



Use this guide and PL729 to repair a Hale Thermal Relief Valve (TRV) when the valve does NOT vent above or does vent below 120° F (or 170° F for a TRV-170) or fails to provide the appropriate status indication for a TRV-L. All referenced documents and plate (PL) drawings are available from the Tech Resource Center on the Hale website (<https://www.haleproducts.com>).

NOTES: Hale makes two TRVs one opens at 120° F the other opens at 170° F. Both look identical except the tip of the sensing element of the 120° F TRV is colored white while the tip of the 170° F TRV is colored blue and the type is stamped on the TRV.

Recommended O-ring Lubricant: Synthetic Multi-Purpose Clear O-ring Lubricant (Synthetic NLGI Grade 2 Heavy Duty, Multi-Purpose)

Recommended Grease: Super Lube Food Grade NLGI 2 Synthetic PTFE (or equivalent) and Dow 55M silicone (or equivalent)

Recommended Solvent: Safety Kleen® or Stoddard Solvent (or equivalent) (Use lime scale remover & soft bristle Brush for mineral deposits)

Table 1. Applicable TRV Kits

Kit Number	Description	Remarks
546-1210-00-0	TRV-120 Repair Kit	Kit contains a 120° F piston assembly, retaining ring, O-rings, and instruction tag.
546-1210-01-0	TRV-170 Repair Kit	Kit contains a 170° F piston assembly, retaining ring, O-rings, and instruction tag.

NOTE: Kit Number 200-2600-00-0 provides a 7 psi pressure switch, fittings, placard, and light to repair a 12 volt TRV XXX-L. Kit includes detailed install instructions.

Kit Number 200-2600-03-0 provides a 7 psi pressure switch, fittings, placard, and light to repair a 24 volt TRV XXX-L. Kit includes detailed install instructions.

ATTENTION ⚠ DANGER

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED WILL RESULT IN SERIOUS INJURY OR DEATH.

IMPORTANT ⚠ NOTICE

ADDRESSES PRACTICES NOT RELATED TO PERSONAL INJURY (EQUIPMENT DAMAGE)

Table 2. Tools And Consumables List

Standard Tools	Special Tools	Consumables
PPE Protection For/From Eye, Hand / Scalding Water	Small Bore Hone (1-inch)	Shop Rag(s) (As Required)
** 1 inch Open End Wrench		O-ring Lubricant (See NOTES, page 1)
** 2 inch Open End Wrench		Grease (See NOTES, page 1)
Drift Punch		Loctite ® 542 (or Equivalent)
Vice Grips		Loctite ® 592 (or Equivalent)
Hammer		Loctite ® 640 (or Equivalent)
Needle Nose Pliers		Lime Scale Remover
Snap Ring Pliers (Compression)		Soft Bristle Brush
5/32-inch Hex Key Socket & Ratchet (or Allen Wrench)		Safety Kleen® or Stoddard Solvent (or Equivalent)
Angled (or Hooked) Removal Tool		Pressurized Water Supply 30 to 60 psi (2 to 4 bar)

**** Alternatively a 12 to 15 inch adjustable wrench may be used.**

Since both TRVs look identical except for the color placed on the tip of the sensor at the factory, Hale stamps the body of each TRV to identify it as a TRV-120 or TRV-170 (See Figure 1). Do NOT change the operating temperature of a TRV with these kits.



Figure 1.

If the TRV-L operates correctly (discharges water at and above 120° F or 170° F) yet fails to provide the associated PUMP HOT indication, test the indicator using the PUSH TO TEST switch.

1. Test PUMP HOT WHEN LIT indicator. See Figure 2.
 - a. Connect power connection and chassis ground to appropriate (12 or 24 volt) 10 amp protected source.
 - b. Using panel control and indicator, press PUSH TO TEST button.
 - c. Verify PUMP HOT WHEN LIT indicator illuminates.
 - d. Release button and verify PUMP HOT WHEN LIT indicator extinguishes.



Figure 2.

2. Replace light (or entire assembly if switch has failed). (See Table 1 NOTE, on page 1.)

If the TRV-L PUMP HOT WHEN LIT indicator illuminates when tested yet fails to provide the associated indication when the TRV discharges water, perform the following to remove and replace the pressure switch portion (see Table 1 NOTE, on page 1) of a Hale TRV-L.

NOTE: If the TRV is hot, wait until the TRV cools before beginning a repair.

1. Remove pressure switch from TRV.
 - a. Tag and disconnect wiring.
 - b. Remove pressure switch. See Figure 3.
 - 1) Using 1 inch (or adjustable) wrench, loosen pressure switch.
 - 2) Remove pressure switch.
2. Install new pressure switch on TRV.
 - a. Prepare switch for installation.



Figure 3.

NOTE: Do NOT use an excessive amount of sealant or allow the sealant to get into the opening at the bottom of the switch.

- 1) Apply Loctite 640 (or equivalent) to pressure switch threads.
- 2) Hand start switch.
- b. Using 1 inch (or adjustable) wrench, tighten pressure switch.
- c. Connect wiring according to tags.
- d. Verify TRV-L functions. See Step **Error! Reference source not found.** on page **Error! Bookmark not defined.**

If the TRV/TRV-L does NOT operate correctly (discharges water at and above 120° F or 170° F) or leaks, perform the following to remove and replace the piston assembly portion (see Table 1) of a Hale TRV/TRV-L.

1. Disassemble TRV as follows.

NOTE: Do NOT use an excessive amount of force (or the threaded end of the housing) to hold the brass housing.

- a. Place TRV in a vice.
- b. Remove cold roll pin. See Figure 4.
 - 1) Use a drift punch (or vice grips) to remove cold roll pin.
 - 2) Using a hammer, tap punch (or vice grips) to drive cold roll pin out of TRV.

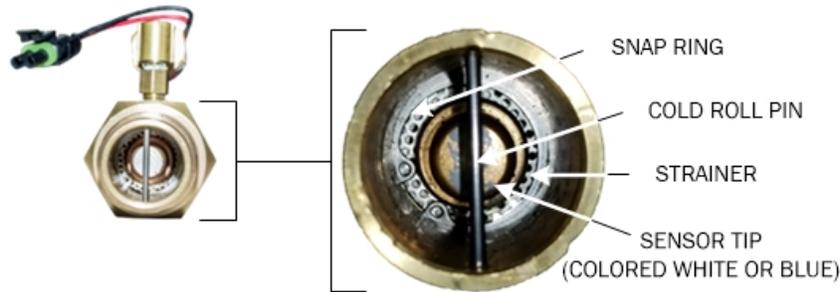


Figure 4.

c. Remove piston assembly (Figure 5. also shown as sensor tip in Figure 4) as follows.

- 1) Using snap ring pliers, compress piston assembly retaining (snap) ring. See Figure 4.
- 2) Remove snap ring. (Discard snap ring.)
- 3) Using needle nose pliers, pull piston assembly out of TRV.

NOTE: If the piston assembly is stuck inside the TRV, remove the adjustment screw (using a 5/32-inch hex key socket and ratchet [set CCW] or Allen wrench) and use a long drift punch and hammer to drive the assembly out of the TRV.



Figure 5.

2. Remove and replace O-rings.

- a. Using angled (or hooked) removal tool (pick), remove both O-rings from bore of TRV body.

Using Safety Kleen® (or Stoddard Solvent) and a soft bristle brush clean any debris and/or deposits out of the TRV body and discharge ports. Remove all mineral deposits (lime scale remover). Flush the TRV with clean water.

Inspect TRV bore for pitting or other damage; resurface or replace TRV if a new body is required.

NOTES: If the TRV body bore requires resurfacing, use a hone to lightly clean and smooth the bore. See Figure 6 and Figure 7.

If TRV body bore requires resurfacing, remove the adjustment screw (using a 5/32-inch hex key socket and ratchet [set CCW] or Allen wrench) and both discharge port plugs or fittings before honing.

If the TRV body bore required resurfacing, check the bore diameter after honing. If the bore is greater than \varnothing 1.192 inches (30.28 mm) replace the entire TRV.

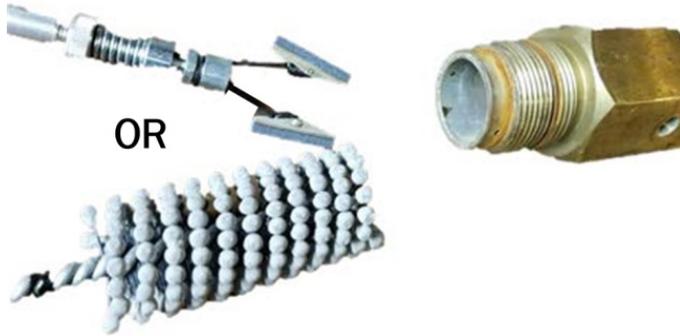


Figure 6.



Figure 7.

- b. Lightly coat both O-rings (prevents O-ring damage and aides assembly) with O-ring lubricant. (Do NOT get lubricant in bore of TRV body, this may block the ports.)
- c. Install two [2] new O-rings.
- d. Ensure O-rings are seated in grooves.
- 3. Install new piston assembly into TRV.
 - a. Lightly coat base of piston assembly with Dow 55M silicone grease (or equivalent).
 NOTE: Do NOT over lubricate, lubricant in bore of TRV body may block the ports.

NOTE: Install retaining ring with the gap in the ring aligned with the slot in the piston.

- b. Push piston assembly (strainer end outward) into TRV body until fully seated.
- 4. Install new retaining ring.

IMPORTANT ▲ NOTICE FAILURE TO INSTALL THE COLD ROLLED PIN WILL ALLOW THE PISTON ASSEMBLY TO ENTER THE PUMP IF THE RETAINING RING FAILS.

- 5. Install cold roll pin (see Figure 4).
- 6. Adjust TRV adjustment screw. (Located on top of TRV, see Figure 8.)
 - a. If installed, remove adjustment screw, using a 5/32-inch hex key socket and ratchet (set CCW) or Allen wrench.
 - b. Clean adjustment screw threads.
 - c. Apply a single bead of Loctite® 592 (or equivalent) to threads of adjustment screw.
 - d. Hand start adjustment screw.



Figure 8.

- e. Attach a (turned off) 30 to 60 psi (2 to 4 bar) pressurized water supply to TRVs discharge port. (Plug remaining discharge port if open.)
- f. Turn on water supply.
- g. Turn adjustment screw clockwise until water begins to flow out TRV inlet.
- h. Turn adjustment screw counterclockwise 2-1/2 turns and verify water flow stops.
- i. Turn pressurized water supply off.
- j. Vent water pressure and remove water supply.



7. Install TRV/TRV-L on pump as follows.
 - a. Using 2 inch (or adjustable) wrench, tighten TRV.
 - b. Connect TRV discharge plumbing according to tags.
 - c. If TRV-L, connect wiring according to tags.