

Fuel Injection Fitting Kits

Reference Guide for:

Domestic Kit

Import Kit

Master Kit

⚠ Safety Precautions ⚠

WARNING: The following safety precautions must be observed to reduce the risk of fire and personal injury:



- Read and understand all instructions and safety precautions before servicing fuel injection systems. If the operator cannot read English, operating instructions and safety precautions must be read and discussed in the operator's native language.



- Wear eye protection that meets ANSI Z87.1 and OSHA requirements.
- Keep tools, electrical cords, and hoses away from moving engine parts.
- Do not modify any components of the gauge assembly, adapters, or accessories. If it is necessary to replace parts, use only OTC replacement parts.



- Vent exhaust to the outside while running the vehicle.



- Have a Class B fire extinguisher nearby when working on fuel injection systems. Observe normal precautions for working with flammable liquids: no smoking, open flames, electrical sparks, etc.



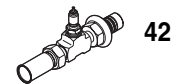
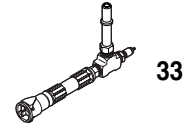
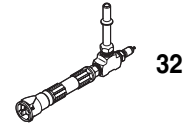
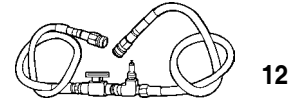
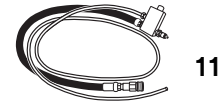
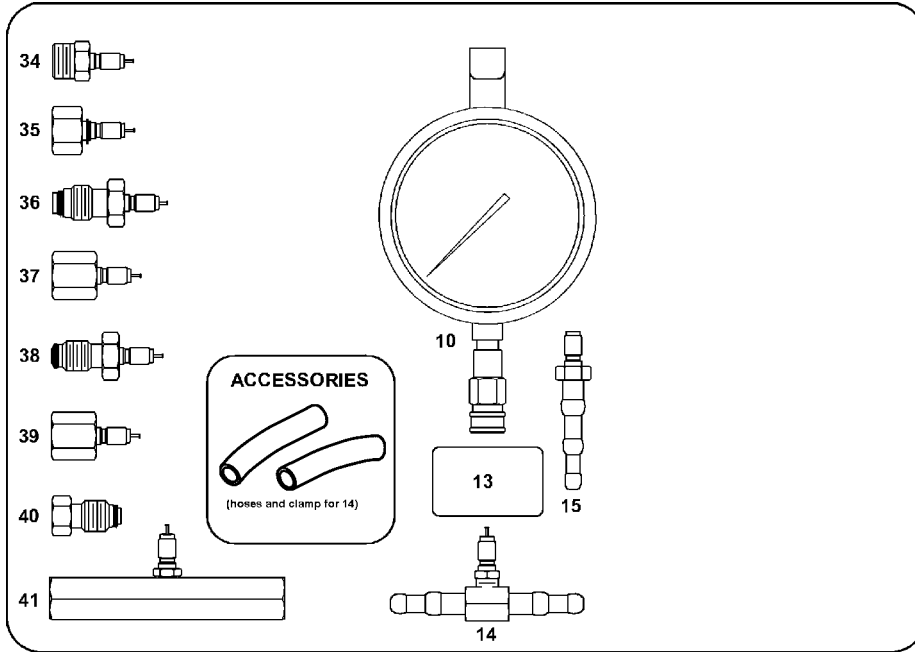
- Use fuel injection fitting kits on gasoline engines only.
- Release fuel system pressure before servicing fuel system components
- Residual line pressure can cause fuel spray. Wrap a shop towel around pressure tap fittings when connecting and disconnecting adapters or removing the gauge assembly hose. Wipe up fuel spills immediately; protect painted surfaces from fuel spills. Clean or dispose of towels according to local, state, and federal regulations.
- Tighten all connections before checking fuel pressure.
- Use the vehicle manufacturer's recommended procedures to service injectors. Replace injector o-rings whenever injectors are removed. Keep dirt out of the system.

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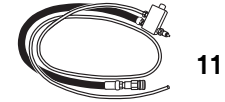
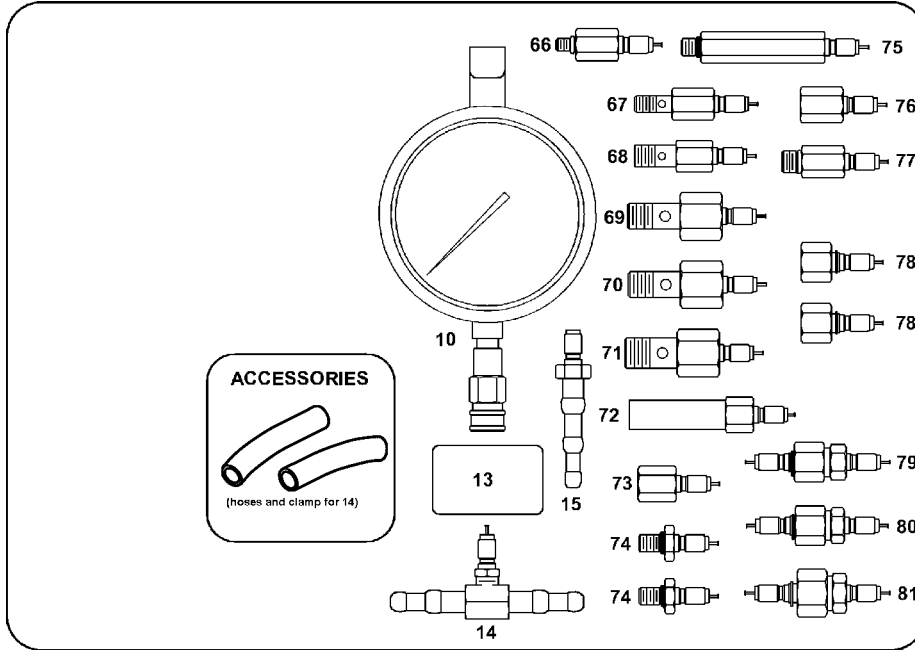
Kit Components

Domestic Kit

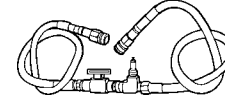


Kit Components

Import Kit



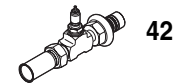
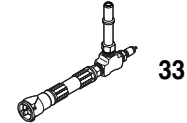
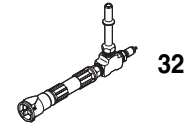
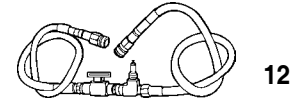
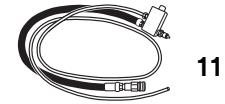
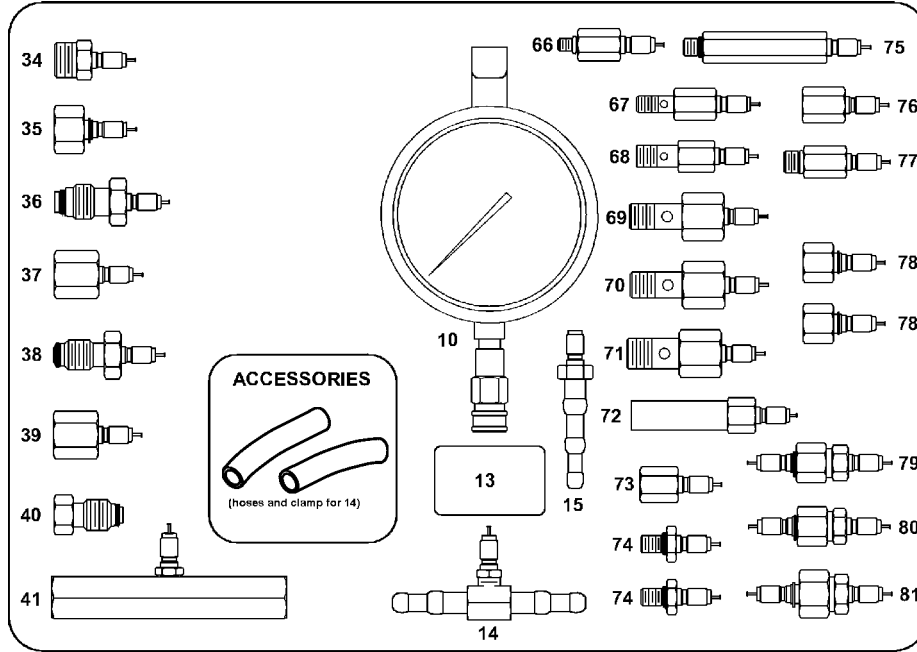
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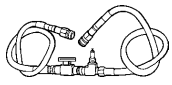
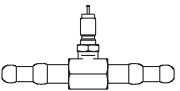
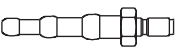

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Kit Components




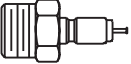
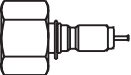
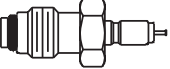

Master Kit



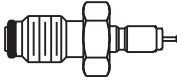
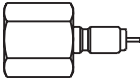
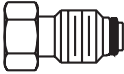
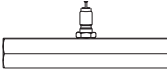
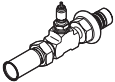
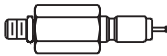

Components / Applications

Item No.	Master Kit	Domestic	Import	Reorder No.	Description	Graphic	Common Application (see page # for connection illustration)
10	•	•	•	518483	3-1/2" Pressure Gauge with protective boot and hanger 0-100 psi (0-7 BAR)		All tests - connects to No. 11
11	•	•	•	518530	Gauge Hose Assembly with relief valve and drain tube		All tests - connects to No. 10 (valve used for pressure release and for volume tests)
12	•	•	•	518356	TBI/CIS Hose Assembly with shutoff valve		Connects to Nos. 10 and 11 for pressure tests for GM TBI - supply line (page 19), fuel pump (page 20), and return line (page 21) European CIS - primary system (page 33)
13	•	•	•	518477	Seal Kit		Replacement seals, o-rings, quick couplers
14	•	•	•	518480	Double Ended Hose Adapter; 5/16", 3/8" (use with hose and clamp in Accessory compartment; use hose that fits fuel line)		AMC and Chrysler TBI (page 17) AMC and Chrysler MPFI (pages 22, 23) Diahatsu EFI (page 28) Subaru Single Point (page 28) Asian AFC (page 28) European AFC (page 32)
15	•	•	•	518478	Single Ended Hose Adapter; 5/16", 3/8", 1/4"		MPI - (page 25) for fuel pump "deadhead" test EFI and MFI (page 29)
30	•	•		518495	Ford MPI Adapter		Ford MPI (page 24)

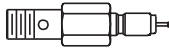



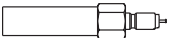
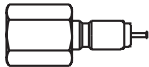

Components / Applications

Item No.	Master Kit	Domestic	Import	Reorder No.	Description	Graphic	Common Application <i>(see page # for connection illustration)</i>
31	•	•		518542	7/16" x 20 GM/Chrysler Adapter		Chrysler and Jeep MPFI (page 24) GM MPI (page 24)
32	•	•		518476	5/16" Hairpin Adapter		Ford CFI (page 16) Chrysler MPFI (pages 22, 23) GM MPI (pages 22, 23)
33	•	•		518527	3/8" Hairpin Adapter		Chrysler MPFI (pages 22, 23) GM MPI (pages 22, 23)
34	•	•		518534	5/8"-18 External Flare Adapter		GM TBI - early systems, supply line (page 19) used with No. 35
35	•	•		518535	5/8"-18 Internal Flare Adapter		GM TBI - early systems, supply line (page 19) used with No. 34
36	•	•		518481	16 mm x 1.5 External O-ring Adapter		GM TBI - supply line (pages 19, 20) used with No. 37
37	•	•		518472	16 mm x 1.5 Internal O-ring Adapter		GM TBI - supply line (pages 19, 20) used with No. 36

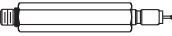

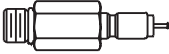




Components / Applications

Item No.	Master Kit	Domestic	Import	Reorder No.	Description	Graphic	Common Application <i>(see page # for connection illustration)</i>
38	•	•		518473	14 mm x 1.5 External O-ring Adapter		GM TBI - return line <i>(page 21)</i>
39	•	•		518474	14 mm x 1.5 Internal O-ring Adapter		GM TBI - return line <i>(page 21)</i>
40	•	•		518482	14 mm x 1.5 External O-ring Plug		GM TBI - return line plug for fuel pump “deadhead” test <i>(page 20)</i>
41	•	•		518487	16 mm x 1.5 In-Line Adapter		GM TBI - used in fuel filter location <i>(page 18)</i>
42	•	•		518499	Ford Spring Lock Adapter		Ford MPI - 2003 and newer with returnless fuel system, 1985 and newer with return fuel system <i>(page 23)</i>
66	•		•	518490	M6 x 1.0 External O-ring Adapter		Acura and Honda PGM <i>(page 26)</i>
67	•		•	518491	M8 x 1.0 External Banjo Adapter		Asian AFC, EFI, MFI <i>(pages 27, 28)</i> European AFC <i>(pages 31, 32)</i> European CIS and CISE <i>(pages 33, 34)</i>

Components / Applications

Item No.	Master Kit	Domestic	Import	Reorder No.	Description	Graphic	Common Application (see page # for connection illustration)
68	•		•	518492	M10 x 1.0 External Banjo Adapter		Asian AFC, EFI, MFI (pages 27, 28) European AFC (pages 31, 32) European CIS and CISE (pages 33, 34)
69	•		•	518493	M12 x 1.5 External Banjo Adapter		Asian AFC, EFI, MFI (pages 27, 28) European AFC (pages 31, 32) European CIS and CISE (pages 33, 34)
70	•		•	518494	M12 x 1.25 External Banjo Adapter		Acura and Honda PGM (page 26) Asian AFC - mostly Toyota (pages 27, 28) European AFC (pages 30, 31, 32) European CIS and CISE (pages 33, 34)
71	•		•	518501	M14 x 1.5 External Banjo Adapter		Toyota AFC (pages 27, 28)
72	•		•	518537	M8 x 1.0 Internal O-ring Adapter (long)		European CIS (page 33) European CISE (page 34)
73	•		•	518485	M8 x 1.0 Internal O-ring Adapter		European CIS (page 33) European CISE (page 34)
74	•		•	518536	M8 x 1.0 External O-ring Adapters (2)		European CIS (page 33) European CISE (page 34)

Components / Applications

Item No.	Master Kit	Domestic	Import	Reorder No.	Description	Graphic	Common Application (see page # for connection illustration)
75	•		•	518488	M8 x 1.0 External O-ring Adapter (long)		European CIS (page 33) European CISE (page 34)
76	•		•	518484	M10 x 1.0 Internal O-ring Adapter		European CIS (page 33) European CISE (page 34)
77	•		•	518489	M10 x 1.0 External O-ring Adapter		European CIS (page 33) European CISE (page 34)
78	•		•	518486	M12 x 1.5 Internal Swivel Adapters (2)		European CIS (page 33) European CISE (page 34)
79	•		•	518498	M14 x 1.5 External and Internal Swivel Adapter		European CIS (page 33) European CISE (page 34)
80	•		•	518497	1/4" BSPT External and Internal Swivel Adapter		European CIS (page 33) European CISE (page 34)
81	•		•	518496	M16 x 1.5 External and Internal Swivel Adapter		European CIS (page 33) European CISE (page 34)

About Fuel Systems and Testing

A vehicle's fuel delivery and return system consists of a circular system of components. Fuel is pumped from the fuel tank by the fuel pump. The fuel flows through the hoses, through the fuel filter, and to the fuel regulator and injection system. The fuel injection system delivers the fuel to the engine and returns unused fuel to the fuel tank.

For an engine to run properly, the fuel system must maintain precise fuel pressure and adequate fuel volume. The fittings in the Fuel Injection Fittings Kit let you connect a pressure gauge into the fuel system to test the pressure of the fuel pump, supply (delivery) lines, and return lines. You can also use the Kit to test the fuel pump output volume.

NOTE: When connecting to a fuel system, use the illustrations provided in this Guide. Some vehicles and/or adapters have more than one connection option. If so, use the option with the easiest access to the fuel line.

Although manufacturers use various acronyms and names for fuel injection systems (MPI, EFI, etc.), there are two basic types of fuel injection systems: throttle body injection and port injection. Throttle body injection delivers fuel into an engine throttle body. Port injection delivers fuel separately to each engine cylinder through fuel injectors that are connected to either a fuel rail or a fuel distributor. The next column lists the various injection systems.

Throttle Body Injection Systems (Domestic)

CFI – Central Fuel Injection: Ford

TBI – Throttle Body Injection: AMC, Chrysler, GM

Port Injection Systems (Domestic and Import)

Systems with a Fuel Rail (Domestic)

MPFI – Multi-Port Fuel Injection: AMC, Chrysler, Jeep

MPI – Multi-Port Injection: Ford, GM

PFI – Port Fuel Injection: Ford, GM

SFI – Sequential Fuel Injection: AMC, Chrysler, Ford, GM, Jeep

Systems with a Fuel Rail (Import)

AFC – Air Flow Control: Asian vehicles (Datsun, Mazda, Nissan, Subaru, Toyota), and European vehicles (BMW, VW)

EFI – Electronic Fuel Injection: Asian vehicles (such as Diahatsu, Honda, Mazda, Nissan, Subaru, Toyota, etc.)

MFI – Multiple Fuel Injection: Asian vehicles (such as Honda, Mazda, Nissan, Subaru, Toyota, etc.)

PGM – Programmable: Acura, Honda

Single Point: Subaru

Systems with a Fuel Distributor (Import)

CIS – Constant Injection System: European vehicles (with a warm-up regulator in the return line)

CISE – Constant Injection System Electronic: European vehicles (warm-up regulator built into fuel distributor)

General Test Instructions

Use the following instructions as a general guideline. For specific steps, always refer to the vehicle's service manual.

1. Loosen vehicle's fuel filler cap.
2. Remove fuel pump fuse from fuse block.
3. Turn ignition to START/RUN and idle engine until fuel in fuel line is consumed (engine stops).

NOTE: For some 1991 and newer GMs, if engine does not start and run: replace pump fuse, raise and safely support vehicle, disconnect fuel pump electrical connector(s), lower vehicle, repeat step 3. (Refer to vehicle's service manual.)

4. To release remaining pressure, turn ignition to START/RUN for 3 seconds and then turn to OFF (engine should not run).
5. Replace fuel pump fuse [or electrical connector(s)].
6. Determine adapters required for testing and make connections: Connect gauge (No. 10) to hose assembly (No. 11); if required, connect 11 to TBI/CIS hose assembly (No. 12); connect adapters to 11 or 12 (as required) and to vehicle at testing location. (For assistance, use the applications list and illustrations provided in this Guide.)

NOTE: If using TBI/CIS hose assembly (12), make sure shutoff valve is open.

7. Turn ignition to START/RUN. Wait until fuel pump stops (takes about 1.5 to 3 seconds). Then turn ignition to OFF.

NOTE: Gauge pressure should stabilize. If pressure does not stabilize, or if pump does not run properly, refer to vehicle's service manual.

8. Place loose end of clear plastic hose on hose assembly (11) into approved drain container. Press and hold (open) relief valve (on 11) until fuel drains and air bubbles are no longer visible in hose, then release (close) valve.
9. Wait 10 seconds; turn ignition to START/RUN (engine should start unless "dead head" testing).
10. Do the specific tests on the next two pages:

CFI, TBI, AFC, PGM, and Single Point – static (running) fuel pressure, fuel volume, or fuel pressure leak down (for GM TBI can also do primary system pressure "dead head" test)

MPFI, MPI, PFI, SFI, EFI, and MFI – static (running) fuel pressure, fuel volume, fuel pressure leak down, or fuel pump output pressure

CIS – fuel volume, cold control pressure, hot control pressure, primary system pressure, or rest pressure

CISE – fuel volume, system pressure, residual pressure

11. After testing, remove test components and replace vehicle components as follows: turn ignition to OFF; repeat steps 2, 3, 4, and 5; disconnect test components; reconnect vehicle components; repeat steps 7 and 8; tighten fuel filler cap.

Specific Tests

Follow the General Test Instructions on the previous page. At step 10, do the following tests as necessary.

NOTE: For all tests, refer to the vehicle's service manual for specifications and diagnostic/repair procedures.

Static (Running) Fuel Pressure

1. Run engine at idle until gauge pressure stabilizes.
2. Compare gauge pressure to pressure specified in vehicle's service manual.

Fuel Volume

1. Run engine at idle and place loose end of clear plastic hose (on No. 11) into approved drain container.
2. Press and hold (open) relief valve (on 11) while keeping engine at idle; monitor fuel output for 30 seconds; release (close) valve.

Fuel pump should maintain engine idle and output a minimum of one pint of fuel in 30 seconds. (For CIS and CISE, output should be one quart in 30 seconds).

Fuel Pressure Leak Down

NOTE: For GM low pressure TBI, test does not work because of pressure drop caused by pressure regulator design.

1. Run engine at idle and compare gauge pressure with pressure specified in vehicle's service manual.
2. Turn ignition to OFF, wait 15 to 20 minutes, check gauge pressure. Pressure should not drop more than specified in vehicle's service manual (if it does, pressure may be leaking down).

NOTE: If necessary, turn ignition to START/RUN to restart engine for other tests.

Fuel Pump Output Pressure (“Dead Head”)

1. Turn ignition to OFF.
2. Compare gauge pressure with pressure specified in vehicle's service manual.

Specific Tests

Follow the General Test Instructions on page 13. At step 10, do the following tests as necessary.

NOTE: For all tests, refer to the vehicle's service manual for specifications and diagnostic/repair procedures.

Cold Control Pressure (CIS)

NOTE: Engine must be cold for this test.

1. Run engine at idle until gauge pressure stabilizes.
2. Disconnect electrical connector from fuel control pressure regulator. **Do not run engine for more than 1 minute with regulator disconnected.**
3. Compare gauge pressure with pressure specified in vehicle's service manual.
4. Turn ignition to OFF and reconnect electrical connector to fuel control pressure regulator.

NOTE: If necessary, turn ignition to START/RUN to restart engine for other tests.

Hot Control Pressure (CIS)

1. Run engine at idle until it reaches operating temperature.
2. Compare gauge pressure with pressure specified in vehicle's service manual.

Rest Pressure (CIS)

Same as **Fuel Pressure Leak Down** on page 14.

Primary System Pressure (CIS/GM TBI) [Fuel Pump Output - "Dead Head"]

1. Run engine at idle until it reaches operating temperature.
2. Close shutoff valve on TBI/CIS hose assembly (No. 12). This "dead heads" fuel pump. **Do not close valve for more than 10 seconds;** closed valve creates very high fuel pressure.
3. Compare gauge pressure with pressure specified in vehicle's service manual.

System Pressure (CISE)

Same as **Static (Running) Fuel Pressure** on page 14.

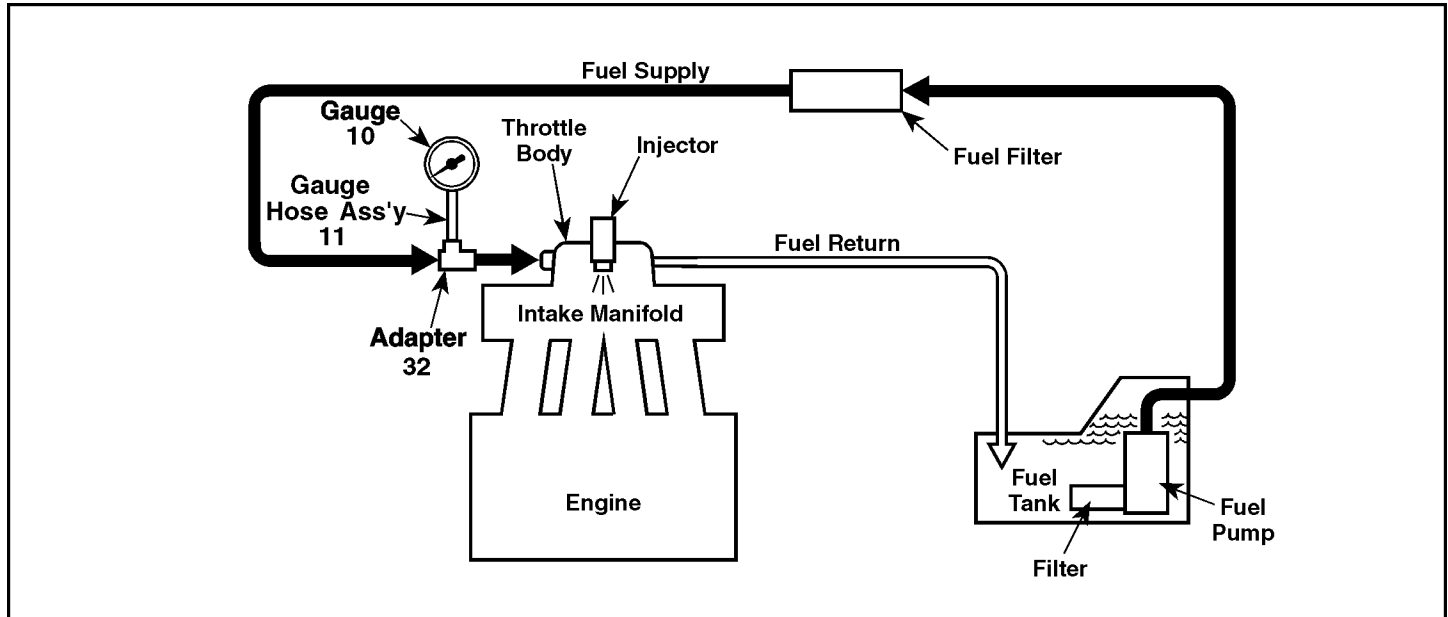
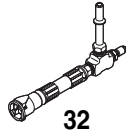
Residual Pressure (CISE)

Same as **Fuel Pressure Leak Down** on page 14.

Domestic Vehicle Connections

CFI Vehicles – Ford

*Connecting at the Throttle Body
using 10 and 11
with 32*



Domestic Vehicle Connections

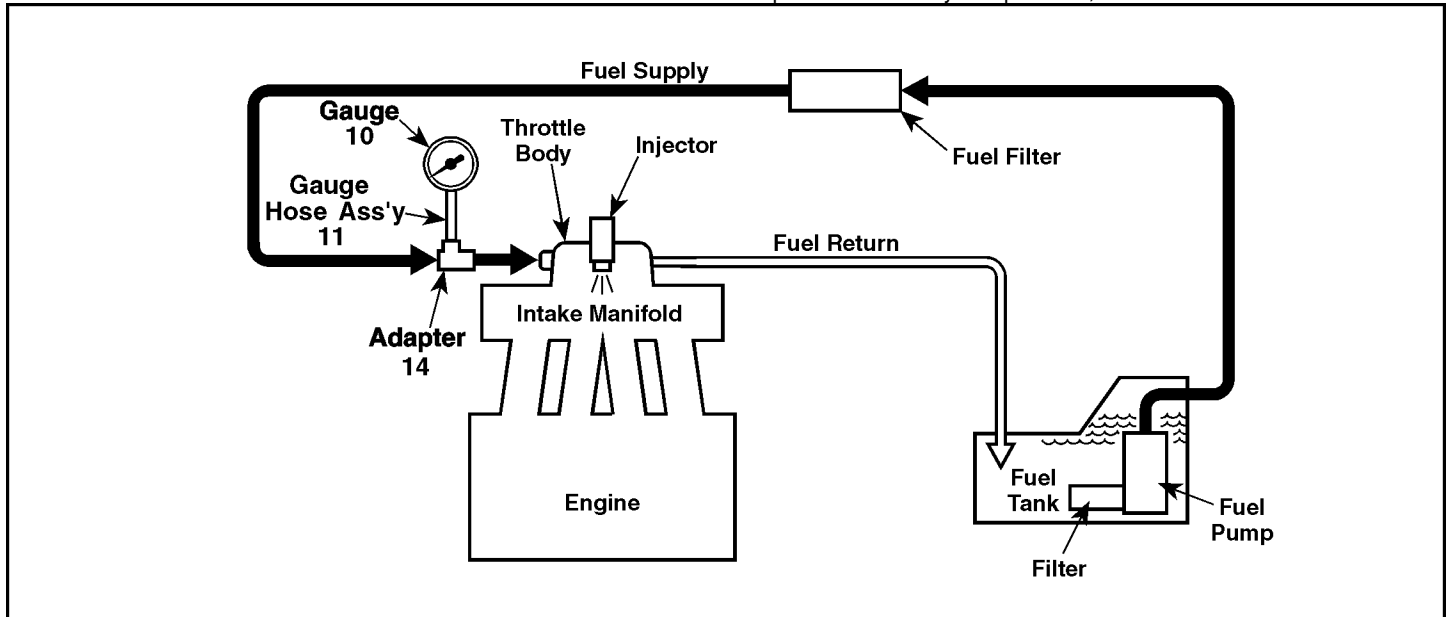
TBI Vehicles – AMC and Chrysler

*Connecting at the Throttle Body
using 10 and 11
with 14*



14*

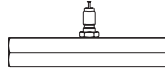
*Use No. 14 with hose and clamp in Kit's Accessory Compartment; use hose that fits vehicle's fuel line.



Domestic Vehicle Connections

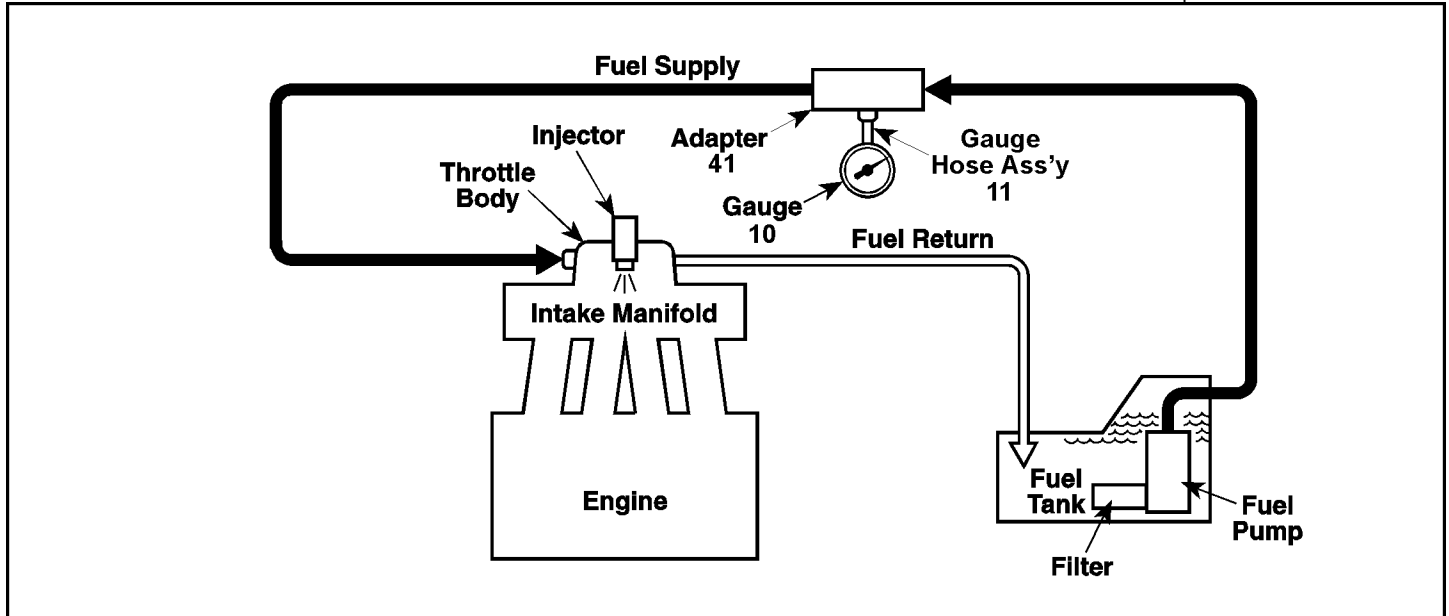
TBI Vehicles – GM

Connecting at the Fuel Filter Location
using 10 and 11
with 41



41*

*Replace Fuel Filter with No. 41



Domestic Vehicle Connections

TBI Vehicles – GM

*Connecting at the Throttle Body
using 10, 11, and 12
with 34 and 35 or 36 and 37*



34



35

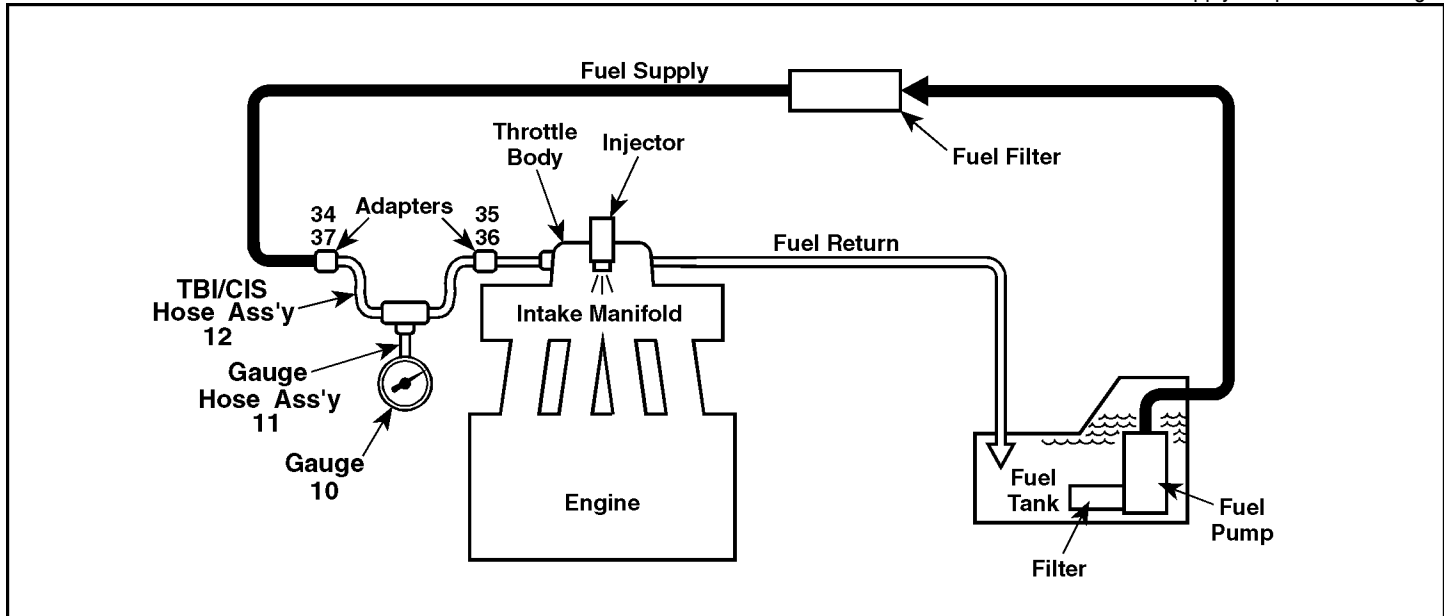


36



37

NOTE: This connection is for supply line pressure testing.



Domestic Vehicle Connections

TBI Vehicles – GM

*Connecting to the Supply Line End
using 10, 11, and 12
with 36 and 37, and plug 40*



36

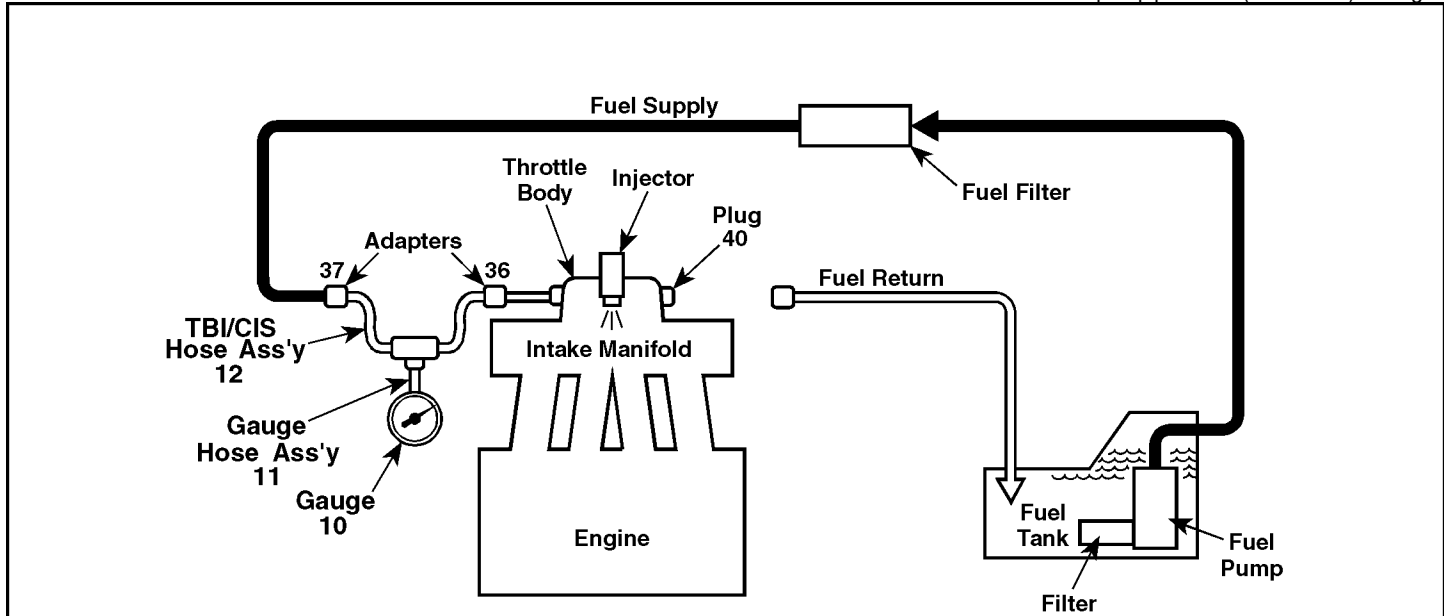


37



40

NOTE: This connection is for fuel pump pressure (dead head) testing.



Domestic Vehicle Connections

TBI Vehicles – GM

*Connecting into the Return Line
using 10, 11, and 12
with 38 and 39*

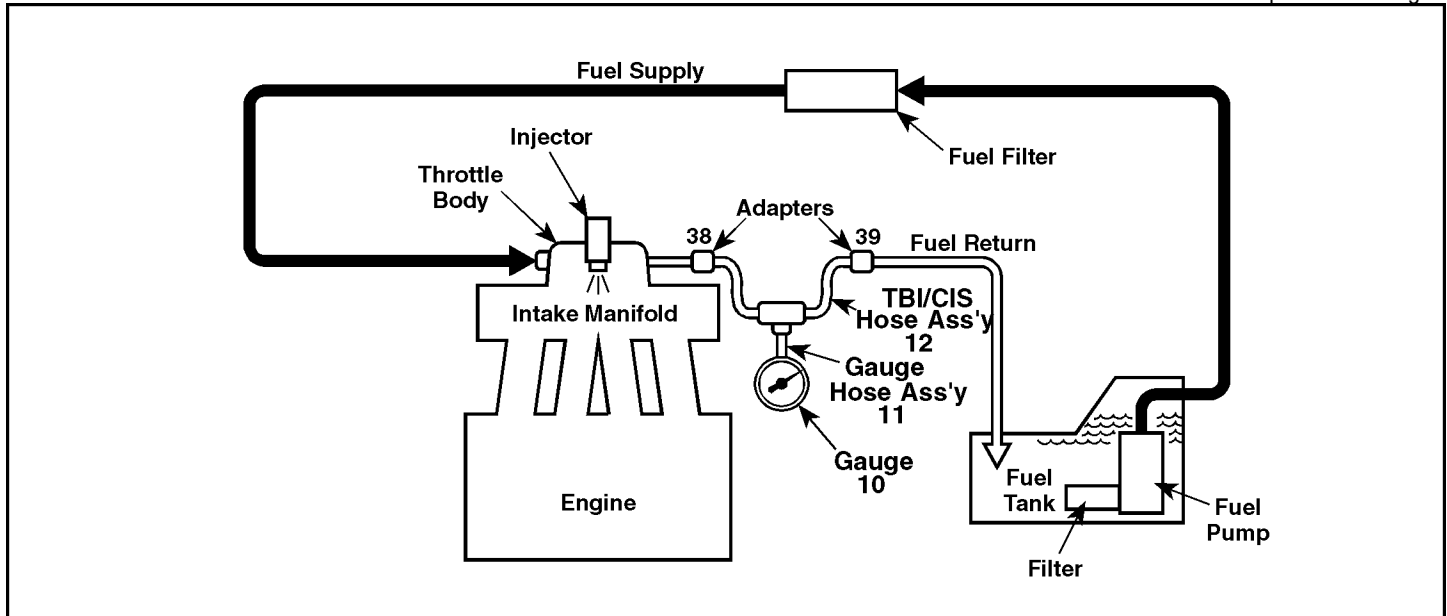


38



39

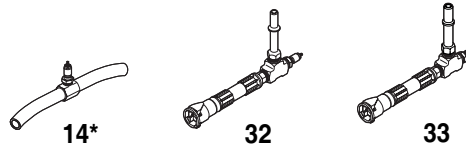
NOTE: This connection is for return line pressure testing.



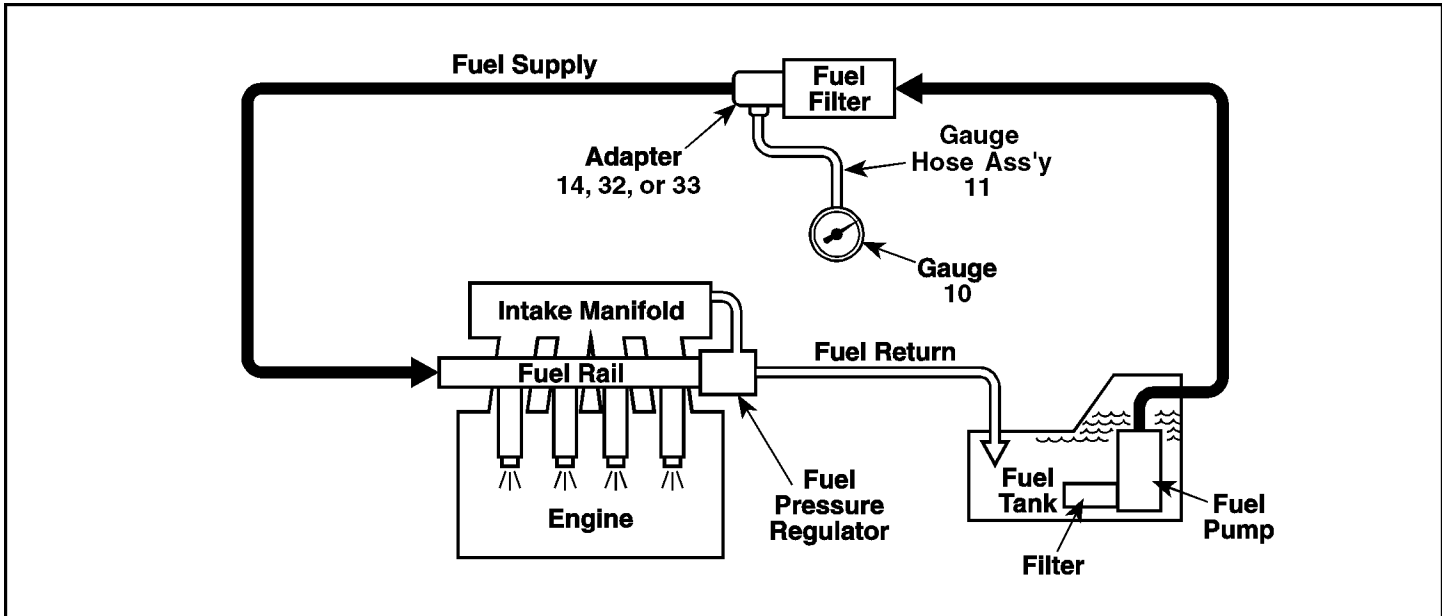
Domestic Vehicle Connections

MPFI, MPI, PFI, and SFI Vehicles

Connecting at the Fuel Filter Location
using 10 and 11
with 14, 32, or 33



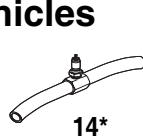
*Use No. 14 with hose and clamp in Kit's Accessory Compartment; use hose that fits vehicle's fuel line.



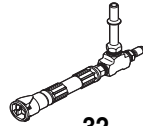
Domestic Vehicle Connections

MPFI, MPI, PFI, and SFI Vehicles

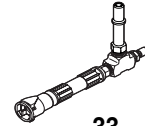
*Connecting into the Supply Line
using 10 and 11
with 14, 32, 33, or 42*



14*



32

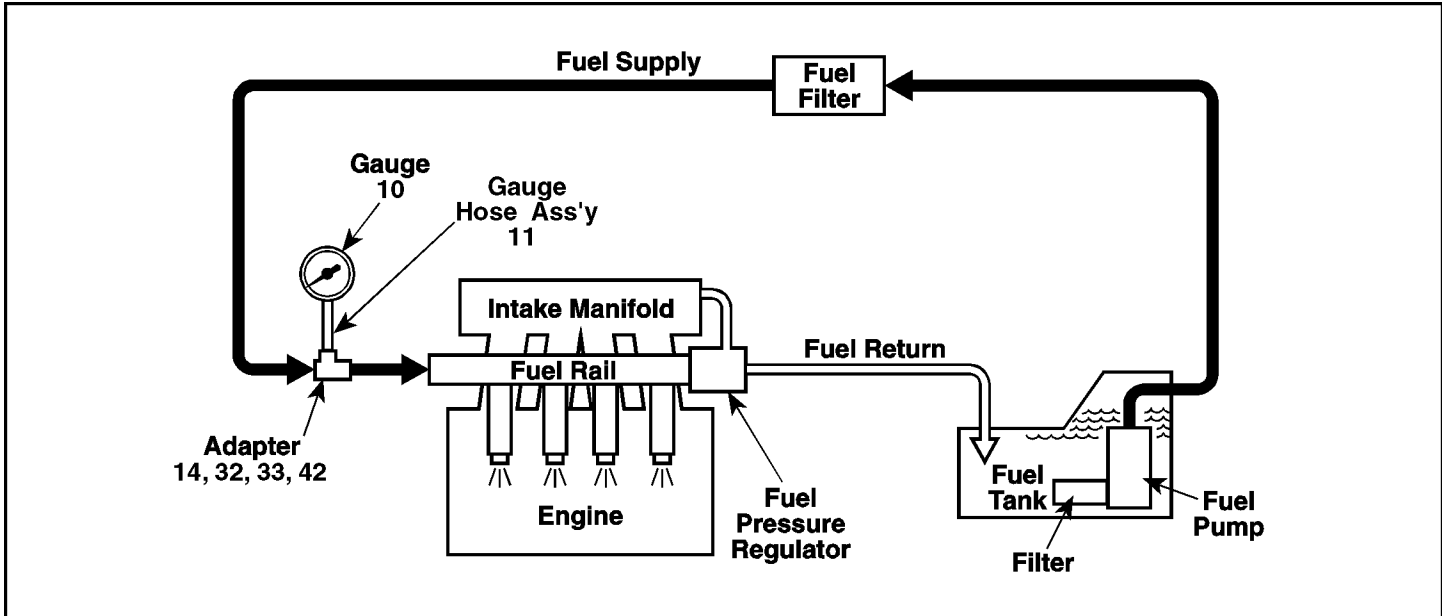


33



42

*Use No. 14 with hose and clamp in Kit's Accessory Compartment; use hose that fits vehicle's fuel line.



Domestic Vehicle Connections

MPFI, MPI, PFI, and SFI Vehicles

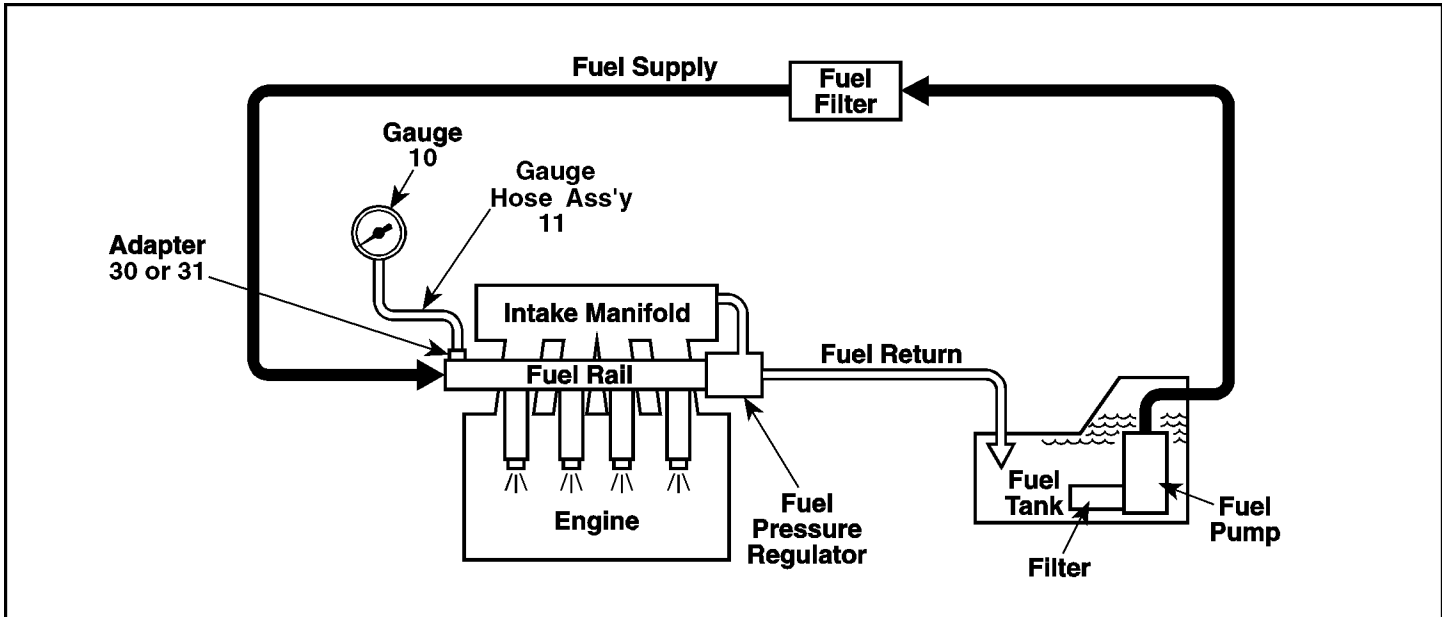
Connecting at the Fuel Rail
using 10 and 11
with 30 or 31



30



31



Domestic Vehicle Connections

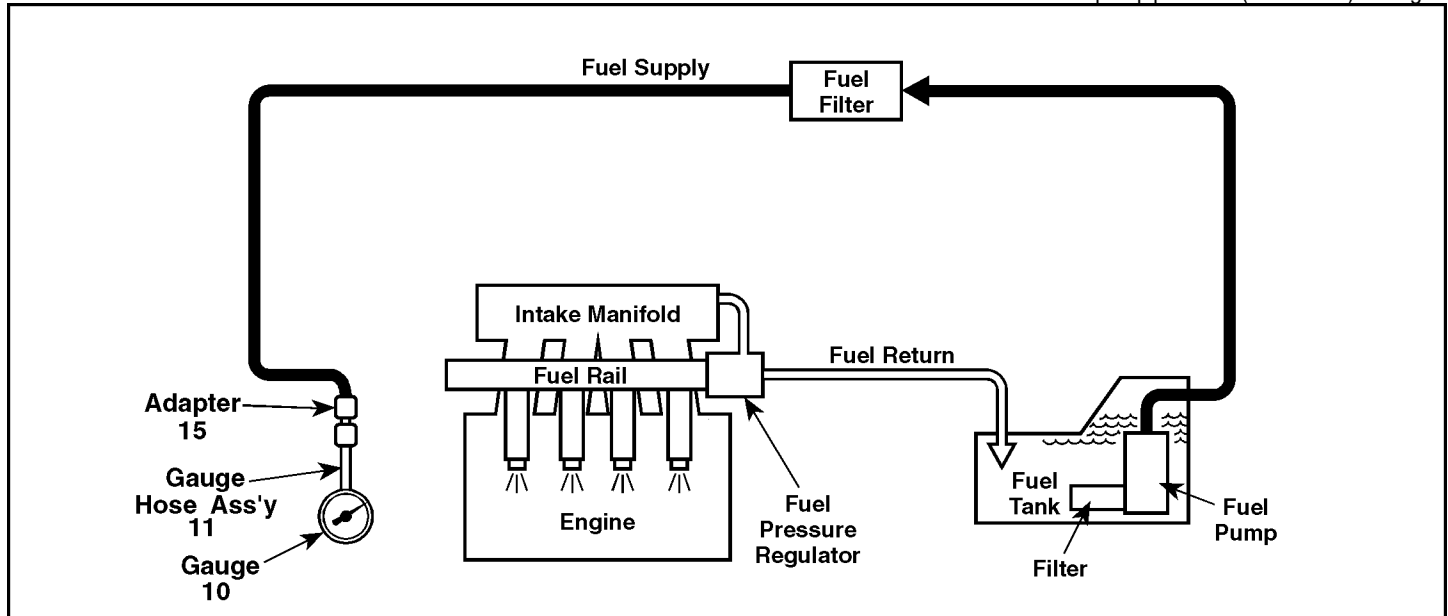
MPFI, MPI, PFI, and SFI Vehicles

Connecting to the Supply Line End
using 10 and 11
with 15



15

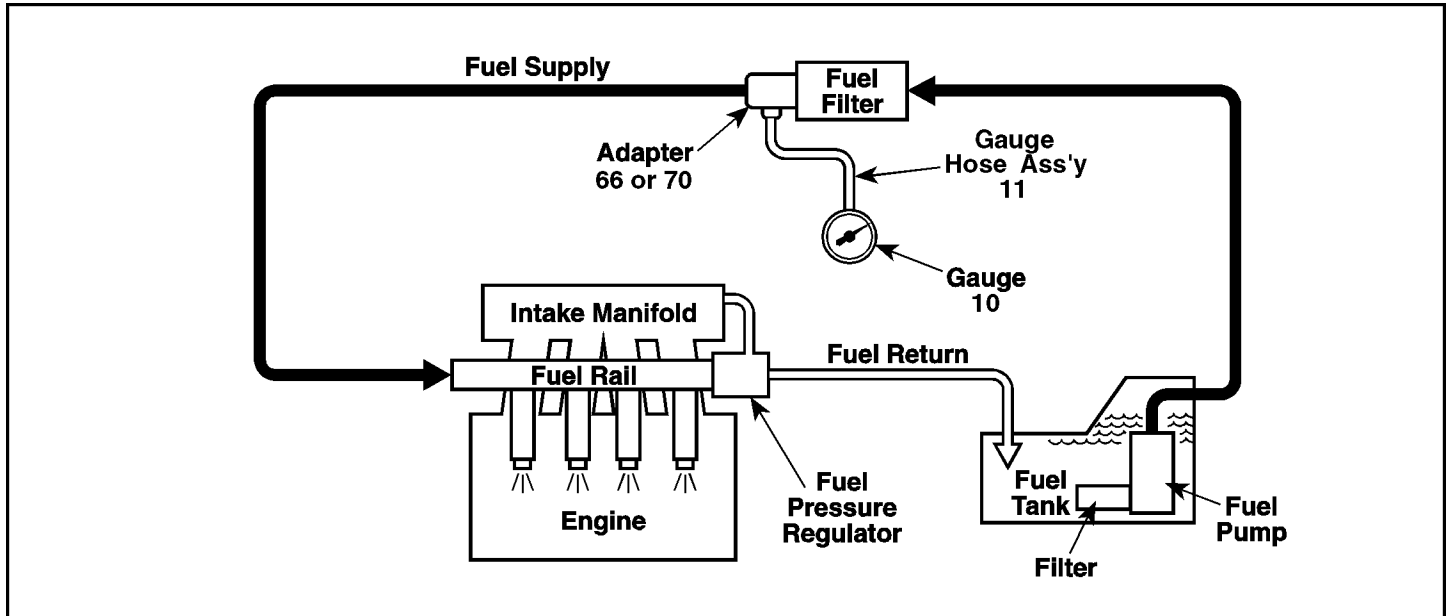
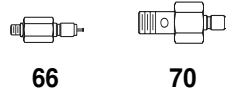
NOTE: This connection is for fuel pump pressure (dead head) testing.



Import Vehicle Connections – Asian

AFC, EFI, MFI, and PGM Vehicles

Connecting at the Fuel Filter Location
using 10 and 11
with 66 or 70

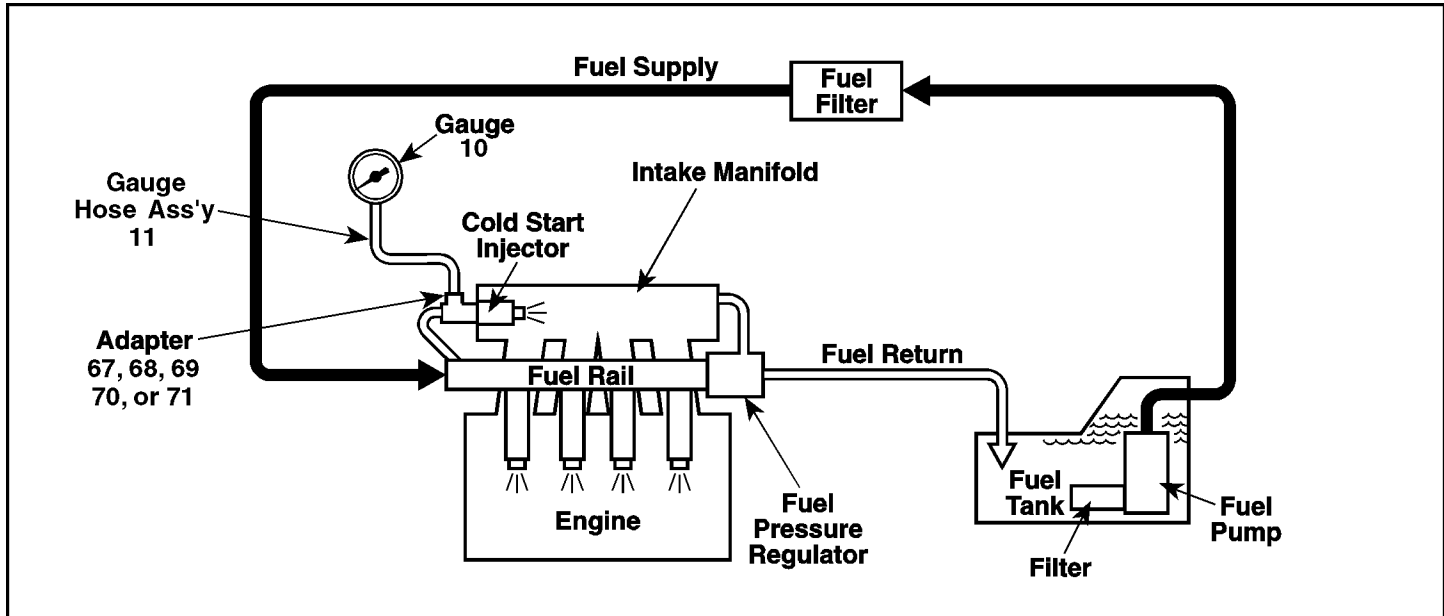
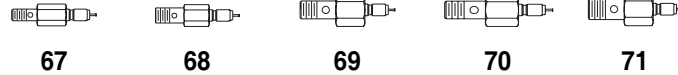


Import Vehicle Connections – Asian

AFC, EFI, and MFI Vehicles

Connecting at the Cold Start Injector
using 10 and 11

with 67, 68, 69, 70, or 71



Import Vehicle Connections – Asian

AFC, EFI, MFI, and Single Point Vehicles

Connecting at the Fuel Rail
using 10 and 11

with 14, 67, 68, 69, 70, or 71



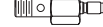
14



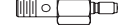
67



68



69

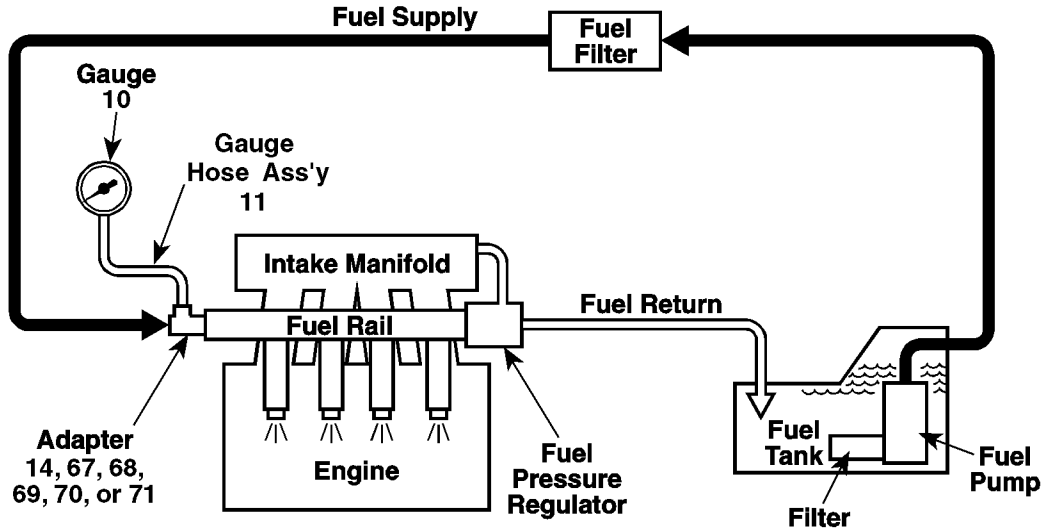


70



71

*Use No. 14 with hose and clamp in Kit's Accessory Compartment; use hose that fits vehicle's fuel line.



NOTE: Vehicle may have a cold start injector (not shown); connection is the same as shown above.

Import Vehicle Connections – Asian

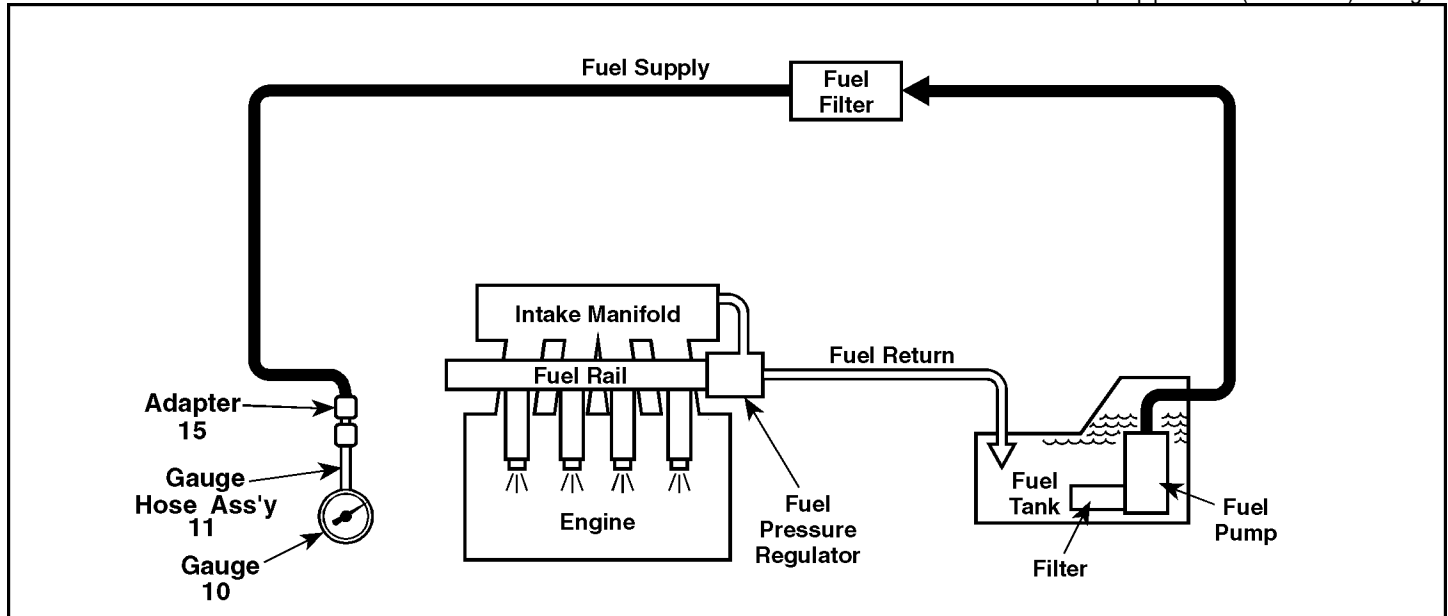
EFI and MFI Vehicles

*Connecting to the Supply Line End
using 10 and 11
with 15*



15

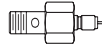
NOTE: This connection is for fuel pump pressure (dead head) testing.



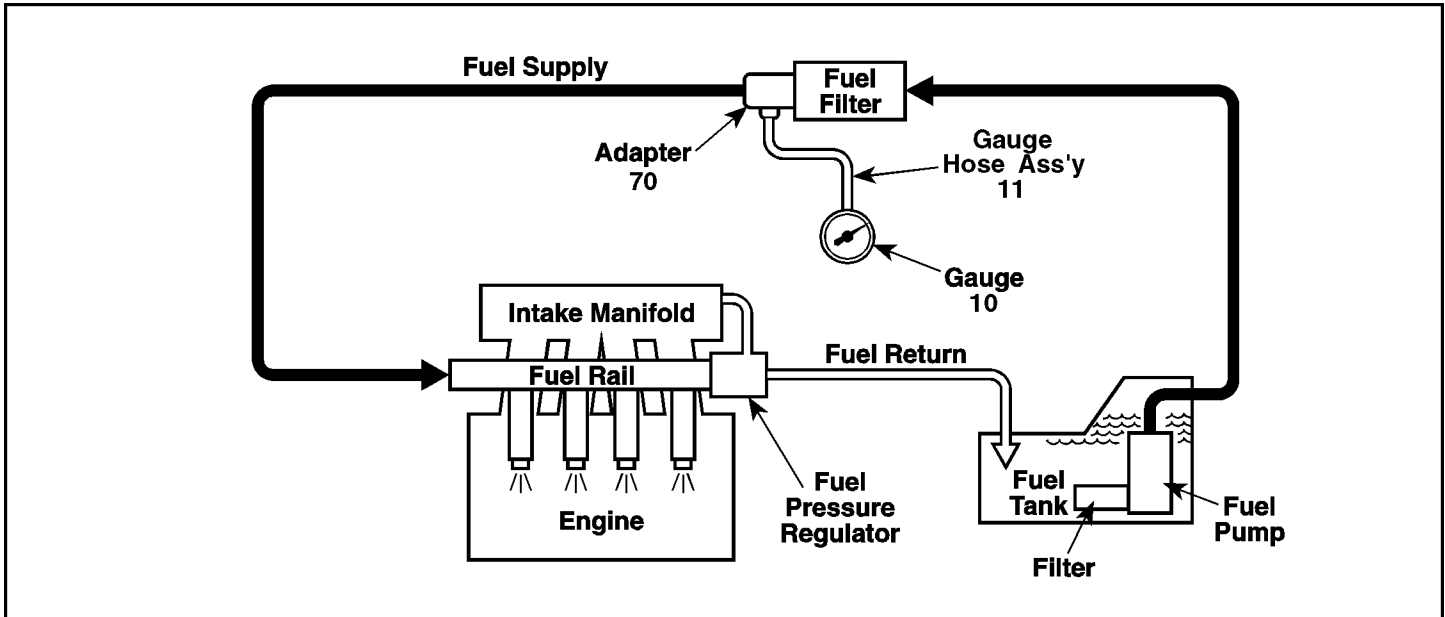
Import Vehicle Connections – European

AFC Vehicles

Connecting at the Fuel Filter Location
using 10 and 11
with 70



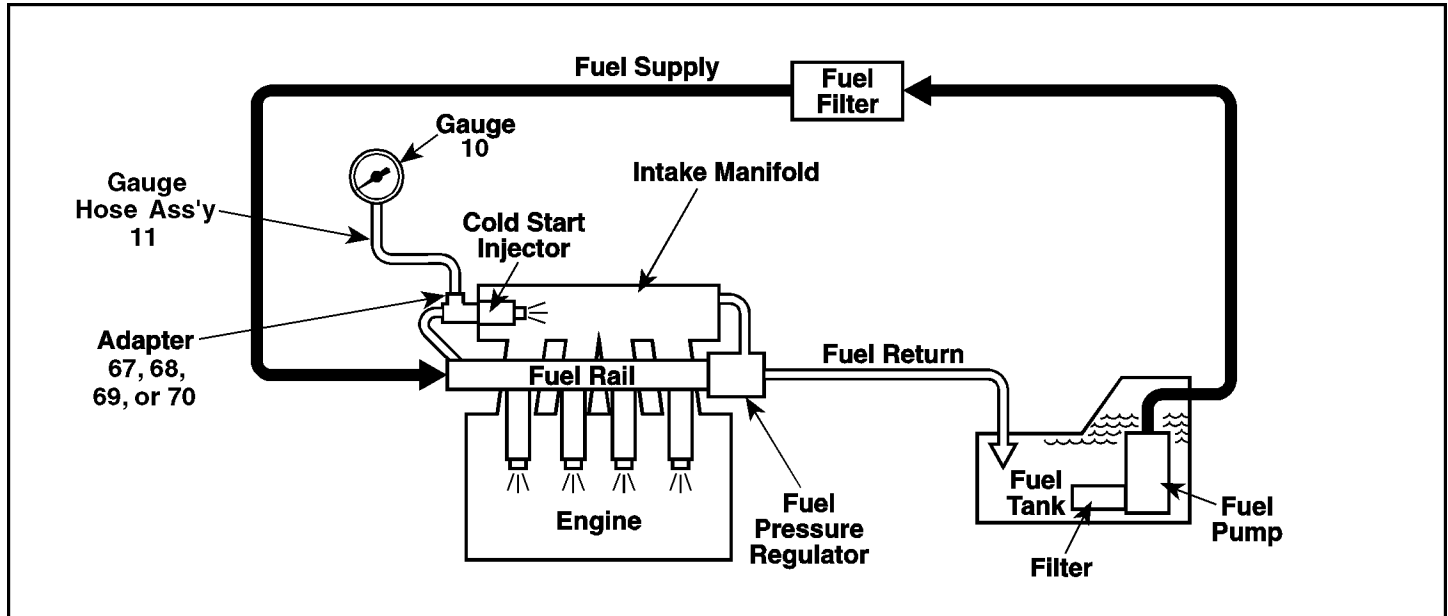
70



Import Vehicle Connections – European

AFC Vehicles

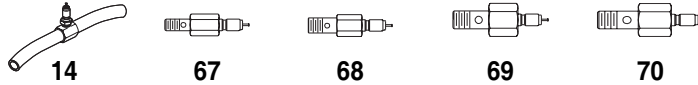
Connecting at the Cold Start Injector
using 10 and 11
with 67, 68, 69, or 70



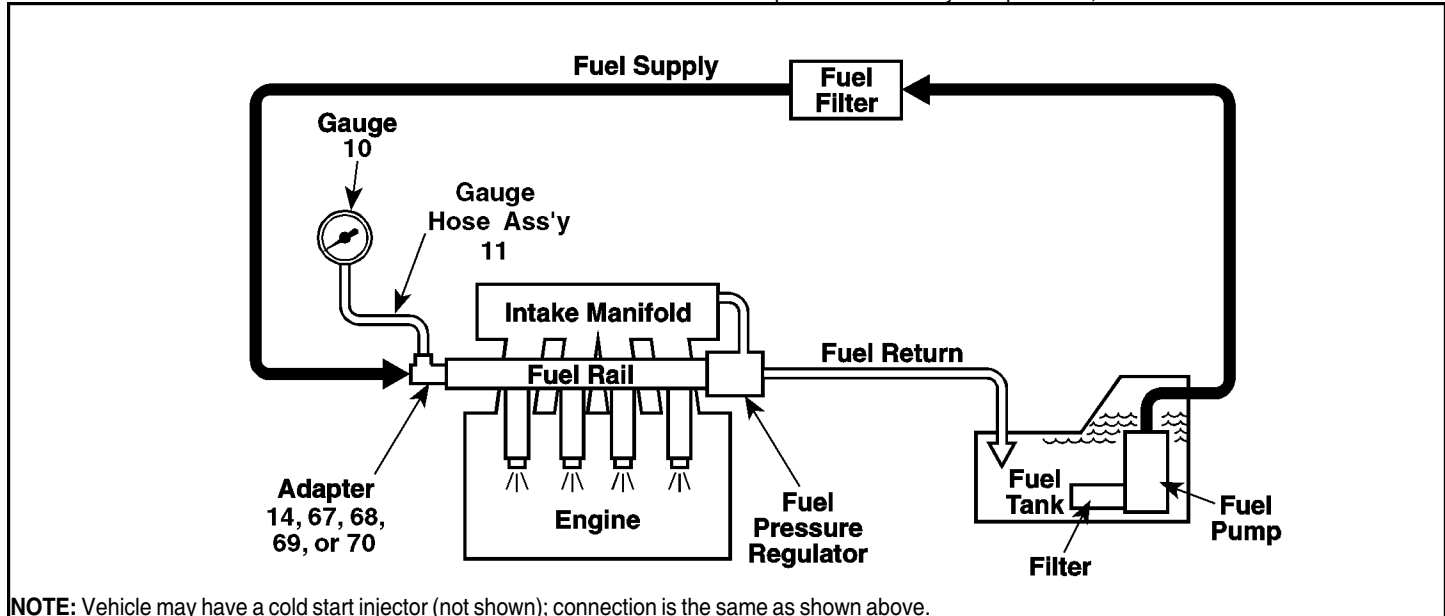
Import Vehicle Connections – European

AFC Vehicles

Connecting at the Fuel Rail
using 10 and 11
with 14, 67, 68, 69, or 70



*Use No. 14 with hose and clamp in Kit's Accessory Compartment; use hose that fits vehicle's fuel line.

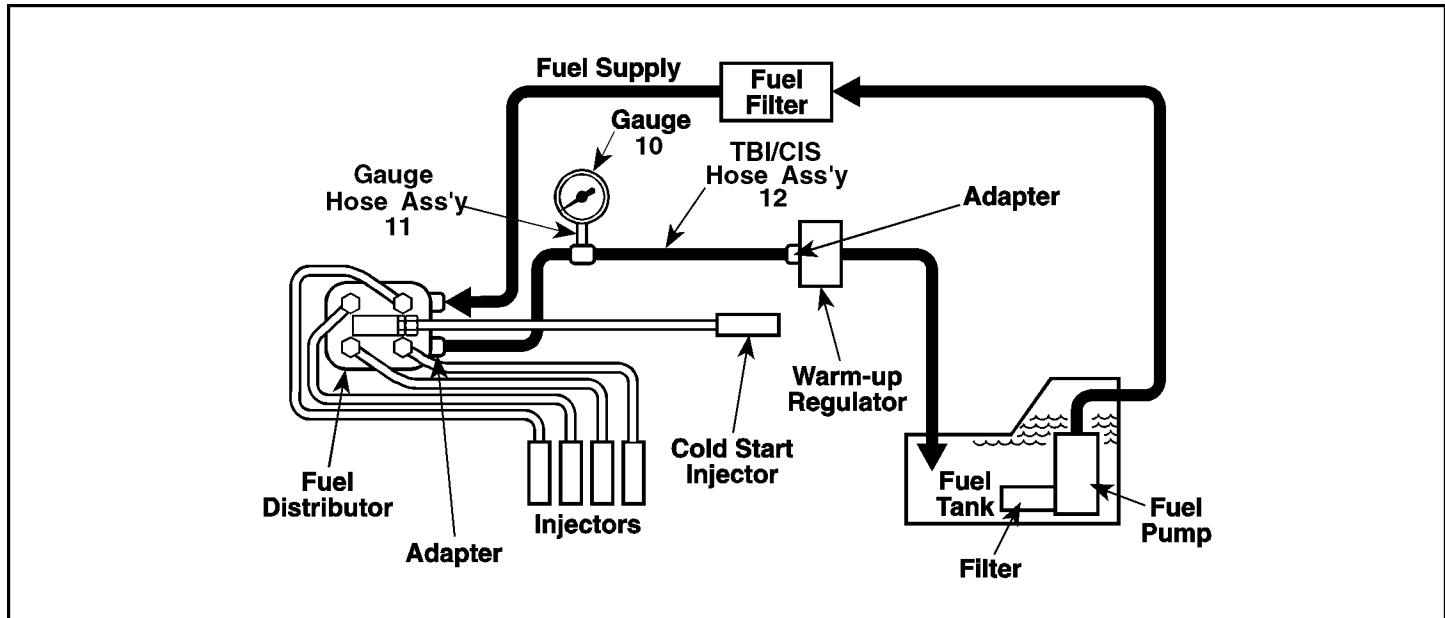
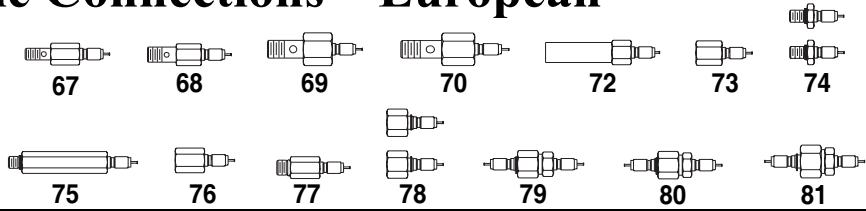


NOTE: Vehicle may have a cold start injector (not shown); connection is the same as shown above.

Import Vehicle Connections – European

CIS Vehicles

Connecting into the Return Line
using 10, 11, and 12 with 67, 68, 69, 70,
72, 73, 74, 75, 76, 77, 78, 79, 80, or 81



Import Vehicle Connections – European

CISE Vehicles

Connecting at the Fuel Distributor using 10 and 11 with 67, 68, 69, 70, 72, 73, 74, 75, 76, 77, 78, 79, 80, or 81

