



Avon Barrier Company Ltd

THE TRIUMPH EB950 BARRIER

Installation and Maintenance Manual



Example Illustrations Only



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INTRODUCTION

This manual provides information on the Avon EB950 Triumph Actuator operated Rising Arm Barrier and is designed to assist the Installers, Maintainers, Operators and System Integrators.

Should you require and further assistance or specific assistance please contact our security specialists at our UK Head Office.

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SCOPE OF DOCUMENT

The EB950 Triumph Rising Arm barrier shall hereafter be referred to as the "Barrier" or "EB950"

This document is intended for those who will:

Install/Interface the Barrier

Operate the Barrier

Maintain the Barrier

NOTE FOR SYSTEM DESIGNERS/INSTALLERS

The safe operation of the EB950 depends on a careful balancing of the various factors that are inevitably associated with operating a piece of moving equipment in a public place. It is vital that these factors are taken into consideration before the system specifications are made final

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Health & Safety Statement



This symbol indicates a potentially hazardous situation that might result in minor injury or machine damage. It also indicates strict attention must be given to the instructions following the displaying of this symbol.

Where associated equipment is supplied or fitted by others, the seller and purchaser of the equipment are responsible for ensuring that:

- The equipment complies with all safety requirements, the associated equipment does not adversely affect the operation or safety of equipment supplied by Avon Barrier Company Ltd.
- It is the sole responsibility of the owner/user of the equipment to establish which legislation is applicable to the country in which the equipment is installed, and to ensure subsequent compliance with all national and local regulations.
- It is also important that the owner/user of the equipment has assessed all equipment and operational hazards, which might arise from the presence of electrical power, powered machinery and exposed moving parts, both pre and post-installation. It is recommended that this assessment be reviewed before the equipment is set to work.



Personnel Safety

The vendor should train one or more authorised persons, nominated by the employer to be responsible for controlling the access system or advising vehicle users of the correct entry and exit procedures.

Training should include instruction on the Safe Practices and known hazards including normal and emergency use. Operators and attendants should be directed NOT to operate the barrier unless the area is clear and all covers/guards are in place.

All maintenance and servicing must be carried out by suitably qualified and experienced personnel, who are familiar with the risks and dangers inherent to their particular discipline, and the precautions necessary to minimise them.

Safe Maintenance

Only carry out maintenance and servicing:

- When suitable warning signs are posted and the area is cordoned off to traffic
- If no hazard exists (ie crushing hazard, slipping hazard etc)
- With the correct tools
- With the correct PPE
- When the control panel is at zero volts and is secured against restoration of the power supply (Isolator is off)

PRODUCT DESCRIPTION

The Avon EB950 Triumph is a Rising Arm Barrier that provides reliable and secure means of controlling wider roadways. This application can be applied to dual width roadways (2.5 m to 9m); vehicle air-locks and areas where personnel access points need to be restricted. With its ability to be fitted with full height skirts, the EB950 is also used in the higher security arena.



The high duty cycling Linear 24VDC 400W Actuator connects to the drive shaft via a torsion arm and provides an operating speed of under 10 seconds.



Fig 5.0

An industrial grade nitrogen gas strut is used to provide smooth operation counterbalancing and damping to the unit.



Fig 5.1

Mode of Operation

Standard control features allow for simple push-button controls through to more complex access control systems.

Internal raise and lower control is provided with a spring loaded toggle switch (No.1 in *Fig 7.0* on the next page) to assist in installation and service/maintenance work.

In the event of a power failure, a manual winding facility provides a means of raising or lowering the barrier arm (No. 13 in *Fig 6.0*). Details of which can be found on page 24.



1. Nitrogen filled strut
2. EB950 shaft
3. Raise cam
4. Lower cam
5. Raise limit switch
6. Lower limit switch
7. Linear Actuator
8. Transformer 240V – 24V
9. Capacitor 100V
10. Choke 10Amp 15mH
11. Electrical panel
12. Rectifier
13. Manual raise/lower cap

Fig 6.0

Control panel – including Parking Logic



1. Raise/lower toggle
2. PCB thermal reset
3. Motor fuse 5A
4. Accessory fuse 1A
5. Main fuse 2A
6. SW2 dipswitches (enables auto close)
7. Presence loop detector
8. Free exit loop detector
9. Raise relay (240V)
10. Lower relay (240V)
11. Terminal connection
12. Isolator switch 20A
13. Motor thermal overload reset

Fig 7.0

TECHNICAL DETAILS

Electrical requirements:

Single phase, 230V AC, 50 Hz, 6 Amp is required at the barrier position. This is supplied via conduit through the base of the barrier and is wired to an isolating switch (No. 12 in *Fig 7.0*) inside the barrier cabinet. The drive unit is protected by a thermal cut-out (No. 13 in *Fig 7.0*) mounted on the electrical panel. The Linear Actuator is powered by a transformer. Limit switches are triggered by cams on the main shaft to control the raising and lowering of the barrier.

Electrical Supply	Value	Tolerance	Comments
Supply Voltage (V ac)	230	+10%, -15%	International voltages can be accommodated
Supply Voltage Frequency (Hz)	50		
Current Rating (A)	6A		
Maximum power cable size (mm ²)	4		
Maximum signal cable size (mm ²)	1.5		

Cabinet:

The all steel constructed cabinet, door and lid are manufactured from 3mm CR4, and stands 1160mm above the foundation level. This is then shot blasted and primed with a two pack high zinc primer, 40 microns, followed by a textured polyester powder coating in yellow (RAL 1007), 40 microns thick.

The side arm is constructed from heavy steel and is located onto the main shaft with a spring pin (*Fig 9.3 & Fig 9.4* on next page). 2 x M12 x 25 grub screws are then located at the end of the shaft to prevent movement on rotation (*Fig 9.5* on next page)

The lid is retained by 2 x thumbwheels located internally, at the front and rear of the cabinet, which is accessed via the key lockable hinged door.

Fully assembled the main unit weighs approximately 185 KG.

Barrier (boom)

The barrier arm is constructed from corrosion proof GRP (glass reinforced polymer), supplied with alternating, traffic grade, reflective, red and white bands. The length of the barrier arm can be a minimum of 2.5 m and a maximum of 9 m. Boom end supports and straining wires are required for booms in excess of 5 m or where collapsible skirts are fitted.

Side Arm Assembly



The side arm assembly is fabricated from heavy steel . It is attached to the shaft via a M12 x 80mm spring pin and rotates in 2 x LDK bearings. The shaft is rotated through 85 degrees by the action of the linear actuator. The purpose of the V -bracket (Fig 9.1 and Fig 9.2) is to allow the arm to pop out under impact and reduce the likelihood of damage to the arm.

Fig 9.0

2 x M12 x 50mm screws for tightening the bracket against the boom

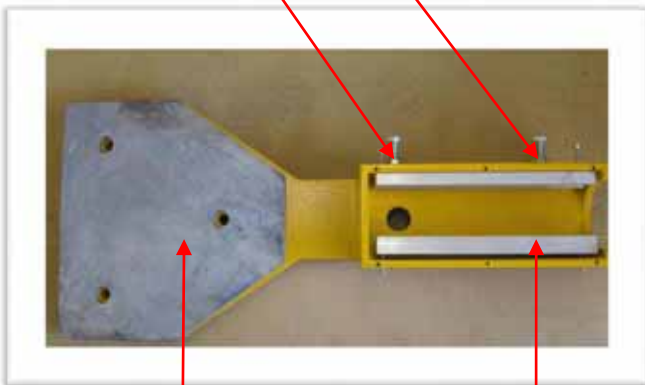


Fig 9.1

Counterweight

bottom V-bracket

2 x M6 x 60mm screws are for holding the top V bracket in place

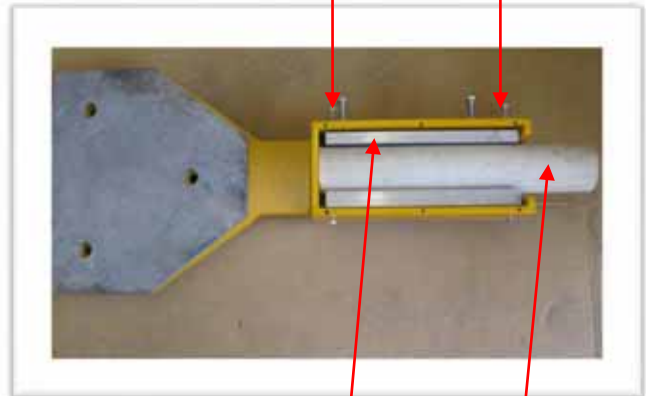


Fig 9.2

top V-Bracket (adjustable)

boom

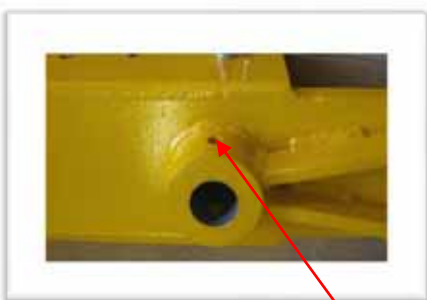


Fig 9.3

When side arm is in position, it can be secured via a M12 x 80 spring pin

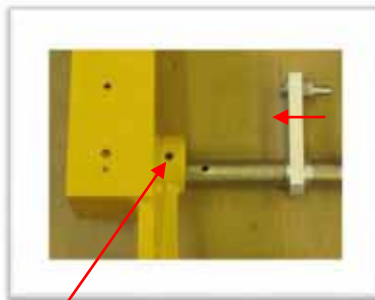


Fig 9.4



Fig 9.5

2 x M12 x 25 grub screws located here

Internal Electrical Components

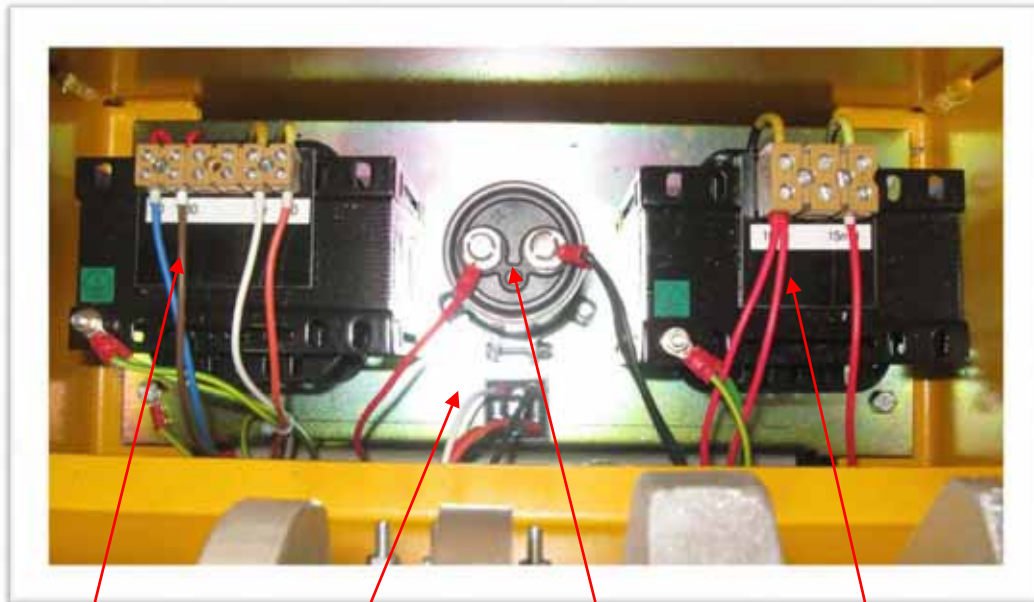


Fig 10.0

transformer

bridge rectifier

capacitor

choke

Components used for 24 VDC Motor Supply



Fig 10.1

**Transformer –
240V AC –24VAC**



RISK OF ELECTRIC SHOCK – SWITCH OFF MAINS SUPPLY



ENSURE CAPACITOR IS FULLY DISCHARGED



Capacitor – 100V 10,000 μ F

Fig 11.0



Choke – 10A 15mH

Fig 11.1



Bridge Rectifier

Fig 11.2

Counter weighting/balancing



This barrier is designed to be run with the appropriate number of counterweights to suit the weight of the boom assembly. **UNDER NO CIRCUMSTANCES should the barrier be operated with the boom in position without the correct number of counterweights, or with the counterweights fitted, but no boom assembly in place.**

A 15mm thick counterweight weighs approximately 16.5KG

A 10mm thick counterweight weighs approximately 11.5KG

WEAR AND USE APPROPRIATE SAFETY CLOTHES AND EQUIPMENT (IE SAFETY BOOTS & HELMET).

The counterweights are held in place via 3 x M20 studs with washers and spring washers. Weights should be loaded one at a time with the heaviest being nearest the barrier cabinet. When all the necessary weights have been loaded, secure in place with the 3 x M20 nuts, washers and spring washers provided. To balance the boom, use the following procedure:

1. Disconnect the Actuator top pin (Page 14)
2. A correctly balanced boom will be approximately 1KG tip heavy at the furthest point
3. Reconnect the Actuator top pin (Page 14)



Fig 12.0

Technical Data – Linear Actuator



Fig 13.0

Motor type:	DC Motor with automatic reset thermal switch
Operating voltage:	24-32V DC
Max current (A)	10 A
Restraining torque (Nm)	11.3 Nm
Ambient temperature (Degrees Celsius)	-25 to +65
Lubrication	For life
Anti – back drive mechanism	Yes
Protection class	IP65
Stroke	8 inch
Max power (VA)	10
Max current (A)	0.5 A
Max load (N)	6800 N

Parts List - Diagram

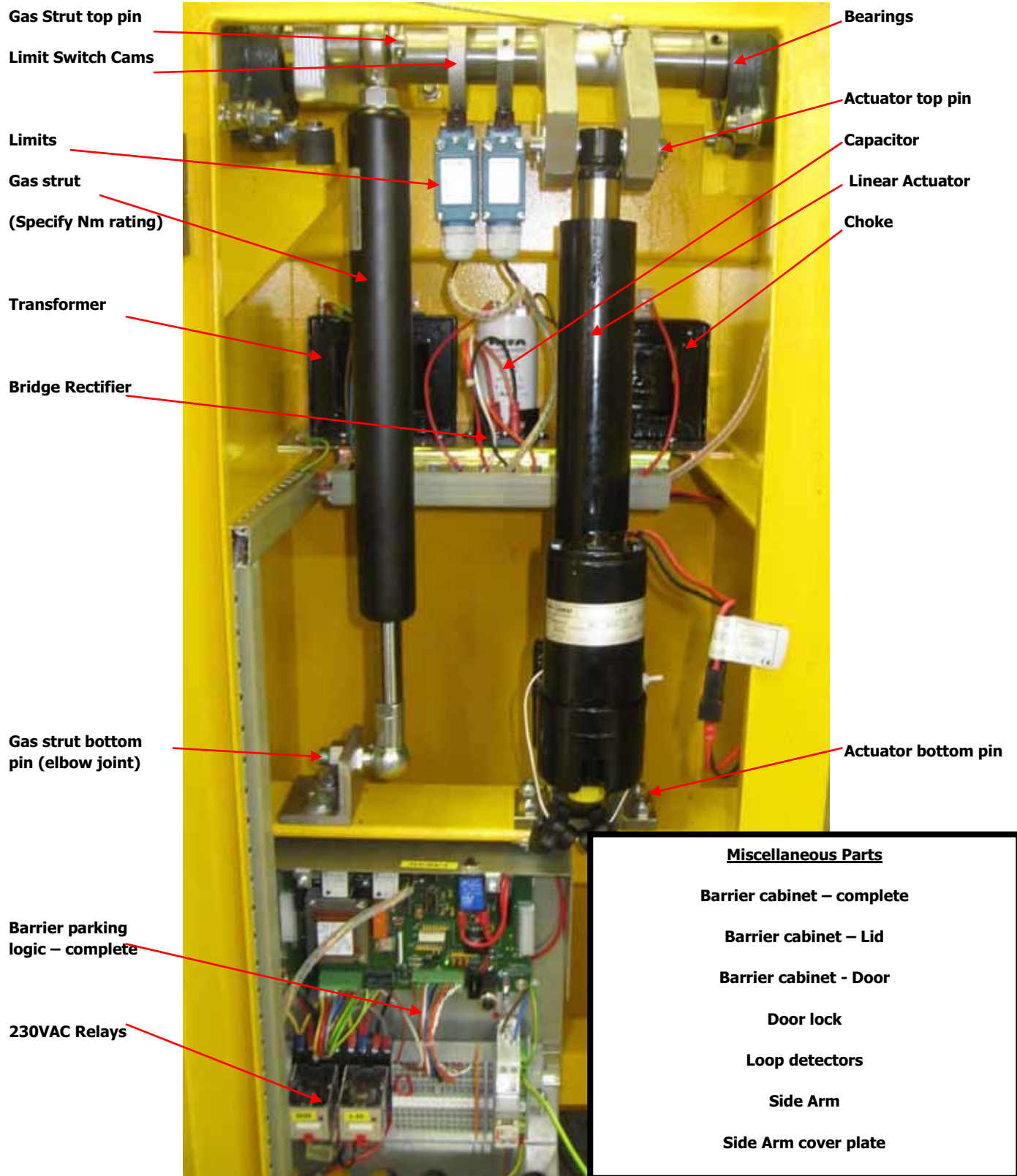


Fig 14.0

EB950 Optional Extras

The barrier can be customised to interface with a wide range of access control equipment to suit customer needs and personal choice. The list is not definitive and includes:

- ❖ Inductive loop systems (Free exit and Auto closing)
- ❖ Card readers
- ❖ Key pads
- ❖ Communication equipment (intercoms),
- ❖ Traffic light management can also be provided with signalling via the back indication output
- ❖ Stop signs/No entry (single and double sided)
- ❖ Up and Over skirts (up to 6m)
- ❖ Under slung skirts (up to 8m)
- ❖ Radio transmitter
- ❖ Pogo stick
- ❖ Additional push button controls
- ❖ High visibility dual aspect red warning lights
- ❖ Sounders
- ❖ Boom lights
- ❖ Photocells and safety strips
- ❖ Key switches (Raise & Hold/Auto)



Example illustrations only

COSHH STATEMENT



The Gas Spring is filled with Nitrogen which is not classed as 'Hazardous to Health' however the following guidelines must be adhered to when storing or fitting the spring to the barrier.

Gas springs contain Nitrogen Gas at high pressure – **DO NOT** puncture or incinerate.

Great care must be taken, to ensure that no damage occurs to the rod that may cause damage to the internal seal, specifically, **DO NOT SCRATCH, DENT, BEND OR PAINT**

Spare gas springs must be stored with the rod pointing down, this will ensure that the seal will be kept lubricated by the oil within the body of the unit.

When installing or removing gas springs do not unscrew the rod end fitting. If the body end has to be removed, ensure that the body does not rotate during the removal.

PROCEDURE FOR REMOVAL OF GAS SPRING



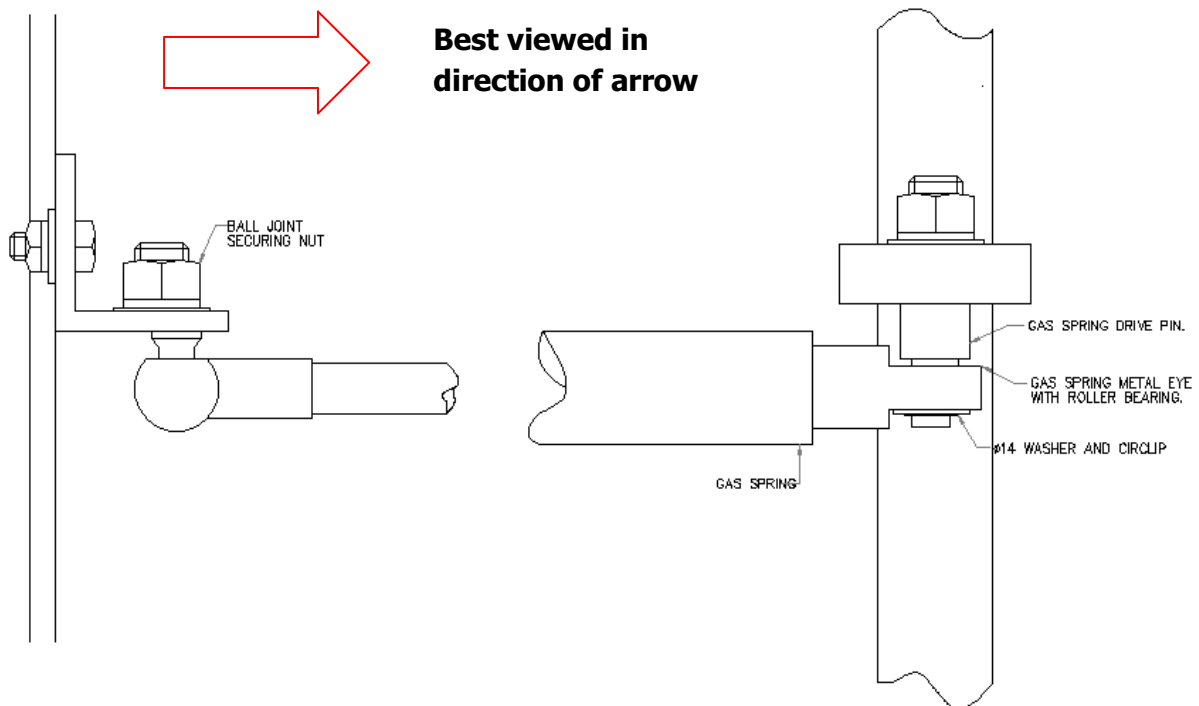
NO ATTEMPT should be made to uncouple the spring without the barrier being in the fully raised position.



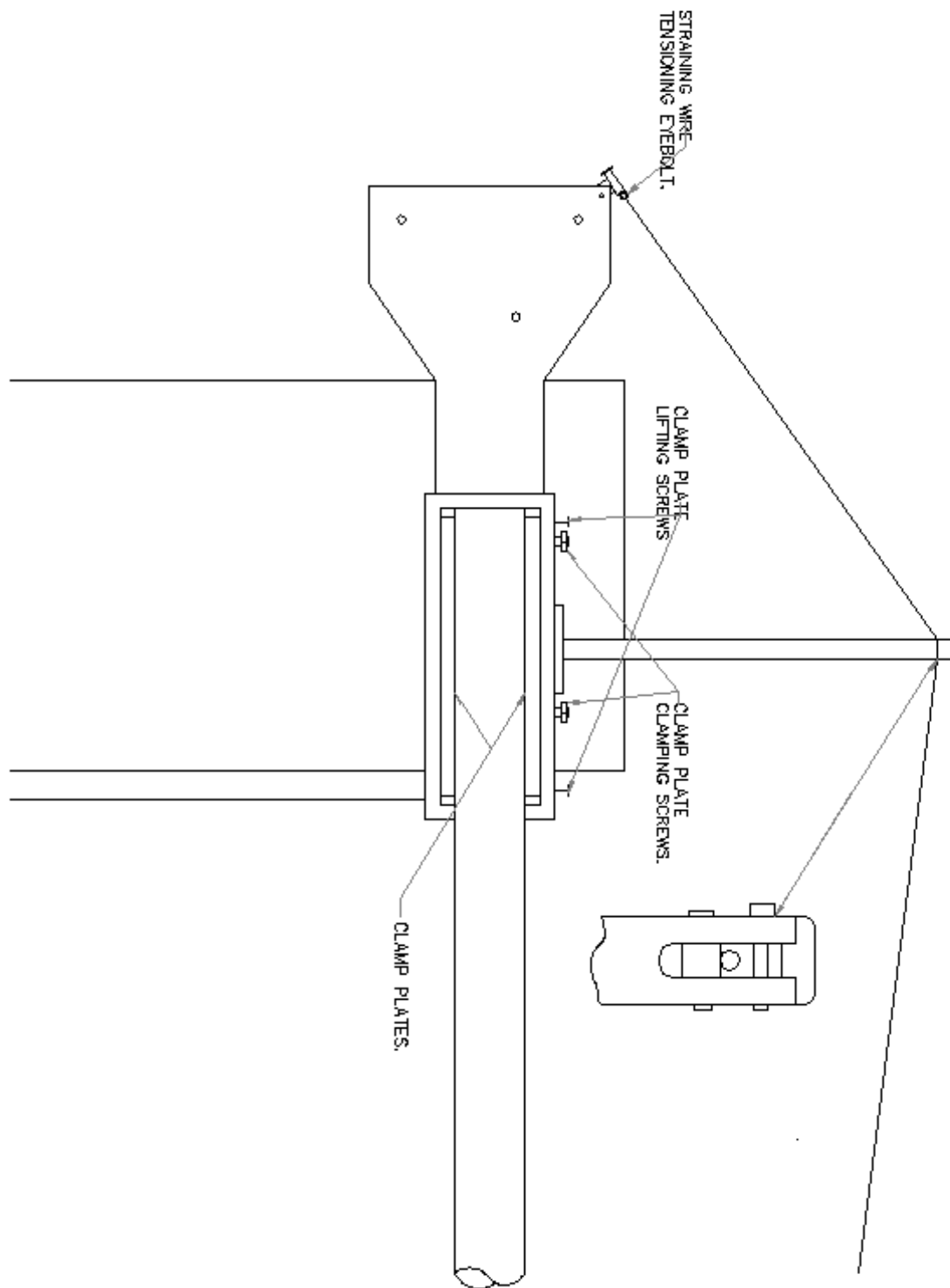
Whilst in compression mode, the gas spring is capable of exerting considerable force.

- Isolate the power
- Slacken off the M14 nut, securing the ball joint at the base of the strut (see *Fig 14.0* on Page 14 for location).
- Insert the winding handle into the end of the actuator shaft and manually wind the barrier into the fully raised position noted in Page 20/21, until the ball coupling fixing of the strut becomes loose.
- Swivel the winding handle through 180 degrees and engage in the parking hole.
- Now with the barrier locked in the raised position, the gas spring can now be removed/installed.

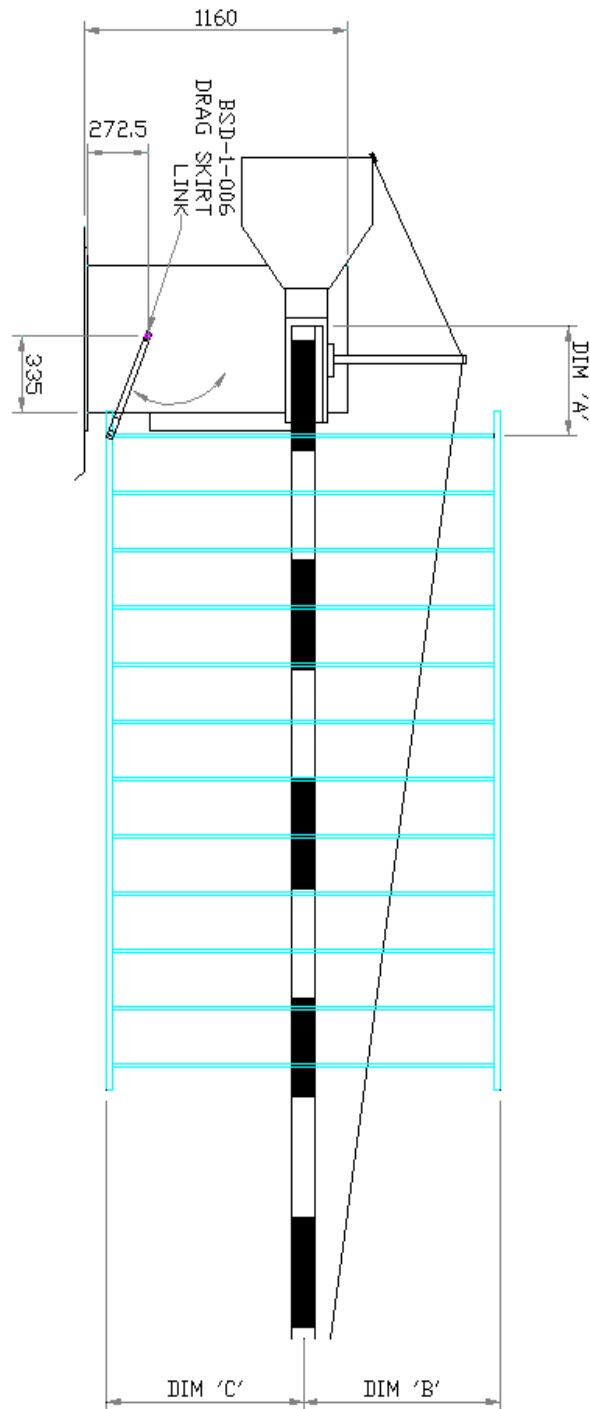
The stud has a hole drilled into one end to fit over the release valve and must be re-fitted accordingly. Once the stud is removed, the valve is visible in the body end of the gas spring.



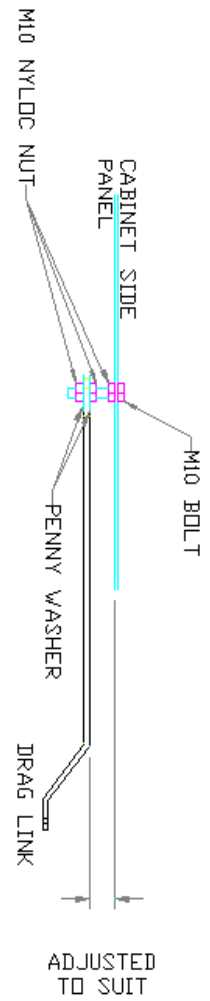
CLAMPING AND STRAIN WIRE DRAWING



DRAG LINK DRAWING

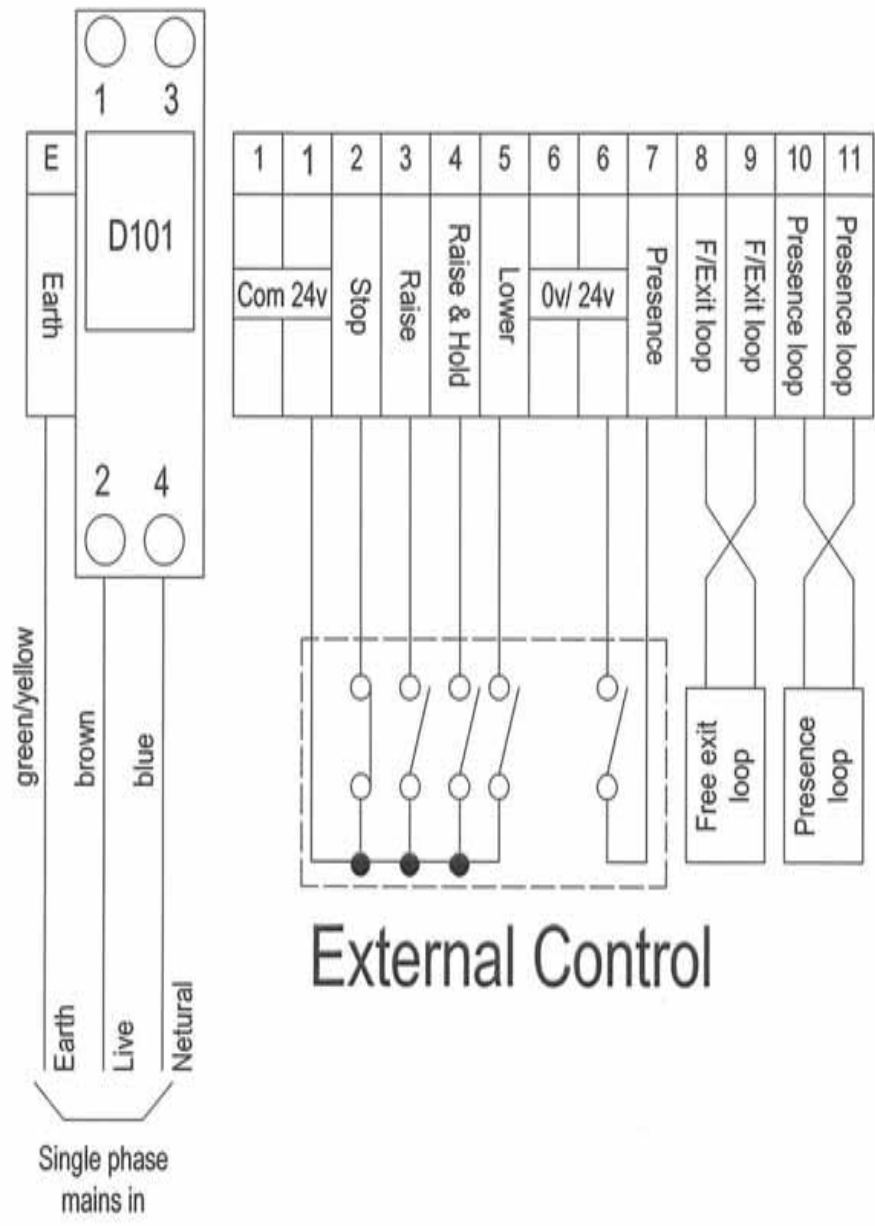


PLAN VIEW FOR FIXING ARRANGEMENT
(LINK ONLY)

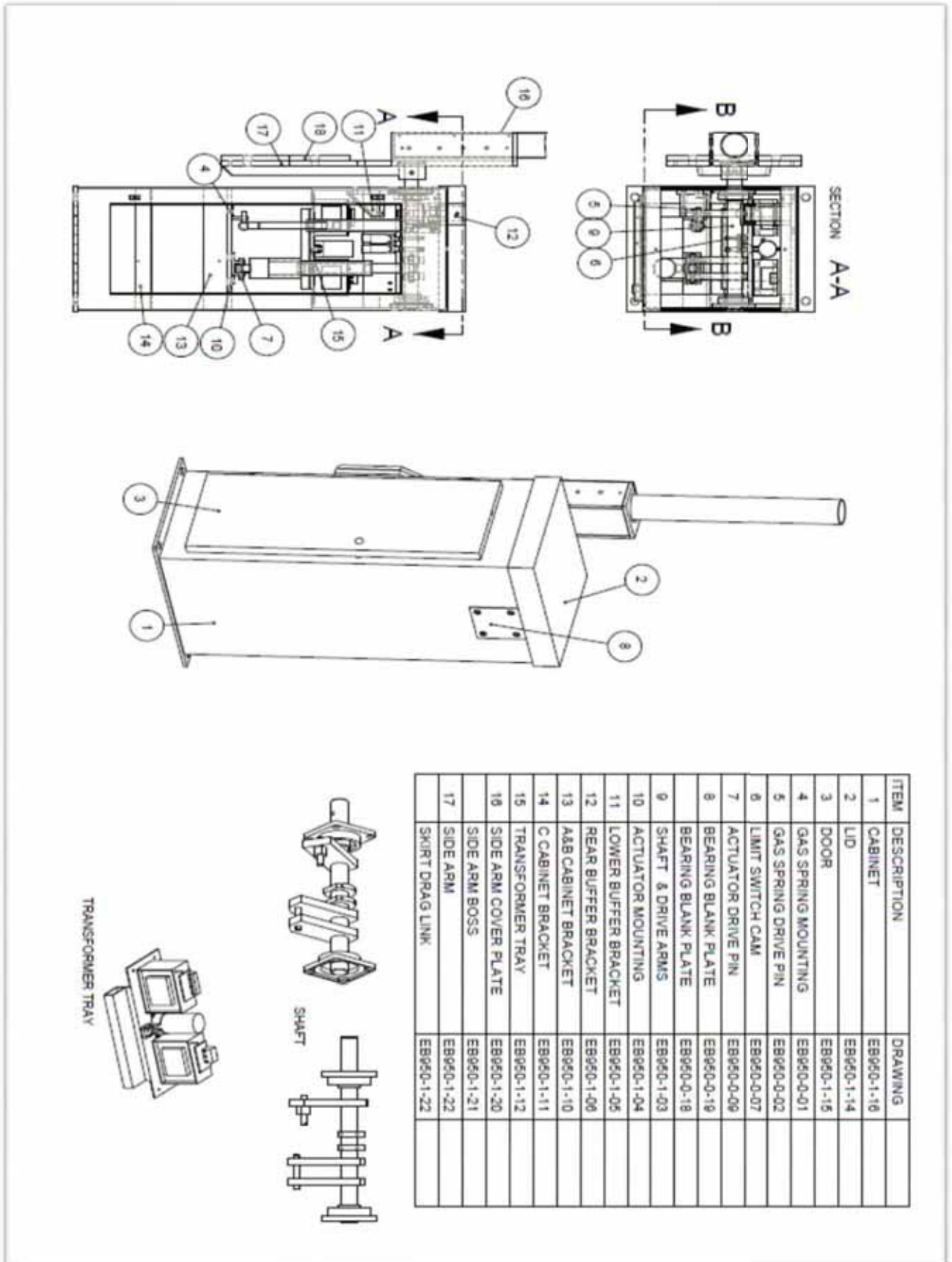


SCALE 1 : 5

GENERIC PARKING LOGIC DRAWING



COMPLETE ASSEMBLY DRAWING OF EB950

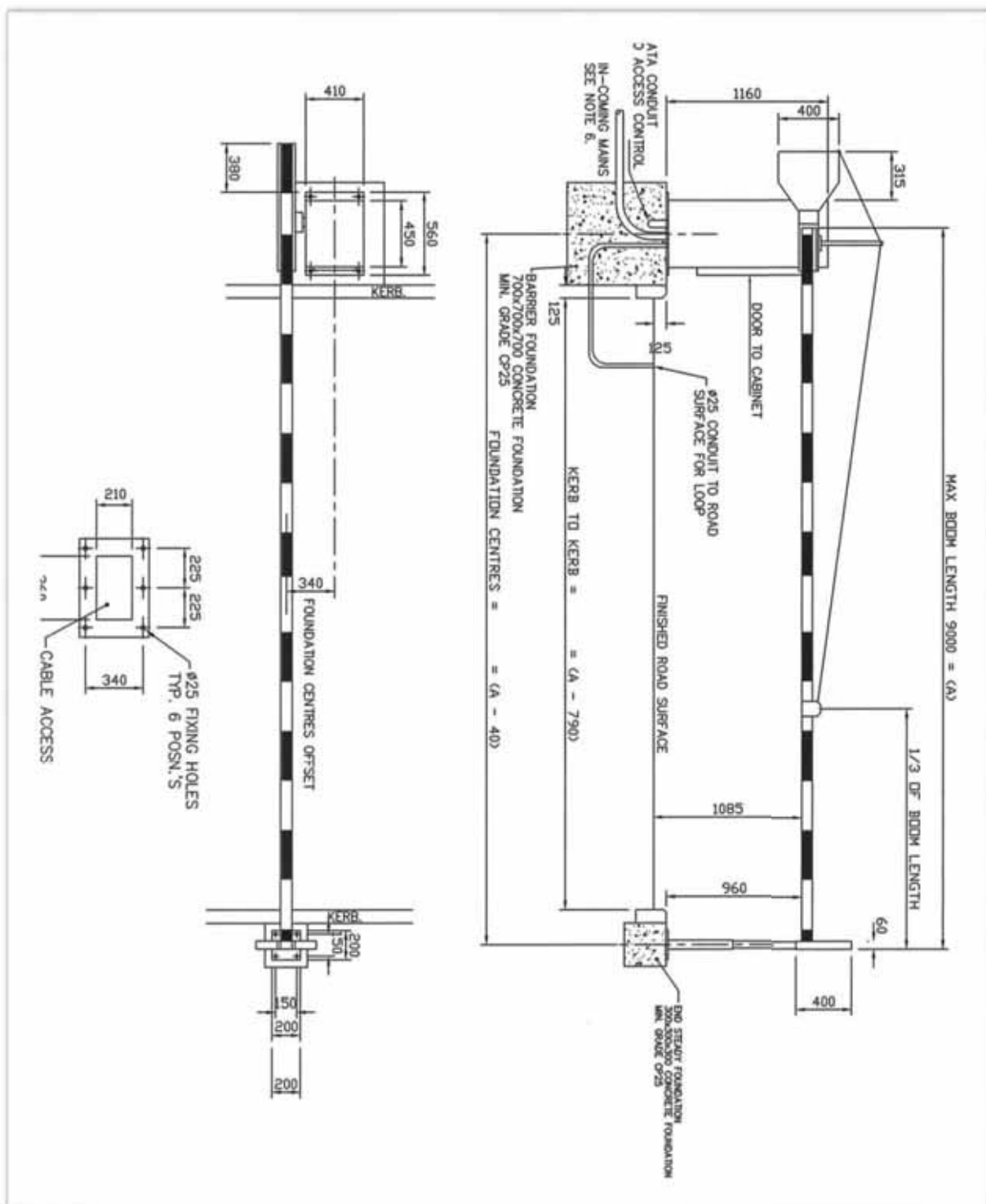


GENERAL ARRANGEMENT DRAWING

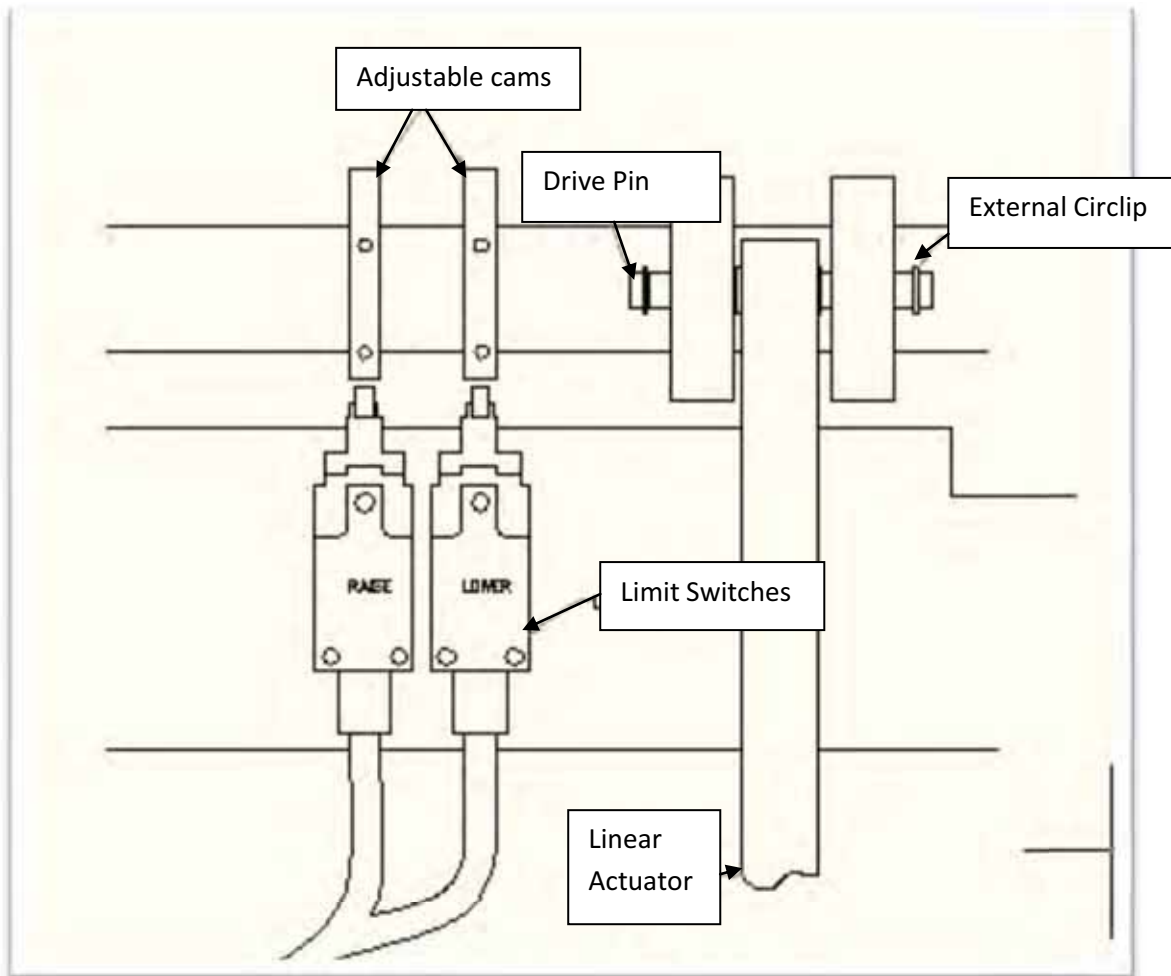
It is recommended that the barrier is secured to its foundation using 4 nos. M16 x 190mm chemical anchors. A further two fixing points are located within the barrier cabinet in case they are required.

Boom end supports and straining wires are required for booms in excess of 5M or where collapsible skirts are fitted.

The barrier arm should then be fitted and the end support (where applicable) can then be positioned to suit.



LIMIT SWITCH DRAWING



LIMITS

The limits can be adjusted if necessary via the adjustable cams on the EB950 shaft pictured above.



Fig 23.0 Internal Limit switch view

Emergency raise/lower procedure



- **Ensure control panel is at zero volts and is secured against restoration of the power supply (Isolator is off).**
- **Ensure suitable warning signs are posted and the area is cordoned off to traffic and pedestrians.**



Fig 24.0

- **Remove the 3 items needed to manually raise/lower the barrier from inside the cabinet**
- **1 x 6 mm hex head socket**
- **1 x 3/8 flex drive**
- **1 x winding handle**



Fig 24.1



Fig 24.2

- **Unscrew yellow, protective plastic cap and insert the 6mm hex head socket and flex drive**



Fig 25.0

- Start winding clockwise to raise barrier and anti clockwise to lower barrier
- After the barrier has been raised or lowered to the selected position, remove the 6mm hex head and replace yellow, protective cap.



REMOVE MANUAL OPERATION TOOLS FROM THE DRIVE BEFORE



POWER IS RESTORED

Service and Maintenance

The Service schedule for the Avon EB950 'Triumph' Barrier should be carried out at 60,000 cycles or half-yearly intervals, dependent upon usage.

Apart from lubricating the areas specified, check the fitting of the Side Arm onto the Main Shaft. This is to ensure the safe operation of the barrier.

On Page 28, there is an example of a typical servicing schedule.

Always remember Safety First when servicing or working in or around the barrier and be aware of moving vehicles and pedestrians even though the area may be cordoned off.



Ensure control panel is at zero volts and is secured against restoration of the power supply (Isolator is off).

Ensure suitable warning signs are posted and the area is cordoned off to traffic and pedestrians.

Typical servicing schedule - example

Service schedule	Checked		Comments
	√	x	
During servicing visits, check to ensure all fixings are secured and that, the linear actuator and gas springs are aligned correctly. Any undue misalignment can cause wear and possible premature failure of the equipment. A check should also be made to ensure that all the correct circlips/split pins are in place.			
The 2 x flanged bearings carrying the main shaft are pre-greased prior to assembly and should not require re-greasing.			
Grease should be applied to the drag link assembly, if fitted and the straining wire post roller on top of the side arm.			
A visual inspection should be made of the straining wire rope and boom light cable, to check that no fraying or damage is occurring.			
The needle roller bearing within the metal eye of the gas spring should be lightly oiled, along with the drive shaft pin at the top of the linear actuator.			
Boom light LEDs/Bulbs (if applicable) May need replacing from time to time.			
Check cables to actuator for signs of chaffing.			
Check transformer plate located behind the actuator for loose cables.			
Disconnect induction loops (if applicable) and carry out insulation/continuity tests and record results.			
Check all terminals for loose connections on din rail and main PCB.			
Check 11 Pin push in relays (located at the bottom of the PCB for integrity).			
Check cables to accessories (if applicable).			
Check main transfer shaft pin and replace if necessary.			
Check counter weight bolts are secure.			
Check floor-securing bolts.			
Test all access control/ manual switches and push buttons.			
Check all safety equipment (circuits, loops).			
Lubricate door lock with a quality switch cleaner.			
Check balance of boom (see Page 12 for details)			

EB950 Serial number:	
Number of cycles:	
Engineers name:	
Date:	

Fault Finding



Ensure control panel is at zero volts and is secured against restoration of the power supply (Isolator is off).

Ensure suitable warning signs are erected and the area is cordoned off to traffic and pedestrians.

SYMPTOM & POSSIBLE CAUSES	ACTION
Barrier not operating raised or lower Main power tripped Thermal protection of PCB activated Fuse blown on Barrier logic (PCB) Transformer failure Actuator failure	Reinstate power supply Reset thermal protection switch Replace fuse Replace transformer Replace actuator
Barrier permanently raised Faulty inductive loop Permanent raised input from access control equipment Faulty raised reply Faulty actuator Lower limit switch activated Activated/faulty safety accessories	Replace faulty loop or check loop detector Clear raised input Replace raise relay Replace actuator Adjust limit switch Deactivate/replace safety accessories
Barrier judders when lowering Loss of nitrogen in the gas strut Counter balancing incorrect Gear slipping on Actuator	Replace gas strut Remove or replace counter weights Replace
Barrier permanently lowered Permanent lowered input Faulty lower relay Faulty actuator Raise limit switch activated	Check push button control (if applicable) Replace lower relay Replace actuator Adjust limit switch
Barrier making grinding noise when operational Actuator internal gear slipping	Replacement of actuator required
Excessive play in the barrier boom carrier (side arm) Boom carrier (side arm) pin sheared inside the drive shaft	Replace M12 x 80 mm spring pin

Certificates & Warranty

DISCLAIMER

Careful consideration must be given to the selection, placement and design of a barrier installation, and care must be taken to ensure that approaching vehicles as well as pedestrians are fully aware of the barrier system and its operation.

Proper illumination, clearly worded signage and auxiliary safety devices, should be considered.

Avon Barrier Company Ltd. has information available on many such pieces of safety equipment not specifically listed here.

WARRANTY AND LIMITATION OF LIABILITY

Avon Barrier Company Ltd. warrants that during the first 12 months following delivery, the products will be free from defect in material and workmanship. Avon Barrier Company Ltd's sole obligation under the terms of this warranty shall be to repair (or at Avon Barrier Company Ltd's option, to replace) any defective product/part, without extra charge to the Buyer, provided that, (a) Buyer gives Avon Barrier Co. written notice of any such claimed defect within such period of 12 months, (b) the products, if installed, were installed by an Avon Barrier Company Ltd authorised installer, and (c) the products have not been altered, subjected to misuse, improper maintenance, negligence or accident, or used with parts not authorised by Avon Barrier Company Ltd.

NO OTHER WARRANTY IS EXPRESSED AND NONE SHALL BE IMPLIED, INCLUDING WITHOUT THE WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR USE.

THE FOREGOING STATES THE ENTIRE LIABILITY OF AVON BARRIER CO. LTD. WITH RESPECT TO THE PRODUCTS.

IN NO EVENT SHALL AVON BARRIER CO. LTD. BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH RESULT FROM USE BY BUYER OR ANY OTHER PARTY, OF THE PRODUCTS, AND IN NO EVENT SHALL AVON BARRIER CO. LTD'S LIABILITY EXCEED THE AMOUNTS PAID BY THE BUYER FOR THE PRODUCTS THEREUNDER.

DECLARATION OF CONFORMITY

E C MACHINERY DIRECTIVE 98/37/EEC

E C LOW VOLTAGE DIRECTIVE EN60204-1:1998

E C ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

EN 50081-1 & EN 50082-2

We hereby certify that EB950 complies with the relevant provisions of the EC Directives detailed above.

Manufactured by:

Avon Barrier Company Ltd

Nova House

195 South Liberty Lane

Ashton Vale Trading Estate

Bristol

BS3 2TN

Signed:

A handwritten signature in blue ink, appearing to be 'P A Jeffrey', written over a light blue horizontal line.

Date: 17th November 1999

Name: P A Jeffrey

Position: Managing Director, Avon Barrier Company Ltd