

2021/22
Ford F-250/350 6.2L
Adsorbed Natural Gas Vehicle Supplemental Owner's Manual



Adsorbed Natural Gas Vehicle (ANGV)

Supplemental Owner's Manual

Bi-Fuel - Natural Gas/Gasoline



2021-22 Ford F-250/350 6.2L Super Duty Truck

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Required Maintenance Schedule & Log

The two ANGV coalescing filters must be inspected and 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

Maintenance

Engine Oil – No special oil is needed for the natural gas system. Follow manufacturer’s recommendation for engine oil type and change intervals as listed in the original equipment Owner’s Guide.

Engine Coolant - No special coolant is needed for the natural gas system. Follow manufacturer’s recommendation for engine coolant type and coolant service intervals as listed in the original equipment Owner’s Guide. Your vehicle has 2 additional coolant hoses that are connected to the natural gas 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.

ANGV Coalescing Filters - Your ANGV has two high pressure natural gas coalescing filters mounted near the natural gas storage fuel cylinder, usually located in the bed of the truck. The two coalescing filters remove aerosol compressor oils, moisture and other contaminates from the natural gas to help protect your engine and natural gas system components.

Warning: Having compressor oil or other contaminates in your adsorbed natural gas cylinder may void warranties and deteriorate the adsorption material and the inside liner of the cylinder.

The coalescing filters need to be replaced every 10,000 miles. The filter housing is under high pressure and must use special tools and procedures. Please contact your authorized dealer for maintenance on the filter.

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

Contact Altech-Eco for replacement coalescing filters at 828-654-8300.

ANGV SYSTEM & VEHICLE IDENTIFICATION

V.I.N.: _____

NGV System Master Serial (MS#): _____

NGV System Installation Date: _____

Installer Name: _____

Dealer Name: _____

Original Owner

Name: _____

Address: _____

Address: _____

Second Owner

Name: _____

Address: _____

Date Purchased: _____

Introduction

This booklet supplements your Owner's Guide and is part of the owner's portfolio. It describes the operation of your adsorbed natural gas vehicle (ANGV) and how it differs from a standard gasoline powered vehicle. Your new natural gas vehicle operates and performs like 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 others operating this vehicle with this information.

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

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.

Service to high-pressure fuel system components must be conducted only at qualified dealerships by qualified technicians. Failure to do so may cause damage to components or cause bodily harm.

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

Any bed cap added to this vehicle must be well ventilated. Failure to provide adequate ventilation could result in a gas vapor build up over time potentially resulting in a combustible mixture.

ANGV Cylinder Capacity, Pressure, & Lifetime

Cylinder Capacity – approximately 6 gge (gasoline gallon equivalent).

The cylinder manufactures provide an industrial standard capacity amount for the cylinders they make. This amount will not be what you are able to refuel the cylinder when fueling with your fueling appliance. The gasoline gallon equivalent (GGE) amount on refills will vary depending on dispensing equipment, weather, temperatures, altitude, storage vessel pressure, temperature compensation, etc... The natural gas cylinders will always have natural gas pressure remaining in tank even if the ANGV fuel gauge shows it is empty.

The natural gas fuel cylinder meets the specifications and safety standards for ANSI/CSA NGV2 and US DOT FMVSS. Cylinder is rated for a service pressure of 900 psi (24800 KPa).

Cylinder Service Pressure - 900 psig (6,206 kPa)

Cylinder Lifetime – 15 years. Check the cylinder sticker under the hood for details on your specific tank expiration date.

Natural Gas Cylinder Cover

Your natural gas system can have several different types of cylinder covers such as; a diamond plate metal cover, a tool box cover, a black powder coated cover, etc.... Do not drill into or modify a tank cover. There is a (900 psi rated) high pressure natural gas tank underneath the cover and under no circumstances must anyone drill into the natural gas cylinder. Drilling into a natural gas cylinder can cause serious injury and or death.

Do not sit, stand or place heavy loads on in-bed cylinder cover. Any bed cap added to this vehicle must be well ventilated. Failure to provide adequate ventilation could result in a gas vapor build up over time potentially resulting in a combustible mixture.

NGV Fuses Location

The fuses for your natural gas system are located in the same location as the original Ford fuses. Fuse location 68 and 52 (10 amp and 15 amp)

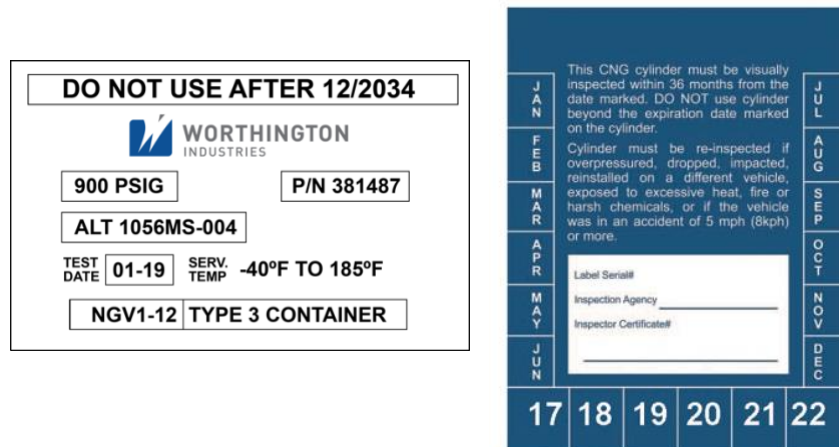
Natural Gas Cylinder Labeling / Inspection

Federal law requires the natural gas cylinder to be inspected every 3 years or 36,000 miles, whichever occurs first, by a certified natural gas 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 natural gas fuel cylinders have a lifetime of 15-20 years. After manufacturer expiration date the cylinder is required to be replaced and destroyed. The expiration date of the NGV fuel cylinder is on a label the manufacturer attached to the fuel cylinder. If removing or replacing the NGV 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 natural gas system. Cylinders are high pressure and need to be vented properly before removal or replacement.

Examples of cylinder manufacturer and cylinder inspection labels. (not from actual tank in vehicle)



Your ANGV Bi-fuel System

Unlike the conventional gasoline model, your bi-fuel Adsorbed Natural Gas Vehicle (ANGV) system means this vehicle operates on gasoline or natural gas, or a mixture of the two.

Your new natural gas conversion system is a result of years of research and technical experience. Altech-Eco uses the newest electronics to provide excellent drivability, emissions control and fuel economy.

Adsorbed Natural Gas (ANG) Overview

ANG is an alternative fuel option for large, light-duty vehicles, like SUVs, half-ton pickup trucks and service vans, made possible by Ingevity's long history of activated carbon expertise. Our NuChar® FuelSorb™ activated carbon monoliths reduce the storage pressure of natural gas without sacrificing the on-board volume of gas stored through the process of adsorption.

ANG is counterintuitive: It reduces the pressure of natural gas by 75%, allowing the monolith to store 50% more fuel than an empty cylinder filled with traditional compressed natural gas (CNG) at the same reduced pressures.

This lower-pressure storage removes the need for large, costly commercial CNG stations and enables safe, economic fueling at work and at home. ANG saves money, is more efficient and reduces greenhouse gas emissions when compared to comparable CNG, gasoline and diesel vehicles. Visit www.ingevity.com for additional information.

About Natural Gas

Natural gas is a mixture of hydrocarbon gases with approximately 96% methane and is highly flammable, odorless and colorless. Natural gas is a highly pressurized version of the same clean burning natural gas used in many homes. 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.

Fuel Source Indicator Display

The fuel source indicator display is located to left of the steering wheel on the dashboard.

Natural gas mode icon:



Gasoline mode icon:



Important: This bi-fuel ANGV relies on gasoline to start, it is necessary to maintain a minimum of 1/4 tank of gasoline at all times. This vehicle will not start if it is empty of gasoline.

This ANG bi-fuel system is always in natural gas mode and cannot be turned off. As long as there is natural gas available in the cylinder the vehicle will use the natural gas to operate.

The indicator will illuminate as **GREEN** when in natural gas mode. The indicator will illuminate as **ORANGE** for gasoline mode.

Natural Gas Mode



Gasoline Mode



Starting in Natural Gas Mode

Start the vehicle as per vehicle manufacturer's instruction. Do not depress gas pedal during crank and start up. This vehicle will start on gasoline and will automatically switch to natural gas mode once required warmup parameters have been reached, as long as there is natural gas available to be used. The gasoline icon will illuminate **ORANGE** and the natural gas icon will blink **GREEN**. Once switch over occurs the natural gas icon will stop blinking and illuminate **GREEN** and the gasoline **ORANGE** icon will turn off.

Starting in Gasoline Mode When Out of Natural Gas

Start the vehicle as per vehicle manufacturer's instruction. Do not depress gas pedal during crank and start up. Gasoline mode will illuminate **ORANGE**. Drive in gasoline mode as you normally would.

Natural Gas 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 natural gas to engine by turning the manual natural gas quarter turn shut off valve located under driver side door.
4. Do not drive the vehicle. Your vehicle should be towed to an authorized natural gas service facility for inspection. The complete natural gas fuel system must be inspected and tested before the vehicle can be operated again by an authorized dealership by a qualified technician.

In the Event of an Accident

Was is 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 natural gas vehicle? Firefighters have been trained in the different techniques necessary for natural gas vehicles and they may not notice the CNG diamond label on the rear of the vehicle.

Starting the Engine

Your ANGV vehicle will start like a 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 off 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 10 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 10 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.

Natural Gas Fuel Level Indicator Display

The natural gas fuel level indicator display is located to left of the steering wheel on the dashboard. There are 5 fuel level lights that illuminate showing the quantity of natural gas fuel remaining in the adsorbed natural gas cylinder.



Natural Gas Quantity Indicators in Green

	100% FULL
	75%
	50%
	25%
	0% EMPTY

Running Out of Natural Gas

The natural gas system is programmed to automatically switch to gasoline mode when running out of natural gas. When this occurs, the vehicle remains in natural gas mode, but the **ORANGE** gasoline icon will light up indicating that the vehicle is now running on gasoline. A fuel level indicator will light up **RED** indicating that the natural gas cylinder is empty.

Once the vehicle has been refueled with natural gas, the natural gas system will again run on natural gas, and once again the natural gas icon will light up **GREEN**.

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 natural gas 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 natural gas 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 ANGV is to be painted, the natural gas cylinder must be emptied before painting begins. This venting procedure must be done at an authorized dealership by qualified technicians.

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. 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.

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

ANGV System Fuel Shut-Off Locations

Electronic Solenoid & Manual Cylinder Shut-Off Valve

The ANGV system has a shut-off valve (Electronic and Manual) located on the natural gas fuel storage cylinder, usually in the cargo area or bed of the truck.

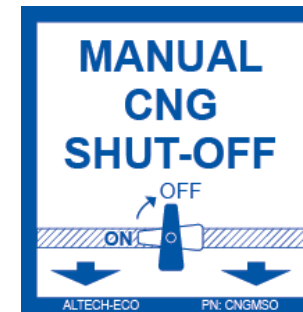
This valve has two ways to shut-off the flow of natural gas to the engine.

1. Manually, by turning the valve handle clockwise until snug. Access the valve by reaching through access point on tank cover on driver side.
2. Electronically, by turning ignition to OFF position. The electronic solenoid valve opens and closes with ignition ON and OFF.

When turning ignition ON and OFF you may hear a clicking sound when the cylinder valve opens and closes, this is normal operation.

Manual Quarter Turn Shut-Off Valve

The flow of natural gas to the engine can also be turned off manually by turning the quarter turn shut-off valve located under driver side door to OFF position. The label shown below is located on bottom of the driver side door, indicating location of the shut-off valve for first responders.



ANGV Refueling Instructions

Refueling appliance and dispensing equipment procedures can vary. Always read and follow instructions provided with the fueling equipment being used.

The following steps explain the FuelMaker FMQ 2.5 (900 psi) refueling appliance process.

The adsorbed natural gas conversion system uses only a P9 nozzle for 900 psi. Do not use any other type of nozzle.

1. With engine off, connect fuel nozzle (P9) to the vehicles fuel receptacle (P9) and check for a good connection by slightly pulling on nozzle.
2. Push the START button and the fueling appliance will start filling the adsorbed natural gas cylinder with natural gas.
3. When ANG cylinder is full, the FMQ will stop automatically. If you need to stop prior to being full, press the STOP button.
4. Remove fuel nozzle from the fuel receptacle and secure to appliance.
5. Push cap closed on the vehicle fuel receptacle securely.
6. You are now ready to operate the vehicle as normal.



Natural Gas Fuel Quality

Your vehicle has been converted to operate on natural gas. 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.

Gasoline Fuel Quality

This vehicle must have gasoline in the vehicle at all times to operate on natural gas. We recommend using 91 octane gasoline.

Ethanol Fuel Quality

Do not use ethanol in this vehicle, it will not operate properly. Even if the originally the vehicle was designed for ethanol, the Ford ethanol calibration has been removed to allow the vehicle to operate on natural gas.

Jump Starting

Do not jump start your vehicle if you suspect a natural gas leak. If you smell gas or hear a hissing sound, the fuel system may have a leak the needs to be repaired by an authorized technician. If you suspect a leak, have the vehicle towed to an authorized service facility for inspection. If the fuel system is not leaking or damaged, you may jump-start the vehicle. Refer to the manufacturer's recommendation as listed in the original equipment Owner's Guide for jump-starting procedure.

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.

Vehicle Identification and Labeling

Your vehicle has an “CNG” label located in rear of vehicle. This label is required by Federal law for Natural Gas Vehicles and must never be removed from the vehicle. This label allows first responders to know your vehicle is powered by natural gas and to take appropriate measures in case of an accident.



The adsorbed natural gas conversion system has a unique identification number that can be located on the vehicle emission control information label located under the hood. This label will identify the ANG system installation information and the master serial number (MS#). The MS# will be needed for service and warranty.

VEHICLE EMISSION CONTROL INFORMATION			
	ALTECH-ECO CORPORATION 101 Fair Oaks Road • Arden, North Carolina 28704 • Phone 828-654-8300	MS#:	21-F62-137
<small>This vehicle is equipped with a clean alternative fuel aftermarket conversion system designed to operate on compressed natural gas (CNG) or gasoline. This clean alternative fuel conversion system has been certified to meet EPA emission standards. This conversion was manufactured and installed consistent with the principles of good engineering judgment and all U.S. EPA regulations and installed only on 2021 models in the Ford test group MFMXD06.27BC and MFMXD06.27CH. *THIS VEHICLE IS EXCLUDED UNDER 40 CFR 1037.150(c).*</small>			
CONFORMS TO EPA REGULATIONS:	U.S. EPA: T3B270 HDV	OBD: F II	
MODEL YEAR: 2021	FUEL: CNG or Gasoline		
TEST GROUP: MAECD06.27BC	EVAP FAMILY: MAECR0250NHJ, MAECF0250NDJ, MAECR0360NHJ, MAECF0360NHJ, MAECF0210GDJ		
Installed by: <u>Altech-Eco Corp.</u>	Install Date: <u>1/25/21</u>	Mileage: <u>125</u>	
Address: <u>101 FairOaks Rd.</u>	City: <u>Arden</u>	State: <u>N.C.</u>	
Zip: <u>28704</u>	Phone #: <u>828-654-8300</u>		
<small>PIN: MAECD06.27BC</small>			

FuelMaker FMQ 2.5 ANG Fueling Appliance

Your ANG Vehicle is to be fueled with an ANG refueling appliance. Refer to the ANG Fueling Procedure page for instructions for refueling. Always observe all safety recommendations and operating instructions on the refueling equipment.

- Italy-based Cubogas is the main manufacturer.
- Two fueling hoses with P9 nozzles, for ability to service 2 trucks at once.
- Fuels at a rate of approximately 1 gasoline gallon equivalent (GGE) per hour to 900 psi.
- Maintains American National Standards Institute NGV certification (5.2).

The ANG vehicle system requires a specially designed P9 nozzle and has a maximum fill pressure of 900 psi. Do not use any other type of nozzle. For example, a P36 nozzle is rated for 3,600 psi. A P36 nozzle will not attach properly and cannot be used with this vehicle.

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. P9 for 900 psi, 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.

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