

AMANN Education Suite · Learning Stream LS 19 Embroidery / Punching
Technical Advisory Services (TAS)

Learning Nugget LN 029

Sewing vs. Embroidery – Machines and Process Logic

Learning Hub · prepared by Gherzi Germany for AMANN Group
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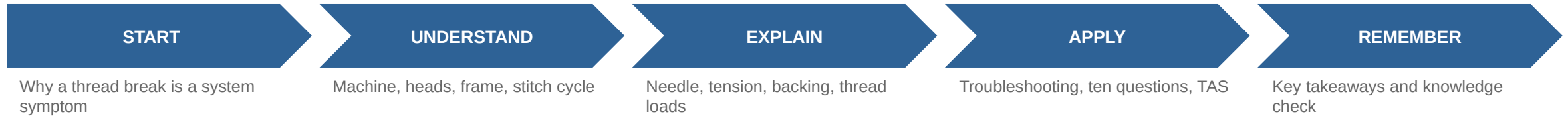
What you will learn – and what you should be able to do afterwards

LEARNING QUESTION



What is technically different between sewing and embroidery – and why does this matter when advising an embroidery customer about thread?

YOUR LEARNING JOURNEY



AFTER THIS NUGGET YOU CAN

- Explain in two sentences what an embroidery machine shares with a sewing machine and what is different.
- Name the components of an embroidery head and read a fault pattern: one head – all heads – one needle.
- Say how needle, tension, fabric, backing and framing decide whether the thread runs – and when the thread is a plausible cause.
- Ask the ten questions and decide: first-level answer, sample request or a case for Technical Advisory Services (TAS).



WHO THIS IS FOR

AMANN employees in Sales, Technical Sales, Technical Service, Application Consulting, Customer Service and Product Management.

You know threads and textiles. You may never have stood next to a running embroidery machine. This nugget does not train operators or digitizers – it prepares the customer conversation.

A thread break is the end of a load chain – the thread shows the fault, it is not automatically the cause

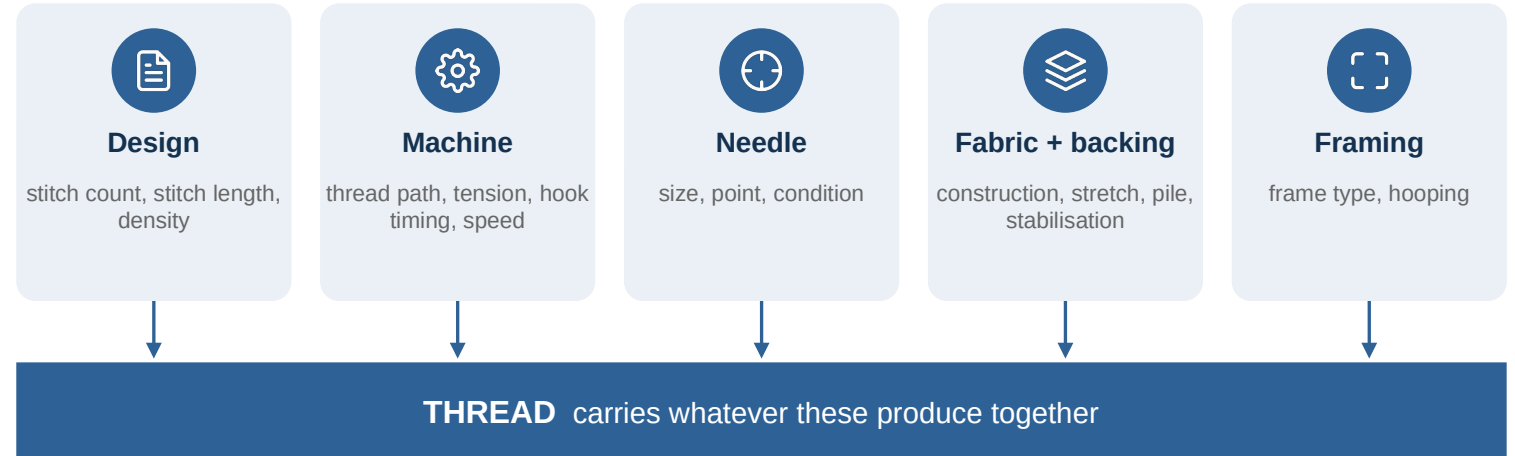
Customer Relevance

“The thread is breaking on our machine.”

An embroiderer says this on the phone. He runs a twelve-head machine, has a delivery on Friday and has already decided that the thread is the problem: it is the part that broke and the part he can exchange by tomorrow.

Is the thread necessarily the problem?

WHERE THE LOAD ON THE THREAD IS GENERATED



AMANN Perspective

Six items the AMANN Technical Sales Training asks Sales to collect before a technical assessment

- 1 good artwork
- 2 the DST file, if one exists
- 3 size and location of the embroidery
- 4 thread type and size
- 5 fabric type – ideally a sample
- 6 a precise description of the customer issue

POINT TO REMEMBER

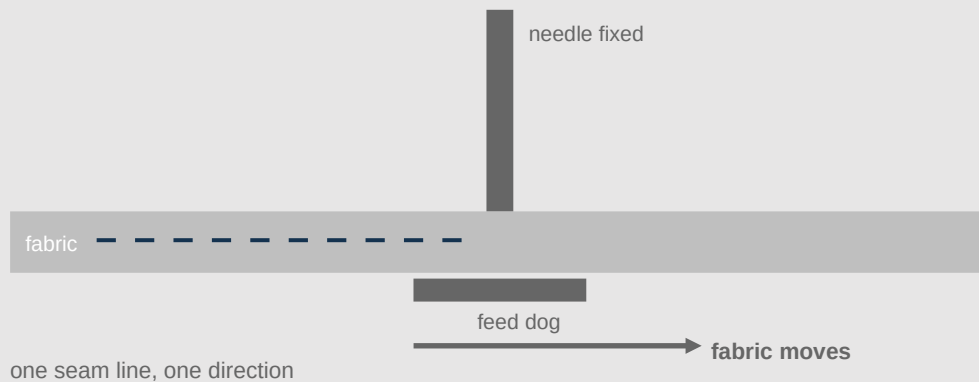
A thread break is a symptom of the system. Ask for the pattern – which heads, where in the design, since when – before you discuss the product.

Same hook, different logic: in sewing the operator guides the fabric, in embroidery the data guides the frame



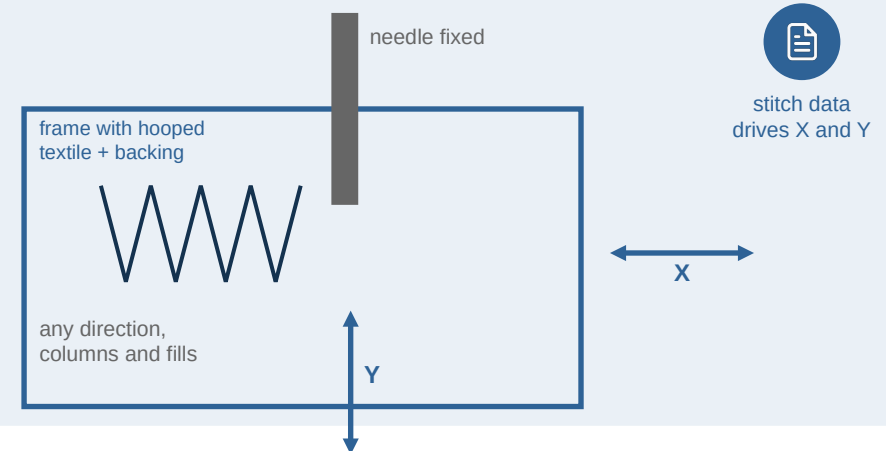
INDUSTRIAL SEWING

Joins components – the result is a seam



MACHINE EMBROIDERY

Builds a picture – the result is a design



SHARED: both form the lockstitch with a rotating hook – needle thread and bobbin thread interlace. The AMANN training states it in two points: same rotating hook as a sewing machine; frame movement in x- and y-direction.

A SEAM IS JUDGED BY FUNCTION

strength · elasticity · tightness · clean stitch line

AN EMBROIDERED DESIGN IS JUDGED BY EYE

coverage · sharp edges · readable lettering · colour · shape retention



Lockstitch sewing and embroidery share the stitch formation, not the process. In embroidery the data moves the material, the design sets the load, and the visible result is the product.

What changes when the data moves the material – six points of comparison

INDUSTRIAL SEWING

MACHINE EMBROIDERY



Material movement

Feed dog, puller or walking foot moves the fabric forward through the machine

The frame moves the hooped, stabilised textile in X and Y; the needle position is fixed



Operator influence

High: guiding, speed, handling

Low while stitching: the operator hoops, loads, threads and watches; the machine follows the data



Digital data

Usually none, except on programmable sewing

Stitch coordinates and key machine commands are defined in the embroidery data before execution; machine settings still influence how the design is produced



Stitch direction & thread changes

Along the seam line; rare thread changes – one thread for a long run

Any direction; satin columns reverse with every stitch; frequent colour changes inside one design, one colour per needle



Machine configuration & speed

One head, one needle (two or three on multi-needle seams); speed depends on machine class

1 to 72 heads, on average 12 to 15 needles per head; average 750 to 850 stitches per minute, max. 1,800 (AMANN training, 2021)

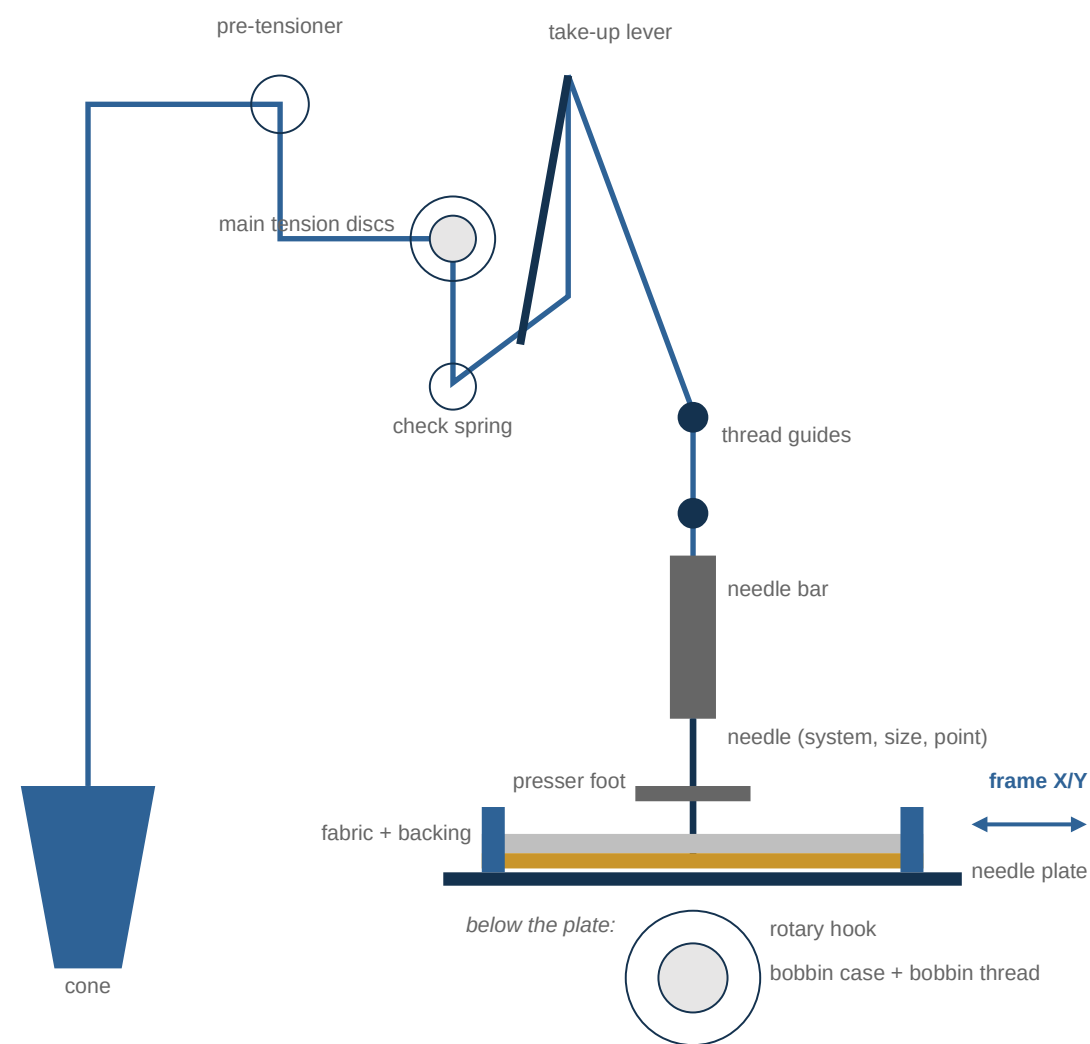


Visual quality & failure modes

Even stitch line, no skips, correct tension; skipped stitches, seam pucker, thread breakage, needle damage

Coverage, sharp edges, readable lettering, no show-through, lustre; thread breakage, looping, poor coverage, registration faults, puckering, bird-nesting

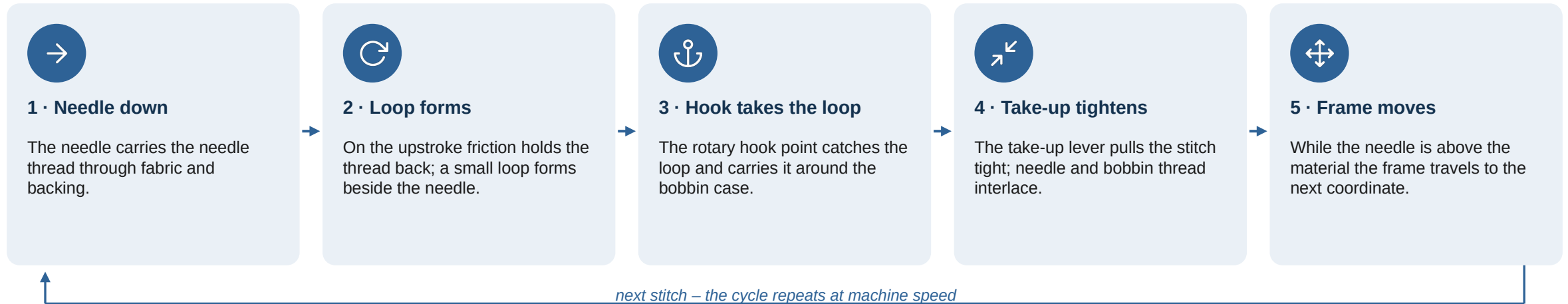
One head, one thread path, ten components – name them and the customer's description locates the fault



Schematic side view of one head – drawn by the authors, not a specific manufacturer. Source: LN 029 V05 chapter 3.2 / 3.3.

COMPONENT	WHAT IT DOES	WHAT GOES WRONG HERE
Embroidery head	one complete stitching unit; a multi-head machine repeats it along a beam	a fault on one head only – threading, a tension disc, a needle
Needle bar and needle	drives the selected needle through fabric and backing, once per stitch	wrong size, point, bent or blunt needle, wrong insertion depth
Thread path and guides	lead the thread from cone via pre-tensioner, main tension, take-up lever to the needle	a missed guide, thread wrapped around a guide, a grooved guide
Tension system	sets the needle-thread tension; the bobbin case sets the bobbin-thread tension	too tight: breaks, puckering, bobbin thread on top · too loose: loops, soft edges
Take-up lever	feeds thread for the loop and pulls the stitch tight after the hook has carried the loop	timing or thread-path faults show as irregular tension and loops
Rotary hook	its point catches the needle-thread loop and carries it around the bobbin case	damaged point, wrong timing, wrong needle-to-hook distance: skips, breaks
Bobbin and bobbin case	supply the bobbin thread – pre-wound or self-wound	bobbin tension, dirty or damaged case, unsuitable bobbin thread
Frame and pantograph	hold the stabilised textile and move it in X and Y exactly as the data prescribes	loose hooping, slipping fabric, frame too large: registration, distortion
Needle plate	supports the material at the point of penetration	damaged hole edges abrade the thread
Multi-needle system	several needle bars per head; the head selects the needle for the next colour	one mis-threaded or damaged needle position affects one colour only

One revolution of the main shaft is one stitch – the frame can only move while the needle is out of the material



≈ 75 ms

per stitch at 800 stitches per minute ($60 \text{ s} \div 800$)

The frame move has to fit into the part of the cycle in which the needle is clear of the material.

WHAT FOLLOWS FROM THE CYCLE



Long stitches and jumps

The frame has further to travel in the same window – the machine slows down. A design with many jumps and trims runs more slowly than its stitch count suggests.



Very short stitches – small lettering

The machine keeps full speed, and the thread changes direction at every stitch. The load on the thread is highest exactly where the customer wants the finest result.

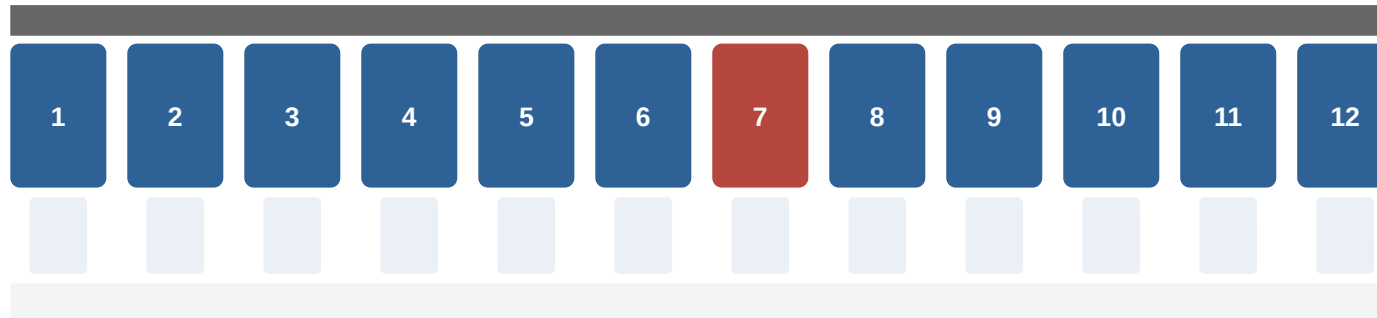


Speed is a system variable

Head count, needle count and speed in the AMANN training are typical values, not limits. When it matters, ask for the actual configuration: which machine, how many heads, which speed.

All heads read the same data – so the fault pattern tells you where to look before you look at the thread

A TWELVE-HEAD MACHINE: ONE FILE, TWELVE OUTPUTS



frame – all twelve pieces move together, driven by the same stitch data

ONE HEAD ONLY

Points first to head-specific factors or the individual cone:

needle, threading, tension discs, hook timing, needle plate – or that one cone

The design and a whole thread lot would show on all heads.

ALL HEADS AT ONCE

Almost never a mechanical fault of a single head. Points to a global factor:

the file, the thread lot, the material, the backing, a global setting such as speed

A systematic thread-lot issue becomes plausible only when comparable problems occur across heads, designs or machines using the same lot.

AMANN Perspective

The first check costs nothing: the cone swap

Move the cone from the faulty head to a good head.

Fault moves with it → it is the cone.

Fault stays on the head → it is the head.

You can say this on the phone; the customer saves a day of thread trials.

Customer Relevance

“Thread breaks on head 7 only; the other eleven heads run the same cone lot without a problem.”

All heads execute the same data. The fault limited to head 7 initially points more strongly to head-specific factors or the individual cone – needle, threading, tension discs, hook timing, needle plate. A fault occurring consistently on one head strongly suggests a head-specific or cone-specific cause rather than the design.



A cone swap is a useful first isolation check; a thread-lot hypothesis requires broader, reproducible evidence.

The machine type decides how the material is held – and that decides which questions you ask



FLAT-BED

AMANN training

Table under the heads; primarily used for unfinished goods and fabrics; large-format designs can be stitched.

What follows from it

Cut pieces, fabric by the metre, badges and emblems in border frames, large designs. The material lies flat and can be stabilised well.



TUBULAR / FINISHED GOODS

AMANN training

Commonly used when embroidering finished goods, e.g. shirts; found mainly in North America and Europe, less common in the Asian market.

What follows from it

Finished polos and sweatshirts, caps with cap frames, bags. Only one layer passes under the needle; hooping and stabilising demand more care.

FOUR SPECIAL ATTACHMENTS IN THE AMANN TRAINING

each with the AMANN thread named for it

Sequin embroidery

Sequins fixed by stitches

Serafil fine

a fine, strong filament thread holds the sequin without covering it; the needle works close to a hard object

Drilling / boring

The borer opens a hole; the thread embroiders around its edge

Isacord or Serafil

stitching over a cut edge – resistance to abrasion and fraying matters

Moss (chenille) and chain

Special machine or a separate head; cones sit underneath, thread pulled up from below

Sabatex 60

not a lockstitch: a loop-forming yarn, a different stitch formation and thread feed

Cord embroidery

A cording device lays a cord and fixes it with a zigzag stitch

Serabraid as the cord

the cord is the visible material; the fixing thread must be fine and must not cut into it



Customer Relevance

When a customer mentions sequins, boring, chenille or cording, the standard embroidery-thread conversation does not transfer one-to-one. Ask which attachment and which head, and involve TAS for the product choice. Appliqué and 3D puff are not part of the AMANN training but common in practice; the product choice for them is confirmed with TAS.

The frame moves precisely – the fabric must not move inside it

FRAME TYPES IN THE AMANN TRAINING



Frames for ready-mades

finished garments on tubular machines – hold one layer without the rest of the garment getting under the needle



Single frames

cut pieces before assembly – flat, tight hooping, the easiest material control



Plastic frames

the cheapest option; “a little bit slippery” – the fabric can move



Cap frames

a curved frame holds the cap front; the curvature limits design width and stitch direction



Border frames

a strip of fabric clamped along its edges – many designs per frame, no re-hooping



Magnetic frames

finished goods, thick or delicate materials – hold very well; the training calls them the best frames

TWO RULES FROM THE AMANN TRAINING – AND WHY

1

Hoop the fabric tightly; pay attention to elastic fabrics.

An elastic fabric must be held without being stretched, otherwise the design contracts when the piece comes out of the frame.

2

Select the smallest possible frame – the smaller the frame, the easier it is to stabilise the fabric.

A large frame around a small design leaves unsupported fabric that flexes with every stitch.



Customer Relevance

How a framing fault presents itself



Outlines do not meet the fill (“registration is off”)

the fabric moved in the hoop between fill and outline: hooping too loose or frame too large



The design is narrower than the file

elastic fabric was stretched during hooping and relaxed afterwards



Puckering around the design

fabric not held flat; backing too weak for the stitch count; the pull of dense stitching not controlled



Thread breaks in one area of the frame

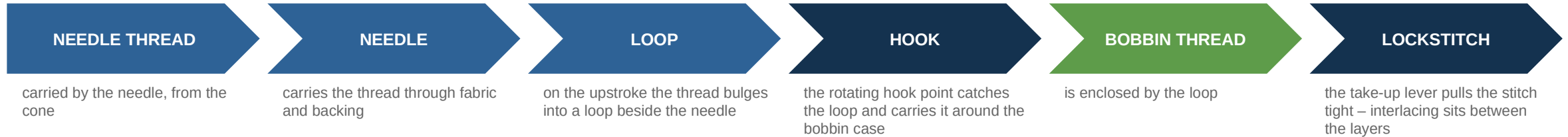
fabric flapping at the unsupported edge of a large frame; the needle deflects



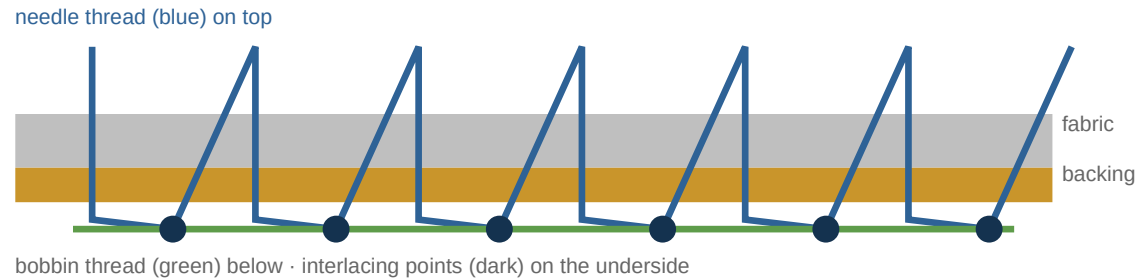
POINT TO REMEMBER

If the fabric slips, stretches or flaps inside the frame, the result looks like a bad file or a bad thread. Tight hooping, the smallest suitable frame and a frame type that fits the product are quality factors before the first stitch.

The stitch is made in a few millimetres: needle eye, loop, hook point



CROSS-SECTION: WHERE THE INTERLACING SITS



One difference to a seam belongs here: in sewing the interlacing is normally controlled within the material. In embroidery, needle-thread and bobbin tension are adjusted to achieve stable stitch formation and the required appearance.



Technical Knowledge

Tension: a practical diagnostic reference, not a universal setting

≈ 1/3 bobbin thread

≈ 2/3 needle thread

visible on the underside of a conventional satin-stitch tension test

Needle-thread and bobbin tension together decide where the interlacing sits. The reference above is a check for a conventional satin-stitch test – not a setting for every thread, machine or application.

Too tight: breaks, puckering, bobbin thread pulled to the surface. **Too loose:** loops of needle thread on the surface, soft edges.



Most “thread problems” that reach AMANN are decided within a few millimetres around the needle eye and the hook point.

Four relationships decide the stitch – the thread cannot compensate for a mismatch



Thread size ↔ needle size

THE RULE

The thread passes freely through the eye and lies protected in the long groove.



WHEN IT IS WRONG

Thread too thick for the eye: friction, fraying, breaks. Thread too thin: an unstable loop, skipped stitches, large needle holes.



Needle point ↔ fabric structure

THE RULE

Point style depends on fabric construction, elasticity and the risk of material damage – RG, R and FFG are point examples used in embroidery. Select the point per needle-manufacturer recommendation.



WHEN IT IS WRONG

Cut loops in knits that open after washing; needle deflection in dense wovens; damaged fibres around the design.



Thread ↔ needle eye

THE RULE

Embroidery needle systems have an enlarged, polished eye; a shiny filament thread needs a smooth eye without burrs.



WHEN IT IS WRONG

A burred eye shreds filament thread – the classic case of “it breaks only on this needle”.



Needle ↔ hook timing

THE RULE

The hook point reaches the loop at the right height and moment; needle depth and orientation are correct.



WHEN IT IS WRONG

Skipped stitches, thread cut by the hook point, breaks on one head only.

NEEDLE SYSTEM IN THE AMANN TRAINING – e.g. DB x K5

The system defines shank, length and geometry for the machine; DB x K5 is a widely used embroidery system with an enlarged eye. The customer's machine determines the system – it is not a free choice. The point designations are the needle manufacturer's, not AMANN's; LN 027 provides the detailed selection logic.



AMANN Perspective

Practical note from the training: insert the needle and turn it slightly to the right – it brings the loop closer to the hook, a field practice reported for metallic threads.

The stitches sit on the backing, not on the fabric alone – a wrong backing looks like a thread problem

Tear-away

AMANN TRAINING

for stable fabrics without stretch; as the name suggests, it can easily be torn away on the back

WHY

A stable woven needs support during stitching, not afterwards. Tear-away leaves a clean back.

A practical starting rule for stable wovens

Cut-away

AMANN TRAINING

for fabrics which need more stabilisation; prevents distortion during and after embroidery; used on knits and other stretchy material

WHY

A knit stretches and recovers; the stitches do not. Without permanent support the design distorts with every wear and wash. Cut-away stays in the garment.

Permanent support for knits and stretch-sensitive material

Water-soluble film

AMANN TRAINING

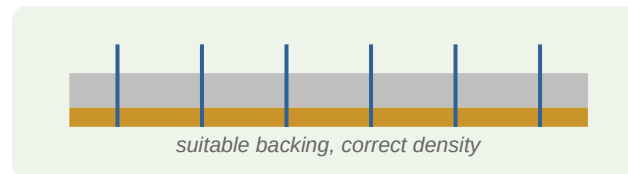
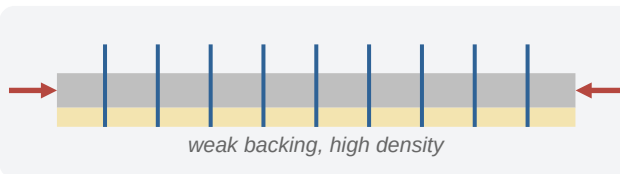
named in the training as a further stabiliser

WHY

Placed on top of pile fabrics – terry, fleece – as a “topping”, so the stitches do not sink into the pile; also a carrier for free-standing designs. Dissolves in water.

Topping on pile; carrier for free-standing designs

WHY MORE DENSITY DOES NOT CURE PUCKERING



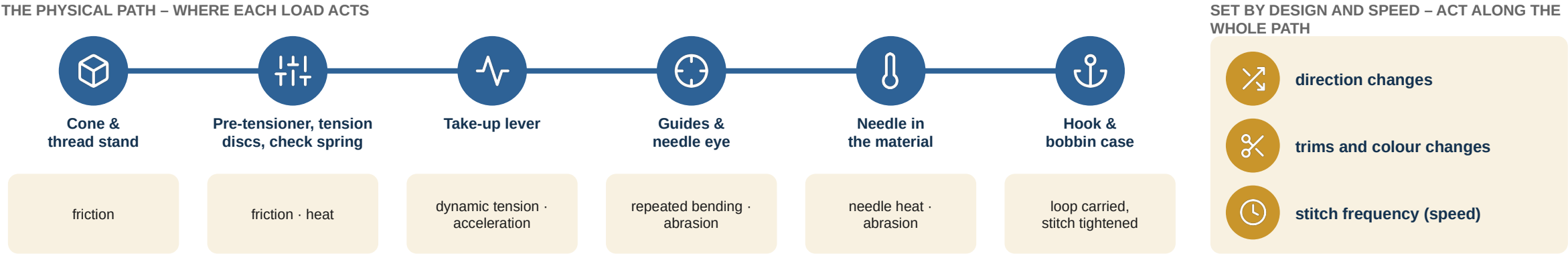
A design with a high stitch count pulls the fabric together with every stitch. If the backing does not resist that pull, the fabric puckers, satin columns come out narrower than designed and fills show gaps. Raising the density increases the pull. The remedy is stabilisation – backing type, number of layers, hooping – not a heavier thread.



Customer Relevance

A promotional-wear embroiderer moves a logo that runs well on twill caps onto fleece jackets: “the letters look thin and the fabric wrinkles – is this a different thread lot?” Same thread, same file. Fleece stretches and has pile. A cut-away instead of the tear-away and a water-soluble topping bring the letters back; the design may also need a lighter density for the softer material.

From cone to stitch the thread is bent, rubbed, heated, jerked and reversed hundreds of times a minute



An embroidery thread is engineered for this load profile – and for the visual result

FROM LOAD PROFILE TO PROPERTY PROFILE



Even thickness, smooth closed surface

so that friction stays low and constant



High tenacity with a reserve of elongation

to absorb the dynamic peaks



Raw material and finish survive the needle eye at high stitch rate

heat and abrasion



Lustre, colour depth and colour fastness

because the thread is the visible product

Sewing thread: optimised for seam strength and sewability along one line at one tension.

Embroidery thread: optimised for thousands of direction changes at high stitch rate with a visual result. That is why AMANN carries dedicated embroidery products – and why “we use our sewing thread for the logo” deserves a question.



The second thread is easy to forget

The bobbin thread is finer than the needle thread, keeps the back flat and runs longer between changes. Its tension is set at the bobbin case; when a customer complains about the back – loops, show-through, a hard feel – look at bobbin thread and bobbin tension first.

AMANN EMBROIDERY THREADS IN THE TRAINING – THREE GROUPS

Classics

polyester continuous filament ticket 40 – needle thread, bright and shiny · polyester/polyamide wrapped yarn 40, 50 – metallic · spun polyester 150, 180 – bobbin thread

Specials

e.g. PBT/PP filament 40 – shiny and fine · polyester filament 180, 300, (420) – dull, “rustic” · core-spun (...), 120, 150 – shiny and coarse · filament 30 to 80 for special embroidery machines

Technical & Functional

e.g. spun cotton (30, 40,) 50, 60 – garment dyeing · meta-aramid 70, 120 – flame retardant, heat-protective · polyamide/polyester hybrid – conductive · special-finish filament 60, 180, 300 – composites

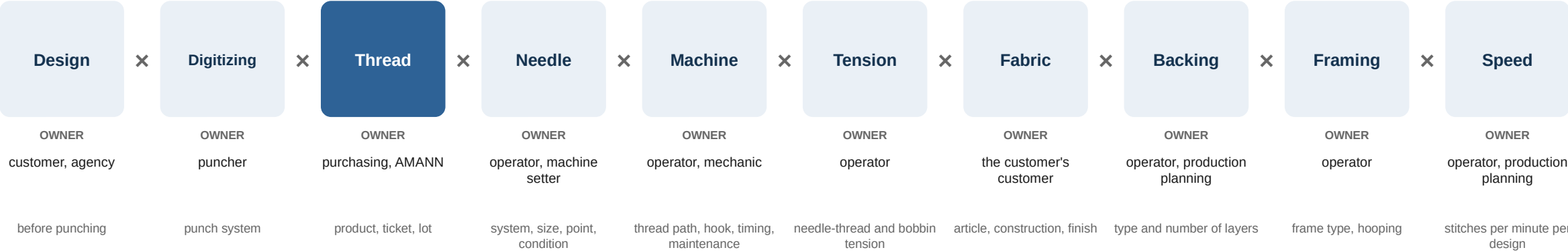
Raw material · construction · ticket · use as needle or bobbin thread · appearance or application – the same logic as the LS 16 portfolio stream. Reproduced from the training without interpretation; the product choice for a specific case is confirmed with TAS.



Handling and storage – trade practice, not in the training

A cone that fell over, was crushed or lost its bottom layers unwinds unevenly; filament and metallic threads slip off in loose coils – a thread net helps. Dust, lint, direct sunlight and very dry or humid storage change how a thread runs. “The thread runs badly” may describe a cone that stood in a window for a year.

Embroidery quality is a system result: ten factors, one product – the thread is one of ten



= the embroidered result the customer judges by eye

Technical Knowledge

The multiplication sign is conceptual, not mathematical.

It illustrates that a critically weak factor – a damaged needle, excessive design density, insufficient stabilisation – may dominate the final result and cannot necessarily be compensated by excellence elsewhere. An excellent thread does not lift a badly set system.

AMANN Perspective

The thread is one factor of ten – and often one of the easiest to change, which is why it may be suspected early.

For the AMANN employee this has one practical consequence: in every conversation, walk the ten factors in your head before you accept the thread as the cause. Your job is to check the other nine.

Symptom → causes → checks → questions → action → thread relevance: never start with the thread

SYMPTOM	POSSIBLE CAUSES	WHAT TO CHECK	QUESTIONS TO ASK	POSSIBLE ACTION	THREAD RELEVANCE
Thread breakage	first: real break or sensor stop? (a loose thread or slack cone trips the sensor) · needle · tension too high · thread-path fault · hook timing · excessive density or very short stitches · speed · heat	which heads and needles; where in the design; since when; threading; density in the punch file	does the thread actually break, or does the machine stop and the thread is intact? one head or all? which ticket? only in small lettering? only at high speed? same cone lot everywhere?	change needle, re-thread; reduce tension or speed for a test; check hook; have density and stitch length reviewed	plausible if all heads and all designs fail since a lot change, or if ticket and needle do not match – otherwise low
Puckering	backing too weak or wrong type · hooping too loose or fabric stretched · density too high; tension too high	backing type and layers; hooping; density in the file	which backing? woven or knit? same design fine on other fabrics? how was it hooped?	cut-away or an extra layer; reduce density; reduce tension	low – a heavier thread does not solve puckering
Poor coverage, show-through	density too low for the fabric and ticket; wrong underlay; a finer ticket than the design was punched for; backing too weak	punch file settings; ticket used vs. ticket planned; underlay; backing with pile	which ticket was the design punched for? which ticket is on the machine? fabric with pile?	adjust density and underlay; use the ticket the design was made for; topping on pile	high – a ticket mismatch between punch file and machine is a frequent cause
Small lettering unreadable	letters below the minimum size for ticket and column width; density too high for narrow columns; wrong ticket; stitch length too short	letter height; column width; density	how high are the letters? which ticket? punched for this size or scaled down?	re-punch for the size; a finer ticket with the matching needle; a simpler font	high – a finer embroidery thread is often the right answer, with the needle to match

Four of the eleven symptoms in the master document. Causes are listed in a practical checking order – the cheapest and quickest checks first; every case still has to be checked on its own. Where the mechanism is the same as in a seam – needle, tension, hook timing – LN 026 gives the detailed diagnosis.

Ten questions turn “your thread breaks” into a case that can be assessed

Artwork

1

What does the design look like – can you send the artwork? Vector or bitmap, and how large is the original?

Why: Artwork quality decides how much the puncher had to guess (LN 030).

Machine file

2

Do you have the DST or another machine file, and the original punch file? Who punched it?

Why: The DST shows what the machine executes; the punch file allows changes.

Embroidery size

3

How large is the embroidery in millimetres, and how high are the smallest letters?

Why: The minimum feature size drives ticket, needle and density.

Location, application

4

Where is it embroidered – polo chest, cap front, shoe, badge, workwear? Finished good or cut piece?

Why: The application defines frame type, machine type and stabilisation.

Fabric

5

Which fabric – woven or knit, weight, stretch, pile, coating? Can you send a sample?

Why: The fabric decides backing, needle point and pull behaviour.

Thread type

6

Which product exactly – needle and bobbin thread? AMANN or other? Which lot?

Why: Product and lot identify what is on the machine. “AMANN” alone is not an answer.

Thread size

7

Which ticket no.? Is it the ticket the design was punched for?

Why: A ticket mismatch is a frequent cause of coverage and lettering problems.

Needle

8

Which needle system, size and point? When was it changed?

Why: Needle-to-thread and needle-to-fabric fit decide the stitch.

Machine

9

Which machine – make, flat-bed or tubular, how many heads, which attachments? Speed and tension?

Why: Locates the problem: one head or all, and how the material is held.

The problem itself

10

What exactly happens – a real break or a sensor stop – where in the design, on which heads, since when, and what has changed?

Why: Turns the complaint into a pattern – the basis of every diagnosis.

The ten questions expand the six items of the AMANN sales information list. In practice the customer opens with question 10, and the AMANN employee walks back up the list. Write the answers down – TAS needs exactly these facts.

Decide with the pattern: first-level answer, sample request or a case for Technical Advisory Services

WHAT THE PATTERN POINTS TO

FIRST LEVEL – SALES, CUSTOMER SERVICE

TECHNICAL ADVISORY SERVICES (TAS)

 Information incomplete	collect the ten answers, the artwork, the DST and a fabric sample first	not yet – TAS cannot assess without them
 One head, one needle or a recent machine change	suggest needle change, re-threading, tension check; ask for feedback	if the customer cannot resolve it, or asks for a visit
 The file – coverage, lettering, density, consumption	explain the ticket–design relationship; ask for punch file and DST	yes – TAS reviews the file and recommends ticket, density and needle
 Material or backing	explain the tear-away / cut-away logic; ask for a sample	yes, with the sample, for a trial embroidery
 The thread – all heads, all designs, since a lot change	secure lot number, cone label and the remaining cones; do not speculate on the cause	immediately – lot investigation, comparative embroidery, quality process
 Special applications or technical threads	record attachment and requirement	yes – product selection with TAS
 Customer asks for a written technical statement or product recommendation	never from memory	always

 Ten questions, one rule: collect the facts TAS needs before you interpret. Involve TAS when the pattern points to the file, the material or the thread lot – and always before a written technical statement.

Practical example: two needles shred the thread – the pattern is read before the product is discussed

Customer Relevance

A customer embroiders a fine polyester filament thread on cotton piqué polos and reports “shredded thread on two needles”. The machine is a fifteen-needle head. He wants a replacement lot by Friday.

1 · Read the pattern

Two needles out of fifteen. The other thirteen run the same thread and the same design without a fault. That points to those two needle positions – or to their two cones – not to the thread lot, which would show on all fifteen.

2 · Ask before the thread

Which needle system and size are on those two needles – the same as on the other thirteen? When were they replaced? Is the eye damaged? Do the same two cones run without fault when moved to other needles?

3 · The cheapest check

Swap the two cones to other needle positions. Fault moves with the cones → the cones. Fault stays with the positions → check needle system, size and the condition of the eye: a burred eye shreds filament thread.

4 · Decide

First-level answer with the needle check; if the fault stays and the customer cannot resolve it, TAS – with the answers written down. A replacement lot is not the first step, because a whole lot would shred on all fifteen needles.

AMANN Perspective

Compare the workwear case: a maker of polo shirts sews with a core-spun sewing thread and asks whether the same thread can run on the embroidery machine for the logo – “it is the same lockstitch after all”. The stitch formation is the same; the thread is not asked to do the same thing. Short stitches, direction changes at high stitch rate and a visible result ask for a thread built for embroidery. The answer starts with the process, not with the product list.

Heard in every embroidery company – and wrong for a reason you can now explain



“It is the same lockstitch, so our sewing thread will do.”



The stitch is the same; the load is not. Short stitches, constant direction changes, high stitch rate and a visible result ask for a thread built for embroidery.



“The thread breaks – so the thread is bad.”



A break is where the load shows, not where it comes from. Ten factors decide the load; the thread is one.



“It only breaks on one head, so it is a bad cone lot.”



A fault limited to one head points to that head or the individual cone. A systematic lot issue becomes plausible only when comparable problems occur across heads, designs or machines using the same lot – the cone swap is the first isolation check.



“Bad coverage? Use a thicker thread.”



Density is set for one ticket. A thicker thread in a file punched for a finer one gives a stiff, over-dense result; the file has to match the ticket.



“Puckering? Increase the density.”



More stitches pull the fabric more. Puckering is a stabilisation problem: backing, hooping, frame size.



“Tear-away is fine for everything.”



Knits and stretch fabrics need cut-away, or the design distorts in wear and wash.



“The machine says thread break, so the thread broke.”



The sensor also stops on a slack thread or a loose cone. Look at the thread before you blame it.



“We use AMANN thread” is a complete answer.



Product, ticket, colour and lot identify what is on the machine. Without them nobody can assess anything.

What you should remember – LN 029 in eight sentences



1 An embroidery machine forms the same basic lockstitch as a sewing machine; the process logic differs because stitch data controls the X/Y movement of the framed textile relative to the needle.



5 The stitch is made at the needle eye and the hook point; thread size, needle size, needle point, fabric and hook timing must fit together – the thread cannot compensate for a mismatch.



2 A machine has one to seventy-two heads and on average twelve to fifteen needles per head; all heads execute the same data – so the fault pattern tells you where to look.



6 The stitches sit on the backing: tear-away for stable wovens, cut-away for knits and stretch, water-soluble film on pile – as starting rules; more density does not cure puckering.



3 Flat-bed machines take fabric and cut pieces, tubular machines take finished garments; special attachments for sequins, boring, chenille and cord each have their own AMANN thread.



7 The thread is bent, rubbed, heated, jerked and reversed hundreds of times a minute and then shown as the product – that is why dedicated embroidery threads exist.



4 The frame moves precisely, so the fabric must not move inside it: hoop tightly, and use the smallest frame that fits.



8 Embroidery quality is a system of ten factors; the thread is one. Ask where, when and on what before you discuss the product; collect what TAS needs; involve TAS when the pattern points to the file, the material or the thread lot.

Knowledge check – four situations from the customer conversation

1 What moves the material under the needle in machine embroidery?

- A The frame, in X and Y, driven by the stitch data
- B The feed dog
- C The operator
- D The take-up lever

2 Thread breaks on head 7 of a twelve-head machine; the other heads run the same cone lot without faults. Where do you look first?

- A At head 7: needle, threading, tension discs, hook timing
- B At the punch file
- C At the thread lot
- D At the backing

3 A customer reports puckering around a dense logo on fleece and wants to increase density “for better coverage”. What happens?

- A The pull increases and the puckering gets worse
- B The coverage improves and the puckering stays the same
- C The puckering disappears
- D Nothing changes

4 A customer reports thread breaks on all heads and all designs since a new cone lot arrived. What do you do first?

- A Secure lot number, cone label and remaining cones, and involve TAS
- B Recommend a needle change
- C Ask for the punch file
- D Advise a lower density

Answers and reasoning on the next slide. Items K-1, K-3, K-9 and K-12 from the LN 029 knowledge-check set (twelve items).

Knowledge check – answers and why

1 A – the frame, in X and Y

The needle stays in position and the frame moves the hooped textile. The feed dog belongs to the sewing machine; there is none under an embroidery head.

Source: chapter 2.1

2 A – at head 7

All heads execute the same data. Only what is specific to head 7 – needle, threading, tension, hook, or the one cone feeding it – can explain a fault on head 7; the file or a whole lot would show on all heads. Move the cone to a good head first: if the fault moves with it, it is the cone.

Source: chapter 3.3

3 A – the pull increases and the puckering gets worse

Every stitch pulls the fabric together. More density means more pull. The remedy is stabilisation – cut-away, more layers, correct hooping – not more stitches.

Source: chapter 7.2

4 A – secure the lot and involve TAS

All heads, all designs, since a lot change: this is the one pattern in which the thread is the first candidate. The lot has to be secured and investigated; guessing at needle or file wastes the evidence.

Source: chapter 11.2

Near misses (option B in each item) are terms from LS 19 that are wrong for a reason that fits in one sentence – see the master document.

Sources, method and scope

PRIMARY SOURCE

AMANN Technical Sales Training, Process of Embroidery, Parts 1 to 3 (B. Nielsen, G. Wenzel, TAS, April to June 2021) – Part 2: Punching (05-2021); Part 3: Embroidery Machine & Accessories (06-2021).

Master content: Learning Nugget LN 029 – Sewing vs. Embroidery – Machines and Process Logic, GG-MOON-A2-LN029-DOC, V05, 14 September 2026 (Schumann / Selkind / Wied / Dhanshatty; Gherzi Germany GmbH for AMANN Group). This slideshow is derived from it and may not state anything that is not in it.

EXTERNAL VERIFICATION SOURCES USED IN V05

Groz-Beckert – machine needles for single- and multihead embroidery; DBxK5 LGR (2025). Confirms DB x K5 as a common embroidery needle system and that point selection is application-specific.

Madeira USA – thread tension gauge guidance (1/3 bobbin, 2/3 needle-thread underside reference); backing and topping guidance.

External sources support selected technical corrections; they do not replace AMANN product information, machine-manufacturer specifications or TAS instructions.

RELATED LEARNING NUGGETS

LN 021 ticket and Tex system · LN 025 stitch types (lockstitch, ISO 4915 class 300) · LN 026 seam defect diagnostics · LN 027 needle selection · LN 030 From Design to Embroidery – the DST / DSI workflow (next nugget in LS 19).

METHOD NOTE AND DISCLAIMER

Source research, literature analysis and data evaluation were carried out with the support of AI systems, among them Claude (Anthropic), ChatGPT (OpenAI), Perplexity and comparable tools. These systems were used to locate, compare and structure sources and data. Technical statements, standard designations, measured values and their attributions were reviewed by the authors against the underlying primary sources before release. Responsibility for the content rests with the authors.

This is learning material. It contains no product specification, no product recommendation and no assurance of product properties. Binding technical statements on AMANN products are made by the AMANN Group. Head counts, needle counts and speeds are typical values from the 2021 training, not machine specifications. Backing assignments and the tension reference are practical starting rules, not universal laws. Machine, needle and software designations are quoted as examples from the AMANN training and do not constitute an endorsement. Trademarks are the property of their respective owners.

Schematics on slides 4, 6, 7, 11 and 13 were drawn by the authors from the technical statements of the master document; they show no specific manufacturer's machine.

Thank you – next: LN 030 From Design to Embroidery

The moment the conversation moves from the machine to the file

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