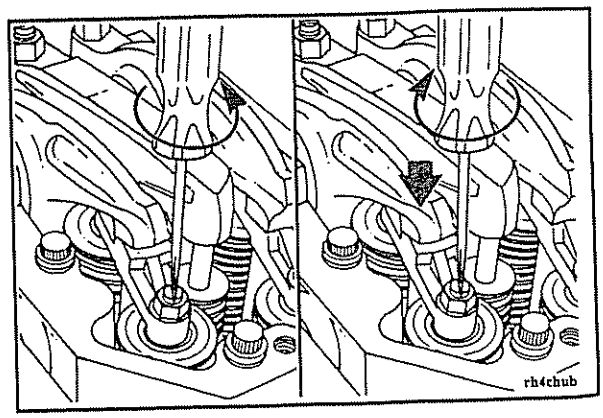


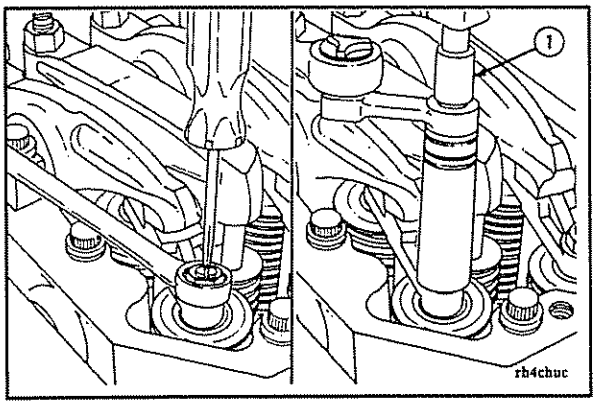
NOTE: Use the following procedure to adjust both the intake and the exhaust crossheads.

Turn the adjusting screw out at least one turn.

Hold the crosshead down against its guide.

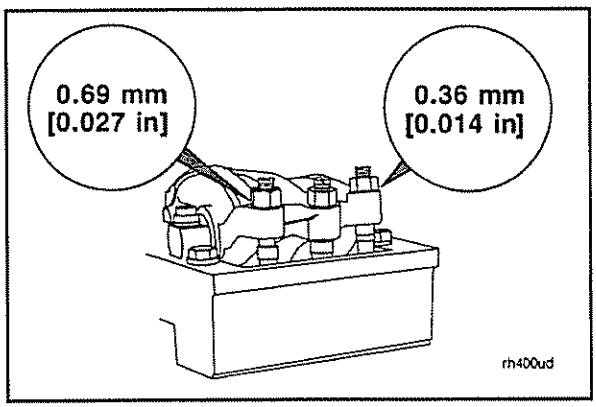
Turn the adjusting screw in until it touches the top of the valve stem but does **not** raise the crosshead.





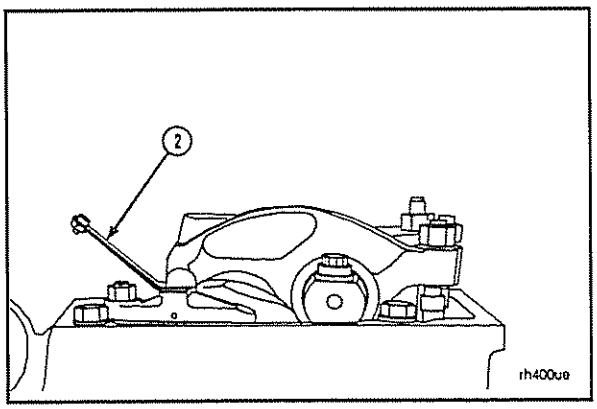
Hold the adjusting screw in this position. The adjusting screw **must not** turn when the lock nut is tightened to its torque value. Tighten the lock nut. The following torque values are given with and without Part No. ST-669 Torque Wrench Adapter (1):

	Torque Values	
	N•m	ft-lb
With Adapter	35	25
Less Adapter	40	30

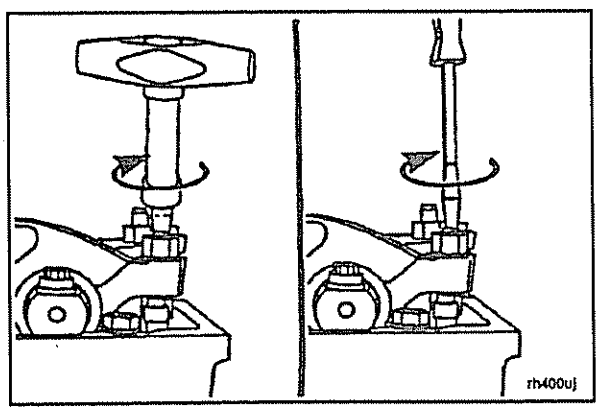


Adjust the Valves

Valve Adjustment (Initial Set)		
mm		in
0.69	Exhaust	0.027
0.36	Intake	0.014



Select a feeler gauge for the correct valve lash specification. Insert the gauge (2) between the rocker lever and the crosshead.



Two different methods for establishing valve lash clearance are described below. Either method can be used; however, the torque wrench method has proven to be the most consistent.

a. **Torque Wrench Method:** Use Part No. 3376592 Inch Pound Torque Wrench and tighten the adjusting screw to 0.68 N•m [6 in-lb] torque.

b. **Feel Method:** Use a screwdriver and turn the adjusting screw ONLY until the lever touches the feeler gauge.

NOTE: The adjusting screw **must not** turn when the locknut is tightened.

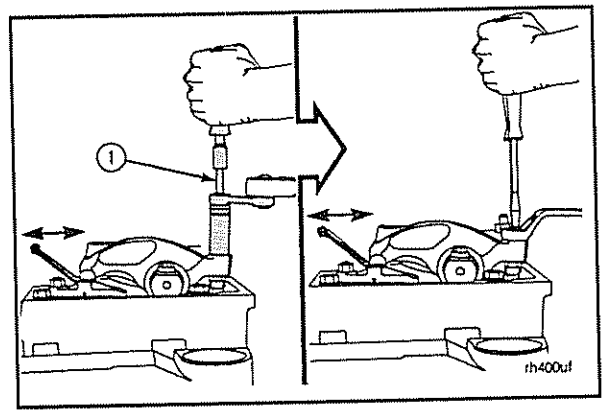
Tighten the locknut to the value indicated below.

With Torque Wrench Adapter, Part No. ST-669 (1)	45 N•m [35 ft-lb]
Without Adapter	60 N•m [45 ft-lb]

The feeler gauge **must** slide backward and forward with only a slight drag.

Attempt to insert a feeler gauge that is 0.03 mm [0.001 inch] thicker. The valve lash is **not** correct when the thicker gauge will fit.

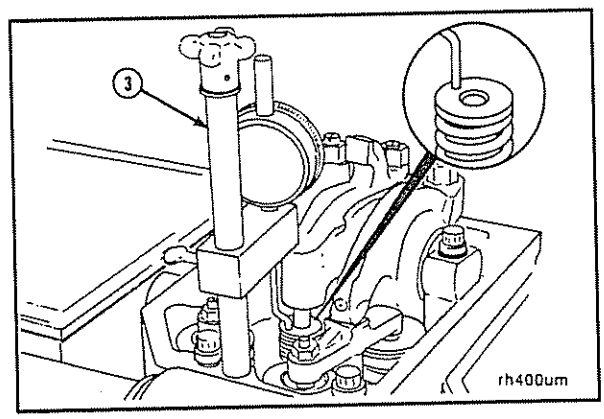
Repeat the adjustment process until the clearance is correct on both the intake and the exhaust valves on the cylinder being adjusted.



(PT (type D) Injector Adjustment

NOTE: All KT and KTA19 engines have PT (type D) injectors **except** marine engines with 580 or more horsepower and 1988, 1989 Automotive CPL's. To determine if the engine being serviced contains PT (type D) injectors, refer to the engine dataplate. The Injector Travel section will specify 0.304 inch.

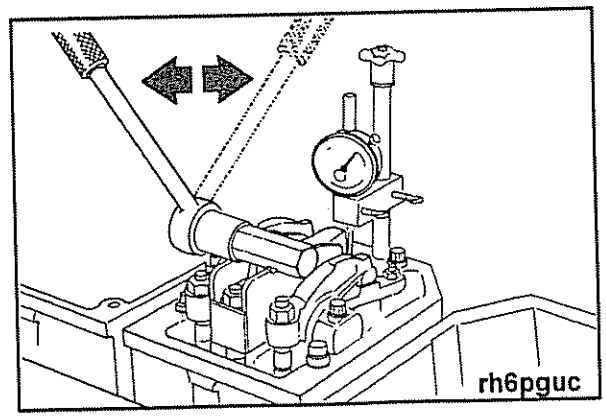
1. Assemble the parts of an injector and valve adjustment kit (3), Part No. 3822575, or equivalent. Install the adjustment kit on the cylinder to be adjusted as shown.
2. Adjust the indicator so that the tip is touching the top of the injector plunger.
3. Lower the indicator 12.7 mm [0.05 inch] to allow for travel. Lock the indicator support to the post.

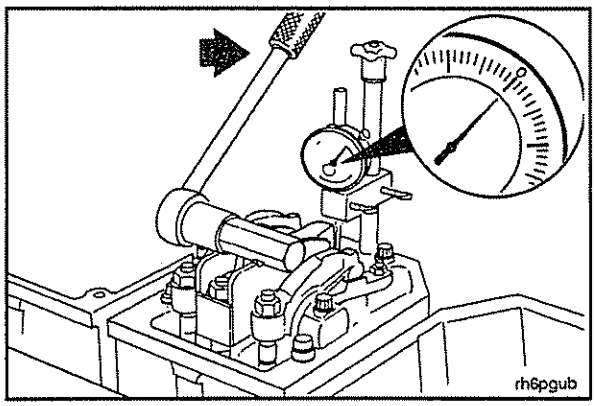


Caution: The injector plunger is under spring tension. Do NOT allow the tool to slip. Personal injury can result.

NOTE: Prevent damage to the indicator by allowing the lever to return slowly.

4. Use a rocker lever actuator, Part No. 3822574, or equivalent. Depress the lever until the injector bottoms two or three times. This will remove fuel from the cup.

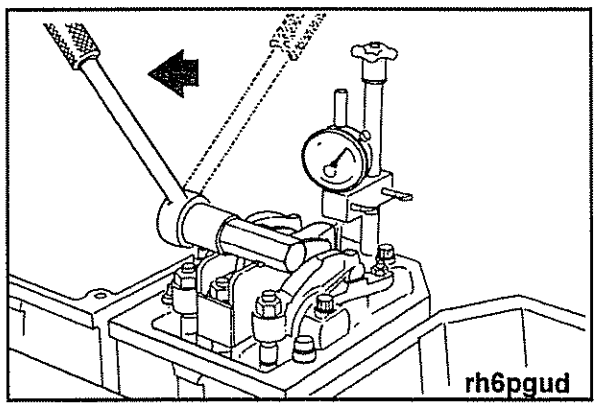




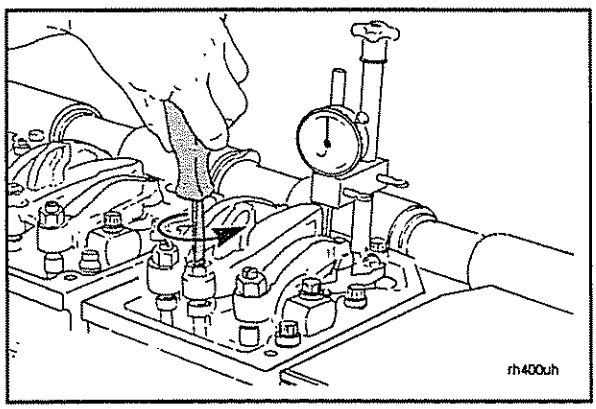
Check Existing Setting

1. Hold the lever with the injector plunger firmly bottomed in the cup. Set the indicator to ZERO.

   Raise and lower the lever a few times to confirm the ZERO.



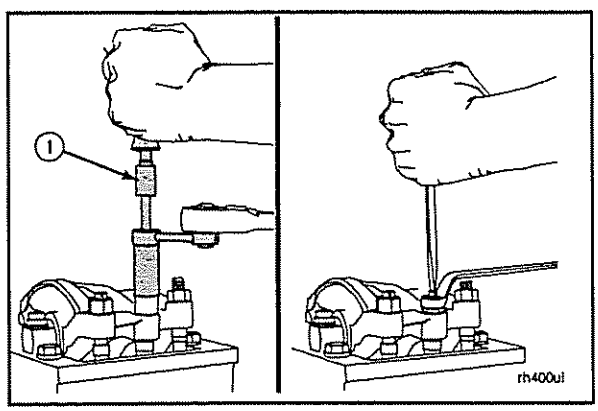
2. Slowly release the lever and observe the travel of the gauge. Press down or tap lightly on the adjusting screw to confirm the reading.



Reset

1. Loosen the locknut and turn the adjusting screw until the indicator reads the specified travel.

PT (type D) Injector Travel Specifications		
mm	Model	in
7.72	KT/KTA19	0.304



NOTE: The adjusting screw **must not** turn when the locknut is tightened.

2. Tighten the locknut to the value indicated below:

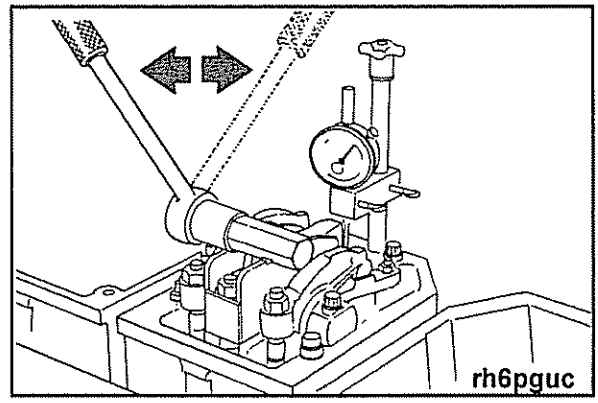
With Torque Wrench Adapter, Part No. ST-669 (1)	45 N•m [35 ft-lb]
Without Adapter	60 N•m [45 ft-lb]

Check New Setting

Caution: The injector plunger is under spring tension. Do NOT allow the tool to slip. Personal injury can result.

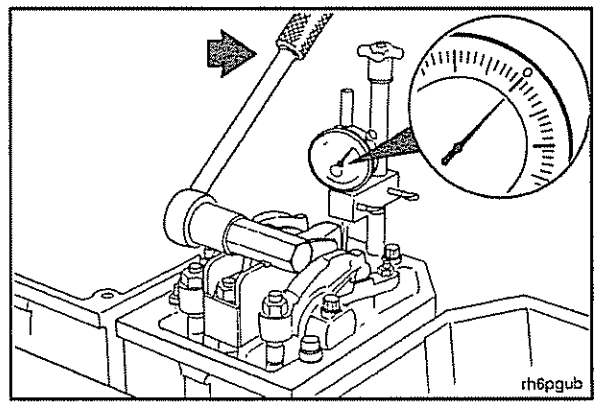
NOTE: Prevent damage to the indicator by allowing the lever to return slowly.

1. Check the injector adjustment. Use the rocker lever actuator. Bottom the injector plunger. Confirm the ZERO on the indicator.

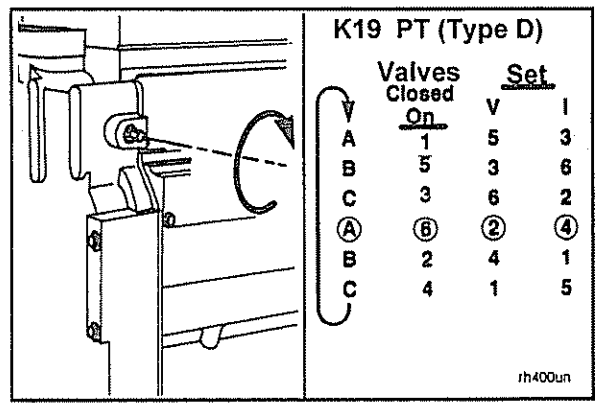


2. Allow the rocker lever to return slowly. Check the injector setting. Repeat the adjustment process if it is **not** within specification.

PT (type D) Injector Travel Specification		
Model	**mm**	**in**
KT/KTA19	7.72	0.304



3. Rotate the engine. Align the next mark. Adjust the appropriate valves and injectors. Repeat the process to adjust all of the valves and the injectors correctly.
4. If the spring device was used, disengage or allow the spring to push the shaft and clear the gear. Install the clip.

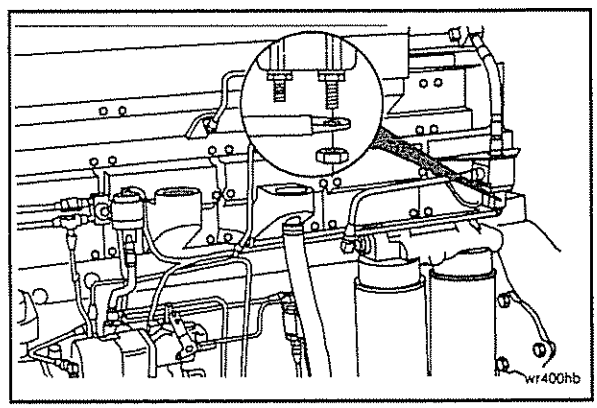


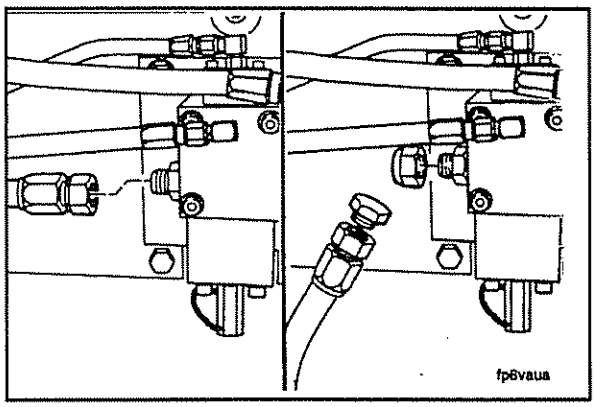
STC or HVT OBC Valve Injector Set Procedure

Steam clean the engine.

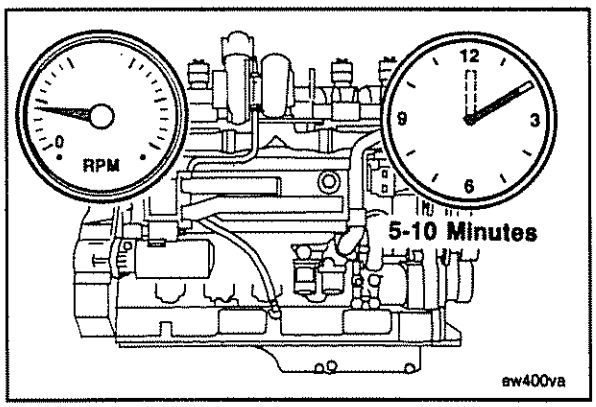
Run the engine in the retard mode **before** setting the OBC method. This removes oil from the tappets which can cause an improper set.

On engines with an electric STC valve, remove the wire from the terminal on the oil control valve. This prevents the engine from going to the advance timing.

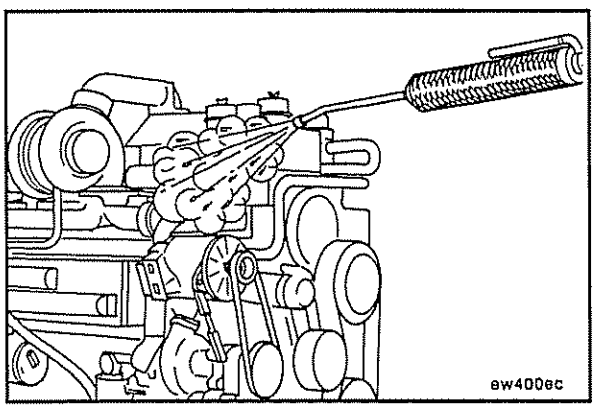




On engines with a hydromechanical STC valve, remove the oil supply hose from the oil control valve. Plug the hose and fitting to prevent the engine from going into advance timing.

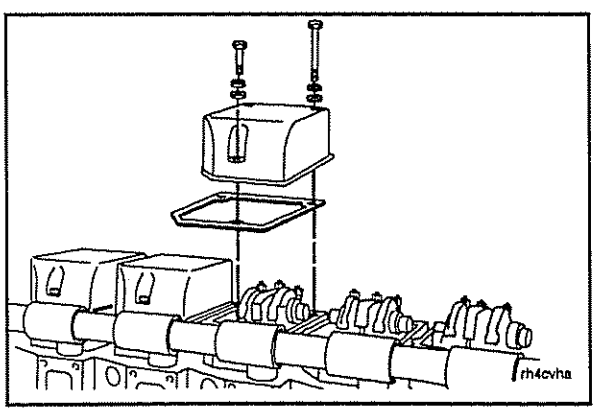


Operate the engine at high idle for 5 minutes (in normal timing mode). This will allow all of the oil to pump out of the injector tappets so a correct injector adjustment can be made.



Shut the engine off.

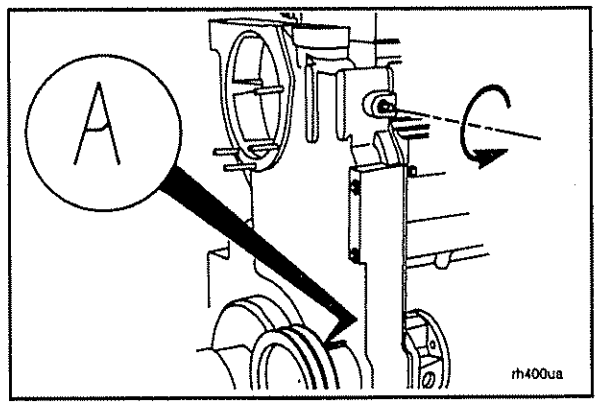
If you have **not** previously cleaned the engine, steam clean the engine now to prevent dirt from entering the engine when the rocker lever covers are removed.



Remove the rocker lever covers and all related components.

NOTE: The barring device shaft turns approximately two revolutions before the engine begins to turn. The device will **not** turn the engine opposite the direction of normal rotation.

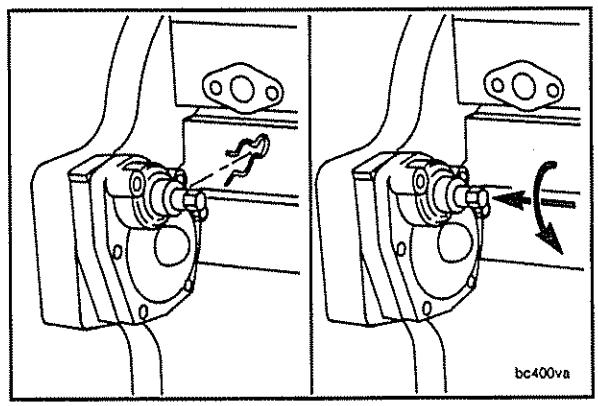
Push the shaft in and turn the barring device until the **A** mark on the pulley is aligned with the mark that is cast into the boss for the accessory drive seal on the front gear cover.



On engines with a two-piece front cover,

- remove the clip
- push the shaft in to engage the gears
- rotate the device shaft **counterclockwise** to turn the engine in the direction of normal rotation.

The alignment mark is also on the boss for the accessory drive seal.

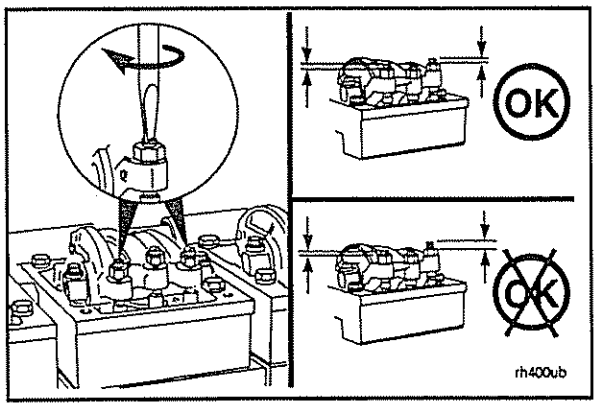


Determine The Cylinder In Position For Valve Set

The crossheads and valves will be adjusted on the cylinder that has all the valves closed. Use the table to determine the cylinders to check for valve position.

If Valve Set Mark Is:	Check Valve Position On:
A	1,6
B	2,5
C	3,4

fi400uz



If the rocker lever assemblies have been removed, use this step to determine the cylinder to set.

NOTE: All adjusting screws **must** be loose on all cylinders, and the push rod **must** remain in alignment.

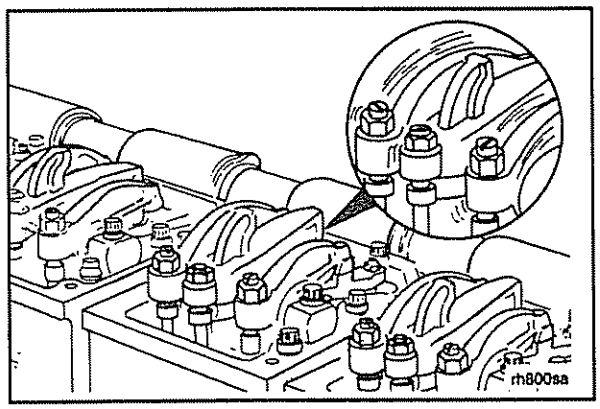
NOTE: Perform this step on both cylinders to be checked.

Hold both rocker levers against the crossheads. Turn the adjusting screws until they touch the push rods. Turn the locknuts until they touch the levers.

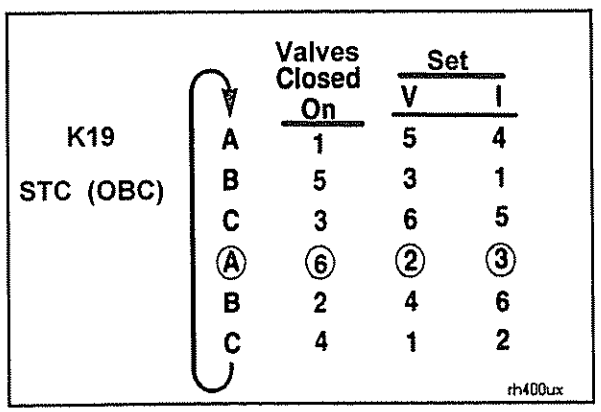
Compare the height of the adjusting screws above the locknut. The cylinder with the adjusting screws that are nearest to the same height is the cylinder on which the valves are CLOSED.

NOTE: The push rods will be close to the same height above the top of the rocker lever housing on the cylinder which has the valves CLOSED.

NOTE: One engine model, KTTA19-G/GS/GC2 CPL1170, contains a unique camshaft that creates a noticeable difference in the height of the valve adjusting screws. When the valves are properly adjusted on CPL1170 **only,** the exhaust valve adjusting screw will have approximately one thread visable **above** the top of the locknut. The intake valve adjusting screw will have approximately 3 threads visable **above** the top of the adjusting screw.



If the rocker levers have **not** been removed, wiggle the valve rocker levers on the two cylinders in question. The crossheads and valves on the cylinder where both levers feel loose are ready to adjust.



Use the chart to determine the injector that is ready to adjust.

NOTE: Adjustment can begin on any valve set mark.

In our example, assume the **A** mark is aligned and the adjusting screw height indicates that the valves on cylinder No. 2 are closed (ready to set). The chart shows the injector on cylinder No. 3 is ready to adjust.

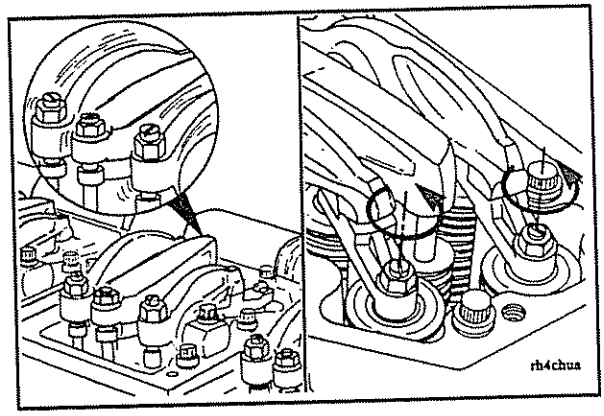
After adjusting the crossheads, valves, and injector, bar the engine to the **B** set mark. Adjust the crossheads and valves on cylinder No. 4 and adjust the injector on cylinder No. 6.

Adjust the Crossheads

NOTE: Crosshead adjustment **must always** be made before attempting to adjust the valves.

Adjust the crossheads on the cylinder that has both valves closed.

Loosen the crosshead adjusting screw locknuts on the intake and exhaust valve crossheads.

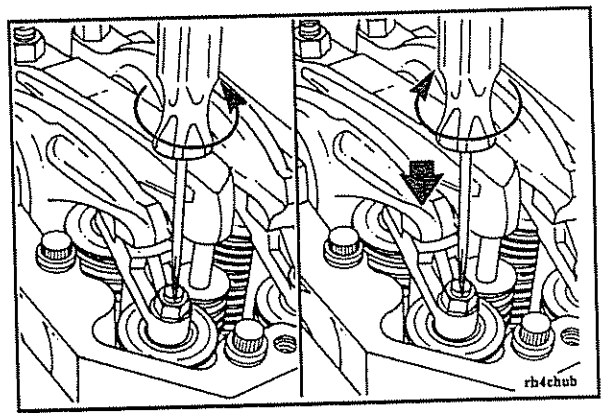


NOTE: Use the following procedure to adjust both the intake and the exhaust crossheads.

Turn the adjusting screw out at least one turn.

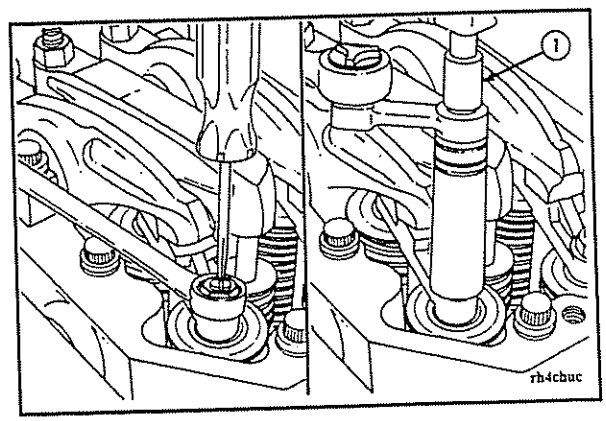
Hold the crosshead down against its guide.

Turn the adjusting screw in until it touches the top of the valve stem but does **not** raise the crosshead.



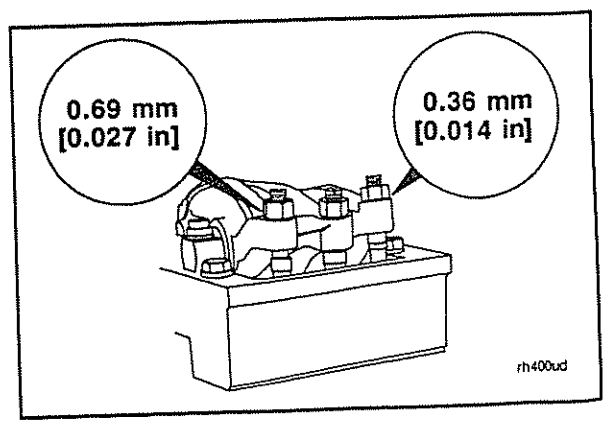
Hold the adjusting screw in this position. The adjusting screw **must not** turn when the locknut is tightened to its torque value. Tighten the locknut. The following torque values are given with and without Part No. ST-669 Torque Wrench Adapter (1):

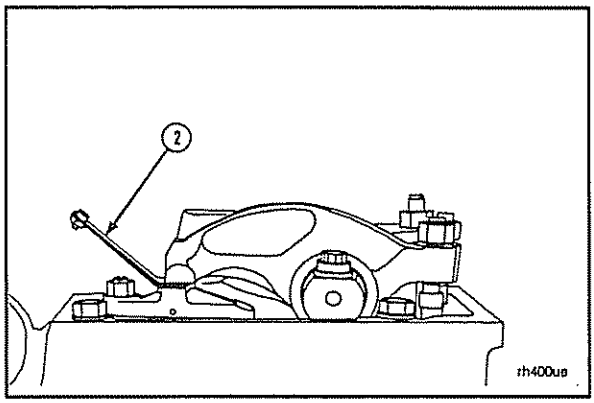
	Torque Values	
	N•m	ft-lb
With Adapter	35	25
Less Adapter	40	30



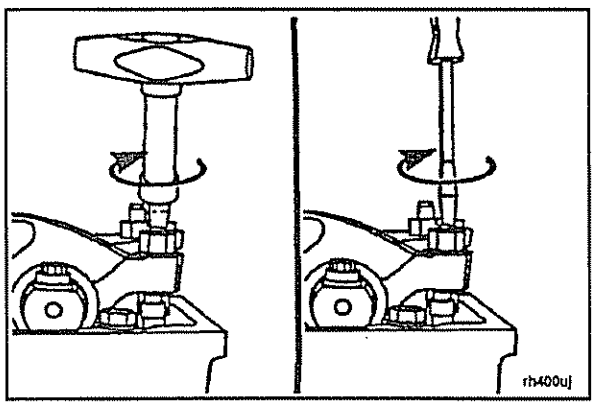
Adjust the Valves

Valve Adjustment (Initial Set)		
mm		in
0.69	Exhaust	0.027
0.36	Intake	0.014





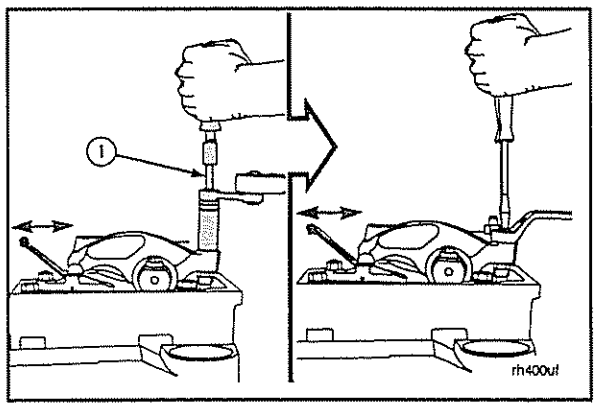
Select a feeler gauge for the correct valve lash specification. Insert the gauge (2) between the rocker lever and the crosshead.



Two different methods for establishing valve lash clearance are described below. Either method can be used; however, the torque wrench method has proven to be the most consistent.

a. **Torque Wrench Method:** Use Part No. 3376592, Inch Pound Torque Wrench, and tighten the adjusting screw to 0.68 N•m [6 in-lb] torque.

b. **Feel Method:** Use a screwdriver and turn the adjusting screw ONLY until the lever touches the feeler gauge.



NOTE: The adjusting screw **must not** turn when the locknut is tightened.

Tighten the locknut to the value indicated below.

With Torque Wrench Adapter, Part No. ST-669 (1)	45 N•m [35 ft-lb]
Without Adapter	60 N•m [45 ft-lb]

The feeler gauge **must** slide backward and forward with only a slight drag.

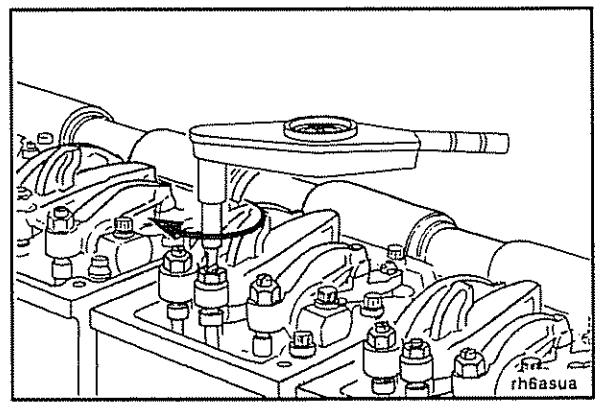
Attempt to insert a feeler gauge that is 0.03 mm [0.001 inch] thicker. The valve lash is **not** correct when the thicker gauge will fit.

Repeat the adjustment process until the clearance is correct on both the intake and the exhaust valves on the cylinder being adjusted.

OBC Injector Adjustment

Use a dial type torque wrench to tighten the injector rocker lever adjusting screw. If the screw causes chattering during setting, repair the screw and lever as required.

Hold the torque wrench in a position that allows you to look in a direct line at the dial. This is to make sure the dial will be read accurately.



Tighten the adjusting screw to 11 N•m [100 in-lb] to make sure the parts are in alignment and to squeeze the oil out of the valve train.

Loosen the adjusting screw at least one turn.

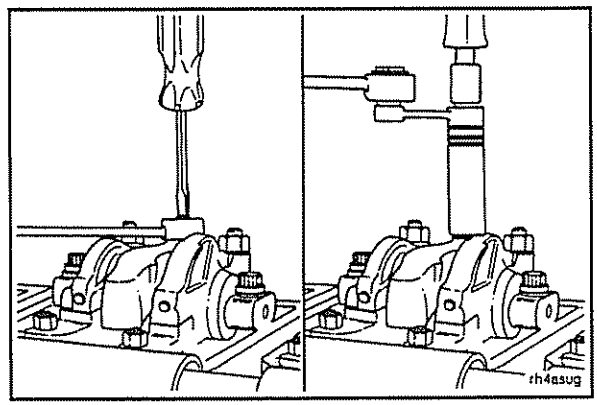
Tighten the adjusting screw to 10 N•m [90 in-lb].

The torque wrench **must** be calibrated, have a resolution of 0.28 N•m [2.5 in-lb], and have a range of 17 to 23 N•m [150 to 200 in-lb]. Do **not** use a clicker-type torque wrench.

Hold the adjusting screw in this position. The adjusting screw **must not** turn when the lock nut is tightened.

Tighten the lock nut to the following values:

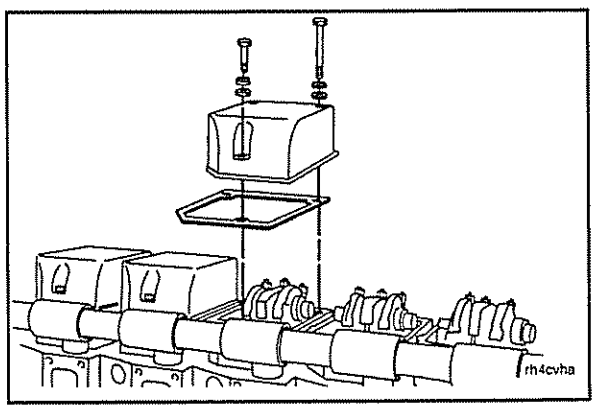
With Torque Wrench Adapter, Part No. ST-669	45 N•m [35 ft-lb]
Without Adapter	60 N•m [45 ft-lb]

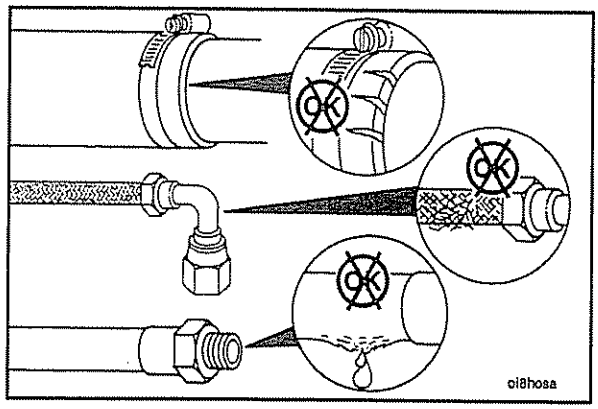


If the barring device was used, allow the spring to push the shaft and clear the ring gear. Install the clip.

Install the rocker lever cover and all related components.

Torque Value: 40 N•m [30 ft-lb]

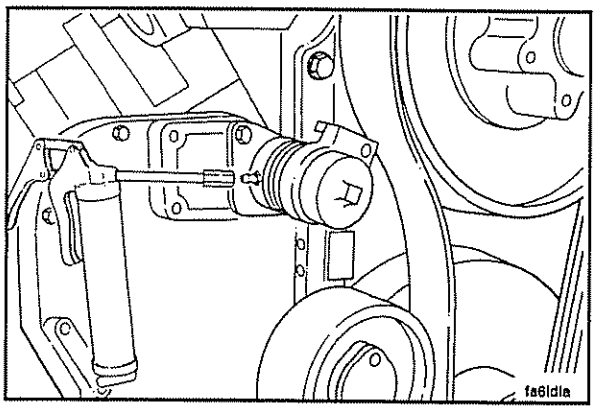




Hoses

Check/Replace

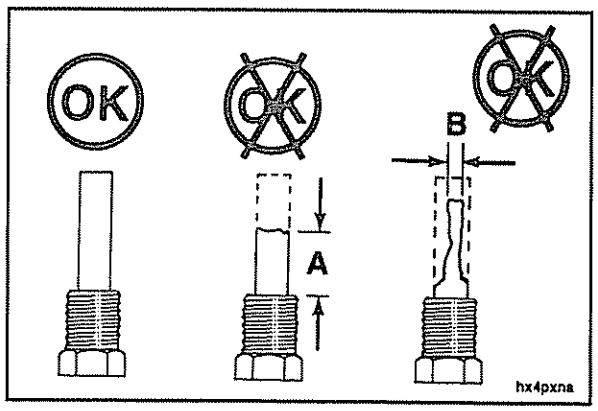
Annually inspect the bypass oil filter and cooling system hoses and hose connections for leaks or deterioration. Particles of deteriorated hose can be carried through the cooling system or lubricating system and restrict or clog small passages, especially radiator core, and lubricating oil cooler, and partially stop circulation. Replace as necessary.



Fan Idler Pivot Arm

Lubricate

Use water pump type grease to lubricate the fan idler pivot arm assembly. Lubricate the pivot arm until grease appears from under the cap.

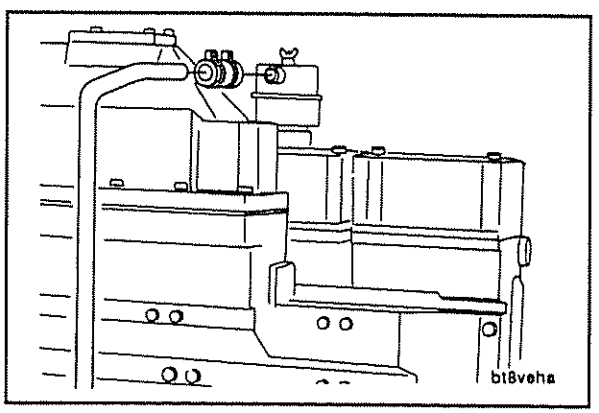


Heat Exchanger Zinc Plugs (Marine Only)

Check

Check the length of all zinc plugs in the heat exchanger and change if they are 50 percent eroded. Frequency of change depends upon the chemical reaction of raw water circulated through the heat exchanger.

	Erosion Limts REPLACE	NEW
A = Approximately	19 mm [0.75 in]	51 mm [2 in]
B = Approximately	6.4 mm [0.25 in]	16 mm [0.625 in]



Crankcase Breather Element

Screen Element Breather - Clean/Replace

Every 1500 hours or 1 year, clean and/or replace the crankcase breather element.

The tube is to be removed and checked internally for obstructions or sludge buildup.

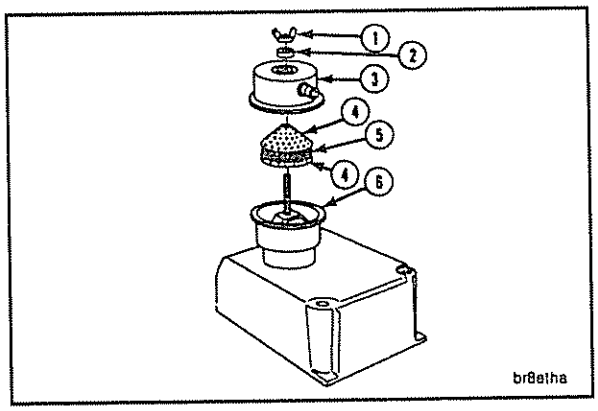
If the tube is blocked, it is to be cleaned to prevent excess crankcase pressure buildup.

Remove the vent tube.

Remove the following parts from the breather body (1):

(1) Wing Nut
(2) Washer
(3) Breather Cap
(4) Screen Mesh
(5) Element

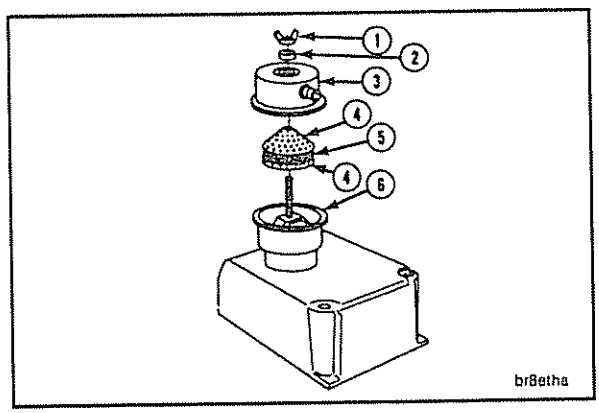
Clean the vent tube and screens in an approved cleaning solvent. Dry with compressed air. Wipe out the breather housing.



Install the parts in the following order:

(4) Screen Mesh
(5) Element
(4) Screen Mesh
(3) Breather Cap
(2) Washer
(1) Wing Nut

Replace the vent tube.



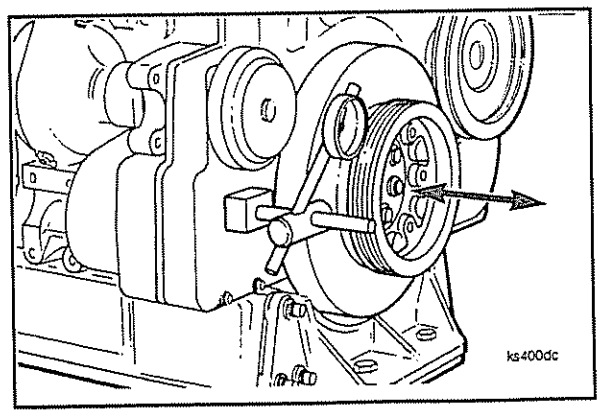
Crankshaft End Clearance

Inspect

Measure the crankshaft end clearance with a dial indicator. Measure the clearance.

Crankshaft End Clearance Table

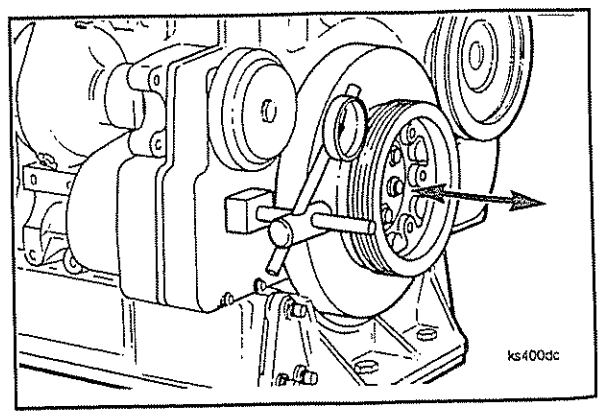
Engine Series	New Minimum	New Maximum	Worn Limit
KT/KTA/KTTA19	0.18 mm [0.007 inch]	0.43 mm [0.017 inch]	0.56 mm [0.022 inch]

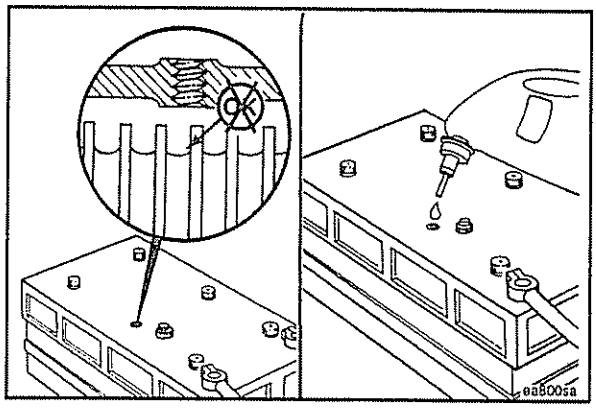


The check can be made by attaching an indicator to rest against the damper or pulley, while prying against the front cover and inner part of the pulley or damper. End clearance **must** be in specification with the engine mounted in the unit and assembled to the transmission or converter.

Caution: Extreme care MUST be used in prying against the viscous damper. Sharp pry bars can damage the damper casing, resulting in a leak of the viscous fluid and ultimate failure of the damper.

If the clearance is **not** within specifications, contact your Cummins Repair location.





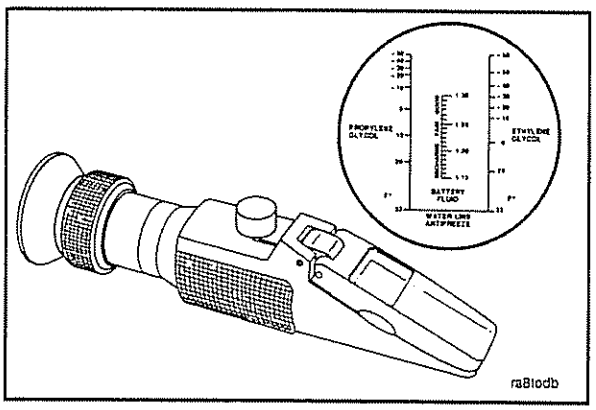
Batteries

Check

If conventional batteries are used, remove the cell caps or covers and check the electrolyte (water and sulfuric acid solution) level.

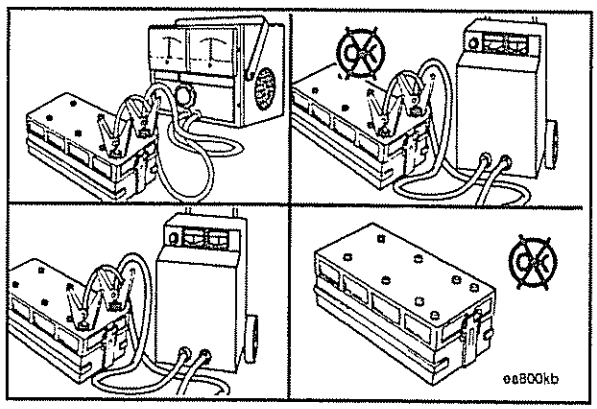
NOTE: Maintenance-free batteries are sealed and do **not** require the addition of water.

Fill each battery cell with distilled water. Refer to the manufacturer's specifications.



Use the Fleetguard® refractometer, Part No. CC-2800, to check the condition of the battery.

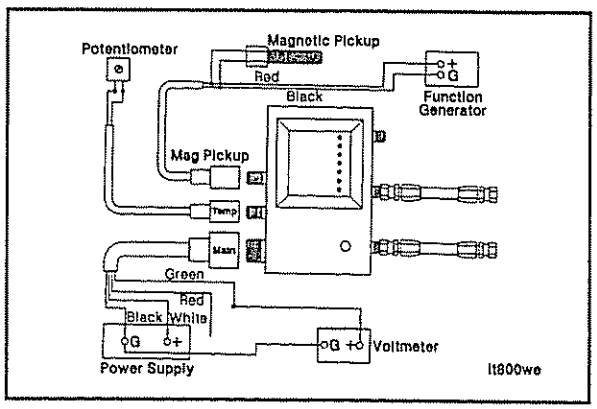
Refer to the battery fluid column in the refractometer to determine the state-of-charge of each battery cell.



Use battery tester, Part No. 3377193, to test the state-of-charge of maintenance-free batteries.

If the state-of-charge is low, use a battery charger to charge the battery. Refer to the manufacturer's instructions.

Replace the battery if it will **not** charge to the manufacturer's specifications or will **not** maintain a charge.



Engine Protection System

Check

The Engine Protection System **must** be checked every 1500 hours or yearly. Follow the manufacturer's recommended maintenance procedures.

If the Compusave unit is in use, refer to the Operations and Maintenance Manual for the Flight Systems 9560 Test Set.

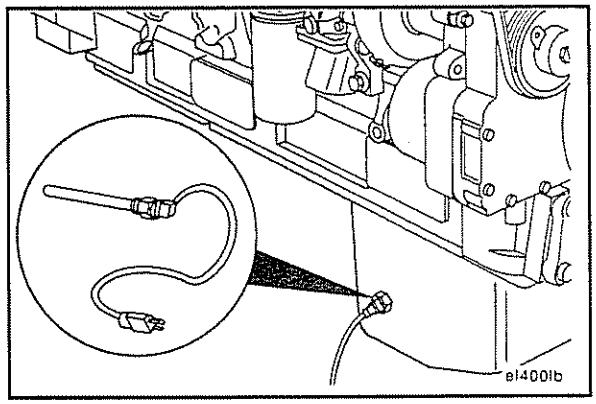
If the Flight Systems Engine Saver is in use, refer to the Engine Save Level 7 Manual, Bulletin No. 57- ASSO-26.

Cold Start Aids (Seasonal)

Check

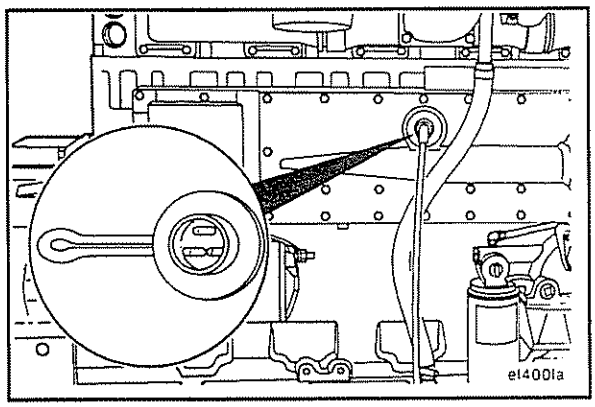
- Oil pan heater

Check for proper operation. Inspect for loose connections, frayed wires, and oil leaks. Repair or replace as needed.



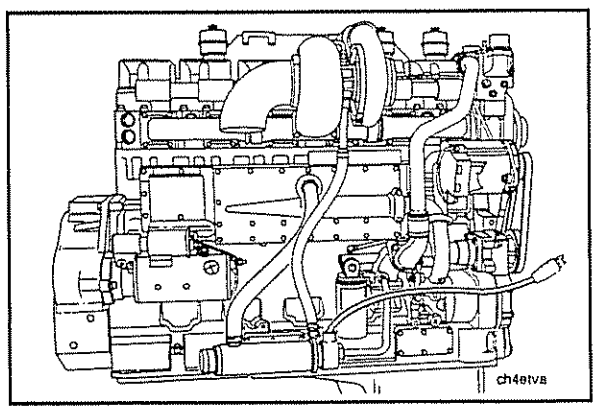
- Block heater

Check for proper operation. Inspect for loose connections, frayed wires, and oil leaks. Repair or replace as needed.



- Engine Pre-heater (Coolant)

Check for proper operation. Inspect for loose connections, frayed wires, and coolant leaks. Clean out the unit of alkali and sludge. Clean the scale from the copper heating element with a wire brush.

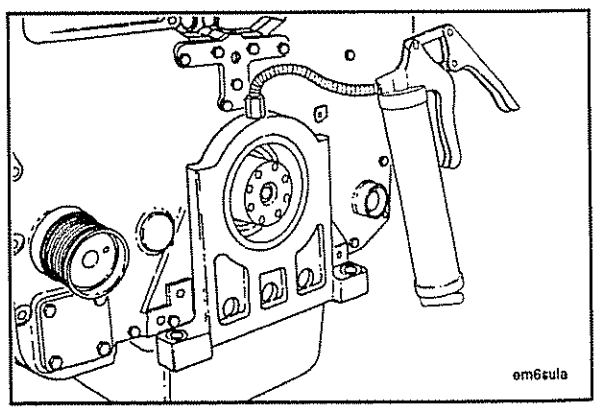


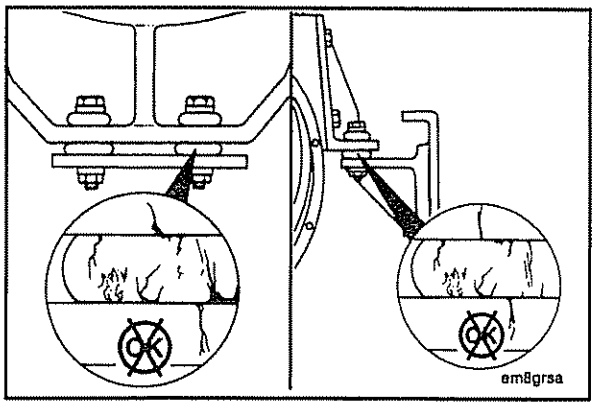
Front Engine Support

Lubricate

NOTE: Only use this on engines with a trunion type front mount.

Use water pump type grease to lubricate the front engine support. Lubricate the support until grease appears at the outside of the support.





Engine Mounting Bolts and Nuts

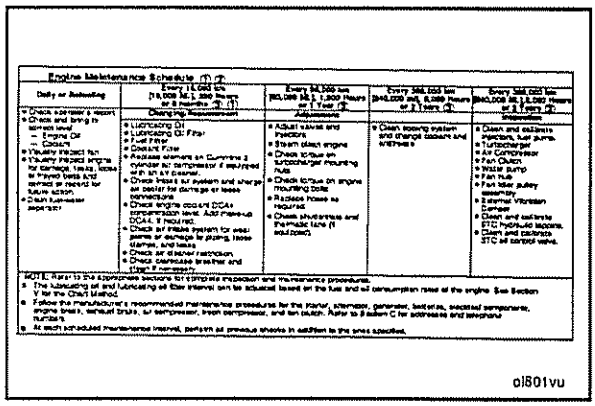
Check/Tighten

Check the torque on the nuts and bolts annually. Tighten any that are loose. Inspect the rubber for deterioration and age hardening. Replace any broken or lost bolts, capscrews, or damaged rubber.

Capscrew size and grade vary with the flywheel housing and mounting arrangement. Determine the size and grade of the mounting bolts. Refer to the capscrew torque values in Section V of this manual.

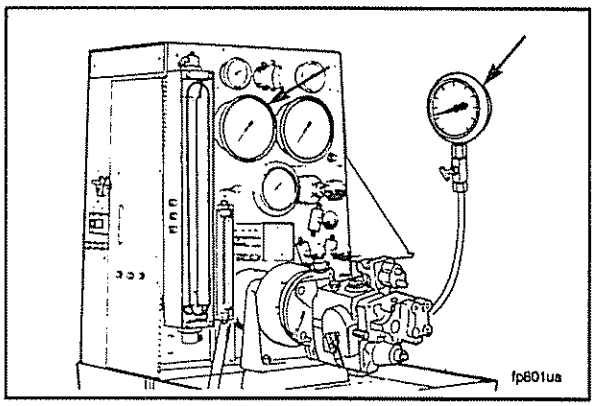
Section 7 - Maintenance Procedures Every 6,000 Hours or 2 Years

Section Contents



General Information

All checks or inspections listed under the previous maintenance intervals **must** also be performed at this time in addition to those listed under this maintenance interval.

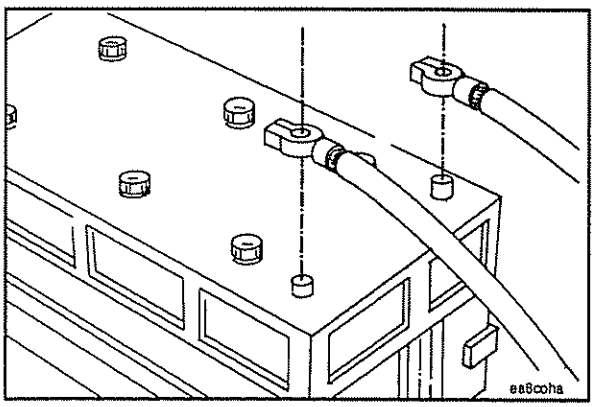


Fuel Pump

Clean and Calibrate

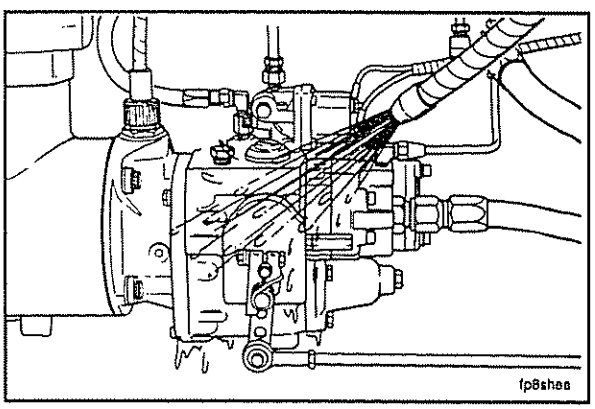
Every 6,000 Hours or 2 years clean and calibrate the fuel pump.

NOTE: This procedure requires special equipment and **must** be done at a Cummins Authorized Repair Location.



Remove

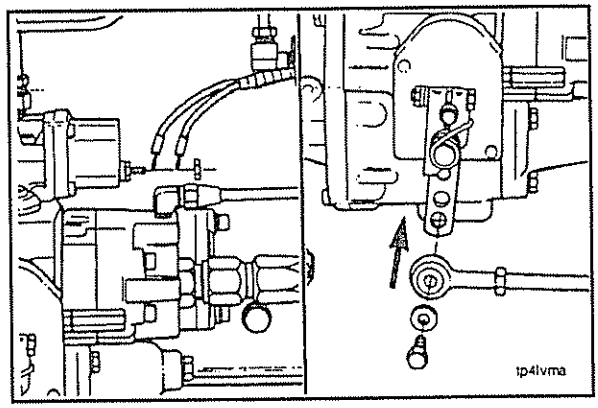
Disconnect the negative (-) battery cable then the positive battery cable.



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

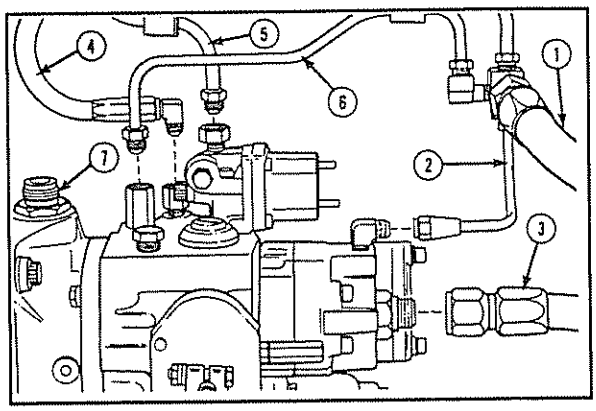
Disconnect the wires to the fuel shutoff valve.

Disconnect the linkage from the throttle lever.

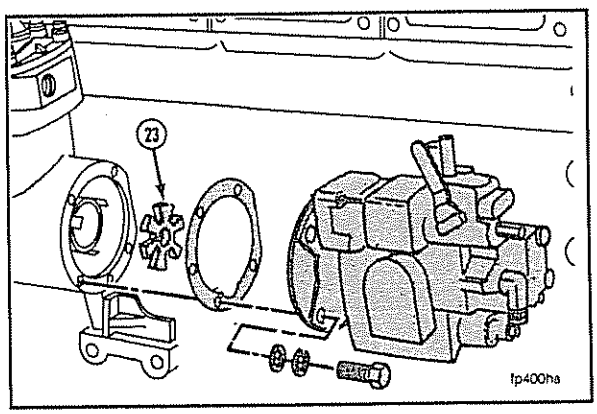


Disconnect the fuel tubing and air hose.

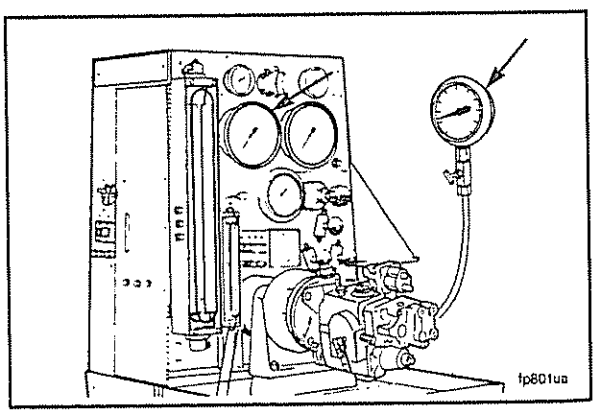
- Fuel drain (1).
- Gear pump cooling drain (2).
- Gear pump suction line (3).
- AFC air hose (4).
- Fuel supply to injectors (5).
- AFC fuel drain (6).
- Tachometer (7).

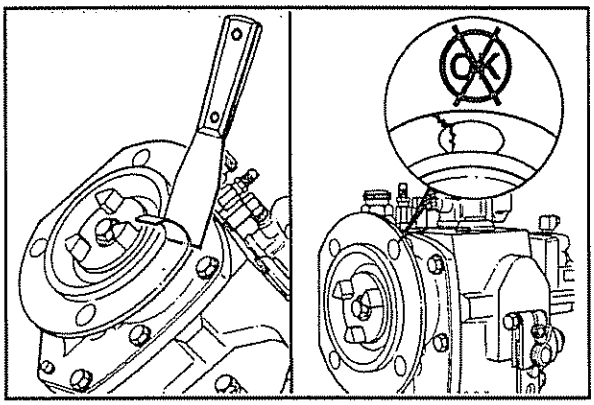


Remove the four mounting capscrews, and the fuel pump. Remove the drive coupling (23). Remove and discard the gasket.



Calibrate the fuel pump. The procedure **must** be done at a Cummins Authorized Repair location. Refer to the PT Fuel Pump Rebuild and Calibrate Manual, Bulletin No. 3379084.

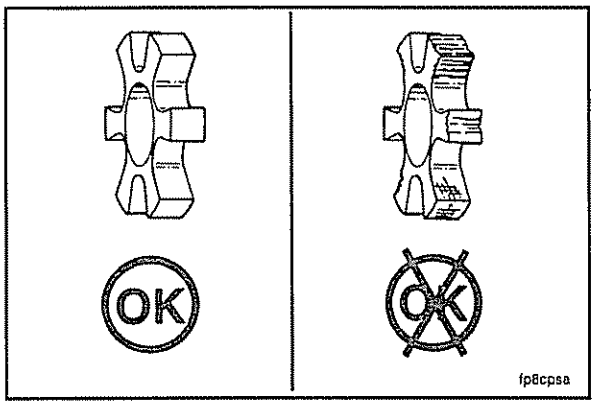




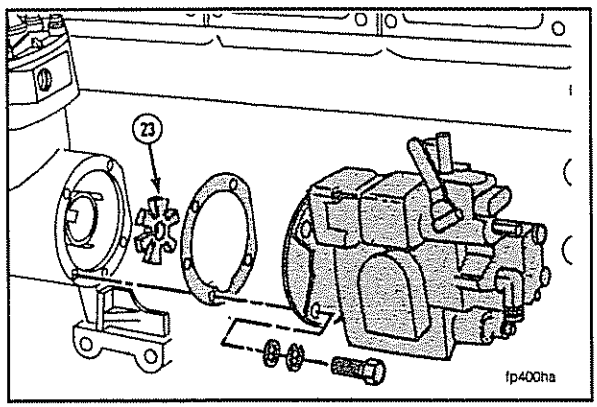
Clean and Check

Clean the fuel pump and the air compressor or accessory drive mounting surfaces.

Inspect the mounting surfaces for damage.



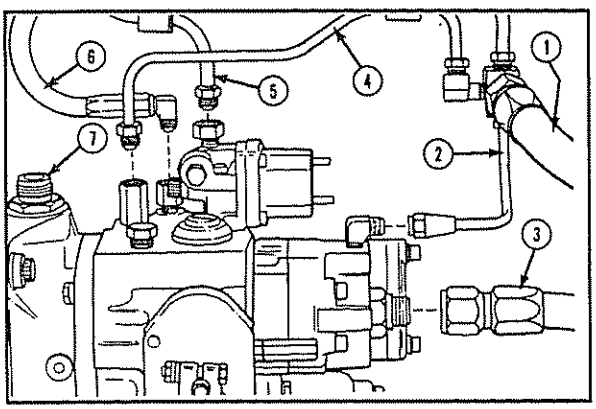
Visually inspect the spider coupling for damage.



Install

NOTE: All K19 engines use a white or light green fuel pump drive coupling.

Install the drive coupling (23), gasket, fuel pump, and four capscrews. Tighten the capscrews to 45 N•m [35 ft-lb].



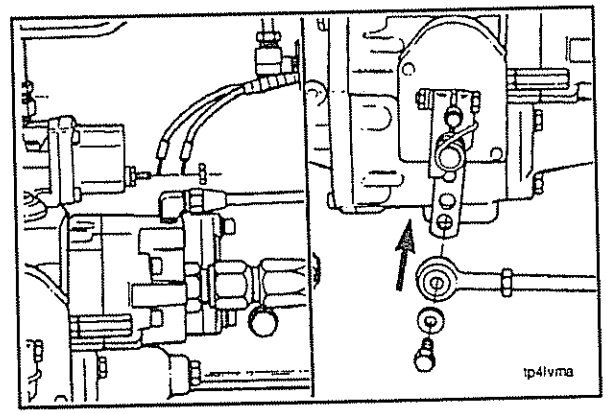
Connect the fuel tubing and air hose.

- Fuel drain (1).
- Gear pump cooling drain (2).
- Gear pump suction line (3).
- AFC fuel drain (4).
- Fuel supply to the injectors (5).
- AFC air hose (6).
- Tachometer (7).

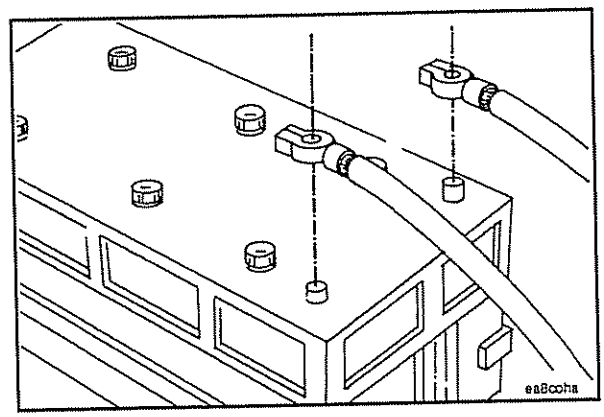
Connect the electric wires to the fuel shutoff valve.

NOTE: The wire connection nut and the ground post nut **must** be clean and tight.

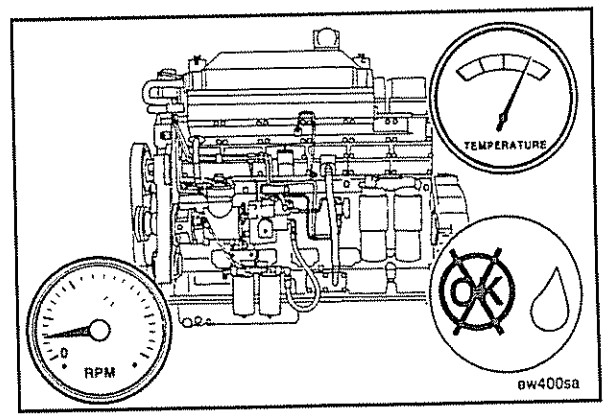
Install the linkage to the throttle lever.



Connect the positive (+) battery cable then the negative (-) cable.



Operate the engine to normal operating temperature and check for leaks.

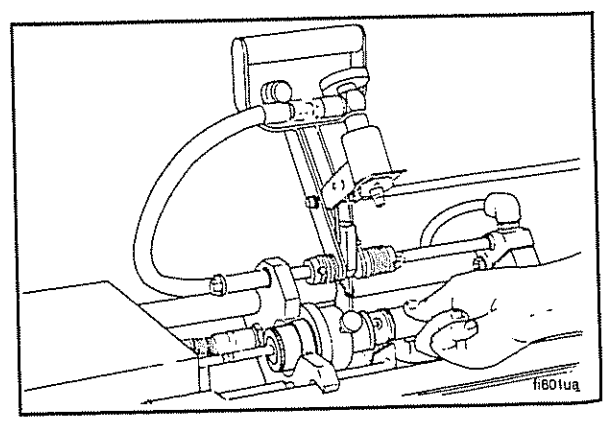


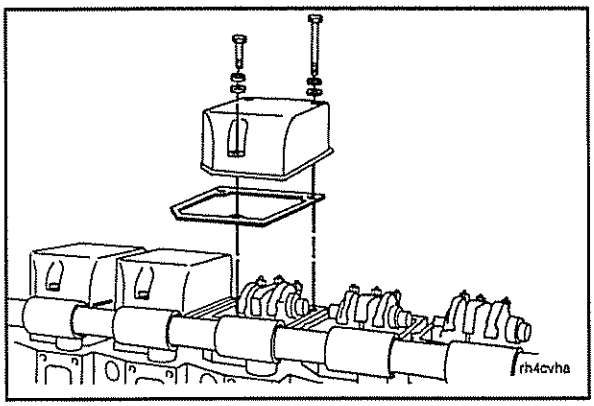
Injectors

Clean and Calibrate

Every 6,000 hours or 2 years clean and calibrate the injectors.

NOTE: This procedure requires special equipment and **must** be done at a Cummins Authorized Repair Location.

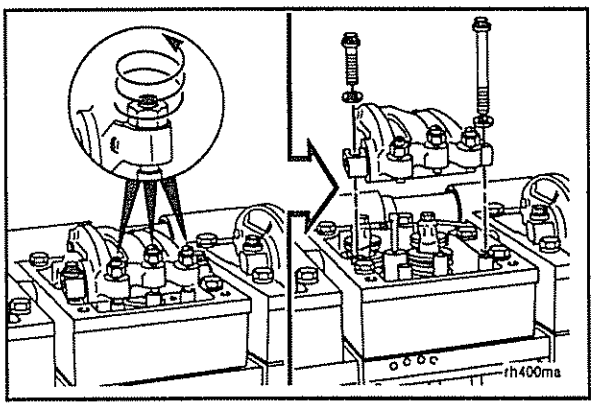




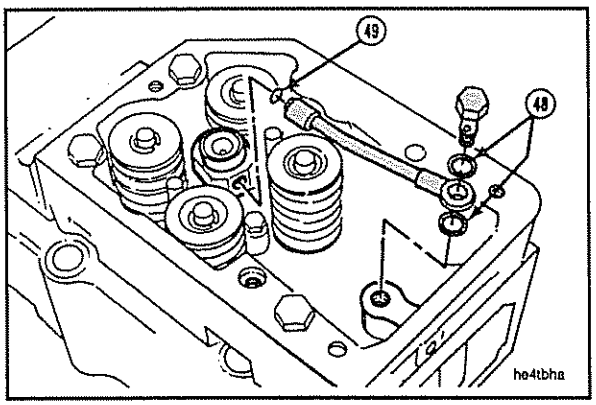
Remove

NOTE: To clean and calibrate the injectors, remove them from the engine. The injectors **must** be calibrated on an injector test stand. Refer to the Injector Rebuild Manual, Bulletin No. 3379084, for the rebuild and calibration procedures.

Remove the rocker lever cover.

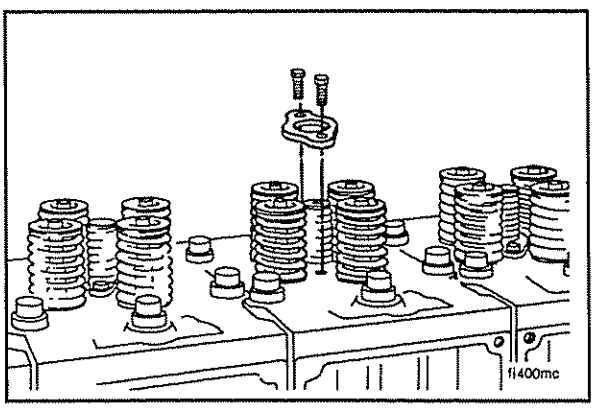


Remove the rocker lever assembly.



NOTE: This step applies **only** to engines equipped with STC or HVT injectors.

Remove the banjo connector mounting screw. Remove the oil transfer tube. Remove and discard the sealing washers (48) and the o-ring (49).



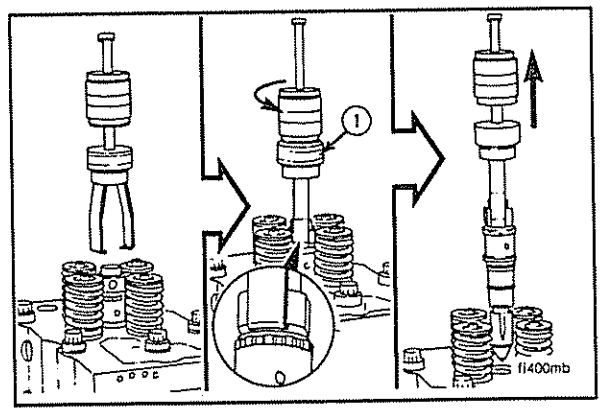
Remove the injector hold down capscrews. Remove the clamp.

NOTE: The rocker lever housing does **not** need to be removed. For clairty, the rocker lever is **not** shown in the next three pictures.

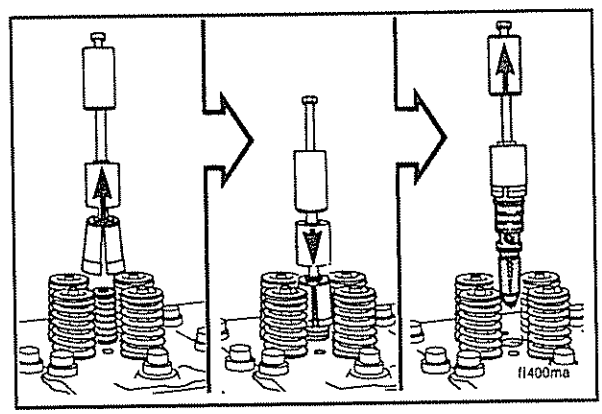
NOTE: The rocker housing has been removed from the illustration for clarity.

NOTE: Do **not** let the tappet fall out of the HVT injector. Damage can result.

For STC or HVT injectors, use an injector puller, Part No. 3376497. Be sure the puller arms are firmly under the top stop screw. Tighten the clamping ring (1). Use the slide hammer to remove the injector.



For standard injectors, use injector puller, Part No. 3376000 or 3376497. Put the split collar over the injector. Slide the locking collar over the split collar. Use the slide hammer to remove the injector.



Check For Reuse

NOTE: Injector plungers and barrels have a very precise fit and are damaged easily. Do **not** remove the plungers unless you have been trained using the proper techniques. Do **not** allow the plunger to fall out of the injector.

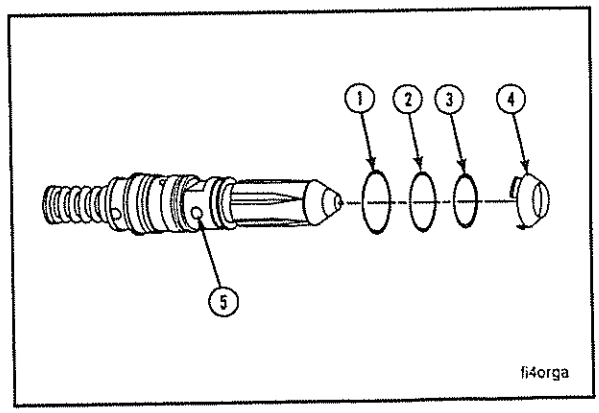
Remove the o-rings (1, 2, and 3).

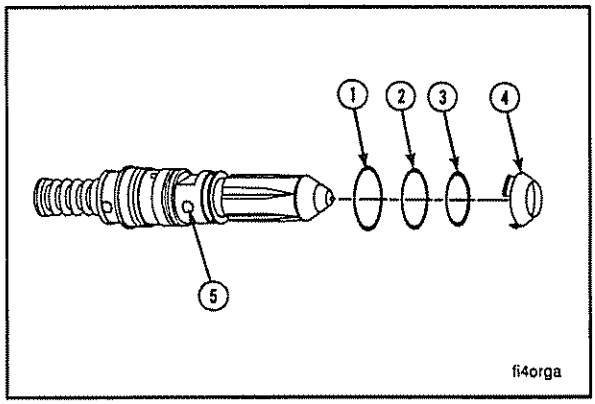
NOTE: Sealing rings are available in different thicknesses to adjust the injector protrusion.

Remove the sealing ring (4), and note the cylinder location.

Use a lint free cloth and clean the exterior of the injector. Carefully check the area where the sealing ring makes contact with the injector.

Check the orifice screen (5). It **must** be clean. If there is debris on the screen, remove the retaining clip and the screen for cleaning. Clean the screen in solvent and dry with compressed air. Install the screen and retaining clip.





Identify the o-rings so they can be installed in the correct injector groove.

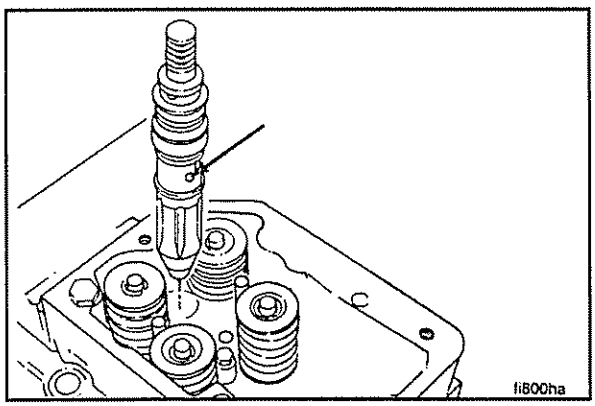
O-ring (1), Part No. 3010510, has a red dot or stripe. The o-ring is a dull gray in appearance.

O-ring (2), Part No. 205216, has no markings.

O-ring (3), Part No. 193736, has a green dot or stripe. The ring is shiny black in appearance. Lubricate the o-rings with vegetable oil and install them on the injector.

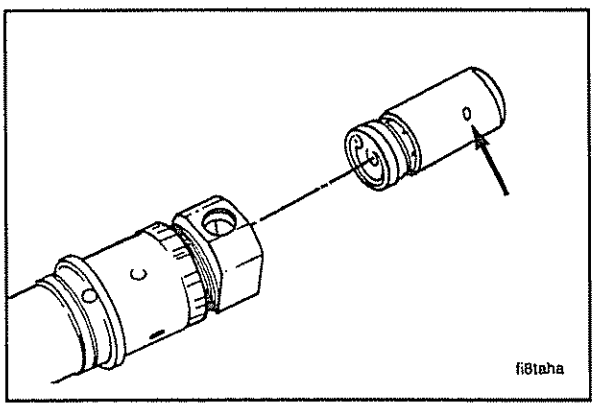
Install the proper size seal ring (4).

NOTE: Premium K injectors use the same o-ring, Part No. 193736, in all three locations (1, 2, 3). Premium K injectors can be identified by the presence of two balance orifices (5) in the injector body. Standard STC injectors have only one orifice.



Install

Position the standard injector in the bore. Turn the injector so that the injector screen points toward the hold down capscrew hole on the intake side of the head.



NOTE: Do **not** let the tappet fall out of the HVT injector. Damage can result.

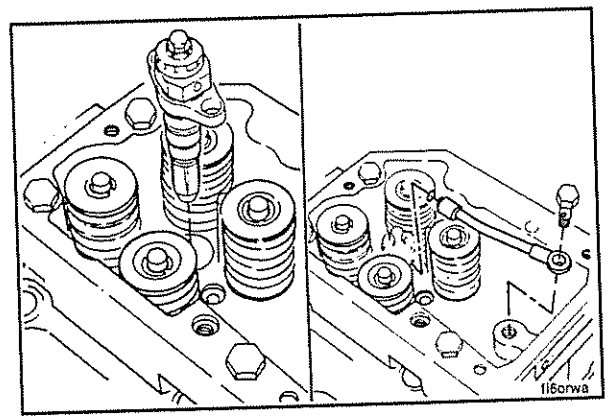
The tappet **must** be installed correctly. The large holes in the side **must** be near the rocker lever assembly.

The tappet can **not** fall out of the STC Top Stop injector.

NOTE: Do **not** push the injector on the seat until it is correctly aligned.

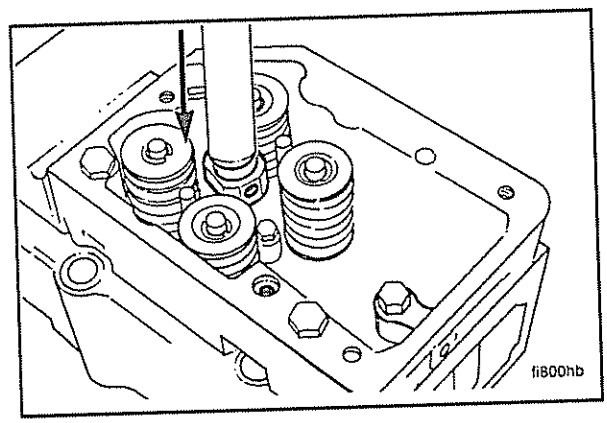
Position the STC or HVT injector in the bore. Turn the injector so that the hole in the top stop screw points to the oil supply hole in the rocker lever housing.

Use the oil jumper tube and the connector screw as tools. Turn the injector until the holes are aligned. Remove the connector screw and the tube.



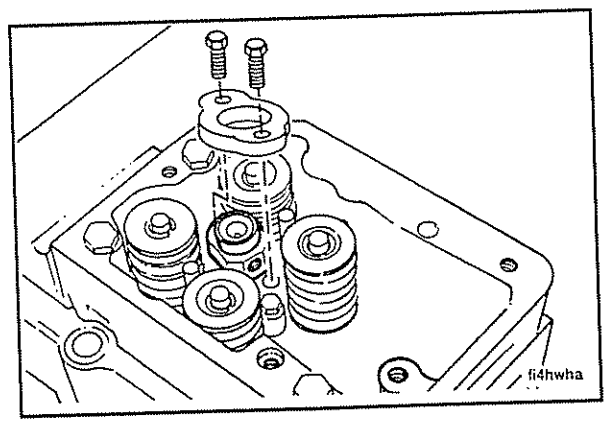
Caution: Do NOT use a wooden tool to push the injector on the seat. Failure can result due to splinters falling into the tappet.

Use a blunt object that touches the top stop screw. Use a quick, hard push with your hands to seat the injector. A single snapping sound will be heard when the injector is seated properly.

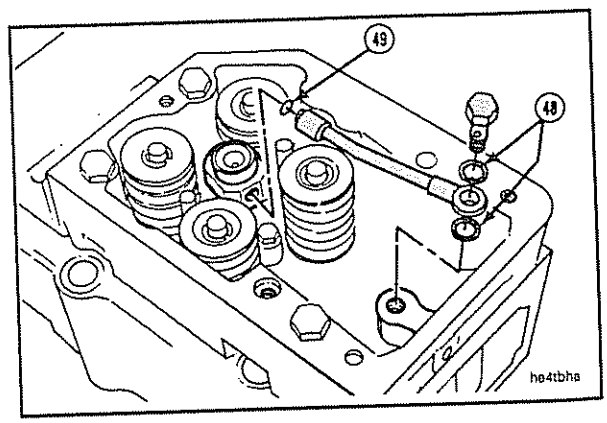


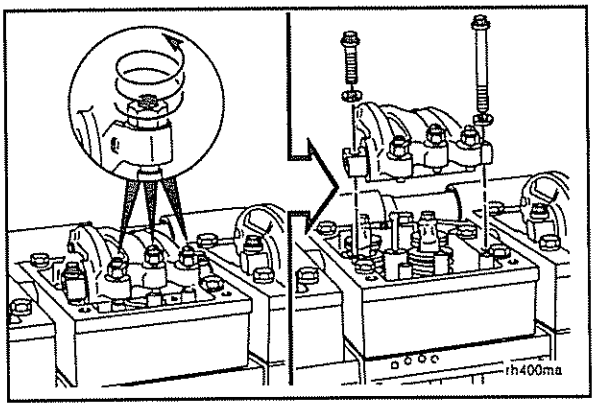
NOTE: The injector hold down clamp that is used on engines with STC or HVT requires capscrews that are 3 mm [1/8 inch] longer than those on other K19 engines.

Install the hold down clamp and the self-locking capscrews. Tighten the capscrews alternately and evenly so the clamp will be centered on the injector body. Tighten the capscrews alternately and evenly to 16.2 N•m [145 in-lb].



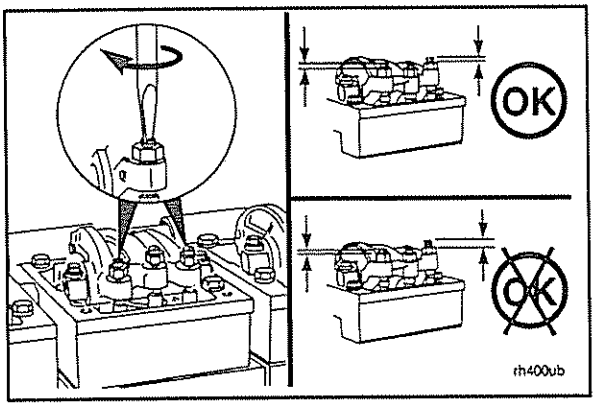
Install the o-ring (49) on the jumper tube. Lubricate the o-ring with engine oil. Install the jumper tube and the copper sealing washers (48). Install the connector screw. Tighten the screw to 25 N•m [20 ft-lb].



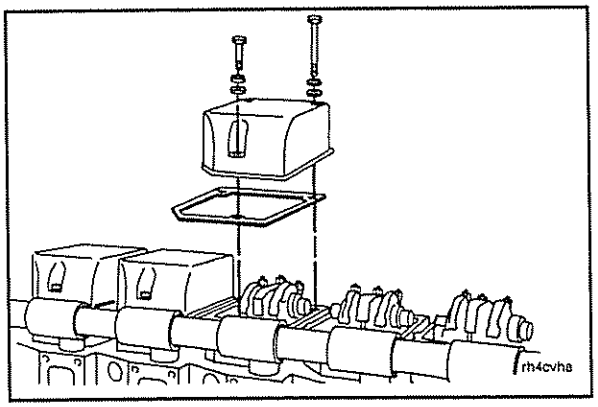


Install the rocker lever assembly and STC injector link, if applicable.

Torque Value: 90 N•m [65 ft-lb]



Adjust the valves and injectors. Refer to Section 6 for this procedure.



Install the rocker lever cover.

Torque Value: 45 N•m [35 ft-lb]

Coolant and Filters

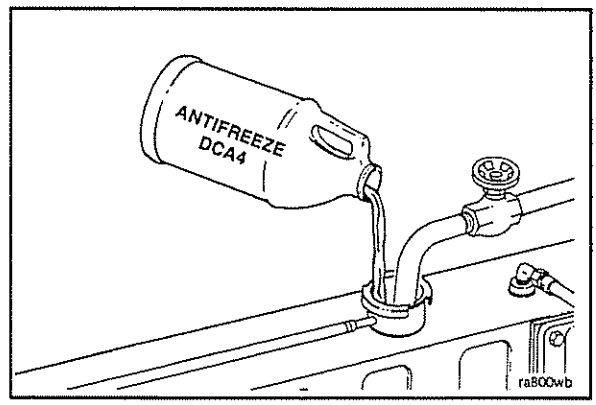
Change

Caution: Do NOT use caustic cleaners in the cooling system. Aluminum components will be damaged.

Every 6,000 hours or 2 years change the coolant and the antifreeze.

The cooling system **must** be clean to work correctly. Drain the system, and flush with clean water. If the system shows mineral buildup, scale, rust, or oil, clean with a heavy duty engine coolant cleaner and follow the manufacturer's directions.

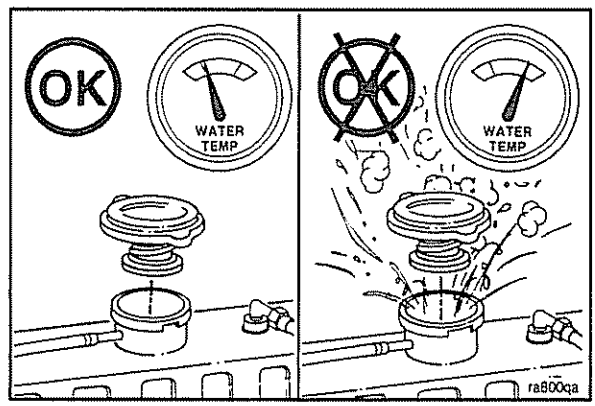
Fill the cooling system with the correct mixture of antifreeze, water, and the correct DCA4 units as outlined in Section V of this manual.



Warning: Check the coolant level only when the engine is stopped. Wait until the coolant temperature is below 50°C [120°F] before removing the pressure cap. Failure to do so can cause personal injury from heated coolant spray.

Operate the engine, and check for coolant leaks.

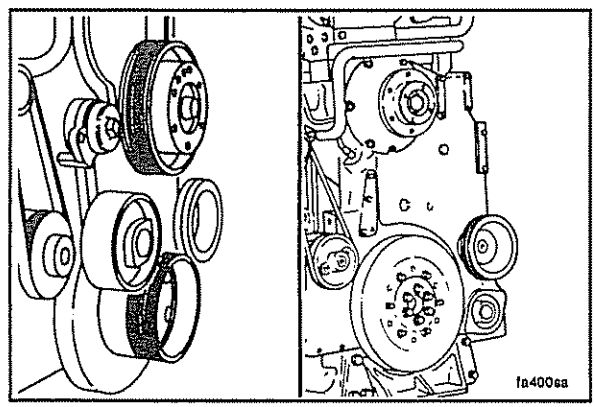
After the air has been purged from the system, check the coolant level again.



Fan Hub (Belt Driven or Gear Driven)

Inspect

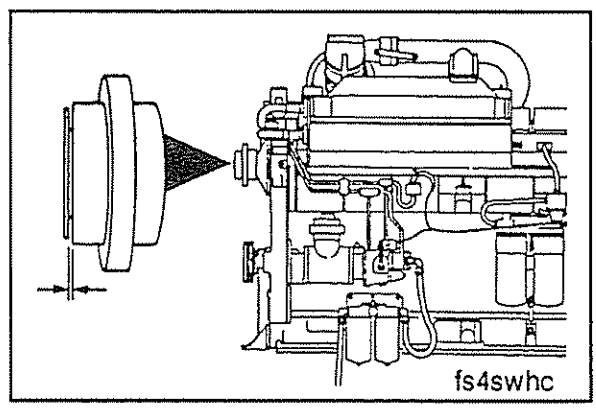
Every 6,000 hours or 2 years inspect the fan hub for wobble and grease leakage. Replace with a new or rebuilt unit as necessary. Refer to the Troubleshooting and Repair Manual, K19 Engines, Bulletin No. 3810307, for removal and replacement instructions.

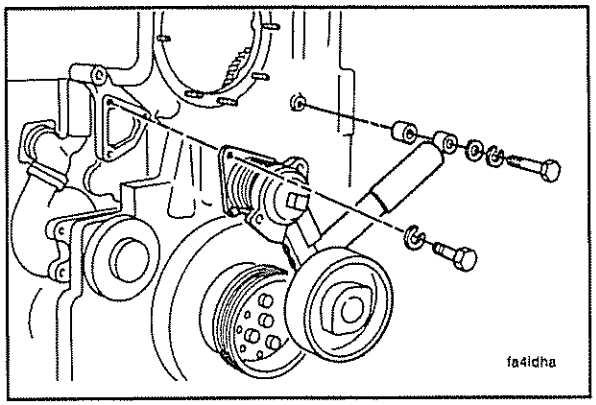


Fan Hub (Gear Driven)

Inspect

Measure the clearance between the outer fan hub member and inner fan hub member (retainer). If the clearance is less than 2.54 mm [0.100 inch], it indicates the hub has moved on the retainer. If less than 2.54 mm [0.100 inch], refer to the Troubleshooting and Repair Manual, K19 Engines, Bulletin No. 3810307.

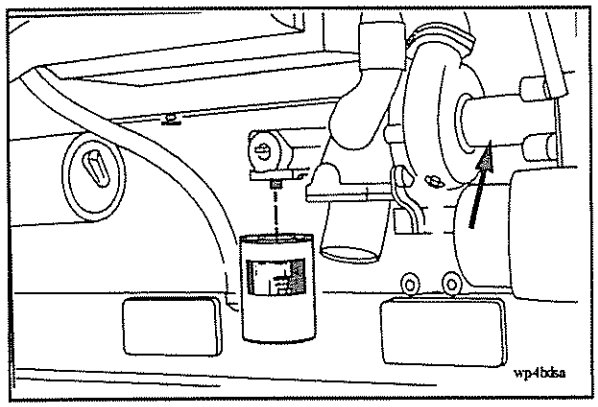




Fan Idler Pulley Assembly

Inspect

Every 6,000 hours or 2 years inspect the fan idler pulley assembly. Rebuild or replace the idler pulley as necessary. Refer to the Troubleshooting and Repair Manual, K19 Engines, Bulletin No. 3810307, for rebuild or replacement procedures.

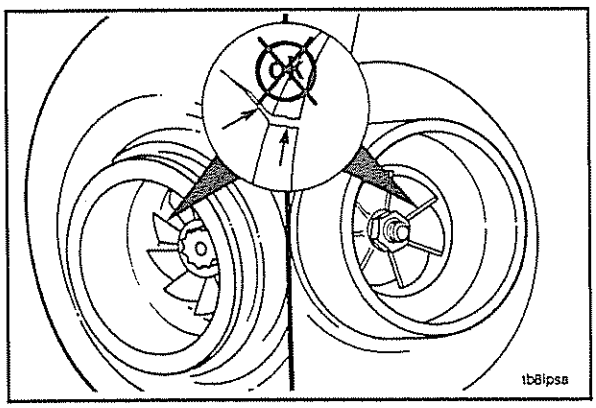


Water Pump

Inspect

Every 6,000 hours or 2 years inspect the water pump for coolant or oil leakage at the water pump weep hole.

NOTE: A minor chemical build up or streaking at the water pump weep hole is normal. Do **not** repair or replace the water pump unless an actual leak is confirmed. Refer to the Troubleshooting and Repair Manual, K19 Engines, Bulletin No. 3810307.



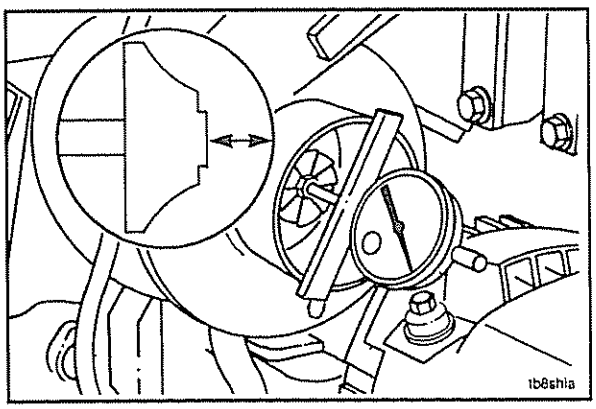
Turbocharger

Inspect

If the engine is equipped with a turbocharger, inspect the turbocharger every 6,000 hours or 2 years. Remove the air intake and the exhaust piping. Check the turbocharger as follows:

Look for damaged or cracked compressor or turbine blades. Check to see that the turbocharger shaft spins freely.

NOTE: If visual inspections or dimensional checks indicate a problem, contact a Cummins Authorized Repair Location for assistance. Refer to the model number on the turbocharger dataplate.

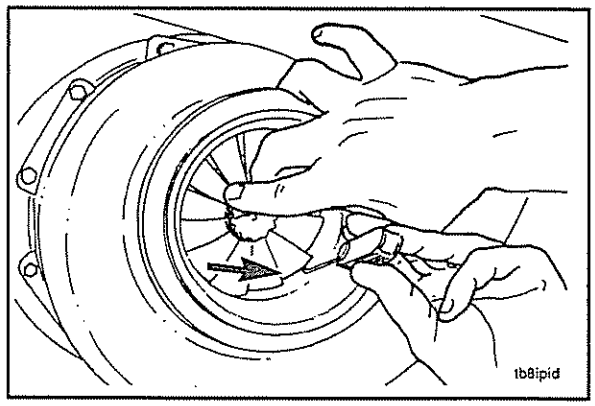


Measure the axial clearance (end to end). Rebuild or replace the turbocharger if axial motion is greater than specified below. Refer to the Troubleshooting and Repair Manual K19 Engines, Bulletin No. 3810307, for removal procedures and to the Turbocharger Rebuild Manual, Bulletin No. 3379091, for rebuild procedures.

Model	Dimension	
	Min	Max
HC5A	0.05 mm [0.002 in]	0.13 mm [0.005 in]
T18A	0.10 mm [0.004 in]	0.23 mm [0.009 in]

Measure the radial clearance (side to side).

NOTE: Hold the shaft toward the feeler gauge to check this dimension.



Model HC5A	
Compressor Impeller	
Min	Max
0.15 mm [0.006 in]	0.45 mm [0.018 in]
Turbine Wheel	
Min	Max
0.20 mm [0.008 in]	0.55 mm [0.021 in]

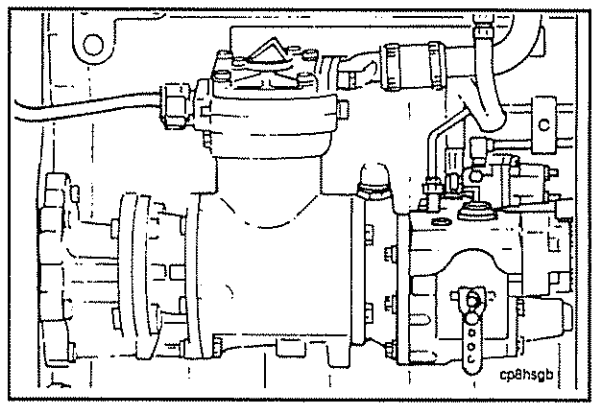
Model T18A	
Compressor Impeller and Turbine Wheel	
Min	Max
0.08 mm [0.003 in]	0.18 mm [0.007 in]

Air Compressor

Inspect

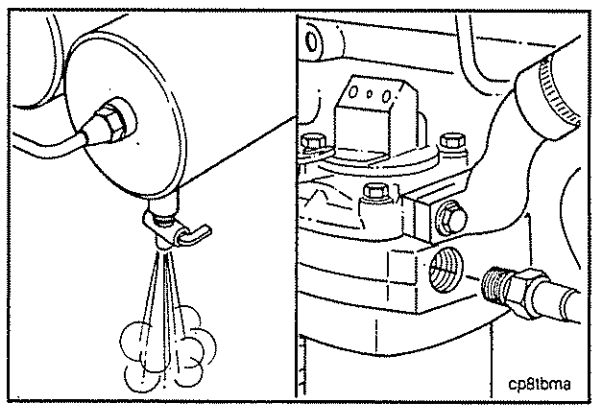
Complete air compressor inspection is required every 6,000 hours or 2 years.

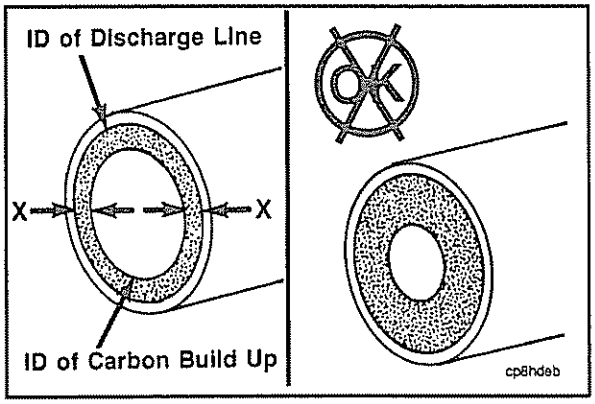
NOTE: All air compressors have a small amount of oil carryover which lubricates the piston rings and moving parts. When this oil is exposed to normal air compressor operating temperatures over a period of time, it will form varnish or carbon deposits. If the following inspections are **not** done, the air compressor piston rings will be affected by high operating temperatures and pressures, and will **not** seal correctly.



Air Compressor Discharge - Check

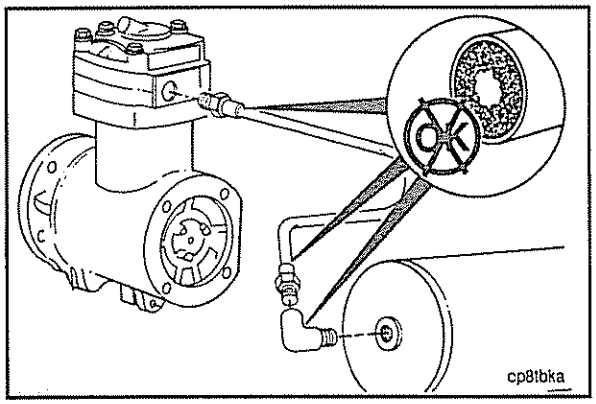
Drain the air system wet tank to release the system air pressure. Remove the air discharge line from the air compressor.



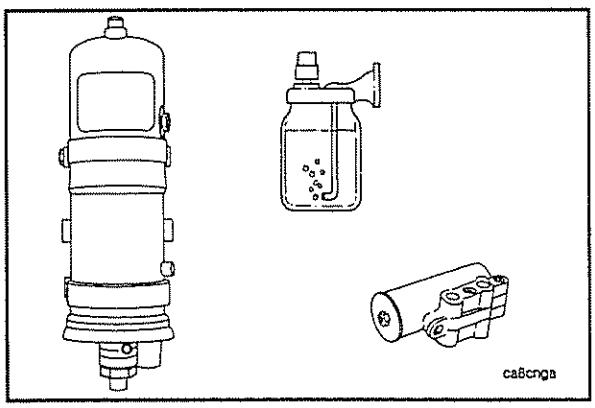


Measure the total carbon deposit thickness inside the air discharge line as shown. If the total carbon deposit (X + X) exceeds 2 mm [1/16 inch], clean and inspect the cylinder head, the valve assembly, and the discharge line. Replace if necessary. Refer to the appropriate Air Equipment Manual listed below for procedures, or contact your Cummins Authorized Repair Location:

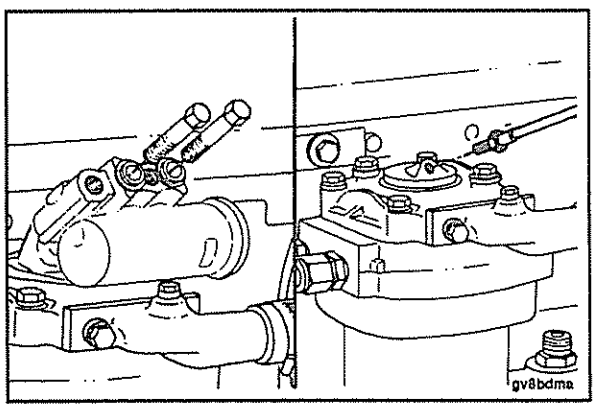
- Single Cylinder, Bulletin No. 3810242
- Twin Cylinder, Bulletin No. 3379056



If the total carbon deposit exceeds specifications, continue checking the air discharge line connections, up to the first tank, until total carbon deposit is less than 2 mm [1/16 inch]. Clean or replace any lines or connections that exceed this specification.



Inspect any air driers, spitter valves, pressure relief valves, and alcohol injectors for carbon deposits or malfunctioning parts. Inspect for air leaks. Maintain and repair the parts according to the manufacturer's specifications.

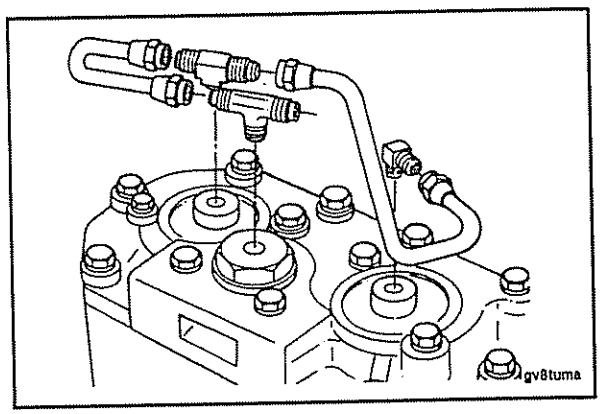


Air Compressor Intake - Check

NOTE: The illustrations shown will be of the single cylinder air compressor. Differences in procedures for one and two cylinder Cummins air compressors will be shown where necessary.

Remove the air governor or air governor signal line from the air compressor unloader body.

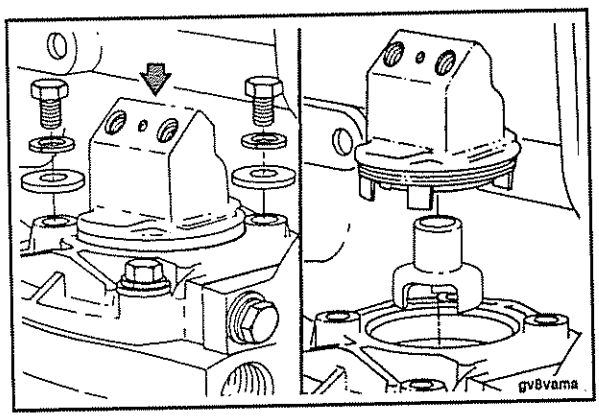
Remove the copper tubing from the top of the two cylinder air compressor (early models only).



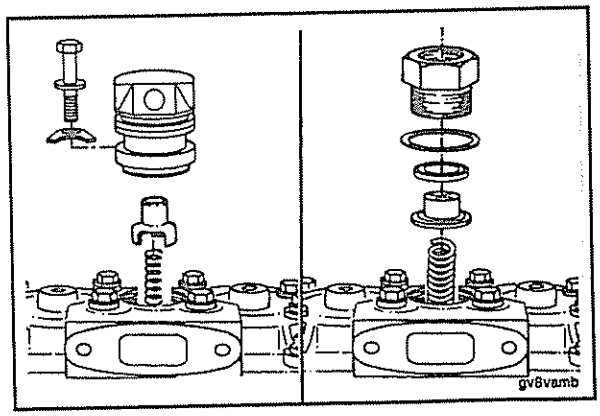
Warning: The unloader valve body is installed with spring tension. To avoid personal injury, hold the unloader body down while removing the capscrews.

Hold the unloader body down and remove the two capscrews and washers.

- On two cylinder air compressors, remove the two unloader assemblies above each cylinder. Discard the o-rings and seals.
- On a single cylinder air compressor, remove the unloader assembly. Discard the o-rings and seals.

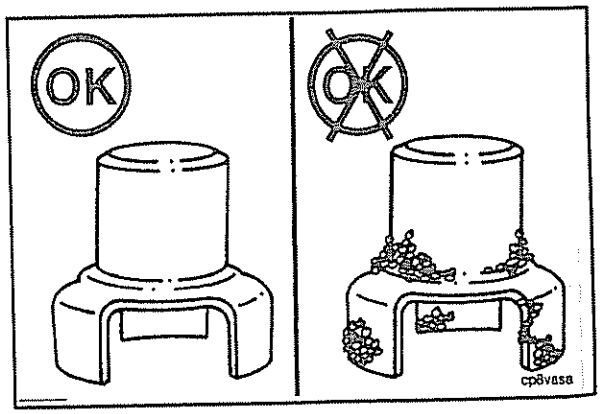


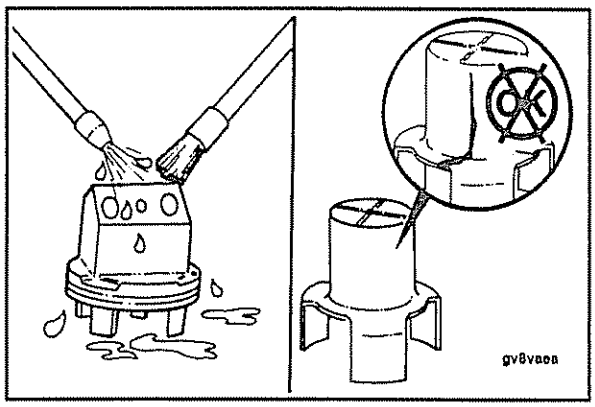
- Remove the center unloader valve on the two cylinder air compressor. Two types have been used, one that is held down by one capscrew, and one that is screwed in.



Visually inspect the unloader valve for carbon buildup. If carbon or heavy varnish is present, remove, clean, and inspect the compressor head and the valve assembly. Replace the parts as necessary. Refer to the appropriate Air Equipment Manual listed below for procedures, or contact your nearest Cummins Authorized Repair Location:

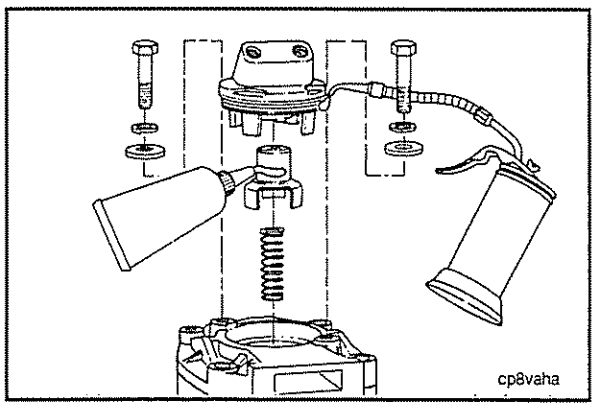
- Single Cylinder, Bulletin No. 3810242
- Twin Cylinder, Bulletin No. 3379056





Clean the unloader valve with solvent and a non-metallic brush to remove carbon. Do **not** use a sharp object. The sealing surfaces can be damaged.

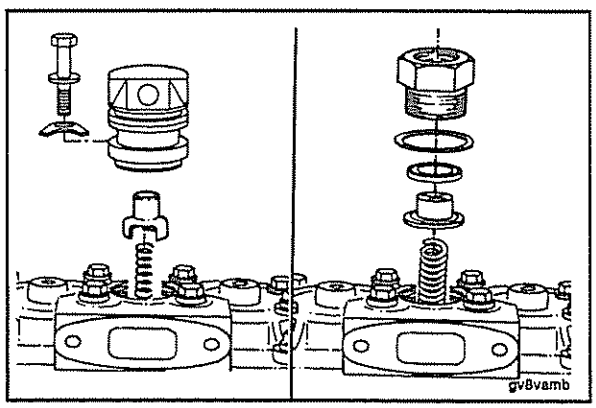
Check for reuse. Refer to the check procedure.



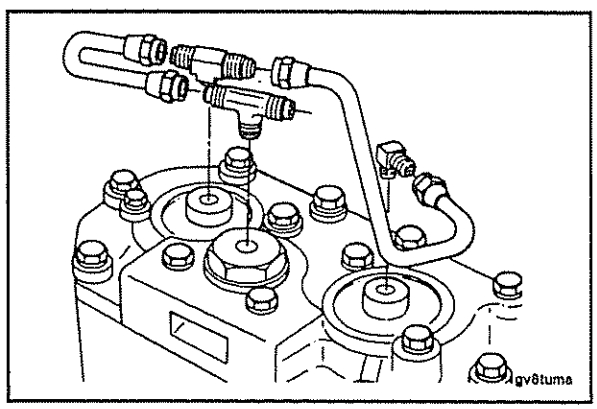
Lubricate the unloader cap with anti-seize compound. Lubricate the unloader body o-ring with engine oil. Assemble the unloader assembly to the cylinder head cover. Tighten the capscrews.

Torque Value: 14 N•m [10 ft-lb]

NOTE: If the compressor has the three-prong unloader valve as shown, make sure the prongs are aligned with the slots in the intake valve retainer.

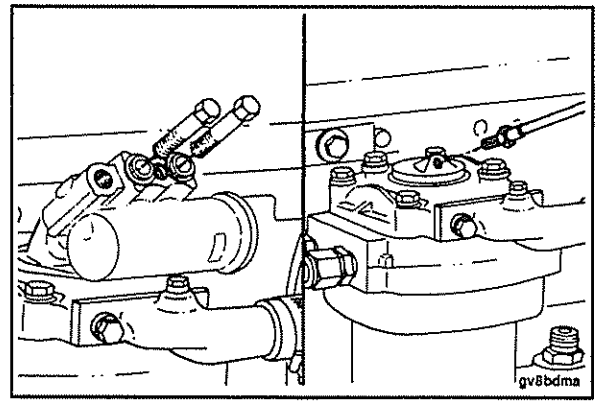


Install the center unloader on the two cylinder air compressor. Follow the previous steps. Tighten the capscrews to 40 N•m [30 ft-lb]



Install the copper tubing to the top of the two cylinder air compressor (early models only).

Install the air governor or air governor signal line to the unloader body.



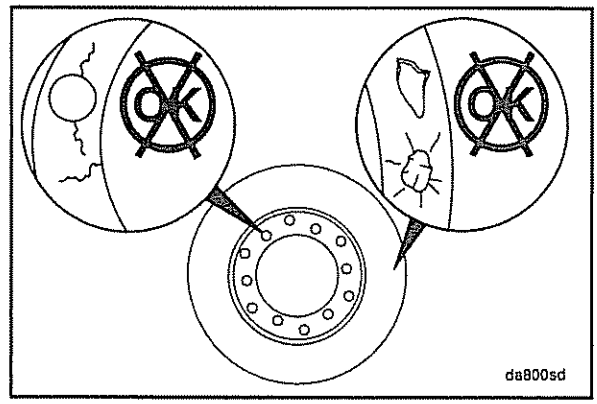
Vibration Dampers

Viscous Vibration Dampers - Check

Caution: 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 driveline failures.

Vibration dampers have a limited service life. The damper **must** be replaced after 576,000 km [360,000 miles] or 15,000 hours of service.

NOTE: Do **not** repair or balance a viscous damper in the field.



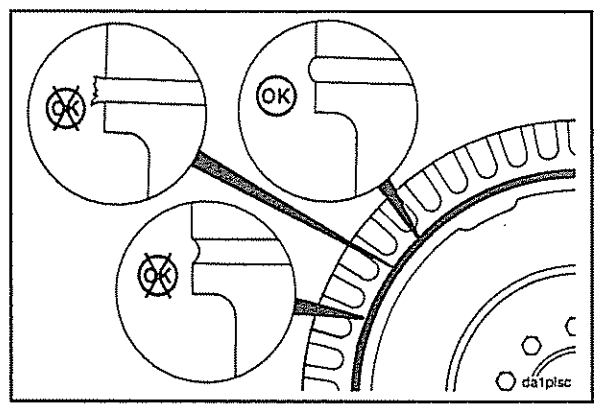
Check the damper for evidence of fluid loss, dents, and wobble. Visually inspect the vibration damper thickness for any deformation or raising of the damper front cover plate.

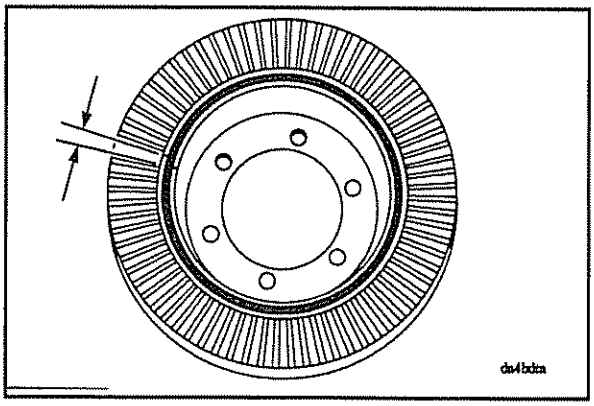
If any variations or deformations are detected, refer to the Troubleshooting and Repair Manual, K19 Engines, Bulletin No. 3810307, for inspection procedures.

Rubber Vibration Dampers - Check

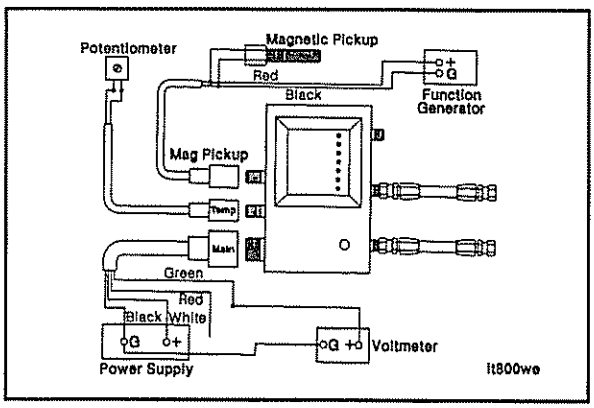
NOTE: Vibration dampers have a limited service life. The damper **must** be replaced after 576,000 km [360,000 miles], or 15,000 hours of service.

Inspect the rubber member for deterioration. If pieces of rubber are missing or if the elastic member is more than 3 mm [1/8 inch] below the metal surface, replace the damper. Refer to the Troubleshooting and Repair Manual, K19 Engines, Bulletin No. 3810307, for detailed inspection procedures.





Check the alignment of the index marks on the hub and the inertia member. If the marks are more than 1.5 mm [1/16 inch] out of alignment, the damper **must** be replaced.



Engine Protection System

Calibrate

The engine protection system **must** be calibrated every 6,000 hours or 2 years. Follow the manufacturer's recommended maintenance procedures.

If the CompuSave unit is in use, refer to the Operation and Maintenance Manual for the Flight Systems 9560 Test Set.

If the Flight Systems Engine Save is in use, refer to the Engine Save Level 7 Manual, Bulletin No. 57-A550-26.

Section 8 - Other Maintenance Procedures

Section Contents

Miscellaneous

On the following components follow the manufacturer's recommended maintenance procedures. Refer to Section C for Component Manufacturers locations.

- Alternator
- Generator
- Starter
- Air Compressor
- Electric Connections
- Batteries
- Freon Compressor
- Hydraulic Governor
- Fan Shaft Bearings
- Clutch or Marine Gear

Section D - Systems Diagrams

Section Contents

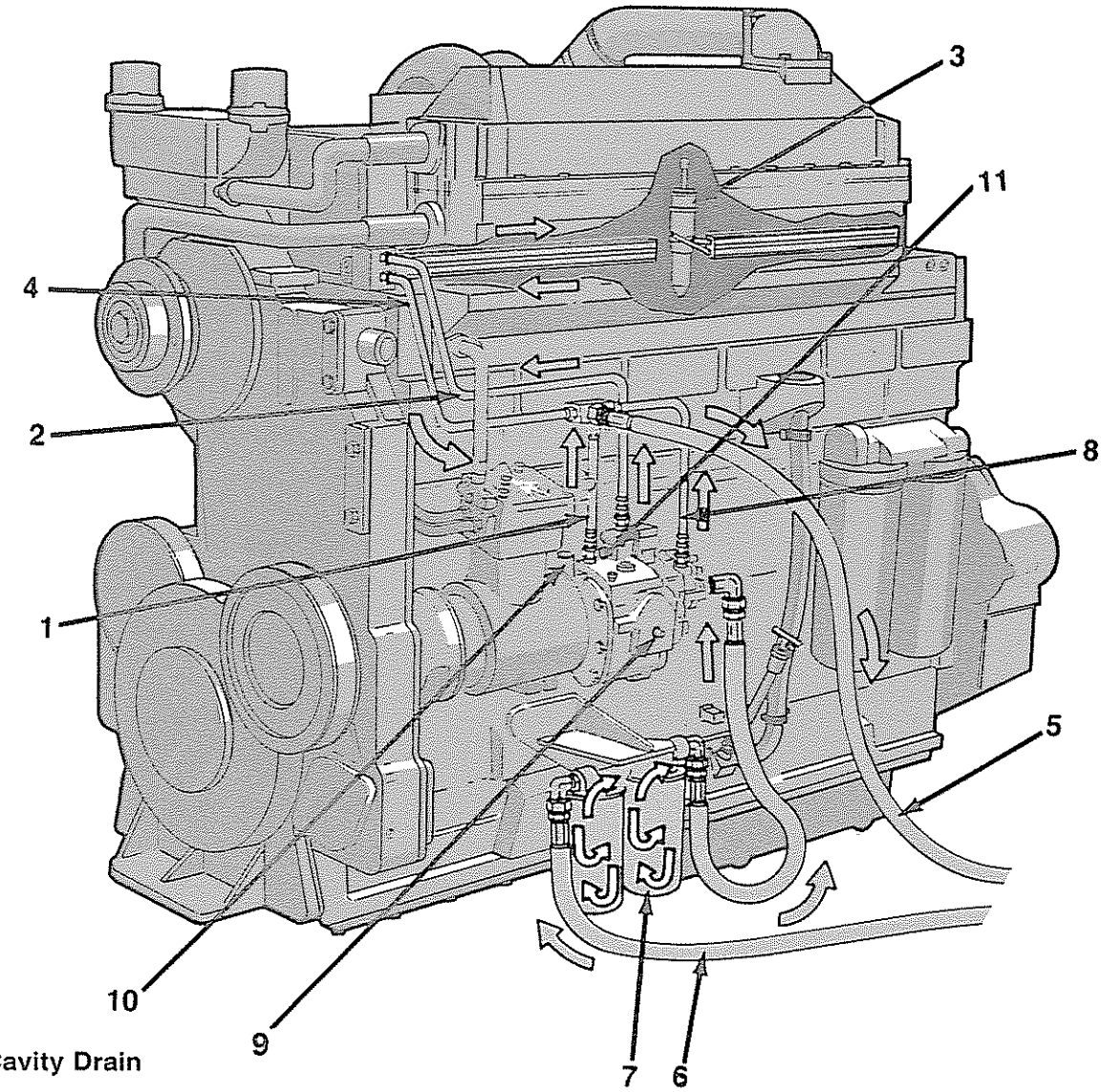
General Information

The following drawings show the flow through the engine systems. Although parts can change between different applications and installations, the flow remains the same. The systems shown are:

- Fuel System
- Lubricating Oil System
- Coolant System
- Intake Air System
- Exhaust System
- Compressed Air System

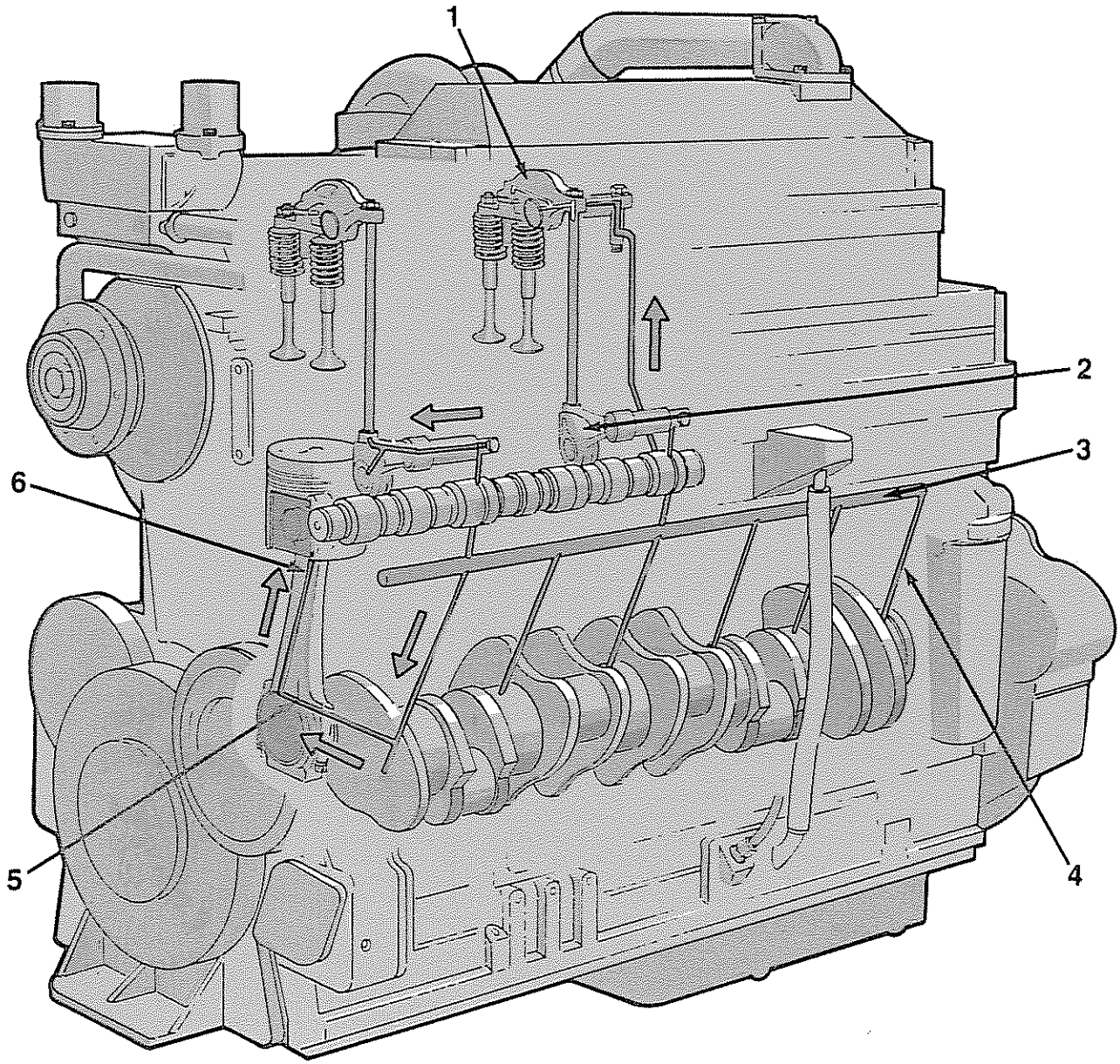
Knowledge of the engine systems can help you in troubleshooting, service and general maintenance of your engine.

Fuel Systems Flow Diagram



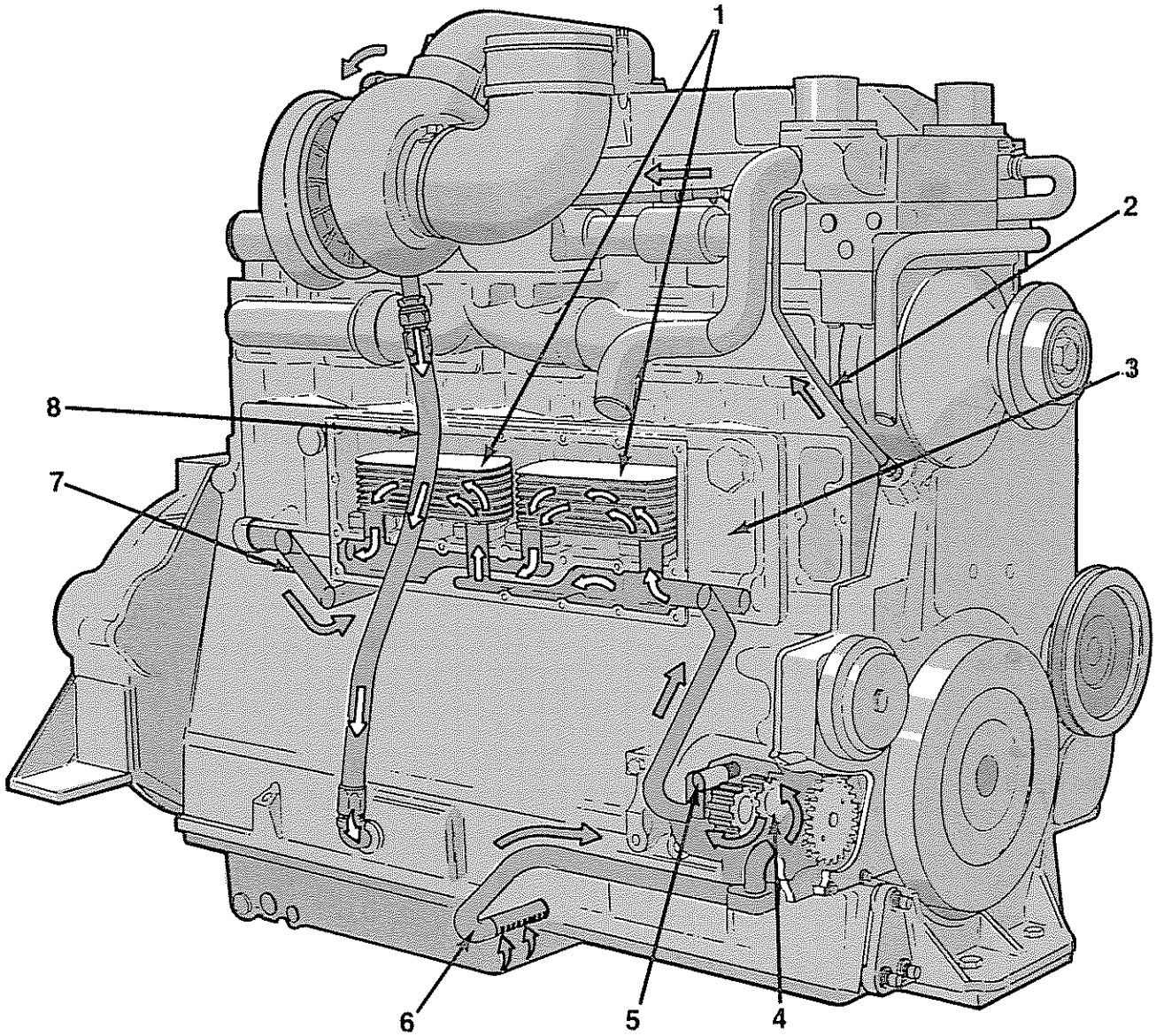
1. AFC Cavity Drain
2. Fuel Rail Pressure Line
3. Injector
4. Injector Fuel Drain Return
5. Fuel Return to Tank
6. Fuel Inlet Supply
7. Fuel Filters
8. Gear Pump Coolant Drain
9. Fuel Pump
10. Tachometer Drive
11. Fuel Pump Manual Override

Lubricating System Flow Diagram



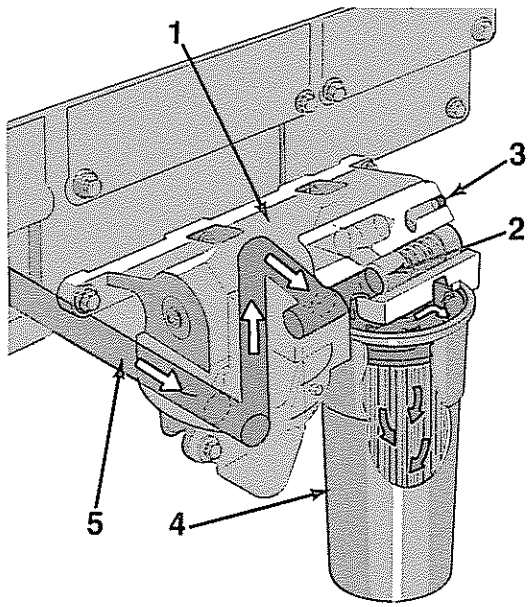
1. Rocker Lever
2. Cam Follower
3. Main Oil Rifle
4. Oil Supply to Main Bearings
5. Oil Supply to Connecting Rods
6. Oil Supply to Piston Pin Bushing

Lubricating System Flow Diagram (Continued)



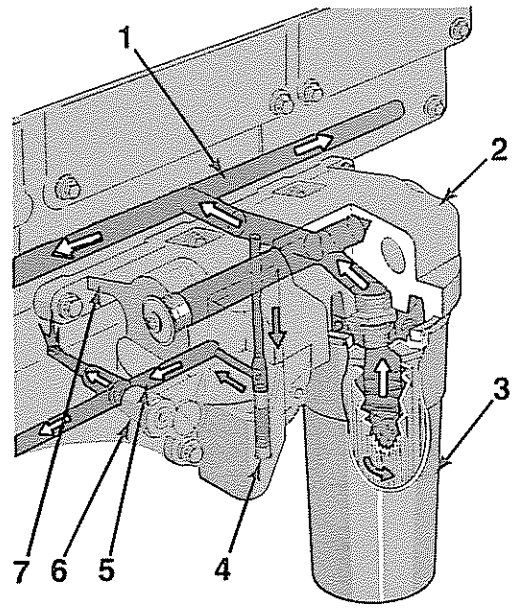
1. Oil Cooler Elements
2. Turbocharger Oil Supply
3. Oil Cooler Housing
4. Lubricating Oil Pump
5. Lubricating Oil Pump Regulator
6. Oil Suction Tube
7. Oil to Filter Head
8. Turbocharger Oil Drain

Lubricating System Flow Diagram (Continued)



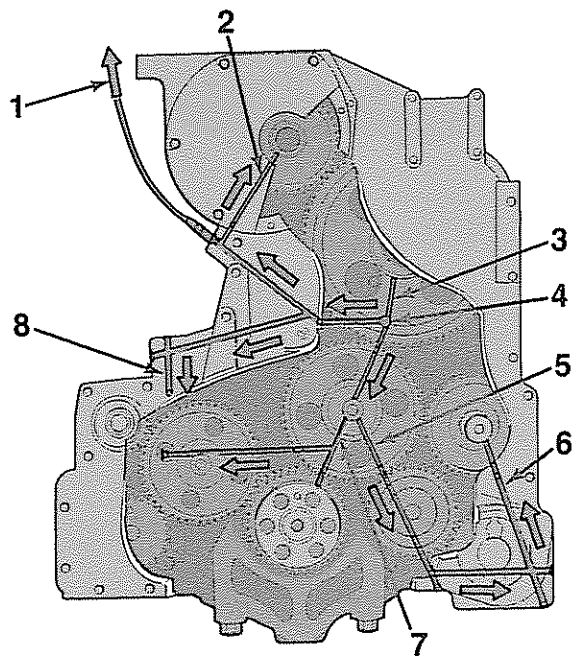
Filter Head

1. Filter head
2. Filter Bypass Valve
3. Oil Before Filter
4. Full Flow Filter
5. Oil to Filter Head



Filter Head

1. Main Oil Rifle
2. Oil Filter Head
3. Full Flow Filter
4. Piston Cooling Control Valve
5. Piston Cooling Oil Rifle
6. Piston Cooling Nozzle
7. Oil After Filter

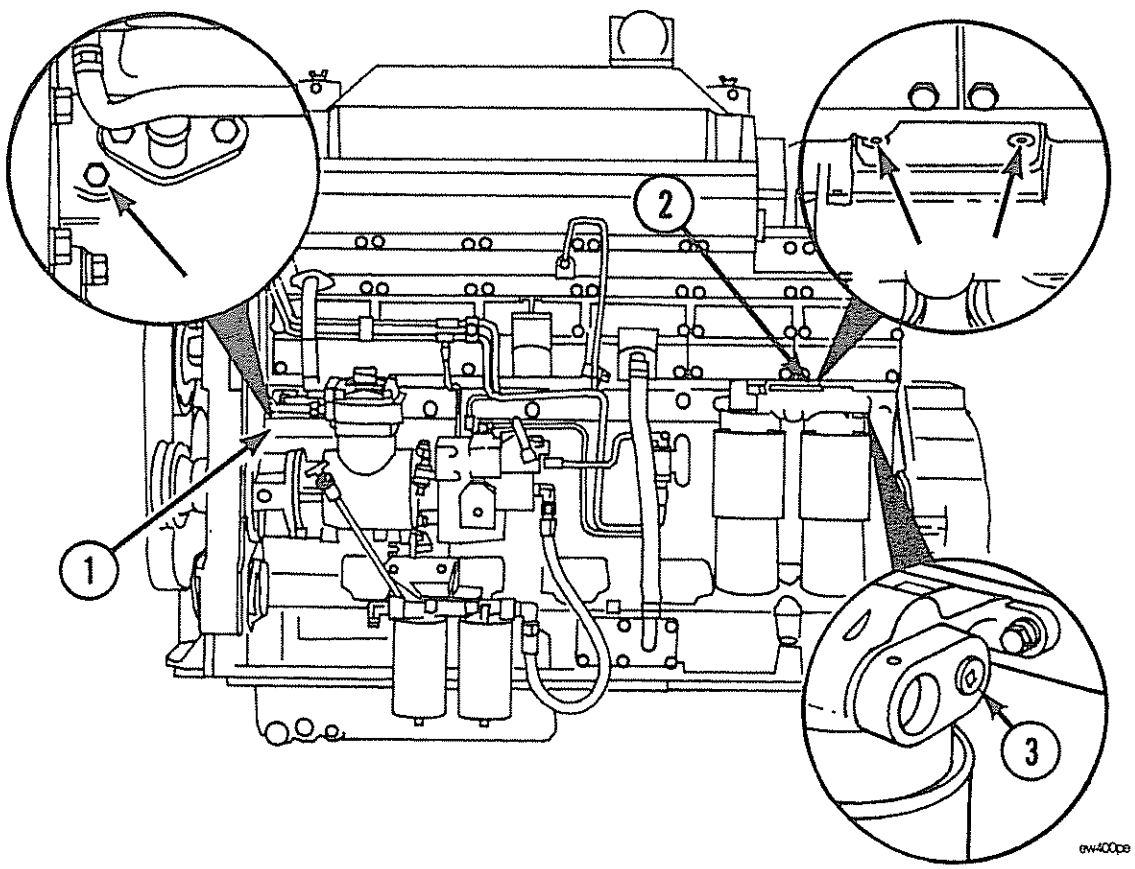


Front of Engine

1. Oil Supply to Turbocharger
2. Oil Supply to Gear Driven Fan Hub
3. Oil Supply to Cam Bushing
4. Main Oil Rifle
5. Oil Supply to Idler Gear and Hydraulic Pump Drive
6. Oil Supply to Air Compressor and Fuel Pump Drive
7. Oil Supply to Main Bearing and Idler
8. Oil Supply to Water Pump and Drive

Lubricating System Flow Diagram (Continued)

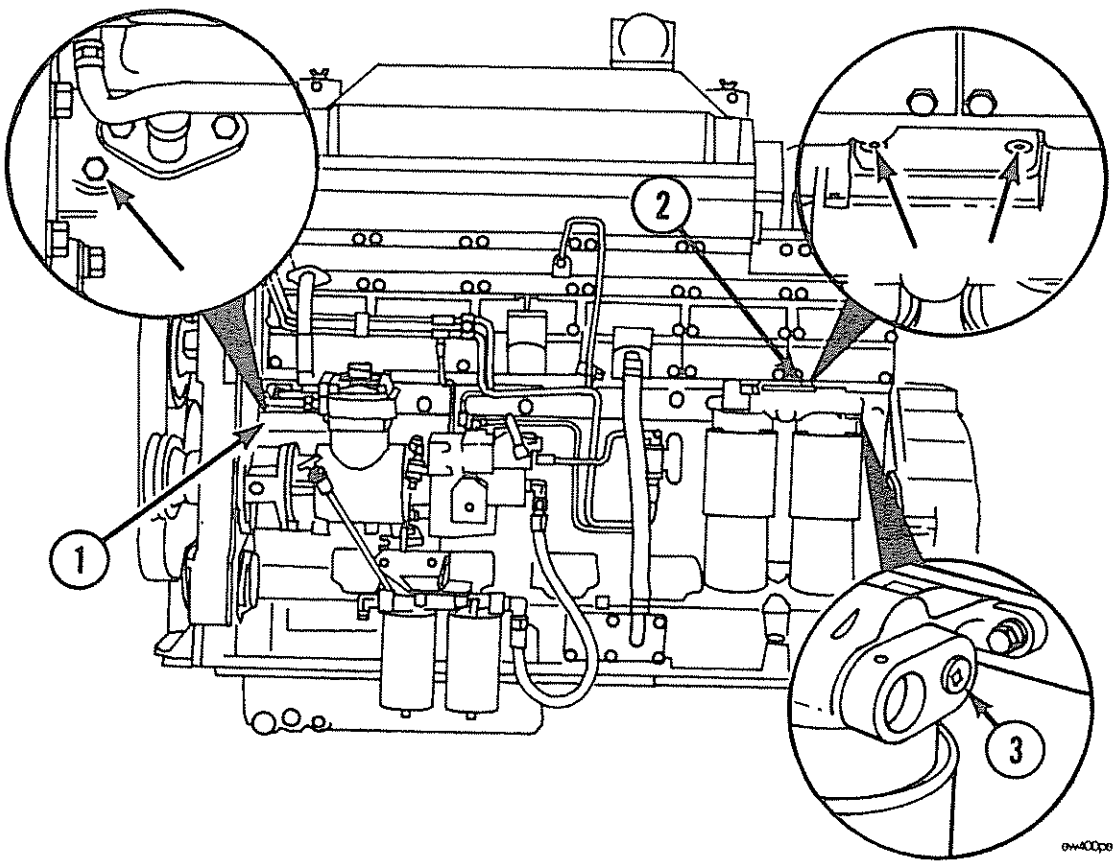
1. Engine Oil Rifle Pressure Plug
2. Pipe Plug - Filtered Oil
3. Pipe Plug - Unfiltered Oil



Lubricating System Flow Diagram (Continued)

STC Oil Flow (Normal Timing)

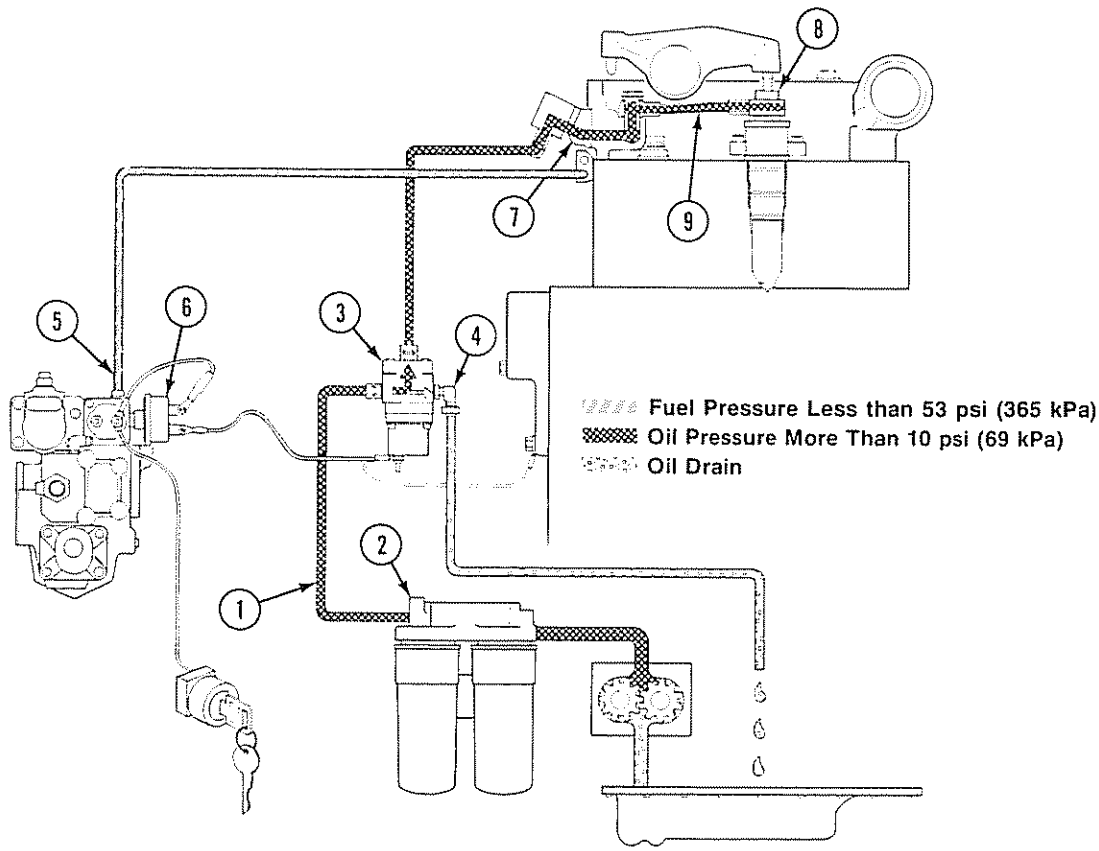
1. Oil Supply to Oil Control Valve
2. Oil Filter Head
3. Oil Control Valve
4. Pressure Relief Valve
5. Fuel Supply to Injectors
6. Fuel Pressure Switch



Lubricating System Flow Diagram (Continued)

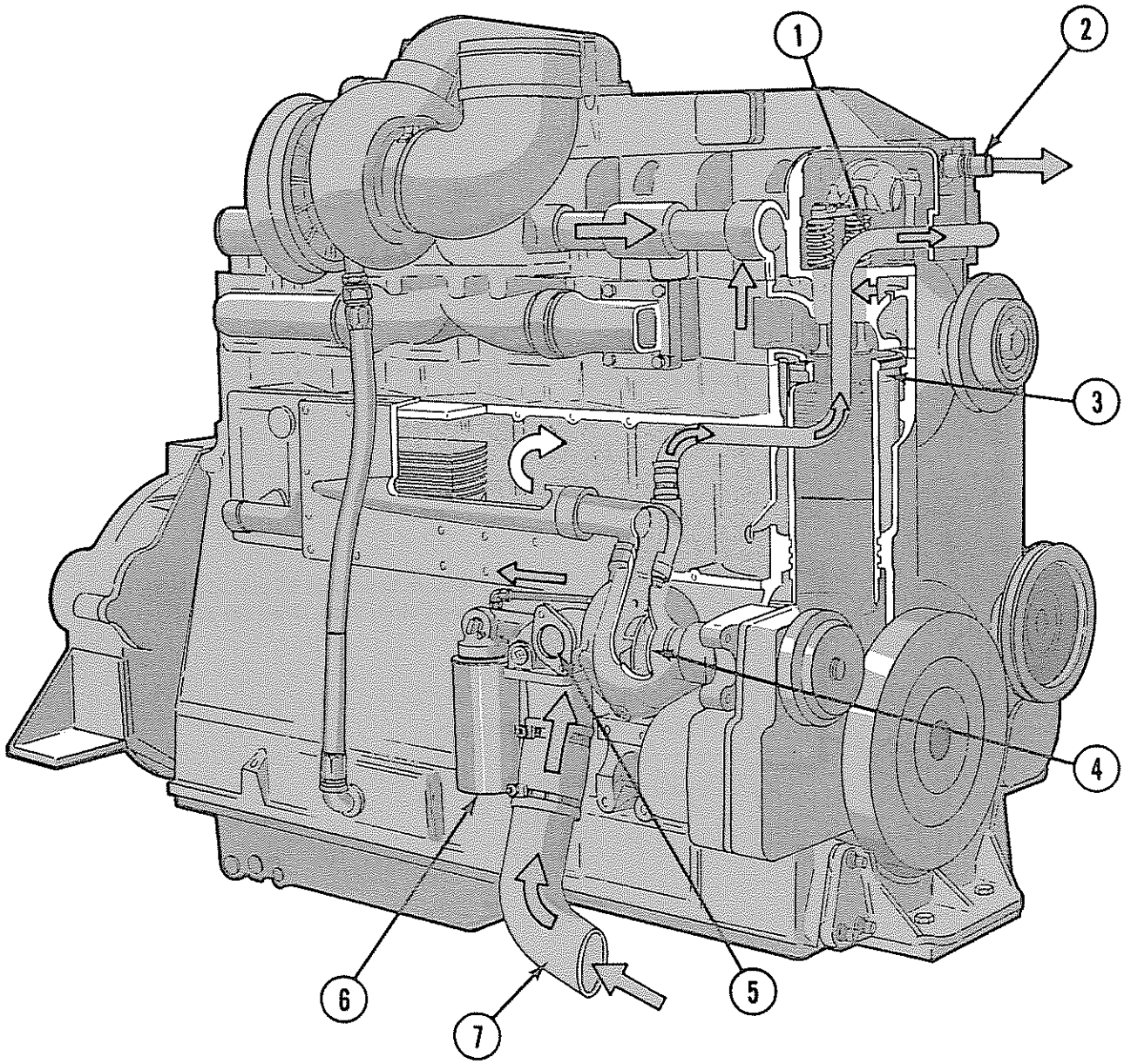
STC Oil Flow (Advanced Timing)

1. Oil Supply to Oil Control Valve
2. Oil Filter Head
3. Oil Control Valve
4. Pressure Relief Valve
5. Fuel Supply to Injectors
6. Fuel Pressure Switch
7. Oil Manifold
8. STC Tappet
9. Oil Transfer Connection



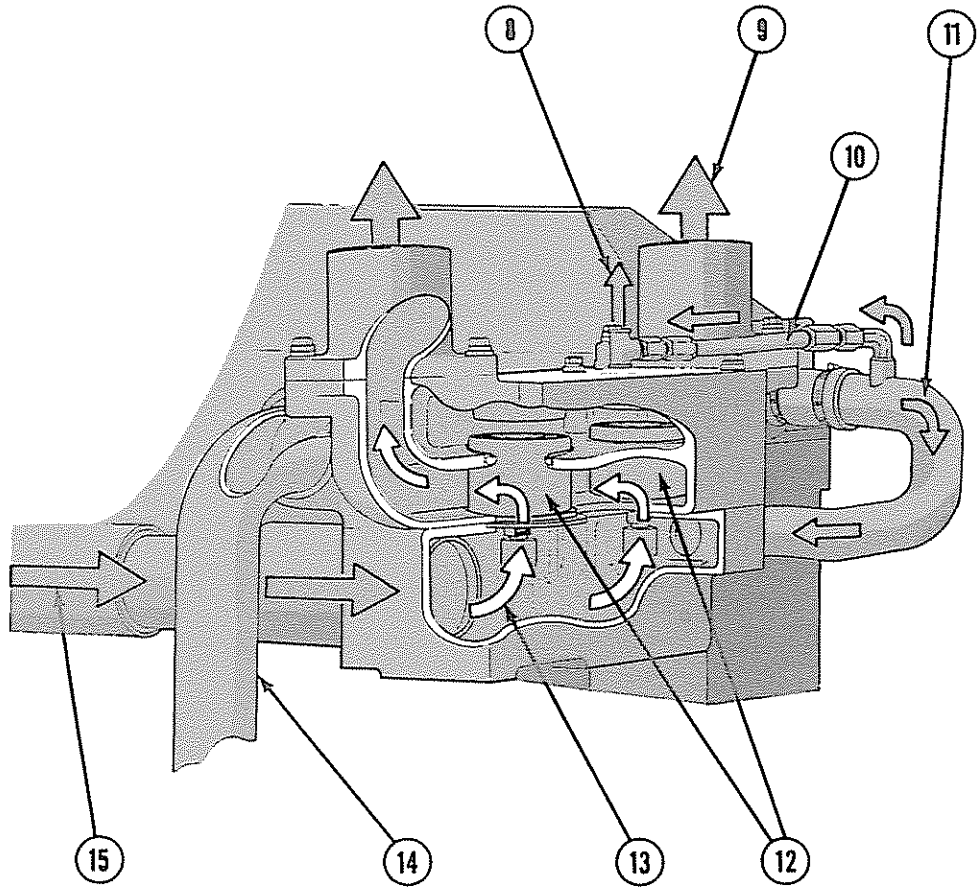
Coolant System Flow Diagram

1. Coolant to Aftercooler
2. Coolant Out of Aftercooler
3. Cylinder Liner
4. Water Pump
5. Coolant Bypass From Thermostat
6. Water Filter
7. Water Inlet

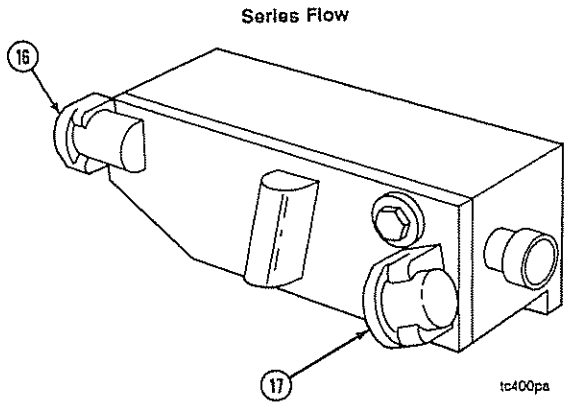


Coolant System Flow Diagram (Continued)

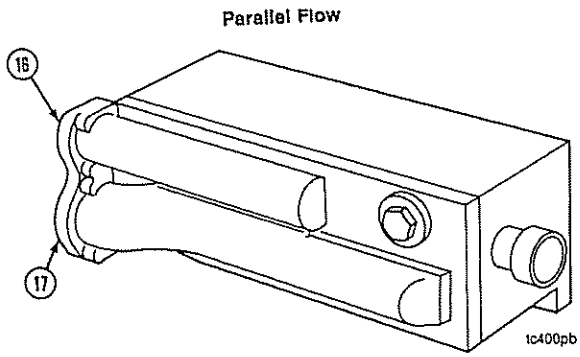
8. Vent to Radiator Top Tank
9. Coolant to Radiator
10. Vent Line From Aftercooler
11. Coolant Out of Aftercooler
12. Thermostats
13. Coolant Before Thermostats
14. Coolant Bypass
15. Coolant Manifold



Coolant System Flow Diagram (Continued)



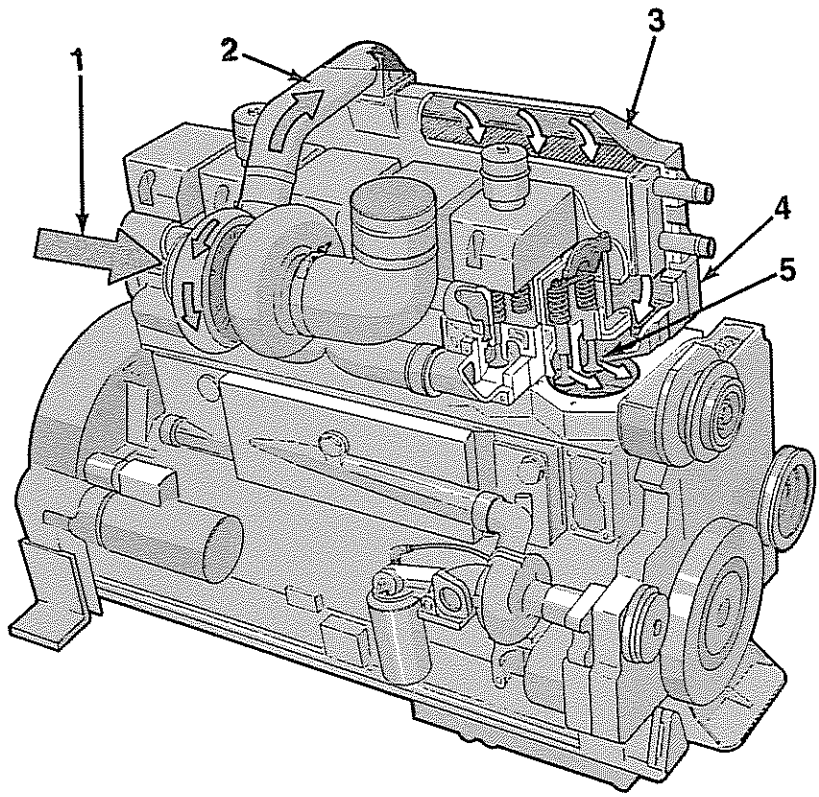
16. Converter Oil Inlet
17. Converter Oil Outlet



Combustion Air System Flow Diagram

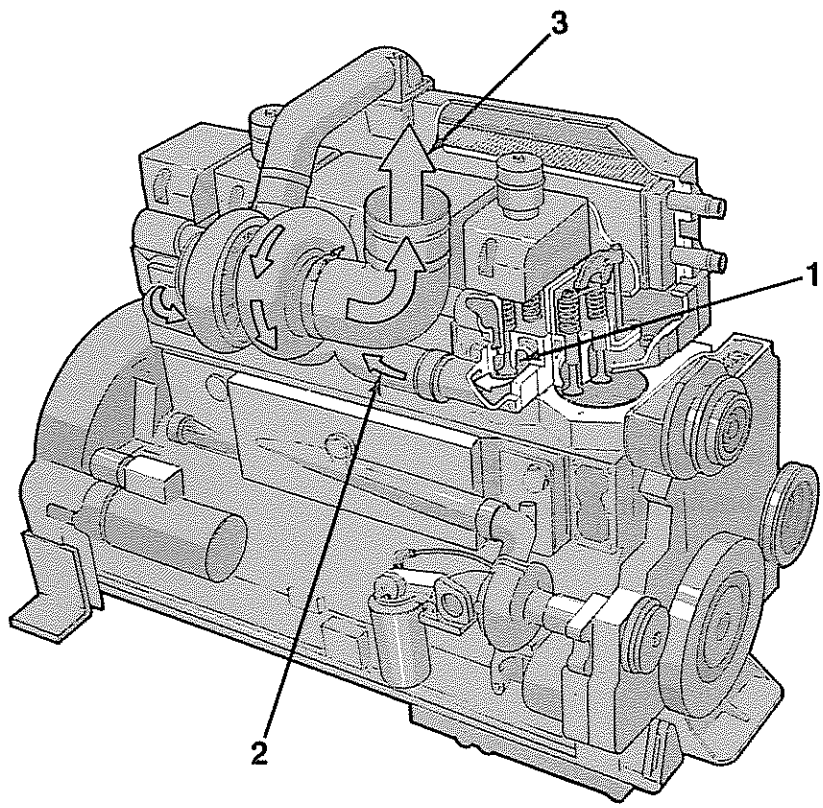
Intake System

1. Intake Air Inlet to Turbocharger
2. Turbocharger Air to Aftercooler
3. Aftercooler
4. Intake Manifold
5. Intake Valve Ports



Exhaust System

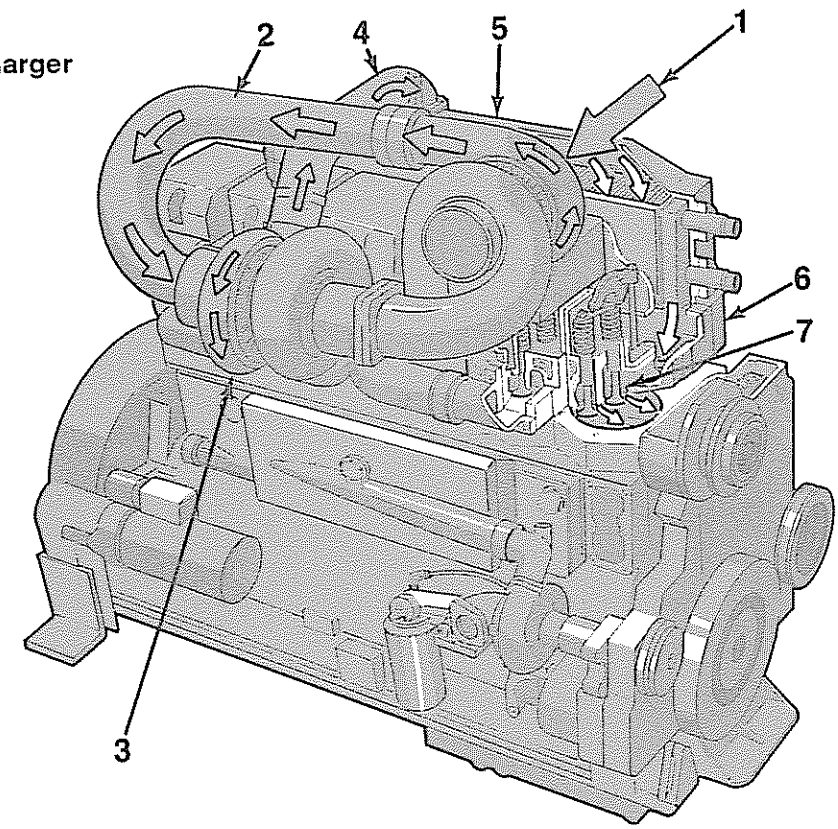
1. Exhaust Valve Ports
2. Exhauld Manifold
3. Turbocharger Exhaust Outlet



Combustion Air System Flow Diagram (Continued)

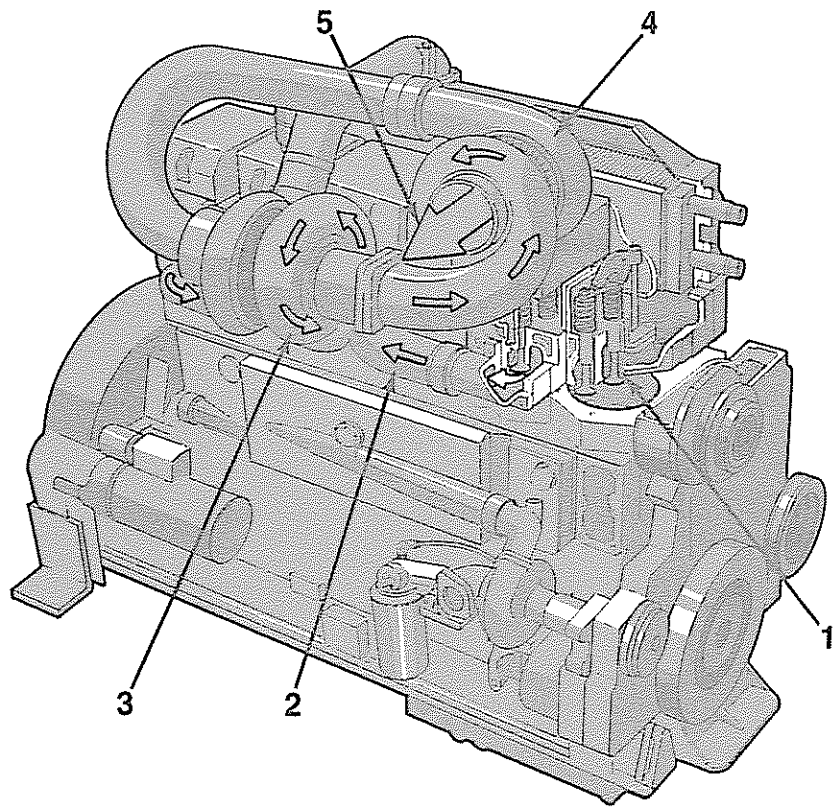
KTTA Intake

1. Intake Air Inlet to Turbocharger
2. Turbocharger Air to High Stage Turbocharger
3. High Stage Turbocharger
4. Turbocharger Air to Aftercooler
5. Aftercooler
6. Intake Manifold
7. Intake Valve Ports

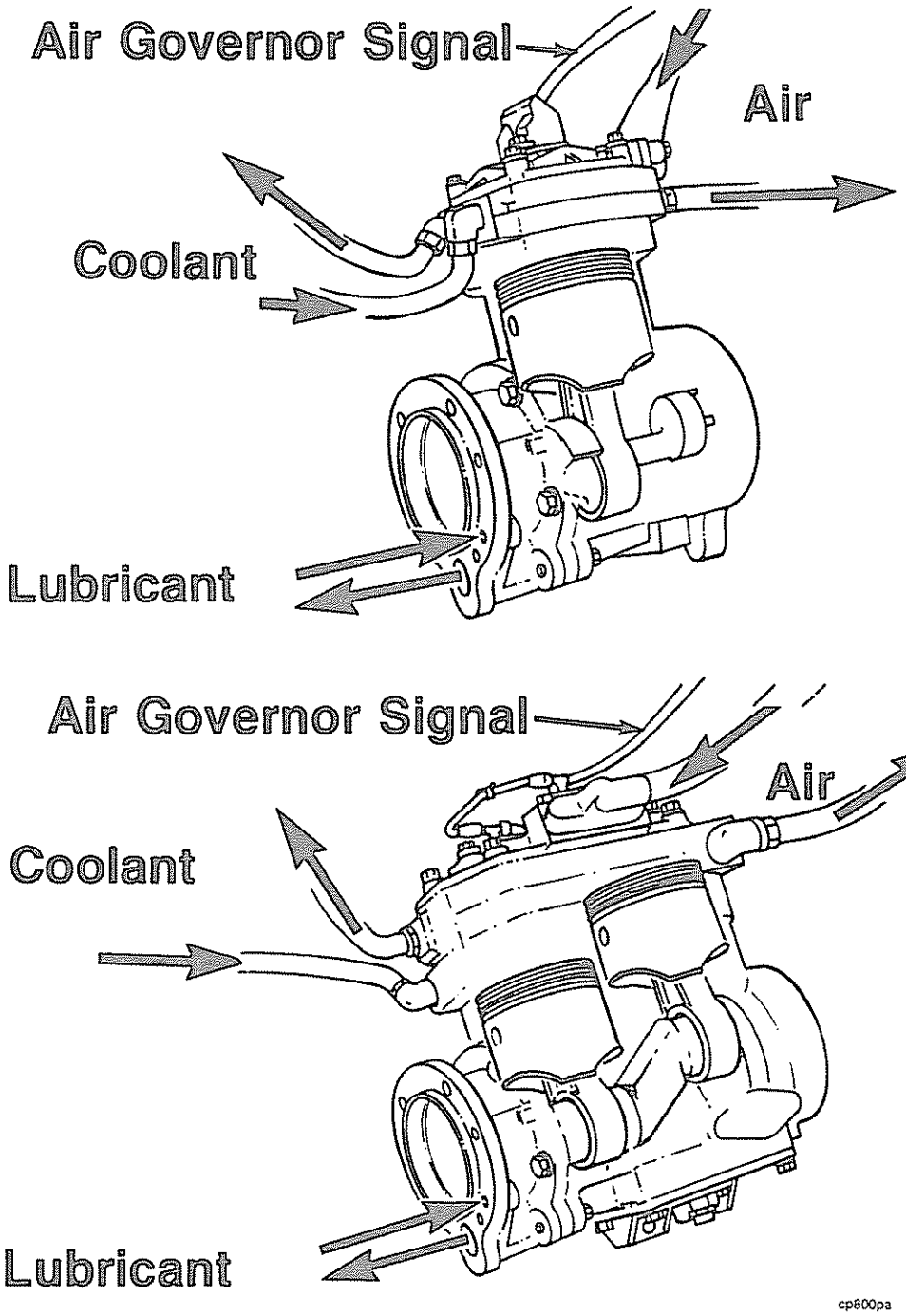


KTTA Exhaust

1. Exhaust Valve Ports
2. Exhaust Manifold
3. High Stage Turbocharger
4. Low Stage Turbocharger
5. Turbocharger Exhaust Outlet



Compressed Air System Flow Diagrams



Section T - Troubleshooting

Section Contents

Troubleshooting Guide for the Operator

This guide describes some typical engine operating problems, their causes, and some acceptable corrections to those problems. For more procedure information, refer to the K19 Troubleshooting and Repair Manual, Bulletin No. 3810307. Unless noted otherwise, the problems listed are those which an operator can diagnose and repair. See a Cummins Authorized Repair Location for diagnosis and repair of problems **not** listed.

Follow the suggestions below for troubleshooting:

- Study the problem thoroughly before acting.
- Refer to the engine system diagrams.
- Do the easiest and most logical things first.
- Find and correct the cause of the problem.

Procedures and Techniques

A thorough analysis of the customer's complaint is the key to successful troubleshooting. The more information known about a complaint, the faster and easier the problem can be solved.

The Troubleshooting Symptoms Charts are organized so that a problem can be located and corrected by doing the easiest and most logical things first. Complete all steps in the sequence shown from top to bottom.

It is **not** possible to include all the solutions to problems that can occur; however, these charts should stimulate a thought process that will lead to the cause and correction of the problem.

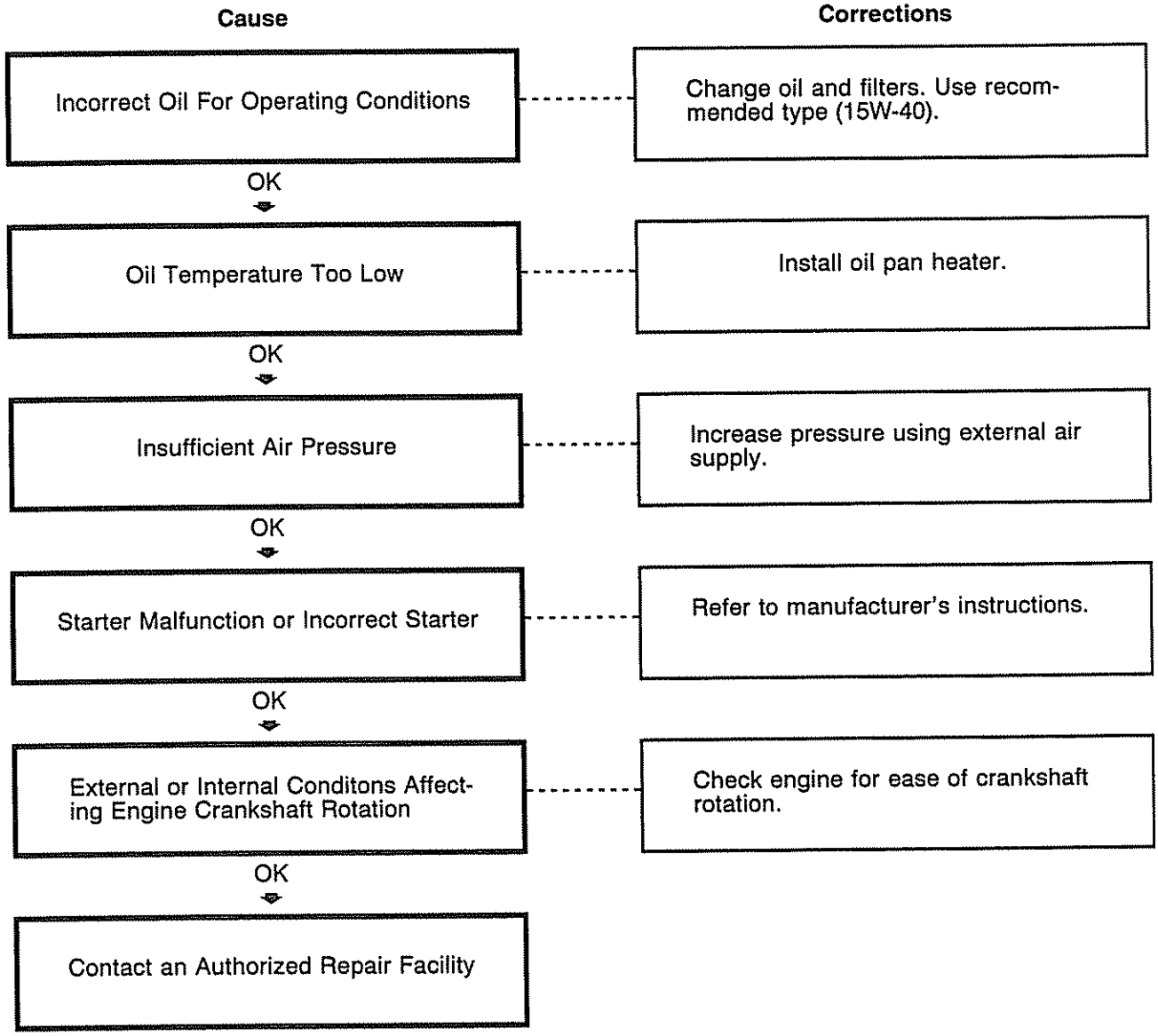
Follow these basic troubleshooting steps:

- Get all the facts concerning the complaint.
- Analyze the problem thoroughly.
- Relate the symptoms to the basic engine systems and components.
- Consider any recent maintenance or repair action that may relate to the problem.
- Double-check before beginning any disassembly.
- Solve the problem by using the logic charts and doing the easiest things first.
- Determine the cause of the problem and make a thorough repair.
- After repairs have been made, operate the engine to make sure the cause of the problem has been corrected.

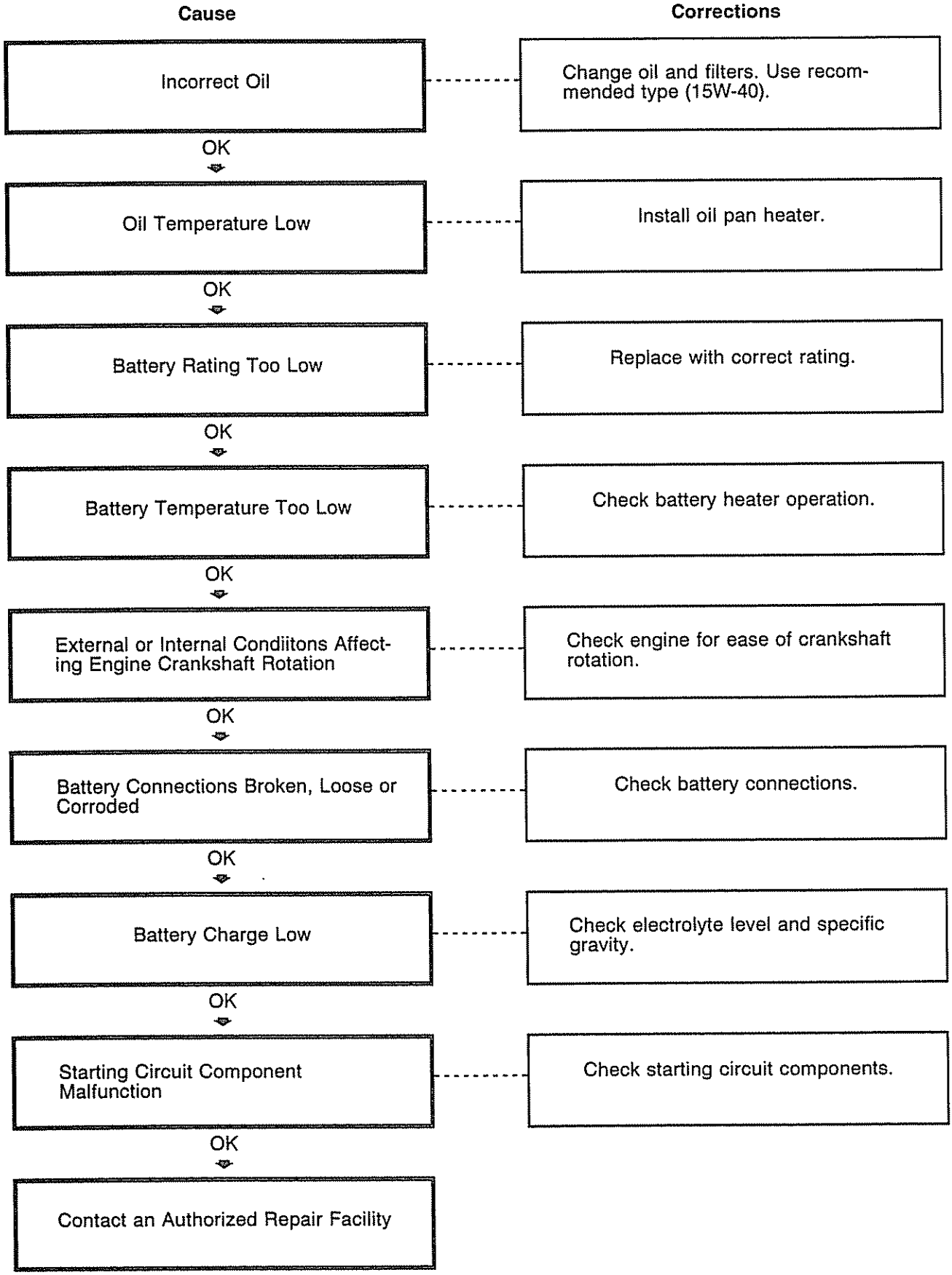
Troubleshooting Symptoms Charts

Use the charts on the following pages of this section to aid in diagnosing specific engine problems. Read each row of blocks from top to bottom. Follow the arrows through the chart to identify the corrective action.

Engine Will Not Crank or Cranks Slowly (Air Starter)



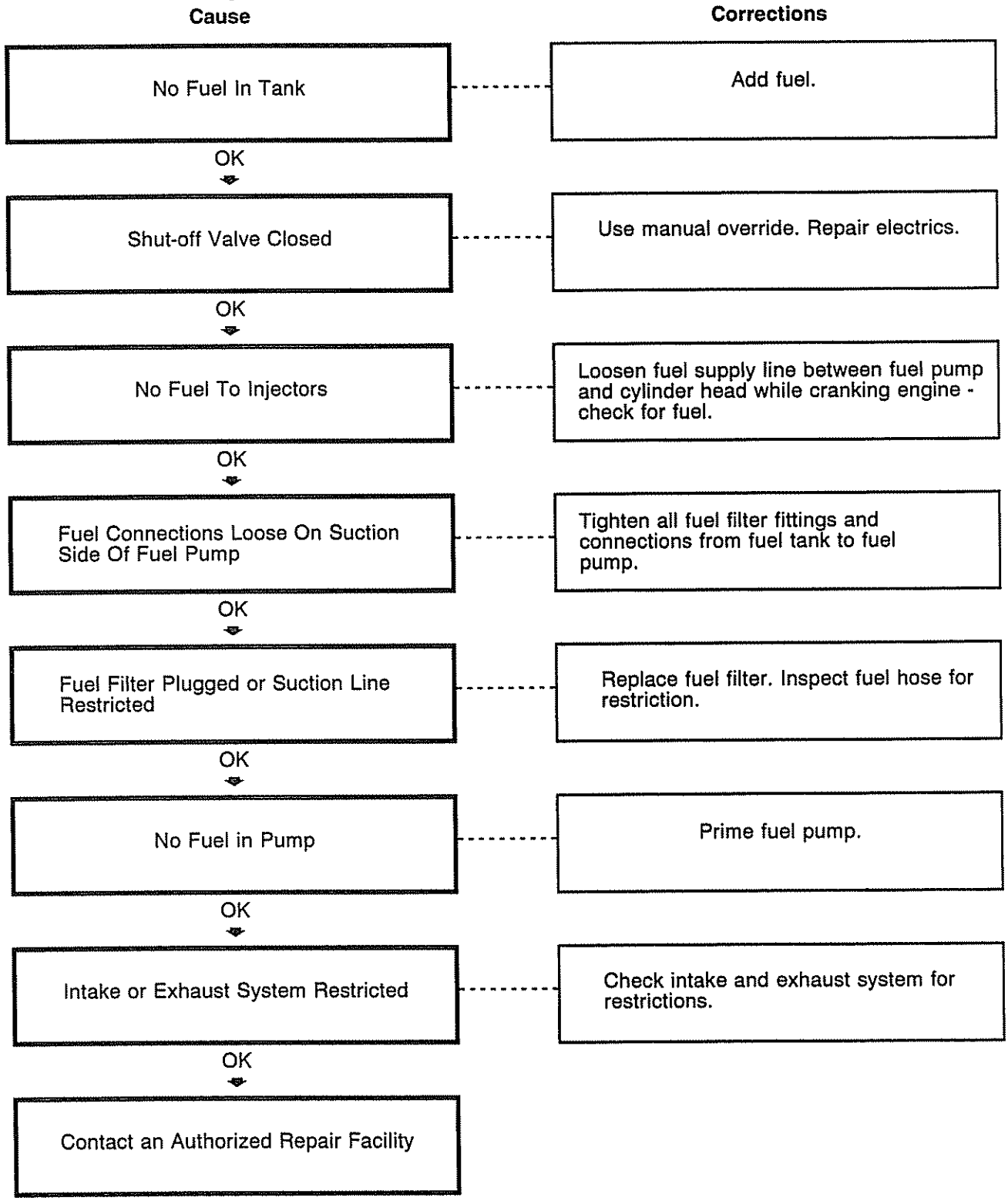
Engine Will Not Crank or Cranks Slowly (Electric Starter)



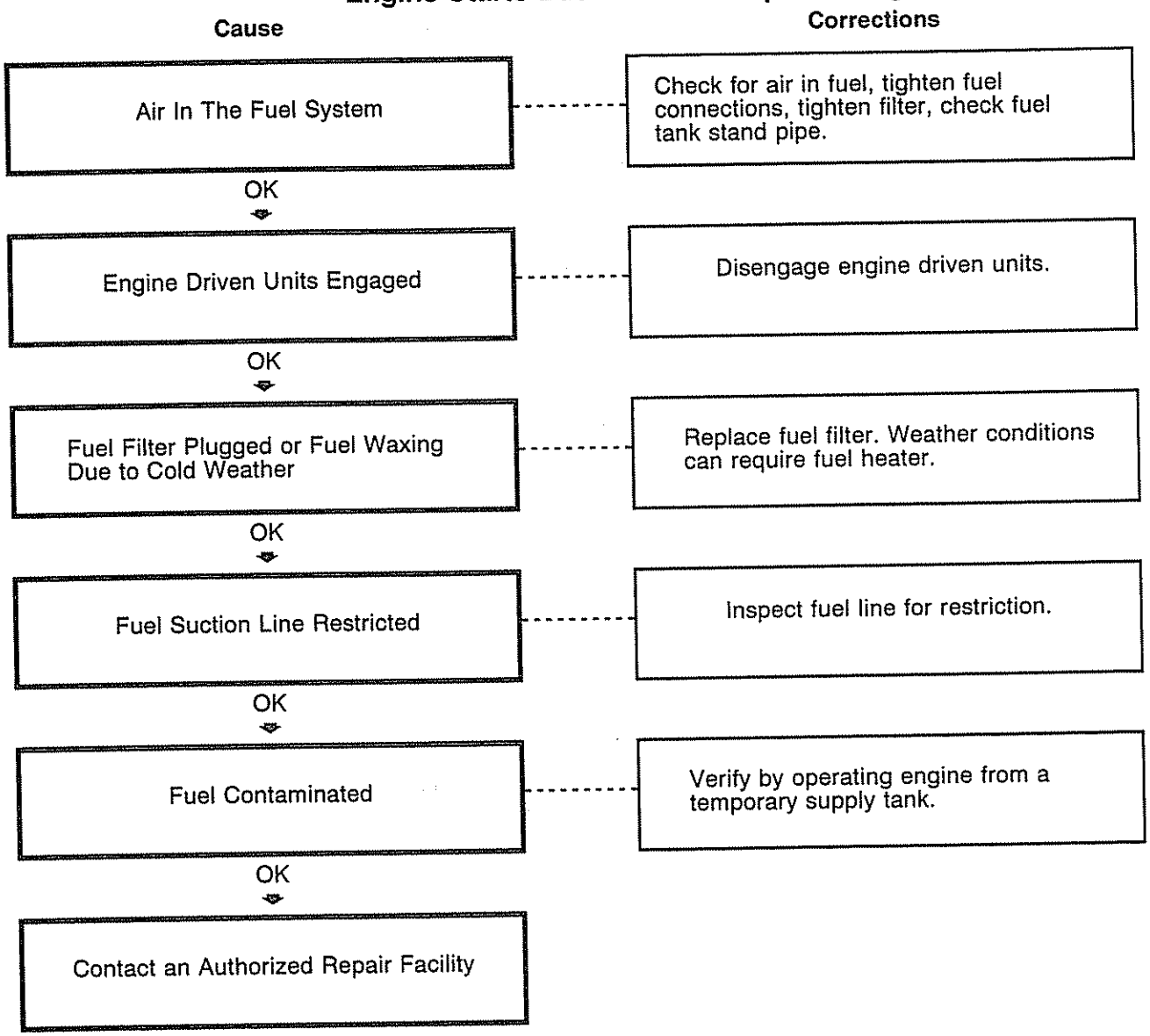
Engine Hard to Start or Will Not Start (Exhaust Smoke Present)

Cause	Corrections
Engine Cranking Speed Low (Below 150 RPM)	Check engine starting system.
OK ⇩	
Engine Driven Units Engaged	Disengage engine driven units.
OK ⇩	
Cold Start Aid Needed or Not Working Correctly	Install cold start aid. Check, repair, or replace if necessary.
OK ⇩	
Fuel Filter Plugged	Replace fuel filter.
OK ⇩	
Air in the Fuel System	Check for air in fuel, tighten fuel connections and filter, check fuel tank stand pipe.
OK ⇩	
Fuel Suction Line Restricted	Check fuel line for restrictions.
OK ⇩	
Intake Air System Restricted	Check intake air system for restrictions.
OK ⇩	
Fuel Contaminated	Verify by operating engine from a temporary supply tank.
OK ⇩	
Contact an Authorized Repair Facility	

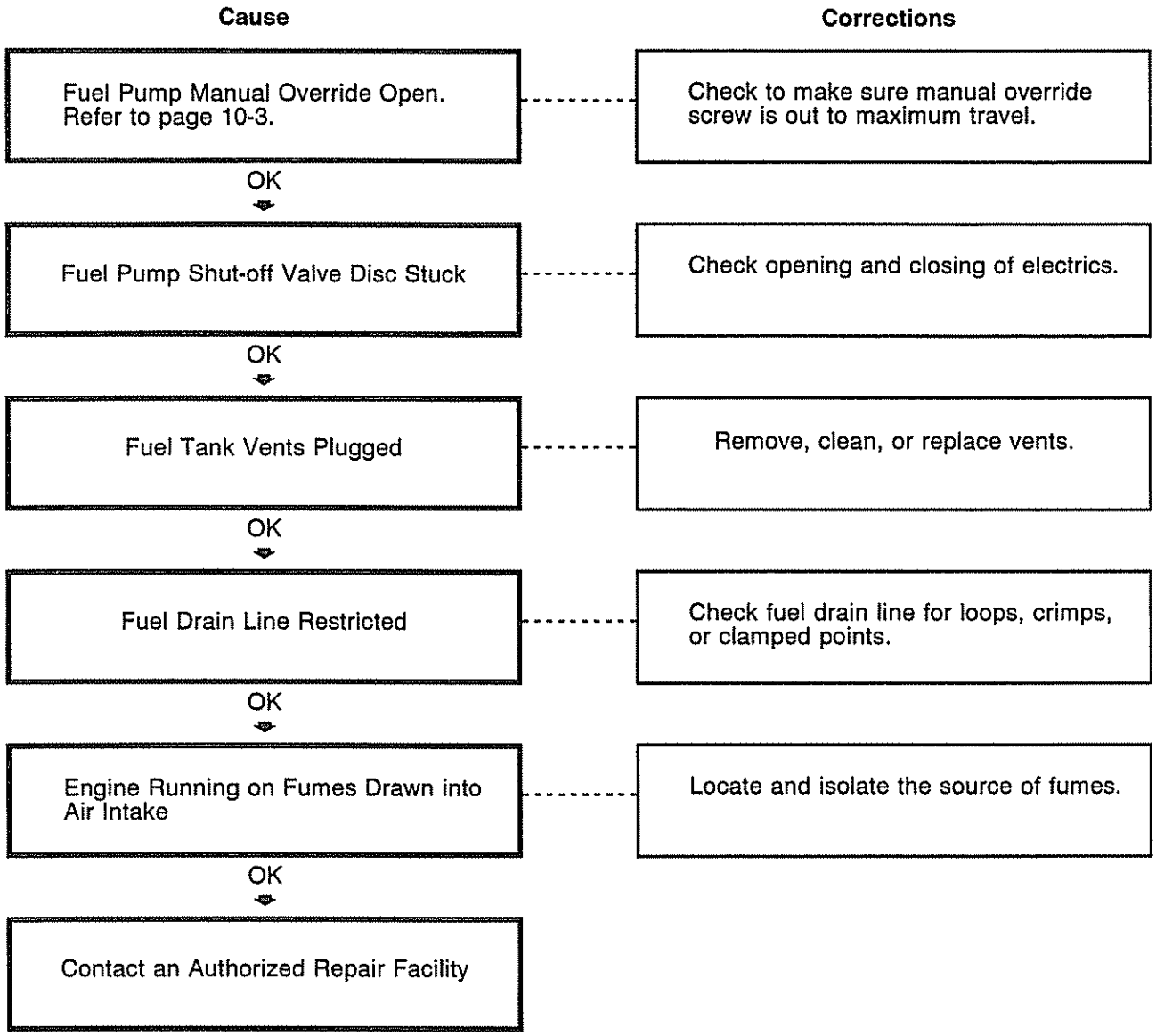
Engine Cranks But Will Not Start (No Smoke From Exhaust)



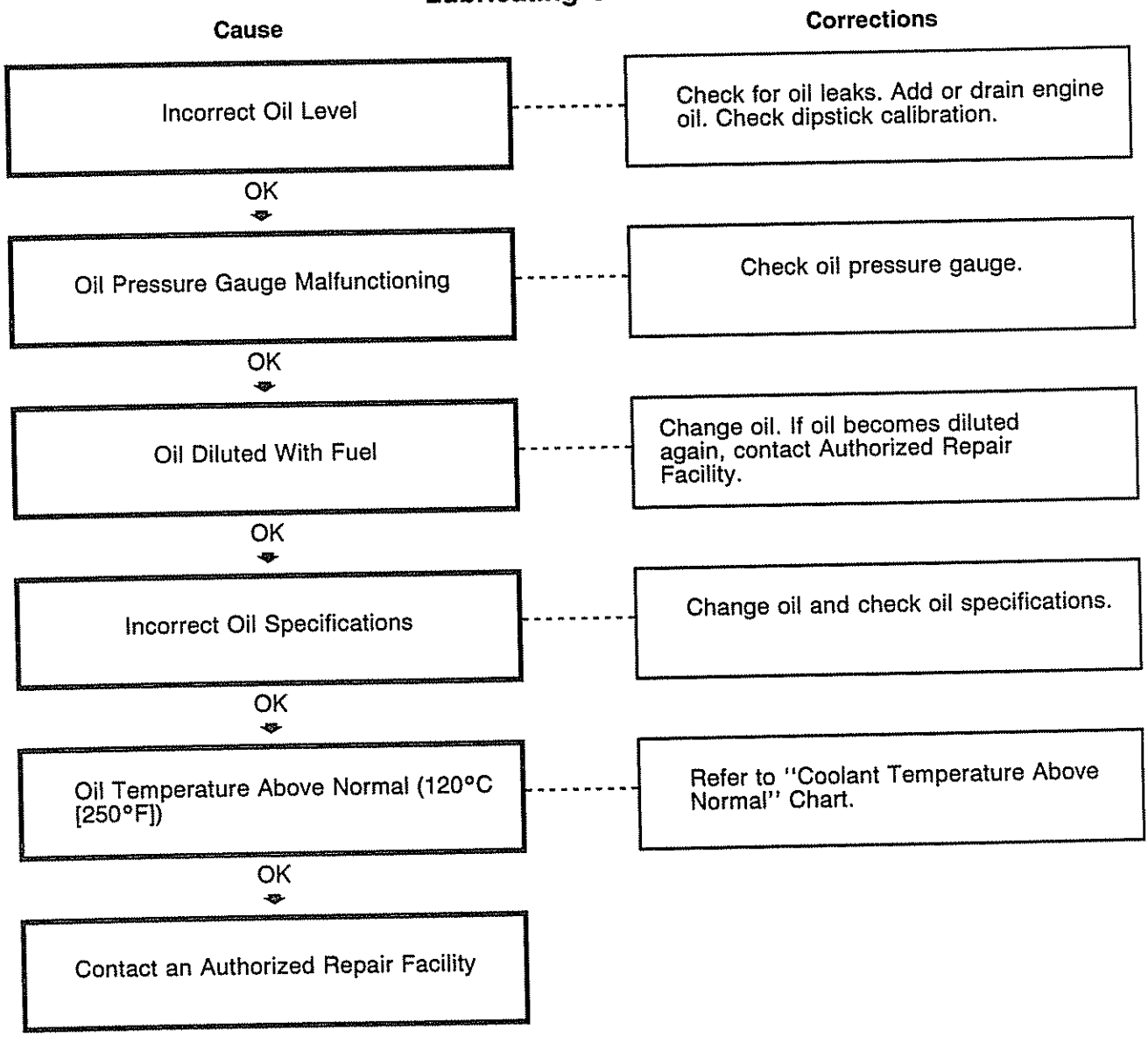
Engine Starts But Will Not Keep Running



Engine Will Not Shut Off



Lubricating Oil Pressure Low

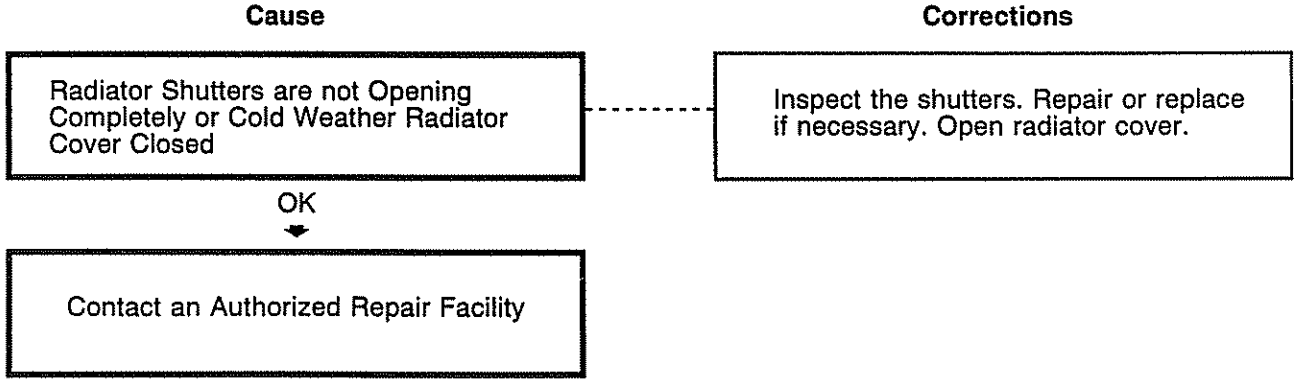


Coolant Temperature Above Normal

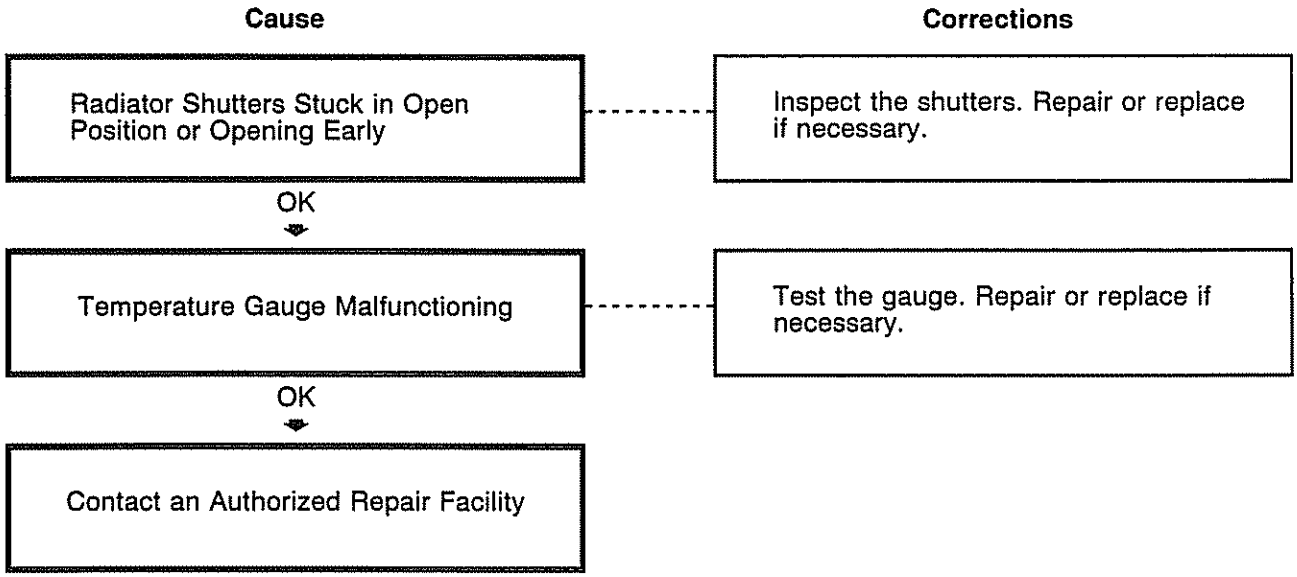
Cause	Corrections
Low Coolant Level	Add coolant.
OK ⇩	
Radiator Fins Damaged or Obstructed with Debris	Inspect radiator fins. Clean or repair if necessary.
OK ⇩	
Collapsed or Restricted Radiator Hose	Inspect hoses. Replace if necessary.
OK ⇩	
Loose Fan Drive Belt	Check belt tension and tighten if necessary.
OK ⇩	
Incorrect Oil Level	Add or drain engine oil. Check dipstick calibration.
OK ⇩	
Cooling Fan Shroud Damaged or Missing	Inspect shroud. Repair, replace, or install.
OK ⇩	
Incorrect or Malfunctioning Radiator Cap	Check the radiator cap. Replace if necessary.
OK ⇩	
Temperature Gauge Malfunctioning	Test the gauge. Repair or replace if necessary.
OK ⇩	

(Continued)

Coolant Temperature Above Normal (Continued)



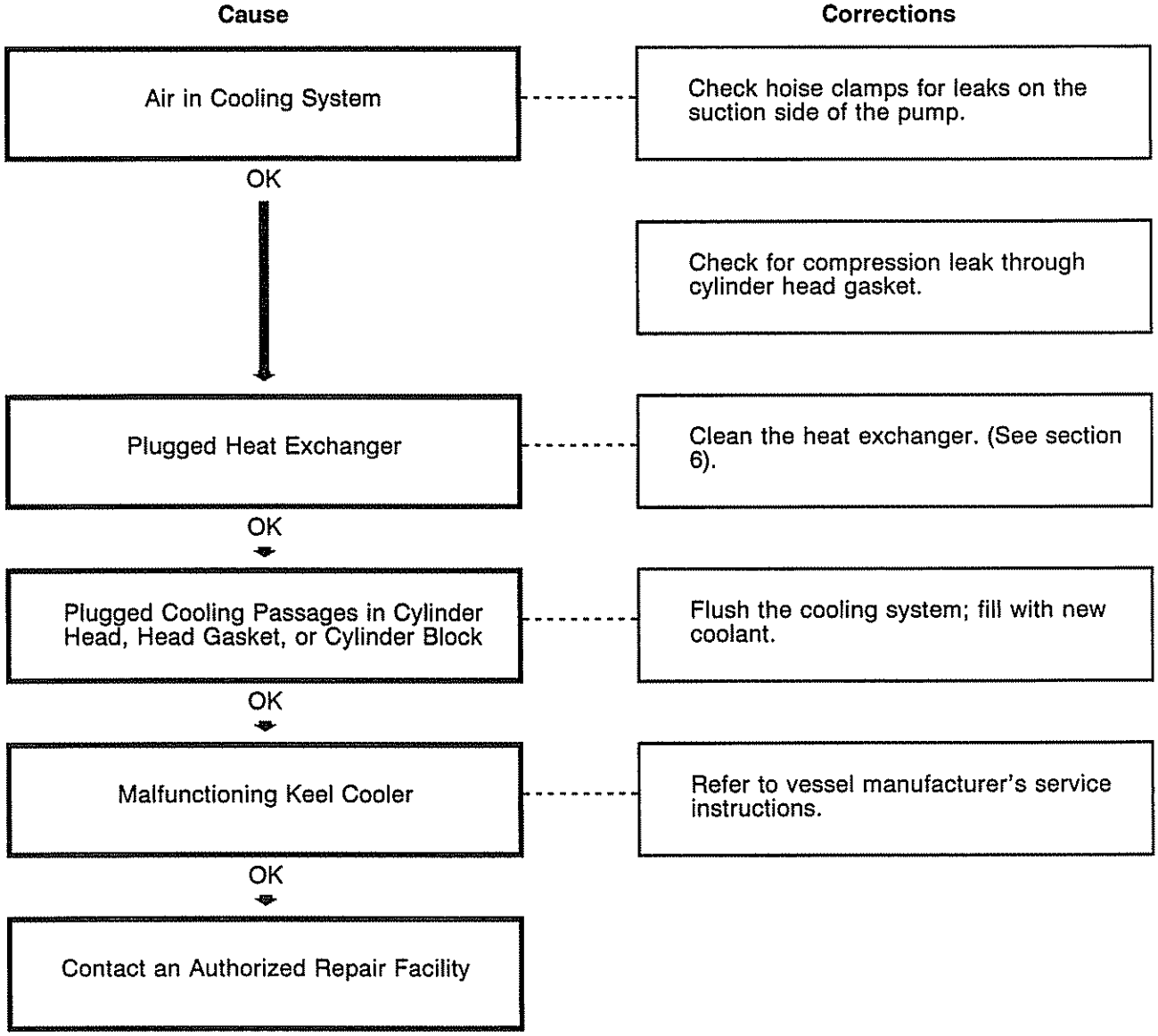
Coolant Temperature Below Normal



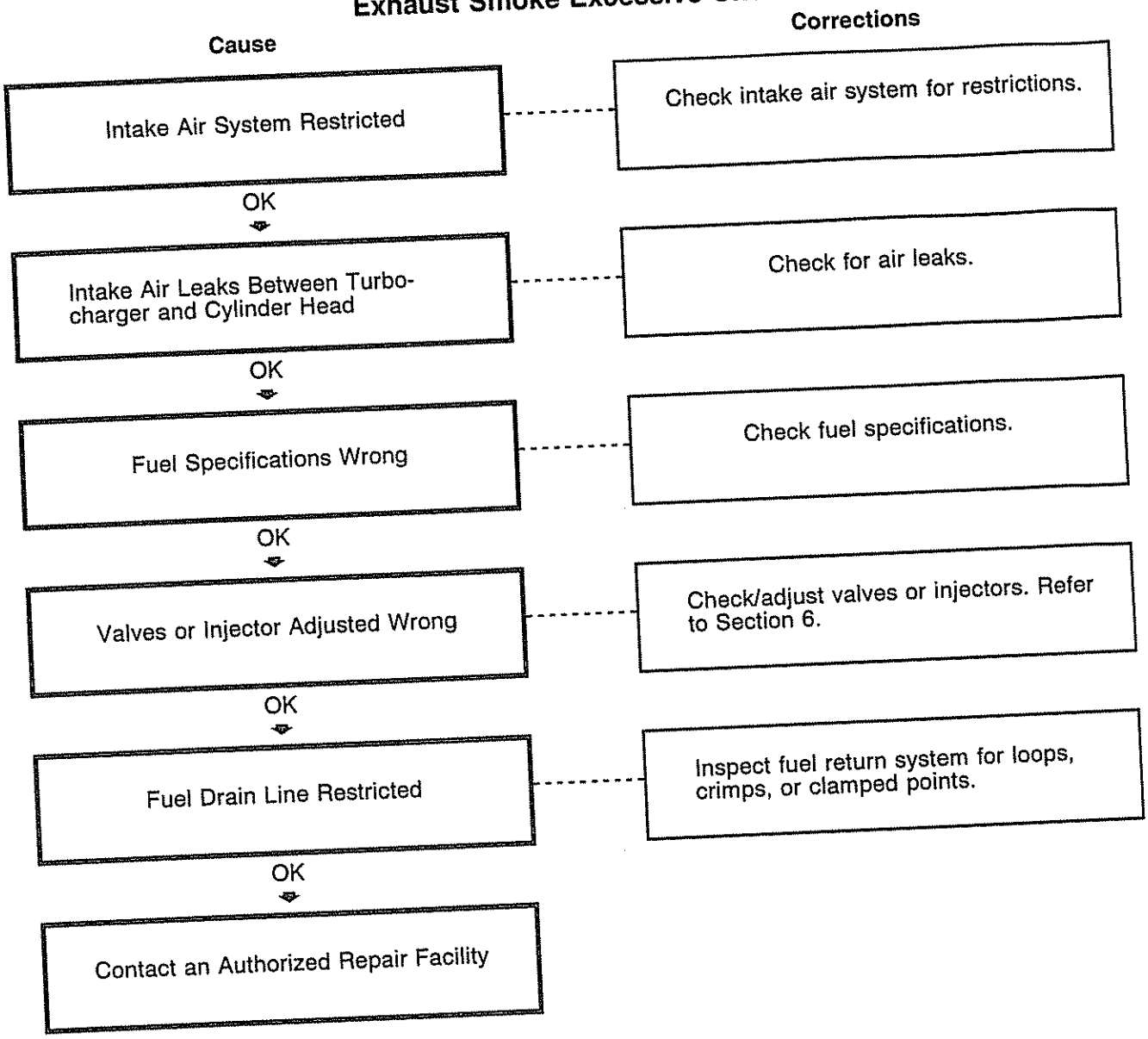
Coolant Temperature Above Normal (Marine)

Cause	Corrections
Low Coolant Level	Add coolant.
OK	
Air Trapped in Coolant	Vent the cooling system to remove air/check engine vent lines.
OK	
Improper Oil Level	Add/drain oil to the proper level.
OK	
Malfunctioning Sea (Raw) Water Pump	Check/replace pump.
OK	
Incorrect/Malfunctioning Pressure Cap	Replace cap with one rated at 48 kPa [7 psi].
OK	
Malfunctioning Temperature Sensor or Gauge	Check/replace temperature sensor/gauge.
OK	
Malfunctioning/Incorrect Thermostat	Check/replace the thermostat.
OK	
Malfunctioning Engine Water Pump	Check/correct water pump.
OK	

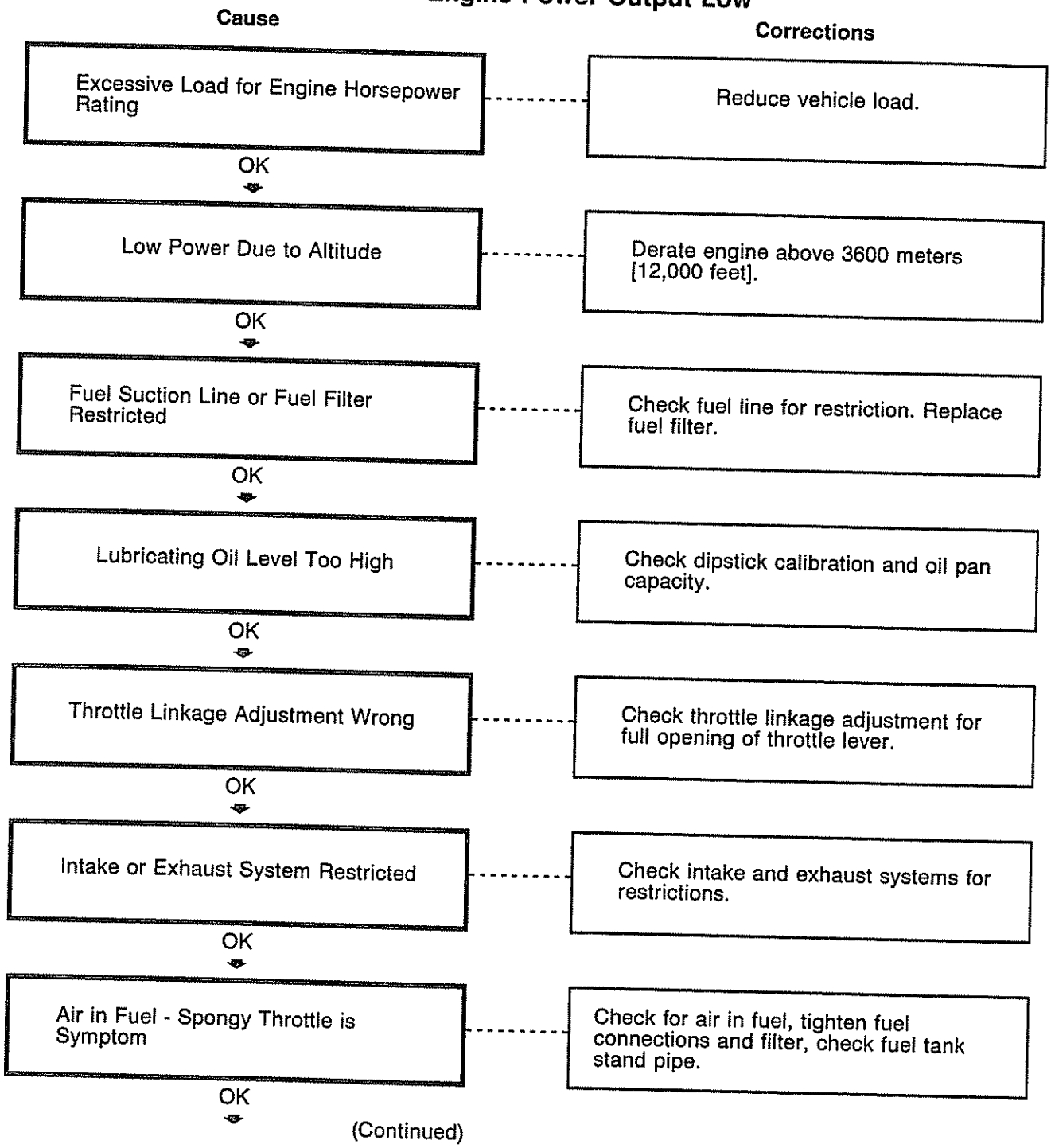
Coolant Temperature Above Normal (Marine) (Continued)



Exhaust Smoke Excessive Under Load

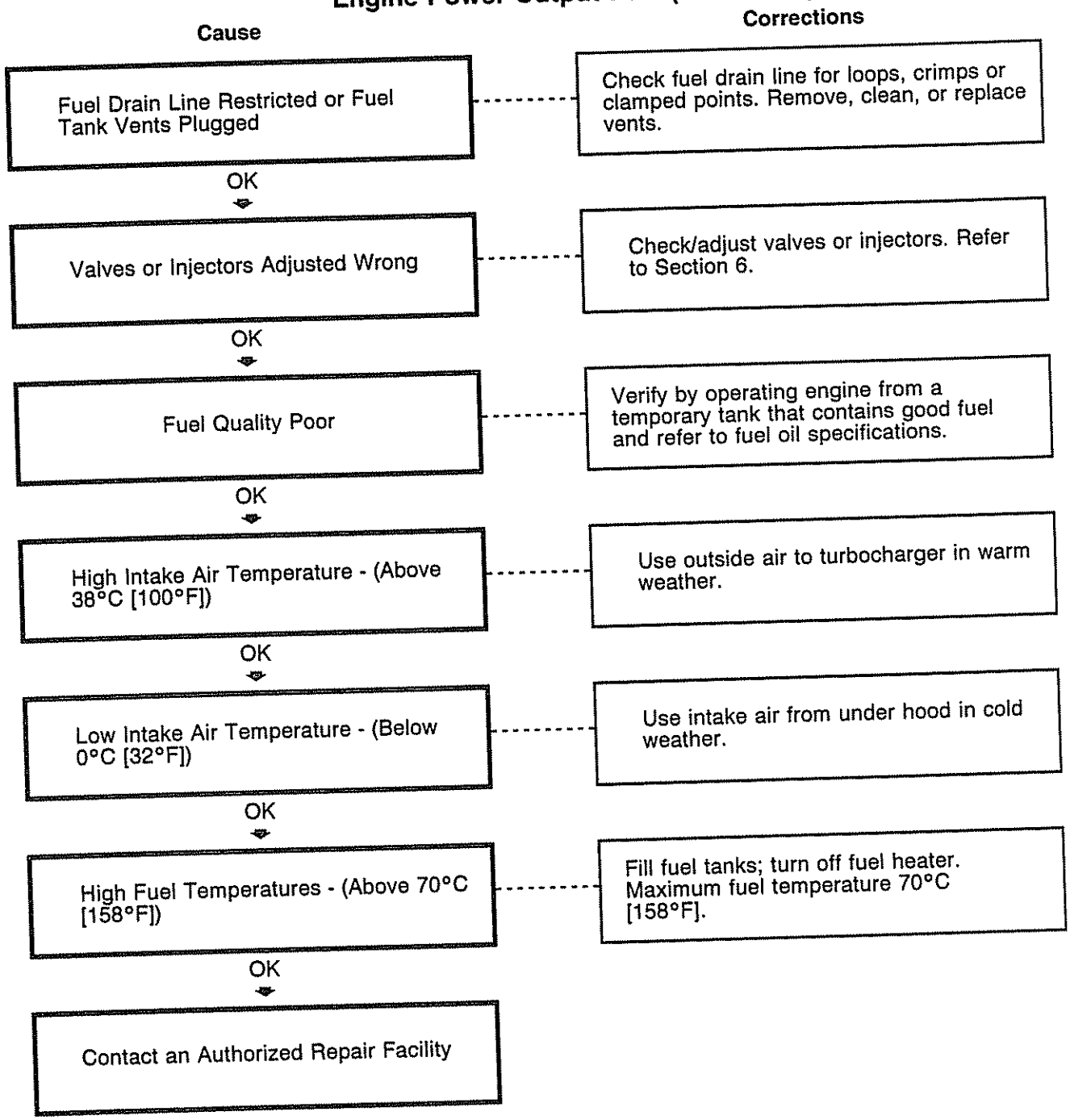


Engine Power Output Low

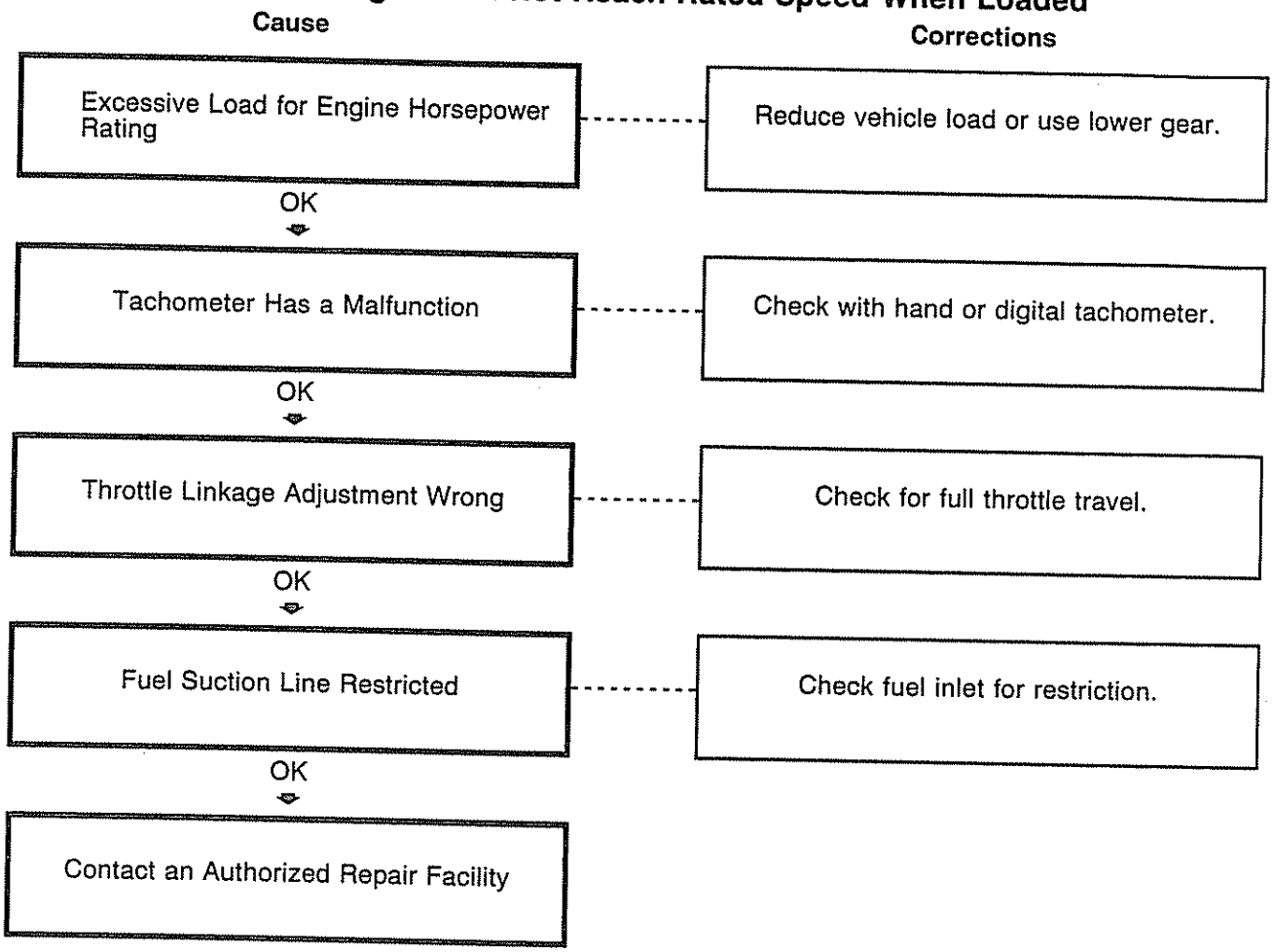


(Continued)

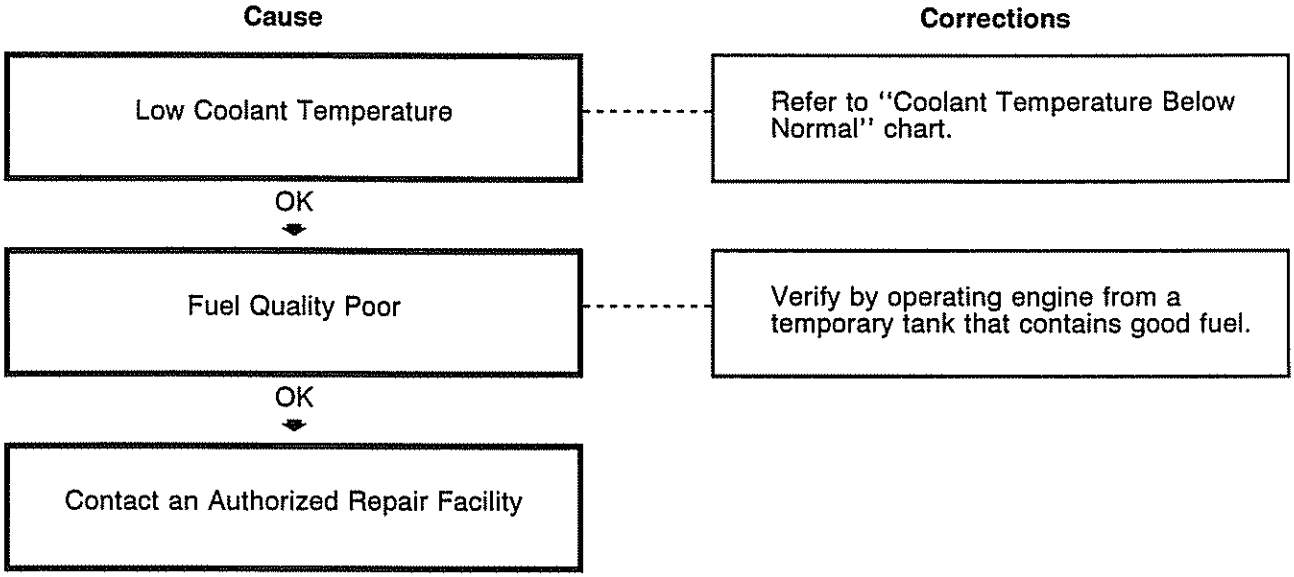
Engine Power Output Low (Continued)



Engine Will Not Reach Rated Speed When Loaded



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



Section A - Adjustment, Repair, and Replacement

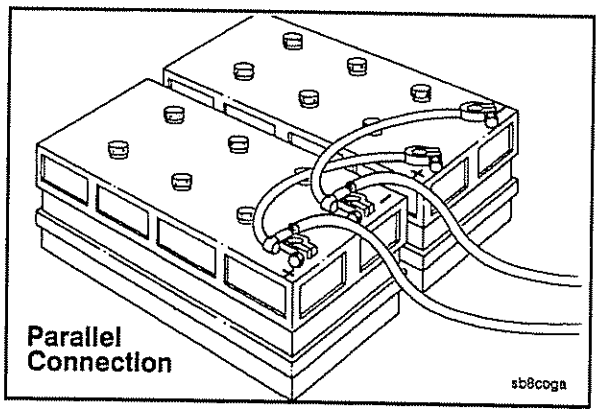
Section Contents

Air Starting Motors

The air starting motor system (tanks, line sizes, and valves) is designed and installed by the original equipment manufacturers and the starting motor suppliers. Refer any questions about the air starting systems to the manufacturer.

Maintenance

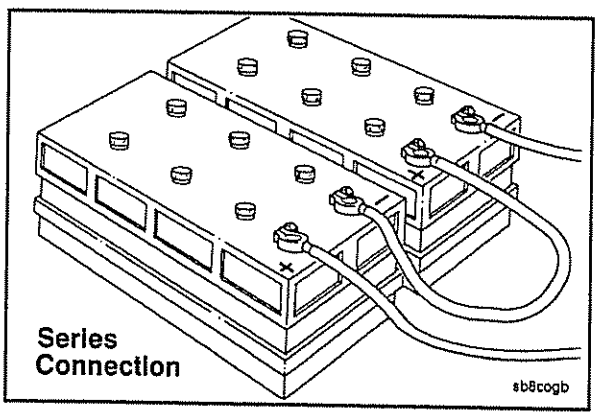
- Do **not** operate the air starting motor with air pressure lower than 480 kPa [70 psi].
- Maintain the air compressor according to the recommendations outlined in the manual.
- For manimum efficiency, the hoses, tubes, and lines **must not** leak.
- Refer to the original equipment manufacturers' and starting motor manufacturers' manuals for specific information regarding the starting motors, valves, and systems.



Battery Connections

Caution: When using jumper cables to start the engine, make sure to connect the cables in parallel: positive (+) to positive (+) and negative (-) to negative (-). When using an external electrical source to start the engine, turn the disconnect switch to the OFF position and remove the key before attaching the jumper cables.

The accompanying illustration shows a typical **parallel** battery connection. This arrangement doubles the cranking amperage.



This illustration shows a typical **series** battery connection. This arrangement, positive to negative, doubles the voltage.

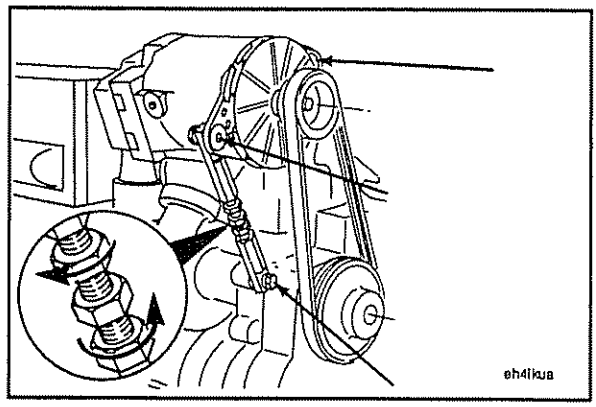
Alternator Belt

Adjust

NOTE: The lower jam nut has left-hand threads.

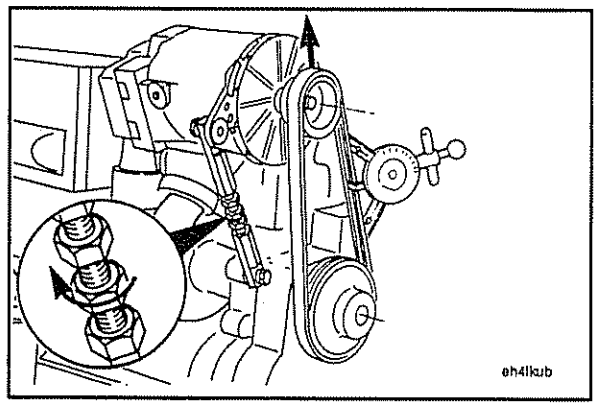
Loosen the alternator and adjusting link mounting capscrews.

Loosen the jam nuts on the adjusting screw.



Turn the adjusting screw **clockwise** to tighten the belt tension.

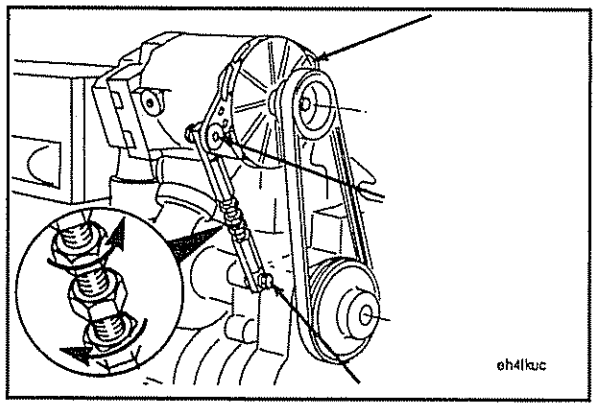
Belt tension: 225 N•m [165 ft-lb]



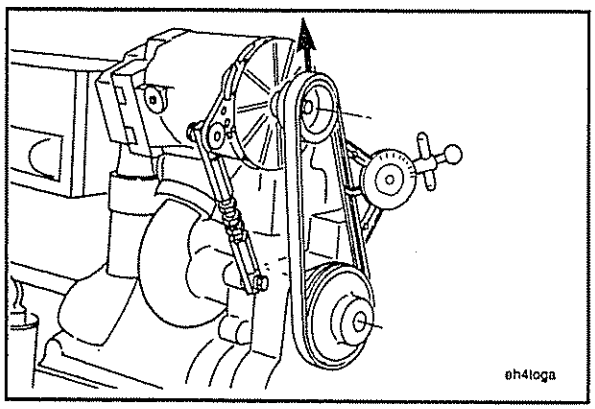
NOTE: The lower jam nut has left-hand threads.

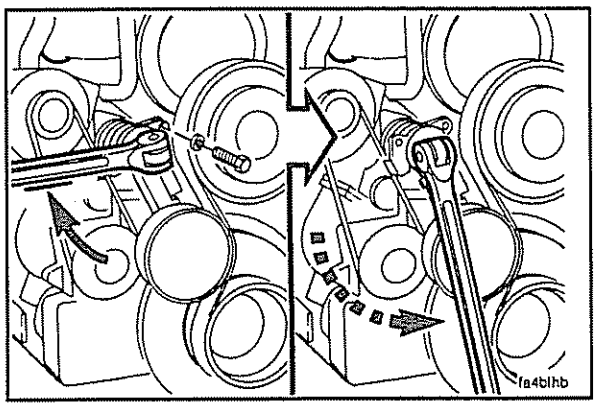
Tighten the jam nuts on the adjusting screw to 55 N•m [40 ft-lb].

Tighten the adjusting link and alternator mounting capscrews to 55 N•m [40 ft-lb].



Check the belt tension again to make sure the tension is correct.





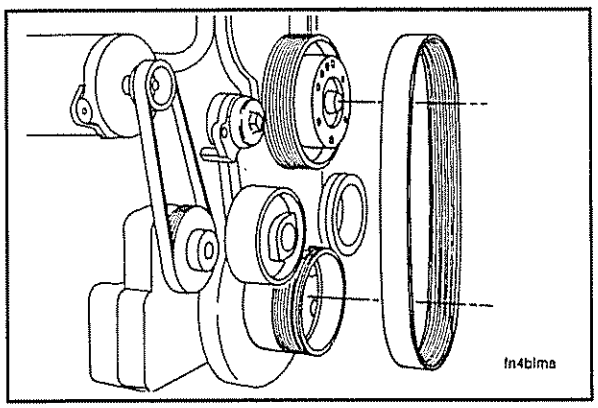
Fan Belt - Replace

Remove

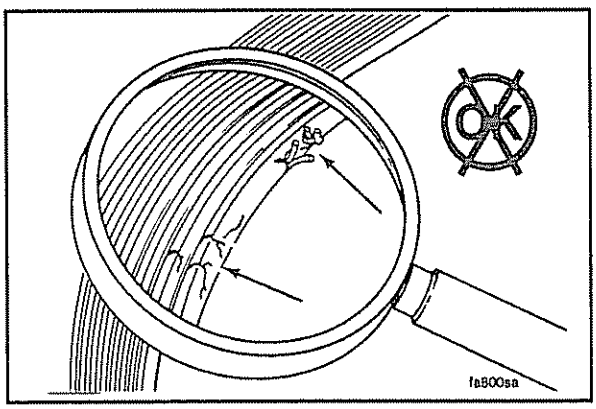
Caution: The fan belt idler is under tension. Do NOT allow your hands to get between the idler and the belt, or the fan hub. Personal injury can result.

Use an 8-point socket and breaker bar or large wrench. Hold the idler in position against the spring tension and remove the capscrew.

Slowly turn the wrench until the spring tension is relieved.



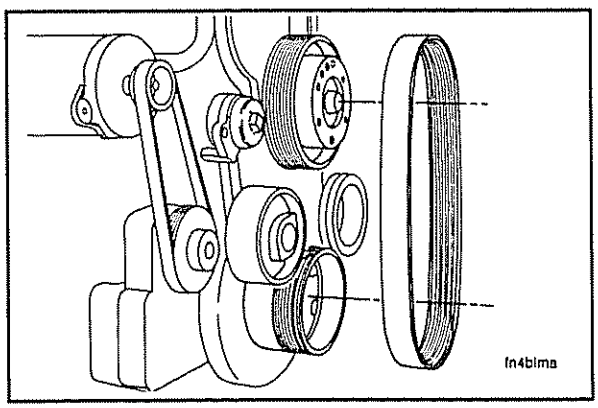
Remove the fan belt.



Check for Reuse

Visually check the belt for:

- Cracks
- Glazing
- Tears or cuts



Install

Caution: The fan belt idler is under tension. Do NOT allow your hands to get between the idler and the belt, or the fan hub. Personal injury can result.

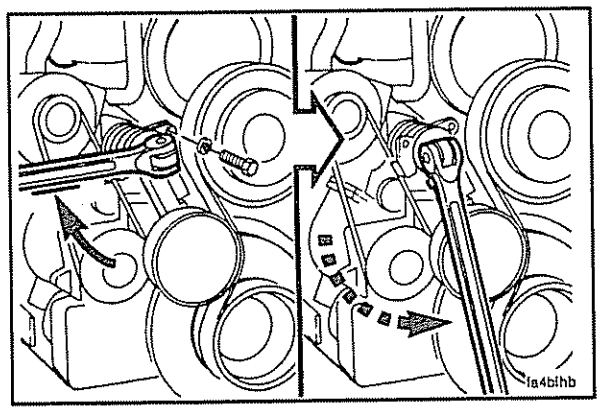
Install the belt.

Rotate the idler against the spring tension until the capscrew holes are aligned. Install the capscrew.

Tighten the capscrew.

Torque Value: 45 N•m [35 ft-lb]

Slowly turn the wrench until the idler is against the belt.

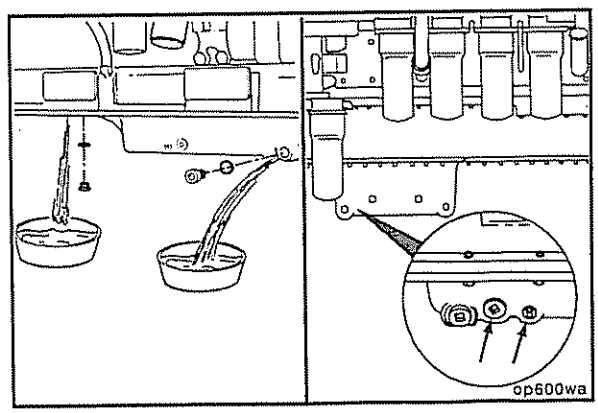


Storage for Engines Out of Service

If the engine will be out of service longer than 6 months, take special precautions to prevent rust. Contact the nearest Cummins Authorized Repair Location, or refer to the Engine Shop Manual, Bulletin No. 3810263, for information concerning engine storage procedures.

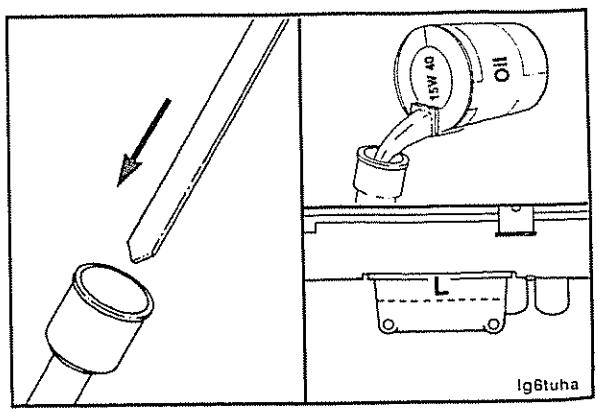
Dipstick - Calibrate

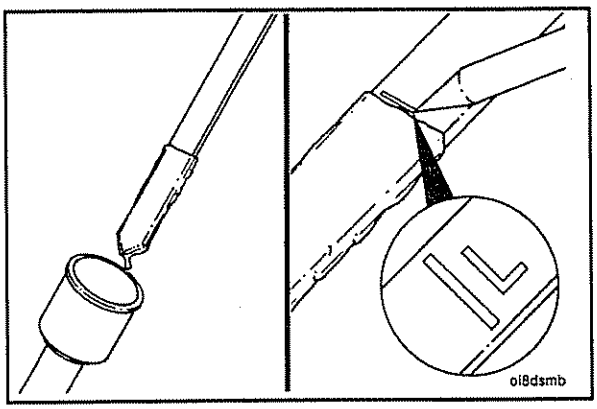
Drain the oil from the oil pan. Refer to Section V for the oil pan capacity.



Install the dipstick in the dipstick tube housing.

Use clean 15W-40 oil to fill the oil pan to the specified **low** level.

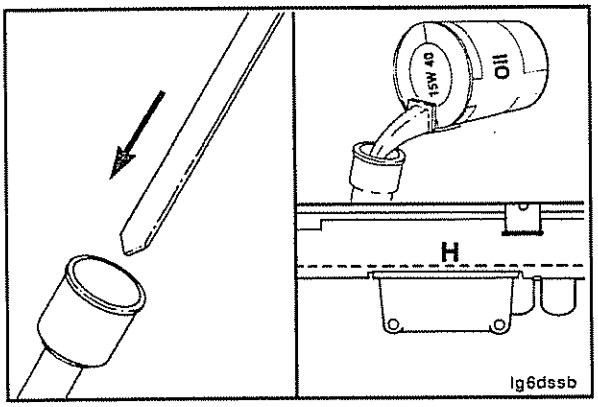




Remove the dipstick and scribe a mark across the dipstick at the oil level. Mark the **low** oil level with a **L**.

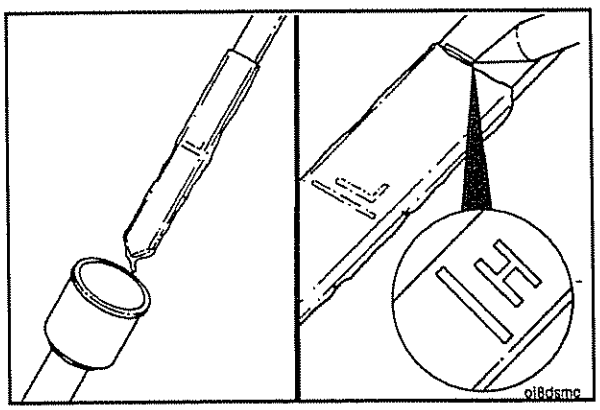
NOTE: The dipstick will break if the scribe mark is too deep.

NOTE: When checking the dipstick calibration, the dipstick mark is acceptable if the oil level is within 3.2 mm [1/8-inch] of the mark on the dipstick.



Install the dipstick tube.

Add additional oil to the oil pan to specified **full** level. Refer to the lubricating oil system specifications in Section V.



Remove the dipstick and scribe a mark across the dipstick at the oil level. Mark the **high** oil level with an **H**.

NOTE: When checking the dipstick calibration, the dipstick mark is acceptable if the oil level is within 3.2 mm [1/8-inch] of the mark on the dipstick.

Section V - Specifications and Torque Values

Section Contents

Specifications and Torque Values

Engine Specifications

General Specifications

NOTE: For performance and fuel rate values, refer to the engine data sheet, or the fuel pump code for the particular model involved.

Engine Speed ..... Refer to the fuel pump calibration data for optional speed rating

Displacement ..... 18.7 liters [1150 C.I.D.]

Bore and stroke ..... 158.75 mm x 158.75 mm [6.25 in x 6.25 in]

Engine Weight

- Dry ..... 1720 kg [3800 lb]
- Wet ..... 1800 kg [3965 lb]

Firing order 1-5-3-6-2-4

Valve and injector settings:

- Intake valve adjustment ..... 0.36 mm [0.014 in]
- Intake valve limits ..... 0.28 to 0.43 mm [0.011 to 0.017 in]
- Exhaust valve adjustment ..... 0.69 mm [0.27 in]
- Exhaust valve limits ..... 0.60 to 0.76 mm [0.024 to 0.030 in]
- PTD Non-Top Stop injector travel adjustment ..... 7.72 mm [0.304 in]
- PTD Non-Top Stop injector travel limits ..... 7.67 to 7.77 mm [0.302 to 0.306 in]
- HVT Non-Top Stop injector travel adjustment ..... 10.24 mm [0.403 in]
- HVT Non-Top Stop injector travel limits ..... 10.18 to 10.29 mm [0.401 to 0.405 in]
- STC Top Stop injector adjustment (in engine) (OBC method) ..... 10 N•m [90 in-lb]
- STC Top Stop injector travel limit (total travel in engine) ..... 10.18 to 10.29 mm [0.401 to 0.405 in]
  - with high lift cam and injectors ..... 12.47 to 12.57 mm [0.491 to 0.495 in]

Compression Ratio:

- KT 15.5:1
- KTA ..... 14.5:1 or 15.5:1
- KTA-C(700) 13.8:1
- KTTA ..... 13.8:1 or 13.9:1

Crankshaft Rotation (viewed from the front of the engine) ..... Clockwise

Fuel System

NOTE: For performance and fuel rate values, refer to the engine data sheet, or the fuel pump code for the particular model involved.

Maximum Allowable Restriction to Pump:

- With Clean Filter ..... 100 mm Hg [4 in Hg]
- With Dirty Filter ..... 200 mm Hg [8 in Hg]

Maximum Allowable Return Line Restriction ..... 63 mm Hg [2.5 in Hg]

Maximum Allowable Return Line Restriction
with Check Valves and/or Overhead Tanks ..... 165 mm Hg [6.5 in Hg]

Minimum Allowable Fuel Tank Vent Capability .....

Lubricating Oil System

Oil Pressure

Oil Pressure, Main Oil Rifle (15W40 oil at 107°C [225°F]:
At idle (minimum allowable) ..... 138 kPa (20 psi)
At no load governed speed ..... 345-483 kPa [50-70 psi]

Oil Filter Capacity

Bypass filter (spin-on) ..... 2.8 liter [0.75 U.S. gal]
Full flow filter (spin-on) ..... 3.5 liter [0.93 U.S. gal]

Oil Pan Capacity

Oil Pan Part No.	LOW Capacity Liter [U.S. Gal]	HIGH Capacity Liter [U.S. Gal]
* 3008538	32 [8.5]	38 [10]
*3046856	32 [8.5]	38 [10]
*3202152	32 [8.5]	38 [10]
*3227451	32 [8.5]	38 [10]
205881	40 [10.5]	48 [12.5]
207304	40 [10.5]	48 [12.5]
3006484	40 [10.5]	48 [12.5]
3009643	40 [10.5]	48 [12.5]
3200709	40 [10.5]	48 [12.5]
3201960	40 [10.5]	48 [12.5]
3032521	40 [10.5]	48 [12.5]
3024391	66 [17.5]	72 [19]
**3234974	55 [14.5]	61 [16]

* Shallow sump oil pans are **not** recommended for use with the rear gear train Option HD-4041. The shallow sump oil pan with the rear gear train is limited to a 6 degrees maximum power angle on all applications.

** Horizontal Rail Engine Only (Option No. OP-4043)

When the rear gear train Option HD-4041 is used, add 7.6 liters [2 U.S. gallons] to the low and to the high capacity levels.

If the 32 to 38 liter [8.5 to 10 U.S. gallon] oil pan is used on KTTA19 engines (except generator drive), an LF750 bypass filter **must** be used to provide more oil capacity.

Total System Capacity

Total system capacity is the summation of the oil pan capacity at the high mark on the dipstick, the full flow oil filter capacity, and the capacity of any bypass filters that are used. On engines with the rear gear train option, add 7.6 l [2 U.S. gal] to both the low and high oil pan capacity listed in the table above.

Cooling System

	KT	KTA/KTTA
Coolant capacity (Engine only)	26 liters [28 U.S. qts]	30 liters [32 U.S. qts]
Standard modulating thermostat-range	80°-90°C [175-195°F]	80°-90°C [175-195°F]
Maximum coolant pressure (Exclusive of pressure cap)	241 kPa [35 psi]	241 kPa [35 psi]
Maximum allowable top tank temperature	95°C [203°F]	95°C [203°F]
Minimum recommended top tank temperature	70°C [160°F]	70°C [160°F]
Maximum allowable deaeration time	25 minutes	25 minutes
Minimum allowable drawdown or 20% of system capacity (whichever is greater)	9.5 liters [10 U.S. qts]	11 liters [12 U.S. qts]
Minimum allowable pressure cap	50 kPa [7 psi]	50 kPa [7 psi]

Air Intake System

NOTE: Engine intake air **must** be filtered to prevent dirt and debris from entering the engine. If intake air piping is damaged or loose, unfiltered air will enter the engine and cause premature wear.

Metric [U.S. Customary]

Maximum Intake restriction (at rated speed and load)
- Clean air filter element ..... 380 mm H_20 [15.0 in H_20]
- Dirty air filter element ..... 635 mm H_20 [25.0 in H_20]

Exhaust System

Maximum back pressure (at rated speed and load): ..... 75 mm Hg [3.0 in Hg]

Normal exhaust pipe diameter:
- KTTA ..... 152 mm [6in]
- KTA ..... 127 mm [5 in]
- KT ..... 127 mm [5 in]

Compressed Air System

Single Cylinder Air Compressor

Cylinders 1

Compressor Capacity @ 1250 RPM ..... 6.2 L per sec. [13.20 CFM]

Model No.	L per sec. (CFM) Air Delivery
Single Cylinder	
SS296	6.2 L per sec. [13.2 CFM]
SS296E	6.3 L per sec. [13.3 CFM]
SS338E	7.1 L per sec. [15.0 CFM]

Piston Displacement ..... 296 C.C. [18.6 C.I.]

Bore ..... 92.08 mm [3.625 inch] stroke ..... 44.45 mm [1.750 in]

Speed ..... Engine Speed

Cooling ..... Engine Coolant

Lubrication ..... Engine Lubricating Oil

Plumbing Line Sizes:
- Coolant Inlet and Outlet (Pipe Fitting) ..... 9.53 mm NPTF [0.375 inch NPTF]
- Air Inlet (Inside Diameter) ..... 22.22 mm [0.875 in]
- Air Outlet (Minimum Inside Diameter ..... 12.7 mm [0.50 in]

Height, Overall (approximate) ..... 31.1 cm [12.25 in]

Width, Overall (approximate) ..... 14.6 cm [5.75 in]

Length, Overall (approximate) ..... 22.9 cm [9.00 in]

Weight (approximate) ..... 18 Kg [40.0 lbs]

Two Cylinder Air Compressor

Cylinders 2

Compressor Capacity @ 1250 RPM ..... 14.2 L per sec. [30.00 CFM]

Model No.	L per sec. (CFM) Air Delivery
Two Cylinder	
ST676	14.2 L per sec. [30.0 CFM]

Piston Displacement ..... 676 C.C. [41.3 C.I.]

Bore ..... 92.08 mm [3.625 in]

Stroke ..... 50.8 mm [2.00 in]

Speed ..... Engine Speed

Cooling ..... Engine Cooling

Lubrication ..... Engine Lubricating Oil

Plumbing Line Sizes:
- Coolant Inlet and Outlet (Pipe Fitting) ..... 9.53 mm NPTF [0.375 inch NPTF]
- Air Inlet (Inside Diameter) ..... 22.22 mm [0.875 in]
- Air Outlet (Minimum Inside Diameter) ..... 15.88 mm [0.625 in]

Height, Overall (approximate) ..... 34.3 cm [13.50 in]

Width, Overall (approximate) ..... 17.8 cm [7.00 in]

Length, Overall (approximate) ..... 28.7 cm [11.30 in]

Weight (approximate) ..... 33.5 Kg [74.50 lbs]

Electrical System

Minimum battery capacity @ -18 to 0°C [0 to 32°F] ambient temperature
- 12-volt starter 400 ampere hour ..... 1800 cold cranking amps @ -18°C [0°F]
- 24-volt starter 200 ampere hour ..... 900 cold cranking amps @ -18°C [0°F]

Minimum battery capacity above 0°C [32°F] ambient temperature
- 24-volt starter 150 ampere hour ..... 640 cold cranking amps @ -18°C [0°F]

Maximum starting circuit resistance
- 12-volt starter ..... 0.00075 OHMS
- 24-volt starter ..... 0.00200 OHMS

Battery cable sizes - American wire gauge (Maximum length in cranking motor circuit)

12-volt
- No. 00 ..... 3.7 meters [12 ft]
- No. 000 ..... 4.9 meters [16 ft]
- No. 0000 or two No. 0* ..... 6.1 meters [10 ft]
- Two No. 00 ..... 7.6 meters [25 ft]

12-volt High Output
- No. 00 ..... 2.1 meters [7 ft]
- No. 000 ..... 8.2 meters [27 ft]
- No. 0000 or two No. 0* ..... 3.7 meters [12 ft]
- Two No. 00 ..... 4.3 meters [14 ft]

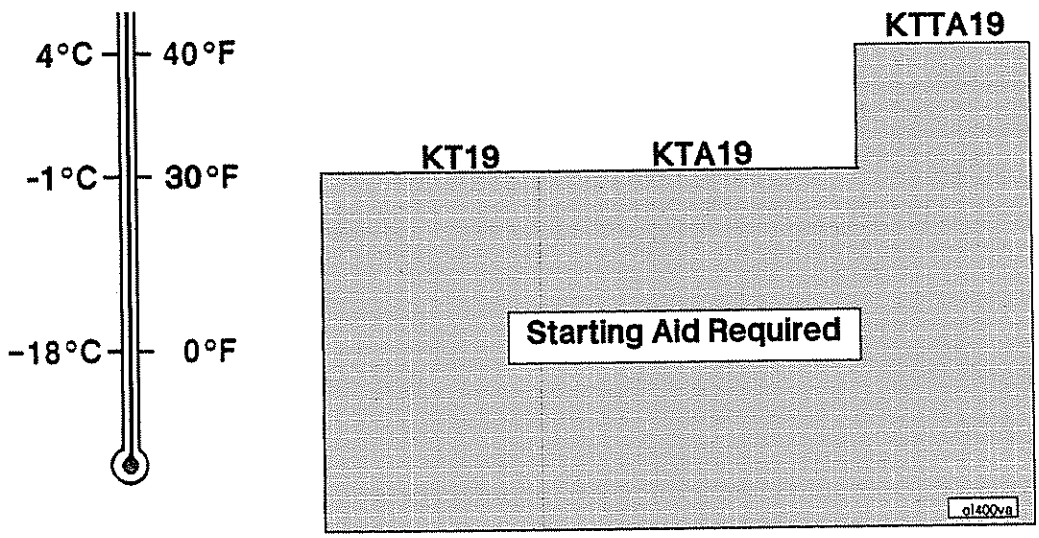
24 to 32-volt
- No. 00 ..... 6.1 meters [20 ft]
- No. 000 ..... 8.2 meters [27 ft]
- No. 0000 or two No. 0* ..... 10.7 meters [35 ft]
- Two No. 00 ..... 13.7 meters [45 ft]

Minimum ambient temperature without starting aid ..... Refer to the follow chart.

Minimum cranking speed without starting aid ..... 150 RPM

* Two strands of No. 0 cable can be used in place of one No. 0000 cable providing all connections are carefully made to ensure equal current flow in each parallel cable.

Refer to the following chart to determine the temperature for which a cold weather starting aid is required.



NOTE: Starting aids such as block heaters, lubricating oil pan heaters, etc. are available to aid in cold weather starting.

Minimum Recommended Battery Capacity

System Voltage	Ambient Temperature -18°C [0°F]		0°C [32°F]	
	Cold Crankikng Amperes	Reserve Capacity* Amperes	Cold Cranking Amperes	Reserve Capacity* Amperes
12 Volt**	1800	640	1280	480
24 Volt***	900	320	640	240

* Note: The number of plates within a given battery size determines reserve capacity. Reserve capacity is the length of time sustained cranking can occur.

** Note: **Not** recommended for K19 Engines.

*** CCA ratings are based on two, 120 volt batteries in series.

Batteries (Specific Gravity)

Battery State of Charge	Specific Gravity @ 27°C [80°F]
100%	1.260-1.280
75%	1.230-1.250
50%	1.200-1.220
25%	1.170-1.190
Discharged	1.110-1.130

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Fuel Recommendations/Specifications

Warning: Do NOT mix gasoline or alcohol with diesel fuel. This mixture can cause an explosion.

Cummins Engine Company, Inc. recommends the use of ASTM No. 2 D fuel. The use of No. 2 diesel fuel will result in optimum engine performance. At operating temperatures below 0°C [32°F], acceptable performance can be obtained by using blends of No. 2 D and No. 1 D. The use of lighter fuels can reduce fuel economy.

The viscosity of the fuel **must** be kept above 1.3 cSt to provide adequate fuel system lubrication.

For a more detailed description of fuel properties, refer to Fuel For Cummins Engine, Bulletin No. 3379001. See ordering information in the back of this manual.

Lubricating Oil Recommendations/Specifications

The use of quality engine lubricating oils combined with appropriate oil drain and filter change intervals is a critical factor in maintaining engine performance and durability.

Cummins Engine Company, Inc. recommends the use of a high quality SAE 15W-40 heavy duty engine oil (such as Cummins Premium Blue) which meets the American Petroleum Institute (API) performance classification CE or CF4.

NOTE: CD or CD/SF engine oils can be used in areas where CE or CF4 oils are **not** yet available.

A sulfated ash content of 1.0 mass percent will yield optimal control of piston and valve deposits and will minimize oil consumption. The sulfated ash limit **must not** exceed 1.85 mass percent.

For further details and discussion of engine lubricating oils for Cummins engines, refer to Bulletin No. 3810340, Cummins Engine Oil Recommendations.

Arctic Operation

If an engine is operated in ambient temperatures consistently below -23°C [-10°F] and there are no provisions to keep the engine warm when it is not in operation, use a synthetic CE/SF engine oil with adequate low temperature properties such as 5W-30.

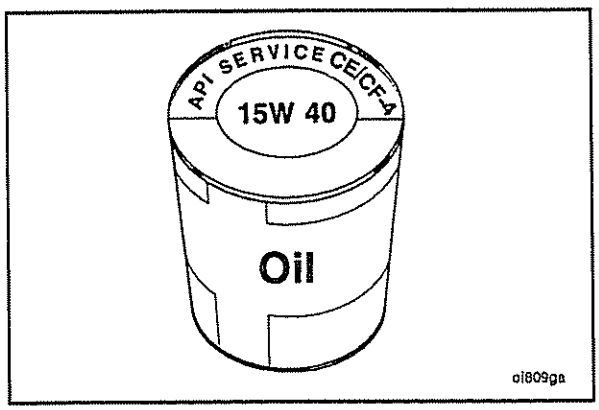
The oil supplier **must** be responsible for meeting the performance service specifications.

Caution: The use of a synthetic base oil does not justify extended oil change intervals. Extended oil change intervals can decrease engine life due to factors such as corrosion, deposits, and wear.

New Engine Break-in Oils

Special break-in engine lubricating oils are **not** recommended for new or rebuilt Cummins engines. Use the same type oil during the break-in as that which is used in normal operation.

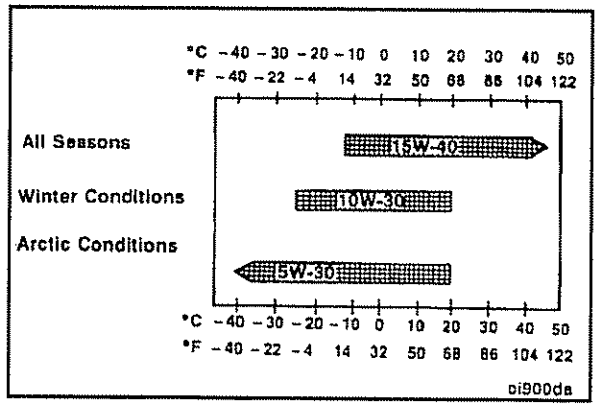
Additional information regarding lubricating oil availability throughout the world is available in the E.M.A. Lubricating Oils Data Book for Heavy Duty Automotive and Industrial Engines. The data book can be ordered from the Engine Manufacturers Association, One Illinois Center, 111 East Wacker Drive, Chicago, IL U.S.A. 60601. The telephone number is: (312) 644-6610.



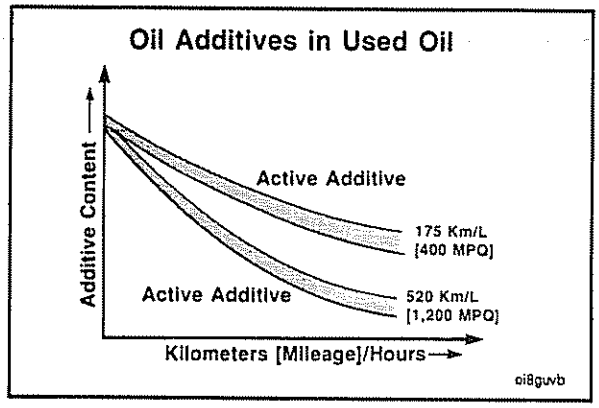
NOTE: The use of low viscosity oils, such as 10W or 10W-30, can be used to aid in starting the engine and in providing sufficient oil flow at ambient temperatures below -5°C [23°F]. Continuous use of low viscosity oils can decrease engine life due to wear.

The API service symbols are shown in the accompanying illustration. The upper half of the symbol displays the appropriate oil categories; the lower half can contain words to describe oil energy conserving features. The center section identifies the SAE oil viscosity grade.

Caution: The use of low viscosity oils, such as 10W or 10W-30, can be used to aid in starting the engine and in providing sufficient oil flow at ambient temperatures below -5°C [23°F]. Continuous use of low viscosity oils can decrease engine life due to wear.



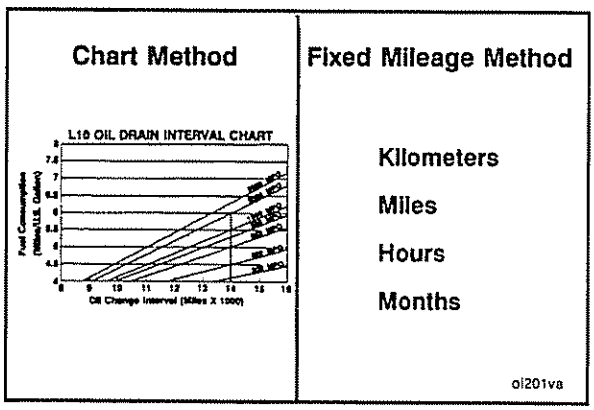
As the engine oil becomes contaminated, essential oil additives are depleted. Lubricating oils protect the engine as long as these additives are functioning properly. Progressive contamination of the oil between oil and filter change intervals is normal. The amount of contamination will vary depending on the operation of the engine, hours or miles on the oil, fuel consumed, and new oil added.



NOTE: Do **not** extend oil and filter change intervals beyond 250 hours or 6 months (except generator drives) unless the Chart Method is used. On generator drives, the intervals are 250 hours or 12 months, whichever occurs first. Refer to the charts below. Extended oil and filter change intervals will decrease engine life due to factors such as corrosion, deposits, and wear.

There are two recommended methods used to determine the proper oil and filter change interval:

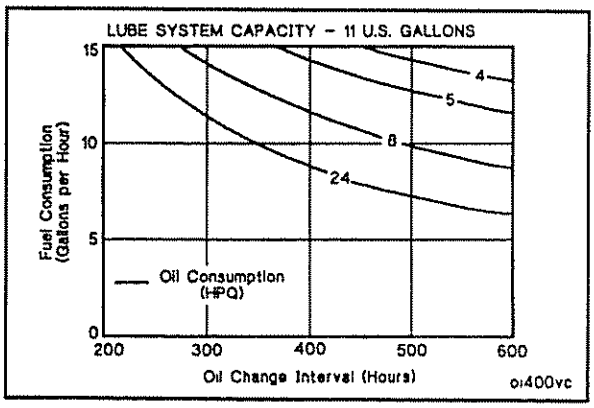
- Chart Method (based on known fuel and oil consumption rates).
- Fixed Mileage Method (based on fixed kilometers, miles, hours, or months; whichever occurs first).



The Chart Method is recommended to provide the lowest total cost of operation while still protecting the engine.

Use the Chart Method with the required information listed below to determine the correct oil and filter change interval for your engine:

- Fuel consumption rate
- Oil consumption rate
- Total System Capacity



Determine fuel and oil consumption rates:

- To use the Chart Method effectively, accurate fuel and oil consumption records **must** be kept and maintained.
- As oil and fuel consumption rates change as a result of a change in operation or duty cycle of a particular engine, the oil change interval established by the Chart Method **must** be re-evaluated based on the change in oil and/or fuel consumption.

Determine total lubricating oil system capacity:

- Total lubricating oil system capacity in U.S. gallons can be determined by adding the high level of the oil in the oil pan plus the capacity of the full flow and by-pass oil filters. Refer to the chart below.

Oil Pan Part No.	Capacity @ High level On Dipstick (U.S. Gallons)	Lubricating Oil Filter	Capacity
	10	Full Flow Filter (each) (LF670)	0.7 gal
	12.5		
	12.5		
	12.5		
Refer to Oil Pan Capacity, page V-3, for the correct Part Number	12.5	Spin-on by-pass (each) (LF777)	0.6 gal
	17	Remote by-pass filter (750 in 3, LF750A, or LF750B)	2.91 gal
	18		
	19	**Note:** On engines with the optional rear gear train, add 7.6 l [2 U.S. gal] to the oil pan capacity listed above.	

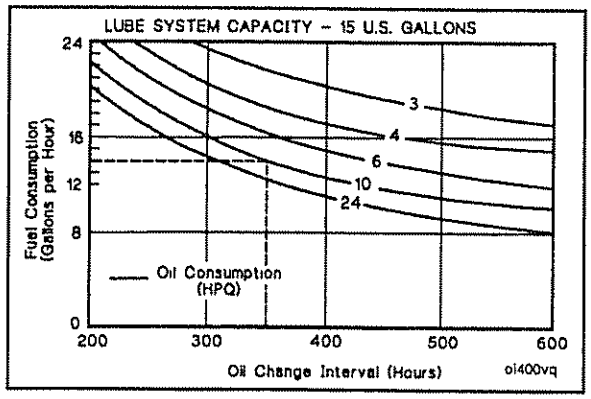
From the charts above, determine the total lubricating oil system capacity.

Example: A KTA19 engine has oil pan, Part No. 3200709, and utilizes the standard full-flow filter head (2 LF670 filters) and one spin-on by-pass filter (LF777).
Total capacity equals:

12.5 U.S. gal (oil pan)
1.4 U.S. gal (2 x LF670 filters)
.6 U.S. gal (1 LF777 filter)
14.5 U.S. gal Total Capacity

Round this capacity to the nearest whole U.S. gallon (15 U.S. gallons) and select the appropriate chart.

For our example, assume the average fuel consumption equals 14 U.S. gallons per hour and the average oil consumption equals 10 hours per U.S. quart.



To read the chart:

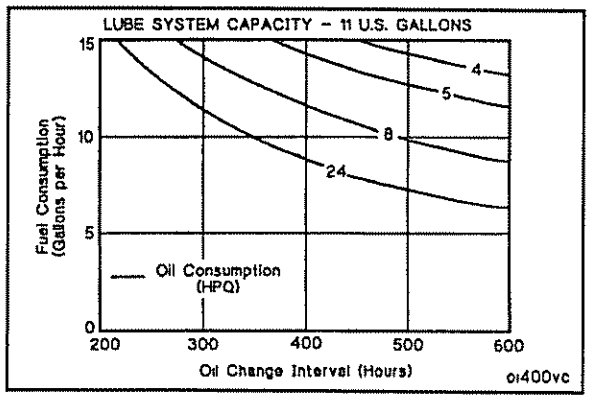
Select the chart entitled 15 U.S. gallons.

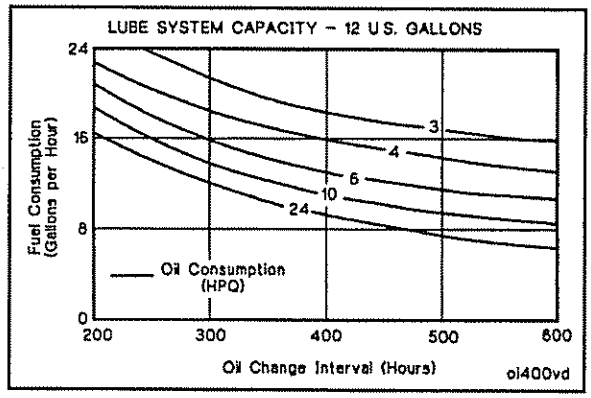
The left vertical axis of the chart represents fuel consumption in U.S. gallons per hour.

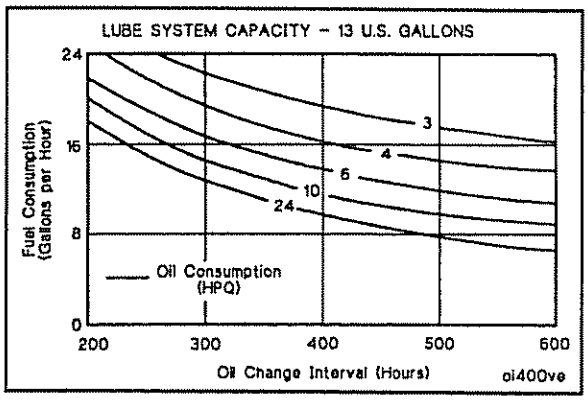
Determine the location of 14.0 gallons on the left vertical axis and draw a line from left to right across the chart, parallel with the bottom of the chart, until it intersects with the curve marked 10 (10 hours per quart).

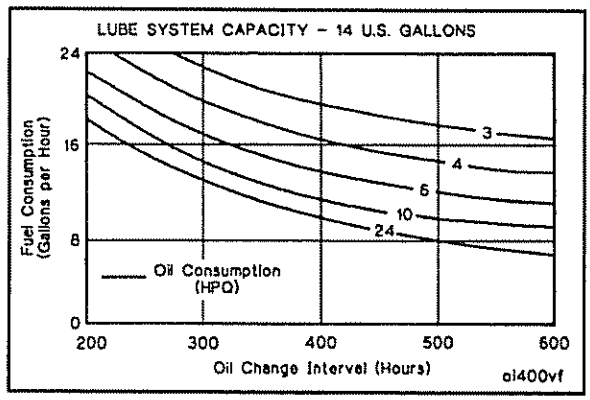
From the intersection point on the curve 10, draw a line perpendicular to the bottom of the chart. The number across the bottom of the chart represents the oil change interval in hours. In this case, the total oil capacity, oil consumption, and fuel consumption of this engine indicates that an oil change interval of 355 hours is recommended.

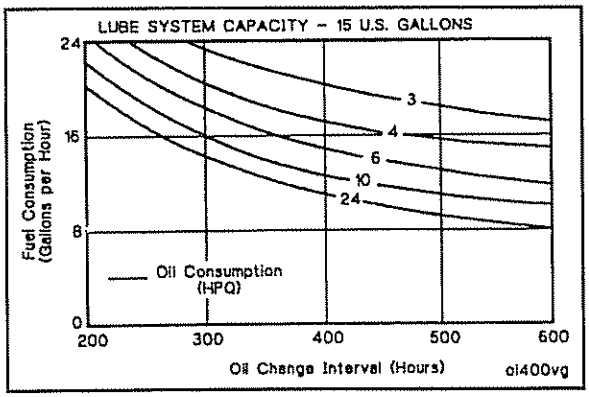
The charts that follow will allow oil change intervals to be calculated for the total lubricating oil system capacity of any K19 engine.

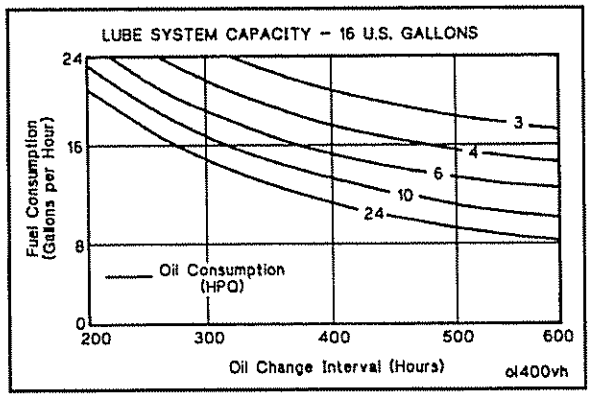


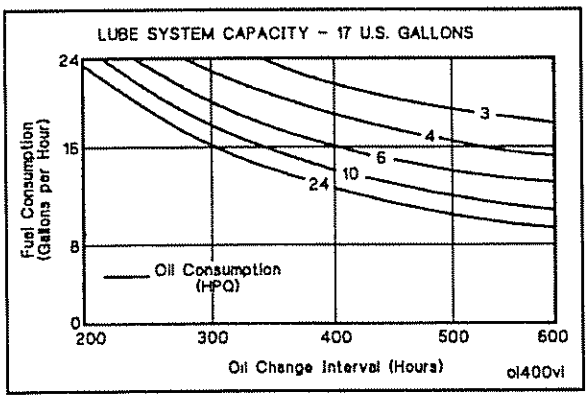


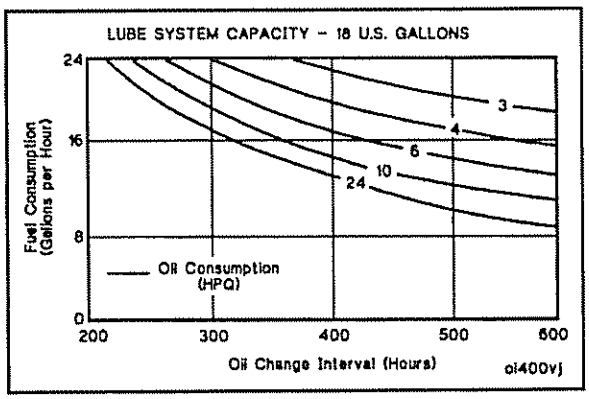


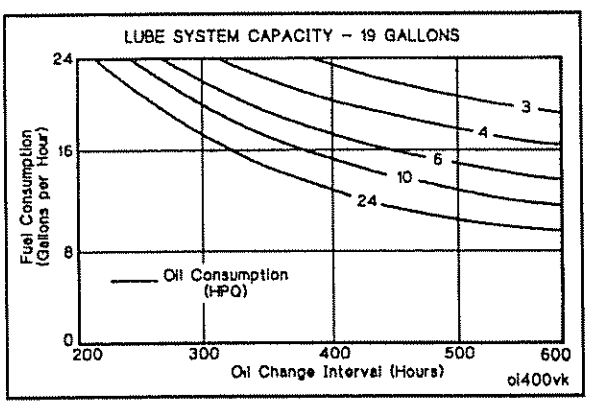


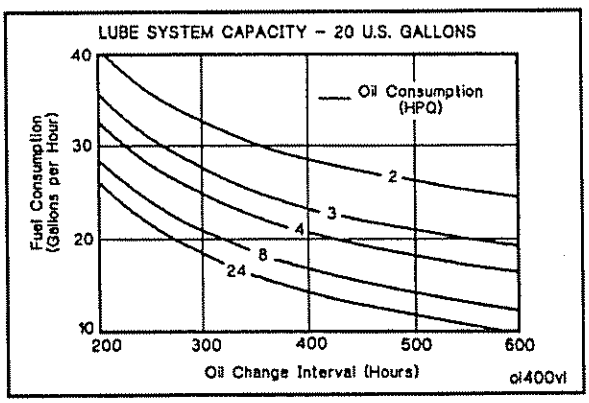

LUBE SYSTEM CAPACITY – 15 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
24
16
8
0
200
300
400
500
600
3
4
6
10
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vg

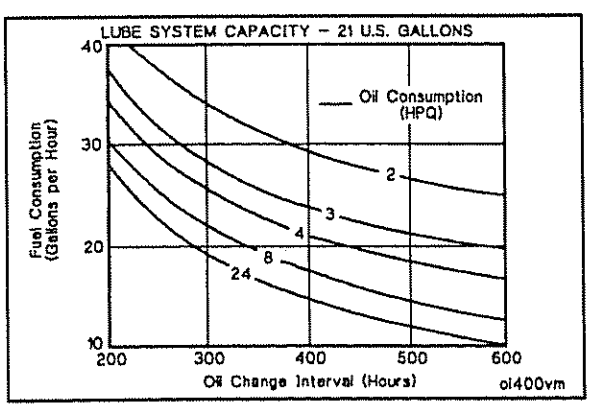

LUBE SYSTEM CAPACITY – 16 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
24
16
8
0
200
300
400
500
600
3
4
6
10
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vh

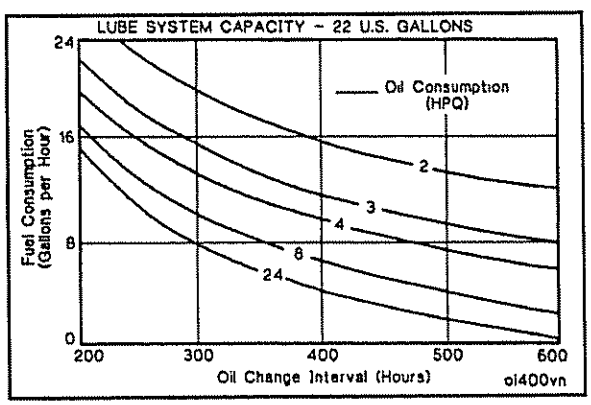

LUBE SYSTEM CAPACITY – 17 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
24
15
8
0
200
300
400
500
600
3
4
6
10
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vi

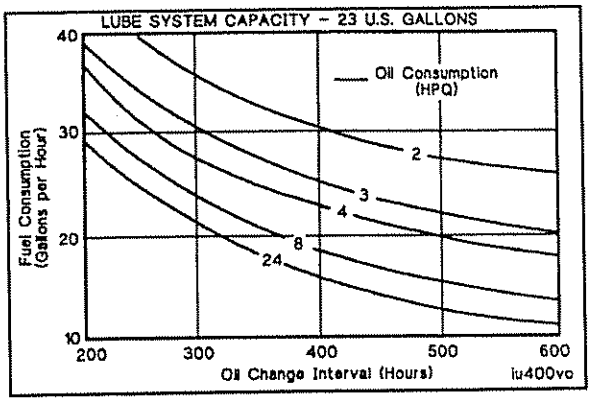

LUBE SYSTEM CAPACITY – 18 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
24
16
8
0
200
300
400
500
600
3
4
6
10
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vj

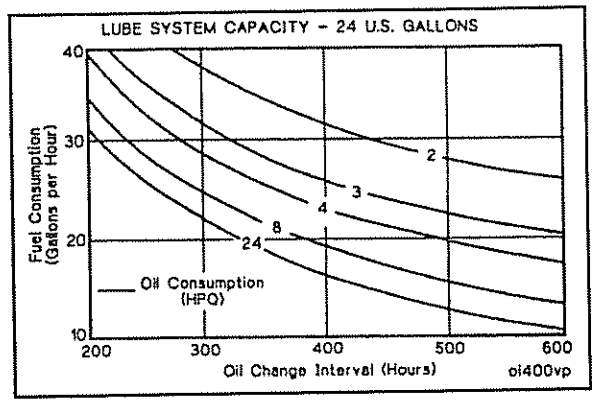

LUBE SYSTEM CAPACITY – 19 GALLONS
Fuel Consumption (Gallons per Hour)
24
16
8
0
200
300
400
500
600
3
4
6
10
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vk


LUBE SYSTEM CAPACITY – 20 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
40
30
20
10
200
300
400
500
600
2
3
4
8
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vl


LUBE SYSTEM CAPACITY – 21 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
40
30
20
10
200
300
400
500
600
2
3
4
8
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vm


LUBE SYSTEM CAPACITY – 22 U.S. GALLONS
Fuel Consumption (Gallons per Hour)
24
16
8
0
200
300
400
500
600
2
3
4
8
24
Oil Consumption (HPQ)
Oil Change Interval (Hours)
oi400vn





Fixed Mileage or Hours Oil Change Interval (All Applications)

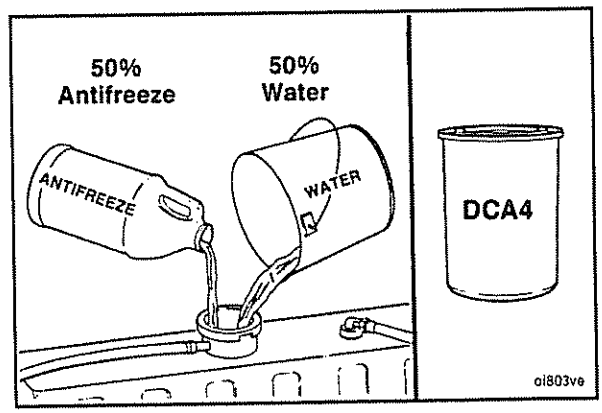
Cummins recommends an oil change interval for all K19 engine applications (except for generator drives) of 250 hours or 6 months whichever occurs first or an oil change interval based on the Chart Method. The generator drive recommended fixed hour oil change interval is 250 hours or 12 months whichever occurs first.

Coolant Recommendations/ Specifications

Heavy duty diesel engines require a **heavy duty coolant.** Heavy duty coolant is defined as a correct mixture of good quality water, low silicate antifreeze and supplemental coolant additives (SCA's).

The following information provides an explanation of water, antifreeze, and SCA's, the correct way to mix them and how to test antifreeze and SCA levels.

This section also contains information on cooling system maintenance and a coolant treatment chart that is used to determine the correct DCA4 service filters and liquid pre-charge.



Heavy Duty Coolant

Water

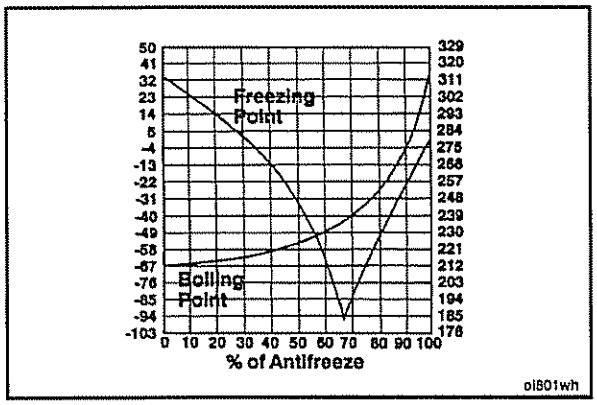
Water quality is important for cooling system performance. Excessive levels of calcium and magnesium contribute to scaling problems, and excessive levels of chlorides and sulfates cause cooling system corrosion.

Water Quality	
Calcium Magnesium (Hardness)	170 PPM as ($CaCo_3$ + $MgCo_3$)
Chloride	40 PPM as (C1)
Sulfur	100 PPM as (SO_4)

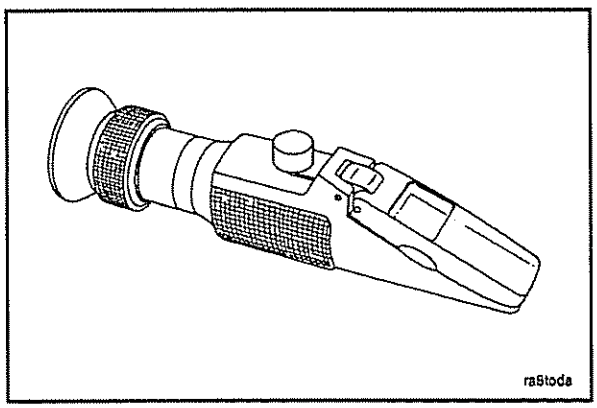
li600wa

Antifreeze

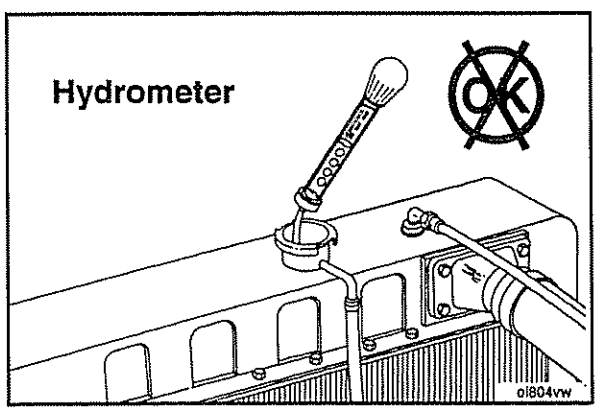
Cummins and Fleetguard® recommend using a low-silicate antifreeze concentrate that meets ASTM D4985 specifications (less than .10% silicate, expressed as Na_2S10_3).



Low-silicate antifreeze **must** be mixed with quality water at a 50/50 ratio (40 to 60% working range). A 50/50 mixture of antifreeze and water gives a -34°F freeze point and a boiling point of 228°F, which is adequate for locations in North America. The actual lowest freeze point of ethylene glycol antifreeze is at 68%. Using higher concentrations of antifreeze will raise the freeze point of the solution and increase the possibility of a silicate gel problem.



A refractometer **must** be used to accurately measure the freeze point of the coolant.

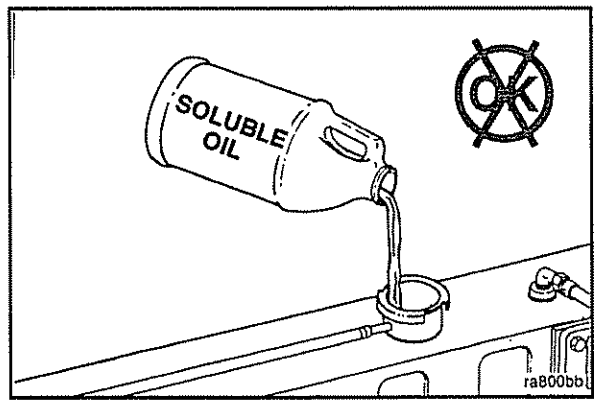


Using floating ball hydrometers can give incorrect readings.

Cooling System Soluble Oils

Do **not** use soluble oils in the cooling systems. The use of soluble oils will:

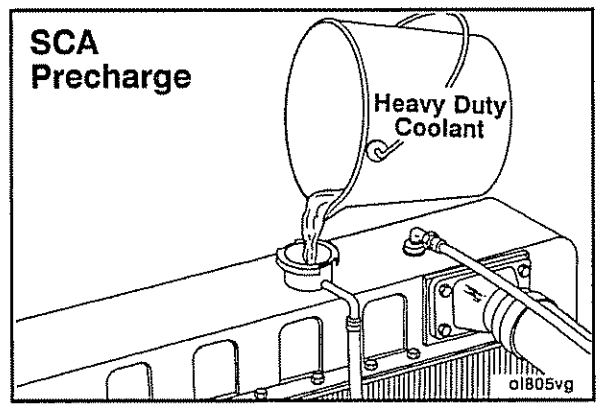
- allow cylinder liner pitting,
- corrode brass and copper,
- damage heat transfer surfaces, and
- damage seals and hoses.



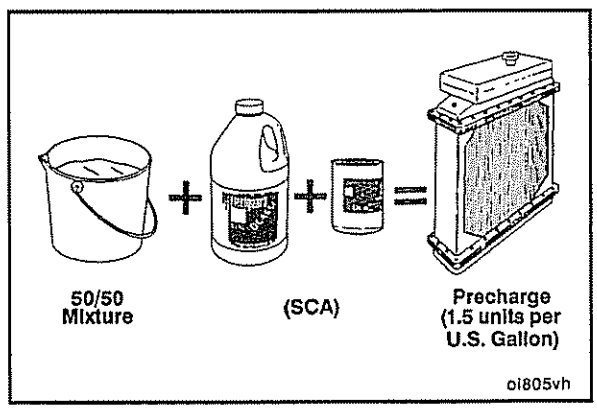
Supplemental Coolant Additives(SCA's)

Correct use of SCA's in conjunction with water and antifreeze are needed to protect engines from cooling system problems. The system **must** be pre-charged with the correct concentration of SCA.

Cummins and Fleetguard® use the SCA unit to define the required concentration level to protect against liner pitting.



When coolant is replaced in the field, it **must** be replaced with **Heavy Duty Coolant** pre-charged with SCA's. In addition, a service coolant filter **must** be installed. Together, this will result in a total pre-charge of approximately 1.5 SCA units per gallon of coolant.

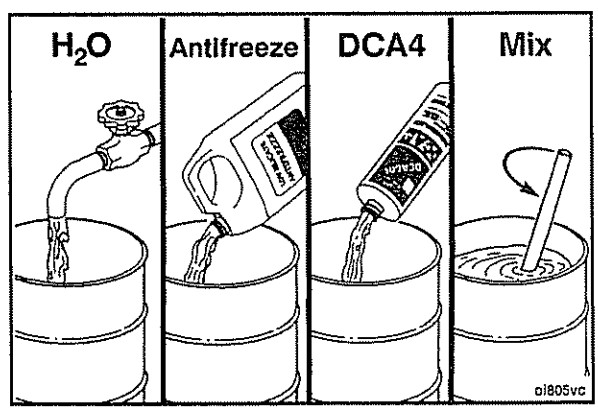


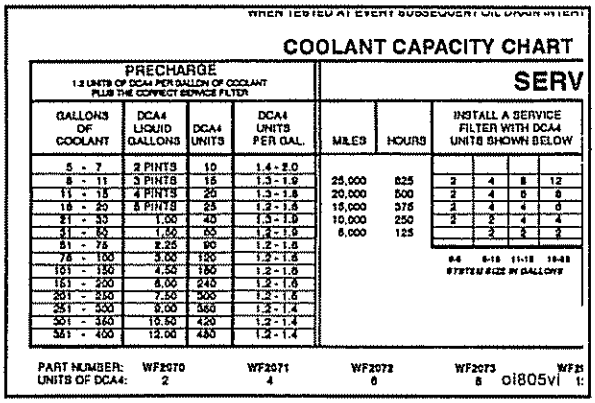
Coolant Blending/Mixing

Proper blending of **Heavy Duty Coolant** requires:

1. Pour water into the container
2. Add low-silicate antifreeze
3. Add DCA4 liquid
4. Thoroughly blend the components

Following the correct order for mixing the **Heavy Duty Coolant** will prevent additive dropout during the mixing process.





COOLANT CAPACITY CHART

PRECHARGE (1.2 UNITS OF DCA4 PER GALLON OF COOLANT PLUS THE CORRECT SERVICE FILTER)				SERV					
GALLONS OF COOLANT	DCA4 LIQUID GALLONS	DCA4 UNITS	DCA4 UNITS PER GAL.	MILES	HOURS	INSTALL A SERVICE FILTER WITH DCA4 UNITS SHOWN BELOW			
5 - 7	2 PINTS	10	1.4 - 2.0						
8 - 11	3 PINTS	15	1.3 - 1.9	25,000	625	2	4	6	12
11 - 15	4 PINTS	20	1.3 - 1.8	20,000	500	2	4	6	8
16 - 20	5 PINTS	25	1.2 - 1.6	15,000	375	2	4	4	6
21 - 30	1.00	40	1.3 - 1.9	10,000	250	2	2	4	4
31 - 50	1.50	60	1.2 - 1.9	6,000	125		2	2	2
51 - 75	2.25	90	1.2 - 1.8						
76 - 100	3.00	120	1.2 - 1.6						
101 - 150	4.50	180	1.2 - 1.8						
151 - 200	6.00	240	1.2 - 1.6						
201 - 250	7.50	300	1.2 - 1.5						
251 - 300	9.00	360	1.2 - 1.4						
301 - 350	10.50	420	1.2 - 1.4						
351 - 400	12.00	480	1.2 - 1.4						

PART NUMBER:	WF2070	WF2071	WF2072	WF2073	WF2
UNITS OF DCA4:	2	4	6	8	1:

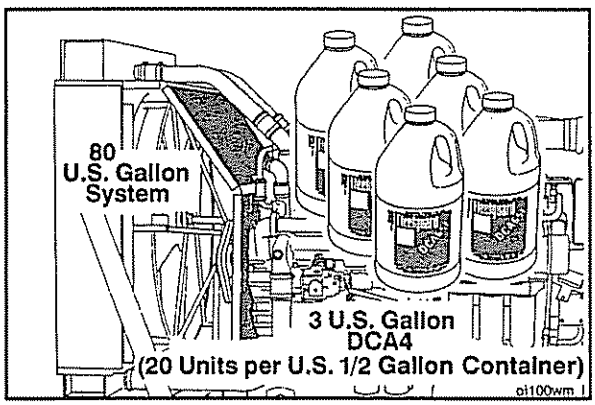
oi805vl

This chart, shown later in this section, **must** be followed to determine how much liquid SCA **must** be added to pre-charge different quantities of make-up coolant (water and low-silicate antifreeze). **Remember, a service filter must also be installed.**

In addition to using the chart as shown, the system requirements can also be calculated as shown in the following examples.

NOTE: It is important to know the cooling system capacity. If **not** sure of system capacity, contact the equipment OEM.

The following example illustrates how to calculate the required SCA quantity to add to the coolant to reach the desired concentration level.



For an 80-gallon system, three (3) gallons of DCA4 liquid **must** be added to pre-charge the coolant to the correct SCA concentration level.

U.S. Customary Example:

$$80 \text{ gallons} \times \frac{1.5 \text{ units}}{\text{gallon}} = 120 \text{ units}$$

$$120 \text{ units} \div \frac{20 \text{ units}}{1/2 \text{ gallons DCA4}} = 6 \text{ half gallon containers of DCA4}$$

or 3 gallons of DCA4

Metric Example:

$$300 \text{ Liter} \times \frac{4 \text{ units}}{\text{Liter}} = 120 \text{ Units}$$

$$120 \text{ Units} \div \frac{20 \text{ Units}}{1.89 \text{ Liters DCA4}} = (6) \text{ 1.89 Liter Containers of DCA}$$

Fleetguard® DCA4 Service Filtes and Liquid Pre-Charge

Fleetguard® Part No. DCA4 Spin-On Coolant Filters	Cummins Part No.	DCA4 Units
WF-2070	3318157	2
WF-2071	3315116	4
WF-2072	3318201	6
WF-2073	3315115	8
WF-2074	3316053	12
WF-2075	3318318	15
WF-2076	3318319	23
DCA4 Liquid		
DCA60L (1 pint)	3315459	5
DCA65L (1/2 gallon)	3305373	20
DCA75L (5 gallons)	3317428	200
DCA80L (55 gallons)		2200
DCA4 Powder		
DCA95	3318320	20

Coolant Capacity Chart

PRECHARGE UNITS OF DCA4 PER GALLON OF COOLANT				SERVICE							
GALLONS OF COOLANT	DCA4 LIQUID GALLONS	DCA4 UNITS	DCA4 UNITS PER GAL.	HOURS	INSTALL SERVICE FILTERS WITH DCA4 UNITS TOTALING				GALLONS OF COOLANT	ADD DCA4 LIQUID PINTS AS SHOWN	
										250 HRS.	500 HRS.
51 - 75	2.25	90	1.2 - 1.8						51 - 75	4	8
76 - 100	3.00	120	1.2 - 1.6	625	60	68	100	*125	76 - 100	5	10
101 - 150	4.50	180	1.2 - 1.8	500	40	50	80	100	101 - 150	8	15
151 - 200	6.00	240	1.2 - 1.6	375	30	38	60	75	151 - 200	10	20
201 - 250	7.50	300	1.2 - 1.5	250	20	25	40	50	201 - 250	13	25
251 - 300	9.00	360	1.2 - 1.4						251 - 300	15	30
301 - 350	10.50	420	1.2 - 1.4		51-75	76-100	101-150	151-200	301 - 350	18	35
351 - 400	12.00	480	1.2 - 1.4		SYSTEM SIZE IN GALLONS				351 - 400	20	40
					* Requires liquid in addition to Cummins largest filters.				8 PINTS EQUALS 1 U.S. GALLON		

Notes:

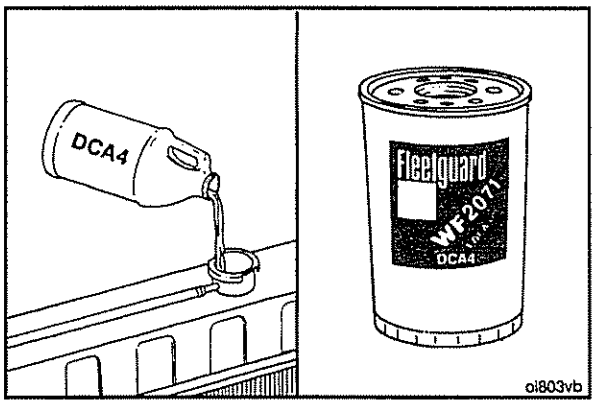
A. Consult the vehicle equipment manufacturer's maintenance information for total cooling system capacity.

B. After draining and replacing the coolant, **always** pre-charge the cooling system to a SCA level of 1.5 units per gallon. This concentration level **must never** be allowed to go below 1.2 units and **must** be controlled when level is greater than 3 units. Action needed when level goes below 1.2 is a filter and liquid; above 1.2 to 3.0 filter only; above 3.0, test and add filters when 3.0 and below.

Caution: Under NO circumstances MUST a customer exceed one oil change interval before adding chemicals (by filter or liquid) to the coolant. If the recommended service intervals are neglected, there is a high probability that cylinder liner corrosion will occur.

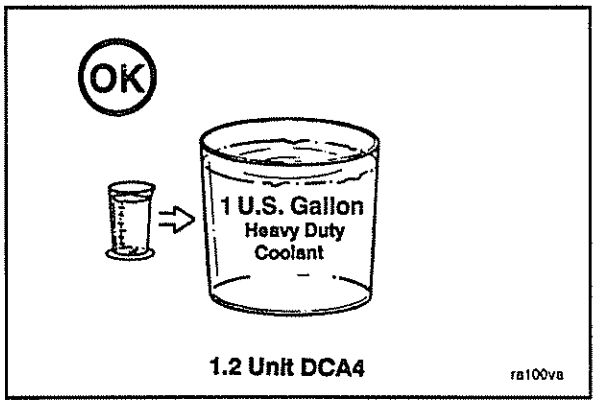
NOTE: When performing service which requires draining the cooling system, take special precautions to collect it in a clean container, seal it to prevent contamination, and save for reuse.

C. Change coolant filters at each oil change to protect the cooling system. The service filters are satisfactory for use with maintenance intervals from 125 hours to 6,000 hours.



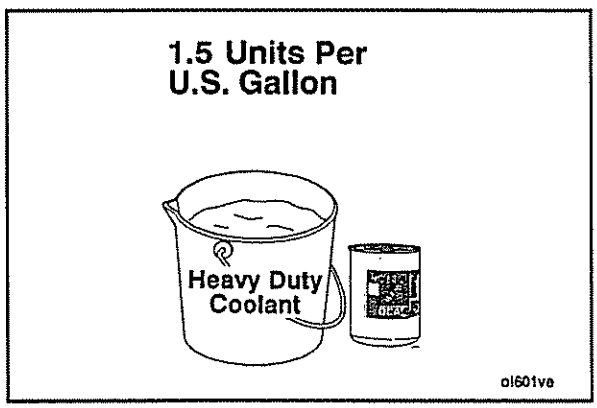
Cooling System Maintenance

Supplemental Coolant Additives (DCA4), or equivalent, are required to protect the cooling system from fouling, solder blooming, and general corrosion. The cooling filter is required to protect the coolant system from abrasive materials, debris, and precipitated coolant additives.



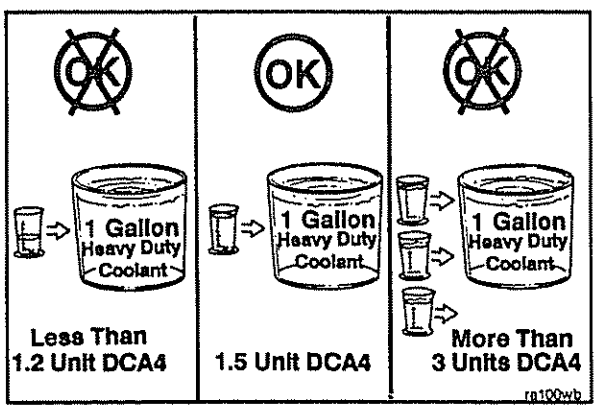
NOTE: Cummins Engine Company requires that a service filter be used and SCA liquid added when the coolant is changed or a significant (more than 50 percent) coolant loss occurs. A service filter **must** be used during the normal oil change interval due to normal depletion (refer to the Operation and Maintenance Manual).

Diesel Coolant Additives (or equivalent) are used to prevent liner pitting, corrosion, and scale deposits in the cooling system.



After changing the coolant, the initial charge of DCA4 (or equivalent) concentration **must** be 1.5 units per 3.8 liters [1 U.S. gallon] of coolant in the system.

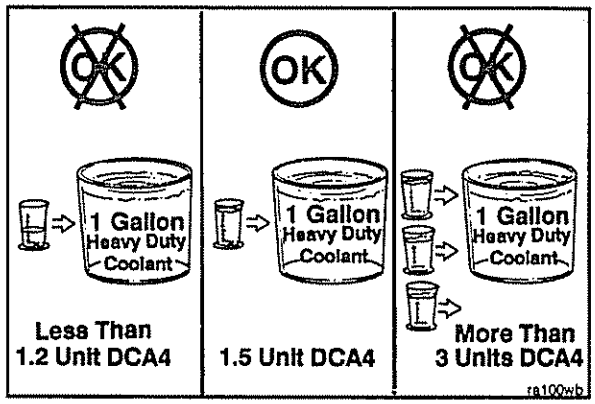
NOTE: The cooling system **must** be clean before adding DCA4 (or equivalent).



The DCA4 concentration **must not** fall below 1.2 units or exceed 3 units per gallon of cooling system capacity.

If make-up coolant is added between intervals, additional DCA4 (or equivalent) is required. Any coolant added **must** be pre-mixed with DCA4 to a concentration of 1.2 units per 3.8 liters [1 U.S. gallon] of coolant. With the service filter installed, the total system concentration **must** be 1.5 units DCA4 per gallon of coolant.

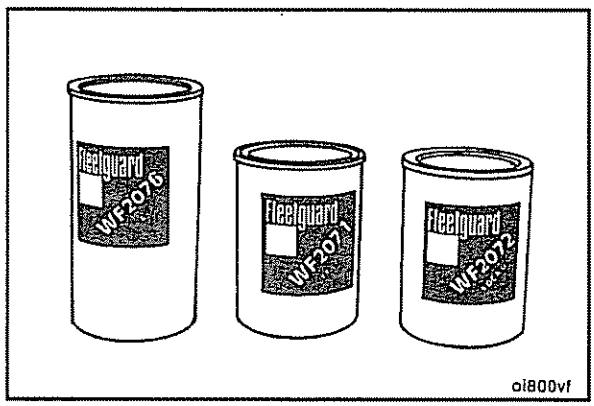
Caution: Under-concentration of the coolant additive can result in liner pitting and system corrosion. Over-concentration can result in water pump seal leakage.



Use the correct Fleetguard® coolant filter to maintain the recommended DCA4 concentration in the system.

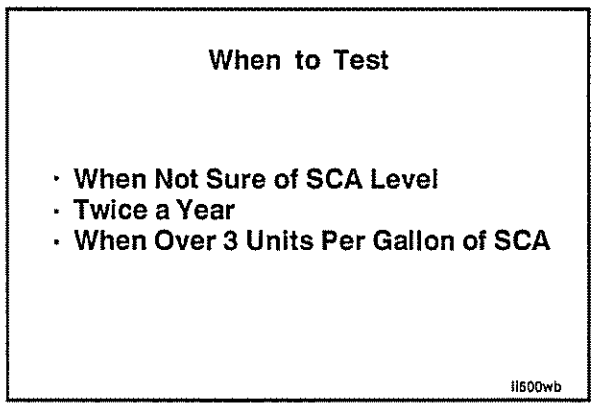
Maintain the correct concentration by changing the service coolant filter at each oil drain interval.

NOTE: The correct filter is determined by the total cooling system capacity and other operational factors.

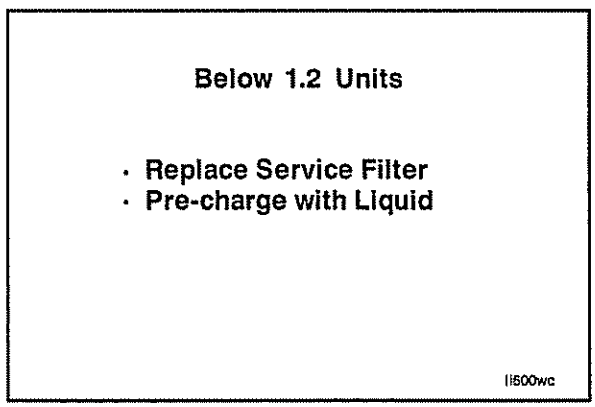


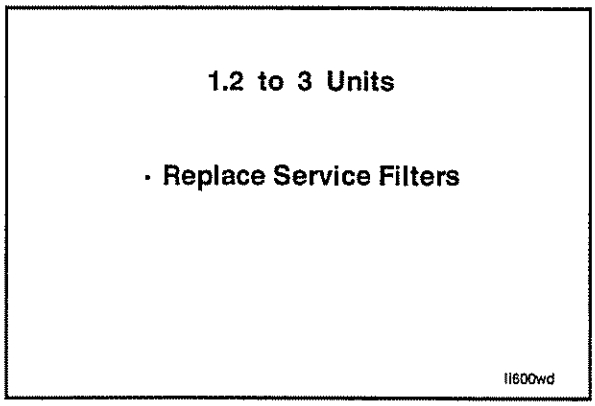
Testing is recommended if the operator is **not** sure of his cooling system conditon due to leaks, uncontrolled topping off of the system, or major coolant loss.

Testing is also recommended twice a year to monitor the SCA level. If the SCA level is above 3 units, test at subsequent oil drain intervals until the concentration is back under 3 units. When the concentration is back under 3 units, start installing service filters at each drain interval.

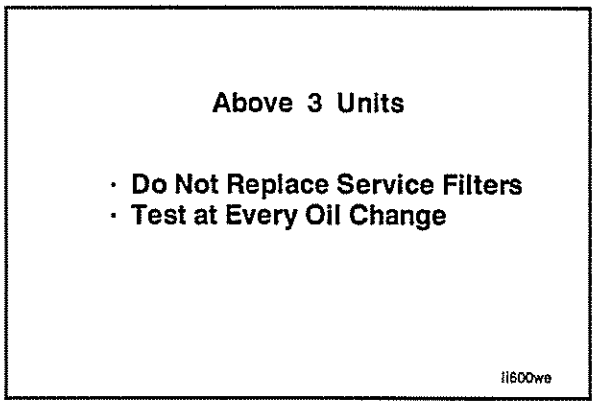


If the concentration is below 1.2 units per gallon, replace the filter and pre-charge with liquid.

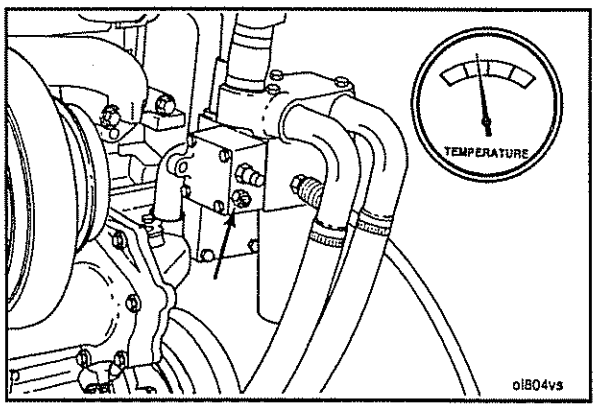




If the concentration is 1.2 to 3 units per gallon, replace the filters.



If the concentration is above 3 units per gallon, do **not** replace the service filter. Test the coolant at subsequent oil drain intervals until the concentration is back under 3 units. When the concentration is back under 3 units, start installing service filters at each oil change interval.



Testing SCA Concentration Level CC-2626 Test Kit

If unsure about coolant loss and coolant condition, use the CC-2626 test kit to determine the SCA level of the cooling system.

Precautions:

DO
Do carry out testing in a well-lighted area.
Do make sure that hands are dry before removing strips from bottles.
Do allow coolant sample to reach room temperature for best results.
Do make sure that pad ends of strips are dipped.
Do replace and tighten caps on strip bottles to avoid getting moisture on strips.
Do make sure that all plastic containers are rinsed with water after each use to avoid contamination.

Don't
Don't handle pad ends of strip.
Don't allow pad ends of wet strips to touch during testing.
Don't get solution in eyes or on skin and clothing.
Don't allow contamination of the strips and solution bottles.
Don't allow contamination of the plastic containers during testing.
Don't use kits beyond expiration date.

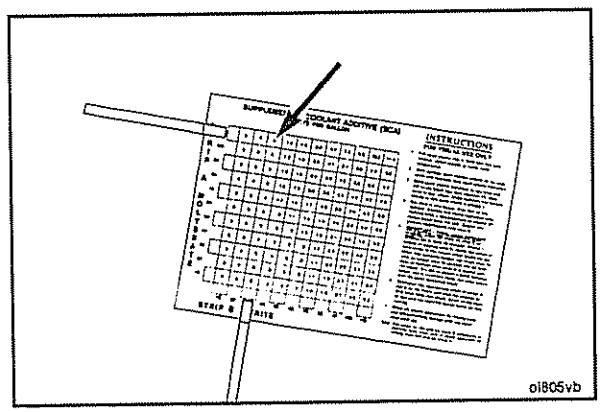
Any variation to the technique listed below will give false readings resulting in incorrect service action.

Instructions For Proper Kit Use

1. Fill large plastic cup at least half full with coolant.
2. With syringe, draw coolant sample to the stop point and dispense into small plastic container.
3. Hold small plastic container at eye level and fill to the black line with Solution #1, then swirl to mix. (Note: Many coolants will become cloudy at this point which is normal.)
4. Dip strip A into solution for 1 to 2 seconds, remove and shake vigorously to remove excess coolant. This action is much like shaking down a thermometer. Lay strip A down on a clean surface and read after reading strip B.
5. Dip strip B into solution for 1 to 2 seconds, shake vigorously, wait 30 seconds and match to nearest color on the test kit chart within the next 30 seconds. If **not** sure of exact color, read to the left or lower concentration.
6. Read strip A the same as strip B.
7. Determine the intersecting block of strips A and B on the chart, and follow requirements listed above under Testing DCA4.
8. Clean all plastic containers by rinsing cups and filling or flushing syringe with tap water after each use.

NOTE: Do **not** utilize the test kit to maintain minimum SCA concentration levels (i.e., 1.5 units).

NOTE: In some instances, the A or B reading can be high. However, it is the combined reading that is important. **Always follow the chart.**



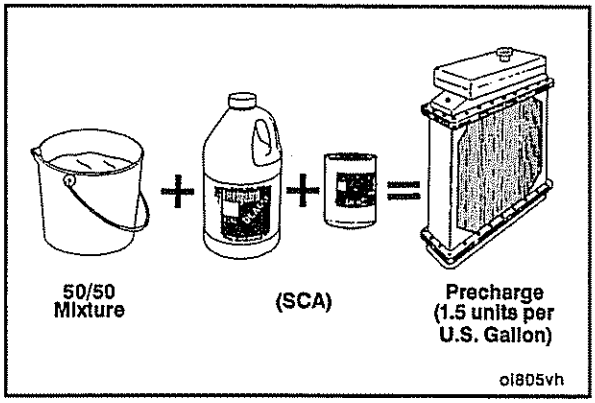
The following coolant testing devices are available to assist in determining the condition of the coolant:

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 free of charge. 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



Coolant Replacement Requirement

Drain and flush the cooling system after 2 years or 6,000 hours 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.

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

Drive Belt Tension Chart

SAE Belt Size	Belt Tension Gauge Part No.		Belt Tension New		Belt Tension Range Used*	
	Click-type	Burroughs	N	lbf	N	lbf
0.380 in.	3822524	N/A	620	140	270 - 490	60 - 110
0.440 in.	3822524	N/A	620	140	270 - 490	60 - 110
1/2 in.	3822524	ST-1138	620	140	270 - 490	60 - 110
11/16 in.	3822524	ST-1138	620	140	270 - 490	60 - 110
3/4 in.	3822524	ST-1138	620	140	270 - 490	60 - 110
7/8 in.	3822524	ST-1138	620	140	270 - 490	60 - 110
4 rib K	3822524	ST-1138	620	140	270 - 490	60 - 110
5 rib K	3822524	ST-1138	670	150	270 - 530	60 - 120
6 rib K	3822525	ST-1293	710	160	290 - 580	65 - 130
8 rib K	3822525	ST-1293	890	200	360 - 710	80 - 160
10 rib K	3822525	3823138	1110	250	440 - 890	100 - 200
12 rib K	3822525	3823138	1330	300	530 - 1070	120 - 240
15 rib K	3822525	3283138	1670	375	670 - 1340	150 - 300
16 rib L**	N/A	3376344	2490	560	1160 - 2315	260 - 520
20 rib L**	N/A	3823772	3115	700	1470 - 2890	330 - 650

* A belt is considered used if it has been in service for ten minutes or longer.

* If used belt tension is less than the minimum value, tighten the belt to the maximum used belt value. The minimum value is usually 50 percent below the maximum value.

Note:

1. Chart does **not** apply to automatic belt tensioners.
2. K section V-ribbed belts have 3.5 mm [0.140 in] rib width.
3. L section V-ribbed belts 4.7 mm [0.185 in] rib width.
4. V-ribbed belt tension averages are:
   - K section, 25 lb/rib new, 10 to 20 lb/rib used belt.
   - L section, 35 lb/rib new, 16 to 32 lb/rib used belt.
5. Belt manufactures typical belt tension recommendations are:
   - V-belts have similar tension value as listed above.
   - K section, 40 lb/rib new, 16 to 35 lb/rib used belt.
   - L section, 45 lb/rib new, 20 to 40 lb/rib used belt.
6. Tension specifications are based on a cold belt. Hot shut down tension varies greatly depending on speed, load temperature, but approximately 30 percent higher.

Engine Component Torque Value

Component	Wrench Size	Torque Value N•m	Torque Value ft-lb
Air Compressor Mounting Capscrews (Single Cylinder)	9/16	45	35
Air Compressor Mounting Capscrews (Two Cylinder)	3/8	65	45
Air Compressor Support Bracket (Single Cylinder)			
Mounting Capscrews to Air Compressor	9/16	45	35
Mounting Capscrews to Engine Block	9/16	45	35
Air Compressor Support Bracket (Two Cylinder)			
Mounting Capscrews to Air Compressor	9/16	45	35
Mounting Capscrews to Engine Block	9/16	60	45
Air Compressor Unloader Valve Capscrews	1/2	15	120 in-lb
Barring Mechanism	3/8	45	35
Cooling Fan Mounting Capscrews	3/4	135	100
Cooling System Hose Clamps	5/16	5.6	50 in-lb
Crosshead Adjusting Screw Lock Nut			
With adapter ST-669	1/2	35	25
Without adapter ST-669	1/2	40	30
Fan Hub (Belt Driven) Mounting Nuts	9/16	35	25
Fan Hub (Gear Driven) Mounting Capscrews	9/16	45	35
Fuel Pump Mounting Capscrews			
Without Air Compressor	9/16	45	35
With Air Compressor	3/8	45	35
Fuel Pump Mounting Nuts			
Without Air Compressor	11/16	45	35
Injector Adjusting Screw Lock Nut			
With Adapter ST-669	3/4	45	35
Without Adapter ST-669	3/4	60	45
Injector Hold Down Capscrews	1/2	16.2	145 in-lb
Oil Control Valve Mounting Capscrews	1/8	9.0	80 in-lb
Rocker Lever Cover Mounting Capscrews	9/16	45	35
Turbocharger Mounting Nuts	9/16	35	25
Valve Adjusting Screw Lock Nut			
With Adapter ST-669	3/4	45	35
Without Adapter ST-669	3/4	60	45
Vibration Damper Mounting Capscrews			
To Crankshaft	3/4	445	330
To Pulley	1/2	140	105

Capscrew Markings and Torque Values

Caution: When replacing capscrews, always use a capscrew of the same measurement and strength as the capscrew being replaced. Using the wrong capscrews can result in engine damage.

Metric capscrews and nuts are identified by the grade number stamped on the head of the capscrew or on the surface of the nuts. U.S. Customary capscrews are identified by radial lines stamped on the head of the capscrew.

The following examples indicate how capscrews are identified:

Metric - M8-1.25 X 25

M8	1.25	25
Major Thread Diameter in Millimeters	Distance Between Threads in Millimeters	Length in Millimeters

U.S. Customary [5/16 X 18 X 1-1/2]

5/16	18	1-1/2
Major Thread Diameter in Inches	Number Threads per Inch	Length in Inches

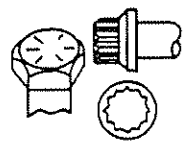
NOTES:

1. **Always** use the torque values listed in the following tables when specific torque values are **not** available.
2. Do **not** use the torque values in place of those specified in other sections of this manual.
3. The torque values in the table are based on the use of lubricated threads.
4. When the ft-lb value is less than 10, give consideration to converting the ft-lb value to in-lb to obtain a better torque with an in-lb torque wrench. Example: 6 ft-lb equals 72 in-lb.

Capscrew Markings and Torque Values - U.S. Customary

SAE Grade Number 5 8

Capscrew Head Markings
These are all SAE Grade 5 (3) line

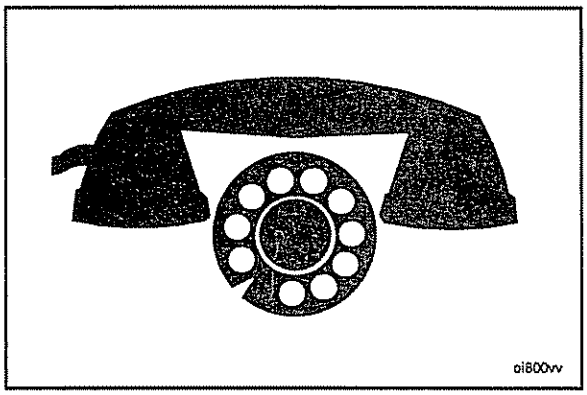


Capscrew Body Size	Capscrew Torque - Grade 5 Capscrew				Capscrew Torque - Grade 8 Capscrew			
	Cast Iron		Aluminum		Cast Iron		Aluminum	
	N•m	ft-lb	N•m	ft-lb	N•m	ft-lb	N•m	ft-lb
1/4 - 20	9	7	8	6	15	11	8	6
- 28	12	9	9	7	18	13	9	7
5/16 - 18	20	15	16	12	30	22	16	12
- 24	23	17	19	14	33	24	19	14
3/8 - 16	40	30	25	20	55	40	25	20
- 24	40	30	35	25	60	45	35	25
7/16 - 14	60	45	45	35	90	65	45	35
- 20	65	50	55	40	95	70	55	40
1/2 - 13	95	70	75	55	130	95	75	55
- 20	100	75	80	60	150	110	80	60
9/16 - 12	135	100	110	80	190	140	110	80
- 18	150	110	115	85	210	155	115	85
5/8 - 11	180	135	150	110	255	190	150	110
- 18	210	155	160	120	290	215	160	120
3/4 - 10	325	240	255	190	460	340	255	190
- 16	365	270	285	210	515	380	285	210
7/8 - 9	490	360	380	280	745	550	380	280
- 14	530	390	420	310	825	610	420	310
1 - 8	720	530	570	420	1100	820	570	420
- 14	800	590	650	480	1200	890	650	480

Section S - Service Assistance

Section Contents

Section S - Service Assistance



Routine

Personnel at a Cummins Authorized Repair Location can assist you with the correct operation or service of your engine. We have a worldwide service network of more than 5,000 Cummins Distributors and Dealers who have been trained to provide sound advice, expert service, and complete parts support. Check the telephone directory yellow pages or refer to the directory in this section for the nearest Cummins Authorized Repair Location.

Emergency

The Cummins Customer Relations Department provides a 24-hour, toll free telephone number to aid in locating emergency service when a local Cummins Authorized Repair Location can **not** be reached. The emergency service telephone numbers are:

- United States and Canada (excluding Alaska and Hawaii)
  - (800) D-I-E-S-E-L-S
  - (800) 343-7357
- Outside of North America contact your Regional Office. Telephone numbers and addresses are listed in this section.

Problem Solving

Normally, any problem that arises with the sale, service, or repair of your engine can be handled by a Cummins Authorized Repair Location in your area. Refer to the telephone directory yellow pages for the one nearest you. If the problem has **not** been handled satisfactorily, follow the steps outlined below:

1. If the disagreement is with a Dealer, talk to the Cummins Distributor with whom he has his service agreement.
2. If the disagreement is with a Distributor, call the nearest Cummins Division or Regional Office; however, most problems are solved below the Division or Regional office level. Telephone numbers and addresses are listed in this section. Before calling, write down the following information:
   a. Engine model and serial number
   b. Type and make of equipment
   c. Total kilometers [miles] or hours of operation
   d. Warranty start date
   e. Nature of problem
   f. Summary of the current problem arranged in the order of occurrence
   g. Name and location of the Cummins Distributor or Dealer
3. If a problem can **not** be resolved satisfactorily through your Cummins Authorized Repair Location or Division Office, write to:

Customer Relations - 41403, Cummins Engine Company, Inc., Box 3005, Columbus, IN 47202-3005

Division and Regional Offices

NOTE: The following list contains offices in U.S., Canada, Australia, New Zealand, and Puerto Rico.

United States

Northern Division Office

Cummins Engine Company, Inc.
2629 Waterfront
Parkway East Drive
Suite 200
Indianapolis, IN 46204
Telephone: (317) 328-3740

Southern Division Office

Cummins Engine Company, Inc.
425 Franklin Road S.E.
Suite 500
Marietta, GA 30067
Telephone: (404) 423-1108

Western Division Office

Cummins Engine Company, Inc.
5660 Greenwood Plaza Blvd.
Englewood, CO 80111
Telephone: (303) 773-2866

Canada

Canadian Division Office

Cummins Diesel of Canada, Ltd.
700 Dorval Drive
Suite 600
Oakville, Ontario L6K 3V3
Telephone: (416) 842-8070

Western Canada Regional Office

Cummins Diesel of Canada, Ltd.
22359 Lougheed Highway
Mapleridge, B.C. V2X 2T3
Telephone: N/A

Australia Regional Office

Cummins Diesel Australia

513-515 Maroondah Highway
Ringwood 3134
Victoria, Australia
Telephone: (3) 871-2222

NOTE: This office also serves New Zealand.

Cummins Americas Regional Office

Cummins Caribbean

16085 N. W. 52nd Avenue
Hialeah, FL 33014
Telephone: (305) 621-1300

NOTE: This office serves Puerto Rico and South America excluding Brazil.

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 Marine Branch

Cummins Alabama, Inc.
Marine Center
921 Corporate Drive South
P.O. Box 2566
Mobile, AL 36601
Telephone: (205) 456-2236

Mobile Onan 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
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
P.O. Box 9000
Little Rock, AR 72209
Telephone: (Sales): (501) 569-5600
(Service): (501) 569-5656
(Parts): (501) 569-5613

Van Buren - (Branch of Memphis)

Cummins Mid-South, Inc.
1906 N. 6th Street
Van Buren, AR 72956
Telephone: Sales: (501) 474-7953
Parts: (501) 474-7951
Service: (501) 474-7955

California

San Leandro Distributor

Cummins West, Inc.
1515 Aurora Drive
San Leandro, CA 94577
Telephone: (415) 351-6101

Bakersfield Branch

Cummins West, Inc.
301 East Fourth Street
Bakersfield, CA 93304
Telephone: (805) 325-9404

Eureka/Arcata Branch

Cummins West, Inc.
4801 West End Road
Arcata, CA 95521
Telephone: (707) 822-7385

Fresno Branch

Cummins West, Inc.
2740 Church Avenue
Fresno, CA 93706
Telephone: (209) 486-6050

Los Angeles Industrial Branch

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

Los Angeles Branch

Cummins West, Inc.
1661 McGarry Street
Los Angeles, CA 90021
Telephone: (213) 746-3850
Branch: (213) 746-6410

Montebello Branch

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

Redding Branch

Cummins West, Inc.
2725 Favretto Avenue
Redding, CA 96001
Telephone: (916) 241-2154

Rialto Branch

Cummins West, Inc.
161 East Valley Blvd.
Rialto, CA 92376
Telephone: (714) 877-0433

San Diego Branch

Cummins West, 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: (415) 351-6101

Stockton Office

Cummins West, Inc.
41 W. Yokuts Avenue, Suite 131
Stockton, CA 95207
Telephone: (209) 473-0386

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
3801 E. 50th Avenue
Denver, CO 80216
Telephone: (303) 399-7697

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 and Energy System
5421 N. 59th Street
Tampa, FL 33610
Telephone: (813) 621-7202

Ft. Myers Branch

Cummins Southeastern Power, Inc.
2671 Edison Avenue
Ft. Myers, FL 33902
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

Orlando Branch

Cummins Southeastern
Power, Inc.
4820 North
Orange Blossom Trail
Orlando, FL 32810
Telephone: (407) 298-2080

Tampa Branch

Cummins Southeastern Power, Inc.
5910 E. Hillsborough Avenue
P. O. Box 11737
Tampa, FL 33680
Telephone: (813) 626-1101

Georgia

Atlanta Distributor

Cummins South, Inc.
5125 Georgia Highway 85
College Park, GA 30349
Telephone: (404) 763-0151

Albany Branch

Cummins South, Inc.
1915 W. Oakbridge Drive
Albany, GA 31707-4938
Telephone: (912) 888-6210

Atlanta Branch

Cummins South, Inc.
100 University Avenue, S.W.
Atlanta, GA 30315-2202
Telephone: (404) 527-7800

Augusta Branch

Cummins South, Inc.
1255 New Savannah Road
Augusta, GA 30901-3891
Telephone: (404) 722-8825

Columbus Area

J. M. Cash (James)
4401 Conisburgh Way
Columbus, GA 31904
Telephone: (404) 563-2536

Dalton Branch

Cummins South, Inc.
204 Carbondale Road
Dalton, GA 30720-5303
Telephone: (404) 277-1144

Savannah Branch

Cummins South, Inc.
8 Interchange Court
Savannah, GA 31401-1627
Telephone: (912) 232-5565

Hawaii

Honolulu Distributor

Cummins Hawaii, Inc.
215 Puuhale Road
Honolulu, HI 96819-2235
Telephone: (808) 845-6606

Idaho

Boise - (Branch of Salt Lake City)

Cummins
Intermountain, Inc.
2851 Federal Way
P.O. Box 5212
Boise, ID 83705
Telephone: (208) 336-5000

Pocatello - (Branch of Salt Lake City)

Cummins Intermountain, Inc.
1429 Highway 30 West
Pocatello, ID 83201
Telephone: (208) 234-1661

Illinois

Bloomington-Normal - (Branch of Indianapolis)

Cummins Mid-States Power, Inc.
P.O. Box 348
(at U.S. 51 N and I-55)
Bloomington-Normal, IL 61761
Telephone: (309) 452-4454

Hodgkins Distributor

Cummins Northern Illinois, Inc.
7145 Santa Fe Drive
Hodgkins, IL 60525
Telephone: (312) 579-9222

Rock Island - (Branch of Omaha)

Cummins Great Plains
Diesel, Inc.
7820-42nd Street West
P. O. Box 4445
Rock Island, IL 61201-4445
Telephone: (309) 787-4300

Rockford - (Branch of Hodgkins)

Cummins Northern Illinois, Inc.
4617 Sandy Hollow Road
Rockford, IL 61109
Telephone: (815) 874-1700

Mt. Vernon - (Branch of St. Louis)

Cummins Gateway, Inc.
819 Casey Street
P.O. Box 1744
Mt. Vernon, IL 62864
Telephone: (618) 244-1232

Indiana

Indianapolis Distributor

Cummins Mid-States Power, Inc.
2421 Production Drive
Indianapolis, IN 46241
Telephone: (317) 243-7979

Evansville - (Branch of Louisville)

Cummins Cumberland, Inc.
1650 North Fares Avenue
Evansville, IN 47711
Telephone: (812) 425-2464

Ft. Wayne Branch

Cummins Mid-States Power, Inc.
3415 Coliseum Blvd. West
(At Jct. I-69 & 30/33)
Ft. Wayne, IN 46808
Telephone: (219) 482-3691

Gary - (Branch of Hodgkins)

Cummins Northern Illinois, Inc.
1440 Texas Street
Gary, IN 46402
Telephone: (219) 885-5591

Indianapolis Branch

Cummins Mid-States Power, Inc.
P. O. Box 41317
3621 West Morris Street
Indianapolis, IN 46241
Telephone: (317) 244-7251

Linton - (Branch of Indianapolis)

Cummins Mid-States Power, Inc.
1244 N.E. A Street
State Road 54 East
Linton, IN 47441-0678
Telephone: (812) 847-2201 and
(812) 847-2202

Iowa

Cedar Rapids - (Branch of Omaha)

Cummins Great Plains
Diesel, Inc.
625 - 33rd Avenue SW
P.O. Box 1107
Cedar Rapids, IA 52406
Telephone: (319) 366-7537
(24 hours)

Des Moines - (Branch of Omaha)

Cummins Great Plains
Diesel, Inc.
1680 N.E. 51st Avenue
P.O. Box B
Des Moines, IA 50313
Telephone: (515) 262-9591
Parts: (515) 262-9744
(515) 262-9591 after midnight

Des Moines - (Branch of Omaha)

Midwestern Power Products
Division of Cummins Great Plains
Diesel, Inc.
10100 Dennis Drive
Des Moines, IA 50322
Telephone: (515) 278-5521

Kansas

Colby - (Branch of Kansas City, Missouri)

Cummins Mid-America, Inc.
1880 South Range
P.O. Drawer "P"
Colby, KS 67701
Telephone: (913) 462-3945
(913) 462-3143, (913) 462-3970

Garden City - (Branch of Kansas City, Missouri)

Cummins Mid-America, Inc.
2203 W. Jones Frontage Road
Box 2598
Garden City, KS 67846
Telephone: (316) 275-2277

Olathe - (Branch of Kansas City, Missouri)

Cummins Mid-America, Inc.
11615 South Rogers Road
Olathe, KS 66062
Telephone: (913) 469-5660

Wichita - (Branch of Kansas City, Missouri)

Cummins Mid-America, Inc.
5101 North Broadway
P.O. Box 2681
Wichita, KS 67201
Telephone: (316) 838-0875
(24 hours)

Kentucky

Louisville Distributor

Cummins Cumberland, Inc.
(Corporate Office)
9822 Bluegrass Parkway
Louisville, KY 40299
Telephone: (502) 491-6060

Hazard Branch

Cummins Cumberland, Inc.
Highway 15 North
P.O. Box 510
Hazard, KY 41701
Telephone: (606) 436-5718

Louisville Branch

Cummins Cumberland, Inc.
9820 Bluegrass Parkway
Louisville, KY 40299
Telephone: (502) 491-4263

Louisiana

Morgan City - (Branch of Memphis)

Cummins Mid-South, Inc.
Hwy. 90 East
P.O. Box 1229
Amelia, LA 70340
Telephone: (504) 631-0576

New Orleans - (Branch of Memphis)

Cummins Mid-South, Inc.
110 E. Airline Highway
Kenner, LA 70062
Telephone: (504) 468-3535

Maine

Bangor (Branch of Boston)

Cummins North Atlantic, Inc.
142 Target Industrial Circle
Bangor, ME 04401
Telephone: (207) 941-1061

Scarborough - (Branch of Boston)

Cummins North Atlantic, Inc.
10 Gibson Road
Scarborough, ME 04074
Telephone: (207) 883-8155

Maryland

Baltimore Distributor

Cummins Chesapeake, Inc.
6120 Holabird Avenue
Baltimore, MD 21224
Telephone: (301) 633-5161

Annapolis Junction Branch

Cummins Chesapeake, Inc.
10820 Guilford Road
Suite 210
Annapolis Junction, MD 20701

Baltimore Branch

Cummins Chesapeake
3140 Washington Boulevard
Baltimore, MD 21230-1090
Telephone: (301) 644-6500

Massachusetts

Boston Distributor

Cummins North Atlantic, Inc.
100 Allied Drive
Dedham, MA 02026
Telephone: (617) 329-1750

West Springfield Branch

Cummins North Atlantic, Inc.
124 Ashley Avenue
West Springfield, MA 01089
Telephone: (413) 737-2659

Michigan

Detroit Distributor

Cummins Michigan, Inc.
41216 Vincenti Court
Novi, MI 48375
Telephone: (313) 478-9700

Blissfield Branch

Diesel Fuel Systems, Inc.
109 East Adrian Street
Blissfield, MI 49228
Telephone: (517) 486-4324

Dearborn Branch

Cummins Michigan, Inc.
3760 Wyoming Avenue
Dearborn, MI 48120
Telephone: (313) 843-6200

Grand Rapids Branch

Cummins Michigan, Inc.
3715 Clay Avenue, S.W.
Grand Rapids, MI 49508
Telephone: (616) 538-2250

Grand Rapids Branch

Standby Power
2745 -29th Street, S.E.
Grand Rapids, MI 49508
Telephone: (616) 949-7990

Iron Mountain - (Branch of De Pere)

Cummins Great Lakes, Inc.
P.O. Box 703
1901 North Stephenson Avenue
Iron Mountain, MI 49801
Telephone: (906) 774-2424

Saginaw Branch

Cummins Michigan, Inc.
722 N. Outer Drive
Saginaw, MI 48605
Telephone: (517) 752-5200

Minnesota

St. Paul Distributor

Cummins Diesel Sales, Inc.
2690 Cleveland Avenue North
St. Paul, MN 55113

(Mailing Address)
P.O. Box 64578
St. Paul, MN 55164
Telephone: (612) 636-1000

Duluth Branch

Cummins Diesel Sales, Inc.
3115 Truck Center Drive
Duluth, MN 55806
Telephone: (218) 628-3641

Hibbing Branch

Cummins Diesel Sales, Inc.
604 West 41st Street
P.O. Box 159
Hibbing, MN 55746
Telephone: (218) 263-7558

Mississippi

Jackson - (Branch of Memphis)

Cummins Mid-South, Inc.
New Highway 49 South
P.O. Box 54224
Jackson, MS 39208
Telephone: Admin.: (601) 932-7016
Parts: (601) 932-2720
Service: (601) 939-1800

Missouri

Kansas City Distributor

Cummins Mid-America, Inc.
1760 North Universal
Kansas City, MO 64120
General Accounting Office
Telephone: (816) 483-5070

Kansas City Branch

Cummins Mid-America, Inc.
3527 Gardner Avenue
Kansas City, MO 64120
Telephone: (816) 483-6313

Kansas City Fuel Systems Branch

KC Diesel & Electric
2810 Nicholson
Kansas City, MO 64120
Telephone: (816) 241-3400

Joplin Branch

Cummins Mid-America, Inc.
3507 East 20th Street
Joplin, MO 64801
Telephone: (417) 623-1661

Springfield Branch

Cummins Mid-America, Inc.
3637 East Kearney
Springfield, MO 65803
Telephone: (417) 862-0777

St. Louis Distributor

Cummins Gateway, Inc.
7210 Hall Street
St. Louis, MO 63147
Telephone: (314) 389-5400

Columbia Branch

Cummins Gateway, Inc.
5221 Highway 763N
Columbia, MO 65205
Telephone: (314) 449-3711

Sikeston Branch

Cummins Gateway, Inc.
101 Keystone Drive
Sikeston, MO 63801
Telephone: (314) 472-0303

Montana

Billings - (Branch of Denver)

Cummins Power, Inc.
5151 Midland Road
P.O. Box 30377
Billings, MT 59101
Telephone: (406) 245-4194

Great Falls - (Branch of Denver)

Cummins Power, Inc.
415 Vaughn Road
P.O. Box 3021
Great Falls, MT 59403
Telephone: (406) 452-8561

Missoula - (Branch of Seattle)

Cummins Northwest, Inc.
4950 North Reserve Street
Missoula, MT 59802-1498
Telephone: (406) 728-1300

Nebraska

Omaha Distributor and Branch

Cummins Great Plains
Diesel, Inc.
5515 Center Street
P.O. Box 6068
Omaha, NE 68106
Telephone: (402) 551-7678
(24 hours) or
(402) 493-4656

Kearney Branch

Cummins Great Plains
Diesel, Inc.
515 Central Avenue
P.O. Box 1326
Kearney, NE 68847
Telephone: (308) 234-1994

Nevada

Elko - (Branch of Salt Lake City)

Cummins Intermountain, Inc.
5370 East Idaho Street
Elko, NV 89801
Telephone: (702) 738-6405

Las Vegas - (Branch of Salt Lake City)

Cummins Intermountain, Inc.
2750 Losee Road
North Las Vegas, NV 89030
Telephone: (702) 399-2339
Mailing Address:
P. O. Box 3997
North Las Vegas, NV 89036-3997

Sparks - (Branch of Salt Lake City)

Cummins Intermountain, Inc.
150 Glendale Avenue
Sparks, NV 89431
Telephone: (702) 331-4983

New Jersey

Newark - (Branch of Bronx)

Cummins Metropower, Inc.
Routes U.S. 1 & 22
Newark, NJ 07114
Telephone: (201) 242-2255

New Mexico

Albuquerque - (Branch of Phoenix)

Cummins Southwest, Inc.
1921 Broadway N.E.
Albuquerque, NM 87102
Telephone: (505) 247-2441

Farmington - (Branch of Phoenix)

Cummins Southwest, Inc.
1101 North Troy King Road
Farmington, NM 87401
Telephone: (505) 327-7331

New York

Bronx Distributor

Cummins Metropower, Inc.
890 Zerega Avenue
Bronx, NY 10473
Telephone: (212) 892-2400

Albany - (Branch of Boston)

Cummins North Atlantic, Inc.
101 Railroad Avenue
Albany, NY 12205
Telephone: (518) 459-1710

Buffalo - (Branch of Boston)

Cummins North Atlantic, Inc.
480 Lawrence Bell Dr.
Williamsville, NY 14221-7090
Telephone: (716) 631-3211

Plainview Branch

Cummins Metropower, Inc.
105 South Service Road
Plainview, NY 11803
Telephone: (516) 249-7500

Syracuse - (Branch of Boston)

Cummins North Atlantic, Inc.
29 Eastern Avenue
Syracuse, NY 13211
Telephone: (315) 437-2751

North Carolina

Charlotte Distributor

Cummins Atlantic, Inc.
11101 Nations Ford Road
P.O. Box 240729
Charlotte, NC 28224-8843
Telephone: (704) 588-1240

Charlotte Branch

Cummins Atlantic, Inc.
3700 North Interstate 85
Charlotte, NC 28206
Telephone: (704) 596-7690

Greensboro Branch

Cummins Atlantic, Inc.
513 Preddy Boulevard
P.O. Box 22066
Greensboro, NC 27420-2066
Telephone: (919) 275-4531

Wilson Branch

Cummins Atlantic, Inc.
1514 Cargill Avenue
P.O. Box 1177
Wilson, NC 27894-1117
Telephone: (919) 237-9111

North Dakota

Dickinson - (Branch of St. Paul)

Cummins Diesel Sales, Inc.
Highway 10 West
P.O. Box 1246
Dickinson, ND 58602
Telephone: (701) 225-9194
(701) 677-5354
after 12:30 a.m.

Fargo - (Branch of St. Paul)

Cummins Diesel Sales, Inc.
4050 West Main Avenue (58103)
P.O. Box 2111
Fargo, ND 58107
Telephone: (701) 282-2466

Grand Forks - (Branch of St. Paul)

Cummins Diesel Sales, Inc.
4728 Gateway Drive
P.O. Box 636
Grand Forks, ND 58201
Telephone: (701) 775-8197
(701) 772-7689
after 12:30 a.m.

Minot - (Branch of St. Paul)

Cummins Diesel Sales, Inc.
1501 - 20th Avenue, S.E.
P.O. Box 1179
Minot, ND 58702
Telephone: (701) 852-3585
(701) 839-3417
after 12:30 a.m.

Ohio

Columbus Distributor and Branch

Cummins Ohio, Inc.
4000 Lyman Drive
Box 10
Hilliard (Columbus), OH 43026
Telephone: (614) 771-1000

Akron Branch

Cummins Ohio, Inc.
1033 Kelly Avenue
Akron, OH 44306
Telephone: (216) 773-7821

Cincinnati Branch

Cummins Ohio, Inc.
10470 Evendale Drive
Cincinnati, OH 45241
Telephone: (513) 563-6670

Cincinnati Branch

Power Systems Division
Cummins Ohio, Inc.
10660 Evendale Drive
Cincinnati, OH 45241
Telephone: (513) 563-9303

Cleveland Branch

Cummins Ohio, Inc.
7585 Northfield Road
Cleveland, OH 44146
Telephone: (216) 439-6800

Lima Branch

Cummins Ohio, Inc.
960 Broadway
Lima, OH 45804
Telephone: (419) 227-2641

Strasburg Branch

Cummins Ohio, Inc.
777 South Wooster Avenue
Box 136
Strasburg, OH 44680
Telephone: (216) 878-5511
After hours: (216) 364-1433

Toledo Branch

Cummins Ohio, Inc.
801 Illinois Avenue
Maumee
(Toledo), OH 43537
Telephone: (419) 893-8711

Youngstown Branch

Cummins Ohio, Inc.
7145 Masury Road
Hubbard
(Youngstown), OH 44425
Telephone: (216) 534-1935

Oklahoma

Duncan - (Branch of Arlington)

Cummins Southern Plains, Inc.
1400 East Bois D'Arc
P.O. Box 310
Duncan, OK 73534-0310
Telephone: (405) 255-1414
(24 Hours)

Oklahoma City - (Branch of Arlington)

Cummins Southern Plains, Inc.
5800 West Reno
P.O. Box 1636
Oklahoma City, OK 73101-1636
Telephone: (405) 946-4481
(24 hours)

Tulsa - (Branch of Arlington)

Cummins Southern Plains, Inc.
16525 E. Skelly Drive
P.O. Box 471616
Tulsa, OK 74147-1616
Telephone: (918) 234-3200
(24 hours)

Oregon

Bend - (Branch of Seattle)

Cummins Northwest, Inc.
3500 N. Highway 97 (97701-5729)
P.O. Box 309
Bend, OR 97709
Telephone: (503) 389-1900

Eugene - (Branch of Seattle)

Cummins Northwest, Inc.
91201 Industrial Parkway
Coburg, OR 97401

(Mailing Address)
P.O. Box 10877
Eugene, OR 97440-2887
Telephone: (503) 687-0000

Medford - (Branch of Seattle)

Cummins Northwest, Inc.
4045 Crater Lake Highway
Medford, OR 97504-9796
Telephone: (503) 779-0151

North Bend - (Branch of Seattle)

Cummins Northwest, Inc.
612 California Avenue (97459-3402)
P.O. Box 447
North Bend, OR 97459-0105
Telephone: (503) 756-3111

Pendleton - (Branch of Seattle)

Cummins Northwest, Inc.
223 S.W. 23rd Street
Pendleton, OR 97801-1810
Telephone: (503) 276-2561

Portland - (Corporate Branch of Seattle)

Cummins Northwest, Inc.
4711 N. Basin Avenue
P. O. Box 2710 (97208-2710)
Portland, OR 97217-3557
Telephone: (503) 289-0900

Portland - (Branch of Seattle)

Cummins Northwest, Inc.
4711 N. Basin Avenue
P. O. Box 2710 (97208-2710)
Portland, OR 97217-3557
Telephone: (503) 289-0900

Pennsylvania

Philadelphia Distributor

Cummins Diesel Engines, Inc.
3941 Commerce Avenue
Willow Grove, PA 19090-1108
Telephone: (215) 657-2200

Philadelphia (Bristol) Branch

Cummins Diesel Engines, Inc.
2727 Ford Road
Bristol, PA 19007
Telephone: (215) 785-6005

Ashland Branch

Cummins Diesel Engines, Inc.
32 Lehigh Street
Ashland, PA 17921
Telephone: (717) 875-2200

Clearfield Branch

Cummins Diesel Engines, Inc.
Clearfield Parts Center
501 Williams Street
Clearfield, PA 16830
Telephone: (814) 765-2421

Harrisburg Branch

Cummins Diesel Engines, Inc.
Lewis Road and Penhar Drive
P.O. Box 4215
Harrisburg, PA 17111
Telephone: (717) 564-1344

Mercer Branch

Cummins Diesel Engines, Inc.
R.D.#5, Box 58
Mercer, PA 16137
Telephone: (412) 748-4586

Monroeville Branch

Cummins Diesel Engines, Inc.
2740 Mosside Boulevard
Monroeville, PA 15146
Telephone: (412) 856-6700

Puerto Rico

Catano

Cummins Diesel Power, Inc.
Box CPR
San Patricio Plaza
Puerto Rico 00920
Location:
Calle C #31 El Matadero
Puerto Nuevo
Telephone: (809) 793-1072

South Carolina

Charleston - (Branch of Charlotte)

Cummins Atlantic, Inc.
3010 West Montague Avenue
P.O. Box 10341
Charleston, SC 29411-0341
Telephone: (803) 554-5112

Columbia - (Branch of Charlotte)

Cummins Atlantic, Inc.
1233 Bluff Road
P.O. Box 13543
Columbia, SC 29201-3543
Telephone: (803) 799-2410

South Dakota

Rapid City - (Branch of Omaha)

Cummins Great Plains
Diesel, Inc.
2310 Haines Avenue
P.O. Box 244
Rapid City, SD 57701
Telephone: (605) 343-6130

Sioux Falls - (Branch of Omaha)

Cummins Great Plains
Diesel, Inc.
701 East 54th Street North
Sioux Falls, SD 57104
Telephone: (605) 336-1715
(605) 334-6492

Tennessee

Memphis Distributor & Parts Distribution Center

Cummins Mid-South, Inc.
666 Riverside Drive
P.O. Box 3080
Memphis, TN 38103
Telephone: (901) 577-0666

Chattanooga - (Branch of Atlanta)

Cummins South, Inc.
1509 East 26th Street
Chattanooga, TN 37407-1095
Telephone: (615) 629-1447

Knoxville - (Branch of Louisville)

Cummins Cumberland, Inc.
1211 Ault Road
Knoxville, TN 37914
Telephone: (615) 523-0446

Memphis Branch

Cummins Mid-South, Inc.
1784 E. Brooks Road
Memphis, TN 38116
Telephone:
Sales/Admin.-(901) 345-7424
Parts - - - - -(901) 345-1784
Service - - - -(901) 345-6185

Nashville - (Branch of Louisville)

Cummins Cumberland, Inc.
706 Spence Lane
Nashville, TN 37217
Telephone: (615) 366-4341

Texas

Arlington Distributor and Branch

Cummins Southern Plains, Inc.
600 Watson Road
P.O. Box 90027
Arlington, TX 76004-3027
Telephone: (817) 640-6801
(24 hours)

Amarillo Branch

Cummins Southern Plains, Inc.
5224 Interstate 40 -
Expressway East
P.O. Box 31570
Amarillo, TX 79120-1570
Telephone: (806) 373-3793
(24 hours)

Corpus Christi Branch

Cummins Southern Plains, Inc.
1302 Corn Products Road
P.O. Box 48
Corpus Christi, TX 78403-0048
Telephone: (512) 289-0700
(24 hours)

Dallas Branch

Cummins Southern Plains, Inc.
3707 Irving Boulevard
Dallas, TX 75247
Telephone: (214) 631-6400
(24 hours)

El Paso - (Branch of Phoenix)

Cummins Southwest, Inc.
14333 Gateway West
El Paso, TX 79927
Telephone: (915) 852-4200

Fort Worth Branch

Cummins Southern Plains, Inc.
3250 North Freeway
Fort Worth, TX 76111
Telephone: (817) 624-2107
(24 hours)

Houston Branch

Cummins Southern Plains, Inc.
4750 Homestead Road
P.O. Box 1367
Houston, TX 77251-1367
Telephone: (713) 675-7421
(24 hours)

Mesquite Branch

Cummins Southern Plains, Inc.
2615 Big Town Blvd.
Mesquite, TX 75150
Telephone: (214) 321-5555
(24 hours)

Odessa Branch

Cummins Southern Plains, Inc.
1210 South Grandview
P.O. Box 633
Odessa, TX 79760-0633
Telephone: (915) 332-9121
(24 hours)

San Antonio Branch

Cummins Southern Plains, Inc.
6226 Pan Am Expressway North
P.O. Box 18385, Serna Station
San Antonio, TX 78218-0385
Telephone: (512) 655-5420
(24 hours)

Utah

Salt Lake City Distributor

Cummins Intermountain, Inc.
1030 South 300 West
P.O. Box 25428
Salt Lake City, UT 84125
Telephone: (801) 355-6500

Vernal Branch

Cummins Intermountain, Inc.
1435 East 335 South
P.O. Box 903
Vernal, UT 84078
Telephone: (801) 789-5732

Virginia

Bristol - (Branch of Louisville)

Cummins Cumberland, Inc.
400 Stage Coach Road
1-81 at Old Airport Road
Bristol, VA 24201
Telephone: (703) 669-4200

Richmond - (Branch of Charlotte)

Cummins Atlantic, Inc.
3900 Deepwater Terminal Road
Richmond, VA 23234
Telephone: (804) 232-7891

Roanoke - (Branch of Charlotte)

Cummins Atlantic, Inc.
5307 Peters Creek Road
P.O. Box 7237
Roanoke, VA 24019-7237
Telephone: (703) 362-1673

Washington

Seattle Distributor

Cummins Northwest, Inc.
811 S.W. Grady Way (98055-2944)
P.O. Box 9811
Renton, WA 98057-9811
Telephone: (206) 235-3400

Chehalis Branch

Cummins Northwest, Inc.
1200 N.W. Maryland
Chehalis, WA 98532-1813
Telephone: (206) 748-8841

Longview Branch

Cummins Northwest, Inc.
1153 Third Avenue (98632-3204)
P.O. Box 1459
Longview, WA 98632-0141
Telephone: (206) 425-0100

Spokane Branch

Cummins Northwest, Inc.
E. 3904 Trent Avenue (99202-4471)
P.O. Box 2746 -
Terminal Annex
Spokane, WA 99220-2746
Telephone: (509) 534-0411

Tacoma Branch

Cummins Northwest, Inc.
3701 Pacific Highway East
Tacoma, WA 98424-1135
Telephone: (206) 922-2191

Yakima Branch

Cummins Northwest, Inc.
1905 East Central Avenue (98901-3609)
P.O. Box 9129
Yakima, WA 98909-0129
Telephone: (509) 248-9033

West Virginia

Charleston - (Branch of Louisville)

Cummins Cumberland, Inc.
Charleston Ordnance Center
P.O. Box 8456
South Charleston, WV 25303
Telephone: (304) 744-6373

Fairmont - (Branch of Louisville)

Cummins Cumberland, Inc.
South Fairmont Exit, I-79
Rt. 73, South
P.O. Box 988
Fairmont, WV 26554
Telephone: (304) 367-0196

Wisconsin

DePere Distributor

Cummins Great Lakes, Inc.
P.O. Box 530
Route #3, Hwy. 41
DePere (Green Bay), WI 54115
Telephone: (414) 336-9631

Chippewa Falls Branch

Cummins Great Lakes, Inc.
Route #7
Box Number 88
Chippewa Falls (Eau Claire), WI 54729
Telephone: (715) 832-4329

Milwaukee Branch

Cummins Great Lakes, Inc.
9401 South 13th Street
Oak Creek, WI 53154
Telephone: (414) 768-7400

Wyoming

Gillette - (Branch of Denver)

Cummins Power, Inc.
2700 Hwy. 14 & 16 North
Gillette, WY 82716
Telephone: (307) 682-9611

Rock Springs - (Branch of Salt Lake City)

Cummins Intermountain, Inc.
2000 Foothill Blvd.
P.O. Box 1634
Rock Springs, WY 82901
Telephone: (307) 362-5168

Distributors and Branches - Canada

Alberta

Edmonton Distributor

Cummins Alberta
14755 - 121A Avenue
Edmonton, Alberta T5L 2T2, Canada
Telephone: (403) 455-2151

Calgary Branch

Cummins Alberta
703-64 Avenue S.E.
Calgary, Alberta T2H 2C3, Canada
Telephone: (403) 255-6691

Fort McMurray Branch

Cummins Alberta
158 Becker Crescent
Fort McMurray, Alberta T9K 1M7, Canada
Telephone: (403) 791-6836

Hinton Branch

Cummins Alberta
135 Veats Avenue
Hinton, Alberta T7V 1S8, Canada
Telephone: (403) 865-5111

Lethbridge Branch

Cummins Alberta
230 - 24th Street North
Lethbridge, Alberta T1J 3N2, Canada
Telephone: (403) 329-6144

British Columbia

Vancouver Distributor

Cummins British Columbia
4270 Dawson Street
Burnaby, B.C. V5C 4B1, Canada
Telephone: (604) 299-9111

Kamloops Branch

Cummins British Columbia
976 Laval Crescent
Kamloops, B.C. Canada V2C 5P5
Telephone: (604) 828-2388

Sparwood Branch

Cummins British Columbia
731 Douglas Fir Road
Sparwood, B.C. VOB 2GO, Canada
Telephone: (604) 425-0522

Tumbler Ridge Branch

Cummins British Columbia
Box 226
Tumbler Ridge, B.C.
Canada VOC 2WO
Telephone: (604) 242-4217

Manitoba

Winnipeg Distributor

Cummins Mid-Canada Ltd.
489 Oak Point Road
P.O. Box 1860
Winnipeg, MB R3C 3R1, Canada
Telephone: (204) 632-5470

New Brunswick

Fredericton - (Branch of Montreal)

Cummins Diesel

Branch of Cummins Americas, Inc.
Vanier Highway
P.O. Box 1178, Station "A"
Fredericton,
New Brunswick E3B 5C8, Canada
Telephone: (506) 452-1940

Newfoundland

St. John's - (Branch of Montreal)

Cummins Diesel

Branch of Cummins Americas, Inc.
122 Clyde Avenue
Donovans Industrial Park
(Mailing Address)
P. O. Box 159
Donovans Industrial Park
Mount Pearl, Newfoundland A1N 2C2
Canada
Telephone: (709) 364-6972

Nova Scotia

Halifax - (Branch of Montreal)

Cummins Diesel

Branch of Cummins Americas, Inc.
3204 Barrington Street
Halifax, Nova Scotia B3K 2X6, Canada
Telephone: (902) 429-1440

Sydney - (Branch of Montreal)

Cummins Diesel

Branch of Cummins Americas, Inc.
Site 9 Comp. 15, RR No. 6
Sydney, Nova Scotia B1P 6T2
Canada
Telephone: (902) 539-7380

Ontario

Toronto Distributor

Cummins Ontario Inc.
150 N. Queen Street
P.O. Box 40, Station "U"
Toronto, Ontario M8Z 5N1
Telephone: (416) 621-9921

Mississauga Branch

Dieselguard
Division of Cummins Ontario Inc.
1775 Bonhill Road, Unit 4
Mississauga, Ontario L5T 1C1
Telephone: (416) 564-0624

Oakville Industrial Branch

Cummins Ontario Inc.
301 Wyecroft Road
Oakville, Ontario L6K 2H2, Canada
Telephone: (416) 844-5851

Ottawa Branch

Cummins Ontario Inc.
3189 Swansea Crescent
Ottawa, Ontario K1G 3W5, Canada
Telephone: (613) 521-1146

Thunder Bay Branch

Cummins Ontario Inc.
1400 W. Walsh Street
Thunder Bay
Ontario P7C 4V9, Canada
Telephone: (807) 577-7561

Whitby Branch

Cummins Ontario Inc.
1311 Hopkins Street
Whitby, Ontario L1N 2C2, Canada
Telephone: (416) 668-6886

Quebec

Montreal Distributor

Cummins Diesel Branch of Cummins Americas, Inc.
7200 Trans Canada Highway
Pointe Claire, Quebec H9R 1C2, Canada
Telephone: (514) 695-8410

Montreal Branch

Cummins Diesel Branch of Cummins Americas, Inc.
7200 Trans Canada Highway
Pointe Claire, Quebec H9R 1C2, Canada
Telephone: (514) 695-8410
Sales: (514) 694-5143
Parts: (514) 694-5880

Quebec City Branch

Cummins Diesel Branch of Cummins Americas, Inc.
2400 Watt Street
Ste. Foy, Quebec G1P 3T3, Canada
Telephone: (418) 651-2911

Val D'Or Branch

Cummins Diesel Branch of Cummins Americas, Inc.
1025 Rue De L'Echo
Val D'Or, Quebec J9P 4P6
Canada
Telephone: (819) 825-0993

Saskatchewan

Lloydminster - (Branch of Winnipeg)

Cummins Mid-Canada Ltd.
4005 - 52nd Street
P.O. Box 959
Lloydminster, SK S9V OY9, Canada
Telephone: (403) 825-2062

Regina - (Branch of Winnipeg)

Cummins Mid-Canada Ltd.
110 Kress Street
P.O. Box 98
Regina, SK S4P 2Z5, Canada
Telephone: (306) 721-9710

Saskatoon - (Branch of Winnipeg)

Cummins Mid-Canada, Ltd.
3320 Idylwyld Drive North
P.O. Box 7679
Saskatoon, SK S7K 4R4, Canada
Telephone: (306) 933-4022

Distributors and Branches - Australia

Sydney (Lansvale)

Cummins Diesel Sales & Service
P.O. Box 150
164-170 Hume Highway
Lansvale, 2166
Cabramatta 2166
New South Wales, Australia
Telephone: (61-2) 728-6211

Branches:

Adelaide (Gepps Cross)

Cummins Diesel Sales & Service
P.O. Box 108
45-49 Cavan Road
Gepps Cross, 5094
Blair Athol, 5084
South Australia, Australia
Telephone: (61-8) 262-5211

Brisbane (Darra)

Cummins Diesel Sales & Service
P.O. Box 124
2506 Ipswich Road
Darra, 4076
Queensland, Australia
Telephone: (61-7) 375-3277

Cairns

Cummins Diesel Sales & Service
Cnr. Toohey & Knight Streets
Portsmith, Cairns, 4870
Queensland, Australia
Telephone: (61-70) 52-1488

Canberra

Cummins Diesel Sales & Service
15-27 Bayldon Road
Queanbeyan, 2620
A.C.T., Australia
Telephone: (61-62) 97-3433

Darwin (Winnellie)

Cummins Diesel Sales & Service
P.O. Box 37587
Lot 1758 Graffin Crescent
Winnellie, 5789
Winnellie, Darwin, 578
Northern Territory, Australia
Telephone: (61-89) 47-0766

Devonport

Cummins Diesel Sales & Service
P.O. Box 72E
2 Matthews Way
East Devonport, 7310
Tasmania, Australia
Telephone: (61-04) 24-8800

Grafton (South Grafton)

Cummins Diesel Sales & Service
P.O. Box 18
18-20 Induna Street
South Grafton, 2461
New South Wales, Australia
Telephone: (61-66) 42-3655

Kalgoorlie

Cummins Diesel Sales & Service
P.O. Box 706
Kalgoorlie, 6430
Western Australia, Australia
Location:
Cnr. Keogh Way & Atabara Street
Telephone: (61-90) 71-2994

Mackay

Cummins Diesel Sales & Service
P.O. Box 842
4 Presto Avenue
Mackay, 4740
Queensland, Australia
Telephone: (61-79) 55-1222

Melbourne (Campbellfield)

Cummins Diesel Sales & Service
Private Bag 9, G.P.O.
1788-1800 Hume Highway
Campbellfield 3061
Victoria, Australia
Telephone: (61-3) 357-5622

Moorabbin

Cummins Diesel Sales & Service
P.O. Box 368
Moorabbin, 3189
Victoria, Australia
Location:
5 Linton Street
Telephone: (61-3) 555-2255

Mount Gambier

Cummins Diesel Sales & Service
P.O. Box 2219
2 Avey Road
Mount Gambier, 5290
South Australia, Australia
Telephone: (61-87) 25-6422

Newcastle

Cummins Diesel Sales & Service
21 Galleghan Street
Hexham, 2322
New South Wales, Australia
Telephone: (61-49) 64-8466

Perth (Welshpool)

Cummins Diesel Sales & Service
P.O. Box 275
50 Kewdale Road
Kewdale, 6106
Cloverdale, 6105
Western Australia, Australia
Telephone: (61-9) 458-5911

Swan Hill

Cummins Diesel Sales & Service
P.O. Box 1264
5 McAllister Road
Swan Hill, 3585
Victoria, Australia
Telephone: (61-50) 32-9722

Tamworth

Cummins Diesel Sales & Service
P.O. Box 677
Lot 65 Gunnedah Road
Tamworth, 2320
New South Wales, Australia
Telephone: (61-67) 65-5455

Wodonga

Cummins Diesel Sales & Service
P.O. Box 174
9-11 McKoy Street
Wodonga, 3690
Victoria, Australia
Telephone: (61-60) 24-3655

Distributors and Branches - New Zealand

Auckland

Lees Power
8 The Furlong
Takanini, Auckland,
New Zealand
Telephone: (64-9) 299-7448

Branches:

Auckland

Lees Power
P.O. Box 12-120
440 Church Street
Penrose, Auckland,
New Zealand
Telephone: (64-9) 591-009

Christchurch

Lees Power
P.O. Box 16-149, Hornby
268 Main South Road
Sockburn, Christchurch,
New Zealand
Telephone: (64-3) 497-178

Napier

Lees Power
P.O. Box 3021, Onekawa
Austin Street
Onekawa, Napier,
New Zealand
Telephone: (64-70) 436-129

Palmerston North

Lees Power
P.O. Box 9024
852-860 Tremaine Avenue
Palmerston North,
New Zealand
Telephone: (64-63) 62-209

Rotorua

Lees Power
P.O. Box 934
Te Ngae Road
Rotorua, New Zealand
Telephone: (64-73) 56-699

Wellington

Lees Power
P.O. Box 30-447,
Port Road South
Seaview, Lower Hutt,
New Zealand
Telephone: (64-4) 686-029

Regional Offices - International

Latin America Area Office - Hialeah

Cummins Americas, Inc.
16085 N.W. 52nd Avenue
Hialeah, FL 33014
U.S.A.
Telephone: (305) 621-4451

Countries Covered:
- Argentina
- Bolivia
- Chile
- Costa Rica
- Dominican Republic
- El Salvador
- Guatemala
- Honduras
- Nicaragua
- Panama
- Paraguay
- Peru
- Uruguay

Colombia Regional Office - Bogota

Cummins Engine Co. de Colombia S.A.
Carrera 11A No. 90-15 Of. 601/602
Bogota, D.E., Colombia
Telephone: (57-1) 218-6248

Mailing Address:
Apartado Aereo 90988
Bogota D.E., Colombia

Countries Covered:
- Colombia
- Ecuador

Venezuela Regional Office - Caracas

Cummins Engine Company
Oficina del Delegado
Torre La Primera, Oficina 5-D
Av. Francisco de Miranda
Chacao, Caracas 1060, Venezuela

Mailing Address:
Cummins Engine Company M-227
c/o Jet Cargo International
P.O. Box 020010
Miami, FL 33102-0010
Telephone: (58-2) 32-0563, 32-7187

Country Covered:
- Venezuela

India Kirloskar Office - Pune

Kirloskar Cummins Limited
Kothrud
Pune - 411 029, India
Telephone: (91-212) 33-0240, 33-1074, 33-1105

Countries Covered:
- Bhutan
- India
- Nepal

Brazil Cumbrasa Office - Sao Paulo

Cummins Brasil S.A.
Rua Jati, 266
07270 Guarulhos
Sao Paulo, Brazil

Mailing Address:
P.O. Box 13
07270 Guarulhos
Sao Paulo, Brazil
Telephone: (55-11) 945-9811

Country Covered:
- Brazil

South And East Asia Area Office - Singapore

Cummins Diesel Sales Corporation
8 Tanjong Penjuru
Jurong Industrial Estate
Singapore 2260
Telephone: (65) 265-0155

Countries Covered:
- Bangladesh
- Brunei
- Burma
- Cambodia
- Guam
- Hong Kong
- Indonesia
- Laos
- Malaysia
- Philippines
- Singapore
- Sri Lanka
- Taiwan
- Thailand
- Vietnam

South Pacific Area Office - Scoresby

Cummins Australia Pty. Ltd.
2 Caribbean Drive
Scoresby, 3179
Victoria, Australia
Telephone: (61-3) 765-3222

Countries Covered:
- Australia
- French Polynesia (including Tahiti)
- New Caledonia
- New Zealand
- South Pacific Islands (including Eastern New Guinea, Fiji Islands, and the Solomon Islands)

North Asia Area Office - Tokyo

Cummins Diesel Sales Corporation
1-12-10 Shintomi
Chuo-ku, Tokyo 104
Japan
Telephone: (81-3) 555-3131/2/3/4/5

Countries Covered:
- Japan
- South Korea

China Regional Office - Beijing

Cummins Corporation
China World Tower, Suite 917
China World Trade Centre
No. 1 Jianguo Men Wai
Beijing 100004
People's Republic of China
Telephone: (86-1) 505-4209/10
Country
Covered: China

U.K. Area Office - New Malden

Cummins Engine Company Limited
46-50 Coombe Road
New Malden
Surrey KT3 4QL
England
Telephone: (44-1) 949-6171

U.K. Regional Office - Wellingborough

Cummins Diesel
Denington Estate
Wellingborough
Northants, NN8 2QH
England
Telephone: (44-933) 76211
Countries
Covered: Ireland
United Kingdom

Middle East Regional Office - Mechelen

Cummins Diesel N.V.
Blarenberglaan 4
Industriepark Noord 2
2800 Mechelen
Belgium
Telephone: (32-15) 200031

Countries Covered:

Afghanistan	Lebanon	Sudan
Bahrain	North Yemen	Syria
Cyprus	Oman	Turkey
Egypt	Pakistan	United Arab Emirates
Iran	Quatar	
Iraq	Saudi Arabia	
Jordan	South Yemen	
Kuwait		

Daventry

Cummins Engine Company Ltd.
Royal Oak Way South
Daventry, Northants NN11 5NU
England
Telephone: (44-327) 76000

Darlington

Cummins Engine Company Limited
Yarm Road
Darlington, Co. Durham DL1 4PW
England
Telephone: (44-325) 460606

Shotts

Cummins Engine Company Limited
Calderhead Road
Shotts, Lanarkshire ML7 4JT
Scotland
Telephone: (44-786) 824879

East and Southern Africa Regional Office - Harare

Cummins Diesel International Ltd.
72 Birmingham Road
(Heavy Industrial Sites)
Southerton
Harare, Zimbabwe

Mailing Address:
P.O. Box 8440, Causeway
Harare, Zimbabwe
Telephone: (263-4) 67645

Countries Covered:

Botswana	Namibia
Congo	Reunion
Djibouti	Seychelles
Ethiopia	Samalia
Kenya	South Africa
Lesotho	Swaziland
Madagascar	Tanzania
Malawi	Uganda
Mauritius	Zambia
Mozambique	Zimbabwe

West/Northern Africa Regional Office - Mechelen

Cummins Diesel N.V.
Blarenberglaan 4
Industriepark Noord 2
2800 Mechelen
Belgium
Telephone: (32-15) 200031

Countries Covered:

Benin	Guinea Bissau
Burkina Faso	Liberia
Burundi	Mali
Cameroon	Malta
Cape Verde	Mauritania
Central African Republic	Morocco
Chad	Niger
Cote d'Ivoire	Nigeria
Equatorial Guinea	Rwanda
Gabon	Sao Tome & Principe
Gambia	Senegal
Ghana	Sierre Leone
Guinea	Togo
	Tunisia
	Zaire

North Africa Regional Office - Algiers

Cummins Corporation
Bureau de Liaison
38, Lotissement Benachour Abdelkader
Cheraga
42300 Wilaya de Tipasa
Algeria
Telephone: (213) 281-06-90

Countries Covered:
- Algeria
- Angola

European Regional Office - Mechelen

Cummins Diesel N.V.
Blarenberglaan 4
Industriepark Noord 2
2800 Mechelen
Belgium
Telephone: (32-15) 200031

Countries Covered:
- Austria
- Belgium
- Czechoslovakia
- Denmark
- Finland
- Greece
- Hungary
- Iceland
- Israel
- Luxembourg
- Netherlands
- Norway
- Portugal
- Sweden
- Switzerland

France Regional Office - Lyon

Cummins Diesel Sales Corporation
39, rue Ampere - Zone Industrielle
69680 Chassieu
France
Telephone: (33) 78-90-43-05

Country Covered: France

Italy Regional Office - Milan

Cummins Diesel Italia S.p.A.
Piazza Locatelli 8
Zona Industriale
20098 San Giuliano Milanese
Milan, Italy
Telephone: (39-2) 982-81235/6/7

Country Covered: Italy

Mexico Cummsa Office - Mexico City

Cummins, S.A. de C.V.
Arquimedes No. 209
Col. Polanco
11560 Mexico, D.F.
Mexico

Mailing/Shipping Address:
Gonzalez de Castilla Inc.
P.O. Box 1391
4605 Modern Lane
Modern Industrial Park
Laredo, TX 78040
Telephone: (52-5) 254-3822

Country Covered: Mexico

Germany Regional Office - Gross-Gerau

Cummins Diesel Deutschland GmbH
Odenwaldstr. 23
D-6080 Gross-Gerau
Federal Republic of Germany
Telephone: (49-6152) 174-0

Mailing Address:
P.O. Box 1134
D-6080 Gross Gerau
Federal Republic of Germany

Countries Covered:
- Albania
- Bulgaria
- Federal Republic of Germany
- German Democratic Republic
- Poland
- Romania
- U.S.S.R.
- Yugoslavia

Spain Representation Office - Madrid

Cummins Diesel N.V.
C Andarrios 11-C
28043 Madrid
Spain
Telephone: (34-1) 759-2880

Country Covered: Spain

Moscow

Cummins Engine Co., Inc.
c/o Control Data Corporation
Krasnopresnenskaya Nab. 12, Office 2006
123100 Moscow
U.S.S.R.
Telephone: (7-95) 253-8379

Distributors - International

ABU DHABI
-See United Arab Emirates

AFGHANISTAN
-See Middle East Regional Office

ALBANIA
-See Germany Regional Office - Gross Gerau

ALGERIA

Algiers
Cummins Corporation
Bureau de Liaison
38, Lotissement Benachour Abdelkader Cheraga
43200 Wilaya de Tipasa
Algeria
Telephone: (213) 281-0690

AMERICAN SAMOA

Pago Pago
Burns Philp (South Seas) Co. Ltd.
P.O. Box 129
Pago Pago, American Samoa
Telephone: (684) 633-4281

ANDORRA
-See European Regional Office - Mechelen

ANGUILLA
-See Antigua

ANTIGUA

Miami (Office In U.S.A.)
Cummins Southeastern Power, Inc.
9900 N.W. 77 Court
Hialeah Gardens, FL 33016
Telephone: (305) 821-4200

ARGENTINA

Buenos Aires
Motores Stork
Werkspoor S.A.I.C.
Av. Ader 3707-11
1605 Carapachay
Buenos Aires, Argentina
Telephone: (54-1)766-0865/0738/0580

ARUBA, ISLAND OF
-See Netherlands Antilles

AUSTRIA

Vienna
Cummins-Industriemotoren
Ges.m.b.H.
Bickfordstr. 25
A-7201 Neudoerfl Austria
Telephone: (43-26) 22-77-418

AZORES ISLANDS
-See Portugal

BAHAMAS

Miami (Office in U.S.A.)
Cummins Southeastern Power, Inc.
9900 N.W. 77 Court
Hialeah Gardens, FL 33016
Telephone: (305) 821-4200

BAHRAIN

Bahrain
Yusuf Bin Ahmed Kanoo W.L.L.
Kanoo Commercial
P.O. Box 45, Manama
Bahrain
Telephone: (973) 252454

BALEARIC ISLANDS

Madrid (Office in Spain)
Cummins Ventas y Servicio, S.A.
Torrelaguna, 56
28027 Madrid, Spain

BANGLADESH

Dhaka
Equipment & Engineering Co., Ltd.
P.O. Box 2339
Dhaka 1000, Bangladesh

Location:
56, Dilkusha Commercial Area
2nd Floor/Eastern Block
Telephone: (880-2) 34357, 34060

BARBADOS

Miami (Office in U.S.A.)
Cummins Southeastern Power, Inc.
9900 N.W. 77 Court
Hialeah Gardens, FL 33016
Telephone: (305) 821-4200

BELGIUM

Brussels
Cummins Distributor
Belgium S.A.
623/629 Chaussee de Haecht
B-1030 Brussels, Belgium
Telephone: (24 hr.)
(32-2) 216-81-10

BELIZE

Miami (Office in U.S.A.)
Cummins Southeastern Power, Inc.
9900 N.W. 77 Court
Hialeah Gardens, FL 33016
Telephone: (305) 821-4200

BENIN
-See Togo

BERMUDA

Bronx (Office in U.S.A.)
Cummins Metropower, Inc.
890 Zerega Avenue
Bronx, NY 10473
Telephone: (212) 892-2400

BHUTAN

Pune (Office in India)
Cummins Diesel Sales & Service (India) Ltd.
35A/1/2, Erandawana
Pune - 411 038, India
Telephone: (91-212) 56096/7/8

BOLIVIA

La Paz
Machinery & Auto Service
Casilla 4042
La Paz, Bolivia

Location:
Av. 20 de Octubre Esq.
Rosendo Gutierrez
Telephone: (591-2) 379650, 366394

BONAIRE, ISLAND OF
-See Netherlands Antilles

BOTSWANA
-See East and Southern Africa Regional Office Harare

BRAZIL

Ananindeua
Marcos Marcelino & Companhia Ltda.
Rodovia BR-316, Km 9
67000 Ananindeua, Para,
Brazil
Telephone: (55-91) 235-4100/4132/
4143/4012

Belo Horizonte
Distribuidora Cummins
Minas Ltda.
Rua PI, 25, Caicara
30770 Belo Horizonte,
Minas Gerais, Brazil
Telephone: (55-31) 462-5144

Campo Grande
Distribuidora Cummins
Mato Grosso Ltda.
Rodovia BR 163 Km 01
79060 Campo Grande
Mato Grosso do Sul, Brazil
Telephone: (55-67) 387-1166

Curitiba
Festugato S.A.,
Distribuidora Cummins
Rua Brasilio Itibere, 2195
80230 Curitiba, Parana
Brazil
Telephone: (55-41) 222-4036

Fortaleza
Distribuidora Cummins Diesel
Do Nordeste Ltda.
Av. da Abolicao, 3882,
Mucuripe
60165 Fortaleza, Ceara
Brazil
Telephone: (55-85) 244-9292

Goianian
Distribuidora de Motores Cummins
Centro Oeste Ltda.
Av. Caiapo 777 - Sta. Genoveva
74410 Goiania, Goias
Brazil
Telephone: (55-62) 264-1144

Manaus
Distribuidora Cummins
Amazonas Ltda.
Estrada da Ponta Negra, 6080 - Sao Jorge
69037 Manaus, Amazonas,
Brazil
Telephone: (55-92) 238-7174/7177/8856/7631

Porto Alegre
Distribuidora Cummins
Meridional S.A.
Rua Dona Alzira, 98, Sarandi
91050 Porto Alegre,
Rio Grande do Sul, Brazil
Telephone: (55-512) 40-8222

Rio de Janeiro
Distribuidora Cummins
Leste Ltda.
Rua Sariema, 138-Olaria
21030 Rio de Janeiro,
Rio de Janeiro, Brazil
Telephone: (55-21) 290-7899

Sao Paulo
Companhia Distribuidora
de Motores Cummins
Rua Martin Burchard, 291 - Bras
03043 Sao Paulo,
Sao Paulo, Brazil
Telephone: (55-11) 270-2311

Sao Paulo
Motores Cummins Diesel
do Brasil Ltda.
Av. Thomaz Edson, 448 - Barra Funda
01140 Sao Paulo,
Sao Paulo, Brazil
Telephone: (55-11) 826-9376, 867-3702

BRITISH VIRGIN ISLANDS
-See Puerto Rico

BRUNEI
-See Malaysia

BURKINA - FASO
-See West/Northern Africa Regional Office - Mechelen

BULGARIA
-See Germany Regional Office - Gross Gerau

BURMA

Kuala Lumpur (Office In Malaysia)
Contact: Scott &
English (M) Sdn Bhd
P.O. Box 10324
50710 Kuala Lumpur
West Malaysia

Location:
16 Jalan Chan Sow Lin
55200 Kuala Lumpur
West Malaysia
Telephone: (60-3) 2211033

BURUNDI

Brussels (Office in Belgium)
Bureau Technique Bia, S.A.
Rameistraat, 123
B-1900 - Overijse, Belgium
Telephone: (32-2) 6892811

CAMBODIA
-See South & East Asia
Regional Office - Singapore

CAMEROON

Limbe
LEYCAM Motors Ltd.
P.O. Box 307
Limbe
Cameroon
Telephone: (237) 33-22-66

CANARY ISLANDS

Madrid (Office in Spain)
Cummins Ventas y
Servicio, S.A.
Torrelaquna, 56
28027 Madrid, Spain

CAPE VERDE
-See West/Northern Africa
Regional Office - Mechelen

CENTRAL AFRICAN REPUBLIC
-See West/Northern Africa
Regional Office - Mechelen

CEYLON
-See Sri Lanka

CHAD
-See West/Northern Africa
Regional Office - Mechelen

CHILE

Santiago
Distribuidora Cummins Diesel
S.A.C.I.
Casilla Postal 1230
Santiago, Chile

Location:
Avda. Providencia 2653, Office 1901
Providencia
Telephone: (56-2) 321940, 517464/5/6

CHINA, PEOPLE'S REPUBLIC
-See China Regional
Office - Beijing

COLOMBIA

Barranquilla
Cummins de Colombia S.A.
Apartado Aereo 5347
Barranquilla, Colombia

Location: Calle 30, No. 19 - 21
Telephone: (57-58) 40-11-99, 40-13-46

Bogota
Cummins Colombiana Ltda.
Apartado Aereo No. 7431
Bogota, D.E. Colombia

Location:
Av. Americas X Carrera
42C No. 19-45
Bogota, D.E., Colombia
Telephone: (57-1) 244-5688/5882

Bucaramanga
Cummins API, Ltda.
Apartado Aereo 352
Bucaramanga, Colombia

Location:
Autopista a Giron, Km 7
Telephone: (57-73) 68060

Cali
Distribuidora Cummins del Valle, Ltda.
Apartado Aereo No. 6398
Cali, Colombia

Location: Av. 3a. # 39-35 - Vipasa
Telephone: (57-3) 65-4343

Medellin
Equipos Tecnicos Ltda.
Apartado Aereo No. 2046
Medellin, Colombia

Location: Carrera 52 No. 10-184
Telephone: (57-4) 255-4200

Pereira
Equipos Tecnicos Ltda. C.Q.R.
Apartado Aereo No. 1240
Pereira, Colombia

Location: Carrera 8a. No. 45-39
Telephone: (57-63) 366341/43

COMOROS
-See East and Southern
Africa Regional Office
Harare

CONGO, PEOPLE'S REPUBLIC

Brussels (Office in Belgium)
Bureau Technique Bia, S.A.
Rameistraat, 123
B-1900
Overijse, Belgium
Telephone: (32-2) 6892811

CORSICA
-See France

COSTA RICA

San Jose
Servicios Unidos, S.A.
P.O. Box 559
San Jose, Costa Rica

Location:
Curridabat
Telephone Office: (506) 53-93-93
Telephone Service Shop:
(506) 26-00-76

COTE D'IVOIRE

Abidjan
AFI-TECHNIK
2 Rue Clement Ader, Zone 4
04 B.P. 350
Abidjan 04
Cote d'Ivoire
Telephone: (225) 35-70-96, 35-65-06

CUBA

Miami (Office in U.S.A.)
Cummins Southeastern Power, Inc.
9900 N.W. 77 Court
Hialeah Gardens, FL 33016
Telephone: (305) 821-4200

CURACAO, ISLAND OF
-See Netherlands Antilles

CYPRUS

Nicosia
Alexander Dimitriou & Sons Ltd.
P.O. Box 1932
Nicosia, Cyprus
Telephone: (357-2) 461350

CZECHOSLOVAKIA
-See European Regional Office - Mechelen

DENMARK

Glostrup
P. L. Industrimaskiner A/S
Post Box 166
2605 Broendby, Denmark

Location:
Midtager 22
Telephone: (45-2) 96-21-61

DJIBOUTI
-See East and Southern Africa Regional Office - Harare

DOMINICA

Miami (Office in U.S.A.)
Cummins Southeastern Power, Inc.
9900 N.W. 77 Court
Hialeah Gardens, FL 33016
Telephone: (305) 821-4200

DOMINICAN REPUBLIC

Santo Domingo
Argico C. Por A.
P.O. Box 292-2 Feria
Santo Domingo
Dominican Republic, ZP-6

Location:
Calle Jose A. Soler
No. 3, ESQ.
Avenida Lope de Vega
Telephone: (809) 562-6281

DUBAI
-See United Arab Emirates

ECUADOR

Guayaquil
Motores Cummins (MOTCUM) S.A.
P.O. Box 1062
Guayaquil, Ecuador

Location:
Avenida Carlos Julio
Arosemena Km. 4
Telephone: (593-4) 204264, 202600

Quito
Rectificadora Botar S.A.
P.O. Box 3344
Quito, Pichincha, Ecuador

Location:
Av. 10 de Agosto No. 5980
Telephone: (593-2) 241-544

EGYPT

Cairo
ADAT*
P.O. Box 1572
25, Pyramids Road
Giza
Cairo, Egypt
Telephone: (20-2) 850077, 851829

Cairo (Egyptian Marine Market)
Egypt Diesel (Sales Office)
6 Abdel Rahman Abu Taleb Street
P.O. Box 72
Saveda Nafisa
Cairo 11411, Egypt
Telephone: (20) 3631413

EL SALVADOR

San Salvador
Salvador Machinery
Company, S.A. de C.V.
P.O. Box 125
San Salvador, El Salvador

Location:
Blvd. Ejercito Nacional
Telephone: (503) 711022, 228388

ENGLAND
-See United Kingdom

* All applications **except** marine market.

EQUATORIAL GUINEA
-See West/Northern Africa Regional Office - Mechelen

ETHIOPIA

Addis Ababa
AFCOR (Ethiopia) P.L.C.
P.O. Box 263
Addis Ababa, Ethiopia
Telephone: 128130

FAROE ISLANDS

Wellingborough (Office in United Kingdom)
Cummins Diesel
Denington Industrial Estate
Wellingborough
Northants NN8 2QH,
England

FERNANDO PO
-See Spain

FIJI

Suva
Burns Philp (South Seas) Co. Ltd.
P.O. Box 355
Suva, Fiji
Telephone: (679) 31-1777

FINLAND

Helsinki
Machinery OY
P.O. Box 56

Location:
Teollisuuskatu 29
SF 00511 Helsinki, Finland
Telephone: Nat: (9-0) 77221
Int: (358-0) 77221

FRANCE

Lyon
Cummins Diesel
Sales Corporation
38, rue Ampere Z.I.
69680 Chassieu, France
Telephone: (33-7) 8-90-43-05

GABON

Libreville
SODIM T.P.
B.P. 506
Libreville, Gabon

Location:
Zone Industrielle d'Oloumi
Telephone: (241) 72-06-85

GAMBIA
-See West/Northern Africa Regional Office - Mechelen

GERMANY, EAST
-See W. Germany Regional Office - Gross-Gerau

GERMANY, WEST

Gross-Gerau
Cummins Diesel Deutschland GmbH
P.O. Box 1134
D-6080 Gross-Gerau,
W. Germany

Location: Odenwaldstr. 23
Telephone: (49-6152) 174-0

GHANA

Accra
Leyland DAF (Ghana) Ltd.
P.O. Box 2969
Accra, Ghana

Location:
39/40 Ring Road South
Industrial Estate
Telephone: 22-88-06

GREECE

Athens (Ag. Ioannis Rentis)
Cummins Distributor Hellas Ltd.
4b Thessalonikis Str.
182 33 Ag. Ioannis Rentis
Greece
Telephone: (1) 493-1086

Workshop:
Cummins Distributor Hellas Ltd.
4 Thessalonikis Str.
Telephone: (30-1) 491-5264

GREENLAND
-See Denmark

GRENADA

Miami (Office in U.S.A.)

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

GUADELOUPE

Miami (Office in U.S.A.)

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

GUAM

Tamuning

Mid-Pac Far East, Inc.
150 E. Harmon
Industrial Park Road
Tamuning, Guam 96911
Telephone: (671) 646-5447/1770

GUATEMALA

Guatemala City

Maquinaria y Equipos, S.A.
P.O. Box 2304
Guatemala City, Guatemala

Location:
Carretera Amatitlan
Km 12 zona 12
Telephone: (502-2) 773334/7/9

GUINEA

-See West/Northern Africa Regional Office - Mechelen

GUINEA BISSAU

-See West/Northern Africa Regional Office - Mechelen

GUYANA

Miami (Office in U.S.A.)

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

GUYANA, FRENCH

Miami (Office in U.S.A.)

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

HAITI

Miami (Office in U.S.A.)

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

HOLLAND

-See Netherlands

HONDURAS

Tegucigalpa

Comercial Laeisz
Honduras, S.A.
P.O. Box 1022
Tegucigalpa, D.C., Honduras

Location:
Zona La Burrera,
Blvd. Toncontin
Frente a Gasolinera Esso.
Telephone: (504) 333570, 331148, 335615

HONG KONG

Kowloon

Cummins Diesel Sales & Service Ltd.
G.P.O. Box 10004
Hong Kong, B.C.C.

Location:
Unison Industrial Centre
15th Floor, Units C & D
27-31 Au Pui Wan Street
Fo Tan, Shatin
Telephone: (852-0) 6065678

HUNGARY

Vienna (Office in Austria)

Cummins-Industriemotoren
Ges. m.b.H.
Bickfordstr. 25
A-7201 Neudoerfl, Austria

ICELAND

Reykjavik

Bjorn & Halldor Ltd.
P.O. Box 8560
Sidumula 19
128 Reykjavik, Iceland
Telephone: (354-1) 36030, 36930

INDIA

Pune

Cummins Diesel Sales &
Service (India) Ltd.
35A/1/2, Erandawana
Pune - 411 038, India
Telephone: (91-212) 31234, 31534, 31635, 30066, 30166, 30356, 31706

INDONESIA

Jakarta

P.T. Alltrak 1978
P.O. Box 64/KBJL
Jakarta Selatan 12330, Indonesia

Location:
J1. R.S.C. Veteran No. 4
Bintaro, Rempoa
Telephone: (62-21) 773377, 773155, 772401

IRAN

-See Middle East Regional Office - Mechelen

IRAQ

Genk (Office in Belgium)

Industrial Construction Consultancy, N.V.
Essenlaan 5, Bus 4
3600 Genk
Belgium
Telephone: (32-11) 38-48-32

IRELAND

Wellingborough (Office in England)

Cummins Diesel
Denington Estate
Wellingborough
Northants NN8 2QH, England

ISRAEL

Tel Aviv

Israel Engines &
Trailers Co. Ltd.
Levinson Brothers Engineers
P. O. Box 390
Tel Aviv, Israel 61003

Location:
33 Hahashmal Street
Telephone: (972-3) 622671/2/3/4/5

ITALY

Milan

Cummins Diesel Italia S.p.A.
Piazza Locatelli, 8 (gia' Via Basento)
Zona Industriale
20098 S. Giuliano
Milanese (Milan), Italy
Telephone: (39-2) 988-1235/6/7

Rome

O. ME. CO. S.p.A.
Via Trionfale 12526
00135 Roma, Italy
Telephone: (39-6) 376-5152/5151/5702

IVORY COAST

-See Cote d' Ivoire

JAMAICA

Miami (Office in U.S.A.)

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

JAPAN

Tokyo

Cummins Diesel (Japan) Ltd.
1-12-10-Shintomi
Chuo-ku, Tokyo 104
Japan
Telephone: (81-3) 555-8511

JORDAN

Amman

S.E.T.I. Jordan Limited
P.O. Box 8053
Amman, Jordan
Telephone: (962-6) 621867

KENYA

Nairobi

Werrot & Company Limited
P.O. Box 41216
Nairobi, Kenya

Location:
Lusaka Road
Telephone: (254) 150-20316

KOREA, SOUTH

Seoul

Hwa Chang Trading Co., Ltd.
Central P.O. Box No. 216
Seoul, South Korea

Location:
143-11 Doksan-Dong, Kuro-Ku
Telephone: (82-2) 854-0071/2/3/4/5,
869-1411/2/3

Repair Shop:
336-6, Won-Doug, Osan-City
Kyeongi-Province, South Korea
Telephone: (82-339) 73-0235/6/7/8,
73-2146

KUWAIT

Kuwait

General Transportation &
Equipment Co.
(Sales Department)
P.O. Box 1096
13011 Safat, Kuwait

Location:
Shuwaikh Behind
Canada Dry Factory
Telephone: (965) 4833380/81

Kuwait

General Transportation &
Equipment Co.
(Service Department)
East Ahmadi Area
13011 Safat, Kuwait
Telephone: (965) 3981577

LAOS

-See South and East
Asia Regional Office
- Singapore

LEBANON

Beirut

S.E.T.I. Charles Keller
S.A.L.
IMM.B.P. 16-6726
Beirut, Lebanon

Location:
Corniche du Fleuve
Telephone: (961-1) 425040/41, 426042

LESOTHO

-See East/South Africa Regional Office -
Harare

LIBERIA

Monrovia

Electromotor, Inc.
P.O. Box 573
Monrovia, Liberia

Location 1:
U.N. Drive, Bushrod Island, Waitown
Telephone: (231) 22-19-50, 22-29-38

Location 2:
Tubman Blvd. & 3rd St.
Telephone: (231) 26-12-40, 26-12-41

LIBYA

Valletta (Office in Malta)

Plant and Equipment Ltd.
Regency House
254, Republic Street
Valletta, Malta

LIECHTENSTEIN

-See Switzerland

LUXEMBOURG

Brussels (Office in Belgium)

Cummins Distributor Belgium S.A.
623/629 Chausse de Haecht
B-1030 Brussels, Belgium
Telephone: (32-2) 216-81-10

MACAU

-See Hong Kong

MADAGASCAR

-See East and Southern
Africa Regional Office -
Harare

MADEIRA ISLANDS

-See Portugal

MALAWI

-See East and Southern
Africa Regional Office -
Harare

MALAYSIA

Kuala Lumpur

Cummins Diesel Sales & Service
Div. of Scott & English
(M) Sdn. Bhd.
P.O. Box 10324
50710 Kuala Lumpur, West Malaysia

Location:
16 Jalan Chan Sow Lin
55200 Kuala Lumpur, West Malaysia
Telephone: (60-3) 2211033

MALI

-See West/Northern Africa Regional
Office - Mechelen

MALTA

Valletta

Plant & Equipment Ltd.
254, Republic Street
Valletta, Malta
Telephone: (356) 23-26-20, 23-33-43

MARTINIQUE

Miami (Office in U.S.A.)

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

MAURITANIA

-See West/Northern Africa Regional
Office - Mechelen

MAURITIUS

-See East/South Africa Regional
Office - Harare

MEXICO

Guadalajara

Cummins de Occidente, S.A.
Apartado Postal 1-1065
44890 Guadalajara,
Jalisco, Mexico

Location:
Calz. Gonzalez Gallo No. 2213
Col. El Rosario
Telephone: (52-36) 39-3101, 39-3153

Merida

Cummins del Sureste, S.A. de C.V.
Av. Aviacion 647
Esquina Calle 100, Col. Sambula
97000 Merida, Yucatan
Mexico

Mexico City

Cummins de Mexico, S.A.
Norte 35 No. 1015
Col. Industrial Vallejo
07700 Mexico 14, D.F., Mexico
Telephone: (52-5) 567-37-00

Monterrey

Tecnica Automotriz, S.A.
Ave. Universidad
No. 3637 Nte.
Monterrey, Nuevo Leon, Mexico
Telephone: (52-83) 51-41-51, 51-46-56

MOROCCO

Casablanca

Societe Auto-Hall, S.A.
44, Boulevard Lalla Yacout
Casablanca, Morocco
Telephone: (212) 31-84-60, 31-70-52,
31-90-56, 31-70-44

MOZAMBIQUE

-See East and Southern
Africa Regional Office -
Harare

NAMIBIA (Southwest Africa)

Windhoek

Propower, Namibia
P.O. Box 3637, Windhoek
Namibia (Southwest Africa)

Location: 7 Nasmyth Street
Telephone: (264-61) 37693

NEPAL

Pune (Office in India)

Cummins Diesel Sales &
Service (India) Ltd.
35A/1/2, Erandawana
Pune, - 411 038, India
Telephone: 56096/7/8

NETHERLANDS

Dordrecht

Cummins Diesel Sales &
Service, b.v.
Galvanistraat 35
3316 GH DORDRECHT
Netherlands
Telephone: (31-78) 18-12-00

NETHERLANDS ANTILLES

Miami (Office in U.S.A.)

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

NEW CALEDONIA

-See South Pacific Regional
Office - Melbourne

NEW GUINEA

-See Papua New Guinea

NICARAGUA

Managua

F. Alf. Pellas & Cia.
6a. Calle N.O.,
30 y 31 Avs. N.O., Zona 5
Apartado Postal No. 46
Managua, Nicaragua
Telephone: (505-2) 660616

NIGER

Niamey

MECA Diesel
B.P. 11279
Niamey, Niger
Telephone: (227) 73-41-90

NIGERIA

Lagos

SCOATRAC
P.M.B. 21108
Ikeja, Lagos
Nigeria

Location:
Apapa-Oshodi Expressway
Isolo Industrial Estate,
Isolo
Telephone: (234-1) 52-16-83, 52-17-74,
52-46-70, 52-18-03,
52-36-08

Paris (Office in France)

SCOATRAC
c/o SCOA
9/11 rue Robert de Flers
75740 Paris, Cedex 15
France
Telephone: (33-1) 40-58-48-48

NORTHERN IRELAND

-See United Kingdom

NORWAY

Oslo

Cummins Diesel Salg & Service A/S
Verkseier Furulunds vei 11
Boks 6288
Etterstad 0603, Oslo 6
Norway
Telephone: (47-2) 326110

OMAN

Ruwi

Universal Engineering
Services L.L.C.
P.O. Box 5688
Ruwi
Sultanate of Oman
Telephone: (968) 797589

PAKISTAN

Karachi

Primepower Diesels
Sultan Centre - Ground Floor
11 West Wharf Road
Karachi 2, Pakistan
Telephone: (92-21) 202733/4

PANAMA

Panama City

TRACTOMOVIL, S.A.
Apartado Postal #9532
Panama City 4, Panama
Telephone: (507) 341111, 341868,
341948

PAPUA NEW GUINEA

Sydney (Office in Australia)

Cummins Diesel Sales & Service
P.O. Box 150
Cabramatta, 2166
New South Wales, Australia

PARAGUAY

Asuncion

Automotores y Maquinaria,
S.R.L.
Yegros y Fulgencio R. Moreno
P.O. Box 1160
Asuncion, Paraguay
Telephone: (595-21) 93-111/15

PERU

Lima

Comercial Diesel
del Peru S.A.
P.O. Box 14-0234
Lima, Peru

Location:
Ave. V.R. Haya
de la Torre 2648
Lima 3, Peru
Telephone: (51-14) 32-9990, 31-5761,
32-7639, 32-7518

PHILIPPINES

Makati (Head Office)

CDSS, Inc.
P.O. Box 248
Makati
Philippines

Location:
6264 Estacion Street
Makati, Metro Manila
Telephone: (63-2) 85-81-56, 87-45-16/17,
87-61-84, 87-61-23,
87-59-01

Mikati

W & L Corporation
Rm. 704, 7th Floor
FNM Lopez Bldg.
Legaspi cor Herrera Sts.
Legaspi Village, Makati
Metro Manila, Philippines
Telephone: (63-2) 8163031/2

Tondo

Power Systems, Inc. (Navotas)
1099 P.O. Box 3241
Manila CPO
Philippines

Location:
160 H Lopez Blvd., Balut
Tondo, Manila
Telephone: (63-2) 264561/2/3/4/5,
208709

POLAND

-See W. Germany Regional Office -
Gross-Gerau

PORTUGAL

Lisbon

Electro Central
Vulcanizadora, Lda.
P.O. Box 3077
1302 Lisbon, Portugal

Location:
Rua Conselheiro
Martins de Carvalho
Lote 1480
1400 Lisboa (Restelo)
Telephone: (351-1) 615361

QATAR

Doha

Jaidah Motors & Trading Co.
P.O. Box 150
Doha, Qatar (Arabian Gulf)
Telephone: (974) 426161 Sales
(974) 810000 Spares &
Service

REUNION

-See East/South Africa Regional
Office - Harare

RIO DE ORO

-See Spain

ROMANIA

-See W. Germany Regional Office -
Gross-Gerau

RUSSIA

-See U.S.S.R.

RWANDA

Brussels (Office in Belgium)

Bureau Technique Bia, S.A.
Rameistraat, 123
B-1900 - Overijse, Belgium
Telephone: (32-2) 6892811

ST. LUCIA

Miami (Office in U.S.A.)

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

ST. MARTIN, ISLAND OF

-See Netherlands Antilles

ST. VINCENT

Miami (Office in U.S.A.)

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

SAN MARINO

-See Italy

SAO TOME AND PRINCIPE

-See West/Northern Africa Regional Office - Mechelen

SAUDI ARABIA

Dammam

General Contracting Company
P.O. Box 5111
Dammam 31422, Saudi Arabia
Telephone: (966-3) 842-1216

SCOTLAND

-See United Kingdom

SENEGAL

Dakar

NOSOCO Dept. Matforce
B.P. 341
Dakar, Senegal

Location:
10 Avenue Faidherbe
Telephone: (221) 22-18-35, 22-30-40

SEYCHELLES

-See East/Southern Africa Regional Office - Harare

SIERRA LEONE

-See West/Northern Africa Regional Office - Mechelen

SINGAPORE

Singapore

Applied Diesel Sales & Service
8 Tanjong Penjuru
Jurong Industrial Estate
Singapore 2260
Telephone: (65) 261-3555

SOLOMON ISLANDS

-See South Pacific Regional Office - Melbourne

SOMALIA

-See East and Southern Africa Regional Office - Harare

SOUTH AFRICA

Isando

Propower Pty. Ltd.
Cnr. Diesel and Industry Roads
P.O. Box 12
Isando 1600, Transvaal
South Africa
Telephone: (27-11) 974-2751

SOUTHWEST AFRICA

-See Namibia

SPAIN

Madrid

Cummins Ventas y
Servicio S.A.
Torrelaguna, 56
28027 Madrid, Spain
Telephone: (34-91) 267-2000/2404

SPANISH GUINEA

-See Spain

SRI LANKA

Colombo

Blackwood Hodge (Ceylon) Ltd.
P.O. Box 27
Moratuwa, Sri Lanka

Location: (Service Department)
653, Galle Road
Laxapathiya
Moratuwa, Sri Lanka
Telephone: (94-1) 505354, 507330

SUDAN

Khartoum

Bittar Engineering Ltd.
P.O. Box 1011
Gamhuria 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 25
S-17562 Jarfalla
Sweden
Telephone: (46-8) 760-0080

SWITZERLAND

Zurich

Robert Aebi AG
Baumaschinen und
Spezialfahrzeuge
Uraniastrasse 31/33
8023 Zurich, Switzerland
Telephone: (41-1) 211-0970

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
4th Floor
238, Chungshan N Road
Section 6
Taipei, Taiwan
Telephone: (886-2) 834-9168, 836-6414/8143

TANZANIA

Dar es Salaam

Falcon Engineering Africa Ltd.
P.O. Box 5272
Dar es Salaam
Tanzania
Telephone: 23268

THAILAND

Bangkok

Diethelm & Company Ltd.
280 New Road
G.P.O. Box 14
Bangkok 10100, Thailand

Location:
1696 New Petchburi Road
Bangkok 10310
Telephone: (66-2) 254-4900

TOGO

Lome

Togomat
Zone Industrielle CNPPME
B.P. 1641
Lome, Togo
Telephone: (228) 21-23-95

TONGA, ISLAND OF

Nuku-Alofa

Burns Philp
(Tonga) Co. Ltd.
P.O. Box 55
Nuku-Alofa, Tonga
Telephone: 21-500

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

TUNISIA

Tunis

Dalmas et Cie
2 Rue de Thebes
2014 Megrine Riadh
Tunisia
Telephone: (216-1) 49-55-99, 49-51-50, 49-57-65, 49-52-29

TURKEY

Istanbul

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

Location:
Buyukdere Caddesi, 13/A
P.O. Box 136
80222 Sisli
Istanbul, Turkey
Telephone: (90-1) 131-3406

UGANDA

-See East and Southern Africa Regional Office - Harare

UNITED ARAB EMIRATES

Abu Dhabi

Darco Machinery
P.O. Box 2263
Abu Dhabi,
United Arab Emirates
Telephone: (971-2) 562712 (Umm al Nar office and workshop)

UNITED KINGDOM

Wellingborough

Cummins Diesel
Denington Estate
Wellingborough
Northants NN8 2QH, England
Telephone: (44-933) 76231

UPPER VOLTA

-See Burkina - Taso

URUGUAY

Montevideo

Santaro S.A.
P.O. Box 379
Montevideo
Uruguay
Telephone:(598-2) 93908

U.S.S.R.

-See European Regional Office - Mechelen

Contact address in Moscow:
Cummins Engine Co.
c/o Control Data Corporation
Krasnopresnenskaya Nab. 12,
Office 2006
123100 Moscow
U.S.S.R.
Telephone: (7-095) 253-83-79

VATICAN CITY

-See Italy

VENEZUELA

Caracas

Sudimat
Apartado Postal 1322
Caracas 1010
Venezuela

Location:
Final Avenida San Martin
a 100 Metros de la Loteria de Caracas
Urb. la Quebradita
Telephone: (58-2) 442-6161/2647

Caracas

Equipos Diesel C.A.
(EQUIDICA)
Edif. Insenica, Calle 11-1
La Urbina - Caracas
Venezuela
Telephone: (58-2) 241-7043/74

Maracaibo

Equipos y Servicios, C.A.
(ESERCA)
Apartado Postal No. 1484
Maracaibo, Edo. Zulia, Venezuela
Telephone: (58-61) 34-4858, 34-4376

Valencia

Dieselval, C.A.
Avenida Lisandro Alvarado,
La Florida
Apartado Postal 3147
Valencia - Edo. Carabobo, Venezuela
Telephone: (58-41) 50-557/8

VIETNAM

-See South and East Asia Regional Office - Singapore

WESTERN SAMOA

Apia

Burns Philp
(South Seas) Co. Ltd.
P.O. Box 188
Apia, Western Samoa
Telephone: 20-800

YEMEN, NORTH

Sana'a

Zubieri Trading Co.
P.O. Box 535
Sana'a, Yemen Arab Republic

Location:
Zubieri Street
Telephone: (967-2) 79336, 79149

YEMEN, SOUTH

-See Middle East Regional Office - Mechelen

YUGOSLAVIA

Belgrade

Universzal Commercial Representations
Auto Put Beograd - Zagreb 22
11000 Beograd
Yugoslavia

Location:
Majke Jevrosime 51
Telephone: (38-11) 600-333

ZAIRE

Brussels (Office in Belgium)

Bureau Technique Bia, S.A.
Rameistraat, 123
B-1900 - Overijse, Belgium
Telephone: (32-2) 689-28-11

Kinshasa

Bureau Technique Bia, S.P.R.L.
B.P. 8843
Kinshasa 1
Zaire

Location:
Avenue Bobozo
(ex-Route des Poids Lourds)
Kinshasa-Limete, Zaire
Telephones: (243) 77797/8, 78427

ZAMBIA

Ndola

N.E.I. (Zambia) Ltd.
P.O. Box 71501
Ndola, Zambia
Telephone: (260-2) 610729

ZIMBABWE

Harare

Cummins Zimbabwe (Pvt) Ltd.
P.O. Box ST363
Southerton
Harare, Zimbabwe
Telephones: (263-4) 67645, 69220

Section C - Component Manufacturers

Section Contents

Component Manufacturers' Addresses

NOTE: The following list contains addresses and telephone numbers of suppliers of accessories used on Cummins engines. Suppliers may be contacted directly for any specifications **not** covered in this manual.

Air Compressors

Bendix Heavy Vehicles Systems
Div. of Allied Automotive
901 Cleveland Street
Elyria, OH 44036
Telephone: (216) 329-9000

Midland-Grau
Heavy Duty Systems
Heavy Duty Group Headquarters
10930 N. Pomona Avenue
Kansas City, MO 64153
Telephone: (816) 891-2470

Air Cylinders

Bendix Ltd.
Douglas Road
Kingswood
Bristol
England
Telephone: 0272-671881

Catching Engineering
2101 Roberts Drive
Broadview, IL 60153
Telephone: (312) 344-2334

Air Heaters

Fleetguard, Inc.
Route 8
Cookeville, TN 38501
Telephone: (615) 526-9551

Kim Hotstart Co.
West 917 Broadway
Spokane, WA 99210
Telephone: (509) 534-6171

Air Starting Motors

Ingersoll Rand
Chorley New Road
Horwich
Bolton
Lancashire
England
BL6 6JN
Telephone: 0204-65544

Ingersoll-Rand Engine
Starting Systems
888 Industrial Drive
Elmhurst, IL 60126
Telephone: (312) 530-3800

StartMaster
Air Starting Systems
A Division of Sycon Corporation
P. O. Box 491
Marion, OH 43302
Telephone: (614) 382-5771

Alternators

Robert Bosch Ltd.
P.O. Box 98
Broadwater Park
North Orbital Road
Denham
Uxbridge
Middlesex UD9 5HG
England
Telephone: 0895-833633

Butec Electrics
Cleveland Road
Leyland
PR5 1XB
England
Telephone: 0744-21663

C.A.V. Electrical Equipment
P.O. Box 36
Warple Way
London
W3 7SS
England
Telephone: 01-743-3111

A.C. Delco Components Group
Civic Offices
Central Milton Keynes
MK9 3EL
England
Telephone: 0908-66001

Delco-Remy
P.O. Box 2439
Anderson, IN 46018
Telephone: (317) 646-7838

Leece-Neville Corp.
1374 E. 51st St.
Cleveland, OH 44013
Telephone: (216) 431-0740

Auxiliary Brakes

The Jacobs Manufacturing Company
Vehicle Equipment Division
22 East Dudley Town Road
Bloomfield, CT 06002
Telephone: (203) 243-1441

Belts

Dayco Rubber U.K.
Sheffield Street
Stockport
Cheshire
SK4 1RV
England
Telephone: 061-432-5163

T.B.A. Ind. Products
P.O. Box 77
Wigan
Lancashire
WN2 4XQ
England
Telephone: 0942-59221

Dayco Corp.
Belt Technical Center
P.O. Box 3258
Springfield, MO 65804
Telephone: (417) 881-7440

Gates Rubber Company
5610 Crawfordsville Road
Suite 2002
Speedway, IN 46224
Telephone: (317) 248-0386

Goodyear Tire and
Rubber Company
49 South Franklin Road
Indianapolis, IN 46219
Telephone: (317) 898-4170

Clutches

Twin Disc International S.A.
Chaussee de Namur
Nivelles
Belguim
Telephone: 067-224941

Twin Disc Clutch Co.
1328 Racine Street
Racine, WI 53403
Telephone: (414) 634-1981

Coolant Heaters

Fleetguard, Inc.
Route 8
Cookeville, TN 38501
Telephone: (615) 526-9551

Drive Plates

Detroit Diesel Allison
Division of General Motors
Corporation
P.O. Box 894
Indianapolis, IN 46206
Telephone: (317) 244-1511

Electric Starting Motors

Butec Electrics
Cleveland Road
Leyland
PR5 1XB
England
Telephone: 0744-21663

C.A.V. Electrical Equipment
P.O. Box 36
Warple Way
London
W3 7SS
England
Telephone: 01-743-3111

A.C. Delco Components Group
Civic Offices
Central Milton Keynes
MK9 3EL
England
Telephone: 0908-66001

Delco-Remy
P.O. Box 2439
Anderson, IN 46018
Telephone: (317) 646-7838

Leece-Neville Corp.
1374 E. 51st Street
Cleveland, OH 44013
Telephone: (216) 431-0740

Nippondenso Sales, Inc.
24777 Denso Drive
P.O. Box 5133
Southfield, MI 48086-5133
Telephone: (313) 350-7500

Engine Protection Controls

Teddington Industrial Equipment
Windmill Road
Sunburn on Thames
Middlesex
TW16 7HF
England
Telephone: 09327-85500

The Nason Company
10388 Enterprise Drive
Davisburg, MI 48019
Telephone: (313) 625-5381

Robertshaw Controls Co.
P.O. Box 400
Knoxville, TN 37901
Telephone: (615) 546-0550

Flight Systems
Hempt Road Box 25
Mechanicsburg, PA 17055
Telephone: (717) 697-0333

Fan Clutches

Holset Engineering Co. Ltd.
P.O. Box 9
Turnbridge
Huddersfield
England
Telephone: 0484-22244

Horton Industries, Inc.
P.O. Box 9455
Minneapolis, MN 55440
Telephone: (612) 378-6410

Rockford Division
Borg-Warner Corporation
1200 Windsor Road
P.O. Box 7007
Rockford, IL 61125-7007
Telephone: (815) 633-7460

Transportation Components Group
Facet Enterprises, Inc.
Elmira, NY 14903
Telephone: (607) 737-8212

Fans

Truflo Ltd.
Westwood Road
Birmingham
B6 7JF
England
Telephone: 021-557-4101

Hayes-Albion
1999 Wildwood Avenue
Jackson, MI 49202
Telephone: (517) 782-9421

Engineering Cooling Systems
201 W. Carmel Drive
Carmel, IN 46032
Telephone: (317) 846-3438

Brookside
McCordsville, IN 46055
Telephone: (317) 873-5093

Aerovent
8777 Purdue Rd.
Indianapolis, IN 46268
Telephone: (317) 872-0030

Kysor
1100 Wright Street
Cadillac, MI 49601
Telephone: (616) 775-4681

Schwitzer
1125 Brookside Avenue
P.O. Box 80-B
Indianapolis, IN 46206
Telephone: (317) 269-3100

Filters

Fleetguard International Corp.
Cavalry Hill Industrial Park
Weedon
Northampton NN7 4TD
England
Telephone: 0327-41313

Fleetguard, Inc.
Route 8
Cookeville, TN 38501
Telephone: (615) 526-9551

Flexplates

Corrugated Packing and Sheet Metal
Hamsterley
Newcastle Upon Tyne
Telephone: 0207-560-505

Detroit Diesel Allison
Division of General Motors Corporation
P.O. Box 894
Indianapolis, IN 46206
Telephone: (317) 244-1511

Detroit Diesel Allison
Division of General Motors
36501 Van Born Road
Romulus, MI 48174
Telephone: (313) 595-5711

Midwest Mfg. Co.
30161 Southfield Road
Southfield, MI 48076
Telephone: (313) 642-5355

Fuel Warmers

Fleetguard, Inc.
Route 8
Cookeville, TN 38501
Telephone: (615) 526-9551

Gauges

A.I.S.
Dyffon Industrial Estate
Ystrad Mynach
Hengoed
Mid Glamorgan
CF8 7XD
England
Telephone: 0443-812791

Grasslin U.K. Ltd.
Vale Rise
Tonbridge
Kent
TN9 1TB
England
Telephone: 0732-359888

Icknield Instruments Ltd.
Jubilee Road
Letchworth
Herts
England
Telephone: 04626-5551

Superb Tool and Gauge Co.
21 Princip Street
Birmingham
B4 61E
England
Telephone: 021-359-4876

Kabi Electrical and Plastics
Cranborne Road
Potters Bar
Herts
EN6 3JP
England
Telephone: 0707-53444

Datcon Instrument Co.
P.O. Box 128
East Petersburg, PA 17520
Telephone: (717) 569-5713

Rochester Gauge of Texas
11637 Denton Drive
Dallas, TX 75229
Telephone: (214) 241-2161

Governors

Woodward Governors Ltd.
P.O. Box 15
663/664 Ajax Avenue
Slough
Bucks
SL1 4DD
England
Telephone: 0753-26835

Woodward Governor Co.
1000 E. Drake Road
Fort Collins, CO 80522
Telephone: (303) 482-5811

Barber Colman Co.
1300 Rock Street
Rockford, IL 61101
Telephone: (815) 877-0241

United Technologies
Diesel Systems
1000 Jorie Blvd.
Oak Brook, IL 60521
Telephone: (312) 325-2020

Hydraulic and Power Steering Pumps

Hobourn Eaton Ltd.
Priory Road
Strood
Rochester
Kent
ME2 2BD
Telephone: 0634-71773

Honeywell Control Systems Ltd.
Honeywell House
Charles Square
Bracknell
Berks RG12 1EB
Telephone: 0344-424555

Sundstrand Hydratec Ltd.
Cheney Manor Trading Estate
Swindon
Wiltshire
SN2 2PZ
England
Telephone: 0793-30101

Sperry Vickers
1401 Crooks Road
Troy, MI 48084
Telephone: (313) 280-3000

Z.F.
P.O. Box 1340
Grafvonsoden Strasse
5-9 D7070

Schwaebisch Gmuend
West Germany
Telephone: 7070-7171-31510

Oil Heaters

Fleetguard, Inc.
Route 8
Cookeville, TN 38501
Telephone: (615) 526-9551

Kim Hotstart Co.
West 917 Broadway
Spokane, WA 99210
Telephone: (509) 534-6171

Torque Converters

Twin Disc International S.A.
Chaussee de Namur
Nivelles
Belgium
Telephone: 067-224941

Twin Disc Clutch Co.
Racine, WI 53403
Telephone: (414) 634-1981

Rockford Division
Borg-Warner Corporation
1200 Windsor Road
P.O. Box 7007
Rockford, IL 61125-7007
Telephone: (815) 633-7460

Modine
1500 DeKoven Avenue
Racine, WI 53401
Telephone: (414) 636-1640

Section W - Warranty

Section Contents

Automotive - Australia and New Zealand

Coverage

PRODUCTS WARRANTED

These warranties apply to K19 Engines sold by Cummins and delivered to the first user on or after July 1, 1988, that are used in on-highway automotive applications in Australia and New Zealand.

BASE ENGINE WARRANTY

The Base Engine Warranty covers any failures of the Engine which result, under normal use and service, from defects in material or workmanship (Warrantable Failures). This coverage begins with the sale of the Engine by Cummins and continues for two years or 160,935 kilometers (100,000 miles) or 3,600 hours of operation, whichever occurs first, after the date of delivery of the Engine to the first user.

EXTENDED MAJOR COMPONENTS WARRANTY

The Extended Major Components Warranty covers Warranbable Failures of the following Engine parts:

Engine cylinder block
Camshaft
Crankshaft
Connecting rods
Cummins fan clutch

Bushing and bearing failures are NOT covered.

This coverage begins with the expiration of the Base Engine Warranty and ends three years, 482,805 kilometers (300,000 miles) or 10,800 hours of operation, whichever occurs first, from the date of delivery of the Engine to the first user.

Cummins Responsibilities

DURING THE BASE ENGINE WARRANTY

Cummins will pay for all parts and labor needed to repair the damage to the Engine resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to a Warrantable Failure.

Cummins will pay for reasonable labor costs for Engine removal and reinstallation when necessary to repair a Warrantable Failure.

Cummins will pay reasonable costs for towing a vehicle disabled by a Warrantable Failure to the nearest authorized repair location. In lieu of the towing expense, Cummins will pay reasonable costs for mechanics to travel to and from the location of the vehicle, including meals, mileage and lodging, when the repair is performed at the site of the failure.

DURING THE EXTENDED MAJOR COMPONENTS WARRANTY

Cummins will pay for the repair or, at its option, replacement of the defective Covered Part and any Covered Part damaged by a Warrantable Failure of the defective Covered Part.

Owner Responsibilities

DURING THE BASE ENGINE WARRANTY

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items provided during warranty repairs unless such items are not reusable due to the Warrantable Failure.

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 Cummins Operations and Maintenance Manuals. 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 product available for repair by such facility. Except for Engines which are disabled by Warrantable Failures, Owner must also deliver the Engine to the repair facility. Locations are listed in the Cummins International Sales and Service 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 coolant 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 fuel or by water, dirt or other contaminants in the fuel.

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.

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 supplied by Cummins are not covered beyond the first 24,140 kilometers (15,000 miles) or two 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 HEREINAFTER ARE THE SOLE WARRANTY 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.

Worldwide Generator Drive

Engines Warranted

This warranty applies to Engines sold by Cummins Engine Company and delivered to the first user on or after June 1, 1993 that are used in generator drive application anywhere in the world where Cummins-approved service is available. These Engines will have the following rating designations:

Standby Power Rating

Engines of this rating are applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an Engine allowed to operate in parallel with the public utility at the Standby Power rating. This rating should be applied where reliable utility power is available. A standby rated engine is to be sized for a maximum of an 80 percent average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby rating should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

Unlimited Time Running Prime Power Rating

Engines with this rating are available for an unlimited number of hours per year in a variable load application. Variable load is not to exceed a 70 percent average of the Prime Power Rating during any operating period of 250 hours. Total operating time at 100 percent Prime Power shall not exceed 500 hours per year.

A 10 percent overload capability is available for a period of one hour within a twelve hour period of operation. Total operating time at the 10 percent overload power shall not exceed 25 hours per year.

Limited Time Running Prime Power Rating

Engines of this rating are available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating.

Limited Time Running Prime Power ratings differ from Unlimited Time Running in that even though the maximum power output of the engines are the same, the Limited Time Running allows the Engine to be parallel to Public Utility and run at the full Prime Power rating and must never exceed the Prime Power rating.

Continuous/Base Power Rating

Engines with this rating are available for supplying utility power at a constant 100 percent load for an unlimited number of hours per year. No overload capability is available for this rating.

Continuous/Base Power ratings differ from Unlimited Time Running Prime Power ratings in that the Continuous/Base Load ratings are significantly reduced from the Prime Power ratings. Continuous/Base Load ratings have no load factor or application restrictions.

Coverage

Base Engine Warranty

This warranty covers any failures of the Engine, under normal use and service, which result from a defect in material or workmanship (Warrantable Failure).

Coverage begins with the sale of the Engine by Cummins and continues for the Duration stated below. The Duration commences either on the date of delivery of the Engine to the first user, or on the date the Engine is first leased, rented or loaned, or when the product has been ran for 50 hours, whichever of the three occurs first.

Base Engine Warranty

Rating	Duration Months	Duration Hours of Operation Whichever Occurs First
Standby Power	24	400
Unlimited Prime Power	12	Unlimited
Limited Prime Power	12	750
Continuous/Base Power	12	Unlimited

Extended Major Components Warranty

The Extended Major Components Warranty applies to Engines other than B and C series and covers Warrantable Failures of the Engine cylinder block, camshaft, crankshaft and connecting rods (Covered Parts). Bushing and bearing failures are not covered. This coverage begins with the expiration of the Base Engine Warranty and continues for the Duration stated below. The Duration commences either on the date of delivery of the Engine to the first user, or on the date the Engine is first leased, rented or loaned, or when the product has been run for 50 hours, whichever of the three occurs first.

Extended Major Components Warranty

Rating	Duration Months	Duration Hours of Operation Whichever Occurs First
Standby Power	36	600
Unlimited Prime Power	36	10,000
Limited Prime Power	36	2,250
Continuous/Base Power	36	10,000

Consumer Products

This warranty on Consumer Products in the United States is a LIMITED warranty. **CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.** Any implied warranties applicable to Consumer Products terminate concurrently with the expiration of the express warranties applicable to such products. In the United States, some states do not allow the exclusion of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.

These warranties are made to all Owners in the chain of distribution, and coverage continues to all subsequent Owners until the end of the periods of coverage.

Cummins Responsibilities

During Base Engine Warranty

Cummins will pay for all parts and labor needed to repair the damage to the Engine resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to a Warrantable Failure.

Cummins will pay reasonable travel expenses for mechanics to and from the Engine site, including meals, mileage, and lodging when the repair is performed at the site of the failure.

Cummins will pay reasonable labor costs for Engine removal and reinstallation when necessary to make the warranty repair.

During the Extended Major Components Warranty

Cummins will pay for the repair or, at its option, replacement of the defective Covered Part and any Covered Part damaged by a Warrantable Failure of the defective Covered Part.

Owners Responsibilities

During the Base Engine Warranty

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items provided during repairs unless such items are not reusable due to the Warrantable Failure.

During the Extended Major Components Warranty

Owner is responsible for the cost of all labor needed to repair the Engine, including the labor cost for Engine removal and reinstallation. When Cummins elects to repair a part instead of replacing it, the 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 Cummins Operation and Maintenance Manuals. 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 United States and Canada Sales and Service Directory; other locations are listed in the Cummins International Sales and Service 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 and for "downtime" expenses, fines, all applicable taxes, all business costs and other losses resulting from a Warrantable Failure.

Owner is responsible for providing sufficient access to and reasonable ability to remove the Engine from the installation in the event of a Warrantable Failure.

Owner is responsible for maintaining an operating Engine hourmeter. If the hourmeter is not operational, engine usage will be estimated at 400 hours per month.

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 coolant or lubricant; overfueling; overspeeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices. Cummins is also not responsible for Engine performance problems or failures caused by incorrect fuel, or by water, dirt or other contaminants in the fuel.

This warranty does not apply to accessories supplied by Cummins which bear the name of another company. This category includes, but is not limited to: alternators, starters, fans, air conditioning compressors, clutches, filters, transmissions, air cleaners and safety shutdown switches.

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

Failure 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 is not responsible for Engine performance problems or failures resulting from:

1. Use or application of the Engine inconsistent with its rating designation as set forth above.
2. Inadequate or incorrect installations deviating from Cummins Generator Drive Installation Guidelines.

CUMMINS IS NOT RESPONSIBLE FOR WEAR OR WEAROUT OF COVERED PARTS.

CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

THE 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.

In case of consumer sales, in some countries, the Owner has statutory rights which cannot be affected or limited by the terms of this warranty.

Nothing in this warranty excludes or restricts any contractual rights the owner may have against third parties.

Industrial (U.S./Canada)

Coverage

PRODUCTS WARRANTED

This warranty applies to new Engines sold by Cummins Engine Company and delivered to the first user on or after February 1, 1993, that are used in off-highway applications in the United States* and Canada, except for Engines used in marine, generator drive and certain defense applications, for which different warranty coverage is provided.

BASE ENGINE WARRANTY

This warranty covers any failures of the Engine, under normal use and service, which results from a defect in material or workmanship (Warrantable Failure).

Coverage begins with the sale of the Engine by Cummins. Coverage continues for two years or 2,000 hours of operation, whichever occurs first, from the date of delivery of the Engine to the first user, or from the date the unit is first leased, rented or loaned, or from the date the Engine reaches 50 hours of operation in demonstration use, whichever of the three occurs first. If the 2,000 hour limit is exceeded during the first year, coverage continues until the end of the first year.

EXTENDED MAJOR COMPONENTS WARRANTY

The Extended Major Components Warranty covers Warrantable Failures of the Engine cylinder block, camshaft, crankshaft and connecting rods (Covered Parts).

Bushing and bearing failures are not covered.

This coverage begins with the expiration of the Base Engine Warranty and ends after three years or 10,000 hours of operation, from the date of delivery of the Engine to the first user, or from the date the unit is first leased, rented or loaned, or from the date the Engine reaches 50 hours of operation in demonstration use, whichever of the three occurs first.

CONSUMER PRODUCTS

The warranty on Consumer Products in the United States is a LIMITED warranty. **CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.** Any implied warranties applicable to Consumer Products in the United States terminate concurrently with the expiration of the express warranties applicable to such products. In the United States, some states do not allow the exclusion of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.

These warranties are made to all Owners in the chain of distribution, and coverage continues to all subsequent Owners until the end of the periods of coverage.

Cummins Responsibilities

DURING THE BASE ENGINE WARRANTY

Cummins will pay for all parts and labor needed to repair the damage to the Engine resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to a Warrantable Failure.

Cummins will pay reasonable costs for mechanics to travel to and from the equipment site, including meals, mileage and lodging, when the repair is performed at the site of the failure.

Cummins will pay reasonable labor costs for Engine removal and reinstallation when necessary to repair a Warrantable Failure.

DURING THE EXTENDED MAJOR COMPONENTS WARRANTY

Cummins will pay for the repair or, at its option, replacement of the defective Covered Part and any Covered Part damaged by a Warrantable Failure of the defective Covered part.

Owners Responsibilities

DURING THE BASE ENGINE WARRANTY

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items provided during warranty repairs unless such items are not reusable due to the Warrantable Failure.

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 Cummins Operations and Maintenance Manuals. 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 product 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 coolant 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 fuel or by water, dirt or other contaminants in the fuel.

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 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 HEREINAFTER 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.

Industrial (International)

Coverage

PRODUCTS WARRANTED

This warranty applies to new Engines sold by Cummins Engine Company and delivered to the first user on or after February 1, 1993, that are used in off-highway applications anywhere in the world where Cummins-approved service is available, except the United States* and Canada. Different warranty coverage is provided for Engines used in marine, generator drive and certain defense applications.

BASE ENGINE WARRANTY

This warranty covers any failures of the Engine, under normal use and service, which results from a defect in material or workmanship (Warrantable Failure).

Coverage begins with the sale of the Engine by Cummins. Coverage continues for two years or 2,000 hours of operation, whichever occurs first, from the date of delivery of the Engine to the first user, or from the date the unit is first leased, rented or loaned, or from the date the Engine reaches 50 hours of operation in demonstration use, whichever of the three occurs first. If the 2,000 hour limit is exceeded during the first year, coverage continues until the end of the first year.

EXTENDED MAJOR COMPONENTS WARRANTY

The Extended Major Components Warranty covers Warrantable Failures of the Engine cylinder block, camshaft, crankshaft and connecting rods (Covered Parts).

Bushing and bearing failures are not covered.

This coverage begins with the expiration of the Base Engine Warranty and ends after three years or 10,000 hours of operation, from the date of delivery of the Engine to the first user, or from the date the unit is first leased, rented or loaned, or from the date the Engine reaches 50 hours of operation in demonstration use, whichever of the three occurs first.

These warranties are made to all Owners in the chain of distribution, and coverage continues to all subsequent Owners until the end of the periods of coverage.

Cummins Responsibilities

DURING THE BASE ENGINE WARRANTY

Cummins will pay for all parts and labor needed to repair the damage to the Engine resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to a Warrantable Failure.

Cummins will pay reasonable costs for mechanics to travel to and from the equipment site, including meals, mileage and lodging, when the repair is performed at the site of the failure.

Cummins will pay reasonable labor costs for Engine removal and reinstallation when necessary to repair a Warrantable Failure.

DURING THE EXTENDED MAJOR COMPONENTS WARRANTY

Cummins will pay for the repair or, at its option, replacement of the defective Covered Part and any Covered Part damaged by a Warrantable Failure of the defective Covered part.

Owners Responsibilities

DURING THE BASE ENGINE WARRANTY

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items provided during warranty repairs unless such items are not reusable due to the Warrantable Failure.

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 Cummins Operations and Maintenance Manuals. 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 product available for repair by such facility. Locations are listed in the Cummins International Sales and Service 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 coolant or lubricants; overfueling; over-speeding; 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 fuel or by water, dirt or other contaminants in the fuel.

With certain exceptions, this warranty does not apply to accessories supplied by Cummins which bear the name of another company. The exceptions to which this warranty does apply are:

1. Accessories, except for clutches and filters, supplied by Cummins as part of a fire pump or power unit (package units) are covered for the duration of Base Engine Warranty.
2. Starters, alternators, power steering pumps and non-Cummins air compressors supplied by Cummins on B or C Series Engines in applications other than fire pumps or power units are covered for six months.

Examples of accessories to which this warranty does not apply are: air conditioning compressors, clutches, air cleaners, fans, filters, transmissions and torque convertors.

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 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 HEREINAFTER 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.

In case of consumer sales, in some countries, the Owner has statutory rights which cannot be affected or limited by the terms of this warranty.

Nothing in this warranty excludes or restricts any contractual rights the Owner may have against third parties.

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

Marine (U.S./Canada)

Products Warranted

These warranties apply to Cummins Engine Company, Inc, hereinafter 'Cummins', Products used in marine propulsion applications in the United States* and Canada and delivered to the first user on or after October 1, 1991. The 'Product' consists of a new Cummins engine and other accompanying new components. These Products have the following rating designations:

RECREATION/LIGHT DUTY COMMERCIAL RATING

Engines with this rating are intended for powering marine pleasure craft used for personal use only and for powering some marine commercial boats such as gillnetters, bowpickers, skiffs, oil skimmers, and small fishing craft.

This power rating is intended for use in variable load applications where full power is limited to one hour out of every eight hours of operation. Also, reduced power operations must be at or below 200 RPM of the the maximum rated RPM. This rating is an ISO 3046 Fuel Stop Power Rating and is for applications that operate less than 750 hours per year.

MEDIUM CONTINUOUS RATING

Engines with this rating are intended for powering commercial boats such as lobster boats, crew boats, party fishing boats, charter fishing boats, long range cruisers, harbor and coastal patrol boats, search and rescue boats, fire boats, bay shrimpers, clam boats, crab boats and seine skiffs.

This power rating is intended for continuous use in variable load applications where full power is limited to six hours out of every twelve hours of operation. Also, reduced power operations must be at or below 200 RPM of the maximum rated RPM. This is an ISO 3046 Fuel Stop Power Rating and is for applications that operate less than 3000 hours per year.

CONTINUOUS RATING

Engines with this rating are intended for powering commercial boats such as buoy tenders, research vessels, offshore supply boats, fishing trawlers, purse seiners, tugs, tow boats, and car/passenger ferries.

This power rating is intended for continuous use in applications requiring uninterrupted service at full power. This rating is the ISO 3046 Standard Power Rating and the SAE J1228 Continuous Crankshaft Power Rating.

Cummins Responsibilities

During the Base Engine Warranty

Cummins will pay for all parts and labor needed to repair the damage to the Product resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses, and other maintenance items that are not reusable due to the Warrantable Failure.

Cummins will pay reasonable labor costs for engine removal and reinstallation when necessary to make the warranty repair.

When it is necessary for mechanics to make on-site warranty repairs, Cummins will pay up to six hours total travel expenses for mechanics to and from the repair dock.

During the Extended Major Components Warranty

Cummins will pay for the repair or, at its option, replacement of the defective Covered Part and of any Covered Part damaged by a Warrantable Failure of the defective Covered Part.

Owner Responsibilities

During the Base Engine Warranty

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items replaced during warranty repairs unless such items are not reusable due to the Warrantable Failure.

During the Extended Major Components Warranty

Owner is responsible for the cost of all labor needed to repair the Product, including the labor to remove and reinstall the Product. 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 the repair.

Additional Responsibilities During Both Warranties

Owner is responsible for the operation and maintenance of the Product as specified in the Cummins Operation and Maintenance Manuals. 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 location approved by Cummins of any Warrantable and make the product available for repair by such facility. Locations in the United States are listed in the Cummins U.S. and Canada Sales and Service Directory.

In the event of any Product failure, Owner is responsible for the cost of towing the boat to the repair dock and for all associated docking and harbor charges.

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

Owner is responsible for maintaining the engine hourmeter in good working order at all times and to ensure that the hourmeter accurately reflects the total hours of operation of the product.

Owner is responsible for costs to investigate complaints, unless the problem is caused by a defect in Cummins material or workmanship.

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 coolant or lubricants; overfueling; over-speeding; 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 fuel, or by water, dirt, or other contaminants in the fuel.

Cummins is also not responsible for failures resulting from:

1. Use or application of the product inconsistent with its rating designation set forth above.

2. Incorrect installation

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 are covered only during the first 90 days of the warranty period.

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.

THE WARRANTIES SET FORTH HEREINAFTER ARE THE SOLE WARRANTIES MADE BY CUMMINS IN REGARD TO THESE PRODUCTS. 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, Commonwealth of Northern Mariana Islands, Guam, Puerto Rico, and U. S. Virgin Islands.

Marine (International)

Products Warranted

These warranties apply to Cummins Engine Company, hereinafter 'Cummins', Products used in marine propulsion applications anywhere in the world except in the United States* and Canada and delivered to the first user on or after October 1, 1991. The 'Product' consists of a new Cummins engine and other accompanying new Cummins components. These Products have the following rating designations:

RECREATION/LIGHT DUTY COMMERCIAL RATING

Engines with this rating are intended for powering marine pleasure craft used for personal use only and for powering some marine commercial boats.

This power rating is intended for use in variable load applications where full power is limited to one hour out of every eight hours of operation. Also, reduced power operations must be at or below 200 RPM of the the maximum rated RPM. This rating is an ISO 3046 Fuel Stop Power Rating and is for applications that operate less than 750 hours per year.

MEDIUM CONTINUOUS RATING

This power rating is intended for continuous use in variable load applications where full power is limited to six hours out of every twelve hours of operation. Also, reduced power operations must be at or below 200 RPM of the maximum rated RPM. This is an ISO 3046 Fuel Stop Power Rating and is for applications that operate less than 3000 hours per year.

CONTINUOUS RATING

This power rating is intended for continuous use in applications requiring uninterrupted service at full power. This rating is the ISO 3046 Standard Power Rating and the SAE J1228 Continuous Crankshaft Power Rating.

Cummins Responsibilities

During the Base Engine Warranty

Cummins will pay for all parts and labor needed to repair the damage to the Product resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to the Warrantable Failure.

Cummins will pay reasonable labor costs for engine removal and reinstallation when necessary to make the warranty repair.

When it is necessary for mechanics to make on-site warranty repairs, Cummins will pay up to six hours total travel expenses for mechanics to and from the repair dock.

During the Extended Major Components Warranty

Cummins will pay for the repair or, at its option, replacement of the defective Covered Part and of any Covered Part damaged by a Warrantable Failure of the defective Covered Part.

Owner Responsibilities

During the Base Engine Warranty

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items replaced during warranty repairs unless such items are not reusable due to the Warrantable Failure.

During the Extended Major Components Warranty

Owner is responsible for the cost of all labor needed to repair the Product, including the labor cost to remove and reinstall the Product. 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 the repair.

Additional Responsibilities During Both Warranties

Owner is responsible for the operation and maintenance of the Product as specified in the Cummins Operation and Maintenance Manuals. 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 Product available for repair by such facility. Locations are listed in the Cummins International Sales and Service Directory.

In the event of any Product failure, Owner is responsible for the cost of towing the boat to the repair dock and for all associated docking and harbor charges.

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

Owner is responsible for maintaining the engine hourmeter in good working order at all times and to ensure that the hourmeter accurately reflects the total hours of operation of the product.

Owner is responsible for costs to investigate complaints, unless the problem is caused by a defect in Cummins material or workmanship.

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 coolant or lubricants; overfueling; over-speeding; 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 fuel, or by water, dirt, or other contaminants in the fuel.

Cummins is also not responsible for failures resulting from:

1. Use or application of the product inconsistent with its rating designation set forth above.
2. Incorrect installation

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 are covered during the first 90 days of the warranty period.

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.

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

In case of consumer sales, in some countries, the Owner has statutory rights which cannot be affected or limited by the terms of this warranty.

Nothing in this warranty excludes or restricts any contractual rights the Owner may have against third parties.

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

Coverage

Base Engine Warranty

The Base Engine Warranty covers any failures of the Product which result, under normal use and service, from a defect in material or workmanship (Warrantable Failure). This coverage begins with the sale of the Product by Cummins and continues for the Duration stated below. The Duration commences either on the date of delivery of the Product to the first user, or on the date the unit is first leased, rented or loaned, or when the Product has been operated for 50 hours, whichever occurs first.

	Duration Whichever Occurs First	
RATING	**Years**	**Hours**
Recreation/Light Duty Commercial - Personal Use	1	Unlimited
Recreation/Light Duty Commercial - Commercial Use	1	750
Medium Continuous	1	3000
Continuous	1	Unlimited

Extended Major Components Warranty

The Extended Major Components Warranty applies to Engines other than A, B and C series and covers Warrantable Failures of the Engine cylinder block, camshafts, crankshaft and connecting rods (Covered Parts). Bushing and bearing failures are NOT covered. This coverage begins with the expiration of the Base Engine Warranty and ends three years or 10,800 hours of operation, whichever occurs first, after the Base Engine Warranty start date.

These warranties are provided to all Owners until the end of the Duration stated above.

Section L - Service Literature

Section Contents

Publications Titles

The following publications can be purchased by filling in and mailing the Service Literature Order Form:

Bulletin No.	Title of Publication
3810259	K19 Specifications Manual
3810258	K19 Shop Manual
3379084	Fuel Pump Rebuild Manual
3379071	Injector Rebuild Manual
3810242	Single Cylinder Air Compressor Shop Manual
3810257	Two Cylinder Air Compressor Shop Manual
3379091	Turbochargers Rebuild Manual
3810243	HC-5A Turbocharger Shop Manual
3387082	K Temperature Sensing Fan Drive Operation and Installation (Recall Book)
	Fuel Pump PT (Type G) Calibration Values
3379068	1970-1975
3379182	1976-1982
3379352	1983-Present
	Engine Data Sheets/Performance Curves
3381194	Construction, Mining, Locomotive, and Agriculture
3381174	Generator Drive and Genset
3381237	Automotive
	Installation Recommendations Bulletin
	Construction, Mining, Logging, and Agriculture
3382108	Air Intake System
3382118	Cold Weather Operation
3382643	Compressed Air System
3382171	Cooling System
3382362	Engine Mounting
3382138	Engine Performance
3382109	Exhaust System
3382409	Fuel System
3382113	Lubrication System
3382110	Noise Control
3382014	Power Trains
3382150	Service Accessibility
3382452	Starting & Electrical System
3382135	Torsional Vibration
	Automotive
3382673	Air Intake System
3382384	Cold Weather Operation
3382643	Compressed Air System
3382413	Cooling System
952804	Electrical System
952863	Engine Driven Accessories
3382382	Engine Mounting
3382685	Exhaust System
3382707	Fuel System
3382385	Lubrication System
3382383	Noise Control
952845	Power Train
3382101	Accessibility

Service Literature Ordering Location

Region	Ordering Location
United States and Canada	Cummins Distributors or Cummins Engine Co., Inc. Publishing Services CMC 40924 Box 3005 Columbus, IN 47202-3005
U.K., Europe, Mid-East, Africa, and Eastern European Countries	Cummins Engine Co., Ltd. Royal Oak Way South Daventry Northants, NN11 5NU, England
South and Central America (excluding Brazil and Mexico)	Cummins Americas, Inc. 16085 N.W. 52nd Avenue Hialeah, FL 33104
Brazil and Mexico	Cummins Engine Co., Inc. International Parts Order Dept., MC 40931 Box 3005 Columbus, IN 47202-3005
Far East (excluding Australia and New Zealand)	Cummins Diesel Sales Corp. Literature Center 8 Tanjong Penjuru Jurong Industrial Estate Singapore
Australia and New Zealand	Cummins Diesel Australia Maroondah Highway, P.O.B. 139 Ringwood 3134 Victoria, Australia

Obtain current price information from your local Cummins Distributor or (for U.S.A.) by calling Cummins Toll Free Number 1-800-DIESELS (1-800-343-7357).

Service Publications Order Form

Use this form for prompt handling of your literature order from the factory.

Item	Bulletin Number	Title of Publication	Quantity	U.S. Price Each	Amount
1				$	$
2					
3					
4					
5					
6					

Publications Total	
Indiana Residents: Add 5% Sales Tax	
Handling & Shipping Chg: No. Items X $1.50 =	
Order Total	$

☐ Payment Enclosed. Make certified check or money order payable to Cummins Engine Co.

☐ Please ship C.O.D. (U.S.A. only)

Prices subject to change without notice.

Please Cut on Dotted Line

Service Publications Order Form

Use this form for prompt handling of your literature order from the factory.

Item	Bulletin Number	Title of Publication	Quantity	U.S. Price Each	Amount
1				$	$
2					
3					
4					
5					
6					

Publications Total	
Indiana Residents: Add 5% Sales Tax	
Handling & Shipping Chg: No. Items X $1.50 =	
Order Total	$

☐ Payment Enclosed. Make certified check or money order payable to Cummins Engine Co.

☐ Please ship C.O.D. (U.S.A. only)

Prices subject to change without notice.

For factory orders, mail the Service Publications Order Form along with your ship-to address to:
Cummins Engine Co., Inc., Publishing Services (MC 41407)
Box 3005, Columbus, IN 47202-3005.

FROM:

Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____

SHIP TO: (Name and address where literature is to be shipped)

Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____

Please cut on the dotted line

For factory orders, mail the Service Publications Order Form along with your ship-to address to:
Cummins Engine Co., Inc., Publishing Services (MC 41407)
Box 3005, Columbus, IN 47202-3005.

FROM:

Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____

SHIP TO: (Name and address where literature is to be shipped)

Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____

Cummins Customized Parts Catalog

Cummins is pleased to announce the availability of a parts catalog compiled specifically for you. Unlike the generic versions of parts catalogs that support general high volume parts content; Cummins Customized catalogs contains only the new factory parts that were used to build your engine.

The catalog cover, as well as the content, is customized with you in mind. You can use it in your shop, at your worksite, or as a coffee table book in your RV or boat. The cover contains your name, company name, address, and telephone number. Your name and engine model identification even appears on the catalog spine. Everybody will know that Cummins created a catalog specifically for you.

This new catalog was designed to provide you with the exact information you need to order parts for your engine. This will be valuable for customers that do not have easy access to the Cummins Electronic Parts Catalog or the Cummins Parts Microfilm System.

Additional Features of the Customized Catalog include:

- Engine Configuration Data
- Table of Contents
- Separate Option and Parts Indexes
- Service Kits (when applicable)
- ReCon Part Numbers (when applicable)

ORDERING THE CUSTOMIZED PARTS CATALOG

Customers can call Gannett Marketing Services at 1-800-646-5609 and order by credit card. Ask for bulletin 3672139 the Customized Parts Catalog. North American customers can mail in the attached postage pre-paid order card.

ATTENTION: INTERNATIONAL CUSTOMERS (outside U.S.A.) insert the completed Customized Catalog order form in an envelope and mail to the address printed on the order form. Or, use the E-mail address **catalog@gdms.com** to place an order for a Customized Parts Catalog.

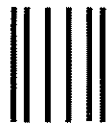
Contact GDMS for the current price; Freight will be an additional expense.

This information is required to provide a Customized Parts Catalog:

- Name
- Street Address
- Company Name (optional)
- Telephone no.
- Credit Card No.
- Cummins Engine Serial Number (located on the engine dataplate)

Unfortunately not all Cummins Engines can be supported by this parts catalog. Engines older than 1984 or newer than 3 months may not have the necessary parts information to compile a catalog. We will contact you if this occurs and explain why we are unable to fill your order.

Customized Parts Catalogs are produced specifically for a single customer. This means they are not returnable for a refund. If we make an error and your catalog is not useable, we will correct that error by sending you a new catalog.



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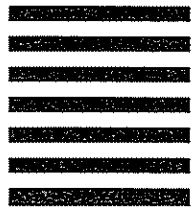
IN THE
UNITED STATES



BUSINESS REPLY MAIL

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–POSTAGE WILL BE PAID BY ADDRESSEE—

CUMMINS ENGINE COMPANY, INC.
MAIL CODE 40905
BOX 3005
COLUMBUS, IN 47202-3005

Customized Parts Catalog Order Form

Customer Name _____

Street _____

City _____ State _____ Zip _____

Company Name (Optional) _____

Telephone _____

Credit Card Number _____ Expires _____

Signature _____

Engine Serial Number _____

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I am interested in the following Customized Assurance Plans:

- ☐ **Custom Registry**
- ☐ **Extended Coverage - Industrial**
- ☐ **Please forward the specified plans information**
- ☐ **Have your representative contact me**

CUSTOMIZED ASSURANCE PROGRAMS (CAP)

Name _____

Title _____

Company _____

Address _____

City _____

State/Province _____ Zip/PC _____

* CAP programs available in U.S. and Canada markets only.

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Literature Survey Form

Bulletin No. 3666013-02

We are always open to any suggestions or recommendations that will aid in improving our manuals. Use this postage paid survey form to evaluate this manual. Please check the appropriate response and use the space provided below to list any additional comments:

	Yes	No
Is the needed information easy to locate in the manual?	____	____
Is the information easy to read?	____	____
Is the information easy to understand?	____	____
Does the information sufficiently cover the subject?	____	____
Are subjects in the Index specific enough to locate in the manual?	____	____
Are the important points sufficiently emphasized?	____	____
Are the illustrations easy to understand?	____	____
Does the text support the operation being illustrated?	____	____
Do you use the Table of Contents?	____	____
Do you use the Index?	____	____

Please comment on any response(s) marked "No" in this survey. _____

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Other comments that you feel would help improve the manual. _____

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Name: _____

Company: _____

Address: City _____ State _____ Country _____ Zip Code _____