



# THE LF-690 SERIES

Operating and Service Manual

Series includes all variants of LF-690/691 and 692

**Issue C**  
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## **1. Description**

The LF-690 is a single stage piston sensed pressure regulator, capable of a maximum 690 bar inlet pressure. This can then be controlled to a range of outlet pressures depending upon the sensing arrangement. As standard, the LF-690 comes with a Tungsten Carbide main valve and heat treated 17-4ph seat, which provides excellent resistance to erosion on hydraulic media.

Ceramic Ball and Plug options are available which provide ultimate protection against the harsh service encountered on hydraulic systems with the Ceramic Plug design allowing the LF-691 to achieve up to 1380 bar inlet\*.

For gas applications the LF-692 incorporates a PEEK seat cartridge and 316 SS main valve which provides a positive shut off and is able to achieve up to 690 bar working pressures.

The regulator is also available with balanced main valve options which allow high accuracy control of both low and high downstream pressures.

The housing has been machined from 316 SS (17-4ph SS on the LF-691 high pressure option) to ensure maximum protection against the media on which it will be used, and the environment in which it will be placed.

\*achievable with specific modification – Please contact the office for information.

## **2. Installation**

Before system start-up, it is recommended that all systems be pressure tested, leak tested and purged with an inert gas such as nitrogen.

Prior to placing into service ensure that the regulator is in the fully closed position, with the adjusting mechanism turned completely anti-clockwise.

Check the model number reference to ensure that the pressure range complies with the installation requirements.

Visually inspect the regulator for any signs of damage or contamination. If any foreign materials are present and cannot be removed from the regulator, or if the threads on the regulator appear to be damaged, please contact the office immediately to arrange for the regulator to be returned for service.

The Inlet and Outlet ports are clearly marked. Select the correct size and type of connection fittings for these ports which are indicated in the regulators part number. Both medium pressure type (MP) 'A' and National Pipe Thread (NPT) 'N' options are available on this regulator. For NPT threads, ensure that PTFE tape is applied correctly to the fittings, applying two overlapping layers in the direction of the thread, taking care that the tape does not come into contact with the first thread.

Any gauge ports on the regulator will be 1/4" NPT unless otherwise stated. If any gauge port is not required, ensure that the port is plugged prior to installation.

The media supplied to the regulator must be clean. Contamination can damage the seat which may cause the regulator to fail. Filtration suited to the application is recommended upstream of the regulator.

Should further assistance or information be required in relation to installation of any Pressure Tech regulator please contact the office, giving reference to the regulators part number and/or serial number.

### **3. Operation**

Turning the hand wheel (or T-Bar) clockwise compresses the load spring, which in turn opens the main valve, and allows the inlet pressure to pass through the orifice until the outlet pressure is equivalent to the loading forces set by the compressed spring.

The LF-690 incorporates a segregated captured vent, which allows the outlet pressure to be reduced whilst turning the hand wheel anti-clockwise. Excess pressure is vented off through the 'Vent' port marked at the bottom of the regulator. This port should not be plugged or blocked at any time.

The LF-690 series may be offered with pressure limiting, pressure locking or pre-set pressure options:

Pressure limited regulators are fitted with locknuts on the adjusting mechanism in order to limit the maximum allowable downstream pressure. Regulators fitted with pressure limiting locknuts will state the limited pressure on the regulator label and this will also be indicated in the part number.

Pressure locking regulators are fitted with a locking cap which may be set (when specified) to pre-determined requirements. It is secured in place by three M5 grub screws which lock against the bonnet of the regulator creating an anti-tamper device to ensure the pressure cannot be adjusted accidentally.

Pre-set pressure regulators are adjusted (factory set) to specified customer requirements within a given pressure range.

Both pressure locking and pre-set pressure regulators will be fully adjustable through a given pressure range and the maximum allowable working pressures will be indicated on the regulator label and in the part number.

\*Note - A table is available on request defining allowable tolerances for set points within a given pressure range.

## **4. Special Conditions for Safe Use**

Turning the hand wheel anti-clockwise (with pressure on the outlet) should be refrained on non-venting regulators. Pressure should be reduced in this case by venting downstream of the regulator, and turning the hand wheel simultaneously anti-clockwise.

## **5. Hazardous Location Usage**

This equipment has not been manufactured specifically for use in potentially explosive atmospheres and as such an ignition hazard assessment has not been carried out on this product. If the user should wish to use this product in such an environment where there may be a potentially explosive atmosphere then it is the responsibility of the user to conduct an ignition hazard assessment against 99/92/EC.

## **6. Servicing and Maintenance**

With so many variants of the LF-690 available, the following section uses three examples with the aim of covering most options. The product supplied may vary from these examples. Should any assistance be required then please do not hesitate to contact the office.

Servicing and maintenance work on the LF-690 regulators should only be performed after fully reading and understanding the Operating and Servicing Manual. Due to the typical nature of the gases the regulator can be used with, the operator should not endanger himself/herself or others by working on this regulator without prior knowledge on the Health and Safety concerns relating to handling of technical gases. Any uncertainty should be clarified with Pressure Tech before working on the regulator.

Pressure Tech Ltd recommends the use of Krytox GPL 205 during servicing.

Prior to commencing service, please ensure that:

- The equipment has been de-pressurised
- The load spring has been de-compressed by turning the adjusting mechanism fully anti-clockwise
- Applications involving toxic, flammable or corrosive media have been fully purged

To ensure the best possible results from servicing, when re-assembling the regulator and any assemblies within it, ensure that all areas of the components and the regulator body are cleaned and free from contaminants which may result in failure of the regulator.

## 6.1. Servicing the LF-690 regulator

\*Note: fig 1 should be used as a reference for the following set of instructions

### 6.1.1. Accessing the Main Valve Assembly

To access the Main Valve Assembly:

- i. Firmly clamp the flats at the bottom of the regulator in the vice, with the bottom nut (7) facing up.
- ii. Remove the bottom nut (7) from the body (1).
- iii. The valve spring (6), shuttle (4), seat cartridge (5), ceramic ball (9) and ceramic seat (2) can now be removed from the assembly. It may be necessary to remove the regulator from the vice to do so.
- iv. The connector pin (8) may also be withdrawn at this point by up righting the regulator with the main valve assembly removed.
- v. Care should be taken when reassembling not to damage the sealing face of the connector pin (8). Needle nose pliers should be used to replace the connector pin chamfer down into the body while the body is up-side down. The pin should locate within the baffle plate (3).
- vi. The new ceramic seat (2) should be placed in the seat cartridge (5) with the BS 806 'O' ring (26).
- vii. These can then be placed into the regulator body, being careful to ensure that the 'O' ring (26) remains in place and that the seat cartridge (5) locates in the correct place within the body (1).
- viii. The ceramic ball (9) and shuttle (4) can then be placed into their location within the seat cartridge (5).
- ix. The main valve spring (6) can now be placed on the stem of the shuttle (4).
- x. Replace the BS019 'O' ring (25) and back up ring (28) on the bottom nut (7), then assemble into the regulator body.

It is recommended that all parts in the repair kits are used. Any defect parts removed during the service should be disposed of.

To ensure that the main valve assembly has been correctly and effectively installed it may be required to perform the appropriate seat leak test as per ANSI/FCI 70-2.

## 6.1.2. Accessing the Sensor Assembly

The loading mechanism and vent seat for the LF-690 can be accessed from the top of the regulator. Ensure the spring is de-compressed by rotating the hand wheel fully anti-clockwise and follow the instructions below:

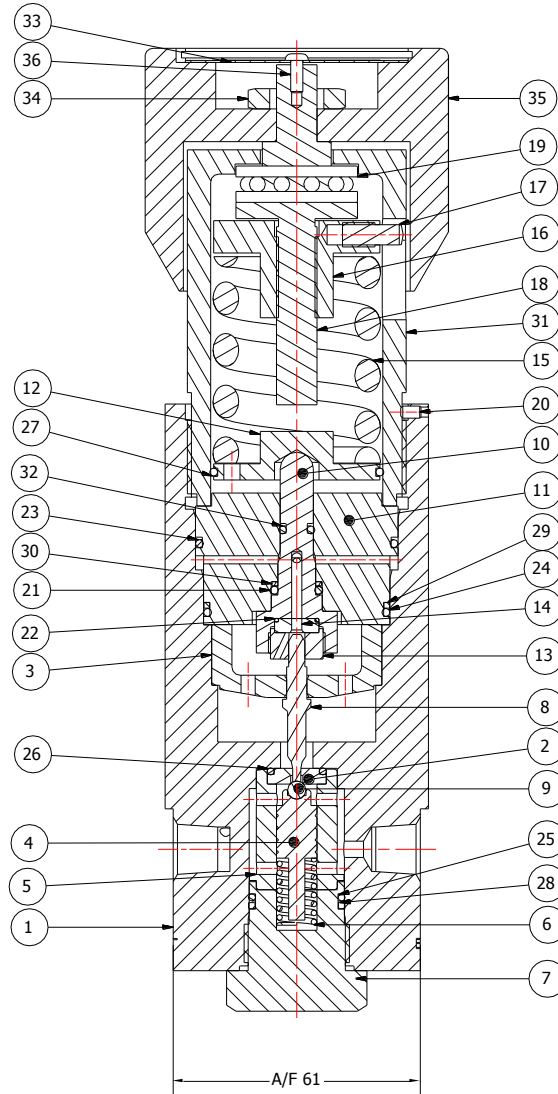
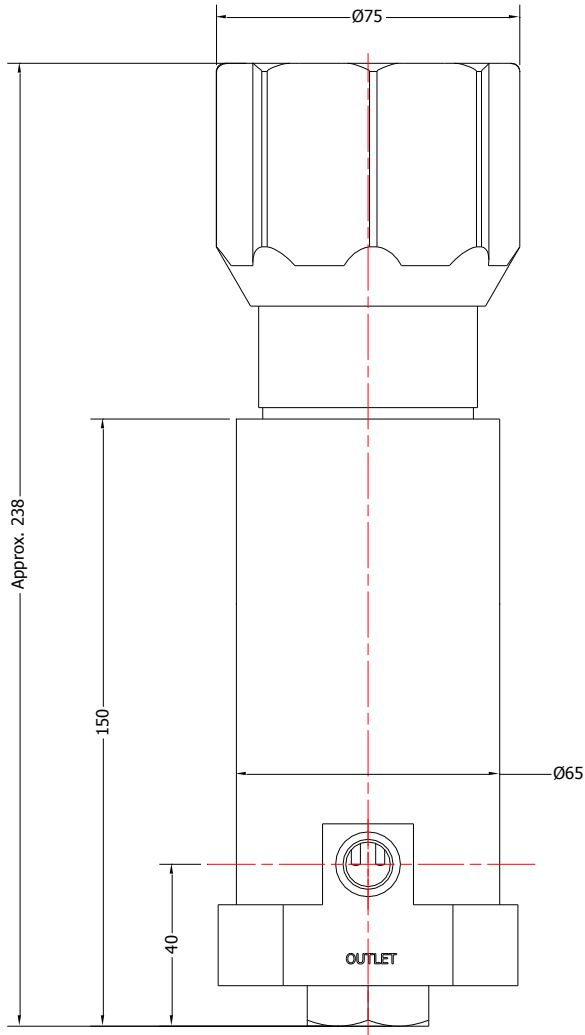
- i. Remove the securing grub screw (20) from the regulator body (1).
- ii. Unscrew the pan screw (36) and remove the name plate (33) from the hand wheel (35).
- iii. Using a 24mm socket, unscrew the locknut (34) and remove the hand wheel (35) from the adjusting screw (18).
- iv. With the regulator secured up-right in a vice, remove the bonnet (31) by using a torque wrench or equivalent with 47mm open end.
- v. Un-screw and lift the top works from the assembly, inclusive of the bonnet (31), load spring (15), adjusting mechanism (16, 17, 18 & 19) and lower spring rest (12) from the body.
- vi. The sensor assembly (10, 11, 13 & 14) can be removed from the body by using an M5 bolt (supplied with kit) and pliers.
- vii. If necessary, the baffle plate (3) and connector (8) can be withdrawn. Inspect the connector for damage and replace if required.
- viii. The vent seat (14) can be accessed by removing the sensor (10) from the sensor holder (11) and gripping the sensor firmly in a vice with the vent seat nut (13) facing upwards.
- ix. The vent seat nut (13) can be removed using a 10mm open ended spanner and the vent seat (14) can then be removed from the sensor (10) along with the 9mm x 1mm 'O' ring (22).
- x. Inspect the vent seat (14) for damage and replace if necessary.
- xi. Replace all 'O' rings (21, 22, 23, 24, 29, 30 & 32) located on the sensor (10) and sensor holder (11) prior to reassembly, ensuring adequate lubrication is used.
- xii. Place the connector (8) into the baffle plate (3) and locate into the regulator body, taking care not to damage the sealing edge of the connector.
- xiii. After reassembling the sensor (10) and holder (11), place the assembly into the regulator body (1) ensuring that it is firmly in place.
- xiv. Remove the M5 screw from the sensor holder if used.
- xv. Screw the top works onto the regulator body and using a torque wrench, tighten to 120Nm.
- xvi. Tighten the securing grub screw (20) against the bonnet (31).
- xvii. The hand wheel (35) can now be secured on to the adjusting screw (18) using the locknut (34).
- xviii. The name plate (33) can then be secured using the pan screw (36).

It is recommended that all parts in the repair kits are used. Any defect parts removed during the service should be disposed of.

Replacement 'O' rings should be lubricated with suitable non-hydrocarbon grease such as Krytox GPL 205.

6.1.3. Figure 1 – Sectional View of the LF-690

\* ALL DIMENSIONS IN MILLIMETERS, UNLESS OTHERWISE STATED.



PARTS LIST		
ITEM	PART NUMBER	DESCRIPTION
1	PT-690-N-LF	BODY 'N' PORTING 1/4" NPT
2	PT-C-029-007	CERAMIC SEAT
3	PT-C-086	BAFFLE PLATE
4	PT-C-088-006-002	HYD MAIN VALVE
5	PT-C-089-008	SEAT CARTRIDGE
6	PT-C-099	MAIN VALVE SPRING
7	PT-690-010	BODY BOTTOM NUT
8	PT-690-011-011	CONNECTOR
9	PT-690-017	CERAMIC BALL
10	PT-C-094	9MM SENSOR
11	PT-C-093	9MM SENSOR HOLDER
12	PT-C-095-001	SPRING REST - DOME
13	PT-C-091	VENT SEAT NUT
14	PT-C-029-013	PEEK VENT SEAT GF30
15	PT-C-042	500KG LOAD SPRING
16	PT-C-045	ADJUSTING NUT
17	PT-C-046	SCREW
18	PT-C-043-004	ADJUSTING SCREW
19	51103-SS	SS BEARING
20	FIT-M3X5	GRUB SCREW
21	OR-0090-20	O' RING STD
22	OR-0090-10	O' RING STD
23	OR-0460-20	O' RING STD
24	OR-0420-20	O' RING STD
25	OR-BS019	O' RING STD
26	OR-BS806	O' RING STD
27	OR-0350-20	O' RING STD
28	ORB-BS019	PTFE BACK UP RING
29	ORB-PT-C-139	PTFE BACK UP RING
30	ORB-PT-C-098-004	PEEK BACK UP RING
31	PT-C-040	BONNET
32	OR-0050-20	O' RING STD
33	PT-C-049	NAME PLATE
34	PT-C-132	LOCK NUT
35	PT-C-048-001	LARGE NYLON HAND WHEEL
36	FIT-M3X8	SCREW

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## 6.2. Servicing the LF-691 regulator

\*Note: fig 2 should be used as a reference for the following set of instructions

### 6.2.1. Accessing the Main Valve Assembly

To access the Main Valve Assembly:

- i. Firmly clamp the flats at the bottom of the regulator in the vice, with the bottom nut (7) facing up.
- ii. Remove the bottom nut (7) from the body (1).
- iii. The valve spring (6), shuttle (4), seat cartridge (5), ceramic plug (9) and ceramic seat (2) can now be removed from the assembly. It may be necessary to remove the regulator from the vice to do so.
- iv. The connector pin (8) may also be withdrawn at this point by up righting the regulator with the main valve assembly removed.
- v. Care should be taken when reassembling not to damage the sealing face of the connector pin (8). Needle nose pliers should be used to replace the connector pin chamfer down into the body while the body is up-side down. The pin should locate within the baffle plate (3).
- vi. The new ceramic seat (2) should be placed in the seat cartridge (5) with the BS 806 'O' ring (26).
- vii. These can then be placed into the regulator body, being careful to ensure that the 'O' ring (26) remains in place and that the seat cartridge (5) locates in the correct place within the body (1).
- viii. The ceramic plug (9) and shuttle (4) can then be placed into their location within the seat cartridge (5).
- ix. The main valve spring (6) can now be placed on the stem of the shuttle (4).
- x. Replace the BS019 'O' ring (25) and back up ring (28) on the bottom nut (7), then assemble into the regulator body.

It is recommended that all parts in the repair kits are used. Any defect parts removed during the service should be disposed of.

To ensure that the main valve assembly has been correctly and effectively installed it may be required to perform the appropriate seat leak test as per ANSI/FCI 70-2.

## 6.2.2. Accessing the Sensor Assembly

The loading mechanism and vent seat for the LF-691 can be accessed from the top of the regulator. Ensure the spring is de-compressed by rotating the T-Bar fully anti-clockwise and follow the instructions below:

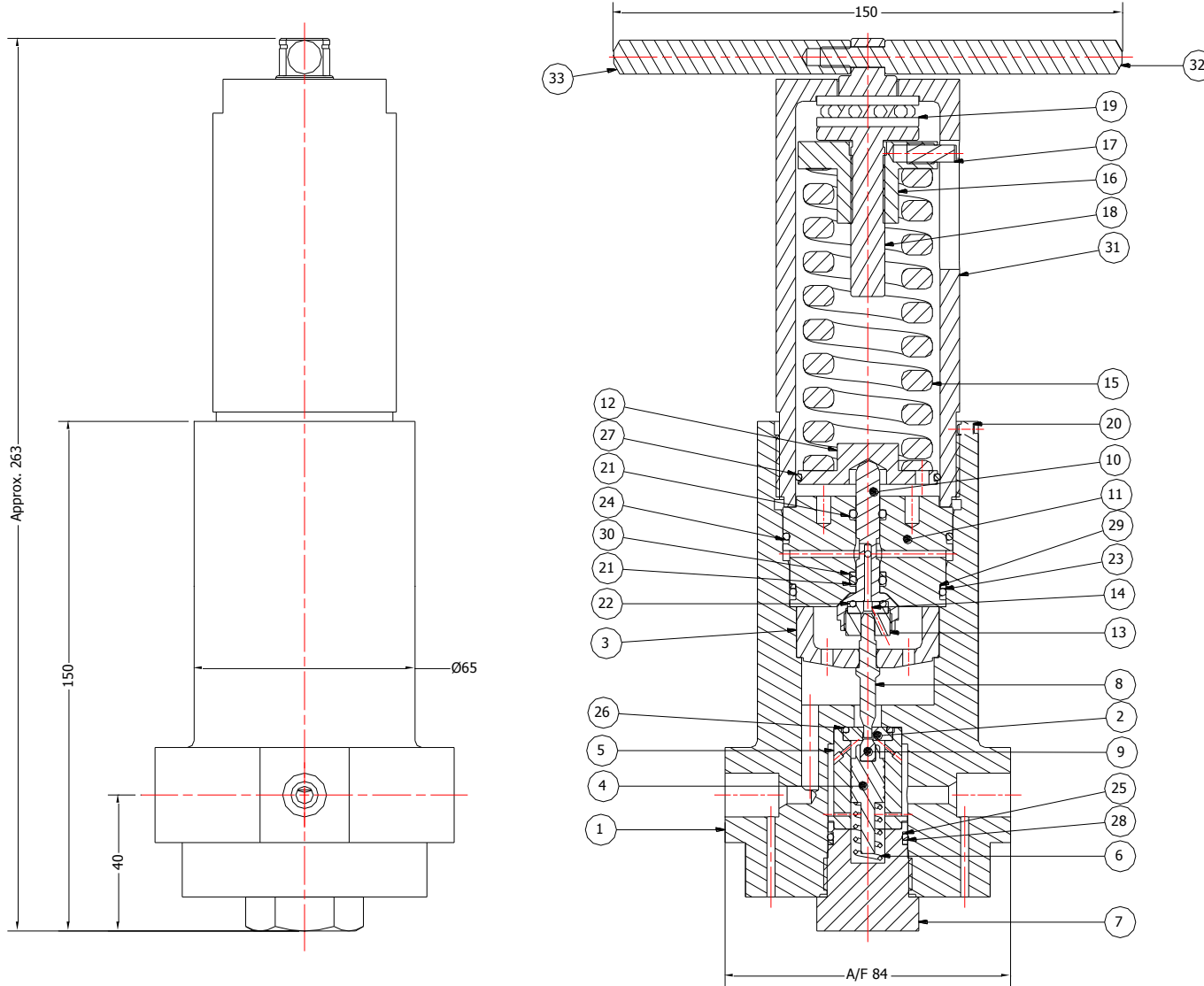
- i. Remove the T-Bar (32, 33) by unscrewing one side whilst firmly gripping the other.
- ii. With the regulator secured up-right in a vice, remove the bonnet (31) by using a torque wrench or equivalent with 47mm open end.
- iii. Un-screw and lift the top works from the assembly, inclusive of the bonnet (31), load spring (15), adjusting mechanism (16, 17, 18 & 19) and lower spring rest (12) from the body.
- iv. The sensor assembly (10, 11, 13 & 14) can be removed from the body by using an M5 bolt (supplied with kit) and pliers.
- v. If necessary, the baffle plate (3) and connector (8) can be withdrawn. Inspect the connector for damage and replace if required.
- vi. The vent seat (14) can be accessed by removing the sensor (10) from the sensor holder (11) and gripping the sensor firmly in a vice with the vent seat nut (13) facing upwards.
- vii. The vent seat nut (13) can be removed using a 10mm open ended spanner and the vent seat (14) can then be removed from the sensor (10) along with the 6.85mm x 2mm 'O' ring (22).
- viii. Inspect the vent seat (14) for damage and replace if necessary.
- ix. Replace all 'O' rings (21, 22, 23, 24, 29 & 30) located on the sensor (10) and sensor holder (11) prior to reassembly, ensuring adequate lubrication is used.
- x. Place the connector (8) into the baffle plate (3) and locate into the regulator body, taking care not to damage the sealing edge of the connector.
- xi. After reassembling the sensor (10) and holder (11), place the assembly into the regulator body (1) ensuring that it is firmly in place.
- xii. Remove the M5 screw from the sensor holder if used.
- xiii. Screw the top works onto the regulator body and using a torque wrench, tighten to 120Nm.
- xiv. Tighten the securing grub screw (20) against the bonnet (31).
- i. Place the T-Bar piece with the male thread (32) through the hole on the adjusting screw and tighten the second T-Bar piece (33) against it.

It is recommended that all parts in the repair kits are used. Any defect parts removed during the service should be disposed of.

Replacement 'O' rings should be lubricated with suitable non-hydrocarbon grease such as Krytox GPL 205.

6.2.3. Figure 2 – Sectional View of the LF-691

\* ALL DIMENSIONS IN MILLIMETERS, UNLESS OTHERWISE STATED.



PARTS LIST		
ITEM	PART NUMBER	DESCRIPTION
1	PT-690-N-LF-03A-001	BODY 'N' PORTING 3/8" MP
2	PT-C-029-007	CERAMIC SEAT
3	PT-C-086	BAFFLE PLATE
4	PT-C-088-006-001	MAIN VALVE SHUTTLE
5	PT-C-089-011	LOW FLOW SEAT HOLDER
6	PT-C-099	MAIN VALVE SPRING
7	PT-690-010-002	BODY BOTTOM NUT
8	PT-690-011-015	CONNECTOR PIN 20KPSI
9	PT-690-018	CERAMIC PLUG
10	PT-C-155-001	7MM SENSOR
11	PT-C-156-001	7MM SENSOR HOLDER
12	PT-C-095-001	SPRING REST - DOME
13	PT-C-091-003	VENT SEAT NUT
14	PT-C-029-013-001	PEEK VENT SEAT GF30
15	SPR-G40X89	730KG LOAD SPRING
16	PT-C-045	ADJUSTING NUT
17	PT-C-046	SCREW
18	PT-C-043-001	ADJUSTING SCREW
19	BEAR-51103-SS	SS BEARING
20	FIT-M3X5	GRUB SCREW
21	OR-0061-25	O' RING STD
22	OR-0068-20	O' RING STD
23	OR-0418-22	O' RING STD
24	OR-0457-22	O' RING STD
25	OR-BS019	O' RING STD
26	OR-BS806	O' RING STD
27	OR-0350-20	O' RING STD
28	ORB-PT-C-168	PEEK BACK UP RING
29	ORB-PT-C-167	PEEK BACK UP RING
30	ORB-PT-C-166	PEEK BACK UP RING
31	PT-C-040-008	BONNET
32	PT-C-108	T BAR HANDLE
33	PT-C-107	T BAR HANDLE

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## 6.3. Servicing the LF-692 regulator

\*Note: fig 3 should be used as a reference for the following set of instructions

### 6.3.1. Accessing the Main Valve Assembly

To access the Main Valve Assembly:

- i. Firmly clamp the flats at the bottom of the regulator in the vice, with the bottom nut (7) facing up. Remove the bottom nut (7) from the body (1).
- ii. The valve spring (6), main valve (4), seat cartridge (5) and 16mm x 2mm 'O' ring (26) can now be removed from the assembly. It may be necessary to remove the regulator from the vice to do so.
- iii. The connector pin (8) may also be withdrawn at this point by up righting the regulator with the main valve assembly removed.
- iv. Care should be taken when reassembling not to damage the sealing face of the connector pin (8). Needle nose pliers should be used to replace the connector pin chamfer down into the body while the body is up-side down. The pin should locate within the baffle plate (3).
- v. With the regulator upside down, the 16mm x 2mm 'O' ring (26) can be located in the bottom of the regulator body (1).
- vi. The seat cartridge (5) can then be placed into the regulator body (1), being careful to ensure that it locates in the correct place within the body and that the 'O' ring (26) seal remains in the correct position between the cartridge and the body.
- vii. The main valve (4) can then be placed into its location within the seat cartridge (5).
- viii. The main valve spring (6) can now be placed onto the stem of the main valve (4).
- ix. Replace the BS019 'O' ring (25) and back up ring (28) on the bottom nut (7), then assemble into the regulator body.

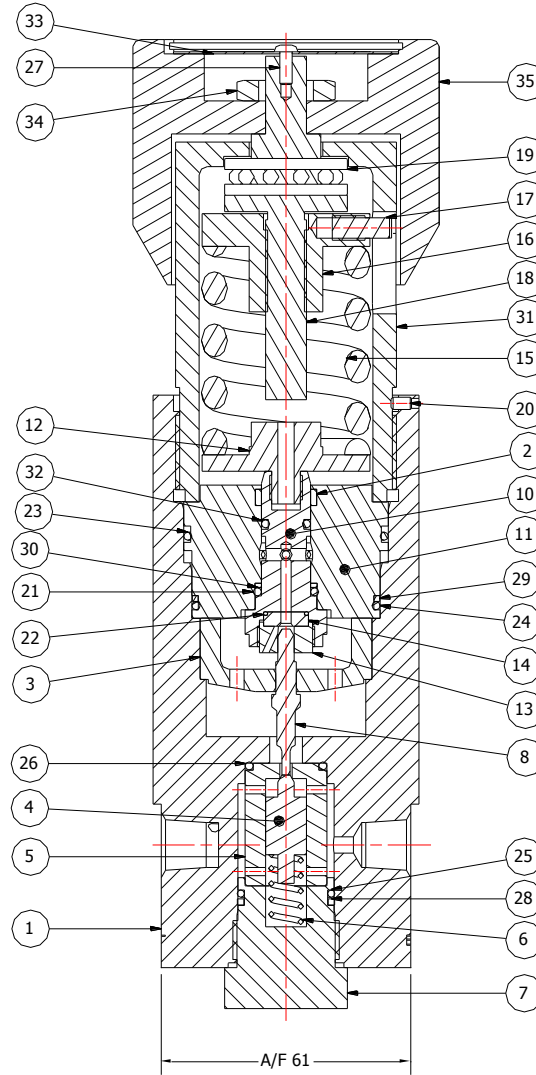
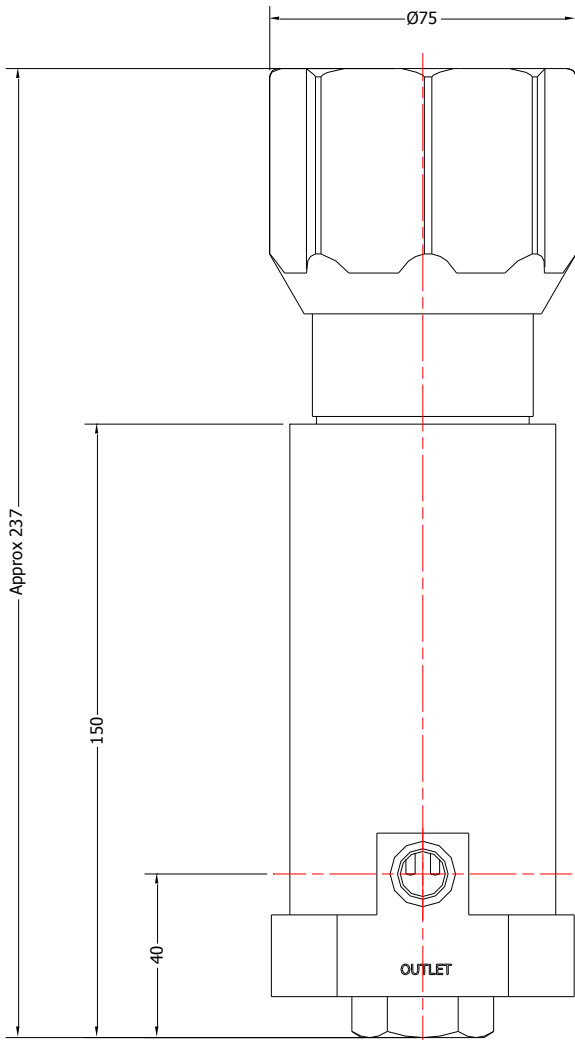
It is recommended that all parts in the repair kits are used. Any defect parts removed during the service should be disposed of.

### 6.3.2. Accessing the Sensing Assembly

The loading mechanism and vent seat for the LF-692 can be accessed from the top of the regulator. Ensure the spring is de-compressed by rotating the hand wheel fully anti-clockwise and follow the instructions below:

- i. Remove the securing grub screw (20) from the regulator body (1).
- ii. Unscrew the pan screw (27) and remove the name plate (33) from the hand wheel (35).
- iii. Using a 24mm socket, unscrew the locknut (34) and remove the hand wheel (35) from the adjusting screw (18).
- iv. With the regulator secured up-right in a vice, remove the bonnet (31) by using a torque wrench or equivalent with 47mm open end.
- v. Un-screw and lift the top works from the assembly, inclusive of the bonnet (31) and adjusting mechanism (16, 17, 18 & 19) from the body.
- vi. Remove the load spring (15).
- vii. The sensor assembly (10, 11, 12, 13 & 14) can be removed from the body by firmly gripping the flats of the lower spring rest with pliers and lifting.
- viii. If necessary, the baffle plate (3) and connector (8) can be withdrawn. Inspect the connector for damage and replace if required.
- ix. Grip the flats of the lower spring rest (12) in a vice so that the vent seat nut (13) is facing.
- x. The vent seat nut (13) can be removed using a 10mm open ended spanner and the vent seat (14) can then be removed from the sensor (10) along with the 9mm x 1mm 'O' ring (22).
- xi. Inspect the vent seat (14) for damage and replace.
- xii. The sensor (10) can then be unscrewed from the lower spring rest (12) and the sensor can then be removed from the sensor holder (11).
- xiii. Replace all 'O' rings (21, 22, 23, 24, 29, 30 & 32) located on the sensor (10) and sensor holder (11) prior to reassembly, ensuring adequate lubrication is used.
- xiv. Insert the sensor (10) into the sensor holder (11) and screw the lower spring rest (12) in place.
- xv. Grip the flats of the lower spring rest (12) in a vice and tighten the sensor (10) against it using the flats at the base of the sensor.
- xvi. Secure the vent seat nut (13) using a 10mm open ended spanner.
- xvii. Place the connector (8) into the baffle plate (3) and locate into the regulator body, taking care not to damage the sealing edge of the connector.
- xviii. After reassembling the sensor assembly, place into the regulator body (1) ensuring that it is firmly in place.
- xix. Place the load spring (15) onto the spring rest (12).
- xx. Screw the top works onto the regulator body ensuring that the adjusting screw properly locates within the load spring and using a torque wrench, tighten to 120Nm.
- xxi. Tighten the securing grub screw (20) against the bonnet (31).
- xxii. The hand wheel (35) can now be secured on to the adjusting screw (18) using the locknut (34).
- xxiii. The name plate (33) can then be secured using the pan screw (27).

6.3.3. Figure 3 – Section view of the LF-692



PARTS LIST		
ITEM	PART NUMBER	DESCRIPTION
1	PT-690-N-LF	BODY 'N' PORTING 1/4" NPT
2	PT-C-037	SLIDE RING
3	PT-C-086	BAFFLE PLATE
4	PT-C-088-003	MAIN VALVE
5	PT-C-089-001	SEAT CARTRIDGE
6	PT-C-099	MAIN VALVE SPRING
7	PT-690-010	BODY BOTTOM NUT
8	PT-690-011-003	CONNECTOR
10	PT-C-087	12MM SENSOR
11	PT-C-085	12MM SENSOR HOLDER
12	PT-C-039	BOTTOM SPRING REST
13	PT-C-091	VENT SEAT NUT
14	PT-C-029-013	PEEK VENT SEAT GF30
15	PT-C-042	500KG LOAD SPRING
16	PT-C-045	ADJUSTING NUT
17	PT-C-046	SCREW
18	PT-C-043-004	ADJUSTING SCREW
19	51103-SS	SS BEARING
20	FIT-M3X5	GRUB SCREW
21	OR-0120-20	O' RING STD
22	OR-0090-10	O' RING STD
23	OR-0460-20	O' RING STD
24	OR-0420-20	O' RING STD
25	OR-BS019	O' RING STD
26	OR-0160-20	O' RING STD
27	FIT-M3X8	SCREW
28	ORB-BS019	PTFE BACK UP RING
29	ORB-PT-C-139	PTFE BACK UP RING
30	ORB-PT-C-051-001	PTFE BACK UP RING
31	PT-C-040	BONNET
32	OR-0080-20	O' RING STD
33	PT-C-049	NAME PLATE
34	PT-C-132	LOCK NUT
35	PT-C-048-001	LARGE NYLON HAND WHEEL

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\* ALL DIMENSIONS IN MILLIMETERS, UNLESS OTHERWISE STATED.

## 6.4. Servicing the LF-690 Balanced Regulator

\*Note: fig 4 should be used as a reference for the following set of instructions

### 6.4.1. Removal of existing Balanced Main Valve Assembly

To access the Main Valve Assembly:

- i. Firmly clamp the flats at the bottom of the regulator in the vice, with the bottom nut ( ) facing up. Remove the bottom nut ( ) from the body ( ).
- ii. The main valve spring ( ), seat cartridge ( ), main valve ( ), washer ( ), and 'O' rings ( ) can then be removed from the assembly. It may be necessary to remove the regulator from the vice to do so.
- iii. The connector pin ( ) may also be withdrawn at this point using needle nosed pliers or by up righting the regulator with the main valve assembly removed.
- iv. Care should be taken when reassembling not to damage the sealing face of the connector pin ( ). Needle nose pliers should be used to replace the connector pin chamfer down into the body while the body is up-side down. The pin should locate within the baffle plate ( ).

### 6.4.2. Fitting the new Tecasint/Ceramic Balanced Main Valve Assembly

- v. Place the Tecasint or Ceramic seat into the seat cartridge ( ) with the 'O' ring groove on the seat facing outwards and place the BS806 'O' ring ( ) into the groove.
- vi. Holding the regulator upright, position the assembly ( ) into the regulator body ( ) ensuring that it finds the locating bore, then turn the regulator body ( ) upside down whilst supporting the assembly ( ) to ensure it does not fall out of place.
- vii. The main valve ( ) can then be placed into the seat cartridge ( ) with the stem protruding outwards.
- viii. The main valve spring ( ) can then be placed over the stem of the main valve ( ).
- ix. Place the washer ( ) onto the stem of the main valve (this acts as a lower spring rest).
- x. Replace all of the seals ( ) on the bottom nut\* ( ) and with the regulator remaining upside down, screw the bottom nut ( ) into the regulator body (\*\*

\*The small back up ring ( ) should be placed into the bottom nut ( ) first, followed by the 3.6mm 'O' ring ( )

\*\*It is possible, once the o-rings are in place on the bottom nut ( ), to position the washer ( ), main valve spring ( ) and main valve to the bottom nut ( ) and screw the entire assembly into the regulator body, ensuring that the main valve ( ) guides into the seat cartridge ( ).

## 7. Technical Data

Fluid Media:	All gases and liquids compatible with materials of construction
Max Inlet Pressure:	Standard – 690 bar High Pressure Option – 1380 bar Balanced Main Valve – 300 bar High Pressure Balanced Option – 690 bar
Max Outlet Pressure Range:	0 – 1380 bar
Operating Temperature:	-20°C to +80°C
Materials:	Body and Trim: 316 SS Seat:
Flow Capacity (Cv):	Standard – 0.1 High Pressure – 0.05 Balanced – 0.3
Leakage:	Liquid: Zero drops of water at max inlet Gas: Bubble tight

## 8. Warranty Statement

Pressure Tech Ltd guarantee all products correspond with their specification at the time of delivery and, with exception to wear and tear, wilful damage, negligence, and abnormal working conditions, will be free from defects for a period of 12 months from date of delivery.