Installation

Flow Restrictor Retrofit Kits K94308, K94309, K94310, K94328, K94329 & K94330 For The Advantage® Series, Legacy™, Highline® & MPD®-1, -A, -C/-2 and -3 Units

Purpose

This document provides instructions for installing various Gilbarco fixed orifice flow restrictors into Gilbarco pumps and dispensers. This includes installation of flow restrictor retrofit kits as well as flow restrictors and associated parts supplied with factory units. Restrictors reduce fuel flow rate by approximately 2-3 gallons per minute (gpm) in dispensers with line operating pressures of 30-36 pounds per square inch (psi).

Note: The Environmental Protection Agency (EPA) has established regulations limiting maximum fuel flow rate to 10 gpm.

Related Documents

MDE-2531	Pump and Dispenser Start-Up and Service
MDE-2540	Pump and Dispensers Owners Manual

Read All Applicable Documents

Reviewing all related procedures before you begin work is important. Read and understand all related manuals thoroughly. If you do not understand a procedure, call 1-800-743-7501 for Gilbarco Tele-Support.

Read NFPA 30A and NFPA 70

Before installing equipment, read and understand applicable information in the following codes:

- The National Electric Code (NFPA 70)
- The Automotive and Marine Service Code (NFPA 30A)
- Any national, state and local codes that may apply.

Failure to install and service equipment in accordance with NFPA 30A and NFPA 70 may adversely affect the safe use and operation of the system.

Required Tools

- alcohol, isopropyl
- approved fuel absorbent material
- brush, soft
- pliers, needle nose
- screwdrivers, flat and Phillips
- wooden block, small
- wrench, adjustable or pipe
- wrench, filter

Note: Not all tools are required for every kit installation.

Safety Information

Alert Symbol

This is a standard alert symbol. When you see this symbol, along with the following signal words, be alert to the potential for personal injury or damage to equipment.

Signal Words

These signal words alert you to important safety hazards.

DANGER	WARNING	CAUTION
The hazard or unsafe practice **will** result in severe injury or death.	The hazard or unsafe practice **may** result in severe injury or death.	The hazard or unsafe practice **could** result in minor injury or damage to equipment.

Safety Symbols

The following safety symbols are used in Gilbarco manuals to alert you to important safety hazards and precautions.

Hazard of Explosion
When pressurized fuel is present failure to release pressure and dispose of or clean up fuel according to proper procedures may lead to an explosion causing severe injury or death.

Fire Hazard
Spilled or leaking fuel can ignite leading to severe injury or death.

No Smoking or Open Flames
Sparks and embers from burning cigarettes or pipes or open flames from matches, lighters, welding torches, etc. can ignite fuels and their vapors.

No Power Tools
Sparks from power tools (such as drills) can ignite fuels and their vapors.

No Vehicles In The Area
Moving vehicles in the area during service can create a potential for personal injury to you or others. Sparks from starting vehicles can ignite fuels and their vapors.

Turn Power Off
Live power to a dispensing device creates a potential shock hazard. Always turn power off to the dispensing device and associated STPs when servicing the unit.

No People In The Area
Unauthorized people in the area during service can create a potential for personal injury to you and them.

Use Safety Barricades
Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape and your vehicle to block the work area.

Wear Eye Protection
Spraying fuel from residual pressure in the lines can cause serious eye injuries. Always wear eye protection.

Use Only Approved Containers for Fuel
Use only approved containers for collecting and disposing of fuel in accordance with national, state and local codes and regulations.

Parts List

Factory Units

The factory unit's shipping crate contains a bag of parts which have been configured for your unit. All of the materials are provided to install flow restrictors on each hose. Follow the installation instructions in this manual.

Retrofit Kits K94308, K94309, K94310 and K94330 (for Non-Vapor Recovery Units)

The following table shows the flow restrictor provided for each kit. Use one kit per dispenser. *Note: Flow restrictors are the only parts in these kits.*

Kit Number	Used On	Flow Restrictor Number	Quantity
K94308	MPD®-1, -A, C/-2, -3 and Highline®	N23718-01	6
K94310	Legacy™	N23720-01	2
K94309	The Advantage® Series (balanced vapor ready units with non-vapor hose)	N23719-01	6
K94330-01	The Advantage® Series (non-vapor ready units)	N23734-01	6

Retrofit Kits K94328 and K94329 (for Vapor Recovery Units)

Kit K94328 for The Advantage Series Units with VaporVac® or VaporVac Retrofit Kits built before January 1, 1996. Use one kit **per hose**.

Description	Part Number	Quantity
flow restrictor adaptor	K94328	1
flow restrictor washer	N23731-01	1
o-ring, large	Q12974-124	1
o-ring, small	Q12974-012	2
screw	Q11271-17	1

Kit K94329-01 for The Advantage Series Units with VaporVac or VaporVac Retrofit Kits built after January 1, 1996, use one kit **per dispenser**.

Description	Part Number	Quantity
flow restrictor washer	N23733-01	6
screw	Q13399-01	6

Filter Information (Non-Kit Parts)

For reference only, part numbers are provided for Gilbarco filters. Always use Gilbarco filters (standard, water alert and high capacity) and note that filters **are not** part of kits.

Filter	Part Number
standard, 3/4"	K82584
standard water alert, 3/4"	N22601
high capacity, 10 micron	R18189-10
high capacity, 30 micron	R18189-30 (diesel with sediment in tank)
high capacity water alert	R20039

Installation

Use the following procedure to install all Gilbarco® flow restrictors.

WARNING

Residual pressure and entrapped fuel may still be present and may spray when removing filter.

Fire and explosion could result in severe injury or death.

- Wear eye protection.
- Catch fuel in approved container.
- Clean up all spills promptly.

Before You Begin

1. Read all instructions before beginning.

2. Observe the following safety precautions.
   - Barricade the work area.
   - Do not allow vehicles or unauthorized people in work area.
   - Do not permit smoking or open flames in work area.
   - Do not use power tools in work area.
   - Wear protective gear while performing this installation.

3. Record all mechanical and electronic totals.

4. Turn off all power to the unit, unit lights and STPs at points detailed in this manual.
   - Use system circuit breakers.
   - Multiple disconnects may be required.
   - Isolate each pump at distribution box.

5. Use only approved container to collect fuel and comply with all national, state and local codes and regulations to dispose of fuel.

Preparing For Installation

1. Test current flow rate to determine if compliance to regulations are being met.
   - Dispense fuel at full flow for 15 seconds into an approved container. Clean up spills promptly.
   - Multiply volume obtained by 4 to calculate gallons per minute (gpm). Example: 2.5 gallons x 4 = 10 gpm. (See MDE-2531 for detailed flow rate information.)

2. Use the OSHA Lock-Out and Tag-Out Procedures. Refer to MDE-2531 Pump and Dispenser Start-Up/Service Manual.

3. Close single shear valve on dispensers, or multiple shear valves on blenders. Check valve operations.

4. Bleed pressure (dispensers only):
   - Lift operating handle and authorize unit
   - Place nozzle in approved container
   - Open nozzle to reduce system pressure
   - Close nozzle
   - Turn off operating handle

5. Turn off associated STP circuit breakers. Blenders require multiple STP disconnects.

6. Turn off pump/dispenser circuit breaker.

7. For The Advantage® Series pumps, bleed line pressure.
   - Place nozzle in approved container
   - Open nozzle to release system pressure
   - Close nozzle

Removing Filters

MPD®--1, -2 or -3 Series

For MPD® Series, Highline™ and Legacy™ Units

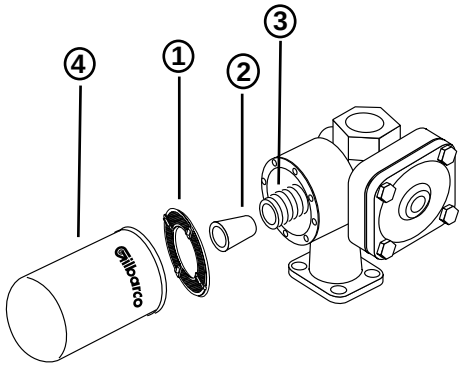
Note: Use approved container to collect residual fuel and approved fuel absorbent to clean up spilled fuel.

1 Turn filter slowly counterclockwise and remove.

2 Drain removed filter into approved container.

3 Follow local, state and national code requirements for disposal of filter.

Installing Flow Restrictor in Filter Base (Non-Vapor Recovery Units)



For Installing Kit K94308 in MPD-1, -A, -C/2, -3 and Highline

1 Remove strainer (1) located under filter (4), using needle nosed pliers.

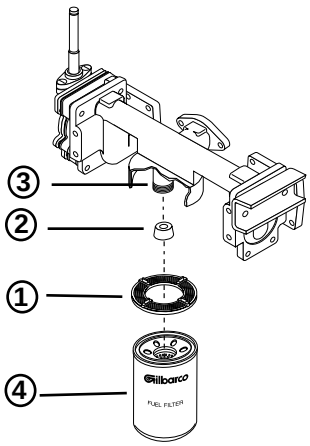
2 Clean strainer using soft brush and alcohol, or properly dispose of strainer if clogged or damaged.

3 Insert small end of flow restrictor (2) N23718-01 into opening of threaded stub (3) in filter base.

4 Use small wooden block to tap flow restrictor into opening for snug fit.

Note: Do not exert excessive force when tapping flow restrictor into threaded stub (3).

5 Install cleaned or new strainer back into bore with tabs to outside after flow restrictor has been installed.



For Installing Kit K94310 In Legacy Units

1 Remove strainer (1) located under filter (4), using needle nosed pliers.

2 Clean strainer using soft brush and alcohol, or properly dispose of strainer if clogged or damaged.

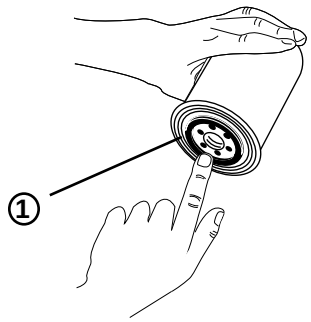
3 Insert small end of flow restrictor (2) N23720-01 into opening of threaded stub (3) in filter base.

4 Use small wooden block to tap flow restrictor into opening for snug fit.

Note: Do not exert excessive force when tapping flow restrictor in to threaded stub (3).

5 Install cleaned or new strainer back into bore with tabs to outside after flow restrictor has been installed.

Installing New Filter



1. Using finger, coat new filter gasket (1) with a thin film of oil.
2. Read instructions printed on new filter.
3. Attach filter to base and turn clockwise. Hand tighten only.

Checking For Leaks

1. Restore power.
2. Open shear valves on dispensers.
3. Lift nozzle hook and authorize pump.
4. Check for leaks.
5. For each hose, bleed air by dispensing 10 gallons into an approved container.
6. Check for leaks again.

Preparing to Install Flow Restrictor at Hose Casting Location

WARNING

Petroleum soaked absorbents can create a safety hazard.

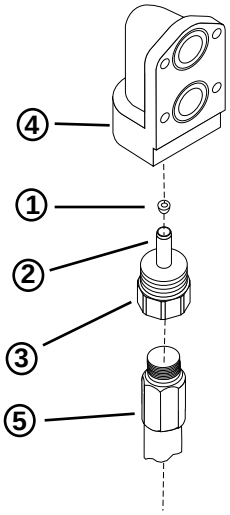
Vapors may collect causing a serious fire/explosion and injury/death could result.

Follow manufacture of absorbent instructions for safe clean-up and disposal. Dispose of contaminated materials as specified by your local or state regulators.

Keep environment free from petroleum contamination.

1. Use approved fuel absorbent material to clean up spilled fuel.
2. Follow local, state and national code requirements for disposal.
3. Turn hose slowly counterclockwise and remove from casting.

Installing Flow Restrictor at Hose Casting Location on Non-Vapor Recovery Units



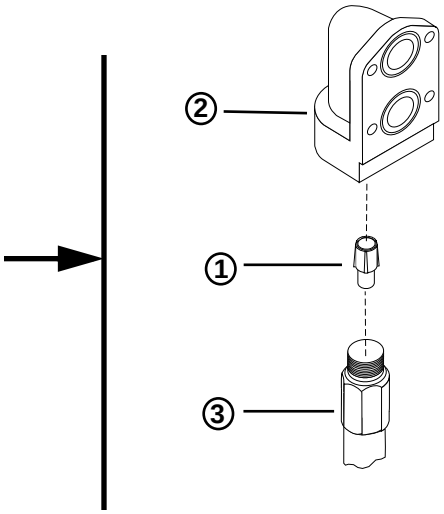
For installing Kit K94309 in The Advantage® Series Balanced Vapor Ready Units with Non-Vapor hoses

1 Insert small end of flow restrictor (1) into flow passage of adaptor's internal stub (2).

2 Use small wooden block to tap restrictor into opening for snug fit.
Note: Do not exert excessive force when tapping flow restrictor in to flow passage.

3 Screw adaptor (3) into casting (4).

4 Screw hose (5) securely into hose fitting on adaptor.



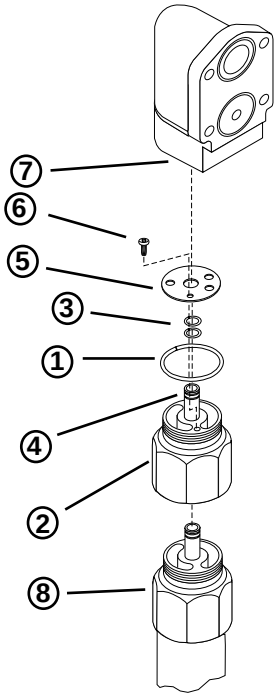
For installing Kit K94330-01 in The Advantage Series Non-Vapor Ready Units

1 Insert flow restrictor (1) into opening of casting (2) with large end of restrictor facing up into casting. Large end of restrictor has four raised fins.

2 Push flow restrictor up into casting as far as possible.

3 Screw hose (3) securely into casting.

Installing Flow Restrictor at Hose Casting Location on Vapor Recovery Units



For installing Kit K94328 on The Advantage® Series Units with VaporVac® and VaporVac Retrofit Kits built before January 1, 1996.

Note: Castings manufactured before 11/96 do not have screw hole in bottom of casting; for this reason restrictor adaptor is needed.

1 Place large O-ring (1) on vapor recovery hose adaptor (2), pushing past threads and seating O-ring against hose body.

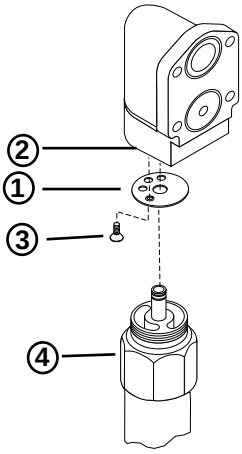
2 Place two small O-rings (3) on flow restrictor adaptor stem (4) and seat into grooves.

3 Place flow restrictor washer (5) on top of adaptor and align screw holes in washer and adaptor.

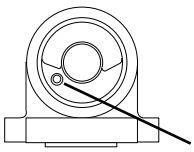
4 Insert screw (6) into holes and tighten.

5 Insert stem of flow restrictor adaptor (4) into bottom opening of casting (7) T18194-11 and screw adaptor clockwise until snug against casting body.

6 Screw hose (8) securely into flow restrictor adaptor.



Bottom view of T18194 casting



Factory drilled hole inside casting

For installing Kit K94329 on The Advantage Series Units with VaporVac and VaporVac Retrofit Kits built after January 1, 1996.

Note: Castings manufactured after 11/96 have screw hole in bottom of casting.

1 Place flow restrictor washer (1) on bottom opening of casting (2) and align screw holes in washer and casting.

2 Place screw (3) in holes and tighten.

3 Screw hose (4) securely into casting.

Gilbarco
WORKING TOGETHER™