TESS™ Systems
Maintenance and Service Manual

This guide can be used as a trouble shooting reference and for maintaining or servicing all TESS™ systems. This manual is to be used with TESS single barrel roller blind systems operating with tension. All products are designed, tested, and manufactured in line with relevant European standards.
All systems are available with motor options to suit local supply.
All systems are available with motors using manual limits or radio control.

TESS systems are technical products that require installation, servicing and maintenance by professionals with appropriate skills. If in doubt, contact us for further advice.

Guthrie Douglas

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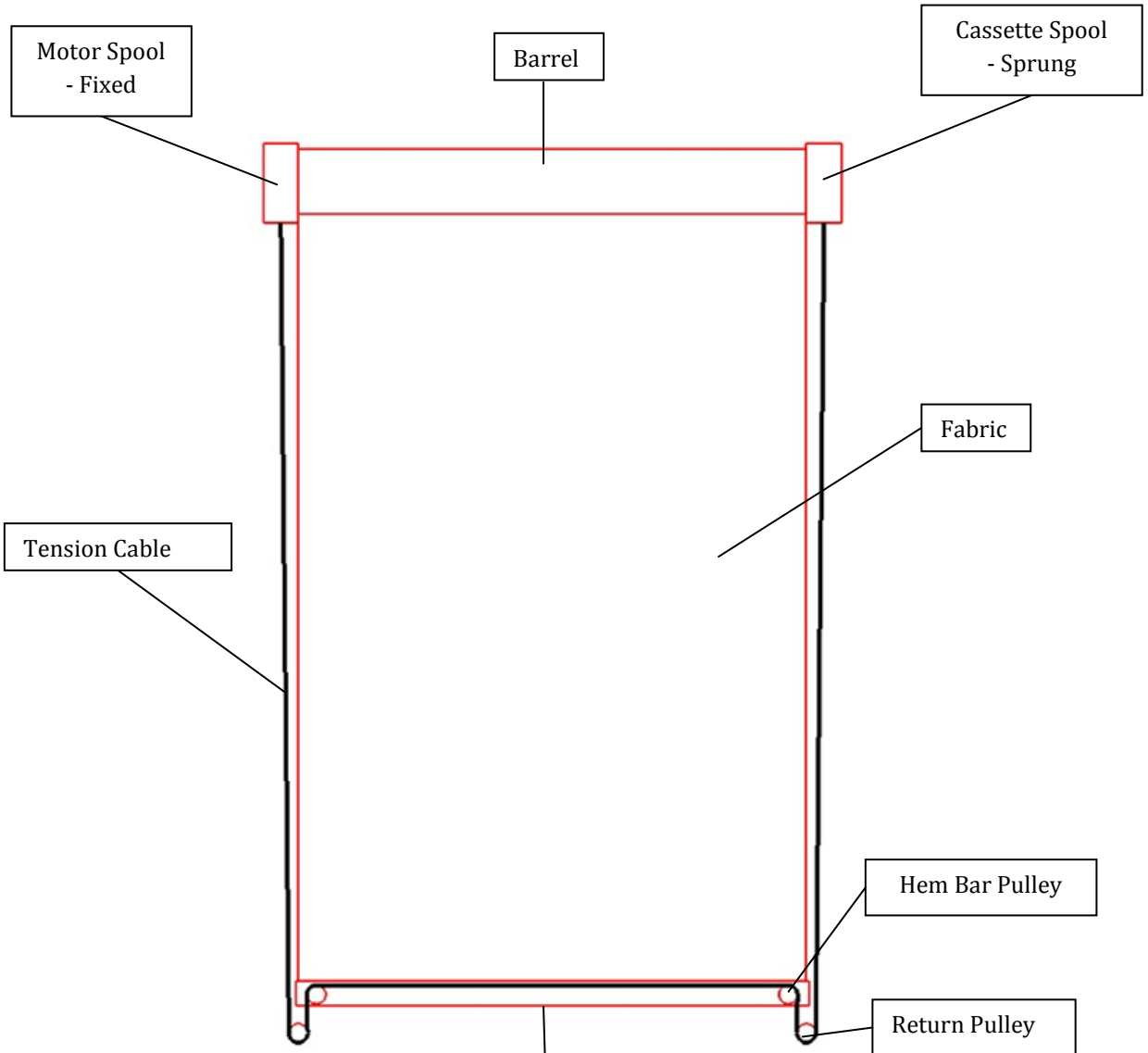


Fig 1
TESS 100 GD System

TESS systems are motorised and the fabric is tensioned. The tension in the fabric is generated by pulling on a hem bar via a tension cable attached to spools. One side of the tension cable is fitted to a spool driven directly by the motor and barrel, the other is indirectly linked to the barrel by means of a torsion spring and gearbox.

The gearbox is used in the tensioning process, as the gearbox key is wound it loads the spring until the required torque setting and tension in the cable is achieved.

Some GD solar shading systems are used in conjunction with hem bar guides.
Refer to specific product installation manuals and drawings for details. If you are unsure of which TESS model you are servicing/ maintaining, please contact Guthrie Douglas for clarification.
The system is described as above in Fig 1. Guides and Gearbox are not shown for clarity.

1. Product Descriptions—TESS 100 Type Systems

1.2. TESS 100 Type—Systems

The TESS 100 is the basic system in the range; the barrel from the system is used in several other products for different applications. See tables below.

Product - TESS 100 / 101 / 102		
Description	Application	CE Rating
Barrel and Return Pulleys Only Deploy in any direction and with shaped fabrics such as triangles and trapezoids. Can be used with Relieving rollers for shaped buildings such as curved roofs.	Internal. Can be used externally with advice and with head box.	If used externally wind speed limit with technical advice on application.

Product - TESS 120 / 420		
Description	Application	CE Rating
As per TESS 100 for rectangular shaped fabrics only. System is guided by aluminium profiles. All system tension is maintained inside the system; no tension forces are passed on to the building.	Internal. External (typically with head box TESS 420).	External Up to 13m^2 at Class 3 Winds. Up to 18m^2 at Class 2 Winds.

Product - TESS 140 / 440		
Description	Application	CE Rating
As per TESS 100 for rectangular shaped fabrics only. System is guided by a tensioned guide cable. System tension is passed to the building; this can be high (up to 100Kg at each fixing point).	Internal. External (typically with head box TESS 440).	External Up to 13m^2 at Class 3 Winds. Up to 18m^2 at Class 2 Winds.

1. Product Descriptions—TESS 600 Type Systems

1.3. TESS 600 Type—Overview

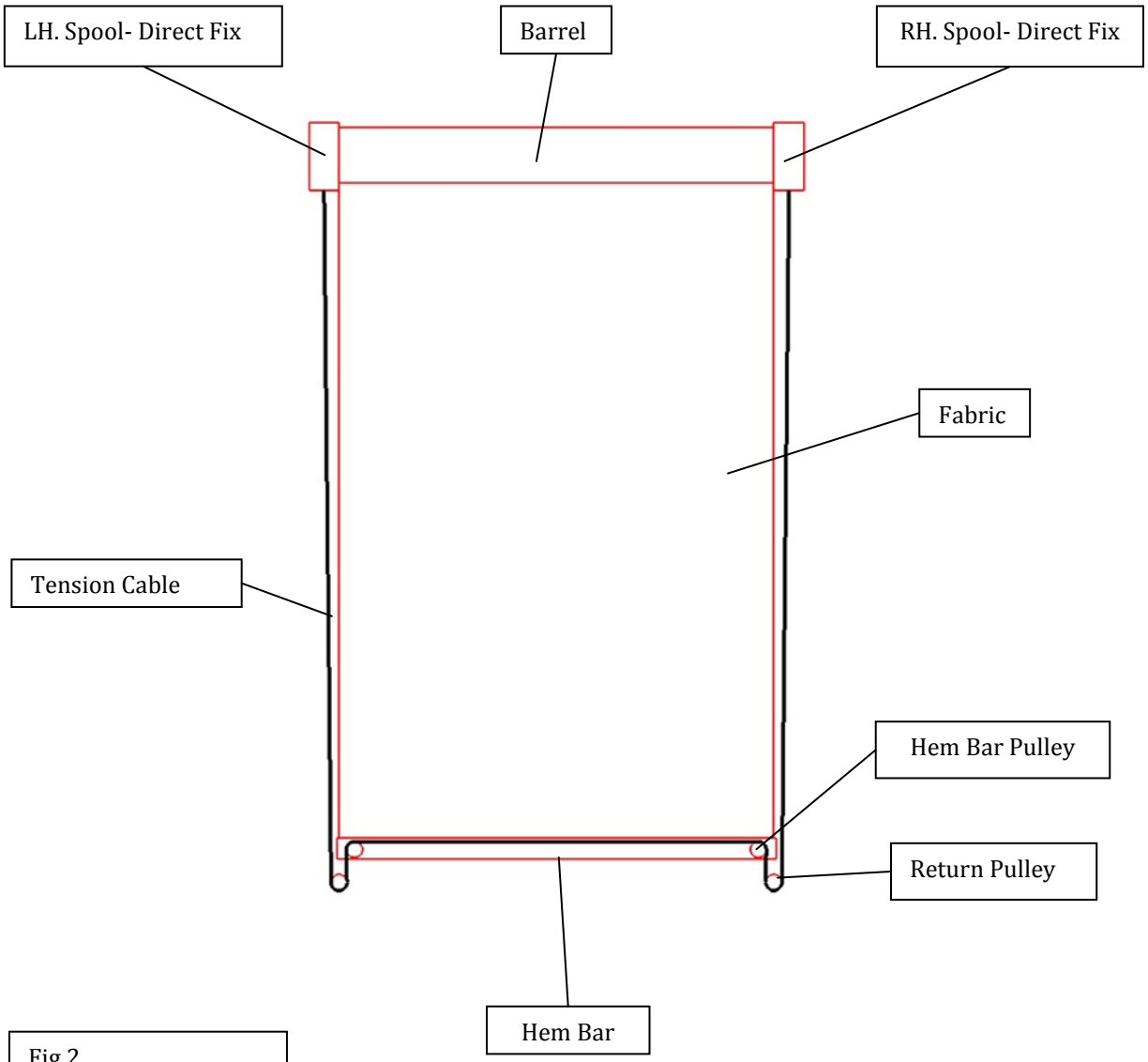


Fig 2
TESS 660 GD System

The TESS 660 is motorised and the fabric is tensioned. The tension in the fabric is generated by pulling on a hem bar via a tension cable attached to spools. The barrel is made up from two tubes; a drive tube that connects the motor to the spool at each side and a fabric tube that is free floating and connected to the drive tube via a torsion spring.

Tension across the fabric is generated by locking the hem bar and back winding the motor (without tension cable fitted). The design tension is achieved at motor stall, when the motor is at stall the cables are fitted. On deploy the torque and system tension is transferred from the locked hem bar to the cable and fabric.

The system is described as above in Fig 2. Guides are not shown for clarity.

1. Product Descriptions—TESS 100 Type Systems

1.4. TESS 600 Type—Systems

The TESS 600 is the basic system in the range; the barrel from the system is used in several other products for different applications. See tables below.

The TESS 660 barrel is always supplied with a head box.

Product - TESS 600 / 601 / 602

Description	Application	CE Rating
Barrel, Head Box and Return Pulleys Only Deploy in any direction and with shaped fabrics such as triangles and trapezoids. Can be used with Relieving rollers for shaped buildings such as curved roofs.	Internal. Can be used externally with advice.	Wind speed limit with technical advice on application.

Product - TESS 640

Description	Application	CE Rating
As per TESS 600 for rectangular shaped fabrics only. System is guided by a tensioned guide rod. System tension is passed to the building; this can be high (up to 60Kg at each fixing point).	Internal. External.	External Up to 9m^2 at Class 2 Winds.

Product - TESS 660

Description	Application	CE Rating
As per TESS 600 for rectangular shaped fabrics only. System is guided by aluminium profiles. All system tension is maintained inside the system; no tension forces are passed on to the building. Possible to produce black out, system uses zip edged fabric and Side-Lock device. Return pulleys are built into side guides. Guides available as face fix and side fix.	Internal. External.	External Up to 9m^2 at Class 3 Winds. Less than 9m^2 beyond Class 3 Winds.

2. Motor Options

Three types of motor are typically supplied with TESS systems. Hex Drive manual limits, Push Button manual limits and radio control (RTS). On large projects with building management systems in place it is common to use manual limit setting.

In all cases refer to the instructions supplied with the system.

The operating conditions for the systems are set in the main by the limits of the motor. This is rated at temperatures between 0°C and 55°C. The product should not be used outside of these limits. A range of control options are available to protect and prevent the system from operating outside of this range.

2.1. Manual limit – Hex Drive

Typically found on small Somfy motors and all Simu motors. The small Somfy motor is used in the TESS 600 type products and the Simu motors in most TESS 100 type products.

For limit setting a key is used to turn the adjusters. One adjuster will set the deployed limit position limit and the other to set the retracted limit position.

It is important to check the direction of rotation (of the motor) and the direction of the hem bar. The upper adjuster may not the correct adjuster to set the retracted limit position. It is important to check the direction of adjustment; turning the key clockwise may or may not be increasing the limit position.

Each adjuster on the motor will have two arrows; one shows the rotation direction of motor and the other shows a plus or minus sign with adjuster direction. These must be checked and observed correctly.

2.2. Manual limit – Push Button

Found on Somfy motors; used in some TESS 100 type products; TESS 200 and TESS 512.

A push button is used to set each motor direction and both limit positions. With the button depressed the motor is in setting mode and set with the button released.

2.3. Radio Control

Radio motors are set via the transmitter. The setting procedure is more complex and the correct procedure must be followed.

The setting of radio controlled Somfy and Simu motors is the same.

The motors limit positions can be reset at any time via the transmitter.

The motor program can be scrambled at any time and re-programmed from scratch.
The important aspect of radio control setting is that only one motor at a time should be worked on whilst in programming mode; all other systems in the area should be isolated.

Only attempt programming of radio motors with access to the full instruction manual supplied with the motor and system.

3. System Layout

At installation the system must be installed square and parallel. This can be checked by measuring the system draw and width, and by measuring the diagonals across the system.

The width (X) should be parallel, the draw (Y) should be parallel, and the diagonals (D) should be equal. Shown in Fig 3

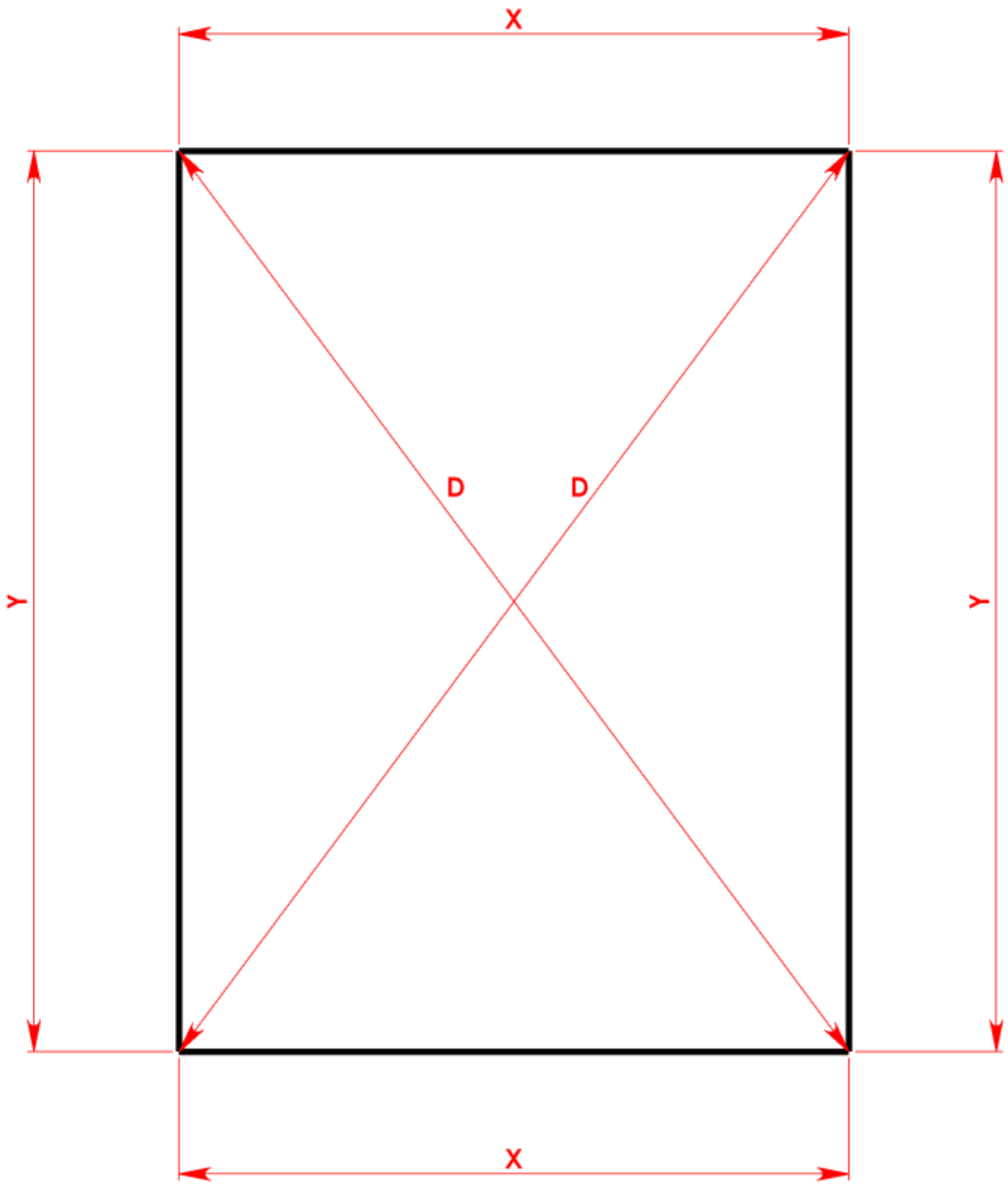


Fig 3
System Layout

4. Fabric Tracking - Adjustment

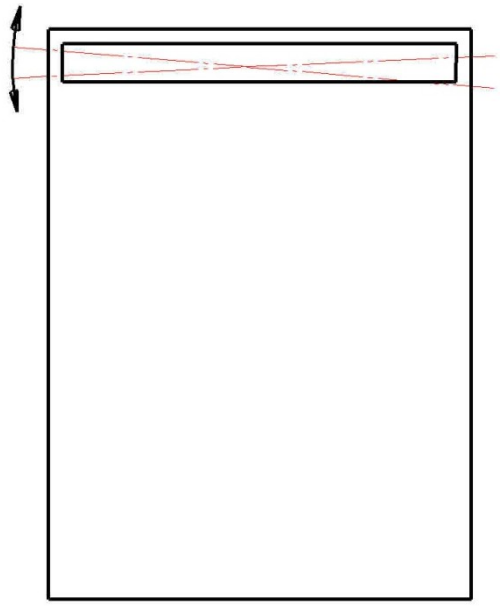


Fig4
The TESS 100 type barrel can be adjusted at the tracking slots.

See product manual.

The fabric when being retracted back towards the barrel should remain in position on the barrel; the fabric should not travel towards one side.

Long fabrics might move towards one side and then back towards the other.

Tracking should be adjusted so that the fabric rolls up at the centre.

4.1. Troubleshooting - Fabric Problems

4.1.1. Diagonal Creasing – System Out of Square

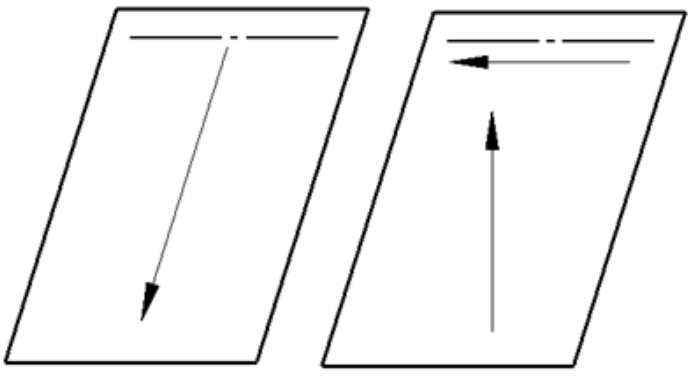


Fig 5 Out of Square System

The system deploys towards pulley (Fig 5 Left Image)
On retract the fabric is dragged across the barrel (Fig 5 Right Image)
Fault will be shown by diagonal creasing (Fig 7)
To rectify replace fabric and adjust layout – refer to product manual

4. Fabric Tracking - Adjustment Cont.....

4.1.2. Diagonal Creasing – Barrel Adjustment

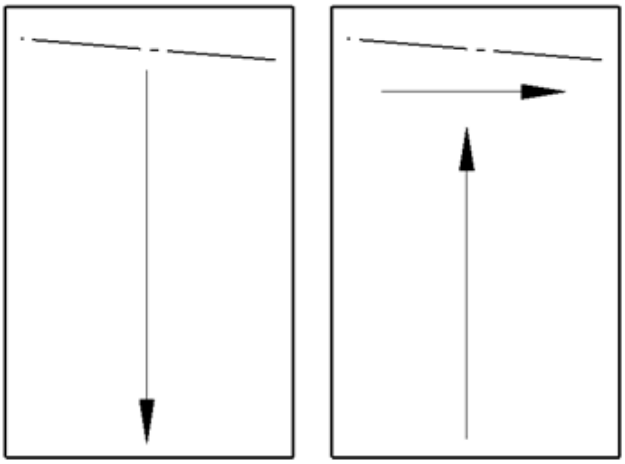
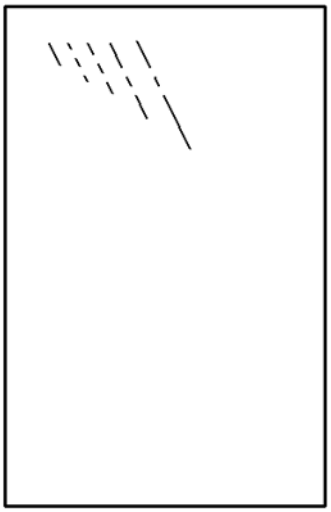


Fig 6 Fabric Tracking

The system deploys towards pulley (Fig 6 Left Image)
On retract the fabric will move towards a lower tension, where the barrel is closer to the return pulleys (Fig 6 Right Image)
Fault will be shown by diagonal creasing (Fig 7)
To rectify replace fabric and adjust tracking – refer to product manual

4.1.3. Diagonal Creasing – Crease Pattern



GD systems are designed to work with high strength fabric manufactured from fibre glass core yarns. If the fabric is allowed to crease the core of the yarn becomes weakened; it is unlikely that the correct performance from a fabric will be possible after has been creased, even if a perfect set up is achieved.

Fig 7 Diagonal Creasing

4. Fabric Tracking - Adjustment Cont.....

4.1.4. Herringbone Creasing – Over Tensioning

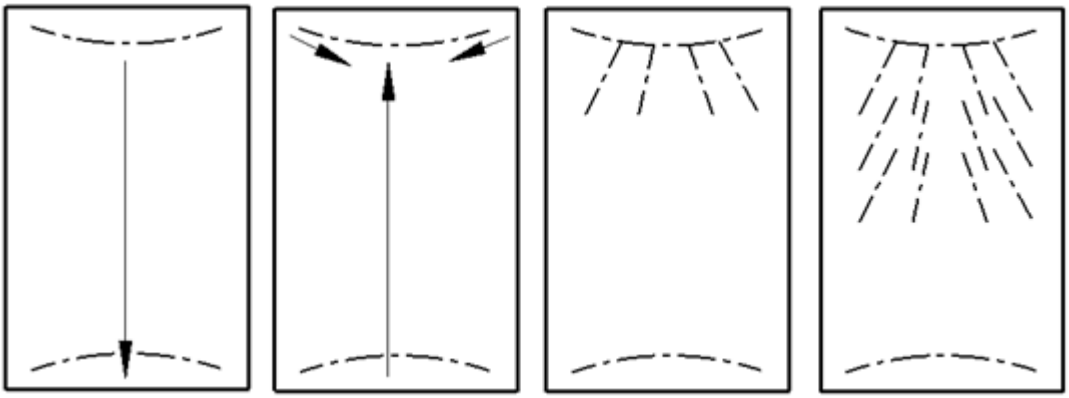


Fig 8 Over-Tensioning of a System

When working with wider systems (TESS 100 Type at >3.5m wide) it is important to take care when tensioning. The fabric tube and hem bar will deflect with increasing tensions, when working with a horizontal system some fabric sag should be expected. Sag is dependent on size and fabric weight; if in doubt seek technical advice.

Starting from the left image

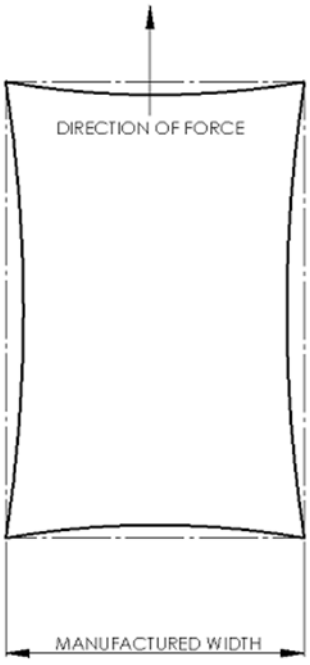
Fabric deploys to the return pulley

Fabric retracts to the barrel; with barrel deflection the fabric gradually creeps towards the barrel centre equally from both sides.

Over time (several dozen cycles) the fabric will wrinkle on retract

Eventually the wrinkles in the fabric will become creases

4.1.5. Fabric Necking



Fabrics when subjected to tension will stretch. High strength fabrics do resist this but over time some necking should be expected.

Fig 9 Fabric Necking

5. Tension Cable

The tension cable is aircraft grade stainless steel wire rope coated with a plastic finish to aid handling and pulley life. The cable is black and measures 1.5mm diameter.

The system operating conditions will affect cable life. Temperature and environment will have the biggest impact but system setting will also have an effect on cable life.

In very cold conditions the plastic coating on the tension cable can become brittle. On operation as the cable bends around a pulley the coating may fail; this might lead to other issues such as the coating fouling and jamming a pulley. The system should not be used below 0°C.

Dust, sand and other debris might affect cable life. High temperatures and UV light will affect the cable coating over time.

During each cycle the tension cable bends around several pulleys; this over time will cause the cable to become fatigued. When fatigued; some of the strands of wire making up the cable might break and become knotted under the plastic coating. These will be visible and can be felt between fingers. If wire strands have failed the cable will be weaker than expected; it should be changed.

If the system is installed over-tension and especially where relieving rollers on barrel type roofs are used the plastic coating can fail. Take care when setting system tension.

If in doubt, contact Guthrie Douglas Group for advice.

6. System Maintenance

Maintenance must be considered with local conditions in mind but it is expected the installed system will be checked once a year as a minimum. For difficult conditions (external, dusty, sandy, cold, high wind etc) the systems could be checked on a more regular basis.

6.1. Every 12 Months

- Check tracking and fabric condition (creases)
  - Check that tracking is correct and fabric is clear of spools
  - Make adjustments where required (See Section 4)
- Check limit positions
  - Do not allow the hem bar to touch the return pulleys, barrel or head box
  - Make adjustments (See 2)
- Check fabric edges for small rips / cuts / damage
  - Damaged edge will reduce the tear strength of the fabric
- Check tension cable (See 5)
  - Ensure cable is spooling correctly and neatly
  - Check the plastic coating is in place and not damaged
  - Check for knots of damaged wire under the surface
  - Replace cable if necessary
- Check for good pulley rotation
  - Ensure cable is sat in the pulley V correctly
- Check fixing screws
  - Tighten any loose screws
- Check for good relieving roller operation
- Check wind sensor operation
- Clean and remove any debris from the system

6.2. Every 5 Years (additional checks)

- Check hem bar end caps (TESS 120/140/420/440/660) for wear
  - Replace if necessary
- Replace tension cable if not replaced already

6.3. Every 10 Years (additional checks)

- Check motor operation
  - Depending motor usage and working conditions and consider replacement

Notes

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