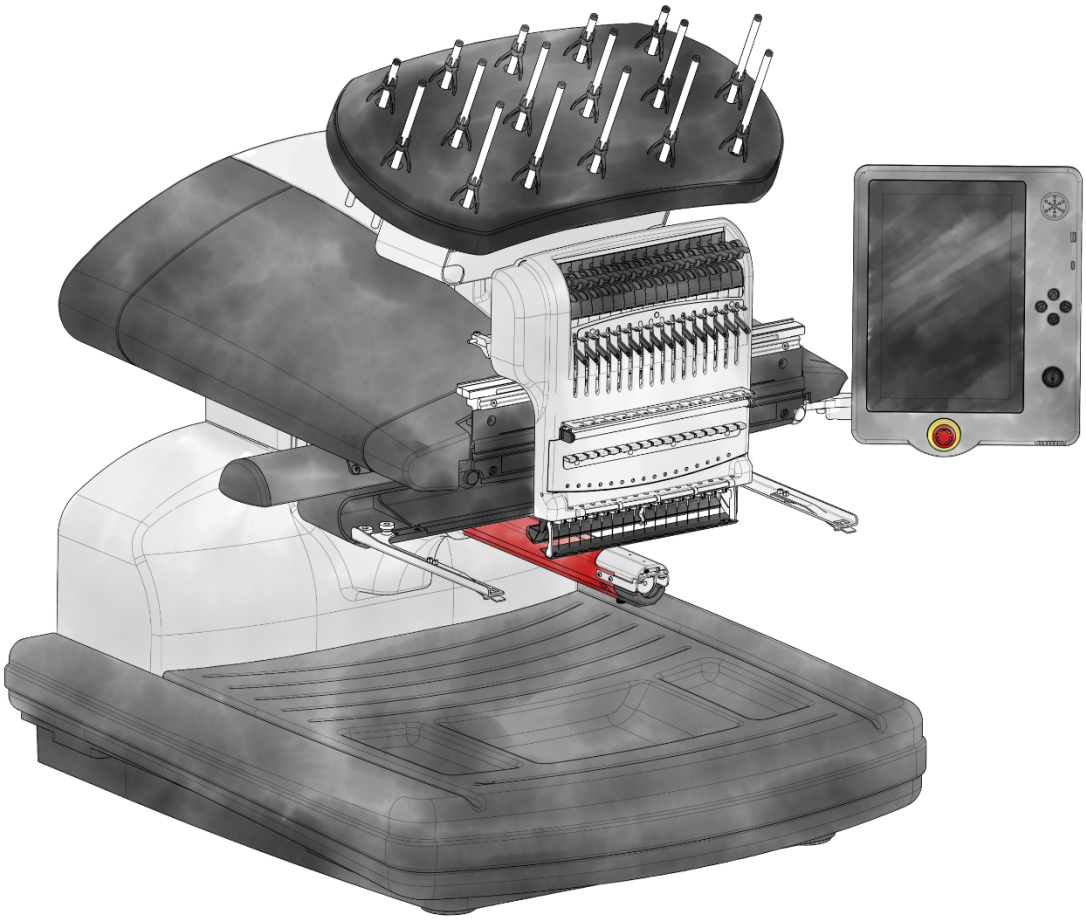


E 16 PRO Operator's Manual

BERNINA

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1. Copyright Notice

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- Patent US 6,445,970 B1
- Patent US 6,823,807
- Patent CH 693569 A5
- Patent US 6,736,077 B2
- Patent US 6,732,668 B2
- Patent US 6,871,605
- Patent US 6,983,192 B2
- Patent US 7,308,333 B2
- Patent US 7,513,202
- Patent US 8,851,001 B2
- Patent US 9,702,070
- Other patents pending

2. Hazards of Operation & Safety Warnings

Hazards of Operation

There are risks in operating any mechanical equipment. The following is intended to elevate your awareness of both the areas of risk and the meaning of the warning signs located on the machine. Always refrain from interfering with mechanical or electromechanical parts while in operation unless otherwise specified in this manual.



Laser Beam

Do not look directly into the laser beam.



Take-up Lever Oscillation

Do not touch the take-up levers during operation.



Needles During Operation

Do not place body parts or other foreign objects under the needles during operation.



Needle Case Movements

During operation, do not place hands or other objects on or around the needle case.



Rotary Hook Rotation

Do not attempt to change the bobbin thread during operation. During operation, do not place hands or other objects in the rotary hook area. Do not operate the machine without the hook guards in place.



Cap Frame Pinch Points

Do not touch the cap frame, driver, or driver bar during operation.



Pinch Points (X-Carriage and Y-Carriage)

Do not rest hands or other objects near any moving part of the machine during operation. Do not reach behind the x-carriage during operation. Avoid touching or resting objects near the X and Y carriage while the machine is running.

Safety Warnings

The list below specifies safety warnings that you should heed during normal operation and maintenance of your machine.



Do not attempt to lubricate the machine while it is in operation.



Failure to engage the emergency stop button while removing or replacing needles can result in the machine starting through machine or operator error. This can result in damage to the machine and/or serious personal injury.



Never attempt to remove or insert the bobbin while the machine is operating.



Do not operate the machine without the covers being installed. Moving parts can cause crushing and pinching injuries. In addition, fabric and other materials can get caught in the moving belts and gears and damage the machine.



Do not adjust the presser foot height while the machine is sewing. Doing so can result in serious injury.



Do not attempt to pull on or trim threads near moving needles. This can result in painful injury.



The lubricants specified in the Software and Technical manuals contain known carcinogens. Do not allow lubricants to come into contact with your eyes, mouth, or nose. Always wash your hands thoroughly after performing lubrication procedures.



When using solvents to clean components in the machine, always ensure adequate ventilation. Allow all solvents to completely evaporate before turning the machine back on to prevent shorting out electrical components. Vapors from most solvents are both toxic and flammable.



Dispose of rags soaked with solvent properly.



You must unplug the machine before replacing the power switch fuse.

The following table lists specific safety warnings that you should heed when you perform procedures (such as repairs and technical adjustments) that extend beyond normal operation and maintenance.

Area of Machine	**Warning**
Entire Machine	Personal injury may result if proper precautions are not observed. Remove rings, watches, and any other metallic objects from hands and wrists before servicing the machine. Remove metallic articles from shirt pockets to prevent them from falling into the machine. Do not allow loose clothing to come into contact with moving parts of the machine. Under certain conditions of machine failure, the moving parts of the machine may not be controllable by normal means. At these times, the machine may operate without notice. Failure to practice good maintenance and repair techniques may result in injury to personnel performing the work and/or damage to the equipment. The warranty is exclusive of, and may be VOID if poor maintenance practices have caused damage to the equipment. Failure to use a grounding strap, or failure to practice other good maintenance/ repair techniques may cause damage to the machine and possible personal injury. DO NOT attempt to use any grounding strap that is not specifically designed for static use. A “straight-wire” grounding device (one without built-in resistance) will place the operator in danger of exposure to dangerous voltages. It is recommended that the static strap be checked during daily use for proper resistance protection.

Area of Machine	Warning
	DO NOT operate the machine with the lower rear cover removed, except when indicated by the instructions in the Technical Manual. Operating the machine without the covers creates a risk of severe electrical-related injury.
Harnesses	Always turn the power off before disconnecting or connecting any harness. At the minimum engage the emergency stop button.
36V Power Harness	Do not attempt to repair a damaged 36V power harness if the wiring insulation is damaged through chafing, nicks, or cuts, or if the wires were overheated due to an over-current machine error. Never handle the 36V power harness unless power to the machine is completely disconnected. Do not rely on the power switch to break the power supply to the machine.
Power Supply	Lethal voltages exist inside the power supply unit, at the back side of the electrical supply input connector, and in the wires between the two. If you plan to do any work with any of these components, turn the power switch off and disconnect the electrical input supply cord from the machine. It is very important that the power cord is plugged into a properly wired electrical outlet. Failure to have a properly wired outlet may result in damage to the equipment and personal injury. It is recommended that a licensed electrician be consulted to ensure that the electrical outlet is properly wired and grounded. If a properly wired electrical outlet is not used for the source supply voltage to the system, electrical failures may result. Do not attempt to disassemble the power supply unit for any reason. There are no user-serviceable components inside. Internal components in the power supply unit might still have residual voltage (even if power is disconnected) that can cause painful electrical shock. Do not attempt to replace or service any component in the rear of the lower bed without disconnecting the A/C power input cord. Failure to do so will leave the power supply and power switch energized with dangerous levels of voltage even when turned off and can result in severe injury from electrical shock.
Laser Assembly	The laser assembly replacement procedure is intended to be performed only by specially trained Melco service technicians and personnel. Disassembly by untrained individuals will void any warranty protection and can result in personal injury or damage to the machine.

Area of Machine	Warning
	DO NOT install laser assembly until the machine is turned OFF!!! Failure to turn the machine off may result in personal injury or damage to the machine. The laser light adjustment procedure is intended to be performed only by specially trained and authorized Melco service technicians and personnel. Disassembly by untrained individuals will void any warranty protection and can result in personal injury or damage to the machine. DO NOT allow the laser beam to be aimed at your or anyone else's eyes. The laser emits a very concentrated light beam that can cause permanent blindness. Use extreme care in handling the laser assembly to make sure it is not going to be inadvertently aimed at someone's eyes or face. DO NOT LOOK DIRECTLY AT THE LASER LENS WHILE IT IS ENERGIZED!
LED Cluster Assembly	The LEDs may be hot to the touch when illuminated. They must be turned off for a few minutes before handling or they can cause minor burns.
Movable Knife	Keep clear of the moving parts that are exposed during the movable knife adjustment procedure.
Needle Case	During needle case removal, once you have completed the first two steps of the procedure. Do not proceed without engaging the emergency stop button or by turning the machine off. The machine may begin operating if you do not do so. This can result in severe damage to the machine and/or personal injury. You do not need to disconnect the power input cord from the machine.
Trimmer Drive Assembly	The Trimmer Drive Assembly replacement procedure requires the removal of the lower arm rear cover from the back of the machine. DO NOT place your hands into the back of the lower bed while the A/C input cord is connected to the machine. Failure to disconnect the A/C power input cord can result in potential electrical shock if you inadvertently touch the back of the power switch or the wiring to the power supply.
X/Y Home PCB	A small risk exists of unpredictable movement of internal parts when the optical sensors are disconnected. This creates a risk of personal injury if parts suddenly move. Always turn off the machine before disconnecting the optical sensors.

Area of Machine	Warning
Y-Motor Assembly	Risk of serious personal injury exists when handling internal motors, belts, and cabling due to electrical shock and moving parts hazards. Always turn off the embroidery machine when working on or adjusting motors, belts, or gears.
Z-Home Sensor PCB	The Z-Home Sensor PCB replacement procedure requires the removal of the left and right transparent arm covers and the upper arm back cover. Do not remove the covers from the machine without either turning the machine off or engaging the emergency button. The motors might move when the sensor is removed or the harnesses are disconnected.

Safe Operating Principles

The following list contains some safe operating principles you should follow when operating the machine.

- No untrained persons should be permitted within the designated working area around the machine.
- No untrained persons should operate the machine.
- This machine will embroider stitches in a safe and controlled manner when used as outlined throughout this documentation.
- Thread break sensors stop the machine automatically when a fault changing thread feed dynamics is detected, this stoppage is normal and recovery from such a stop is explained in this manual.
- The machine will stop operating at the end of each design automatically, do not attempt to manually stop an operating machine in any way other than what is described in this manual.
- DO NOT interfere with moving machine parts during operation.
- Only after the machine has stopped should you interact with it.
- DO NOT wear loose or baggy clothing or jewelry while operating the machine.
- ALWAYS wear eye protection when operating your machine.
- Keep the working area clean and free from any objects that may interfere with the normal movements of the machine.
- Keep up on the required maintenance. This not only ensures safe operating conditions but will also maintain a quality sew-out and extend the life of the machine.
- Read the entire manual prior to operation.

3. Dangers de fonctionnement et avertissements de sécurité

Risques de fonctionnement

L'utilisation de tout équipement mécanique comporte des risques. Ce qui suit est destiné à vous sensibiliser aux zones de risque et à la signification des panneaux d'avertissement situés sur la machine. Évitez toujours d'interférer avec les pièces mécaniques ou électromécaniques pendant le fonctionnement, sauf indication contraire dans ce manuel.



Rayon laser

Ne regardez pas directement au rayon laser.



Oscillation releveur de fil

Ne touchez pas les releveurs de fil lors du service.



Aiguilles lors du service

Ne mettez pas de parties corporelles ou d'autres objets étrangers au-dessous des aiguilles lors du service.



Mouvements du boîtier à aiguilles

Ne mettez pas vos mains ou d'autres objets sur ou autour du boîtier d'aiguilles lors du service.



Rotation de la navette rotative

N'essayez pas de changer le fil de canette pendant le service. Ne mettez pas vos mains ou d'autres objets dans la zone de la navette rotative lors du service. Ne manoeuvrez pas la machine, si les gardes-crochet ne sont pas bien en place.



Points de pincement au cadre casquette

Ne touchez pas le cadre casquette, l'entraînement ou la barre d'entraînement lors du service.



Points de pincement (support X et Y)

Ne placez pas vos mains ni aucun objet à proximité des pièces mobiles de la machine pendant son fonctionnement. Ne passez pas la main derrière le chariot X lorsque la machine est en marche. Évitez de toucher les chariots X et Y ou d'y poser des objets pendant le fonctionnement de la machine.

Avertissements de sécurité

Le liste ci-après comprend avertissements de sécurité spécifiques que vous devriez rappeler lors du service normal et lors de l'entretien de la machine.



N'essayez pas de lubrifier la machine lorsqu'elle est en marche.



N'oubliez pas d'actionner le bouton d'arrêt d'urgence de la machine si vous voulez enlever ou remplacer des aiguilles sinon vous risquez que la machine commence à marcher à cause d'une erreur de machine ou par l'opérateur. Vous risquez des dommages de la machine et/ou de graves blessures corporelles.



N'essayez jamais d'enlever ou installer la bobine lorsque la machine est en service.



Ne manoeuvrez pas la machine sans recouvrements installés. Des pièces mobiles peuvent causer de blessures de pincement et d'écrasement. De plus, le tissue et d'autres matériaux peuvent être attrapés dans des ceintures et entraînements mobiles et endommager la machine.



Ne réglez pas la hauteur du pied presseur lorsque la machine est en train de broder. Sinon vous risquez de graves blessures.



N'essayez pas de tirer ou couper des fils à côté des aiguilles mouvantes. Vous risquez de graves blessures.



Les lubrifiants spécifiés dans les manuels logiciels et techniques contiennent des substances cancérigènes connues. Les lubrifiants indiqués dans les Instructions de service et techniques contiennent de carcinogènes connues. Evitez que les lubrifiant entrent en contact avec vos yeux, votre bouche ou nez. Lavez toujours bien vos mains après avoir réalisé des procédures de lubrification.



Si vous utilisez des détergents pour nettoyer des composants de la machine, veuillez toujours vous assurer qu'il y a assez de ventilation. Il faut que les détergents soient complètement évaporés avant de remettre la machine en marche pour éviter des courts-circuits des composants électriques. Les vapeurs de la plupart des détergents sont toxiques et inflammables.



Eliminez les torchons imbibés de détergent soigneusement.



Vous devez débrancher la machine avant de remplacer le fusible de sécurité.

Le tableau suivant comprend des avertissements de sécurités spécifiques que vous devriez respecter lors des travaux de réparation, des réglages techniques ou d'autres procédures qui sont hors le service normal ou d'entretien.

Zone de la machine	AVERTISSEMENT!
Machine entière	Des blessures corporelles peuvent être causées en cas de non-respect des précautions soigneuses. Enlever des anneaux, montres et d'autres objets métalliques de vos mains et bras avant de faire marcher la machine. Enlevez des articles métalliques des poches de chemise pour empêcher qu'ils tombent dans la machine. Faites attention que des vêtements lâches entrent en contact avec des pièces mobiles de la machine. Au cas où la machine est en panne, il est possible que les pièces mobiles ne puissent plus être commandées proprement. À ces moments-là, la machine peut fonctionner sans préavis. Défaut d'appliquer une bonne technique d'entretien et de réparation peut causer des blessures au personnel travaillant à la machine et/ou endommager l'équipement. La garantie ne comprend pas de pratiques d'entretien mauvaises et sera NUL, si celles-ci ont endommagé l'équipement. Défaut d'utiliser une bande de mise à la terre ou défaut d'appliquer d'autres techniques d'entretien /de réparation peut endommager la machine et éventuellement causer de blessures corporelles. N'essayer PAS d'utiliser n'importe quelle bande de mise à la terre qui n'est pas construite spécifiquement pour l'utilisation statique. Un dispositif de mise à la terre "par fil métallique direct" (un sans résistance intégrée) posera l'opérateur en danger d'exposition à des voltages dangereux. Il est recommandable de vérifier la bande statique pendant l'utilisation journalière pour protéger la bonne résistance. Il NE faut PAS manoeuvrer la machine si le recouvrement arrière en bas a été enlevé, sauf si indiqué par les instructions du manuel technique. Faire marcher la machine sans recouvrement provoque un risque de blessures graves dues au système électrique.

Zone de la machine	AVERTISSEMENT!
Le câblage	Veuillez toujours couper le circuit avant de débrancher ou brancher des câbles. Au moins appuyez sur le bouton d'arrêt d'urgence.
Câbles électriques à 36V	N'essayez pas de réparer un câble 36V endommagé si l'isolation de fil a été endommagée par friction, des entailles ou coupures ou si les fils ont été surchauffés à cause d'une erreur de machine de courant de surcharge. Ne jamais touchez le câblage 36V si le courant de la machine a été complètement coupé. Ne comptez pas sur l'interrupteur de courant pour couper le circuit à la machine.
Alimentation électrique	A l'intérieur du système d'alimentation électrique, à l'arrière du connecteur d'entrée de l'alimentation électrique et aux fils entre les deux, il y des tensions mortelles. Si vous avez l'intention de travailler sur un de ces composants, coupez le circuit et déconnectez le câble d'alimentation électrique de la machine. Il est très important que le câble électrique soit bien branché sur une prise électrique correctement installée. Défaut d'avoir une prise bien installée peut endommager l'équipement et causer des blessures corporelles. Il est recommandé de consulter un électricien autorisé pour vous assurer que la prise électrique a été installée correctement et mise à la terre. Si l'on n'utilise pas de prise électrique bien installée pour l'alimentation électrique du système, on aura de défauts électriques. N'essayez pas de démonter le système d'alimentation électrique pour n'importe quelle raison. Il n'y a pas de composants utiles à l'intérieur pour l'utilisateur. Les composants intérieurs du système d'alimentation électrique peuvent toujours avoir de tension résiduelle (même si le circuit a été coupé) qui pourrait causer des chocs électriques douloureux. N'essayez pas de remplacer ou entretenir des composants à l'arrière du fond bas sans déconnecter le câble d'alimentation électrique C/A. Défaut de le faire provoquera que l'alimentation électrique ainsi que l'interrupteur soient toujours alimentés ayant des niveaux de tension dangereux, même si débranché, et pourra résulter en des blessures graves dues au choc électrique.
Système Laser	La procédure de remplacement du système Laser ne doit être fait que par des techniciens d'entretien et du personnel Melco spécialement entraînés. Le démontage par des personnes non entraînées annulera toute protection de garantie et peut causer des blessures corporelles et endommager la machine. Installez le système Laser seulement si la machine a été mise HORS SERVICE!!! Défaut de mettre la machine hors service peut causer des blessures corporelles ou endommager la machine. La procédure d'ajustage de la lumière Laser ne doit être faite que par des techniciens et du personnel Melco spécialement entraînés et autorisés. L Le démontage par des personnes non entraînées annulera toute protection de garantie et peut causer des blessures corporelles et endommager la machine.

Zone de la machine	AVERTISSEMENT!
	Le Laser émettra un rayon lumineux bien concentré qui peut causer d'aveuglement permanent. Le Laser émettra un rayon lumineux bien concentré qui peut causer d'aveuglement permanent. Soyez extrêmement prudent en manœuvrant le système Laser pour vous assurer qu'il ne soit pas dirigé par inadvertance aux yeux ou à la figure de quelqu'un. NE JAMAIS REGARDEZ DIRECTEMENT DANS LA LENTILLE DU LASER LORSQU'ELLE SE TROUVE EN SERVICE!
Système Groupe DEL	Il faut les débrancher pendant quelques minutes pour pouvoir les toucher et pour éviter de petites brûlures. Il faut les débrancher pendant quelques minutes pour pouvoir les toucher et pour éviter de petites brûlures.
Couteau mobile	Éloignez-vous des composants mobiles qui sont exposés pendant l'ajustage du couteau mobile.
Boîtier d'aiguilles	Lors de l'enlèvement du boîtier d'aiguilles, après avoir terminé les deux premiers pas de la procédure. Ne procédez pas sans avoir appuyé sur l'arrêt d'urgence ou mis la machine hors service. La machine pourrait se mettre en marche si vous ne le faites pas. Ainsi, la machine ou des personnes pourraient être endommagées gravement. Il ne faut pas déconnecter le câble d'alimentation électrique de la machine.
Système d'entraînement du coupe-fil	Pour remplacer le système d'entraînement du coupe-fil il sera nécessaire d'enlever le recouvrement du bras arrière en bas de l'arrière de la machine. NE mettez PAS vos mains dans l'arrière du fond bas pendant que le câble d'alimentation C/A est connecté à la machine. Défaut de déconnecter le câble d'alimentation électrique C/A peut causer des chocs électriques graves si vous touchez l'arrière de l'interrupteur ou le câblage vers le dispositif d'alimentation électrique par inadvertance.
Position originale X/Y Carte à circuits imprimés	Il y a un petit risque de mouvements imprévus des composants intérieurs si les détecteurs optiques sont déconnectés. Cela causera un risque de blessures corporelles si des composants bougent soudain. Mettez toujours la machine hors service avant de déconnecter les détecteurs optiques.
Système Moteur Y	Il y a un risque de blessures corporelles lorsqu'on touche des moteurs intérieurs, des ceintures et du câblage qui est dû au choc électrique et danger des pièces mobiles. Mettez toujours la machine à broder hors service si vous travaillez ou ajustez des moteurs, ceintures ou engrenages.
Position originale Z détecteur Carte à circuits imprimés	Pour remplacer le détecteur Cartes à circuits imprimés de la position originale Z, il faut enlever les recouvrements des bras transparents à gauche et à droite et le recouvrement du bras arrière en haut. Il ne faut pas enlever les recouvrements sans avoir mis la machine hors service ou appuyé sur le bouton d'arrêt d'urgence. Les moteurs pourraient bouger si les détecteurs ont été enlevés ou le câblage a été déconnecté.

Principes de fonctionnement sûrs

La liste suivante contient certains principes de fonctionnement sûrs que vous devez suivre lors de l'utilisation de la machine.

- Aucune personne non formée ne doit être autorisée dans la zone de travail désignée autour de la machine.
- Aucune personne non formée ne doit utiliser la machine.
- Cette machine brodera des points de manière sûre et contrôlée lorsqu'elle est utilisée comme indiqué dans cette documentation.
- Les capteurs de casse-fil arrêtent automatiquement la machine lorsqu'un défaut modifiant la dynamique d'alimentation du fil est détecté. Cet arrêt est normal et la récupération après un tel arrêt est expliquée dans ce manuel.
- La machine cessera automatiquement de fonctionner à la fin de chaque conception. N'essayez pas d'arrêter manuellement une machine en fonctionnement d'une manière autre que celle décrite dans ce manuel.
- NE PAS interférer avec les pièces mobiles de la machine pendant le fonctionnement.
- Ce n'est qu'une fois la machine arrêtée que vous pourrez interagir avec elle.
- NE PAS porter de vêtements amples ou amples ni de bijoux lorsque vous utilisez la machine.
- Portez TOUJOURS des lunettes de protection lorsque vous utilisez votre machine.
- Maintenir la zone de travail propre et exempte de tout objet susceptible de gêner les mouvements normaux de la machine.
- Suivez l’entretien requis. Cela garantit non seulement des conditions de fonctionnement sûres, mais permettra également de maintenir une couture de qualité et de prolonger la durée de vie de la machine.
- Lisez l’intégralité du manuel avant l’utilisation.

4. Software Versions

v3.1.436

Updates

- Reverted firmware changes introduced in v3.0.50. Future machine startups will be shorter.
- Added the ability to hold the Transform button to immediately center the hoop.
- Hoops are now sorted by size on the Hoop Selection screen. Use the Hoop Sort switch to sort hoops from smallest to largest or largest to smallest.
- Improved the visibility of the Confirm and Cancel buttons.
- Added support for creating and restoring backups of touchscreen settings, as well as restoring settings to their defaults.
- Added the ability to view the network password as it is being typed.
- Consolidated and simplified the network setup screen.
- Updated language around backing up and restoring needle case calibration tables.
- Added a maintenance step to remove excess grease from the grabber drive eccentric area.
- Adjusted the styling for the Thread Charts screen and scrolling behavior with the arrow buttons.
- Updated the Move to Trim and Move to Color icons to better differentiate them from Trim Immediate and Move to Needle.
- Added Show/Hide All to both the Thread Chart and Hoop Visibility screens.
- Adjusted reconnect behavior so that if the connection to the machine is lost, the touchscreen remains on the current screen.
- Altered maintenance oiling amounts for the Y-Drive Bearing Block.
- Increased the delay after the last keypress before searching. The touchscreen will now wait slightly longer to ensure the user has finished typing in the search field.
- Reduced the initial loading time for the Hoop Setup screen.
- Adjusted touch behavior to avoid accidental scrolling or selection while browsing files.
- Addressed an issue that prevented empty network locations from being connected.

Hoops and Threads

- Added support for Amann Serafil thread.
- Added retired ARC thread charts.
- Added additional names for some Madeira threads.
- Updated Fil-Tec Glide threads.
- Added the following hoops:
    - Allied Dual Orientation 30 cm x 10 cm Hoop
    - Allied Dual Orientation 24 cm x 30 cm Hoop
    - Hoop Tech 3.5" Square Hoop

Bug Fixes

- Fixed an issue that could cause a few touchscreens to go completely black at the lowest brightness setting.
- Corrected an issue where the last character of a password was immediately hidden.
- Corrected an issue that prevented the Acti-Feed minimum and maximum from being set to the same value.
- Addressed an issue that caused no networks to appear when first entering the Network Setup screen.

v3.0.61

- Addressed an issue with network shares failing when also shared with OneDrive.
- Added an option to increase network share connection speed by not generating previews.

v3.0.60

- Addressed an issue that prevented connection with certain Ethernet hardware.

v3.0.50

- The machine now performs additional firmware checks and repairs (if necessary) during its power-up sequence.
- The network connection may need to be reselected after a software upgrade or downgrade.
- You can now use pinch gestures to zoom in and out on the View Window.

- Added navigation shortcuts to maintenance screens.
- You can now use the Start button to confirm out of some machine dialog screens.
- Communication infrastructure improvements.
- Various bug fixes and improvements.
- Known Issue: A small number of testers were unable to connect to network shares after updating. If you experience this, first try deleting and adding the share again. If that doesn't work, please contact technical support.



Information

This firmware update and future machine startups will take longer than they did previously. DO NOT power down the machine while this is in progress.

v2.3.12

- Enabled USB update to install the APP and OS SWUs before rebooting.

v2.2 - Internal Build

v2.1 - Internal Build

v2.0.161

- Added warning about inexact color matches. You can turn on this warning via Machine Preferences.
- The machine will now remember your last thread detection settings.
- Various changes to maintenance procedures:
    - Time-based maintenance timers have been adjusted for machines that haven't been in continual operation to prevent over-oiling.
        - Weekly (2,000,000 stitches) is now every two weeks
        - Monthly (10,000,000 stitches) is now every six months
        - Quarterly (30,000,000 stitches) is now every six months

- Changes to 2,000,000 stitch maintenance:
    - When cleaning under the linkage arm (step 12) changed image to blow lint from back to front.
    - Trimmer motor will now home before reinstalling needle plate.
- The Touchscreen will now enforce file naming like Windows.
- Updated various screens, text, and icons for improved clarity and visibility.
- Added horizontal dotted lines to Melco Fast Clamp display to indicate small and medium arm lengths.
- Added/edited hoops:
    - Mighty Hoop 8"x13"
    - Round 8.66"
    - Back of Cap Clamp (small)
    - Added “(large)” description to Back of Cap Clamp (large)
    - Adjusted hoop limits on Mighty Hoop 5.5"x5.5"
- Updated or added thread color charts for:
    - Candle Threads Poly and Rayon
    - Exquisite Dime
    - Fujix King Star Metallic
    - Hemingworth Poly Select
    - Madeira Fire Fighter
- Updated translations.
- Multiple bug fixes.

v1.4.100

- Resolved an issue that caused the app to become increasingly sluggish as run time increased.

v1.4.97

- Corrected an issue that in rare instances could cause inappropriate trimmer blade movements, resulting in needle breaks.
- Added maintenance instructions for Wide-Angle Driver (Linear Rail).

v1.4.95

- Should an issue requiring a firmware re-flash arise, the machine will automatically re-flash the firmware.
    - A dialog will inform the user if a re-flash is in progress and when it has completed.
- Improved the use of networked folders.
- Fixed an issue where the *background color from design* view option would not save after a machine restart.
- Fixed an issue where screensaver text was not displaying correctly.
- The machine will now display a progress bar while searching for networks.
- Fixed an issue where trims generated in Fusion were not loading correctly.
- Fixed an issue that would cause a crash when updating the firmware.
- Various other bug fixes and interface improvements.

v1.3.679

- Color Setup has two new modes:
    - Manual Selection or Auto Select Next Color: Allows for the manual or automatic selection of the next color block upon setting a new needle.
    - Unique Colors or Color Sequence: Allows for the setting of colors by the distinctive colors of the design or the color sequence itself.
- Added Repeat Color Sequence Command: Allows for the setting of a repetitive color sequence by setting a few colors and specifying a repeat.
- Added language support for Spanish.
- Added an Internet Connection Test to hardware test and network setup screens.
- Added Network drive access : Shared network folders can now be accessed.
- Firmware install button now indicates if the firmware is a reinstallation of current, update to new, or installation of older firmware.
- Known Issue: If the machine is manually stopped during a trim that is followed by an automatic stop (Pause or Applique) the design display on screen will become out of sync with the actual design progress. The display will re-sync to the correct progress once the machine is started again (after the automatic stop has resolved).

v1.2.372

- Added Several Hoops/Frames:
    - Hoop Tech 8" and 13" Strap Clamps
    - Hoop Tech Quick Change
    - Hoop Tech Side of Cap Clamp
    - Fast Frame 7-n-1
- Color Charts have been added:
    - A&E Signature Thread
    - Bridor AC, CO, Masterfil, NY, PB, and PF
    - Dime Exquisite Thread
    - Floriani Polyester, Metallic, and Glow-in-the-Dark
    - GEM Polyester and Metallic
    - Hilos Iris UltraBrite Poly
    - Madeira Cotona
    - Wonderfil Polyfast and Splendor
- Quality of life improvements
    - Design browsing now has a list view as well as a grid view.
    - Use a long press to enable selecting, copying, and deleting multiple files.
    - Search now looks within sub-folders as well as the currently selected folder.
    - Some onscreen keyboards have been moved/edited to allow better viewing of information.
    - Hoop categories are no longer exclusive. You can now select multiple categories at once.
- View Options added:
    - The center of the sew field can now be displayed
    - Background Color stored in file is an optional toggle separate from thread colors from file.
    - Trace now previews the trace shape on the screen.
- Bug fixes and Technical improvements:
    - Thread Feed Home Button added
    - Hardware Test screen added under Maintenance
    - Created a cap/log feature for technicians

    - Technician feature > Trim in Steps
    - Moving forward, an announcement will be made for software updates, including release notes.

v1.1.171

- Addressed an issue where certain progress bars or dialogs would disable the physical buttons.

v1.1.170

- Resequenced Maintenance Walk-throughs:
    - Trimmer maintenance is now in the weekly maintenance.
    - Needle drive oiling now allows additional steps before moving the needle case to allow additional steps to be completed while oil is being absorbed.
    - Added pinch roller maintenance to the end of the quarterly maintenance.
    - Altered image for warning about removing clamping devices to show that clamping devices must be removed.
- Absolute movements now better respect hoop limits:
    - Dragging a design or moving a design with the numbers will show outside hoop limits on the screen until the hoop arms move. Once the move is complete, the design will be repositioned to match the actual hoop position within the limits.
    - Jogging with the arrow buttons remains the same behavior and continues to respect hoop limits on large jogs.
- Additional support for USB devices:
    - The file structure in the OS was altered to better handle a wider range of USB flash drives.
- Slow Start / Inching added to Start / Stop Button:
    - Press and hold the Start / Stop button to slow the machine sewing.
        - Release to resume normal speed.
    - Tap to Start or Stop normally.
- Improved Update Behavior:
    - Updating the OS will now retain Wi-Fi settings. This update will still cause a loss of the settings, but future updates will retain them.

    - Additional dialogs and progress bars to provide more clarity to the process.
- Reset Thread Tree added:
    - If you desire to clear all thread assignments to the needles on the thread tree, there is now a button to do that.
- The onscreen keyboard now has numbers added to the top row.
- Thread Break Troubleshooting has been added to the manual.
- Thread Break Sensitivity has been inverted. In the previous version, the setting had the opposite effect of the label.
- X and Y Satin Width Adjustments are now respected upon rotation.
- Various visual adjustments, spelling corrections, bug fixes and improvements, and firmware updates and improvements.

v1.0.79

- Launch of Product

5. Specifications

Machine Specifications	
Operation Environment	For indoor use only.
Number of Needles	16
Maximum Tubular Frame Size (XxY)	500mm x 430mm (19.7"x 16.9")
Maximum Sew Field (XxY)	410mm x 393mm (16.1"x15.5")
Wide Angle Cap Frame	360mm x 82mm (14.1" x 3.25")
Min/Max Sew Speed Flats	300-1400 s.p.m.
Min/Max Sew Speed (Wide Angle Driver)	300-1200 s.p.m.
Stitch Length Range	Only limited by hoop sew field.
User Interface	Connected Onscreen Touch Environment
Machine Configuration	One machine is connected to one touchscreen unit.
Self-Diagnostics Capability	Retrieves relevant machine data for troubleshooting.
Touchscreen Design Memory	≈6GB, Max file size 500k
Supported Design Files	.OFM (≥v9), .ARTX, .EXP, .DST
Pre-Sew Trace	Laser
Garment and Hoop Position	Laser Positioning System
Thread Feed Technology	Patented Acti-Feed

Machine Specifications	
Thread Break Detection	Upper & Lower Electronic Force Gauge Sensor
Automatic Stitch Backup	Yes
Automatic Trimmer	Yes
Lighting Type Cold Bright	Cold bright LED
Power Supply	90-260 V AC (Single Phase, 50/60 HZ, 4A), Class I (Grounded)
Power Consumption (Watts)	140-195 (250 Max)
Temperature Range	15-40° C
Humidity	Max 85% Relative Humidity
Installation Category (overvoltage)	II
Pollution Degree	2
Motor Type(s)	Servo, Stepping
Motor Capacity	X and Z: 100 Watts, Y: 250 Watts
Machine Construction Material	Aluminum

Physical Specifications with Cart	
Width (with user interface attached)	847mm (33.4")
Width (without user interface)	724mm (28.5")
Height	1684mm (thread tubes 130mm extended) (66.3")
Depth	848mm (33.4")

Machine Specifications	
Weight	100.2kg (221 lbs)

Physical Specifications without Cart	
Width (with user interface attached)	847mm (33.4")
Width (without user interface)	724mm (28.5")
Height	950mm (thread tubes 130mm extended) (37.4")
Depth	848mm (33.4")
Weight	75.7kg (167 lbs)

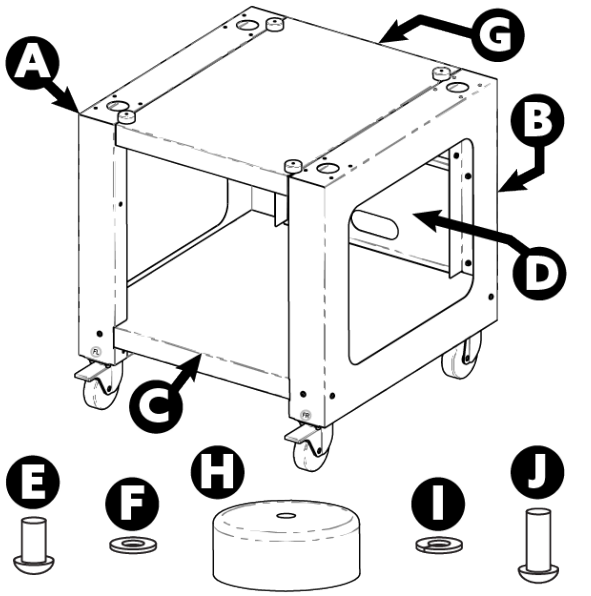
6. Machine Overview & Setup



1. Thread Tree
2. Thread Feed Rollers
3. Touchscreen Control Panel
4. Needle Case
5. Left Side Cover
6. Right Side Cover
7. Hoop Arms
8. Lower Arm
9. Ethernet Inlet (On Back)
10. Power Inlet (On Back)

6.1. Cart Assembly

The cart consists of the items assembled as shown.

Item	Quantity	Description	Image
A	1	Left Cart Leg Assembly	
B	1	Right Cart Leg Assembly	
C	1	Cart Base Support	
D	1	Cart Rear Support	
E	14	M6 x 1.0 x 12mm Button Head Screw	
F	18	M6 Flat Washer	
G	1	Cart Shelf	
H	4	Locator	
I	4	M6 Split Lock Washer	
J	4	M6 x 1.0 x 16mm Button Head Screw	

Tool Required

- 4mm hex wrench (like the one included in the machine operator's kit)

Prior to assembly of the cart, place cardboard or a blanket on the floor to prevent damaging cart parts.

Assembly

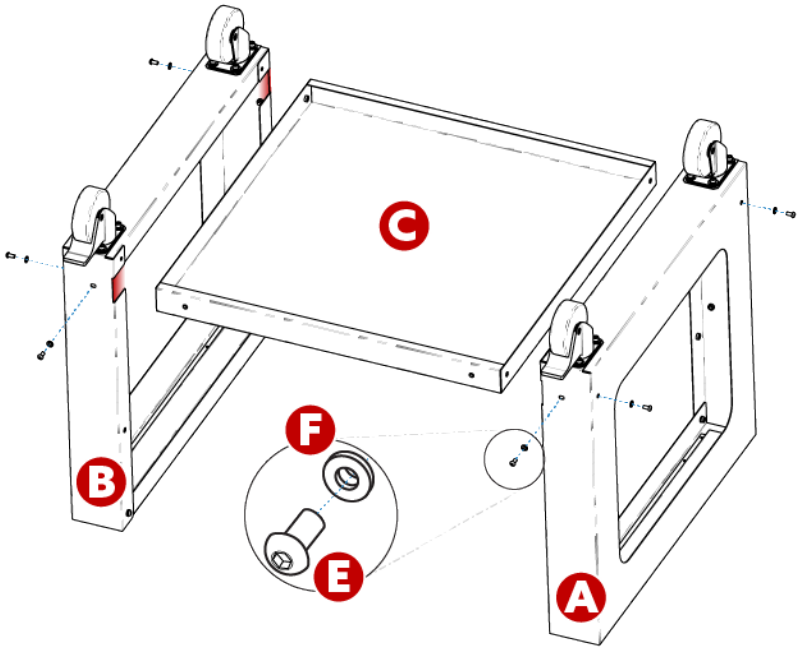
Assembly of the cart is easiest on the floor. If you are concerned with marking up the cart or floor, begin by placing down a large piece of cardboard or a blanket.

The assembly of the larger pieces may be easier with two people. One person can hold while the other attaches. It isn't necessary, but it can make assembly smoother.

BERNINA

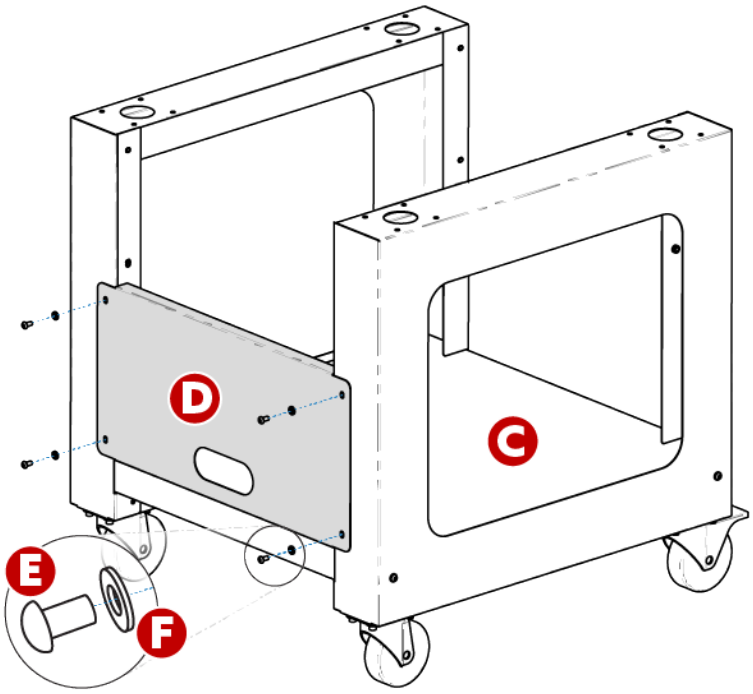
Stage 1 - Attaching the Base Support

1. Place items A and B (Cart Leg Assemblies) on the floor with the Casters facing up. The Casters with the brake face the front of the Cart.
2. Assemble Item C (Base Support) into the cutouts (see red highlights) located on each side of both Cart Legs, Items A and B, as shown.
3. Install (6 each) items E and F (M6 x 12mm Screw and M6 Washer) at the locations shown. Assemble loosely, do not tighten.
4. Fully tighten all (6) item E Screws.



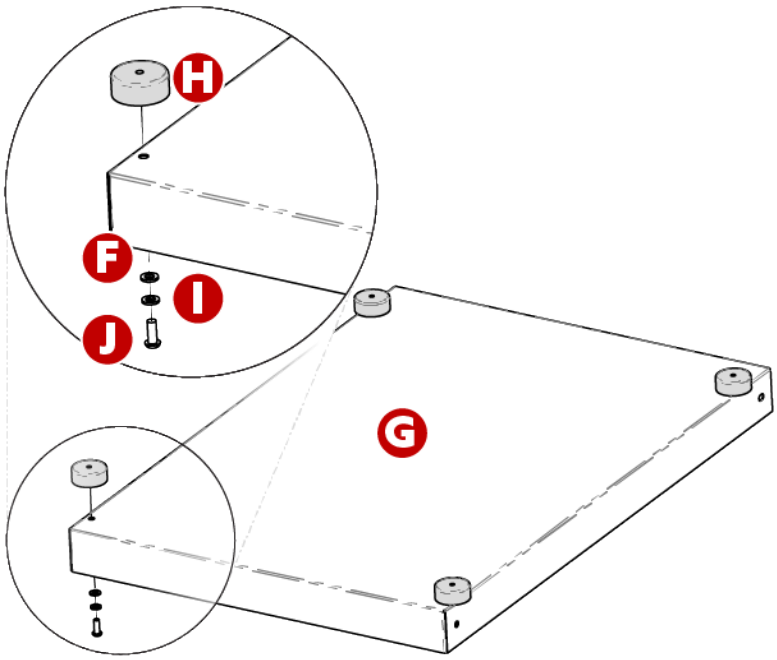
Stage 2 - Installing the Rear Support

1. Rotate the Cart to its upright position.
2. Assemble Item D (Rear Support) to the rear side of the Cart resting on Item C (Base Support), with the obround opening facing towards the bottom of the Cart.
3. Install (4 each) items E and F (M6 x 12mm Screw and M6 Washer) at the locations shown. Assemble loosely, do not tighten.
4. Fully tighten all (4) item E Screws.



Stage 3 - Installing the Machine Locators

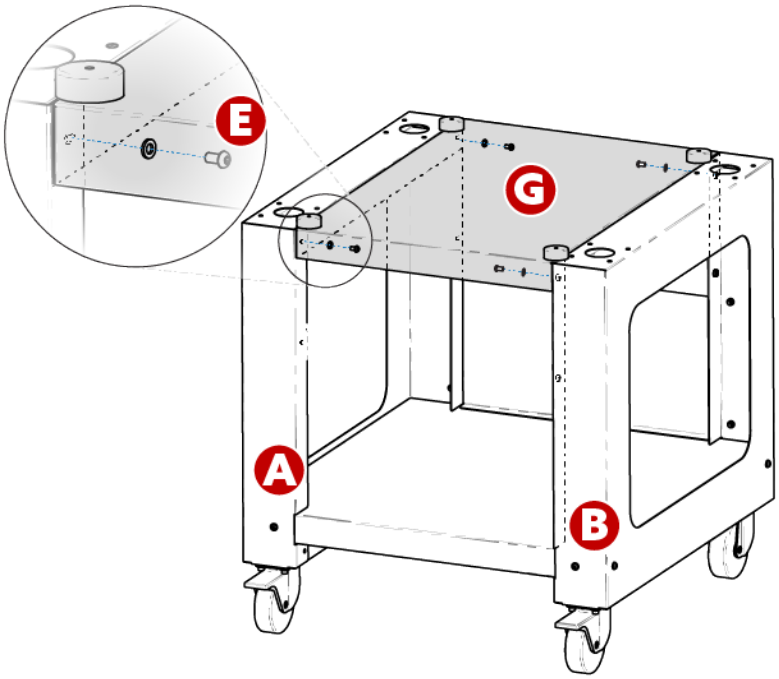
1. Install items J, I, and F (M6 x 16mm Screw, M6 Lock Washer, and M6 Washer) from the bottom side of item G (Cart Shelf) as shown.
2. Install item H (Machine Locator) onto item J (Screw) from the top side of item G (Cart Shelf) as shown.
3. Fully tighten items H (Machine Locator) and J (Screw).
4. Repeat steps 1-3 for the (3) remaining sets of items J, I, F, and H at the (3) remaining corners of item G (Cart Shelf).



Stage 4 - Installing the Cart Shelf

1. Position item G (Cart Shelf) between the two Cart Legs, items A and B, with the (4) Machine Locators (item H) resting on the Cart Legs, items A and B.

   IMPORTANT: The side of item G (Cart Shelf) labeled with the "F" sticker (with the two Machine Locators (item H) positioned closer to the edge) faces the front of the Cart.



2. Install (2 each) items E and F (M6 x 12mm Screw and M6 Washer) at locations shown towards the front of the Cart.

Note: Lift item G (Cart Shelf) slightly to align item E (Screw) with the threaded inserts in the Cart Legs (items A and B). Assemble loosely, do not tighten.

3. Install (2 each) items E and F (M6 x 12mm Screw and M6 Washer) at locations shown towards the back side of the Cart.

   Note: Lift item G (Cart Shelf) slightly to align item E (Screw) with the threaded inserts in the Cart Legs (items A and B). Assemble loosely, do not tighten.

4. Fully tighten all (4) item E Screws.

Cart Assembly Complete!

With two people, lift the machine onto the Cart so the (4) Machine Locators (item H) on top of the Cart are centered over the round bosses on the bottom side of the Machine.

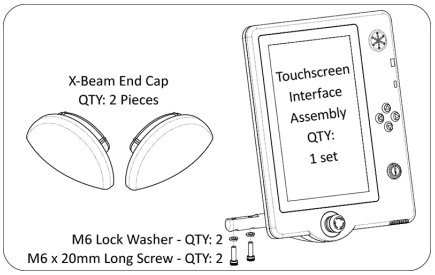
Warning!!

Do not attempt to lift the machine by yourself. Always move the machine with two people. Do not lift the machine at any points other than the Lift Handles indicated by the “LIFT HERE” stickers in the machine packaging. Otherwise, damage to sensitive parts might result.

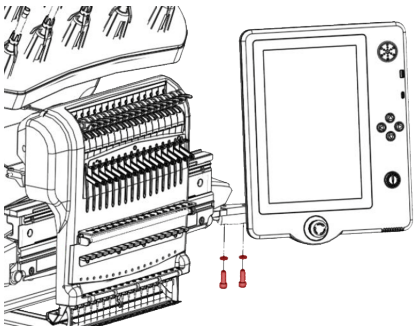
6.2. Installing & Adjusting the Screen

Installing the Touchscreen

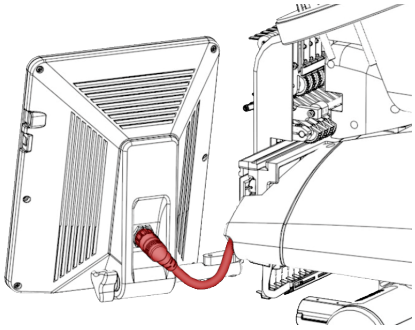
1. Locate the box containing the Touchscreen Assembly and X-Beam End Caps. The box is labeled with the following:



2. Attach the Touchscreen Assembly.
    a. Using the two screws and two lock Washers that came with the Touchscreen Assembly, attach the Touchscreen Assembly as shown in the image using a 5mm hex wrench (provided in the Machine Operator's Kit).



    b. Route the cable (shown in red) from under the right-side Machine Cover and plug it into the back of the Touchscreen Assembly. To connect properly, angle the cable such that the pins and tab align, then twist the collar to secure it.

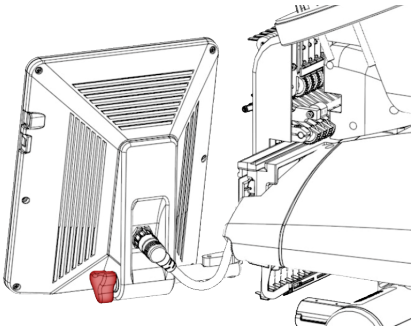


Note:

If present, the protective film can be removed from the screen after installation.

Adjusting the Touchscreen Angle

1. Locate the tightening knob on the back of the touchscreen assembly.



2. Loosen the knob by turning it counterclockwise.
3. Tilt the touchscreen to the desired angle.
4. Tighten the knob by turning it clockwise. This will hold the touchscreen angle where it's set.

Caution!

Do not adjust the touchscreen without first loosening the adjustment knob.

6.3. Powering Up the Machine

Connecting the Power Cable

1. Locate the power cable you will be using with your machine.
2. Locate the power cable plug in the rear of the machine.
3. Make sure the machine power switch is in the OFF position. Plug the power cable into the inlet.



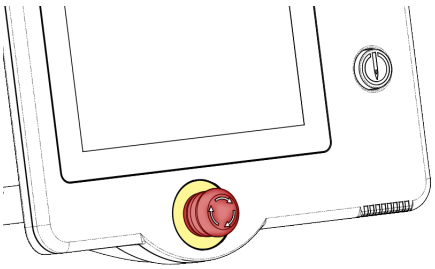
4. Connect the power cable to a power source.

Information

It is recommended that a line conditioner or an uninterruptible power supply with a line conditioner be used with your machine. If using this, connect the power cord to the conditioner, and the conditioner to the power source.

Initial Power Up

1. Make sure the E-Stop is disengaged by turning it in the direction of the arrows.



2. Power up the machine with the power switch located on the rear of the machine (just above the power inlet).



- The screen will power up. The machine will continue through a series of initializing movements to find the hoop arm home position, move the needle to head up, and place the needle case on a needle.
- Once this is complete, a connection should fully establish between the machine and the screen.

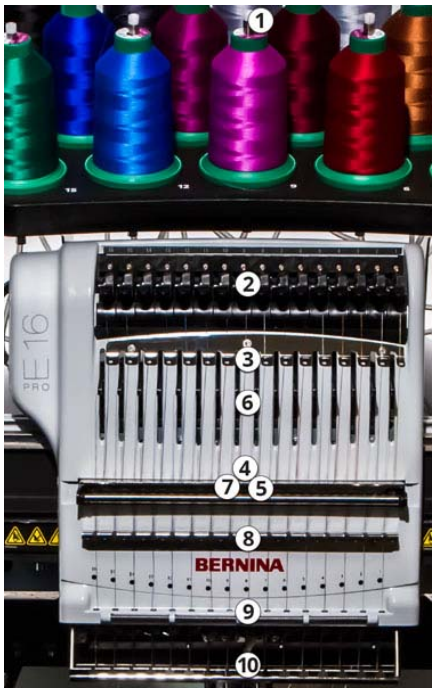
7. Threading the Machine

The proper thread path from the cone of thread to the eye of the needle is critical in the operation of the machine. Ensuring that the thread moves along the appropriate route will help prevent thread breaks as well as increase efficiency and sew quality. Understanding the upper threading will also help in troubleshooting.

The following image displays the main components of the needle case and the upper threading system.

Threading the Machine for the First Time

When you first receive your machine, there will be thread in the system. The tops of the thread will most likely be taped to the side of the thread tree. Remove the tape and untwist the threads. New cones of thread may now be placed on the thread tree using the quick thread change method below. The image below describes the order thread should be fed through the machine.



7.1. Upper Threading

Upper Thread Path (Quick Change)

Changing a cone of thread does not require rethreading the entire thread path. If thread is already in the system, the fastest and easiest way to change a cone of thread is to remove the old cone but leave a good length of the old thread on the machine.

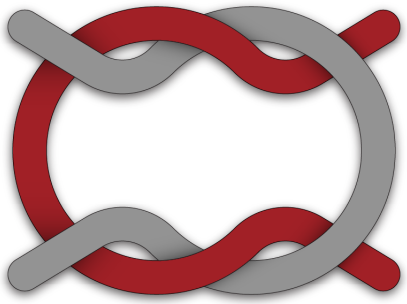
1. Place the new cone of thread on the thread tree with the old thread end sticking out of the thread tube and over the new cone.



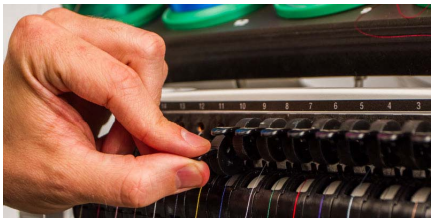
2. Extend the thread tube ½ to 1 inch above the cone. Neglecting to extend the thread tube ½ to 1 inch above the cone could result in frequent thread breaks.
3. After placing the cone of thread on the machine, the old thread will be trapped on the inside and underneath the cone. From near the tube, pull the thread free and over the top of the new cone.



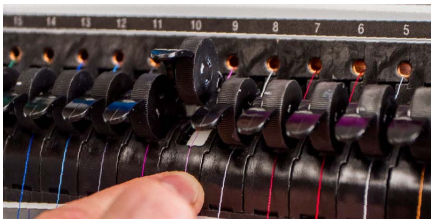
4. Tie the end of the old thread to the end of the new thread using a square knot.



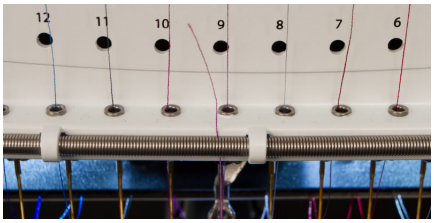
5. Lift the pinch roller and carefully pull the thread from the back of the needle. This will pull the new thread completely through the system. If the knot is tight and small enough, it will even slip through the needle.



6. When finished, line up the thread under the pinch roller and press the pinch roller back down.

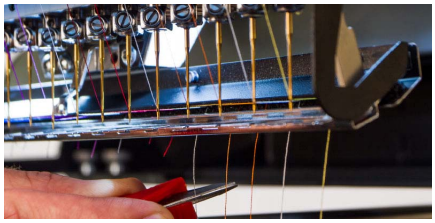


7. If desired, the thread can then be held by the retaining spring in front of the lower thread guide or held in place using the grabber.



To utilize the grabber, with your hands out of the way, tap the Grabber In button  to close the grabber and move the thread into the holder behind the needles.

8. Trim the end to about an inch in length.



9. Tap the Grabber Out button  to open the grabber again.

Upper Thread Path (Full Change)

If the thread comes out of the system, you may need to thread the machine without a starter thread.

1. To start a new cone of thread, push the plastic thread tubes up from behind the thread tree. Place the cone of thread on the thread seat. The thread tube should extend ½ to 1 inch above the cone. Neglecting to extend the tube ½ to 1 inch above the cone could result in frequent thread breaks.



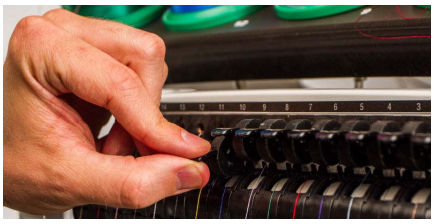
2. Using either the mono-filament provided in the operator's kit or a can of compressed air, feed the thread through the thread tube from the cone to the small hole behind the thread feeder assembly.



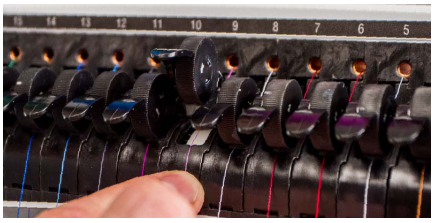


- To use the monofilament, locate the small hole behind the thread feed assembly. Push the monofilament into this hole and up through the supply tube until the end extends above the cone of thread. Then, secure the end of the thread in the notch of the monofilament and slowly pull the thread through the tube.
- If using compressed air, place the end of the thread in the top of the thread supply tube. Feed enough that the thread will stay without holding it. Now blow the compressed air into the tube. The air will carry the thread and shoot out the front of the machine.

3. Using the black tab just in front, lift the pinch roller.



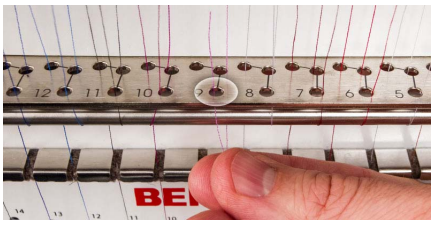
4. Pull the thread from the hole and place it under the pinch roller. Bring the thread down through the upper thread guide.



5. Pull the thread down to the middle thread guide. Of the three holes, push the thread from the top through the back right hole. Make sure the thread is on the right side of the take-up lever.



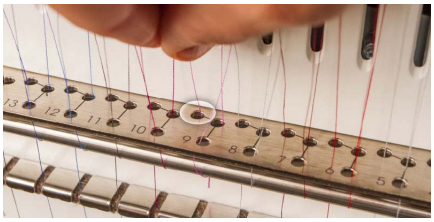
6. Bring the thread around the thread sensor from back to front and up through the front hole of the middle thread guide.



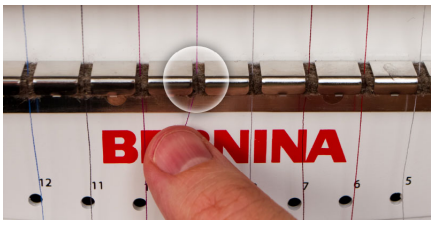
7. Pull the thread up and through the eye of the take-up lever from right to left.



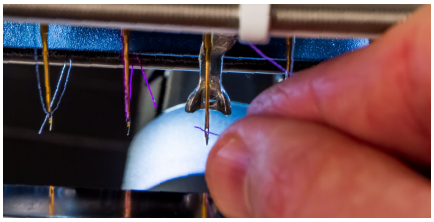
8. Route the thread straight down through the back left hole in the middle thread guide.



9. Press the thread into the felt restraint and feed it down through the lower thread guide.



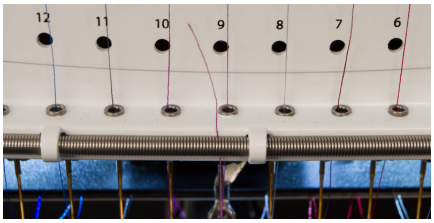
10. Thread the needle from front to back. Cutting the end of the thread may allow it to more easily pass through the eye.



11. Be sure to align the thread with the small v-notch in the thread feed cover.

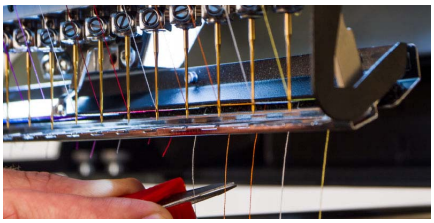


12. Press the black tab to lower the pinch roller.
13. If desired, the thread can then be held by the retaining spring in front of the lower thread guide or held in place using the grabber.



To utilize the grabber, with your hands out of the way, tap the Grabber In button  to close the grabber and move the thread into the holder behind the needles.

14. Trim the end to about an inch in length.



15. Tap the Grabber Out button  to open the grabber again.

7.2. Bobbin Threading & Tensioning

The proper bobbin tension and installation also play an integral role in the quality and efficiency of an embroidery sew-out.

What Type of Bobbin?

For the best results with your machine, use Style L continuous polyester filament bobbins.

Removing the Bobbin Case

Warning!!

Never attempt to remove or insert the bobbin while the machine is in operation.

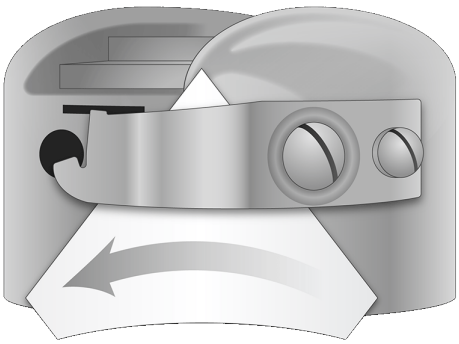
The bobbin case can be removed from the lower arm of the machine by locating the release lever on the bobbin case.



1. Pull forward on this lever until the case is free from the machine.
2. Remove the old bobbin from the case.

Cleaning the Bobbin Case

You should clean under the tension spring of your machine bobbin case every time you change the bobbin.

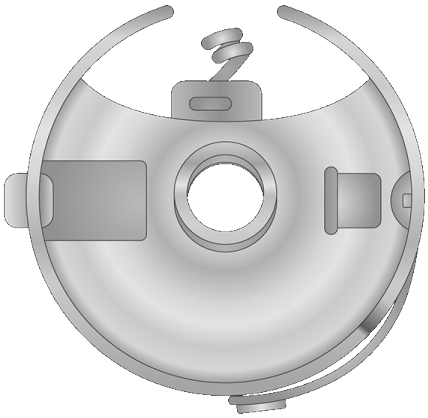


Lint and bobbin wax can build up under the spring, and this can affect bobbin tension. This, in turn, will impact sew quality (loose bobbin, bobbin showing on front side of sew out, thread breaks, false thread breaks). To clean under the spring, slide a corner of a small piece of paper under the tension spring in the same direction the thread travels. While cleaning under the tension spring, be careful not to bend the spring.

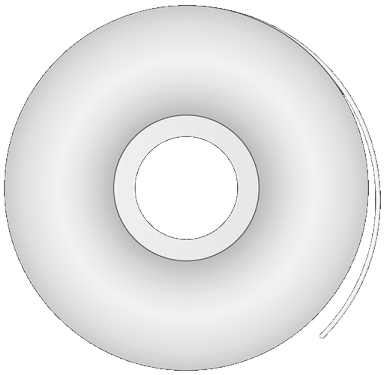
After cleaning the bobbin case, blow the case out with compressed air. It is also recommended that you check the bobbin tension.

Inserting a New Bobbin in the Bobbin Case & Checking the Tension

1. Hold the bobbin case with the front facing down and the open end facing up.

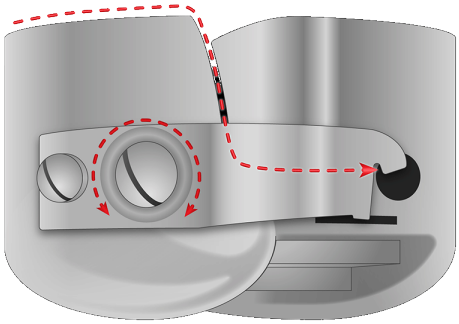


2. Hold the new bobbin with the thread coming over the top and to the right in a clockwise fashion. It should look like a number nine (9).



3. Without flipping the bobbin, drop it into the bobbin case.

4. Route the thread through the thin slot opening and under the tension spring. Stop before threading through the pigtail. The bobbin thread should now be releasing from the side of the case.

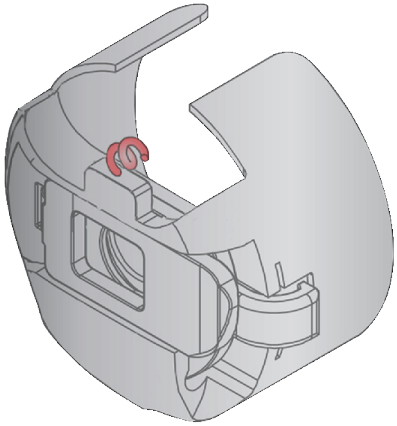


5. To check the bobbin tension, hold the bobbin thread with one hand. As you gently bounce the thread, the bobbin case should drop 1"-2" or 2.5 - 5cm.
6. If the tension is incorrect, use a flat-blade screwdriver to turn the larger adjustment screw clockwise to tighten or counterclockwise to loosen the tension.

Information

This test must be completed BEFORE winding the thread through the pigtail.

7. Once the tension is set, wind the thread through the pigtail.

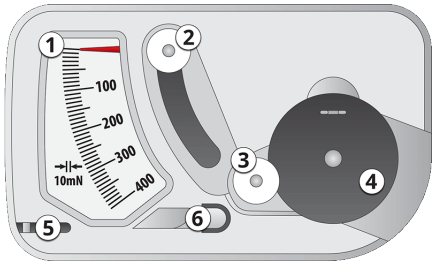


Information

For a more accurate test of the bobbin tension, use a bobbin tension gauge.

Bobbin Case Tension Gauge

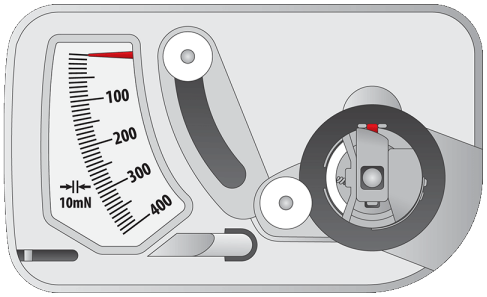
Overview



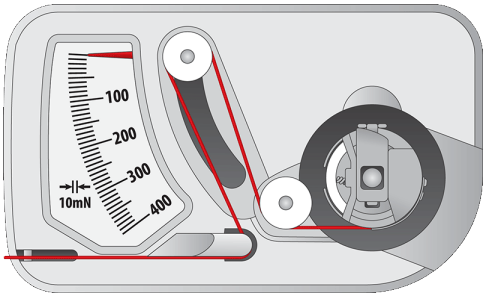
1. Indicator
2. Second Pulley
3. First Pulley
4. Bobbin Case Set Position
5. Thread Cutter
6. Thread Take-up

Using the Gauge

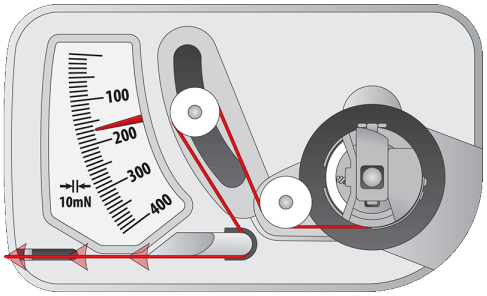
1. Clean and thread the bobbin case as you normally would.
2. Pull the thread through the tension spring, but do not pull the thread through the pigtail.
3. Insert the threaded bobbin case into the tension gauge with the extended portion of the latch falling into the guide as shown in red.



4. Route the thread through the two pulleys and the take-up as shown in red.



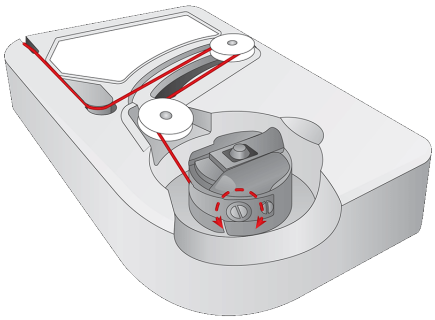
5. Pull the thread gently and smoothly in the direction of the arrow at a rate of approximately an inch per second. Doing this will cause the second pulley to move down and with it, the gauge indicator. Watch as you pull for where the indicator is when the bobbin is starting to turn.



- The ideal setting for bobbin tension for embroidery is between 150 and 190 mN.

Adjusting Bobbin Tension

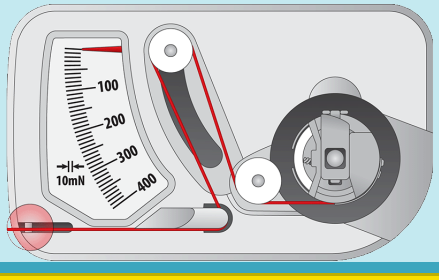
1. To adjust the tension, access the adjustment screw (the larger of the two) on the tension spring from the recessed corner of the gauge.
2. Using a small flat-blade screwdriver, turn the adjustment screw in small increments between testing. Small rotations can make large adjustments to the tension.
    - Clockwise: This increases the tension on the bobbin thread.
    - Counterclockwise: This decreases the tension on the bobbin thread.



Additional Instructions

Information

Extra thread may be trimmed away using the thread cutter located below the indicator.



Warning!!

This device is a precise measuring apparatus that has been carefully tested and adjusted. Do not drop, hit against another body, or disassemble it.

Avoid gauge contact with thinner oil, benzine oil, alcohol, and/or petroleum.

Inserting the Bobbin Case

Warning!!

Never attempt to remove or insert the bobbin while the machine is in operation.

1. Insert the bobbin and case in the machine with the pigtail facing up. Push on the bobbin case until it snaps into place.
2. Test the bobbin orientation by pulling on the thread. The bobbin should rotate counterclockwise.



3. Trim the thread to 2–3 inches.



Note:

If the thread is cut too short, it will not pick up on the stitch. If the thread is left too long, it may wrap into the machine.

8. Sewing a Design

Here is a general checklist for sewing a design.

- Load A Design
- Set the Color Sequence
- Select the Hoop
- Set the Speed
- Adjust Acti-Feed Settings for Fabric
- Hoop the Product
- Load Hooped Product onto the Machine
- Adjust Placement and Orientation in Hoop
- Adjust Presser Foot Height
- Trace the Design

If you have done all of the above, you are ready to press the start button and watch your design sew.



After the Design is Sewn

After the design is complete, remove the hoop from the machine by gently lifting the spring clips and pulling the hoop free of the hoop arms.

Before giving the garment to the customer, remove the stabilizer, hoop rings, and any toppings used.

9. Main Screen

View Window

The largest portion of the screen is devoted to a preview of the design in the selected hoop. This is meant to give the user an understanding of placement within the hoop and color selection.

Within the View Window, you can:

- Pan (Move) the view
- Zoom the view
-  Change View Options
-  Zoom to Design
-  Zoom to Hoop
-  Change to Full Screen
-  Restore to Normal View
-  Trace

Status Bar

Below the view window is the status bar.

Design Information & Progress

The status bar will display the following information:

- File Name
- Design Dimensions
- Current X/Y Location
- Time Sewn / Estimated Time Remaining

- Stitches Sewn / Total Stitch Count (Total Stitch Count may differ from stitch count listed in the file browser depending on Design Filter settings)

The status bar will change to a progress bar as a design is sewn. It will fill in from flat to dimensional as it finishes sewing.

Machine Status

The status bar will also change colors depending on the machine's state. Additional information may appear as needed. This would include:

- Silver
  - The machine is ready to be interacted with, and a design can be loaded.
- Green
  - The machine is running.
- Amber
  - The machine was stopped by the user.
  - Color sequence commands like "Applique" or "Pause".
- Red
  - Hoop limits are exceeded.
  - Errors such as communication, tracking, or other critical machine errors have occurred.
  - E-Stop is engaged.

Color Sequence Bar

Just below the status bar lies the color sequence bar. This bar is a visual representation of the color sequence. As the status bar fills in with progress, the dimensional progress display above lines up with the color blocks below.

Sewing a Design



Load Design

Load Design allows you to browse for a design that you would like to load to the machine and prepare for embroidery.

This also allows you to manage the embroidery designs on your machine or flash drives.



Return to Origin

If not at design origin (start of design before any machine movements have occurred), the Load Design button will be swapped for the Return to Origin button. This button will return the machine to the very start of the design.

- This may or may not be the same as the first needle penetration. That is decided by the digitizer of the design.



Color Setup

Color Setup goes into the color sequence screen. This allows you to set up the sequence for all the color changes within a design. Effects and interrupt commands can be added to the color sequence to create stops for thread cone changes or bobbin checks on larger designs.

- This is only available when the machine is stopped.
- Once running, this space indicates the current color and needle.



Hoop Selection

Use hoop selection to tell the machine what hoop is being used. Confirming your hoop selection will return you to the main screen. The main screen will indicate if you have exceeded the hoop's limits, ensuring that your design will fit within the selected hoop. This will prevent hoop strikes with the needle.

Machine Sew Speed



This reflects the maximum speed the machine will run in stitches per minute. The machine may automatically slow for longer stitch movements in X, Y, and also Z. Longer stitches, as well as higher thread feed values, may affect speed.

Changing Machine Speed

The machine speed may be altered by tapping the plus or minus button on either side of the speed setting.

Actual Speed

The actual speed is displayed below the set maximum speed.

Acti-Feed



Acti-Feed affects the amount of thread fed to the material being embroidered. While much of Acti-Feed is automated based on sensor feedback, giving Acti-Feed guidelines such as a minimum can help create higher-quality sew-outs.

Feed Chart

This chart helps monitor the feed of thread to the product. It displays the following:

- Feed - This is the amount of thread being fed to account for the detected material thickness.
- Minimum - Displayed as the lower user-adjustable line. This represents the lowest the Acti-Feed is allowed to go.
- Maximum - Displayed as the upper user-adjustable line. This represents the highest amount the Acti-Feed is allowed to go without modifiers/effects in the color sequence.

As the machine embroiders, this will show a history of the Acti-Feed. This can be used to help diagnose thread breaks, false breaks, and sew quality issues. When the minimum is set appropriately on an even material, the feed activity will only be making minor adjustments. Large adjustments in feed tend to indicate shifts in material, embroidery, or potential problems.



Information

Bobbin case cleanliness and differences in bobbin tension can affect the Acti-Feed.

Minimum

The Acti-Feed Minimum sets a lower limit for the Acti-Feed. It allows the machine to adjust the amount of thread fed as needed, but it will not allow feeding of less than the specified amount.

The ideal setting for the minimum is the actual thickness of the material (and stabilizer) being sewn, minus two points.

The Acti-Feed Minimum is displayed as the lower set line in the Feed Chart.

Maximum

The Acti-Feed Maximum sets an upper limit for the Acti-Feed. It allows the machine to adjust the amount of thread fed as needed, but it will not allow feeding more than the specified amount. It is uncommon to need to limit the maximum for the Acti-Feed.

Acti-Feed Suggestions

The Acti-Feed Suggestions can provide a guideline for where the minimum should be set.

Tapping any fabric/garment suggestion populates the slider and Acti-Feed Minimum to a mid-point suggestion for that material. As even the same type of garment can vary in thickness, you may wish to adjust the Acti-Feed slider further.

 Transform (Move & Rotate)

Move and rotate the design within the confines of the selected hoop. This will allow you to adjust the angle or position of the design.

Center the Hoop

You can quickly center the hoop from the Main Screen by pressing and holding the Transform button.

Moving Through a Design

Occasionally, you will need to move forward or backward within a design. These tools allow you to do that quickly:

-  Seek Back or  Seek Forward
    - Tapping this button will bring up the option to move through a design 1, 10, or 100 stitches at a time without stitching.
    - Holding a button will continue the movement at the specified speed.
    - Press confirm to exit the window.
-  Move to Stitch

- Tapping this will open a window with a field for specifying an exact stitch number.
- Enter a stitch number and press confirm to move there.
- Press cancel to exit the window without moving.

-  Move to Trim
  - Tapping this will bring up a scrollable area with design segments previewed.
  - These segments are divided by trims.
  - Select the segment to move to and confirm to move through the design to the desired segment.
  - Press cancel to exit the window without moving.
-  Move to Color
  - Tapping this will bring up a scrollable area with design segments previewed.
  - These segments are divided by color change commands.
  - Select the segment and confirm to move through the design to the start of the desired color block.
  - Press cancel to exit the window without moving.



Press Start to Confirm

You can use the Start button on the touchscreen to confirm and exit all Moving through a Design dialog windows.

Machine Operations

Machine Operations will activate different functions of the machine that are often used when embroidering during and between runs. These include:

-  Hoop Forward/Back
  - Moves the frame forward as far as possible while leaving the needle within the sew-field of the hoop.
  - Tapping again will move the frame back to the original position.
-  Trim Immediate

- This causes the machine to execute a trim command.

-  Change to Needle (Move Needle case)
  - Tapping this brings up a window displaying the thread tree and needle assignments.
  - Selecting the desired needle number and confirming will move the needle case to that needle.

-  Laser On /  Laser Off
  - Activates or deactivates the laser for positioning.

-  Grabber In /  Grabber Out
  - Extends and retracts the grabber.
  - This is helpful when changing needles or capturing threads in the trap behind the needles.



Press Start to Confirm

You can use the start button on the touchscreen to confirm and exit the Change to Needle and Trim Required dialog windows.



Presser Foot Adjustment

This will bring the needle to its bottom-most rotation for a better view of the presser foot at this location. This is used for adjusting the presser foot height against the material.

Maintenance & Settings



Maintenance

Access to maintenance timers and technician screens is found within Maintenance.

- This button will flash if a maintenance procedure is due.



Settings

Find settings such as preferences, design filters, time zones, and network settings here.

- This button may flash if a software update is available.

9.1. View Window

The view window displays the loaded design alongside information and other options.

Design Display

The currently loaded design is displayed in the view window. The design display can show:

- Stitch Progress
    - Before starting, the design is displayed in 3D.
    - After the design has started sewing, unsewn portions appear in 2D while sewn portions appear in 3D.
- Position
    - The design is shown where it will be sewn in relation to the machine and the hoop.
    - After starting a design, a change in the position is displayed as a dotted line.

View Options

 If you would like to change what is seen in the view window, you can alter the view options.

Background Color

A swatch of color representing the background color in the view window can be seen.

Custom Color Sliders

- Via the sliders, you can alter the background to match the material to be embroidered.
    - RGB - These sliders alter the levels of Red, Green, and Blue light used to create the background color
    - HSV - These sliders alter the following:
        - Hue - while definitions get lengthy and hard to understand, this is essentially what people think of as the base color and where along a color wheel it would fall.
        - Saturation - a numeric representation of how bright or dull a color is.
        - Value - a numeric representation of how light or dark a color is.

Presets

Preset swatches are stored background color values for later use.

Show / Hide Options

Graphic additions to the view window that can be toggled on or off depending on your preferences. These include:

-  **Colors from Design**
  - This displays the colors of the design as saved in the design file, rather than the colors assigned in the color sequence.



Note:

This can result in the embroidery on products being different in color from what appears on the screen.

-  **Background from Design**
  - This displays the background color of the design if saved in the design file, rather than the background color assigned above.
-  **First and Last Stitch**
  - This shows the first and last stitch of the design. This can be helpful when the first stitch is not at the design origin.
-  **Display Origin**
  - This displays the machine's origin as a crosshair contained within the mechanical limits.



Note:

This may or may not align with the center of the hoop or the center of the sew-field. It is a display of the mechanical origin of the machine.

  - This displays the mechanical limits of the machine as a large box.
  - This displays the design origin as a small propeller shape.

-  **Display Sew-Field Center**
  - This displays the center of the selected hoop's sew-field.

> ***Note:***
>
> *This may or may not align with the center of the hoop.*

Zoom & Pan

The touchscreen allows for zooming and panning in the main portion of the view window. You can pan by touching and dragging. You can also use pinch gestures to zoom in and out.

Zoom Bar

The vertical bar on the left side of the window functions as a zoom area.

- Dragging up or down on this bar changes the zoom level.

> ***Note:***
>
> *The view will follow the current stitch while zoomed in and sewing.*

Move X/Y & Rotate

When in the transform screen, the view window takes on different functions. These functions can be changed back using the switch on the right side of the screen:

 Allows you to Move and Rotate the design

 Allows you to Pan and Zoom

Move

The main portion of the view window allows for tapping and dragging a design to a new location in the hoop. Once let go, the hoop arms will move to accommodate the new design location.

Warning!!

Dragging or moving designs outside the hoop limits can cause damage to you or the machine.

Rotate Bar

What was the zoom bar becomes the rotate bar when in the transform screen.

Dragging up or down on this bar rotates the design.

10. Touchscreen Physical Buttons

Start / Stop

This button will begin or stop sewing. A green or red light will indicate when the button is available for use and what function is associated with the button.

-  Unlit - When unlit, this button has no function. This is usually due to the current screen or state of the machine.
-  Green - When lit green, tapping this button will cause the machine to begin or continue sewing the currently loaded design.
    - Slow sewing or inching - Pressing and holding this button will cause the machine to begin sewing very slowly. Releasing the button will cause the machine to resume normal speed.
-  Red - When lit red, tapping the button will cause the machine to stop sewing.
    - Slow sewing or inching - Pressing and holding this button will cause the machine to begin sewing very slowly. Releasing the button will cause the machine to resume normal speed.
-  Red while stopped - This indicates a critical error has occurred.



Warning!!

Do not confuse this button with the Emergency Stop button. The machine can still start if there is a machine fault somewhere. The stop/start button does not disconnect power from the motors or internal components.

Emergency Stop Button

The emergency stop button breaks the electrical circuit to all the motors to prevent its operation.

Direction Buttons

On the Main Screen and the Transform screen, the position of the hoop on the machine can be changed with these buttons.

This can be used to change the position of the design within the hoop. This function is only available on these two screens.

10.1. Bug Report Function

The touchscreen can capture screenshots and machine logs which are then saved to a USB. These files can be helpful to technicians when trying to diagnose a problem.

To create a bug report:

1. Plug a USB drive into the touchscreen USB port.
2. Hold the Left and Right buttons together for five seconds.



3. Choose whether you wish to save machine logs or just a screenshot.
4. Press the green confirm button.
    - Files will save directly to your USB stick (if plugged in) as a .bugreport file.
    - Plug the USB drive into your computer and email the .bugreport file as needed.

11. Loading a Design

Your embroidery machine can hold a large number of designs in the touchscreen panel.

Designs can also be loaded from a USB flash drive or a network storage location.

Supported File Types

Your embroidery machine will support the following embroidery design file types:

- **OFM - version 9 and later**
  - Can contain color information.
  - Can contain explicit trims.
  - Versions older than 9 are not supported.
- **ARTX**
  - Can contain color information.
  - Can contain explicit trims.
- **EXP**
  - May contain additional hidden .INF file with color information.
  - Can contain explicit trims, but may rely on a jumps count to trim conversion.
- **DST**
  -
  - May contain additional hidden .INF file with color information.
  - Requires jumps count to trim conversion to create trims.

Loading a Design

 To load a design, begin by tapping the load button in the bottom left corner of the main screen. Then you will need to:

1. Select a Design Source

Tap on the Design Source from which you would like to load the design. Tapping on any of these sources will take you to a design browser showing the designs contained within.



Favorites

Favorites is a collection of designs that have been marked as a favorite. Any design stored locally on the touchscreen module can be marked as a favorite. This will allow it to show in these designs to be quickly referenced from this screen.

Favorite designs are not moved from their original locations. Favoriting a design merely links it to this source for easier access. The original source location will be displayed with the file.

Favorite designs that are moved (not copied) from local storage to USB will lose their favorited status.



Local

Local accesses the local storage in the touchscreen module where many designs can be stored. Designs can be copied to and from local storage.



USB

USB accesses the USB flash drive currently plugged into the touchscreen module.



Windows Prompts for USB Drive Repair

When sharing a USB drive between the machine touchscreen and a PC, Windows may show an alert stating that there is a problem with the USB drive, and that it requires repair (scan and fix). This is a common notification. It doesn't require repair. Ignoring or accepting the repair will not affect performance.



Network

Network accesses shared folders that have been set up over the network.

Network locations must be configured and added. Find more information in the Network Source Setup section.

- Network locations you add will be saved for future use.

Selecting a previously added network folder will bring up a connection dialog.

- If the password for this location has changed or has not been saved, you will need to enter it at this time and click Connect.
- If the password is saved and has not changed, leave it blank and click Connect.

Folders will take longer to load the more designs they contain. Once you are connected to a folder, you can navigate to a design and load it as you normally would.

2. Use the Design Browser to Select a Design

Browse the contents of the source chosen, then tap the design you wish to load.

Design Preview

Tap the switch at the top right of the screen to change how designs are displayed:

 Grid View - provides a larger preview, but less room for additional information.

 List View - provides more room for information, but less room for the preview.

List Style

Tap the switch at the top right of the screen to change how designs are displayed:

 Grid View - provides a larger preview, but less room for additional information.

 List View - provides more room for information, but less room for the preview.

Location / Breadcrumbs

At the top of the screen, the current location is displayed.

 Parent Folder - Tapping on this button will navigate up a folder to the parent directory.

Search

 Tapping in the search box next to the search icon brings up a keyboard and allows searching the contents of the current folder and any sub-folders.

Location Contents

The contents of the current folder/directory/source will be displayed in the main portion of this screen.

-  Tapping on a folder will enter the folder/directory.
- Tapping on a design file will bring up the Design Preview window.

Folder Management

Functions for managing folders are located at the bottom of the screen.

-  New Folder - creates a new folder in the current location.
-  Delete Folder - deletes the current folder and its contents.
-  Rename Folder - renames the current folder.
-  Pastes a cut or copied file into the current location.

Multiple File and Folder Management

To manage multiple files or folders:

g. Long-press the first desired file or folder.

h. After the selection is highlighted with a ring around it, additional options become available:

- Add items - more items may be selected by tapping on them.
- Deselect items - items can be removed from the selection by tapping them again.
-  Deselect All - All currently selected items will be deselected. You will exit the multi-file mode. Long-press on an item to reenter the mode.
-  Cut Design File - This prepares the current selection to be moved to a new location. It places these items in memory to be pasted into a new location.

- Tapping this button will return to the Design Sources screen. From there, navigate to the desired location for the selected items.
- Once in the desired location, tap the paste design button to place the selected items in the new location.

-  Copy Design File - This prepares the current selection to be copied to a new location. It places a copy of these items in memory to be pasted into a new location.
  - Tapping this button will return to the Design Sources screen. From there, navigate to the desired location for the item copies.
  - Once in the desired location, tap the paste design button to place the selected items in the new location.
-  Delete File - This deletes the selected items.

Adding a Network Location

To add a new Network location in the Network sources screen:

 Press the Add Network Location button in the bottom left corner of the Network Designs screen.

You can find more information in the Adding a Network Location section.

Deleting a Network Location

To delete a Network location in the Network sources screen:

 Press the Delete Network Location button. This will bring up a dialog allowing you to select a network location to delete.

You can find more information in the Delete a Network Location section.

3. Preview the Design

The design preview that appears when tapping on a design file will show the following:

Design Preview Image

A rendered preview image of the design will be shown with the colors saved in the file (if available).

Design Information

- Design Name and Extension (for example: filename.ofm)
- Stitch Count (Stitch Count may differ from the total stitch count listed on the status bar depending on Design Filter settings)
- Design Size (width x height)
- Color Change Count - This may be far greater than the number of thread cones required for the design. Individual thread colors may be repeated throughout the design's color sequence.
- Trim Count

Design File Management

Design file management icons are located on the right side of the window. This includes the following:

-  Favorite - On locally stored files only. Tapping this button fills the icon and marks the design as a favorite. This will create a link in the Favorites location and make it visible from that location.
  -  Design is not a Favorite. Tapping will make it a Favorite, place a link in the Favorites Design Source, and fill in the icon.
  -  Design is a Favorite. Tapping will remove the Favorite status, remove the link in the Favorites Design Source, and hollow out the icon.
-  Rename - This brings up the ability to rename the file.
-  Cut Design File - This prepares the current file to be moved to a new location. It places the file in memory to be pasted into a new location.
  - Tapping this button will return to the Design Sources screen. From there, navigate to the desired location for the design file.
  - Once in the desired location, tap the paste design button at the bottom of the screen to place the design in the new location.

-  Copy Design File - This prepares the current file to be copied to a new location. It places a copy of the file in memory to be pasted into a new location.
  - Tapping this button will return to the Design Sources screen. From there, navigate to the desired location for the design file copy.
  - Once in the desired location, tap the paste design button at the bottom of the screen to place the design copy in the new location.
-  Delete File - This deletes the file.

Close the Window

At the bottom of the window, there are two options:

-  Confirm - closes the window and loads the selected file to the machine.
-  Cancel - closes the window and does not load the file to the machine.

4.  Press Confirm to Load the Design

12. Network Source Setup

Several steps are required before you can load designs from a network source for the first time.

Start by connecting your touchscreen and computer to the same network. Then visit each section below to set up your network:

1. Configure Windows to share files.
2. Share the folder containing your designs on the computer.
3. Add the network location of the shared folder to your touchscreen.

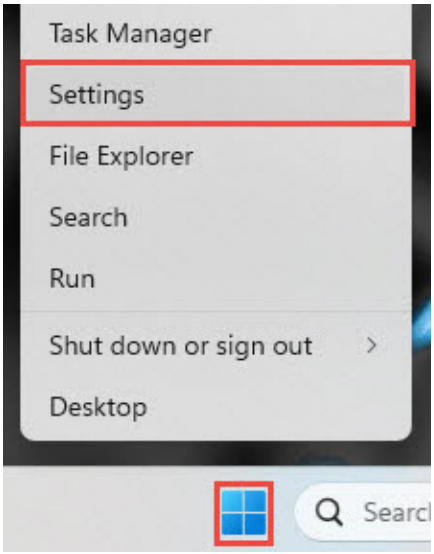
If you've followed these steps and are still having trouble, visit the Network Source Troubleshooting section.

12.1. Configuring Windows for File Sharing

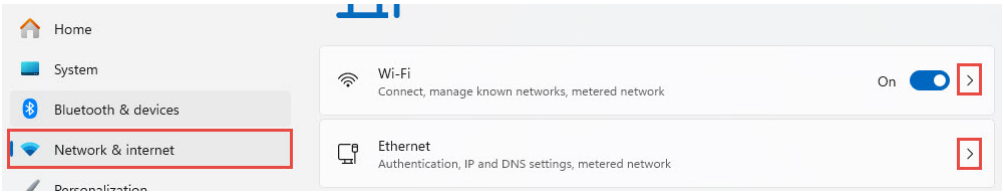
The following section describes how to set up Windows 11 so a folder can be shared over the network. These are general guidelines and your setup process may differ depending on your operating system version, local network, and security environment.

Go through the following steps to configure Windows 11 to share a folder:

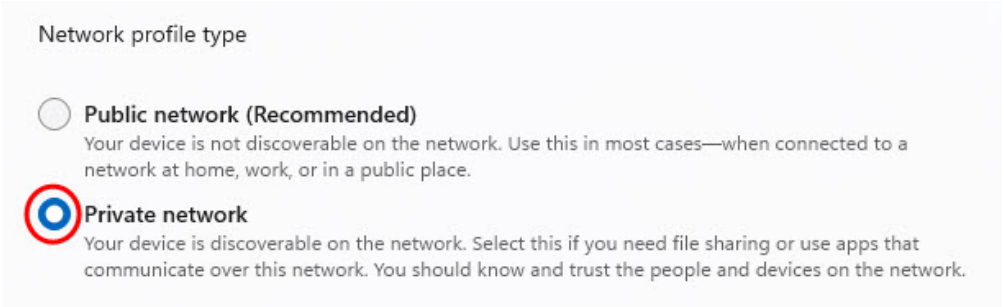
1. Right-click the Windows Start button and click on Settings.



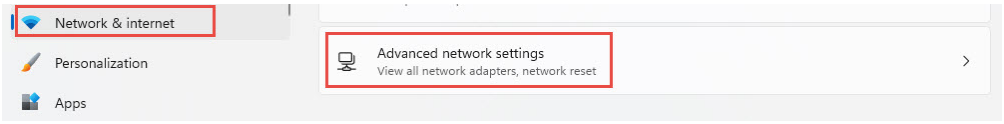
2. Click on Network & Internet.
3. Click on the connection that you are using (Ethernet or Wi-Fi). Then, if using Wi-Fi, click the name of your Wi-Fi network.



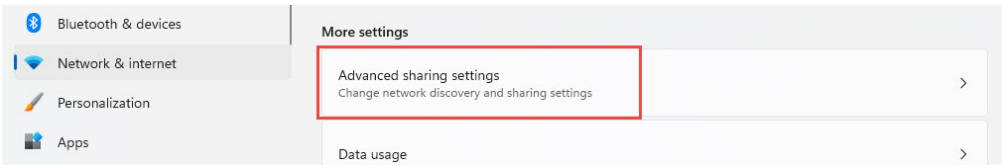
4. Set the Network profile type to Private network.



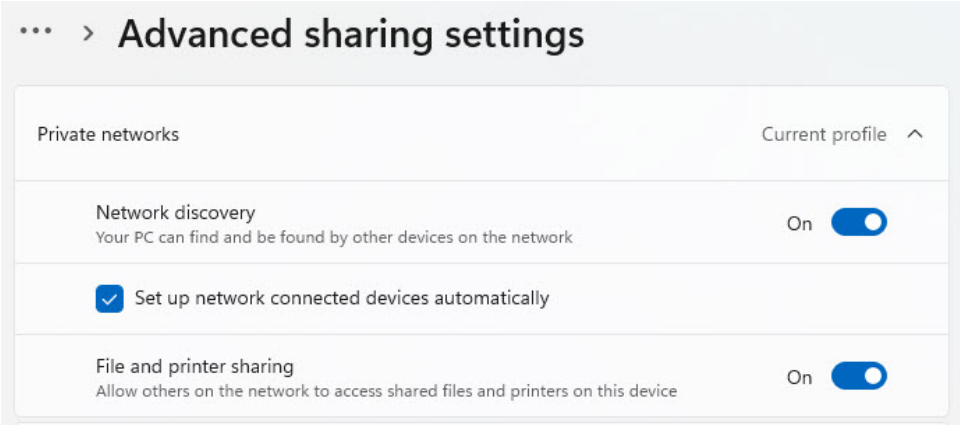
5. Click on Network & Internet and click on Advanced network settings.



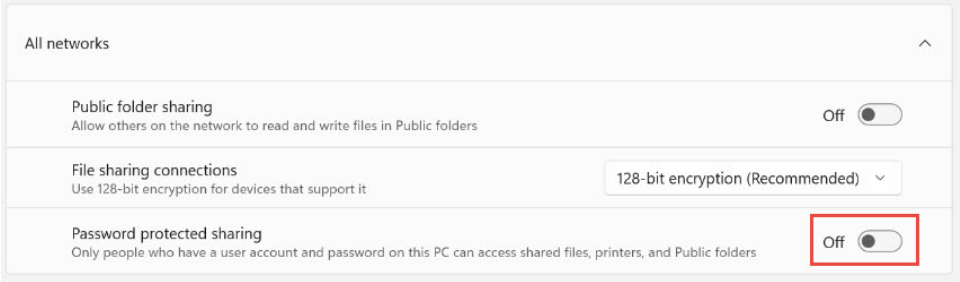
6. Click on Advanced sharing settings.



7. Edit your Advanced sharing settings:
    a. For Private networks:
        a. Set Network discovery to On.
        b. Check the box to Set up network connected devices automatically.
        c. Set File and printer sharing



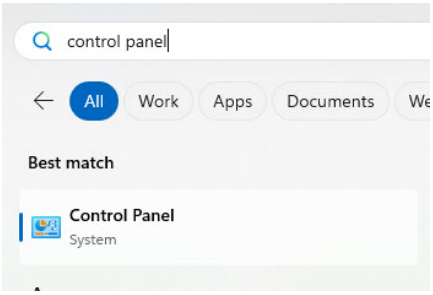
    b. For All networks:
        a. **Set Password protected sharing to Off.** This setting may not be available on some PCs.



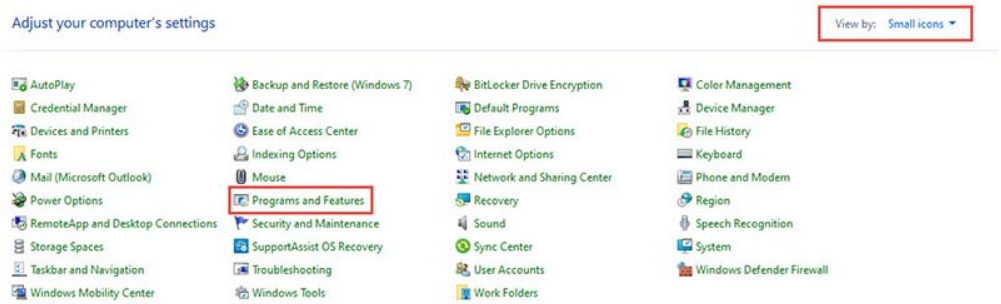
Information

Turning off Password protected sharing allows other devices connected to your network, like your embroidery machine, to access shared folders. While your files will still be protected by your network level security (i.e. Wi-Fi password) we advise against sharing any folders that contain private or sensitive information.

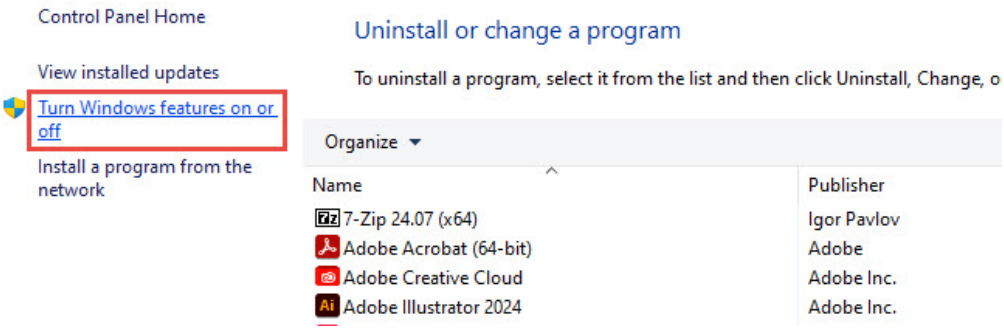
8. Open the Control Panel.
    - Click on the Windows Start button, type Control Panel, and select it from the menu.



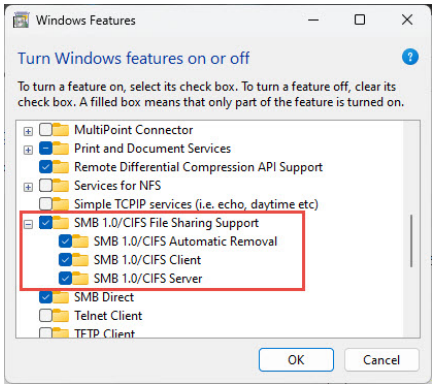
9. Ensure "View by" is set to "Small icons" on the top right.
10. Click on Programs and Features.



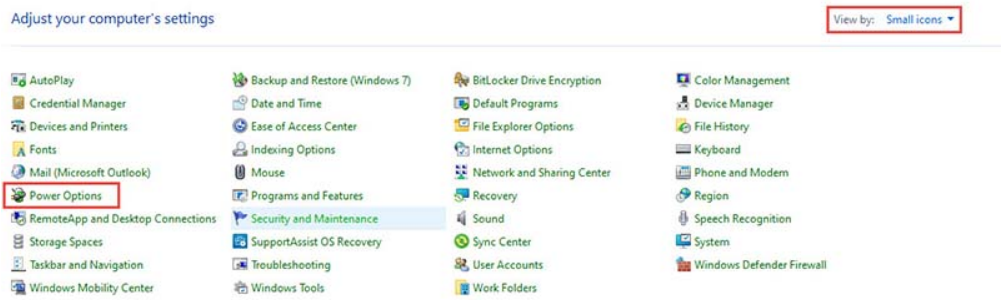
11. Click on Turn Windows features on or off and wait for the list to populate.



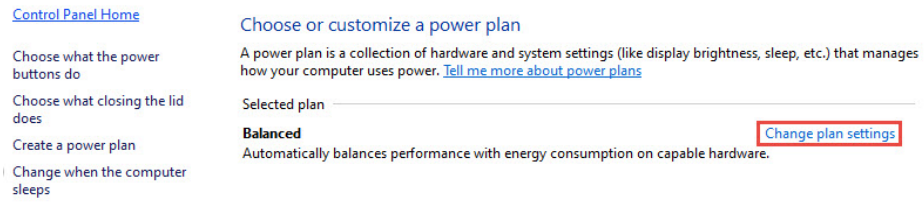
12. Scroll down to SMB 1.0 and check the box to turn it and all its components on.



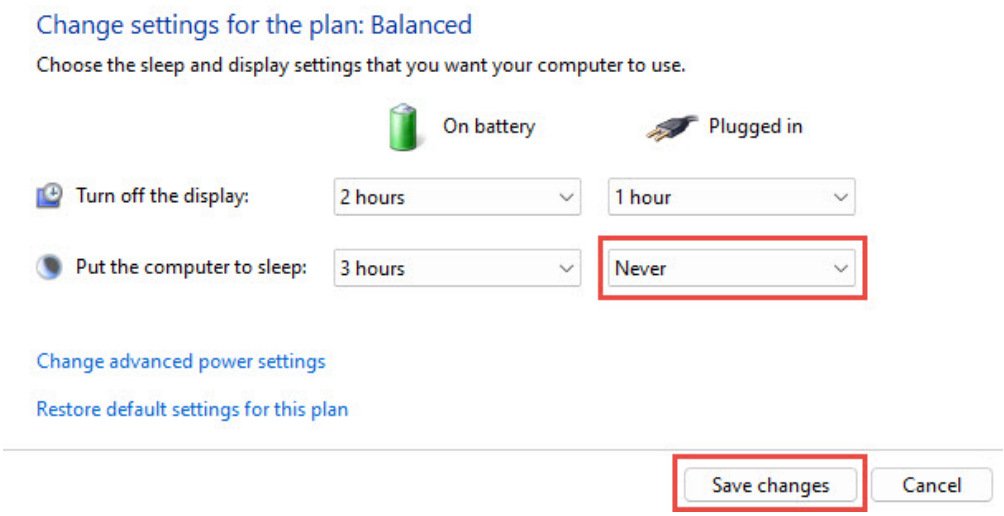
13. After a short install, Windows will prompt you to restart your computer.
14. If you wish your network files to be available at all times, you will need to change your computer's Power Options.
    a. From the Control Panel, click on Power Options.



    b. Change plan settings for whatever power plan you are using.



    c. Set the computer to never fall asleep (otherwise shared files might stop being available). Save Changes.

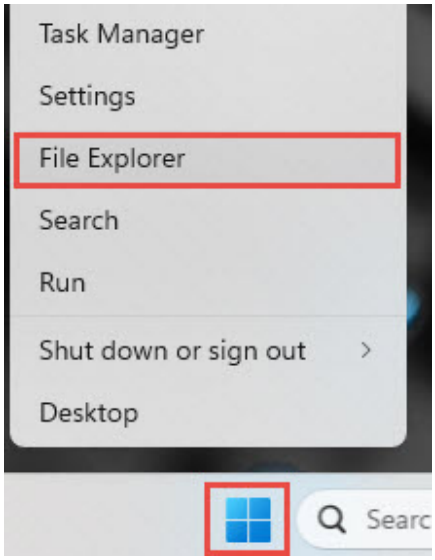

Change settings for the plan: Balanced
Choose the sleep and display settings that you want your computer to use.
On battery
Plugged in
Turn off the display:
2 hours
1 hour
Put the computer to sleep:
3 hours
Never
Change advanced power settings
Restore default settings for this plan
Save changes
Cancel

12.2. Sharing a Folder on Windows

The following section describes how a folder can be shared when using Windows 11. These are general guidelines and your setup process may differ depending on your operating system version, local network, and security environment.

Select and share a folder by following the steps below:

1. Right-click the Window's Start button and click on File Explorer.



Information

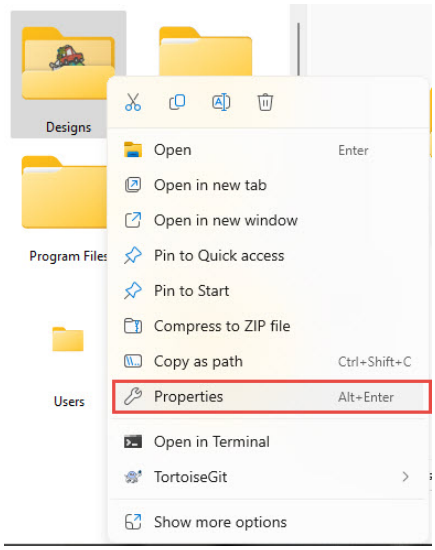
Using a folder with a short and easy-to-type name will make future steps easier. For example: "DesignFiles", "SummitFiles", or "E16Files".

2. Navigate to the folder you wish to share.

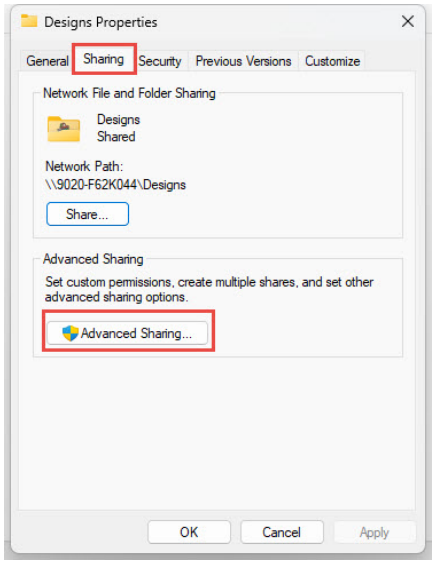
Caution!

Never share files or folders over your network that contain private or sensitive information.

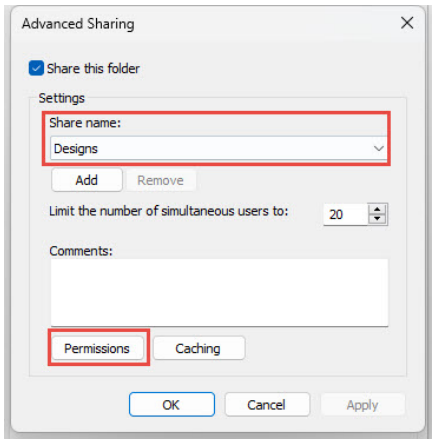
3. Right-click on the folder and click on Properties (you may need to click on Show more options first).



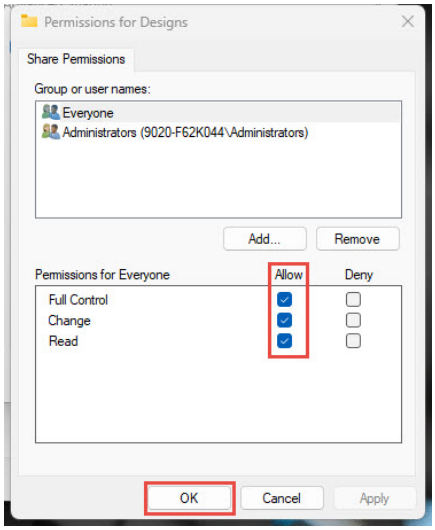
4. Move to the Sharing tab and click on Advanced Sharing.



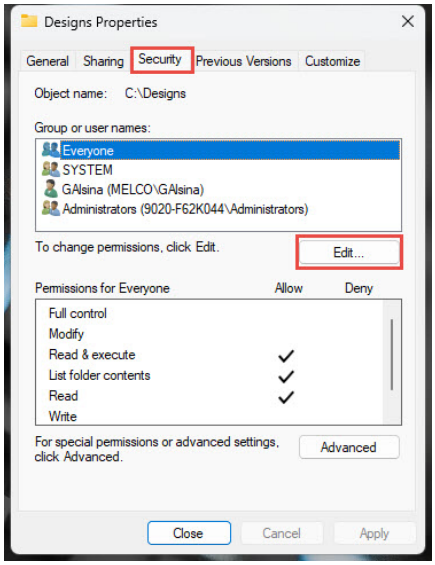
5. You can change the display name of the shared folder, and click on Permissions.



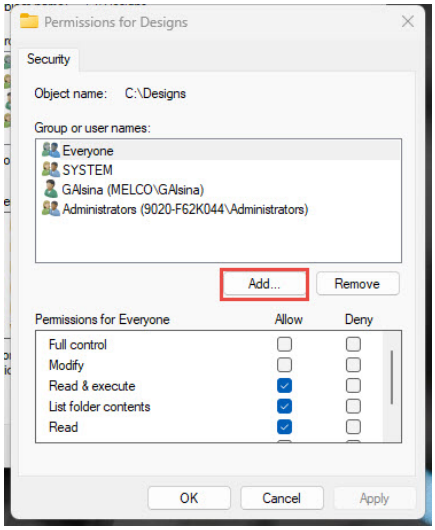
6. Select Everyone, Allow Full Control, and click OK.



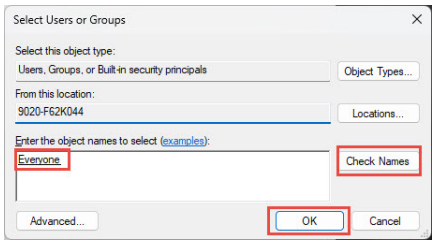
7. Move to the Security tab and click Edit.



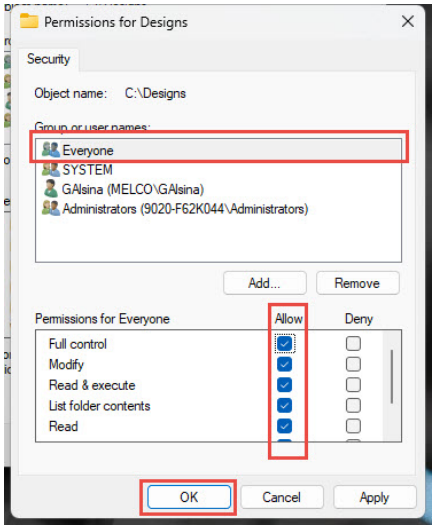
8. Click on Add.



9. Type "Everyone" into the field, click check names, and click OK.

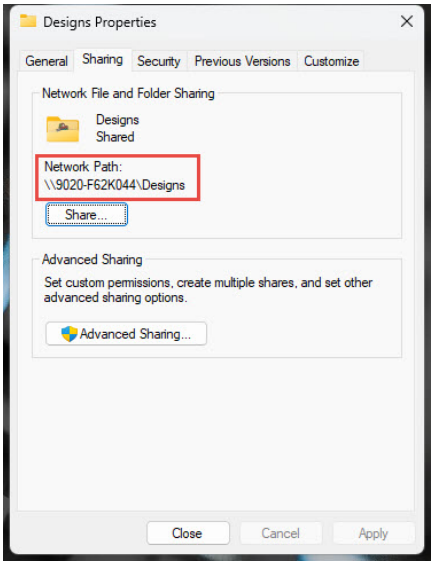


10. Select Everyone, Allow Full Control, and click OK.



11. Move to the Sharing tab.

    a. Note the full Network path for the shared folder, which you will need to enter into your Touchscreen.



12.3. Adding a Network Location

Before you can view shared files, you must add the location they are stored in to the Touchscreen interface:

1.  Press the Load Design button.
2.  Press the Network Source button.
3.  Press the Add Network Location button in the bottom left corner of the Network Designs screen.
4. Enter the Network Location - This is the network path of the shared folder.
    a. On Windows, the shared path will start with your computer name and be followed by the name of the shared folder.
    b. For example: "\\[computer name]\SharedFolder".



Information

In some network setups, it may be necessary to use the computer's IP address instead of its name. Visit the Using IP Address section for more information.

5. Pick a name for the Touchscreen Module Folder - The folder created on the Touchscreen will use this name.
6. Network Locations can be added in two ways:
    a. Anonymous - For most personal computers and networks that do not require a username and password:
        a. Check Anonymous.
        b. Click the Add button.
    b. Credentials - For many business computers on a domain and networks that require a username and password:
        - Uncheck Anonymous.
        - Enter the username, domain, and password for the networked source.
            - If you choose to save your password, it will be encrypted and saved on the touchscreen device. This will allow you access to the shared folder without entering credentials again.
            - If you choose to not save your password, you will need to re-enter the password every time you wish to access the shared folder.

- Click the Add button.

7. It may take several minutes to load your shared folder.
    - The more content there is to display in the folder, the longer it will take to set up.



Warning!!

Choosing to save your network location credentials to the Touchscreen can increase the risk of malicious actors gaining access to the account being used. You can decrease your risk by setting up an anonymous connection instead, or by using credentials to an account that does not have access to private or sensitive information.

12.4. Delete Network Location

You can delete any network location that has been added.

 Delete Network Location button - This will bring up a dialog allowing you to select a network location to delete.

- Deleting a network location does not affect its contents on the networked computer.

12.5. Network Source Troubleshooting

Information

These are general guidelines and your setup process may differ depending on your operating system version, local network, and security environment. You may wish to contact an IT professional for assistance. Additionally, if there are network security or other network configuration options blocking the communication with the network shared folder, you may need to engage your Network Administrator or an IT Professional to reconfigure the network to allow the communication to occur.

Check your Network Connections

Resolving connection issues with a shared network drive often involves resolving the following issues with the network itself:

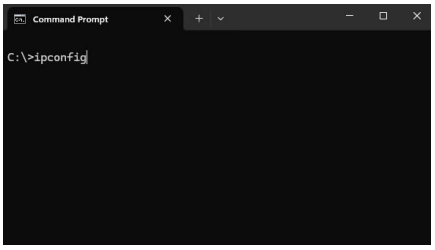
1. Verify that your touchscreen is connected to the network.
    a. The network should be the same as the one used by the computer hosting the shared drive.
    b. Check the internet connection by performing via Test Connection in the Hardware Test page.
2. Verify that the computer hosting the shared drive is connected to the network.
    a. The network should be the same as the one used by your touchscreen.
    b. The computer must only connect to the network in one way. Disable Wi-Fi if the computer uses a wired Ethernet connection to access the network.
    c. Verify that sharing settings on that remote machine have not changed.
    d. Verify that the folder is still shared correctly.
3. Verify that the shared drive can be accessed from another device (a second computer) connected to the same network.
    a. Ensure there is no firewall preventing incoming connections from accessing the PC that is sharing the files.
4. Restart all devices and reset the network connection.
    a. Reset the network connection on the touchscreen by swapping between wired and Wi-Fi and then back.

Using IP Address Instead of Computer Name

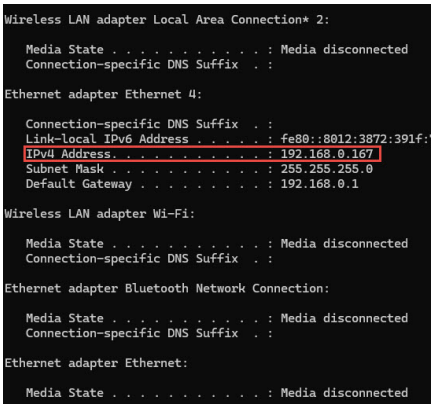
In some networks, it may be necessary to use your machine's IP address instead of computer name.

To find your IP address:

1. Left-click the windows button in the lower left of your screen.
2. Type "cmd" and press Enter.
3. A black and white window (Command Prompt) will open.
4. Type "ipconfig" and press Enter.



5. Your IP address will be the IPv4 address listed after whatever connection is currently in use.



6. Revisit the Add a network location instructions but, during Step 4, change your network path to include your IP address:
    - Standard path format: \\[Computer's IP Address]\[Shared Folder Name]
    - Example path: \\192.168.0.161\Designs

Information

Some computers may use Dynamic IP addresses. In such cases, they will be assigned a new IP address every time they connect. When your IP address changes, you will have trouble connecting to the network share again. If you find that your IP address has changed, you may need to set a static IP address

13. Color Sequence

The Color Sequence screen can be accessed via the Color Setup button on the Main screen. 

This is where you can do the following:

- Set the thread colors on the thread tree.
- Manually or automatically select which colors will be used in the color sequence.
- Apply interrupts or effects to the color sequence.

View Window & Status Bar

Both the view window and status bar display the design colors and color sequence bar differently depending on a setting in view options.

- Colors from Design On - This displays the colors of the design as saved in the design file rather than the colors assigned in the color sequence.
    - This can result in the design on the screen differing greatly from the actual colors on the sewn design.
-  Colors from Design Off - This displays the colors of the design as assigned in the color sequence.
    - If a needle used in the color sequence does not yet have a thread color assigned to it, any color block in the design using that needle will display in the color saved in the file until a thread color is assigned to the needle.

Thread Tree

The thread tree can be set up to mimic the physical thread tree of the machine. Assigning the specific threads that are actually installed on the machine can help prevent mistakes and unintentional results on the embroidered product. Follow these guidelines for best results:

- Colors should be assigned to the thread tree in the software after thread cones have been physically placed on the machine and the upper threading has been completed.
- Colors should be updated on the thread tree any time a cone of thread is swapped for another on the physical thread tree.

Colorize the Thread Tree

To access the screen to colorize the thread tree, either:

- Double-tap on a thread cone on the thread tree display.
    - OR
-  Tap on the Colorize Thread Tree button.

To assign a thread to a needle:

1. Tap the desired needle/cone on the thread tree to select it.
    - Once selected, the circle representing the needle/cone will be ringed to highlight it.
    - If the needle is already populated and the thread exists in the selected chart, the list will automatically scroll to the selected swatch.
2. Tap the desired thread chart to select it from the list.
3. Tap to select the desired color from the contents of the selected chart.
    - The search functionality can hasten the search.
    - The swatch will be highlighted when selected.
    - The cone/needle will change to match the color selected.
4.  Select another cone or needle to change, or tap the confirm button to exit to the Color Sequence screen.

Color Sequence

The color sequence runs through the bottom portion of the screen. This area is scrollable and may be dragged to view different sections of the sequence. You can quickly scroll to the start or end of the sequence using the following commands:

- Go To Start button - found on the left edge of the color sequence. Tap to scroll to the beginning of the sequence.
- Go To End button - found on the right edge of the color sequence. Tap to scroll to the end of the sequence.

Each color change or color block is separated into two parts:

- Upper - The upper section of the color block displays:
    - A background color from the assigned thread.
    - An overlay of any effects applied to that color block:
        - Normal embroidery - no effects applied
        -  Thin 3D - adapts the Acti-Feed for use with thinner 3D embroidery foam - typically around 2mm
        -  Thick 3D - adapts the Acti-Feed for use with thicker 3D embroidery foam - typically around 3mm
        -  Looping - adapts the Acti-Feed for use with thicker thread and intentionally overfeeds, creating loops in the stitches
    -  Color Block - shows the number of the color block in the design. For example, a 3 means the third color to sew.
    -  Needle - shows the needle number assigned to that color block.
- Lower - The lower section of the color block displays color information from the file .
    - Not all files contain color data. If no data is present, a color swatch is still shown for reference as to which portion of the design it is.

Setting the Color Sequence

To set the color sequence of the design:

1. Tap to select the color block.
    - The selected color block will be highlighted in the sequence and the stitches contained within that block will be highlighted in the view window.
    - The selected color block and all color blocks occurring before will it be rendered three-dimensionally in the view window.
    - All color blocks occurring after the selected block will be rendered two-dimensionally.
    - The currently assigned needle in the thread tree will be highlighted with a ring around it.
    - If assigned to a needle with a thread assigned to it, that thread information will appear below the thread tree.

2. Tap to select the desired color.
    - The selected color block will change to its new color and the needle assigned to it.
    -  Colors from Design Off - If this view option is OFF, the selected color block in the view window will update to the newly assigned color.
3. Continue through the color sequence until all colors have been assigned. This can be done either manually or automatically. A switch on the bottom right corner of the color sequence screen allows toggling between modes:
    -  Manual Selection - Continue by selecting the next color block to be set and then select the desired color.
    -  Auto Select Next Color - Automatically selects the next color block in the sequence. Continue by selecting the desired color.



Tip: Try out Auto Select Next Color

Switching from Manual Selection to Auto Select Next Color may save time by automatically selecting the next color block in the sequence.

4. Optional - Add any color sequence commands and/or effects desired. More information is below.
5.  Confirm to apply the sequence and exit the screen.

Unique Colors vs. Color Sequence Modes

Switch between Unique Colors and Color Sequence modes by tapping the switch to the top-right of the color sequence.

 Unique Colors Mode

- Collapses the color sequence down to show only unique colors.
- Reduces the amount of selections necessary when the same color is used multiple times in a design.
- Effects **cannot** be added while in this view.

 Color Sequence Mode

- Shows every color step in the design from start to finish.
- Effects can be added while in this view.

Automatic Color Match

To automatically set the color sequence of the design:

1.  Tap the Color Match button below the color sequence.
    - This will compare the color information from the design and the colors assigned to needles and make matches based on those color values. Each color block will be overlaid with a match evaluation.
        -  Exact Match - The thread brand, line, and color ID/number match. Note that the color itself may vary greatly when thread manufacturers update RGB values for their thread colors.
        -  Close Match - Based on a comparison between the RGB value of the color in the file and the color assigned to each needle, this was found to be a relatively close match, but may not be the exact match to the thread brand, line, or color ID/number.
        -  Distant Match - Based on a comparison between the RGB value of the color in the file and the color assigned to each needle, this was not found to be a close match. An alternative color may be desired.
2. A warning will display if any of the colors that are selected are not an "Exact" match. Review the colors in the color sequence and make changes as desired.
3. Optional - Add any color sequence commands and/or effects desired. See below.
4.  Confirm to apply the sequence and exit the screen.



Color Match on Load

Enable Color Match on Load via Settings > Machine Preferences.

When enabled, every time a new design is loaded the color sequence will be automatically matched as closely as possible to the thread colors assigned to the thread tree.

Color Sequence Commands & Effects

A variety of different commands and effects can be applied in a color sequence.

- **Interrupt Commands**

-  Appliqué - Placing this command between color blocks will cause the machine to move the hoop out as far as possible with the needle still within the hoop limits.
    - This command is often placed after the placement stitch in an appliqué design. This allows the embroiderer to have easier access to the material without taking the hoop off of the machine. It also stops the machine automatically instead of the embroiderer watching the sew-out to stop the machine and place the appliqué material.
    - After an Appliqué command has stopped the machine, starting the machine will move the hoop back into place and continue sewing the design.
-  Pause - Placing this command between color blocks will cause the machine to stop and wait to be restarted, but it will not move the hoop forward.
    - This command is often placed in designs larger than a single bobbin can sew as a reminder to replace the bobbin.
- **Color Sequence Altering Commands**
-  Repeat - Placing this command after a color block will cause the machine to repeat the color sequence preceding the command until no color blocks are left in the design.
    - This command is often placed in designs where the same set of colors is repeated. For example, a red letter, then a blue border, next red letter, next blue border - for the whole design.
- **Effects**
-  Thin 3D - Placing this effect on a color block will adapt the Acti-Feed of the affected block for use with thinner 3D embroidery foam (typically 2mm foam).
    - This effect is often preceded by a pause or applique command to place the foam.
-  Thick 3D - Placing this effect on a color block will adapt the Acti-Feed of the affected block for use with thicker 3D embroidery foam (typically 3mm foam).
    - This effect is often preceded by a pause or applique command to place the foam.
-
-

3D Buttons

Using the Thin or Thick 3D buttons will not modify your original design file. High-quality Puff embroidery requires a design that has been specifically digitized for this technique. Such designs typically include capped satin stitches and increased stitch density to properly support the foam.

 Looping - Placing this effect on a color block will adapt the Acti-Feed of the affected block for use with thicker thread and intentionally overfeeds, creating loops in the stitches.

- This command is often placed in designs that were created for use with this technique and for use with a thicker, fuzzier thread.

Adding Commands and Effects to the Color Sequence

To add a command or effect to the color sequence:

1. Tap to select the color block in the color sequence.
2. Tap on the command or effect to be added.
    - Commands are added before the selected color block and appear with the sequence.
    - Effects are added to the selected color block and appear as an overlay to the color block.

Removing Commands and Effects from the Color Sequence

To remove a command or effect to be removed from the color sequence:

1. Tap on the command or effect to be removed.
    - Commands are displayed and selectable as a block within the sequence.
    - Effects are displayed as an overlay to a color block. Select the color block to which the effect is applied.
2.  Tap the trash button below the color sequence.
    - Commands will be removed from the sequence entirely.
    - Effects will be removed from the color block, but the color block will remain.

Color Sequence Reset

 Reset Color Sequence - Tapping this button below the color sequence produces a window with options within a drop-down menu. These options include:

- Remove all Effects / Stops - This removes all effects and commands while leaving needle assignments.
- Revert Recent Changes - This reverts the color sequence to the state it was in when the color sequence screen was entered.

Additional Functions

On the bottom of the screen is the grabber function. It exists on this screen for easier access if changing cones of thread on the machine.

-  Grabber In /  Grabber Out
  - Extends and retracts the grabber.
  - This is helpful when changing needles or capturing threads in the trap behind the needles.

13.1. Colorize Thread Tree

This screen shows the same thread tree display as on the previous screen. Needles that are changed on this screen are reflected on the Color Sequence screen.

Assigning Thread to a Needle

Thread Charts List

On the left side of the screen, the thread charts are listed. This list can be limited using the following tools:

-  Search - Try adding the Manufacturer, Product Line, or even partial words in the search field to limit the charts listed.
-  Show/Hide - Individual charts can be hidden or shown to limit the list to only your preferred charts. More information is provided in the next section.

Threads List

On the screen's right side, the selected chart's contents will be displayed in the threads list. This list can be limited using the search field.

-  Search - Try adding the color ID number, color name, or even partial words in the search field to limit the colors listed.

Color Assignment

To assign a thread to a needle:

1. Tap the desired needle/cone on the thread tree to select it.
    - Once selected, the circle representing the needle/cone will be ringed to highlight it.
    - If the needle is already populated and the thread exists in the selected chart, the list will automatically scroll to the selected swatch.
2. Tap the desired thread chart to select it from the list.
3. Tap to select the desired color from the contents of the selected chart.
    - The search functionality can hasten the search.
    - The swatch will be highlighted when selected.

- The cone/needle will change to match the color selected.

4.  Select another cone or needle to change, or tap the confirm button to exit to the Color Sequence screen.

Additional Functions

Grabber

At the bottom of the screen is the grabber function. This can be useful when changing cones of thread on the machine. To use the Grabber, press:

-  Grabber In /  Grabber Out
  - Extends and retracts the grabber.
  - This is helpful when changing needles or capturing threads in the trap behind the needles.

Thread Tree Reset

The ability to clear color assignments on the thread tree is also available.

 Clear or Reset Thread Tree - Provides two options for resetting the colors that have been assigned:

- Remove all thread color assignments from the needles on the thread tree.
- Revert recent changes to the thread tree.

13.2. Thread Chart Preferences

 The Show/Hide Button opens the Thread Chart Preferences screen. It can be found on the top of the Colorize Thread Tree screen.

The Thread Chart Preferences screen allows you to customize what charts are visible when colorizing the thread tree.

Search Function

The field at the top of the screen allows you to search for a specific chart.

 Search - Try adding the Manufacturer, Product Line, or even partial words in the search field to limit the charts listed.

Thread Chart Options

Each chart is listed with these two options on the right:

 Set Chart as Default

- This chart is selected by default.
- There can be only one default chart.
- Tapping on the button will make that chart the default, make it visible, and disable its show/hide button as the default chart MUST be shown.

 Show/Hide Chart Switch

- Set the chart to Show to make it visible on the previous screen.
- Set the chart to Hide to make it hidden on the previous screen.

Along the bottom are a few more commands, including:

 Use this button in the bottom-left corner of the screen to show or hide all thread charts at once.

 Scrolls to the default chart.

Confirms the changes and exits to the previous screen.

14. Hoop Selection



 Access the Hoop Selection screen by pressing the Hoop Setup button on the Main screen.

Selecting the same hoop in the software that is installed on the machine is critical for accurate placement and safety.



Warning!!

Using a hoop other than what is selected in the software may cause damage to the embroidered product, the machine, or yourself.

Hoop Categories

Select a single or multiple hoop categories to narrow the search for your desired hoop. The categories include the following:

-  Round
-  Rectangular
-  Square
-  Magnetic
-  Wide-Angle Driver
-  Slim Line Clamps
-  Melco Fast Clamp
-  Miscellaneous
-  Show All Hoops / Clear Filters

Sort by Hoop Size

This switch sorts hoops by size, from smallest to largest or largest to smallest.

 Sorted from smallest to largest

 Sorted from largest to smallest

Measurement Units

This setting changes the display of the hoop measurement units on this screen and the main screen.

 Set to Centimeters

 Set to Inches

Hoop List

The hoop list displays the currently visible hoops and gives rough hoop dimensions.



Hoop Dimensions

Hoop dimensions listed may vary between manufacturers. In this list, dimensions are listed WIDTH x HEIGHT.

To select a hoop:

- Tap on the desired hoop and tap on the confirm button. 
- OR, Double-tap on the desired hoop. This will not work for hoops/clamps with additional messages.



Scanning Hoop Barcodes

If your hoop has a barcode sticker, simply scan it with your Touchscreen's barcode reader and that hoop will instantly load.

Customize Hoop List

The hoop list can be customized to show only the hoops you want by following this procedure:

1.  Press the Customize Hoop List button.
2. Scroll through the hoops on the subsequent screen and select whether they should be shown or hidden:
   -  Show the hoops you wish to include in the main hoop list.
   -  Hide the hoops you wish to exclude from the main hoop list.



Show/Hide All

Use this button in the bottom-left corner of the screen to show or hide all currently displayed hoops.

Confirm or Cancel

Once finished setting up your hoop list preferences, press the Confirm or Cancel buttons at the bottom of the screen.

Choosing the Appropriate Hoop for the Job



Hooping a garment properly and selecting the right hoop for the job is essential to quality embroidery production.

The hoop provides the means to move the product at high speeds and accurately place the stitch. If the hoop is too loose, the wrong size, or if the product is hooped poorly, it can adversely affect the embroidery quality.

Choosing a Hoop Shape

Each hoop shape has benefits and drawbacks.

Hoop Shape	Benefit	Drawback
Traditional Round	Even tension across the fabric. Great hoop for most left-chest designs.	Limited number of sizes. Larger hoops must be used for square-shaped designs.

Hoop Shape	Benefit	Drawback
Traditional Square	Larger sew fields.	Tension is often tighter in the corners and looser on the edges.
Specialty (Clamp & Frames)	Tend to be easier to hoop quickly. Better for difficult-to-hoop materials and/or placements.	Does not hold the material as securely as a traditional style hoop.

Choosing the Appropriate Hoop Size

The ideal hoop for an embroidery design is one that just fits. The design should fall just within the hoop limits. This removes the influence of excess material from around the design and can help with registration (lining up), puckering, and overall stitch quality.

Occasionally there will be obstacles to using the smallest hoop possible for a design. It could be that a button is in the way or a seam would fall right into the hoop. Adjusting your hoop size to better accommodate the material may be necessary.

Hoop Construction

Some of the larger hoops come in either wood or plastic. The wooden hoops are double-walled and have more grip than the plastic. However, the inner and outer wooden hoop must remain aligned. The outer hoop cannot be rotated for easier hooping or tightening. Each set of hoops will have a registration number printed on both hoops to help keep them aligned.

Specialty Hoops

Specialty hoops such as clamps and frames that use adhesives are useful when dealing with difficult placements on garments or materials that are hard to hoop.

As they rarely provide the same hold on the materials as a traditional hoop, these hoops tend to be reserved for more specialized applications.

15. Machine Speed



This reflects the maximum speed the machine will run in stitches per minute. The machine may automatically slow for longer stitch movements in X, Y, and also Z. Longer stitches, as well as higher thread feed values, may affect speed.

Changing Machine Speed

The machine speed may be altered by tapping the plus or minus button on either side of the speed setting.

Actual Speed

The actual speed is displayed below the set maximum speed.

Machine Speed Suggestions

While the embroidery machine has an extremely fast sew speed, this sew speed may need to be changed depending on the products or designs you are planning to embroider.

When the machine starts to sew, it will begin slowly and then rapidly speed up after the thread has had a couple of stitches to catch.

The machine will sew at the set sew speed if it is possible. However, design factors may cause the machine to slow down. Longer machine movements and stitches will cause this. If you hear the machine changing speeds constantly, you may want to lower the set sew speed to even out sew quality.

Machine Speed Suggestions

Machine Speed	Application
850-1000 s.p.m.	Sewing using the Wide Angle Driver for caps and micro (pocket) clamps. Designs using rayon, metallic, or specialty threads.
1000-1200 s.p.m.	Finer detailed designs and smaller lettering.
1200-1400 s.p.m.	Faster production.

These sew speeds are meant as guidelines and should be adjusted as needed.

Thread Types and Machine Speed

Some thread types (rayon, metallic, etc.) may require a small decrease in Machine Speed to decrease sewing issues. You can read more about thread type and its effects on sewing in the Tread Types section.

Symptoms From Sewing Too Fast

Sewing at too high of a speed can result in a few undesirable outcomes. These would include:

- Thread breaks
- Bobbin pulling to the top
- Poor registration of designs (design details or outlines don't line up)

These symptoms can also be caused by other settings or issues. However, if you experience one or more of these symptoms, adjusting your sew speed could be a possible solution.

16. Acti-Feed



Acti-Feed affects the amount of thread fed to the material being embroidered. While much of Acti-Feed is automated based on sensor feedback, giving Acti-Feed guidelines such as a minimum can help create higher-quality sew-outs.

Feed Chart

This chart helps monitor the feed of thread to the product. It displays the following:

- Feed - This is the amount of thread being fed to account for the detected material thickness.
- Minimum - Displayed as the lower user-adjustable line. This represents the lowest the Acti-Feed is allowed to go.
- Maximum - Displayed as the upper user-adjustable line. This represents the highest amount the Acti-Feed is allowed to go without modifiers/effects in the color sequence.

As the machine embroiders, this will show a history of the Acti-Feed. This can be used to help diagnose thread breaks, false breaks, and sew quality issues. When the minimum is set appropriately on an even material, the feed activity will only be making minor adjustments. Large adjustments in feed tend to indicate shifts in material, embroidery, or potential problems.



Information

Bobbin case cleanliness and differences in bobbin tension can affect the Acti-Feed.

Minimum

The Acti-Feed Minimum sets a lower limit for the Acti-Feed. It allows the machine to adjust the amount of thread fed as needed, but it will not allow feeding of less than the specified amount.

The ideal setting for the minimum is the actual thickness of the material (and stabilizer) being sewn, minus two points.

The Acti-Feed Minimum is displayed as the lower set line in the Feed Chart.

Maximum

The Acti-Feed Maximum sets an upper limit for the Acti-Feed. It allows the machine to adjust the amount of thread fed as needed, but it will not allow feeding more than the specified amount. It is uncommon to need to limit the maximum for the Acti-Feed.

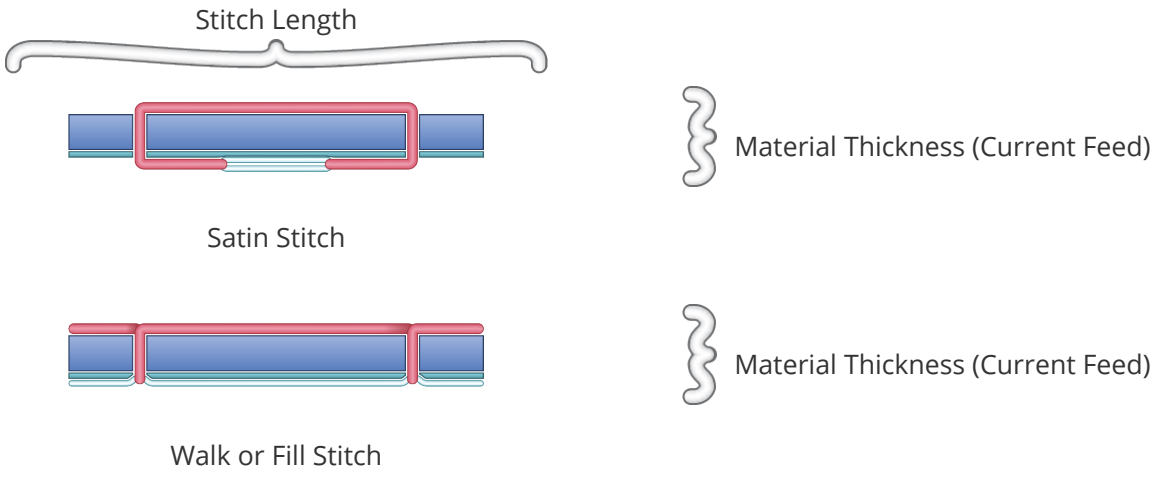
Acti-Feed Suggestions

The Acti-Feed Suggestions can provide a guideline for where the minimum should be set.

Tapping any fabric/garment suggestion populates the slider and Acti-Feed Minimum to a mid-point suggestion for that material. As even the same type of garment can vary in thickness, you may wish to adjust the Acti-Feed slider further.

Material Thickness

Material thickness is a determining factor in the amount of thread fed for each stitch. The perceived material thickness is displayed as the current feed value in the Feed Chart. Material thickness is measured in points. In this and many embroidery software applications, a point is used as a fine unit of measure representing a tenth of a millimeter.



Example Material Thickness Measurement

You can calculate an exact Acti-Feed minimum if calipers are available to measure the actual thickness of the material and stabilizer. The result can then be converted to points (1 millimeter = 10 points).

For example, you might measure the thickness of a cap being readied for a puff application to be 4.2 millimeters (mm):

- 1 mm for the structured cap
- 0.2 mm for 1 piece of tear-away stabilizer
- 3.0 mm for a piece of 3 mm puff foam

A 4.2 mm thickness converts to 42 points (pts). Subtracting two would result in a recommended Acti-Feed minimum of 40 pts.

Appropriate Acti-Feed Settings

Finding the perfect settings or limits for your Acti-Feed is not always necessary, but it can improve sew quality and machine performance.

Sew quality and thread breaks are indicators of appropriate or inappropriate thread feed. Those symptoms are listed in the sections below.

Acti-Feed Minimum Value is Adequate When...

The minimum is appropriate when:

- Satin and Fill stitches - There is no looping or pulling on the top of a sew-out when sewing satin and fill stitches.
- Satin stitches - On the back side of the sew-out, there is a consistent thin line of bobbin ties between each stitch.
- Fill Stitches - On the back of the sew-out, the top thread is even along the outer edge of the shape.

Increase Acti-Feed Minimum Value When...

When too little thread is being fed into the design, you may experience the following problems:

- Satin stitches - You are encountering thread breaks and can see bobbin thread on the top of the design.
- Satin stitches - Too much bobbin is showing on the back of the design.
- Fill stitches - You can see bobbin thread on the top of the design.
- Fill stitches - There is insufficient top thread showing on the back of the design.

- Registration Loss - If designs are not lining up when sewn and the cause is the thread being pulled way too tight, increasing the Material Thickness may help. Using a stable support material will also help.

If you are experiencing these problems, you may need to increase the Acti-Feed Minimum to increase the amount of thread being fed.



Thread Type and Acti-Feed

Some thread types like Rayon may require a small increase in Acti-Feed Minimum to decrease the tension on the thread. You can read more about thread type and its effects on sewing in the Tread Types section.

Decrease Minimum Acti-Feed Value When...

When too much thread is being fed into the design, you may experience the following problems:

- Satin stitches - The stitches in the design are looping.
- Satin stitches - Not enough bobbin is showing on the back of the design.
- Fill stitches - You are encountering thread breaks, and the stitches in the design are looping.
- False Bobbin Breaks - When the software falsely detects bobbin breaks that are not truly broken thread, it could be that your material thickness is too high.

If you are experiencing these problems, you may need to decrease the Acti-Feed Minimum to decrease the amount of thread being fed.



Advanced Acti-Feed Calibration

Acti-Feed behavior is based on the play of the thread through the system and against the sensor. One of the key factors is the bobbin tension. If your desired tension is different from that called out in the Bobbin Threading & Tensioning section, the Advanced Acti-Feed Calibration section shows how Acti-Feed can be adjusted to suit your needs or the needs of your embroidery application.

17. Transform

The transform screen allows for the movement or placement and rotation of designs.

 Access the Transform screen by tapping the transform graphic on the Main screen.

View Window in the Transform Screen

Move X/Y & Rotate

When in the transform screen, the view window takes on different functions. These functions can be changed back using the switch on the right side of the screen:

 Allows you to Move and Rotate the design

 Allows you to Pan and Zoom

Move

The main portion of the view window allows for tapping and dragging a design to a new location in the hoop. Once let go, the hoop arms will move to accommodate the new design location.

Warning!!

Dragging or moving designs outside the hoop limits can cause damage to you or the machine.

Rotate Bar

What was the zoom bar becomes the rotate bar when in the transform screen.

Dragging up or down on this bar rotates the design.

Specific Movements

Quick Orientation

Rather than rotating by dragging on the rotate bar, the left side of the screen allows for access to the most commonly used transforms:

 45° Counterclockwise, or  45° Clockwise

 90° Counterclockwise, or  90° Clockwise

 180° - Often used with cap designs

 Flip the design vertically

 Flip the design horizontally

Move/Rotate By

The right side of the screen provides an area for more precision in movement and rotation.

Tap into a field to specify an amount. Then use the following buttons to execute the movement or rotation:

Rotate  Counterclockwise, or  Clockwise by the specified amount

Move  Left, or  Right by the specified amount

Move  Down, or  Up by the specified amount

Actual Rotation, Reset, and Center Hoop

In the middle of the lower section of the screen, you'll find functions for resetting rotation, the current rotation of the design, and centering the hoop.

 Reset Rotation to 0°

- If the design elements were rotated in design software, resetting to 0° will not change them from what is stored in the file.

 Center the Hoop

- This moves the hoop on the machine to the center of the sew field. This may differ from the actual center of the hoop.

Machine Operations

To make positioning in the hoop a bit easier, some machine functions were copied to this screen to help with visibility. They include the following:

 Change to Needle (Move Needle case)

- Tapping this brings up a window displaying the thread tree and needle assignments.
- Selecting the desired needle number and confirming will move the needle case to that needle.

 Laser On, or  Laser Off

- Activates or deactivates the laser for positioning.

 Grabber In, or  Grabber Out

- Retracts and extends the grabber.
- This can help get the grabber into a better position for seeing the fabric or the laser light.

Laser Alignment

 Tapping the laser alignment button will enter the laser alignment screen.

Laser Alignment is a technique for rotating and positioning a design based on two points and the (often invisible) line that connects them. This can be a helpful technique when trying to line up to lines on a garment such as stripes, seams, or the tops of pockets.

Laser Alignment aligns the horizontal axis of the design origin to the line created by specifying the two points on the garment.

To use laser alignment:

1. Using the arrow keys, move to the first point on the hooped product to which you would like to align.
2.  Confirm the position of the first point by tapping the confirm first point button. The second confirm button becomes visible.
3. Using the arrow keys, move to the second point to which you would like to align.
4.  Confirm the position of the second point by tapping the confirm second point button.
5.  Once both points are confirmed, the design is rotated to match the line created by the two points and the positioning buttons become available. Tapping any one of the following buttons will differently position the design in relation to the line created by the two confirmed points:
    -  Position the bottom of the design on the line and the design origin horizontally aligned to the first confirmed point.
    -  Position the bottom of the design on the line and the design origin horizontally centered between the first and second confirmed points.
    -  Position the bottom of the design on the line and the design origin horizontally aligned to the second confirmed point.
    -  Position the design origin horizontal axis on the line and the design origin horizontally aligned to the first confirmed point.
    -  Position the design origin horizontal axis on the line and the design origin horizontally centered between the first and second confirmed points.
    -  Position the design origin horizontal axis on the line and the design origin horizontally aligned to the second confirmed point.
    -  Position the top of the design on the line and the design origin horizontally aligned to the first confirmed point.
    -  Position the top of the design on the line and the design origin horizontally centered between the first and second confirmed points.

-  Position the top of the design on the line and the design origin horizontally aligned to the second confirmed point.

Vector Line Registration

If your design has been set up with a vector line for registration, two additional vector line registration controls appear. These controls allow you to rotate and scale the design to match the vector line. This can be a useful tool when creating multimedia designs where specific reference points are needed. It can also be useful when adjusting designs to fit within panels on a garment, like in a sports uniform.

To utilize Vector Line Registration, set the two switches below and then continue laser registration as usual.

Enable Switch

Choose whether the vector line will be visible to assist with selecting registration points:

 Switch Disabled - Will make the vector line visible.

 Switch Enabled - Will make the vector line visible.

Scaling Switch

Choose whether the design will be scaled:

 Scaling Disabled - Continue by using the vector line as a guide for laser alignment.

- The design will maintain its current size.
- The design will rotate based on what registration points you choose.

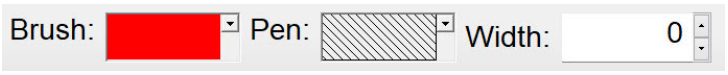
 Scaling Enabled - Continue by designating where the vector line endpoints will be on the garment.

- The design will rotate and scale such that the endpoints of the vector match the registration points you choose.

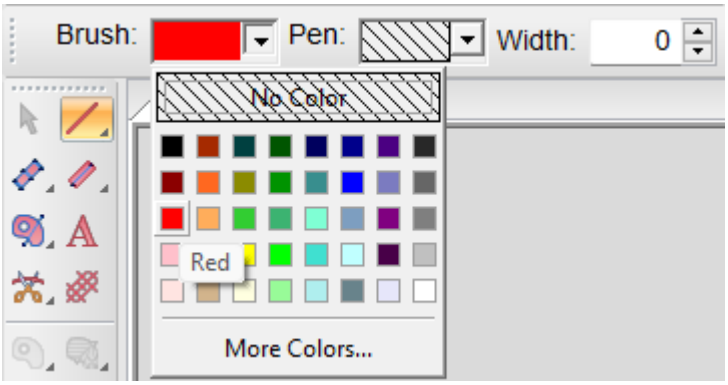
Setting up a Design for Vector Registration in DesignShop

Vector Line Properties

For a design to be scalable, it must contain a vector line element with the brush color of “Red”. The pen color can be any color.



If you’re not sure which color swatch is “Red”, hover over the swatches in the drop-down palette to see the name of the colors. The vector line must use these exact properties to work for the scaling feature.



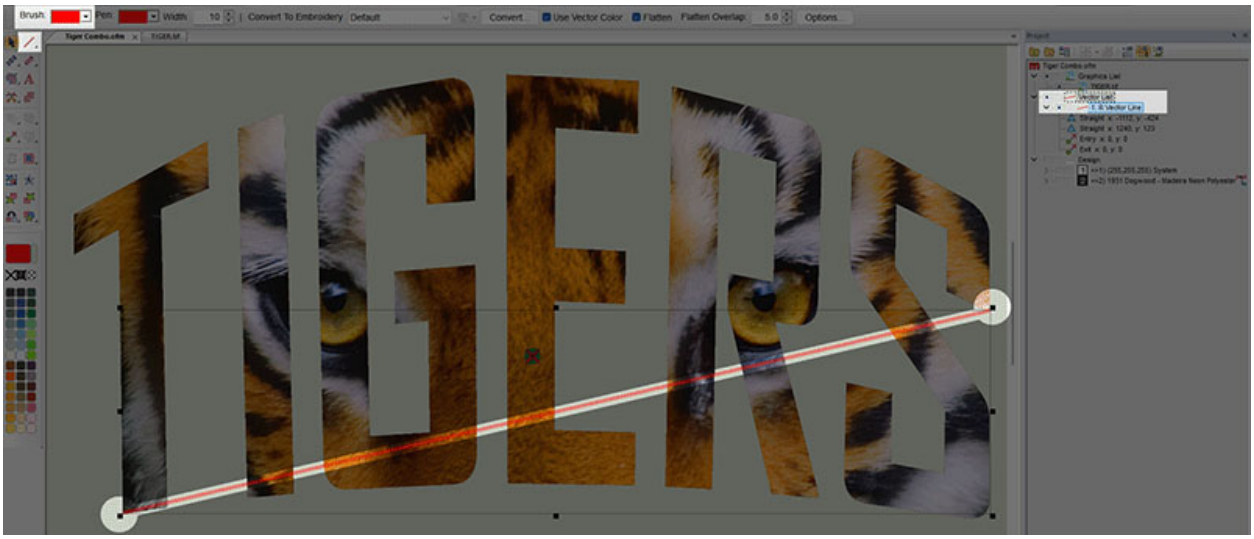
Vector Line Placement

1. Find two points in your design that you want to use as reference points.
    - These points can be inside or outside the stitching area, but they need to be within the hoop limits of the hoop you are planning on using to embroider the design.
    - The line between the two points can be at any angle.
    - Using points that are farther apart will help with accuracy when scaling or rotating on the machine. Points that are closer together are more affected by slight differences in how the operator references these points on the machine.
    - Consider how the design will be used.
        - If you are lining up to a horizontal line in a garment, you may want to place your reference points on a horizontal line.

- If you are lining up embroidery to a screen print or digital print on a garment, you may want to have the image behind your embroidery in DesignShop. This way, you can find distinctive features in the print to line up with.
- In the example below, print is combined with embroidery to create a multimedia design.



2. Using the vector line tool, create a vector line between your two chosen reference points.
    - In the example below, the embroidery elements of the design were hidden to make it easier to find reference points on the print. The vector line was input with the point on the left first, then the point on the right. Notice that the points fall on sharp corners in the print. This will make them easier to line up to with the final print on the embroidery machine.



3. Once an embroidery file has a vector line with Red for the brush color, the file can be loaded to the machine.

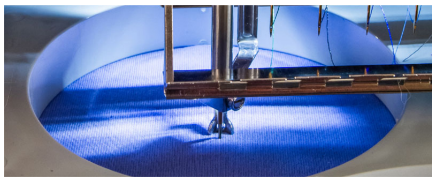
18. Presser Foot Adjustment

The machine has an adjustable presser foot that can be set from 0.5 mm to 3.5 mm above the needle plate. The presser foot height should be changed when the thickness of the material you are sewing changes dramatically. To adjust the presser foot height, a hoop with the fabric you will be using should be installed.

1. Adjusting the presser foot is easiest with the needle case moved to needle 16. It is not necessary, but it makes the adjustment gear easier to see. If the machine is not on needle #16, the gear can still be accessed. Do not attempt to move the needle case during the following steps.
2. Tap the presser foot button on the main screen to lower the needle and the presser foot.
3. Locate the presser foot eccentric (gear) behind the needle case.



4. Turn the gear with your fingers to adjust the presser foot height up or down as needed.
5. Set the presser foot height over an unsewn section of the fabric. Set the presser foot so that it is just barely touching the material.



6. Confirm through the dialog onscreen to return the needle to head up.

Setting the Presser Foot for Different Materials

The presser foot will need to be adjusted whenever you drastically change the thickness of the material that you are sewing on. For example, if you sew a sweatshirt and then sew a T-shirt, the presser foot would need to be adjusted.

The presser foot is meant to stabilize the material as the needle moves down through it. It helps keep the material off of the needle as the needle moves back up. Ideally, the presser foot would sit just on the surface of the material, but that setting may not work for all material types.

For squishy materials like fleece or terry cloth, it is often better to lower the foot a bit more and press into the material.

Symptoms of Poor Presser Foot Height

Having the presser foot set poorly can result in a few sewing issues.

Presser Foot Height	Symptom
Too High	• Thread breaks • Poor registration
Too Low	• Louder sewing • Faint light halo around designs on dark fabric (Usually removed with steam, water, or a light ironing aid)

19. Trace Design

Tracing a design is an easy way to check its placement on the hooped product.

Trace

1.  Tap on the Trace button in the View window.
2. Optional - Select the trace shape. A preview of the trace path will appear on the screen.
    -  Traces a polygon created from the outermost points of the design
    -  Traces a rectangle around the farthest edges of the design.
3. Optional - Adjust the trace speed.
4.  Tap to begin the trace.
    - If the trace shape exceeds the hoop limit, the trace will not be allowed.
        -  Rectangle traces can exceed hoop limits. Even if the design falls well within.
        -  Polygon traces fall much closer to the edges of the design and cannot exceed hoop limits if the design itself does not also exceed them.
    - When tracing, the laser will be shining onto the hooped product.
    - The hoop will move, and the laser will trace the rectangular design bounds or the design's outermost points. The selected shape determines this.
    -  Tap to pause mid-trace.
        -  Once paused, tap to resume the trace.
        -  Once paused, tap to abort the trace and return to the origin.
        -  If the window is closed mid-trace, the machine will return to the origin.

Move Laser To

The hoop can be moved to shine the laser on specific points along the outer bounds of the design.

-  **Top Left Corner**

-  **Top Center**
-  **Top Right Corner**
-  **Middle Left**
-  **Middle Center (Usually Design Origin)**
-  **Middle Right**
-  **Bottom Left Corner**
-  **Bottom Center**
-  **Bottom Right Corner**

Additional Functions

 Grabber In /  Grabber Out

- Extends and retracts the grabber.
- This is helpful when changing needles or capturing threads in the trap behind the needles.

20. Settings

The Settings page contains various settings for the touchscreen. Additional settings screens are accessed on the lower portion of the screen.

 This screen is accessed via the Settings button on the Main screen.

- **Machine Name**
  -  Edit the machine name by tapping on the edit button or within the field.
  - This provides a customizable machine name to make it easier to tell multiple machines apart.
  - This does not affect machine performance.
- **Network**
  - Shows the current network setup.
  - An internet connection is not required to run the machine, but it is required for software updates and video content within the help system.
  -  Tap the Network Connection button to select network settings.
- **Language**
  - Select your preferred language from the drop-down. This will convert all touchscreen text and help documents to this language.
- **Time Zone**
  - Select your current time zone from the drop-down. This helps convert time stamps to the local time of the machine.
- **Units of Measure (Designs)**
  - This changes the display of design size as well as units of movement in the transform screen.
  -  Set to Centimeters
  -  Set to Inches
- **Units of Measure (Hoops)**
  - This changes the display of the hoop size on the main screen and in the hoop selection screen.

- Set to Centimeters
- Set to Inches

- **Touchscreen Volume**
  - This slider adjusts the volume of the touchscreen's speaker.
  - It does not adjust sounds from the machine.
- **Touchscreen Brightness**
  - This slider adjusts the brightness of the screen.
- **Screen Saver Delay**
  - This adjusts the delay for the screen saver.
  - Setting this to zero disables the screen saver.

Additional Settings

- **Design Filter**
  - Adjust settings related to stitching and trims within the design.
- **Advanced Acti-Feed**
  - Adjust the machine's Acti-Feed behavior.
- **Machine Preferences**
  - Alter some of the machine's behaviors around loading, trimming, and thread breaks.
- **Software Update (Internet Connection Required)**
  - Access software and firmware updates as well as notification settings.
- **Back Up & Restore Settings**
  - Access a dialog where you can back up, restore, or reset touchscreen settings:
    - Back up to a USB: Saves a backup of your user settings to the attached USB drive.
    - Restore from a USB: Restores user settings from a backup on the attached USB drive. The machine restarts when the process is complete.
    - Reset to Defaults: Resets user settings to their default values. The machine restarts when the process is complete.

Back Up & Restore Settings

Affected settings include those available on the Machine Preferences, Design Filter, Advanced Acti-Feed, Colorize Thread Tree, Thread Chart Preferences, and Customize Hoop List screens. Maintenance timers, Network settings, and Account settings are not affected.

20.1. Network Connection

Use the Network Connection screen to set up, test, and check the status of your network connection.

 This screen is accessed through the Network button on the Settings screen.

Network Selection

Start by selecting Wired or Wireless as the connection type.

Wired Connection

Select this option to connect using an Ethernet cable. No additional settings will be required.

Wireless Connection

Select this option if choosing to connect to a wireless Ethernet cable.

Wireless Network Commands

 Rescan for Networks - Scan for wireless networks and generate a list of available networks.

- Select a network from the list by pressing the network name or the Wireless Strength icon to the right of it.
- If a password is required, a dialog and keyboard will appear so you can enter it.

 Connect to Other - Manually enter the network name and password. This is useful for connecting to hidden networks.



Information

For best compatibility with the Bernina E16 PRO, make sure your Wi-Fi router uses WPA2 or WEP security protocols—WPA3 may prevent connection.

Favorite Networks

Use the Favorite button to identify the wireless networks you often connect to:

-  Favorite Networks - always appear at the top of the list.
-  Other Networks - always appear below favorite networks.

Wireless Strength

The Wireless Strength button indicates the strength of each listed wireless network.

The number of filled bars on the icon indicates the signal strength:

- One bar - weak connection to this network.
-  Three bars - moderate connection to this network.
-  Five bars - strong connection to this network.

 The Wireless Strength button is highlighted after connecting to a network.

Current Network Status

This section displays information about the current network connection.

 Press the Internet Test button to check the internet connection.

- If the touchscreen has an active internet connection, the screen displays a large green checkmark.
- If the touchscreen does not have an active internet connection, the screen displays an error page.

 Pressing confirm will exit this screen.

20.2. Design Filter

The Design Filters screen has many settings that affect how your machine will sew.

 This screen is accessed via the Design Filters button on the Settings screen.

Stitch Filters

These filters add or remove needle penetrations along existing lines based on the settings below.

- **Maximum Stitch Length**
  - If a stitch exceeds this amount, a needle penetration will be added to evenly divide the stitch into lengths that fall below this threshold.
- **Short Stitch Length**
  - This defines a "Short Stitch" for the next filter setting.
- **Delete Short Stitches**
  - If a stitch falls below the defined "Short Stitch Length", needle penetrations will be filtered out until a stitch remains that exceeds this defined length.

Ties and Trims

Tie and Trim settings are only applied upon design (re)load.

- **Optimize Ties**
  - When enabled, this adds a small stitch on either side of a trim command. This may help hold the thread if the ties in the design are insufficient.
- **Convert Jumps to Trim**
  - When enabled, this filter counts consecutive jumps. If the number of consecutive jumps in a design meets or exceeds the specified Count to Convert, those jumps will be converted to trim commands.



Explicit Jump Commands

Some embroidery design files will not or cannot contain explicit jump commands. These designs may rely on this setting to create machine trim commands within a color block.

Convert Jumps to Trim

Some embroidery designs with longer stitches may contain a jump between the needle penetrations creating the stitch. If the Count to Convert number is less than or equal to the number of jumps between these penetrations, the stitches themselves will become trims. This creates an odd machine behavior where there is only a single needle penetration, followed by a trim. This repeats until the jumps between the needle penetrations fall below the count.

If you encounter one of these designs, change the count, disable the conversion, or contact the design supplier for explicit trims or edits.

Satin Width Adjustment

This setting allows you to adjust the width of all satin stitches when they are being sewn. This can help compensate for some pull of stitches.

The width of the satin stitches is adjusted by percentages and by points (0.1mm).

- Percentage - The width of the satin stitches is multiplied by this value.
- Points - The satin stitch width has this value added to each end of the stitch.
- Values of 100% and 0 points will load the design unaltered.

These stitches can be altered along the X-axis (horizontal stitch direction) and the Y-axis (vertical stitch direction).

-  If locked together, X and Y will both be changed according to the value entered for X.
-  If unlocked, X and Y can be altered independently.
-

Minimum Width

A Minimum Width can be specified in points. Satin stitches that fall below this value are expanded to meet this width.

Minimum Width is used with the pull compensation above and the custom table below. Only a value of zero leaves the design unaltered from this setting.

Information

The diameter of most needles used for embroidery ranges between six and eight points.

Setting this value to something close to that may prevent thread breaks from continually trying to sew satin stitches smaller than the needle being used.

Use Custom Table

The compensation settings above are only used if Custom Table is disabled.

If Custom Table is enabled, a custom table is used. These tables allow for compensation to vary depending on the width of the satin stitches.

Tap to enter the Compensation Tables screen, where a custom table can be selected and/or altered.

20.2.1. Satin Width Adjustment

Selecting a Compensation Table

1. Tap the expand-down button to open the drop-down.
    - Tapping within the field will allow the name of any custom table to be edited.
    - Wide-Angle Driver offsets will be added to the global compensation values when using any frame that utilizes the wide-angle driver.
2. From the list, tap to select the desired table.

Editing a Variable Compensation Table

With a compensation table selected, the values will populate below.

Tap any field to begin editing.

- Width Range - This is the range that the different compensations will affect.
    - This range is displayed in points (0.1mm)
    - The fields for 0 and ∞ cannot be changed.

The width of the satin stitches is adjusted by percentages and by points (0.1mm).

- Percentage - The width of the satin stitches is multiplied by this value.
- Points - The satin stitch width has this value added to each end of the stitch.
- Values of 100% and 0 points will load the design unaltered.

These stitches can be altered along the X-axis (horizontal stitch direction) and the Y-axis (vertical stitch direction).

-  If locked together, X and Y will both be changed according to the value entered for X.
-  If unlocked, X and Y can be altered independently.

Saving Changes

Changes to the value fields will be saved by any of the following:

- Shifting the focus to another field
- Selecting another table

-  Confirming out of the screen



Caution!

Altering these values can produce a subtle shift or a huge difference in the look of the satin stitches produced by your machine.

Keeping notes of changes made and used in this screen is advised.

20.3. Advanced Acti-Feed Calibration

Advanced Acti-feed Calibration will alter the behavior of the Acti-Feed. This will cause thread breaks to be detected more or less frequently and make tighter or looser embroidered stitches.

 This screen is accessed via a button on the Settings screen.



Caution!

Changing these settings will alter the way the thread is fed to the cloth and the accuracy of thread break detection.



Information

If using a different bobbin tension than that explained in the Bobbin Threading & Tensioning section, these sliders will most likely need adjusting to maintain appropriate Acti-Feed and thread break detection.

Standard Embroidery

The Standard Embroidery slider will affect the loft of the stitches on standard embroidery. This includes any embroidery without the additional color sequence effects of 3D Foam or Looping stitches applied to it.

Feed Adjust

- Sliding this slider to the right will create looser stitching.
    - This could also increase false bobbin breaks or create looped stitches.
- Sliding this slider to the left will create tighter stitches.
    - This could also increase fabric ripples and design distortion from push/pull.



Feed Adjust for Thread Type

Some thread types like rayon may require a small increase in Feed Adjust to decrease the tension on the thread. You can read more about thread type and its effects on sewing in the Thread Types section.

 Thin or  Thick 3D Foam

Feed Adjust

- Sliding this slider to the right will create looser stitching.
    - This could also increase false bobbin breaks or create looped stitches.
- Sliding this slider to the left will create tighter stitches.
    - This could also increase fabric ripples and design distortion from push/pull.

Minimum Offset

The minimum offset is applied to the minimum Acti-Feed setting. The offset accounts for the thickness of the foam used when creating 3D embroidery. This number should be about or just under the thickness of the foam in tenths of a millimeter. As most foams used are either 2mm or 3mm thick, the defaults for these values reflect that thickness.

 Looping Stitch

The Looping stitch intentionally overfeeds thread. This creates relatively consistent loops and a unique look that can mimic other thread-through-cloth techniques like a chenille or moss stitch.

This style of embroidery is usually done with a thicker 12wt wool-like thread.

Feed Adjust

The feed adjust for looping stitches is already adjusted, but the slider can adjust that further.

- Sliding this slider to the right will create looser stitching.
- Sliding this slider to the left will create tighter stitches.

Minimum Offset

This offset is applied to the minimum Acti-Feed setting. Adding to this will feed more thread, creating larger loops.

Calibration History

This drop-down provides a history of the changes made to the Act-Feed Calibration settings. This allows for backtracking if the newest changes don't have the desired effect.

Thread Break Sensitivity

The sensitivity of the thread break sensor can be adjusted to be more or less sensitive.

- If your other adjustments are where you like them, and you are still experiencing too many false thread or bobbin breaks, you can decrease the sensitivity.
- If your machine is not detecting actual thread or bobbin breaks, the sensitivity can be increased to detect more thread breaks.



Information

Upon closing this screen, you will be cautioned about making changes to these settings, as changes here can greatly impact the performance of the machine and the quality of the embroidery.

20.4. Machine Preferences

The Machine Preferences screen provides a variety of additional options for how the machine will function.

 This screen is available via the Machine Preferences button on the Settings screen.

Embroidery Settings

- **All Thread Detection**
  -  When disabled, no upper or lower thread breaks are detected. Disabling automatically disables Bobbin Thread Detection.
  -  When enabled, upper thread breaks are detected. Enabling DOES NOT automatically re-enable Bobbin Thread Detection.
  - Thread break detection can be affected by poor hooping technique, unsuitable Acti-Feed settings, and inappropriate presser foot adjustment.
- **Bobbin Thread Detection**
  -  When disabled, no lower thread breaks are detected.
  -  When enabled, lower thread breaks are detected.
- **Move Hoop Forward at End of Design**
  -  When disabled, the hoop will remain where the design ended. This is usually at design origin.
  -  When enabled, the hoop will move forward as far as possible with the needle remaining within the hoop limits.
- **Inching Stitch Count**
  - When beginning to sew at the start of a design or after a trim, the machine will sew slowly. This is the number of stitches the machine sews before starting to speed up to the set speed.
- **Upper Break Backup Count**
  - When an upper thread break is detected, the machine will automatically back up this specified number of stitches.
  - It will not back up past a trim, color change, or start of a design.

- **Bobbin Break Backup Count**
  - When a bobbin thread break is detected, the machine will automatically back up this specified number of stitches.
  - It will not back up past a trim, color change, or start of a design.
- **Force Design Return to Origin**
  -  When disabled, the hoop position may remain at the last stitch of the design. Many designs already end with a return to origin command.
  -  When enabled, the hoop position will return to the design origin whether or not the design file ends with that command.
- **Tail Length**
  - This adjusts the length of the upper thread left behind to start the next stitch after a trim.
- **Trim Type**
  - This slightly alters the trim behavior of the machine.
    - Normal - Used for most threads
    - Metallic - Altered to improve trimming on some of the stretchier metallic threads

Color Sequence Settings

- **Closest Color Match on Load**
  -  When disabled, the color sequence is not automatically color-matched.
  -  When enabled, the color sequence is automatically matched as closely as possible to the thread colors currently assigned to the thread tree.



Information

Because color information from software providers, software versions, and thread manufacturer color card versions vary, it is recommended that the color sequence be reviewed before sewing.

Design Preview Settings

You can disable design previews (thumbnails) to help folders load more quickly.

- **USB Design Previews**
-
    -  When disabled, previews will not be displayed when browsing designs on a USB drive.
    -  When enabled, previews will be displayed when browsing designs on a USB drive.
-
-
- **Network Design Previews**
    -  When disabled, previews will not be displayed when browsing designs in a network location.
    -  When enabled, previews will be displayed when browsing designs in a network location.

Saving Preferences

 Pressing confirm will exit this screen and save your preferences.

20.5. Software Updates

Updates are routinely made available with product improvements. The Software Updates screen shows the currently installed software version and will walk you through performing an update when one is available.

 This screen is available via the Settings screen.

Notifications (Internet Connection Required)

 When disabled, the Settings button on the main screen won't flash red when there is an update available.

 When enabled, the Settings button will flash red when an update is available.

Currently Installed

This shows the current version numbers of the installed following:

- UI Operating Software - This is the operating software that keeps the touchscreen running.
- UI Application - This is the software that is visible and allows access to the embroidery machine controls.
- Firmware - This is the firmware that runs on the machine board and controls machine behavior.

Install from USB Drive

If the machine is not connected to the internet, updates can be downloaded from the internet and installed onto a USB drive via a separate computer.

1. Download the SWU file.
2. Place only this file on a USB drive.
3. Insert the USB drive into the touchscreen unit.
4. Tap on "Search for Update".
5. Follow the prompts.

Installing Firmware from USB Drive

Firmware can also be updated from a USB drive.

1. Download the desired firmware (three .bin files).
2. Place only these three .bin files on a USB drive.
3. Insert the USB drive into the touchscreen unit.
4. Tap on "Search for Update".
5. Follow the prompts.

Updates

When updates are available for specific components, those components will be displayed below with a highlighted Install or Reboot button.

1. Tap the Reboot button to restart in the new application or OS version. Tap the Install button to install new firmware.
    - It may take a few moments to install or reboot in a new environment.

Available Firmware

The current firmware will also be displayed as available, but not highlighted. If a technician instructs you to, "Install Firmware" can be used to reinstall the current firmware on the board.



Connection Setup

Tapping on Connection Setup takes you to the Network Selection screen.

21. Maintenance

The Maintenance screen displays maintenance timers and machine information. The lower portion of the window allows navigation to other Technical screens and displays the machine's Status log.

 This screen is accessed via the Maintenance button on the Main screen.

Maintenance Timers

The top portion of the screen is devoted to the maintenance timers. Each timer will count down and prompt you to perform the required maintenance after the specified amount of time or stitches. When a time or stitch interval is reached, the maintenance will be due and the step-through button will pulse yellow.

The timers can be viewed as a function of time or stitches.

-  The Maintenance Timer Bar displays the time elapsed and the time remaining till the maintenance is due.
-  The Maintenance Timer Bar displays the number of stitches run and the number of stitches remaining till the maintenance is due.

The timer bars will fill up as time or stitches elapse. This indicates how soon a maintenance timer will be due.





Timer With No Progress





Timer Full - Maintenance Due

Maintenance Step-Through

 Tapping the Maintenance Step-Through Start button will begin stepping the machine through the corresponding maintenance procedure.

Each procedure will walk the user through where and how much to lubricate, move the machine to the proper positions for lubrication, and reset the timer upon completion.

Each screen of the step-through will have instructions, images, and buttons on the bottom to proceed through. Not all buttons will be available on every screen. There are times when the next steps must be completed before exiting the step-though.

-  Go to the Previous Step.
-  Go to the Next Step.
-  Cancel - Exit without completing the step-through.
-  Completed - Exit and reset the timer.
-  In Spec - The X-cable tension is within the spec - continue to the next step.
-  Out of Spec - The X-cable tension is out of spec - continue to the next step for adjustment.

Machine Information

The machine information section displays information about the software, environment, firmware, and the machine itself. Z Run Time indicates how long the machine has spent sewing during the life of its control board. Z Rotations corresponds to how many stitches the machine has run during the life of its control board.

Much of this information will be useful if speaking with technical support.

Technical Screens

The buttons at the bottom of the screen will open technical screens that deal with different facets of the machine's functionality.

-  **Head Timing**
  - Deals with the rotation of the hook and Z position.
-  **Sensors**
  - Shows the current state of the sensors.

- **Needle Case Calibration**
  - Stores and manipulates the left-right needle centering.
- **Steppers**
  - Deals with the functions of several motors.
- **Hardware Test**
  - Allows for the testing of the physical buttons and other hardware on the touchscreen.

Status Log

The status log shows the latest captured action of the machine.

Tapping this will open the status log and display a history of actions along with timestamps.

21.1. Head Timing

The Head Timing screen deals with the Z-rotation of the machine. This can be useful to lower or raise the needle to a specific position.

 This screen is accessed via the Head Timing button on the Maintenance screen.



Warning!!

Tapping almost any button on this screen will make the machine move the needle. Be careful and stay clear of the needle.

Exiting this screen will also cause the machine to return to the Head Up position.

 Move To a Specified Degree

1. Enter a number into this field.
2.  Press the Move To button to move to this rotation.
3. The Current Z Position will be displayed near the bottom of the screen.

You can also tap one of the buttons to the right to go to a common Head Timing position:

-  **Top Center**
-  **Head Up**
-  **Bottom Center**
-  **Hook Timing**

 Move By a Specified Degree

1. Enter a number into this field.
2.  Press the Rotate Back button to rotate back by the specified amount, or
3.  Press the Rotate Forward button to rotate forward by the specified amount.

4. The Current Z Position will be displayed near the bottom of the screen.

You can also use the buttons below to rotate by a specified amount:

-  **Rotate plus 20°**
-  **Rotate plus 10°**
-  **Rotate plus 5°**
-  **Rotate plus 1°**
-  **Rotate plus 0.1°**
- **or**
-  **Rotate minus 20°**
-  **Rotate minus 10°**
-  **Rotate minus 5°**
-  **Rotate minus 1°**
-  **Rotate minus 0.1°**

Current Z Position

This displays the current Z position of the machine. It will update whenever the rotation changes.

Release / Engage Z

The motors controlling the Z shaft can be disengaged. This allows the Z position to be subject to gravity and manual manipulation. Tap the button to release or engage Z.

-  Z Engaged - The Z motor is engaged and the Z position is being held by the machine.
-  Z Released - The Z motor is disengaged and the Z position can be changed manually.

Maintenance Navigation

You can quickly navigate between machine maintenance screens by pressing the shortcut icons found on the top-right of the screen.

-  **Head Timing**
  - Deals with the rotation of the hook and Z position.
-  **Sensors**
  - Shows the current state of the sensors.
-  **Needle Case Calibration**
  - Stores and manipulates the left-right needle centering.
-  **Steppers**
  - Deals with the functions of several motors.

Status Log

The status log shows the latest captured action of the machine.

Tapping this will open the status log and display a history of actions along with timestamps.

21.2. Sensors

The sensors screen shows the status of the sensors.

 This screen is accessed via the Sensors button on the Maintenance screen.

The onscreen representation of the LEDs corresponds to the state of the LEDs on the board. The sensors show as:

-  Active
-  Inactive

The groups indicate which sensor is being shown.

- X-Axis
    - Count - Shows the position in relation to machine origin or "Home".
    - Home Sensor - This sensor looks for the change point between active and inactive to set the X-Axis as centered. It may be lit or unlit when at home. The slightest movement will cause it to shift to the other state.
        - Active - The carriage is toward the left of the machine. (X coordinate/count is positive)
        - Inactive - The carriage is toward the right of the machine. (X coordinate/count is negative)
- Y-Axis
    - Count - Shows the position in relation to machine origin or "Home".
    - Home Sensor - This sensor looks for the change point between active and inactive to set the Y-Axis as centered. It may be lit or unlit when at home. The slightest movement will cause it to shift to the other state.
        - Active - The carriage is toward the front of the machine. (Y coordinate/count is positive)
        - Inactive - The carriage is toward the back of the machine. (Y coordinate/count is negative)
- Z-Axis
    - Count - Shows the rotational position.

    - Index - Detects which side of the rotation the Z is on.
        - Active - Z Position is between 180° and 360°.
        - Inactive - Z Position is between 0° and 180°.
    - Safe - Provides information to the machine related to color change operations.
        - Active - Z Position is at Head Up (27°).
        - Inactive - Z Position is not at Head Up.
- Trimmer
    - Shows the state of the trimmer sensor.
- Grabber
    - Shows the state of the grabber sensor.
        - Active - Grabber is Out
        - Inactive - Grabber is In
- Thread Feed
    - Shows the state of the thread feed sensor.

Maintenance Navigation

You can quickly navigate between machine maintenance screens by pressing the shortcut icons found on the top-right of the screen.

-  **Head Timing**
    - Deals with the rotation of the hook and Z position.
-  **Sensors**
    - Shows the current state of the sensors.
-  **Needle Case Calibration**
    - Stores and manipulates the left-right needle centering.
-  **Steppers**
    - Deals with the functions of several motors.

Status Log

The status log shows the latest captured action of the machine.

Tapping this will open the status log and display a history of actions along with timestamps.

21.3. Needle Case Calibration

The Needle Case Calibration screen is used for making changes to the color change table. This information keeps all the machine's needles centered with respect to the rotary hook. Each needle is calibrated individually. If this calibration is off, it can cause a variety of issues including thread breaks and needle breaks.

 This screen is accessed via the Calibration button on the Maintenance screen.



Caution!

Making changes on this screen can severely impact the performance of your machine. Please adjust these settings only under the guidance of a technician.

Table Commands

- Back Up Calibration
  - Saves a copy of the calibration table from the machine's board to the touchscreen unit.
- Default Calibration
  - Loads a generic calibration table to the machine's board.
  - This is a general table and is not meant to be sewn with. It can be used as a starting point for the calibration process.
- Restore Calibration
  - Loads the calibration table saved on the touchscreen unit to the machine's board.

Quick Z Position

Test any adjustments to a needle's centering by moving the needle down and comparing it to the post in the center of the bobbin area. Find more information about performing a needle case calibration in the Technical Manual for your machine.

The needle can quickly be moved up or down using these buttons in the middle of the screen:

-  Head Up

-  Bottom Center

Move to Needle

The needle case can be quickly moved using the following buttons on the lower portion of the screen:

-  Move One Needle Up
-  Select the Needle to Move to
-  Move One Needle Down

Needle Case Adjustments

Each needle can be adjusted left or right using the following buttons on the lower portion of the screen:

-  Shift Needle Case Left - Shifts the needle case a very small amount to the left and saves the new position of the current needle to the machine's board.
-  Shift Needle Case Right - Shifts the needle case a very small amount to the right and saves the new position of the current needle to the machine's board.

Move between needles easily by cycling from one needle to the next:

-  Cycle Needles - This moves the current needle to head up, moves one needle up, and then moves that needle to bottom center.

Maintenance Navigation

You can quickly navigate between machine maintenance screens by pressing the shortcut icons found on the top-right of the screen.

-  **Head Timing**
  - Deals with the rotation of the hook and Z position.
-  **Sensors**
  - Shows the current state of the sensors.

-  **Needle Case Calibration**
  - Stores and manipulates the left-right needle centering.
-  **Steppers**
  - Deals with the functions of several motors.

Status Log

The status log shows the latest captured action of the machine.

Tapping this will open the status log and display a history of actions along with timestamps.



Information

Upon closing this window, you will be prompted about changes made.

21.4. Steppers

The Steppers screen allows access to many motor functions and tests. It is used mainly by technicians.

 The Steppers page is accessed through the Steppers button on the Maintenance screen.

Color Change

Allows movement and testing of the color change motor.

Home (Button)

- Returns the needle case to the home position.
- This will move to a mechanical limit and then back to needle 1.

Needle +

- Moves the needle case right one needle.

Needle -

- Moves the needle case left one needle.

Start Test / End Test

- Cycles through all the needles.

Trimmer

Allows movement and testing of the trimmer motor.

Home (Button)

- Move the trimmer to the Home position.

Select

- Move the trimmer to the Select position.

Cut

- Move the trimmer to the Cut position.

Map Sensor

- Maps the trimmer sensor and returns the values in the Status Log.

Start Test / End Test

- Repeatedly performs the trim procedure without moving the needle.

Home (Indicator)

-  The trimmer is in the home position.
-  The trimmer is not in the home position.

NPT Sensor

-  NPT Sensor is enabled.
-  NPT Sensor is disabled.

Grabber

Allows movement and testing of the grabber motor.

Home (Button)

- Moves the grabber out (Home).

In

- Moves the grabber in.

Start Test / End Test

- Cycles the grabber in and out.

Home (Indicator)

-  The grabber is in the home position.
-  The grabber is not in the home position.

Thread Feed

Home (Button) Forward 200

- Moves the thread feed drive gear to a home position.

- Moves the thread feed drive motor forward 200 steps.
- This should result in feeding roughly 89 mm or 3.5" of thread.

Backward 200

- Moves the thread feed drive motor backward 200 steps.

Step Forward

- Steps the thread feed motor one step forward.

Step Backward

- Steps the thread feed motor one step backward.

Start Test / End Test

- Cycles through forward and backward movements.

Home (Indicator)

-  The thread feed gear is in the home position.
-  The thread feed gear is not in the home position.

Feeder Profile

- Use the Feeder Profile button to rotate the thread feed motor one full revolution. This analyzes the tooth profile of the drive gear and populates the fields below the button.
- Feeder Home Adjust
    - When enabled, this allows for a slight adjustment to the rotation of the gear when in the home position.
    -  Feeder Home Adjust is enabled.
    -  Feeder Home Adjust is disabled.
    - The value entered when enabled is the amount of the adjustment.

Maintenance Navigation

You can quickly navigate between machine maintenance screens by pressing the shortcut icons found on the top-right of the screen.

-  **Head Timing**
  - Deals with the rotation of the hook and Z position.
-  **Sensors**
  - Shows the current state of the sensors.
-  **Needle Case Calibration**
  - Stores and manipulates the left-right needle centering.
-  **Steppers**
  - Deals with the functions of several motors.

Status Log

The status log shows the latest captured action of the machine.

Tapping this will open the status log and display a history of actions along with timestamps.

21.5. Hardware Test

The Hardware Test screen is used to diagnose any problems with the physical buttons and other hardware on the touchscreen unit.

 You can access this screen via the Hardware Test button on the Maintenance screen.

Button Tests

When on this screen, the buttons on the touchscreen unit will not cause the machine to move. When pressed, their corresponding image should indicate that it has been pressed.

- **Up Button**
  -  Up button is not pressed.
  -  Up button is pressed and functioning.
- **Left Button**
  -  Left button is not pressed.
  -  Left button is pressed and functioning.
- **Right Button**
  -  Right button is not pressed.
  -  Right button is pressed and functioning.
- **Down Button**
  -  Down button is not pressed.
  -  Down button is pressed and functioning.
- **Start/Stop Button**
  -  Start/Stop button is not pressed.
  -  Start/Stop button is pressed and functioning.

Other Hardware Tests

- **Speaker**
  -  Drag the volume slider to the desired volume.
  -  Press the speaker button to play a test sound.
- **USB-A Connections**
  -  USB-A Connection is not detected.
  -  USB-A Connection is detected.
- **USB-C Connections**
  -  USB-C Connection is not detected.
  -  USB-C Connection is detected.
- **Internet**
  -  Pressing the Internet Test button will check for an internet connection.
    - If the touchscreen has an active internet connection, the screen will display a large green checkmark.
    - If the touchscreen does not have an active internet connection, the screen will display an error page.

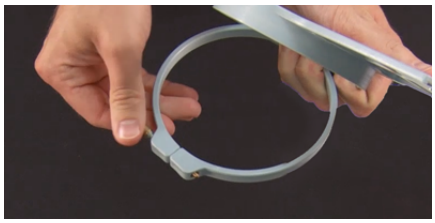
22. Hooping

Hooping the fabric or garment securely is important to the quality of the embroidery. This section will walk you through the adjustment of the hoop tension as well as the hooping process.

Adjusting the Hoop Tension

You will need to adjust the tension of the hoop any time you change to a drastically different material. For example, changing from a T-shirt to a sweatshirt would require a change in hoop tension.

1. Start with a clean, flat working surface. Remove clutter from the area. Do not hoop on an uneven surface or stack of shirts.
2. Use an appropriate hoop for your design. For more information, read the section on choosing an appropriate hoop.
3. Loosen the tension on the outer hoop ring by turning the adjustment screw counter-clockwise.



4. Place the outer hoop ring inside the garment.
5. Slide the appropriate stabilizer between the outer ring and the hoop.
6. Smooth the fabric over the hoop.
7. Gently align the inner hoop with the outer hoop, sandwiching the stabilizer and a single layer of the garment. The mounting brackets should be facing up.
8. Press the hoop down and into place. It should go fairly easily. Take care to press on the ring rather than on the arms.

Warning!!

Pressing on the arms can bend the hoop out of shape or break it.

9. Reach inside the garment and tighten the outer hoop by turning the adjustment screw clockwise. Tighten the hoop to finger-tight.



10. Now, without loosening the screw, remove the hoop from the garment.
11. Tighten the adjustment screw a turn or two more.
12. The outer hoop is now adjusted.

Note:

The appropriate tightness of a hoop can be tested by tapping rapidly with moderate pressure on the fabric inside the hoop. By doing this, you can mimic the presser foot of the machine. If material walks into the hoop, the hoop is too loose and needs further adjustment.

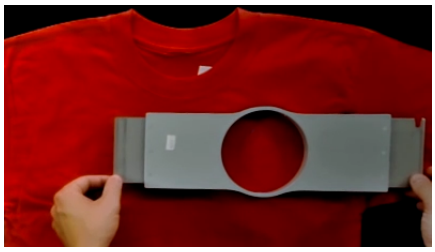
Hooping the Garment or Fabric

With the hoop properly adjusted, the garment can be hooped.

1. Start with a clean, flat working surface. Remove clutter from the area. Do not hoop on an uneven surface or stack of shirts.
2. Use an appropriate hoop for your design. For more information, read the section on choosing an appropriate hoop.
3. Place the properly tensioned outer hoop ring inside the garment.
4. Slide the appropriate stabilizer between the outer ring and the hoop.
5. Smooth the fabric over the hoop.



6. Gently align the inner hoop with the outer hoop, sandwiching the stabilizer and a single layer of the garment. The mounting brackets should be facing up. The notch in the mounting bracket will face the machine when the hoop is loaded onto the machine.
7. Using the hoop arms as a guide, make sure that the hoop is level with the garment. This will help prevent sewing a design crookedly on a product.

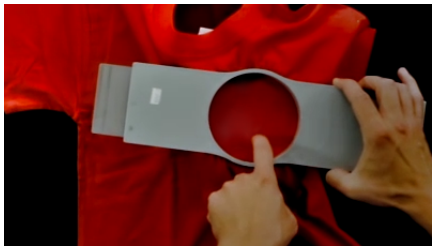


8. Press the hoop down and into place. Take care to press on the ring rather than on the arms. Pressing on the arms can bend the hoop out of shape or break it.
    - It may be helpful to start by placing one hand just below and off of the outer hoop to stabilize and smooth the fabric.
    - Try to hoop in a smooth motion. If the hoop rocks back and forth, extra material will move into the hoop and diminish the quality of the embroidery.
    - Do not overstretch the material. Stretching the material will stretch and distort the sew-out. It can also lead to puckering.





9. Once the material has been hooped, make sure that the garment is smooth, flat, and taut. If the garment is loose, you may need to remove the hoop and adjust the hoop tension or hooping method.



10. Check the back of the hooped piece. Make sure that there are no wrinkles or other parts of the garment lodged in the hoop.
11. As a final step, check the hoop for placement accuracy and straightness.

Hooping Tips

Round hoops give the most even tension of all the hoop shapes.

Wooden hoops will have registration marks on them. These help maintain the shape and hold of the hoop.

Many wooden hoops are double-high, meaning their sides are twice as tall as normal hoops. They help grip slick or bulky goods because of the larger surface area and slight tooth the wood provides.

Choose the smallest hoop that the design will fit in without going over the hoop limitations.

Adjust the hoop tension before hooping the final garment. If you adjust the tension of the hoop while the garment is in it, you will increase your chances of “hoop burn” and create ripples in the garment.

Sew a Swatch!

It is often a good idea to sew a practice piece on material as similar to the final product as possible. Although not essential, producing a sample is an excellent way to prevent or solve potential problems before embroidering the final product.

Working With Different Fabrics

Different fabrics and fabric weights may require you to loosen or tighten the hoop. It might take a few attempts to get the exact setting for the fabric you are working with. Most fabrics do not require the hoop to be tightened down once in the hoop.

23. Attaching & Adjusting Hoop Arms

Depending on the hoop you plan on using, the hoop support arms on the machine will need to be in the inner position, outer position, or removed completely if using a clamp or the wide-angle driver.

This section will walk you through attaching and removing the support arms properly, as well as adjusting the spring clips.

Attaching the Hoop Support Arms



Determine which support arm position the chosen hoop requires. Most of the smaller hoops require the inner position. Most of the larger hoops require the outer position. To attach the hoop support arms:

1. Align the hoop arms to the inner holes or outer holes on the x-carriage. There will be two holes for each support arm.
2. Make sure the clips on the ends where the tubular frame will attach are facing up. The sides of the hoop arms should face outward. This will ensure the brackets are attached to the correct side of the carriage. Also, make sure both clips are attached securely to the arms.
3. Insert two thumbscrews for each arm. Install them to nearly finger-tight.
4. Install a hoop by sliding the side brackets of the hoop underneath the spring clips on the support arms. Slide the hoop towards the rear of the machine until it snaps into place and the brackets are fully seated beneath the spring clips. Make sure that the slotted bracket is to the right as you are facing the machine. The support arms will still move a little.
5. Using the installed hoop as a guide, square up the support arms.
6. Tighten the thumb screws to finger-tight.
7. Using a 6mm hex wrench, tighten the screws a quarter to half turn more. Do not overtighten, as the screws are designed to snap before damage to the x-carriage can occur.



Information

If the hoop brackets shift forward and back, the spring clip may need to be adjusted. See the information below.

Removing the Hoop Support Arms

1. Use a 6mm hex wrench to loosen each of the two thumb screws attaching each arm to the x-carriage.
2. Using your fingers, fully loosen the thumb screws.
3. Remove the support arms from the x-carriage.

Adjusting the Spring Clips

When you have a hoop installed, you should make sure both spring clips are attached securely to the arms. If either side of the hoop can move front to back underneath the clip, the clip needs to be adjusted. It may be necessary to move the hoop forward for easier access to the nuts holding the clips. To adjust the clip:

1. Use a 5mm Hex nut driver to loosen the two nuts holding the clip in place.
2. Push the block underneath the clip as far forward as it will go.
3. Hold the block in place while tightening the nuts.

24. Loading a Hoop onto the Machine



1. Install a hoop by sliding the side brackets underneath the spring clips on the support arms. Make sure that the slotted bracket is to the right as you are facing the machine.
2. Slide the hoop towards the rear of the machine until it snaps into place and the brackets are fully seated beneath the spring clips.
3. Pull back gently on the hoop arms to ensure the spring clips are engaged.
4. Run your fingers around the edges of the hoop to ensure that sleeves, collars, zippers, or other garment parts are not inadvertently under the hoop. Balloon the garment out around the cylindrical lower arm. This will prevent other garment parts from becoming sewn into the underneath side of the embroidery.

25. Needles

Embroidery quality can be greatly affected by your choice of needles. You will need to find what works best with your applications. The following information should help.

Choosing a Needle

Your machine utilizes DBxK5 needles. Among other things, this means that they are industrial needles with larger eyes.

Needle Sizes

Needles come in a variety of sizes, and most are marked with two numbers. For example, you will find 75/11 needles. The first number is metric and is the diameter of the needle blade. It is measured in hundredths of a millimeter. A 75/11 needle has a blade that is 0.75 mm in diameter.

Standard sewing conditions will utilize needle sizes ranging from 65/9 to 80/12 needles.

Smaller needles work well for finer materials, thinner threads, and delicate detail work.

Larger needles work well for tougher and more abrasive materials. As the holes made by the needle are larger, sewing creates less friction on the threads and helps prevent thread breaks.

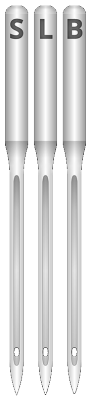
Size	Benefit	Drawback
60/8	Used for the thinnest threads and finest detail work.	A thinner needle blade is more prone to needle deflection and breakage. Uncommon needle size and can be difficult to source and purchase.
65/9	Smallest of the more common needles. Used for fine fabrics, 60-weight thread, delicate design details, and tiny lettering.	A thinner needle blade is more prone to needle deflection and breakage.
70/10	Used for fine fabrics, design details, and small lettering. Good needle size for a larger majority of embroidery work.	A thinner needle blade is more prone to needle deflection and breakage.
75/11	Standard needle size and good for the majority of embroidery applications.	May be too large for finer detail work.
80/12	Largest of the more common needles. Often used in caps with buckram backing or cotton duct jackets to help alleviate thread breaks.	Larger holes can damage finer materials and smaller design details.

Size	Benefit	Drawback
90/14	Used with some specialty and metallic threads.	Larger holes can damage finer materials and smaller design details. Uncommon needle size and can be difficult to source and purchase.
100/16	Used with the thicker 12-weight threads, like the wool-acrylic blends.	Larger holes can damage finer materials and smaller design details. Uncommon needle size and can be difficult to source and purchase.

Needle Points

Needle points also come in a variety of options. The main two are sharp and ballpoint.

- Sharp point needles are generally better at cutting through materials and are usually used on tightly woven or non-woven.
- Ball point needles are most often used on knit materials. They tend to move the threads of the material to the side of the needle as they sew. Ball point needles are usually marked with a “BP” on the package.



S - Sharp

L - Light Ball or Universal

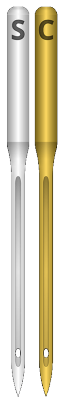
B - Ballpoint

Needle Coatings

Needles are offered with a few different coatings:

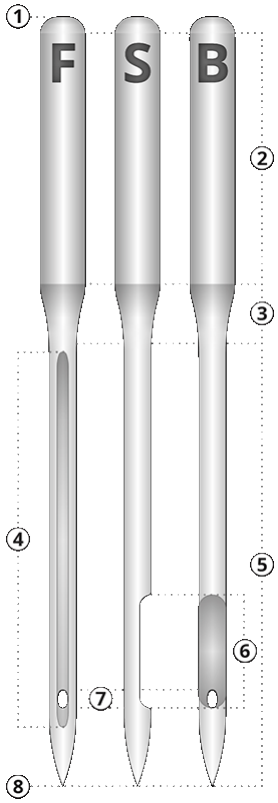
- Standard needles are silver in color and offer a sewing life of approximately 4 to 6 solid sewing hours.
- Titanium needles are gold in color and offer an extended sewing life of 2 to 3 times the life of a standard needle. While they are stronger needles, they have less flexibility. If deflected, they will often break instead of bend.

Other needle coatings exist, including some that reduce the heat built up when traveling through synthetic materials.



Needle Coatings

Anatomy of a Needle



1. Butt
2. Shank
3. Taper or Shoulder
4. Thread Guide or Front Groove

5. Blade
6. Scarf
7. Eye
8. Tip or Point

25.1. Replacing A Needle

Sew conditions and material properties will affect the life of a needle, but eventually, needles will need to be changed.

Replacing a Needle



1. Make sure the safety grabber blade is in the back position before changing a needle. If not, press the Grabber In button to move the grabber back.
2. Above each needle is a needle clamp set screw that holds it in place. Using a small flat-blade screwdriver, turn the needle clamp set screw counterclockwise about half of a turn until the needle can slide down and out of the needle bar. Do not loosen too much or remove the set screw. Loosen the screw just enough for the needle to be removed.
3. Remove the needle by pulling it down.
4. Embroidery needles have a front and a back side. The needle must be installed correctly or the sew quality may suffer. If you install the needle incorrectly, you may also get thread breaks. The front of the needle has a long groove (thread guide), while the back has an indented notch (scarf) just above the eye of the needle.
5. With the thread guide facing forward and the scarf facing back, slide the needle up and into the needle clamp as far as it will go. The eye of the needle should then be turned 5° to the right. The acceptable range is 0° - 20° to the right.
6. A needle orientation magnet may be used to help determine the angle of the needle eye. This cylindrical magnet can be temporarily attached to the front of the needle just above the eye. The end

of the magnet will rest on each side of the thread guide and stick straight out from the needle. This will better indicate the angle of the eye. For reference, one minute is 6° on a clock face.

7. While holding the needle in place, re-tighten the needle clamp set screw to hold the needle in place.

Common Reasons to Change the Needle

- The needle breaks or is bent.
- The thread will consistently fray - This usually means there is a bur on the needle, causing it to fray a part of the thread.
- The needle is dull.
- Sewing conditions change, such as a change in fabric.

26. Thread Types

Thread comes in many styles, weights, and compositions. Understanding these differences can help determine the appropriate thread for the job.

Information

Manufacturers and suppliers often have fact sheets with sewing tips, design settings, and needle recommendations on their websites. This is very useful in learning to use a variety of thread types.

Thread Content

Thread comes in a few compositions. These have different properties that can drastically affect sewing and quality.

Polyester

Polyester thread has become the standard thread for Melco embroidery machine users.

- Stronger than other threads
- Fewer thread breaks when sewing
- Colorfast and resistant to chlorine, making it ideal for garments that are washed frequently. It is perfect for uniforms and corporate apparel
- Comes in a wide variety of colors

Information

Polyester thread is recommended for use with your machine to achieve full sew speed and prevent thread breaks.

Metallic

Metallic threads are often used to add a bit of sparkle to a design.

- Come in high sheen or sometimes a matte finish
- Can be more problematic to sew with

- Require lighter densities and longer stitch lengths
- Usually require slower sew speeds and larger needles

Wool/Acrylic Blend and Wool/Cotton

Usually a heavier thread, these threads can be used for a more natural or hand look.

- Unique look
- Can be more problematic to sew with
- Requires much lighter densities and longer stitch lengths
- Usually requires slower sew speeds and larger needles

Rayon

Rayon threads are made of natural fibers and can have a slightly higher sheen than polyester.

- Wide variety of colors
- Beautiful sheen
- Not chlorine resistant
- Usually requires slower sew speeds
    - A machine speed of 1000 spm is recommended when doing flat embroidery using rayon thread
- Weaker than polyester, consider easing the tension on the thread (see below)

Rayon Thread and Tension

Because rayon is weaker than polyester, it is often advised to ease the tension on the thread.

For a single project:

- Increase the Acti-Feed Minimum by a point or two.
- You can find more information on Acti-Feed Minimum in the Acti-Feed section.

For a long-term solution:

- Increase the Feed Adjust by a point or two.
- You can find more information on Feed Adjust in the Advanced Acti-Feed Calibration section.

Thread Weight (Thickness)

Thread is commonly referred to by its weight. In many cases, this is a number beside the type. For example, you might find a “Poly 40”. This number usually means that it would require 40 kilometers of thread to weigh 1 kilogram. With this method, the higher the number, the thinner the thread.

- 40-weight thread is the industry standard for embroidery. Most stock designs are digitized for use with 40-weight.
- 60-weight thread is excellent for fine details and small lettering.
- 12-weight thread is very thick and can work well for a hand embroidery look.

Each thread weight will require different needles and design specifications.

27. Stabilizers

Using an appropriate stabilizer is essential for embroidering most fabrics. Without stabilizer, fabrics can slip even when they are hooped tightly. Using the proper stabilizer is directly linked to the production of consistently high-quality embroidery. It is important to understand that many different embroiderers with identical criteria may choose completely different stabilizer and topping formulas and still achieve successful embroidery results. Experimentation and experience are essential in creating consistently high-quality embroidery. New products are constantly being developed and introduced. Find the combinations that work best for you.

Stabilizer is commonly placed underneath a fabric before it is embroidered. It is also sometimes referred to as interfacing or backing. Depending on the material, stabilizer can:

- Stabilize the material as it is being sewn
- Provide support for the stitches after sewing is complete

Different stabilizer types provide varying levels of support

Cut-away

Cut-away stabilizer is a woven or non-woven material that must be cut from the fabric after the embroidery is complete. This type of stabilizer is used to support the embroidery on the fabric during and after the embroidery process. It also prevents the fabric from stretching during embroidery.

Cut-away stabilizer is a great choice for knits or loosely woven materials. These materials tend to move and stretch. The cut-away stabilizer helps to stabilize the material and support the stitches.

Cut-away stabilizer also has a softer feel to it. If the embroidery is going to eventually be against the skin directly, consider using cut-away for a more pleasant experience for the wearer.

As the name implies, cut-away stabilizer must be removed by cutting it away with scissors after the embroidery is complete. It is best to leave a ⅛ to ¼ of an inch edge.

Tear-away

Tear-away stabilizer is a non-woven material that tears easily in any direction and can be easily removed after embroidery. This stabilizer is extremely simple and fast to use, but the uses are limited because it offers little support to unstable fabrics. Some examples of fabrics suitable for tear away are cotton sheeting, heavy woven dress shirts, denim, terry cloth, and hats.

Tear-away stabilizer is a favorite among embroiderers because of its ease of removal. It is simply torn away from the garment after the embroidery is finished.

It often has a feel that is similar to paper, and leftovers can be rough against the skin.

It is best used with stable materials, as the stabilizer offers little support for the material.

Specialty Stabilizers

Specialty stabilizers such as poly mesh and nylon mesh are also options. While they may not be as stable as traditional Cut-away, they are much less visible through lighter-weight garments. They also tend to be softer than other stabilizers.

Water-soluble stabilizer is also available for jobs that require that no stabilizer be left after the completion of the embroidery. Be aware that this would require a fairly stable garment, as the stabilizer will be dissolved completely and offer no support once the garment has been laundered.

Stabilizer Choice Example

The choice of stabilizer impacts the quality of the embroidery greatly. The following examples were sewn on the same machine with all the same settings. The only difference was the choice of stabilizer.

Example 1 - Embroidery on a T-Shirt



Cut-away stabilizer provides needed stability to the thin knit of a T-shirt. The embroidery holds the shape of the design.



Tear-away stabilizer does not hold up to the embroidery. The stitching is allowed to pull in and the borders do not line up.

Example 2 - Embroidery on a T-Shirt



Cut-away stabilizer provides needed stability to the thin knit of a T-shirt. The embroidery holds the shape of the design.



Tear-away stabilizer allows the T-shirt to pull and pucker as the design is sewn.

Stabilizer Weights

Stabilizer comes in different thicknesses. Often, you can ask for sample packets from suppliers to find what will work best with your application.

Heavier stabilizers tend to offer more support. Lighter stabilizers are often less visible. Because finding the right stabilizer for the application requires some experience and experimentation, having a medium-weight stabilizer is a good starting place for new embroiderers.

Toppings

Toppings are used to keep your stitches from falling into the nap of a lofty material like terry cloth or polar fleece. It can also be used to clean up small lettering and the overall appearance of your embroidery. Most toppings are water-soluble and can be easily removed after the embroidery is complete.

28. Installing the Wide-Angle Driver

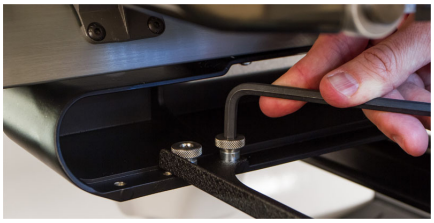
Cap frames and micro clamps utilize the Wide-Angle Driver. The Wide-Angle Driver consists of two pieces:

- The cap frame driver ring
- The lower arm bracket

You must ALWAYS select the proper frame/hoop in the software when sewing with the Wide-Angle Driver. Failure to do so may result in damage to your equipment!

Wide-Angle Driver Installation

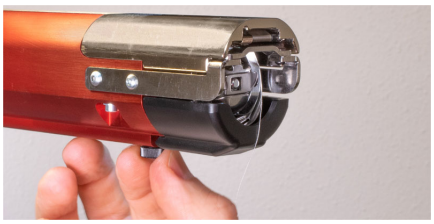
1. Select the Wide-Angle Cap Frame for the hoop in the software.
    a.  Tap to select a hoop
    b.  Tap to select the Wide-Angle Driver Category
    c. Locate and select the Wide-Angle Cap Frame
    d.  Confirm to return to the main screen
2. Center the sew field.
    a.  Tap to go to the Transform screen
    b.  Tap to center the sew field of the Wide-Angle Cap Frame
    c.  Confirm to return to the main screen.
3. Moving the machine to either needle 8 or needle 9 is also beneficial.
    a.  Tap to access the move-to-needle option.
    b. Tap to select either needle 8 or 9.
    c.  Confirm to move the needle case and return to the main screen.
4. If attached, remove the hoop arms from the machine. To do this, use a 6mm Allen wrench to loosen the two thumb screws securing each arm. Unscrew them and remove the arms.



Warning!!

Failure to remove the hoop arms will result in the wide-angle driver colliding with the arms during sewing.

5. Remove the hook guard.
    a. Loosen the thumb screw securing the hook guard and slide it away from the machine.
    b. Set aside.



6. Loosen the knobs of the lower shaft support until the top of the screws are flush with the t-nut.
7. Slide the shaft support mount into the lower arm extrusion and toward the back of the machine until it contacts the hard stop. It should slide smoothly into the t-channel. The t-nut must go all the way back to the hard stop or the shaft will be set too far forward on the machine.



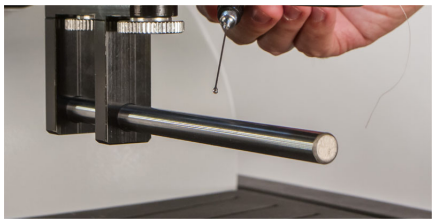
8. Tighten the two knobs to finger-tight.



9. Using a 3mm hex wrench, tighten the screws a quarter turn more.
10. Reattach the hook guard by sliding it back into place and tightening the thumb screw.



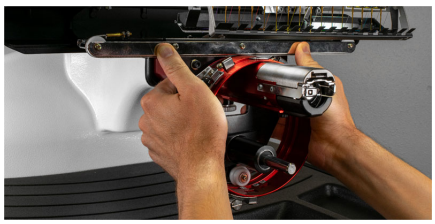
11. A few drops of sewing machine oil should be applied to the lower support shaft prior to the initial installation of the driver ring assembly. This oil should be applied every three months on later installations.



12. Slide the red driver assembly onto the lower arm and support shaft. This may be easier if the grabber bar of the machine is closed.

    -  Tap to close the grabber.

    Then, slide the red driver assembly onto the lower arm and support shaft. Notice the orientation of the ring in the picture.



13. Using two of the thumb screws from the hoop arms, attach the red driver to the x-carriage of the machine. The driver will attach to the two innermost holes. Tighten them to finger-tight, and then use a 6mm Allen wrench to tighten an eighth to quarter turn more. Do not over-tighten the screws. They are designed to break before damage to the machine can occur.



Information

The red driver ring should slide easily over the lower arm of the machine and should allow for a business card or two to fit between the ring and the lower arm. The space should be enough for the card(s), but no more.

If the gap between the ring and the lower arm is incorrect, or if you are unable to install the driver, it will need to be adjusted. See the adjustment section for instructions on how to test and adjust.

14. The Red Wide Angle Driver is now installed and ready to use.

Red Wide Angle Driver Removal

1. Starting with a 6mm Allen wrench, remove the thumbscrews attaching the red driver assembly to the x-carriage.



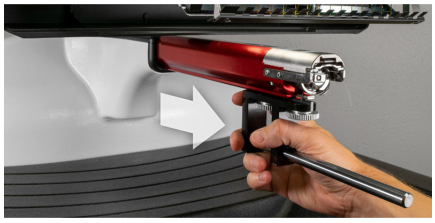
2. Slide the red driver assembly toward you and off of the lower arm and support shaft. This may be easier if the grabber bar of the machine is closed.
    -  Tap to close the grabber.



3. Remove the hook guard.
    a. Loosen the thumb screw securing the hook guard and slide it away from the machine.
    b. Set aside.



4. Using a 3mm hex wrench, loosen the knobs of the lower shaft support. Then, slide the lower support shaft out of the t-channel and off the machine.



5. Reattach the hook guard by sliding it back into place and tightening the thumb screw.



6. The wide-angle driver is now removed. Hoop arms can be reattached to sew with flat hoops.

28.1. Adjusting the Wide-Angle Driver

This procedure may need to be performed if the Wide-Angle Driver was purchased separately from your machine, the driver has been dropped or mishandled, if the initial installation of the driver shows the adjustment to be off, or if prompted by technical support.

The Wide-Angle Driver may need to be adjusted to custom-fit each machine. A driver that is not properly adjusted to the machine it is used on will result in a negative impact on sew-out quality, machine productivity, and reliability.

The following tools will be used:

- Screwdriver, Hex Drive, Ball End, 4mm
- Hex Set, 7 Pieces, Metric Long – 6mm and 2mm

Testing for Appropriate Adjustment

1. Install the driver using the instructions for Installing the Wide-Angle Driver.
2. Position the driver so that the bearing block is aligned to the front of the support shaft and the driver ring is centered with the hole in the needle plate. Reference the ring's frame location tab.



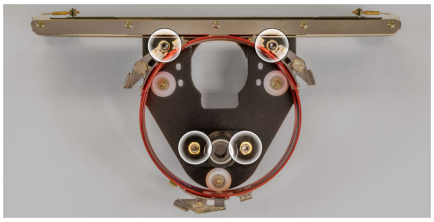
3. Place a business card of medium to heavy stock (or equivalent) between the needle plate and the driver ring. A single business card should be able to slide between them with little resistance. A gap of two business cards is acceptable.



4. If the gap is too small or too large, the driver will need to be adjusted using the steps below.

Adjustment Procedure

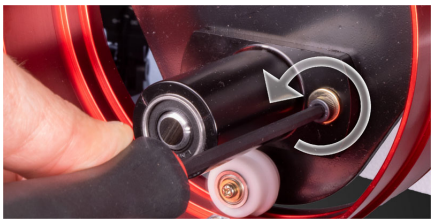
1. Begin by loosening the two bearing block hex screws and the two interface bracket screws using the 4mm hex screwdriver.







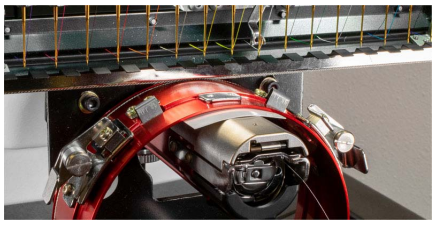




2. Install the Wide-Angle Driver on your machine.
3. Position the driver so that the bearing block is aligned to the front of the support shaft and the driver ring is centered with the hole in the needle plate. Reference the ring's frame location tab.



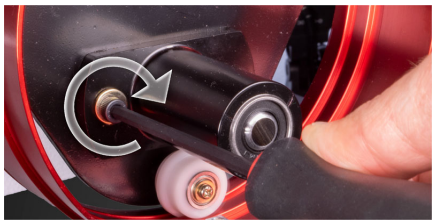
4. Place a business card of medium to heavy stock (or equivalent) between the needle plate and the driver ring. This will act as a spacer. The ring should just rest on the card.



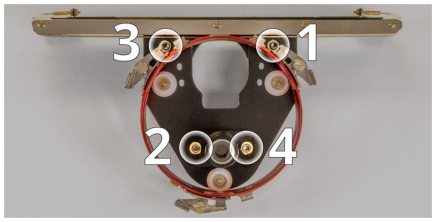
5. While making sure the edges of the two black brackets are aligned, tighten one of the upper screws.



6. Tighten the opposite screw securing the bearing mounting block.



7. Tighten the second upper screw securing the bracket and then the second lower screw securing the bearing mounting bracket. Tightening these four screws in a star-like pattern achieves the best results. Then remove the business card.



8. Move the y-beam and x-carriage by hand to ensure there is no binding. This can only be accomplished with the machine off or the e-stop engaged.

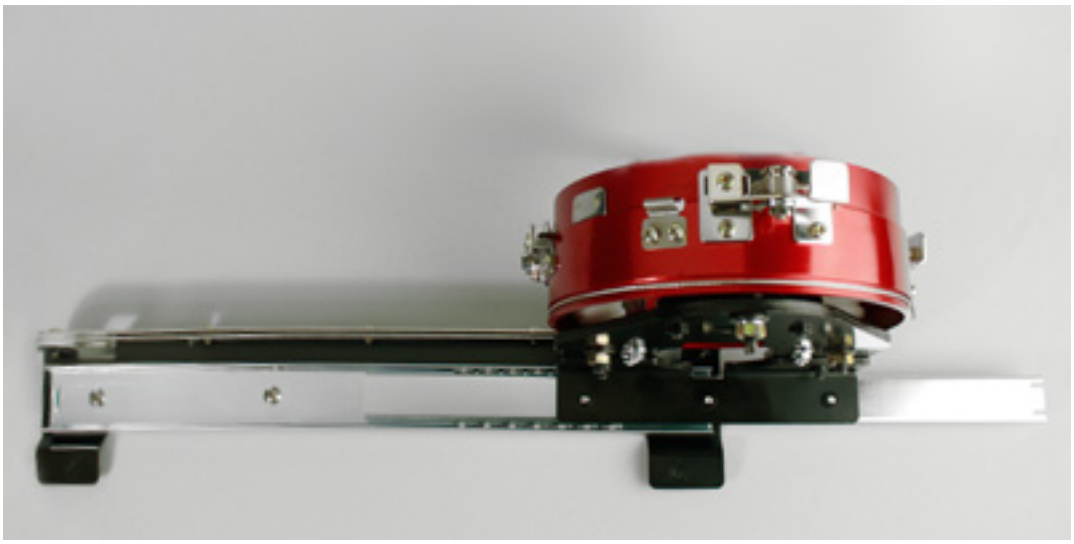
28.2. Maintaining the Wide-Angle Driver

Approximately once per year, the red wide-angle driver will need to be cleaned and greased. The procedure will vary depending on which version of the wide-angle driver you are using.

Compare your driver to the images below to determine which maintenance procedure is appropriate for you:

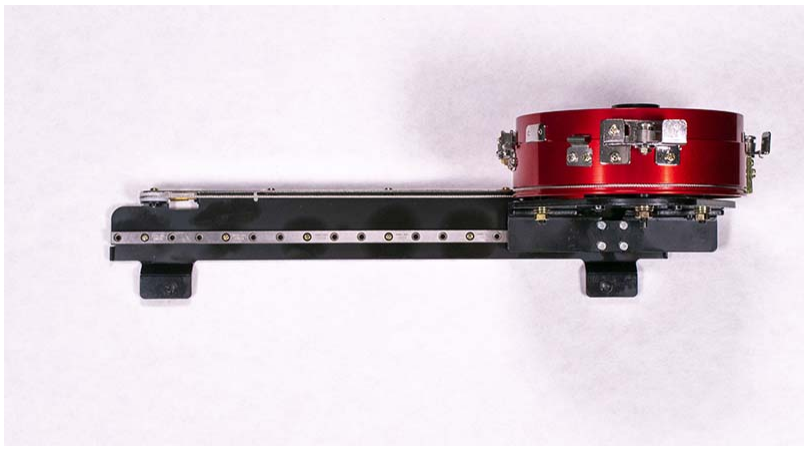
Wide-Angle Driver with Bearing Slide

Visit the Maintaining the Wide-Angle Driver (Bearing Slide) section if your driver has a wide bearing slide like that pictured below.



Wide-Angle Driver with Linear Rail

Visit the Maintaining the Wide-Angle Driver (Linear Rail) section if your driver has a slim linear rail like that pictured below.

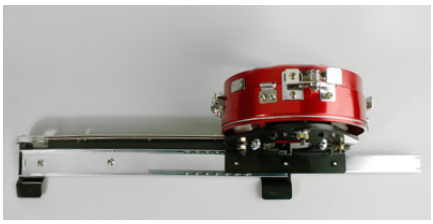


28.2.1. Maintaining the Wide-Angle Driver (Bearing Slide)

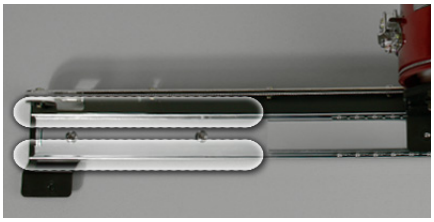
The red wide-angle driver will need to be cleaned and greased once per year.

The following steps will walk you through the procedure:

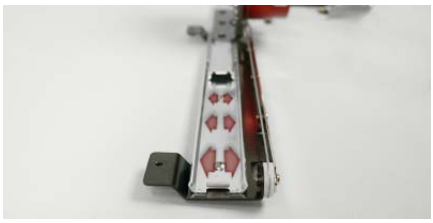
1. Remove the driver from the machine and lay it upside down on a flat surface.
2. Slide the driver ring fully to one side.



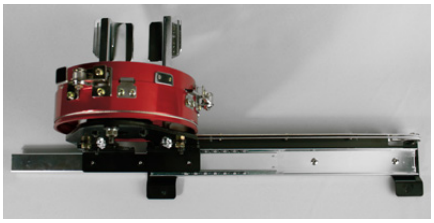
3. Clean the exposed portion of the exposed slider bearing groove with a clean towel.



4. Apply a thin film of HP grease to the grooves of the slider bearing.



5. Move the driver all the way to the opposite side and repeat the previous two steps.



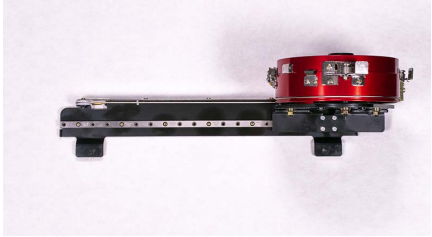
6. Move the driver back and forth a few times to spread the grease.
7. The driver may now be reinstalled on the machine or stored for future use.

28.2.2. Maintaining the Wide-Angle Driver (Linear Rail)

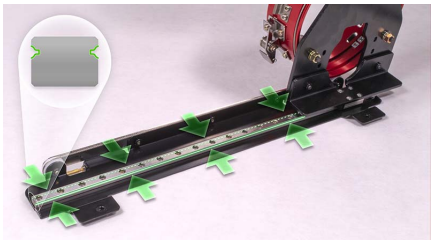
The red wide-angle driver's linear rail will need to be cleaned and greased once per year.

The following steps will walk you through the procedure:

1. Remove the driver from the machine and lay it upside down on a flat surface.
2. Slide the driver ring fully to one side.



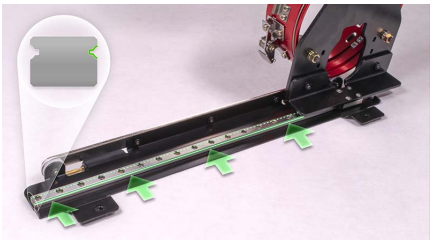
3. Clean both sides of the exposed portion of the linear rail with a clean towel.



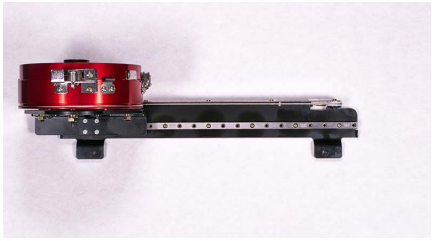
4. Apply a thin film of HP grease to the front and back linear rail channel.
    a. Front channel:



    b. Back channel:



5. Move the driver all the way to the opposite side and repeat the previous two steps for the sections of the channel that are now accessible.



6. Move the driver back and forth a few times to spread the grease.
7. The driver may now be reinstalled on the machine or stored for future use.

29. Sewing Caps

Sewing caps will require a little more setup than sewing a flat product. For sewing caps, you will need to do the following.

1. Select the appropriate hoop in the application.
2. Install the Wide-Angle Driver.
    - This may need adjusting the first time.
3. Hoop a cap.
4. Load the hooped cap onto the driver.
5. Set up the design for caps
6. Load the design and set the proper settings for sewing caps.
7. Adjust the presser foot for the cap.
8. Center the design on the cap.

The next few sections of this document will assist in sewing a cap.

29.1. Hooping A Cap

The process for hooping a cap on the Wide Angle Cap Frame (WACF) is the same for almost any type of cap or visor you are hooping.

You will want to have the cap gauge installed on a sturdy surface to start.

Preparing the Cap

Preparing the cap before it is hooped will help the sew quality and ease the hooping process.

To prepare the cap:

1. Remove any cardboard from the inside of the cap.



2. Straighten the bill as best you can. It can be reshaped after the embroidery is complete.



3. Pull the sweatband to the outside of the cap. Near the back of the cap, the sweatband may be sewn into the cap. At this point, it may need to be folded a bit to fit in the frame.



4. If the cap has a braid, move it around the cap to the inside and under the brim.

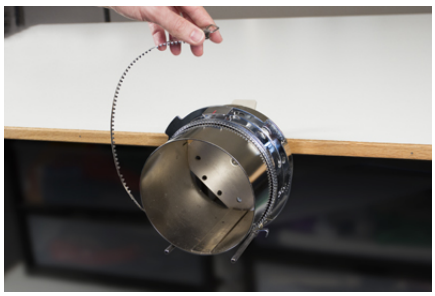
Hooping the Cap

To hoop the cap:

1. Slide the cap frame onto the cap gauge. Make sure the locating tab on the cap gauge fits into the cap frame notch and the cap frame slips firmly under the two roller clips. Watch your fingers! Don't pinch them between the back of the frame and the gauge.



2. Swing the metal strap open.



3. Place an appropriate stabilizer over the gauge and the teeth of the cap frame. Make sure that the stabilizer is long enough to support the full embroidery area. It may be easiest to use a stabilizer long enough to reach the posts on the bottom of the cap frame.



Note:

Some people find it easier to use the binder clips to hold the stabilizer while they are hooping the cap. The downside to this technique is that you have to remove the clips from inside the cap when you are done hooping. That isn't always easy. Clipping the stabilizer before hooping the cap is completely optional.



4. Slide the prepared cap onto the cap frame with the visor pointing up and the frame going inside the cap. The bill should be pushed against the bill-stop on the frame. The bill should also be relatively centered on the frame. The centering mark on the bill-stop can be used for reference.



Note:

The sweatband may not touch the vertical ridge of the frame. That's okay. Different caps have varying sweatband widths and not all will appear the same when hooped.

5. The cap should ride over the two clip posts toward the bottom of each side of the frame.
6. Press down on the bill to ensure that it is falling in the bill trough of the cap frame. This will help keep the cap from slipping around or off the frame when the cap is being sewn.



7. Pull the side of the sweatband toward the cap frame and down. Smooth any bunching of the cap sides or sweatband. You may eventually need to fold the sweatband a bit to avoid the latching hook. But this will help with the placement of the cap on the frame. As you do this, watch the stabilizer to ensure it is still in.



8. When the left side of the cap is within the strap hinge post, swing the strap up and over the cap brim. On the side of the cap, the teeth of the strap should fall just above the seam attaching the sweatband to the cap.



9. Continue bringing the strap around the front of the cap. On the front of the cap, the teeth of the strap must fall into the seam for the bill.



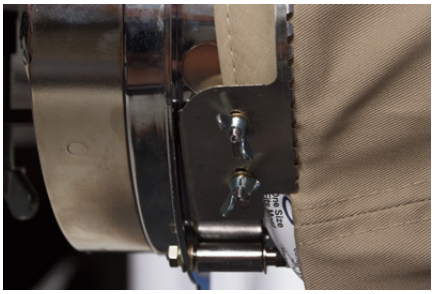
10. Bring the strap down the other side of the cap. Make sure the teeth of the strap fall just above the stitching attaching the sweatband. This will help ensure a level sew-out.



11. Hook the latch on the strap into the hook on the latch post. You may need to fold or adjust the sweatband of the cap slightly to accommodate the hook and latch. At this point, you want to hook the latch, but not close the latch.



12. The cap frame strap may need to be tightened if it does not fit the cap snugly, or loosened should it be too tight to fasten appropriately. This is only necessary when hooping a different style of cap for the first time using the cap frame. Any subsequent hooping of that style should fit well after the adjustment.
    - To adjust the cap frame strap, loosen the two wing nuts on the left side of the frame.



    - Then, push the strap down against the cap brim, moving from the latch toward the wing nuts so that it is very snug to the cap.



- Slide the strap toward the wing nut to remove the excess.



- Tighten the wing nuts while holding the strap tight against the cap.

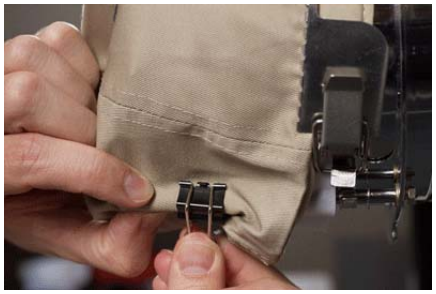
13. Smooth the lower part of the cap while snapping the buckle closed. The buckle should be tight.



14. If clips were used to secure the stabilizer while hooping, remove them now.



15. If sewing on the sides of the cap, smooth the cap material backward and over the clip posts on both sides. Indent the cap material along the clip posts.
16. While pressing the cap material around the post, use a clip to secure the material to the post. Orient the clip handles toward the back of the cap.



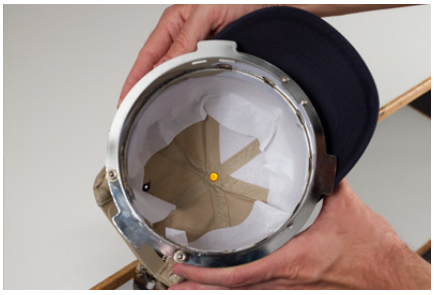
Note:

These are only necessary when sewing the sides of the cap or if the cap is unstructured.

17. You may now remove the cap frame from the gauge.
    - To do this, place the palms of your hands on the gauge and place your fingers on the frame.



    - Pull your fingers toward your palms until the cap frame is released from the gauge.
    - Inspect the hooping. Look at the inside of the cap to ensure that the stabilizer is not bunched and that it is caught in the teeth of the frame.



18. The cap is now ready to be placed on the wide-angle driver on the machine.

29.2. Loading a Hooped Cap

To load a hooped cap onto the installed wide-angle driver, follow these steps:

1. Rotate the hooped cap 90° to allow the bill to pass under the needle case.



2. Rotate the bill back up so that it is behind the needle case and the location tab on the driver aligns with the notch in the frame.



3. This also aligns the rectangular holes along the edge of the frame with the spring-loaded locking clamps on the driver.



4. With the frame aligned, press the frame toward the driver until the three (3) spring-loaded locking clamps snap into place. It may be helpful to grasp the back of the driver and close your grip to push the cap into place as pictured.



Removing a Hooped Cap

To remove a hooped cap from the installed Wide-Angle Driver, use the following steps.

1. Press the three locking clamps on the driver while gently pulling back on the frame.



2. This will allow the frame to release and be pulled free from the driver.



3. Rotate the hooped cap 90° so the bill can pass under the needle case. The hoop can now be removed from the machine.



29.3. Sew Settings For Caps

The settings in the application will need to be adjusted for better quality on a cap. Be sure to address the following.

Design Orientation

To be oriented appropriately for a cap, the design usually needs to be rotated 180° in the software. For assistance on this, review the Transform section of this document.

Sew Speed

Sew speed for caps will need to be adjusted. Because the material is going around instead of back and forth, the machine speed will need to be set between 850–1200 stitches per minute. For newer embroiderers, starting at 1000 s.p.m. and adjusting from there may be a good idea.

For more information, see the Machine Speed section.

Acti-Feed Settings

Don't forget to change the Acti-Feed settings for caps. There is an Acti-Feed suggestion for caps that can be fine-tuned as you are sewing. For more information, see the Acti-Feed section.

Adjusting the Presser Foot for Caps

The presser foot will need to be adjusted any time you significantly change the thickness of the material you're sewing on.

With caps, adjusting the presser foot is a little different than with flat goods. Because the cap flags (bounces) and has a seam, it is often best to set the presser foot to a standard setting and adjust from there.

Make sure the machine is stopped.

Adjust the presser foot by rotating the adjustment gear counterclockwise until it can no longer rotate. This will take the presser foot to the lowest position possible. This can be accomplished with the needle at head up (default position) or at bottom center (as described in the adjusting the presser foot section).

If the needle is not at the presser foot adjustment point, the presser foot will not appear to move. Even if the needle is at the adjustment point, it may be difficult to see a change in the presser foot. The material of the cap is pressing up against it. You may not see it lift off the material. This is normal and will not affect the actual adjustment.

With the presser foot adjusted all the way down, rotate the gear clockwise and bring the presser foot back up. Count the clicks of the gear. Raise the presser foot two to five clicks back up. Again, you most likely will not see the presser foot move. You may need to adjust further based on the sew-out experience.

Centering a Design on a Cap

Unless you hooped absolutely perfectly, and that is exceedingly difficult to do, you will most likely need to adjust the hoop position on the machine to better center the design on your cap.

The best way to accomplish this is to have the hoop loaded on the machine first.

Screen Versus Cap

Pressing the Center Hoop button on the Transform screen is convenient, but it doesn't work well for caps. It functions by centering the hoop or frame to the machine's origin.

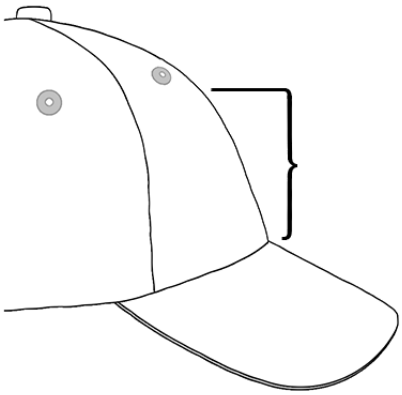
The View Window will display the hoop limits. Centering the design within these limits will not necessarily center the design on the cap. Because caps have different profiles and embroiderers hoop inconsistently, small adjustments may need to be made to the hoop placement.

When the design is centered on the cap, the placement may appear to be off in the software and on screen.

Centering Vertically

Centering the design vertically will take a bit of measuring, but it only needs to be done once for a particular style of cap. Additional caps will not require vertical adjustments.

To find an appropriate vertical placement on the cap, measure from the bill of the cap to where the curve really starts to come over the head. This is similar to measuring the design height that the cap can accommodate. Once measured, divide the measurement in half. Measure up from the bill that half distance to find a good vertically centered placement for the design.



Marking this measurement on the cap with masking tape or tailor's chalk works well. Use the physical up or down arrow to move the hoop into position. As you use these buttons, the machine's laser will illuminate the placement.

Centering Horizontally

With the cap frame loaded on the machine, use the physical left or right arrow buttons to center the cap horizontally. If the cap has six panels, you will have a seam running down the middle of the front. This acts as a marker for the center. If the cap has five panels, it will not have a seam, and you may need to use a tape measure and tailor's chalk to find the center.

Using the laser to line up to the center may not work as well in this case. As the cap comes off of the needle plate, the laser is displayed farther to the right. This is from the laser being set just behind the right upper arm front cover of the machine.

For more accurate placement, line up the active needle (the needle with the presser foot behind it).

Trace the Design

Tracing the design will also give you a good idea of where the design will be sewn.

Watch the Hoop Limits

Depending on the structure of the cap, you will be able to sew within varying distances from the hoop limits. Softer, thinner, and more pliable materials will allow you to sew closer to the limit. Tougher and less flexible materials may cause the fabric to ramp up at the teeth causing flagging, needle deflection, and thread or needle breaks.

30. Thread Break Troubleshooting

Thread breaks are an irritating part of embroidery, but they do not have to be merely tolerated. By following a few steps when rethreading the needle, you can begin to diagnose the nature of the thread break and hopefully avoid a subsequent one.

Diagnosing a Thread Break

Following a diagnostic method when rethreading a needle is a good way to eliminate the simplest and most common causes of thread breaks. Start with the following steps. Each step is explained in more detail in the following sections.

After the first thread break:

1. Check the upper thread path.
2. Check the bobbin tension.

Rethread the machine and sew. If a second thread break occurs in a relatively short time:

3. Check the needle.
4. Check the presser foot height.
5. Check the Acti-Feed settings.

Rethread the machine and sew. If a third thread break occurs relatively quickly, you may need to contact Technical Support or utilize the next sections to help determine the cause.

6. Use the Thread Break Diagnostic Table below to begin a more thorough analysis.

Thread Break Diagnostic Table

Sections containing information about each of the possible solutions follow the table.

Symptom		Possible Solutions
Real Top Thread Break (this design only)	Thread breaks on this material/garment only.	• Check for application-specific issues like specialty thread or needle type. • If the application information does not help, contact Technical Support.

Symptom			Possible Solutions
	Thread breaks on all materials/garments.	Thread breaks at the start or end of elements.	• Check the tie stitches of the design. • Check the bobbin tension and tail length. • If the items above do not help, contact Technical Support.
		Thread breaks mostly on lettering.	• Avoid doubling tie stitches. • Make sure the stitches are long enough to sew well. • Check the density settings. Lettering that is too dense will not sew smoothly. • If the items above do not help, contact Technical Support.
		Thread breaks mostly in the corners.	• Try capping or mitering the troublesome corners. • If that does not help, contact Technical Support.
		Thread breaks all over the design.	• Check for stitches that are too small to sew well. • Check the density settings. Designs that are too dense will not sew smoothly. • Has the design been scaled too far? • Check for too many needle penetrations in a concentrated area. • Check for application-specific issues like specialty thread or needle type. • If the items above do not help, contact Technical Support.
False Top Thread Break			• Check your Acti-Feed settings. • Check your presser foot adjustment. • Check your bobbin tension. • Check for thread buildup under the needle plate. • If the above items do not work, contact Technical Support.
False Bobbin Break			• Check your Acti-Feed settings. • Check your presser foot adjustment.

Symptom		Possible Solutions
		• If the above items do not work, contact Technical Support.
Real Bobbin Break		• Check the bobbin tension. • Clean the bobbin case. • Check the bobbin case for damage. • Use continuous filament polyester bobbin thread. • Check for an overwound bobbin. • If the above items do not work, contact Technical Support.
Real Top Thread Break (all designs)	Thread breaks on one needle only.	• Change the needle. • Check the needle orientation. • Change the cone of thread. Some cones can become damaged and prevent smooth sewing. • Check for application-specific issues like specialty thread or needle type. • If the items above do not help, contact Technical Support.
	Thread breaks on all needles.	• Check the presser foot adjustment. • Check the Acti-Feed settings. • Check the bobbin tension. • Check for application-specific issues like specialty thread or needle type. • Clean under and center the needle plate. • Check the rotary hook support. • Reset the machine (described in a later section). • If the items above do not help, contact Technical Support.
Missed Trim		• Check the tie stitches of the design. • Check your Acti-Feed settings. • Clean underneath the needle plate and ensure that it is centered. • If the above items do not work, contact Technical Support.
Missed Start		• Check the needle orientation. • Check the tie stitches of the design. • Check the Acti-Feed settings.

Symptom	Possible Solutions
	• Check the bobbin tension and tail length. • If the above items do not work, contact Technical Support.
Bird Nest (mass of thread under the needle plate)	• Make sure the thread is lined up under the pinch roller. • Clean and grease the pinch rollers. • Check the rotary hook support. • Clean underneath the needle plate and ensure that it is centered. • If the above items do not work, contact Technical Support.

30.1. Thread Break From Thread Path Issues

Troubleshooting the Upper Thread Path

The upper thread path should run smoothly the entire way from the cone of thread through the eye of the needle. If there is a rough spot or the thread does not follow the proper path, thread breaks are more likely. Look for the following issues when troubleshooting a thread break.

- Thread Does Not Follow Proper Path
- Damaged Cones of Thread (Bruised Cones)
- Rough Spot in the Thread Path
- Thread Wrapped Around Thread Tube
- Thread Pulling Across Top of Cone
- Thread Pooling Below Cone

Thread Does Not Follow Proper Path

If it is wrapped around the thread tube or missing from one of the thread guides, it will not sew as reliably.

As you are rethreading the machine from a thread break, make sure that the thread follows the proper path. See how in the upper threading section.

Damaged Cones of Thread (Bruised Cones)

While not the most common cause of thread breaks, damaged cones can create issues for embroiderers. If a cone has been dropped, the threads may have shifted. This can cause the thread to cast off the cone less freely and create thread breaks.

As you rethread the machine, pull on the thread with the pinch roller up and see how it pulls. If the cone is damaged, it may pull easily for a bit and then feel as though it is being pulled across sandpaper. This can cause thread breaks.

The age of the thread and exposure to the elements can also weaken thread. Storing your thread where it is shielded from the elements and light can help prolong the life of your thread.

Change to a different cone of thread. Some cones can be saved by casting off thread until you are past the damaged part of the cone.

Rough Spot in the Thread Path

Check along the thread path for any rough areas. You may find that the cone of thread has a rough spot on the plastic core. This can catch thread as it is being cast off and fed through the machine.

Remove any rough spots from the plastic core with a fine sandpaper or emery board.

Thread Wrapped Around Thread Tube

If the thread wraps around the thread tube at the top of the cone, the thread will most likely break. This is usually caused from the thread tube being extended too far above the cone.

Adjust the thread tube to extend just above the cone. Extend it about ½".

Thread Pulling Across Top of Cone

As thread casts off and runs through the system of the machine, it pulls through the thread tube quickly. If the thread tube is not extended far enough above the cone, the thread can pull across the top of the cone and create thread breaks.

Adjust the thread tube to extend just above the cone. Extend it about ½".

Thread Pooling Below Cone

If the thread cones are not properly seated on the thread tree of the machine, vibration from the machine can cause the cones to spin and/or the thread to cast off and puddle at the bottom of the cones. As thread collects below the cone, it can catch before being fed into the machine. This can cause extreme tension on the thread and cause the thread to snap.

If using larger cones, be sure to sit the cone snugly on the thread tubes. If the cones wobble, install a thread clover on the thread tube before loading the cone of thread. The clover will expand inside the cone and prevent it from wobbling.

If using smaller spools of thread, you may need to use a thread cone/spool holder to prevent the thread casting off from falling under the spool base.

Troubleshooting the Bobbin Thread

Thread breaks can occur from issues with the bobbin. To ensure that the bobbin is not the problem, look for the following issues when troubleshooting thread breaks.

- Wrong Type of Bobbin
- Bobbin Thread is Low or Out
- Bobbin is Overwound
- Bobbin Case Not Properly Inserted into the Machine
- Bobbin Tail Too Short
- Improper Bobbin Tension or Dirty Bobbin Case
- Damaged Bobbin Case

Wrong Type of Bobbin

The machine uses a style L bobbin. Attempting to use a different style would be difficult and could produce many problems.

Using spun polyester bobbins can also cause some thread break issues. Spun polyester bobbins are created by spinning multiple polyester fibers together. This creates a fuzzier thread that pulls less smoothly through the system and generates a good deal more lint.

Use Style L continuous polyester filament bobbins.

Bobbin Thread is Low or Out

As bobbins unwind, the tension can become inconsistent. This can cause bobbin tension that is too loose or too tight. That can result in bobbin pulling through to the top of the design or thread breaks. It can also result in bobbin breaks.

Change to a new continuous filament polyester bobbin.

Bobbin is Overwound

Some pre-wound bobbins are over-wound and become big enough to apply pressure to the bobbin case. This creates resistance as the bobbin attempts to spin. This resistance can mimic a bobbin tension that is too tight and produce thread breaks and misstarts.

Before loading the bobbin into the bobbin case, cast off the bobbin thread or try a new bobbin.

Bobbin Case Not Properly Inserted into the Machine

If the bobbin case is not inserted properly in the machine, the machine cannot form a complete stitch. A loose bobbin case will rattle and can cause thread breaks and needle breaks.

If the bobbin case is not inserted at all, the machine cannot create a stitch. The thread will usually get caught on the central shaft of the rotary hook. You will also commonly hear a popping sound before the thread breaks.

Remove the bobbin case and ensure that the rotary hook is clean. Clean the area with a brush or canned air. Then, with the pigtail in the twelve o'clock position and the bobbin facing the machine, insert the bobbin case into the rotary hook. If the lever on the case is not used, you can hear the bobbin case click into place. See how in the bobbin threading and tensioning section.

Bobbin Tail Too Short

If the thread breaks occur mostly as the machine is starting, the problem could be misstarts from the bobbin tail being too short when the bobbin case is inserted into the machine. Ideally, the bobbin tail should be two to three inches long. Longer tails can wrap up in the machine. Shorter tails may not allow for a stitch to catch when starting the machine.

When inserting the bobbin case into the machine, trim the tail to two to three inches in length.

Improper Bobbin Tension or Dirty Bobbin Case

Bobbin tension that is too tight can cause thread breaks, misstarts, puckering, and design registration issues.

Bobbin tension that is too loose can cause bobbin pull to the top of the design.

A dirty bobbin tension spring can mimic any of the problems above. If lint is caught under the tension spring and the spring is over-tightened to compensate, the tension spring may become damaged. The case may need to be replaced.

Clean and properly tension the bobbin case. See how in the bobbin threading and tensioning section.

Damaged Bobbin Case

The bobbin case that holds the bobbin must maintain its original shape. If dropped, the bobbin case may become bent and no longer be round. This will apply uneven pressure on the bobbin and create uneven tension.

Replace the bobbin case with a new one.

Troubleshooting the Needle

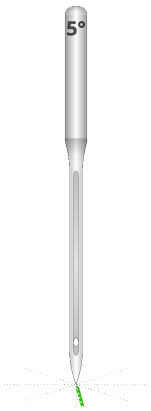
Proper needle orientation is essential to producing a proper stitch. If the needle orientation is incorrect, the loop of thread that is created while making a stitch may not be in the appropriate location to be caught by the rotary hook to complete the stitch.

A damaged needle can also cause thread breaks.

Look for the following items when diagnosing a thread break.

- Needle Angle Out of Range
- Needle in Backward
- Damaged Needle

Needle Angle Out of Range



Ideally, the eye of the needle should be 5° to the right of center when sewing. There is an acceptable range of 0°-20° to the right, but 5° is the absolute ideal. The chance of thread breaks increases if the needle orientation is outside the acceptable range.

As a visual reference, think of a minute on a clock face as being 6°.

Adjust the needle orientation to have the eye of the needle 5° to the right. For more help, see the needle replacement section.

Needle in Backwards

Embroidery needles have a front and a back side. If you install the needle in backward, you will most likely encounter thread breaks within the first few stitches after starting a design.

The front of the needle has a long groove (thread guide), while the back has an indented notch (scarf) just above the eye of the needle.

Reorient the needle to have the thread guide to the front, the scarf to the back, and the eye of the needle to be 5° to the right. For more help, see the needle replacement section.

Damaged Needle

Standard needles last approximately 4 to 6 solid sewing hours. After this time they begin to wear out. Burs may form on the needle or become dull and cause thread breaks.

Replace the needle. For more help, see the needle replacement section.

Troubleshooting the Presser Foot

Proper presser foot height can contribute greatly to the sew quality of the machine. Look for the following issues when troubleshooting a thread break.

Presser Foot Set Too High

If the presser foot is set too high, you may see more material movement and a loss of design registration. This is often accompanied by thread breaks.

Stop the machine and adjust the presser foot. See how in the presser foot section.

Presser Foot Set Too Low

While this rarely creates a thread break, having the presser foot too low can increase the sound of the machine as it sews. It can also create a faint light halo around the design on a dark garment. This halo can usually be removed with steam, water, or a light ironing aid.

Stop the machine and adjust the presser foot. See how in the presser foot section.

30.2. Troubleshooting Designs

How a design has been digitized can greatly affect how it sews. Testing against a standard test design is a good way to tell if the design you've been trying to sew is the cause of your thread breaks.

Sew the test design on a swatch of broadcloth and a couple of pieces of cut-away stabilizer. If the test design sews well, but the problem design does not, there is a good chance that the design is the issue.

When diagnosing design issues, pay attention to where the thread breaks are occurring.

- Thread Breaks Occur at the Beginning or End of Elements
- Thread Breaks in the Corners of Elements
- Thread Breaks on the Lettering
- Thread Breaks All Over the Design



Information

While many of the methods discussed use DesignShop as the embroidery digitizing/editing software for the examples, the general principle can be applied to most embroidery software. A few tools used may be DesignShop-specific features and tools.

Thread Breaks Occur at the Beginning or End of Elements

How the design ties in and ties off the elements will affect how the stitches start and trim. If these ties are not appropriate, thread breaks and mistrims can occur.

Check your tie ins and tie offs.

Thread Breaks in the Corners of Elements

As stitches navigate around corners, it can be common for them to bunch up and cause puckering, thread breaks, and even holes in the garment. Changing how the stitches handle corners can smooth these problems out.

Cap or miter the corners of elements.

Thread Breaks on the Lettering

Lettering that is added to a design can have different settings that will change how the lettering sews. Stitches may be smaller than your needle, densities may be too tight, and with some keyboard alphabets, tie stitches may have been doubled up. All of these problems can cause thread breaks.

To address these issues, you'll need to check:

- Tie ins and tie offs (Avoid double ties)
- Density settings
- Smaller stitches - Use "Pull Offset"

Thread Breaks All Over the Design

If thread is breaking everywhere in the design, and the test design sews well, it could be that the design is too dense, there are too many needle penetrations in concentrated areas, or perhaps the design was scaled down too far.

To address these issues, you'll need to check:

- Density settings
- Scaling a Design
- Stitch Proximity

Troubleshooting Tie Stitches

Tie stitches are a small grouping of stitches a the beginning and end of embroidery elements. Their purpose is to lock the thread in place and prevent it from pulling out when the machine starts sewing or trims. Setting tie stitches appropriately for the design will help keep the design running smoothly as well as stay in the garment after laundering.

Watch for the following issues when working with tie stitches:

- Misstarts Caused by a Lack of Tie Stitches
- Manually Digitized Tie Stitches
- Tie In/Tie Off Property
- Mistrims Caused by Doubled Tie Stitches

- Removing Digitized Ties From Alphabets
- Use Optimize Ties. This will optimize the tie stitches in the design.

Misstarts Caused by a Lack of Tie Stitches

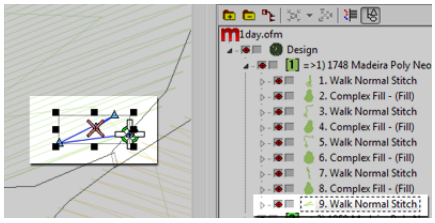
Thread breaks, or at least what look like thread breaks, can be caused by a lack of tie stitches. A lack of tie stitches will often cause the thread not to catch as the machine starts to sew. The needle may even come unthreaded. The machine will detect this as a thread break when it is really a missed start.

In DesignShop, ensure the design contains tie stitches.

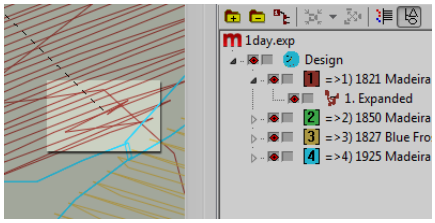
Manually Digitized Tie Stitches

In wireframe files, you may find tie stitches in the form of manually digitized small walk normal or manual stitch elements at the beginning and end of an element. This is typical of older designs or designs from digitizers who may have started digitizing in older versions of software.

If you zoom in on the last element of a color, you may see these few stitches going back and forth across each other. If you don't see these, check the properties of the project for tie stitches.



In expanded stitch files, these tie stitches are a bit harder to see because you cannot just select the last element before a trim.



Tie In/Tie Off Property

The properties window of DesignShop allows you to automatically add tie stitches to a wireframe design. To ensure that a wireframe design has tie stitches:

1. Select the design in the project view and open the Object Properties window.
2. With “All Elements” selected in the properties drop-down menu, select the Tie In And Tie Off.
    a. Placing check marks in the “Tie In” and “Tie Off” boxes will add tie stitches to the beginning and/or end of a digitized element.
    b. Choosing “Only When Necessary” from the “When To Tie” drop-down menu will add the tie stitches only when at a trim command or at the beginning or end of the design. Choosing “Always” will add tie stitches to the entry and exit of every element.
3. Clicking Apply and OK will apply the changes to the object properties.

Tie stitches applied through the object properties window can also be seen in the stitches tab as “TI” or “TO” (Tie In or Tie Off).

The ideal tie stitch for the machine is most often style 1 with a width of 6 points and the number of stitches set to “Default”. This creates a nice small stitch pattern that adjusts how aggressive the tie stitch is based on the length of the stitch line. Since longer stitch lines usually require more aggressive tie stitches, this works well for most applications.

Mistrims Caused by Doubled Tie Stitches

Using object properties to add tie stitches to designs or embroidery alphabets that already contain manually digitized tie stitches will double them up. Doubling tie stitches will often cause thread breaks and/or mistrims.

Do not use object properties in designs or embroidery alphabets that already contain manually digitized tie stitches.

Before adding tie stitches, look for manually digitized tie stitches in older files like those described above. If using older alphabets in DesignShop, check the alphabet information to prevent doubling tie stitches. As only some of the alphabets contain tie stitches, this is an important step in creating smooth-sewing lettering.

Removing Digitized Ties From Alphabets

The manually digitized tie stitches on the older embroidery alphabets may be removed so that object properties may be used on all the alphabets in DesignShop. To do that, go to the Tools menu and select Convert Alphabets.

From the Convert Alphabets window, click on Remove Ties to remove the manually digitized tie stitches from all of the installed alphabets.

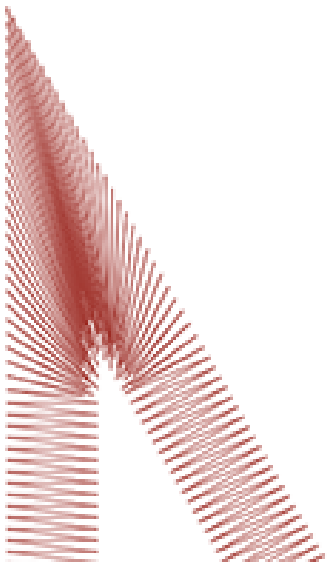
Use The Software Features to Address Tie Stitches

Both DesignShop and Melco OS contain features that will allow you to easily optimize the locks (tie stitches) of a design. It will scan through a design, remove tie stitches if there are any, and replace them with optimal ties for the design. The design filter works well for both wireframe and stitch files.

To use this filter in Design Shop, go to Tools, then Filters, and select Design Filter. In the design filter window, check "Optimize Locks". Next, click Filter and Adjust Now. Click OK to close the window.

For the machine, go to Settings, then Design Filter. Enable "Optimize Ties". Once enabled, the feature will stay on until disabled. This means that every design to be loaded in the software will be filtered and have the ties altered or added. This may be a good option if you are uncertain how to handle tie stitches.

Troubleshooting Corners



The problem of thread breaks in corners arises as stitches navigate around corners. It can be common for them to bunch up and cause puckering, thread breaks, and even holes in the garment. Notice the dark area of stitches in the example. Such tight stitching is problematic.

Changing how the stitches handle the tighter angled corners can smooth these problems out.

Look at the following examples to prevent sewing issues in the corners.

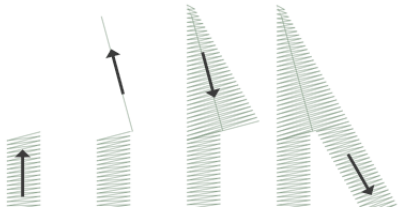
- Capping the Corners
- Mitering Corners
- Variations On Miters
- Corners On Singleline Elements

Capping the Corners

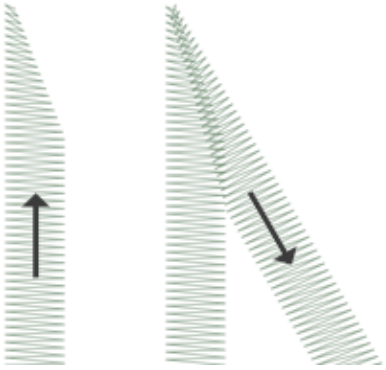
Capping the corners is a way to keep the stitches in a consistent direction and maintain an even stitch spacing. The drawback of capping comes from the limited range of use. Larger corners should not be capped as longer satin stitches are prone to snagging and becoming loose. Try to avoid creating satin stitches longer than 6 - 7 millimeters in length.

To cap a corner:

1. Use a satin stitch element to sew to the inside edge of the corner.
2. Use a walk stitch to travel to the tip of the corner.
3. Use a second satin stitch element to sew back to the inside edge of the corner.
4. Use a third satin stitch element to sew the last leg of the corner.



Mitering Corners

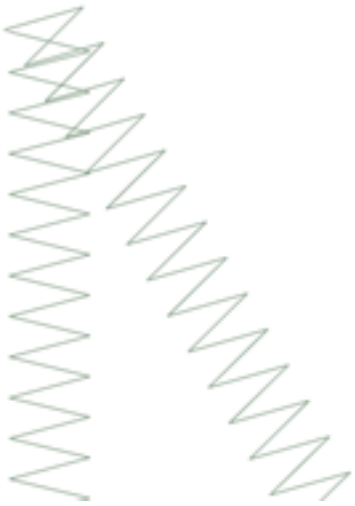


Mitering corners is another way to keep the stitches in a consistent direction and maintain an even stitch spacing. Mitering works well for less extreme angles and wider satin stitches.

To miter a corner:

1. Use a satin stitch element to sew to the inside edge of a corner. Continue the element but taper the end from the inside of the corner to the point. Be sure to leave enough of the edge under the corner to create an overlap with the second element.
2. Use a second satin stitch element to sew from the point to continue to the second leg of the corner. The inside edge of the element should create a seam from the tip of the point to the inside of the corner.

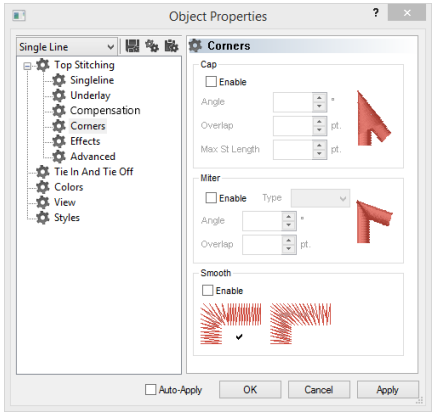
Variations On Miters



Miters can and should be altered to adapt to the size of the design and the application. A complete overlap may work well for smaller elements that do not have room to taper before becoming smaller than a needle. This is also typical of traditional tackle twill tack-down stitches.

This type of corner is also common on small lettering.

Corners On Singleline Elements



Singleline column elements have a “Corners” property. This object properties submenu will allow you to choose how that element handles corners.

You can choose to have the corners cap or miter. With miter, you have the option of type 1 or type 2. Type 1 is the miter that comes to a point. It is the first example of a miter shown above. The example shown under “variations” is a type 2 miter.

With the cap and the miter, you can choose at what angle the special corner should occur. You can also select an overlap amount.

The “Corners” property is available in the higher levels of DesignShop.

Stitches Too Small

Some designs may contain elements with stitches that are too small to sew reliably well.

DesignShop will begin filtering out every other stitch that falls below five points in length. This will help alleviate the issue, but it may not solve it completely.

Look for the following if your design has thread breaks on thin outlines or small elements or lettering.

- Stitch Size vs. Needle Size
- Thread Breaks On Small Satin Stitches
    - Edit the Smaller Areas Manually
    - Use Pull Offset to Lengthen Stitch Lines
    - Use Minimum Column Width to Prevent Thread Breaks
    - “Short Stitches”
- Thread Breaks on Walk Stitches
    - Use Fewer Input Points



Measurement Units - What’s a Point?

Points are a very fine unit of measure found in the embroidery industry and represent a tenth of a millimeter.

For reference:

- 10 points = 1 millimeter
- 100 points = 1 centimeter
- 254 points = 1 inch

Stitch Size vs. Needle Size

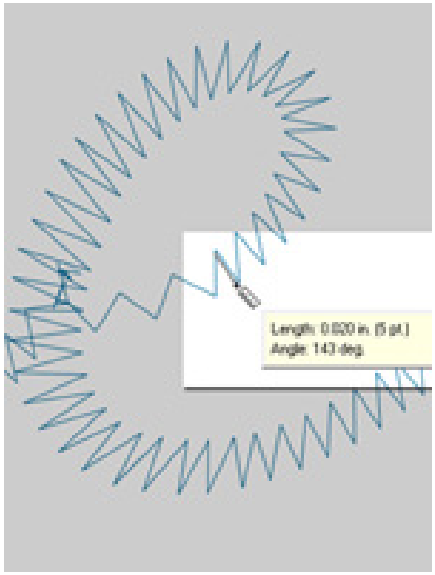
As a general rule, it is best to keep stitch lengths longer than the diameter of the needle you are using to sew them. Because most needles are between 7 and 8 points in diameter, for most applications and designs, try to keep stitches 10 points long or longer.

Ideal minimum stitch lengths would be:

- Walk Stitches ≥ 15 points
- Satin Stitches ≥ 10 points
- Fill Stitches ≥ 20 points

These values may be altered if the application or design dictates, but they are good general minimums.

Thread Breaks On Small Satin Stitches



If thread breaks are occurring on small satin stitches or small lettering, it could be that your stitches are smaller than the needle that you're using. This can cause some thread breaks. To find these problem areas, use the ruler tool in DesignShop to measure the stitches in the thinnest satin stitch areas. If you find that the stitches are less than ten points or one millimeter wide, you will most likely need to address that area.

Widen the smaller stitch areas to better accommodate the needle and sew with few thread breaks. This can be done in a few ways:

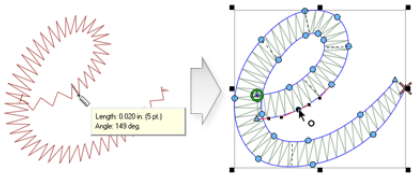
- Edit the small areas to widen the stitches.

- Use Pull Offset to widen the stitches.
- Use minimum column width to prevent any satin stitch from falling below the specified amount.

Edit the Smaller Areas Manually

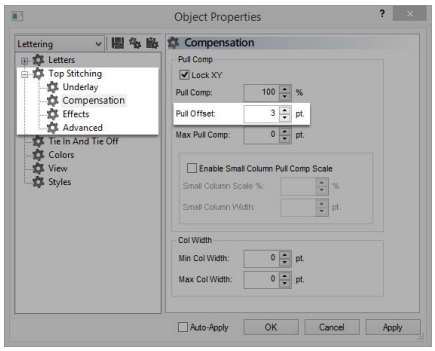
The smaller area of stitches may be edited manually. If the file is an OFM or in wireframe format, you can edit the edges of the wireframe elements to allow for longer stitches.

Use the ruler tool to find the smaller areas of the design. Then, using wireframe edit mode, move the input points to widen the column and lengthen the stitch lines.



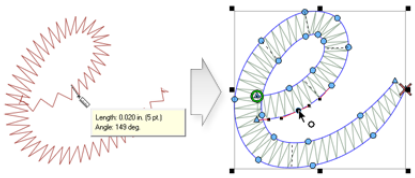
Use Pull Offset to Lengthen Stitch Lines

To modify larger areas of designs, it might be more helpful to use pull offset. Pull offset is found in object properties under the “Pull Comp” sub-menu.



Pull offset extends the stitch lines of an element by adding the specified amount to each side. If the element was 5 points wide at the thinnest point, a “3” could be entered into the pull offset field to extend the stitch lines by three points on each end. This would create an element that at the thinnest point is now 11 points wide and thick enough to sew without breaking a thread.

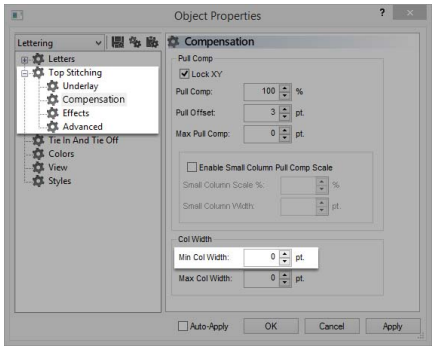
Because pull offset extends each end of the stitch line, adding 3 to each side of a 5-point satin stitch will give you an 11-point satin.



Use Minimum Column Width to Prevent Thread Breaks

Another way to prevent tiny satin stitches from giving you thread breaks is to use the “Minimum Column Width”. This feature will prevent any multi-stitch line element (columns or fills) from creating a stitch less than the specified amount.

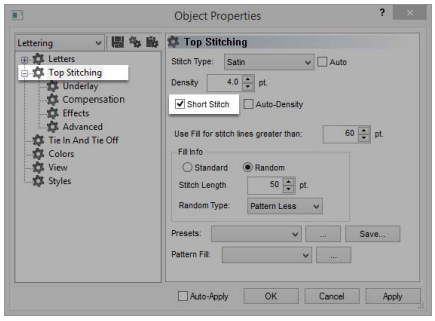
Found in object properties under “Compensation”, placing a “10” in the “Min. Col. Width” field can help prevent thread breaks on more questionable designs.



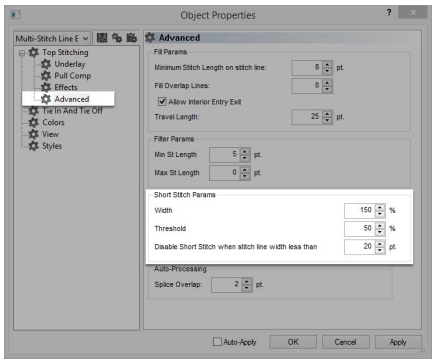
“Short Stitches”

“Short Stitches” is a feature that alternates the length of stitches on the inside of curves and sharper angles. It is meant to prevent thread breaks, thread build-up, and damage to garments in those tighter areas.

Newer versions of DesignShop have this feature on by default.



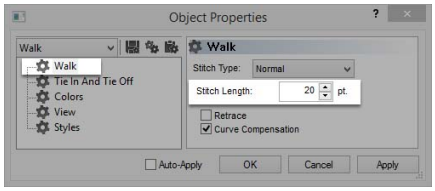
While this feature is beneficial most of the time, it can cause stitches that are too small in smaller lettering or narrow satin stitches. For that reason, since DesignShop V9, a new parameter has been added to the short stitch properties. It will automatically disable for stitch lines shorter than a specified amount. This is set to 20 points by default and should work well for most designs. These parameters can be found under the "Advanced" sub-menu.



With designs saved in older versions of software, these parameters may need to be checked.

Thread Breaks on Walk Stitches

If walk stitches are the problem area of a design, it could be that the stitch length is just set too short. Try to avoid a stitch length of less than 15 points.



Use Fewer Input Points

Probably the most common cause of thread breaks on walk stitch elements from digitizing is using too many input points in a small area. Every input point that is created also creates a needle penetration.

Many new digitizers try to use more input points to help a walk input element follow a line in the artwork. Try to use fewer points to create the same shape. It will decrease the stitch count, allow the design to be more easily edited, and help prevent stitches that are shorter than the diameter of the needle.

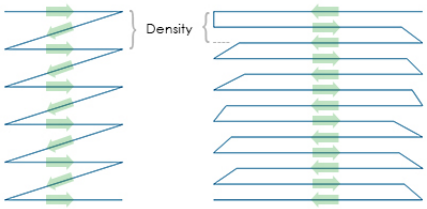
Also, try to keep at least 10 points (1 mm) between the input points.

Troubleshooting Density

The density of the stitches in a design can also lead to thread breaks. This usually occurs from one of the following:

- Density Setting is Too Tight
    - What is an Ideal Density Setting?
- Too Many Layers of Stitches
- Needle Penetrations are too Concentrated
    - Stitch Proximity Plot
    - Stitch Proximity Filter

Density Setting is Too Tight



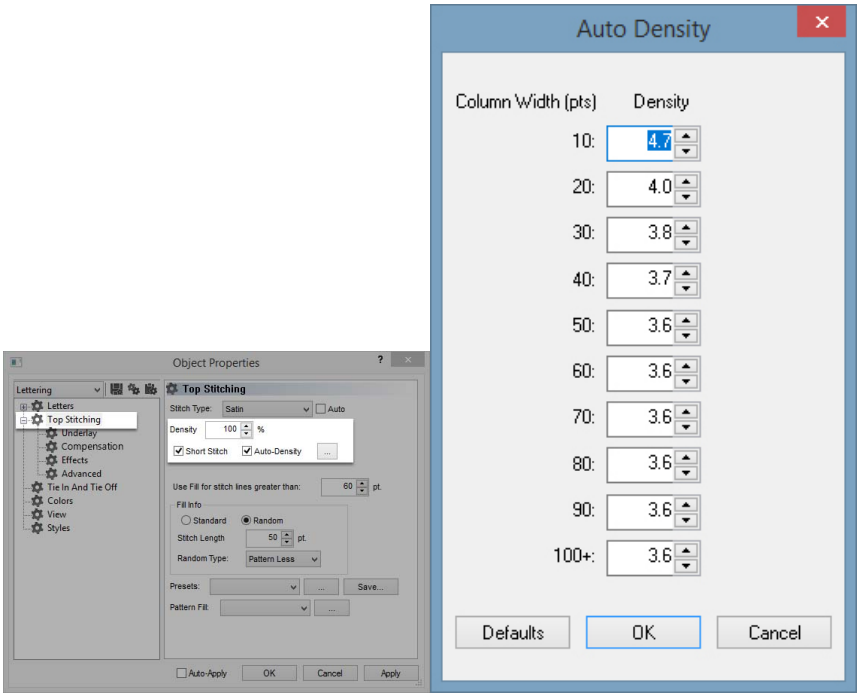
The density setting in DesignShop represents the distance between stitch lines going in the same direction. In some ways, it may be helpful to think of it as stitch spacing. The larger the number is, the farther apart the stitch lines will be.

If the stitches are too close together, it can cause friction and thread breaks as well as causing rippling and poor sew quality.

What is an Ideal Density Setting?

Density settings will need to be changed to accommodate different stitch types and applications. Finding an appropriate setting may take some experimentation. Good starting points are found in the software.

For satin stitches:



Consider using “Auto Density”. Auto density is a setting that will vary the density based on the length of the stitch lines. The longer a stitch is, the more it stays up out of the material. For that reason, longer stitches or wider columns often require tighter densities with the stitches closer together. This keeps the stitches even and looking nice.

For fill stitches:

One density setting should work well throughout a fill. Fill stitches are usually comprised of a series of identical stitch lengths. A standard density setting of 3.8 points should work fairly well as a starting point for most fills. This setting may need to be adjusted for different stitch lengths, fill patterns, and applications.

Information

Specialty threads and applications often require altering density settings. The manufacturers’ websites are good places to find recommended design and sew settings.

Too Many Layers of Stitches

Building up multiple layers of stitching can also lead to density issues. Too many stitches packed into one place can create a tough or stiff patch of stitches. This will often lead to friction and thread breaks as another layer of stitching is applied on top.

In designs that require layers of stitches, each layer will need to have a lighter density setting so that when all the layers are built up, they reach an overall stitch density close to that of a single normal fill.

Needle Penetrations Are Too Concentrated

If multiple design elements line up in one area, it can create a concentration of needle penetrations. This concentration can create holes in a garment as well as thread breaks.

Avoid overlapping design elements with needle penetrations that are concentrated in a small area.

Stitch Proximity Plot

DesignShop can plot out the needle penetrations and color code the concentrations. To use this tool, go to Tools > Filter > Stitch Proximity Plot... Then, hide the stitches in your design. Behind the design, you will see the proximity plot. It resembles a weather map. The dark areas are your possible trouble areas, and the lighter areas should give you little trouble.

Stitch Proximity Filter

The Stitch Proximity Filter will slightly adjust the needle penetrations in the most concentrated areas to help alleviate the troublesome areas in a design. To use the filter, go to Tools > Filter > Proximity Filter...



Caution!

Using this filter will convert all wireframe data to expanded data, making future editing or scaling difficult.

30.3. Troubleshooting Application Thread Breaks

Different sewing applications may cause thread breaks and other sew quality issues. Look for the following when diagnosing an application problem:

- Embroidering Abrasive or Coated Materials
- Is the Needle Size Appropriate for the Design?
- Is the Stabilizer Appropriate for the Material?
- Is the Design Appropriate for the Material?
- Are You Using Adhesives?
- Is the Garment Hooped Properly?
- Are You Using Specialty Threads?

Embroidering Abrasive or Coated Materials

Course or rough materials can cause friction on the thread and create thread breaks. Using a larger needle will create a bigger hole and reduce the friction on the thread. This can be helpful on materials like heavy canvas or cotton duct.

On abrasive materials, use a larger needle like an 80/12 to alleviate thread breaks.

Coated and water-resistant materials like some computer bags can heat a needle and begin to melt as the needle moves through the material. This melted material can gum up a needle making it more prone to thread breaks and more difficult to rethread.

Using a titanium-coated or non-stick needle can help prevent thread breaks on these coated materials.

Is the Needle Size Appropriate for the Design?

If your design contains a significant amount of finer detail work, the smaller stitches can result in thread breaks if they are smaller than your needle.

Using a smaller needle like a 70/10 or 65/9 can help with small lettering and fine details.

Is the Stabilizer Appropriate for the Material?

Sewing without proper support can reduce sew quality and increase thread breaks.

Choose a stabilizer that is appropriate to the material and design you are embroidering.

Lighter, stretchy, and flimsy materials may require a more substantial cut-away type of stabilizer. More stable materials can utilize tear-away type stabilizers.

Design size and density may also need to be considered when choosing a stabilizer. Heavier stitch counts in smaller areas will require a more stable stabilizer.

Is the Design Appropriate for the Material?

While the majority of standard garment material will support the majority of embroidery designs, the design and material relationship must be considered.

Consider the difference in embroidering a 10-inch, 50,000 stitch design on a jacket back and then on a t-shirt. The jacket back would have a far better sew quality with that number of stitches in that space. The t-shirt would likely pucker and curl under the embroidery.

Make sure that the material and stabilizer can support the design, OR make sure the design settings are appropriate for the material.

If you are embroidering on a lighter material, try using lighter densities and placing fewer stitches on the garment.

Are You Using Adhesives?

Adhesives can certainly gum up the works when it comes to embroidery. These sticky helpers keep appliqué and stabilizer in place, but they can build up on the needles and cause thread breaks.

Avoid using adhesives if possible. If the job requires the use of adhesives, use the minimum amount you can. Using a titanium or non-stick needle can prevent the adhesive buildup and consequent thread breaks.

Is the Garment Hooped Properly?

How a garment is hooped will affect how the material runs in the machine. If hooped poorly, the material may bounce or “flag”. This can create odd thread dynamics and produce thread breaks, as well as registration loss and overall poor sew quality.

Sewing with loose hoop arms can create similar results.

Use a hoop that fits as closely to the design as possible. Properly adjust the hoop tension, and ensure that the hoop arms are securely attached.

Are You Using Specialty Threads?

Specialty threads often require specific needles and digitizing to sew smoothly.

Consult the manufacturer's website for specifics on sewing specialty threads.

30.4. Troubleshooting Machine Caused Thread Breaks

Cleaning Under the Needle Plate

Thread trimmings and lint buildup can cause thread breaks and misstrims. Cleaning beneath and ensuring that the needle plate is centered can prevent these frustrations.

- Cleaning Under the Needle Plate
- Center the Needle Plate

Cleaning Under the Needle Plate

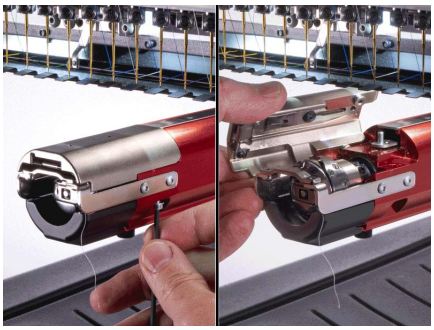
1. Remove the bobbin case.



2. Remove the rotary hook guard by loosening the thumb screw securing the hook guard and sliding it away from the machine.

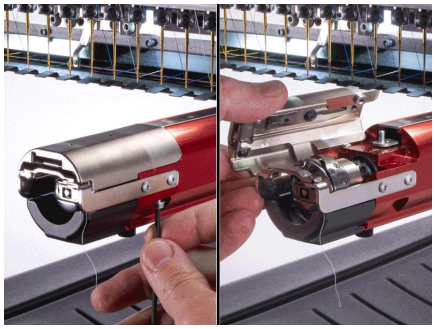


3. Remove the needle plate by removing the two Allen screws that secure it.



4. Using compressed air or a brush, remove any thread or lint buildup from the area.

5. Reinstall the rotary hook guard.
6. Reinstall the needle plate. Ensure that the blade is in the far back position before installing.



Warning!!

The needle plate must be installed with the trimmer in the far back position. If it is installed with the trimmer in any other position, damage to your machine can occur. The hole in the back of the knife must fit over the pin in the lower arm.

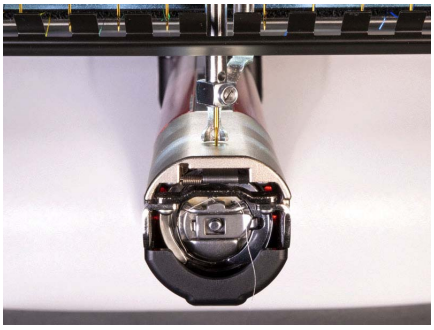
Center the Needle Plate

1. Center the needle plate as best you can by feel and by eye.
2. Lower the needle to its bottom-most rotation. This can be done manually by:
    - Pressing the e-stop and rotating the z-shaft to control the descent of the needle, OR
    - Tapping the Presser Foot button, OR
    - Going to Maintenance, then the Head Timing, and then tapping on Bottom Center.

Warning!!

Either software option will bring the needle down very quickly. If the needle plate is installed with the trimmer in the wrong position or if the needle plate isn't roughly centered, damage to your machine can occur.

3. With the needle lowered, loosen the screws securing the needle plate, and center the hole in the needle plate around the needle.



4. Tighten the screws securing the now-centered needle plate.
5. Depending on the method used to lower the needle, raise it back up by releasing the E-stop or by tapping on 27° Head Up and ✔ Confirm to exit.

Pinch Rollers Need Maintenance

The most common sign that pinch rollers need maintenance is that the thread will walk to the side of the roller and create a “bird’s nest”. This is typically flagged by the software as a thread break, but when you look at the top thread, it doesn’t appear to be broken. However, when you look under the cloth, you find a mass of thread under the needle plate.

Maintaining these rollers is part of the normal maintenance timers, but if you are experiencing trouble with bird-nesting, clean and grease the rollers.

Cleaning & Greasing the Pinch Rollers

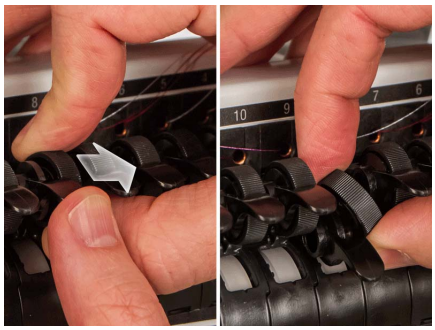
To clean and grease the pinch rollers:

1. Lift the thread feed arm.



2. With one hand, steady the lever. With the other hand, pull the pinch roller to the right and off of the hub.

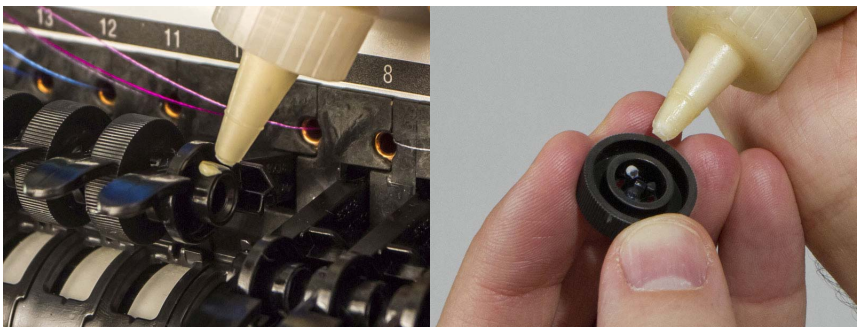
3. Next, with the roller tilted, pull the arm slightly to the left and pull the roller straight out from the machine. The arm has a small amount of flex to it, but if pulled too far to the left, it can be damaged.



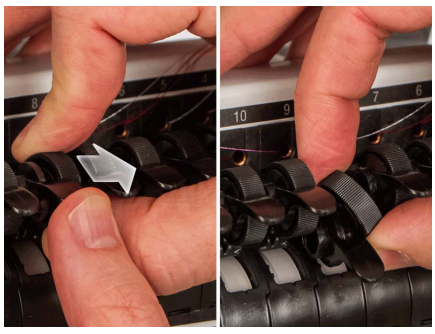
4. With a soft cloth, clean both the hub and the pinch roller. Take care to avoid getting grease on the pinching surface of the roller.



5. Apply EMB Polymer grease to the top surface of the hub and on the outer surface of each of the three tabs inside the pinch roller.

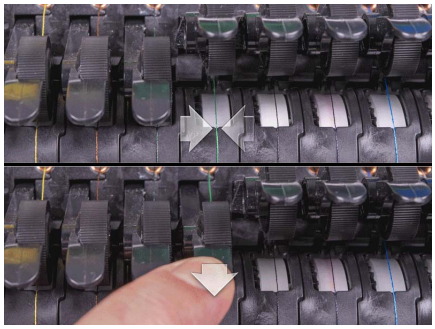


6. Reinstall the pinch roller.



- With the roller tilted, pull the arm slightly to the left and reinsert the roller straight into place.
- Tilt the roller back up. Gently rotate the roller to help spread the grease before snapping it into place.
- Press the roller to the left to snap it into place.

7. Line the thread up with the v-notch on the thread feed gear cover and press the pinch roller arm back down.



Rotary Hook Support Adjustment

The rotary hook support may need to be adjusted if a garment gets caught in the rotary hook or if it is struck too forcefully with a hoop as the hoop is being loaded onto the machine. It may also need to be adjusted if the screws securing it are accidentally loosened.

If the rotary hook support gap is too large or too small, it will cause sewing issues.

To inspect and adjust the rotary hook support gap, you will need the Hook Retaining Finger Gauge (PN:009027-01).

Inspect the Rotary Hook Support Gap

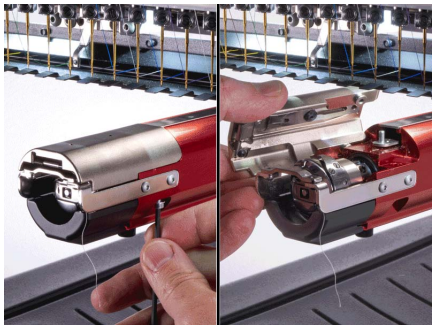
1. Remove the bobbin case.



2. Remove the rotary hook guard by loosening the thumb screw securing the hook guard and sliding it away from the machine.



3. Remove the needle plate by removing the two Allen screws that secure it.

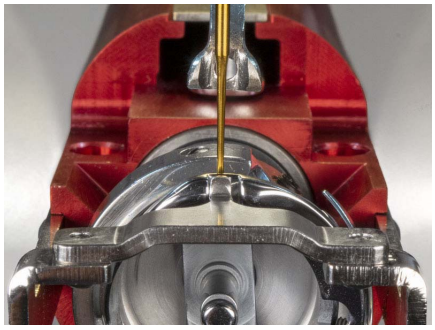


4. In the software, go to Maintenance and then the Head Timing screen. Then tap on Bottom Center.

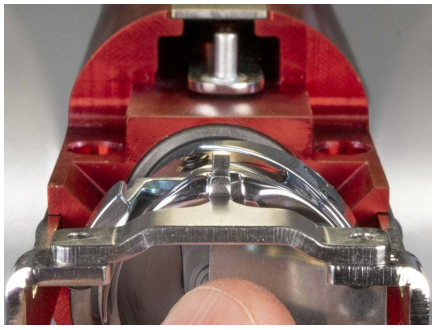
Warning!!

This will bring the needle down very quickly.

5. Inspect the left-to-right position of the hook support as it aligns with the needle. It should be center left to right. If not, it may be necessary to form the hook support to the correct alignment. If this is not possible, you may need to replace the hook support.



6. Once the left-to-right position of the hook support is correct, tap on Head Up and Confirm to exit.
7. Insert the retaining finger gauge between the hook support and the hook basket.



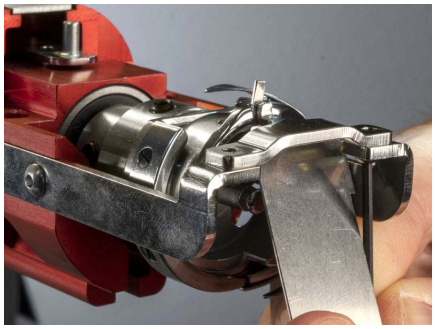
Warning!!

If the gauge does not slide in easily, do not force it. You may scratch the highly polished surface of the hook support or hook basket, resulting in thread breaks.

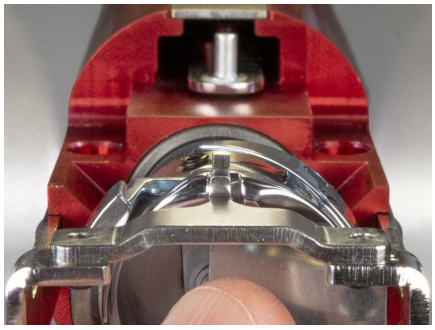
8. The retaining finger gauge should slide between the hook support and the hook basket with no resistance. The gap between the hook support and the hook basket should be no more than 1.1 times the thickness of the gauge. (The gauge is 0.020', and the tolerance is +/- 0.002')
9. The tip of the hook support should be flush with the top of the hook basket.
10. If the adjustment is not correct, adjust the rotary hook support with the procedure below.

Adjusting the Rotary Hook Support

1. Use a hex wrench to loosen the two screws toward the front of the machine holding the hook support. (1.5mm hex)
2. Insert the gauge between the hook support and the hook basket.



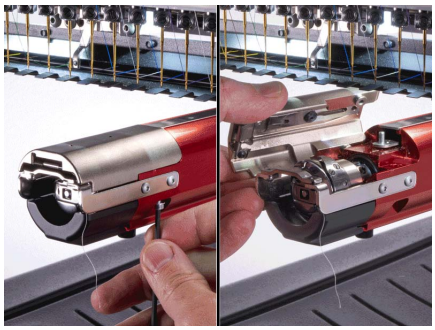
3. Adjust the position of the hook support to the requirements from the inspection procedure above.
4. Remove the gauge while holding the position of the hook support. Make sure that the tip of the hook support is no higher than the hook basket.



5. Tighten the screws holding the hook support.
6. Verify that the gauge still slides freely between the basket and the hook support.
7. Reinstall the rotary hook guard.



8. Reinstall the needle plate. Ensure that the blade is in the far back position before installing.



Warning!!

The needle plate must be installed with the trimmer in the far back position. If it is installed with the trimmer in any other position, damage to your machine can occur. The hole in the back of the knife must fit over the pin in the lower arm.

9. Center the needle plate as above.

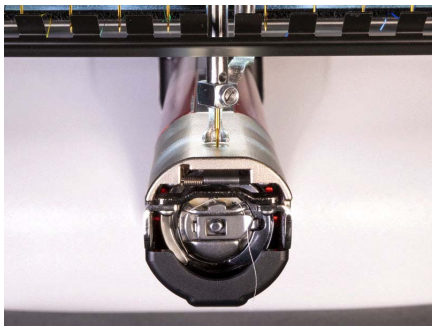
30.4.1. Center the Needle Plate

1. Center the needle plate as best you can by feel and by eye.
2. Lower the needle to its bottom-most rotation. This can be done manually by:
    - Pressing the e-stop and rotating the z-shaft to control the descent of the needle, OR
    - Tapping the Presser Foot button, OR
    - Going to Maintenance, then the Head Timing, and then tapping on 180° Bottom Center.

Warning!!

Either software option will bring the needle down very quickly. If the needle plate is installed with the trimmer in the wrong position or if the needle plate isn't roughly centered, damage to your machine can occur.

3. With the needle lowered, loosen the screws securing the needle plate, and center the hole in the needle plate around the needle.



4. Tighten the screws securing the now-centered needle plate.
5. Depending on the method used to lower the needle, raise it back up by releasing the E-stop or by tapping on 27° Head Up and Confirm to exit.

31. Main Screen Button Guide

View Window

-  Change View Options
-  Zoom to Design
-  Zoom to Hoop
-  Trace
-  Change to Full Screen
-  Restore to Normal View

Sewing a Design

-  Load Design
-  Return to Origin
-  Color Setup
-  Hoop Selection
-  Acti-Feed
-  Transform (Move & Rotate)

Moving Through a Design

-  Seek Back or Forward
-  Move to Stitch
-  Move to Trim
-  Move to Color

Machine Operations

-  Hoop Forward/Back
-  Trim Immediate
-  Change to Needle (Move Needle case)
-  Laser On / Laser Off
-  Grabber In / Grabber Out
-  Presser Foot Adjustment

Maintenance & Settings

-  Maintenance
-  Settings