



DH·Budenberg
The Pressure Reference

OPERATING AND MAINTENANCE INSTRUCTIONS

MODEL NUMBER: 38

SERIAL NUMBER: -



DH Budenberg Ltd, 2 Gilchrist Road, Northbank Industrial Estate, Irlam, Manchester M44 5AY, UK
Telephone: +44(0)870 787 7370, Fax: +44(0)870 787 7369, E-mail: sales@dh-budenberg.co.uk
REGISTERED OFFICE: Electrocral Group Ltd, Unit 7, Alfred Court, Saxon Business Park, Hanbury Road, Stoke Prior, Bromsgrove, Worcestershire B60 4AD
Registered in England No. 3239293 As agent for Budenberg Gänge Co. Ltd



TESTER MOUNTED OIL SEAL**General Description**

The oil seal is designed for use as a liquid/liquid seal and may be used to calibrate gauges that have to be kept clean and free of oil. When the pressure range of a gauge, which is normally used on a gas, is beyond that of an air-operated dead-weight tester, the seal may be used in conjunction with an oil-operated tester to perform calibration.

Construction

The oil seal consists of a corrosion resistant 13% chromium steel pressure chamber, a stainless steel top cap with gauge connection, to which is attached a synthetic rubber sac that separates the oil in the chamber from the testing liquid. Bleed points are provided for releasing air from the testing liquid in the sac and the oil in the chamber.

Application

The seal can be used up to a maximum pressure of 700 bar (10,000 lb/in²) and is supplied with a connection suitable for 278, 279 and 380 and 480 series testers.

It should be noted that there are two types of sac material available for use in the seal. The material of the standard sac PA/908/1 and identified with a red spot, is Viton¹ which has excellent resistance to oils, fuels, lubricants, synthetic hydraulic fluids, most mineral acids and to many aliphatic and aromatic hydrocarbons that act as solvents for other rubbers. Examples of these solvents are industrial alcohol, carbon tetrachloride, toluene, benzene and xylene. The seal can therefore be used to calibrate gauges on such solvents and water, **but is not suitable for use on air**. An alternative material for the sac is Butyl rubber, PA/908/2 identified with a yellow spot, which is suitable for use with Skydrol 500B and Girling Brake Fluid 6293.

Accuracy

The seal is suitable for testing gauges up to 12" in diameter with a graduation of 4 bar (60 lb/in²) or more. All gauges to be calibrated must have their Bourdon tubes filled with the test liquid before calibration. The error introduced by the sac is not more than 0.014 bar (0.2 lb/in²) on a completely liquid filled Bourdon tube and not more than 0.028 bar (0.4 lb/in²) if there is air trapped within the Bourdon tube.

For accurate calibrations at low pressure, it may be necessary to include the head of oil between the PCU datum and the pressure gauge connection on the oil seal; for Model 380 and 480 series testers, this corresponds to 240mm head of oil and using our standard oil with a specific gravity of 0.885, this is equivalent to a pressure of 0.02 bar (0.31 lb/in²).

¹ Viton is a registered trade mark of Du Pont.

INSTALLATION AND PREPARATION FOR USE**Unpacking**

The oil seal is supplied complete with a loose union nut screwed 1/2" BSP, an internal connection to a tester base, tapped 3/4" BSP, a connection screwed 3/8" BSP, a spare sac and an 'O' ring. When ordered, 1/4" and 1/2" NPT connections are supplied.

Assembly

- 1) Unscrew and remove the gauge adaptor from the tester base to which the Model 38 oil seal is to be fitted.
- 2) Ensure that the 'O' ring is seated in its recess on the top of the gauge stand.
- 3) Fit the Model 38 Oil Seal to the gauge stand on the tester base and tighten. Excessive force is not required to make a seal.

Preparing for Use

- 1) Select a pressure gauge to be calibrated and fill its Bourdon tube via the inlet, using a syringe as illustrated on data sheet 1/162B, with the test liquid.
- 2) Open all valves on the tester base and the air release valve and oil chamber bleed screw on the Model 38.
- 3) Pour the gauge testing liquid into the Model 38 via the gauge connection until the liquid emerges in the trough. A small funnel or syringe may be required for this operation.
- 4) Close the air release valve.
- 5) Fit the selected pressure gauge to the oil seal.
- 6) Using the tester base, gently apply pressure until oil emerges from the bleed screw.
- 7) Close the oil chamber bleed screw and wipe away the excess oil.
- 8) The tester and seal are now ready for use.

Continued Calibration of Pressure Gauges

- 1) The oil chamber bleed screw is only used when a Model 38 oil seal is fitted to a tester base.
- 2) Before fitting any pressure gauge to the oil seal, always check that the sac is full and uncontaminated, by pouring the test liquid in through the gauge connection with the air release valve open until the liquid appears in the trough. This must be done with no pressure applied to the oil seal, i.e. with all valves on the tester base open.
- 3) Close the air release valve.
- 4) Fit the selected pressure gauge to be tested, ensuring that the gauges Bourdon tube is filled with the test liquid. It is not advisable to fit contaminated pressure gauges as these should be cleaned before calibration. For full details of cleaning pressure gauges, please see Data Sheets 1/162A and B.
- 5) Apply pressure through the tester and carry out test or calibration.
- 6) Release pressure on tester completely before removing a pressure gauge.
- 7) Before carrying out further tests or calibrations on pressure gauges, check that the sac is full as described above.
- 8) When not in use, make sure that there is no pressure applied to the sac.

MAINTENANCE

Very little maintenance is required on the oil seal and the only part that needs replacing is the sac. A burst sac is indicated by oil appearing on the liquid in the connection or trough. Sacs are likely to be damaged if not kept absolutely full; always ensure that both sac and pressure gauge Bourdon tube are full.

Fitting new sac

Unscrew top cap by means of a tommy bar in the holes provided, withdraw from chamber. Release sac and remove by unscrewing sac retaining screw. Fit new sac and tighten screw, inspect 'O' ring item 2 for damage and replace if necessary. Screw back assembly into chamber and pull down with tommy bar. Excessive force is not required.

If the non-return valve is sticking or a part needs replacing the top cap should be removed and a suitable screw driver should be used to hold the ring support screw, while the spring compression screw is undone. The parts should be re-assembled in reverse order.

SPARES

ITEM	DESCRIPTION	PART NO.
1	Synthetic Rubber Sac	PA/908/1 or PA/908/2
2	'O' Ring	2002184490
3	Bleed Screw	P/9767
4	Release Valve Complete	P/9679
5	'O' Ring	2000104470

The spares are illustrated on the Diagram Page 4.

Ordering Spares

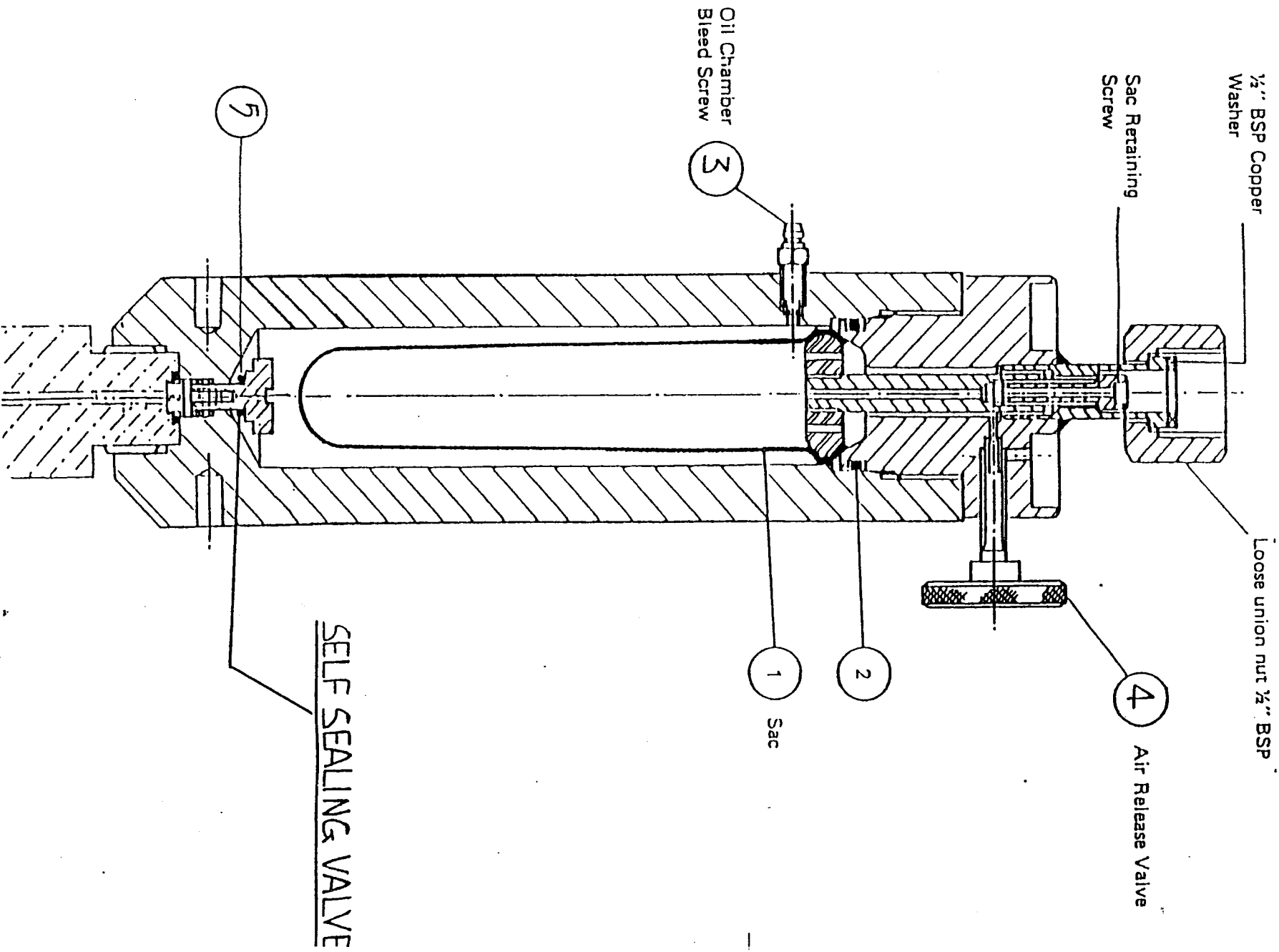
When ordering spares or making enquiries please state:--

Oil Seal Serial No. (On nameplate)

Description of Part.

Part No.

Whilst every effort is made to ensure that the correct parts are sent as spares, this cannot be guaranteed unless full information is given.



Dr.: RPP/CMA

App: *K.P.*

Date: 11/5/92

Issue: *K.P.*

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Page: 1 of 1

CLEANING GAUGES

Warning:

This cleaning/degreasing process is only suitable for use with pressure gauges with either phosphor bronze, beryllium copper, monel or stainless steel bourdon tubes in the form of a 'C'.

It is not advise to degrease pressure gauges with steel Bourdon tubes since a very small amount of corrosion on the bore of a Bourdon tube can cause inaccuracies of reading and early failure of the tube.

This method of cleaning is not suitable for use with pressure gauges which are fitted with coiled Bourdon tubes, nor any gauges which are to be used on oxygen, as complete removal of oil is not assured, Refer to Manufacture.

Equipment

This consists of a syringe and a special needle with the point bent through 90°.

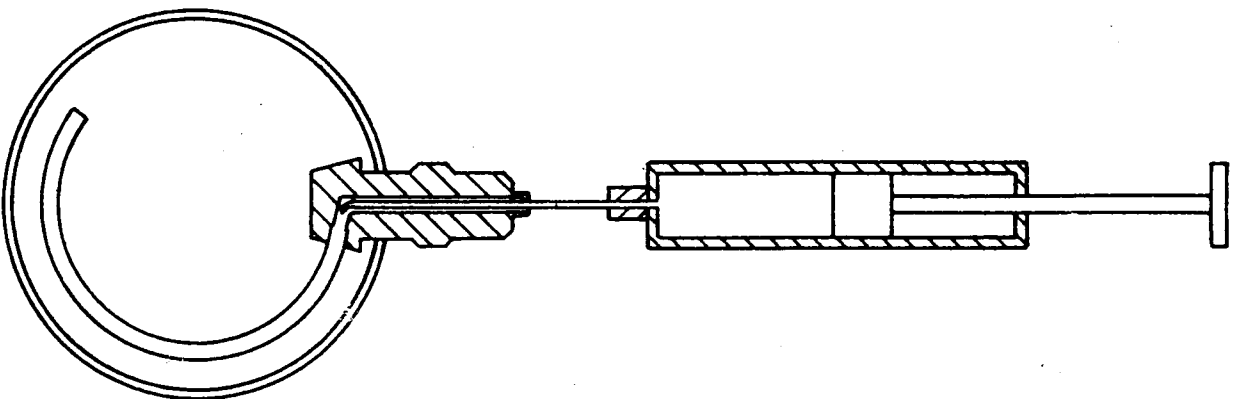
Instructions for Use:

1. Fill syringe with solvent (Trichloroethylene, for example).
2. With gauge connection pointing upwards, put needle into connection and insert by feel the point into the hole leading to the tube, (See illustration).
3. Inject the solvent. Ideally the tube should be half full.
4. Shake gauge in various attitudes to agitate solvent.
5. Suck solvent back into syringe, holding gauge at an angle (See illustration).
6. Check that solvent removed is clean. To be sure that all oil has been removed, repeat cleaning process until solvent removed from gauge is as clean as that put in.
7. Shake out solvent remaining in gauge.

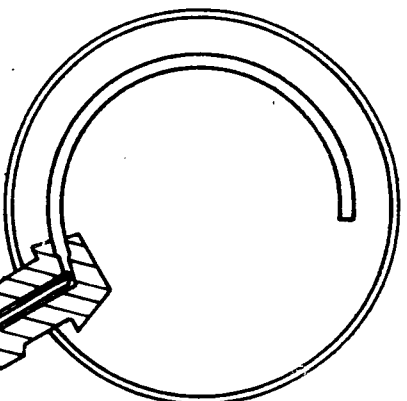
Copy with each syringe
Warehouse

DATA SHEET

No. 1/162B.



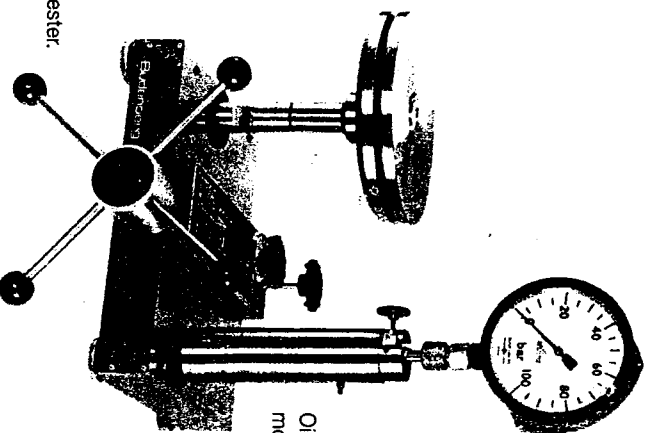
FILLING



EMPTYING

CLEANING AND FILLING PRESSURE GAUGES USING A SYRINGE.

DR. M.R.L.
TR. M.R.L.
DATE 13.12.74



Oil-free gauge mounted on Model 38 seal.

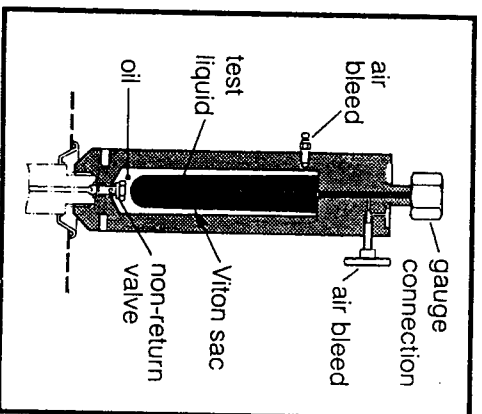
Oil operated dead-weight tester.

Application

The calibration of pressure gauges or transducers which cannot be connected directly to an oil or water dead-weight tester. Examples are gauges for use on liquids which must not be contaminated by oil or water, gauges for oxygen or medical gases, gauges that have been contaminated by fluids which might harm a dead-weight tester.

See pages 3-39 for notes on fluids for use in hydraulic testers.

It is preferable to calibrate oxygen gauges for pressure up to 120 bar (1,600lb/in²) using an air dead-weight tester since this does not introduce any liquid into the tube of the gauge.



Description (see illustration)

The gauge to be calibrated is screwed into the stainless steel connection on top of the seal and so is connected to the interior of the synthetic rubber sac, the gauge and sac being filled with the test liquid. The sac is fitted into the test chamber which is filled with oil and connected to the oil dead-weight tester by screwing in place of the gauge port. Bleed screws are provided to bleed air from the test liquid and from the oil. The sac is usually made from Viton* but butyl rubber sacs are available. The seal can easily be dismantled for cleaning and for replacement of the sac.

Connection to tester

The seal is fitted with a non return valve to enable the seal to be removed from the tester without any spillages, and reduce the time to re-fill the oil seal when reconnecting to the tester.

Test liquids

The most common test liquids are water and solvents such as carbon tetrachloride, toluene, benzene, xylene or industrial alcohol. When the test liquid is an ester based hydraulic fluid or a castor based fluid a butyl sac should be used.

The test liquid is often the liquid on which the gauge is to be used. This prevents the process liquid from contamination when the gauge is in use.

Accuracy

The error introduced by the sac is not more than 0.014 bar (0.2 lb/in²) on a pressure gauge when the tube has been filled with the test liquid and not more than 0.028 bar (0.4 lb/in²) if there is air in the gauge tube.

Pressure rating

The seal is suitable for use at pressures up to 700 bar (10,000 lb/in²). The lowest graduation of pressure gauge which can be calibrated is dependent upon the accuracy required (See "Accuracy").

Testers

The seal may be used with oil operated dead-weight testers and comparators Model 278, 279, 480C, 480L, 480M and 480DX.

For use with Model 480HX and Model 480C up to 1200 bar (16,000 lb/in²) we offer a small seal. **Model 25**, details available on request.

Specification

Model 38 tester mounting oil seal with stainless steel gauge connections tapped 3/8" and 1/2" BSP, connection to tester screwed 3/4" BSP suitable for maximum working pressure of 700 bar (70,000 kPa, 10,000 lb/in²) complete with spare synthetic rubber sac and 'O' ring.

Packing

Packing specification (inland transit, air freight or container shipment)

1 Carton

38 x 27 x 14 cm (15" x 10 1/2" x 5 1/2")
0.014m³

Nett 5.4kg (12lb)

Gross 6.1kg (15lb)

NPT connections

1/2" and 3/4" NPT connections can be supplied as alternatives to or in addition to BSP connections.

*Viton is registered trade mark of Du Pont