



Installation Instructions

18SP551—Install Diesel Pro® 233, 233E, or 233F Filter/Separator/Warmer

Introduction

The Diesel Pro® 233 diesel fuel processor system consists of a fuel processor assembly, a replaceable 5-micron filter element, a removable filter element cover and locking collar, a cover seal, vent cap, vent cap seal, and a collar/vent cap wrench. Kits may also include an electric fuel preheater assembly. See Figure 1. Kit numbers are listed in Table 1.

Part Number	Description
23530042	Kit, Diesel Pro 233 Fuel Processor (No Electric Preheater)
23530043	Kit, Diesel Pro 233E Fuel Processor (12 Volt DC Electric Preheater)
23530044	Kit, Diesel Pro 233E Fuel Processor (24-Volt DC Electric Preheater)

Table 1. Diesel Pro 233 and 233E Kits

This system is installed between the fuel tank and the fuel pump *after* the primary fuel filter adaptor head is removed and a special fuel diverter cap is installed on the secondary filter head. Diverter caps are not included with Diesel Pro 233 service kits, but are sold separately. For a list of available diverter caps, refer to section "Install Diverter Cap Onto Secondary Filter Head."

Remove Former Primary Filter Assembly

Installation of the Diesel Pro kit requires removal of the former primary fuel filter assembly as follows:



CAUTION:

To avoid injury from hot surfaces, allow the engine to cool before removing any component. Wear protective gloves.



CAUTION:

To avoid injury from accidental engine start-up while servicing the engine, disconnect/disable the starting system.

1. With the engine at ambient temperature (cool to the touch) and the starting system disconnected/disabled, close the fuel shutoff valve (if equipped) between the primary filter and/or water separator and the fuel pump. Place a suitable container under the primary filter assembly, remove the element and drain the fuel.
2. Dispose of the filter element in an environmentally responsible manner, according to state and/or federal (EPA) recommendations. Return the fuel to the fuel tank, if desired.
3. Disconnect the fuel hoses at the filter head, remove the primary filter head and discard.

Install Diesel Pro 233, 233E or 233F Service Kit

Install the Diesel Pro 233 fuel processor service kit as follows:

1. Mount the fuel processor assembly in the desired location, keeping the following points in mind:
 - A. Mount vertically with the element pointing up and the inlet/outlet fittings perpendicular to the mounting plate.
 - B. Make sure the filter element is *above* the full level of the fuel tank to prevent fuel siphoning when the engine is not in use. If filter element must be mounted below full tank level, install a shutoff valve at the inlet to permit filter changes without fuel siphoning from the tank.

- C. Ensure there is enough top and side clearance for convenient cover removal and filter element replacement. Leave at least 1.5 inches (38 mm) of clearance between the vent cap at the top of the filter cover and any obstruction above it.
 - D. Ensure there is enough bottom clearance for convenient draining of the fuel processor body.
2. Fuel inlet and outlet connections are 3/8 inch NPTF. To minimize restrictions, observe the following guidelines when plumbing the system:
- A. Keep fuel line routing as smooth as possible with no low-hanging loops that can trap water. Use 90-degree elbows only when necessary.
 - B. If hoses are made to length on the job, inspect before using to make sure liners are not cut by the fittings, creating potential check valve effects. Make sure hoses are clean and free of debris before using.

- C. If a fuel inlet or outlet fitting in the processor body should be loosened or detached, check to make sure the O-ring seal is installed and then torque the fitting to 41 N•m (30 lb-ft).
- D. Route the supply line from the fuel tank to the Diesel Pro inlet port (labeled “Fuel In”).
- E. Route the outlet line from the Diesel Pro outlet port (labeled “Fuel Out”) to the fuel pump.

Diesel Pro 233E Kit Wiring Instructions

Wiring systems should be fused. For example, the pre-heater wire in a 12-volt system should be connected to a 15-amp fuse in the Accessory/Ignition circuit. A 10-amp fuse should be used in a 24-volt system. See Figure 2 for a typical wiring diagram. If a fused circuit is not available, a circuit breaker should be installed. See Figure 3 for a typical wiring diagram.

Install Diverter Cap Onto Secondary Filter Head

For a one-filter system, select the secondary filter diverter cap from those listed in Table 2. To determine the required part number, measure the size of the spin-on filter head stud and the diameter of the filter-sealing surface.

NOTICE:

To avoid damaging the aluminum fuel processor body, do not over tighten fuel lines or fuel line fittings.

Diverter Cap Part No.	Required Filter Head Stud Size	Required Filter Head Seal I.D.	Required Filter Head Seal O.D.
23521050	1 in.-14	2.475 in.	2.895 in.
23521051	1 in.-14	3.225 in.	3.435 in.
23521052	M16 X 1.5	2.475 in.	2.895 in.
23521053	3/4 in. X 16	2.475 in.	2.895 in.
23521054	7/8 in. X 14	2.475 in.	2.895 in.
23521055	M18 X 1.5	2.475 in.	2.895 in.
23519116	13/16 in. X 12	3.225 in.	3.235 in.

Table 2. Diverter Cap Part Numbers

Install the diverter cap on the secondary filter head as follows:

1. Place a suitable container under the secondary filter assembly. Remove the filter element and drain into the container. Dispose of the element in an environmentally responsible manner, according to state and/or federal (EPA) recommendations. Return the fuel to the fuel tank, if desired.
2. Lightly lubricate the seal on top of the diverter cap with clean engine oil.

NOTICE:

Do not use tools to tighten the diverter cap, since this may distort or crack the filter head.

3. Thread the adaptor onto the secondary filter stud and tighten *by hand only*.

Prime the Fuel System

The fuel processor system *must* be primed before the engine is started. Use this procedure:

1. Ensure the fuel processor drain valve is closed and the plug is installed.
2. Using collar/vent cap wrench 232002 supplied (see Figure 4), remove the vent cap from the see-through cover by turning counter-clockwise.
3. Fill the cover with clean fuel until the level is above the element.

NOTICE:

To avoid cover or vent cap damage, do not use tools to tighten the cap.

4. Ensure the O-ring is installed on the vent cap. Reinstall the vent cap and tighten by hand.
5. Open the vent at the secondary filter.
6. Using a hand or electric priming pump, prime the fuel system until fuel is evident at the secondary filter vent.
7. Close the vent at the secondary filter. Remove the priming pump.



CAUTION:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- **Always start and operate the engine in a well-ventilated area.**
- **If operating an engine in an enclosed area, vent the engine to the outside.**
- **Do not modify or tamper with the exhaust system or emission control system.**

8. Start the engine. When the lubrication system reaches its normal operating pressure, increase engine speed to high idle for 2 - 3 minutes.

NOTICE:

Do not allow the fuel level in the see-through cover to fall below the top of the retainer collar, since this may lead to interruption of the fuel flow and engine stalling.

9. After the air is purged and with the engine still running, slowly loosen the vent cap on the filter cover. The fuel level in the cover will start falling. When the level falls to the top of the collar, tighten the vent cap quickly *by hand*.

10. Check for leaks. Shut down the engine.

Replace the Filter Element

Use the following procedure to replace the filter element:



CAUTION:

To avoid injury from hot surfaces, allow the engine to cool before removing any component. Wear protective gloves.



CAUTION:

To avoid injury from accidental engine start-up while servicing the engine, disconnect/disable the starting system.

1. With the engine at ambient temperature (cool to the touch) and the starting system disconnected/disabled, shut off the fuel valve (if installed) to the filter being serviced.
2. Place a suitable container under the filter. Using collar/vent cap wrench P/N 232002 provided, loosen the vent cap on the filter cover. See Figure 1 and see Figure 4.
3. Open the valve and drain the fuel until the level is *below* the element in the see-through cover. Close the drain valve and replace the plug.
4. Using collar/vent cap wrench 232002, remove the cover collar by turning counter-clockwise. Remove the cover, filter spring and cover seal by lifting straight up and over the filter element. Remove the element from the center stud by pulling upward and twisting slightly. Allow the element to drain.
5. Return the drained fuel to the fuel tank, if desired, or dispose of the fuel and filter in an environmentally friendly way, according to state and/or federal (EPA) recommendations.
6. Make sure a rubber sealing grommet is installed in the base of the new element. *Do not install the element if the grommet is missing, since this will result in fuel leakage and possible contamination. Use a different element .*
7. Install the element onto the processor center stud by pressing down and twisting slightly until seated.
8. Ensure the filter spring is installed at the top of the see-through cover. If missing, the spring *must* be replaced to ensure correct filter operation.
9. Inspect the O-ring seal at the base of the cover. Replace the seal if damaged or no longer resilient.
10. Wipe the cover lip and seal clean.

NOTICE:

To avoid cover or vent cap damage, do not use tools to tighten the cover collar or vent cap.

NOTICE:

Ensure the rubber sealing grommet at the base of the filter is removed with the filter. If detached, remove the grommet from the center stud. Failure to remove the old grommet from the stud before installing a new filter assembly will result in filter malfunction and damage, which could lead to severe engine damage.

11. Install the O-ring seal in the base of the cover, making sure it is not twisted. Install the cover over the element. Install the collar over the cover and tighten securely *by hand*.
12. Prime the fuel system, start the engine, and check for leaks. Refer to section, "Prime the Fuel System."

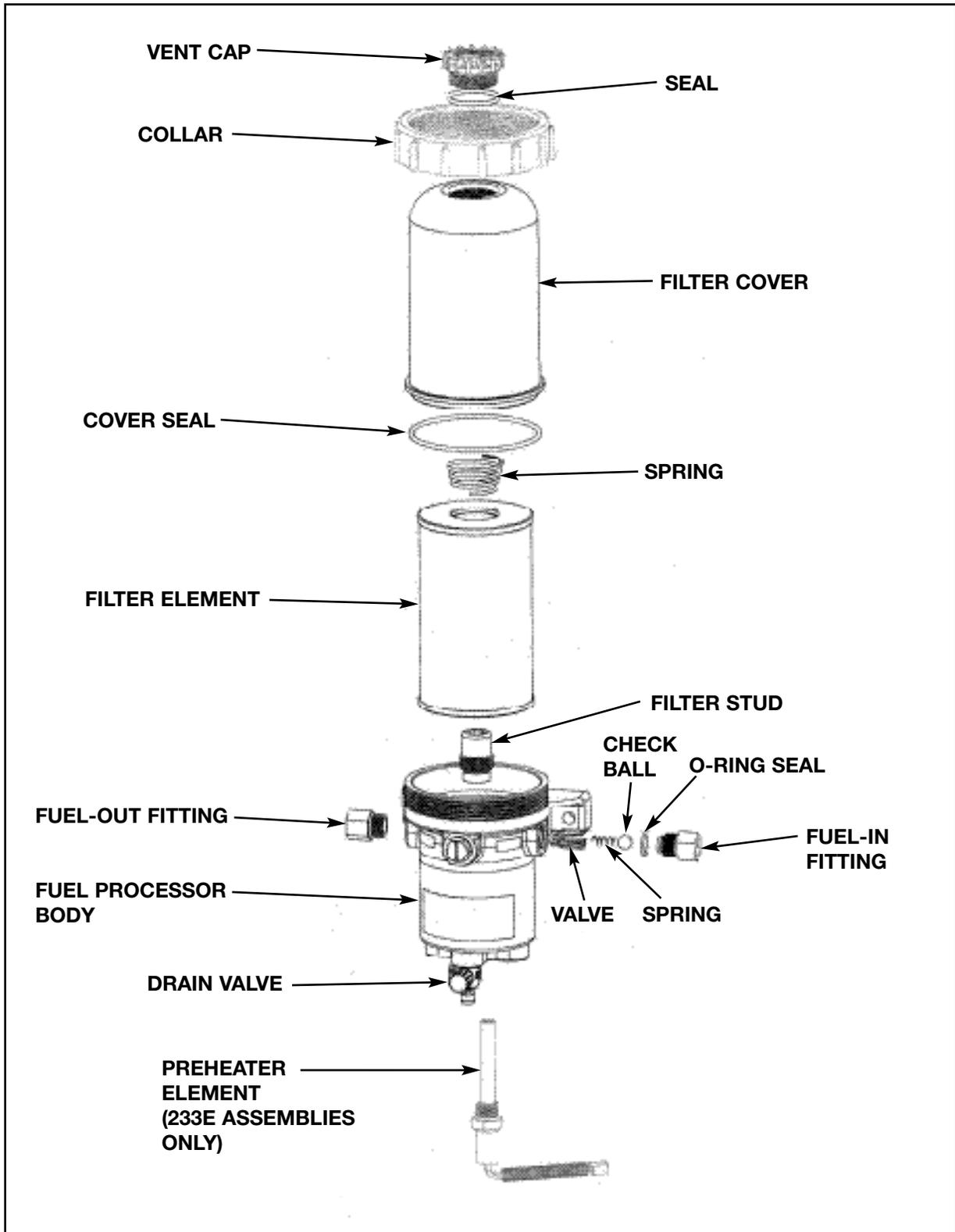


Figure 1. Diesel Pro Fuel Processor Assembly

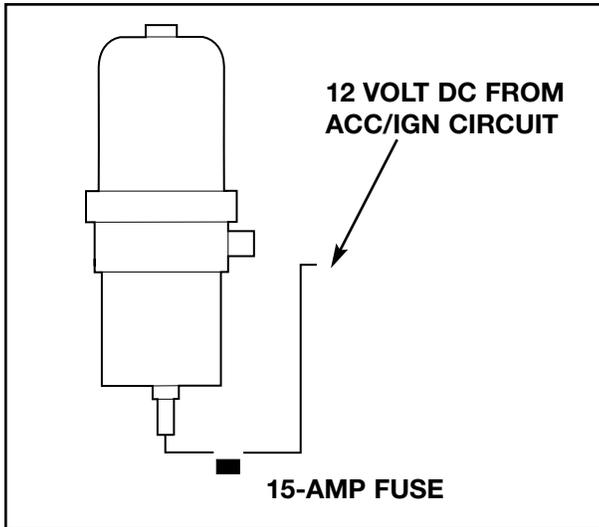


Figure 2. Typical Fused Circuit

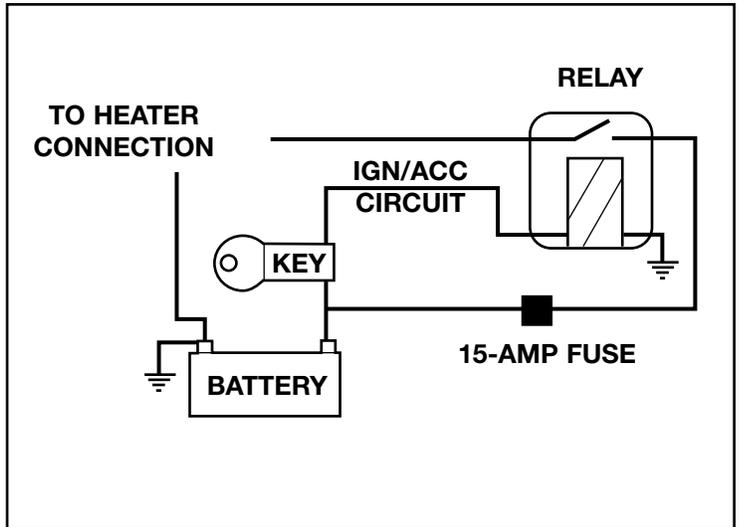


Figure 3. Typical Circuit Breaker System

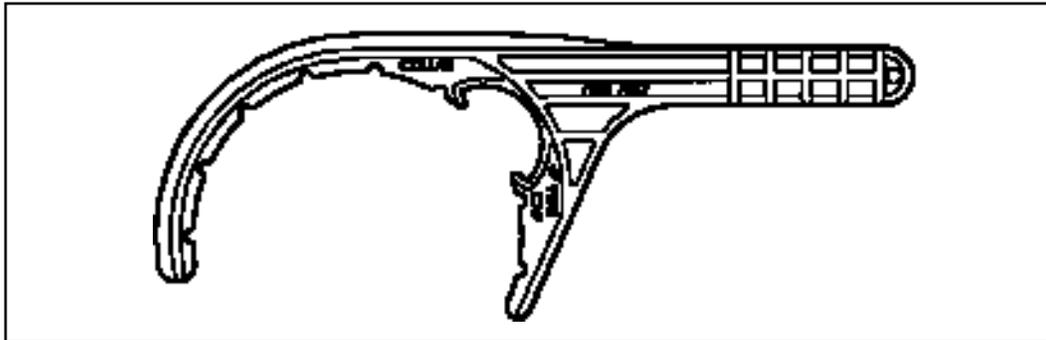


Figure 4. Collar/Vent Cap Wrench P/N 232002

DETROIT DIESEL



13400 Outer Drive, West, Detroit, Michigan 48239-4001
 Telephone: 313-592-5000
 www.detroitdiesel.com