



TWISTER

INSTALLATION

&

OPERATION MANUAL

T80 – T235 EVO
Turbo Diesel | T4F

COPY DATED 07/24

Serial No. _____

Engine SN _____

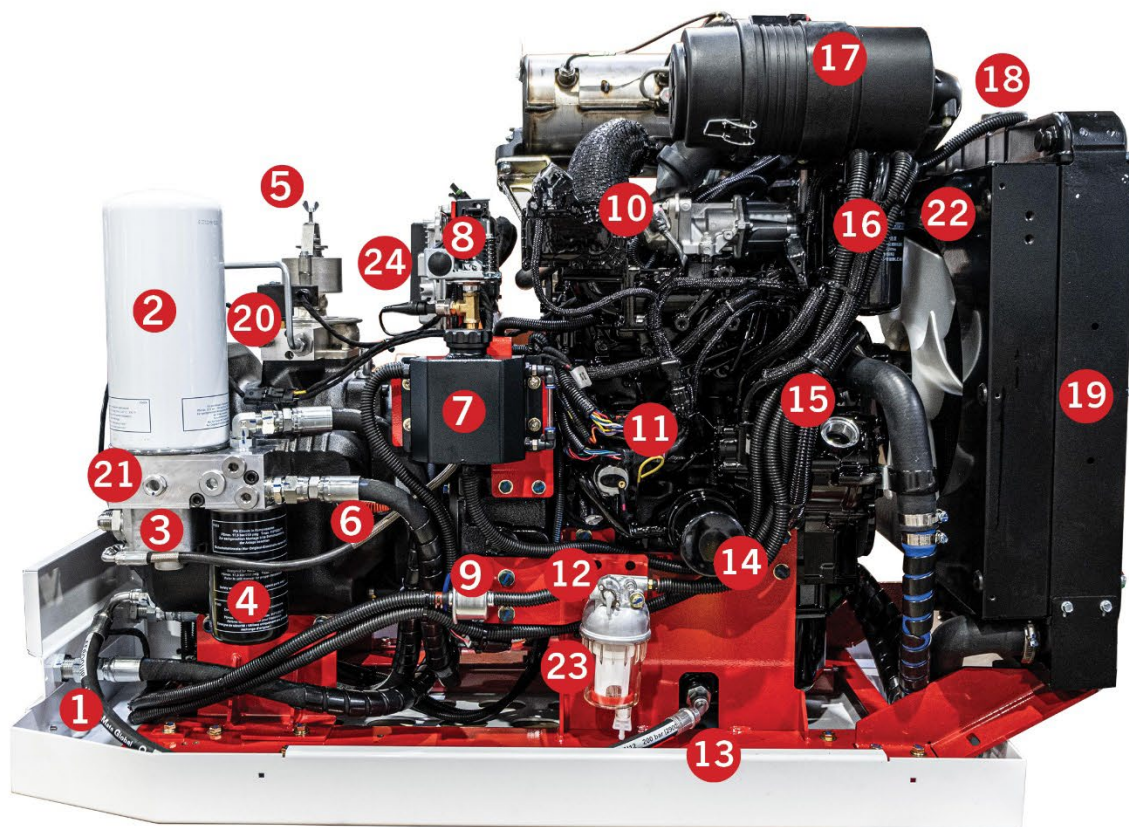
Compressor SN _____

Control Box SN _____

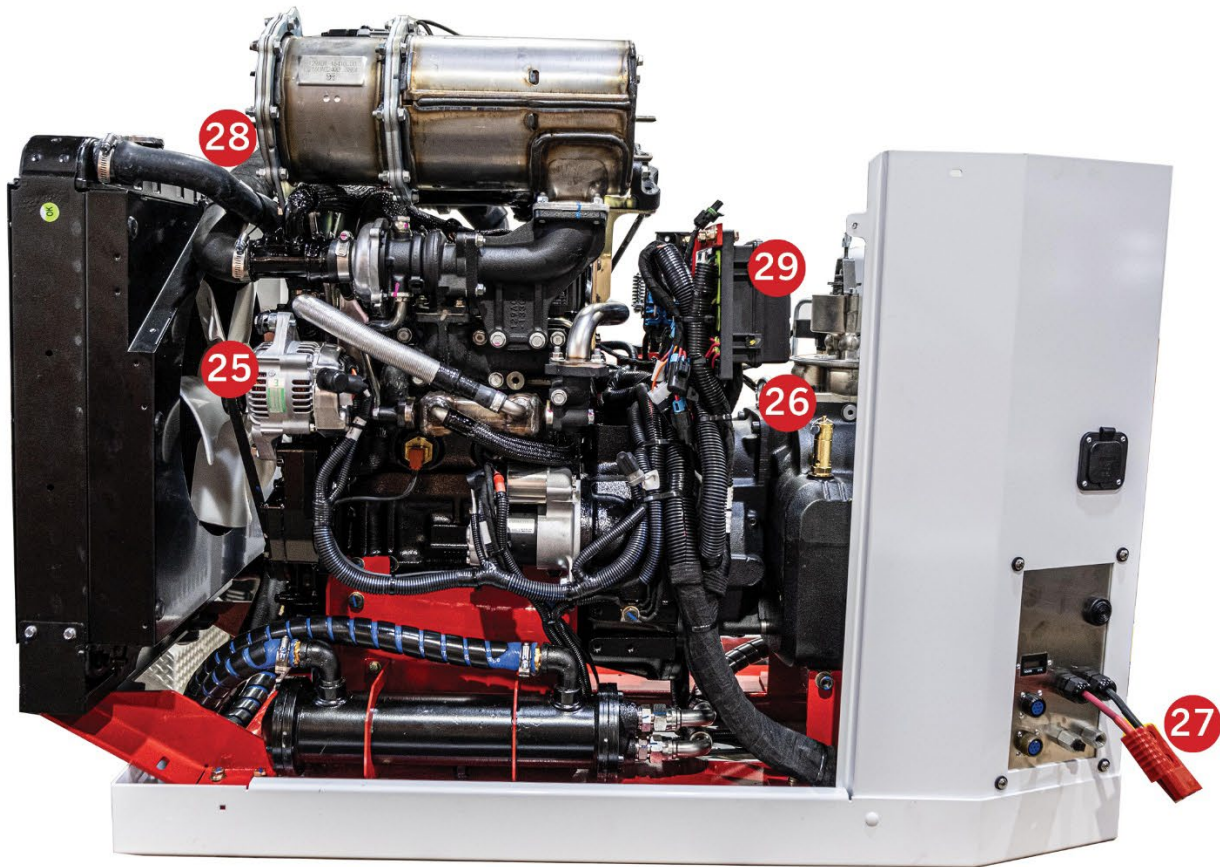
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MOBILE AIR COMPRESSION

Unit Diagram



- 1) Compressor Oil Drain Hose
- 2) Coalescing Filter
- 3) Minimum Pressure Valve
- 4) Compressor Oil Filter
- 5) Compressor Air Inlet (Filter & housing not pictured)
- 6) Compressor Oil Fill
- 7) Coolant Overflow Tank
- 8) Pressure Switch
- 9) Fuel Pump
- 10) Intake Heater
- 11) Engine Oil Dipstick
- 12) Fuel Petcock
- 13) Engine Oil Drain Hose
- 14) Engine Oil Filter
- 15) Engine Oil Fill
- 16) Engine Fuel Filter
- 17) Engine Air Intake (Engine air filter inside)
- 18) Coolant Fill
- 19) Radiator
- 20) Compressor Temperature Probe (Located behind coalescing filter)
- 21) Oil Scavenging Sight Glass
- 22) Engine Temperature Probe (Brass fitting behind engine fuel filter)
- 23) Fuel/Water Separator
- 24) Engine Side Fuse Box



- 25) Fan Belt
- 26) 200 PSI Pressure Relief Valve
- 27) Battery Quick Connectors
- 28) Positive Air Shutoff (Not pictured)
- 29) Compressor Side Fuse Box

Installation Instructions

Important: Read and understand operation manual before installation.

1. Preparation

- Trace the base size and mount hole locations onto cardboard to create a template. Use this template to drill holes for mounting the compressor in a suitable location. Exercise caution when drilling to avoid obstacles beneath the surface.
- Allow for proper fitting and hose/wire routing. Ensure there is adequate space for ventilation and service access.

2. Mounting the Compressor

- Securely fasten the compressor to the service body using the 4 holes provided in the base and locking fasteners.
- Mount the Twister control panel in an accessible location. For extended length locations, use extension (Part Number AOCBH10).

3. Fuel Line Installation

- Run supply and return fuel lines to the truck diesel fuel tank using the auxiliary pickup provisions on the tank. **Note:** Do not cut into the truck engine lines. Consult the vehicle manufacturer for the proper procedure and use kit (Part Number ATA013).
- Prevent fuel line rubbing/pinching when the vehicle is in motion and avoid any contact with hot or moving parts.
- If the electric fuel pump (#9) on the Twister needs relocation near the fuel tank on long fuel line runs or for high lifts (over 3 feet) and long runs (over 6 feet), an auxiliary fuel pump (Part Number AOF003) is available for long fuel line runs.

4. Battery Connection

- Use a minimum of 4-gauge welding wire with a 150-amp breaker in line when connecting the battery cables to the Twister. Due to the rubber mounting bases, ground the unit using the supplied ground lead from the Twister to the chassis battery.
- Run the battery cable from the Twister quick connector (#27) to the truck battery. Install a 150-amp circuit breaker near the battery and size the cable appropriately for the length of the run. Protect the cable from rubbing and damage. Fine strand welding cable is recommended.

5. Air Line Restrictions

- Limit the use of 45-degree and 90-degree fittings to three or fewer to prevent loss of airflow. Use at least 3/4" hose/plumbing throughout the system.

6. Airflow Considerations

- When installing the Twister in a confined space, ensure proper airflow direction through the unit. Provide a source of fresh air intake (See #17 and #5) and a vent for warm air exit (See #19). Ensure hot air is not redirected into the cooling air stream. Hot air exits at the radiator end (#19), which needs to be unobstructed.

7. Cooling System

- If connecting the truck cooling system to the Twister, use Airworks' Cold Weather Package, (Part Number ATO112). **Note:** Any alteration to the Twister cooling system will result in a void warranty!
- Operating the unit with a low coolant level will cause damage not covered by the warranty.
- Use only Airworks coolant (Part Number ATE123)

Additional Installation Notes

- The electric fuel pump on the Twister is not capable of drawing fuel from long distances. If the installation of the Twister is more than 6 feet from the fuel tank, relocate the pump closer to the fuel tank. An auxiliary fuel pump (Part Number ATO110) is available for long runs (more than 6 feet) or high lifts (more than 3 feet).
- Ensure there are no restrictions in the air line. Avoid using more than three direction changes or elbows to prevent loss of airflow. Size fittings at least the same size as the Twister air outlet or larger.
- When connecting the battery cables to the Twister, it is recommended to use a minimum 4-gauge welding cable with a 150-amp breaker in line. For installations over 12 feet from the battery, use a heavier cable.

Safety Precautions

Before Operating the Compressor:

1. Read and Understand Manual:

- Ensure you read and comprehend the operation manual and all related safety materials before operating the air compressor. The installer must ensure that the manual and all safety decals are delivered with the unit upon completion of product installation.

Personal Protective Equipment and Practices:

2. Use Appropriate Safety Gear:

- Follow safe work practices and wear the appropriate safety equipment when operating air-powered equipment.

3. Noise Hazard:

- Wear appropriate hearing protection, such as earplugs or earmuffs, to prevent hearing damage from high noise levels.

4. Chemical Exposure:

- Use appropriate personal protective equipment (PPE) when handling lubricants, coolants, or other chemicals. Ensure proper ventilation in the work area.

Operating Precautions:

5. Avoid Drive System Contact:

- Do not operate the compressor with panels removed. Avoid contact with the drive system.

6. Avoid Pressurized Air Contact:

- Avoid skin contact with pressurized air, as it may cause injury or death.

7. Ensure Air Quality:

- Make sure the air entering the compressor is free of flammable vapors to prevent explosions.

8. Vaporized Oil Hazard:

- Be aware that vaporized oil propelled by high-pressure air is an explosive mixture and a respiratory hazard.

9. Hot Components:

- Use caution when handling components during and after operation, as they may be hot.

10. Electrical Safety:

- Ensure all electrical connections are properly insulated and grounded. Do not operate the compressor with wet hands or in wet conditions.

Refueling and Fire Safety:

11. Refueling Precautions:

- Never refuel the unit while it is running or hot. Avoid sparks and flames when refueling. Only refuel in well-ventilated areas.

12. Fire Hazard:

- Keep flammable materials away from the compressor. Have fire extinguishers readily available and know how to use them

Preventing Accidents:

13. Falling Objects:

- Secure all components and tools properly to prevent them from falling. Wear a hard hat in areas where overhead work is being done.

14. Slips, Trips, and Falls:

- Keep the work area clean and free of obstructions. Ensure that hoses and cables are routed safely to avoid tripping hazards.

15. Moving Parts:

- Keep hands and clothing away from moving parts. Ensure all guards and covers are in place during operation.

16. Proper Lifting Techniques:

- Use proper lifting techniques or mechanical lifting devices when moving heavy components to prevent back injuries.

Depressurizing and Servicing:

18. Depressurize System:

- Do not attempt to service the compressor while it is under pressure. Remove fill caps and filters slowly
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When Servicing the Unit:

1. Do Not Bypass Safety Devices:

- Do not bypass any of the unit's safety shutdown devices.

2. Avoid Extreme Heat:

- Do not expose the unit or its components to extreme heat.

3. Depressurize Before Service:

- Do not repair or service a pressurized system.

4. Pressure Relief Valve:

- Do not tamper with the pressure relief valve.

5. No Modifications:

- Do not attempt to modify any component.

6. Power Disconnection:

- Ensure power is disconnected to prevent the compressor from starting unexpectedly.

Safety Features:

1. 200 PSI Relief Valve:

- The unit includes a 200-psi relief valve.

2. Temperature Safety Shut Down:

- There is a temperature safety shutdown feature on both the engine and compressor.

3. Rapid Blow Down Valve:

- This valve discharges system pressure on the compressor side after shutdown.

4. Low Oil Pressure Shut Down:

- The engine has a low oil pressure shutdown feature.

5. Outer Enclosure:

- An outer enclosure prevents contact with hot and moving parts.
- 6. **Optional Low Coolant Sensor:**
 - The optional low coolant sensor is included in the cold weather coolant tie-in kit (Part #AOCW20).
- 7. **Warning Decals:**
 - Warning decals are to be installed throughout the unit for added safety.

How a Rotary Screw Compressor Works

The system uses a flooded lobe, rotary screw compressor. This type of compressor contains two rotors turning at variable speeds. Here's a step-by-step overview of its operation:

1. Air Intake:

- Air at atmospheric pressure is introduced into the housing, where it is trapped between the turning rotors, allowing for compression to take place.

2. Compression:

- A lubricated pitch line provides sealing. As the lobes on the rotors mesh, they reduce the volume of air, compressing it to the desired pressure.

3. Oil Separation:

- Oil separation occurs in two stages:
 - **Stage One:** Mechanical separation, where the air/oil mixture is first separated through a series of baffles.
 - **Stage Two:** Coalescing filter, which further separates the oil from the compressed air.

4. Cooling System:

- The compressor's cooling system maintains the compressor oil temperature. This system uses the cooling system of the prime mover to act as a heat sink for heat transfer and may use an air-to-liquid cooler or liquid-to-liquid heat exchange.

5. Machining Tolerances:

- Rotary screw compressors are machined to close tolerances. Ingestion of foreign objects into the system can rapidly damage or shorten the life expectancy of the unit.

Maintenance Schedule

To maintain your system and warranty, follow the maintenance schedule using only Airworks genuine replacement parts. Proper air filtration and clean oil are crucial for preventing contamination that can damage roller bearings, gears, and rotors. Ensure the compressor air pressure is completely unloaded before servicing, and clean areas to be serviced. Remove fill caps and filters slowly.

Every 25 Hours

- Check compressor oil (appropriate level is at the bottom of the threads within the compressor oil fill), engine oil, and coolant levels.
- Check for loose or rubbing components, leaks, air, and fluid.

Every 100 Hours

- Perform 25-hour checks plus:
 - Check air filter elements' condition (#17, #5).
 - Check fan belt tension (#25).
 - Check fuel filter (#16).

Every 250 Hours

- Perform 100-hour checks plus:
 - Change engine oil (6 quarts) and oil filter.
 - Change compressor oil (10 quarts), oil filter, and air filter.
 - Service engine and compressor air filters.
 - Check radiator hoses and clamps.
 - Check air intake hose.
 - Inspect coupler on engine and compressor; replace if required.
 - Check for leaks, loose fasteners, fittings, wire, and hose chafing.

Requires:

- EVO Series 250 Hour Service Kit (Part Number ATS225S)

Includes:

- Compressor Air Filter (#5) (Part Number ATC202)
- Compressor Oil Filter (#4) (Part Number ATC103)
- Engine Air Filter (#17) (Part Number ATE227)
- Engine Oil Filter (#14) (Part Number ATE225)
- 5 Liters Synthetic Compressor Oil (Part Number ATC005)

- 5 Liters Synthetic Engine Oil (Part Number ATE021S)

Every 500 Hours

- Perform 250-hour checks plus:
 - Change compressor coalescing filter (#2).
 - Replace fan belt (#25).
 - Check radiator hoses and clamps.
 - Check air intake lines.
 - Replace the fuel filter element (#16).
 - Clean the radiator external fins.
 - Check valve lash (Located under tappet cover on top of engine).

Requires:

- EVO Series 500 Hour Service Kit (Part Number ATS250S)

Includes:

- Compressor Air Filter (#5) (Part Number ATC202)
- Compressor Oil Filter (#4) (Part Number ATC103)
- Engine Air Filter (#17) (Part Number ATE227)
- Engine Oil Filter (#14) (Part Number ATE225)
- 5 Liters Synthetic Compressor Oil (Part Number ATC005)
- 5 Liters Synthetic Engine Oil (Part Number ATE021S)
- Coalescing Filter (#2) (Part Number ATC104)
- Fuel Filter (#16) (Part Number ATE207)

Every 1,000 Hours

- Perform 500-hour checks plus:
 - Replace radiator hoses and clamps.
 - Change radiator coolant.
 - Replace air intake hose.
 - Replace and inspect drive coupler.
 - Adjust valve lash (Located under tappet cover on top of engine).
 - Check air pressure and engine speed settings.

Requires:

- EVO Series 500 Hour Service Kit (Part Number ATS250S)

Includes:

- Compressor Air Filter (#5) (Part Number ATC202)
- Compressor Oil Filter (#4) (Part Number ATC103)
- Engine Air Filter (#17) (Part Number ATE227)
- Engine Oil Filter (#14) (Part Number ATE225)
- 5 Liters Synthetic Compressor Oil (Part Number ATC005)
- 5 Liters Synthetic Engine Oil (Part Number ATE021S)
- Coalescing Filter (#2) (Part Number ATC104)
- Fuel Filter (#16) (Part Number ATE207)

Start-Up/Shut Down Procedure (With Autostart Option)

Turning On the Unit

- Ensure that 'COMPRESSOR' button is turned off.
- Turn key to the start position to power on the unit.
- Press 'RUN' to start your Twister's engine.
- Allow the engine to get to a smooth idle.
- Press the 'COMPRESSOR' button to begin building air.
- The unit will idle down once maximum pressure is reached. The unit is now ready to use.

Shutting Down the Unit

- Ensure that compressor is not under load (Currently building air). Deactivate the 'COMPRESSOR' button.
- Press 'OFF' to turn off the Twister's engine.
- Turn the key to the center position. The unit is now turned off.



Auto Start

Activate this feature by pressing 'AUTO'. This will automatically shut off the engine when max air pressure is reached, and turn on again when more air is needed.

Aux Button

By default, the aux button is left available for the installer to integrate as a control for other systems.

ENTER/Up/Down

The screen will cycle through a variety of system parameters, such as PSI, temperature, oil pressure. Use the arrows to navigate through this list. To prevent the screen from cycling, you can lock the current view by holding 'ENTER'.

Status Light

Green: Everything is working correctly.

Red: The engine has thrown an error code. This code will be visible on the screen.

IMPORTANT: Avoid shutting the engine off or the compressor button while the unit is building pressure. This may cause oil loss and/or damage to your compressor.

Adjusting the System

Your EVO series Twister has been designed to continuously run tools requiring roughly 90 PSI. In the event that either of these values have drifted, they can be brought back to our spec with some simple adjustments.

Setting the PSI

The pressure switch (#8) can be adjusted to a range of values. This component determines the cut-in and cut-out pressure of your compressor.

Setting the engine speed

The engine speed is maintained by the engine's internal ECU. While this speed can be modified, this process requires that the ECU be reprogrammed by one of our trained technicians.

IMPORTANT: There are additional safety and performance considerations to be made when adjusting either of these components. We advise you to contact us at 780-252-2263 to speak with a trained technician before attempting this on your own.

Determining Custom Specs

If you need to set up a system without knowing its demands, you can make adjustments by using an orifice in the outlet to simulate tool use. A system testing and adjustment tool is available from Airworks (ATT001).

Troubleshooting

Below are a variety of commonly observed air compressor issues, along with steps to identify or solve each one.

Compressor Does Not Produce Adequate Air

Check and correct the following:

1. Ensure the compressor oil level (#11) is correct.
2. Confirm the pressure relief valve (#26) is operational.
3. Ensure air filters (#5, #17) are clean.
4. Check for any blockages downstream of the compressor (e.g., kinked hose or compromised plumbing).
5. Verify the engine RPM is set to spec; adjust as required.
6. Check for a sticking or misadjusted minimum pressure valve (#3).

Frequent Over-Temperature Shutdowns

Check and correct the following:

1. Verify engine and compressor oil levels (#6, #11) are correct.
2. Check the engine coolant level (#7) while the unit is cool.
3. Inspect engine and compressor hoses for kinks.
4. Check the over-temperature shutdown temperature probes (#20, #22) for both the engine and compressor.
5. Ensure adequate air circulation around the unit and confirm that hot air is not being recirculated into the air intakes (#17, #5).
6. Make sure oil filters (#4, #14) are not plugged.
7. Verify the fan belt (#25) is properly adjusted.
8. Clean the radiator (#19) core with caution using compressed air, ensuring not to damage the fins.
9. Check for a faulty over-temperature switch on the engine (240°F) or compressor (270°F).
10. Look for rapid compressor cycling which might indicate air volume exceeds usage.

Excessive Air Pressure

Check and correct the following:

1. Ensure the pressure relief valve (#26) is operating correctly.
2. Check for leaks between the air end and the pressure relief valve (#26).
3. Confirm the inlet valve (#5) is sealed properly and there is no oil in the compressor air filter inside of it.
4. Ensure the pressure switch (#8) is operating correctly.
5. Inspect the system pressure line for leaks (from compressor to pressure switch).

Engine Stalls When Compressor Starts

Check and correct the following:

1. Ensure the air compressor is not under pressure – allow it to unload.
2. Verify the engine speed is adequate. Refer to the 'Adjusting the System' section of the manual.
3. Confirm the blow-down valve (#26) is operating properly.
4. Ensure the engine fuel filter (#16) or air filter (#17) is not plugged; replace if necessary.
5. Check if the fuel pump (#9) is functioning.
6. Verify the compressor switch is off during startup.
7. Inspect the positive air shut-off valve (#28) (optional – not on all units).

Low Air Pressure

Check and correct the following:

1. The maximum air flow may be exceeded. Try running the compressor with a lighter load and observe its operation.
2. Verify the engine speed is adequate. Refer to the 'Adjusting the System' section of the manual.
3. Ensure the pressure relief valve (#26) is operating properly – adjust or replace as required.
4. Check for restricted flow due to kinked or collapsed air lines or ice blockages.
5. Inspect air lines and fittings for leaks.

Excessive Oil in the Air Produced

Check and correct the following:

1. Verify the compressor oil level (#6) is correct.
2. Ensure the oil scavenging sight glass is clean (#21)
3. Inspect the coalescing filter (#2) and replace it if necessary.
4. Ensure the shutdown procedure is proper; avoid shutting down under load.

Diesel Engine Turns but Will Not Start

Check and correct the following:

1. Ensure there is an adequate fuel supply (minimum 4 psi running).
2. Confirm the compressor switch is turned on.
3. Ensure the fuel petcock (#12) is open.
4. Test the intake heater (#10).
5. Check if the fuel filter (#16) is restricted or if the fuel petcock (#12) is off; bleed air from the filter housing.
6. Inspect the positive air shut-off valve (#28) (optional – not on all units).
7. Verify fuel pump (#9) operation and check flow.
8. Bleed air from the fuel system through the screw at the top of the filter.