

AVK SERIES 41 SWING CHECK VALVE  
FIELD MAINTENANCE AND INSTRUCTION  
MANUAL FOR SWING CHECK VALVES DN350 - DN600

**TABLE OF CONTENTS**

**EXPLODED ASSEMBLY / PARTS LIST**  
**INTRODUCTION / DESCRIPTION**  
**HEALTH AND SAFETY AT WORK**  
**SPARE PARTS**  
**DESIGN CONSTRAINTS**  
**STORAGE AND HANDLING**  
**INSTALLATION**  
- SWING  
- LEVER AND WEIGHT  
- LEVER, WEIGHT AND GUARD  
**MAINTENANCE**  
**TROUBLESHOOTING**  
**DISASSEMBLY FOR INSPECTION**  
**RE-ASSEMBLY AFTER INSPECTION**

AVK GROUP A/S

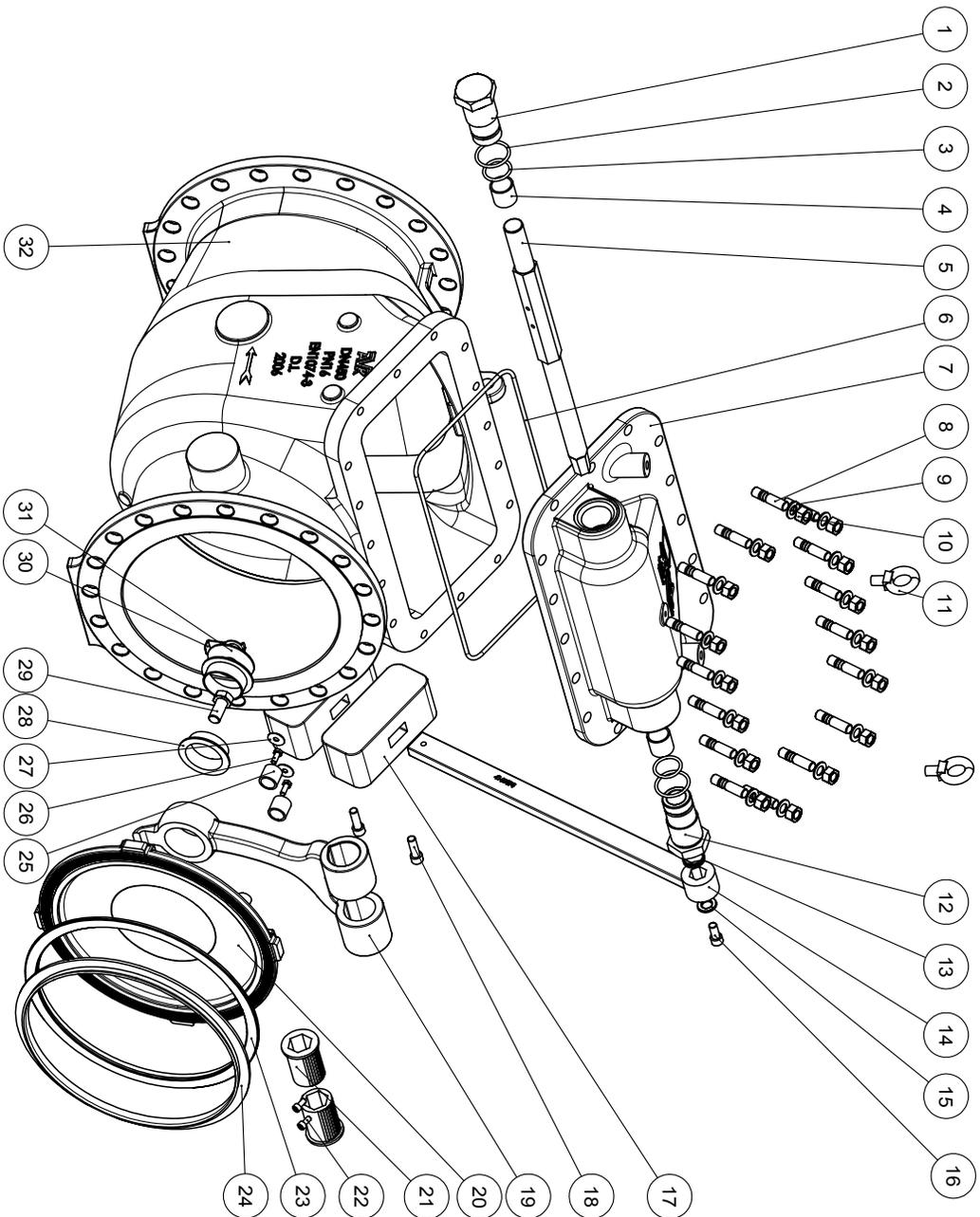


AVK GROUP A/S  
An ISO 9001-2000 registered company



Maintenance Manual Series 41  
\*Subject to change without notice. (rev. 11/09 C)

# AVK Series 41 Swingcheck Valve Exploded Parts Breakdown DN350 through DN600



ITEM NO.	DESCRIPTION
1	CLOSED BUSHING
2	O-RING
3	O-RING
4	SPACER
5	HINGE STEM
6	O-CORD
7	BONNET
8	STUDBOLT
9	WASHER
10	NUT
11	EYEBOLT
12	OPEN BUSHING
13	O RING
14	LEVER
15	WASHER
16	BOLT
17	WEIGHT
18	CAPSCREW
19	HINGE ARM
20	DISC
21	CONNECTOR
22	CAPSCREW
23	DISC SEAT RING
24	BODY SEAT RING
25	BUSH
26	BOLT
27	WASHER
28	BUSH
29	CAPSCREW
30	TAB WASHER
31	WASHER
32	BODY

## INTRODUCTION / DESCRIPTION

AVK Valves Swing Check Valves are primarily designed and manufactured for the prevention of flow reversal and are suitable for potable water or sewage applications. The operation of the valve is fully automatic allowing liquid to flow in one direction only. The function of the external lever and weight, where fitted, is to provide additional weight loading to the valve disk, thus giving mechanical assistance towards closure. The position of the weight is adjustable and allows the closure rate to be varied to suit the actual working conditions.

Swing check valve options covered by this manual

- Standard (without lever and weight)
- Lever and weight (right hand as standard)
- Lever, weight and guard

## HEALTH AND SAFETY AT WORK

**Please ensure that all relevant Health and Safety issues and regulations are strictly adhered to, prior to and during any installation or maintenance work carried out on these valves.**

**It is essential that wherever work is being undertaken on a valve that may involve the release of any internal pressure, the valve is fully depressurised prior to any work being carried out, and the line drained.**

**It is also essential that the user handling the valve is aware of the weight of the components or assemblies to be handled and manipulated during installation and maintenance. It is the end users responsibility to ensure that safe working practices are followed at all times.**

Whenever AVK Valves products are installed, operated, or maintained, the inherent dangers of pressurised liquids and gasses, which can be severe, must be addressed.

Therefore, it is essential that staff undertaking these operations are adequately trained and it is the responsibility of the end user to ensure that only trained and competent staff undertake these duties.

This manual has been designed to assist, but it can never fully replace quality training in the workplace. However AVK Valves technical staff are always available to answer any questions relating to specific problems that may not be covered by this manual.

AVK Valves products are designed and manufactured to be fit for purpose, and to a high and reliable standard. This provides a safe product with minimum risk to health when used correctly for the purpose for which it was designed.

However, this assumes that the equipment is used and maintained in accordance with this manual, and the user is advised to study this manual, and to make it available to all staff that may need to refer to it.

AVK Valves cannot be held responsible for any incidents arising from incorrect installation, operation or maintenance. The responsibility for this must rest wholly with the end user.

### **Note:**

These valves are **NOT** designed for "end off 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.

Ensure that the main will **NOT** be re-charged before all on the valve is completed.

## SPARE PARTS

The use of inferior materials or parts in a valve can have serious consequences. Therefore it is absolutely essential that in order to guarantee the highest level of safety and performance, only genuine AVK Valves spare parts are be used.

AVK Valves cannot accept any responsibility whatsoever for the fitting and subsequent failure of any non-AVK Valves or non-approved parts.

## 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

## **STORAGE AND HANDLING**

### **Storage**

- If valves are to be stored in the open for some time, protection should be provided to keep the valves clear of sand and mud
- Protection against weather should be provided. Ideally, valves should be kept indoors, with the actual valve temperature always higher than the dew point. If outdoor storage is unavoidable, valves should be supported off the ground and protected by a weather proof cover
- Valves may be stacked and the upper open end covered with waterproof material and boarded over

### **Handling**

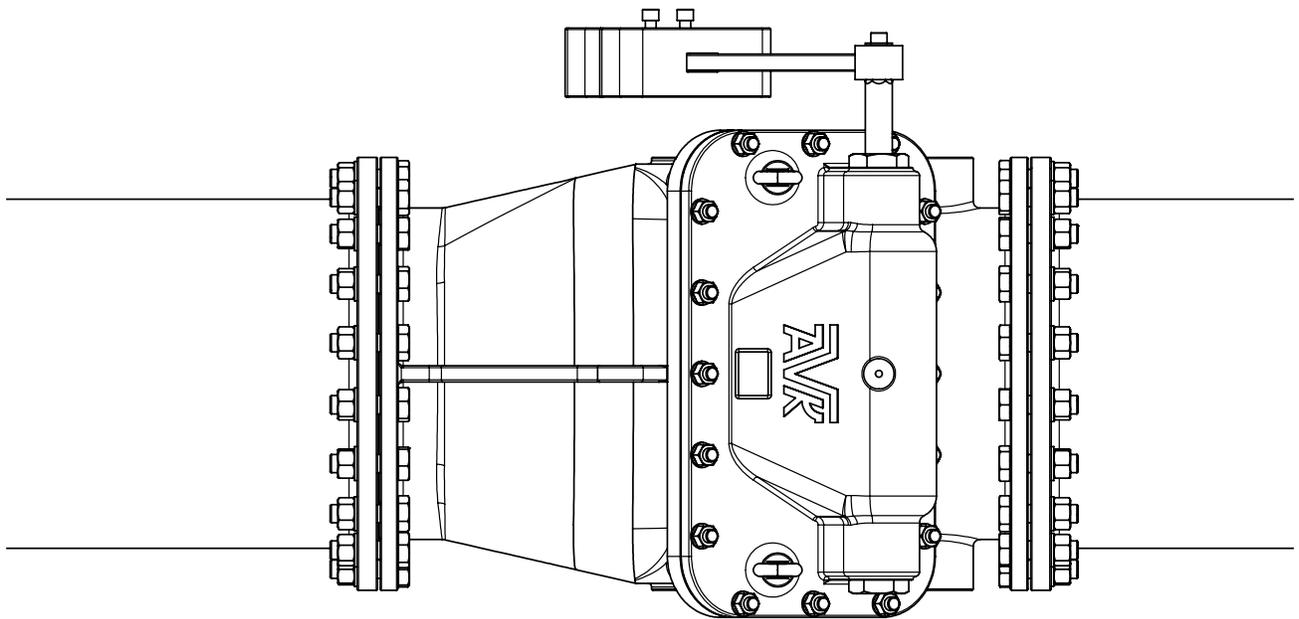
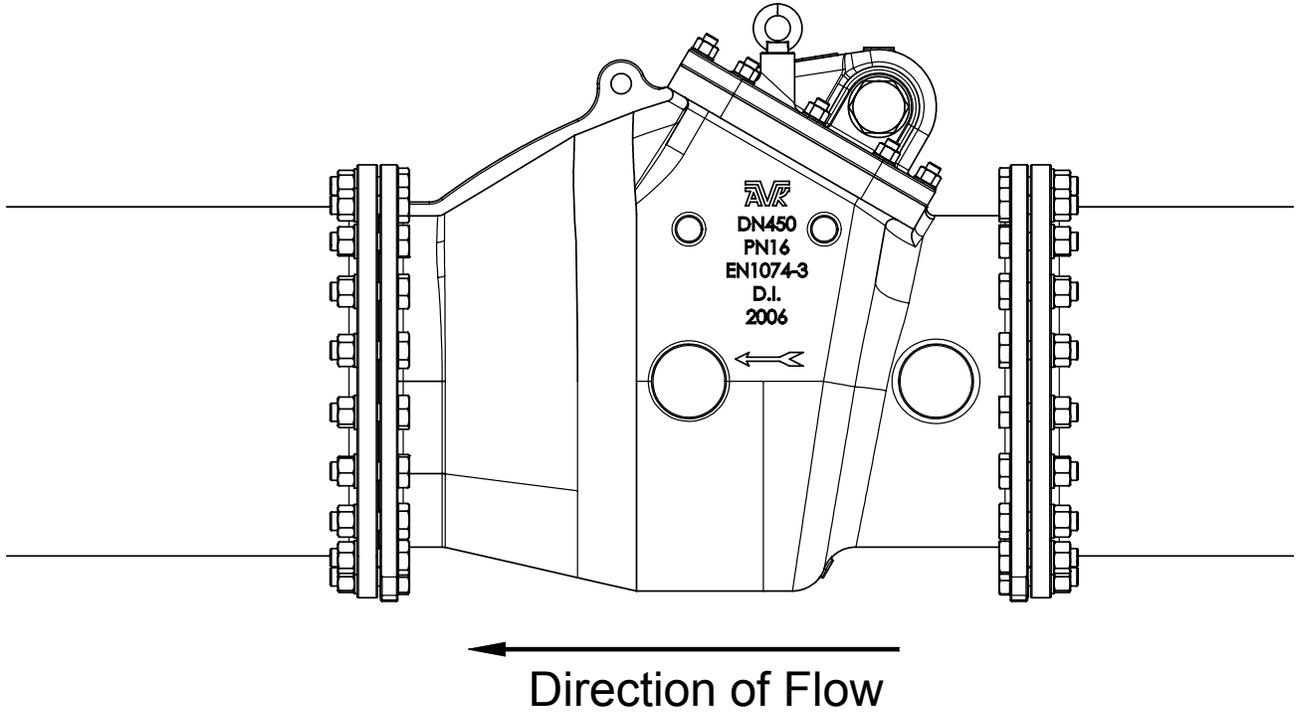
- When handling valves, it is preferable to lift by means of shackles in the holes provided in the valve body/cover
- Where slings are employed the valves should only slung by the main body casting only. No contact should be made with the lever or guard where fitted.
- Valves should be lowered gently onto wooden battens placed on firm ground, clear of mud and water

## **INSTALLATION**

Correct installation of the Series 41 Check Valve is important for proper operation. It may be installed in either horizontal or vertical flow-up applications. If installed in the vertical flow-up position, a lever and weight or lever assembly must be used to ensure proper valve operation. See figures 1, 2 and 3 for proper positioning of the lever and weight for horizontal and vertical flow-up applications. In all installations, the flow arrow cast on the valve body must be pointed in the direction of flow during normal system operation.

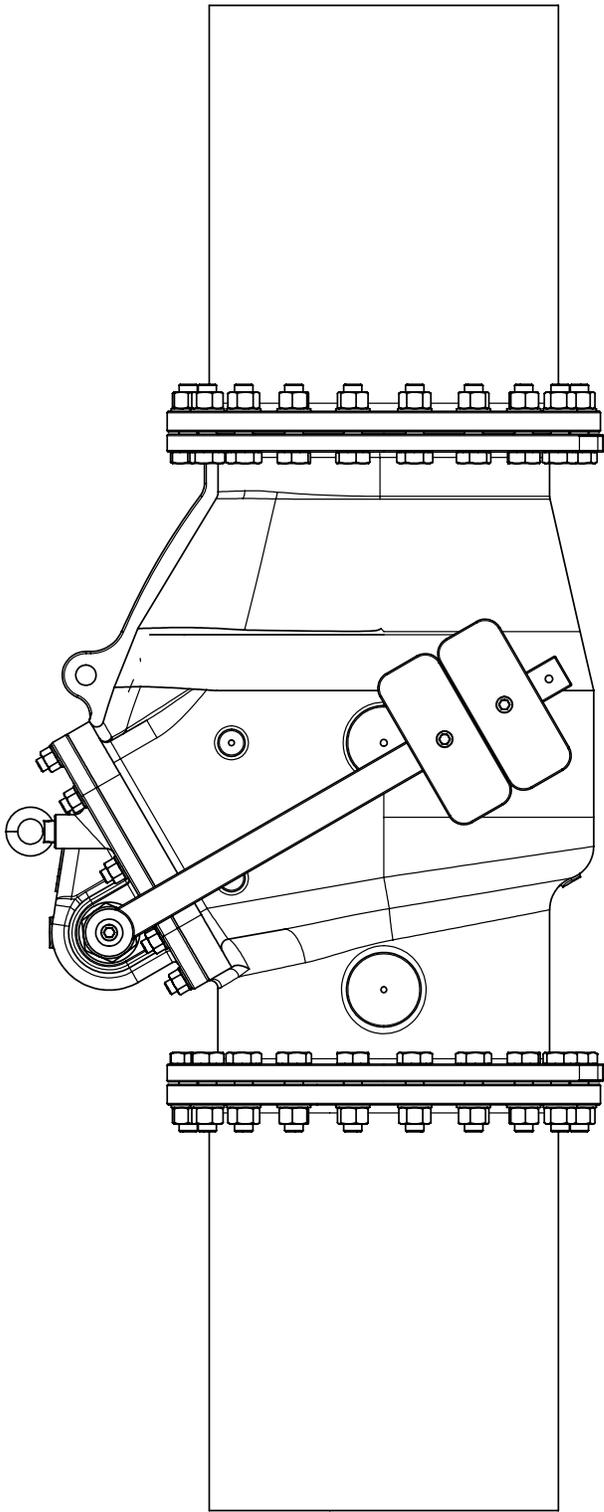
Flanged valves should be mated with raised-faced pipe flanges equipped with full face resilient gaskets. Once the flange bolts or studs are lubricated and inserted around the flange, tighten them uniformly hand tight. The tightening of the bolts should then be done in graduated steps using the crossover tightening method. The appropriate torques should be used.

# Front View

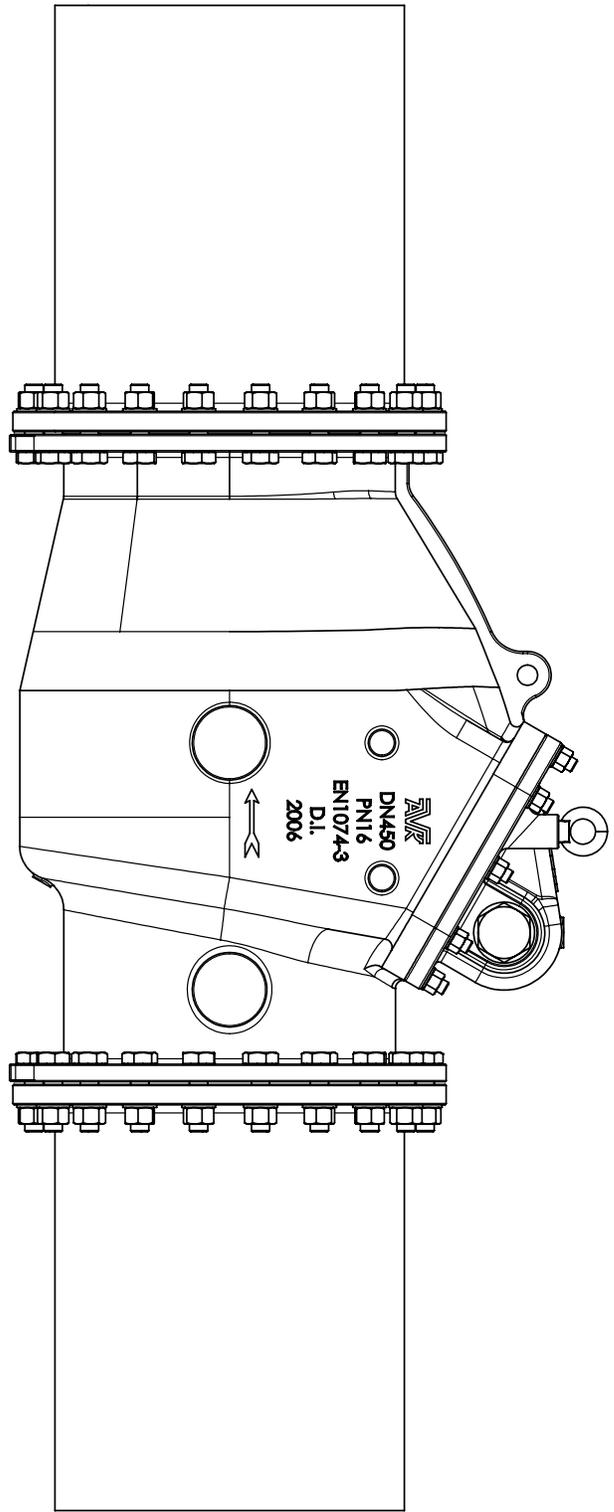


# Top View

Fig.1  
Horizontal Mounting



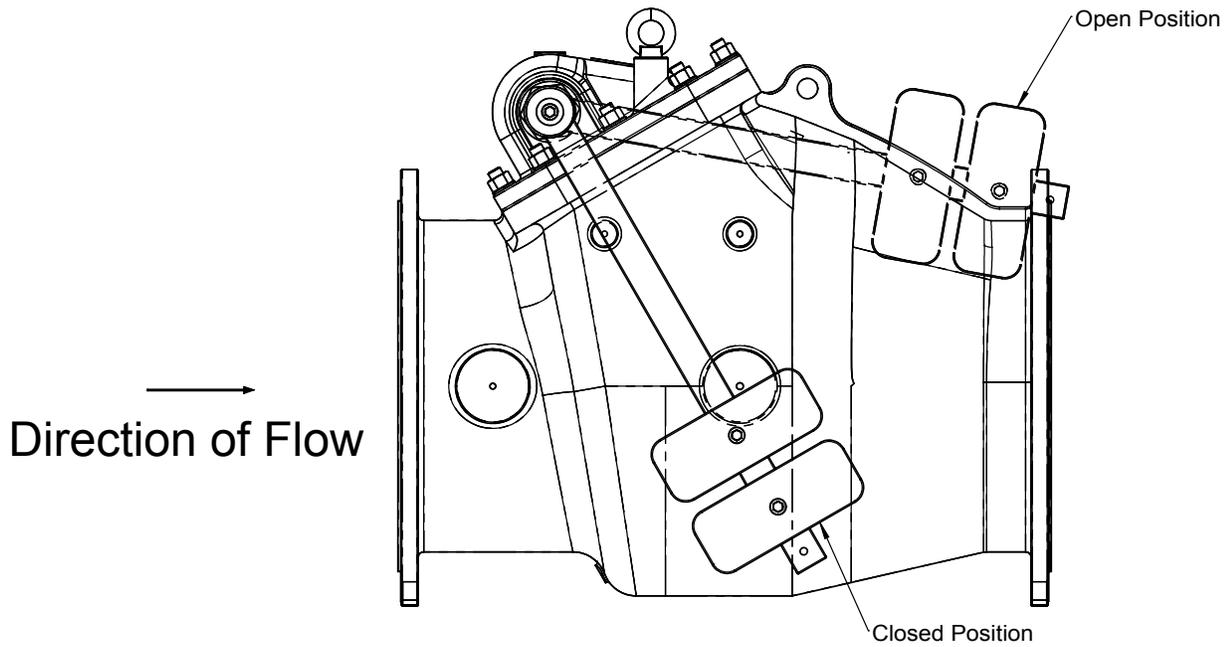
Rear View



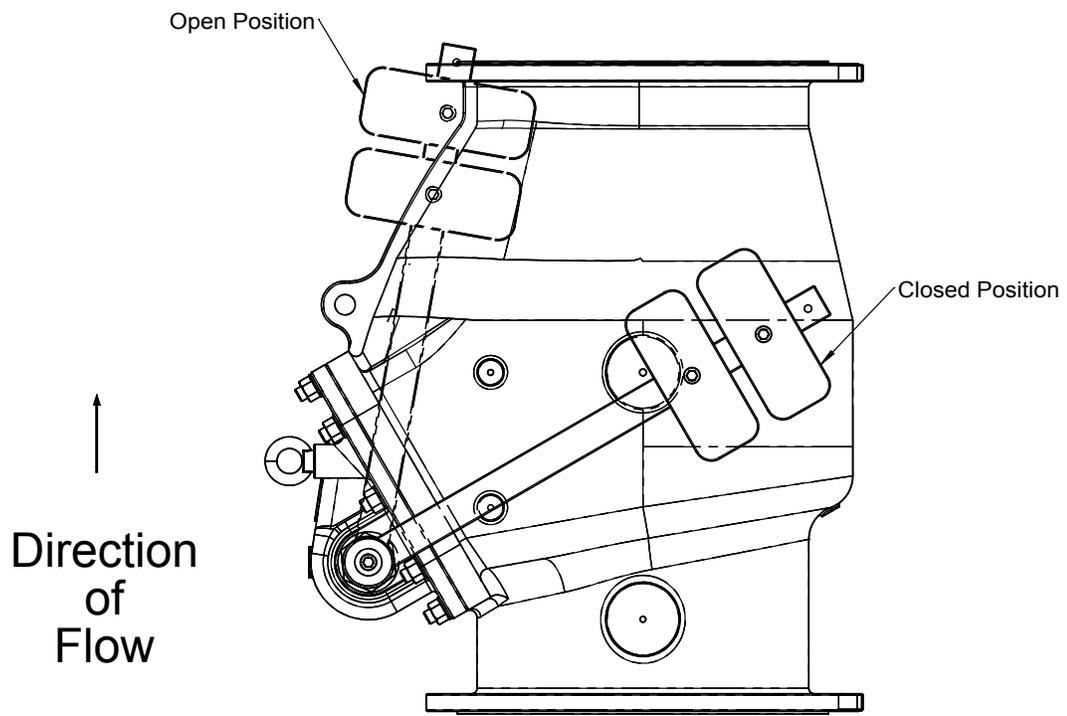
Front View

Direction  
of  
Flow

Fig.2  
Vertical Mounting



Horizontal Mounting



Vertical Mounting

Fig.3  
Optimal Leverage  
Configurations

## INSTALLATION - continued:

### SWING

A valve without a lever is referred to as 'Swing'. For Swing installation, follow the "INSTALLATION" instructions on page 3 .

### LEVER AND WEIGHT (OPTIONAL)

Once the valve is properly installed, the lever and weight assembly needs to be attached to the Hinge stem passing through the Open Bushing in the Bonnet. Slide the Lever onto the Hinge stem and position as shown in figure 2. Secure the Lever with the Washer and Nut and tighten. Attach the Weight and tighten the Capscrew to hold the weight in place. A medium strength thread locking compound such as Loctite should be used to attach the Lever and Weight.

**WARNING:** The weight can be moved on the lever to adjust closing speeds for optimum performance. DO not adjust the weight while the system is in operation. Serious injury can occur.

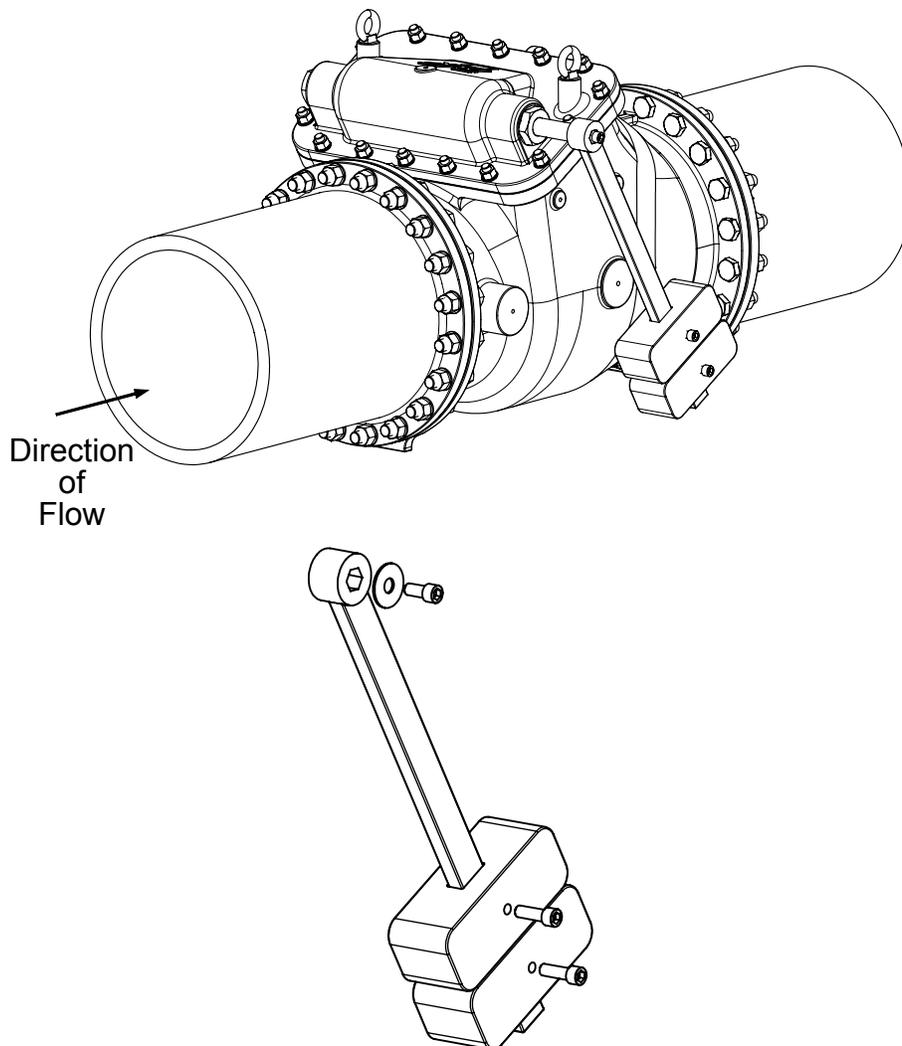


Fig. 4  
Lever & Weight Mounting

## INSTALLATION - continued:

### LEVER WEIGHT AND GUARD DN350- DN600 (OPTIONAL)

Once the valve is properly installed, install Space Washer and fasten the Back part guard by washers and bolts, then the lever and weight assembly needs to be attached to the Hinge stem passing through the Open Bushing in the Bonnet. Slide the Lever onto the Hinge stem and position as shown in figure 5. Secure the Lever with the Washer and Nut and tighten. Attach the Weight and tighten the Capscrew to hold the weight in place. A medium strength thread locking compound such as Loctite should be used to attach the Lever and Weight. At last, install the Front part guard and tighten bolts, washers and nuts

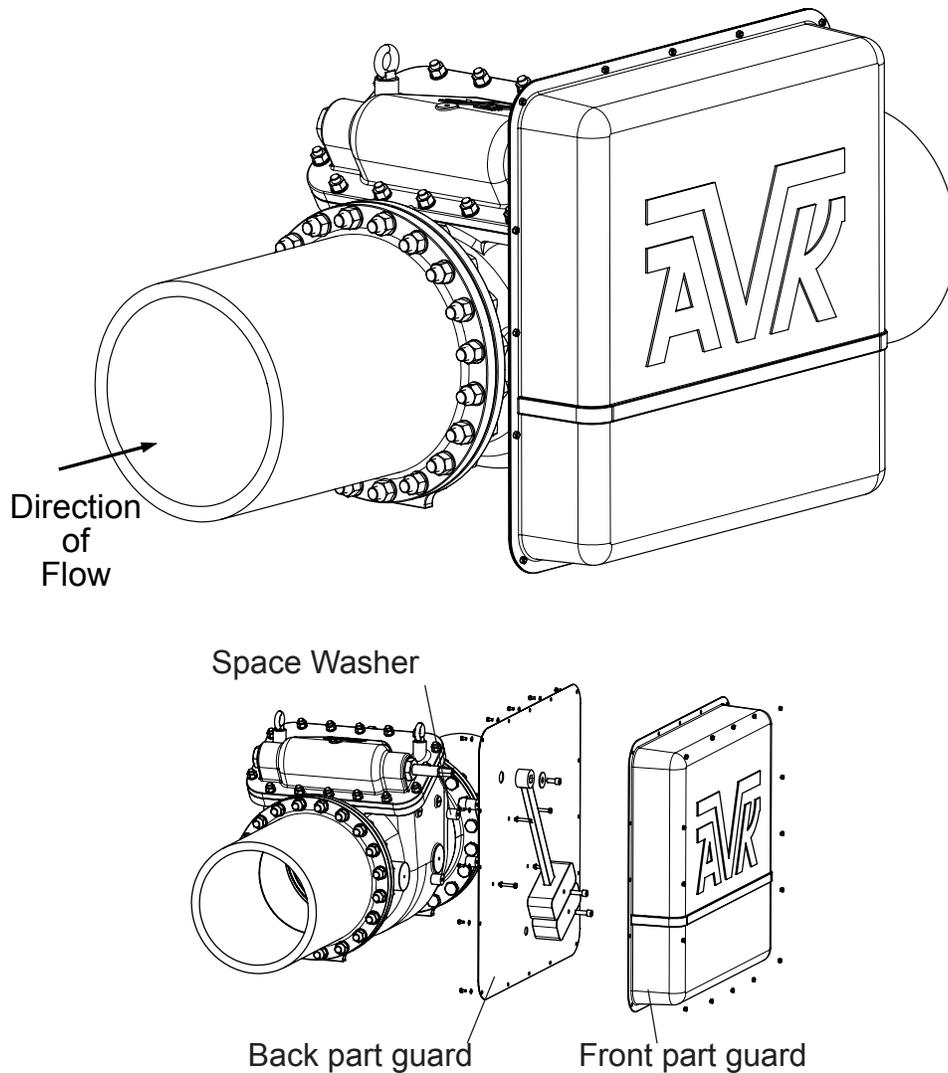


Fig. 5  
Lever Weight & Guard Mounting  
DN350 - DN600

## **MAINTENANCE AND INSPECTION**

All AVK Swing Check Valves are automatic in operation allowing flow in one direction only.

### **MAINTENANCE:**

The valve is designed for underground use with little maintenance and no lubrication required. However, attention to the following points will ensure satisfactory working at all times.

Removing the head assembly from the valve and examining the faces and moving parts for wear and if necessary, removing the hinge stem, and lifting out the internals for more detailed examination or re-conditioning. New parts can be fitted as required.

The frequency of the maintenance depends not on the length of time that the valve has been installed, but on the flow conditions. If the flow is such that the door is held stationary against the open stop, the valve should operate for some years without attention.

However, fluctuating flow or low flow causing constant movement of the door and linkage, can result in hinge stem wear. The need for servicing due to wear and tear is indicated by mechanical noise and/or failure of the valve to prevent backflow. It is usually advisable to renew joints after disturbing them.

### **MAINTENANCE SCHEDULE:**

1. Valves that are not operated frequently and which may remain open or closed for long periods should be operated, even partially, about once a month.

2. Inspection

Should be carried out thoroughly every six months. If inspection of the valve is required, follow the **DISASSEMBLY FOR INSPECTION Instructions**.

3. O-rings and O-cord

When faulty O-rings and O-cord are the cause of leaks, care should be taken to ensure that the replacements are of the correct material.

4. Vibration

After lengthy periods of operation connecting bolts should be checked for tightness. (This should be done more often if vibration is experienced in the pipeline).

5. Freezing

Where it is necessary to keep a valve closed in cold weather precautions must be taken to prevent it 'freezing up'.

6. Scouring

Routine scouring is of great value in keeping the water free of grit and thus saving unnecessary wear and tear on the faces and seals.

## **TROUBLESHOOTING:**

Several problems and solutions are presented below to assist you in troubleshooting the valve.

- Leakage at the shaft bushings ( Open Bushing, Closed Bushing ) : Ensure that the shaft bushings are properly tightened. If leakage persists replace the Inner and Outer Bushing O-rings.
- Leakage at the Bonnet: Ensure that the bonnet bolts are tightened. If leakage persists, replace bonnet O-ring.
- Valve leaks when closed: Remove and inspect disc for damage. Replace if necessary. Ensure that the sealing surface in the valve body is clean and undamaged.
- Valve does not open or close: Verify operating pressure is high enough to open the valve. Disassemble the valve to check for an obstruction in the valve or pipeline.

## DISASSEMBLY FOR INSPECTION:

For convenience, the valve can be disassembled without removing it from the pipeline. All work on the valve should be performed by a skilled mechanic with proper tools and a hoist for larger valves. Disassembly may be required to inspect the disc for wear or the valve for deposits.

**WARNING:** The line must be isolated, depressurized, and drained before removing the valve bonnet or removing the valve from line. Failure to do so may cause pressure to be released resulting in severe injury or death.

1. Refer to Figure (6). If equipped with a lever and weight, the weights may need to be removed from the lever before the head assembly can be removed. If equipped with a lever, weight and guard, the front part guard may need to be removed from back part guard first then remove the weights from the lever before the head assembly can be removed. Remove the Bonnet Bolts, and Bonnet Washers from the Bonnet. Note bolt length when the bolts are removed. The bonnet bolts are different lengths depending on location (upstream or downstream). The longer bonnet bolts are located upstream.
2. Pry the Bonnet loose and lift off the head assembly. Refer to Figure (6) for head assembly components.
3. Inspect head assembly for worn or damaged parts. If resilient seated, inspect the disc for tears or cracks in the EPDM coating.
4. Replace worn parts as necessary or replace head assembly with a new head assembly.

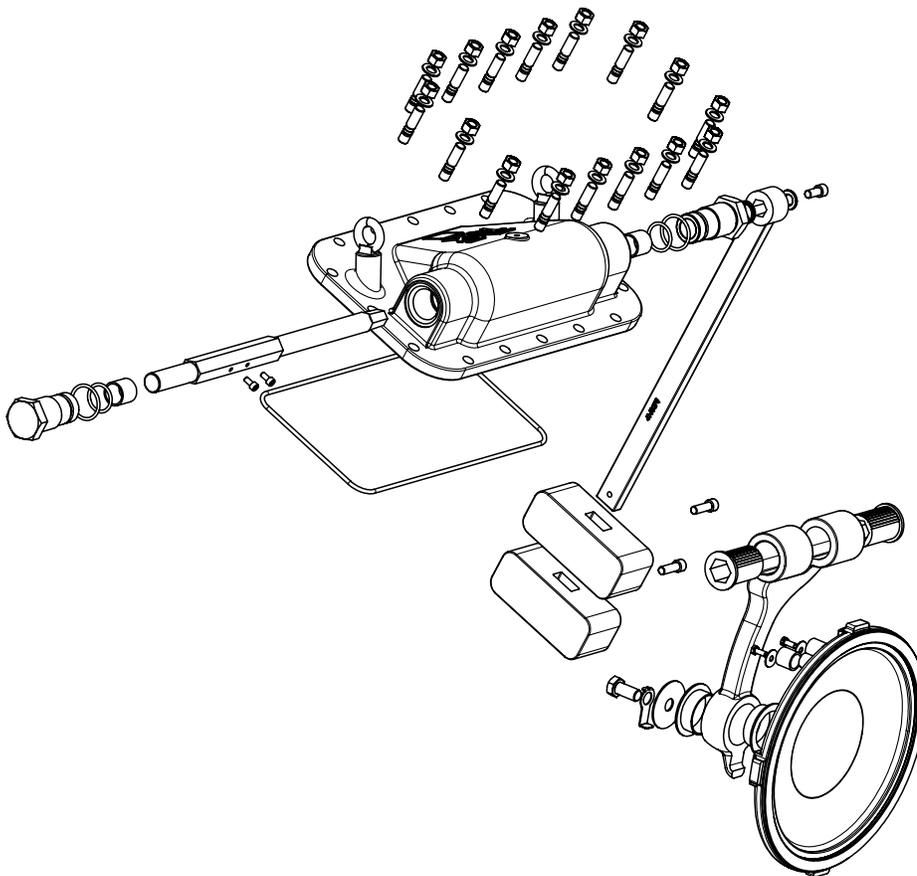


Fig. 6  
Head Assembly Components

## **REASSEMBLY AFTER INSPECTION:**

All parts and sealing surfaces must be cleaned before reassembly. Worn parts and seals should be replaced prior to reassembly..

1. Lay the head assembly upside down on a clean surface so that the disc is up.
2. Place the studbolts in the valve body. Ensure that the studbolts are properly installed. Place the bonnet O-cord in the groove in the Bonnet.
3. Pick up the head assembly holding bonnet O-cord in place and mount it on the valve body. The studbolts in the valve body should carefully pass through the bolt holes in the bonnet. Ensure that the disc is facing the proper direction and that the bonnet O-cord is not being pinched between the bonnet and valve body.
4. Place a washer and a nut on each of the studbolts. Tighten the nuts incrementally in a crossover pattern to ensure that the bonnet does not bend and the bonnet O-cord is evenly compressed.
5. If equipped with a lever and weight assembly, remount weights if necessary. If equipped with a lever and weight and guard assembly, remount weights if necessary and remount front part guard at last by tightening bolts and nuts around guard.

**NOTES:**