

NISSAN DIESEL AMERICA, INC.

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MALONE DUAL FUEL TANK KIT TROUBLESHOOTING GUIDE

PURPOSE

The attached troubleshooting guide has been developed for the Malone dual draw / dual return kit for all models and model years.

TROUBLESHOOTING GUIDE

Dealers are advised to read the troubleshooting guide carefully to diagnose and test complaints of improper operation of the dual fuel tank system. Retain this guide in the service shop as reference information.

NOTICE

Dual draw / dual return systems utilize shutoff valves at the fuel supply and the fuel return tees located on the frame crossmember. All valves must be open for proper operation.

On dual fuel tank kits installed at a port facility, the shutoff valves on the new fuel tank are closed and must be opened at first use.

Note: For Dual Fuel Tank System with Transfer Pump and Module refer to [TSB FS-10](#)

| | | | | | | | |
|---|-----------------|---|------------------|---|------------------------------------|--|--|
| THE INFORMATION CONTAINED IN THIS BULLETIN SHOULD NOT BE INTERPRETED AS THE BASIS FOR WARRANTY CLAIMS | | | | | | | |
| FOR THE INDICATED PERSONNEL BELOW, PLEASE READ, INITIAL, AND ROUTE TO THE FOLLOWING: | | | | | | | |
| X | SERVICE MANAGER | X | WARRANTY MANAGER | X | SERVICE TECHNICIANS INITIAL BELOW: | | |
| X | PARTS MANAGER | X | SHOP FOREMAN | | | | |

TROUBLE SHOOTING GUIDE

Dual Draw Dual Return Kit Part #MLKD33G or MLKD50G

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TROUBLE SHOOTING GUIDE

Diagnostic and Test Information

This guide outlines the proper installation of a Dual Draw Dual Return fuel system which incorporates the Malone Specialty return flow splitter with shutoff valves. This system effectively equalizes fuel level from side to side on the vehicle while evenly distributing hot fuel, **without the need for a crossover line.**

Tank Installation

The new fuel tank and the existing fuel tank must be equal distance from the ground.

Line Diameters

Both fuel lines from the tanks to the tee must be the same diameter. The line to the engine may be any size within engine guidelines.

Line Lengths (Refer to Fig. 1)

Lines from the tanks to the tees must be equal in length.

Line Routing (Refer to Fig. 1)

The draw lines from the tanks to the tee should rise steadily (or at least be level). Avoid forming upward loops that could trap an air bubble and stop the fuel flow. The line from the tee to the engine may be routed in any convenient way.

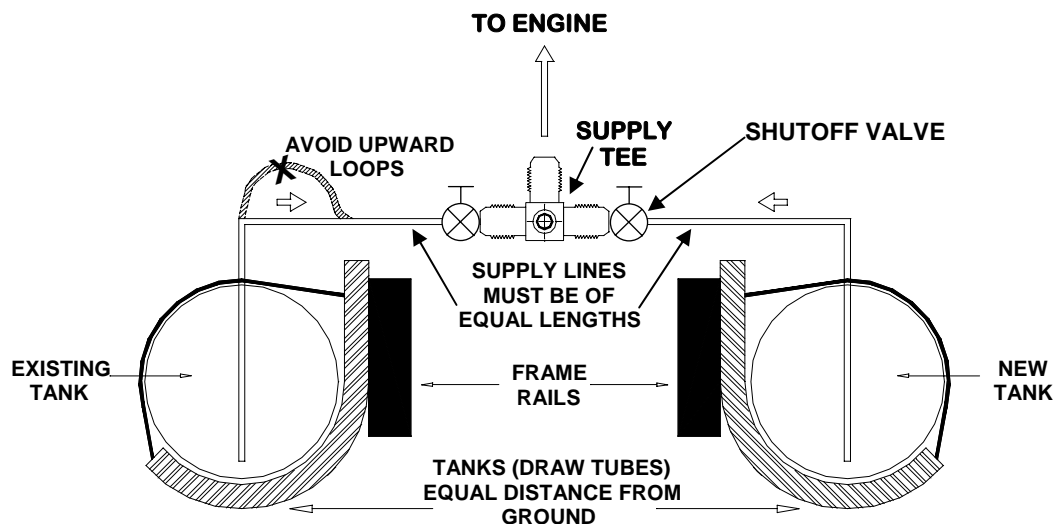


FIGURE 1

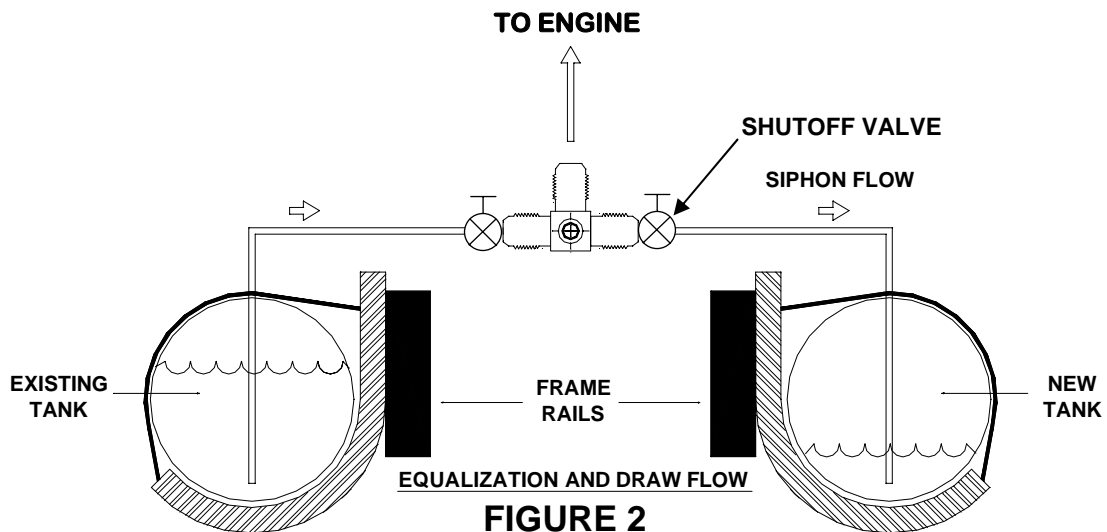
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Equalization (Refer to Figure 2)

If full of fuel (bubble free), the lines will act as a siphon to level the fuel loads in the two tanks, just like a crossover line. An air bubble can break the siphon if trapped in an upward loop, and stop flow from one tank.

Draw Flow (Refer to Figure 2)

If fuel tank levels are the same, and the lines are full, the engine will draw equally from each tank. If levels are different, more fuel will flow from the more full tank, tending to equalize the tanks.



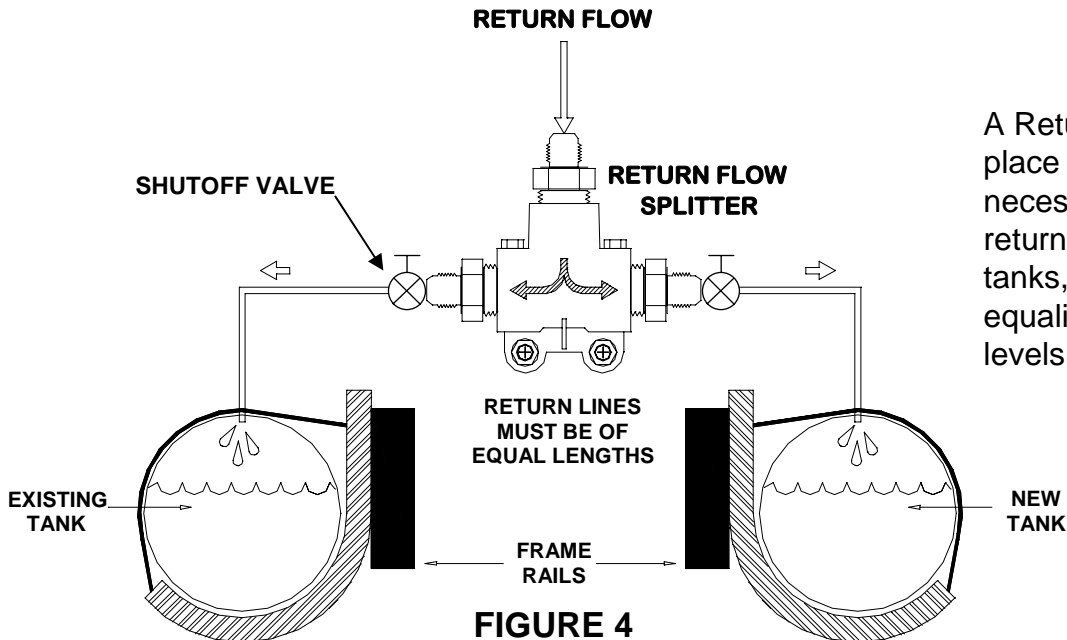
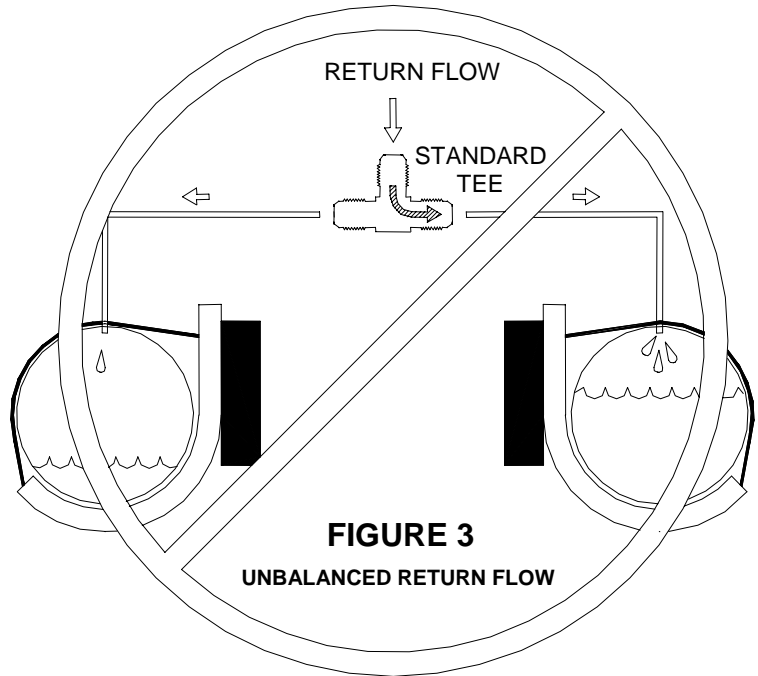
IF FULL OF FUEL (BUBBLE FREE), THE LINES WILL ACT AS A SIPHON TO LEVEL THE FUEL LOADS IN THE TWO TANKS. AN AIR BUBBLE CAN BREAK THE SIPHON AND STOP FLOW FROM ONE TANK.

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Return Lines

Although the draw lines may serve as the crossover line by siphoning, equal return of the unused fuel to the two tanks is also necessary for equalization.

Flow through a standard tee can be very unpredictable. Even a slight difference in lines routing, or a little air in one line, can cause all the flow to go to one of the tanks. This will cause unequal fuel levels. Refer to Figure 3.



A Return Flow Splitter in place of the return tee is necessary to assure equal return flow to the two tanks, and therefore equalization of their fuel levels. Refer to Figure 4.

ASSURES EQUAL RETURN FLOW TO THE TWO TANKS, AND THEREFORE EQUALIZATION OF THEIR FUEL LEVELS.

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Line Diameters

The two draw lines and return lines from the splitter to the tanks should be the same diameter and length.

THIS SYSTEM HAS THREE IMPORTANT ASPECTS

1. Properly siphoning draw lines are necessary for fuel level equalization, but without the Return Flow Splitter return fuel may still be flowing entirely to one tank.
2. A Return Flow Splitter is necessary to assure fuel level equalization, but without properly siphoning draw lines, draw flow may be reduced or entirely stopped from one tank.
3. Fuel level equalization, in all applications, requires both properly routed draw lines that provide siphoning and a Return Flow Splitter in the return line.

For system problems and corrective action, please refer to the troubleshooting guide on page 6.

TROUBLE SHOOTING GUIDE

TROUBLESHOOTING GUIDE FUEL IMBALANCE PROBLEMS DUAL DRAW DUAL RETURN FUEL SYSTEM

Fuel imbalance problems are nearly always on the draw side. The draw lines form the siphon that equalizes fuel from side to side. The return side is less significant, has more pressure driving flow, and is much less prone to problems. Look for problems on the draw side first. All shutoff valves at the supply and return tees must be open.

| Problem | Possible Cause | Corrective Action |
|----------------------------------|---|---|
| Truck not level | Truck has been on a slope or crown of the road. | Level the truck (May take 1-2 hours to level fuel). |
| Draw Line Obstruction | Part of line or fitting is obstructing flow. | Check for hose lining flap, incomplete fitting, deformed hose on fuel tank side. |
| | Foreign object obstructing flow. | Check for loose rubber, plastic film, foreign object in tank, standpipe, fittings, on full tank side. |
| | Trapped air in draw line. | Re-route draw lines to go from tank exit continuously upward to draw tee. |
| | Fuel too cold, waxed, and obstructing a draw line. | Warm truck and fuel; add #1 diesel to reduce cloud point. |
| | Water frozen in a draw line. | Thaw lines; re-route line continuously up to tee so there are no low pockets for water to collect and freeze. |
| Incorrect design or installation | Draw lines different diameter and length, tanks not at same height. | Replace line or lines with largest possible short but equal length lines, assuring they rise continuously to tee. Correct tank height to be equal distance from the ground. |
| | Fittings different side-to-side, or undersized. | Replace with fittings appropriate to hose size, and same both sides. |
| Return line obstruction | Part of line or foreign object obstructing flow. | Check for loose hose lining or loose fragments in empty tank side or in splitter itself. |
| | Test to verify return flow. | Remove tank end of each return line, flow into buckets for a measured time period while holding hose ends at same level as when mounted on truck. Compare; if more that 2:1 difference, look for obstruction on low flow side. If none is found replace splitter. |