

# 45 GDS Helpsheet



*World Leaders in Computer Controlled Testing  
Systems for Geotechnical Engineers and Geologists*

Hardware

Advanced Controller - High Pressure

Piston Upgrade

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## 1. Introduction

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The piston has been upgraded to have the following new features:

- Detachable face to allow easy replacement of the composite seal. Note that the white backing ring must be to the rear of the piston.
- Slydring to provide bearing surface for contact with and guidance along cylinder.
- New composite seal which can be used with water, silicone oil and mineral oil.

It is often more convenient for you the user to send to GDS the ball screw and old piston for upgrade. This helpsheet will help you install the returned ball screw and new piston. The new piston is slightly longer than the old one and so it is necessary to reposition the limit switches which limit the stroke of the piston.

## 2. Installation Procedure

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### ***By Hand***

Apply silicone grease to the piston and opening of the pressure cylinder.

Push the piston and ballscrew into the cylinder. It will help if you move the end of the screw about in small circular movements. You will need to hold the Slydring in place as the piston enters the cylinder.

As soon as you can, attach the ball nut to the cylinder. You will now be able to easily move the piston along the cylinder by turning the screw by hand about its' axis of rotation.

By hand, move the piston down the cylinder until you feel it make contact with the end block. Turn the screw back one half turn of 180°. This will cause the piston to back off from the end of the cylinder by half the pitch of the screw i.e. 5mm.

Push the output shaft of the motor and gearbox into the end of the ballscrew slot. You will probably have to switch the pressure controller on briefly to use the FILL and EMPTY functions to align the output shaft of the gearbox with the slot of the ballscrew.

Check that the magnet on the motor-gearbox carriage has closed the limit switch. Use a multimeter to carry out a simple continuity check. Adjust the position of the limit switch until the magnet closes it.

The limit switch operation can now be checked under power. Do not use the FILL and EMPTY functions at this time. Pull the motor/gearbox away from the screw. Turn the screw a quarter turn (i.e. 90 ) to move the piston towards the end of the stroke. Switch on the pressure controller to realign the output shaft of the gearbox with the slot of the ballscrew. Switch off the pressure controller. Push the motor/gearbox output shaft onto the ball screw to reconnect them. Using a multimeter check again that the limit switch has closed. Now switch the pressure controller on. Check that there is a limit condition with the machine beeping and the display announcing "LIMIT CORRECTED". Make sure the screw is turning in a sense to move the piston away from the end of stroke. If the screw is turning the wrong way then the limit switch connector is not connected the right way round. Allow the pressure controller to drive out of the limit condition.

For the limit switch location for the other end of the stroke repeat steps (4)- (7) for the piston moved to the motor end of the stroke. Be careful not to let the carriage come off the rail. The carriage rides on recirculating balls. The balls can escape if the carriage leaves the rail.