

# *Trouble-free APQS Synchronous Belt helps ensure precise quilting.*

Synchronous transmission between the top needlebar shaft and the bottom hook shaft is a must to prevent slippage and maintain precise relative positioning.

The trouble-free APQS Synchronous Belt Drive helps ensure beautiful stitches, even at high speeds.

## ***Exactly How Do They Work?***

Synchronous belt drives work by engaging two sets of meshing teeth (pictured, left) that do not slip. By eliminating slippage you maintain precise relative positioning even as you push your quilting machine through constant changes in velocity and direction.

The positive nature of these belt drives makes them capable of transmitting large torque and withstanding quick accelerations.

This makes them perfect for maintaining a constant speed ratio and a permanent relative position, both extremely important in an application like high-speed machine quilting.

These reasons are probably why every major manufacturer of high-end industrial sewing machines use synchronous belt drives as their technology of choice to transmit power to both shafts.



## ***What Does This Mean To You?***

It means that your APQS longarm will produce beautiful stitches, even at high speeds. It also means that your machine will maintain its timing, which is the relationship between needle and hook.

## ***Reasons to use a Synchronous Belt Drive in longarm quilting machines:***

- Synchronous belts will not stretch and do not require lubrication. APQS Synchronous Belts are guaranteed for the life of your machine.
- Precise registration—synchronous belts provide timing and synchronization accuracy that make for flawless registration, with no loss of torque-carrying capacity. Synchronous transmission between the top needlebar shaft and the bottom hook shaft is a must to prevent slippage and maintain precise relative positioning; i.e. timing.
- Quieter operation—specially engineered teeth mesh cleanly with pulley grooves to reduce noise and vibration. No gearboxes, grease, or oil required.
- No need for lubrication (lubrication attracts dirt which can lead to wear.)
- Precision—synchronous belts are specifically designed for applications where precision is critical, such as plotters, machine tools, medical diagnostic equipment, industrial sewing machines, robotics, centrifuges, and DC stepper/servo applications.

## *APQS Smart•Bobbins control thread backlash and improve stitch quality.*

Inertia is the resistance of an object to a change in its state of motion. Inertia is good in flywheels, which help car engines idle smoothly...but bad in bobbins, because of the quilting machine's constant changes in speed and direction.

Due to inertia an unwinding bobbin may accelerate too rapidly or continue to rotate in the unwinding direction after the thread ceases to be pulled from the bobbin. This results in loosened turns of thread known as "backlash." This backlash is responsible for unsightly looking stitches commonly referred to as loops, bird nests, etc. Backlash occurs after the take-up lever has pulled the stitch tight. If allowed, the bobbin would continue to spin causing the bobbin thread to be thrown out of the groove in the bobbin resulting in very loose tension as the machine starts up again. Backlash is undesirable in all types of sewing machines and is especially troublesome with high speed quilting machines where many starts, stops and changes in speed and direction are commonplace.

Our Smart•Bobbin has almost 50% less mass than the oversized bobbin. Lower mass means lower inertia, so it can stop and start, slow down and speed

up faster and easier. Lower mass and inertia mean that less tension is required to control the bobbin. Less bobbin tension enables you to quilt with less top tension. That produces the beautiful stitches for which APQS longarm machines are famous.

Lower operating tension also reduces rubbing friction of thread through the needle eye. This enables you to use a wider range of thread types – from delicate cottons, silks and specialty threads to sturdy polyesters.

### *The advantages of our Smart•Bobbin:*

- Enjoys almost 50% less inertial mass.
- Very low moment of inertia allows high speed quilting at lower tension levels.
- Lower bobbin and top thread tensions produce beautiful quality stitches.
- Less inertial mass enables you to quilt with a wide variety of thread types.



Smart  Bobbin



### Benefits:

- No supplemental lubrication required.
- Won't stain quilts.
- Low wear, long life.
- Quiet and smooth running.
- Ultra precise with high positional accuracy.
- Provides even lubrication across the bearing face.
- Bored and honed to critical ID tolerances.
- Operates in a wide temperature band.
- Needlebar shafts microfinished to 8 RMS.

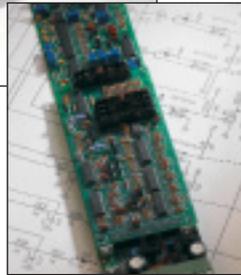
## *APQS self-lubricating bushings never need oiling.*

Self-lubricating needlebar and hopping foot bushings are another reason APQS longarm quilting machines are superior. Surfaces that slide cause friction and wear. Rather than require the quilter to continually lubricate the bushings and risk staining quilts with oil, APQS designers specified self-lubricating bushings.

They are made of sintered bronze that is impregnated with the highest quality oils available. Microscopic pores in the bronze distribute oil evenly across the bearing face, regardless of room temperature. These bearings will provide you with many years of trouble-free service.

PSI load, shaft velocity and diameter were carefully studied before the bushings were specified. Upon arrival from our supplier, our bushings are further precision bored and honed to our critical ID tolerance. In addition, APQS shafts are precision machined and polished to our superior micro finish requirements of 8 RMS (root mean square). This dedication to quality and extra effort is yet another example of APQS's commitment to building you a quilting machine that will provide you with a lifetime of enjoyment and pleasure.





## Benefits:

- Produces stitches of uniform length, adding to the professional appearance of quilts.
- Lets you select 7 to 15 stitches per inch.
- Automatically compensates as you move the quilting head faster or slower or change direction.
- Makes perfect star points and squares with crisply defined corners, even starts and stops with no extra stitches.
- Greater reliability – not as sensitive to electrical surges and interference.
- Designed for the exact requirements of the Millennium, Freedom SR and Liberty.

## *APQS stitch regulators produce consistent stitches at any speed.*

The APQS Stitch Regulator is our proudest accomplishment to date. It produces stitches of consistent length – even as you change quilting speed or direction and makes perfect star points and squares with crisply defined corners. You can see and hear the motor and needle speed up or slow down as you move the quilting head faster or slower.

Simply select 7 to 15 stitches per inch and every stitch will be the same, giving your quilts a professional look that is unmistakable. The stitch regulator also reduces practice time, allowing you to begin quilting faster.

A handy gauge confirms the stitches per inch you've selected with the stitch regulator in "On" position. It also tells stitches per second when you quilt manually.

A product of advanced APQS engineering, the Automatic Stitch Regulator has no lag time when adjusting the needlebar speed on the fly during freehand quilting. That gives you greater control.

It also makes perfectly square corners without rounding them off. The APQS Stitch Regulator has far greater tolerance for electrical surges and interference for improved reliability.

APQS Stitch Regulated models are the machine of choice by quilt artists, instructors and custom quilters worldwide.

## *APQS horizontal wheels enable effortless movement.*

Our horizontal wheels and track system are another example of the superior design found on APQS long-arm machines. Our innovative guiding system absorbs residual vibration while allowing the head to move effortlessly.

The horizontal wheels are fully adjustable to eliminate both binding and play without sacrificing stitch quality. The quilting head is kept at an exact 90-degree angle, which is essential for running patterns and other precision quilting.

This exclusive system includes a set of wheels directly below the head for forward and backward movement. Another set of lower wheels allows sideways movement. You can quilt in any direction fluidly with ease. This is what makes APQS longarms the preferred choice for freehand quilting artists.



### **Benefits:**

- Effectively absorb vibration.
- Fully adjustable to eliminate play while preserving stitch quality.
- Maintains your quilting head at a 90-degree angle for precision quilting.
- Allow 360-degree range of movement for the needle.
- Enables effortless movement
- Quilts in any direction with ease.



## *APQS multi-position handles reduce fatigue and improve your quilting.*

The curved handles on the front of APQS machines are ergonomically designed and adjustable to “fit” your individual size and shape. You are not forced to adapt to the machine – it adapts to you.

The handles reduce fatigue in the wrists, arms and shoulders. You won’t have to work with the combination of raised shoulders, outward bent elbows, and downward bent neck. This minimizes the possibility of musculoskeletal injuries.

Our handles are horizontal and adjust up and down to diminish the risk of carpal tunnel, shoulder, and elbow problems. They may feel different than upright handles at first, but you’ll soon get the hang of them and agree that they are much less stressful to your body.



They let you quilt with your hands as close to the “drawing area” as you prefer. It’s a lot like a pencil. You can draw easier and with greater control when you hold a pencil near the point rather than the eraser. At the same time, the handles provide excellent visibility of the quilting area.

Important function controls for the machine are at your fingertips, where they are instantly accessible without removing your hands from the comfortable handles.

### **Benefits:**

- Our handles are friendly to your body with areas of precise adjustment to “fit” you.
- Provide lasting comfort after long hours of quilting with less fatigue and the reduced possibility of musculoskeletal injuries.
- Up and down horizontal adjustment helps prevent carpal tunnel, shoulder, and elbow injuries while giving you superb visibility.
- They enable greater control through close proximity to work and effortless access to function buttons.

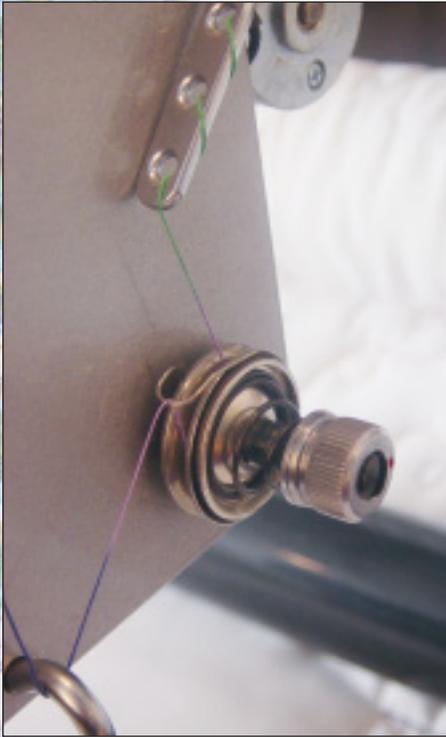
## *APQS thread tensioner handles decorative threads with ease.*

As its name suggests, the thread tensioner on long-arm machines maintains proper thread tension to help prevent backlash that can result in loops on the quilt back.

APQS uses the highest quality industrial grade disc tensioners. Experienced quilters prefer the tensioner used on APQS machines because it adjusts tension as the thickness of the thread changes. It handles any kind of thread, including delicate decorative and variegated threads with no worry about stretching or breaking the thread.

What about hand-dyes and the slubs found in some textured threads? No problem! You can use virtually any kind of thread from heavy polyesters to fussy cottons.

Plus, the simplicity of the APQS tensioner ensures many years of trouble-free service.



### **Benefits:**

- Helps prevent thread backlash and loops.
- Gives you the freedom to use any kind of thread – including delicate decorative threads.
- Compensates for changes in tension as the thickness of the thread changes to prevent stretching or breaking the thread.
- Simple, trouble-free design.