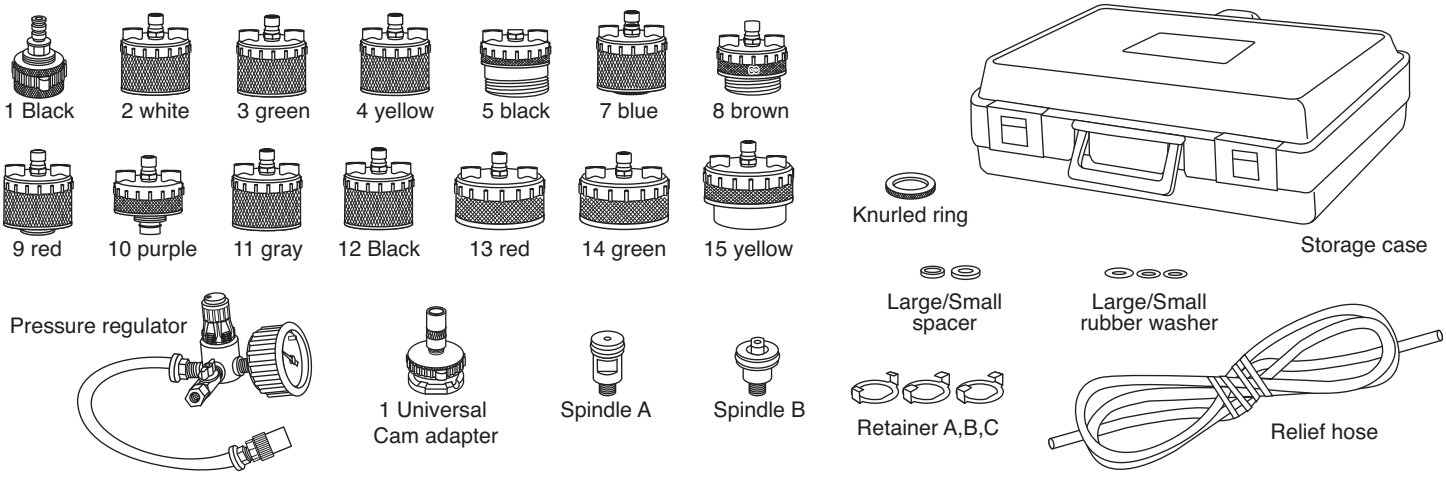
2015 CST Cooling System Test Kits User Guide

For use with all Hickok/Waekon CST Cooling System Test Kits

IMPORTANT! *Please make sure to carefully read all instructions, including the safety information at the back of this sheet* ***before*** *you begin testing.*

Kit Contents



CST Cooling System Kits for Cars and Light Trucks:

62831 Cooling System Base Kit

- Adapter #1
- Retainers A, B, & C
- Pressure Regulator
- Relief Hose
- Knurled Ring
- Washers
- Spacers
- Storage Case

62801 Cooling System Adapter Kit

- Adapters #2 to #11
- Spindles A & B
- Storage Case
- Universal Cam Adapter

62868 Cooling System Test & Adapter Kit

- 62831 Base Kit
- 62801 Adapter Kit

CST Heavy Duty Cooling System Kits for Large Over-the-Road Trucks:

62901 HD Cooling System Adapter Kit

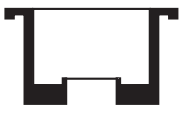
- Adapters #2, #12, #13, #14, #15
- Universal Cam Adapter
- Spindle A
- Storage Case

62968 HD Cooling System Test Kit

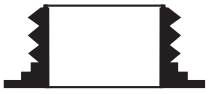
- Pressure Regulator
- Adapters #2, #12, #13, #14, #15
- Spindle A
- Relief Hose
- Storage Case

Select and Assemble the Cap Adapter

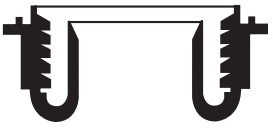
Bayonet



External Thread



Internal Thread



Before you can start the testing procedures, you need to select, assemble and connect the appropriate adapter for the vehicle you are testing. **Warning!** *To avoid injury or damage, never remove a vehicle's radiator cap or tester while the cooling system is under pressure.*

1. Remove the cap from the vehicle's filler neck and determine the style used (bayonet, external thread, internal thread).
2. Using the chart on the following pages, locate the cap adapter configuration that best matches the vehicle's filler neck. When selecting, keep the following in mind:
   - To avoid cross threading and re-threading, ***never*** force an adapter onto a filler neck. If the adapter does not thread on smoothly, select another adapter.
   - Typically if the vehicle's cap has a spindle, you will also need to use one with the adapter for proper sealing.
   - For configurations 1A, 1B, and 1C (cars and light trucks) always make sure to use the correct retainer and that it securely fits the filler neck. Failure to do so may result in injury.
3. Assemble the adapter.

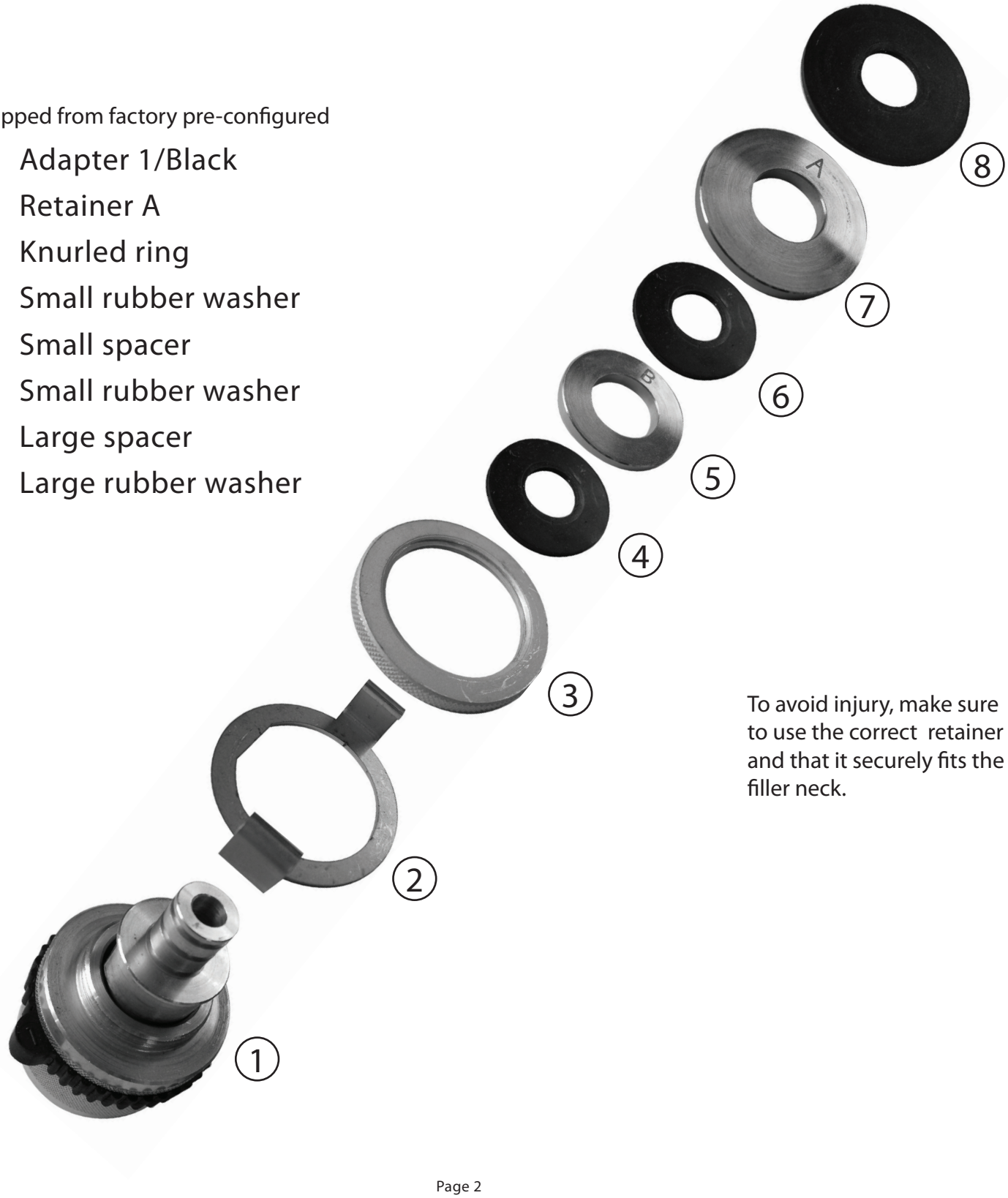
Bayonet Filler Neck Configuration 1A

Cars and light trucks: Typically used with most early model vehicles with large style bayonet (Standard A). May also be used on some current model vehicles.

Large over-the-road trucks: N/A

Shipped from factory pre-configured

1 Adapter 1/Black
2 Retainer A
3 Knurled ring
4 Small rubber washer
5 Small spacer
6 Small rubber washer
7 Large spacer
8 Large rubber washer



To avoid injury, make sure to use the correct retainer and that it securely fits the filler neck.

Bayonet Filler Neck Configuration 1B

Cars and light trucks: Typically used with most domestic and Asian vehicles with a 16 mm deep neck and small style bayonet.

Large over-the-road trucks: N/A

1 Adapter 1/Black
2 Retainer B
3 Knurled ring
4 Small rubber washer
5 Small spacer
6 Small rubber washer

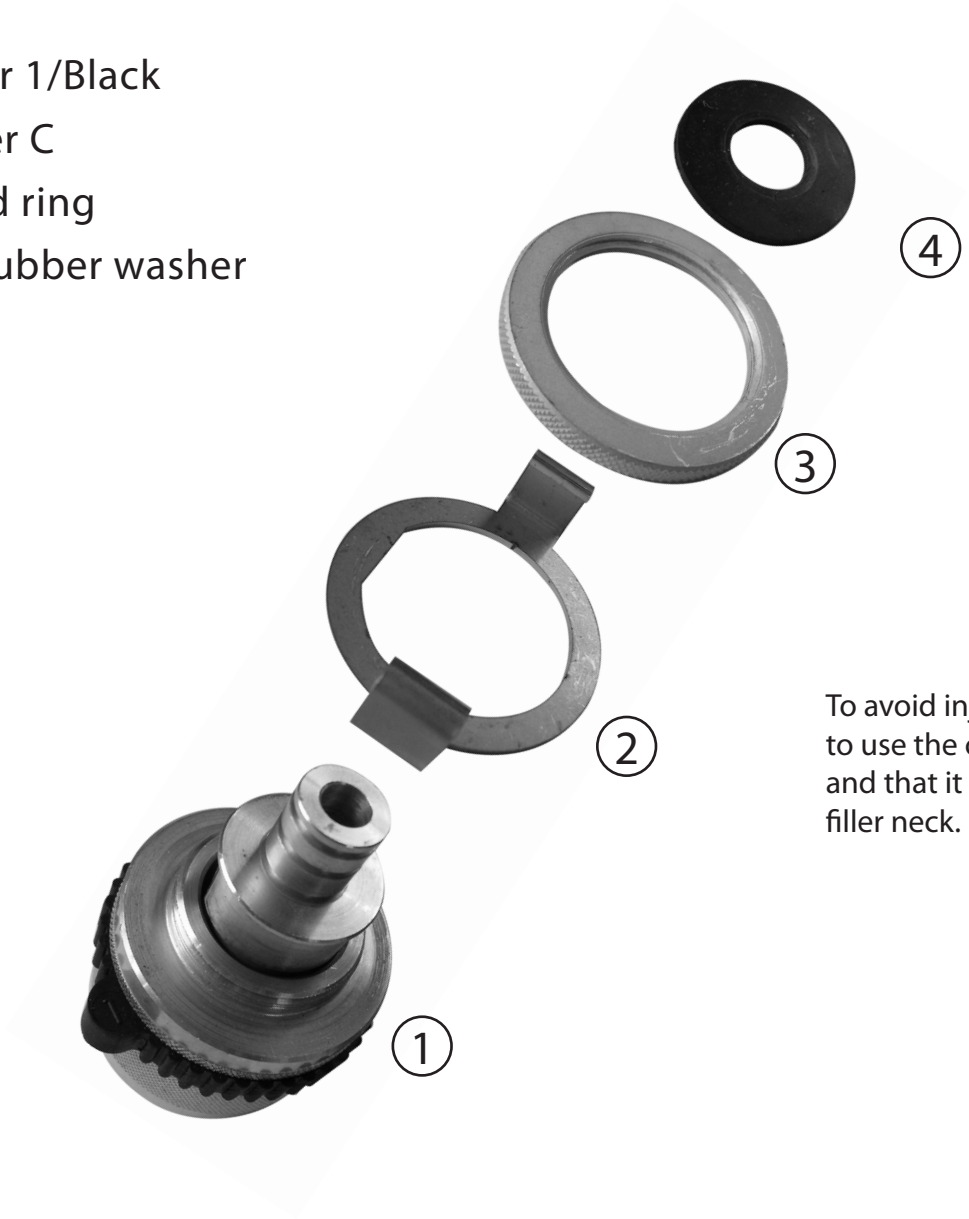
To avoid injury, make sure to use the correct retainer and that it securely fits the filler neck.

Bayonet Filler Neck Configuration 1C
for cars and light trucks

Cars and light trucks: Typically used with most domestic and Asian vehicles with a 9.5 mm deep neck and small style bayonet.

Large over-the-road trucks: N/A

1 Adapter 1/Black
2 Retainer C
3 Knurled ring
4 Small rubber washer



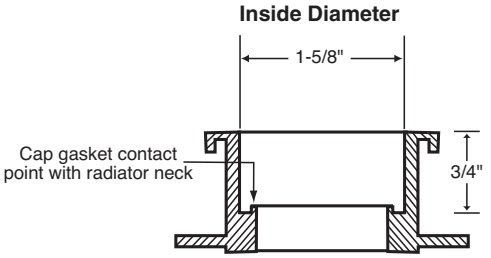
To avoid injury, make sure to use the correct retainer and that it securely fits the filler neck.

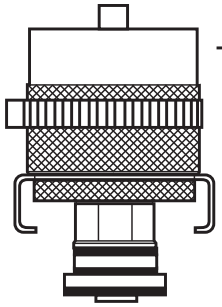
Bayonet Style Filler Necks
Use with Bayonet Configuration Shown

Configuration 1a

Cars and light trucks: Typically used with most early model vehicles and some newer ones with a large bayonet style neck.

Large over-the-road trucks: N/A

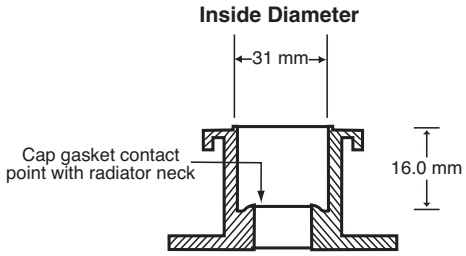


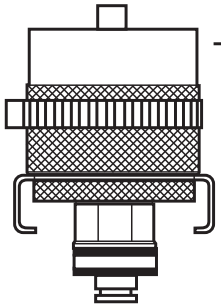


Configuration 1b

Cars and light trucks: Typically used with Domestic and Asian vehicles with a deep neck.

Large over-the-road trucks: N/A

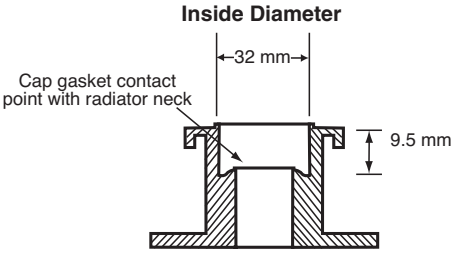


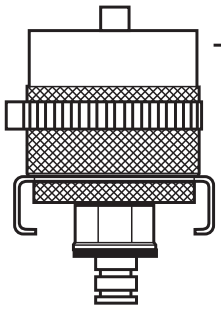


Configuration 1c

Cars and light trucks: Typically used with Domestic and Asian vehicles with a shallow neck.

Large over-the-road trucks: N/A



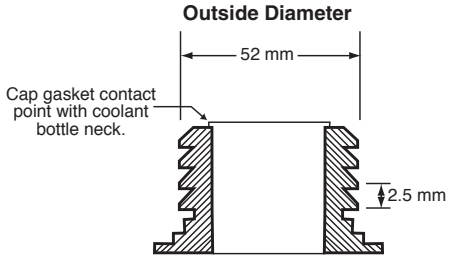


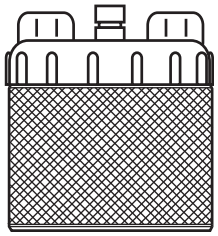
External Threaded Filler Necks

Configuration 2

Cars and light trucks: Typically used with many 1990 to current domestic vehicles (especially GM) and some Mercedes, Jaguar, and Ford.

Large over-the-road trucks: Typically used with Freightliner, GM, International, Kenworth, and Peterbuilt.

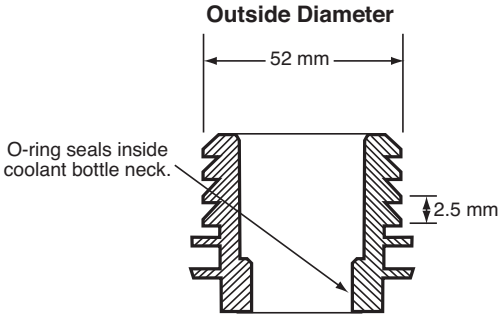


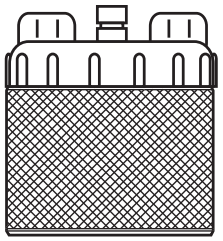


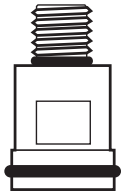
Configuration 2a

Cars and light trucks: Typically used with many 1999 to current domestic vehicles (especially GM) and some Mercedes, Jaguar, and Ford.

Large over-the-road trucks: Typically used with Ford, Freightliner, GM, and Navistar.



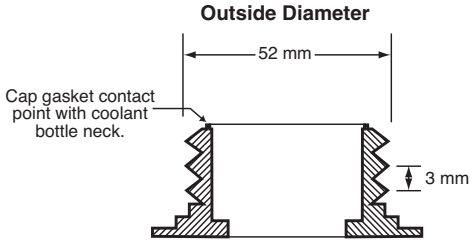


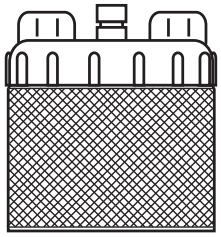


Configuration 3

Cars and light trucks: Typically used with Porsche, Mercury, Saturn, Saab, Jaguar, Range Rover, Pontiac, Daewoo, and Ford.

Large over-the-road trucks: N/A

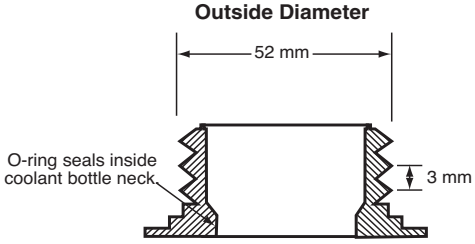


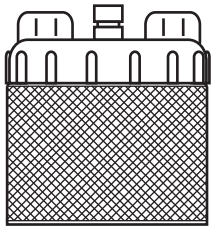


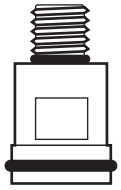
Configuration 3a

Cars and light trucks: Typically used with Ford Focus and Escape, Jaguar XK8 and XJ8, and Mazda Tribute.

Large over-the-road trucks: N/A





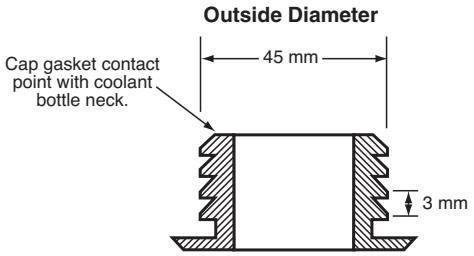


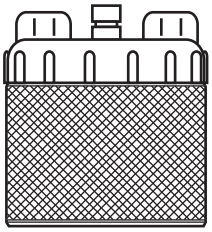
External Threaded Filler Necks

Configuration 4

Cars and light trucks: Typically used with Jeep, Renault, Saab 900, Sterling, and Volvo.

Large over-the-road trucks: N/A

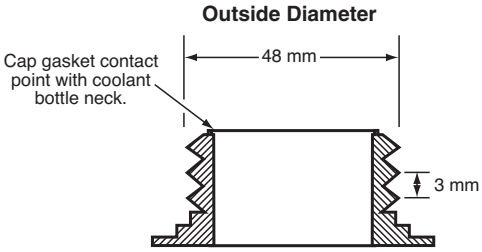


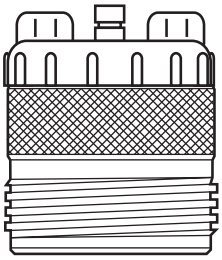


Configuration 5

Cars and light trucks: Typically used with most early model vehicles and some newer ones with a large bayonet style neck.

Large over-the-road trucks: N/A

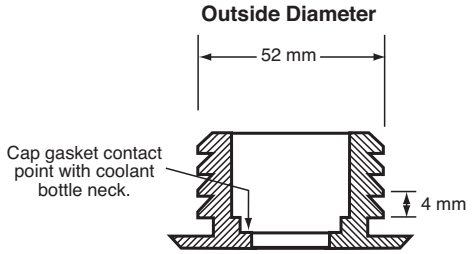


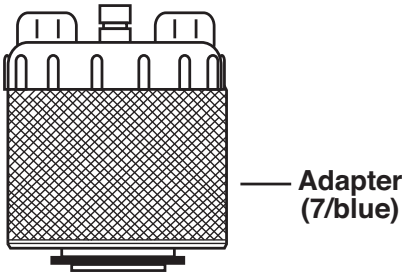


Configuration 7

Cars and light trucks: Typically used with BMW (1988 to 2006 with external thread on coolant bottle), and Range Rover (1995 to 1997).

Large over-the-road trucks: N/A

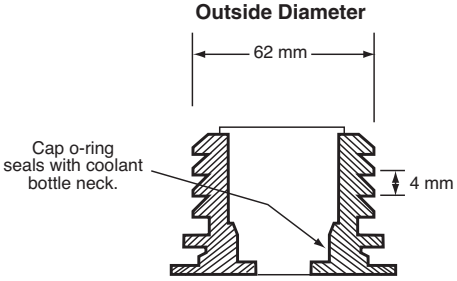


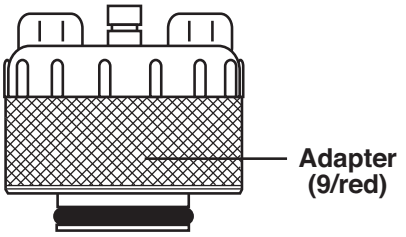


Configuration 9

Cars and light trucks: *T*ypically used with Mercedes-Benz (except M-class 1998 to 2005) and Chrysler Crossfire (2004 to 2008).

Large over-the-road trucks: N/A

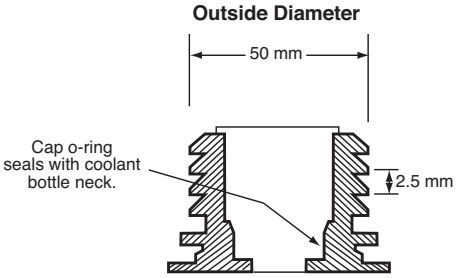


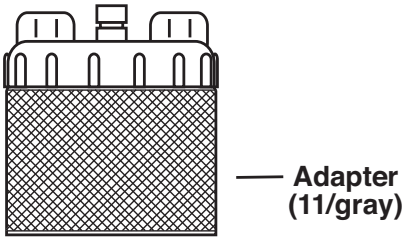


Configuration 11

Cars and light trucks: Typically used with newer Ford models (Escape, Fiesta, Focus, Fusion), Land Rover Lr2, Mazda 3 & 6, Newer Volvo models.

Large over-the-road trucks: N/A



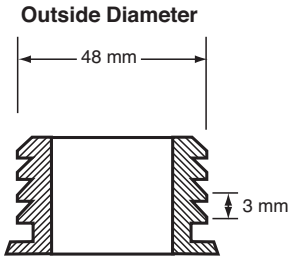


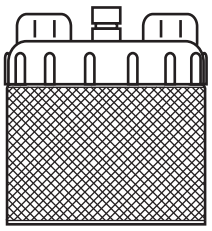
External Threaded Filler Necks

Configuration 12

Cars and light trucks: N/A

Large over-the-road trucks: Typically used with Volvo large trucks 48mm x 3mm.

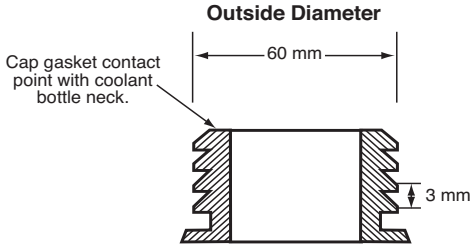


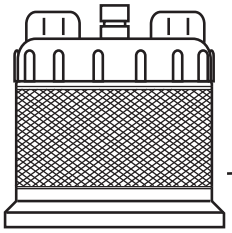


Configuration 13

Cars and light trucks: N/A

Large over-the-road trucks: Typically used with Freightliner 60mm x 3mm.

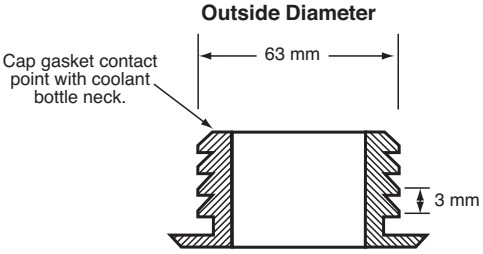


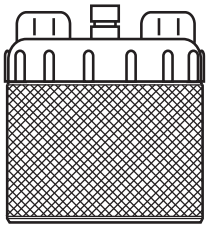


Configuration 14

Cars and light trucks: N/A

Large over-the-road trucks: Typically used with Volvo trucks 63mm x 3mm.

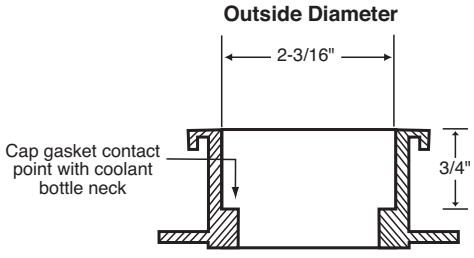


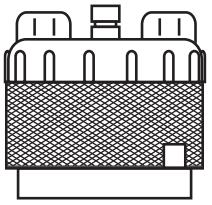


Configuration 15

Cars and light trucks: N/A

Large over-the-road trucks: Typically used with B size truck adapters.



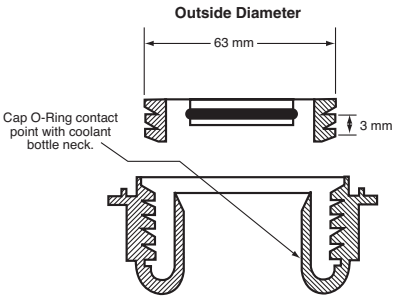


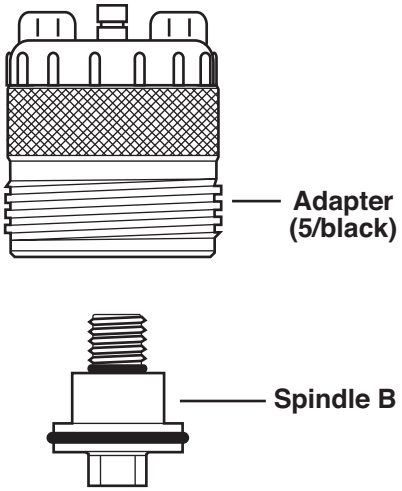
Internal Threaded Filler Necks

Configuration 5b

Cars and light trucks: Typically used with Audi and Volkswagen (1998 and later), some newer Bentley, Lamborghini, and Porsche models.

Large over-the-road trucks: N/A

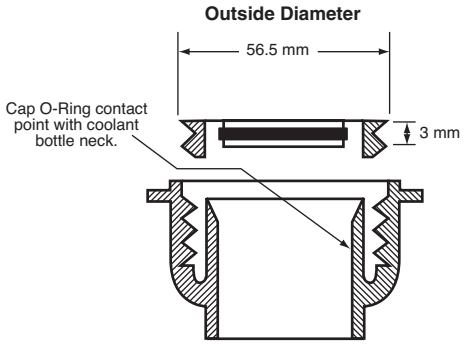


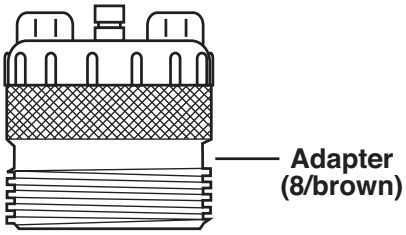


Configuration 8

Cars and light trucks: Typically used with Volkswagen (1990 to 1998).

Large over-the-road trucks: N/A

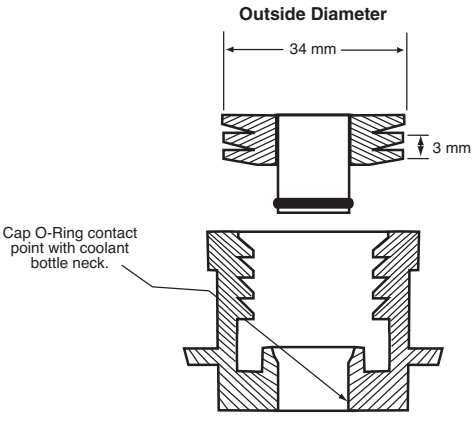


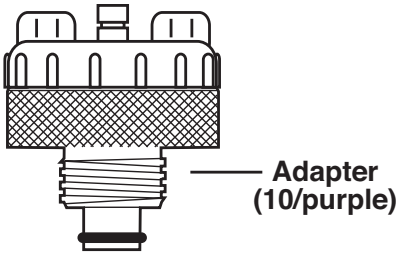


Configuration 10

Cars and light trucks: Typically used with newer Lexus, Toyota Spyder and Celica, and Scion.

Large over-the-road trucks: N/A





Test Procedures

Before You Begin

You must attach a shop air quick disconnect fitting to the pressure regulator.

For the best test results

- Perform the tests in the order listed
- When using shop air, 90 – 125 psi is recommended

Step 1—Visually Inspect for Leaks / Damage

- Hoses, clamps and belts
- Radiator
- Coolant level and condition
- Sufficient airflow
- Water pump
- Water control valve
- Thermostat housing
- Heater core
- Cylinder head/intake manifold

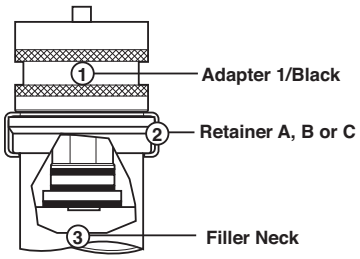
If any of these conditions exist, repair or replace components as necessary before continuing.

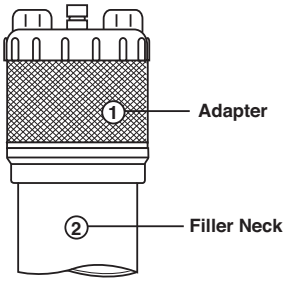
Step 2—Check for Service Codes

Check the engine control module for any service codes. These codes may verify a cooling system related symptom and should be serviced before testing.

Step 3—Select and Assemble Cap Adapter

Using the reference chart, locate and assemble the appropriate cap adapter configuration for the vehicle.





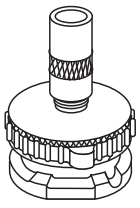
Step 4—Connect to the Vehicle

1. With the system cooled and the engine off, carefully remove the pressure cap from the radiator or service tank.
2. Securely attach the cap adapter assembly to the radiator or filler neck the same as you would the pressure cap.
3. Connect the pressure regulator to the cap adapter assembly per the instructions for the particular test procedure you are performing.

To Disconnect From the Vehicle

1. Verify that the ball valve is in the **OFF** position and then remove the shop air from the pressure regulator.
2. Connect one end of the pressure relief hose to the regulator airline adapter and the other end of the hose into a container (to capture hot coolant). Turn the ball valve to the **ON** position to relieve the system pressure from the previous test.
3. Once the pressure is relieved, remove the pressure relief hose and turn the ball valve to the **OFF** position.
4. Remove adapter(s)

Optional Universal Adapter



This adapter allows you to use typical CAM style hand pumps with the CST Cooling adapters.

The adapter is available with the 62801 Cooling system Adapter Kit, and the 62901 HD Cooling System Adapter Kit.
You may also purchase the adapter separately.

⚠ Warning

To avoid serious injury or damage while performing any of these tests, make sure you do the following:

- *Do not pressurize the system (or allow the pressure to increase) beyond the radiator cap release pressure.*
- *Turn the engine off immediately if it begins to overheat.*
- *Always make sure the ball valve is in the OFF position whenever connecting or disconnecting the shop airline to the regulator. Failure to do so may result in releasing hot/ pressurized coolant.*

Step 5—Pressure/Leak Test (Cold Engine)

This test requires the following components:

- Configured cap adapter for the vehicle you are testing
- Pressure Regulator

Procedure:

Perform this test with the engine off.

1. Remove the vehicle's radiator cap and connect the adapter assembly to the filler neck.
2. Connect the pressure regulator to the cap adapter. Make sure the ball valve is in the **OFF** position
3. Connect the shop's air supply to the Pressure Regulator via the quick disconnect.
4. Turn the ball valve to the **ON** position (handle is parallel to the air hose).
5. Slowly turn the control dial on the regulator until the pressure gauge is at the vehicle's rated pressure.

   Tip: Once the desired pressure is reached, you can lock the dial by pressing in the collar on the dial. Unlock the dial by pulling the collar out.
6. Inspect the cooling system for any external leaks. This includes the following areas:

   - Hoses, Radiator, Water control valve
   - Thermostat housing
   - Water pump
   - Heater core
   - Cylinder head / intake manifold
   - Coolant recovery / reserve tank

   Note: If any leaks are found, repair and retest before proceeding to the next step.
7. Turn the ball valve to the **OFF** position and observe the pressure gauge readings.
   - If the system maintains the pressure, proceed to the next test, **Pressure Test—Warming Engine**.
   - If the system does not hold the pressure, and the gauge readings begin to drop, a leak is present.

     Check for any indication of an external leak. If no leak is found, suspect an internal leak (check for coolant in the oil).

     Repair and retest before proceeding to the next step.

Step 6—Pressure Test (Warming Engine)

This test requires the following components:

- Configured cap adapter for the vehicle you are testing
- Pressure relief hose
- Pressure regulator

Start this test with the engine off and cold coolant.

1. Verify that the ball valve is in the **OFF** position and then remove the shop air from the pressure regulator.
2. Connect one end of the pressure relief hose to the regulator airline adapter and the other end of the hose into a container (to capture hot coolant). Turn the ball valve to the **ON** position to relieve the system pressure from the previous test.
3. Once the pressure is relieved, remove the pressure relief hose and turn the ball valve to the **OFF** position.
4. Turn the pressure control dial clockwise until it stops.
5. Start the vehicle's engine and allow to idle.
6. Observe the pressure gauge as the engine warms up.

If the system is operating normally:

- The pressure gauge increase gradually as the engine warms up.

If the system is NOT operating normally:

- The pressure rises rapidly. This is usually caused by cylinder compression leaking into the cooling system from a cracked cylinder head or gasket leak.
- The pressure fluctuates. This is usually caused by a crack between the valve seats and head gasket.

If the system is operating normally, proceed to the next step. Otherwise make any necessary repairs and retest before proceeding.

Do not perform this next step if the vehicle's thermostat is located in the lower hose.

7. As the pressure rises, increase the engine RPM to approximately 2000 while observing the pressure gauge.

If the system is operating normally:

- The pressure will drop slightly as the RPMs increase.

If the system is NOT operating normally:

- If the pressure drops, suspect low coolant flow from the water pump.
- If the pressure increases, suspect a plugged radiator.

If the system is operating normally, proceed to the next test, **Pressure/leak Test—Hot Engine**. Otherwise make any necessary repairs and retest before proceeding.

Step 7—Pressure/Leak Test (Hot Engine)

This test requires the following components:

- Configured cap adapter for the vehicle you are testing
- Pressure relief hose
- Pressure regulator

Procedure:

Perform this test with the engine off but with the coolant and engine hot.

USE EXTREME CAUTION—coolant is hot and can cause serious injury.

1. Connect the shop's air supply to the pressure regulator via the quick disconnect.
2. Turn the ball valve to the **ON** position (handle is parallel to the air hose).
4. Slowly turn the control dial on the regulator until the pressure gauge is at the vehicle's rated pressure.
5. Inspect the cooling system for any external leaks. This includes the following areas:

- Hoses
- Radiator
- Water control valve
- Thermostat housing
- Water pump
- Heater core
- Cylinder head / intake manifold
- Coolant recovery / reserve tank

Note: If any leaks are found, repair and retest before proceeding to the next step.

6. Turn the ball valve to the **OFF** position and observe the pressure gauge readings.
   - If the system maintains the pressure, a leak is not present. *The test is complete*.
   - If the system does not hold the pressure, and the gauge readings begin to drop, a leak is present.

     Check for any indication of an external leak. If no leak is found, suspect an internal leak (check for coolant in the oil). *Repair and retest*.

Safety Information & Warranty

Safety Information

Before using this equipment, carefully read, understand and follow instructions and safety messages on equipment and in this guide.

The guide cannot anticipate or provide advice and cautions for all situations encountered by technicians. With this in mind, always follow and refer to the manuals provided by the manufacturer or the vehicle or equipment being tested or used for all information and testing procedures whenever diagnosing, repairing or operating such vehicle or equipment.

Failure to follow the instructions, cautions and warnings provided here as well as those provided by the vehicle and equipment manufacturers can result in fire, explosion, bodily injury and property damage.

Vehicles emit flammable vapors which can ignite.

- Keep flames, sparks, cigarettes and other ignition sources away from the vehicle at all times.
- In case of fire, never use water to fight flames caused by methanol or methanol blended gasoline. This will cause the flames to spread instead of extinguishing them.
- Use a dry chemical extinguisher to fight flames (preferably one marked ABC, though BC is acceptable). A foam extinguisher is acceptable only if it is ARF grade, which is resistant to alcohol.

To avoid serious injury, do the following:

- Use caution when testing on a vehicle while the engine is running (electric cooling fans may turn on unexpectedly even if the ignition is in the OFF position, surfaces may become hot, etc.)
- Remove rings, watches, loose or hanging jewelry. Tie long hair securely behind the head. Take extra care with loose or hanging clothing.
- Always wear approved safety glasses when testing. Should coolant get into eyes, flush eyes immediately with water and consult your physician.
- If the skin is directly exposed, wash the area immediately and change any clothes that have become wet with coolant.
- Never remove a vehicle's radiator cap or tester while the cooling system is under pressure.

Before beginning any tests, make sure the test environment is safe and the vehicle meets these testing conditions:

- Test area should be well ventilated.
- Vehicle should be in park.
- Wheels should be blocked.
- Vehicle should have normal exhaust flow.
- Keep all tester cables clear of exhaust manifolds and radiator fan blades.

Warranty

Subject to the conditions that follow and are noted below, this product is warranted to be free from defects in material and workmanship, under proper use and in accordance with the manufacturer's written recommendation and specifications, for a period designated below on all products:

- This product carries a limited lifetime warranty on the adapters and a one year warranty of the pressure regulator.

The manufacturer's obligation under this warranty is limited to unaltered products returned to the manufacturer by the initial end user of the new products. Therefore, this warranty does not cover any products resold by the end user to third parties, nor any reconditioned products sold as such, by the manufacturer. The sole remedy for any such defect shall be the repair, or replacement, of the product at the sole discretion of the manufacturer. This warranty does not cover expendable parts, such as batteries, nor does it cover shipping or handling. In addition, manufacturer is not liable for any loss or damage to product during shipping.

In the event it is determined that the product has been tampered with, or altered in any way, this warranty is void and all claims against the product will not be honored. All warranty claims must be submitted as outlined by the manufacturer and shall be processed in accordance with the manufacturer's established warranty claim procedures. These procedures include provisions that proof of purchase must be established (by either warranty card from the seller or by point of purchase receipt) and that the manufacturer will make every attempt to return ship the product within one business day from receipt of the returned product, freight prepaid.

In addition, all maintenance procedures, as outlined by the product manuals, should be followed for the warranty to be kept in force. Should the product not be used in accordance with procedures as specified, or if the product otherwise fails outside of the warranty, the manufacturer reserves the right to make such judgment and the party returning the product will be notified that written notification will be necessary to repair the product at a cost which the manufacturer deems as reasonable. The product will then be shipped back to the customer, COD; or as the manufacturer deems appropriate.

This is the only authorized manufacturer's warranty and is in lieu of all other expressed, or implied, warranties or representations, including but not limited to any implied warranties of merchantability or fitness or any other obligations on the part of the manufacturer. In no event will the manufacturer be liable for business interruptions, loss of profit, personal injury, costs of delays, or any special, indirect, incidental or consequential damages, costs or losses.

Contact Information

If you have any questions about our products including technical assistance, call our customer care department during standard business hours EST. If a customer care representative directs you to return any equipment, be sure to include these items:

- a written description of the problem;
- the name and telephone number of your contact person;
- your shipping address, and
- our return authorization number (from customer care).

Customer care and tech support:	**800/342-5080**
Service and repair center:	**662/453-6212**
Fax:	**216/761-9879**
E-mail:	**support@hickok-inc.com** **repaircenter@hickok-inc.com**
Service address:	**Hickok Inc.** **Automotive Group** **1716 Carrollton Avenue Dock E** **Greenwood, MS 38930**

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