HELLSTENGEARS

Installation Instructions – Rear Differential with Haldex Coupling

The following points are particularly important as each one individually can cause a failure not covered by the warranty. This guide is a supplementary reminder alongside the vehicle manufacturer's instructions.

1. Basic Setting / Adaptation – check what applies

Perform basic setting/adaptation according to the vehicle manufacturer's instructions. For many Haldex systems **pump learn or an equivalent learning procedure is required using a diagnostic tool that supports Haldex adaptation.**

On some vehicles it is sufficient to clear fault codes or run adaptation. Without a correctly completed learning procedure, the control unit may not handle the pump correctly – the result can be jerking, clunking when engaging, fault codes or absence of four-wheel drive. This is the most common cause of warranty claims that upon inspection turn out to be installation-related.

2. Before Installation

- ☐ **Tools:** ensure access to a diagnostic tool that supports Haldex adaptation according to the vehicle manufacturer's specification. Do not install without being able to perform the learning/adaptation procedure.
- ☐ **Inspect the unit:** verify that the correct part has been received and that there are no transport damages before beginning installation.
- ☐ **Check protrusion:** the protrusion of the output flange/carrier must not exceed 29 mm (see image) – verify that this measurement applies to the current unit. Ensure the flange is fully inserted and that the seal does not fold during insertion (*applies to Volvo*).
- ☐ **Transport plug:** verify that any transport plug has been removed before beginning installation.
- ☐ **Components from old unit:** transfer sensors, brackets and other components from the old rear differential if required. Verify that the propshaft, driveshafts and mountings are in good condition before installation.
- ☐ **Check the cause of the failure:** address the root cause before installing the new unit. Incorrect tyre dimensions, different rolling circumference front/rear, damaged propshaft, binding brakes or a fault in the Haldex control system can cause overloading and result in damage to the new unit as well. Different tyre rolling circumference is a common cause of problems on four-wheel drive vehicles – always verify that all four tyres have the same size and similar wear.

3. Mating Surfaces and Splines

- ☐ **Clean:** clean splines and mating surfaces on the vehicle side from rust and dirt so that the flange/driveshaft goes all the way in. Difficult insertion is usually caused by rust on the vehicle's existing parts.
- ☐ **Lubrication:** lubricate only if the vehicle manufacturer prescribes it, and then with the specified type and quantity. Avoid excess grease – it can cause a hydraulic lock preventing full insertion, and must not contaminate Haldex oil or seals.

4. Oil – Two Separate Chambers

The unit has two oil chambers with **different oils that must not be mixed**:

- ☐ **Haldex chamber:** Haldex oil only (Haldex Oil / Huile Haldex / Haldex-Öl). Wrong oil here will destroy the coupling.
- ☐ **Differential:** GL oil only (GL Oil / Huile GL / GL-Öl).
- ☐ **Oil type and quantity:** use oil and quantity according to the vehicle manufacturer's specification. Check the level in both chambers separately.

5. During Installation

- ☐ **Torque values:** tighten level and drain plugs as well as flange bolts to the correct torque according to the vehicle manufacturer's specification. Over-tightening causes thread damage and leaks.
- ☐ **Driveshafts/carriers:** check correct fit and that seals are not damaged during driveshaft installation.
- ☐ **Electrical connection:** connect the Haldex pump connector and verify the wiring harness is not stretched or pinched. Damaged or stretched wiring can cause fault codes related to the Haldex pump or communication.
- ☐ **Breather:** check that the breather is free from dirt and blockages before completing installation.

6. After Test Drive

- ☐ **Basic setting complete:** confirm that pump learn/basic setting has been completed without errors and that no fault codes remain.
- ☐ **Clear fault codes:** clear any fault codes using the diagnostic tool after completing the basic setting and test drive. Verify that no new fault codes appear.
- ☐ **Verify four-wheel drive:** check that the Haldex actually engages – the vehicle drives normally on the front wheels even if the coupling never engages. Verify via the Haldex control unit's measurement values in the diagnostic tool (that the pump activates and pressure builds), or during a controlled test with load/acceleration.
- ☐ **Leak check:** check that no leaks are present at seals, carriers, propshaft flange or filter housing.
- ☐ **Oil level:** check the oil level in both chambers after the test drive.

7. Activate Warranty

The warranty is activated when the odometer reading at installation along with a detailed description of the original fault is submitted to Hellsten Gears AB – at the time of ordering or when booking a return, no later than 14 days after installation.

THE WARRANTY IS ONLY VALID IF THESE INSTRUCTIONS HAVE BEEN FOLLOWED.
CONTACT TECHNICAL SUPPORT IF ANYTHING IS UNCLEAR.

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Pump Learn Function – Haldex

It is common for owners to have a new pump/Haldex unit fitted by a garage or main dealer and still experience persistent problems or see fault codes related to the pump.

> **When fitting a pump, or even just after a clean out and service, it is essential to carry out the "pump learn" function**
>
> This is done under "Basic Settings" of the Haldex control unit. VCDS/VAGCOM can do this, and so can the main dealer ODIS system.

Why is pump learn required?

Customers are often told there is "no adaption" or programming required to fit a new pump – **this is incorrect.** The control unit learns how much power is required to run the pump until the pressure hits a certain threshold, by monitoring the current consumed by the pump.

When the pump is blocked or faulty, the control unit records very low values. This means that when the Haldex controller tries to engage the pump after a replacement, it does not supply enough power to make it engage.

By carrying out the learn function when fitting a new pump/Haldex unit, it will learn the correct power values and thus engage the system correctly.

Very often customers call having had new pumps/Haldex units fitted, yet the system still does not work and the pump learn has not been performed. Without it, workshops incorrectly quote for a new ECU/Haldex controller or a complete new coupling/rear differential.

How does the learn function work?

The function ramps up the power to the pump slowly until the pressure hits the 44 bar blow-off valve, where it senses the drop in current. It does this a few times so the pump learns how much current and voltage it takes to achieve 44 bar.

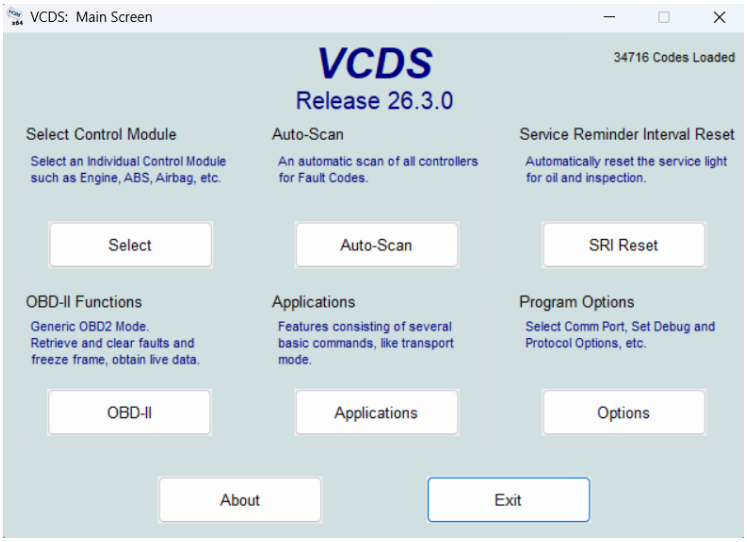
It then saves this value in the calibration values. After a short drive it calculates the 1 bar and 15 bar values from the last measured 44 bar value.

NOTE: After the learn has "completed successfully", the values usually show "0" until the vehicle is taken for a short drive. This is because it estimates the 1 & 15 bar values from use.

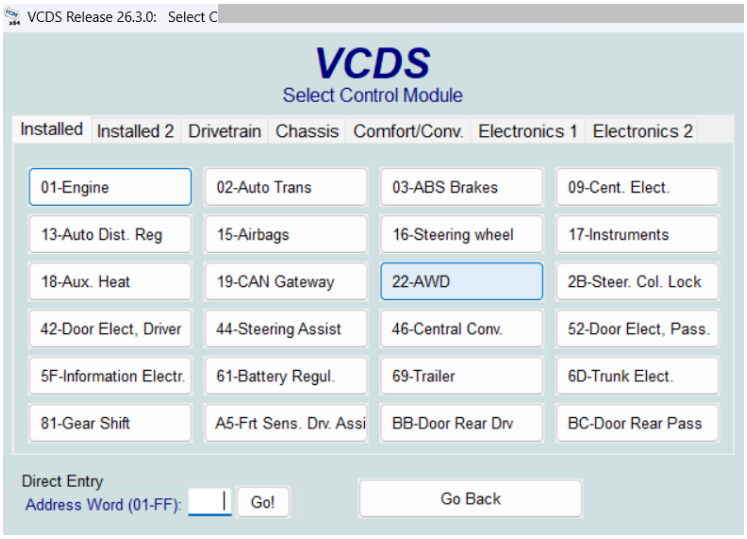
How to carry out pump learn using VCDS

Below are step-by-step instructions for carrying out the pump learn function using VCDS/VAGCOM.

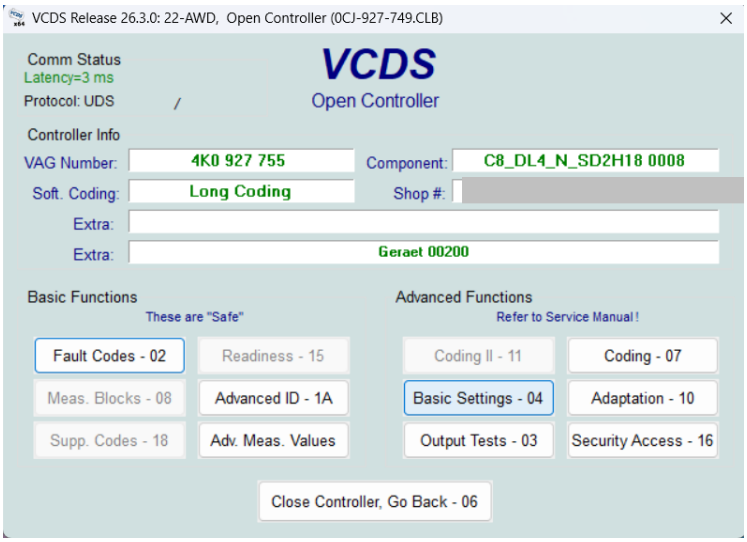
Step 1: Open VCDS and click “Select” from the main screen.



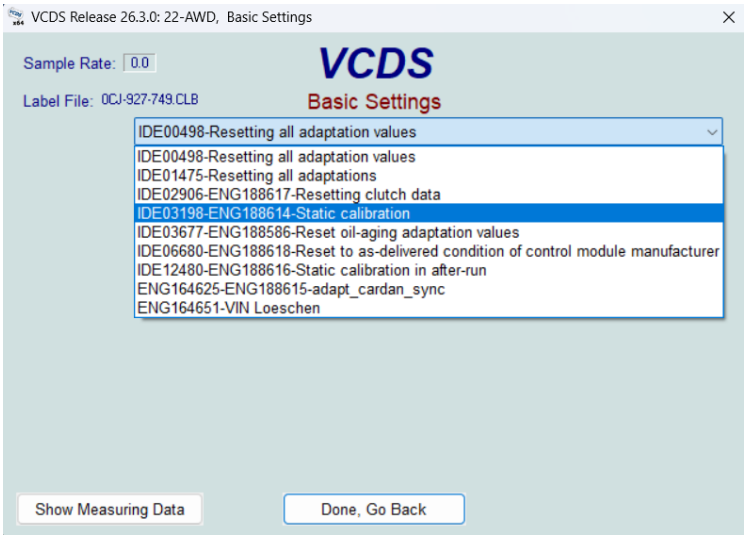
Step 2: Select control module “22-AWD”.



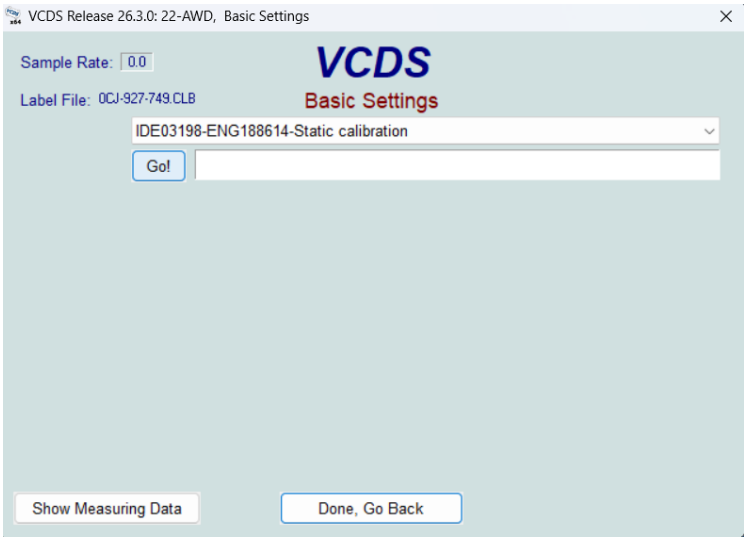
Step 3: Select “Basic Settings – 04”.



Step 4: Select the calibration/adaptation function for the Haldex clutch. The function name and function ID may vary depending on the vehicle and control unit.



Step 5: Click “Go!” and wait approximately 1 minute for the process to complete. You will hear the pump running under the car when you press Go!



MAKE SURE THE ENGINE IS RUNNING TO SUCCESSFULLY CARRY OUT THE PUMP LEARN FUNCTION!
BEWARE – SOME DIAGNOSTIC TOOLS DO NOT COMPLETE THE LEARN FUNCTION CORRECTLY.

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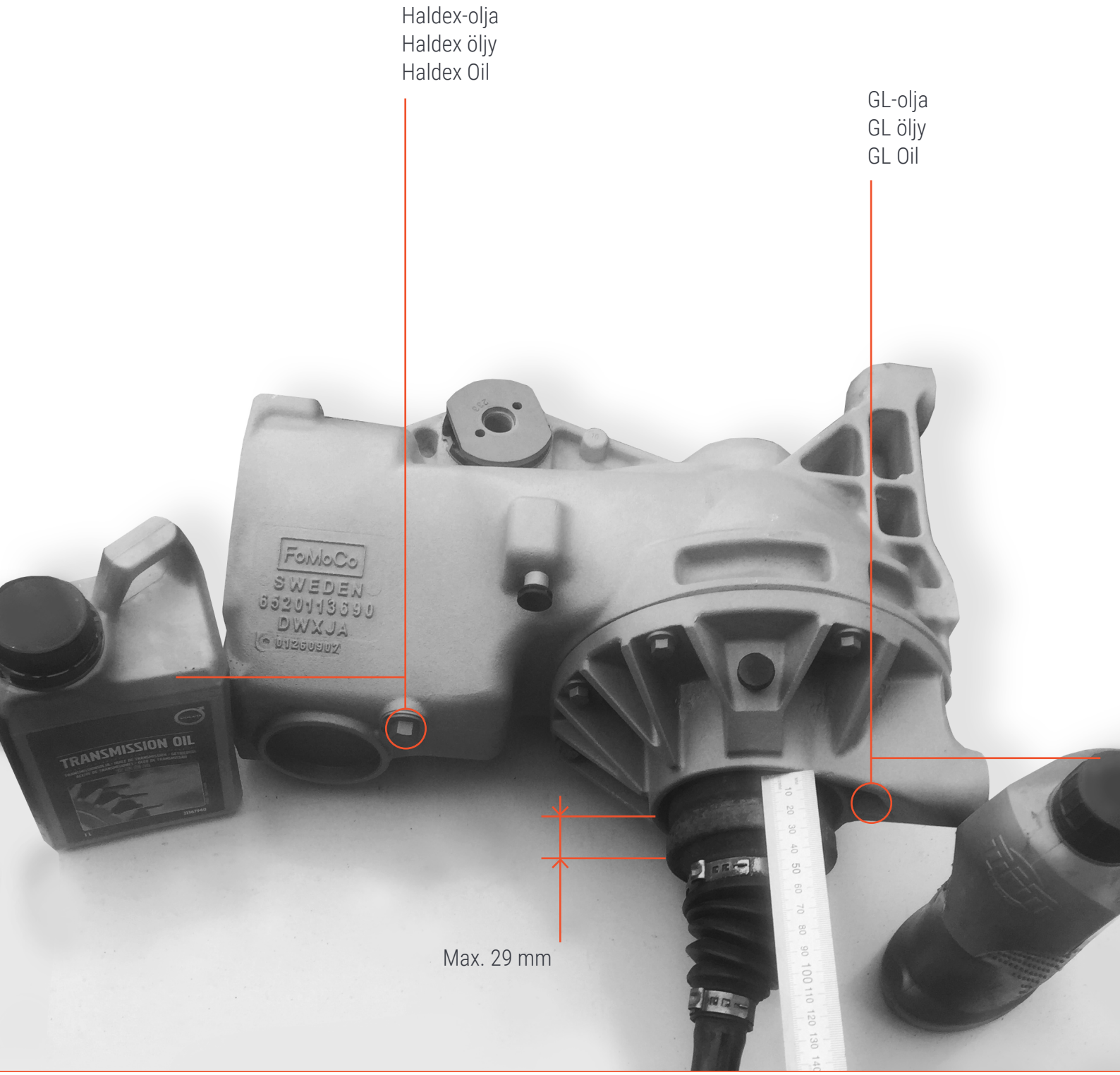
Gearbox specialists since 1983



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