TITAN TN-1341

INSTRUCTION MANUAL

FOR SAFE OPERATION

1. **Keep your hands away from needle, belt and any other moving parts when you turn ON the power switch or while the machine is in operation.**
2. **Do not put your fingers into the thread take-up cover while the machine is operating.**
3. **Turn OFF the power switch when tilting the machine head or removing the belt cover or the V belts.**
4. **During operation, be careful not to allow your or any other person's head, hands, or clothes to come close to the handwheel, V belt and motor. Also, do not place anything close to them.**
5. **Do not operate your machine with the belt cover and finger guard removed.**
6. **When tilting the machine head, be sure to confirm that the head rest is properly attached to your machine head and be careful not to allow your fingers or the like to be pinched in the machine head.**

1. **To ensure safety, never operate the machine with the ground wire for the power supply removed.**
2. **When inserting/removing the power plug, the power switch should be turned OFF in advance.**
3. **In time of thunder and lightening, stop your work and disconnect the power plug from the receptacle to ensure safety.**
4. **If the machine is suddenly moved from a cold place to a warm place, dew condensation may be observed. In this case, do NOT turn ON the power to the machine until after you have confirmed that there is no danger of water drops in the machine.**
5. **The hook rotates at a high speed while the machine is in operation. To prevent possible injury to hands, be sure to keep your hands away from the vicinity of the hook during operation. In addition, be sure to turn OFF the power to the machine when replacing the bobbin.**
6. **To avoid possible accidents due to abrupt start of the machine, be sure to turn OFF the power to the machine.**
7. **Be careful of handling this product so as not to pour water or oil, shock by dropping, and the like since this product is a precision instrument.**
8. **When tilting or returning the sewing machine to the home position, hold the upper side of the machine head with both hands and perform the work quietly so that fingers or the like are not caught in the machine.**

CAUTION

Note that safety devices such as "eye guard", "finger guard", etc. may be omitted from the illustrations in this Instruction Manual for easy explanation.

When operating the machine, be sure not to remove these safety devices.

Contents

SPECIFICATIONS

Model	TN-1341
Sewing speed	Max. 2,500 SPM See “SEWING SPEED TABLE” on page 29.
Stitch length (max.)	Normal feed: 9 mm Reverse feed: 9 mm
Needle	135 × 17 ~ DPx17(Nm 90/14 to Nm 180/24) (Standard : Nm 160/23)
Thread	Tex 45 ~ Tex 210
Hook	Vertical-axis 2.0-fold capacity hook
Lift of presser foot	Hand lifter lever: 9 mm Knee lifter: 16 mm
Safety device for hook	Provided as standard
Lubricating oil	Virgin Mineral Oil 032ISO VG

INSTALLATION

These processes are normally completely by a trained technician and should be completed before you purchase your machine. In some unique cases, you may have purchased your machine "unassembled" and you will need to follow these steps to prepare your machine for sewing.

1. With two people, lift your Titan TN-1341 onto the tabletop and align the machine into its correct position.
2. Fix the machine in place using the (4) countersunk bolt (Fig 1, Item 1), washers (Item 2) and nuts (Item 3).
3. Securely tighten these bolts and nuts before operating the machine.

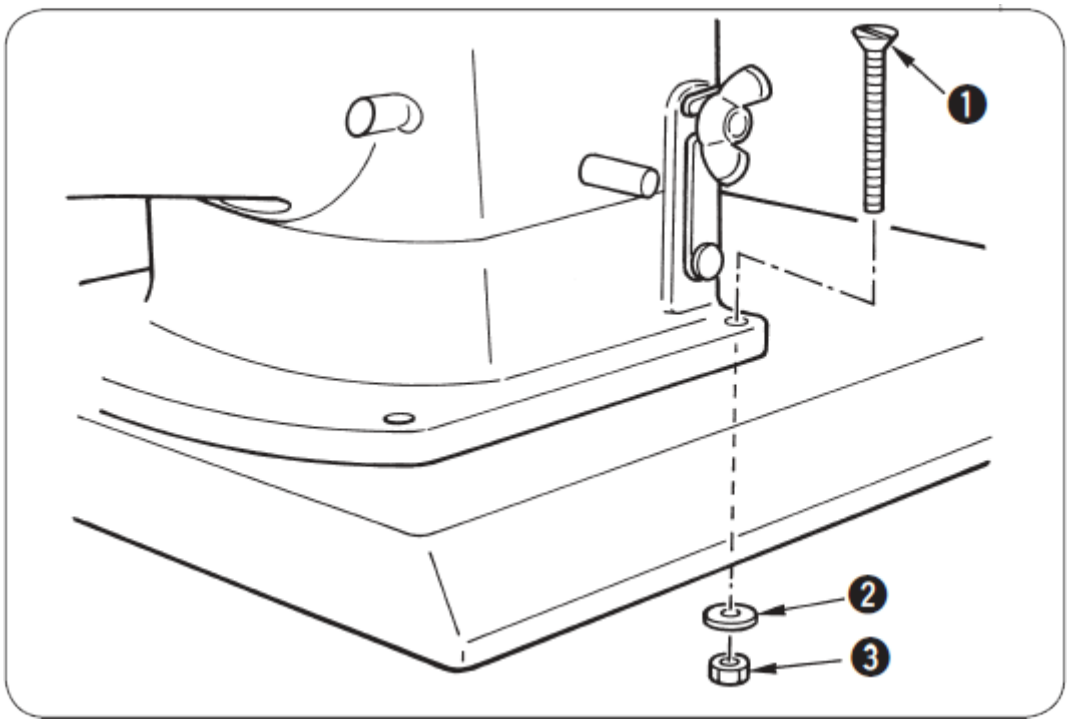

Figure 1

INSTALLATION (Con't)

The Titan TN-1341 comes with a knee lifter unit that allows the operator to lift the presser foot with a knee controller. This is a standard feature but can be changed to a pneumatic lifter as an option (See option page). To mount the knee lifter, follow the instructions below.

1. Attach knee lifter plate rod (Fig 2, Item 5) and knee press plate cover (Fig 2, Item 6) to knee lifter plate rod bracket (Fig 2, Item 4)
2. Align the direction of the pad with setscrews (Fig 2, Item 7, 8 and 9) to the operator's comfort.
3. Be sure to note thee travel of the knee lifter can be large and may require an additional person to find a perfect comfort for the operator.

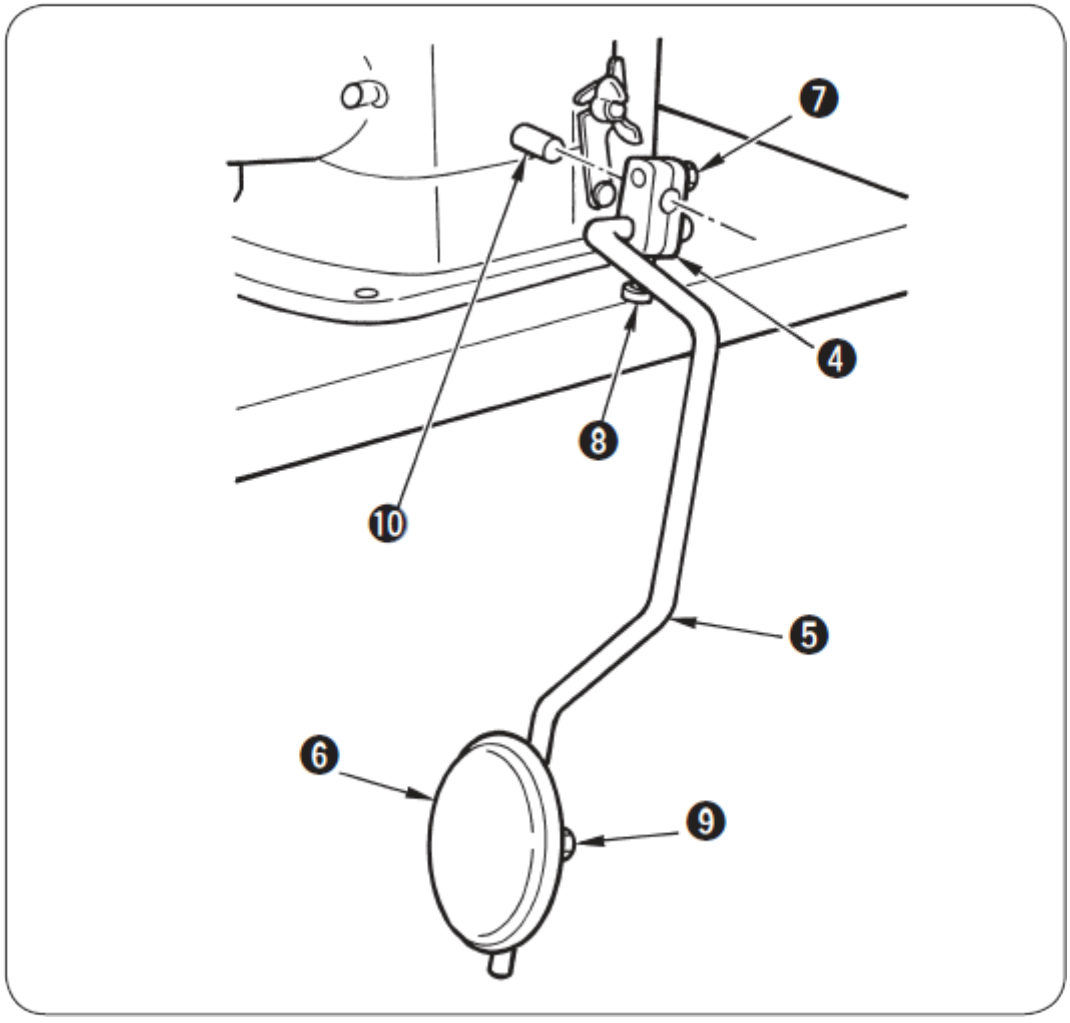

Figure 2

BELT AND BELT COVER

The TN-1341 is typically equipped with a 750W servo motor and while there are options for this on the Options page (needle positioner, speed reducer, etc.), the basic set up for the TN-1341 will be as follows:

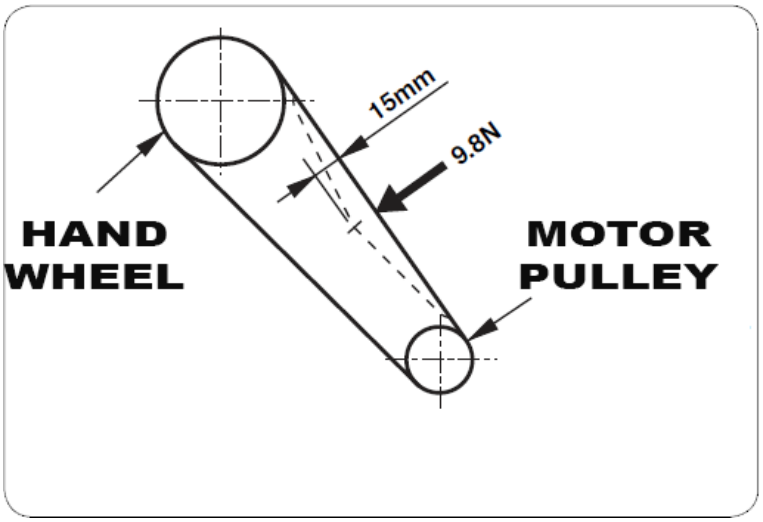

Figure 3

1. Adjust the belt tension with the height of the motor so that the belt sags 15 mm when the center of V belt is applied with a 9.8 N load.
2. Please note, that if the motor belt is too tight, the machine may labour thru stitching and cause the motor to have errors. If the belt is too loose, you will have slipage as you sew and this can also cause motor errors, especially if you have the needle positioning encoder attached to the machine.

BELT AND BELT COVER (con't)

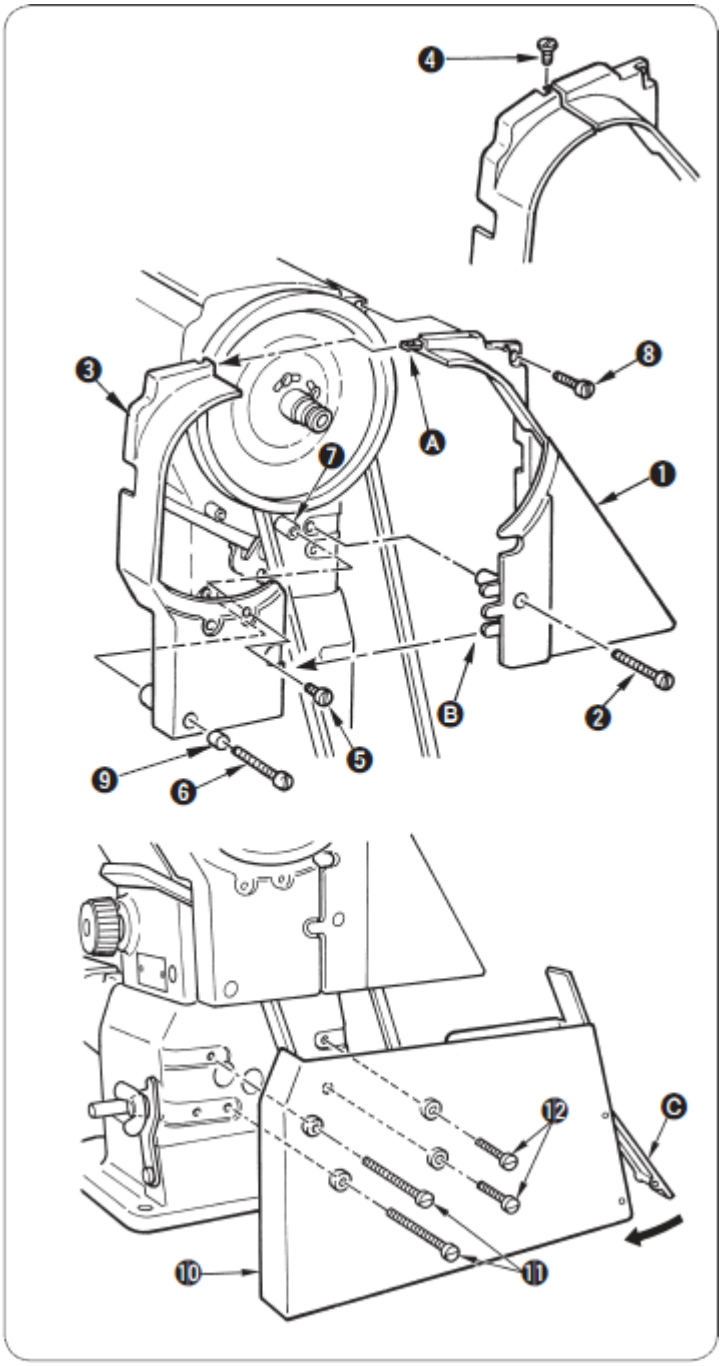

Figure 4

1. Attach belt cover stud (Fig 4, Item 7) to the screw hole in the arm.
2. Fix belt cover (right) (Fig 4, Item 1) on the arm with screws 2 and 8.
3. Fit belt cover (left) (Fig 4, Item 3) to notch A and B of the belt cover (right).
4. Fix belt cover (left) (Fig 4, Item 3) with screws 4, 5 and 6.
5. Fix belt cover, lower, (asm.) (Fig 4, Item 10) on the machine bed with setscrews 11 and 12.

THREAD STAND

The thread stand is often very simple to assemble but there are a few common issues to pay attention to.

1. Assemble the thread stand as shown in figure 5.
2. Pay close attention to ensure all screws and nuts are tightened firmly.
3. Once the thread stand is assembled, it is important to note that the upper arm of the thread guide (Fig 5, Item A) is aligned directly above the lower arm (Fig 5, Item B). failure to align these may cause tension issues, thread breakages and / or other machine issues due to poor threading.
4. To install the thread stand into the table, separate the washers on the base of the stand so that there is one washer on the top and one on the bottom of the table. Then install the lock washer and nut on the base of the stand and tighten until the thread stand no longer floats loose and freely.

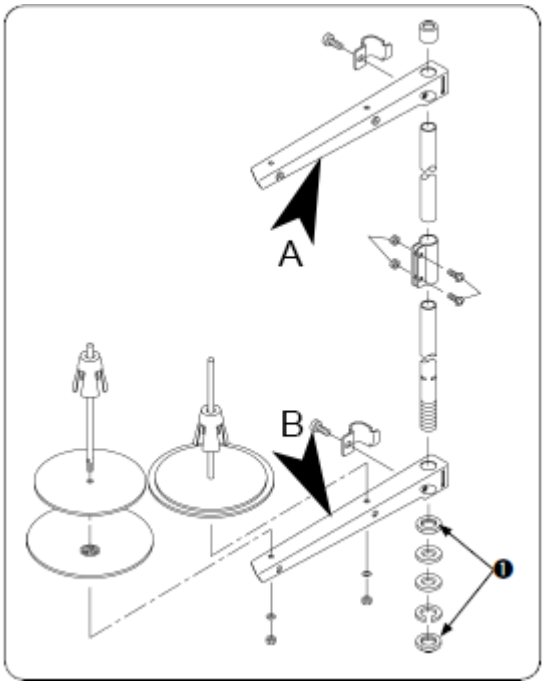

Figure 5

LUBRICATION

It is important to remember that Titan Sewing Machines are produced using some of the highest quality components and assembled and tested thoroughly to ensure the machines can handle factory operation day in and day out from multiple operators and shifts. Noting that, you may choose to alter your lubrication requirements based on the amount of use you are putting your machine through. If you do not use your machine for an extended amount of time, you should consider oiling your machine before you put it away and after, when you first take it out to ensure the machine is properly lubricated before use. The TN-1341 has (3) major components to its lubrication portion of the machine. They are: The face plate head unit, the upper body and the shuttle arm area.

LUBRICATING THE FACE PLATE HEAD UNIT

1. Loosen and remove screw A.
2. Open the face plate in the direction of arrow mark B.
3. Apply an adequate amount of oil once a day to the points marked with the arrow marks.

NOTE: you may notice certain areas of your machine may have grease on components. If there is grease on any of the areas that should be oiled or lubricated, please do NOT oil this. If you place oil on to a greased area, this will cause the oil to break down the grease and it will liquify and could cause this to drip onto your project area.

4. Close the face plate.
5. Tighten and attach screw A.

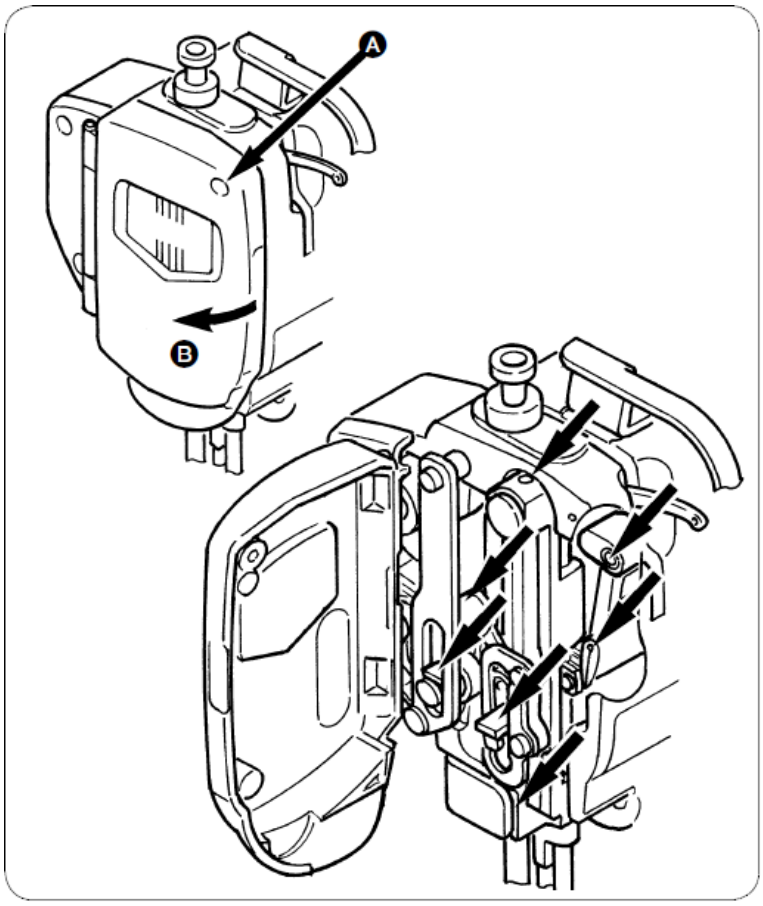

Figure 6

LUBRICATION(con't)

LUBRICATING THE UPPER BODY

Apply an adequate amount of oil once a day to the points marked with the arrow marks.

Before you operate your machine for the first time, or after an extended period of disuse, apply an adequate amount of oil to the points marked with the arrow marks (Fig 7, Item 1, 2 and 3) and to each felt and oil wick thru the oil wicking system.

A and B are oil reservoirs. Be sure to add oil to the oil reservoir approximately once a week.

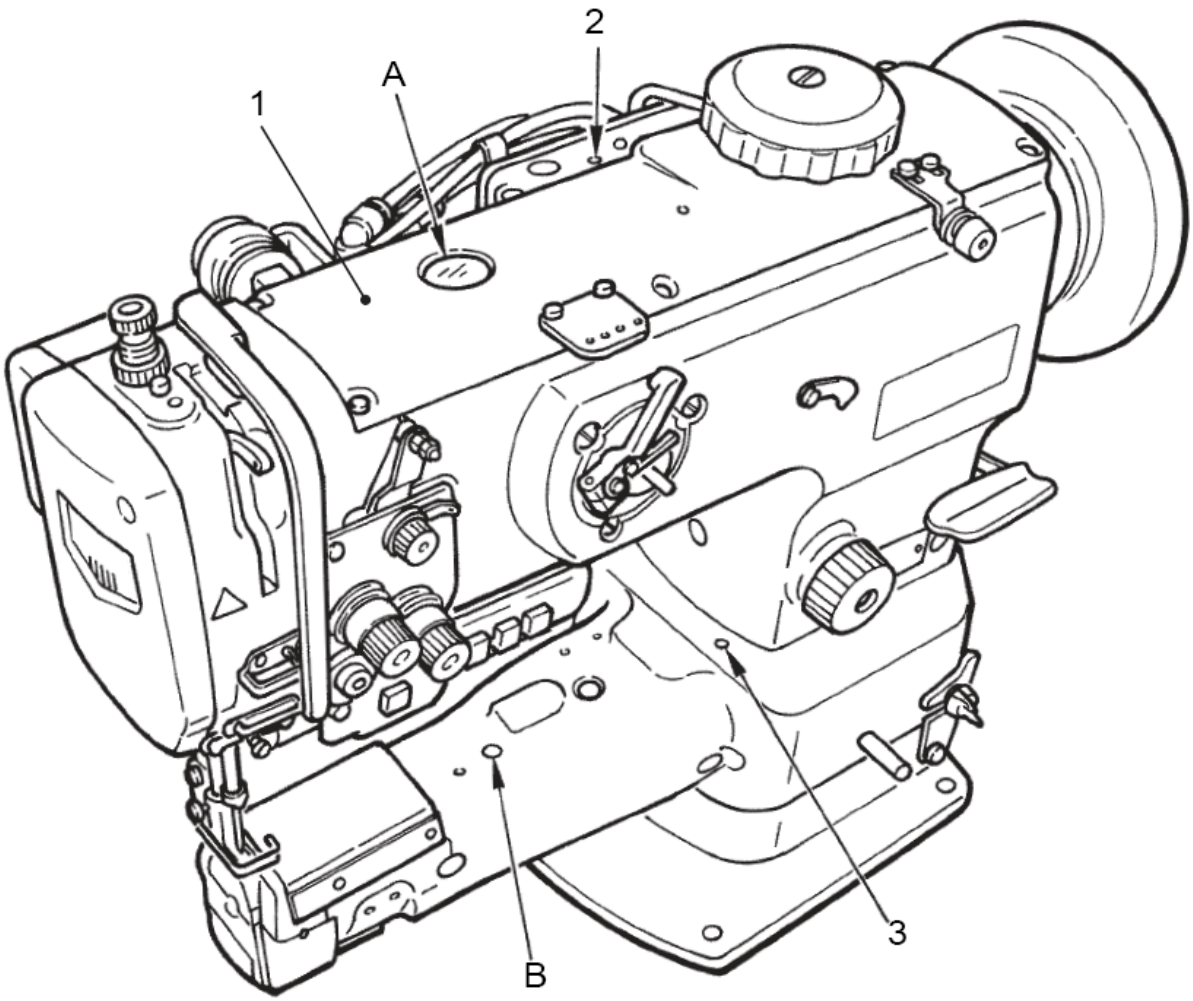

Figure 7

LUBRICATING THE SHUTTLE ARM AREA

Apply an adequate amount of oil once a day to the points marked with the arrow marks.

Before you operate your machine for the first time, or after an extended period of disuse, apply an adequate amount of oil to the points marked with the arrow marks (Fig 8, Item 4 and 5, Fig 9, Item 6 and 7)

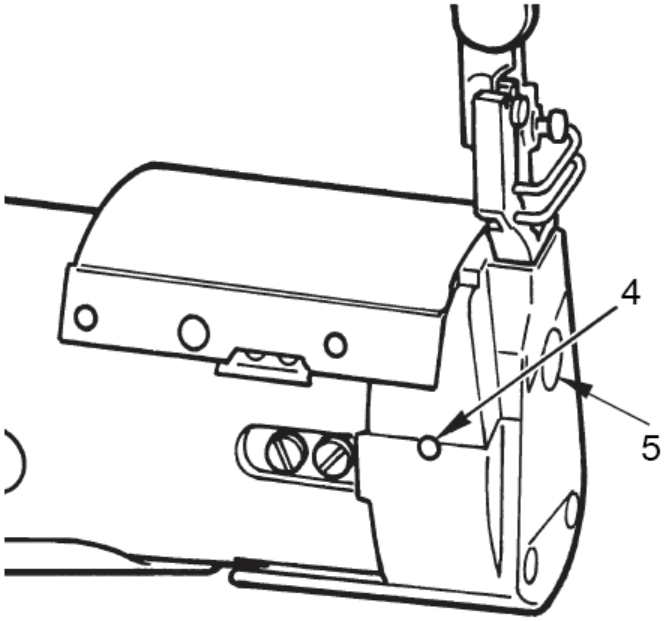

Figure 8

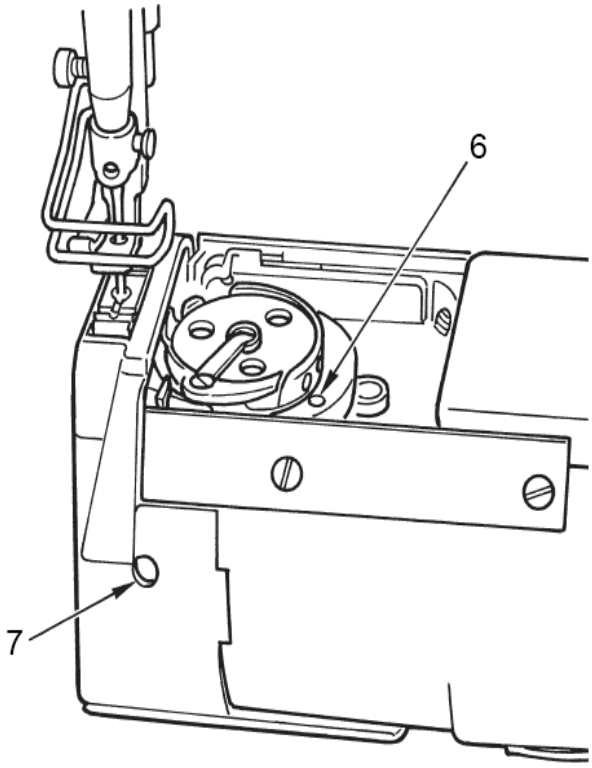

Figure 9

Notes on lubrication:

- Always ensure to use virgin mineral oil on your Titan Sewing Machine
- While under oiling your machine can cause damage to your machine, over oiling can be an issue to your sewing as well. If your machine is dripping oil onto your sewing project, consider reducing the amount and/or frequency of oiling to your machine.
- Do NOT reuse this oil, but please ensure you dispose of this oil in an environmentally friendly way. Most municipalities have Eco-friendly locations that can help you dispose of this waste oil correctly.

NEEDLES AND THREAD

Like all sewing machines, Titan sewing machines work best when you work with not only the correct needle for the project and thread, but when you work within recommended guidelines of use when it comes to needles. Use the chart below to ensure you are matching the correct needle size to your threads. Remember this is a guideline provided for most common threads. If you are using specialty threads, your thread supplier should be able to offer you information on what needle is appropriate for that thread. Failure to do so can cause breaking threads, breaking needles and in some case damage to your project and/or machine.

COMMERCIAL SIZE (OLD CBB)	TEX SIZE*	AVG. STRENGTH	MINIMUM NEEDLE SIZE
46	45	7 lbs.	90/14
69	70	11 lbs.	110/18
92	90	15 lbs.	110/18
138	135	23 lbs.	140/22
207	210	35 lbs.	180/24

*While most suppliers have now changed over to the TEX numbering system for their threads, some still sell under the old commercial sizing system (CBB) and/or Denier.

- TEX is one of the easiest ways to read and understand thread. The TEX number is the weight, in grams of 1000 meters of that thread. Example: TEX 70 means that 1000 meters of that thread weights 70 grams. One slight disadvantage of this system is that different thread types will weigh more or less than others and can give operators a false sense of the real strength of different threads.
- Commercial sizes are determined by the threads denier divided by 10. This can be complicated by threads that are produced of how many strands make up a particular style of thread, the composition, and other factors. (This is often found in older styles of thread and unique threads that may be produced today)
- Denier is like TEX in the fact that it is determined by the weight of the thread, in grams, but of 9,000 meters of thread. This system in more commonly used in Asia and some areas in Europe but as you can tell, it can be more difficult to calculate strength because it can be complicated by how many plies of thread are wrapped in any particular thread (excluding monofilament threads)

THE NEEDLE

Industrial sewing machine needles are made up of several parts of the needle and knowledge of these key areas is helpful when you wish to produce a top-quality finished product.

- Scarf – This could be considered one of the most important parts of the needle. This is the indent that allows the hook to pick up the thread off the needle and form the stitch
- Groove – The groove is the path that the thread will lay in as the stitch is formed. Without this, the formation of the stitch is compromised
- Blade – This is the part of the needle where the size is measured from. ***On every needle there are (2) numbers that determine the size of that needle. The first number is a metric number and the second is imperial. (Example: 110/18 means that it is 1.10 mm is diameter at the blade of the needle)***
- Point – The point is the first part that enters the material and can be a regular tip, a cutting tip (for leathers), or a specialty tip (IE. Ball point)
- Eye – The eye is what transports the thread down into the machine. This is where the most significant wear happens.
- Butt- The butt is the part of the needle that pushes up into the machine and must be fully engaged into the needle clamp of the machine.
- ***NOTE: Change your needles often. Manufacturers of needles rate the lifespan of a sewing machine between 6~8 hours of use. Anything longer and the needle starts to significantly deteriorate and can cause serious issues with your machine and project. Not only that, but damage to your machine can be particularly bothersome considering the replacement price of the needles far outweighs the replacement parts on you machine and/or service related to this.***

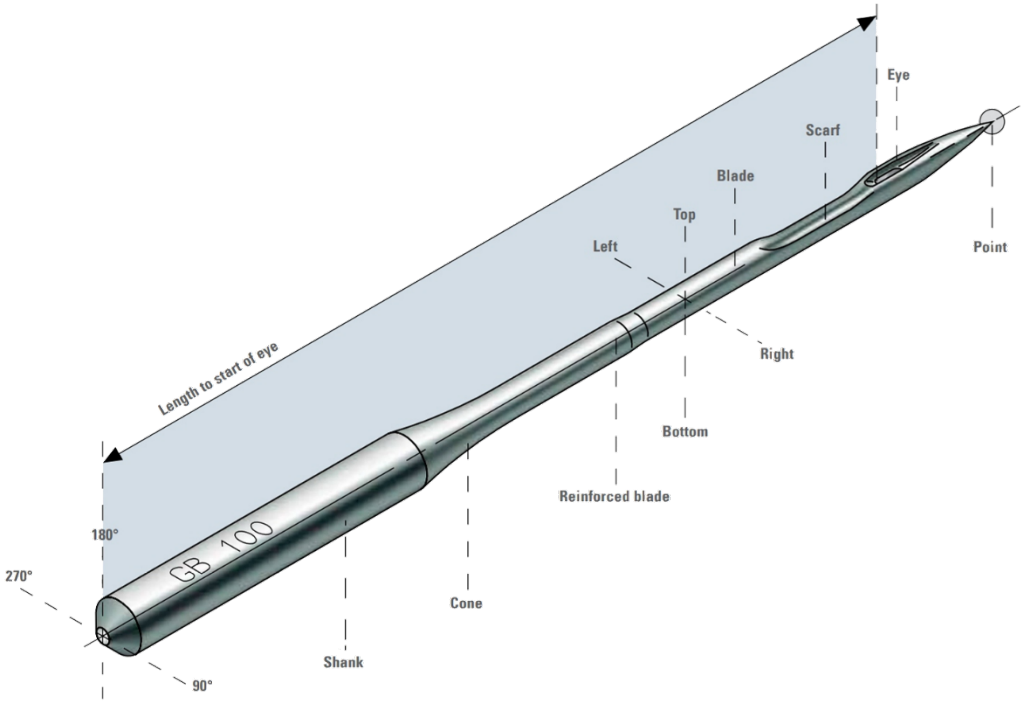

Figure 10

CHANGING THE NEEDLE

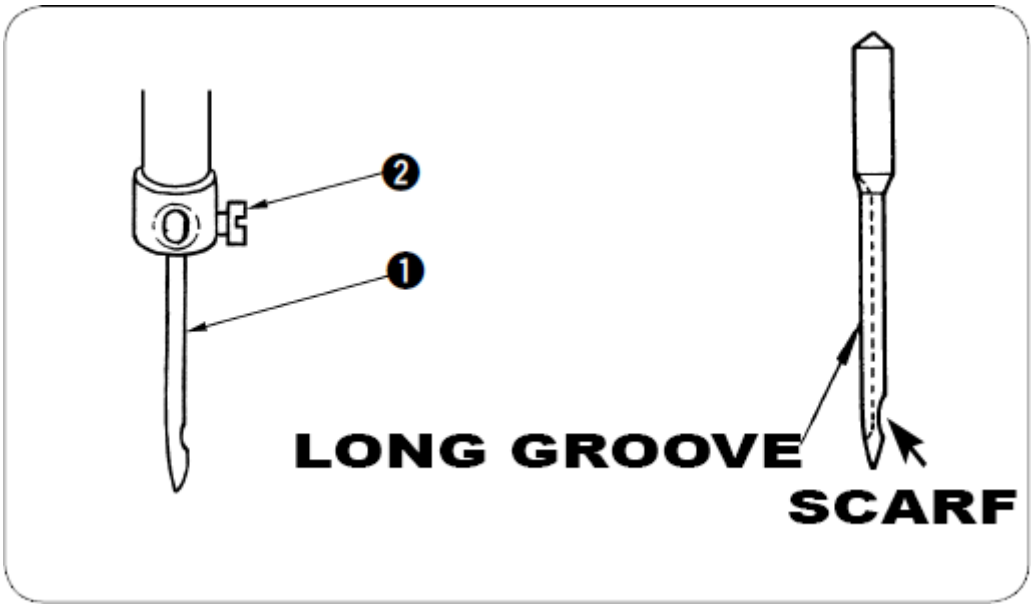

Figure 11

1. Turn the handwheel to bring the needle bar to the highest position of its stroke.
2. Loosen needle clamp screw (Fig 11, Item 2) and hold needle so that the long groove in the needle is facing exactly to the left. This means the scarf should be facing the inside of the machine body.
3. Push needle as far into the needle bar (upwards) into the needle clamp hole until it will go no further.
4. Tighten needle clamp screw firmly.

Notes on changing the needle:

- *It is recommended to only loosen the needle screw. Removing the needle screw completely can increase the chance that the screw can be reinserted incorrectly and cross threading the needle bar.*
- *If your machine skips stitches, or any other inconsistency, change the needle. Damage to needles can be hard to see and are not always obvious. Changing the needle is a great habit when trying to resolve issues.*

BOBBIN WINDING

Before you wind your first bobbin, you will need to set up the thread guide for the bobbin winder.

1. Attach bobbin winder thread guide 1 to the top cover using screws (Fig 12, Item 2). Pay close attention to the two screws. They are used to adjust the bobbin winding (see below)

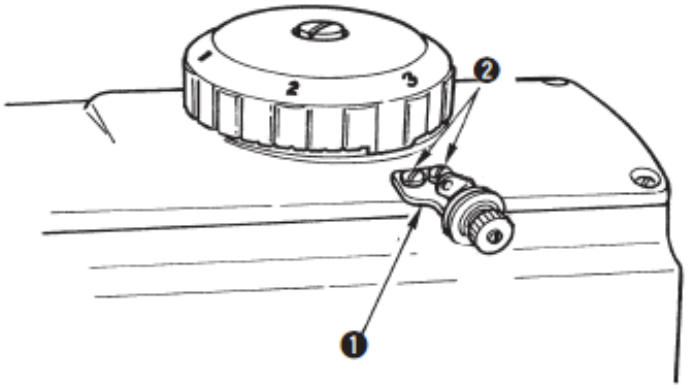

Figure 12

WINDING A BOBBIN

1. If your machine has a thread guide pin, pass the thread in the order of 1, through 4.
2. Pass the thread thru one of the holes on the bobbin from inside out.
3. Engage bobbin winder lever A.
4. TO ADJUST THE CAPACITY OF THE BOBBIN: Loosen set screw B and adjust the position of the adjusting plate to wind a bobbin about 80~90 % of its capacity.
5. If the bobbin is wound unevenly, correct it by loosening the bobbin winder thread guide screws (Fig 13, Items D) and moving the guide back and forth to balance the thread on the bobbin.
6. Then, tighten set screws D.
7. When the bobbin is filled up, the bobbin winder lever automatically releases the bobbin, and the bobbin winder stops.

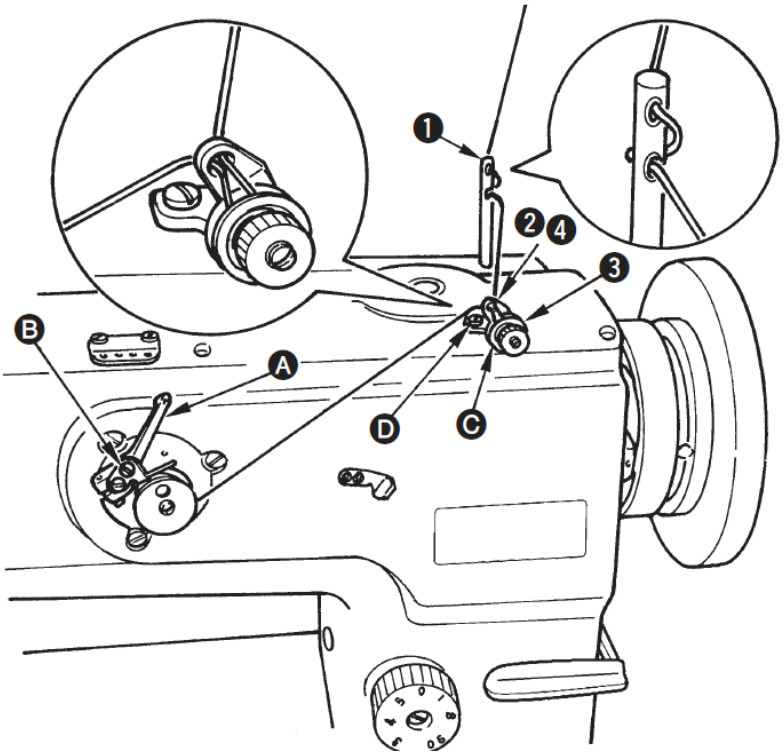

Figure 13

THREADING THE BOBBIN

Threading the bobbin correctly ensures that you will have consistent stitching and end up with a premium quality product. The Titan TN-1341 machine came with 2 versions of a vertical axis shuttle. The first is a capless shuttle that and the second is a shuttle with a cap. Depending on which your machine has, use the following instructions for threading the bobbin.

BOBBIN CAP STYLE

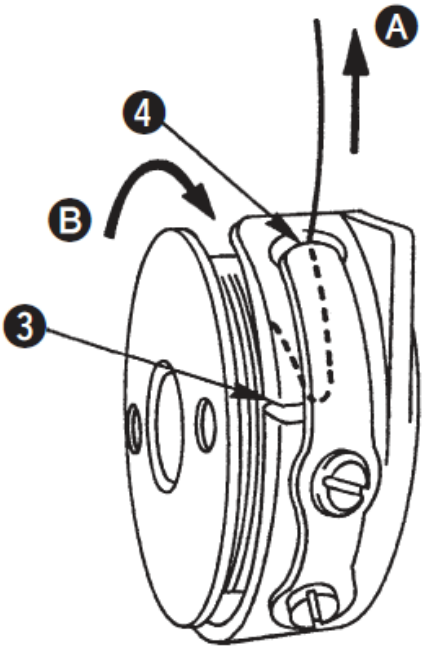

Figure 14

1. Hold a bobbin so that the end of the thread wound round the bobbin is directed to the right (clockwise) and put it into the bobbin case.
2. Pass the thread into the threading slit (Fig 14, Item 3) in the bobbin case, then route it under the tension spring and draw it out from notch .

LATCH STYLE

1. Pass the thread into the threading slit (Fig 15, Item 1) in the inner hook, pass under protruding section (Item 2) and route it to the tension spring.
2. Adjust the bobbin so that it rotates in the direction of arrow mark when the bobbin thread is pulled.

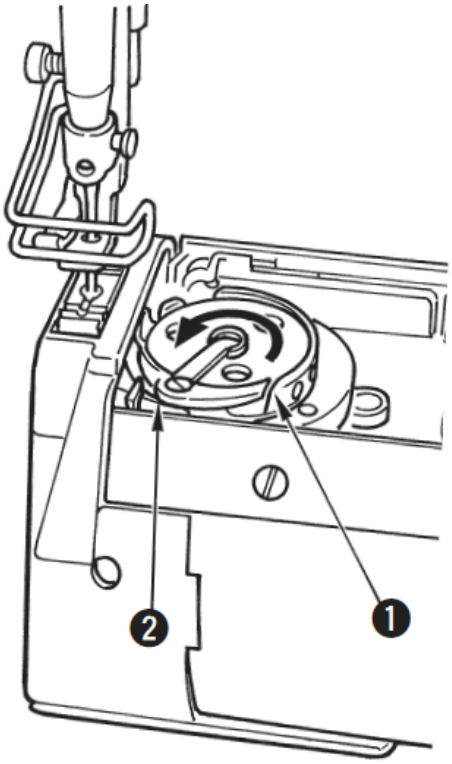

Figure 15

THREADING THE UPPER THREAD

The TN-1341 is equipped with a dual tension unit which allows the machine to not only expand the range of threads the machine can handle, but also offers the operator to have more control over thread tensions.

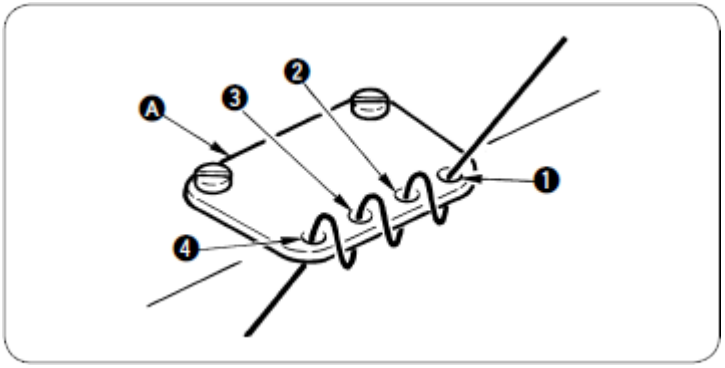

Figure 16

The first thread guide on the machine is important for one simple reason. It controls the threads and ensures that no mater what thread you are using, it will stay comfortably in the tension units.

1. For common threads, it is only necessary to thread this guide through any two holes on this guide.
2. The curlier or twisted the thread is, it is important to thread through more of the holes in the guide like in the picture.
3. Pay attention to certain threads (traditionally heavier threads) that should not go through all the holes on this guide. Doing so will increase the thread tension and can cause issues.
4. Follow the thread path as shown in Fig 17 in order.
5. Pay close attention to make sure the thread passes through each tension unit and between the tension discs.

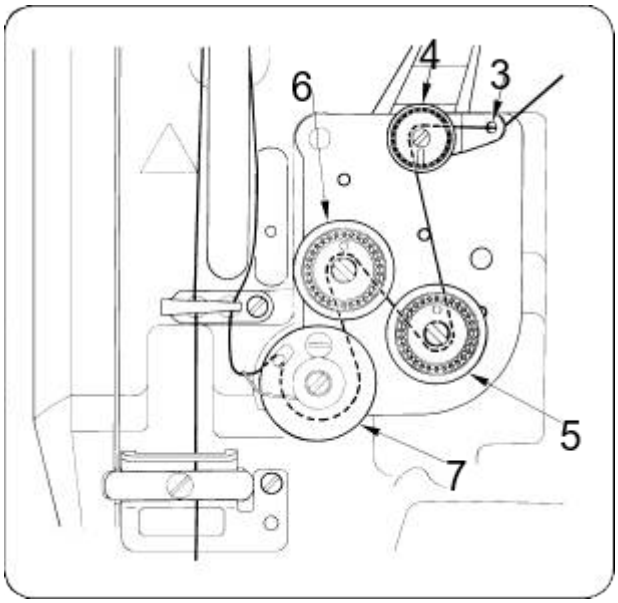

Figure 17

THREADING THE UPPER THREAD(Con't)

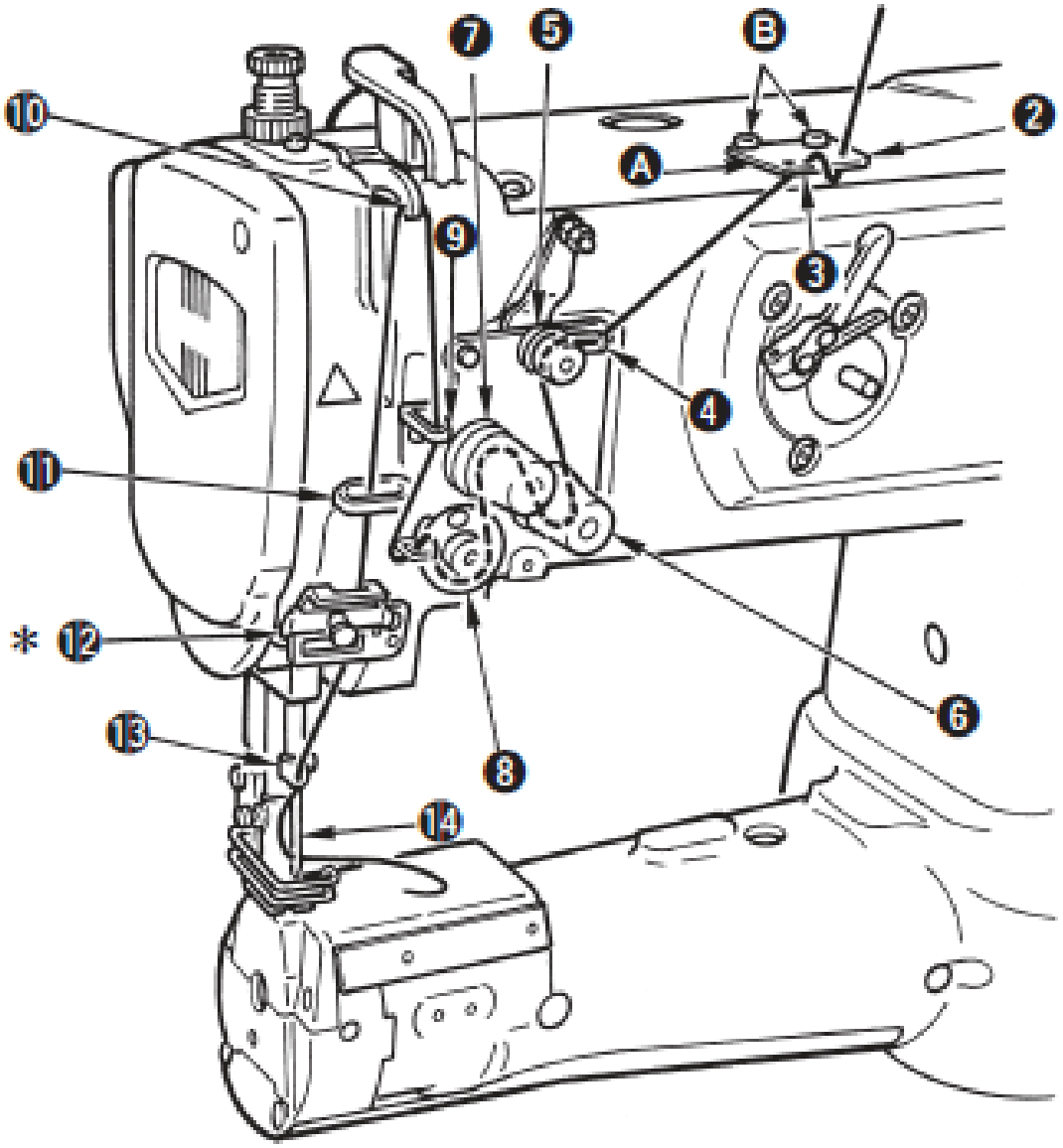

Figure 18

6. Ensure the thread follows the path provided in Fig 18. Pay close attention to the thread guide (Fig 18, Item 13) that is just above the needle. This is commonly overlooked and can cause errors in sewing if not threaded.

THREADING WITH THINNER THREADS

- If you are threading your machine with thinner threads, it is not necessary to thread through both thread tension discs.
- In this case, thread your machine as seen in Fig 19 and skip the second tension unit (Fig 19, Item 6)

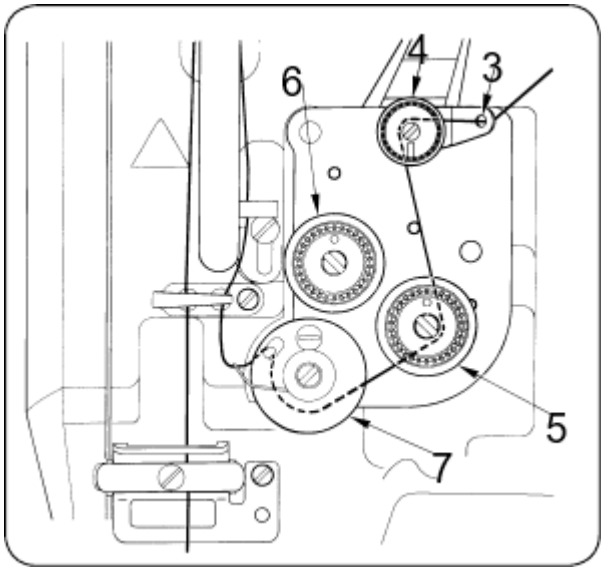

Figure 19

Notes on Threading:

- *Note that when the presser foot is lifted, the tensions release from the thread. It can be easier for an inexperienced user to often lift the foot when threading to make sure the tension discs open to accept the threads.*
- *Once the machine is threaded but before you thread the needle, a good habit to follow is simply pull the threads to ensure there is no tight points or thread incorrectly threaded that can cause the thread undue stress.*

ADJUSTING TENSIONS

Adjusting tensions is often the most concerning adjustment for newer operators. While each machine is individual and may have slightly different tensions, the adjustment for each machine is the same.

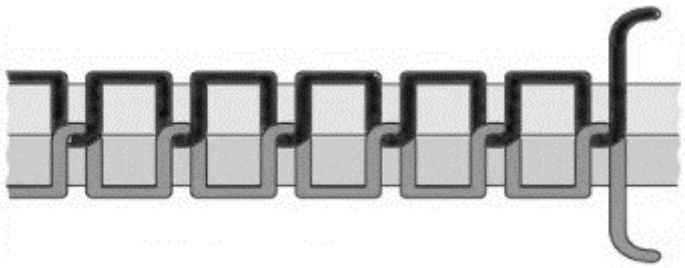

Figure 20

The above figure (Fig 20) demonstrates what perfect tensions should look like. The thicker your material, this will be easier to achieve.

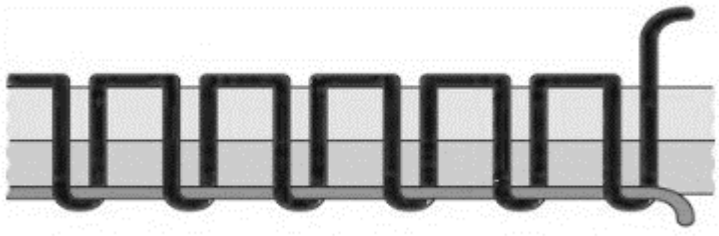

Figure 21

The above figure (Fig 21) demonstrates what incorrect tensions can look like. To resolve this issue, you may need to INCREASE your top tension or DECREASE your bobbin tension.

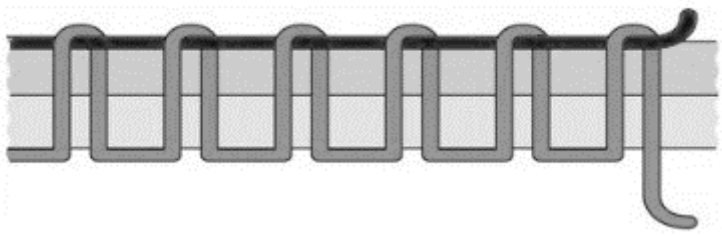

Figure 22

The above figure (Fig 22) demonstrates what incorrect tensions can look like. To resolve this issue, you may need to DECREASE your top tension or INCREASE your bobbin tension.

To adjust your top tension, follow the instructions on “Adjusting upper tensions”

To adjust your bottom tension, follow the instructions on “Adjusting bobbin tensions”

ADJUSTING UPPER TENSIONS

When using both tension units on the top thread, it is important to try to keep both tension units at a similar position. This will help to try to keep your machine working correctly.

- To Increase the upper tension, turn the tension units in the direction of A
- To decrease the upper tension, turn the tension units in the direction of B.

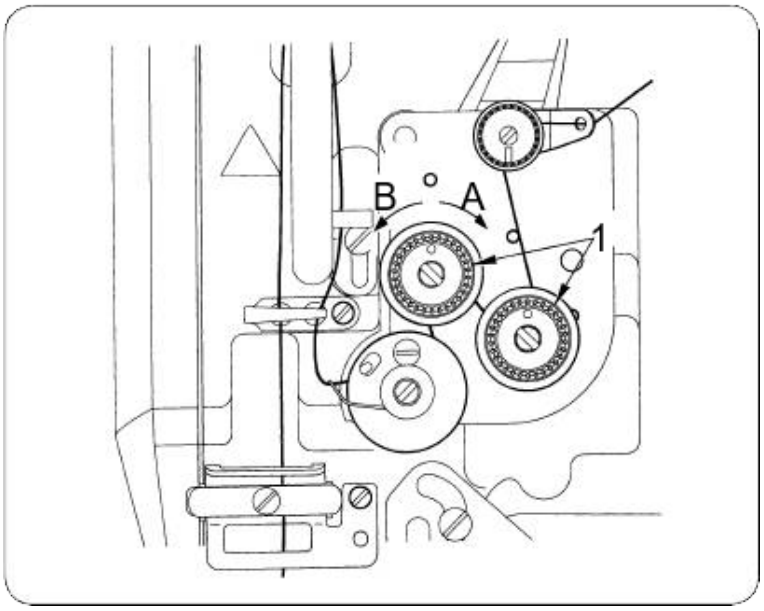

Figure 23

ADJUSTING BOBBIN TENSIONS

Under normal circumstances, it is not normal to adjust your bobbin case tension often. Once the bobbin case tension is set, you should try to make all adjustments to the top tensions.

BOBBIN CAP STYLE

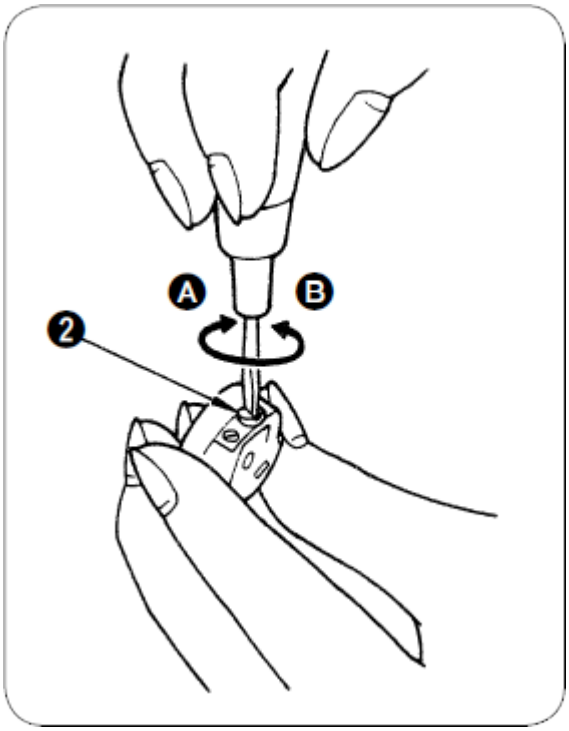

Figure 24

- To Increase the bobbin tension, turn the tension screw (2) in the direction of A
- To decrease the bobbin tension, turn the tension screw (2) in the direction of B.

LATCH STYLE

- To Increase the bobbin tension, turn the tension screw (2) in the direction of A
- To decrease the bobbin tension, turn the tension screw (2) in the direction of B.

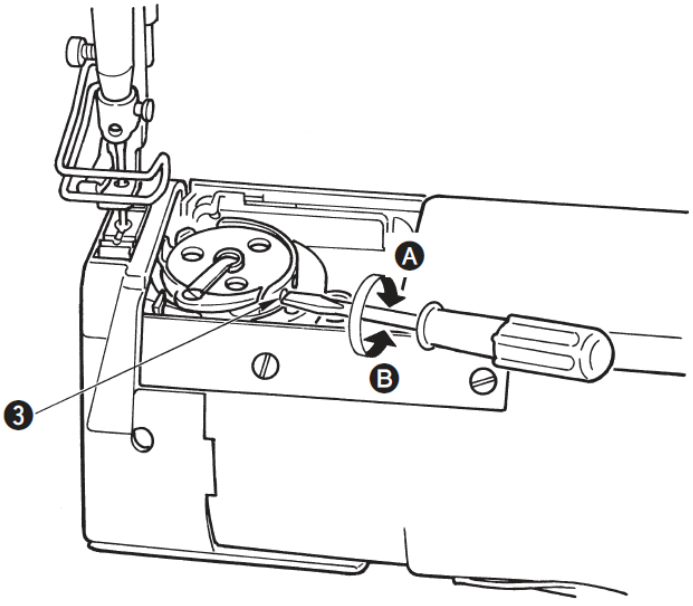

Figure 25

THREAD TAKE-UP SPRING (CHECK SPRING)

The take-up spring (aka check spring) controls the slack on the thread to prevent large loops or knots from forming as the machine operates. In some cases, you may need to adjust this spring, especially when you use technical threads or materials.

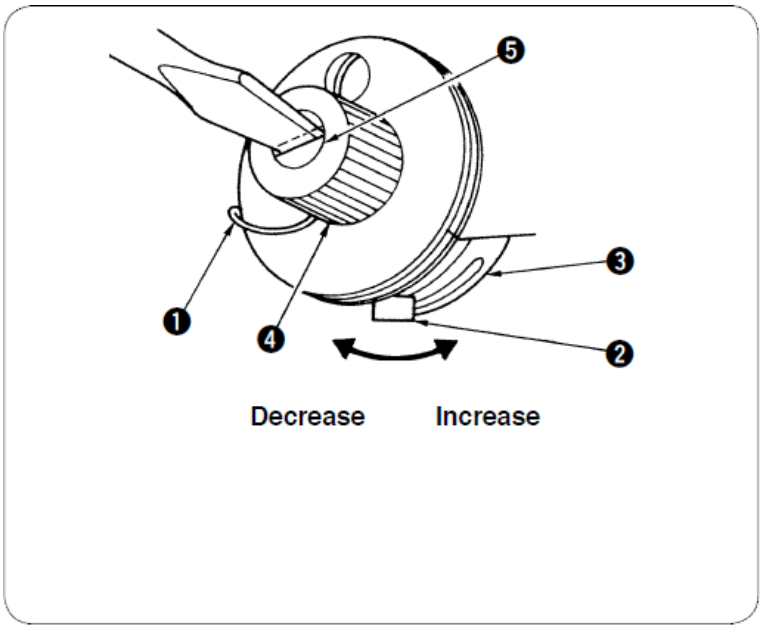

Figure 26

ADJUSTING THE STROKE OF THE SPRING

The stroke, or travel of the spring is set by the stopper (Fig 26, Item 3) on the base of the unit.

- To increase the stroke, loosen screw (Fig 26, Item 2) and rotate the stopper to the right. Then tighten screw 2
- To decrease the stroke, loosen screw (Fig 26, Item 2) and rotate the stopper to the left. Then tighten screw 2

ADJUSTING THE PRESSURE OF THE SPRING

The pressure of the spring should only be adjusted by someone with technical knowledge of machines or when instructed to do so by such a person.

- To increase the pressure, loosen nut (Fig 26, Item 5) and rotate the spring stud to the left. Then tighten nut 5
- To decrease the pressure, loosen nut (Fig 26, Item 5) and rotate the spring stud to the right. Then tighten nut 5

STITCH LENGTH AND REVERSE

The Titan TN-1341 has a stitch length of 9mm in both forward and reverse.

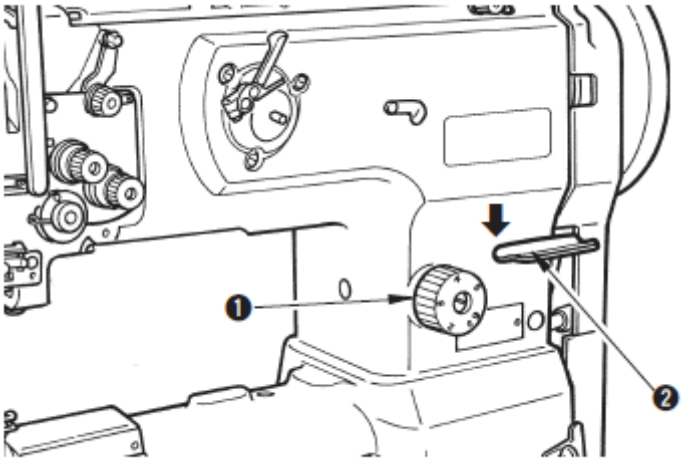

Figure 27

To adjust your stitch length, turn dial (Fig 27, Item 1) counterclockwise to increase the stitch length, and clockwise to decrease the stitch length.

To reverse your stitches, press lever (Fig 27, Item 2) downwards.

Notes on stitch length and reverse:

- *When pressing down on the reverse lever, notice that the stitch length is proportional. This means that pressing the lever down maximum will match the stitch length in reverse. By pressing the lever softer, your reverse will come closer to "0"*
- *If your stitch length dial is hard to turn clockwise, you can release some pressure from the dial by pressing the reverse lever some and this will allow you to turn the dial easier. This happens because the Titan TN-1341 comes with a heavier duty spring in the stitch length mechanism.*

PRESSER FOOT LIFTER

The Titan TN-1341 has a foot lifter on the backside of the machine head that allows the operator to lift and lock the foot in the up position.

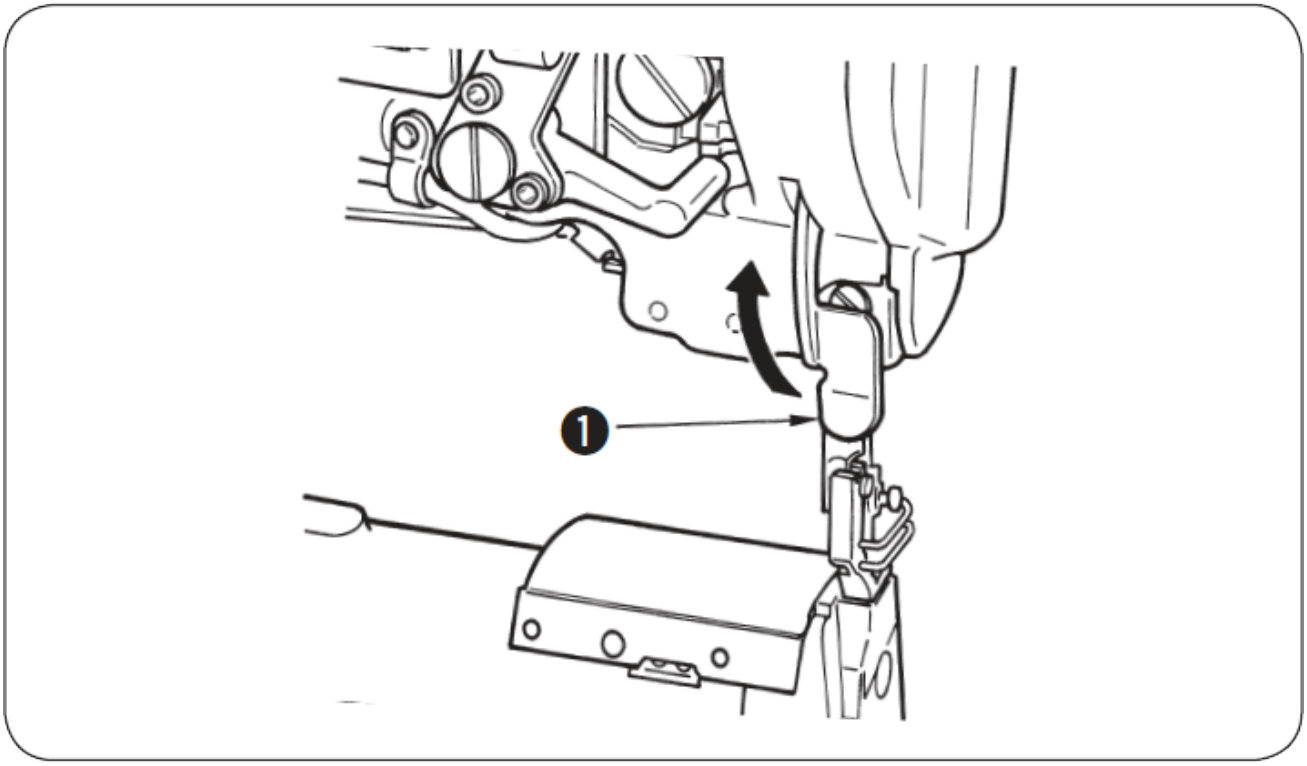

Figure 28

When you want to keep the foot lifted in the up position, pull the lever (Fig 28, Item 1) upwards into the locked position. This will lift the foot 9 mm into position and lock it there until you lift the knee lifter or manually drop the lever.

ADJUSTING THE PRESSER FOOT PRESSURE

The Titan TN-1341 has adjustment screws for both the inner and outer presser feet. While both can be adjusted independently, it is not a common adjustment to be made and should not require regular adjustment.

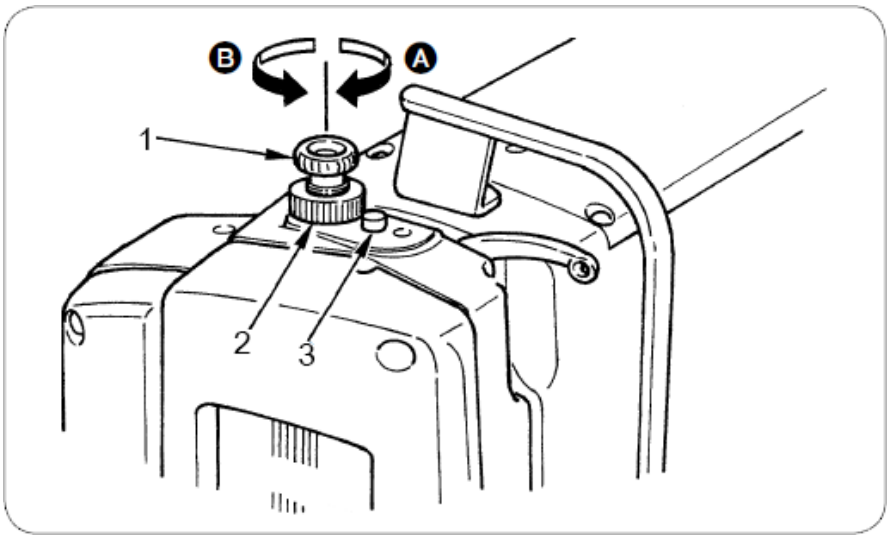

Figure 29

OUTSIDE PRESSER FOOT PRESSURE

- To increase the outer foot pressure, loosen nut (Fig 29, Item 2) and turn the pressure dial (Item 1) clockwise the right. Then tighten nut 2
- To decrease the outer foot pressure, loosen nut (Fig 29, Item 2) and turn the pressure dial (Item 1) conterclockwise the left. Then tighten nut 2

INSIDE PRESSER FOOT PRESSURE

- To increase the inside foot pressure, tighten screw (Fig 29, Item 3) by turning the screw clockwise.
- To decrease the inside foot pressure, loosen screw (Fig 29, Item 3) by turning the screw counterclockwise.

Notes on presser foot pressure:

- *The machine should operate with the minimal amount of pressure on the presser foot. Increasing the amount of pressure on the foot may cause damage or increased marking to your material*
- *When adjusting your inside foot pressure, be careful not to loosen the screw (Fig 29, Item 3) too much. There is no lock on this screw and you may cause damage or lost parts by loosening the screw too far.*

ADJUSTING PRESSER FOOT ALTERNATION

The Titan TN-1341 is equipped with the Titan Climbing Device. This is the dial on the top of the machine that adjusts the alternation of the two presser feet. This is used primarily when climbing on and off material of different heights.

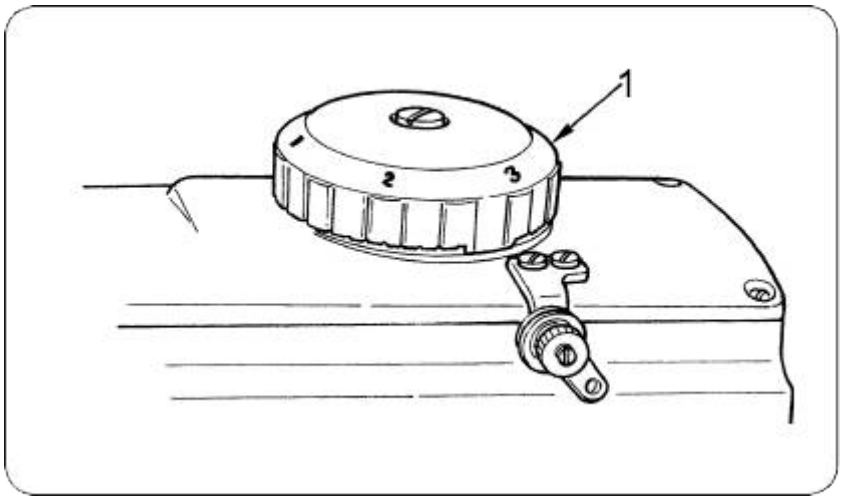

Figure 30

Because the Titan TN-1341 is a compound walking foot, the machine has the capability to climb over seams of different heights. To ensure stitch length, tensions and stitch integrity is kept at the highest level, the Titan Climbing Device allows the operator to adjust the alternation of the inner and outer walking foot when sewing.

- To increase the alternation, turn the Climbing device dial (Fig 30, Item 1) to a higher number(clockwise). The higher the number, the larger the gap between the inner and outer foot grows (Fig 31, Item A).

- To decrease the alternation, turn the Climbing device dial (Fig 30, Item 1) to a lower number(counterclockwise). The lower the number, the smaller the gap between the inner and outer foot shrinks (Fig 31, Item A).

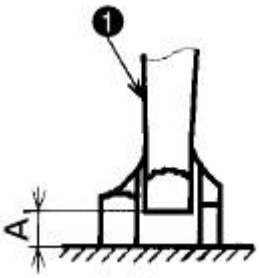

Figure 31

Notes on presser foot alternation:

- *Normally keep the dial between 2~3. This is the most common setting for average materials.*
- *The climbing device is not a setting for overall thickness, it is used to sew on different levels of height in the material*
- *While it is ok to leave this setting at maximum height, your machine will be noisier and often fatigue the operator faster because of the excess noise when sewing at maximum.*

SEWING SPEEDS

While the maximum speed of the sewing machine is 2500 spm, this is only suggested when sewing within the parameters of the chart below. It is highly recommended that you adjust your speed accordingly when it comes to stitch length and alternation of the presser foot

Amount of alternate vertical movement of the walking foot and presser foot	Stitch length : 6 mm or less	Stitch length : More than 6 mm and 9 mm or less
Less than 3 mm	2,500 sti/min	2,000 sti/min
3 mm to less than 4 mm	2,000 sti/min	2,000 sti/min
4 mm to less than 6.5 mm	1,600 sti/min	1,600 sti/min

SAFETY CLUTCH

The Titan TN-1341 comes with a safety clutch release mechanism as a standard feature. The safety clutch is a “break-free” device that operates between the upper and lower shaft and when overloaded by a thread jam, machine jam or any excess stress, releases the connection between the two shafts. This essentially is in place to help reduce any damage or timing issues.

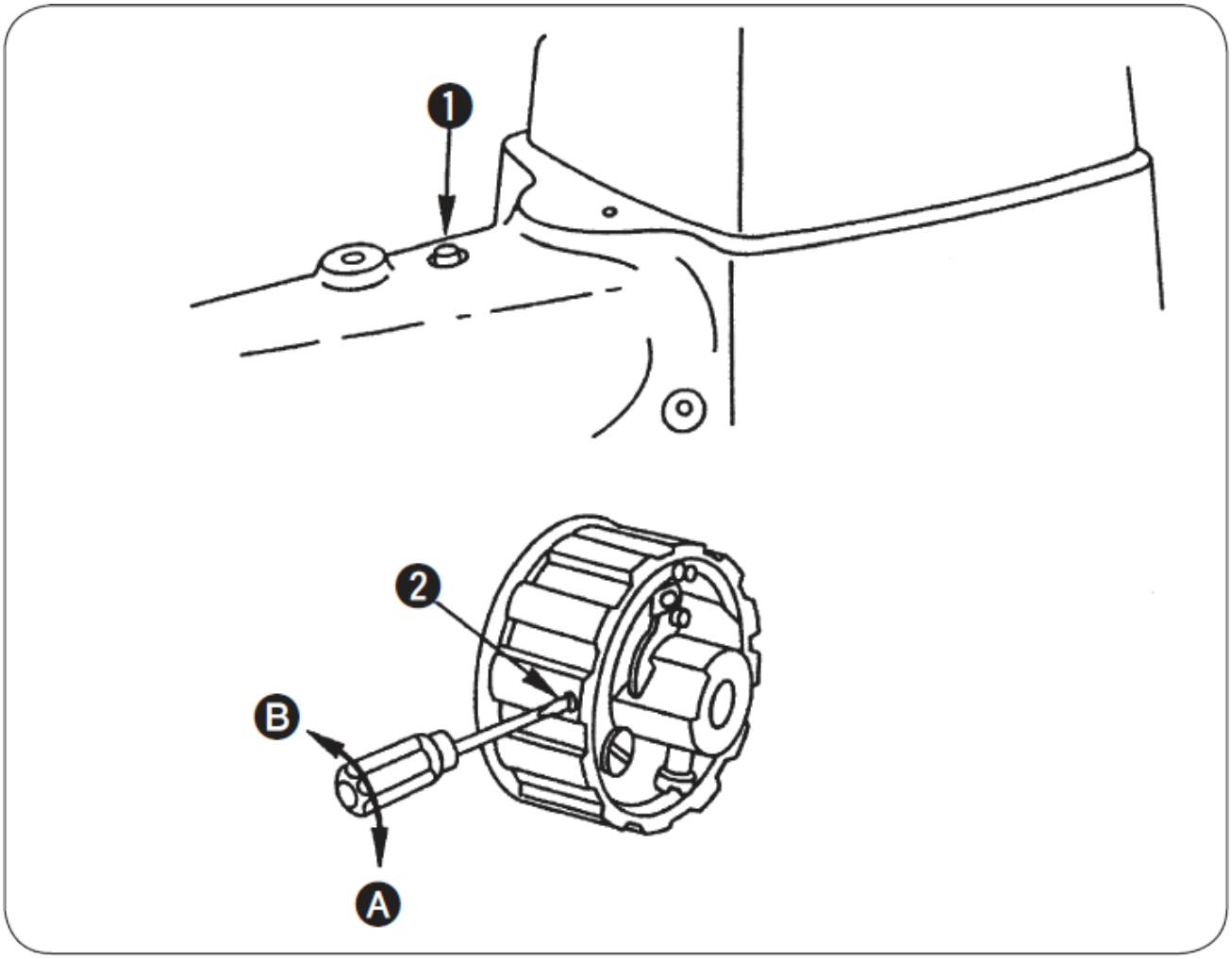

Figure 32

RESETTING YOUR SAFETY CLUTCH

1. Remove any threads caught in the shuttle hook area.
2. Pressing push button (Fig 32, Item 1), strongly turn the pulley in the opposite direction to its normal rotational direction

CLUTCH SAFETY LOAD LIMIT

Turn adjustment screw (2) in direction A (clockwise) to increase the safety load, or in direction B (counterclockwise) to decrease it

.

WARRANTY

Warranty period of this product is 1 year from date of purchase.

Any trouble found within warranty period under normal operation, it will be repaired free of charge.

However, maintenance cost will be charged in the following cases even if within warranty period:

1) Inappropriate use, including wrong connecting high voltage, wrong application, disassemble, repair, modification by untrained personnel, or operation without the precaution, or operation out of its specification range, or inserting other objects or liquids into the product.
2) Damage by fire, Earthquake, lighting, wind, flood, salt corrosive, moisture, abnormal power voltage and any other damage cause by the natural disaster or by the inappropriate environments.
3) Dropping after purchasing or damage in transportation by customer himself or by customer's shipping agency

Note: We make our best effort to test and manufacture the machine for the highest quality possible.

However, it is possible that this product can be damaged due to external magnetic interference and electronic static or noise or unstable power source more than expected. Therefore, it is recommended to ensure the machine and operation area is equipped with a stable ground and the power supply to the machine is the cleanest possible.

Titan Sewing Machines

www.titansewing.ca