FJC

Air Conditioning Products
Tools, Equipment & Refrigerant

Part # 43655

Heavy Duty Cooling System Pressure Test & Refill KIT

Instructions

FJC Air Conditioning Products—Tools, Equipment & Refrigerant

101 Commercial Drive Mooresville, NC 28115

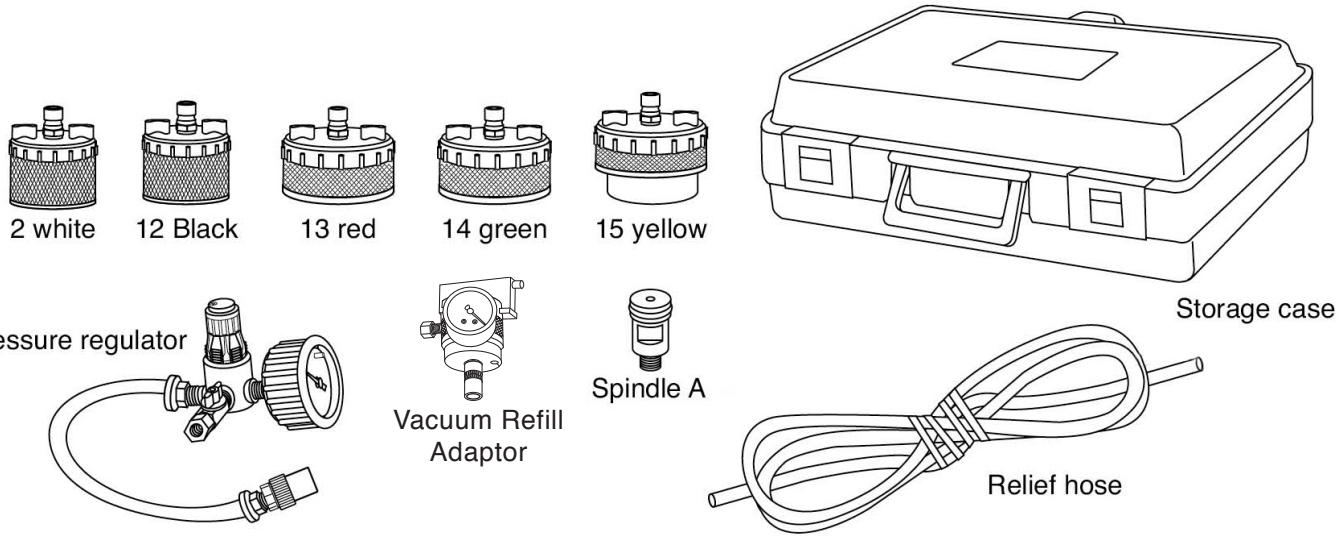
704-664-3587

Heavy Duty Cooling System Pressure Test & Refill Kit

Part #43655

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



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

FJC 43655 HD Cooling System Test Kit

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

Select and Assemble the Cap Adapter

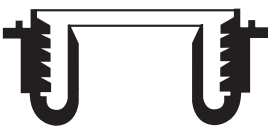
Before you can start the testing procedures, you need to select, assemble and connect the appropriate adapter for the vehicle you are testing. **Warning!** *To avoid injury or damage, never remove a vehicle's radiator cap or tester while the cooling system is under pressure.*

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.

Bayonet

External Thread

Internal Thread



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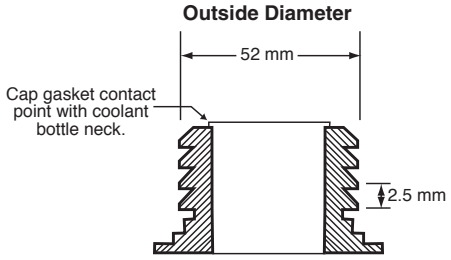
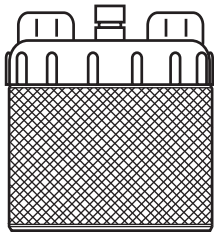
External Threaded Filler Necks

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.

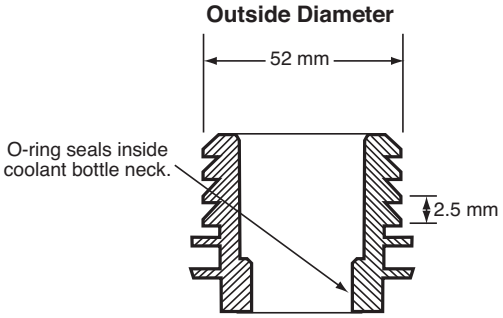


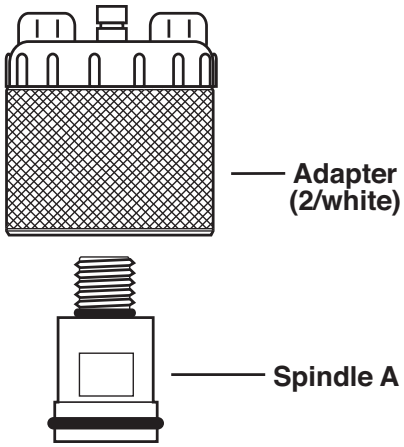


Configuration 2a

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.

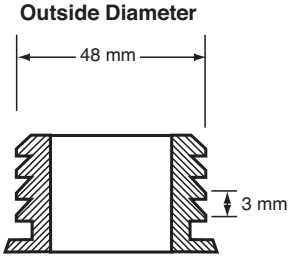


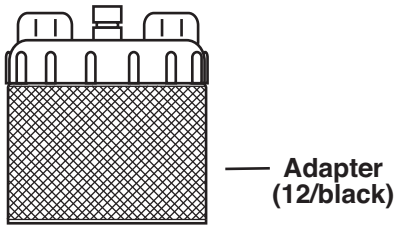


Configuration 12

Cars and light trucks: N/A

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

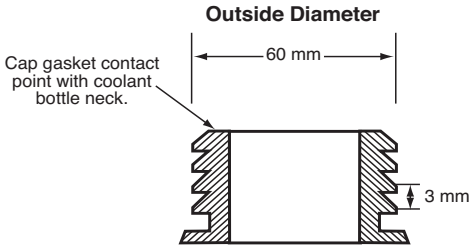


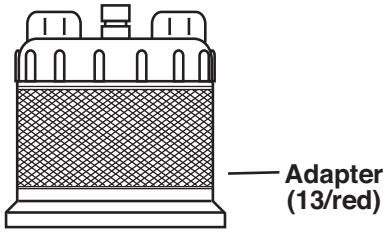


Configuration 13

Cars and light trucks: N/A

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



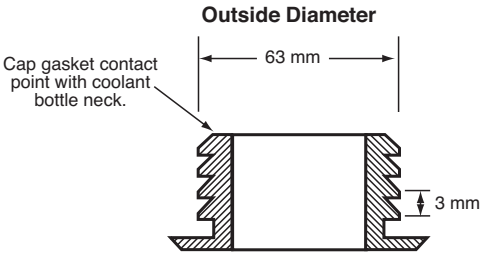


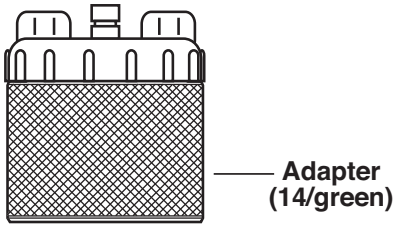
External Threaded Filler Necks

Configuration 14

Cars and light trucks: N/A

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

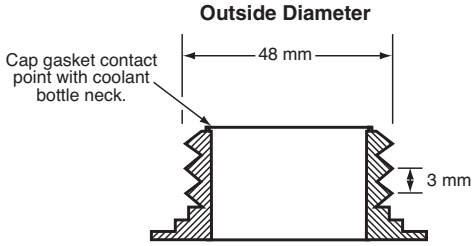


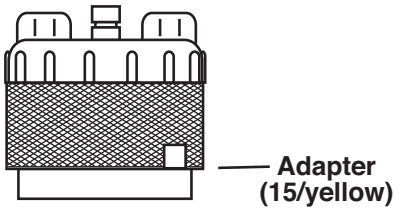


Configuration 15

Cars and light trucks: N/A

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





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

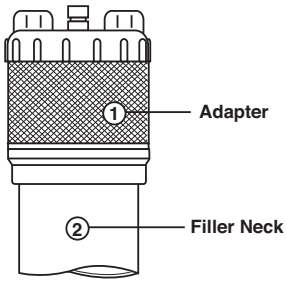
Check the engine control module for any service codes. These codes may verify a cooling system related symptom and should be serviced before testing.

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)

⚠ 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*.

Using the Vacuum Refill Adapter

Use the Vacuum Refill Adapter to replace coolant to an empty system after testing. Normal fill-time is reduced because the Vacuum Refill Adapter removes most air pockets and eliminates the need to bleed the system after filling. Before you begin, make sure that all repairs have been completed and no leaks are detected.

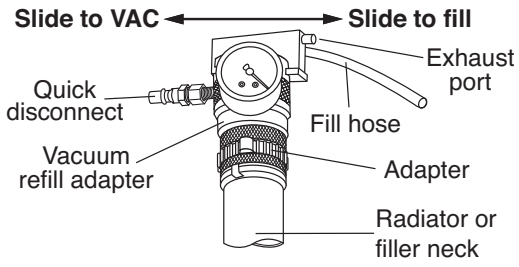
This procedure requires the following components:

- Configured cap adapter for the vehicle you are testing
- Vacuum Refill Adapter
- Fill hose

Procedure:

Perform this procedure with the engine cold and off, and the vehicle's temperature control turned to HEAT.

1. Remove the vehicle's radiator cap and connect the adapter assembly to the radiator or filler neck.
2. Connect the Vacuum Refill Adapter to the cap adapter.
3. Connect the fill tube to the Vacuum Refill Adapter and place the open end of the tube into the coolant. *Note: Make sure the coolant supply is at the same level, or higher, than the adapter.*
4. Connect the shop's air supply to the quick disconnect.
5. Slide the Vacuum Refill Adapter handle to the VAC position. This allows vacuum to build in the cooling system.
6. Monitor the gauge on the Vacuum Refill Adapter. When the vacuum stabilizes rapidly slide the handle to FILL to draw the coolant into the cooling system.
7. Continue filling the system until the gauge is at 0".
8. Remove the Vacuum Refill Adapter and cap adapter.
9. Make sure the system is filled to the proper levels (radiator and overflow tank).
10. Run the engine until it is at the normal operating temperature and the thermostat is open.



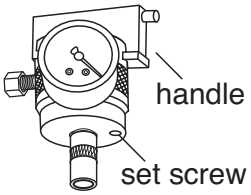
Replacing the Vacuum Refill Adapter O-rings

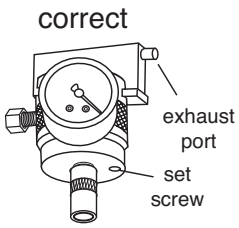
Always replace the O-rings whenever they become damaged, deformed, dried, cracked, or may be leaking.

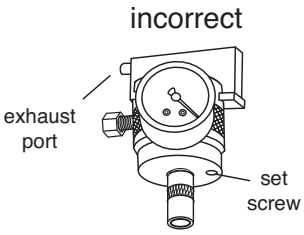
To replace the inner O-rings:

1. Using a phillips screw driver, loosen (do not remove) the set-screw.
2. Slide the adapter's handle off of the adapter body.
3. Discard the old O-rings and install the new ones. Make sure to apply lubricant (included in the O-ring/gasket kit) to the new O-rings.
4. Place the plastic strip (included in the O-ring/gasket kit) over both O-rings. This protects the O-rings from damage when sliding the handle back on to the adapter.
5. Slide the handle back on to the adapter and position it so that it is centered across the adapter.

   Note: Make sure the exhaust port is on the same side as the set screw. .
6. Tighten the set screw.
7. Firmly pull on the plastic strip to remove it from the adapter.







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

FJC warrants this radiator pressure tester for 1 year from date of purchase with proof of purchase. As we cannot control the use of our products, the guarantee shall not exceed the purchase price. We make no other warranty of any kind expressed or implied. This radiator pressure tester is warranted to be free from defects in material and workmanship under normal use and service for 1 year after the sale of this product by FJC, Inc. FJC's sole obligation under this warranty shall be to repair or replace any defective product or parts thereof, which are returned to our factory. The warranty shall not apply to any product or part which has been subject to misuse, negligence or accident. FJC, Inc. shall not be responsible for any special or consequential damages and the warranty as set forth is in lieu of all other warranties either expressed or implied. However FJC, Inc. makes no warranty or merchantability in respect to this item for any particular purpose other than that stated in this manual.

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