

## OPERATION & MAINTENANCE



---

The designs, materials and specifications shown are subject to change without notice due to our continuing programme of product development.

## OPERATION:

Series 41 Swing Check Vales are suitable for use with wholesome (potable) water, raw water and low solids sewage up to 70°C. Minimum liquid temperature must be above freezing. Insulation is recommended for external temperatures from 0° to -10°C. They can have a Lever & Weight option, Right Hand as standard. They can also have an outside spring up to DN 200. These options may be added as a conversion from Non Lever & Weight.

**NOTE: The valves are not designed for “end of line” services. In the event of a valve being mounted on the end of a pipeline, we strongly advise the use of a blanking flange or plug.**

## DESIGN CONSTRAINTS:

Please consider the following points when selecting your valve:

- Consideration should be given at the design stage where valves will be located to give access for operation, adjustment, maintenance and repair.
- If a valve is installed less than 6 diameters downstream of an elbow or tee etc., it will experience very high-localised velocities that are far in excess of the average velocity. This high velocity will result in excessive turbulence within the valve and variations in performance may be experienced, therefore installation in this area should be avoided.
- Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the body which may impair its performance.
- Heavy valves may need independent support or anchorage.

## MAINTENANCE:

The valve is designed for underground use with minimum maintenance and requires no lubrication.

In the event of a spares replacement becoming necessary, the recommended procedure is as follows:

*All of the following procedures must be carried out with due regard to relevant **Road Traffic Act** Guidelines, **Health and Safety** and **COSHH** directives.*

## SAFETY PRECAUTIONS

- a) Procedures must NOT be carried out whilst the valve is installed in a live main under pressure.
- b) Ensure main will NOT be recharged before all work on the valve is completed.

Refer to General Arrangement Diagrams Attached

- Page 7 Diagram for Series 41 without Lever & Weight DN 50 DN 200.
- Page 8 Diagram for Series 41 with Lever & Weight DN 50 DN 200.
- Page 9 Diagram for Series 41 with outside spring DN 50 DN 200.
- Page 10 Diagram showing location of shaft into hinge.
- Page 11 Diagram for Series 41 without Lever & weight DN 250 DN 300.
- Page 12 Diagram for Series 41 with Lever & Weight DN 250 DN 300.

## 1. Replacement of Brass Sealing Bushes with 'O' Ring Seals. (Refer to Pages 7, 8, 9, 11 & 12)

This can only be carried out when there is no pressure in the pipeline.

If fitted, remove guard.

- a. If fitted remove nut (21), washer (22) and lever (23) with weight (20) or spring (26).  
NOTE: position of lever relative to body (12) for re-assembly.
- b. Unscrew either bushing (15) or (24) and replace with new bushing complete with 'O' ring seals.
- c. Repeat step b) with opposite side bushing.
- d. Where necessary, refit lever (23), weight (20), washer (22) and nut (21) or spring (26). Where necessary, replace guard.

## 2. Replacement of Complete Bonnet Assembly (Complete with Shaft, Hinge, Disc & Bushings). (Refer to Pages 7, 8, 9, 11 & 12)

This can only be carried out when there is no pressure in the pipeline.

If fitted remove guard.

- a. If fitted, detach spring (26) from lever (23) or eyebolt (27). Ref. Page 9.
- b. Remove bonnet (10) by removing hexagon screws (5) and washers (4) and lift completed assembly from body (12). (NOTE: Screws are different lengths.)

**NOTE: If bushings only are to be replaced, follow steps 1a, 1b, 1c & 1d.**

Check free movement of hinge prior to re-assembling of body.

- c. Ensure that seat area in body is clean.
- d. Fit hexagon screws (5) and washers (note different lengths) (4) through bonnet (10) and fit bonnet gasket (11) over screws (5).  
Fit bonnet (10) into body (12) with disc (6) facing correct way.
- e. Tighten bonnet screws (5) in a diagonal sequence using torque wrench set at 25Nm to 30Nm. Reset the torque wrench at 40Nm to 50Nm and re-tighten the screws following a circumferential sequence.
- f. Where necessary, refit outside spring (26).
- g. Slowly re-charge the main and check integrity of seals.
- h. Where necessary, re-fit guard.

### 3. Adding Lever & Counterweight to Series 41 Non Lever & Weight Valves (DN 50 up to DN 200)

**Safety Precaution :** This can only be carried out, when there is no pressure in the pipeline.

Replacement of the parts:

If fitted remove guard.

Refer to General Arrangement diagrams attached. (Pages 7 & 8)

- a. Dismantle the bonnet (10) by removing the hexagon screws and washers (4) and (5) and lifting the bonnet assembly away from the body (12). (NOTE: Screws are different lengths.)
- b. Remove the two closed bushings (15) from the bonnet (10), and the shaft (13).
- c. Refer to diagram on Page 10. Insert the new longer shaft (13) into the hinge and enter the assembly into one side of the bonnet (10), taking note of which side the lever and weight is required to be positioned.
- e. Lubricate the internal rubber seals on a CLOSED end bushing (15) and an OPEN end bushing (24) using a Water Regulations approved grease such as Rocol Aqua-Sil silicone grease.
- f. Mount the CLOSED end bushing (15) over the stub end of the shaft (13) using a twisting action to avoid damaging the seals and screw into the bonnet (10).

Mount the OPEN end bushing (24) over the exposed end of the shaft (13) using a twisting action to avoid damaging the seals and screw into the bonnet.

Check for free movement of the hinge / disc assembly.

- g. Fit hexagon screws (5) and washers (4) through bonnet (note different lengths) (10) and fit bonnet gasket (11) over screws (5).  
Fit bonnet (10) into body (12) with disc (6) facing correct way.
- h. Tighten bonnet screws (5) in a diagonal sequence using torque wrench set at 25Nm to 30Nm. Reset the torque wrench at 40Nm to 50Nm and re-tighten the screw following a circumferential sequence.
- i. Attach the lever (23) on the shaft (13) in correct alignment for movement of disc and clearance of guard.
- j. Secure the lever with the nut (21) and washer (22).
- k. Mount the counterweight (20) on the lever (23). Lock its position with the set screw (19) noting clearance of guard.
- l. Re-connect the flow and slowly fill the valve to check integrity of seals etc.
- m. Where necessary, refit guard.

#### 4. Adding Lever & Counterweight to Series 41 Non Lever & Weight Valves (DN 250 up to DN 300)

**Safety Precaution :** This can only be carried out, when there is no pressure in the pipeline.

Replacement of the parts:

If fitted remove guard.

Refer to General Arrangement diagrams attached. (Pages 11 & 12)

- a. Dismantle the bonnet (10) by removing the hexagon screws and washers (4) and (5) and lifting the bonnet assembly away from the body (12). (NOTE: Screws are different lengths.)
- b. Remove the two closed bushings (15) from the bonnet (10), then the hinge (7) with the disc (6) and the shaft (13), spacers (41) and retaining washers.
- c. Insert the new longer shaft (13) complete with keys (46) into one side of the bonnet (10) taking note of which side the lever and weight is required to be positioned.
- d. Mount a spacer (41) and retaining washer then the hinge (7) with disc (6) on the shaft (13). Add the second retaining washer and spacer (41) whilst feeding the shaft through and locate the key drive into the keyways in the hinge (7).
- e. Lubricate the internal rubber seals on a CLOSED end bushing (15) and an OPEN end bushing (24) using a Water Regulations approved grease such as Rocol Aqua-Sil silicone grease.
- f. Mount the new CLOSED end bushing (15) over the stub end of the shaft (13) by using a twisting action to avoid damaging the seals and screw into the bonnet (10).  
  
Mount the OPEN end bushing (24) over the exposed end of the shaft (13) using a twisting action to avoid damaging the seals and screw into the bonnet.  
  
Check for free movement of the hinge / disc assembly.
- g. Fit hexagon screws (5) (note different lengths) and washers (4) through the bonnet (10) and fit bonnet gasket (11) over screws (5). Fit bonnet (10) into body (12) with disc (6) facing correct way.
- h. Tighten bonnet screws (5) in a diagonal sequence using a torque wrench set at 25Nm to 30Nm. Reset the torque wrench at 40Nm to 50Nm and re-tighten the screws following a circumferential sequence.
- i. Attach the lever (23) on the shaft (13) in correct alignment for movement of disc and clearance of guard.
- j. Secure the lever with the nut (21) and washer (22).
- k. Mount the counterweight (20) on the lever (23). Lock into position with the set screws (19) noting clearance of guard.
- l. Remove hexagon screw (44) to allow air to be vented. Refit when valve is full of water. Re-connect the flow and slowly fill the valve to check integrity of seals etc.
- m. Where necessary, refit guard.

**NOTE: A reducer (39) is fitted to restrict the opening of the disc if required. Adjustment can be made by releasing the seal nut (38) and turning the open reducer (39) as required. Re-tighten the seal nut (38).**

## 5. Adding outside spring to Series 41 Non Lever & Spring Valves (DN 50 up to DN 200)

**Safety Precaution :** This can only be carried out, when there is no pressure in the pipeline.

Replacement of the parts:

If fitted, remove guard.

Refer to General Arrangement diagrams attached. (Pages 9 & 10)

- a. Dismantle the Bonnet (10) by removing the hexagon screws and washers (4) and (5) and lifting bonnet assembly away from the body (12). (NOTE: Screws are different lengths.)
- b. Remove the two closed bushings (15) from the bonnet (10), then the hinge (7) with the disc (6) and the shaft (13).
- c. Refer to diagram on page 10. Insert the new longer shaft (13) into one side of the bonnet (10) taking note of which side the lever and weight is required to be positioned.  
Fit the new longer shaft (13) into the hinge (7) and disc (6) assembly; ensure that the drive lugs are fully engaged.
- d. Lubricate the internal rubber seals on a CLOSED end bushing (15) and an OPEN end bushing (24) using a Water Regulations approved grease such as Rocol Aqua-Sil silicone grease.
- e. Mount the new CLOSED end bushing (15) over the stub end of the shaft (13) using a twisting action to avoid damaging the seals and screws into the bonnet (10).

Mount the OPEN end bushing (24) over the exposed end of the shaft (13) using a twisting action to avoid damaging the seals and screws into the bonnet (10).

Check for free movement of the hinge / disc assembly.

- f. Fit hexagon screws (5) and washers (4) through bonnet (10) and fit bonnet gasket (11) over screws (5). Fit bonnet (10) into body (12) with disc (6) facing correct way.
- g. Tighten bonnet screws (5) in a diagonal sequence using a torque wrench set at 25Nm to 30Nm. Reset the torque wrench at 40Nm to 50Nm and re-tighten the screws following a circumferential sequence.
- h. Attach the lever (23) on the shaft (13) in correct alignment for movement of disc and clearance of guard.
- i. Secure the lever with the nut (21) and washer (22).
- j. Mount the springplate bracket (30) onto the relevant flange mounting bolts.
- k. Assemble the spring (26) to the lever (23) and eyebolt (27). Adjust the eyebolt (27) if necessary, to ensure disc (6) is able to fully open and close.
- l. Re-connect the flow to check integrity of seals etc.
- m. Where necessary, refit guard.

## 6. Adding Lever & Counterweight to Series 41 Free End Shaft Valves (DN 50 up to DN 300).

**Safety Precaution :** This can only be carried out, when there is no pressure in the pipeline.

Fitting of the parts:

If fitted, remove guard.

Refer to General Arrangement diagrams attached. (Pages 8 & 12)

- a. Remove plastic protective cover from free end of shaft (13).
- b. Attached the lever (23) to the shaft (13) and secure with washer (22) and nut (21).

**NOTE: The lever (23) must be aligned on the hexagon flats on the shaft (13) to ensure correct closure of the disc (6) and clearance to a guard, if fitted. The alignment is also important with respect to the installation position of the valve, either vertical or horizontal.**

- c. Mount the counterweight (20) onto the lever (23) and lock its position with the set screw (19) noting clearance of any alignment guard. (DN 250 & DN 300 may have more than one counterweight fitted.)
- d. Re-connect the flow and slowly fill the valve to check for correct operation.
- e. Where necessary, refit guard.

## 7. Adding Outside Spring to Series 41 Free End Shaft Valves (DN 50 up to DN 200)

**Safety Precaution :** This can only be carried out, when there is no pressure in the pipeline.

Fitting of the parts:

If fitted, remove guard.

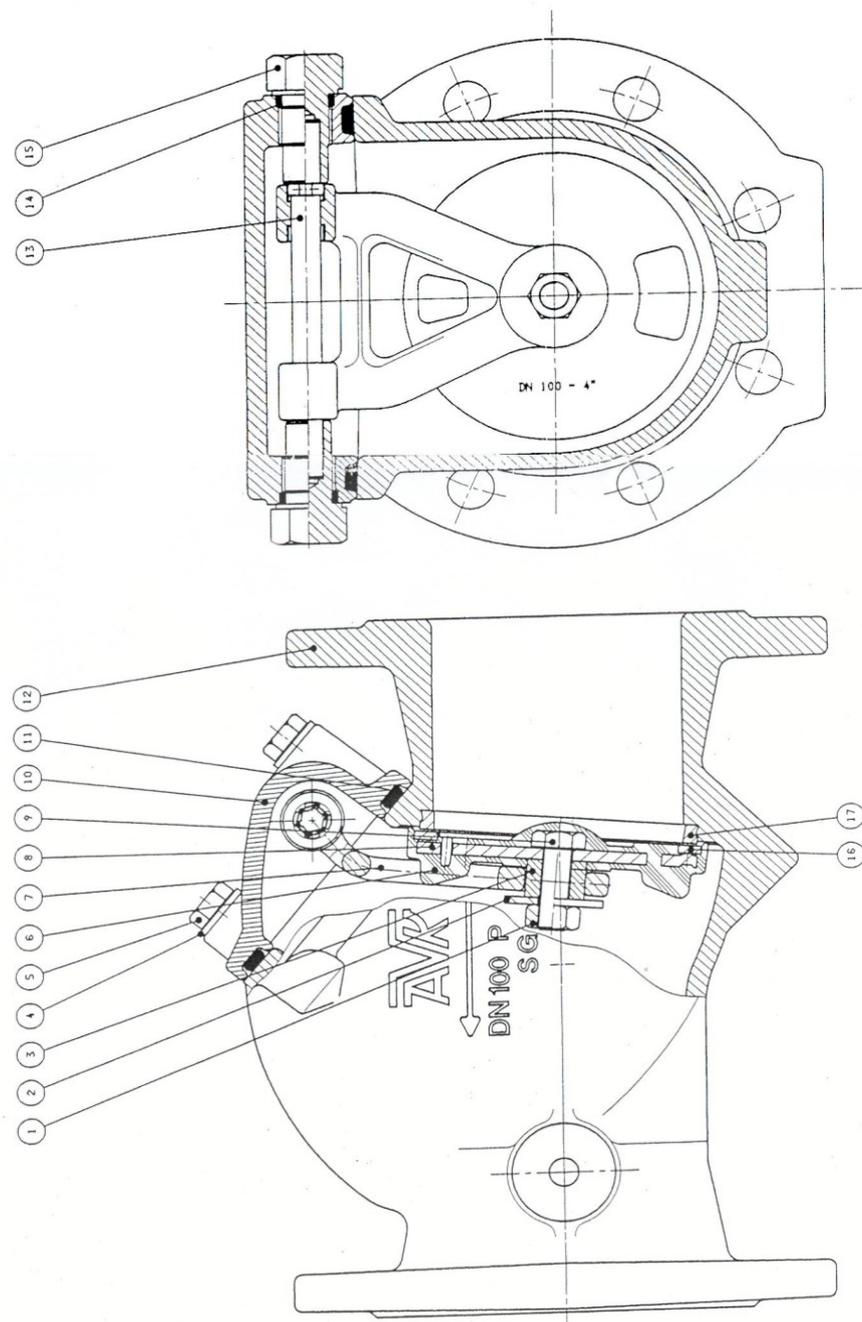
Refer to General Arrangement diagrams attached. (Page 9)

- a. Remove plastic protective cover from free end of shaft (13).
- b. Attach the lever (23) to the shaft (13) and secure with washer (22) and nut (21).

**NOTE: The lever (23) must be aligned on the hexagon flats on the shaft (13) to ensure correct closure of the disc (6) and clearance onto a guard, if fitted.**

- c. Mount the springplate bracket (30) onto the relevant flange mounting bolts.
- d. Assemble the spring (26) to the lever (23), eyebolt (27) and nuts (28). Adjust the eyebolt (27) if necessary, to ensure disc (6) is able to fully open and close.
- e. Re-connect the flow to check integrity of seals etc.
- f. Where necessary, refit guard.

Operation and maintenance instruction diagram for Series 41 without counterweight:



17	Body Seat Ring	Gun Metal, BS 1400 LG 2
16	Seat Ring	Gun Metal, BS 1400 LG 2
15	Bushing	High Tensile Alloy C4132, BS 287A
14	O-ring	Nitrile Rubber
13	Shaft	Stainless Steel
12	Valve Body	Ductile Iron
11	Bonnet Gasket	Nitrile Rubber
10	Bonnet	Ductile Iron
9	Hexagon Screws	Stainless Steel
8	Disc Insert	Carbon Steel
7	Hinge	Ductile Iron
6	Disc Rubber Coating	Rubber compound, EPDM
5	Hexagon Screws	Stainless Steel
4	Washer	Stainless Steel
3	Bushing	Polyamide 6.6
2	Washer	Stainless Steel
1	Nut	Stainless Steel
Pos. Valve detail		Material

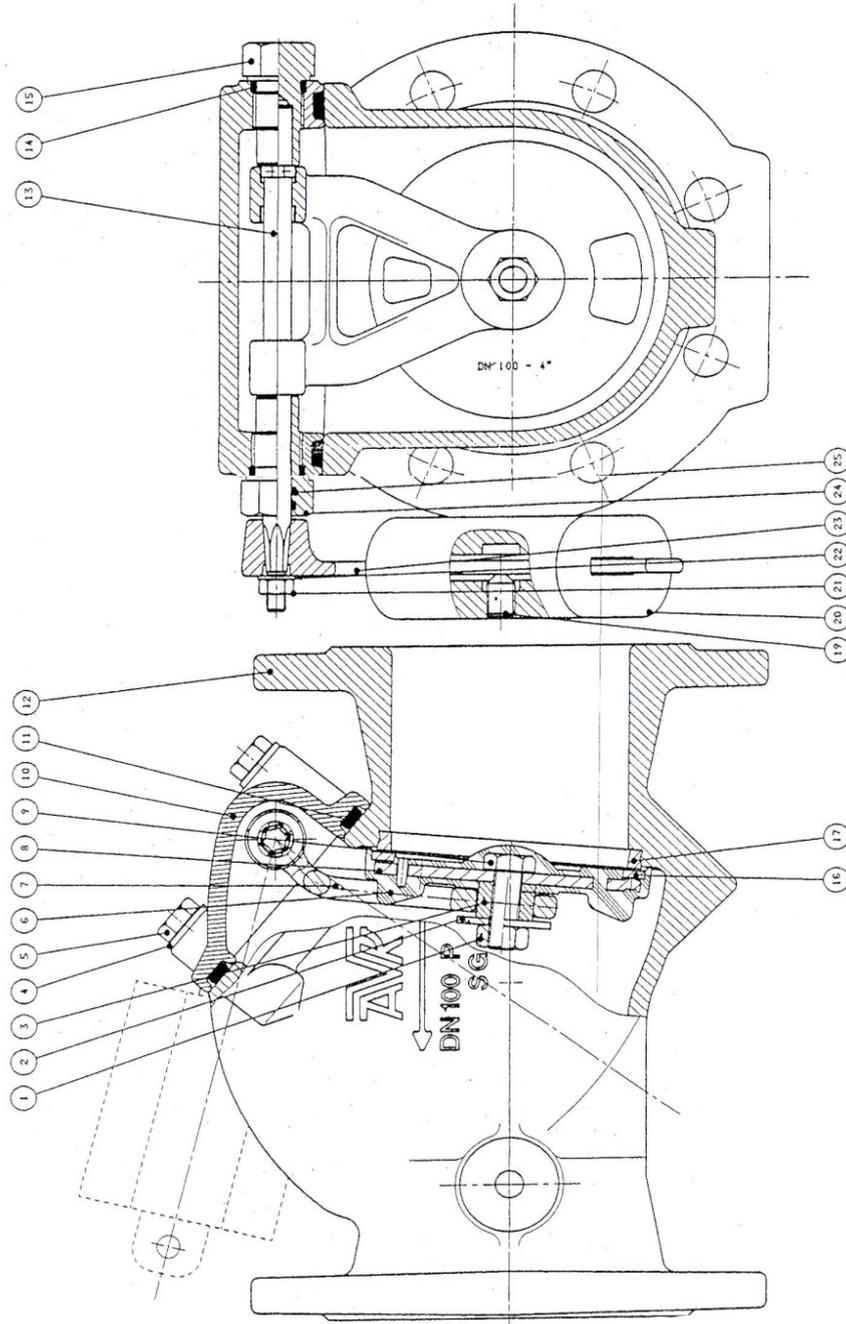
OM. 41 GENERAL ARRANGEMENT  
 SWING CHECK VALVE SERIES 41  
 DN 50 - 200

**AVR**  
 Drawing no.: 41-300-55-Rout-86s  
 Date: 00-06-20  
 Rev. no.: AC  
 Ref. no.:  
 Project no.:

SEPT. 2004



Operation and maintenance instruction diagram for Series 41 with counterweight:

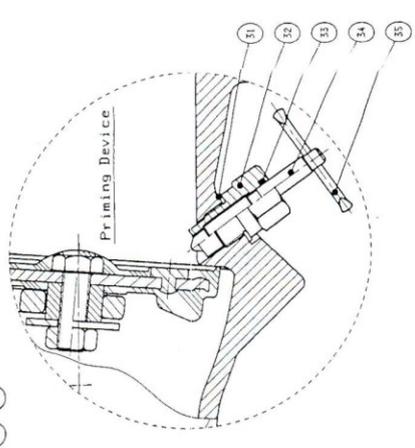
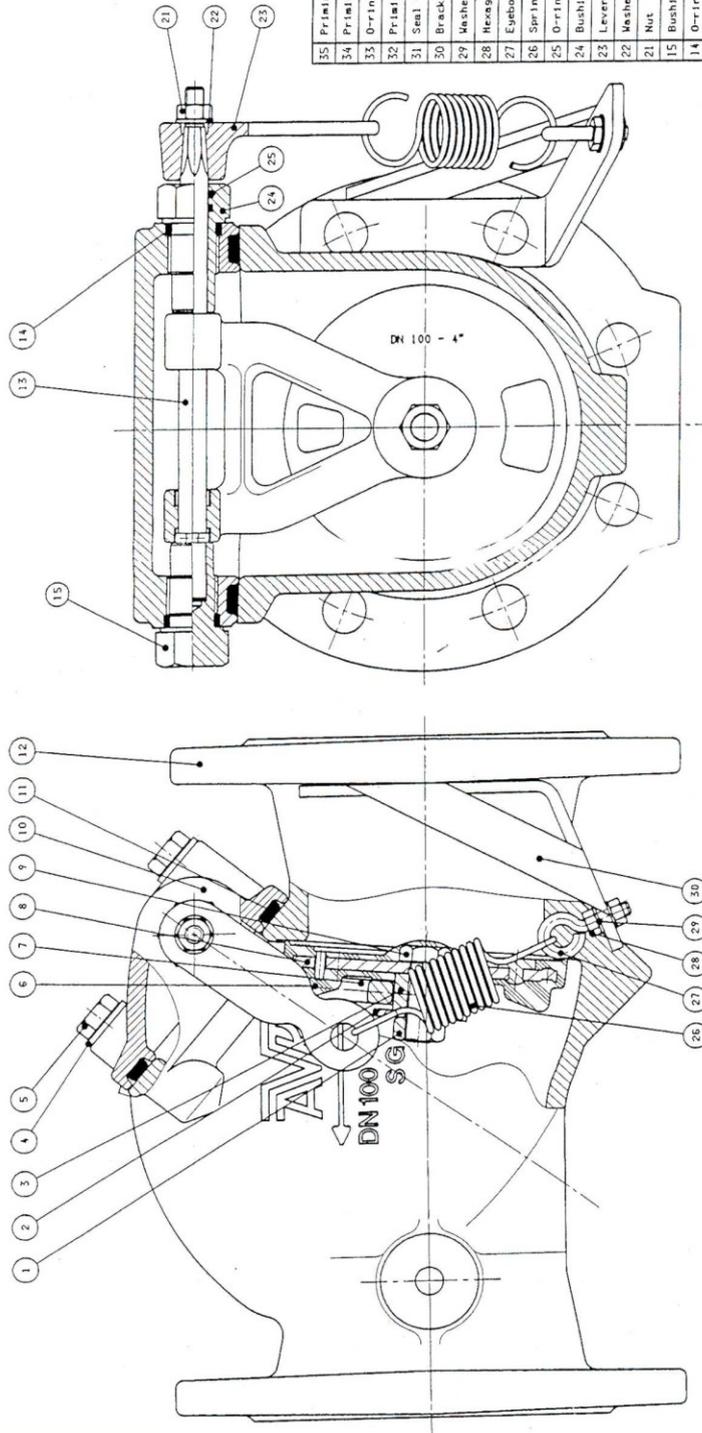


25	O-ring	Nitrile Rubber
24	Bushing	High Tensile Alloy C2132, BS 287A
23	Lever	Carbon Steel
22	Washer	Stainless Steel
21	Nut	Stainless Steel
20	Weight	Ductile Iron
19	Set Screw	Stainless Steel
17	Body Set Ring	Gun Metal, BS 1400 L6 2
16	Seat Ring	Gun Metal, BS 1400 L6 2
15	Bushing	High Tensile Alloy C2132, BS 287A
14	O-ring	Nitrile Rubber
13	Shaft	Stainless Steel
12	Valve Body	Ductile Iron
11	Bonnet Gasket	Nitrile Rubber
10	Bonnet	Ductile Iron
9	Hexagon Screw	Stainless Steel
8	Disc Insert	Carbon Steel
7	Hinge	Ductile Iron
6	Disc Rubber Coating	Rubber compound, EPDM
5	Hexagon Screws	Stainless Steel
4	Washer	Stainless Steel
3	Bushing	Polymide 6.6
2	Washer	Stainless Steel
1	Nut	Stainless Steel
Pos	Valve detail	Material

OM. 41 GENERAL ARRANGEMENT  
 SWING CHECK VALVE SERIES 41  
 DN 50 - 200

<b>AVR</b>	Size : DN 50 - 200	Rev. no. : AC
	Drawn : FK	Scale : 1:1
	Checked : JK	Material : 4120035-000-005
	Approved : JK	Number of : 1

Operation and maintenance instruction diagram for Series 41 with Outside Spring:



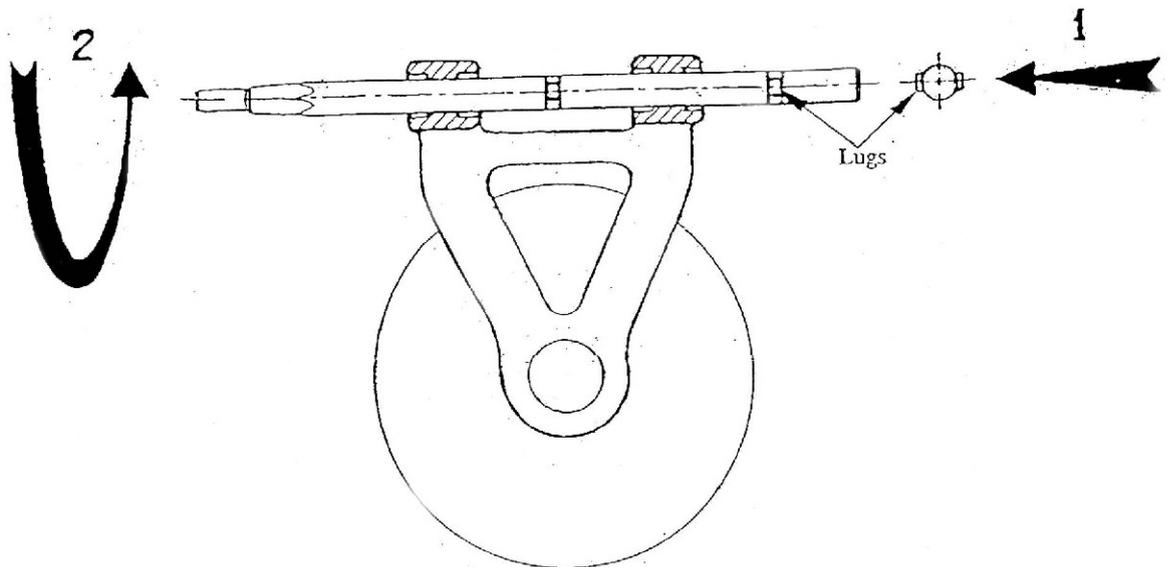
35	Priming tap handle	Stainless Steel
34	Priming tap spindle	Stainless Steel
33	O-ring	Nitrile Rubber
32	Priming tap body	High Tensile Alloy C4132, BS 287A
31	Seal washer	Fiber
30	Bracket	Cast Iron
29	Washer	Stainless Steel
28	Hexagon nut	Stainless Steel
27	Eyebolt	Stainless Steel
26	Spring	Stainless Steel
25	O-ring	Nitrile Rubber, ASTM D2000
24	Bushing	High Tensile Alloy No. C35330
23	Lever	Carbon Steel
22	Washer	Stainless Steel
21	Nut	Stainless Steel
15	Bushing	High Tensile Alloy No. C35330
14	O-ring	Nitrile Rubber, ASTM D2000
13	Shaft	Stainless Steel
12	Valve Body	Ductile Iron
11	Bonnet Gasket	Nitrile Rubber
10	Bonnet	Ductile Iron
9	Hexagon Screw	Stainless Steel
8	Disc Insert	Carbon Steel
7	Hinge	Ductile Iron
6	Disc Rubber Coating	Rubber compound, EPDM
5	Hexagon Screws	Stainless Steel
4	Washer	Stainless Steel
3	Bushing	Polyamide 6.6
2	Washer	Stainless Steel
1	Nut	Stainless Steel
Part	Valve detail	Material

OM. 41 GENERAL ARRANGEMENT  
 SWING CHECK VALVE SERIES 41  
 DN 50 - 200

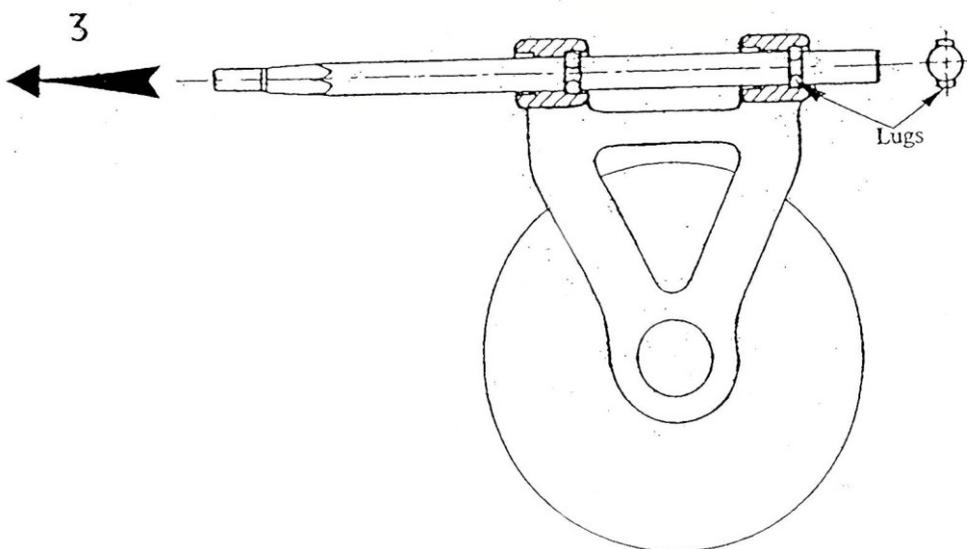
**AVR** Drawing No. : 41-XXX-68-Rouge-Gas Rev. No. : AC  
 Date : 00-06-21  
 Scale : 1:1

SEPT. 2004

**Adding lever and counterweight to Series 41 Valves:  
Reference Procedure 3 c :**

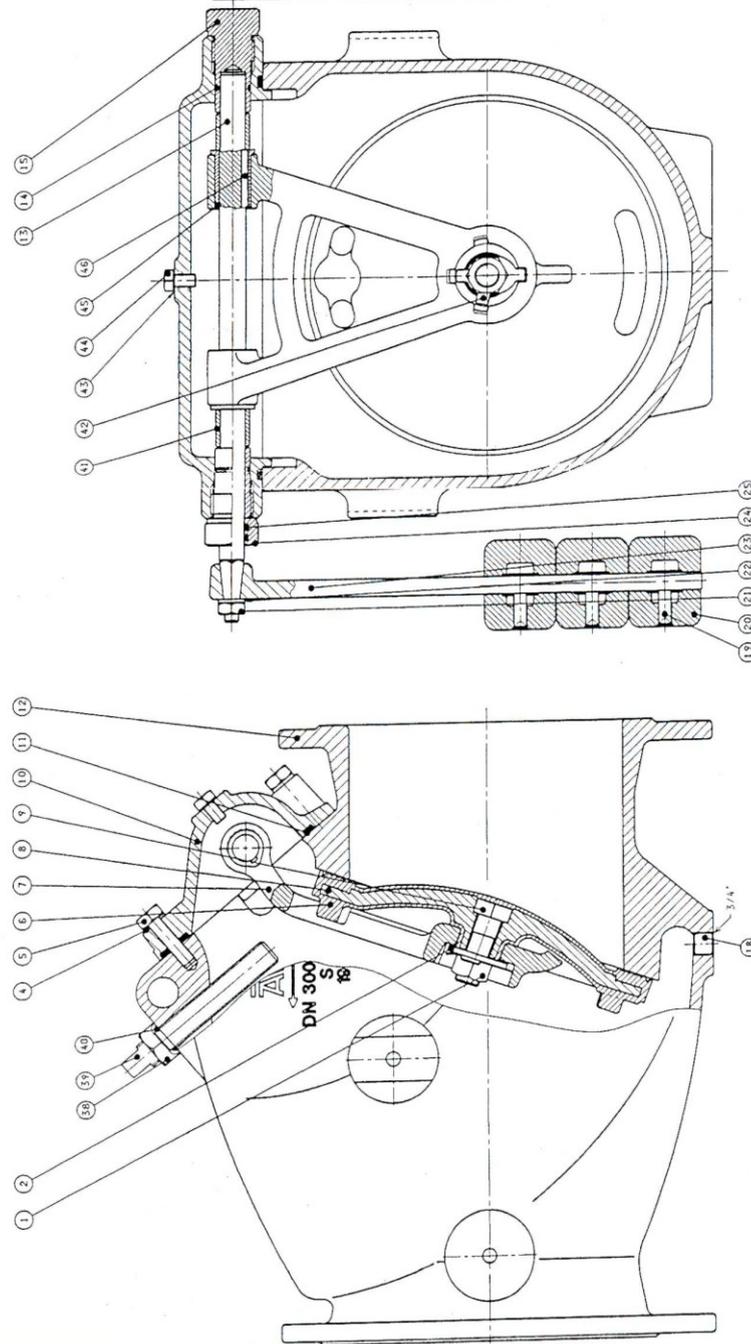


**Adding outside spring to Series 41 Valves:  
Reference Procedure 5 c :**





Operation and maintenance instruction diagram for Series 41 with counterweight:



46	Key	Stainless Steel
45	Connector	Stainless Steel
44	Hexagon Screw	High Tensile Alloy C2132, BS 2874
43	Seal Washer	Copper
42	Lockwasher	Stainless Steel
41	Spacer	Stainless Steel
40	O-ring	Nitrile Rubber
39	Open Reducer	Stainless Steel
38	Seal-Nut	Stainless Steel
25	O-ring	Nitrile Rubber
24	Bushing	High Tensile Alloy C2132, BS 2874
23	Lever	Ductile Iron
22	Washer	Stainless Steel
21	Nut	Stainless Steel
20	Weight	Ductile Iron
19	Set Screw	Stainless Steel
18	Drain Plug	Stainless Steel
15	Bushing	High Tensile Alloy C2132, BS 2874
14	O-ring	Nitrile Rubber
13	Shaft	Stainless Steel
12	Valve Body	Ductile Iron
11	Bonnet Gasket	Nitrile Rubber
10	Bonnet	Ductile Iron
9	Hexagon Screw	Stainless Steel
8	Disc Insert	Ductile Iron
7	Hinge	Ductile Iron
6	Disc Rubber Coating	Rubber compound, EPDM
5	Hexagon Screw	Stainless Steel
4	Washer	Stainless Steel
2	Washer	Stainless Steel
1	Nut	Stainless Steel
Pos	Valve detail	Material

OM, 41 GENERAL ARRANGEMENT  
 SWING CHECK VALVE SERIES 41  
 DN 250 - 300

AVK  
 Size: FK Rev: 00-06-23  
 Part No: 4150055-RRub-Gos  
 Material: AC

SEPT. 2004

**Northampton Office**  
 8 Rushmills, Northampton,  
 NN4 7YB England, UK.  
 Tel.: +44 (0) 1604 601 188  
 Fax.: +44 (0) 1604 604 818

**Chesterfield Office**  
 Colliery Close, Ireland Ind. Est., Staveley,  
 Chesterfield, S43 3FH, England, UK.  
 Tel.: +44 (0) 1246 479 100  
 Fax.: +44 (0) 1246 479 200

