CYCLETUNE

MMC 231

MOTORCYCLE CARBONCLEAN

MOTORVAC TECHNOLOGIES INC.

OPERATOR'S MANUAL

P/N 200-8260

Table of Contents

Introduction

Congratulations on your selection of the CycleTune CarbonClean Fuel System Service Unit.
By choosing this product, you are acquiring the most technologically advanced method available for cleaning harmful fuel system contaminants from gasoline engines.

The CycleTune is a self-contained cleaning system, designed to connect to most any motorcycle gasoline engine. Once connected, the unit temporarily replaces the regular gasoline supply with a mixture of gasoline and the specially formulated CarbonClean Cleaning Detergent.

With the engine idling, the unit supplies a gasoline / detergent mixture through the engine's fuel system. As the mixture passes through the vehicle's gasoline system it will loosen and dissolve accumulated deposits, which then pass harmlessly out through the exhaust system or are removed by the unit's fuel filter. Removing contaminants from the combustion chamber creates a more even burn of fuel, which improves horsepower, increases fuel economy, and reduces exhaust emissions.

It is recommended that you perform the fuel system cleaning procedure every 20,000 miles to obtain the highest fuel system efficiency.

It is imperative that all associated personnel study this operator's manual to become thoroughly familiar with the CycleTune unit before using it.

IMPORTANT

The CycleTune CarbonClean Fuel System Service Unit is designed to work *EXCLUSIVELY* with MotorVac Cleaning Detergents.

Use of any other chemical during this process may cause operational failure of the CycleTune CarbonClean System and voids the manufacturer's warranty. See warranty card for details.

Overview

This manual contains all the information you will need to use the CycleTune CarbonClean System. It is imperative that all associated personnel study this manual and have it within easy reach whenever the unit is being used.

The following is a quick reference to the information in this manual:

System Features and Functions

This chapter describes the CycleTune's gauge, control switches and connections.

Safety Information

Adhere to the safety guidelines in this chapter at all times!

Before You Begin

Follow the instructions in this chapter before using the unit for the first time.

Fuel System Cleaning Procedures

This chapter contains step-by-step setup and cleaning procedures for using the unit with each of the three fuel system types:

- Carbureted
- Port Fuel Injection (PFI)
- Returnless Fuel Systems (Single Line)

Troubleshooting and Additional Help

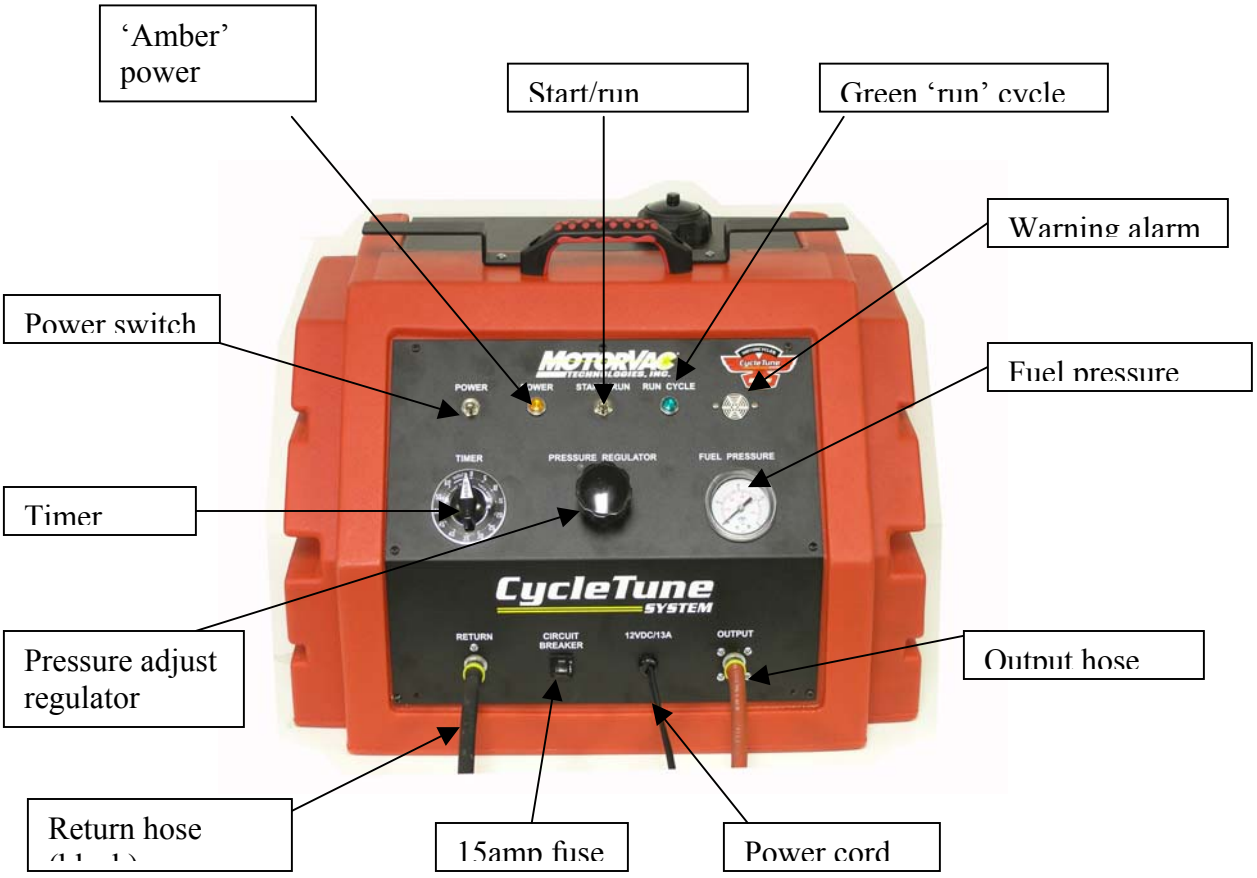
Refer to this chapter in the unlikely event you have problems with the CycleTune unit or need additional help.

Appendices - Maintenance, Accessories, and Parts

The appendices contain routine maintenance procedures for the CycleTune, such as fuel filter replacement, lists of available accessories and replacement parts.

System Features and Functions

The front of the CycleTune's cabinet contains the control panel, control switches and status indicators. The fuel reservoir and filter are mounted on the rear of the cabinet.



CycleTune System Features and Functions

Descriptions of the control switches, gauge and status indicators that make up the control panel are listed below. Become familiar with these control panel features and functions before using the unit**.**

Timer Adjust Knob	Sets or re-sets the system run time in one-minute increments, from 1 to 60 minutes.
System Power Switch	Interrupts or supplies power to the unit.
"Amber" Power Indicator Light	Illuminates when the unit is connected to a power source.
Start/Run Switch	Starts the cleaning cycle.
"Green" Run Cycle Indicator Light	Illuminates when the run cycle is under way.
Warning Alarm	Sounds when the run cycle is complete or a pressure loss occurs.
Fuel Pressure Gauge	Displays output pressure of the unit's output hose or system pressure of the vehicle being serviced.
Pressure Adjust Regulator	Used to adjust the system pressure during the cleaning process. ➢ Turn clockwise to close (increase pressure) ➢ Counterclockwise to open (decrease pressure)
Output Hose (Red)	Connects to the input side of the vehicle's engine fuel system.
Return Hose (Black)	Connects to the return side of the vehicle's engine fuel system.
Power Harness	Positive (Red) and negative (Black) battery connections. (11-15 VOLTS DC)
15 A. Fuse Receptacle	Contains 15 Amps. / SFE type system fuse (For internal circuit protection).

CycleTune Rear View:

The back of the CYCLETUNE unit contains the system fuel reservoir, reservoir filler cap, and serial number plate & fuel filter assembly. See Appendix A for fuel filter replacement information.

Fuel Reservoir Filler Cap	Provides access to the unit's Fuel Reservoir Tank
Fuel Reservoir Tank (With Level Indicators)	Storage for unit's Detergent / Fuel Mixture
Fuel Filter	Filters out contaminants removed during the cleaning process. (Please see Appendix A for filter replacement information)
Serial Number Plate	Identifies the unit's model & manufacturer's production number

Before You Begin

First Time Operation

NOTE
The following process is used to flush testing fluids from your new machine and is only necessary before the first use of the unit.

NOTE
The CycleTune unit is shipped with the Output (Red) & Return (Black) hoses not attached to the unit. Assure that these hoses are securely attached before proceeding.

1. Verify that the Output **(Red)** & Return **(Black)** lines & fuel filter are connected and securely in place before proceeding.
   (Red hose will connect to the “Output” port & the Black hose to “Return” port)

2. Check the battery connections and all external components for damage.

3. Turn the pressure regulator knob on the unit control panel counterclockwise until it is completely open.

4. Attach the unit to the vehicle's battery by connecting the red battery clip to the positive (+) battery terminal and the black battery clip to a solid ground point as far from the battery as possible. Turn on the system power switch.

5. Fill the reservoir with clean gasoline until the tank level is approx. ½ full (40 oz.)

6. Connect the output **(Red)** hose and return **(Black)** hose together with the following adaptor P/N’s: 060-1400 & 060-1100. Connect the adaptors securely with a clamp. Follow the procedures below to flush fuel through the system:

- Set the Timer knob for five minutes.
- Press and hold the Start/Run switch.
- Release the Start/Run switch.

7. Disconnect the adaptors from the output and return lines.

8. Connect adaptor (060-1400) to the output (Red) hose then drain the gasoline from the reservoir using the following procedure:

- Set the Timer knob for five minutes.
- Direct the output (Red) hose into an appropriate container.
- Press & hold the Start/Run switch until the fuel from the unit has been emptied.
- Release the Start/Run switch.
- Dispose of the fuel in an environmentally approved method.

The reservoir is now completely drained of fuel. Follow the steps on the next page before performing the first cleaning service:

Mixing Ratios

Using a separate container or the reservoir, follow the chart below to mix the proper amounts of CarbonClean Cleaning Detergent and gasoline.

NOTE

The proper ratio is 1 oz. (30 ml.) detergent to 3 oz. (90 ml.) gasoline.

DETERGENT / GASOLINE RATIO

3 cylinders = 3 oz. (90 ml.) detergent to 9 oz. (270 ml.) gasoline, (360 TOTAL)

4 cylinders = 4 oz. (120 ml.) detergent to 12 oz. (360 ml.) gasoline, (480 TOTAL)

5 cylinders = 5 oz. (150 ml.) detergent to 15 oz. (450 ml.) gasoline, (600 TOTAL)

6 cylinders = 6 oz. (180 ml.) detergent to 18 oz. (540 ml.) gasoline, (720 TOTAL)

8 cylinders = 8 oz. (240 ml.) detergent to 24 oz. (720 ml.) gasoline, (960 TOTAL)

10 cylinders = 10 oz. (300 ml.) detergent to 30 oz. (900 ml.) gasoline, (1200 TOTAL)

12 cylinders = 12 oz. (360 ml.) detergent to 36 oz. (1080 ml.) gasoline, (1440 TOTAL)

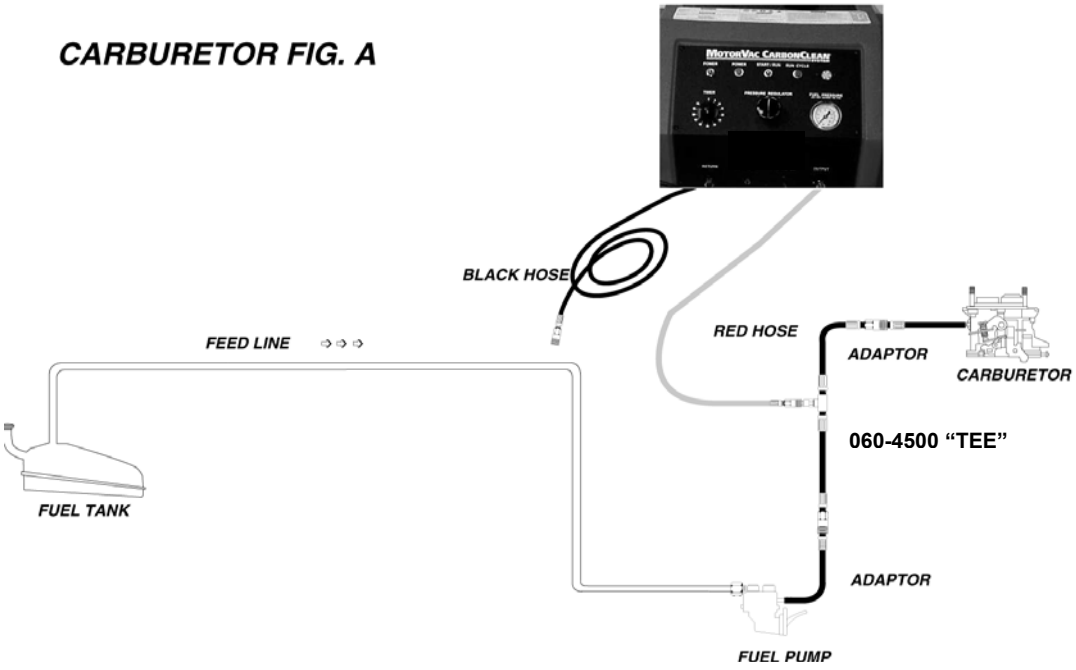
Reservoir Filling & Vehicle Diagnostics

Although vehicle diagnostic tests are not a mandatory part of the cleaning procedure, they can help determine if poor engine performance is caused by other conditions related to the fuel system.
Refer to the following system diagrams to fill the unit's fuel reservoir & to perform diagnostic tests.

Fuel Volume Test & Reservoir Filling Diagrams:

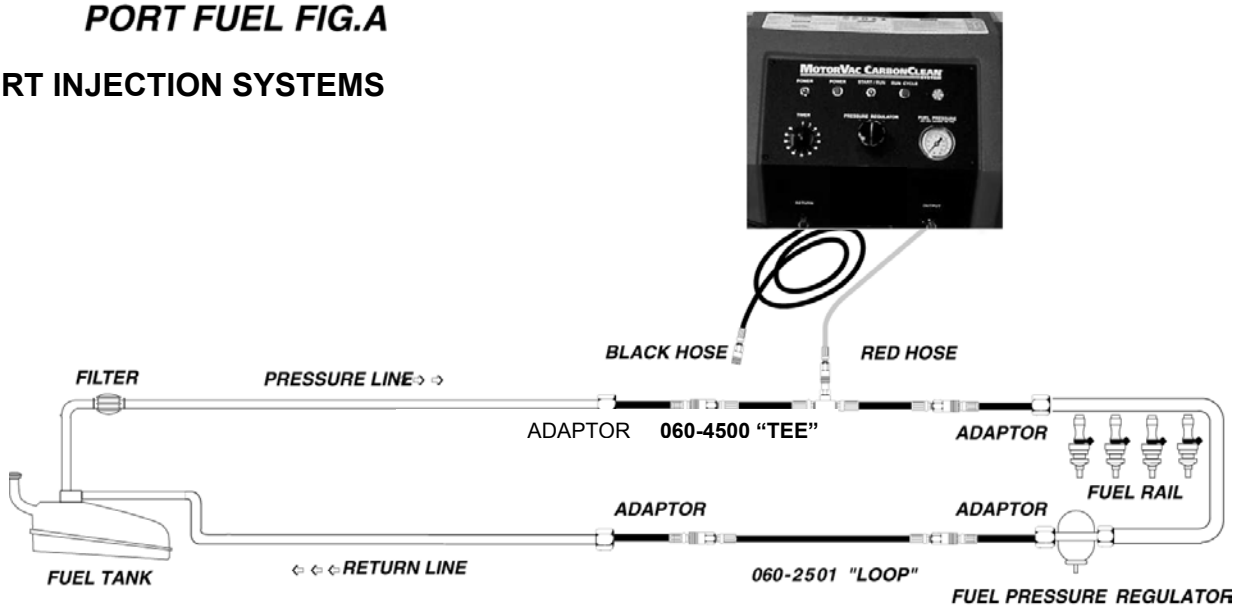
CARBURETOR SYSTEMS

CARBURETOR FIG. A



PORT FUEL FIG.A

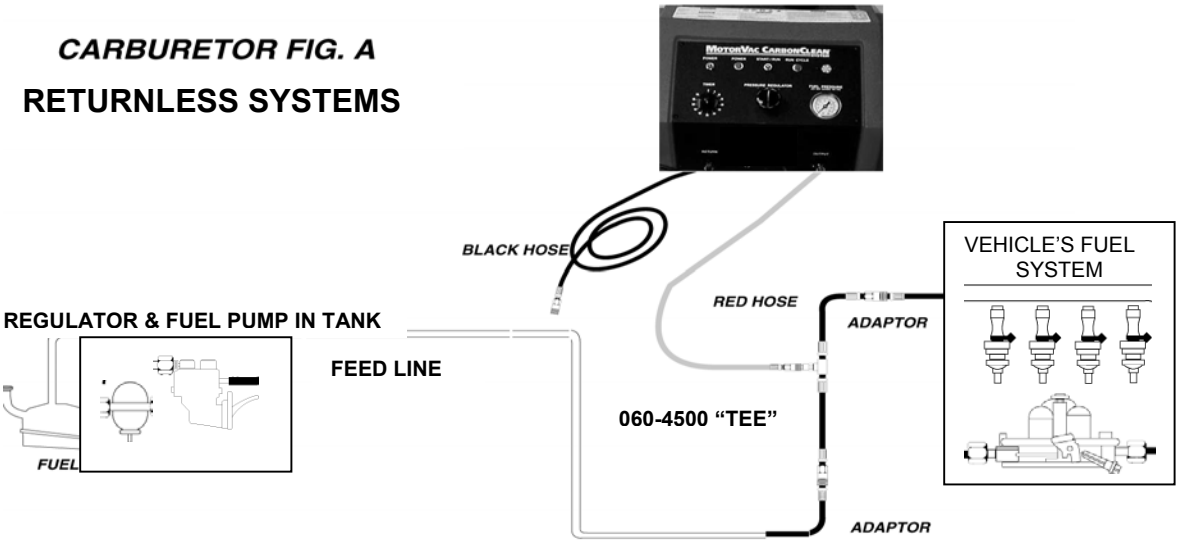
PORT INJECTION SYSTEMS



Fuel Volume Test & Reservoir Filling Diagrams Cont:

CARBURETOR FIG. A

RETURNLESS SYSTEMS



Systems Tested:

Carbureted Systems

The following test may be performed for this system:

- Fuel System Volume Test

PFI Systems

The following tests may be performed for this system:

- Fuel System Volume Test
- Fuel System Pressure Test

Returnless Systems

The following test may be performed for this system:

- Fuel System Volume Test / *See note in returnless section*

Fuel Volume Test & Reservoir Filling Procedure

1. Verify that the setup steps for the volume test from the appropriate fuel system connection diagram have been completed.

2. Start the vehicle's engine and check connections for leaks.

3. Slowly open the gate valve on the T-adaptor (060-4500) clockwise until the vehicle's engine begins to labor slightly while idling.

- You should observe a strong flow of fuel from the vehicle into the unit's fuel reservoir. The Fuel Level Indicators should show 32 oz. In the unit's fuel reservoir within 15 to 20 seconds. This indicates sufficient fuel volume.

4. Close the valve on the T-adaptor (060-4500)

- If the proper fuel level was not reached within 15 to 20 seconds, this could indicate a blocked fuel filter or fuel line on the vehicle.

5. Turn the vehicle's engine off.

6. Return to the appropriate chapter to continue the cleaning process. Otherwise, conclude the test as described below.

IMPORTANT

Close the gate valve on the T-adaptor and wrap a shop towel around pressure fittings before disconnection to protect against residual fuel spray.

7. Disconnect the battery leads, hoses and adaptors. Return the vehicle's fuel system to it's normal operating condition by re-connecting the vehicle's fuel lines.

Fuel System Pressure Test

(This test will not be applicable for Carbureted and Returnless Fuel Systems)

1. Verify that the setup steps for the cleaning procedure from the appropriate fuel system section have been completed.

2. Adjust the timer knob for 10 minutes. Adjust the pressure regulator knob clockwise until closed, and then back it out ½ turn. Move system power switch to the on position, press & hold the unit's start/run switch until the unit's fuel pressure gauge shows above 5 psi, then release switch. Close the pressure regulator knob clockwise until seated. Check all connections for leaks.

   - The pressure shown on the gauge will be the vehicle's regulator opening pressure.
   - Pressure readings without engine vacuum applied will generally be higher than running pressure.

3. Start the vehicle's engine and re-check connections.

4. Note the vehicle's fuel system pressure reading on the fuel pressure gauge.

   - This is the vehicle's running pressure.

5. Return to the appropriate fuel system chapter to continue the cleaning process. Otherwise, conclude the test as described below.

6. Turn the vehicle's engine off. Move the system power switch to the off position.

IMPORTANT

Close the gate valve on the T-adaptor and wrap a shop towel around pressure fittings before disconnection to protect against residual fuel spray.

7. Disconnect the battery leads, hoses and adaptors. Return the vehicle's fuel system to its normal operating condition by re-connecting the vehicle fuel lines.

Fuel System Cleaning Procedures

Determining the Vehicle's Fuel System Type

It is very important to determine the fuel system type of the vehicle to be serviced before performing any setup or cleaning procedures. The unit can be used with any of the five different types of fuel systems listed below:

Carburetion

Carburetors come in a variety of sizes and shapes. These can be easily identified by locating the choke plate in the air horn.

Port Fuel Injection (PFI)

This system uses a single electronic injector per cylinder, mounted so that fuel spray is directed into the intake port.

Returnless Fuel Systems

Returnless fuel systems will be virtually identical to Port Injection systems with a few exceptions. Returnless systems do not have a visible pressure regulator on the fuel rail & do not use a fuel return line leading back to the fuel tank. Because these systems do not have the pressure regulator controlling fuel pressure at the rail assembly and do not have a provision for a return line connection, the rail flush procedure will not be performed. Refer to the Returnless fuel section for specific procedures.

NOTE

Once you have determined the fuel system type, Refer to the appropriate sections for instructions on how to perform setup, diagnostic and cleaning procedures for that system.

Carburetor Setup Procedure

Follow the steps below to connect the unit to the vehicle's fuel system.
Make sure the vehicle has at least 1/8 tank of fuel before beginning this process.

IMPORTANT
Do not perform the setup or cleaning process if the vehicle's engine oil or coolant level is low. If necessary, add oil and/or coolant to the vehicle.

1. Start the vehicle's engine and allow the engine to reach normal operating temperature.

2. Turn the vehicle's engine off when normal operating temperature has been reached.

3. Turn the Pressure Adjust regulator counterclockwise until the regulator is completely open. Verify that the power is switch is turned off.

4. Attach the unit to the vehicle's battery by connecting the red battery clip to the positive (+) battery terminal and the black battery clip to a solid ground point as far from the battery as possible.

5. Remove the vehicle's gas cap to relieve fuel tank pressure.

6. Disconnect the vehicle's fuel line at the carburetor inlet or at the fuel pump outlet. There should now be two open ends to work with:
<u>Pressure Line:</u> One coming from the fuel pump & one going into the carburetor.

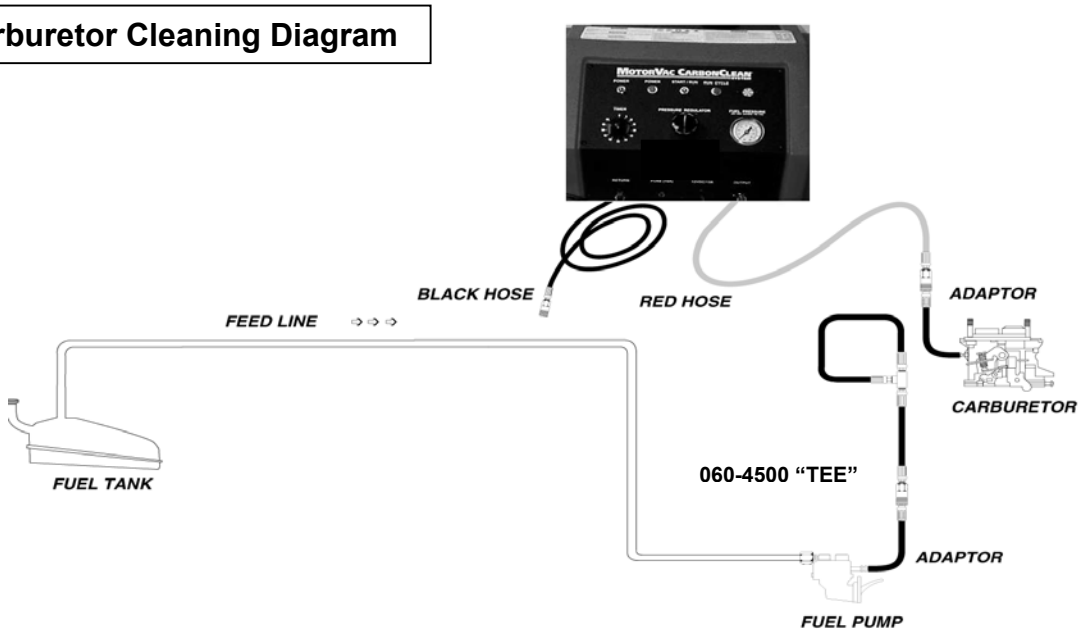
7. Add gasoline and detergent mixture to the reservoir (See Reservoir Filling / Vehicle Diagnostics Section for proper procedure or add gasoline / detergent mixture as per chart on page 3-2)

/!\ WARNING

Flammable Liquid can squirt out of pressurized lines when connecting or disconnecting.
Wear Safety goggles.
Obtain ZERO pressure before connecting or disconnecting any fuel lines or adaptors.
Wear chemical resistant gloves when connecting or disconnecting fittings and adaptors.
Wrap shop towel around pressure fittings and adaptors when disconnecting.
Avoid exposure to flames, sparks, hot engine parts, and other ignition sources.
Explosion or flame or exposure to flammable liquid and vapors can cause injury.

8. As shown in the figure on the next page, connect the output **(Red)** hose to the inlet of the carburetor and block the fuel line coming from the vehicle's fuel pump.

Carburetor Cleaning Diagram



You are now ready to perform the carburetor cleaning procedure

Carburetor Cleaning Procedure

Follow the steps below to feed the fuel / detergent mixture into the vehicle's carburetor.

1. Verify that the Carburetor setup steps 1- 8 above have been completed.

2. Refer to the vehicle's service manual for the manufacturer's recommended PSI.

3. Adjust Timer knob for 30 minutes. (Run time may be adjusted depending on the condition of the vehicle's fuel system). Move the system power switch to the on position. Press and hold the start / run switch.

4. Turn the Pressure Adjust regulator clockwise until the fuel pressure gauge reads 4 PSI (or the equivalent of the manufacturer's recommended specifications).

5. Release the start/run switch. Check all connections for leaks.

6. Start the vehicle's engine to begin the fuel system cleaning process.
    - When the cleaning process is halfway completed, step on the vehicle's accelerator quickly three or four times. Maintain RPM at 1500 - 2000 for 30 seconds.

7. When the run time expires, the cleaning process is complete. The unit will automatically shut down & The alarm will sound. Move the system power switch to the off position.

8. Turn off the vehicle's engine.

9. Turn the pressure adjust regulator on the unit counterclockwise to release any residual pressure.

10. Disconnect the battery leads, hoses, and adaptors. Return the vehicle's fuel system to it's normal operating condition by re-connecting the vehicle's fuel lines.

11. Re-install the vehicle's gas cap.

12. Start the vehicle's engine and verify that there are no leaks.

13. Test drive the vehicle for five miles immediately following the cleaning service to flush all detergent from the vehicle's fuel and exhaust systems.

Port Fuel Injection (PFI) Setup Procedure

Follow the steps below to connect the unit to the vehicle's fuel system.
Make sure the vehicle has at least 1/8 tank of fuel before beginning this process.

IMPORTANT

Do not perform the setup or cleaning process if the vehicle's engine oil or coolant level is low. If necessary, add oil and/or coolant to the vehicle.

1. Start the vehicle's engine and allow the engine to reach normal operating temperature**.**

2. Turn the vehicle's engine off when normal operating temperature has been reached.

3. Turn the pressure regulator knob counterclockwise until the regulator is completely open. Verify that the power switch is turned off.

4. Attach the unit to the vehicle's battery by connecting the red battery clip to the positive (+) battery terminal and the black battery clip to a solid ground point as far from the battery as possible.

5. Remove the vehicle's gas cap to relieve fuel tank pressure.

6. Disconnect the vehicle's fuel lines from the fuel rail. There are now four open ends to work with:
   Pressure Line: One from the fuel tank & one to the fuel rail
   Return Line: One from the fuel rail & one to the fuel tank

7. Add gasoline and detergent mixture to the reservoir (See Reservoir Filling / Vehicle Diagnostics Section for proper procedure or add gasoline / detergent mixture chart on page 3-2)

/!\ WARNING

Flammable Liquid can squirt out of pressurized lines when connecting or disconnecting.
Wear Safety goggles.
Obtain ZERO pressure before connecting or disconnecting any fuel lines or adaptors.
Wear chemical resistant gloves when connecting or disconnecting fittings and adaptors.
Wrap shop towel around pressure fittings and adaptors when disconnecting.
Avoid exposure to flames, sparks, hot engine parts, and other ignition sources.
Explosion or flame or exposure to flammable liquid and vapors can cause injury.

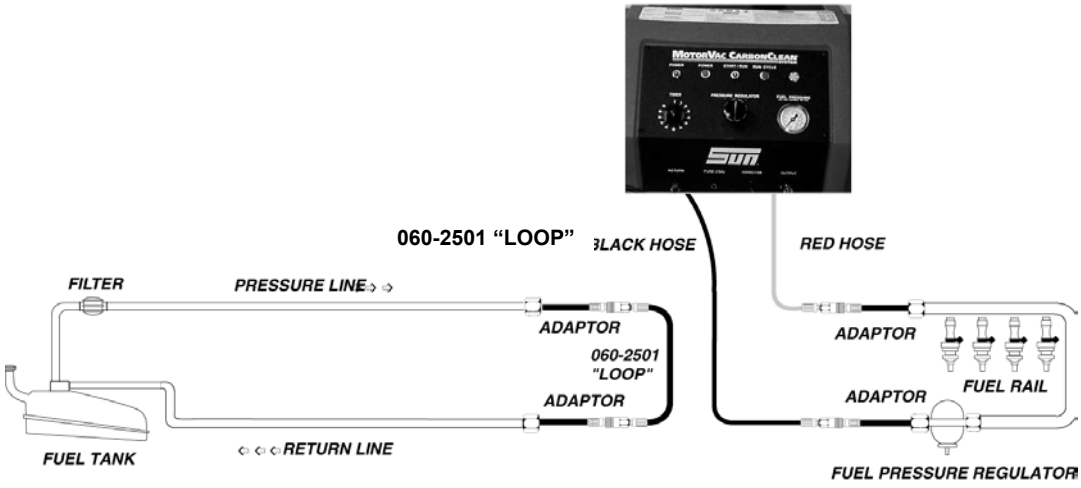
8. As shown in the figure on the next page, connect one end of the loop adaptor (060-2501) to the pressure line coming from the vehicle's fuel tank. Connect the other end of the loop adaptor to the return line going back to the fuel tank. (This forms a loop, making it unnecessary to disconnect the fuel pump)

9. As shown in the figure on the next page, connect the output (**Red**) hose from the unit to the adaptor on the pressure line going into the fuel rail.

10. As shown in the figure on the next page, connect the return (**Black**) hose from the unit to the adaptor on the return line coming from the fuel rail.

Port Fuel Injection (PFI) Cleaning Diagram

PORT FUEL FIG.B



You are now ready to perform the PFI cleaning procedure

Port Fuel Injection (PFI) Cleaning Procedure

Follow these steps to circulate the cleaning mixture through the Port Fuel Injection systems to clean the fuel rail, injector screens and pressure regulator.

1. Verify that PFI Setup Steps 1-10 above have been completed before continuing.

2. Refer to the vehicle's service manual for the manufacturer's recommended PSI. (For reference only)

3. Adjust timer knob for 10 minutes.

4. Turn the pressure regulator knob clockwise until seated, then open ½ turn.
   Move system power switch to the on position.

5. Press and hold the start/run switch until the pressure gauge displays pressure.

6. Release the start/run switch and continue to turn the pressure regulator knob clockwise until it is completely closed. This will clean the PFI unit, injector screens, and fuel rail and pressure regulator and filter the contaminants through the filtration system. Check all connections for leaks.

7. After the 10 minutes has expired, adjust timer to 30 minutes.
   (Run time may be adjusted depending on the condition of the vehicle's fuel system)

8. Press & hold the start/run switch until the pressure gauge displays pressure. Release switch.

9. Start the vehicle’s engine to begin the fuel system cleaning process.
- When the cleaning process is halfway completed, step on the vehicle's accelerator quickly three or four times. Maintain RPM at 1500 - 2000 for 30 seconds.

10. When the run time expires, the cleaning is complete. The unit will automatically shut down and the alarm will sound. Move system switch to the off position.

11. Turn off the vehicle's ignition.

12. Turn the Pressure Adjust regulator counterclockwise on the unit to release any residual pressure.

IMPORTANT

Wrap a shop towel around pressure fittings before disconnection to protect against residual fuel spray.

13. Disconnect the battery leads, hoses and adaptors. Return the vehicle's fuel system to its normal operating condition by re-connecting the vehicle's fuel lines.

14. Re-install the vehicle's gas cap.

15. Start the vehicle's engine and verify that there are no leaks.

16. Test drive the vehicle for five miles immediately following the cleaning service to flush all detergent from the vehicle's fuel and exhaust systems.

Returnless Fuel System Setup Procedure

Follow the steps below to connect the unit to the vehicle's fuel system.
Make sure the vehicle has at least 1/8 tank of fuel before beginning this process.

IMPORTANT

Do not perform the setup or cleaning process if the vehicle's engine oil or coolant level is low. If necessary, add oil and/or coolant to the vehicle.

2. Start the vehicle's engine and allow the engine to reach normal operating temperature.

2. Turn the vehicle's engine off when normal operating temperature has been reached.

3. Turn the pressure regulator knob counterclockwise until the regulator is completely open. Verify that the power is switch is turned off.

4. Attach the unit to the vehicle's battery by connecting the red battery clip to the positive (+) battery terminal and the black battery clip to a solid ground point as far from the battery as possible.

5. Remove the vehicle's gas cap to relieve fuel tank pressure.

6. Disconnect the vehicle's fuel line at the fuel rail or at the fuel pump outlet.
There should now be two open ends to work with:
Pressure Line: One coming from the fuel pump & one going into the fuel rail.

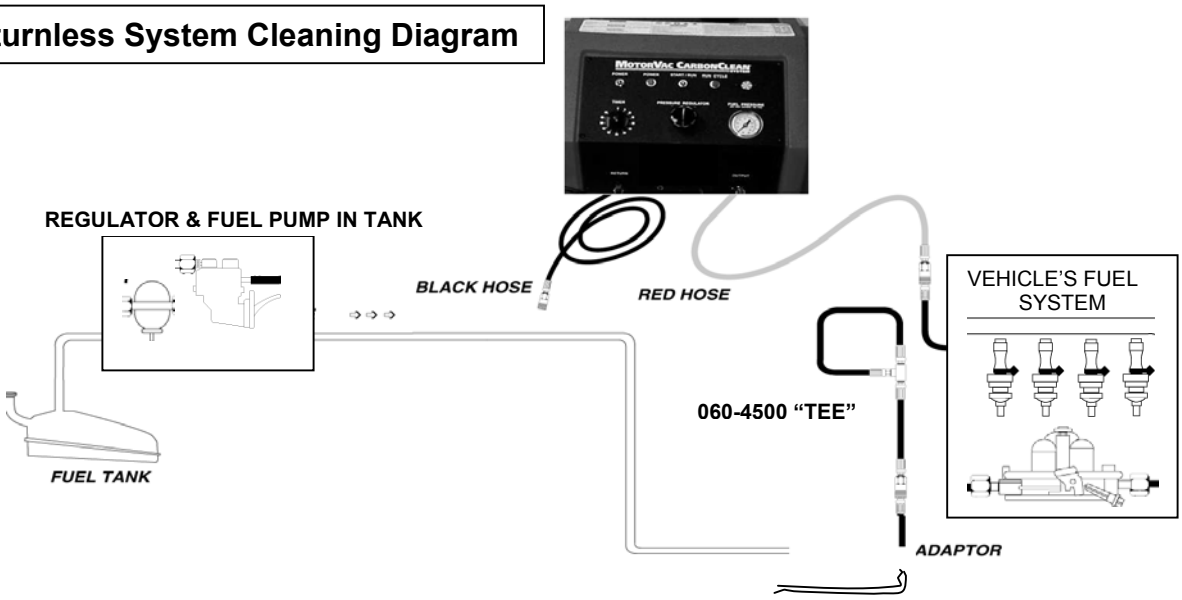
7. Add gasoline and detergent mixture to the reservoir (See Reservoir Filling / Vehicle Diagnostics Section for proper procedure or add gasoline / detergent mixture chart on page 3-2)

/!\ WARNING

Flammable Liquid can squirt out of pressurized lines when connecting or disconnecting.
Wear Safety goggles.
Obtain ZERO pressure before connecting or disconnecting any fuel lines or adaptors.
Wear chemical resistant gloves when connecting or disconnecting fittings and adaptors.
Wrap shop towel around pressure fittings and adaptors when disconnecting.
Avoid exposure to flames, sparks, hot engine parts, and other ignition sources.
Explosion or flame or exposure to flammable liquid and vapors can cause injury.

8. As shown in the figure on the next page, connect the output **(Red)** hose to the adaptor leading to the fuel rail and block the fuel line coming from the vehicle's fuel pump using the T-adaptor (060-4500).

Returnless System Cleaning Diagram



You are now ready to perform the Returnless System cleaning procedure.

Returnless System Cleaning Procedure

Follow the steps below to feed the fuel/detergent mixture into the vehicle's fuel injector system.

1. Verify that the Returnless System Setup Steps 1- 8 above have been completed.
2. Refer to the vehicle's service manual for the manufacturer's recommended PSI or use a separate fuel pressure gauge to obtain system pressures.

3. Adjust Timer knob for 30-45 minutes. (The rail flush procedure is not performed on this system)

4. Turn the Pressure Adjust regulator completely counterclockwise.
   Move system power switch to the on position.

5. Press & hold the start / run switch & at the same time *close pressure regulator clockwise until the vehicle's system pressure obtained from manufacturer's specifications or separate pressure gauge is shown* on the pressure gauge. (This system will not regulate fuel pressure automatically)
   Check all connections for leaks.

6. Start the vehicle's engine to begin the fuel system cleaning process.
   - When the cleaning process is halfway completed, step on the vehicle's accelerator quickly three or four times. Maintain RPM at 1500 - 2000 for 30 seconds.

7. When the run time expires, the cleaning is complete, the unit will automatically shut down and the alarm will sound. Move the system power switch to the off position

8. Turn off the vehicle's ignition.

9. Turn the pressure adjust regulator on the unit counterclockwise to release any residual pressure.

IMPORTANT

Close the gate valve on the T-adaptor & wrap a shop towel around pressure fittings before disconnection to protect against residual fuel spray.

10. Disconnect the battery leads, hoses, and adaptors. Return the vehicle's fuel system to its normal operating condition by re-connecting the vehicle's fuel lines.

11. Re-install the vehicle's gas cap.

12. Start the vehicle's engine and verify that there are no leaks.

13. Test drive the vehicle for five miles immediately following the cleaning service to flush all detergent from the vehicle's fuel and exhaust systems.

Troubleshooting and Additional Help

Refer to the list below in the unlikely event that you have problems with your ***CYCLETUNE*** unit.

Problem:	Solution:
1. Power Light is on but the UNIT is not operational.	Polarity is reversed on vehicle battery connection. Check connections for correct polarity. Check fuse on the front panel
2. Pressure Gauge on the UNIT displays maximum pressure upon start up.	Output and Return hoses may be reversed. Set Timer to zero. Check hoses for correct connection.
3. Rapid loss of fuel from the Unit's reservoir.	The UNIT'S Pressure hose **(Red)** connection may be connected to the vehicle's fuel return line, allowing fuel/detergent to return to the vehicle's fuel tank.
4. Start/Run switch is on but operation does not commence.	Check Run/Time. If no time is set, then turn the Time knob to set the run time.
5. The UNIT performs poorly.	Check all hoses and wires for cuts or frays. Check cabinet for dents or impact markings. Verify that the fuel filter has recently been replaced. (Refer to Appendix A for dates of services performed.)

ADDITIONAL HELP

Please verify that items 1-5 above have been reviewed before calling for additional assistance. In the unlikely event that problems persist with your *CYCLETUNE* unit, call Technical Support.

Have your model and serial numbers available before calling.
Remember to send in your warranty card.

In the U.S. call: (714-558-4822, 800-841-8810)
E-MAIL: marketing@motorvac.com

Appendix A - Maintenance

Maintenance Procedures

The following maintenance procedures should be performed on a routine basis:

1. Drain the unit's fuel reservoir and replace the fuel filter after every 30 cleaning services as described in the next section.

2. Clean the exterior with a non-abrasive cleaning agent or similar product to keep the cabinet looking new. Check the cabinet for dents or impact markings.

3. Check all hoses and wires for cuts or frays.

Draining the *CYCLETUNE* Fuel Reservoir

The unit's fuel reservoir should be drained and the fuel filter replaced after every 30 cleanings to ensure maximum system performance and pump life.

1. Turn the pressure regulator knob on the control panel clockwise until it is completely closed.

2. Attach the unit to the vehicle's battery by connecting the red battery clip to the positive (+) battery terminal and the black battery clip to a solid ground point as far from the battery as possible. Turn on the CYCLETUNE system power switch.

3. Connect the 060-1400 adaptor to the output (Red) hose then drain the gasoline from the unit's fuel reservoir into an approved container using the following procedure:

   - Set the timer until it displays five minutes.
   - Direct the output (Red) hose into an appropriate container.
   - Press & hold the start / run switch until fuel the unit's fuel is emptied into the container.
   - Release the Start/Run switch.
   - Turn the pressure regulator knob counterclockwise until completely open to relieve any residual pressure.

4. Enter your initials, the date and a check mark in the appropriate boxes in the Maintenance Record at the end of this chapter.

Replacing the *CYCLETUNE* Fuel Filter

1. Remove the old fuel filter from the mounting station on the back of the unit's cabinet and install the new filter.

2. Tighten filter securely to prevent any fuel or vacuum leaks.

3. Add the mixture back into the *CYCLETUNE'S* reservoir.

4. Check unit for leaks.

5. Enter your initials, the date, and a check mark in the appropriate boxes of the Maintenance Record at the end of this chapter.

The unit is now ready for the next cleaning service.

Maintenance Record

Use the following table to keep a record of maintenance performed on the ***CYCLETUNE*.**

Initial/Date	DRAIN FUEL RESERVOIR ✓	REPLACE FUEL FILTER ✓	CLEAN EXT. CABINET ✓	CHECK HOSES AND WIRES ✓	OTHER ✓
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Appendix B - System Accessories

Standard Adaptor Kit (200-3116) CycleTune

Machines shipped outside the U.S.A. may have different adaptor kits included in the package.

The most commonly used application is listed. However, other applications may apply.

PART & NO.	QTY	APPLICATION
 060-1000	2	GENERAL APPLICATIONS UTILIZING 1/4" FUEL LINE - MALE. (USE WITH SUITABLE HOSE CLAMPS.)
 060-1100	2	GENERAL APPLICATIONS UTILIZING 5/16" FUEL LINE- MALE. (USE WITH SUITABLE HOSE CLAMPS.)
 060-1300	2	GENERAL APPLICATIONS UTILIZING 1/4" FUEL LINE - FEMALE. (USE WITH SUITABLE HOSE CLAMPS.)
 060-1400	2	GENERAL APPLICATIONS UTILIZING 5/16" FUEL LINE - FEMALE. (USE WITH SUITABLE HOSE CLAMPS.)
 060-3900	2	5/16" QUICK DISCONNECT HARLEY-DAVIDSON, KAWASAKI
 060-4500	1	TEE ADAPTOR FORMS DIAGNOSTIC "TEST PORT" ON ALL VEHICLES.
 060-0440  060-0450	2 2	HOSE CLAMPS. USE WITH 060-1000 THROUGH 060-1500.

OPTIONAL ADAPTERS FOR MCS231 – CYCLE TUNE.

Part & Number	Quantity	Application
	2	Harley-Davidson 1999 Touring model
	1	BMW male adapter
	1	BMW female adapter

Appendix C - Parts

Service Parts for the CYCLETUNE

Please refer to the part numbers below when ordering parts.

Part #	Description
010-6060	Reservoir cap, Vented
020-8063	Harness, power
030-0020	Conn M. 3/8x 1/4 NPT NI
050-0095	Filter, spin-on
080-0230	Female Quick Disconnect Couplers
200-8052	Assy, Return hose (black)
200-8051	Assy, Output hose (red)
020-0014	Fuse-Front Panel (Buss AGC 15 amp)
200-8060	Operator's Manual
200-8670	Storage Cart / Used with CycleTune

ORDERING PARTS

Parts for the *CYCLETUNE* may be ordered by calling Customer Service.
Have your model & serial numbers available:

In the U.S. call: 714.558.4822, 800.841.8810
E-MAIL: marketing@motorvac.com

Appendix D - MATERIAL SAFETY DATA SHEET

Product Identity: Cleaning Detergent and Top Engine Cleaner

Part #: 400-0020

Material Safety Data Sheet

Approved by U.S. Dept., essentially similar to form OSHA 174.

IMPORTANT: Read this MSDS before handling and disposing of this product. Pass this information on to employees, customers, and users of this product.

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Cleaning Detergent and Top Engine Cleaner

Part #: 400-0020

MotorVac Technologies, Inc.,
1431 S. Village Way

Santa Ana, Ca 92705

USA

Effective:
10/30/98
Rev A

Printed:
06/14/06

Tel: (714) 558-4822

24-hour Emergency Phone, Chemtrec: 1-800-424-9300, or international 01-703-527-3887

SECTION 2. INGREDIENT & REGULATORY INFORMATION

All components of this product are on the TSCA List. SARA Title III Section 313 Supplier Notifications. This product contains the indicated <*> toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning & Community Right-To-Know Act of 1986 & of 40 CFR 372. This information must be included in all MSDS's that are copied and distributed for this material.

SARA TITLE III INGREDIENTS	CAS#	Wt.%(Reg.Section)	RQ(lbs.)
Light Aromatic Solvent Naphtha	*64742-95-6	Not appl. (311,312)	None
*1,2,4-Trimethylbenzene	95-63-6	7 (311,312,313,RCRA)	None
*2-Butoxyethanol	111-76-2	8 (313)	None
Specific chemical identity withheld as trade secret	N/A	Not appl. (311,312)	N/A

SARA SECTION 311/312 HAZARDS: Acute Health, Chronic Health, Fire.

MATERIAL	CAS#	TWA + (OSHA)	TLV (ACGIH)
Light Aromatic Solvent Naphtha	*64742-95-6	100 PPM	5 mg/m^3
1,2,4-Trimethylbenzene	95-63-6	25 PPM	25 PPM
2-Butoxyethanol	111-76-2	25 PPM (S)	25 PPM (S)
Specific chemical identity withheld as trade secret	N/A	25 PPM (S)	25 PPM (S)

MATERIAL	CAS#	CEILING	STEL (OSHA/ACGIH)
Specific chemical identity withheld as trade secret	N/A	Not known	40 PPM

MATERIAL	CAS#	Lowest known lethal dose data Lowest known LC50 (vapors)
2-Butoxyethanol	111-76-2	700 PPM (mice)

Hazards; Health (NFPA): 2 Health (HMIS): 3 Flammability: 2 Reactivity: 0

Balance of ingredients: Non-Hazardous

9 Octadecanoic acid (z) ammonium salt CAS#: 544-60-5

California Proposition 65: This product contains no known chemical to the State of California to cause cancer or reproductive toxicity.

SECTION 3. HAZARDOUS IDENTIFICATION

Threshold limit value: Not applicable
Contains: Petroleum Naphtha, 2-Butoxyethanol

Warning!
Combustible!
Acute Hazards

Eye & Skin Contact:
Primary irritation to skin, defatting, dermatitis. Absorption through skin increases exposure.
Primary irritation to eyes, redness, tearing, blurred vision.
Liquid can cause eye burns. Wash thoroughly after handling.

Inhalation:
Anesthetic. Irritates respiratory tract. Acute overexposure can cause serious nervous system depression. Vapor harmful.
Breathing vapor can cause irritation.
Acute overexposure can cause damage to kidneys, blood, nerves, liver, and lungs.

Swallowing:
Harmful or fatal if swallowed.
Swallowing can cause abdominal irritation, nausea, vomiting and diarrhea.

Subchronic Hazards / Conditions Aggravated

Subchronic hazards:
Absorption through skin may be harmful. Chronic overexposure can cause damage to kidneys, blood, nerves, liver & lungs.

Conditions aggravated:
Persons with severe skin, liver, heart, lung or kidney problems should avoid use.

Chronic hazards:

This product has no carcinogens listed by IARC, NTP, NIOSH, OSHA, or ACGIH, as of this date, greater or equal to 0.1%.
This product may contain less than 1 PPM of benzene.
Not considered hazardous in such low concentrations.

SECTION 4. FIRST AID MEASURES PROCEDURES

Eye Contact:
Immediately flush with plenty of water for 15 minutes & call a physician.
Skin Contact:
Immediately remove contaminated clothing. Wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. (Discard contaminated shoes.)
Inhalation:
After high vapor exposure, remove to fresh air. If breathing is difficult, give, oxygen.
If breathing has stopped give artificial respiration. Call a physician immediately!
Swallowing:
Call a physician immediately! Do not induce vomiting. Never give anything by mouth to an unconscious person. Have patient lie down and keep warm. Vomiting may lead to pneumonititis, which may be fatal.

SECTION 5. FIRE FIGHTING MEASURES

Lower flammable limit in air (% by vol.): 1.0
Flash point (test method): 112°F/ 44.4°C (TCC) (lowest component)
Flammability classification: Class II

Extinguishing media:
NFPA Class B extinguishers (carbon dioxide or foam) for Class II liquid fires.

Special fire fighting procedures:
Water spray may be ineffective on fire but can protect fire fighters and cool closed containers. Use fog nozzles if water is used. Do not enter confined fire-space without full bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots). Use NIOSH approved positive-pressure self-contained breathing apparatus.

Unusual explosion and fire procedures:
Combustible!
Keep container tightly closed. Isolate from oxidizers, heat, & open flame. Closed containers may explode if exposed to extreme heat. Applying to hot surfaces requires special precautions. Empty container very hazardous! Continue all label precautions!

SECTION 6. ACCIDENTAL RELEASE MEASURES

Spill or leak procedures:
Stop spill at source. Dike area & contain. Clean up remainder with absorbent materials. Mop up and dispose of.

Waste disposal method:
Recycle or dispose of observing local, state & federal health, safety & pollution laws. If questions exist, contact the appropriate agencies.

Other precautions:
None.

SECTION 7. HANDLING AND STORAGE

Handling:
Isolate from oxidizers, heat, and open flame. Use only with adequate ventilation. Avoid breathing of vapor or spray mist. Do not get in eyes, on skin or clothing. Wear OSHA standard goggles or face shield. Consult safety equipment supplier. Wear gloves, apron and footwear impervious to this material. Wash clothing before reuse. Avoid free fall of liquid. Ground containers when transferring. Do not flame cut, braze, or weld. Empty container very hazardous! Continue all label precautions!

Storage:
Do not store above 49°C/120°F. Store large amounts in structures made for OSHA Class II liquids. Keep container tightly closed and upright when not in use to prevent leakage.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure controls:
None necessary.

Ventilation:
Local exhaust: Necessary
Mechanical (general): Acceptable
Special: None
Other: None

Personal protection:
Wear OSHA standard goggles or face shield. Consult safety equipment supplier. Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.

SECTION 9. PHYSICAL DATA

Appearance:	Liquid, green color
Odor:	Solvent odor
Boiling Range:	100 172 204°C/ 212 343 400°F
Specific gravity (water = 1):	0.92
Pounds/gallon (lbs./gal):	7.66
VOC's (vapor pressure>0.44 lbs./in^2) (lbs./gal):	0.000
Total volatile organic compounds (TVOC) (gr/lt):	595.0
Vapor pressure (mm of HG)@20°C:	1.6
Vapor density (air = 1):	4.3
%Volatile by vol.:	100.0

SECTION 10. REACTIVITY DATA

Stability: Stable
Conditions to avoid: Isolate from oxidizers, heat, and open flame.
Material to avoid: Isolate from strong oxidizers such as permanganates, chromates and peroxides.
Hazardous decomposition products: Carbon monoxide, carbon dioxide from burning.
Hazardous polymerization: Will not occur.

SECTION 11.

Not available

SECTION 12.

Not available

SECTION 13. DISPOSAL CONSIDERATIONS

This product is considered a hazardous waste. May be incinerated or burned in a RCRA licensed facility.

SECTION 14. TRANSPORTATION INFORMATION

***Note the information below are just guidelines. It is the responsibility of the shipper to ensure that all the proper procedures are followed.**

When shipped by ground (U.S.A.), not regulated ref. CFR 173.150
When shipped by ground (U.S.A.), in drums: not regulated

When shipped by air:

(NOT APPLICABLE TO DRUMS)
D.O.T. CFR 49 proper shipping name: Petroleum distillates, n.o.s.
Hazardous Class: 3 UN Number: 1268
Packing Group: III
Packing Instruction: Y309
Transportation Details: Permitted in Passenger and Cargo Aircraft (in appropriate quantities), Non-Radioactive

DRUMS: D.O.T. CFR 49 proper shipping name: Petroleum distillates, n.o.s.
Hazardous Class: 3 UN Number: 1268
Packing Group: III
Packing Instruction: 310
Transportation Details: Cargo Aircraft Only, Non-Radioactive

SECTION 15. REGULATORY INFORMATION

California proposition 65: This product contains no known chemical known to the State of California to cause cancer or reproductive toxicity.

SECTION 16

Not available

Notice

The supplier disclaims all expressed or implied warranties of merchantability or fitness for a specific use, with respect to the product or the information herein, except for conformation to contracted specifications. All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, and therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product. Users also assume all risks in regards to the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in

combination with any other material or process.