172-65441MA-04 (JL14-X/JLH14-X/JLH14-B) 24 June 2015

ISO 9001/ ISO 14001

Manufacturer

TLV. CO., LTD.

Kakogawa, Japan

is approved by LRQA LTD. to ISO 9001/14001

Instruction Manual

Process Float Steam Trap

JL14-X / JLH14-X

(Optional Model)

JLH14-B

Contents

Introduction

Thank you for purchasing the TLV Process Float Steam Trap.

This product has been thoroughly inspected before being shipped from the factory. When the product is delivered, before doing anything else, check the specifications and external appearance to make sure nothing is out of the ordinary. Also be sure to read this manual carefully before use and follow the instructions to be sure of using the product properly.

The Process Float Steam Trap is a large-capacity lever float type mechanical steam trap that uses a high-performance X-element or high-temperature bimetal for the air vent. With the unique sensitivity of mechanical steam traps for condensate discharge, the trap reduces the time required to start up process equipment and improves heating efficiency.

For products with special order specifications or options, if detailed instructions for the special order specifications or options are not contained in this manual, please contact TLV for full details.

This instruction manual is intended for use with the model(s) listed on the front cover. It is necessary not only for installation but for subsequent maintenance, disassembly/reassembly and troubleshooting. Please keep it in a safe place for future reference.

Safety Considerations

- Read this section carefully before use and be sure to follow the instructions.
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- The precautions listed in this manual are designed to ensure safety and prevent equipment damage and personal injury. For situations that may occur as a result of erroneous handling, three different types of cautionary items are used to indicate the degree of urgency and the scale of potential damage and danger: DANGER, WARNING and CAUTION.
- The three types of cautionary items above are very important for safety: be sure to observe all of them as they relate to installation, use, maintenance, and repair. Furthermore, TLV accepts no responsibility for any accidents or damage occurring as a result of failure to observe these precautions.

Symbols

	**Indicates a DANGER, WARNING or CAUTION item.**
DANGER	Indicates an urgent situation which poses a threat of death or serious injury
WARNING	Indicates that there is a potential threat of death or serious injury
CAUTION	Indicates that there is a possibility of injury or equipment / product damage

WARNING	**NEVER apply direct heat to the float.** The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.
CAUTION	**Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges.** Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.
	DO NOT use this product in excess of the maximum operating pressure differential. Such use could make discharge impossible (blocked).
	Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more). Failure to do so may result in back strain or other injury if the object should fall.
	Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.

Safety considerations continued on next page.

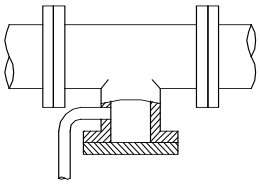
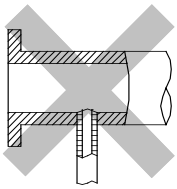
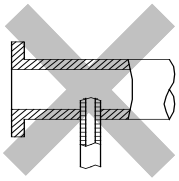
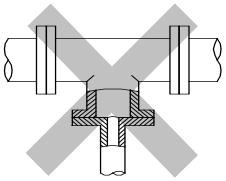
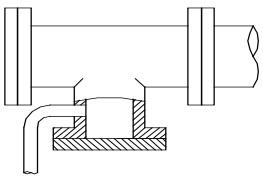
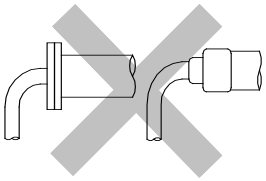
⚠CAUTION	**When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature**. Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.
	Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way. Failure to observe these precautions may result in damage to the product and burns or other injury due to malfunction or the discharge of fluids.
	Do not use excessive force when connecting threaded pipes to the product. Over-tightening may cause breakage leading to fluid discharge, which may cause burns or other injury.
	Use only under conditions in which no freeze-up will occur. Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.
	Use only under conditions in which no water hammer will occur. The impact of water hammer may damage the product, leading to fluid discharge, which may cause burns or other injury.

Checking the Piping

⚠CAUTION **Use only under conditions in which no water hammer will occur. The impact of water hammer may damage the product, leading to fluid discharge, which may cause burns or other injury.**

Check to make sure that the pipes to be connected to the trap have been installed properly.

1. Is the pipe diameter suitable?
2. Is the piping where the trap is to be installed horizontal?
3. Has sufficient space been secured for maintenance (refer to the “Installation” section)?
4. Have isolation valves been installed at the inlet and outlet? If the outlet is subject to back pressure, has a check valve (TLV-CK) been installed?
5. Is the inlet pipe as short as possible, with as few bends as possible, and installed so the liquid will flow naturally down into the trap?
6. Has the piping work been done correctly, as shown in the figures below?

Requirement	Correct	Incorrect
Install catchpot with the proper diameter.		 Diameter is too small.
Make sure the flow of condensate is not obstructed.		 Diameter is too small and inlet protrudes into pipe interior.
To prevent rust and scale from flowing into the trap, the inlet pipe should be connected 25 – 50 mm (1 – 2 in) above the base of the T-pipe.		 Rust and scale flow into the trap with the condensate.
When installing on the blind end, make sure the flow of condensate is not obstructed.		 Condensate collects in the pipe.

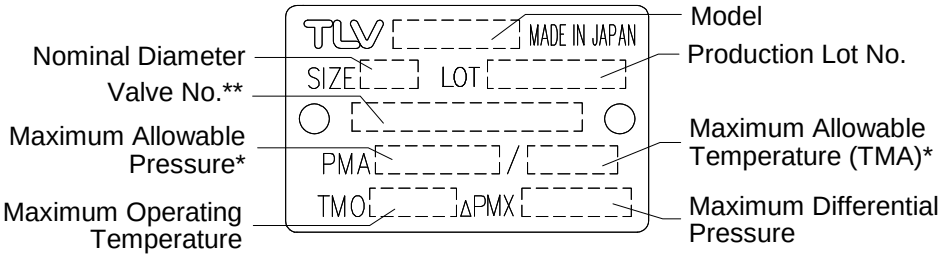
Specifications

⚠CAUTION **Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.**

⚠CAUTION **DO NOT use this product in excess of the maximum operating pressure differential; such use could make discharge impossible (blocked).**

⚠CAUTION **Use only under conditions in which no freeze-up will occur. Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.**

Refer to the product nameplate for detailed specifications.

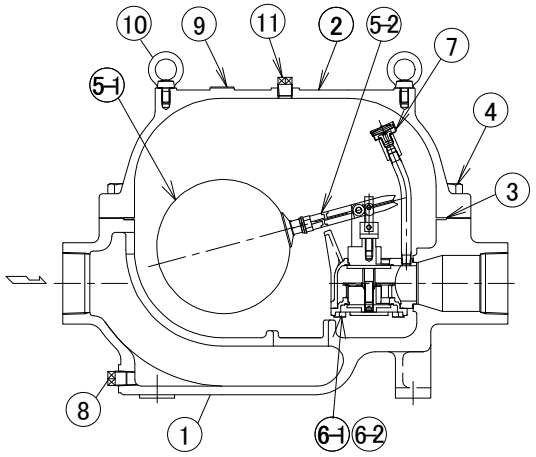


* Maximum allowable pressure (PMA) and maximum allowable temperature (TMA) are PRESSURE SHELL DESIGN CONDITIONS, **NOT** OPERATING CONDITIONS.

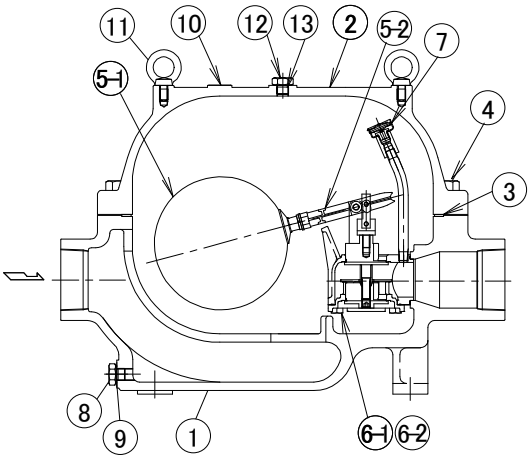
** Valve No. is displayed for products with options. This item is omitted from the nameplate when there are no options.

Configuration

JL14-X



JLH14-X / JLH14-B (option)



JL14-X

No.	Name	M*1	R_L*1	R_T*1	R_A*1	F*1
1	Body					
2	Cover					
3	Cover Gasket	✓	✓	✓	✓	
4	Cover Bolt					
5-1	Float					✓
5-2	Lever Unit		✓			
6-1	Trap Unit (Main Valve Unit)*2			✓		
6-2	Valve Seat Gasket	✓		✓*3		
7	Air Vent Unit				✓	
8	Drain Plug					
9	Nameplate					
10	Eye Bolt					
11	Cover Plug					

JLH14-X / JLH14-B (Option)

No.	Name	M*1	R_L*1	R_T*1	R_A*1	F*1
1	Body					
2	Cover					
3	Cover Gasket	✓	✓	✓	✓	
4	Cover Bolt					
5-1	Float					✓
5-2	Lever Unit		✓			
6-1	Trap Unit (Main Valve Unit)*2			✓		
6-2	Valve Seat Gasket	✓		✓*3		
7	Air Vent Unit*4				✓	
8	Drain Plug					
9	Drain Plug Gasket	✓	✓	✓	✓	
10	Nameplate					
11	Eye Bolt					
12	Cover Plug					
13	Cover Plug Gasket	✓	✓	✓	✓	

*1 Replacement parts are available only in the following kits:
M = Maintenance Kit; R_L = Lever Repair Kit; R_T = Trap Repair Kit; R_A= Air Vent Repair Kit; F= Float
*2 Trap Unit (Main Valve Unit) has a specific Orifice No.
*3 Included in Trap Unit (Main Valve Unit)
*4 X-element Air Vent Unit (JLH14-X) is standard; Bimetal Air Vent Unit (JLH14-B) is an option

Installation

⚠CAUTION **Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.**

⚠CAUTION **Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more). Failure to do so may result in back strain or other injury if the object should fall.**

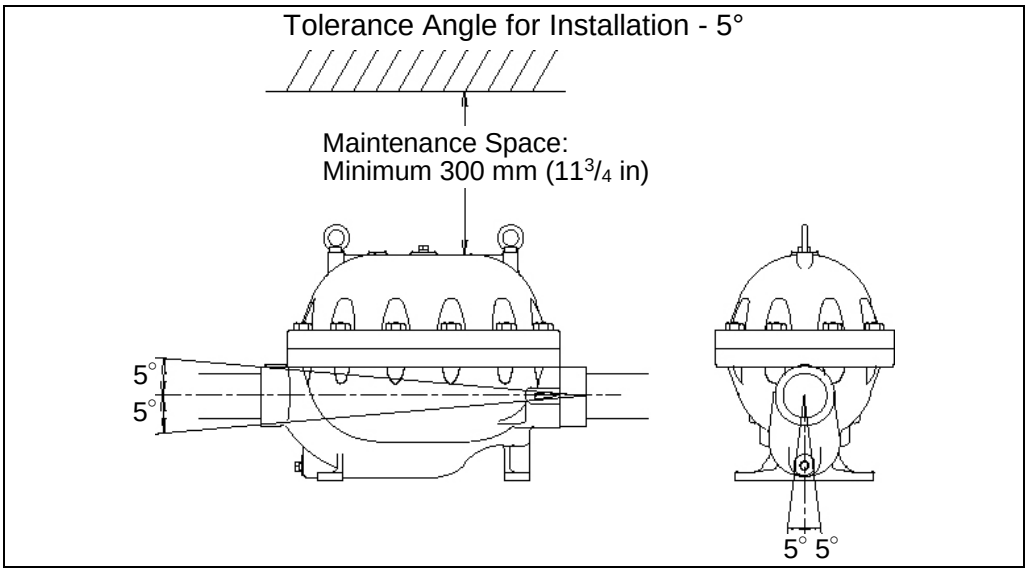
⚠CAUTION **Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.**

⚠CAUTION **Do not use excessive force when connecting threaded pipes to the product. Over-tightening may cause breakage leading to fluid discharge, which may cause burns or other injury.**

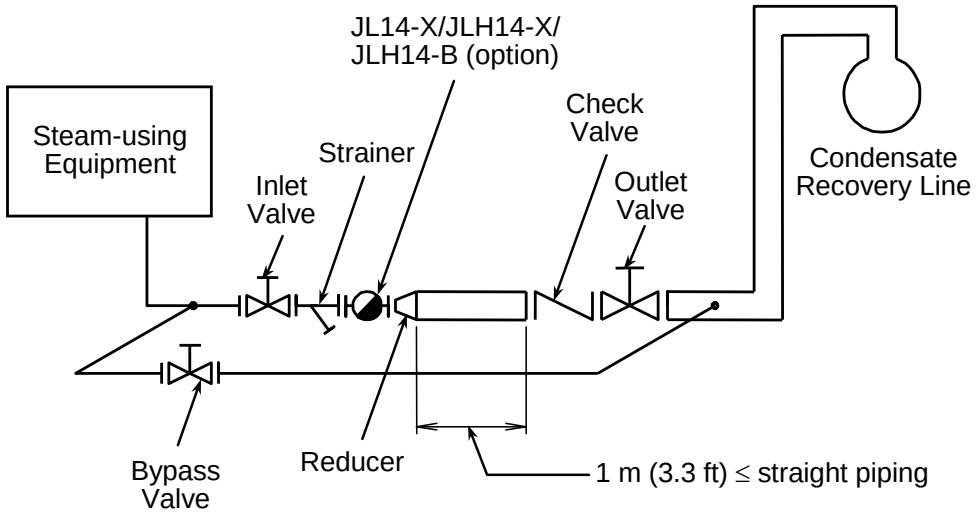
Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.

1. Before installation, be sure to remove all protective seals.
2. Before installing the product, open the inlet valve and blow out the piping to remove any piping scraps, dirt and oil. Close the inlet valve after blowdown.
3. Install a bypass valve and inlet and outlet isolation valves for use in the event of trap failure or when performing maintenance.
4. Install a strainer (40 – 60 mesh) ahead of the trap.
5. Install the product so that the arrow on the body is pointing in the direction of flow.
6. The trap should be inclined no more than 5° horizontally and front-to-back. Be sure to leave adequate clearance for a maintenance space above the trap cover.
7. Connect outlet piping. Be sure to size outlet piping large enough to accommodate any flash steam that may form to prevent any increase in back pressure and allow at least 1 m (3.3 ft) straight piping to avoid possible pipe erosion.
8. Open the inlet and outlet valves and ensure that the product functions properly.

If there is a problem, determine the cause using the “Troubleshooting” section in this manual.



Sample Installation



NOTE: Be sure to size outlet piping large enough to accommodate any flash steam that may form to prevent any increase in back pressure. (Outlet pipe size should always be properly calculated, contact TLV for assistance.)

Inlet, outlet and bypass valves must be full bore valves.

This diagram is for illustration purposes only. For actual installation, piping design must be performed by qualified personnel.

Maintenance

CAUTION **Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.**

CAUTION **Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way. Failure to observe these precautions may result in damage to the product or burns or other injury due to malfunction or the discharge of fluids.**

Operational Check

A visual inspection of the following items should be done on a daily basis to determine whether the trap is operating properly or has failed. Periodically (at least biannually) the operation should also be checked by using diagnostic equipment, such as a stethoscope or thermometer.

If the trap should fail, it may cause damage to piping and equipment, resulting in faulty or low quality products or losses due to steam leakage.

Normal:	Condensate is discharged continuously, together with flash steam, and the sound of flow can be heard. If there is very little condensate, there is almost no sound of flow.
Blocked: (Discharge Impossible)	No condensate is discharged. The trap is quiet and makes no noise, and the surface temperature of the trap is low.
Blowing:	Live steam continually flows from the outlet and there is a continuous metallic sound.
Steam Leakage:	Live steam is discharged through the trap outlet together with condensate, accompanied by a high-pitched sound.

NOTE: JL14-X, JLH14-X and JLH14-B (option) have a minimum required condensate load requirement to ensure proper sealing.

Parts Inspection

When parts have been removed, or during periodic inspections, use the following table to inspect the parts and replace any that are found to be defective.

	Procedure
Gaskets (Cover, Valve Seat):	check for warping or scratches
Float:	check for cracks or dents
Main Joint Stem and Joint Bolt for Lever Unit and Trap Unit (Main Valve Unit):	check for wear
Float/Lever Unit:	check sliding sections for any dirt, oil film or wear that may impede smooth movement; make sure the lever moves smoothly
Valve Opening in Trap Unit (Main Valve Unit):	check for dirt, oil film, wear or scratches that may impair sealing; make sure the valve moves up and down smoothly
Air Vent Valve Seat:	check for scratches
X-element in Air Vent:	check for damage

Disassembly / Reassembly

WARNING **NEVER apply direct heat to the float. The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.**

CAUTION **Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more). Failure to do so may result in back strain or other injury if the object should fall.**

CAUTION **When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature. Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.**

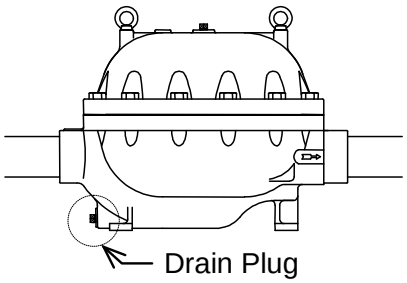
Use the following procedures to remove components. Use the same procedures in reverse to reassemble. (Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.)

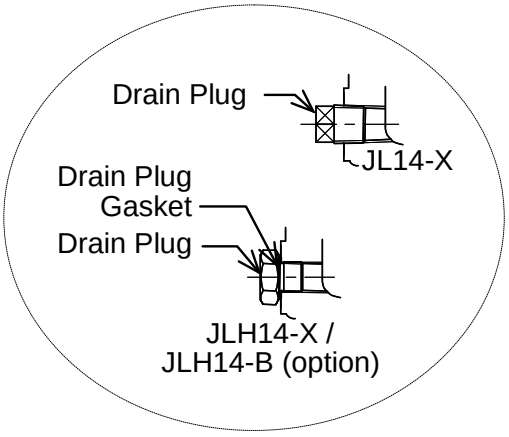
In cases where sufficient space has been secured for maintenance (see the maintenance space diagram in the “Installation” section), it is possible to perform maintenance without disconnecting the inlet and outlet piping. If there is insufficient maintenance space, first disconnect the inlet and outlet piping, then move the unit to a spacious area in which to carry out maintenance.

Removing / Reattaching the Drain Plug

Remove any condensate from inside the body before beginning disassembly.

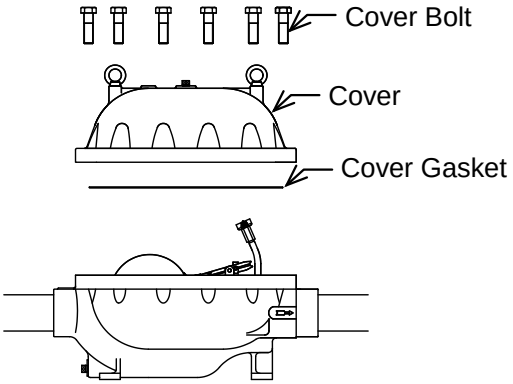
Part	During Disassembly	During Reassembly
Drain Plug	-Remove with a wrench	-JL14-X: Wrap 3 – 3.5 turns of sealing tape around the threads; consult the table of tightening torques and tighten to the proper torque -JLH14-X/JLH14-B (Option): Consult the table of tightening torques and tighten to the proper torque
Drain Plug Gasket (JLH14-X / JLH14-B (Option))	-Remove the gasket and clean sealing surfaces	-Replace with a new gasket; coat surfaces with anti-seize





Detaching / Reattaching the Cover from the Body

Part	During Disassembly	During Reassembly
Cover Bolt (M22 × 12 pcs)	-Remove with a socket wrench	-Consult the table of tightening torques and tighten evenly to the proper torque
Cover	-Lift up to remove	-Make sure to match the direction of the arrow indicated on the body and cover
Cover Gasket	-Remove the gasket and clean sealing surfaces	-Replace with a new gasket



Disassembly / Reassembly of the Air Vent Unit, Connector and Air Vent Pipe

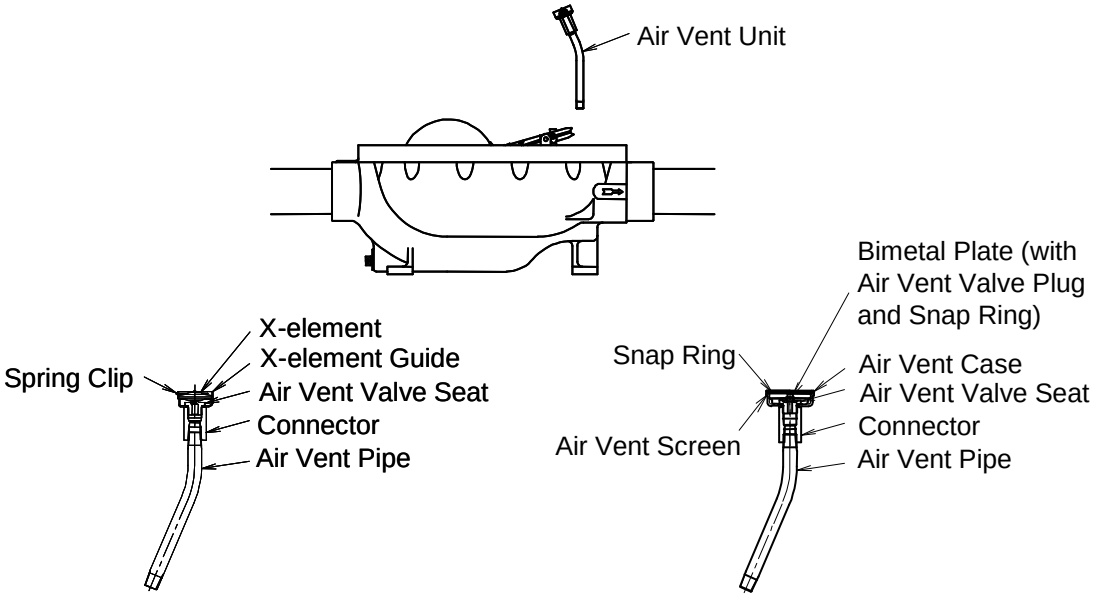
JL14-X / JLH14-X

Part	During Disassembly	During Reassembly
Air Vent Pipe	-Remove with a pipe wrench	-Wrap 3 – 3.5 turns of sealing tape around the threads or coat with sealing compound and screw into trap unit (main valve unit) -Consult the table of tightening torques and tighten to the proper torque
Connector	-Remove with a wrench	-Consult the table of tightening torques and tighten to the proper torque
Spring Clip	-Pinch insides together and remove from the X-element guide	-Insert securely into the groove in the X-element guide
X-element	-Remove from the X-element guide	-Reinsert after making sure of the proper orientation
Air Vent Valve Seat	-Remove with a socket wrench	-Consult the table of tightening torques and tighten to the proper torque
X-element Guide	-Remove without bending	-The X-element must be inserted smoothly

JLH14-B (Option)

Part	During Disassembly	During Reassembly
Air Vent Pipe	-Remove with a pipe wrench	-Wrap 3 – 3.5 turns of sealing tape around the threads or coat with sealing compound and screw into trap unit (main valve unit) -Consult the table of tightening torques and tighten to the proper torque.
Connector	-Remove with a wrench	-Consult the table of tightening torques and tighten to the proper torque
Snap Ring	-Pinch insides together and remove from the air vent case	-Insert securely into the groove in the air vent case
Air Vent Screen	-Remove being careful not to misshape	-Replace, being careful not to misshape

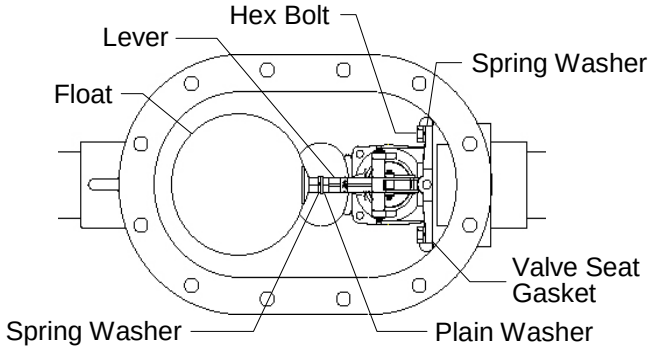
Bimetal Plate	-Remove air vent parts from the air vent case	-Make sure to reinsert in the proper orientation; make sure the seating surface of the air vent valve is facing towards the air vent valve seat
Air Vent Valve Seat	-Remove with a socket wrench	-Consult the table of tightening torques and tighten to the proper torque
Air Vent Case	-Remove from seating	-Check for scratches or dirt on seating surface



X-Element Air Vent Unit **Bimetal Air Vent Unit (Option)**

Detaching / Reattaching the Float and the Trap Unit

Part	During Disassembly	During Reassembly
Float	-Hold the lever firmly with a wrench -Remove the float with a second wrench	-Hold the lever firmly with a wrench -Reattach the float -Consult the table of tightening torques and tighten to the proper torque
Spring Washer	-Remove from the lever, do not misplace	-Place the spring washer on the lever
Plain Washer	-Remove from the lever, do not misplace	-Place the plain washer on the lever
Hex Bolt (M12 × 2 pcs)	-Remove with a socket wrench	-Consult the table of tightening torques and tighten evenly to the proper torque
Spring Washer	-Be careful not to misplace	-Be sure to reinsert the washers
Valve Seat Gasket	-Remove the gasket and clean sealing surfaces	-Replace with a new gasket



Detaching / Reattaching the Lever Unit & Float Unit

Part	During Disassembly	During Reassembly
Lever Unit Trap Unit	-Remove the split pin from each end of the main joint stem -Loosen with a wrench and remove the U-nut use for the joint bolt -Pull out the main joint stem -Pull out the joint bolt, paying attention to the position of the flats on the joint bolt; the lever unit and the trap unit can then be separated	-Ensure proper orientation for the lever unit at reassembly; Connect the lever unit to the trap unit with the “UP” mark facing upwards -Referring to the figure below, insert both the main joint stem and the joint bolt; remember to reinsert the washers; once a new split pin is inserted into each end of the main joint stem, make sure to bend both ends of each split pin so it does not come off -The flats on the joint bolt should be positioned as shown in the figure below; remember to reinsert the washers; make sure the flat surface of the U-nut is facing the washer at reassembly; consult the table of tightening torques and tighten to the proper torque

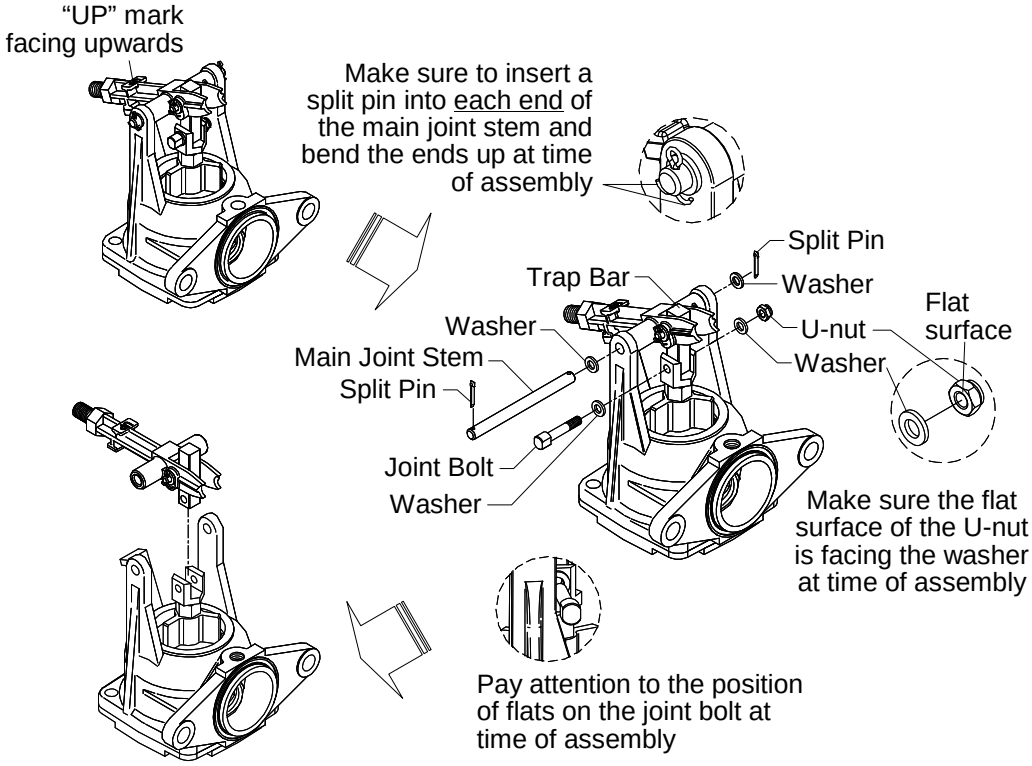


Table of Tightening Torques

Part Name \ Model			JL14-X	JLH14-X	JLH14-B*
Drain Plug/ Cover Plug	Torque	N·m (lbf·ft)	30** (22)**	100 (73)	100 (73)
	Distance Across Flats	mm (in)	12 ($^{15}/_{32}$)	26 (1)	26 (1)
Cover Bolt	Torque	N·m (lbf·ft)	200 (150)	600 (440)	600 (440)
	Distance Across Flats	mm (in)	32 ($1^{1}/_{4}$)	32 ($1^{1}/_{4}$)	32 ($1^{1}/_{4}$)
Air Vent Pipe	Torque	N·m (lbf·ft)	30** (22)**	30** (22)**	30** (22)**
	Distance Across Flats	mm (in)	— (—)	— (—)	— (—)
Connector	Torque	N·m (lbf·ft)	30 (22)	30 (22)	30 (22)
	Distance Across Flats	mm (in)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)
Air Vent Valve Seat	Torque	N·m (lbf·ft)	35 (26)	35 (26)	30 (22)
	Distance Across Flats	mm (in)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)
Float	Torque	N·m (lbf·ft)	50 (37)	50 (37)	50 (37)
	Distance Across Flats	mm (in)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)
Hex Bolt	Torque	N·m (lbf·ft)	80 (59)	80 (59)	80 (59)
	Distance Across Flats	mm (in)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)	19 ($^{3}/_{4}$)
U-nut (Joint Bolt)	Torque	N·m (lbf·ft)	10 (7)	10 (7)	10 (7)
	Distance Across Flats	mm (in)	10 ($^{3}/_{8}$)	10 ($^{3}/_{8}$)	10 ($^{3}/_{8}$)

*Option (1 N·m ≈ 10 kg·cm)

**These values represent tightening torques for threads that are wrapped with 3 - 3.5 turns of sealing tape.

NOTE: - Coat all threaded portions with anti-seize.
- If drawings or other special documentation were supplied for the product, any torque given there takes precedence over values shown here.

Troubleshooting

⚠WARNING **NEVER apply direct heat to the float. The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.**

⚠CAUTION **When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature. Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.**

When the product fails to operate properly, use the following table to locate and remedy the cause.

Problem	Diagnosis (Cause)	Remedy
No condensate is discharged (blocked) or discharge is poor	Check to see if the operating conditions are outside the specification ranges: - Is the pressure differential suitable for the amount of condensate generated? - Has the maximum operating pressure been exceeded?	Compare specifications with actual operating conditions
	Check to see if the trap installation method and location are suitable: - Is the trap inlet pipe installed so the fluid flows downward naturally? - Are the sizes of the inlet and outlet pipes suitable? - Has steam-locking occurred?	Change to a suitable piping arrangement
	Check the inlet and outlet valve open/close status and check to see if the valve is clogged with dirt: - Are the inlet and outlet valves fully open? - Is the inlet strainer clogged with dirt? - Are the pipes clogged with dirt? - Is there accumulated dirt at the bottom of the body, particularly below the trap unit (main valve unit)?	Inspect and clean
	Check sliding sections of the lever unit: - Is rust and/or scale obstructing movement of the lever unit? - Is the movement of the lever smooth?	Clean or replace with a new lever unit
	Check sliding sections of the trap unit (main valve unit): - Is there rust and/or scale in the sliding sections? - Is the movement of the valve smooth?	Clean or replace with a new trap unit (main valve unit)
	Check the float to see if it is damaged or filled with water	Replace with a new float
Steam is discharged or leaks from the trap outlet (blowing) (steam leakage)	Check minimum required condensate amount: - Actual condensate amount falls below minimum required amount	Replace with a product that has a suitable capacity rating
	Check the trap unit (main valve unit): - Check for a clogged valve opening or rust and scale under the float - Check for damage to the valve opening - Check for rust and scale in the sliding sections - Is the movement of the valve smooth? - Are the gaskets deteriorated or damaged?	Clean or replace with new parts/trap units

Troubleshooting continued on next page

Problem	Diagnosis (Cause)	Remedy
Steam is discharged or leaks from the trap outlet (blowing) (steam leakage)	Check sliding sections of lever unit: - Is rust and/or scale obstructing movement of the lever unit? - Is the movement of the lever smooth?	Clean or replace with a new lever unit
	Check the air vent: - Check for damage to or rust and scale on the X-element or the bimetal	Replace parts where necessary
	Check for proper installation	Install correctly
	Check for trap vibration	Lengthen the inlet piping and fasten it securely
Steam is leaking from a place other than the outlet	Check for gasket deterioration or damage	Replace with new gasket(s)
	Check to make sure that the proper tightening torques were used	Tighten to the proper torque
	Erosion has occurred in the body or cover	Replace with a new product
Float frequently becomes damaged	Check to see if water hammer has occurred	Study and correct the piping

Product Warranty

1. Warranty Period
   One year following product delivery.

2. Warranty Coverage
   TLV CO., LTD. warrants this product to the original purchaser to be free from defective materials and workmanship. Under this warranty, the product will be repaired or replaced at our option, without charge for parts or labor.

3. This product warranty will not apply to cosmetic defects, nor to any product whose exterior has been damaged or defaced; nor does it apply in the following cases:
   1) Malfunctions due to improper installation, use, handling, etc., by other than TLV CO., LTD. authorized service representatives.
   2) Malfunctions due to dirt, scale, rust, etc.
   3) Malfunctions due to improper disassembly and reassembly, or inadequate inspection and maintenance by other than TLV CO., LTD. authorized service representatives.
   4) Malfunctions due to disasters or forces of nature.
   5) Accidents or malfunctions due to any other cause beyond the control of TLV CO., LTD.

4. Under no circumstances will TLV CO., LTD. be liable for consequential economic loss damage or consequential damage to property.

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For Service or Technical Assistance:

Contact your TLV representative or your regional TLV office.

Manufacturer

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