Fuel System Service

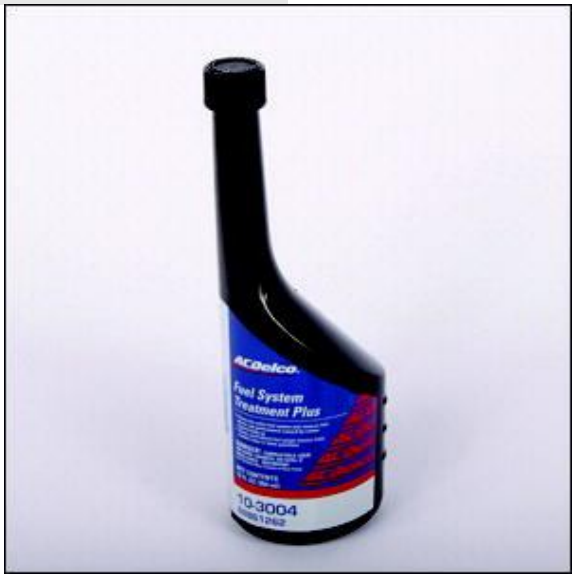
ACDelco Fuel System Treatment Plus (10-3003 & 10-3004) is unbeatable in cleaning the entire fuel system and helping to restore lost power and performance caused by deposit build-up in passenger cars and light duty trucks.

- Restores lost power and performance
- Cleans and protects against sulfurs that can harm fuel gauge sensors
- Cleans power robbing deposits from intake valves
- Cleans harmful deposits from fuel injectors, intake valves, and combustion chambers.

TECH TIP: The plus makes the difference. In addition to standard deposits, ACDelco Fuel System Treatment Plus helps counteract corrosive elements (sulfur, water, etc.) in the fuel that can cause serious damage to fuel-system electronics. Sulfur content is gasoline varies from area to area and market to market. The problem with high sulfur content is damage to the fuel sender. This causes gas gauge problems like fluttering or inaccuracy. ACDelco Fuel System Treatment Plus p/n 10-3004 (12oz) or 10-3003 (20oz) is used at an rate of 1oz per estimated gallon of fuel in tank. Fuel System Treatment Plus cleans and protects the entire fuel system from carbon buildup, deposits, and harmful sulfur contamination. Two tanks of clean gas with ACDelco Fuel System Treatment Plus may cure sending unit problems. Give it a try!

(Note; Avoid aftermarket fuel system treatments that contain high amounts of peroxide...This will damage the fuel pump by attacking the copper components)

Remember, ACDelco also offers fuel sender units to fix gauge failures without having to replace the entire pump assembly.



10-3003 $14.95

10-3004 $7.99

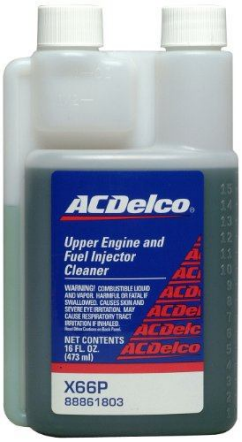
X66P $13.99

ACDelco Upper Engine and Fuel Injector Cleaner (Part Number X66P)

This product comes in a 16 oz. bottle with a 1 oz. measuring chamber, this allows the technician to measure and dispense the exact amount of X66P needed for service.

X66P has multiple service applications including in-rail fuel injector cleaning, fuel inductor cleaning, fuel injection system deposit removal, and piston top soaking clean-up.

Use of lower quality fuels may leave harmful engine deposits that can degrade drivability. Some fuels may not burn cleanly or do not contain sufficient doses of deposit control additives and can leave behind harmful deposits that can decrease engine performance. One treatment of ACDelco Upper Engine and Fuel Injector Cleaner can help clean deposits on carburetors, fuel injectors (when used through the fuel rail), intake valves and ports, and combustion chambers. (**DO NOT use ACDelco Upper Engine and Fuel Injector Cleaner in the fuel tank.)**



ACDelco Upper Engine and Fuel Injector Cleaner is the only injector cleaning agent approved for use with General Motors fuel system components. Refer to GM Technical Service Bulletin 03-06-04-030C, dated March 15, 2007, for the latest service procedures.

JOHNSTON AUTOSTORES

Injector Testing and Cleaning

The control module enables the appropriate fuel injector pulse for each cylinder. The ignition voltage is supplied directly to the fuel injectors. The control module controls each fuel injector by grounding the control circuit via a solid state device called a driver. A fuel injector coil winding resistance that is too high or too low will affect the engine driveability. A fuel injector control circuit DTC may not set, but a misfire may be apparent. The fuel injector coil windings are affected by temperature. The resistance of the fuel injector coil windings will increase as the temperature of the fuel injector increases.
When performing the fuel injector balance test, the scan tool is first used to energize the fuel pump relay. The fuel injector tester or the scan tool is then used to pulse each injector for a precise amount of time, allowing a measured amount of the fuel to be injected. This causes a drop in the system fuel pressure that can be recorded and used to compare each injector.

First verify the resistance of each fuel injector:

- If the engine coolant temperature (ECT) sensor is between 10-32°C (50-90°F), the resistance of each fuel injector should be measured in ohms and checked against specs. (Note: Higher temperatures result in higher resistance)
  * If the injectors measure OK, perform the Fuel Injector Balance Test--Fuel Pressure Test.
  * If not within the specified range, replace the fuel injector.

Note: Subtract the lowest resistance value from the highest resistance value. The difference between the lowest value and the highest value should be equal to or less than 3 ohms.

Compute the difference between the highest individual fuel injector resistance value and the average resistance value. Replace the fuel injector that displays the greatest difference above or below the average.

To begin an injector balance test, use a fuel pressure gauge that indicates kPa. These divisions are more accurate for the testing. If an injector(s) fail the balance test, clean the injectors with **ACDelco X66P** and re-test.

ACDelco X66P is easy to measure, meets low VOC laws and allows multiple vehicles to be serviced, making **ACDelco X66P** more cost effective for your injector cleaning needs. **ACDelco X66P** works with fuel up to 30% ethanol fuel and is GM powertrain certified.

Fill the injector cleaning tank with regular unleaded gasoline and 10% **ACDelco X66P**.
Note: Depending on your equipment, calculate volume. (Example-1.0 gal = 128 fl. Oz.)

1. Electrically disable the vehicle fuel pump by removing the fuel pump relay and fuse. (disconnecting the oil pressure switch connector, if equipped)
2. Disconnect the fuel feed and return line, install a bock-off hose & valve assembly as appropriate for the fuel system. Note: Do not allow **ACDelco X66P** to return to the fuel tank.
3. Connect the fuel injector cleaning equipment to the vehicle fuel rail.
4. Pressurize to 510 kPa (75 psi). Note: See service information regarding system pressure and cleaning info
5. Start and idle the engine until it stalls due to lack of fuel. This should take approximately 15-20 minutes.
6. Turn the ignition to the OFF position.
7. Injectors should be flow-tested at this point. If further cleaning is needed, a repeat of the above procedure should be done.
8. Disconnect the fuel injector equipment from the fuel rail.
9. Reconnect the vehicle fuel pump relay, fuse and oil pressure switch connector, if equipped.
10. Remove the block-off hose & valve assembly and reconnect the vehicle fuel feed and return lines.
11. Start and idle the vehicle for an additional two minutes to ensure residual injector cleaner is flushed from the fuel rail and fuel lines.
12. Pour the entire contents of **ACDelco Fuel System Treatment Plus, (P/N 10-3004)** into the fuel tank at 1oz per estimated gallons of fuel in the tank. Give the remainder to the customer with instructions.
13. Advise the customer to use only a Top Tier Detergent gasoline* and to add a bottle of **ACDelco Fuel System Treatment Plus** to the fuel tank at every oil change. Regular use of **ACDelco Fuel System Treatment Plus (P/N 10-3004)** should keep the customer from having to repeat the injector cleaning.

- **ACDelco X66P** is the only injector cleaning agent recommended by GM powertrain. DO NOT USE OTHER CLEANING AGENTS AS THEY MAY CONTAIN METHANOL, WHICH CAN DAMAGE FUEL SYSTEM COMPONENTS.
- Under NO circumstances should the **ACDelco X66P** be added to the vehicle fuel tank, as it may damage the fuel pump and other system components.

Caution; Do not exceed the recommended cleaning solution concentration. Higher concentrations may damage fuel system components. Testing has demonstrated that exceeding the recommended cleaning solution concentration does not improve the effectiveness of this procedure.

Note: An injector that does not respond to cleaning is considered contaminated and is not subject to ACDelco warranty.

Check for misfire codes to help identify injectors. Always check engine mechanical issues, fuel pressure, pressure regulator and related components for proper operation. Always refer to service information for current TSBs'. Inspect injector terminal connections for damage and "Pin" fit, use recommended silicone lubricant to prevent fuel injector terminal fretting (Check TSBs' for information regarding injector fretting)

See ACDelco www.acdelcotechconnect.com for on-line training opportunities. Ask your ACDelco distributor for more information. (Foot note: *See TSBs related to Top Tier Detergent gasoline availability and recommendations)