

Servicing a Frozen SLX Slide In Truckmount

– by Chris Hill, Cleanco Truckmounts Service Department

Things to keep in mind when dealing with frozen units

Diagnosing and fixing a frozen unit is a SLOW process that should not be rushed. Every aspect of the unit needs to be tested before you can give the “all clear” and hand it back over to the customer. If you take short cuts, you could leave the customer stranded in the middle of a job because a hose blew off or a leak sprung somewhere that you didn’t check. When you book in a frozen truckmount, make sure that you leave yourself adequate time to get through all areas of the truckmount to be tested. Finding leaks in fittings and hoses is just one small component to making sure that a truckmount is functional after it has been frozen. But don’t get frustrated or discouraged if the customer comes back in multiple times for leaks after freezing their unit. Keep in mind, that just because a component isn’t leaking or seem damaged at the time of your testing and repairing, does not mean that it made it through freezing unscathed. Micro fractures of brass fittings, stretching of metal and plastic may not show its damage initially, but could and will show up later. Heating and cooling of the unit over time will expose areas that have stretched and became too thin to handle the pressure or have formed micro fracture somewhere that was undetectable. If you take your time going through and testing each component/area, you lessen the chance of this happening.

How freezing damages a truckmount

When water freezes, it expands. When in a confined space, hoses, brass and components (pump, heat exchanger coils, etc..) take the brunt of this expansion. This causes stretching, cracking and popping of fittings, creating damage to the unit. Any area where there is inadequate space for the water to expand will break regardless of how thick the material is.

Can the customer claim warranty on anything?

No warranty is covered from freezing. Freezing the truckmount can and will void the warranty on almost every component of the truckmount. The Cleanco warranty booklet (see warranty for all Cleanco/Esteam Equipment) states that freezing your truckmount will void the warranty regardless of how new or old the unit is.

Where to start with a frozen truckmount

Before starting to track down leaks and breaks, make sure that the truckmount is warm. There’s nothing worse than working on a cold piece of equipment. This also ensures that any ice still in the system has melted and will allow water to flow free. Open all the van doors to allow as much room temperature air to get into the van as possible. A space heater put into the back of the van will also help speed this process up. If the metal and components are ice cold to the touch, it’s not warm enough. Depending on the severity of the freezing, this can take a day or MORE of sitting in room temperature area to thaw out the unit. **DO NOT** start the unit and try to use the truckmount heat to warm up the unit. This will cause more damage than it will do good.

Start with what caused the damage

Once the truckmount has warmed up and we know all the ice has melted in the system, we need to get water into the unit to find where the damage is. We do this by pressurizing the system with a garden hose. The best and easiest place to attach a garden hose to the system is at the inlet water manifold where the hose from the freshwater tank connects to. Building an adapter to hook up to the inlet water manifold with a garden hose connection on the opposite end is a fairly simple process.

Make sure that you have included on this adapter a way of turning on and off the flow of water so that when a leak is exposed, you are able to turn off the water quickly.

Make sure you have a primer hose/open-ended hose with a shut off valve connected to one of the **RED** quick-connects on the front panel. This will allow you to get water fully through the system and remove any air that may have gotten into the system due to the freezing. The red connection on the front panel is the longest point that water has to run through the system to exit it. So, this is a great place to hook into the front panel to make sure water and pressure get to the furthest places it goes.

DO NOT START THE UNIT

Open your valve on the primer hose and start the water flow from the garden hose. Allow water to flow for a short time through the connected hose to make sure that there is no air left in the system. If you notice any leaks at this point, stop the water flow and address the issues.

It's a waiting game

If you do not see any leaks as the water flows, turn off the valve on the primer hose but allow the water from the garden hose to continue flowing. This will pressurize the system with city water pressure (approx. 80psi) This pressure is usually enough to cause any areas that may have been damaged due to freezing to start showing.

At this point, you are going to do a very thorough check of ALL components on the unit. (Make sure to use a flashlight and look for reflections off dripping and pooling water)

- ALL hose
- ALL brass fittings starting from the rear of the unit, working your way forward to the front lower and top panels
- Pressure regulator and the regulators housing
- Lower panel Quick connects for weeping
- Chemical metering valve on top panel for cracks in the acrylic
- Inlet water manifold Inline filter (cap usually cracks)
- Cat pump (look for water dripping below the pump head (Silver in color), leaks from front and top valve caps. Leaks coming from chemical pump (If installed)
- Liquid Heat exchanger (All compression fittings on the top of the exchanger. Check hoses leading to, in between and exiting from the liquid heat exchanger)
- Last Step injection 3-way valve and chemical metering valve (If last step injection is equipped on your unit)
- Exhaust heat exchanger brass connections for cracked fittings where hoses attach.

Leave the garden hose attached and keep the system pressurized for a **minimum of 30 min** and continuously checking for drips and pooling water.

Doing this will also help to determine if there is any internal damage to components that we cannot physically check due to them being sealed into other components on the unit such as the exhaust heat exchanger and liquid heat exchanger.

What are we looking for during the 30 min wait?

Hoses and brass fittings are easy and obvious to see when damaged most times. Water will start to leak immediately from the areas that are damaged when the unit is under pressure. However, the components that water moves through that we cannot physically see the damage are a different story. We check these by leaving the garden hose attached and the system pressurized, forcing the unit to fill up with water in areas that could be damaged over a longer period of time and looking for the ramifications of the water infiltrating.

While under water pressure from the garden hose, you are going to look mainly at 2 areas outside of the normal hoses and brass fittings for signs of water infiltration and damage.

1. Liquid heat exchanger: how damage internally to the liquid heat exchange will show/ indicate internal damage

At the rear of the unit on the top frame support is the engine coolant overflow container. On the side of the container is a clear tube to view the level of coolant in the overflow container. Using a black marker, place a line on the clear tube at the level of coolant. We do this so that we can see if water is being introduced into the coolant system of the engine. This gives us a visible, easy to see mark for reference. Water and coolant from the engine only ever cross paths at this place in the truckmount. To see if the coils in the liquid heat exchanger have been damaged due to freezing, water pressure to the system will push water into the coolant of the engine at the point of the damage and start to fill up the overflow container for the coolant of the engine. This can take time depending on the size of the crack and damage to the coils. This is one of the reasons that we wait for a 30-minute period with the system pressurized with the garden hose. Check the level compared to your mark on the tube frequently. Since the engine is cold and hasn't been run, this level in the overflow container will only change if there is extra fluid being introduced into the system.

2. Exhaust heat exchanger: see how damage internally shows / indicate internal damage

The exhaust heat exchanger is exactly as its name suggests. Exhaust from the engine passes through the exchanger and transfers to the water moving through the exhaust heat exchanger. If there is a crack or damage internally to this component, it will allow water to fill into the cavity of the exchanger where the exhaust gas passes through. This can take time to show / leak as there is a large cavity in the exchanger that needs to fill before it starts to leak. The 30 minutes allows time to fill the cavity and start to leak from the connection between the exhaust heat exchanger and the exhaust hoses attached if there is damage.

Just like the liquid heat exchanger, you will want to check the exhaust hose connections regularly for water dripping and leaking.

Still no leaks or I have fixed all the visible leaks

Sometimes, garden hose pressure is not enough to expose all micro cracks or leaks that may form from freezing. If you have taken care of all leaks or found none, now's the time to run the unit.

Start the unit and make sure that you still have a primer hose attached to the front panel. Allow the unit to build pressure and flow water. Set your pressure to 500 psi and allow to flow as you again check all areas of the unit as you did under garden hose pressure. If you cannot find any leaks, close off the valve on the primer hose and allow the unit to build pressure to 500 psi. Watch for steady pressure.

If you have fluctuation, allow more water to flow through the primer hose again for a short bit to work out any air in the system. If fluctuation is continuously happening, this may indicate a leak, seeping air into the system, or pump related issues. Time to start looking for the cause.

If you have no fluctuation and no leaks, leave the unit under pressure this way for a couple of minutes and continually check for leaks in all areas. If you do not find any, relieve the pressure, allow flow of water again and then repeat this at 1000 PSI.

If no leaks are found, allow the unit to run at carpet cleaning settings using a wand attached to the unit to simulate carpet cleaning. Once it has reached the temperature set on the thermostat, put the wand down and allow the unit to run on its own with the pressure set to 1000 to 1200 psi.

CONTINUALLY check the overflow container on the unit for movement and overflowing of coolant from the overflow container. Movement of the coolant in the overflow container is going to rise and fall depending on the temperature that the engine is running at. However, coolant should NEVER overflow out of the overflow container. If you do encounter and overflow of coolant from the container, then the liquid heat exchanger needs to be further investigated to see if there are internal issues with the coils.

I can't build any pressure

If you find that you have no leaks but are still unable to build pressure, there MAY be an issue with the seals on the pump. A good indication of issues with wet side pump seals is dripping water under the pump. Garden hose pressure is capable of exposing these issues but not always. I would spend some more time going over ALL of the other areas of the unit looking for leaks, cracks loose fittings and hoses before tackling the pump. If you are 100% sure that there are no leaks or other issues, the pump is the only remaining area that is left. It is also a good idea to remove the oil cap from the pump and shine a flashlight into the body of the pump to check the oil for any water or "milky" fluid. This would indicate that the oil seals have been damaged and is leaking water into the crack cavity of the pump. Oil seals are replaceable but requires a bit of work to replace

Last and Final Step

By this time, hopefully you manage to find all the leaks and issues and the unit is running great! Once it is, it's a good time to check the wands and tools that were in the frozen van as well. There's good chance that if the truckmount was frozen, the tools and wands in the van were frozen as well. Checking these is a nice step to take for the customer so that the next time they go to use their unit, they aren't scrambling to find a wand or tool that isn't leaking or damaged due to the freezing. It also goes to show the customer the extra steps you took to make sure that they were well taken care of.