



Compressed Natural Gas (CNG) Vehicle

Supplemental Owner's Manual

Bi-Fuel CNG / Gasoline



2021 Ford Transit 3.5L PFDI

This Owner's Guide Supplement should be considered a permanent part of the vehicle and should remain with the vehicle when it is sold.

2021 Ford Transit 3.5L PFDI
CNG Conversion System Owner's Guide Supplement
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Required Maintenance Schedule & Log

CNG Coalescing Filter must be replaced every 10,000 miles. Warranty may be voided if not replaced every 10,000 miles.

1.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
2.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
3.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
4.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
5.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
6.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
7.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
8.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
9.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
10.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
11.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature
12.	_____	_____	_____	_____
	Date	Mileage	Service Center Name	Technician Signature

CNG Fuse Box

The fuses for your CNG alternative fuel conversion system are not located in the same area as the original equipment fuses. The CNG alternative fuel conversion system fuses are located in engine compartment next to AEC Engine Control Unit.

Relay List:

- A1, A3, B1, B3 – 35A
- A4, A6, B4, B6 – 35A

Fuse List:

- C6, C5 - 10A – Jumper and Battery Positive
- C4, C3 - 5A – AFCM and Battery Positive
- C1, C2 - 30A – Jumper and Battery Positive



When you find it necessary to replace a fuse, be sure to replace it with a fuse of the same rating.

CNG Tank Capacities, Pressure and Inspections

CNG Tank Capacity – CNG cylinder manufactures supply industrial standard amounts for the cylinders they make. This amount will not be what you are able to refill the cylinders when fueling at the CNG station during normal use. Amount of refill will vary at different stations and other factors will affect amount of refill like the weather, temperatures, CNG fuel station equipment, altitude, storage vessel psi, temperature compensation, etc... The CNG tanks will always have CNG fuel pressure remaining in tank when the fuel gauge shows it is empty due to CNG fuel rail pressures that are needed to supply CNG fuel to the engine. For example; we see for a manufacture rated 21.2 gge CNG cylinder having refills in range of 16 – 18 gge's.

CNG Tank Pressure - 3,600 psi at 70°F

CNG Tank Inspection Requirements – The CNG Cylinder must be inspected every 3 years or 36,000 miles, whichever occurs first, by a Certified CNG Cylinder and Fuel System Inspector (CNG-FSI). Immediate inspection is required in the event of a crash. See page 17 in the event of crash. To search for qualified inspector near you go to: <http://www.csagroup.org/search-qualified-personnel/>

CNG SYSTEM & VEHICLE IDENTIFICATION

V.I.N.: _____

CNG System Master Serial (MS#): _____

CNG System Installation Date: _____

Installer Name: _____

Dealer Name: _____

Original Owner

Name: _____

Address: _____

Address: _____

Second Owner

Name: _____

Address: _____

Date Purchased: _____

Introduction

This booklet supplements your original vehicle owner's guide. It describes the operation of your converted alternative fuel vehicle and how it differs from a standard gasoline powered vehicle. Your new alternative fuel vehicle operates and performs similar to a conventional gasoline only powered vehicle. However, there are a few differences you should be aware of that are covered in this supplement. In addition to reading the original equipment owners guide it is very important that you read this guide and familiarize yourself and anyone else operating this vehicle with the material covered in this supplement.

Some of the information in this supplement replaces certain instructions in the original equipment owners guide. Please read this supplement carefully in its entirety to understand the operation and unique features of your alternative fuel vehicle.

Altech-Eco Conversion Systems are produced by Altech-Eco and are not a Ford Motor Company manufactured product.

Warnings

You will find important safety information in this supplement and in the Owner's Guide. This information reminds and alerts you to be particularly careful in potential hazard areas that can cause damage to your vehicle or possible injury to yourself, your passengers or others. Please read all warnings carefully.



CNG mode is disabled when gasoline low fuel level indicator is illuminated. This vehicle must have gasoline in the vehicle at all times to operate properly. Do not use E85 in this vehicle, it will not operate properly.

Taking Care of the Unexpected

CNG Fuel System Leak Emergency Procedure

If you smell natural gas other than when refueling, or if you hear a hissing sound, follow these directions:

1. Park your vehicle in a well-ventilated area and apply the parking brake. Keep heat, sparks and flames away. Open all windows and the trunk lid for ventilation.
2. Turn the ignition switch to the lock position or OFF.
3. Turn off flow of CNG to engine by turning the manual CNG quarter turn shut off valve located under driver side door.
4. DO NOT drive the vehicle. Your vehicle should be towed to an authorized CNG service facility for inspection immediately. The complete alternative fuel system must be inspected and tested before the vehicle can be operated again by an authorized dealership by qualified technicians.

In the Event of an Accident

Was it an "accident"? Three different types of accident damage are considered here: collisions; chemical spills; and fires. A single accident may involve all three types of damage. Running over an obstruction, such as a curb, or debris in the road can damage cylinders that are located below the vehicle and should be considered an accident.

Call the Emergency First Responders if there is an odor of natural gas after an accident, there is likely a leak in the fuel system and fire fighters should be summoned. Make sure responders know it's a CNG vehicle? Always notify any emergency first responders that the vehicle is powered by CNG. Firefighters have been trained in the different techniques necessary with alternative fuel vehicles and they may not notice the CNG diamond label on the rear of the vehicle.

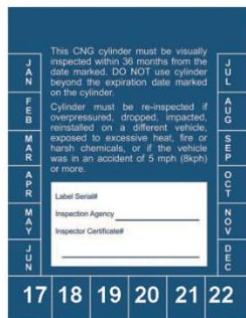
The CNG Tank Inspections, Lifetime & Labeling

The CNG fuel tank meets the specifications and safety standards for ANSI/CSA NGV2, NFPA 52, DOT-NHTSA, and US DOT FMVSS 304.

The CNG Tank must be inspected every 3 years or 36,000 miles, whichever occurs first, by a Certified CNG Cylinder and Fuel System Inspector (CNG-FSI). If cylinder passes inspection, they will put a sticker on the cylinder that will show the next required inspection date or mileage. To search for qualified inspector near you go to: <http://www.csagroup.org/search-qualified-personnel/>

Immediate inspection is required in the event of a crash or collision. See page 17 in the event of crash. Failure to do so may result in personal injury or damage to the alternative fuel system and the vehicle.

Most CNG fuel cylinders have a lifetime of 15 years. After manufacturer expiration date the cylinder is required to be replaced and destroyed. The expiration date of the CNG fuel cylinder is on a label the manufacturer attached to the fuel cylinder. If removing or replacing the CNG cylinder from your vehicle you must contact an authorized dealership by qualified technicians to remove the cylinder. Failure to do so may result in personal injury or damage to alternative fuel system. Cylinders are high pressure and need to be vented properly before removal or replacement.



CNG Mode Operation

By default, this vehicle will always be in CNG mode as long as there is CNG and Gasoline in tanks.

If the vehicle runs out of CNG the system will automatically switch to gasoline mode only. Once refueled with CNG it will switch automatically back into CNG mode.

IMPORTANT: CNG mode is disabled when gasoline low fuel level light indicator is illuminated. Gasoline is required to start this vehicle and for the new Auto Start/Stop technology that is equipped on this vehicle, which helps reduce emissions and fuel used. This vehicle must have gasoline in gasoline tank for vehicle to start.

This vehicle will run on gasoline only but we prefer you run CNG in the vehicle at all times or as much as possible. For best overall vehicle and engine performance, premium gasoline with an octane rating of 91 or higher is recommended. We recommend not using 87 octane gasoline and under no circumstances use E85, the vehicle will not operate properly.

About Compressed Natural Gas (CNG)

CNG is a mixture of hydrocarbon gases with approximately 96% methane and is non-toxic, odorless and colorless. CNG is a pressurized version of the same clean burning natural gas used in many homes. Compressed natural gas is abundant in the United States, which allows natural gas to be used as a very cost-effective alternative fuel. Natural gas is a clean burning fuel, which makes it highly suitable to meet the most stringent automotive emission requirements. Natural gas is cheap, clean, and domestically produced.

The CNG used in your vehicle is stored at 3,600 psi. The CNG system in your vehicle, including the cylinder, hoses, and other components have been designed to hold gas at this pressure. You should never smell gas or hear a hissing sound unless you are refueling. If you smell gas or hear a hissing sound at any other time you need to shut down the CNG system and follow the instructions on page 17.

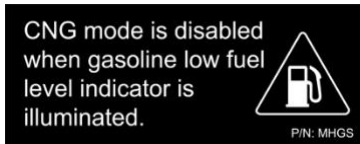
CNG Fuel Level Pressure Gauge

The Gauge (in PSI) provides the driver with the current fuel pressure level in the cylinder. 3600 psi represents being full and 0 represents being empty.



If the vehicle runs out of CNG, it will automatically switch to gasoline mode until refueled with CNG. Once refueled with CNG it will switch automatically back to CNG mode. By Default, the vehicle is always in CNG mode as long as there is CNG in the cylinder.

Gasoline Fuel Level Indicator – CNG Mode



IMPORTANT: CNG mode is disabled when gasoline low fuel level light indicator is illuminated. This vehicle must have gasoline in gasoline tank for vehicle to start. To reactivate CNG mode additional gasoline must be fueled into the vehicle to turn off the low fuel level indicator. During gasoline mode the vehicle will operate as a normal gasoline vehicle.

Do not use E85 in this vehicle, it will not operate properly. We recommend using 91 octane gasoline.

Maintenance

Engine Oil - Follow manufacturer’s recommendation for engine oil change intervals as listed in the original equipment Owner’s Guide.

Engine Coolant - Follow manufacturer’s recommendation for engine coolant service intervals as listed in the original equipment Owner’s Guide. Your vehicle has 2 additional coolant hoses that are connected to the CNG high-pressure regulator. These hoses run the entire length of the vehicle from the engine compartment to the high-pressure regulator in the vehicle. Visually inspect these hoses, their mounts and covering annually.

CNG Coalescing Filter

Your CNG system has a high pressure CNG Coalescing filter mounted under the vehicle on driver side. The natural gas travels through a short high-pressure fuel line and enters a (1 micron) coalescing filter, which removes aerosol compressor oil, oil droplets and other contaminants from the natural gas to help protect your engine and alternative fuel system components. Some CNG stations are not maintained properly and can transport compressor oil in the gas stream. Having oil or other contaminants in your CNG tank deteriorate the inside of the cylinder and become unsafe.

This filter needs to be inspected and replaced every 10,000 miles. The filter housing is under high pressure and requires the use of special tools and procedures. Please contact your authorized dealer for maintenance on the filter.

Service and maintenance to the filter must be conducted at an authorized dealership by qualified technicians. Failure to do so may result in personal injury or damage to alternative fuel system.

Starting the Engine

This vehicle must have gasoline in gasoline tank to start. this CNG vehicle will start like any conventional gasoline vehicle. By following the procedure outlined below you will be assured of consistent engine starts.

1. Apply the parking brake.
2. In cold weather turn of all accessories to reduce power drain on the battery.
3. Make sure the shift lever is in park. Press and hold brake pedal down.
4. Without touching the accelerator pedal, turn the ignition switch to the ON position. You may hear a click from the in-cylinder fuel shutoff valve.
5. Turn the ignition switch to the start position. Do not hold the switch in the start position for more than 15 seconds at a time. If the engine does not start right away, pause for at least 10 seconds and try again.
6. If the engine does not start or starts but stalls right away, repeat step five with the accelerator pedal pressed half way down. If the engine starts, release pressure to the accelerator pedal so the engine does not race.
7. If the engine still does not start, repeat step five with the accelerator pedal pressed all the way down and hold it there while starting. As before, keep the ignition switch in the start position for no more than 15 seconds. Return to step 6 if the engine does not start. If the engine starts lift your foot off of the accelerator pedal so the engine does not race.

CNG Tank Cover

Your CNG system can have different types of cylinder covers such as; a diamond plate metal tank cover, a carpeted tank cover or a powder coated tank cover. Do not drill into or modify the tank cover. There is a high pressure CNG tank underneath the cover and under no circumstances must anyone drill into the CNG cylinder. Drilling into a CNG cylinder can cause serious injury and or death.

Do not place heavy objects on top of or against the cylinder cover.



Precautionary Information

Always use caution when servicing or maintaining any of the alternative fuel system components. Make sure to have adequate ventilation when servicing to prevent build up that may result in combustion.

Service to alternative fuel system must be conducted at an authorized dealership by qualified technicians. Failure to do so may result in injury or damage to alternative fuel system.

In some areas the local authorities require that vehicles that have a CNG conversion system follow certain regulations and guidelines such as: Refueling, underground parking and operation of vehicle under bridges or in tunnels. Contact your local authorities for information in your area.

Breathing hydrocarbon gases like natural gas or air that lacks oxygen can result in headache, dizziness and weakness in the arms and legs. Prolonged breathing of natural gas in confined areas can result in suffocation. In the event of prolonged breathing of natural gas in confined areas, remove victim to fresh air and call your emergency response.

If your alternative fueled vehicle is to be painted, the CNG cylinders must be emptied before painting begins. This venting procedure must be done at an authorized dealership by qualified technicians.

CNG Fuel Quality

Your vehicle has been converted to operate on compressed natural gas (CNG). The natural gas you use to refuel must meet the NFPA-52 and SAE J1616 standards for fuel quality. Do not use liquefied natural gas (LNG) or natural gas that is derived from a process such as flashing (heating LNG). Failure to use the correct type of natural gas may cause damage to the engine and damage the alternative fuel conversion system and void your alternative fuel components warranty.

CNG Fuel Shut-Off locations

There are 2 locations to manually turn off the flow on compressed (CNG) natural gas to engine compartment.

1. Manual & Electronic Tank CNG Shut-Off Valve

This CNG system has an electronically controlled solenoid and manual shut off valve located on the CNG tank valve. When the ignition switch is locked to acc or the OFF position the valve is closed, shutting off the flow of CNG to the engine. The electronically controlled solenoid shutoff valve allows CNG to flow only when the ignition switch is in the ON position. To turn CNG fuel supply off manually just turn the "wheel" handle clockwise on valve until snug.

2. Manual Quarter Turn CNG Shut-Off Valve Under Driver Door

The flow of CNG to engine can be turned off manually by turning the quarter turn shut-off valve located under the driver side door to OFF position.



Carrying Cargo

The CNG fuel tanks are usually located in cargo area enclosed in a cover. When you store items in the cargo area, secure them so they will not shift during travel. Do not carry pointed objects in cargo area because they may damage the CNG fuel system components.

Tire Pressure

Inflate and maintain tires to recommended pressure for extra load as listed in the original equipment Owner's Guide. Reason for this is the extra weight of alternative fuel cylinder in rear of vehicle.

CNG Refueling Procedure

Refueling procedure can vary from station to station. The following steps explain the typical refueling process. Always read and follow instructions provided with the fueling equipment being used.

1. Park vehicle next to CNG dispenser just like a typical gasoline station.
2. Turn engine off, make sure ignition switch is set to the LOCK position and apply the parking brake.
3. Clean any dirt or debris from around the fuel receptacle.



4. Follow the instructions provided on dispenser at the refueling station on how to connect fueling nozzle.
5. Attach CNG fill nozzle to the fuel receptacle and begin dispensing fuel.
6. Once the flow of CNG to the vehicle has stopped, follow the instructions provided on dispenser at the refueling station on how to shut off the flow of CNG to vehicle cylinders.
7. Remove CNG nozzle from fuel receptacle.
8. Push lid closed on the fuel receptacle securely.

If you are not sure how to operate the refueling station, ask for assistance.

Any modification to your alternative fuel system will void the alternative fuel conversion system component warranty. Do not replace components that are not approved to be used with your alternative fuel system. Components approved are specifically designed and calibrated for your alternative fuel system. Failure to use approved components may result in personal injury or damage to vehicle.

If the vehicle is involved in an accident or fire that damages any part of the alternative fuel system than the damaged components must be replaced and the complete system must be tested by an authorized dealership by qualified technicians before the vehicle is operated again on the alternative fuel. *See Page 17 in the event of crash.*

Warning

This vehicle **MUST** have gasoline in the vehicle at all times to operate properly. Do not use E85 in this vehicle, it will not operate properly. We recommend using 91 octane gasoline.

Tampering with or improperly maintaining the high-pressure fuel system can result in fatality or serious injury. Never attempt to modify the fuel system and always have the fuel system maintenance performed at an authorized dealership by qualified technicians. Compressed natural gas is a combustible fuel and is flammable and highly explosive. Failure to read and follow safety procedures can result in fatality or serious injury.

If you suspect or detect a leak, follow the shut down instructions on page 17 and have your vehicle immediately inspected and repaired at an authorized dealership by qualified technicians.

Gasoline Fuel Quality

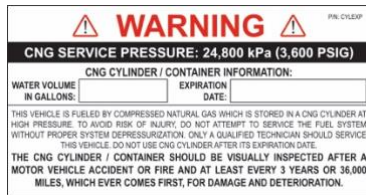
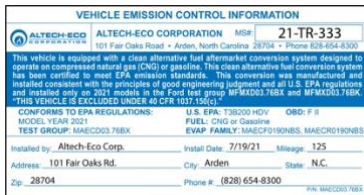
As instructed in the Original Ford Owner's Manual. For best overall vehicle and engine performance, premium gasoline with an octane rating of 91 or higher is recommended. We recommend not using 87 octane gasoline and under no circumstances use E85, the Ethanol calibration has been removed.

Vehicle Identification and Labeling

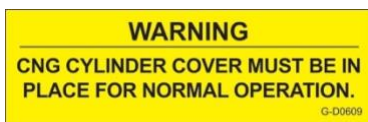
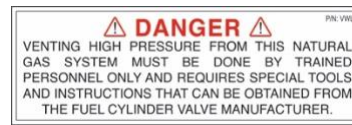
Your vehicle has an “CNG” label located in rear of vehicle. This lets the first responders know it is a CNG powered vehicle.



These labels are located in the engine compartment and list the CNG system installation information. The Master Serial Number (MS#) is located on the EPA Vehicle Emissions Compliant Information decal.



Here are other important warning labels.



CNG System Components

The fuel system components include a fuel cylinder located in the trunk, integrated fuel pressure regulator, in-cylinder fuel shutoff valve, high-pressure fuel lines, electronically controlled CNG fuel injectors and other equipment. All Fuel system components comply with NFPA-52 safety standards.

Do not replace components that are not approved to be used with your alternative fuel system. Components approved are specifically designed and calibrated for your alternative fuel system. Failure to use approved components may result in personal injury or damage to vehicle.

Refueling Your Vehicle with CNG

There are two methods for filling your vehicles CNG cylinder(s).

- Fast-fill – available at most commercial and private CNG refueling stations. It takes about 3 to 5 minutes to fill up the CNG fuel cylinder.
- Slow-fill – usually fueled with a Home Refueling Appliance (HRA). These devices fill around one gasoline gallon equivalent (GGE) per hour. Always observe all safety recommendations and operating instructions on the refueling equipment.

When refueling you should use a fuel fill nozzle that complies with ANSI/AGA NGV-1-1994 standards. Nozzles are designed according to their maximum fill pressure. P24 for 2400 psi, p30 for 3000 psi and p36 for 3600 psi. This vehicle has a maximum fill pressure of 3600 psi., so you should refuel with a p36 nozzle. Using a p30 (3000 psi) or a p24 (2400 psi) nozzle will only partially fill your fuel cylinder and can significantly decrease you CNG driving range.

The fast-fill refueling process warms the natural gas, which causes the pressure in the cylinder to rise and reduces the amount of fuel you can put in your CNG cylinders.

To obtain information about the location of compressed natural gas refueling stations in the United States, visit www.ngvamerica.org, www.cngprices.com or use www.afdc.doe.gov for a complete listing of stations and other useful information.