

### These steps may help:

- Use a low friction presser foot
- Adjust presser foot for minimum pressure, whilst still achieving positive, even feed of the fabric
- Raise the back of the feed dog slightly to create a pulling effect away from the needle
- Check the feed dog for correct height, teeth per inch, and number of rows of teeth, appropriate for the fabric and operation
- Make sure the operator is not holding back on either the top or bottom ply
- Check for fabric hanging in any folders that may be in use
- Match up feed and foot
- The throat plate and presser foot should have needle holes approximately twice the size of the needle
- If the machine has both top and bottom feeders, ensure that the timing is correct



### Quick reference table

	Cause	DiagnosisSolution
Incorrect tension setting	<ul style="list-style-type: none"> <li>• Cut all top and bottom stitches</li> <li>• If pucker disappears, problem is incorrect tension setting</li> </ul>	<ul style="list-style-type: none"> <li>• Use high quality corespun threads</li> <li>• Apply minimum tensions to the threads</li> <li>• Select threads with good lubrication</li> <li>• Ensure correct feed timing</li> </ul>
Structural jamming	<ul style="list-style-type: none"> <li>• Cut and remove all top and bottom stitches</li> <li>• If pucker disappears, problem is structural jamming</li> </ul>	<ul style="list-style-type: none"> <li>• Sew on bias if possible</li> <li>• Use smaller needle sizes</li> <li>• Reduce stitch density</li> <li>• Change stitch type</li> <li>• Use finer sewing threads (where practical)</li> </ul>
Fabric and thread instability	<ul style="list-style-type: none"> <li>• Visual check</li> <li>• Pucker appears after treatment or washing</li> </ul>	<ul style="list-style-type: none"> <li>• Use synthetic threads with low wet shrinkage</li> <li>• Compatible garment components</li> </ul>
Poorly controlled fabric feed	<ul style="list-style-type: none"> <li>• Make two cuts across seam in areas of maximum pucker</li> <li>• Remove all stitches between cuts</li> <li>• If one ply is longer, problem is unequal feed</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum foot pressure</li> <li>• Correct feed dog</li> <li>• Adjust feed dog</li> <li>• Correct operator technique</li> <li>• Matched feed and foot</li> <li>• Correct hole size in throat plate and pressure foot</li> <li>• Correct top and bottom feed timing</li> <li>• Low friction presser foot</li> </ul>



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## Seam Pucker: Causes & Solutions



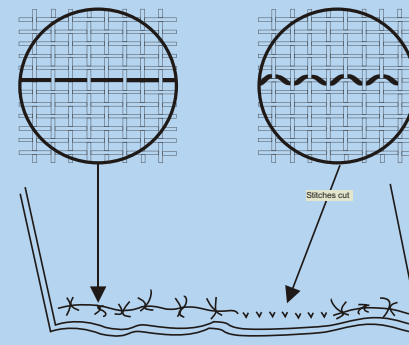
One of the most common problems encountered when making up fine, woven or some very fine knitted fabrics is seam pucker (distortion). Most puckering is the result of one or a combination of four major causes:

- Incorrect tension settings
- Fabric and / or thread instability
- Structural jamming
- Poorly controlled fabric feed

### Incorrect tension settings

Tension pucker is caused by sewing with too much tension, thereby stretching the thread. After sewing, the thread relaxes. As it attempts to recover its original length, it gathers up the seam, causing pucker. The effect may not be apparent for some time and may not appear until the garment is pressed or washed by the consumer.

To identify tension pucker, carefully cut both the top and bottom threads of all stitches along a few centimetres of the seam, without distorting the thread loops in the fabric. If the seam pucker is relieved over this length, then it was caused by sewing thread tension and subsequent recovery.

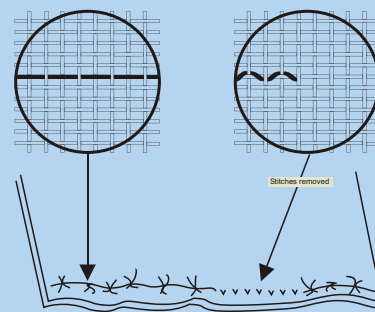


Test for effect of tension

### Try these steps to correct tension puckering

- Reduce the tension applied to the thread as it is wound onto the lockstitch bobbin
- Use the minimum tension required to give a neatly wound bobbin
- Loosen the under thread (bobbin) tension spring so that it is as light as possible but without comprising on thread control
- Set the needle thread tension to be as light as possible whilst still achieving a balanced stitch. This will reduce the amount the thread is stretched and improve sewability
- Use a high quality sewing thread with a low friction lubricant applied to it. This will allow the thread to run smoothly through the thread guides and tension controls
- Ensure that the sewing machine feed timing is correctly set, as incorrect feed timing can lead to the need to apply excessive tension to the needle thread, in order to create a properly balanced stitch

### Structural jamming or inherent pucker



Test for structural jamming

If the fabric is densely woven, there may be insufficient space to accommodate a sewing thread without distorting the woven yarns. Stitching along a straight line will distort and stretch the adjacent fabric yarn or yarns, setting up stresses which cause the seam to pucker. This is known as 'structural jamming' or 'inherent pucker'.

The severity of the condition depends primarily on the characteristics of the fabric fibre, the closeness of the weave or knit and the fabric finish. Relatively coarse fabrics of natural fibres are less likely to experience 'inherent pucker' than tightly-woven synthetics, delicate microfibres or fabrics with pucker-sensitive finishes or treatments.

To identify 'inherent pucker', carefully cut and remove the stitches in a short length of seam, after first checking for 'tension pucker'. If both the faces of the seam revert to a smooth surface, 'structural jamming' has occurred.

### Pucker caused by 'structural jamming' may be combated by:

- Cut and sew on the bias, when possible. By sewing at a biased angle, the needle displaces different sets of warp and weft yarns, thereby significantly reducing the incidence of pucker
- Opt for finer needle and thread sizes
- Reduce the stitch density (stitches per inch), thereby reducing the yarn displaced in the stitch line
- Chainstitch or overedge stitches will produce less 'structural jamming' than lockstitch
- Avoid multiple rows of stitching which cause more pucker because the stresses in each row are cumulative
- When topstitching a seam, use the finest thread size possible to assemble the panels sewn prior to the topstitching operation

### Fabric and thread instability

Dimensional changes in threads or fabrics during post-sewing treatments or washing can cause pucker primarily because threads and fabrics react to these processes differently.

Soft cotton threads, for example, increase in diameter and shorten in length when wet, as they absorb moisture. This can distort the fabric. Even though the thread may return to nearly original dimensions when dry, the fabric can remain puckered.

Hence, synthetic threads, with negligible wet shrinkage, are the best choice for pucker-sensitive fabrics.



### Coats recommends:

- Epic - polyester corespun
- Dual Duty - polyester cotton corespun

*Note: Corespun threads are higher in tenacity than ordinary staple spun sewing threads. This may allow the use of a finer thread and will also facilitate the use of finer needles, resulting in neat, unobtrusive seams*

It also helps if all components of a garment are compatible. If a lining or reinforcing tape, for example, shrinks more than the base fabric, the base fabric will pucker along the stitch line. Similarly, if two pieces of material with different extensions are stretched during sewing, different relaxations can cause seam pucker on one face of the composite.

### Poorly controlled fabric feed

If two plies of material are not fed uniformly past the needle, any variations are held captive by the stitches, causing 'feeding pucker'.

The two most common causes are:

- If the foot pressure on the machine is too high, excessive friction can stretch the top ply. If the foot pressure is too low, the foot can bounce, momentarily losing control of both plies
- Operator stretches one ply more than the other as they are fed into the machine
- Many seams exhibit both conditions when the operator attempts to correct the unequal feeding of the fabric into the machine.

To identify unequal feeding, make two cuts across the seam, then remove all sewing threads between the cuts. If one ply is longer than the other, the pucker is caused by unequal feeding.

