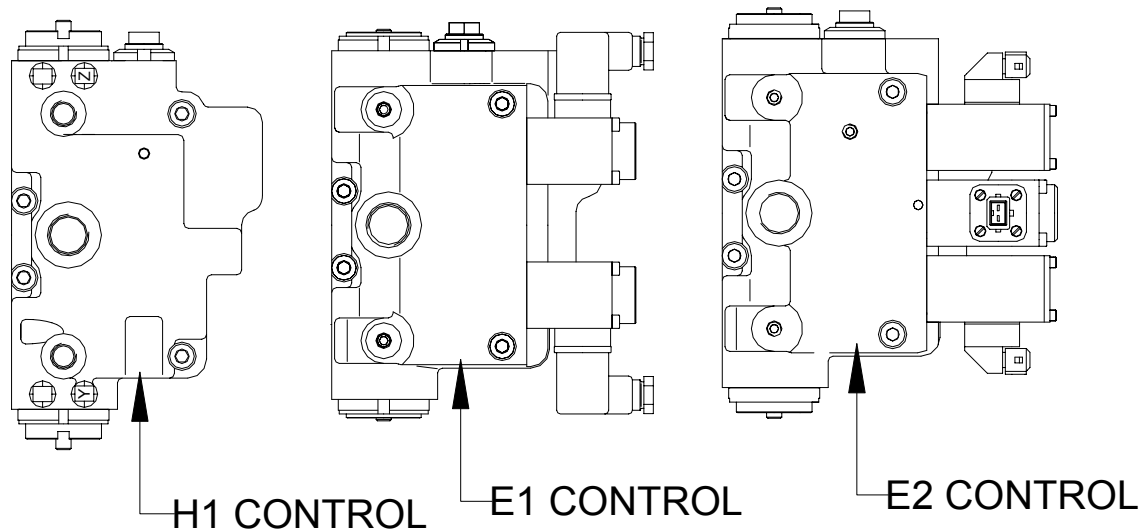


The pump controls (**Henceforth called Type-A Controls**) illustrated directly below are completely interchangeable with each other and no special considerations must be made. Please refer to Linde Conversion Bulletin "HPV_CONTROLS" for detailed instructions on how to exchange "Type-A" controls with other "Type-A" control.



The standard HPV-02 Cam Control is interchangeable with the HPV-02 controls ("Type-A" Controls) illustrated above, but special instructions are required to do this conversion. *The standard HPV-02 Cam Control is **NOT** interchangeable with those HPV-02 controls with the integrated pressure override (POR) feature.*

IMPORTANT:

This Conversion Bulletin is ONLY valid if exchanging "Type-A" controls with the standard HPV-02 Cam Control.

Tools/Equipment Required:

- 6mm Allen wrench
- torque wrench capable of setting 34 N-m (25 ft-lb)
- Blue Loctite No. 243 (for correct part number please refer to Linde Spare Parts Catalog)
- two M8 S.H.C.S. G10.9 (for correct part number please refer to Linde Spare Parts Catalog)
- Acetylene torch
- digital depth calipers
- finger for cam control (for correct part number please refer to Linde Spare Parts Catalog)
- 0.1mm finger shims (for correct part number please refer to Linde Spare Parts Catalog) 0.5mm finger shims (for correct part number please refer to Linde Spare Parts Catalog)
- snap ring (for correct part number please refer to Linde Spare Parts Catalog)
- snap ring wrench (to squeeze a snap ring open)
- cam control (with all o-rings, metal split pins, and mounting S.H.C.S. already included)

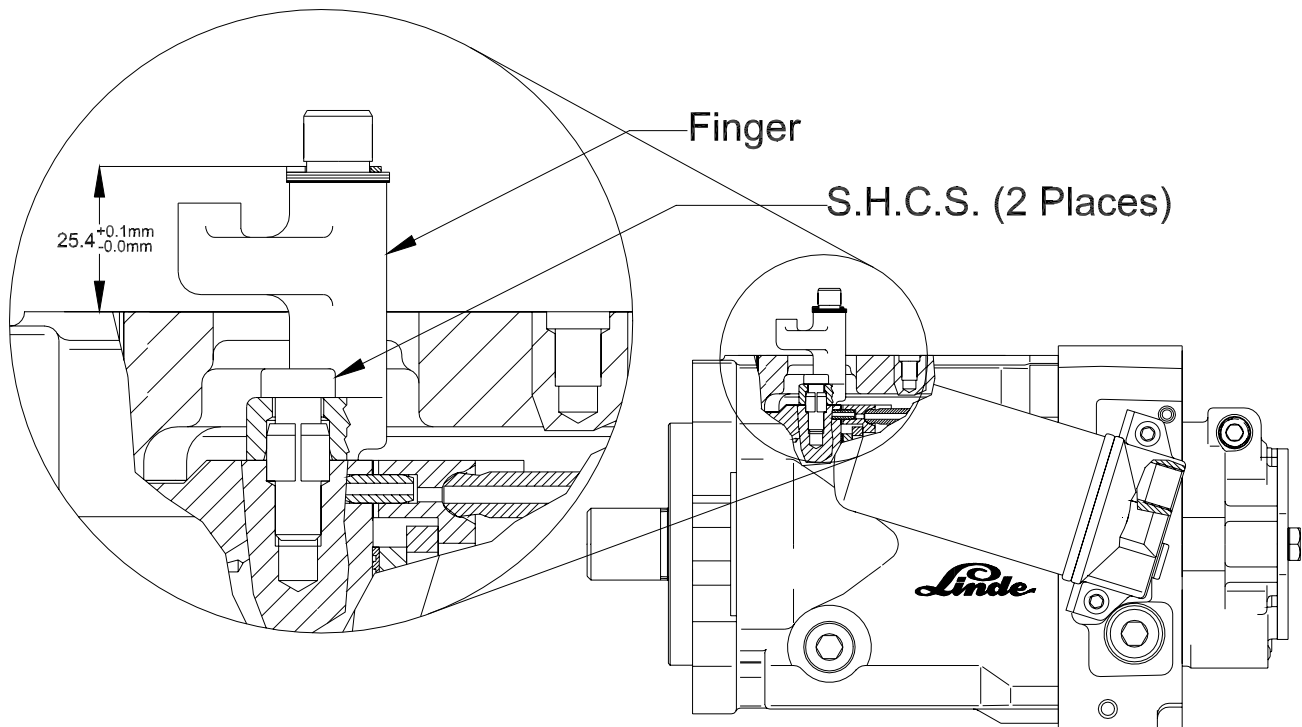
Procedure to Convert to a Standard HPV-02 Cam Control:

1. From the existing control, remove the four *S.H.C.S.* with the 6mm Allen wrench, then set them aside.
2. Pull the existing control straight off of the pump.

Note:

There will be two metal split pins used to hold the control in place after the four *S.H.C.S.* are remove. There will be a slight resistance to remove the existing control - This is due to the split pins. You can over come this resistance by pulling the control straight off of the pump.

3. There will be one large o-ring and several small o-rings on the bottom of the existing control. Some or all of the o-rings may stick to the pump when the existing control is removed. Make sure to remove all o-rings from the pump and keep them all with the existing control.
4. Set aside the existing control, the o-rings, and the four *S.H.C.S.* as an assembly - Do not reuse any of these parts for this conversion.
5. Once the existing control is removed, the *Finger* will protrude from the pump as illustrated below.



Note:

Please note the dimension "25.4mm" illustrated above. This dimension can be acquired via the digital depth calipers by measuring from the top edge of the snap ring to the pump housing. This dimension signifies that the *Finger* is shimmed for a "Type-A" Control. The *Finger* itself is specially configured and sized for the "Type-A" Controls only. A new *Finger* and shimming is required for the Cam Control, as explained below.

6. The existing *Finger* must be removed from the pump. To do this, use the following steps (Use the illustration above as a reference):
 - a. With the Acetylene torch, slowly heat the two *S.H.C.S.* Do not heat them too hot - You only need to heat them enough to break the Blue Loctite No. 243 loose.
 - b. With the 6mm Allen wrench, remove the two *S.H.C.S.* Once removed, discard them.
 - c. Pull the *Finger* from the pump. **Be careful, the *Finger* may still be hot.**

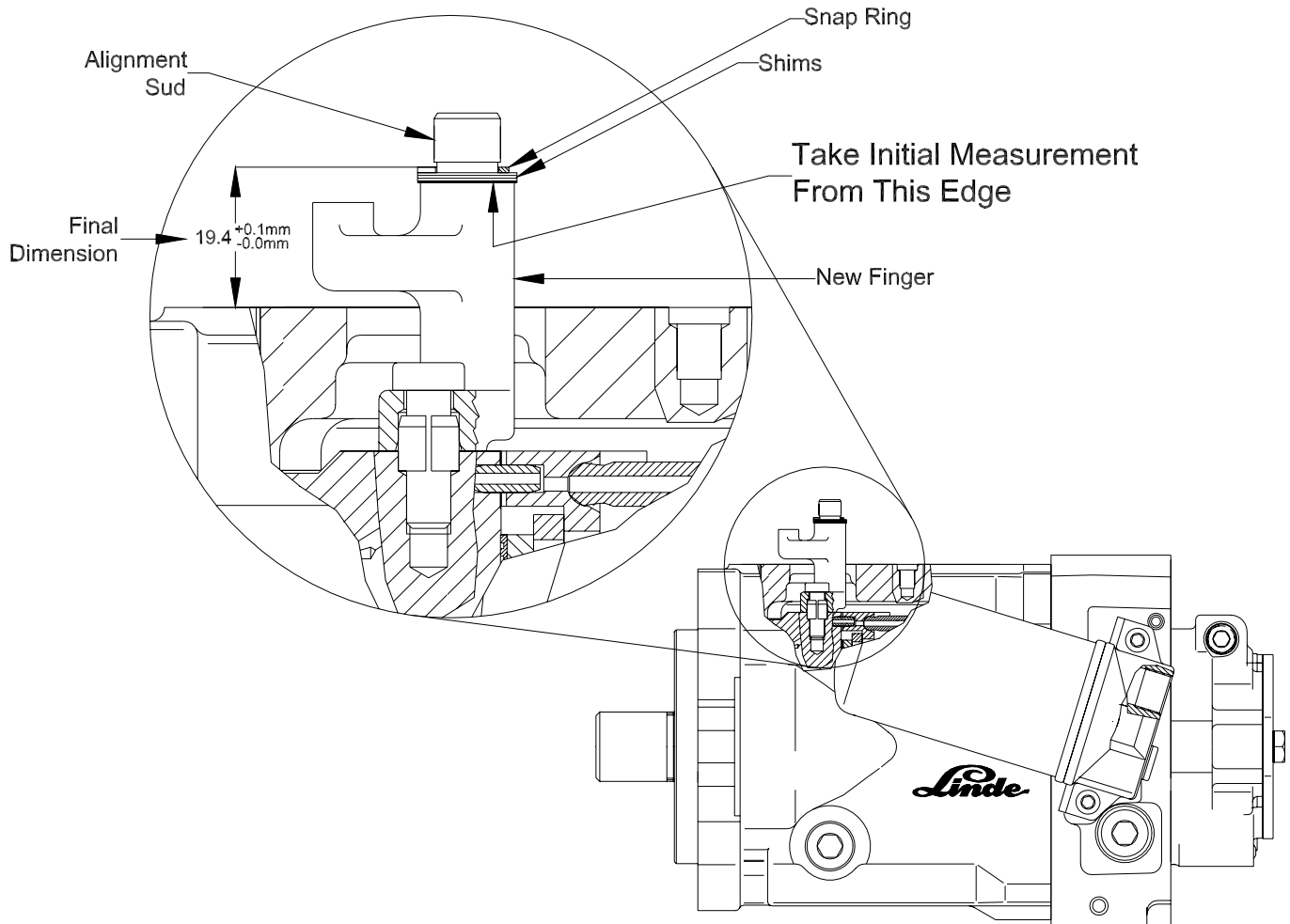
Note:

There will be two metal split pins used to hold the *Finger* in place after the two *S.H.C.S.* are remove. There will be a slight resistance to remove the *Finger* - This is due to the split pins. You can over come this resistance by pulling the *Finger* straight off of the pump.

- d. Leave the two metal split pins in the pump for reuse.
7. The new *Finger* for the Cam Control must be installed:
 - a. Install the new *Finger* into the pump by pressing it onto the two metal split pins. Refer to the illustration above to insure the new *Finger* is oriented correctly.
 - b. Following the manufacturer's recommendations, apply Blue Loctite No. 243 into the threaded holes on the swash plate.
 - c. Install the two new M8 *S.H.C.S.* into the pump and tighten them with the 6mm Allen wrench. Torque each one to 34 N-m (25 ft-lb).
 8. Shim the new *Finger* as follows (Use the illustration below as a reference):
 - a. Using the digital depth calipers, measure from the designated edge of the new *Finger* to the pump housing.
 - b. As required, use enough *Shims* so that the measurement adds up to 19.4mm (+0.1/-0.0mm) **including** the *Snap Ring*.

- c. Install the required *Shims* onto the new *Finger*.
- d. Install the new *Snap Ring*.

9. The *Alignment Stud* must mate with the female linkage inside of the Cam Control. Take this



opportunity to locate the female linkage inside of the new control.

10. Prior to installing the Cam Control, verify that the following things are present:

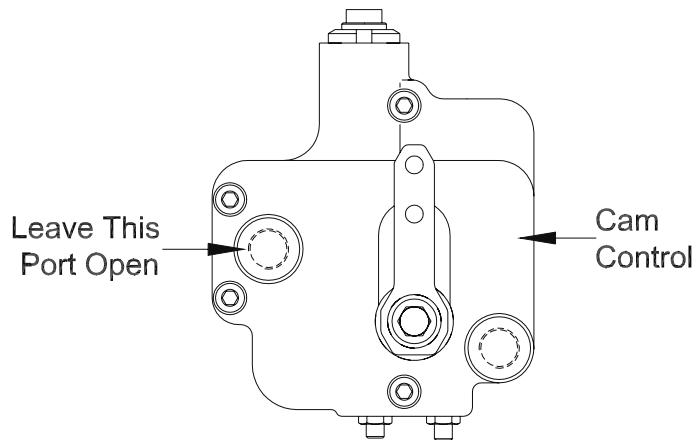
- a. Two metal split pins pressed into two passages on the bottom of the control
- b. One large o-ring in good condition (i.e. undamaged) and properly placed in the o-ring groove (Note: You can use a little petroleum jelly to help hold the o-ring in place)
- c. Several small o-rings in good condition (i.e. undamaged) and properly placed in the o-ring grooves (Note: You can use a little petroleum jelly to help hold the o-rings in place).

11. Install the new control onto the pump making sure that:

- a. The *Alignment Stud* on the *Finger* is properly positioned into the female linkage inside the new control.
- b. The metal split pins are aligned with the corresponding passages in the pump.

HINT:

As illustrated below, removing the metal plug or plastic shipping plug from this port will make it easier to install the *Alignment Stud* into the female linkage. You can use this port as a window during the installation of the Cam Control.



12. Fasten the Cam Control with four new *S.H.C.S.* Tighten the *S.H.C.S.* with the 6mm Allen wrench and torque each one to 25 N-m (18 ft-lb).
13. Test the pump for functionality using Linde Test Procedures and adjust the control if necessary to achieve desired settings.



*******ATTENTION*******

You have been provided information on conversion, repair and/or service of Linde components. Proper application of the information requires specific training and may require use of specialized tooling and equipment. If you choose to proceed with the conversion, repair and/or service of the Linde component(s) absent the necessary training and/or these specialized tools, you do so at your risk.

Linde Hydraulics Corporation will accept no claim for warranty or other consideration resulting from deficiencies in the conversion, repair and/or service done in accordance with the guidance offered herein when the necessary training has not been conducted and/or required specialized tooling and equipment has not been utilized.

All requests for training must be coordinated through your Linde Account Manager. He can also provide you price and availability of any specialized tooling.

Questions regarding the information provided or this disclaimer should be addressed to the Warranty & Service Department, Linde Hydraulics Corporation.

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