COOLING SYSTEM TEST & REFILL KIT
MODEL MV4525

USER'S MANUAL

SPECIFICATIONS

Vacuum Air Pressure Requirements:

Min. Pressure:	90 psi (6.2 bar) (600 kPa)
Max. Pressure:	120 psi (8.3 bar) (830 kPa)
Vacuum threads for air line connection:	1/4" NPT

Table of Contents

Service Parts

Part Number	Description
823032	Valve Coupler
823033	Valve Coupler Repair Kit
823034	Temperature Probe
823035	Extension Hose
823036	Pressure Pump
823038	Venturi Vacuum
823039	Refill Hose
823040	Compound Gauge
823042	Adapter Wrench
823043	Plug and Tether
823044	Hose Clip
823045	Drain Hose
823046	Deep Neck Adapter
823047	MVA100 O-Ring and Washer, MVA101 O-Ring and Washer, MVA102 O-Ring and Washer, MVA103 O-Ring and Washer
823050	Custom-molded case

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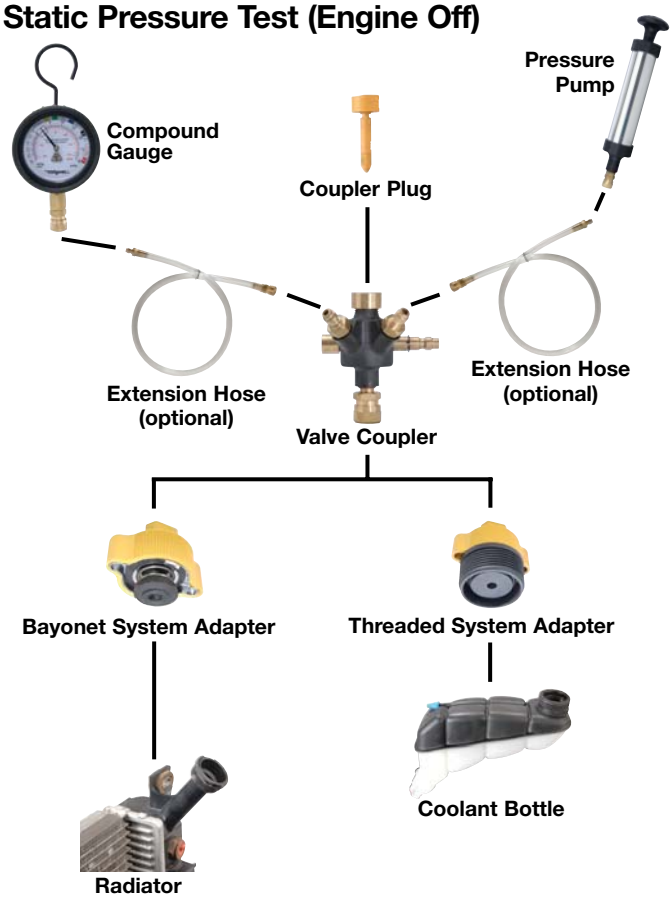
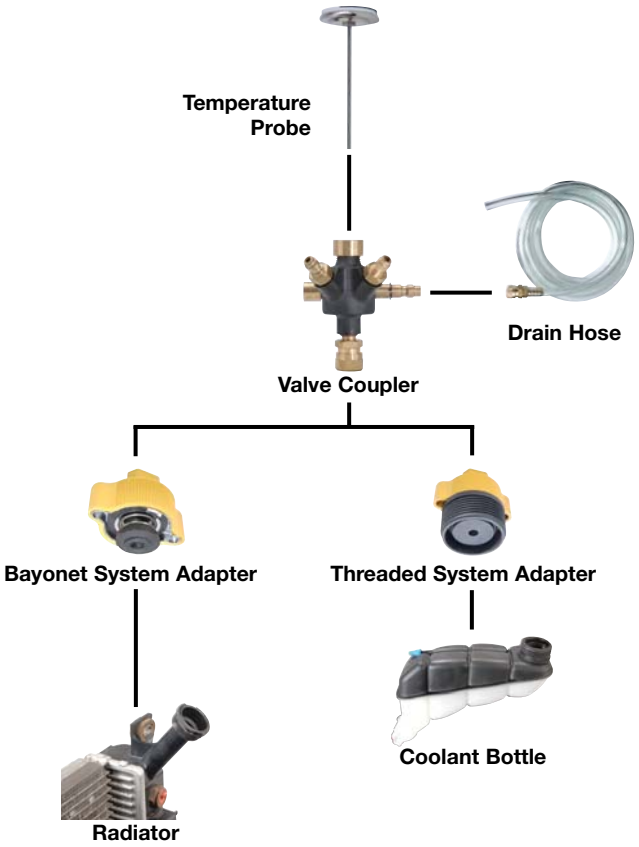
Static Pressure Test (Engine Off)



Temperature Testing (Engine On)



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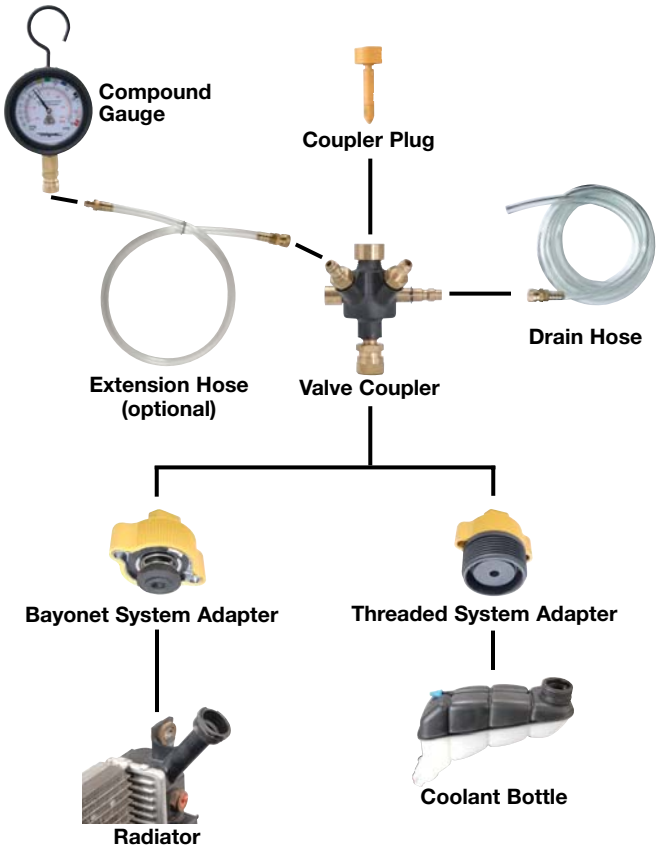
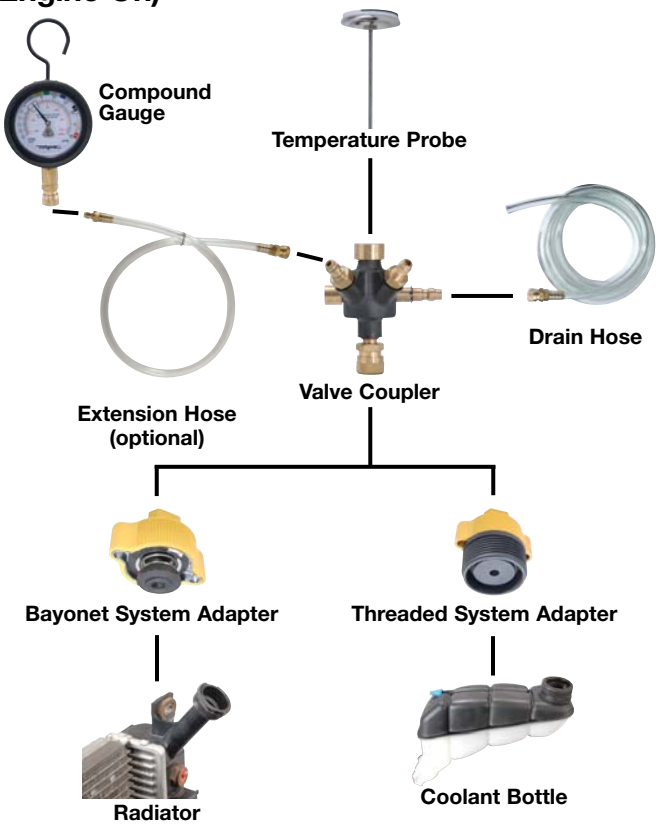
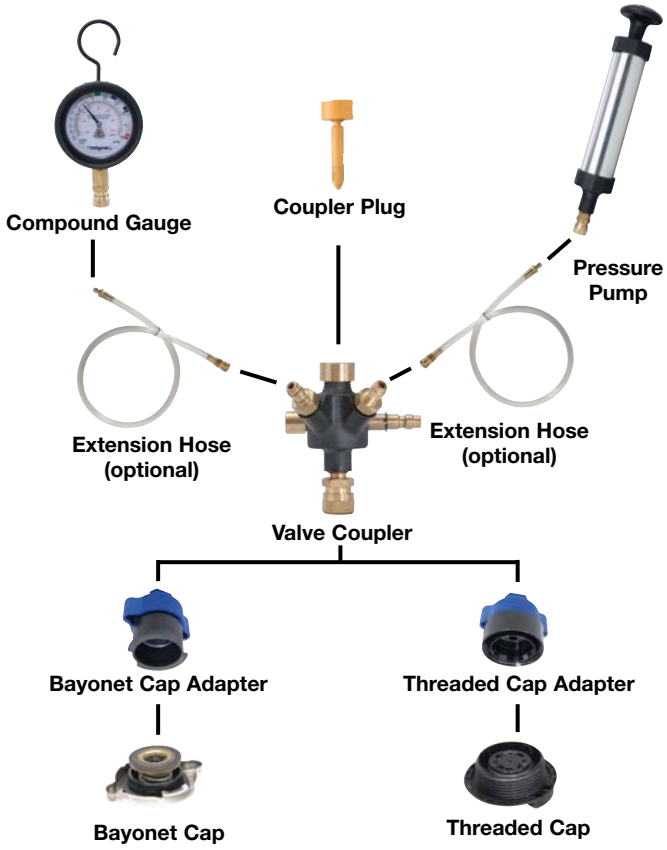


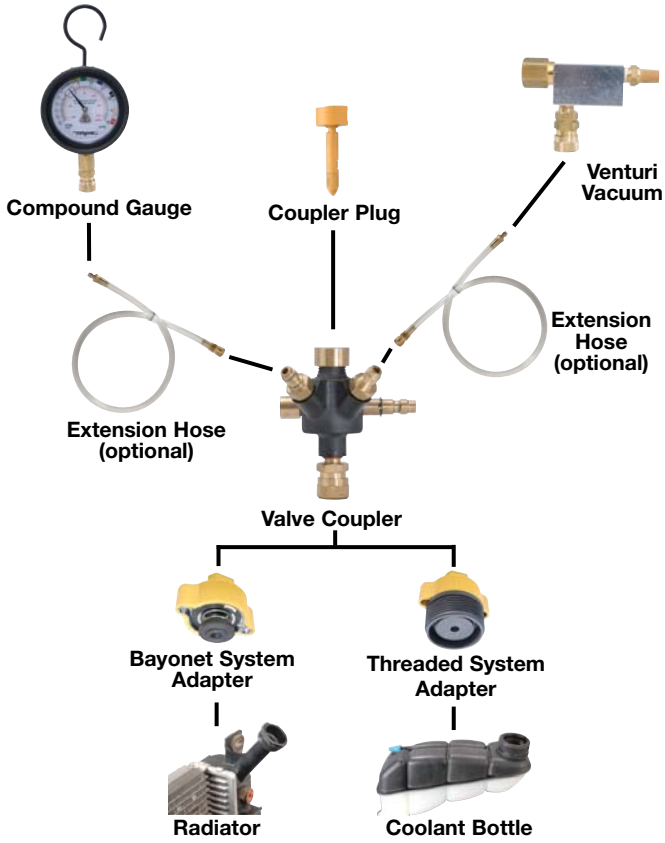
Dynamic Pressure/Vacuum/Temperature Test (Engine On)



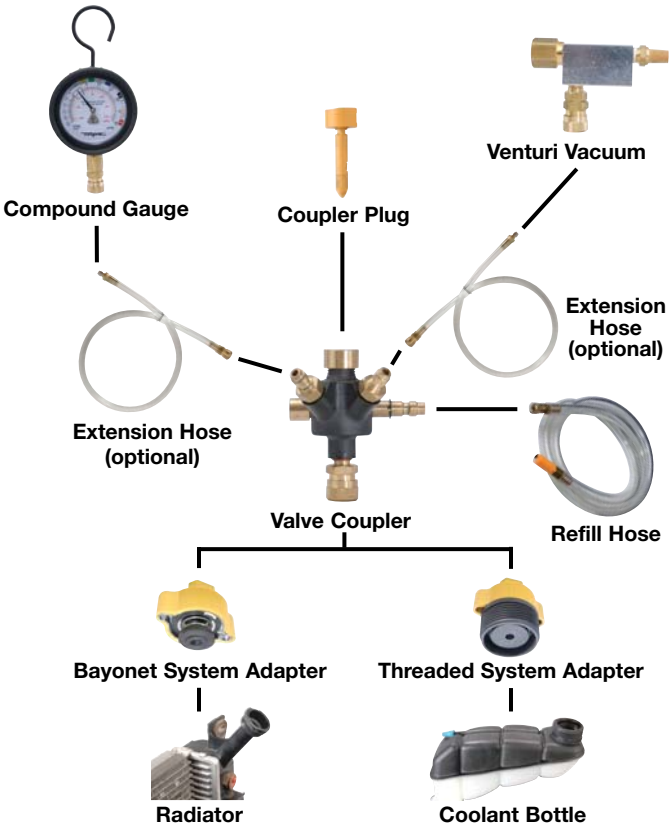
Cap Pressure Test



Vacuum Leak Test



System Refill/Airlock Elimination



Applications & Basics of Testing

The MV4525 Cooling System Test & Refill Kit includes equipment to test and monitor pressure, temperature and vacuum simultaneously to perform a complete cooling system analysis. It is capable of performing diagnostic tests with either the engine off or engine on. While engine off tests are quick and reliable, testing with the engine on more accurately represents the conditions under which cooling system failures occur, and greatly expands the types of failures that can be diagnosed.

Engine "Off" Testing
Cooling system leaks are a common cause of overheating, and can be quickly and easily diagnosed without running the engine. With the MV4525, the user can choose to apply either pressure or vacuum to the system, and then monitor it for a short period of time to determine if a leak exists. Pressure is most commonly used to perform this test because it will force fluid to seep from any external leak, making it easy to identify.

For convenience, a vacuum leak test is usually performed in conjunction with a vacuum refill. A vacuum refill is performed with the engine off, and is a quick and effective way to refill the cooling system without trapping air. A vacuum leak test and refill is performed after the cooling system has been drained. A compressed air operated vacuum is used to remove all air from the empty system, and then the system is monitored to determine if there are any leaks. If no leaks are present, the vacuum is used to automatically draw in new fluid, and fill the system without reintroducing air.

Testing proper function of the cooling system pressure cap is another test that is performed with the engine off. All pressure caps have a built-in vent designed to release pressure from the cooling system when it exceeds a maximum value. The proper function of this cap is critical to preventing failures caused by under- or over-pressurization. This test is performed using the pressure pump and gauge included in this kit, however it also requires cap test adapters that are not included with this kit, and must be purchased separately. Refer to the Adapter Selection Guide included in the kit for more information on cap adapters.

Engine "On" Testing
Simultaneously monitoring pressure, vacuum, and temperature when the engine is first started, and while it progresses towards, or cools down from, normal operating temperature, provides extensive information that is invaluable to diagnosing cooling system related problems. Performing an engine-on test using the MV4525 can quickly diagnose a blown head gasket or cracked or damaged block or head. It can also indicate a faulty thermostat, fan switch/relay, or coolant sensor. In addition, some system leaks may only be evident during an engine's normal operational warm-up and cool-down cycle. The procedures in this manual will illustrate how to perform engine-on tests as well as diagnose the results.

Precautions
This equipment is designed for servicing a variety of vehicles in a safe, convenient manner. However, differences in cooling systems may make it impossible to perform some of the tests indicated in these instructions on every vehicle. The procedures documented in this manual are to serve as guidelines for the use of this equipment. In addition to these guidelines, always follow the manufacturer's recommended procedures when servicing each unique vehicle. Do not attempt to force a test on a cooling system for which this equipment is not designed to perform.

Performing cooling system tests using the MV4525 is simple and straightforward if you follow the instructions. However, always keep in mind that you are working with a system that may be full of hot, pressurized fluid that is just waiting to be expelled. The MV4525 has safety valves built-in at every possible connection, but if you are testing an engine that is hot and/or pressurized, always stop to think before disconnecting a hose or other component, or shifting a valve.

Always read carefully and understand instructions prior to using this equipment.

Always wear eye protection when removing the radiator or coolant bottle cap, or when performing any cooling system test.

Never remove the radiator or coolant bottle cap, or attempt to pressurize the cooling system of a vehicle that is overheated.

Always allow system to cool prior to attempting to perform any cooling system related test procedure.

Basics of Testing
When deciding where to connect to the cooling system, first look for the radiator and determine if it has a fill neck and pressure cap. This is common on about half of U.S. manufactured vehicles, and almost all Asian manufactured vehicles, and would be the first choice for connecting. If the radiator is closed and inaccessible, then the connection will be made through a coolant bottle. Some automotive cooling systems utilize a coolant overflow bottle that is not part of the sealed system. Attempting to test the cooling system through this bottle will not connect you into the sealed system, and will simply vent the test pressure or vacuum to the atmosphere. This type of overflow bottle is easily recognized because it typically utilizes a snap-on style cap or a threaded cap that is open to atmosphere. There are no adapters that are designed to fit this type of coolant overflow bottle. A test connection should be made through a radiator or coolant bottle with a bayonet or threaded style of cap designed to maintain a specific pressure in the cooling system.

Adapters
The MV4525 includes four cooling system adapters that fit the radiators and coolant bottles on the vast majority of U.S. and Asian manufactured vehicles, and even some European vehicles. An adapter is required to connect the test equipment to the specific make and model being tested. Once the correct adapter is identified for the test vehicle, it can be used to perform all of the tests outlined in this manual except for the cap pressure test. To perform a test on a vehicle application not covered by one the four included adapters, or to perform a cap pressure test, additional adapters must be purchased. Adapters are available for virtually every make and model of car, and can be purchased individually or as part of an adapter kit from Mityvac Tools. Refer to the Adapter Selection Guide included in the kit for more information on adapters.

Static Pressure Test (Engine Off)

For diagnosing:
Cooling system leaks

Set-up & Procedure:

1. Ensure the cooling system is cool and not pressurized. Carefully remove the radiator or coolant bottle pressure cap (Fig.1).
2. Check to see that the radiator or coolant bottle is filled to the proper level, and check hoses for visual damage or leaks. Fill and repair as necessary prior to testing.
3. Select the correct Cooling System Adapter for the application. Refer to the Adapter Selection Guide included in the kit.
4. Apply water or coolant to the rubber gasket and/or o-ring on the adapter, and install the adapter in place of the pressure cap (Fig. 2).
5. Install the Valve Coupler onto the System Adapter using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 3).
6. Install the Coupler Plug into the top of the Valve Coupler and tighten the threaded cap securely to form an airtight seal (Fig. 4).
7. Connect the Compound Gauge to the quick-connect labeled “Gauge” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the Valve Coupler and the Gauge (Fig. 5).
8. Connect the Pressure Pump to the quick-connect labeled “Pressure/Vacuum” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the Valve Coupler and the Pump (Fig. 6).
9. Ensure the Shuttle Valve on the Valve Coupler is shifted to the “Closed” position.
10. Operate the Pressure Pump until the needle on the Compound Gauge moves to the end of the colored band indicating the appropriate pressure range (see Chart A) of the cap (Fig. 7).
11. Watch the gauge for a short period of time. If the pressure reading drops, a leak is present.
12. With the system still pressurized, perform a visual inspection of the entire cooling system. Check hoses and connections for seepage, which would indicate a leak. Return to the gauge and check the reading once more.
13. Most leaks are external, and visible seepage occurs. However, a drop in pressure with no visible leakage can indicate a blown head gasket or cracked block, where fluid leaks into the combustion chamber. Visually inspect oil and transmission fluid for signs of coolant. Proceed to the Dynamic Pressure Test for better methods of diagnosing internal leaks.
14. When testing is complete, shift the Shuttle Valve to the “Open” position to relieve system pressure (Fig. 8).
15. Disconnect components, clean and store them properly.
16. Refill the radiator or coolant bottle to the proper level, and replace the cap.


Fig. 1


Fig. 2


Fig. 3

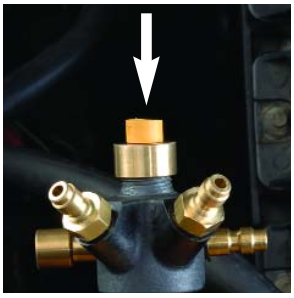


Fig. 4


Fig. 5


Fig. 6


Fig. 7


Fig. 8

Chart A: Cooling System Cap Pressure Test Ranges	
Rated Pressure (PSI)	Pressure Test Range (PSI)
4	3 - 5
7	6 - 8
10	9 - 11
13 or 14	12 - 16
15 or 16	14 - 18
18	16 - 20
20	18 - 22
30	28 - 30

Temperature Testing (Engine On)

For diagnosing:
Thermostat
Cooling fan and related components
Coolant sensor

Set-up & Procedure:

1. Ensure the cooling system is cool and not pressurized. Carefully remove the radiator or coolant bottle pressure cap (Fig. 9).
2. Check to see that the radiator or coolant bottle is filled to the proper level, and check hoses for visual damage or leaks. Fill and repair as necessary prior to testing.
3. Select the correct Cooling System Adapter for the application. Refer to the Adapter Selection Guide included in the kit.
4. Apply water or coolant to the rubber gasket and/or o-ring on the adapter, and install the adapter in place of the pressure cap (Fig. 10).
5. Install the Valve Coupler onto the system adapter using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 11).
6. Loosen the threaded cap on top of the Valve Coupler, and remove the Plug if necessary. Insert the Temperature Probe through the Valve Coupler, and adjust the depth of the probe to ensure it is in contact with the coolant in the bottle or radiator (Fig. 12). Do not force the probe down so hard that it damages the probe, radiator, or coolant bottle.
7. Tighten the cap on the Valve Coupler to form a seal around the Temperature Probe and hold it securely.
8. Ensure the Shuttle Valve on the Valve Coupler is shifted to the “Closed” position. (Fig. 13).
9. Start the vehicle engine and monitor the probe reading as the engine rises to operating temperature. Compare the results to the diagnosis below to determine proper function of thermostat, cooling fan sensor/relay, and coolant temperature sensor.

   Thermostat
   When the thermostat opens, the temperature will surge as hot coolant from the engine flows into the radiator or bottle. Note the peak temperature during this surge and compare it to the manufacturer’s thermostat specification. If the reading is not within a few degrees of the specification, the thermostat is faulty and should be replaced.

   If the temperature reading on the probe does not increase as the engine warms, this may indicate the thermostat is stuck closed, and should be replaced.

   If the reading on the probe increases very slowly and will not reach the thermostat opening temperature, the thermostat may be stuck open, and should be replaced.

   Cooling Fan(s)
   If the vehicle has electric fan(s), note the temperature at which they cycle on and off. Verify this reading against the manufacturer’s specification. If it’s within a few degrees, the cooling fan sensor(s) are functioning properly. If the fan(s) do not cycle on and off, check the fuse(s), motor(s), switch(s), and relay(s) to determine possible cause(s).

continued on next page


Fig. 9


Fig. 10


Fig. 11


Fig. 12


Fig. 13

Temperature Testing (Engine On) *continued*

Coolant Temperature Sensor
A faulty coolant temperature sensor can cause a multitude of drivability issues, but can be extremely difficult to diagnose. With the engine at normal operating temperature, and the thermostat open, note the temperature reading on the probe.
Use a scan tool to retrieve the coolant temperature from the ECM and compare it to the probe reading. If they are not within a few degrees, the sensor should be replaced.

10. When testing is complete, connect the Drain Hose to the Shuttle Valve using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 14).
11. Place the opposite end of the Drain Hose into a container appropriate to capture hot, pressurized coolant. Use the Hose Clip to secure the Drain Hose in position (Fig. 15).
12. Shift the shuttle valve to the “Open” position, allowing the hot fluid and pressure to be expelled (Fig. 16).
13. Once all pressure is relieved, cautiously disconnect components, clean and store them properly.
Caution: Hot fluid being expelled through the test equipment will cause quick-connects and other metal components to become hot. Handle such components with care, using a rag if necessary.
14. Refill the radiator or coolant bottle to the proper level, and replace the cap.

Fig. 14

Fig. 15

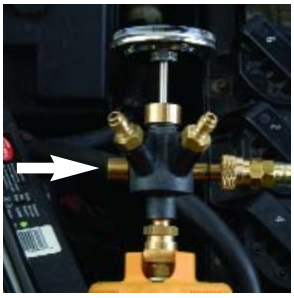


Fig. 16

Dynamic Pressure Test (Engine On)

For diagnosing:
Cooling system leaks

Set-up & Procedure:

1. Ensure the cooling system is cool and not pressurized. Carefully remove the radiator or coolant bottle pressure cap (Fig. 17).
2. Check to see that the radiator or coolant bottle is filled to the proper level, and check hoses for visual damage or leaks. Fill and repair as necessary prior to testing.
3. Select the correct Cooling System Adapter for the application. Refer to the Adapter Selection Guide included in the kit.
4. Apply water or coolant to the rubber gasket and/or o-ring on the adapter, and install the adapter in place of the pressure cap (Fig. 18).
5. Install the Valve Coupler onto the System Adapter using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 19).
6. Install the Coupler Plug into the top of the Valve Coupler and tighten the threaded cap securely to form an airtight seal (Fig. 20).
7. Connect the Compound Gauge to the quick-connect labeled “Gauge” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the Valve Coupler and the Gauge (Fig. 21)
8. Ensure the Shuttle Valve on the Valve Coupler is shifted to the “Closed” position (Fig. 22).
9. Start the vehicle engine and allow it come to normal operating temperature and pressure.
10. Turn off the engine and allow it to cool with pressure still applied. Check for leaks as the engine cools. A leak caused by a slightly loose hose clamp or a stuck hose clamp that gives a false sense of tightness may only be noticeable during cool down.
11. When testing is complete, connect the Drain Hose to the Shuttle Valve using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 23).
12. Place the opposite end of the Drain Hose into a container appropriate to capture hot, pressurized coolant. Use the Hose Clip to secure the Drain Hose in position (Fig. 24).
13. Shift the shuttle valve to the “Open” position, allowing the hot fluid and pressure to be expelled (Fig. 25).
14. Once all pressure is relieved, cautiously disconnect components, clean and store them properly.
    Caution: Hot fluid being expelled through the test equipment will cause quick-connects and other metal components to become hot. Handle such components with care, using a rag if necessary.
15. Refill the radiator or coolant bottle to the proper level, and replace the cap.


Fig. 17


Fig. 18


Fig. 19

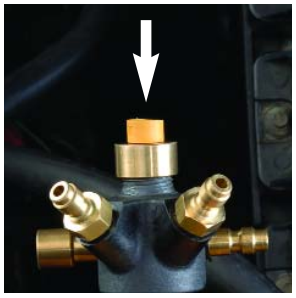


Fig. 20


Fig. 21


Fig. 22


Fig. 23


Fig. 25


Fig. 24

Dynamic Pressure/Vacuum/Temperature Test (Engine On)

For diagnosing:
Cooling system leaks
Cylinder head damage
Blown head gasket
Cracked block

Set-up & Procedure:

1. Ensure the cooling system is cool and not pressurized. Carefully remove the radiator or coolant bottle pressure cap (Fig. 26).
2. Check to see that the radiator or coolant bottle is filled to the proper level, and check hoses for visual damage or leaks. Fill and repair as necessary prior to testing.
3. Select the correct Cooling System Adapter for the application. Refer to the Adapter Selection Guide included in the kit.
4. Apply water or coolant to the rubber gasket and/or o-ring on the adapter, and install the adapter in place of the pressure cap (Fig. 27).
5. Install the Valve Coupler onto the system adapter using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 28).
6. Loosen the threaded cap on top of the Valve Coupler, and remove the Plug if necessary. Insert the Temperature Probe through the Valve Coupler, and adjust the depth of the probe to ensure it is in contact with the coolant in the bottle or radiator (Fig. 29). Do not force the probe down so hard that it damages the probe, radiator, or coolant bottle.
7. Tighten the cap on the Valve Coupler to form a seal around the Temperature Probe and hold it securely.
8. Connect the Compound Gauge to the quick-connect labeled “Gauge” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the Valve Coupler and the Gauge (Fig. 30).
9. Ensure the shuttle valve on the Valve Coupler is shifted to the “Closed” position (Fig. 31).
10. Start the engine, and monitor the readings on the compound and temperature gauges. Pressure and temperature should increase steadily as the engine warms to normal operating conditions.

    A rapid pressure increase followed by a quicker then normal increase in temperature, indicates significant cylinder compression leakage into the coolant system, most likely caused by a blown head gasket. Other indications of a blown head gasket may be a faster than normal increase in temperature, steam flowing from the exhaust, and deposits in the oil. If symptoms indicate a blown head gasket, immediately shut the engine off to prevent overheating and the possibility of additional damage.

    Smaller internal leaks can be caused by a cracked block or head(s). These leaks may not cause obvious rapid pressure buildup, but can still be identified and diagnosed. If the pressure builds to higher than normal readings and/or the pressure gauge reading fluctuates rapidly, a compression or combustion leak is present. A gauge reading indicating vacuum can be a cause by a crack in the intake port or intake valve seat.

continued on next page

Fig. 26

Fig. 27

Fig. 28

Fig. 29

Fig. 30

Fig. 31

Dynamic Pressure/Vacuum/Temperature Test (Engine On) *continued*

11. When testing is complete, connect the Drain Hose to the Shuttle Valve using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 32).
12. Place the opposite end of the Drain Hose into a container appropriate to capture hot, pressurized coolant. Use the Hose Clip to secure the Drain Hose in position (Fig. 33).
13. Shift the shuttle valve to the the “Open” position, allowing the hot fluid and pressure to be expelled (Fig. 34).
14. Once all pressure is relieved, cautiously disconnect components, clean and store them properly.
    Caution: Hot fluid being expelled through the test equipment will cause quick-connects and other metal components to become hot. Handle such components with care, using a rag if necessary.
15. Refill the radiator or coolant bottle to the proper level, and replace the cap.

Fig. 32

Fig. 33

Fig. 34

Cap Pressure Test

For diagnosing:
Proper function of pressure cap

Set-up & Procedure:

1. Ensure the cooling system is cool and not pressurized. Carefully remove the radiator or coolant bottle pressure cap.
2. Select the correct Cap Adapter for the application. Refer to the Adapter Selection Guide included in the kit.
3. Apply water or coolant to the rubber gasket and/or o-ring on the cap, and install the cap onto the adapter (Fig. 35).
4. Install the Valve Coupler onto the Cap Adapter using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 36).
5. Install the Coupler Plug into the top of the Valve Coupler and tighten the threaded cap securely to form an airtight seal (Fig. 37).
6. Connect the Compound Gauge to the quick-connect labeled “Gauge” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the Valve Coupler and the Gauge (Fig. 38).
7. Connect the Pressure Pump to the quick-connect labeled “Pressure/Vacuum” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the Valve Coupler and the Pump (Fig. 39).
8. Ensure the Shuttle Valve on the Valve Coupler is shifted to the “Closed” position (Fig. 40).
9. Determine the rated cap pressure. It will be printed on the cap or in the vehicle manual. Compare this value to the chart (see chart A) to determine the acceptable pressure test range.
10. Operate the Pressure Pump until the cap releases pressure. The pressure should relieve when the arrow is in the colored band on the gauge face corresponding to the test range of the cap.
11. When testing is complete, shift the Shuttle Valve to the “Open” position to relieve the pressure (Fig. 41).
12. Disconnect the components, clean, and store them properly.


Fig. 35


Fig. 36


Fig. 37


Fig. 38


Fig. 39


Fig. 40


Fig. 41

Chart A: Cooling System Cap Pressure Test Ranges	
Rated Pressure (PSI)	Pressure Test Range (PSI)
4	3 - 5
7	6 - 8
10	9 - 11
13 or 14	12 - 16
15 or 16	14 - 18
18	16 - 20
20	18 - 22
30	28 - 30

Vacuum Leak Test

For diagnosing:
Cooling system leaks

Notes
This equipment uses a venturi vacuum to perform a vacuum leak test. The venturi requires clean, dry, high pressure air between 90 and 120 psi (5.5–10 bar) (550–1000 kpa) to create the vacuum.

Prior to testing, install a male quick-change air nipple with 1/4" NPT male thread to the venturi.

The altitude at which the vacuum test is performed can significantly affect the ability of the venturi to produce a vacuum. As the altitude increases, the maximum vacuum the venturi can create will decrease. This is normal and should not be considered a malfunction.

It is recommended that the cooling system be drained of coolant prior to performing a vacuum leak test and automatic refill.

When connecting components using quick-connects, make sure the sleeve snaps forward to lock the connection.

Set-up & Procedure:

1. Properly position the vehicle for service access to the radiator or coolant bottle. Turn on the heater and set it to its highest temperature setting.
2. Ensure the cooling system is cool and not pressurized. Carefully remove the radiator or coolant bottle pressure cap (Fig. 42).
3. Select the correct Cooling System Adapter for the application. Refer to the Adapter Selection Guide included in the kit.
4. Apply water or coolant to the rubber gasket and/or o-ring on the adapter, and install the adapter in place of the pressure cap (Fig. 43).
5. Install the Valve Coupler onto the system adapter using the quick-connect. Make sure the quick-connect sleeve snaps forward to lock the connection (Fig. 44).
6. Install the Coupler Plug into the top of the Valve Coupler and tighten the threaded cap securely to form an airtight seal (Fig. 45).
7. Connect the Compound Gauge to the male quick-connect labeled “Gauge” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the coupler and the gauge (Fig. 46).
8. Connect the Venturi Vacuum to the male quick-connect labeled “Pressure/Vacuum” extending from the Valve Coupler. Note: It may be more convenient to install an Extension Hose between the coupler and the vacuum (Fig. 47).
9. Ensure the Shuttle Valve on the Valve Coupler is shifted to the “Closed” position (Fig. 48).
10. Connect clean, dry, regulated compressed air between 90 and 120 psi (6.2 and 8.3 bar) (600 and 830 kPa) to the Venturi Vacuum by means of the previously installed air nipple (Fig. 49).
11. Turn on the compressed air. The vacuum will make a hissing noise as the high pressure air passes through it. If the cooling system is not empty, it is normal that some fluid may be expelled from the venturi exhaust.

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Fig. 42


Fig. 43


Fig. 44

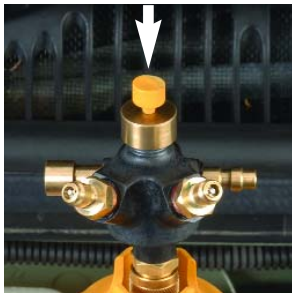
Fig. 45


Fig. 46


Fig. 47


Fig. 48


Fig. 49

Vacuum Leak Test *continued*

12. Allow the vacuum to pull air from the cooling system until the gauge indicates 24 to 26 in Hg (1.6 to 1.8 bar) (81 to 88 kPa) or the value stops increasing (Fig. 50). This should only take about 1 to 2 minutes during which time it is normal for the radiator hoses to collapse.
13. Once the proper vacuum is achieved, disconnect the Venturi Vacuum from the Valve Coupler before turning off the air or disconnecting the air hose (Fig. 51). Turning off the air or disconnecting the air hose prior to disconnecting the venturi from the valve coupler, will allow air to reenter the system.
14. Watch the gauge for at least 30 seconds. The vacuum reading will remain steady if the system does not have a leak. If the cooling system has a leak, the vacuum will drop.
15. If the cooling system has a leak, it may be difficult to determine the exact location because the vacuum will prevent fluid from seeping. At this point it may be best to relieve the vacuum by shifting the shuttle valve to the “Open” position, and run a pressure test as outlined on page 7.
16. If no leak is detected and no further repairs are required, the vacuum may be used to quickly refill the system without trapping air. See the following section for the proper procedure to refill the cooling system with new coolant. Otherwise, shift the Shuttle Valve on the Valve Coupler to the “Open” position to relieve the vacuum.
17. Disconnect components, clean and store them properly.

Fig. 50

Fig. 51

System Refill/Airlock Elimination

Set-up & Procedure:

1. Follow steps 1 through 15 of the procedures for the Vacuum Leak Test.
2. If there are no leaks in the system, do not open the Shuttle Valve!
3. Connect the Refill Hose to the Shuttle Valve using the quick-connect coupler (Fig. 52).
4. Place the opposite end of the Refill Hose into a supply of coolant adequate enough to completely refill the cooling system (Fig. 53).
5. Place the coolant supply at a level even with the radiator or coolant bottle, or higher.
6. Shift the Shuttle Valve to the “Open” position, allowing the vacuum to pull the coolant into the system (Fig. 54).
7. If the system does not completely refill, reapply the vacuum and repeat the refill procedure.
8. Once the refill is complete, disconnect the components, clean, and store them properly.
9. Top off the radiator or coolant bottle if necessary, and replace the cap.

Fig. 52

Fig. 53

Fig. 54