

PD301

Hydraulic Wheel Play Detector



USER MANUAL

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1.0 Introduction

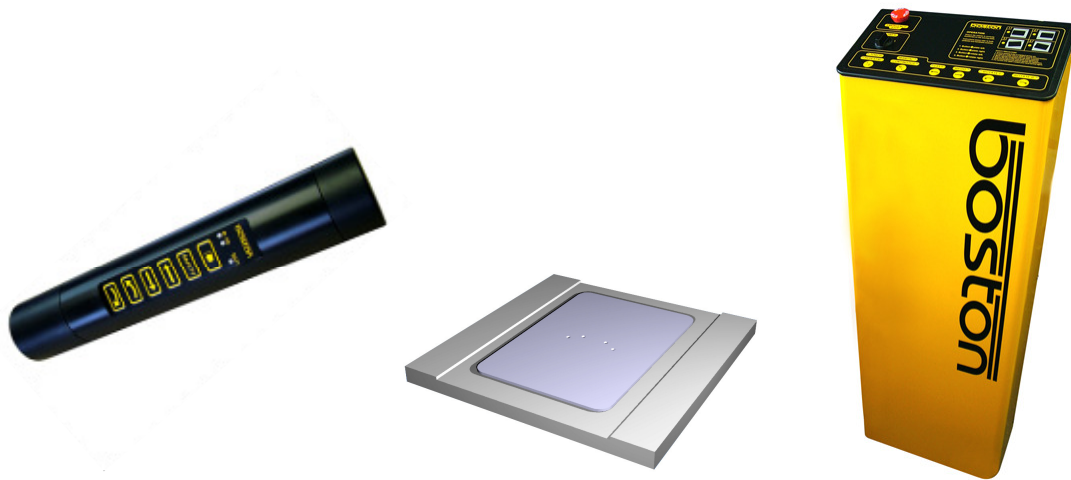
This manual describes how to safely use the PD301 for statutory Vehicle Inspection Classes 4 and 7 vehicles.

Before operating the PD301 this user manual should be read thoroughly, and if any part is not fully understood then please refer to the Boston technical department for clarification.

1.1 Product description

The PD301 is a hydraulically operated device used to move the position of a vehicle wheel in different directions to detect wear and play in suspension and steering joint components. It includes a moving plate that can move laterally by 40mm in both directions and rotate about a centre point by 8 degrees clockwise and anti-clockwise.

The equipment comprises three items. The Pedestal, the Play Detector and the Handheld Torch Control. Operation of the Play Detector can be achieved by using the membrane keypad fitted to the body of the control torch, or by using the secondary keypad located on the pedestal. There is also an optional wireless control torch.



2.0 Safety

In order to comply with your responsibilities under the Health and Safety at Work Act 1999, it is essential that the PD301 is used, operated and maintained by a competent individual with experience in the automotive industry.

The forces operating inside the play detector are considerable and misuse can be dangerous. Always check that the area around the PD301 is clear and free from tools or equipment. Be very careful during operation not to allow any part of the body, loose clothing etc. to rest or come in to contact with the moving plate.

2.1 Special Notice

SPECIAL NOTICE

To meet MoT testing specifications the PD301 play detector applies a very considerable hydraulic forces to the steering components and bearings, in addition to the play detector and its fixings. The PD301 is designed to provide long-life performance with recommended periodic servicing.

The automatic mode should be used for several movements when required and not run continuously. The LEFT, RIGHT and rotational manual movements should be used only as required to provide adequate vehicle inspection. This will maintain your play detector in excellent condition and ensures that vehicles are not affected by applied lateral forces.

IMPORTANT: Using the PD301 on a vehicle hoist supplied by any company other than BOSTON GARAGE EQUIPMENT, or without written certification from BOSTON GARAGE EQUIPMENT that the PD301 is suitable for that hoist, is considered improper use.

- ◆ Appropriate training is required, prior to using or maintaining the PD301.
- ◆ The PD301 has a maximum load capacity of 1500 kg.
- ◆ **If the PD301 is fitted to a vehicle hoist, it is important that the hoist is placed in the 'locked' position prior to operation of the PD301, and not supported by the steel ropes or other means. It is also important to check weekly that the floor fixing bolts of the hoist are tight and in good condition.**
- ◆ The unit should be kept clean and well maintained to protect against wear and ensure good operation.
- ◆ Only a qualified technician should operate the PD301.
- ◆ The operator should follow procedures prescribed by national standards and the regulations of Health and Safety.
- ◆ Keep the operating environment clean and free of oil and tools.

3.0 Operation

The PD301 may be used in conjunction with MoT Automated Test Lanes (ATLs). The operation of the PD301 for MoT testing must be carried out with reference to, and in accordance with the MoT Tester’s Manual. (copy available from VOSA on request) During testing, it is necessary to apply the parking brake so that underside inspection can be safely carried out when using the Play Detector.

On every power-up, the play detector will perform an auto-centre. The plate will first move right and then left until it comes to rest in the centre position. It will only return back to this position after each button press in “Continuous Mode” or when the unit is re-started.

To preserve energy and reduce pump / motor wear, the software will de-activate the motor approximately 2 seconds after each operation.

Note: Ensure the plate is free to move and there is no weight on the plate during the auto-centre procedure. The plate must be at the centre point before testing a vehicle.

3.1 The Pedestal

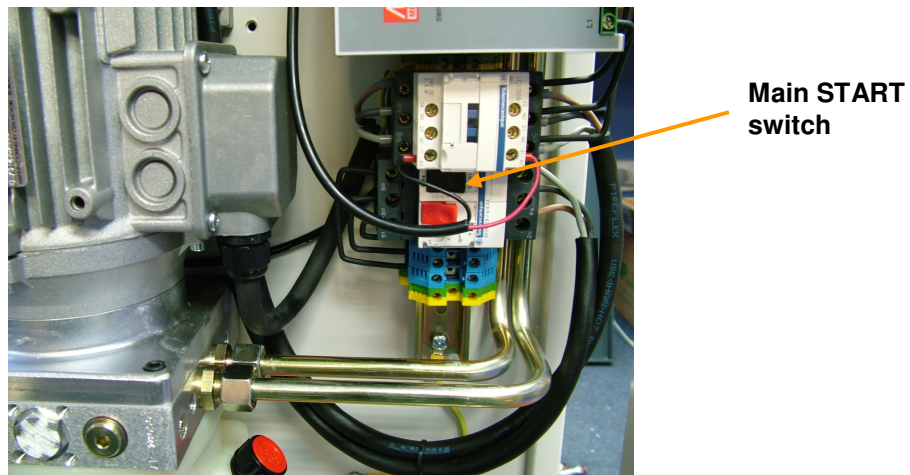
The control pedestal houses the hydraulics and main control system for the Play Detector. From the pedestal, the operator can switch between Torch or Pedestal mode, and Manual or Continuous mode. Also there are individual control buttons to manoeuvre the moving plate in any of four individual directions and an Emergency Stop button that stops the plate immediately.



3.2 Main Power

The Main Power switch disconnects all power to all parts of the console when switched off. There is also a safety power isolator inside the pedestal which disconnects all power in the event of a fault. This can only be accessed by removing the top panel and front cover of the pedestal, and can be reset by depressing the START switch.

It is recommended that the console be switched off every evening.



3.3 Emergency Stop

The Emergency Stop button can be pressed at any time to immediately stop the plate from moving. Its function is to stop the motor and associated operational buttons. The button is spring loaded and once it has been pressed it will remain depressed until released.

To release the button, rotate the button in the clockwise direction until it springs back to its original position.

Note: Always ensure that the plate is free to move and clear before de-activating the Emergency Button. Once re-activated, the motor will restart and the system will perform the auto-centre procedure.

3.4 Mode Switching

a) Torch / Pedestal

When the Torch mode is selected, the Torch LED will show and the play detector can only be operated from the remote torch. The plate operation and mode change buttons on the Pedestal are disabled as a safety precaution against accidental operation from another operator.

When the Pedestal mode is selected, the Pedestal LED will show and the play detector can only be operated from the Pedestal console. The plate operation buttons on the Torch are disabled as a safety precaution against accidental operation from another operator. The inspection lamp at the front of the torch can still be operated as normal.

b) Manual / Continuous

The **Manual** and **Continuous** modes allow the operator to change the way in which the plate moves under the vehicle wheel.

When using the **Manual** mode, the plate will move in the direction corresponding to the pressed button. This allows incremental movement of the top plate when diagnosing problems.

When **Continuous** mode is selected, the plate will move in one direction and then the opposite direction continuously until the button is released. This allows the operator to look for play in both directions, without having to use another button to move the plate in another direction. Whenever a plate operation button is released, the plate will return to the centre position.

3.5 Plate Operation

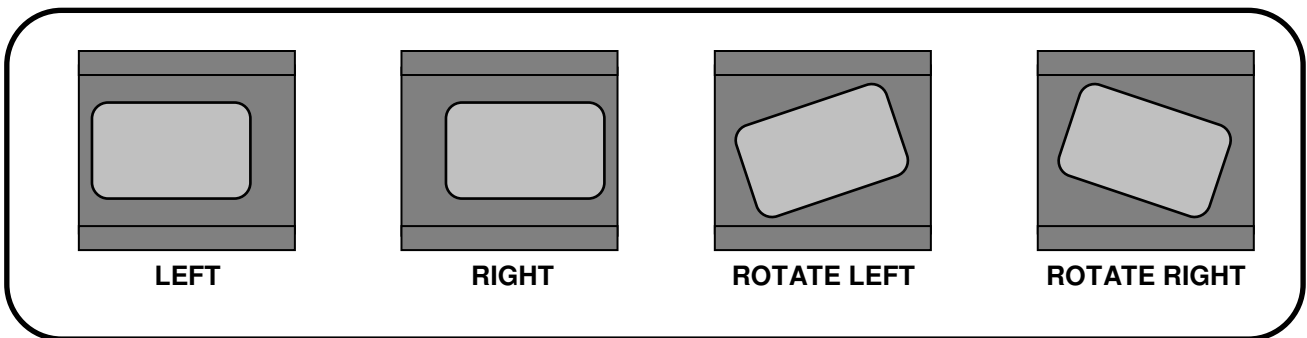
When the **Manual** mode is selected, the **Manual** LED will show and the play detector will operate in the following way.

BUTTON DEPRESSED	PLATE MOVEMENT
LEFT	Moves LEFT
RIGHT	Moves RIGHT
ROTATE LEFT	Rotates LEFT
ROTATE RIGHT	Rotates RIGHT

When the **Continuous** mode is selected, the **Continuous** LED will show and the play detector will operate in the following way.

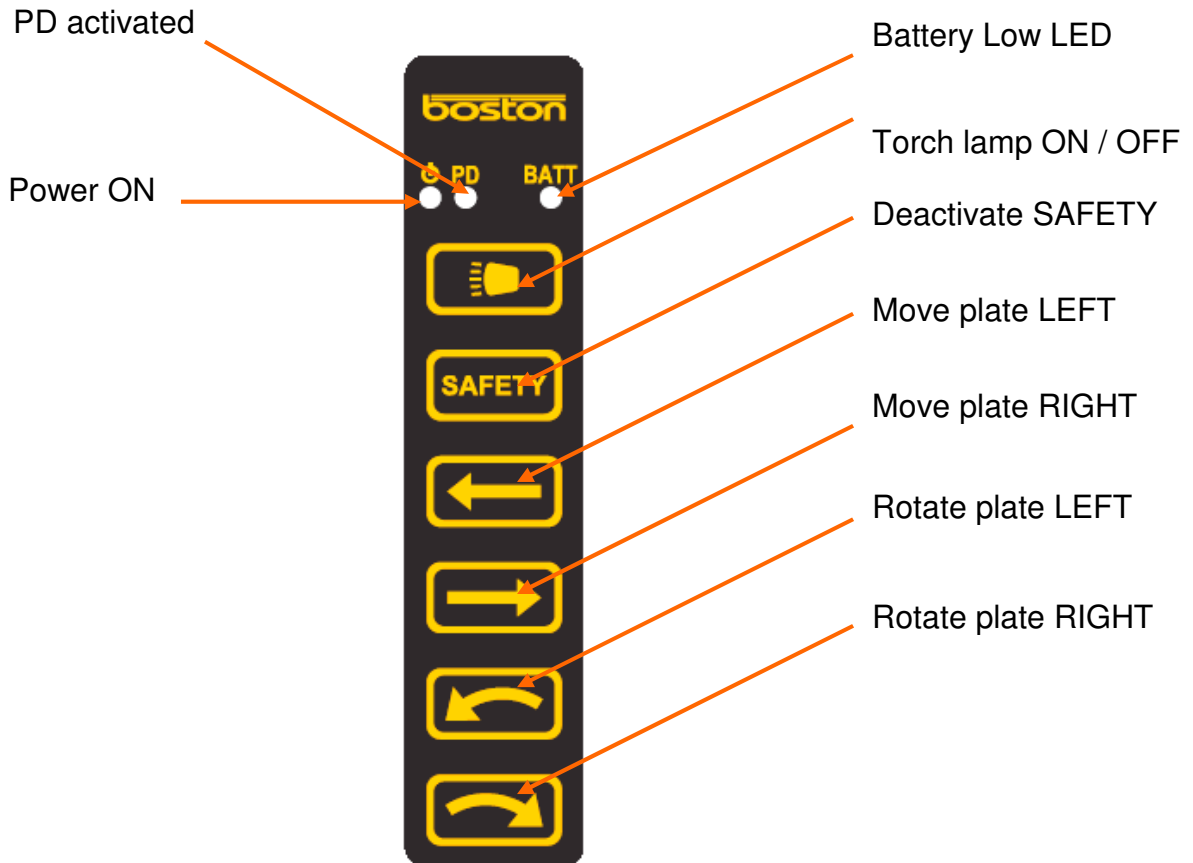
BUTTON DEPRESSED	PLATE MOVEMENT
LEFT	Moves LEFT first and then RIGHT repeatedly until button release
RIGHT	Moves RIGHT first and then LEFT repeatedly until button release
ROTATE LEFT	Rotates LEFT first and then RIGHT repeatedly until button release
ROTATE RIGHT	Rotates RIGHT first and then LEFT repeatedly until button release

The above tables also refer to button operation on the handheld torch control.



3.6 Inspection Torch

The inspection torch provides a remote means of operating the Play Detector with the ability to light the area of inspection. The torch is hard-wired to the pedestal by means of a heavy-duty coiled data cable. The button operations are the same as described in section 3.6 above with the addition of an extra LAMP ON / LAMP OFF button. It is not possible to switch between MANUAL and CONTINUOUS modes using the torch, this can only be done from the pedestal, and only when PEDESTAL mode is selected. The torch keypad is laid out as below.

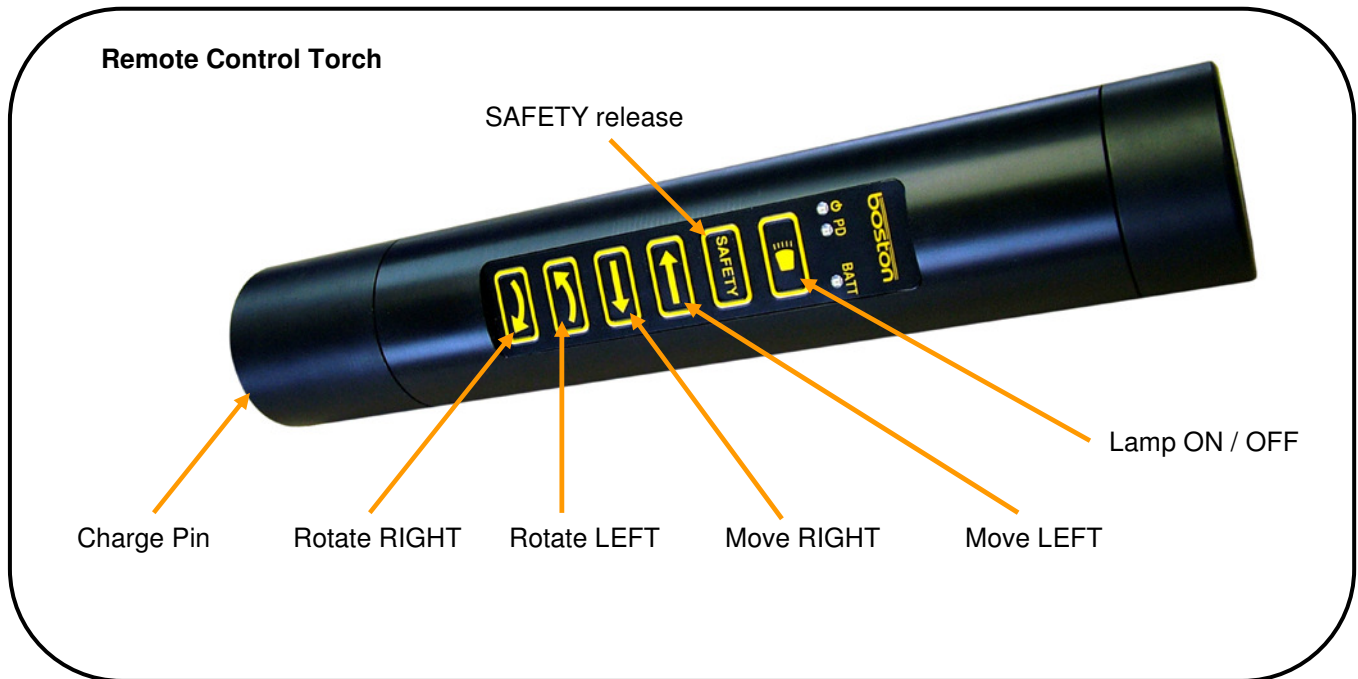


Keypad Functionality – Hardwired Torch

The torch is programmed with a standard safety feature to prevent accidental operation of the Play Detector should the buttons be pressed. The operation of the four lower buttons (control buttons for the moving plate) are disabled until the SAFETY button is depressed first. When the SAFETY button is pressed, the LED under the PD symbol will light. This signifies that the four control buttons are now 'active'. After six seconds of inactivity, the PD LED will automatically switch off and hence the safety is engaged. Only when the PD LED is lit can the Play Detector be operated.

The green power LED will remain lit all the time that power is supplied to the torch, and the lamp ON / OFF will work at all times irrespective of safety status and pedestal / torch modes.

The BATT light has no function on the hardwired torch.



Keypad Functionality – Wireless Torch

The wireless torch is programmed with the same standard safety feature as the hardwired torch to prevent accidental operation of the Play Detector. But in addition, to save power, the torch will automatically switch off completely after eight minutes of inactivity. In this condition, the green power LED will not be lit.

To reactivate the torch, the lamp ON/OFF button must be pressed. The green power LED will now show and the lamp will switch on. To activate the control buttons, the SAFETY button must also be pressed to illuminate the PD LED as before. The operation is now the same as the hardwired version above.

The BATT LED will show when the torch battery requires charging. In this case, the torch should be placed in the charging cradle and allowed to charge. Charging is signified the flashing of the BATT LED and when fully charged, the BATT LED is switched off.

The optional wireless torch operates using radio frequency on the FM band. It has a maximum operating distance of 50m when fully charged and a charging time of approximately eight hours. Under constant use the operating time is approximately 1.5 hours without charge.

To ensure the wireless control is always ready for use, place it on the charger when not in use.

Torch Connectivity – Hardwired Torch

The hardwired torch is connected to the main control pedestal using a corrosive and lubricant resistant, 6m high quality coiled cable. At rest, the cable measures 1.4m and approximately 6m at full stretch. This allows for extra flexibility when using the torch for underside inspection of long wheelbase vehicles.

The cable is attached at the torch end by means of a 6.25mm lockable jack plug socket. The socket is designed to unlatch at maximum pull to prevent damage to either the torch or pedestal connectors. In the event of having to replace the cable, the connection can be unplugged from the torch by simply pulling the connection from the torch body using adequate force. To unplug the cable from the pedestal, pull back the latch, rotate the connector anti-clockwise and remove.

The part numbers for the replacement items can be found at the rear of this manual.

See below.-

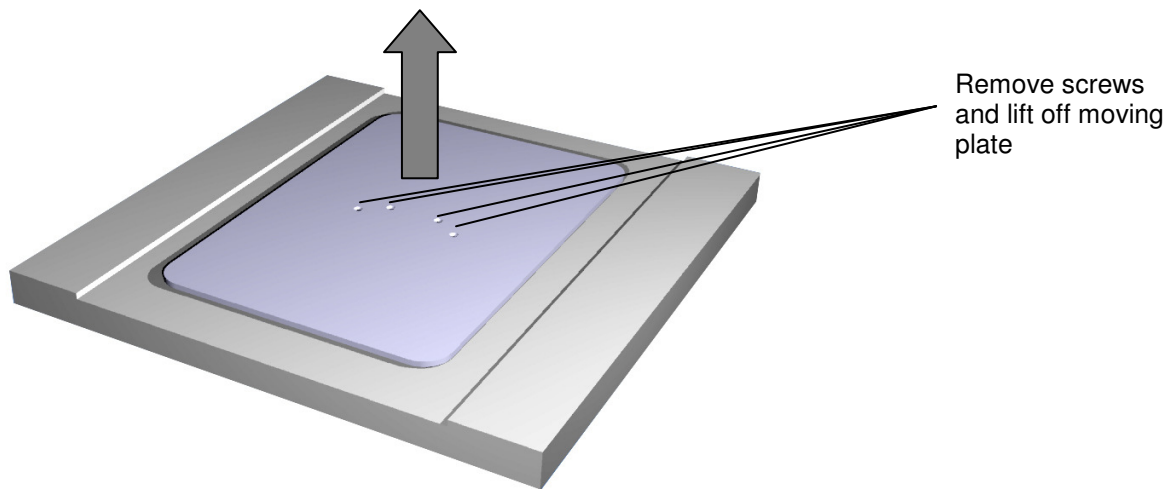


4.0 User Maintenance

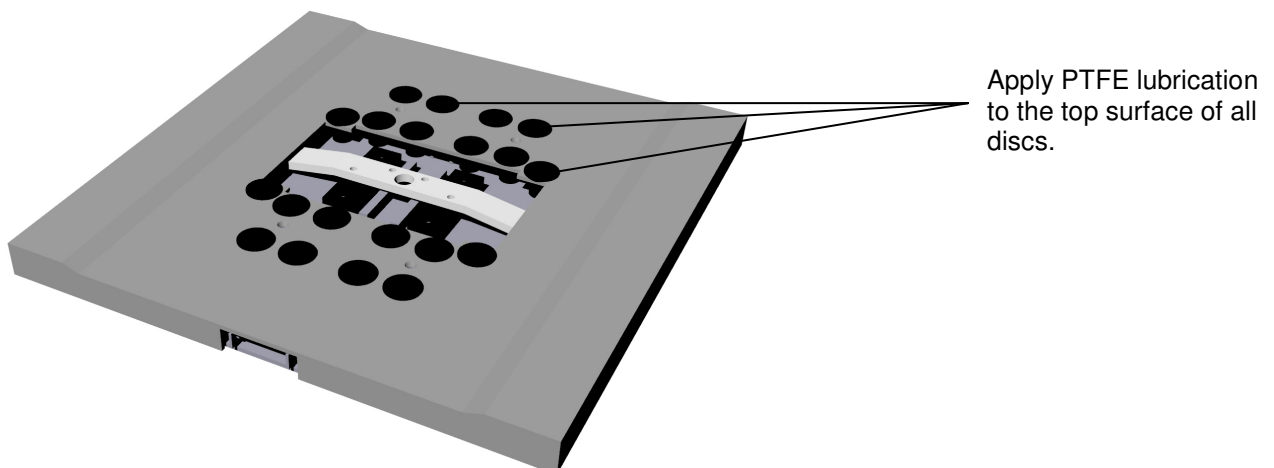
The PD301 requires little maintenance but should be checked every month as below.-

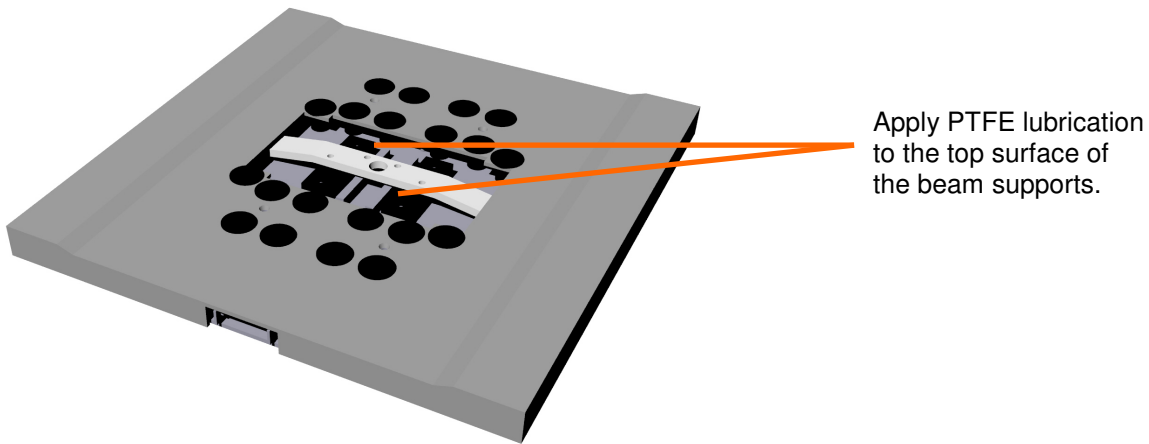
Note: Ensure the main power switch is turned OFF before removing the top plate and the EMERGENCY STOP has been activated.

Remove the four counter-sunk screws that attach the moving top plate to the internal cross beam.

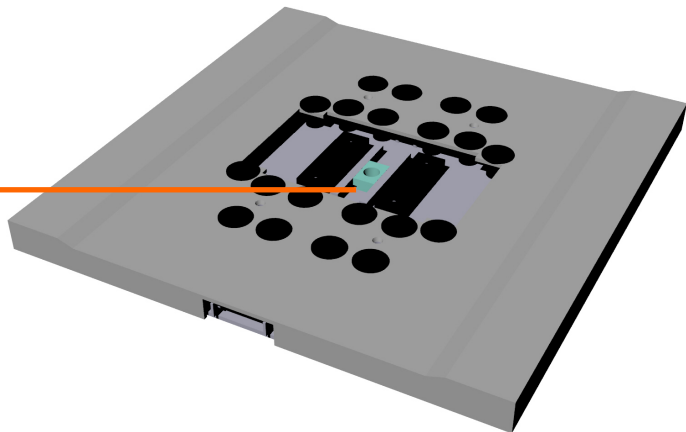


Underneath the top plate, there are twenty Nylatron load bearing discs. Using PTFE spray, apply one spray to each disc in turn. Underneath the main cross beam, there are two more load bearing Nylatron supports. Also apply a single spray to each support. Finally, in the centre of Play Detector underneath the main cross beam, there is a sliding block in which the pin of the moving plate locates. Using multi-purpose industrial / automotive grease, apply lubrication to the block and channel in which it slides. Also apply grease to the main pin in the centre of the moving plate.





Apply GREASE lubrication to the sliding block and channel, and main pin on the underside of the moving plate.



After the monthly maintenance is complete, replace the moving plate and ensure that it is tightly secured. On a regular basis the oil reservoir inside the pedestal should also be checked. The level should always remain the same, but in the event of any leaks this may change. For service and repair always contact your local distributor.

If the PD301 is being used for statutory MoT testing, VOSA stipulate that the equipment is subject to annual service and calibration. This must be done by an APPROVED Boston engineer and a contract should be in place with Boston or an approved agent for this work.

5.0 Troubleshooting

TROUBLE	POSSIBLE CAUSES	SOLUTION
Play Detector does not operate	<ul style="list-style-type: none"> - No electric supply. - Cable connections. - Internal fuse burnt out. - Main power switch is off - Emergency stop activated - Circuit protector activated 	<ul style="list-style-type: none"> - Check three phase supply - Check all connections. - Replace - Switch on - Deactivate emergency stop - Deactivate circuit protector
Power is on but no plate movement	<ul style="list-style-type: none"> - Emergency stop activated - Wrong control selected 	<ul style="list-style-type: none"> - Deactivate emergency stop - Select desired control
Torch does not switch on	<ul style="list-style-type: none"> - LED cluster damaged or faulty 	<ul style="list-style-type: none"> - Check / replace cluster
Torch does not operate plates	<ul style="list-style-type: none"> - Data cable or keypad damaged - Wrong control selected 	<ul style="list-style-type: none"> - Check / replace - Select desired control
Motor operates but no plate movement	<ul style="list-style-type: none"> - Oil level too low - Bad connection on solenoid actuator - Software error 	<ul style="list-style-type: none"> - Add oil - Check internal connections - Contact service agent

6.0 Parts list

Part No.	Description
B3033	Nylatron load bearing discs (set of 20)
B3034	Stainless moving top plate
B3035	Countersunk screws for moving / cover plate (set of 4)
PD301TH	Handheld torch complete (hardwired)
B3079	Handheld torch flexible coiled data cable
PD301TWK	Wireless handheld torch upgrade kit
B3008	Handheld torch white LED lamp cluster
B3010	Handheld torch membrane keypad
B3085	Protective rubber casing for torch
B3040	Pedestal membrane keypad
B3067	Hydraulic hose flexible trunking
B3038	PTFE lubricant spray (200ml)

Orders for spare parts should be forwarded to **BOSTON GARAGE EQUIPMENT** or your APPROVED distributor and must contain the following information:

- **Model number and serial number**
- **Part number of the required part**
- **Item description and quantity required**
- **If the PD301 is installed on a vehicle hoist, the Hoist Model number is required**
- **Required delivery date**

7.0 Specifications

Electric motor	220/380 V -3 PH -50 Hz
Electric motor power	0.75 kW
Inspection torch and control circuit voltage	24 V
Inspection torch LED cluster power	2.25 W
Hydraulic working pressure	200 bar
Maximum force applied to moving plate	12.8 kN
Admissible load on moving plate	1500 kg
Minimum lateral travel of moving plate	40mm
Minimum plate rotation	8°
Dimensions – Play Detector (L x W x H)	600 x 605 x 42 mm
Dimensions – Pedestal (L x W x H)	220 x 420 x 1200 mm
Hydraulic oil and capacity	ISO 32 / 3 Ltr
Hydraulic oil replacement schedule	Annually
Noise level during operation	<70dB
Wireless inspection torch operating distance	Max 50m
Wireless inspection torch charging time	4 Hours (Approx)
Wireless inspection torch battery voltage	7.2 V
Wireless inspection torch operating time (without charge)	1.5 hours (Approx)

8.0 Warranty

The PD301 is covered by Boston's standard 2 year warranty. Terms and Conditions are available on request.

It should be noted that fair wear and tear and the following parts are EXCLUDED from the warranty.

- The flexible coiled data cable from pedestal to torch
- The flexible hose carrier from pedestal to play detector
- The LED cluster inside the torch assembly
- All Nylatron load bearing parts



Boston Garage Equipment – 199 New Road – Rainham – Essex – RM13 8SJ – United Kingdom

Tel: +44 (0)1708 525585 Fax: +44 (0)1708 525408
Email: info@boston-ge.com Web: www.boston-ge.com