ST-9820

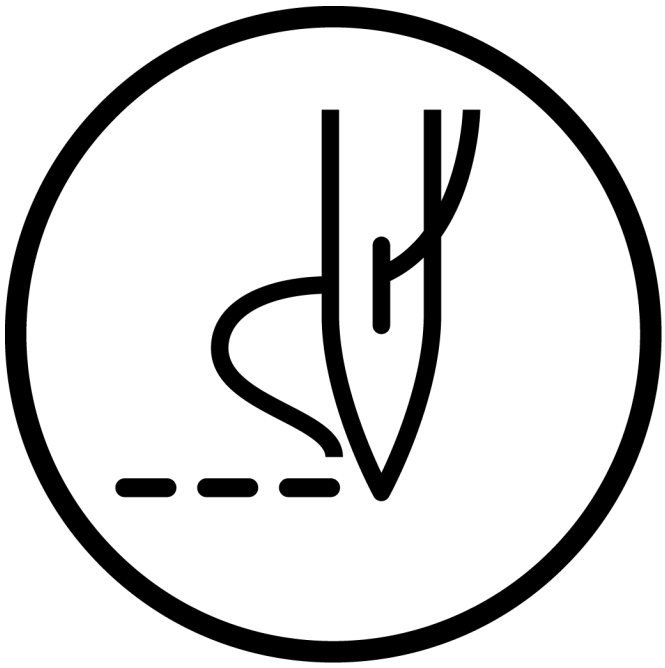
使用说明书
INSTRUCTION MANUAL

电脑圆头锁眼机

在使用缝纫机之前请阅读本使用说明书。
请将本使用说明书放在便于查阅的地方保管。

ELECTRONIC EYELET BUTTON HOLER

Please read this manual before using the machine.
Please keep this manual within easy reach for quick reference.



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ST-9820

电脑圆头锁眼机

十分感谢您购买所特牌工业缝纫机。
在使用缝纫机之前，请仔细阅读<为了您的安全使用>和使用说明。

工业缝纫机的特性之一，因为要在机针和挑线杆等运动零部件附近进行操作，而这些零部件很容易引起受伤的危险，所以请在受过培训的人或熟练人员的安全操作知识的指导下，正确地使用本缝纫机。

为了您的安全使用

[1] 安全使用的标记及其意义

本使用说明书及产品所使用的标记和图案记号是为了您的安全而正确地使用产品，防止您及其他人受到危害和损害。表示方法及含意如下。

标记

⚠ 危险	**该内容表示如果忽视此标记而进行了错误的操作，必将导致死亡或重伤。**
⚠ 注意	**该内容表示如果忽视此标记而进行了错误的操作，有可能会引起人员受伤及造成设备损坏。**

图案和符号

……**该符号(△)表示“应注意事项”。**

三角中的图案表示必须要注意的实质内容。
（例如，左边的图案表示 “当心受伤”）

……**该符号(⃠)表示“禁止”。**

……**该符号(●)表示“必须”。**

圆圈中的图案表示必须要做的事情的实质内容。
（例如，左边的图案表示 “必须接地”。）

[2] 安全注意事项

⚠ 危险

打开控制箱盖时，先关闭电源开关并将电源插头从插座上拔下后，至少等待 5 分钟后，再打开控制箱盖。
触摸带有高电压的区域将会造成人员受伤。

⚠ 注意

使 用 环 境

请不要在有电源线干扰及静电干扰等有强电气干扰源影响的环境下使用。强电气干扰源可能会影响缝纫机的正确操作。

电源电压的波动应该在额定电压的±10% 以内的环境下使用。
电压大幅度的波动会影响缝纫机的正确操作。

电源容量应大于设备的消耗电量。电源容量不足会影响缝纫机的正确操作。

压缩空气的供气量应大于设备所要求的总耗气量。压缩空气的供气量不足可能会导致缝纫机的操作不正常。

环境温度应在 5℃~35℃ 的范围内使用。
低温或高温会影响缝纫机的正确操作。

相对湿度应在 45%~85% 的范围内，并且设备内不会形成结露的环境下使用。干燥或多湿的环境和结露会影响缝纫机的正确操作。

万一发生雷电暴风雨时，关闭电源开关，并将电源插头从插座上拔下。雷电可能会影响缝纫机的正确操作。

安 装

请让受过培训的技术人员来安装缝纫机。

请委托购买商店或电气专业人员进行电气配线。

缝纫机重量约为 120Kg, 安装工作及调整工作台的高度必须由 4 人以上来完成。

安装完成前,请不要连接电源。
如果误按启动开关，缝纫机动作会导致受伤。

缝纫机头倒下或竖起时，请用双手进行操作。
另外在缝纫机头倒下的状态下，请不要用力压缝纫机。如缝纫机失去平衡，缝纫机(特别是工作台)滑落到地上是造成受伤或缝纫机损坏的原因。

必须接地。
接驳地线不牢固，是造成触电或误动作的原因。

所有电缆应固定在离活动部件至少 25mm 以外处。另外，不要过度弯曲电缆或用卡钉固定得过紧。
会引起火灾或触电的危险。

请在机头上安装安全罩壳。

如果使用带小脚轮的工作台，则应该固定小脚轮，使其不能移动。

使用润滑油时,务必戴好保护眼镜和保护手套等，以防润滑油落入眼中或沾在皮肤上，这是引起发炎的原因。
另外，润滑油不能饮用，否则会引起呕吐和腹泻。
将油放在小孩拿不到的地方。

⚠ 注意

缝　纫

本缝纫机仅限于接受过安全操作培训的人员使用。

本缝纫机不能用于除缝纫外的任何其他用途。

使用缝纫机时必须戴上保护眼镜。
如果不戴保护眼镜，断针时就会有危险，机针的折断部分可能会弹入眼睛并造成伤害。

发生下列情况时，请切断电源。
否则误按下启动开关时，缝纫机动作会导致受伤。

- 机针穿线时
- 交换机针时
- 缝纫机不使用，或人离开缝纫机时

如果使用带小脚轮的工作台，则应该固定小脚轮使其不能移动。

为了安全起见，在使用本缝纫机之前，请安装保护装置。
如果未安装这些安全装置就使用缝纫机,会造成人身伤害及缝纫机损坏。

缝纫过程中，不要触摸任何运动部件或将物件靠在运动部件上，因为这会导致人员受伤或缝纫机损坏。

如果缝纫机操作中发生误动作，或听到异常的噪音或闻到异常的气味，应立即切断电源。然后请与购买商店或受过培训的技术人员联系。

如果缝纫机出现故障，请与购买商店或受过培训的技术人员联系。

清　洁

清洁前请关闭电源开关。
否则如果误按启动开关，缝纫机动作会导致受伤。

使用润滑油时,务必戴好保护眼镜和保护手套等，以防润滑油落入眼中或沾在皮肤上，这是引起发炎的原因。
另外，润滑油不能饮用，否则会引起呕吐和腹泻。
将油放在小孩拿不到的地方。

维 护 和 检 查

只有经过训练的技术人员才能进行缝纫机的维修、保养和检查。

与电气有关的维修、保养和检查请委托购买商店或电气专业人员进行。

发生下列情况时，请关闭电源。并拔下电源线插座。
否则误按启动开关时，缝纫机动作会导致受伤。

- 检查、调整和维修
- 更换弯针,切刀等易损零部件

在检查、调整和修理任何使用气动装备之前，请先断开气源,并等压力表指针下降到 “0”为止。

缝纫机头倒下或竖起时，请用双手进行操作。
另外在缝纫机头倒下的状态下，请不要用力压缝纫机。如缝纫机失去平衡，缝纫机(特别是工作台)滑落到地上是造成受伤或缝纫机损坏的原因。

在必须接上电源开关和气源开关进行调整时，务必十分小心遵守所有的安全注意事项。

请使用所特工业公司指定的更换零部件。

取下的安全保护装置, 必须要安装。且请务必安装在原位上,并检查能否正常的发挥作用。

未经授权而对缝纫机进行改装而引起的缝纫机损坏不在保修范围内。

[3] 警告标签

★ 缝纫机上有下列警告标签。
当使用缝纫机时，请遵守标签上的说明。
如果标签脱落或模糊不清，请和最近的所特公司经销商联系。

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⚠ 危 険	⚠ 危 险
高電圧部分にふれて、大けがをすることがある。電源を切り、5分たってからカバーをはずすこと。	触摸高压电部分，会导致受伤。在切断电源5分钟后，再开启盖罩。

⚠DANGER	⚠GEFAHR	⚠DANGER	⚠PELIGRO
Hazardous voltage will cause injury. Turn off main switch and wait 5minutes before opening this cover.	Hochspannung verletzungsgefahr! Bitte schalten sie den hauptschalter aus und warten sie 5 minuten, bevor sie diese abdeckung öffnen.	Un voltage non adapte provoque des blessures. Eteindre l'interrupteur et attendre 5 minutes avant d'ouvrir le capot.	Un voltaje inadecuado puede provocar las heridas.Apagar el interruptor principal y esperar 5 minutos antes de abrir esta cubierta.

2

⚠ 注 意
触摸运动部分,易造成受伤。所以在装上安全保护装置后,再进行缝纫操作。在切断电源后,进行穿线,更换梭芯,机针和做清扫,调整工作。

⚠ CAUTION
Moving parts may cause injury. Operate with safety devices. Turn off main switch before threading, changing bobbin and needle,cleaning etc.

3 缝纫中不要触摸剪刀和锤子，或将物体压在缝纫机上。
因为这会导致受伤或损坏缝纫机。

安全装置:
护眼板、护指器、
针杆护架、针导向盖、
皮带罩等

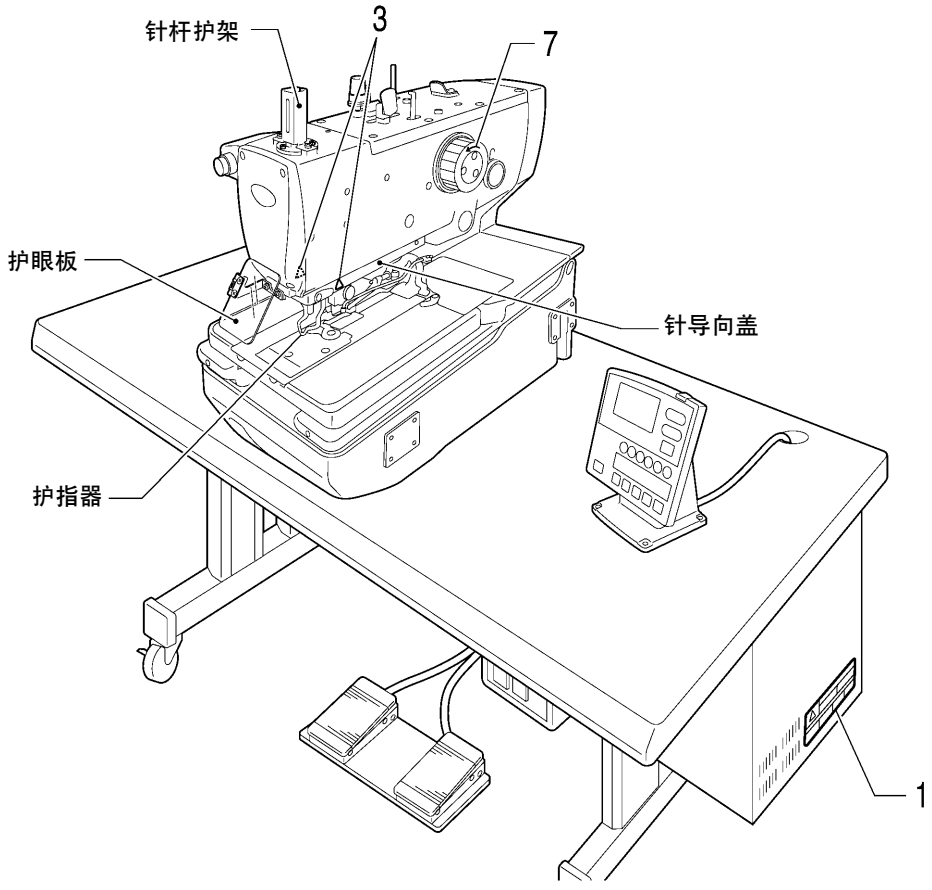
4 缝纫机头竖起时，请注意别夹住您的手指。

5 送布台向后方移动时，请注意别夹住您的手指。

6 必须接地。
如果接驳地线不牢固，是造成触电或误动作的原因。

7 表示回动方向

8 表示注意高温



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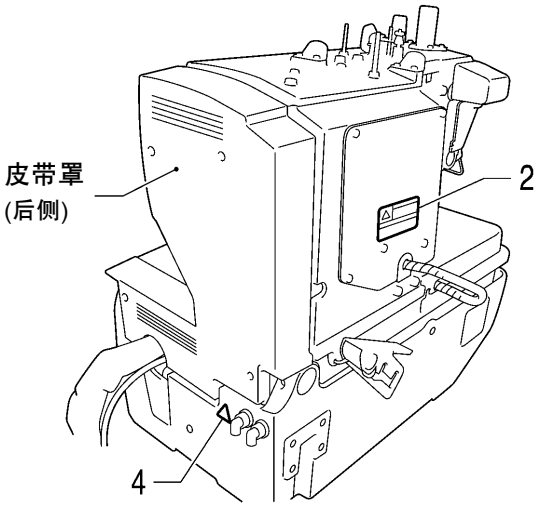

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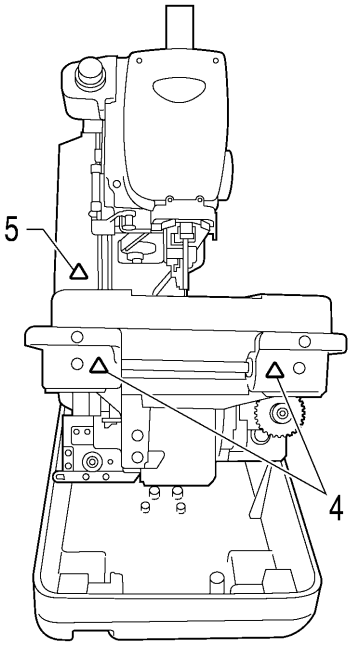

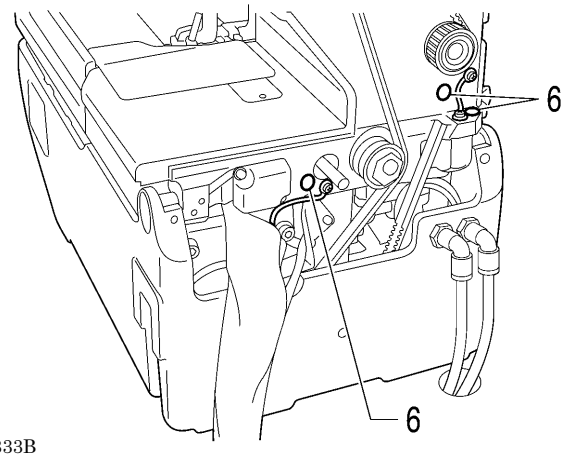

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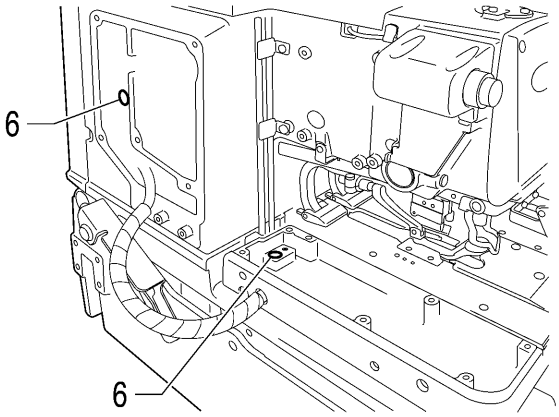

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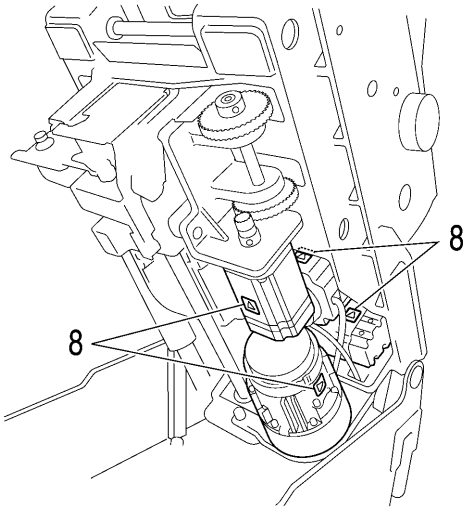

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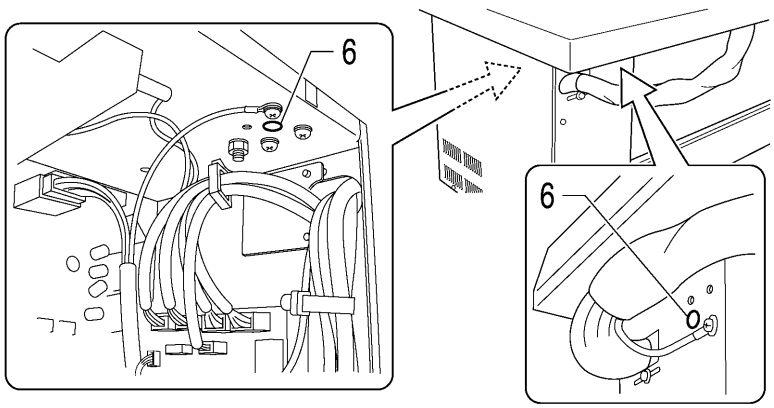

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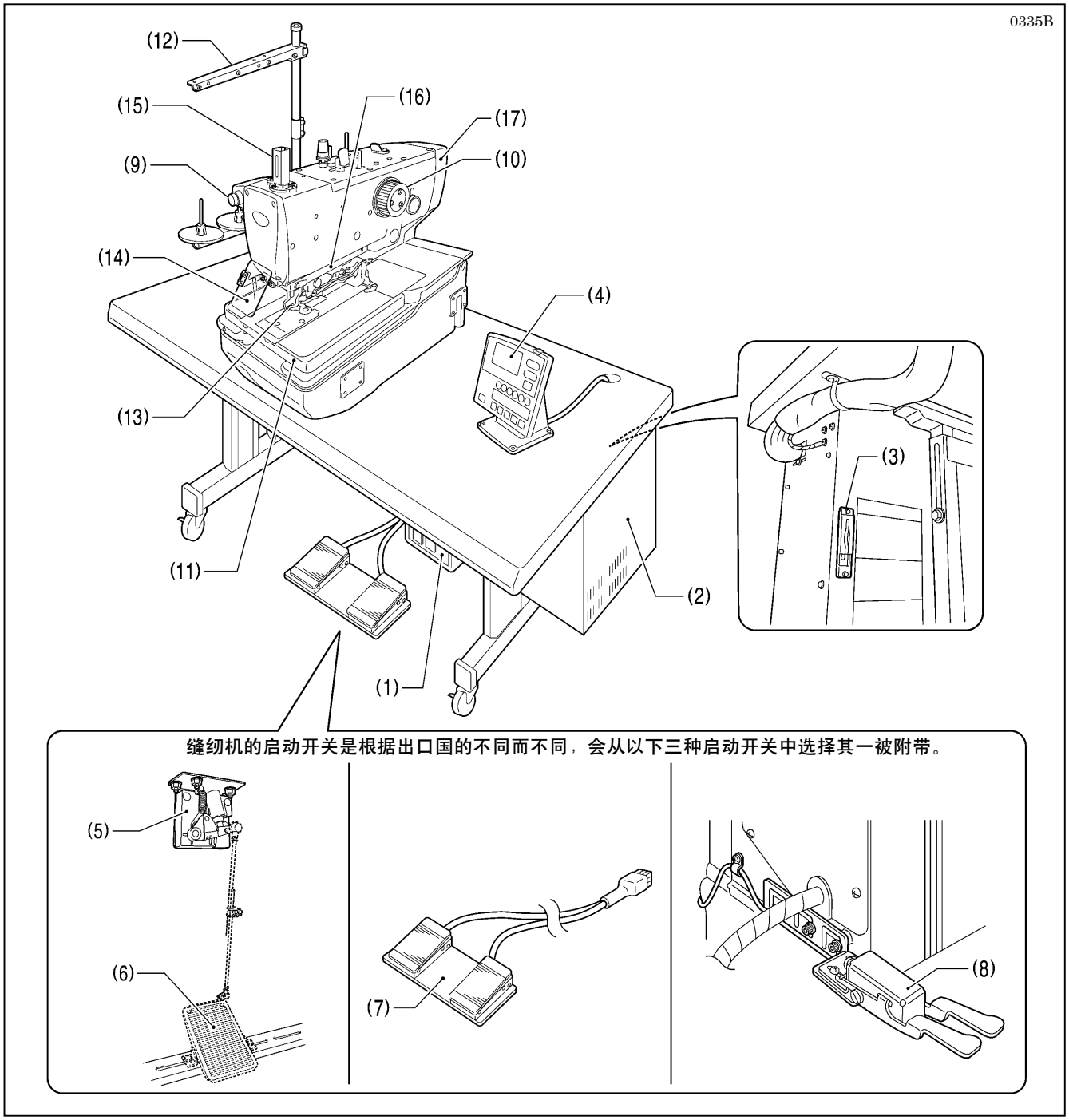
目　　录

1. 主要零部件的名称



(1) 电源开关
(2) 控制箱
(3) CF 卡插入口 *
(4) 操作盘
(5) 脚踏开关复合件
(6) 脚踏板[市场销售品]
(7) 2 连脚踏板
(8) 手动开关
(9) 暂停开关
(10) 上轴手轮
(11) 送布台
(12) 线架

保护安全装置

(13) 护指器
(14) 护眼板
(15) 针杆护架
(16) 针导向盖
(17) 皮带罩

* CF™ 是 SanDisk Corporation 的商标。

2. 缝纫机规格

2-1. 规格

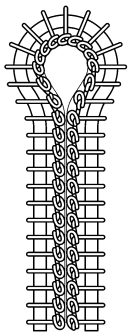
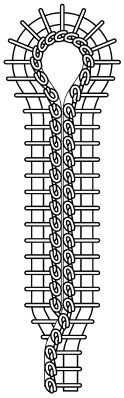
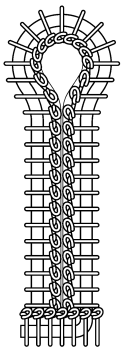
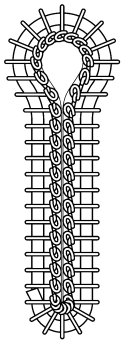
	切面线装置	切底线装置	
		长型	短型
-00	○	—	—
-01	○	○	—
-02*1	○	—	○

*1: 因为-02 规格是根据纽孔锁缝长度分成 L1422～L3442 规格，订货时请务必指定纽孔锁缝长度。

*2: 这些规格暂时还没有,不过，根据交换的量规零部件是可以对应的。(详细情况，请向销售店询问。)

规格	ST-9820-00	ST-9820-01	ST-9820-02
用途	男装、女装		劳动布、工作服
缝制速度	1,000～2,500rpm(可以 100rpm 为单位设定)		
针迹形状	无加固缝 锥形加固缝 直线加固缝 圆形加固缝 菊花孔	无加固缝 锥形加固缝 直线加固缝 圆形加固缝 菊花孔	无加固缝 锥形加固缝 直线加固缝 圆形加固缝 菊花孔
纽孔锁缝长度	圆头形钮孔: 8～50mm 直形钮孔: 5～50mm	圆头形钮孔: 8～42mm 直形钮孔: 5～42mm	L1422: 14～22mm*2 L1826: 18～26mm L2230: 22～30mm L2634: 26～34mm*2 L3442: 34～42mm*2
针迹节距	0.5～2.0mm		
针迹幅宽	1.5mm～5.0mm(机械式最大 4.0mm、程序式最大 1.0mm)		
锥形加固长度	0～20mm		
压布夹高度	标准为 12mm(可以到 16mm 为止)		16mm
启动方式	脚踏开关(脚踏板式、2 连脚踏板式)或是手动开关		
送布方式	X、Y、θ的 3 脉冲马达间歇送布		
机针	DO x 558-NY2 #14～#18(风琴)		
安全装置	内藏暂停功能及当安全电路发生故障时的自动停止装置		
上轴马达	AC 伺服马达(4 极 550W)		
空气压力	主调节器: 0.5MPa 锤子压力调节器: 0.4MPa		
空气消耗量	43.2 l/min(8 次循环/min)		
电源	单相 100V / 220V、三相 3 相 200V / 220V / 380V / 400V 400VA		
重量	头部约 120kg、操作盘约 0.6 kg 控制箱 14.2～16.2 kg(根据出口国的不同而不同。)		

2-2. 针迹形状

圆头形钮孔			
			
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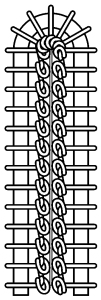
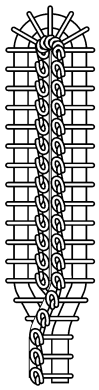
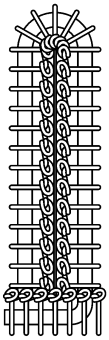
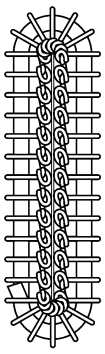
直形钮孔			
			
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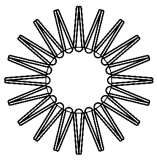
菊花孔


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3. 安装

⚠ 注意

- 请让受过训练的技术人员来安装缝纫机。
- 请委托购买商店或电气专业人员进行电气配线。
- 缝纫机重约 120Kg, 安装工作及调整工作台的高度时必须由 4 人以上来完成。
- 安装完成前,请不要连接电源。
  如果误按启动开关，缝纫机动作会导致受伤。
- 缝纫机头倒下或竖起时，请用双手进行操作。
  另外在缝纫机头倒下的状态下，请不要用力压缝纫机。如缝纫机失去平衡，缝纫机(特别是工作台)滑落到地上是造成受伤或缝纫机损坏的原因。
- 所有电缆应固定在离活动部件至少 25mm 以外处。
  另外，不要过度弯曲电缆或用卡钉固定得过紧。会引起火灾或触电的危险。
- 必须接地。
  接驳地线不牢固，是造成触电或误动作的原因。
- 请在机头及马达上安装安全罩壳。

3-1. 工作台板加工图

・ 请使用能够承受缝纫机的重量(120kg)和具有抗振强度的工作台和台脚。请使用作业台板的厚度为49～60㎜的工作台。

[注意]

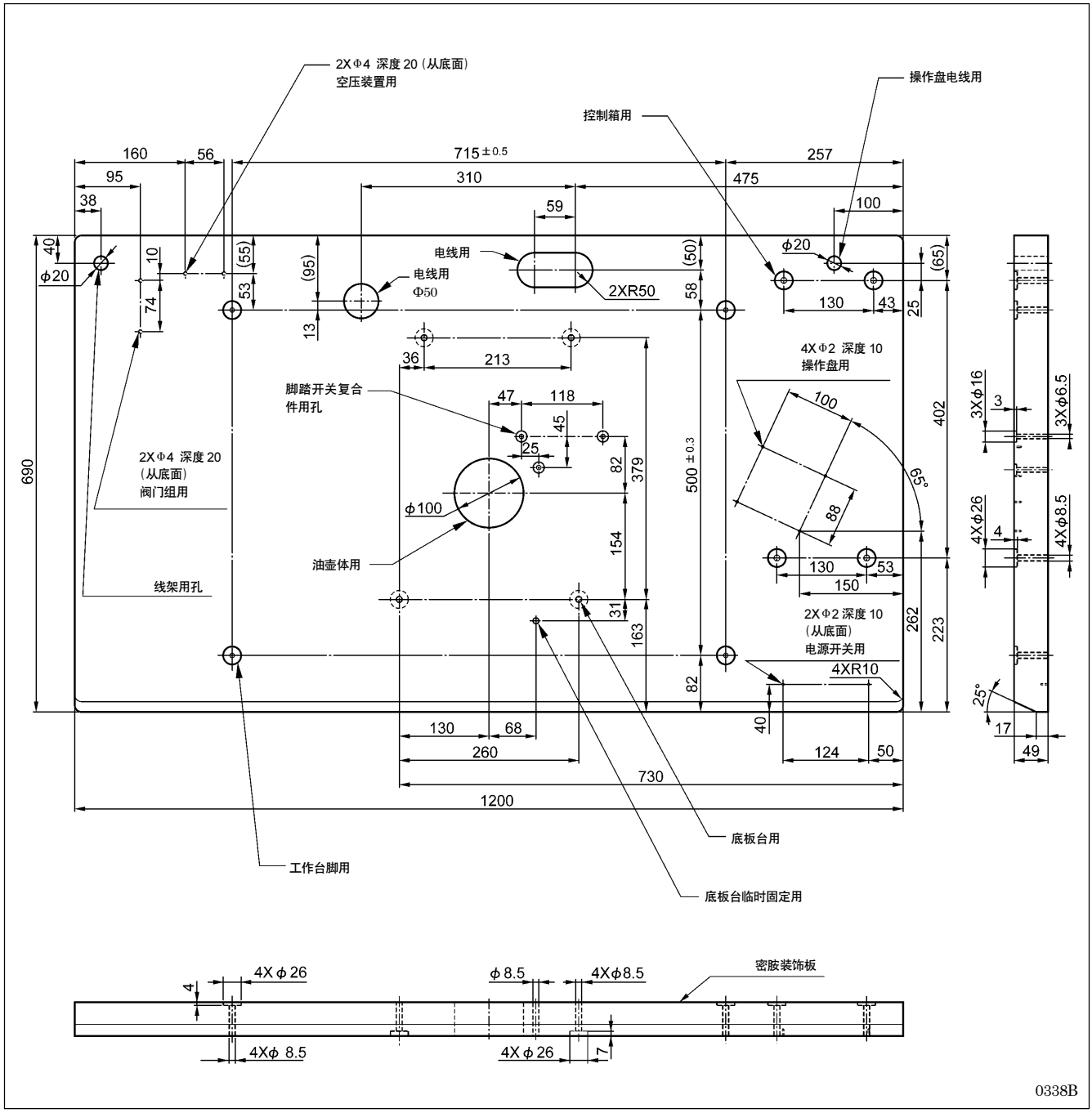
请注意工作台的厚度如超过 60㎜ 的话，附件中的螺栓和来自缝纫机头部的电线的长度均有可能不够长。

・ 如果使用小脚轮时，请使用能够承受缝纫机的总重量的脚轮。

・ 请确认控制箱应安装在离台脚 10㎜ 以上处。控制箱离台脚太接近的话，易使缝纫机产生错误动作。

・ 工作台板的加工方法有搁放在工作台上和半嵌入工作台中，这 2 种不同的安装方法。请根据自己需要的安装方法，参考加工图，进行钻孔。

3-1-1. 搁放在工作台上时

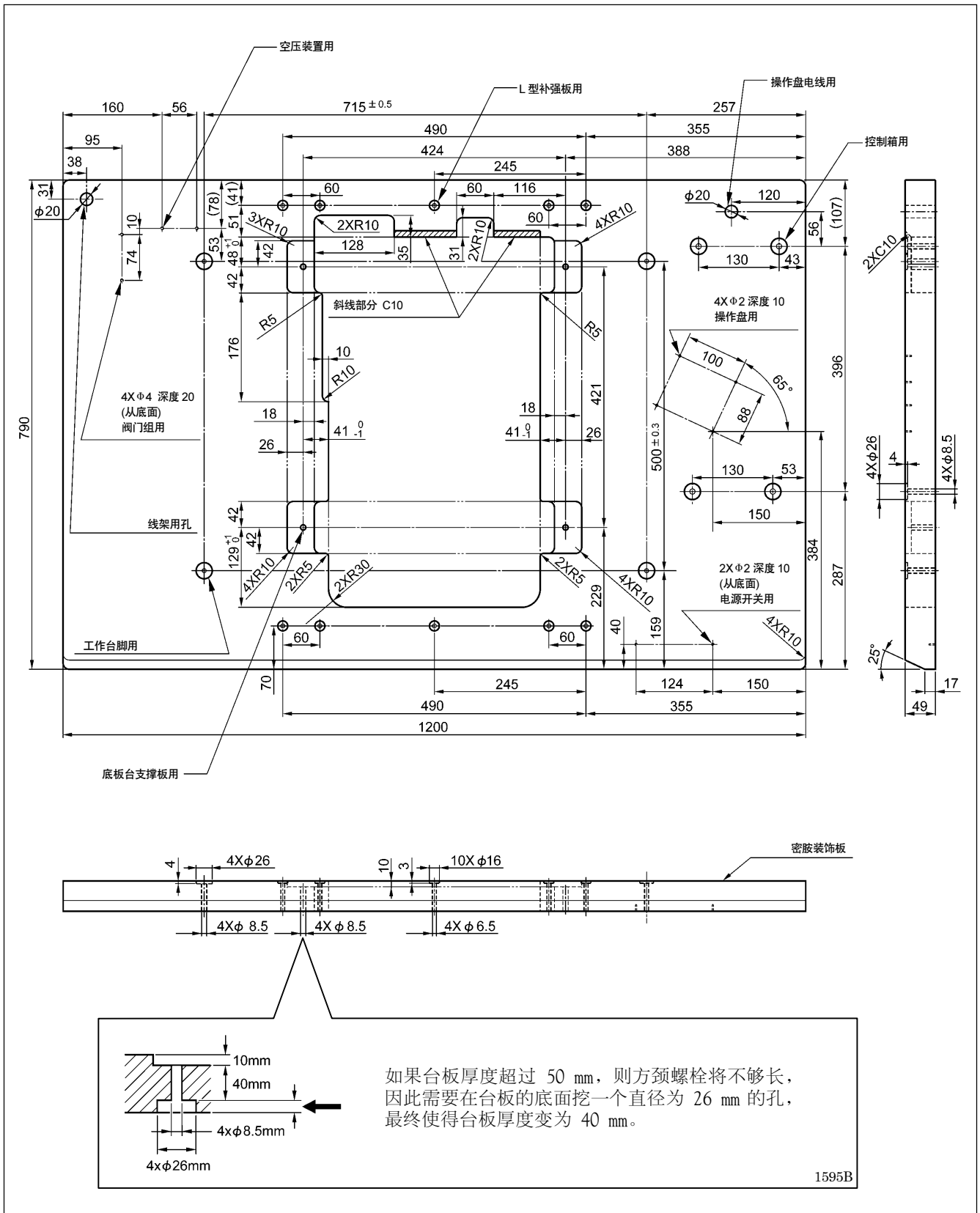


3-1-2. 半嵌入工作台中时

当使用半嵌入工作台中时，另外有需要的零部件，请向购买店询问。

[注意]

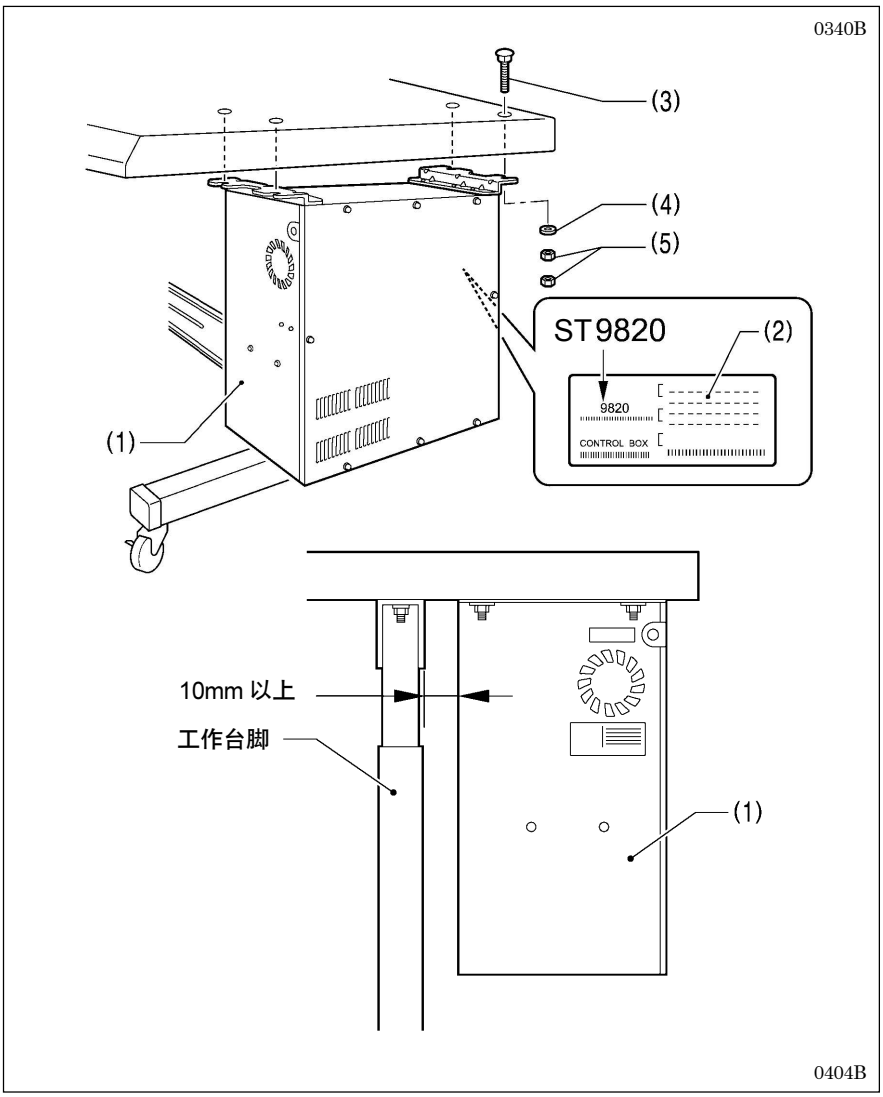
使用半嵌入式时，请一定在工作台上安装L型补强板。(具体请参考「3-3. 工作台补强板的安装法(半嵌入式)」)



3-2. 控制箱的安装法

⚠ 注意

在安装时，请注意不要使控制箱滑落。
会成为脚压伤及控制箱出故障的原因。

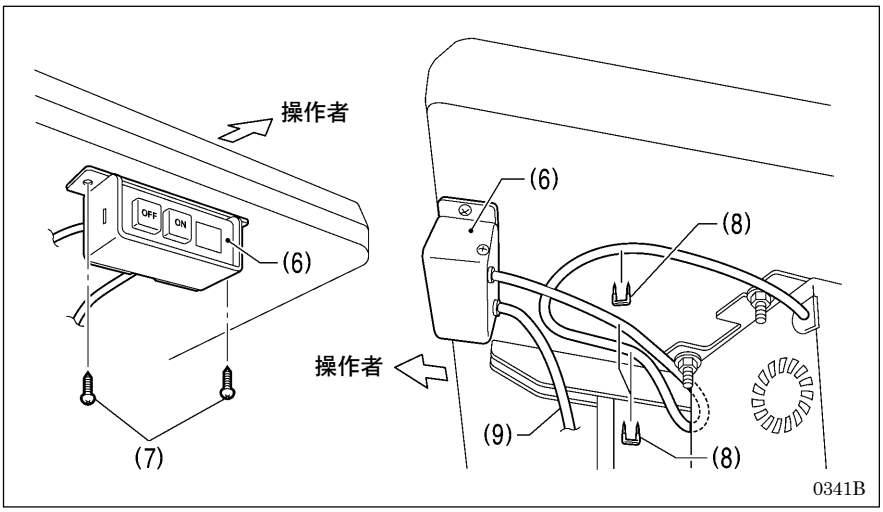


在安装前，请先确认控制箱(1)上形式板(2)上的机种名、及表示缝纫机ST-9820用的控制箱号<RX9820>。

(1) 控制箱
(3) 螺栓［4个］
(4) 垫圈［4片］
(5) 螺母［8个］

[注意]

请确认控制箱(1)应安装在离台脚10mm 以上处。控制箱(1)离台脚太接近的话，易使缝纫机产生错误动作。



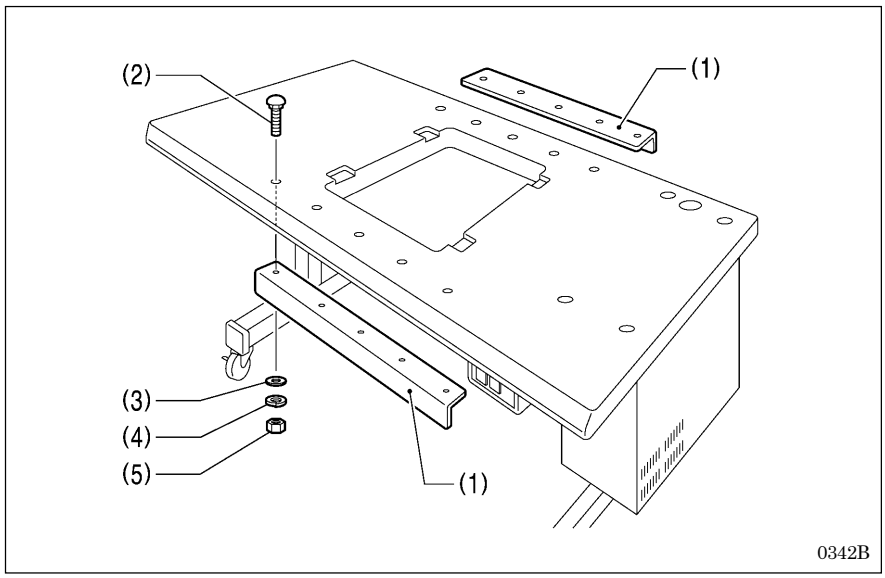
(6) 电源开关
(7) 木螺钉［2个］
(8) 卡钉［5个］

* 电源线(9)请根据电源插座的位置，使用剩下的2个卡钉将其固定在适当的位置。

[注意]

请注意钉入卡钉(8)时，不可将电源线(9)穿通，或钉破电源线(9)。

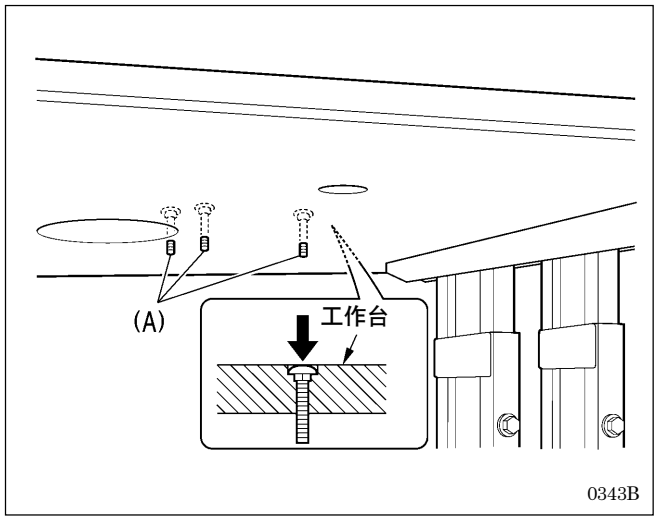
3-3. 工作台补强板的安装法(半嵌入式)



(1) L 型补强板[2 块]
(2) 螺栓[10 个]
(3) 垫圈[10 片]
(4) 弹簧垫圈[10 片]
(5) 螺母[10 个]

3-4. 缝纫机头部的安装法

3-4-1. 搁放在工作台上时



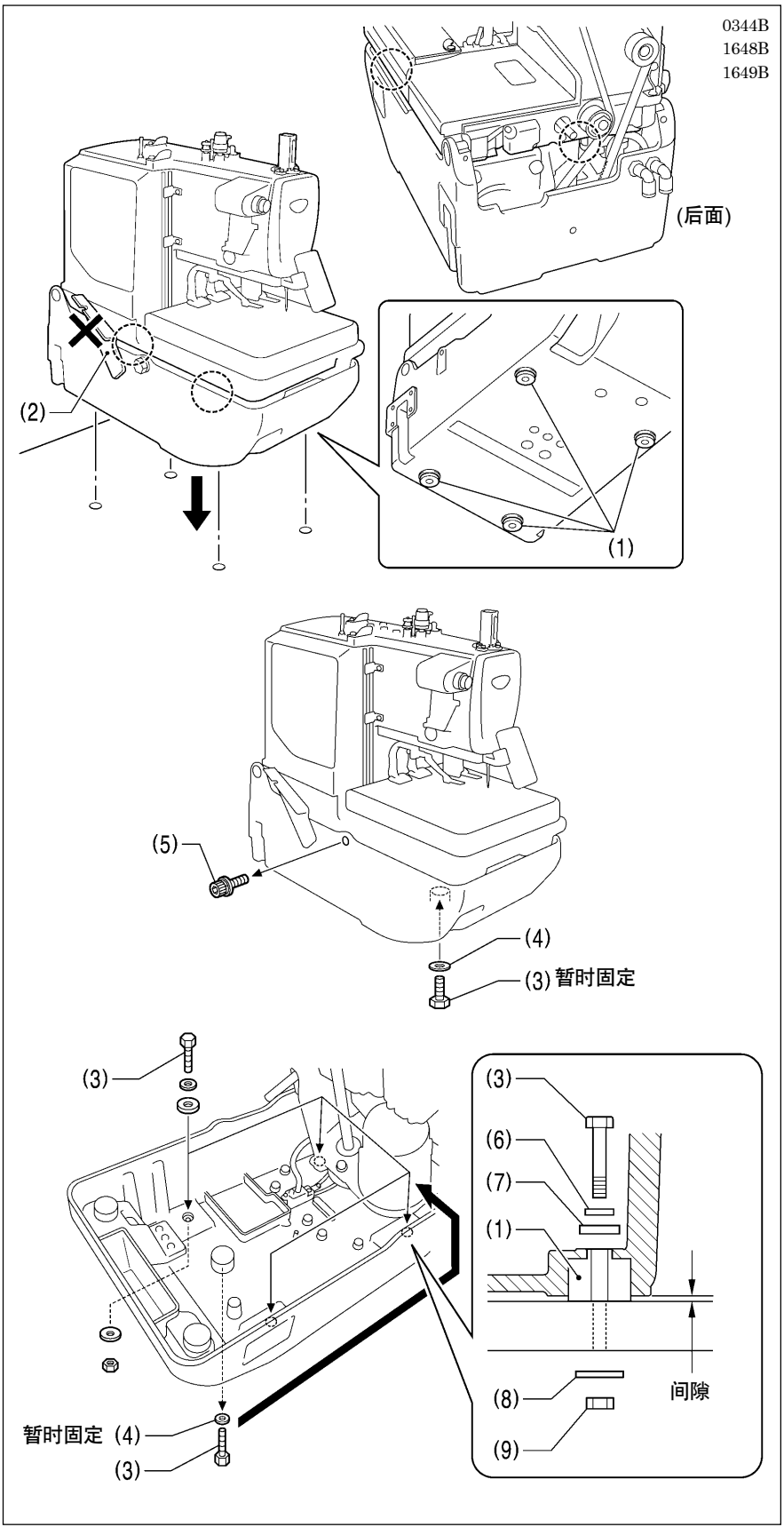
<只使用脚踏板时>
在安装缝纫机头部前，请先将安装脚踏开关复合件用的螺栓(A)[3 个]拧到工作台板上。
* 螺栓(A)的头部不可以高出工作台面，请将螺栓完全拧入。

(具体请参考「3-12. 脚踏开关复合件的安装法(使用脚踏板时)」)

(下一页继续)

⚠ 注意

在进行下述 4 个步骤将缝纫机头倒下时，请一定在拧上临时固定用螺栓后再操作。缝纫机倒下或滑落是造成受伤或缝纫机损坏的原因。



1. 请确认底板台防震垫(1)[4 个]是否安装在底板台的底部，将缝纫机搁放在工作台上。

   [注意]

   - 将缝纫机机头搁放在工作台上面时，请 4 人以上用手握住如图所示的虚线部(◌部)后同时进行安装。
   - 请不要用手握住头部支撑手柄(2)。

2. 将螺栓(3)[4 个]中的一个和垫圈(4)一起使用，从工作台的下面向底板台进行临时固定。
3. 底板台临时固定完后，取下固定用的螺栓(5)。
4. 倒下缝纫机头部，将螺栓(3)[4 个]中的三个螺栓在底板台的三处固定。(有关头部的倒下方法具体请参考「3-5. 缝纫机机头的倒下和竖起法」)

   (6) 垫圈[4 个]
   (7) 橡皮垫[4 片]
   (8) 垫圈(大)[4 片]
   (9) 螺母[4 个]

   [注意]

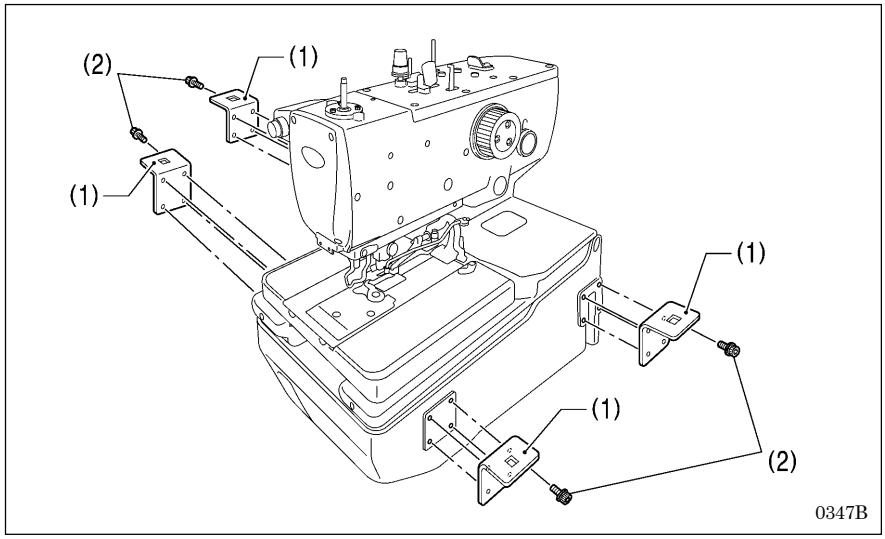
   应在工作台板和底板台之间留有一定的间隙，请不要将螺栓(3)旋得过紧。

5. 取下临时固定用的螺栓(3)和垫圈(4)，将剩下的一处固定。

[注意]

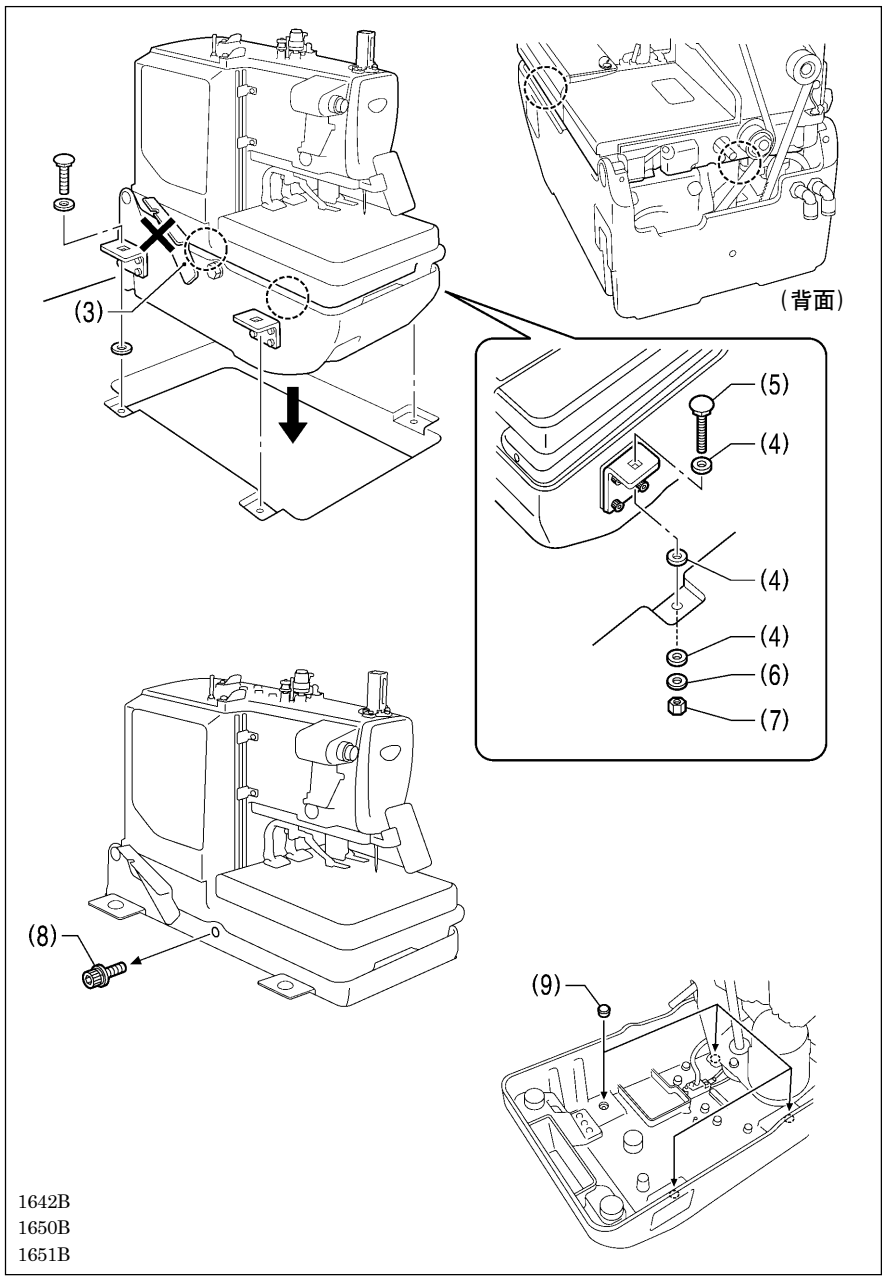
固定用的螺栓(5)在移动缝纫机时，必须要使用的，请注意保管好。

3-4-2. 半嵌入工作台中时



(1) 底板台支撑板[4 个]
(2) 螺钉[16 个]

* 请水平安装底板台。



[注意]
- 将缝纫机机头搁放在工作台上面时，请 4 人以上用手握住如图所示的虚线部(◌部)后同时进行设置。
- 请不要用手握住头部支撑手柄(3)。

(4) 橡皮垫[12 片]
(5) 螺栓[4 个]
(6) 垫圈(大)[4 片]
(7) 螺母[4 个]

缝纫机机头安装完了后，取下固定用的螺栓(8)。

使缝纫机头向后靠并将橡皮塞(9)安装到底板台的四个孔中。

[注意]
- 固定用的螺栓(8)在移动缝纫机时，必须要使用的，请注意保管好。
- 请确保使用橡皮垫(4)。如果没有使用橡皮垫，则振动量将超标。

3-5. 缝纫机机头的倒下和竖起法

⚠ 注意

缝纫机头倒下或竖起时，请用双手进行操作。

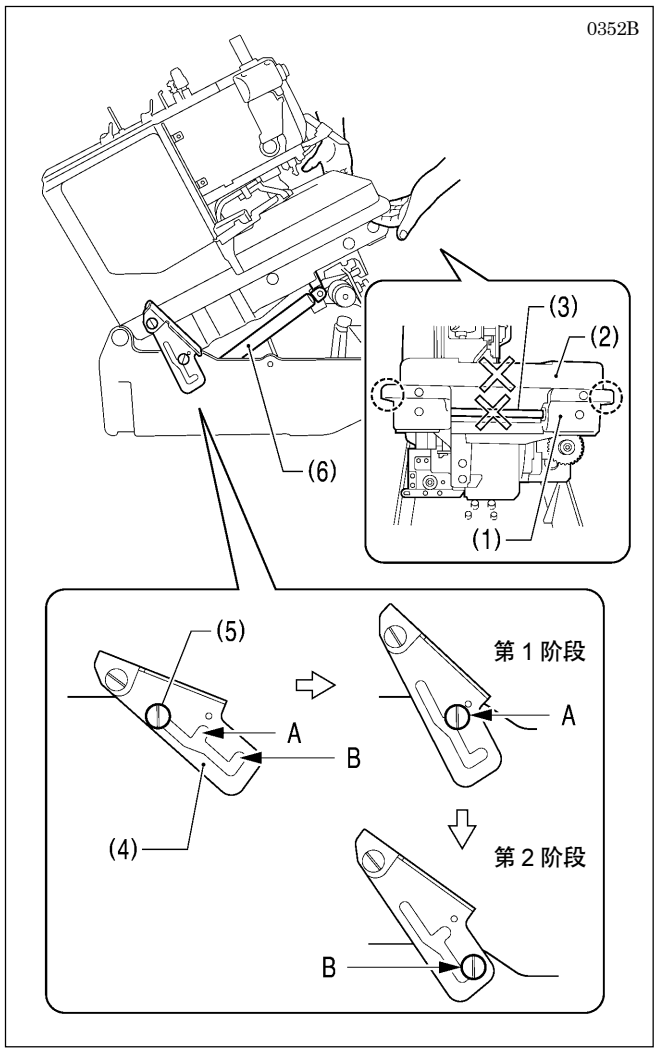
另外在缝纫机头倒下的状态下，请不要用力压缝纫机。如缝纫机失去平衡，缝纫机(特别是工作台)滑落到地上是造成受伤或缝纫机损坏的原因。

请不要用手握住送布台(2)及送布导向轴(3)。如果送布台(2)及送布导向轴(3)脱落的话，缝纫机头落下是造成受伤或缝纫机损坏的原因。

缝纫机头部可以根据需要的高度分 2 阶段倒下或竖起。

[注意]

缝纫机机头的倒下和竖起时，请一定要切断电源后再进行操作。



<缝纫机机头的倒下方法>

1. 如图所示，使用双手握住底板(1)的两侧(如图的虚线◯部)。
2. **倒向第 1 阶段为止:**
   将缝纫机头部慢慢地抬起，直到头部支撑手柄(4)在铰链支撑轴(5)的 A 部处完全嵌入(发出“卡查”的声音)为止。
3. **倒向第 2 阶段为止:**
   先抬起头部支撑手柄(4)，让铰链支撑轴(5)从 A 部离开后，再慢慢地抬起缝纫机头部，直到头部支撑手柄(4) 完全嵌入到 B 部为止。

   [注意]

   缝纫机头部在抬到第 2 阶段之前由于缓冲器(6)一旦停止，但该状态并没有被锁住。请一直抬到确认头部支撑手柄(4)完全嵌入到让铰链支撑轴(5)的 B 部为止。

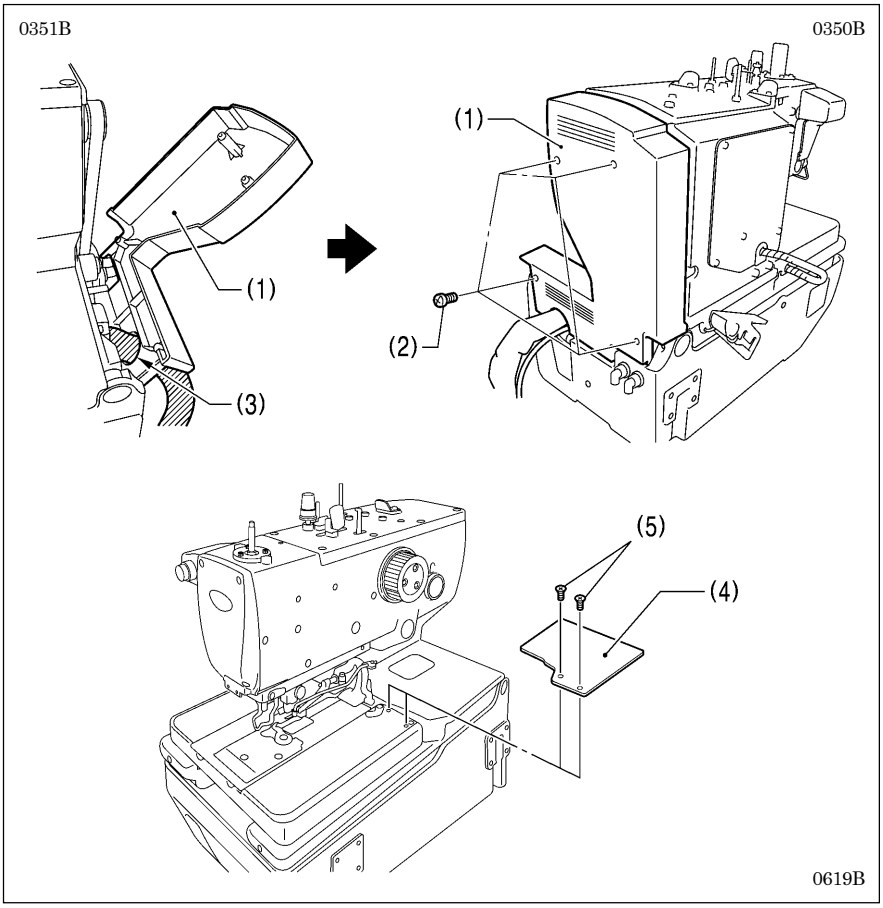
⚠ 注意

请一定要确认头部支撑手柄(4)和铰链支撑轴(5)是完全嵌入在一起。如缝纫机头突然倒回是造成受伤的原因。

<缝纫机机头的竖起方法>

1. **从第 2 阶段开始竖起:**
   将缝纫机头部抬起，头部支撑手柄(4)从铰链支撑轴(5)的 B 部离开后，使用双手握住底板的两侧轻轻地竖起机头。
   * 缓冲器(6)起作用之前机头已竖起，所以请一定用双手支撑住。
   * 返还到第 1 阶段后头部支撑手柄(4)在 A 部被锁住。
2. **从第 1 阶段开始竖起:**
   将缝纫机头部稍稍抬起，头部支撑手柄(4)从铰链支撑轴(5)的 A 部离开后，使用双手握住底板的两侧轻轻地竖起机头。

3-6. 皮带罩和送料台盖 U 的安装法



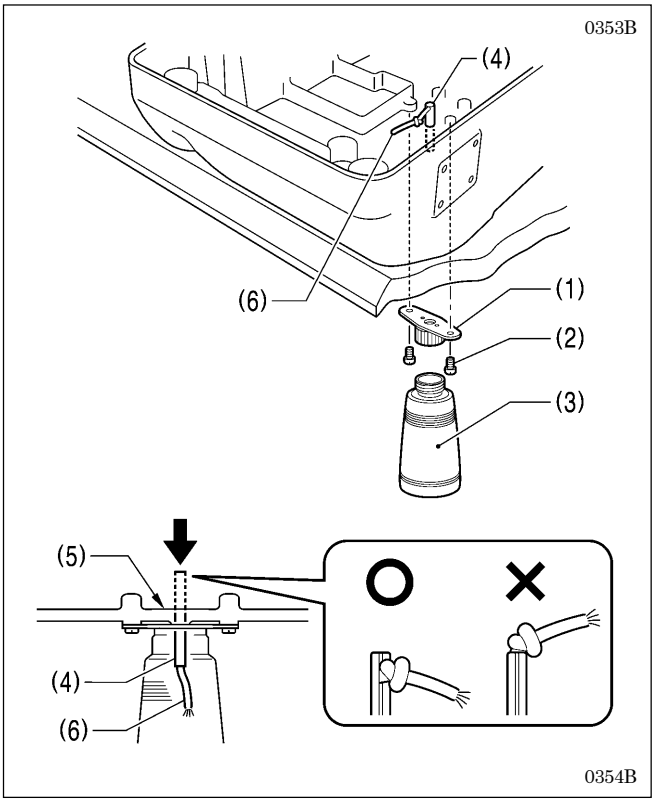
(1) 皮带罩
(2) 固定螺钉[4 个]
・ 在安装皮带罩之前，先将电线类从皮带罩的切口部(3)处通过。

[注意]
・ 在安装皮带罩时，请注意不可夹住电线类。有可能会将皮带罩及电线类损坏。
・ 对于半嵌入工作台式，在倒下缝纫机头时，请确认皮带罩(1)不可接触到工作台。

(4) 送料台盖 U
(5) 螺钉[2 个]

[注意]
请注意如果螺钉(5)拧的过紧的话，送料台盖 U(4)有可能会裂开。

3-7. 油壶体的安装法

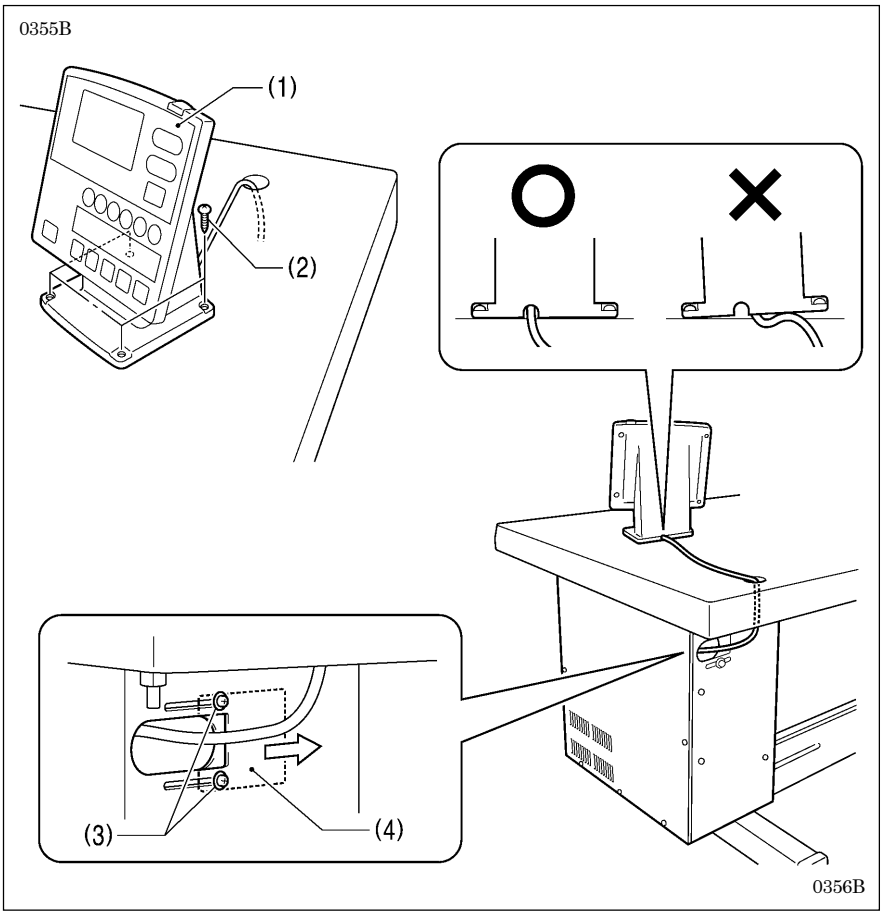


安装是在缝纫机头倒下的状态下进行。
(具体请参考「3-5. 缝纫机机头的倒下和竖起法」)

(1) 废油盖支撑
(2) 固定螺钉[2 个]
(3) 油壶体
(4) 废油用弹簧销

・ 使用榔头等将弹簧销(4)的端部打入到和油盘(5)的底部一样平为止。
[注意]
在敲打弹簧销(4)时，请注意确认如左图所示的油线(6)的结头应该比弹簧销(4)的上部稍稍降下些。如果油线结头在弹簧销(4)的上部，使用榔头敲时会造成油线(6)断裂的原因。
・ 安装完成后，将缝纫机头竖起复位。

3-8. 操作盘的安装法



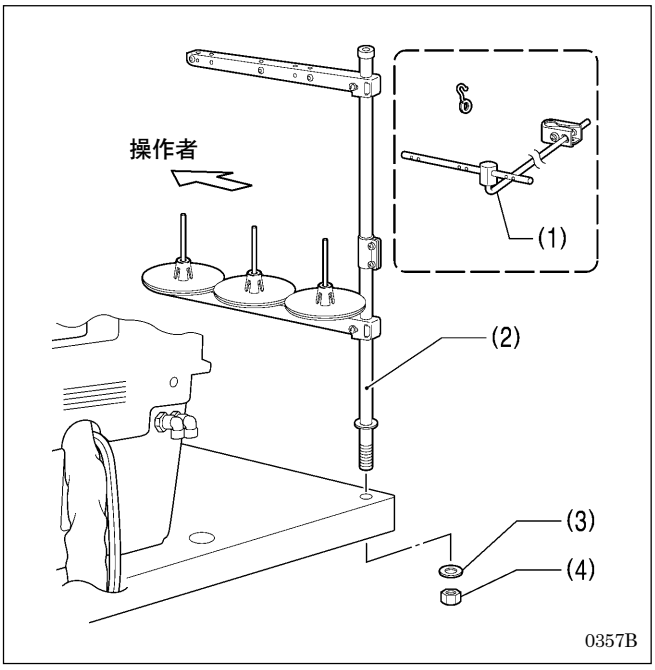
(1) 操作盘
(2) 木螺钉[4 个]

1. 将操作盘(1)的电线穿过工作台上的孔。
2. 松开控制箱后面的螺钉(3)［2 个］后，电线压板(4)按箭头方向拉开，将电线穿过孔进入控制箱内。(关于操作盘的安装位置具体请参考「3-1. 工作台板加工图」)

[注意]

在工作台上拧紧螺钉时，请注意确认不可夹住操作盘电线。有可能会成为电线损坏的原因。

3-9. 线架的安装法



线架应安装在缝纫机的正面的工作台的左上角处。

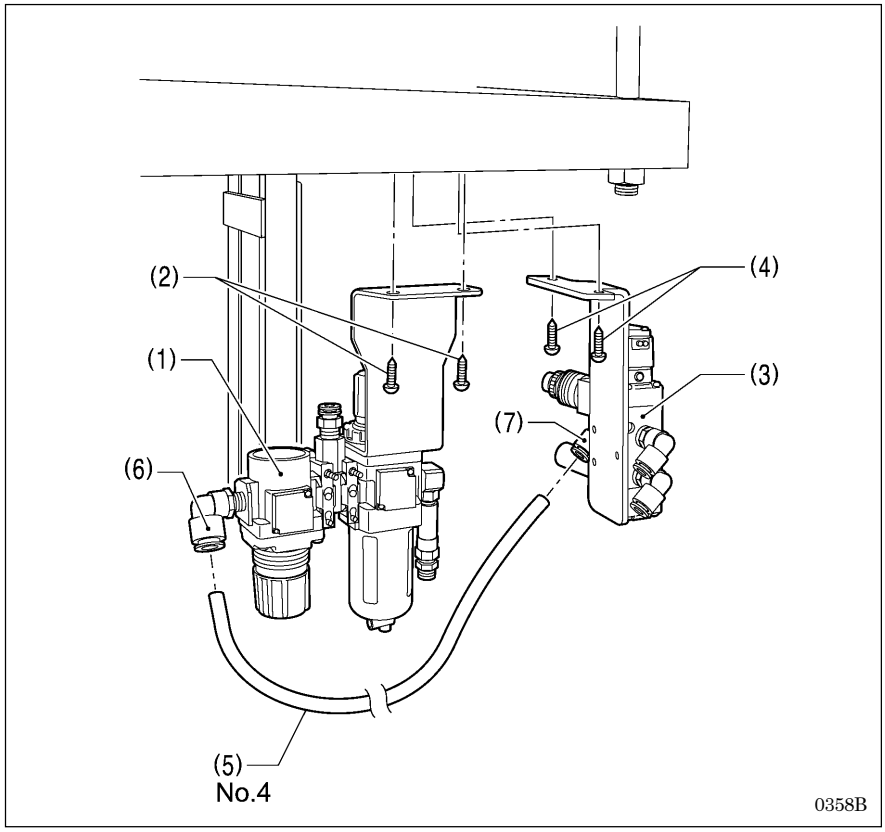
* 请不要使用线架的附属品线导向(1)。

(2) 线架
(3) 垫圈
(4) 螺母

[注意]

- 线架不可移动，请完全拧紧、及固定线架。
- 线架也可安装在工作台的右上角处，但在这种情况时要改变穿线的方法。(具体请参考「4-5. 线架安装在右上角时的穿线法」)

3-10. 空压装置和阀门组的安装法



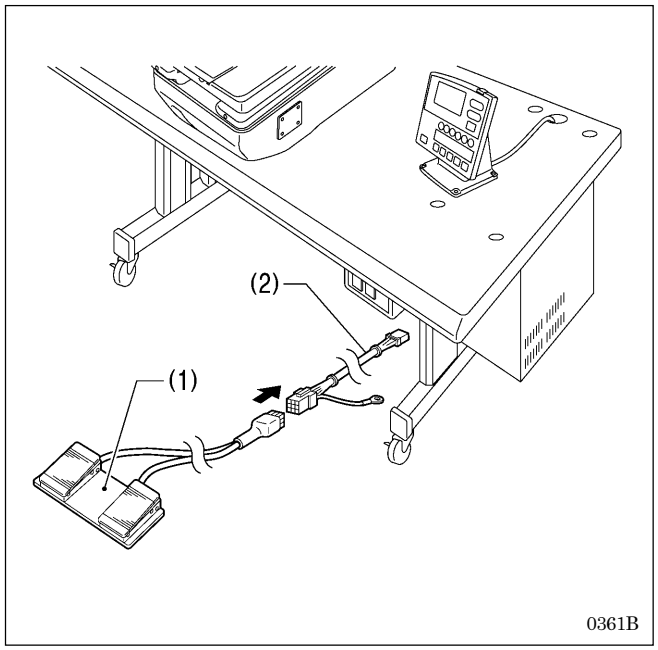
安装在工作台的后面。(关于安装位置具体请参考「3-1. 工作台板加工图」)

(1) 空压装置
(2) 木螺钉[2 个]
(3) 阀门组
(4) 木螺钉[2 个]
(5) 空气管 No.4

将空气管 No.4(5)插入接头(6)和接头(7)。

[注意]
- 空压装置(1)不可碰到工作台脚。
- 安装时，请注意不要被零部件和抽屉的角等弄伤。

3-11.2 连脚踏板的安装法（使用 2 连脚踏板时）

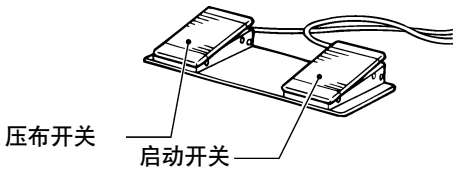


(1) 2 连脚踏板
(2) 脚开关变换配线

将脚开关变换配线(2)的插头从控制箱背面的孔中穿入到控制箱内。(具体请参考「3-8. 操作盘的安装法」)

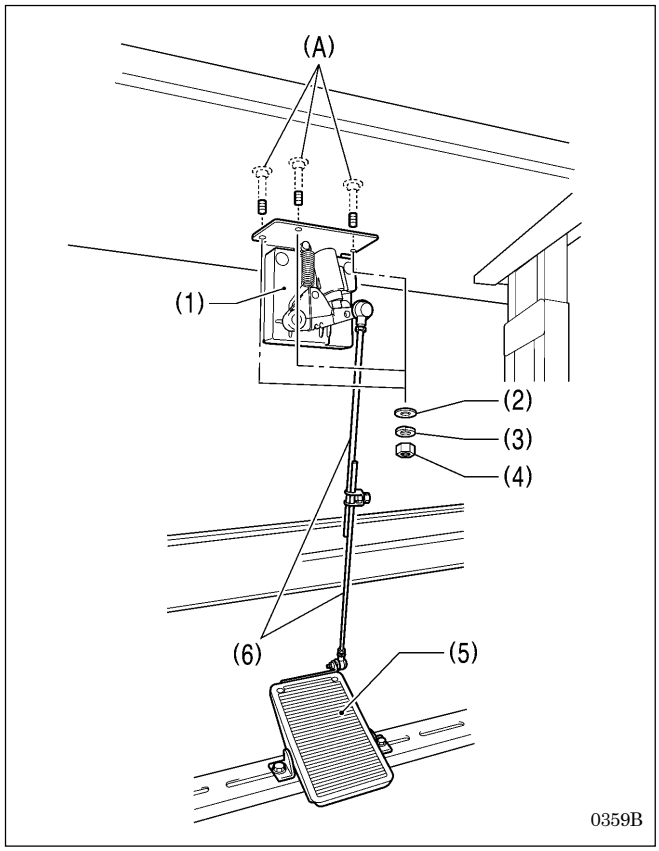
＜2 连脚踏板的操作方法＞

踩入压布开关(左侧) 压布夹降下，踩入启动开关(右侧)缝纫机将启动。



3-12. 脚踏开关复合件的安装法（使用脚踏板时）

3-12-1. 搁放在工作台上时

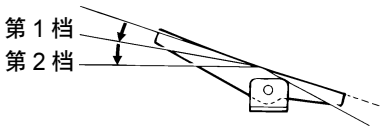


[注意]
在安装缝纫机头前，请先将安装脚踏开关复合件用的螺栓(A)［3个］旋到工作台上。(具体请参考「3-4-1. 搁放在工作台上时」)

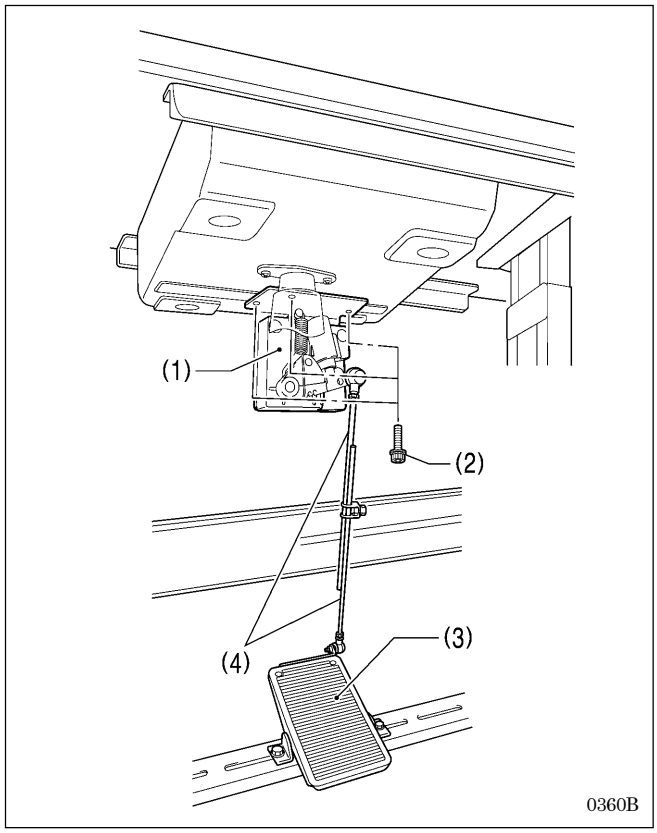
(1) 脚踏开关复合件
(2) 平垫圈［3片］
(3) 弹簧垫圈［3片］
(4) 螺母［3个］

将脚踏开关复合件(1)的插头从控制箱背面的孔中穿入到控制箱内。(具体请参考「3-8. 操作盘的安装法」)
* 脚踏板(5)及连接杆(6)请使用市场销售品。

＜脚踏板的操作方法＞
踩入脚踏板(5)到第1档时，压布夹降下。踩入到第2档时，缝纫机将启动。



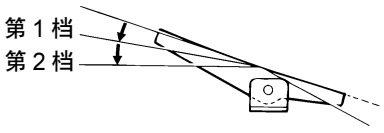
3-12-2. 半嵌入工作台中时



(1) 脚踏开关复合件
(2) 螺钉［3个］

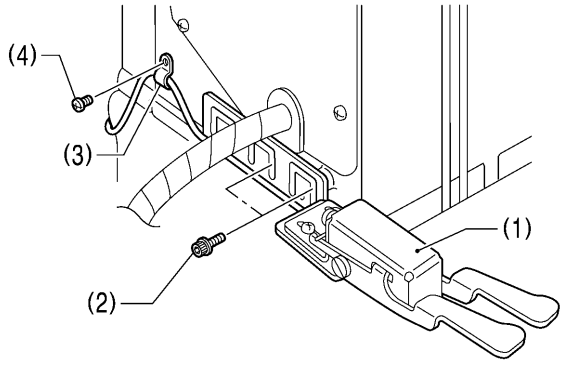
将脚踏开关复合件(1)的插头从控制箱背面的孔中穿入到控制箱内。(具体请参考「3-8. 操作盘的安装法」)
* 脚踏板(3)及连接杆(4)请使用市场销售品。

＜脚踏板的操作方法＞
踩入脚踏板(3)到第1档时，压布夹降下。踩入到第2档时，缝纫机将启动。

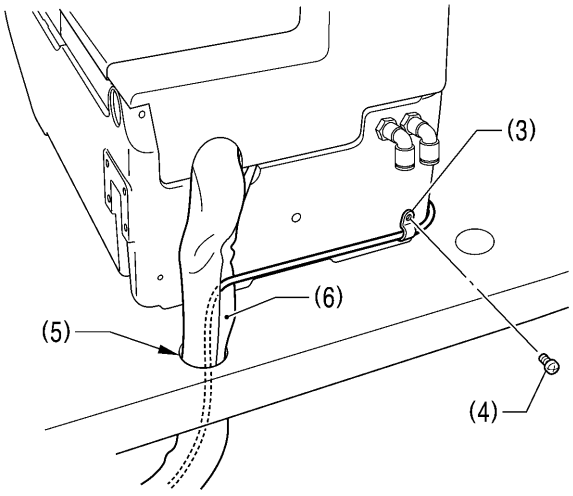


3-13. 手动开关的安装法（使用手动开关时）

0362B

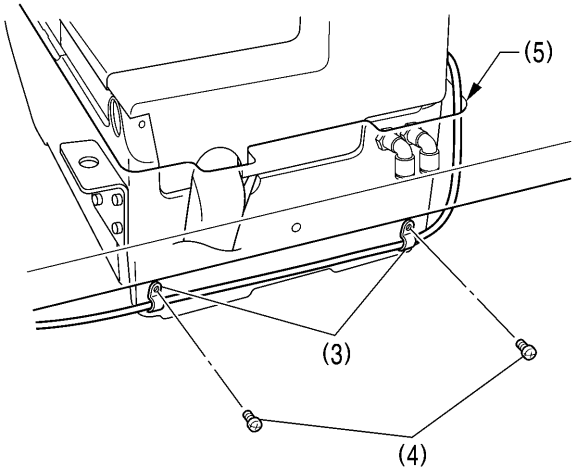


[搁放在工作台上时]



0363B

[半嵌入工作台中时]



0385B

(1) 手动开关
(2) 螺钉[2 个]
(3) 尼龙线夹[3 个]
(4) 螺钉[3 个]

* 搁放在工作台上时，尼龙线夹(3)和螺钉(4)只要各使用 2 个即可。

将手动开关(1)的电线从工作台上的孔(5)中穿入，其插头再从控制箱背面的孔中穿入到控制箱内。(具体请参考「3-8. 操作盘的安装法」)

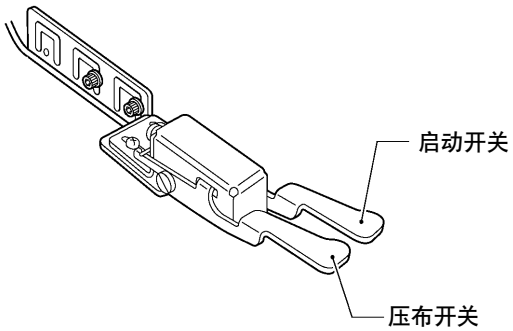
[搁放在工作台上时]

电线放入护管(6)中一起从工作台上的孔(5)中穿入。

* 护管是为了防止缝纫机头倒下、竖起时，电线与工作台上的孔(5)因摩擦而产生电线损伤。

＜手动开关的操作方法＞

按下压布开关(左侧)压布夹降下，按下启动开关(右侧)缝纫机将启动。



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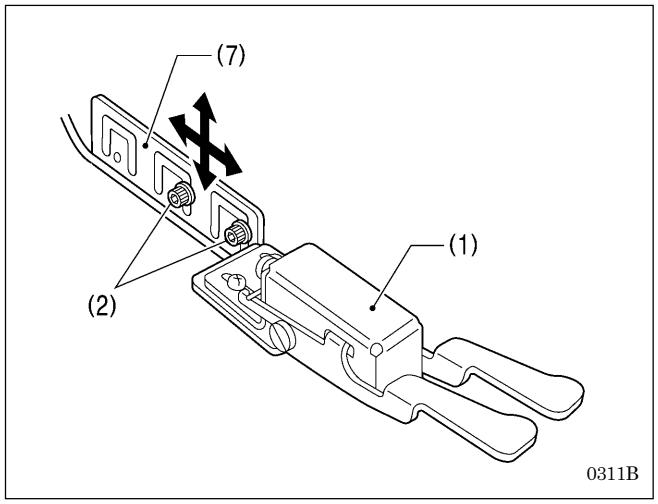
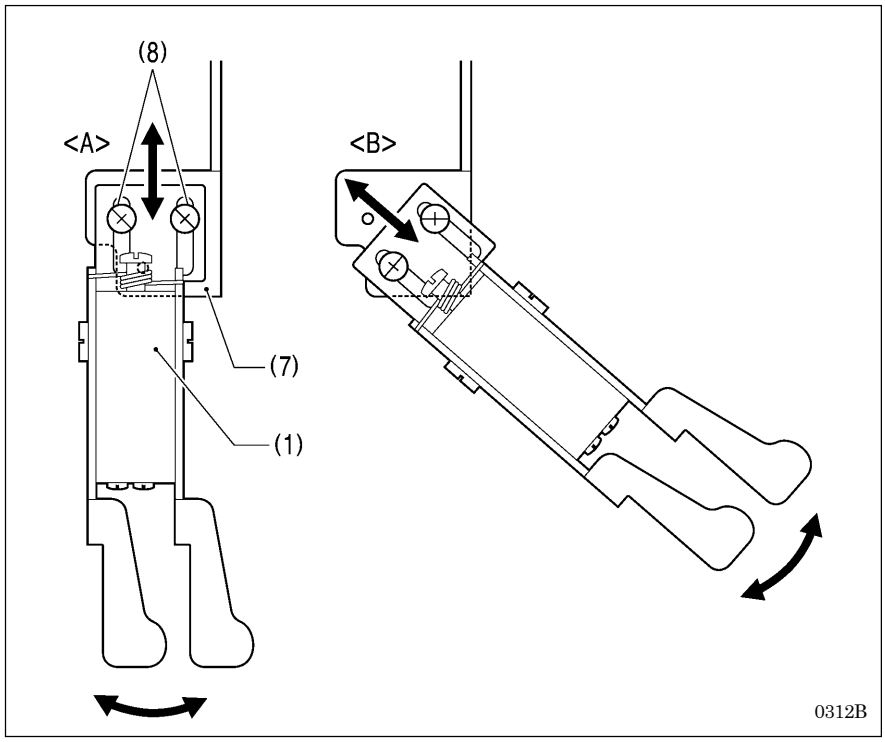


＜手动开关的位置调整＞

如下所述，可将手动开关(1)调整到容易操作的位置处。

[前后・上下位置]

1. 松开螺钉(2)[2 个]，将手动开关安装板(7)进行前后和上下移动来调整到最佳位置。
2. 调整完了后，用力拧紧螺钉(2)。

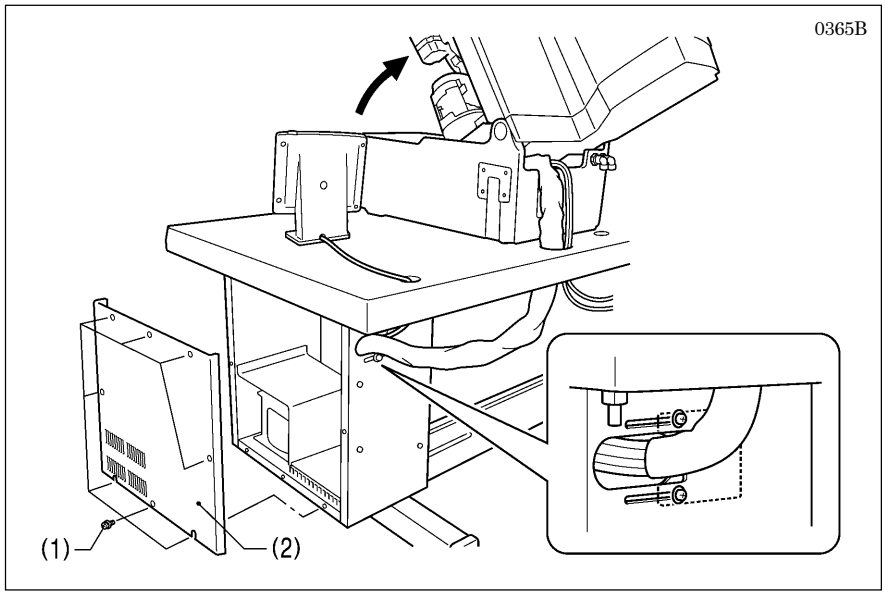


[前后・左右位置]

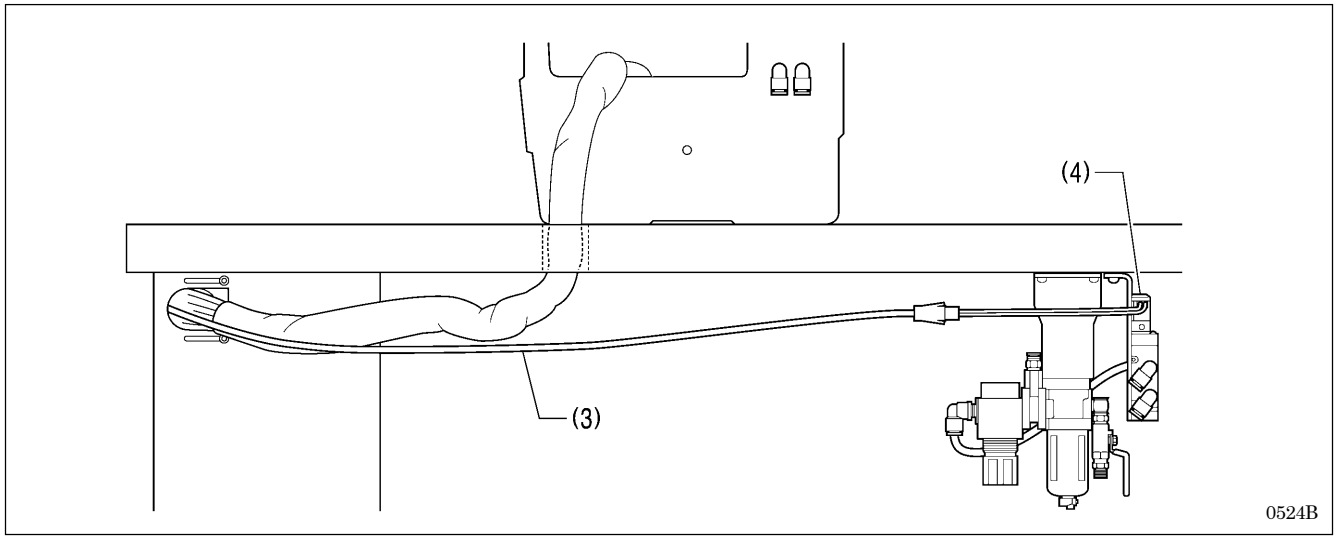
- 在手动开关安装板(7)上有 3 个螺钉孔。固定螺钉(8)可以根据不同的螺钉孔的位置如图<A>和图<B>所示，来选择所需的安装位置。
- 还有，松开固定螺钉(8)，能将手动开关(1)进行前后和左右移动来调整位置。调整完了后，用力拧紧固定螺钉(8)。

3-1 4. 电缆的连接

3-1 4-1. 控制箱内插头的接续



1. 先旋下固定螺钉(1)[8 个]，然后将控制箱盖(2)取下。
2. 慢慢将缝纫机头倒下。
3. 将整束电缆先从工作台上的孔中穿入，再从控制箱背面的孔中穿入到控制箱内。



4. 锤用阀接线(3)从控制箱背面的孔中穿入到控制箱内。

(4) 锤用阀

5. 根据 P. 19、20 的图和表所示，将各插头插入各插座。

[注意]

- 请注意插头和插座的方向，插入后一定要确认已锁住。
- 请注意不要将插头，插座拉的过紧，使用电线捆束夹和电线夹将电缆固定。

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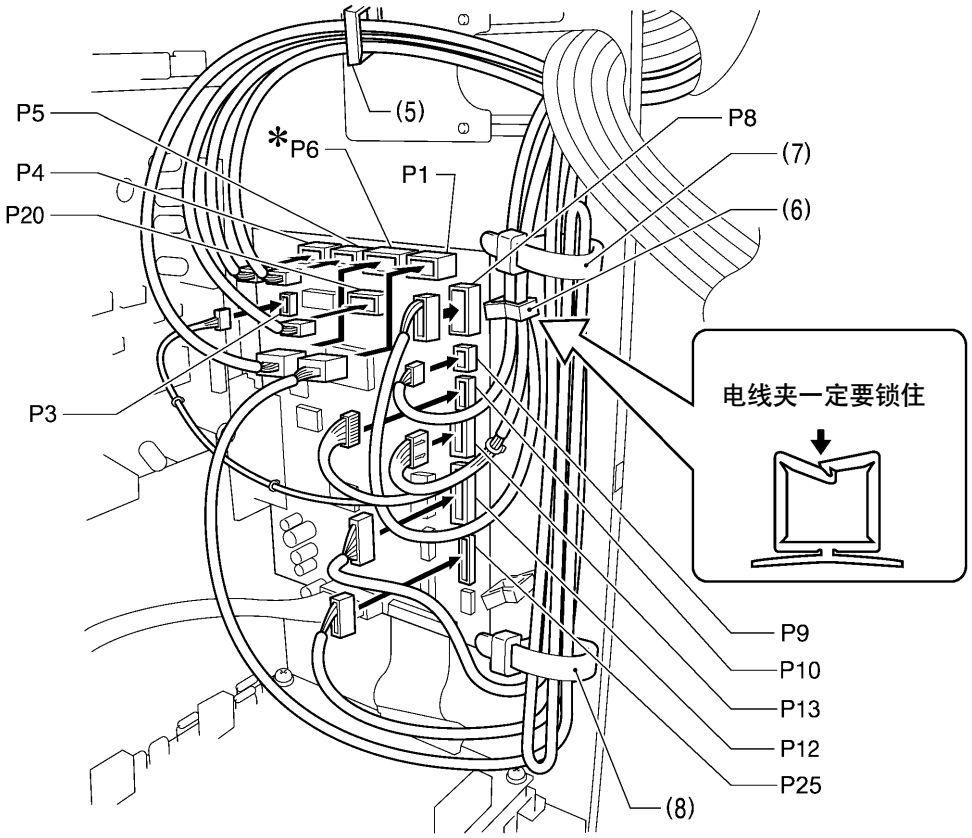
＜主基板＞



＊ **<使用 2 连脚踏板时>**
请一定要接地线。(具体请参考「3-14-2. 地线的连接」)

插头	主基板上插头的表示	电线夹
X 脉冲马达编码器 5 针 白色	P20(X-ENC)	(5)
Y 脉冲马达编码器 5 针 蓝色	P4(Y-ENC)	(5)
θ 送布马达编码器 5 针 黑色	P5(P-ENC)	(5)
(脚踏、2 连、手动)开关 10 针	P6(FOOT)	(5)
操作盘 8 针	P1(PANEL)	(7)、(8)
锤的位置感应器	P3(CUTTER)	(6)
头部安全开关 3 针	P9(HEAD-SW)	(6)
(Y 原点、冷却风扇)感应器 12 针	P8(SENSOR1)	(6)
暂停开关 6 针	P13(HEAD)	(6)
(针摆、底线剪线 OFF)感应器 6 针	P10(SENSOR2)	(6)
阀接线 12 针	P12(AIR1)	(7)、(8)
锤用阀接线 10 针	P25(AIR2)	(7)、(8)

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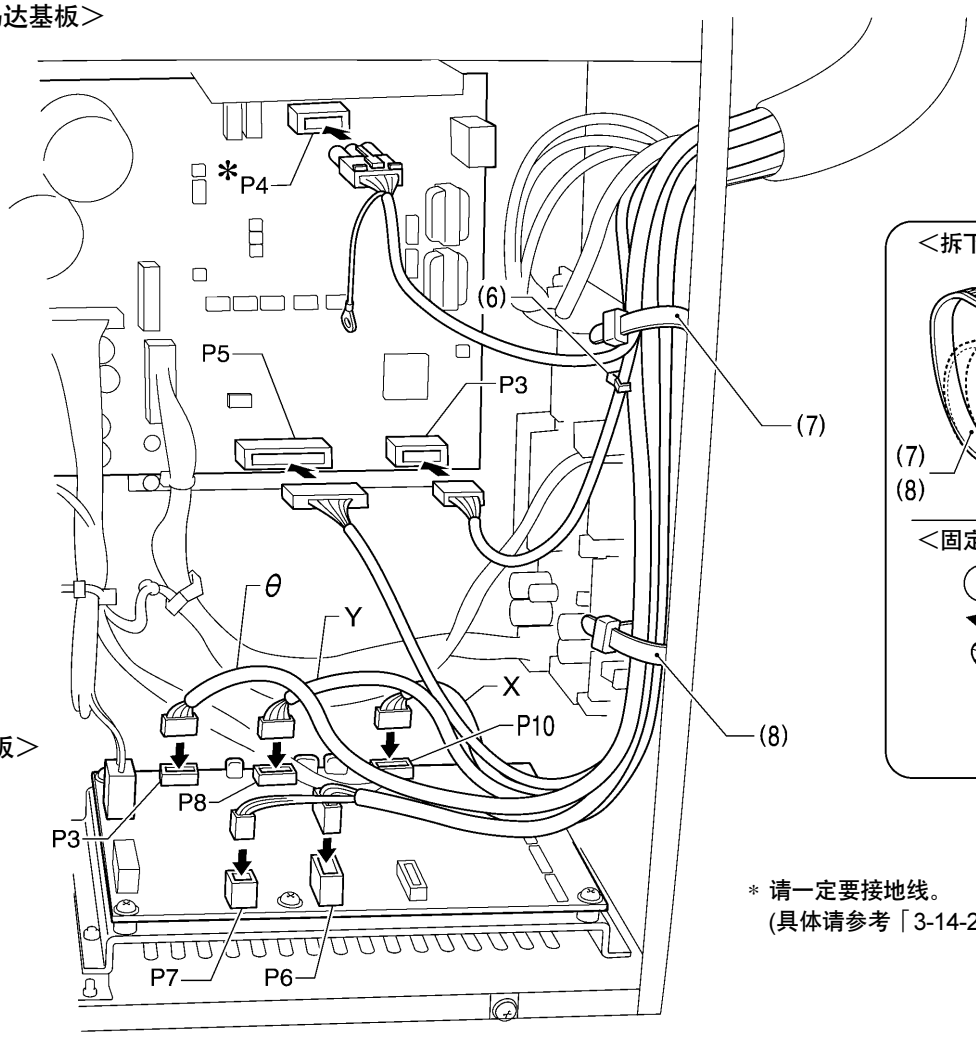
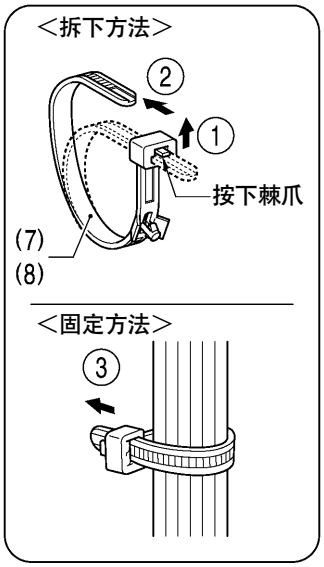
<电源马达基板>



<PMD 基板>



* 请一定要接地线。
(具体请参考「3-14-2. 地线的连接」)

插头	电源马达上插头的表示	电线夹 / 捆束夹
头部记录 7 针	P3(HEAD-M)	(6)
上轴马达 3 针	P4(UVW)	(7)
信号检出器 14 针	P5(SYNC)	(7)、(8)
插头	PMD 基板上插头的表示	捆束夹
θ 送布马达 4 针 黑色	P3(PPM)	(7)、(8)
(芯线压板，松底线) 电磁铁 6 针	P6(SOL1)	(7)、(8)
(松面线) 电磁铁 4 针	P7(SOL2)	(7)、(8)
Y 送布马达 4 针 蓝色	P8(YPM)	(7)、(8)
X 送布马达 4 针 白色	P10(XPM)	(7)、(8)

[注意]

X · Y · θ 送布马达接线在配线时请不要接触或碰到 PMD 基板。

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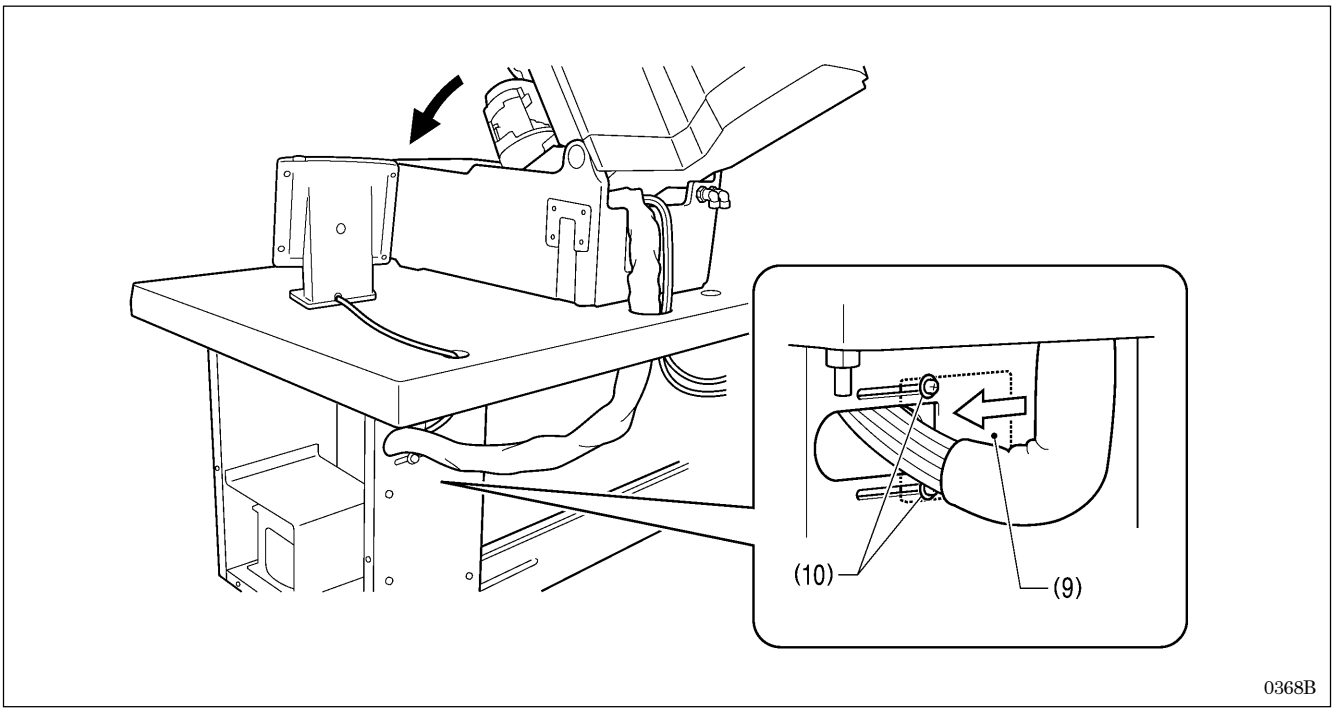


6. 电线压板(9)按箭头方向关上，拧紧螺钉(10)[2 个]。

[注意]

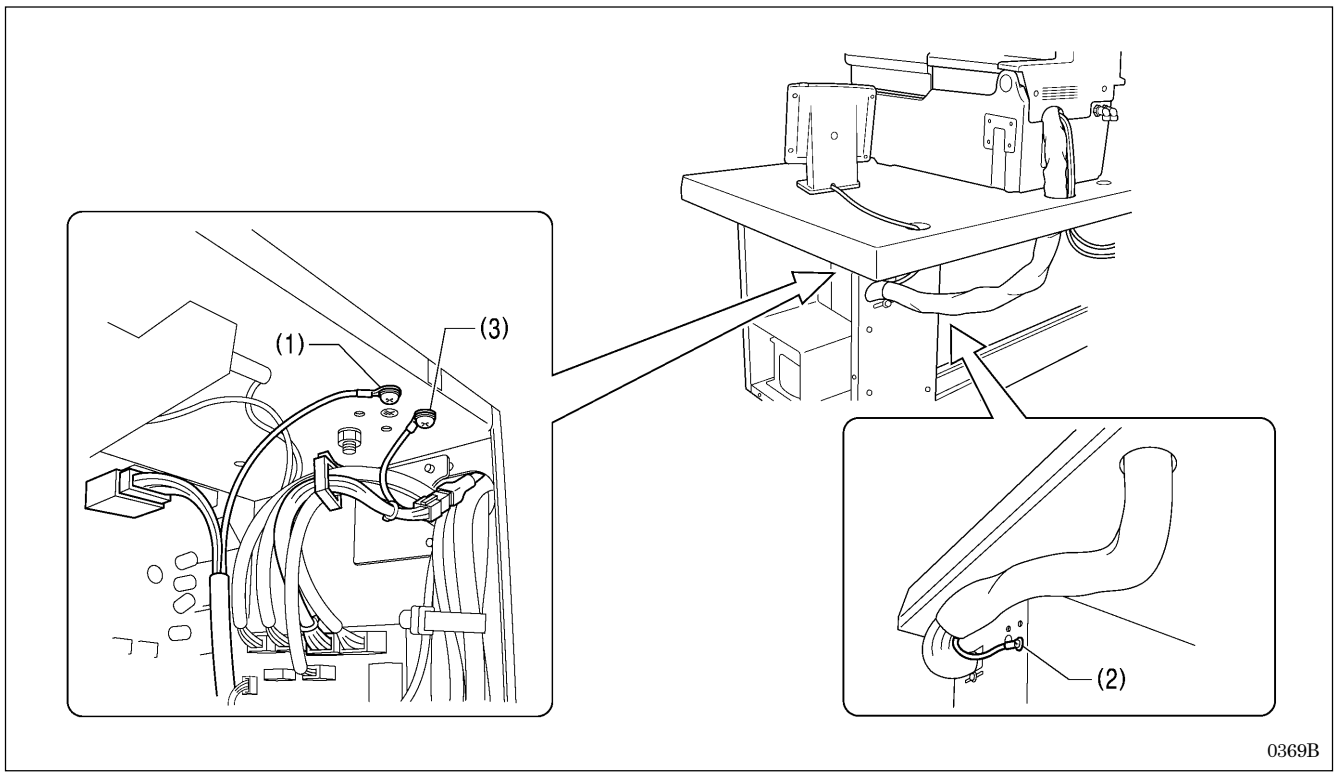
- 控制箱内的电缆线不可拉的过紧，及使控制箱外的电缆稍稍有些松弛。
- 请一定关紧电线压板(9)。不可让灰尘进入控制箱内，灰尘是产生故障的原因。

7. 确认了电缆线不是拉的过紧后，将缝纫机头慢慢竖起复位。

3-1 4-2. 地线的连接

⚠ 注意

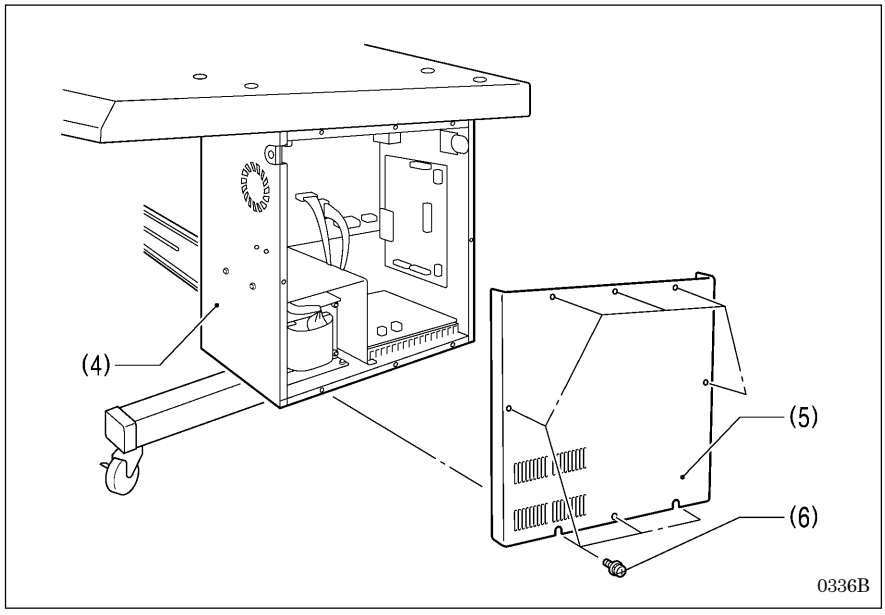
必须接地。
接驳地线不牢固，是造成触电或误动作的原因。



(1) 上轴马达连线中的地线
(2) 从缝纫机头部引出的地线
(3) 2 连脚踏板的脚踏开关变换连线的地线(使用 2 连脚踏板时)

[注意]

为了安全，请确认地线的正确连接。

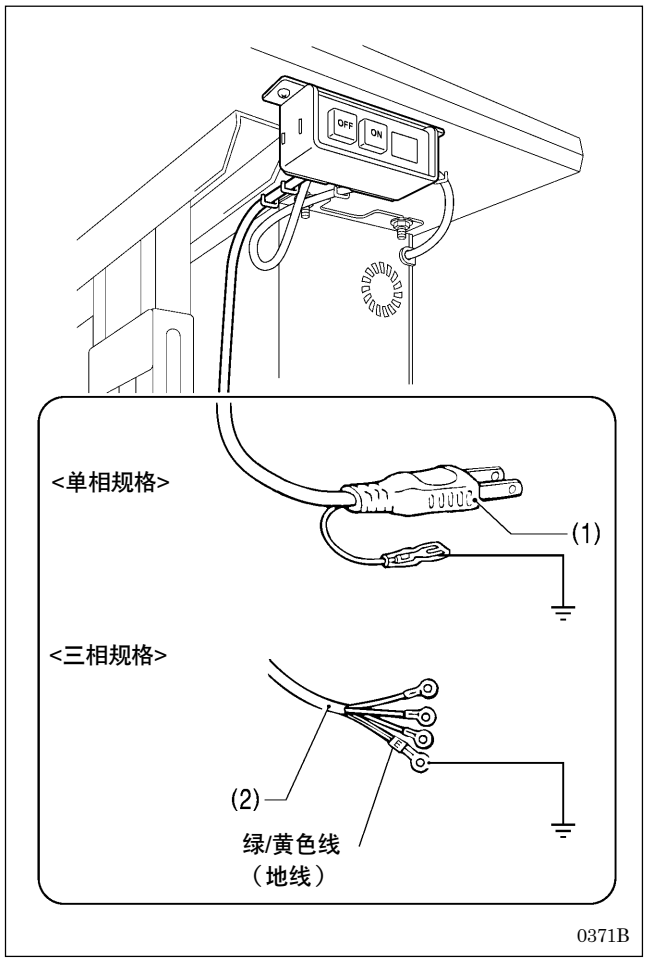


使用固定螺钉(6)[8 个]将控制箱(4)的盖(5)拧紧。此时请一定确认不可将电缆等被盖夹住。

3-1 4-3. 电源线的连接

⚠ 注意

必须接地。
接驳地线不牢固，是造成触电或误动作的原因。



<使用单相规格时>
将电源插头(1)插入电源插座。

<使用三相规格时>
1. 将电源线(2)接上适当的插头。(绿/黄色线是地线。)
2. 将电源插头插入有接地的 AC 插座。

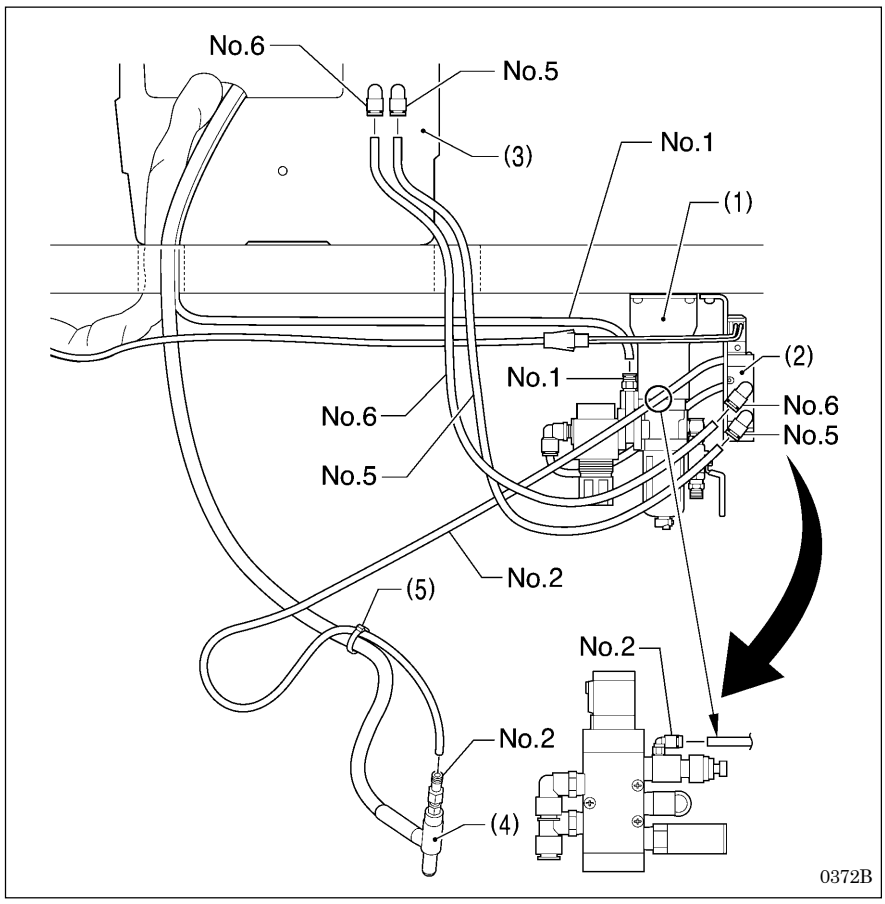
* 控制箱内部使用的是单相。

[注意]
请不要使用延长线，会成为缝纫机错误动作的原因。

3-1 4-4. 空气管的连接

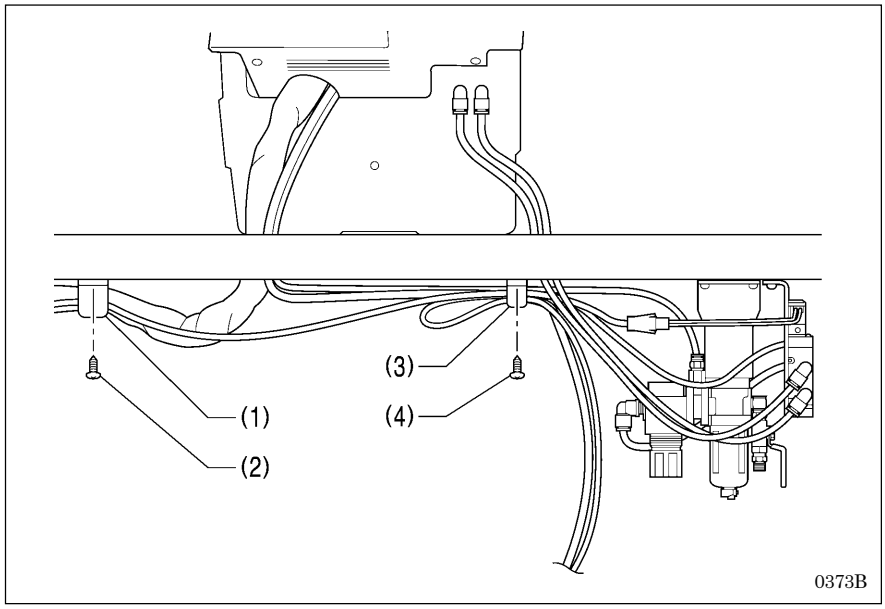
⚠ 注意

空气管 No.5 和 No.6 相互之间不可插错。如果插错的话，当接通电源时和打开空气阀时气锤会降下，是造成受伤的原因。



1. 在空压装置组(1)的接头处插上从缝纫机头部来的空气管 No. 1 。(从缝纫机引出的空气管均带有 No. 号。)
2. 将附带的空气管 No. 5 和 No. 6 分别插入电磁铁阀组(2)和底板台(3)的接头处。(当缝纫机头部搁放在工作台上时，请将空气管穿过工作台上的孔。)
3. 将附带的空气管 No. 2 的一端插入电磁铁阀组(2)和另一端插入文吐里管(4)的接头处。
4. 使用捆束夹(5)将其捆扎。

3-1 4-5. 连线的固定



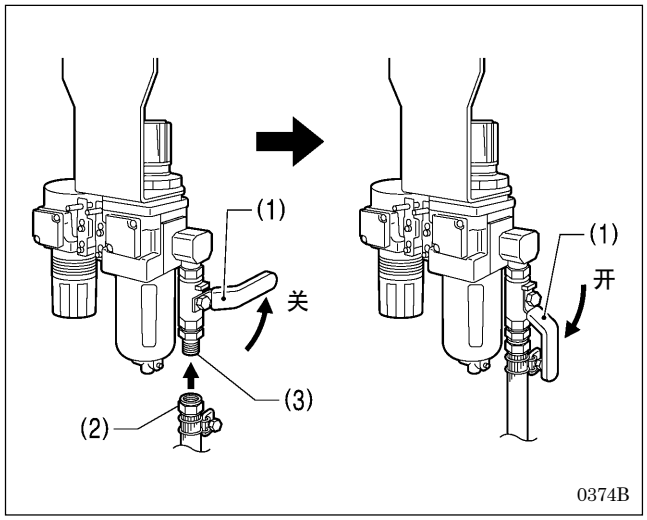
[注意]

在缝纫机头倒下的状态下，接线不要拉的过紧、带有一定的余量的情况，将接线固定。

1. 将整束接线和锤阀连线一起穿过附件中的电线固定支架<大>(1)，使用木螺钉(2)在工作台的反面将其固定。
2. 将空气管和阀连线一起穿过附件中的电线固定支架<小>(3)，再用木螺钉(4)在工作台的反面将其固定。

3-15. 空气导管的安装法

请将从空压机处引出的空气导管和安装在工作台的反面的空压装置连接在一起。



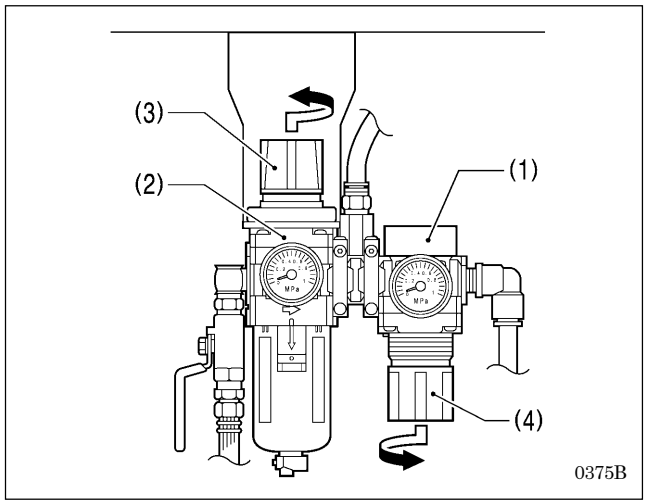
1. 关上空气阀(1)。
2. 回转空气导管前端的螺母(2)，将其与阀(3)连接。
3. 打开空压机侧的空气阀。
   * 请确认阀的连接部处有否泄漏空气。
4. 打开空气阀(1)。
   (表上的指针按顺时针方向回转。)
5. 调节空气压力。

[注意]

请将空气阀(1)慢慢打开。因为活塞有急遽运动的可能。

3-16. 气压的调节

将气锤压力调整用的调节器(1)的气压调节到可切断布料的最低压力。
作为标准的空气压力，请将主调节器(2)上的气压调整到0.5MPa。

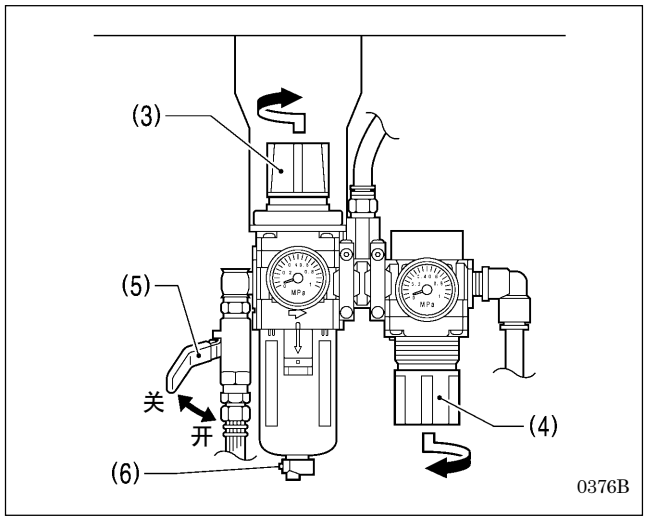


<要调高气压时>

1. 向上拉起主调节器(2)的旋钮(3)后，慢慢回转进行调节。
   * 旋钮(3)按箭头方向回转，气压升高。
2. 向下拉气锤压力调整用的调节器(1)的旋钮(4)，然后慢慢回转进行调节。
   * 旋钮(4)按箭头方向回转，气压升高。

[注意]

气锤压力调整用的调节器(1)的压力调整到 0.4Mpa。请不要随便提高此压力，会使切刀的切割锋利度降低和成为破损的原因。



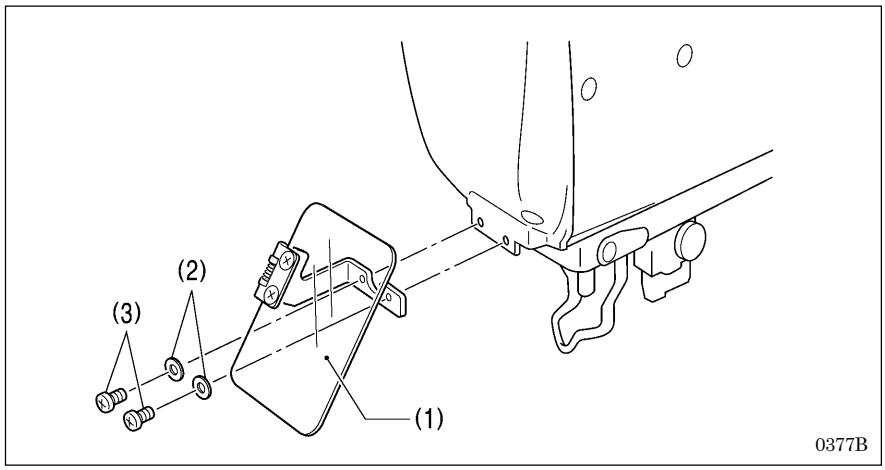
<要调低气压时>

1. 关闭空气阀(5)。(指针还是指向高压位置。)
2. 按下按钮(6)。
   储气筒内空气放出，指针下降。
3. 要降低气压时，向上拉起旋钮(3)或是向下拉旋钮(4)按箭头方向回转。
4. 打开空气阀(5)。
   空气进入储气筒内，指针开始移动。
5. 请按1～4顺序反复调整，直到调到所希望的气压为止。

3-17. 护眼板的安装法

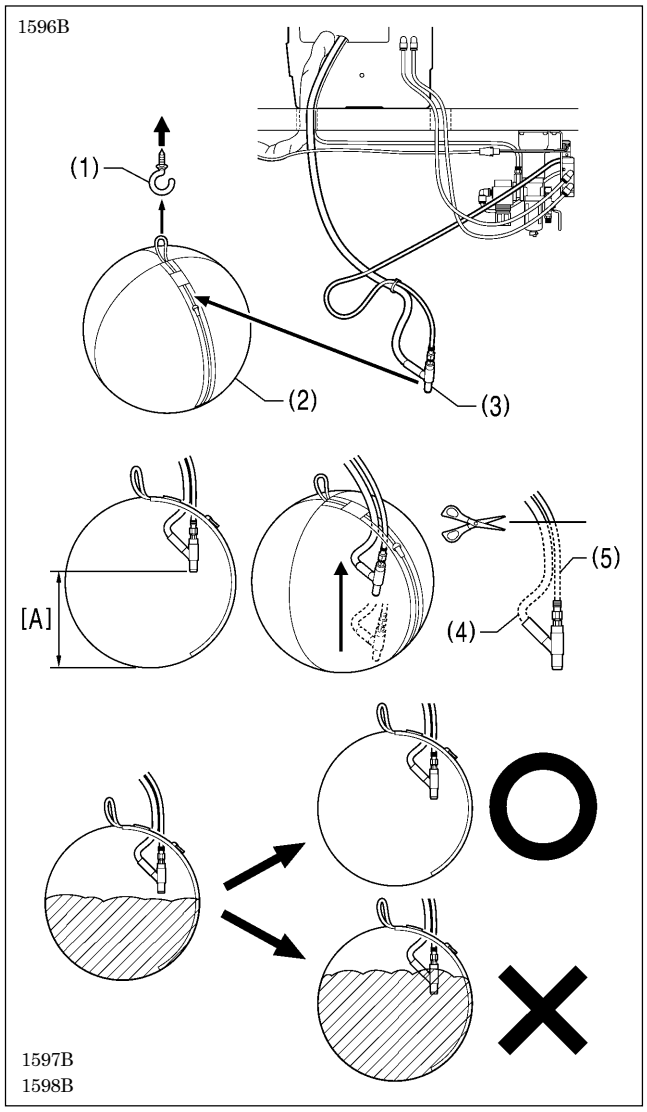
⚠ 注意

为了您的安全，请安装安全保护装置。
如果拆除这些安全保护装置，易发生人生受伤事故。



(1) 护眼板组件
(2) 垫圈[2 片]
(3) 螺钉[2 个]

3-18. 安装布屑袋



1. 在台板下方便使用的位置安装挂钩(1)。
2. 将布屑袋(2)安装到挂钩(1)上。
3. 打开布屑袋(2)的卡盘并插入文吐里管(3)。
4. 合上卡盘。

从布屑袋(2)底部到文吐里管(3)的距离［A］越长，布屑袋(2)可容纳的切屑量就越多。要增加可容纳的切屑量，适当调整使该距离［A］变得更长。
如有必要，将布屑管(4)和空气管(5)切短。

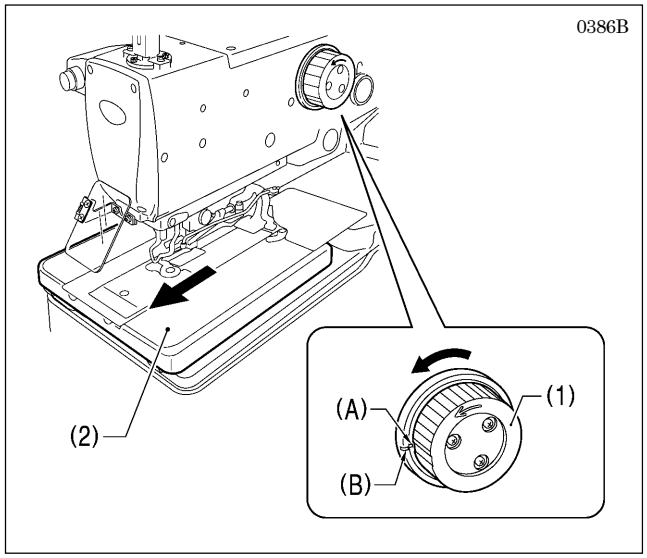
* 如果将布屑管(4)和空气管(5)变短，则将提高吸入切屑的效率。

[注意]

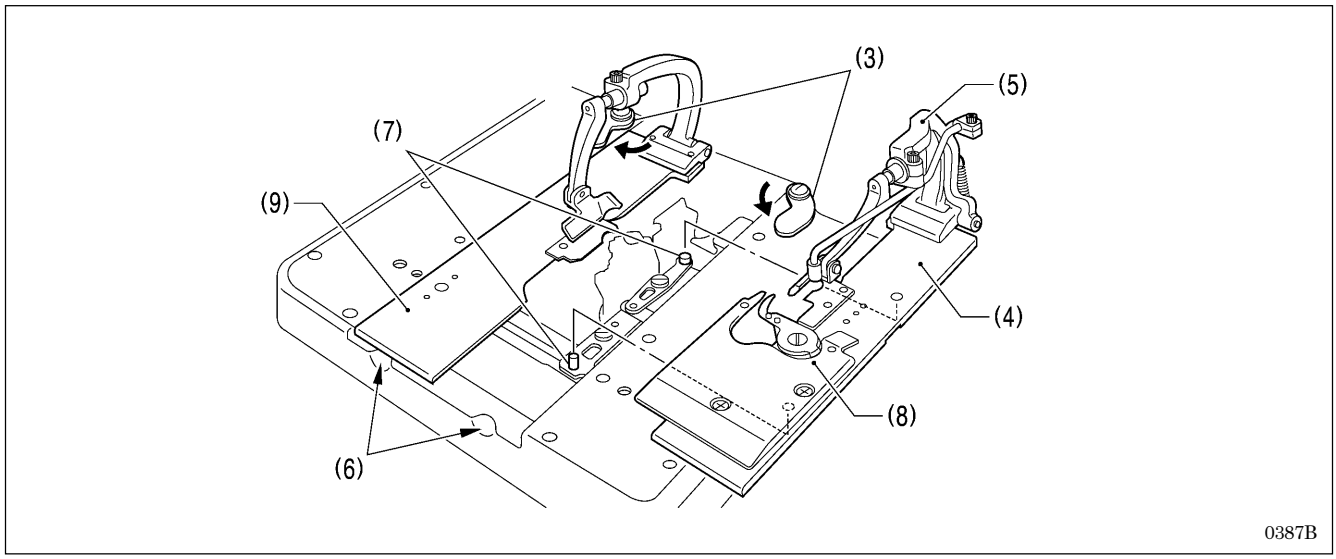
在切屑达到文吐里管(3)的尖端之前要将切屑废物倒掉。如果切屑盖住文吐里管(3)的尖端，则布屑管(4)内部将会堵塞。

3-19. 压布板的拆除和安装法

<拆除方法>



1. 将上轴手轮(1)向前回转，使手轮上的钢印(A)和机头上的缺口(B)一致。
   *将机针设置在针上位置停止。
2. 将送布台(2)移动到跟前。



3. 将左右板夹(3)向箭头方向(向外侧)推。
4. 一手拿着支架手柄(5)，另一手将手指插入到切口部(6)处，将压布板右(4)向上提起使其离开销(7)。
5. 将压布板右(4)拉到跟前取下。

   [注意]

   为了使压板 JU(8)不可碰到机针，将送布台(2)移动到能够卸拆的位置处，然后将压布板右(4)向上提起后再取下。
6. 用同样的方法将压布板左(9)卸下。

<安装方法>

使用上述“拆除方法”的逆顺序将其安装。

3-20. 供油

⚠ 注意

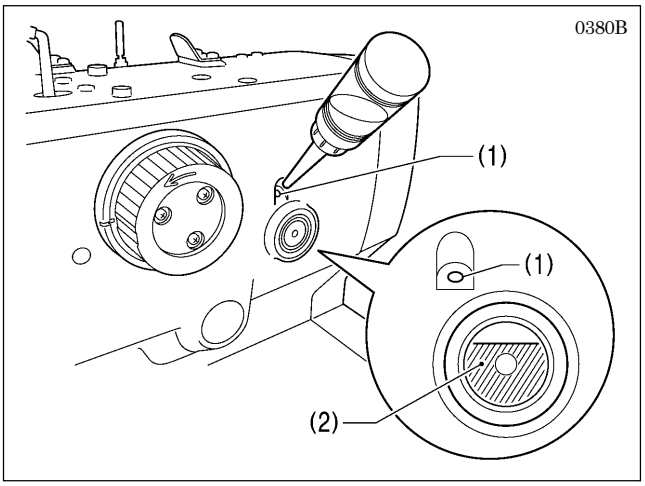
在开始作业前请先关闭电源开关。
如果误按动起动开关，缝纫机动作会导致受伤。

使用润滑油时,务必戴好保护眼镜和保护手套等，以防润滑油落入眼中或沾在皮肤上，这是引起发炎的原因。
另外，润滑油不能饮用，否则会引起呕吐和腹泻。
将油放在小孩拿不到的地方。

[注意]
请使用所特公司指定的缝纫机润滑油（新日本石油缝纫机润滑油 10N;
VG10）。＊如果难于买到，作为推荐机油请使用<Exxon Mobil 公司的ESSOTEX SM10; VG10>。

3-20-1. 缝纫机的供油方法

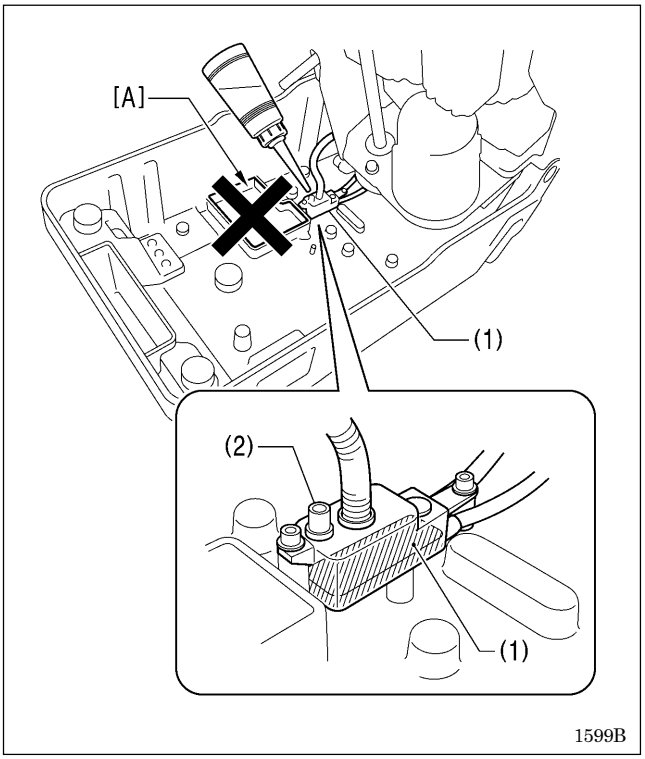
第一次使用缝纫机，或长时间未使用缝纫机时，必须要补充机油。



<给机壳油箱里加油>

向机壳油箱的注油口(1)处添加缝纫机油。请在油量表示窗(2)处确认其注油量为 8 分满左右的程度。

[注意]
- 油量表示窗的油量如果只有 1/3 左右时,请一定要加油。不然会成为零部件烧毁等故障的原因。
- 请注意油不可加的过满，缝纫机内部油会溢满出来。



<给底板油箱里(副油箱)加油>

1. 倒下缝纫机头部。
2. 向副油箱(1)的加油口(2)里注入缝纫机油，加到以不溢出的程度为止。

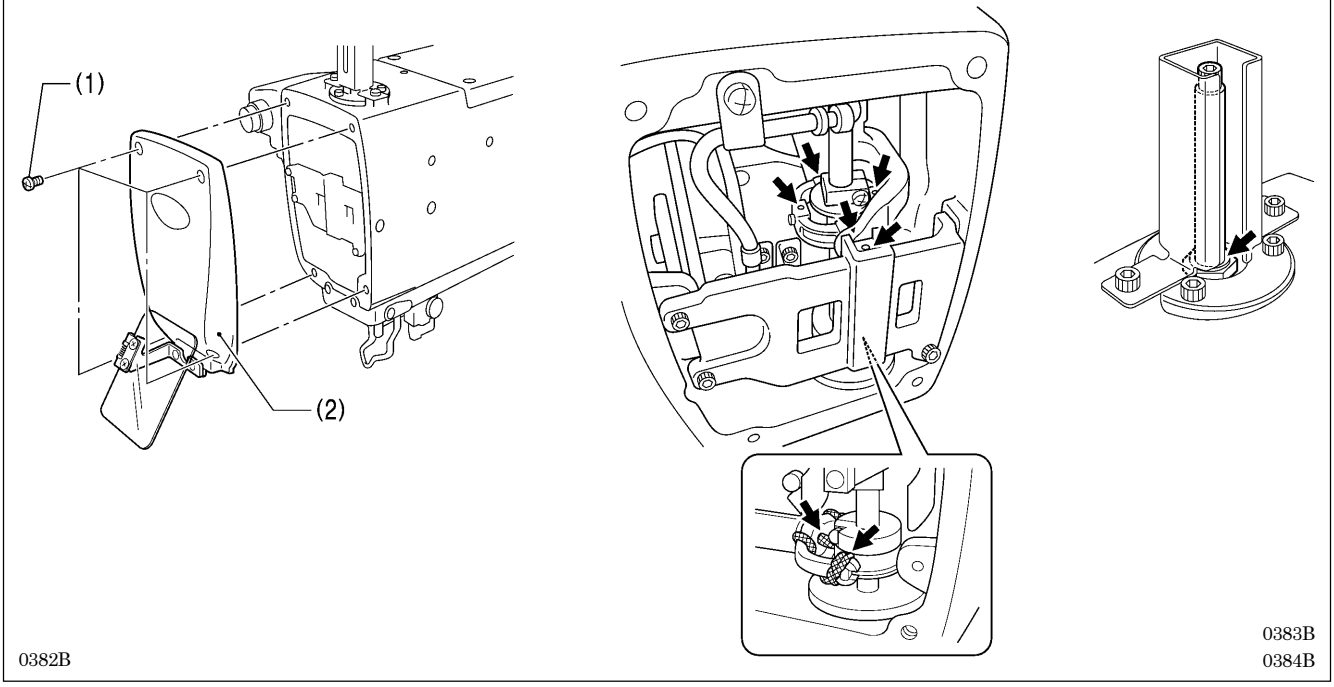
＊ 一般使用时，机壳油箱能自动供油，所以没必要给此副油箱加油的。

[注意]
不要向标记的区域［A］添加任何机油。此部件是一个贮水箱，用来收集从侧板内空气阀放出的水。
如果此贮水箱中收集到水,请将水排干。(请参阅「8-3-4. 清除废水」。)

3-20-2. 缝纫机的注油方法

· 第一次使用缝纫机，或长时间未使用缝纫机时，请按下图的箭头所指的地方加机油。
· 在加油时有可能会沾到缝线上。为了不污染上缝制物，请一定要进行试缝。

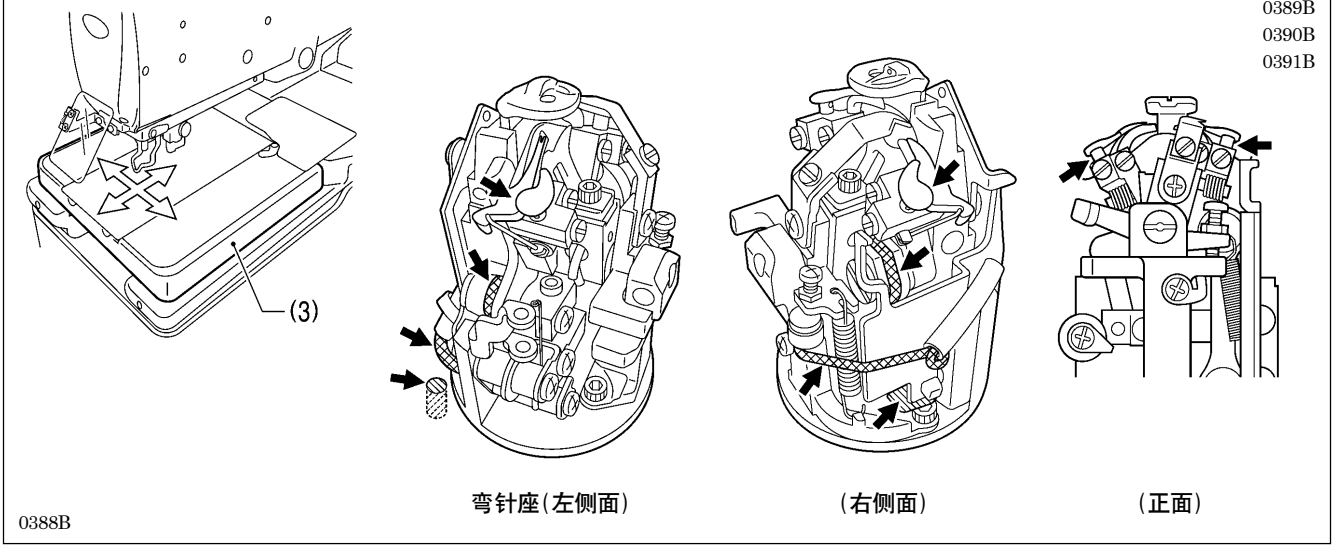
<给针杆加油>



0382B　0383B　0384B

1. 松开螺钉(1)[4 个]，拆下面板(2)。
2. 在箭头所指处滴上 2～3 滴机油。
3. 加油完了后，装上面板(2)。

<给弯针 · 分纱器 · 弯针座部位加油>



0388B　0389B　0390B　0391B

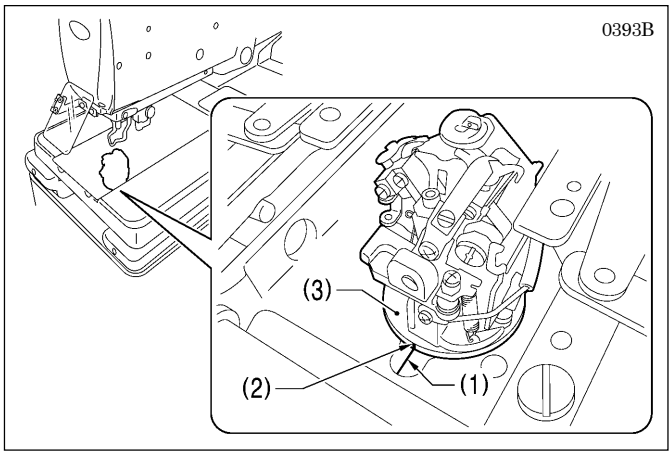
1. 拆下左右压布板。(具体请参考「3-19. 压布板的拆除和安装法」)
2. 将送布台(3)移动到不妨碍加油的位置。
3. 回转弯针座，在箭头所指处滴上 2～3 滴机油。
4. 加油完了后，装上压布板。

4. 缝纫前的准备

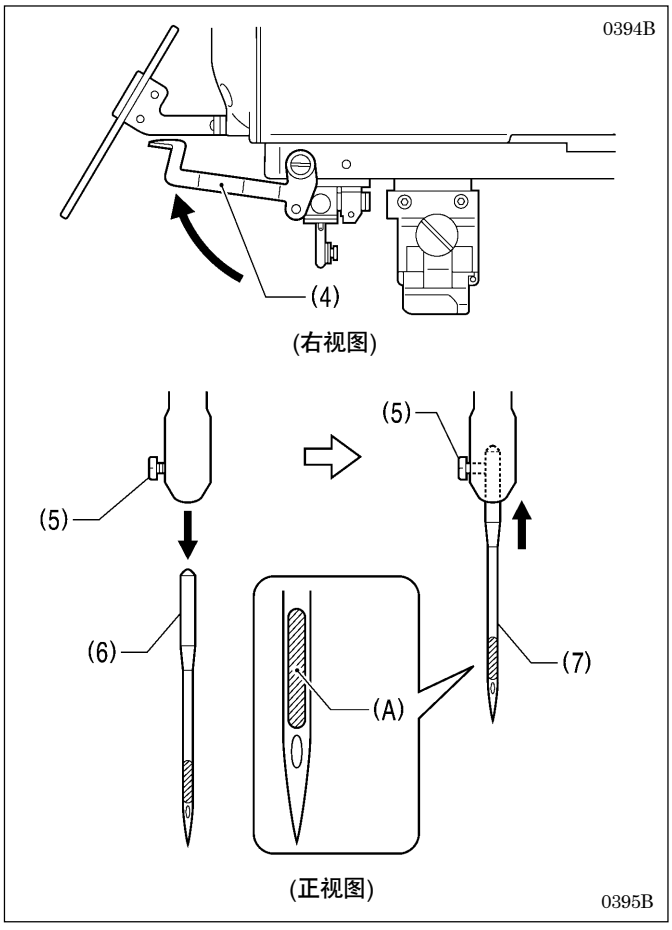
4-1. 机针的安装法

⚠ 注意

安装机针时，请切断电源。
否则误按下启动开关时，缝纫机动作会导致受伤。



1. 将压布板拆下。(有关拆除方法，具体的请参考「3-19. 压布板的拆除和安装法」)
2. 确认底板部的钢印(1)和弯针座的钢印(2)必须一致。
   * 如果不能一致的话，请回转弯针座(3)，使其成为一致为止。



3. 将护指器(4)向上转。
4. 松开固定螺钉(5)，取出机针(6)。
5. 将新的机针(7)的有长槽部(A)向前，笔直插到底为止。
6. 用力拧紧固定螺钉(5)。
7. 放下护指器(4)。

[注意]

在机针取下的状态下请不要拧紧固定螺钉(5)。容易使针杆内部产生划伤，成为装不上机针的原因。

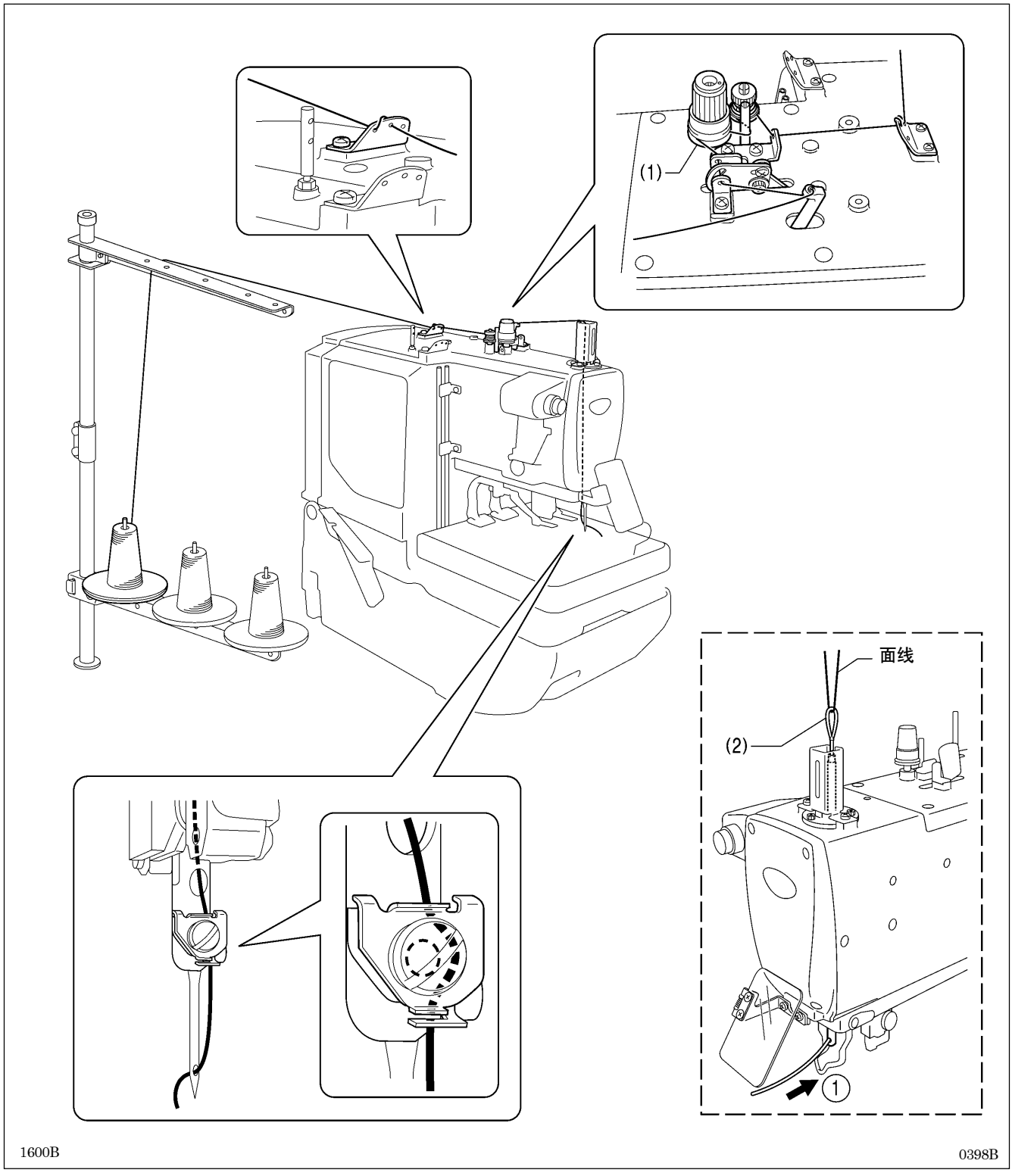
<推荐机针>

DO x 558-NY2 #14～#18(风琴)

4-2. 面线的穿线法

面线的穿法请按下图所示进行正确穿线。

* 下图所示的是线架安装在左上角的情况。如果线架安装在右上角的话，其穿线方法将不一样。具体请参阅「4-5. 线架安装在右上角时的穿线法」。
* 如果使用穿线模式进行穿线时，夹线盘(1)在变成开放状态时穿线比较容易。(具体请参考「5-7. 穿线模式的使用法」)
* 请使用附属的穿线器(2)。(图中的①是表示线穿入的位置。)

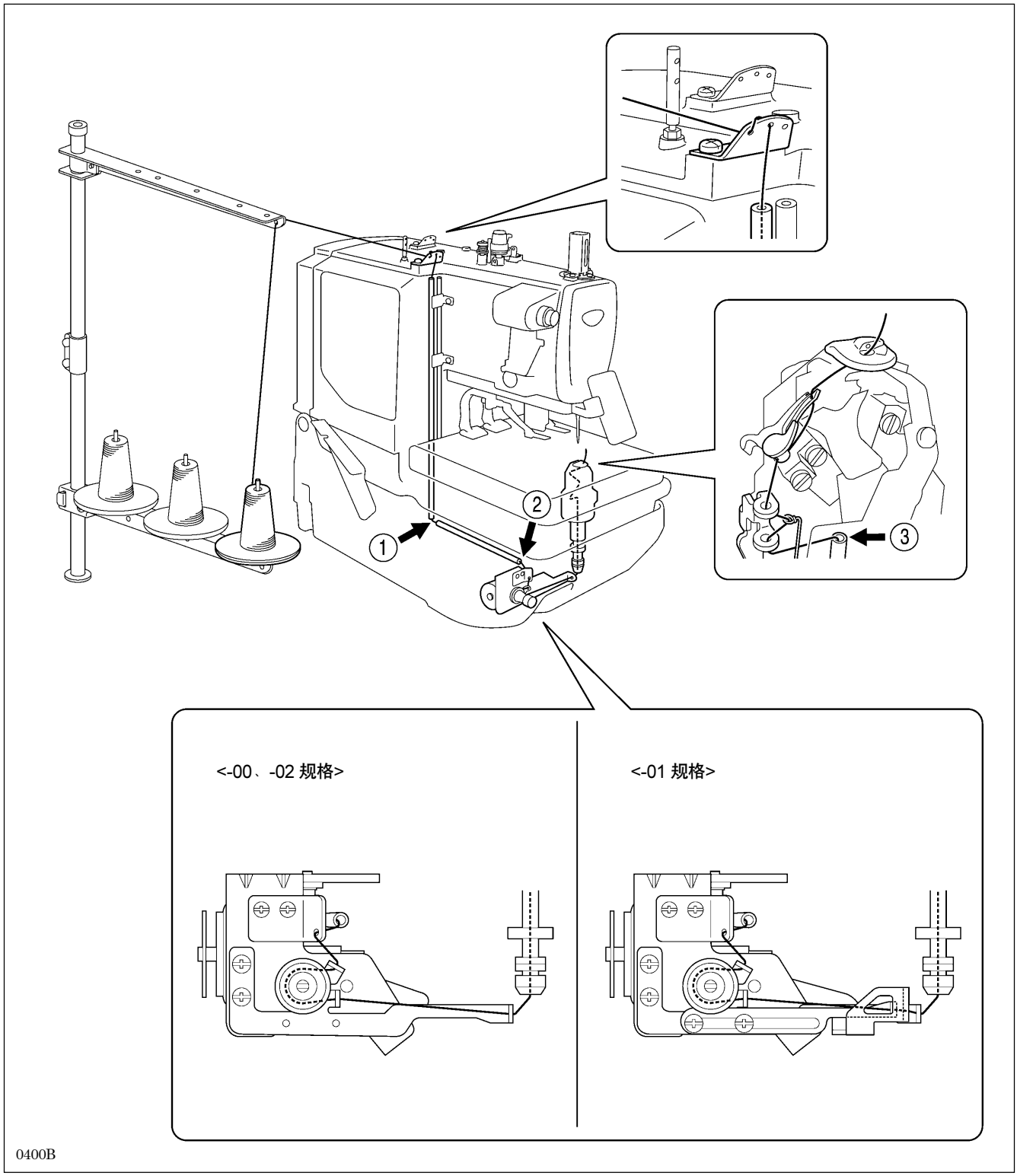


4-3. 底线的穿线法

底线是在压布板拆下后，请按下图所示正确地穿线。
(有关拆除方法，具体的请参考「3-19. 压布板的拆除和安装法」)

* 下图所示的是线架安装在左上角的情况。如果线架安装在右上角的话，其穿线方法将不一样。具体请参阅「4-5. 线架安装在右上角时的穿线法」。

* 图中的①~③是表示线穿入的位置。(有关穿线器的使用方法请参考「4-2. 面线的穿线法」)

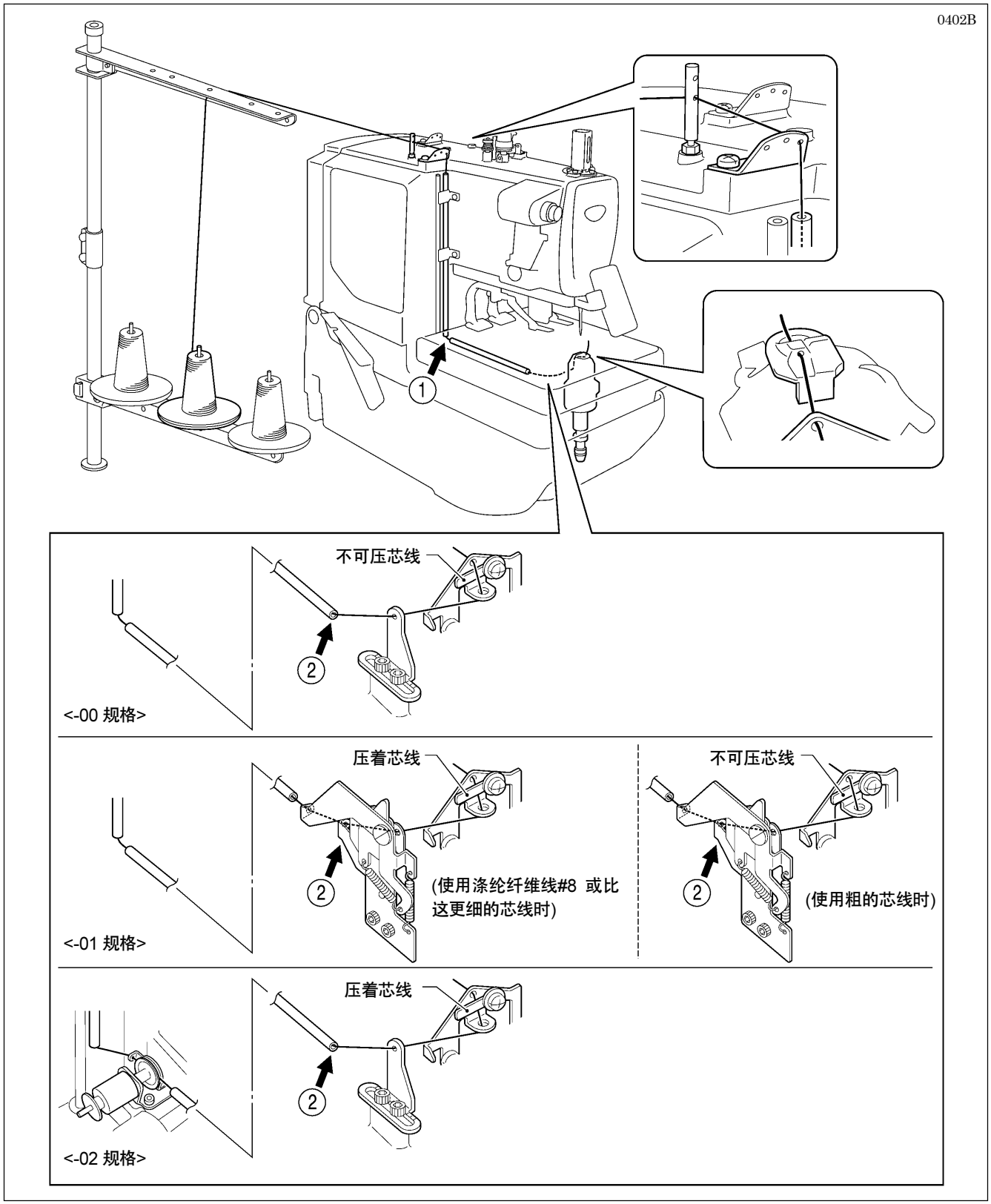


4-4. 芯线的穿线法

芯线是在压布板拆下后，请按下图所示正确地穿芯线。穿完芯线后，请安装好压布板。(具体请参考「3-19. 压布板的拆除和安装法」)

* 下图所示的是线架安装在左上角的情况。如果线架安装在右上角的话，其穿线方法将不一样。具体请参阅「4-5. 线架安装在右上角时的穿线法」。

* 图中的①~②是表示线穿入的位置。(有关穿线器的使用方法请参考「4-2. 面线的穿线法」)



4-5. 线架安装在右上角时的穿线法

线架安装在右上角时，请按下图的虚线框内所示的各种线的穿法。虚线框内以外的各部位的线的穿法，和线架安装在左上角时完全一样。具体请参考「4-2」～「4-4」的各种线的穿法。

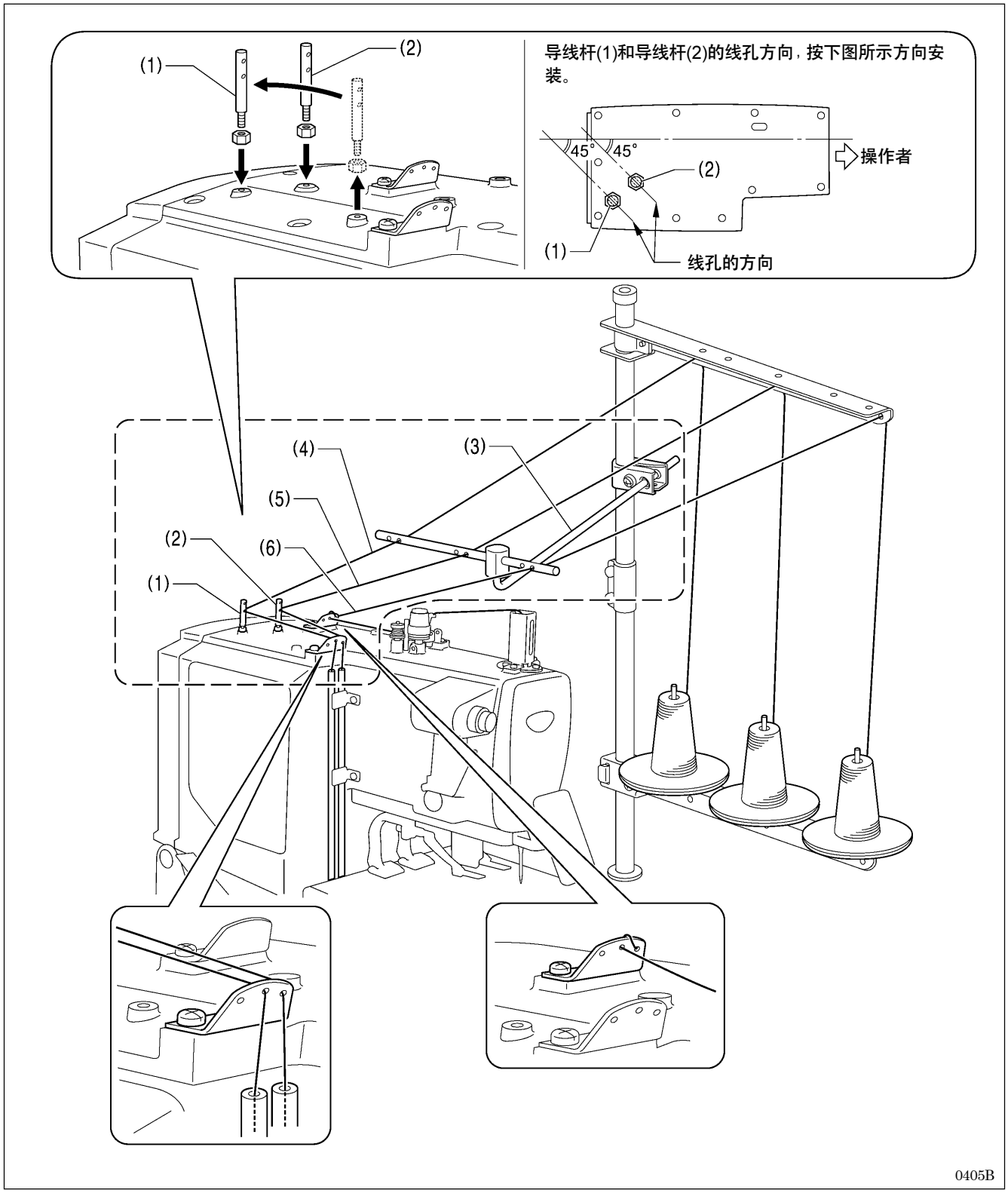
・ 在开始穿线之前，请先按图的位置换插上导线杆(1)，再将附件中的导线杆(2)插上。

・ 线架安装在右上角时，推荐使用附件中的线导向(3)。

(4) 底线

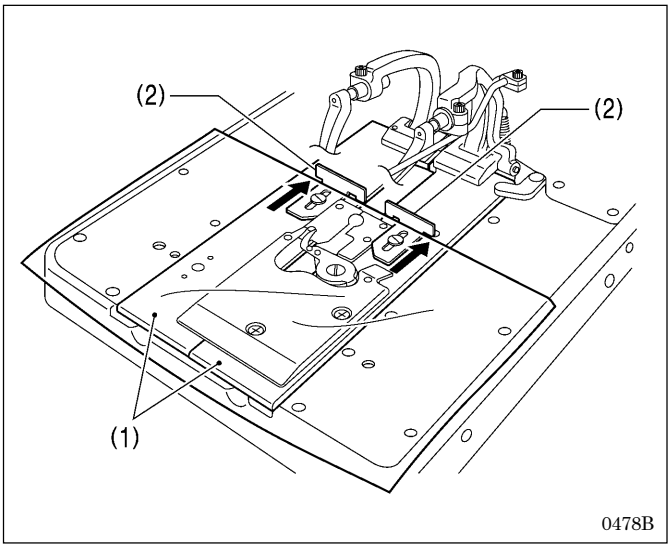
(5) 芯线

(6) 面线



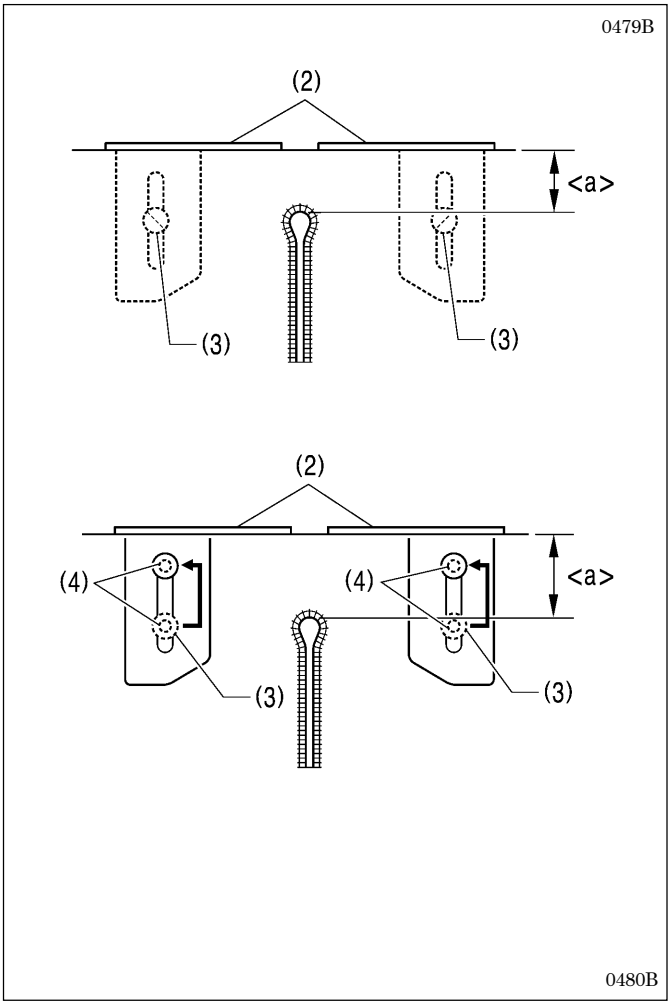
4-6. 布料设置法

在左右的压布板(1)处带有布挡板(2)。将布料的一端和布挡板(2)对齐，布料相对缝纫机来说可以是垂直及平行的设置。另外、随着布挡板(2)的安装位置的改变，可以调节从布料的一端(上端)到缝纫花样为止的宽度(缝纫量)。



布料设置法

如图所示，将布料设置在其一端和布挡板(2)对齐的位置。



缝纫量的调节方法

<-00、-01 规格时>

1. 松开左右螺钉(3)，将布挡板(2)进行前后移动以调节缝纫量<a>。
   * <a>的调节范围为 10～30mm。
2. 调节完了后，将螺钉(3)拧紧。

<-02 规格时>

左右螺钉(3)的安装孔(4)分别有前后 2 处。

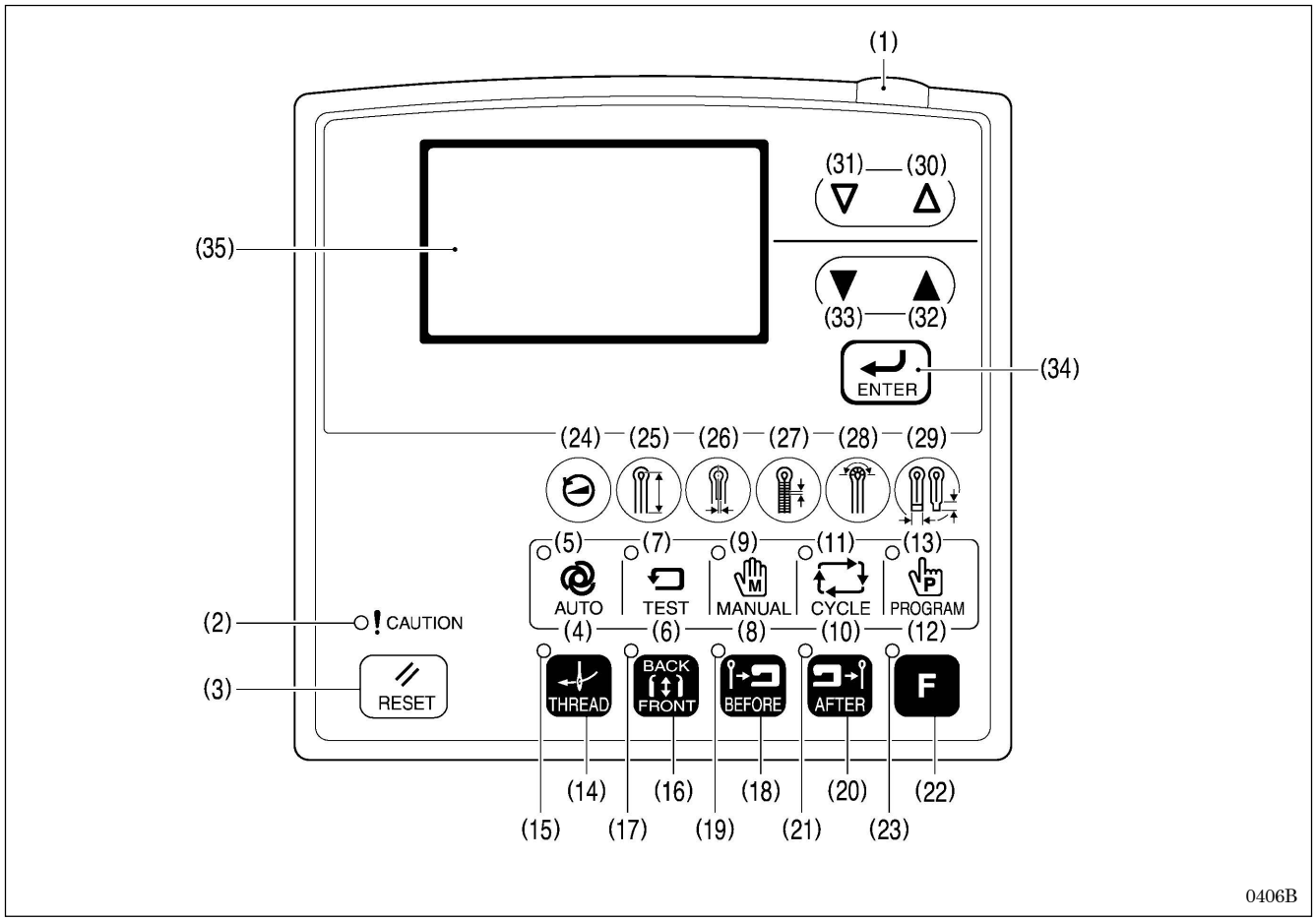
1. 根据需要将螺钉(3)安装在选择的孔(4)处。
2. 在螺钉(3)松开的状态下，前后移动布挡板(2)来调节缝纫量<a>。
   * <a>的调节范围:
     根据不同的安装孔(4)，调节范围如下所示。

规格	调节范围
L1422	10～50mm
L1826	10～46mm
L2230	10～42mm
L2634	10～38mm
L3442	10～30mm

3. 调节完了后，将螺钉(3)拧紧。

5. 缝纫机的使用法(操作盘: 基本篇)

5-1. 操作盘上每个部件的名称和功能



(1) **电源灯**
当打开电源时点亮。

(2) CAUTION(**报警**)**灯**
发生错误时点亮。

(3) RESET(**复位**)**键**
按动此键清除错误，及清除产量计数器的数值。

(4) AUTO(**自动**)**键**
在进入自动模式时使用。

(5) AUTO(**自动**)**灯**
在自动模式时点亮。

(6) TEST(**试送布模式**)**键**
在进入试送布模式时使用。

(7) TEST(**试送布模式**)**灯**
在试送布模式时点亮。

(8) MANUAL(**手动模式**)**键**
在进入手动模式时使用。

(9) MANUAL(**手动模式**)**灯**
在手动模式时点亮。

(10) CYCLE(**循环程序模式**)**键**
在进入循环程序模式时使用。

(11) CYCLE(**循环程序模式**)**灯**
在循环程序模式时点亮。

(12) PROGRAM(**程序模式**)**键**
在进入程序模式时使用。

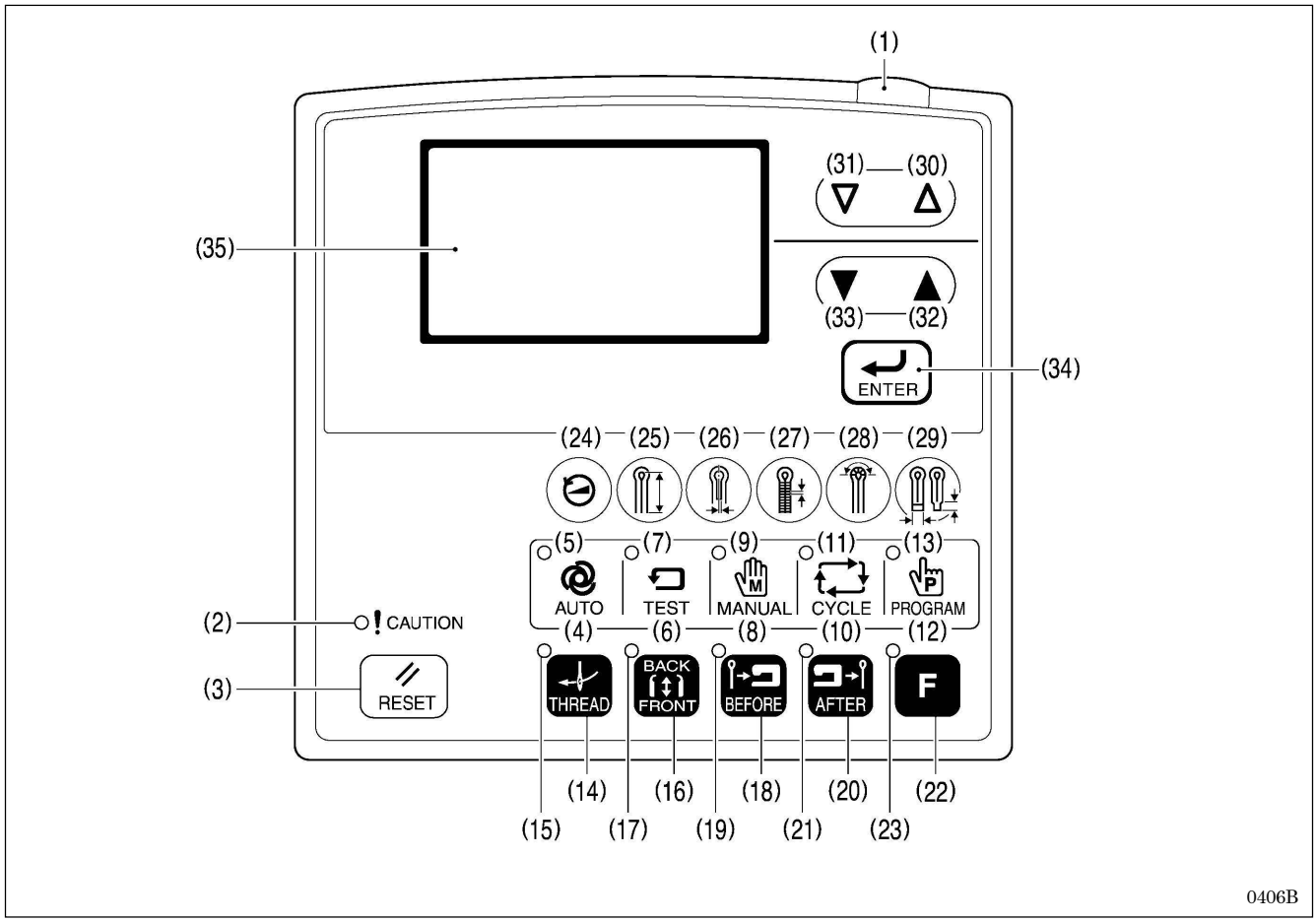
(13) PROGRAM(**程序模式**)**灯**
在程序模式时点亮。

(14) THREAD(**穿线**)**键**
在进入穿线模式时使用。

(15) THREAD(**穿线**)**灯**
按此 THREAD 键时(穿线中)点亮。

(16) FRONT/BACK(**前进/后退**)**键**
将布料放置从“前面”或是“后面”的位置进行交换时使用。

(17) FRONT(**前进**)**灯**
在设定布料位置为“前面”时点亮。



(18) BEFORE(**先切刀**)**键**
设定先切布动作时使用。

(19) BEFORE(**先切刀**)**灯**
设定先切布动作时点亮。

(20) AFTER(**后切刀**)**键**
设定后切布动作时使用。

(21) AFTER(**后切刀**)**灯**
设定后切布动作时点亮。

(22) **F键**
表示帮助画面时使用。

(23) **F灯**
在读写CF卡时点亮。

(24) **快捷方式1键**
改变缝纫速度时使用。

(25) **快捷方式2键**
改变纽孔锁缝长度时使用。

(26) **快捷方式3键**
改变切刀间隔时使用。

(27) **快捷方式4键**
改变针迹节距时使用。

(28) **快捷方式5键**
改变圆头部针数时使用。

(29) **快捷方式6键**
改变加固缝长度时使用。

(30) **△键**
增加程序号码和参数号码的数值时使用。

(31) **▽键**
减小程序号码和参数号码的数值时使用。

(32) **▲键**
增大参数的内容和记忆开关的内容的数值时使用。

(33) **▼键**
减小参数的内容和记忆开关的内容的数值时使用。

(34) ENTER(**设定**)**键**
确认参数的内容和记录开关的内容时使用。

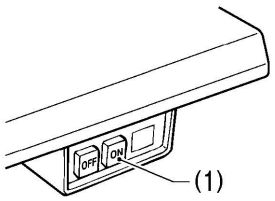
(35) **显示窗**
显示程序号码和及其他消息。

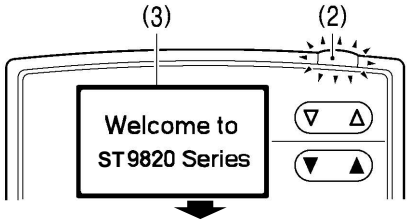
5-2. 缝纫机的启动方法

(所举之例均为-01 规格的缝纫机)

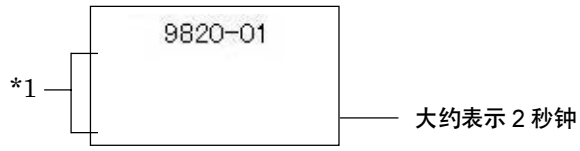
1 按下电源开关的 ON 键(1)。

电源灯(2)点亮，操作盘上的显示窗(3)将按下述顺序自动切换。

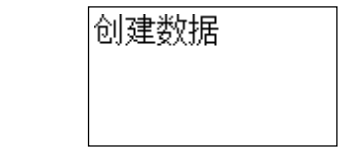




0407B



0261B



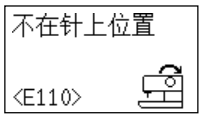
0593B

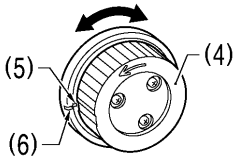
<2 连脚踏板/手动开关规格时>

<脚踏板规格时>

0591B
0592B

[注意]
当“E110”被表示时，请用手回转上轴手轮(4)，使手轮上的钢印(5)和缺口(6)一致。



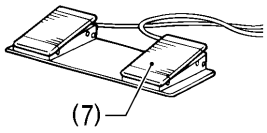


0583B
0408B

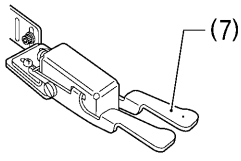
2 按下启动开关(7)。

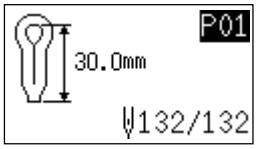
0409B
0506B
0507B
0229B

<2 连脚踏板规格>



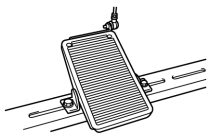
<手动开关规格>





(试送布模式时)

<脚踏板规格>
踩下脚踏板。



- 将送布台移动到放置布料的位置。
- 操作盘上表示的是前一次终了时的模式(自动模式、手动模式、试送布模式、循环程序模式、程序模式中的任何一个)的待机状态*2。

*1: 如果要设定选购装置时，被设定的装置在此处有以下的图像表示。

引导装置	切刀长度转换装置	面线夹装置	断线检出感应装置	气压检出装置
				

0264B−0267B
1644B

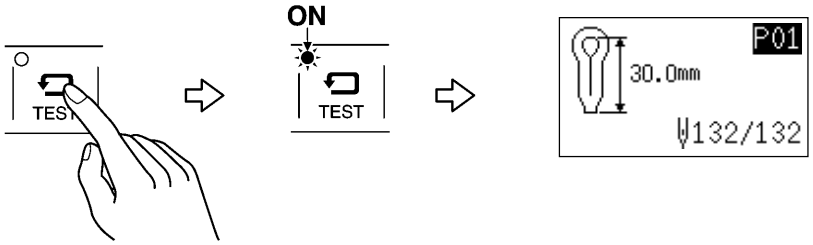
*2: 移动到各种模式后，在开始下一个动作前的状态称为“待机状态”。

5-3. 程序的设定方法

推荐预先登录好经常被使用的缝纫花样的程序。因为登录后，只要选择程序号码就能叫出希望缝纫的花样，这样可以省却每次因设定所需要花费的时间。

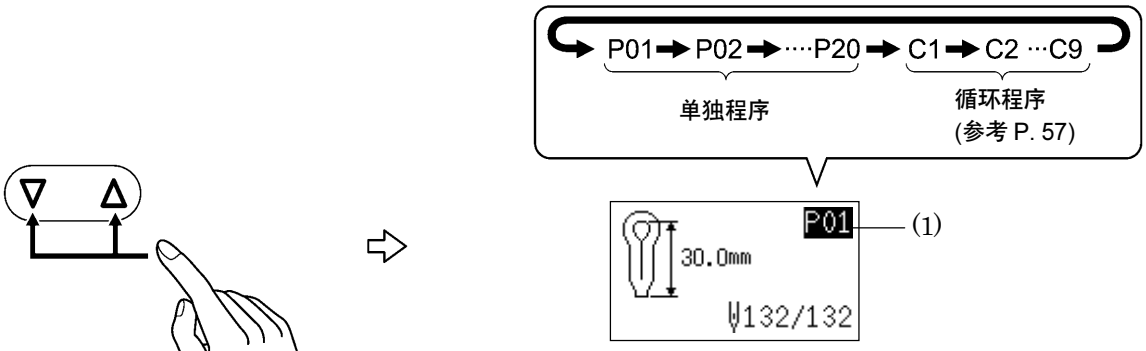
- 程序一般能登录 20 个，并随时可变更内容。即可变更各项目的参数。
- 出厂时，程序号 P01～P20 均保存着假设的程序内容。(程序号 P01～P20 全部是同样内容。)
  请按下列方法，变更内容后再使用。

1 按下试送布模式。



0410B 0229B

2 选择想要更改内容的程序号 P01～P20(1)。

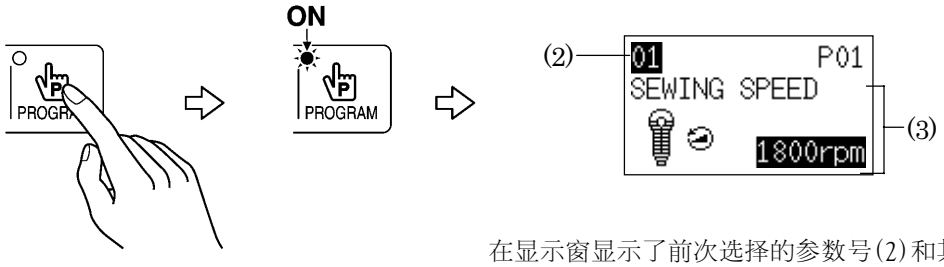


每按一次△键，程序号(1)就会按图的顺序切换。(按▽键正好相反，即为逆顺序。)

[注意]
在选择了循环程序的状态时，就不能进入程序模式。

0413B 0337B 0229B

3 按下程序模式。

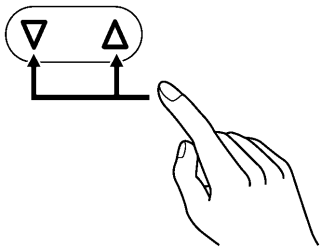


在显示窗显示了前次选择的参数号(2)和其内容(3)。

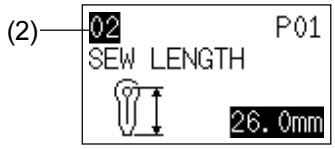
* 按快捷方式键也能进入程序模式。此时请选择与快捷方式键对应的参数号。(参考下一页)

0412B 0585B

4 选择想要变更的参数号(2)。(具体请参考「5-3-1 参数一览表」)

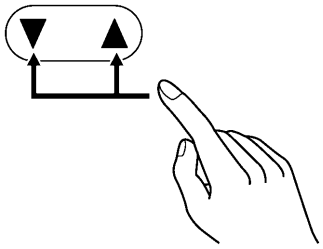


0413B

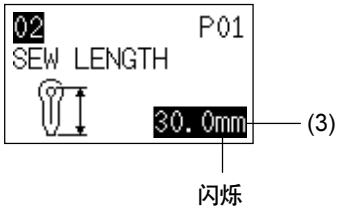


0586B

5 改变参数的内容(3)。



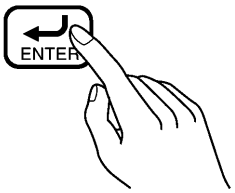
0414B



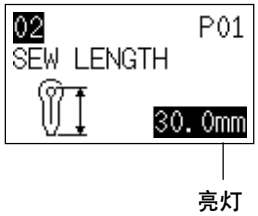
* 闪烁表示其内容尚未确定之意。
* 按 RESET 键，能表示初始值。

0587B

6 确定已更改了的内容。



0415B

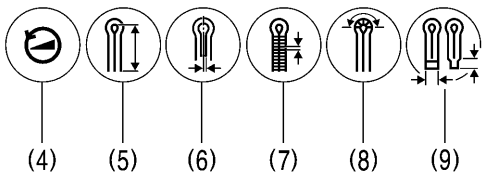


* 从闪烁变成亮灯，表示其内容已被确定之意。
* 如果不按 ENTER 键，而按△键、▽键、AUTO 键、TEST 键、MANUAL 键中的任何一种键，已更改的内容均能废除。

0587B

7 重复上述的 4～6 的顺序，更改其他的参数。

关于快捷方式键



0416B

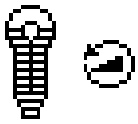
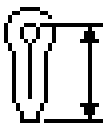
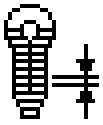
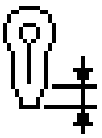
在快捷方式键中，登录了经常使用的以下 6 个参数。
- 只要按下各个键，就可叫出希望要的参数。
- 可以操作除了循环程序模式以外的任何一个模式(自动模式、手动模式、试送布模式、程序模式)。

(4) 缝纫速度(参数号码 No.01)
(5) 纽孔锁缝长度(参数号码 No.02)
(6) 切刀间隔(参数号码 No.03)
(7) 针迹节距(参数号码 No.04)
(8) 圆头部针数(参数号码 No.05)
(9) 加固缝长度(参数号码 No.06、08、10)*

* 可以叫出参数号 No.40 处设定了的对应加固缝样式的参数号 No.

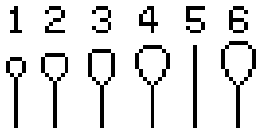
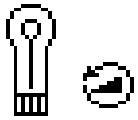
5-3-1. 参数一览表

[注意]
- 根据其它参数的设定的内容，有一部分参数的设定值有可能不能更改或无效。
- 如果更改了任何参数，则在进行实际缝纫之前，在试送布模式下操作缝纫机并检查机针与其它部件之间还有其它各部件之间是否有干扰。

号码	设定内容	设定范围	单位	初始值
01	**缝纫速度** 	1,000～2,500 rpm	100	1,800 rpm
02	**纽孔锁缝长度(*1)** 	<-00 规格> 圆头形钮孔: 8～50 mm 直形钮孔: 5～50 mm <-01 规格>: 圆头形钮孔: 8～42 mm 直形钮孔: 5～42 mm <-02 规格> (L1422): 14～22 mm (L1826): 18～26 mm (L2230): 22～30 mm (L2634): 26～34 mm (L3442): 34～42 mm	0.5	<-00 规格>: 25 mm <-01 规格>: 25 mm <-02 规格> (L1422): 18 mm (L1826): 22 mm (L2230): 26 mm (L2634): 30 mm (L3442): 38 mm
03	**切刀间隔** 	-0.3～0.5 mm	0.05	0.2 mm
04	**针迹节距** 	0.5～2.0 mm	0.1	1.0 mm
05	**圆头部针数** 	4～20 针	1	9 针
06	**锥形套结长度** 	1～20 mm	1	6 mm
07	**偏移量** 	0.5～2.0 mm	0.1	1.5 mm
08	**直线加固缝长度** 	2.0～6.0 mm (单侧 3.0 mm 为止)	0.1	5.0 mm

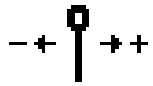
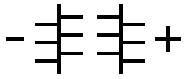
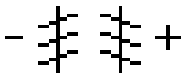
0268B-0275B

*1: 纽孔锁缝长度的设定范围和初始值是随缝纫机规格的不同而异。

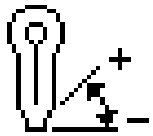
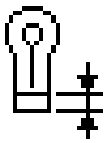
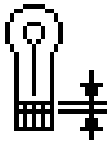
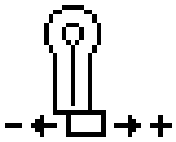
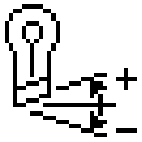
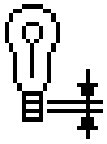
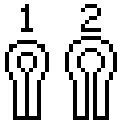
号码	设定内容	设定范围	单位	初始值
09	**直线加固缝针数** 	5～18 针	1	7 针
10	**圆形加固缝针数** 	5～17 针	1	7 针
11	**切刀形状** 	1～6 (如果交换切刀时，确认了交换的切刀号码之后，请选择适当的切刀形状。)	1	2
12	**针摆宽度校正** 	-1.0～1.0 mm	0.1	0.0 mm
13	**圆头部位低速(*2)** 	-600～0 rpm	100	0 rpm
14	**直线加固缝速度(*3)** 	1,000～2,500 rpm	100	1,800 rpm
15	**慢起针针数** 	0～3 针	1	0 针
16	**慢起针速度(*4)** 	400～1,500 rpm	100	700 rpm

0276B-0283B

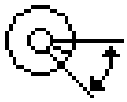
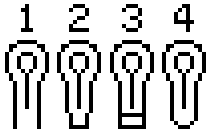
*2: 圆头部位低速，是以参数 01(缝纫速度)设定了的缝纫速度为其基准的。
*3: 缝纫速度比直线加固缝速度还要慢时，直线加固缝速度将和缝纫速度一样。
*4: 缝纫速度比慢起针速度还要慢时，慢起针速度将和缝纫速度一样。

号码	设定内容	设定范围	单位	初始值
17	切刀 X 方向校正 	-0.5～0.5 mm	0.05	0.0 mm
18	切刀 Y 方向校正 	-0.7～0.7 mm	0.05	0.0 mm
19	起缝加固缝针数 	0～4 针	1	0 针
20	尾缝加固缝针数 	0～4 针	1	0 针
21	X 方向校正 	-1～6	1	0
22	Y 方向校正 	-1～6	1	0
23	θ1 校正 	-3～3	1	0
24	θ2 校正 	-3～3	1	0

0284B-0291B

号码	设定内容	设定范围	单位	初始值
25	锥形套结角度 	-5～5	1	0
26	加固缝宽度校正 	-1.0～0.0 mm	0.1	0.0 mm
27	加固缝重合量 	0.0～2.0 mm	0.1	1.0 mm
28	加固缝 X 方向校正 	-1.0～1.0 mm	0.1	0.0 mm
29	加固缝倾斜校正 	-3～1	1	0
30	预备(将来升级时使用。)			
31	尾缝锥形套结加固缝针的针迹节距 	针迹节距的 20% - 100%	5	100%
32	圆形结重叠针数 	1～4 针(45° 度以内)	1	1 针
33	无切刀针迹花样 	1: 与先切刀的针迹花样相同 2: 与后切刀的针迹花样相同	1	1

0292B－0294B 0471B 0295B 1645B 0297B 1646B

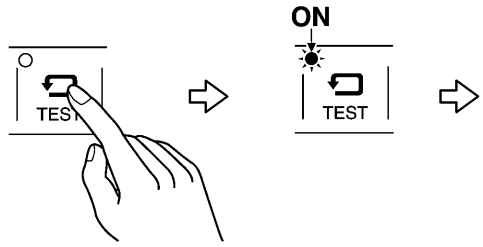
号码	设定内容	设定范围	单位	初始值
34	菊花孔切刀尺寸 	2～5 mm	1	2
35	菊花孔针数 	8～100 针	1	20
36	菊花孔重叠针数 	1～5 针(4 5° 度以内)	1	2
37	副气锤  * 仅当使用切刀长度转换装置时才会启用此部件。	OFF：气锤 ON：副气锤	-	OFF
38	预备(将来升级时使用。)			
39	程序复制	OFF、1～20 (请指定拷贝原件程序的号码)	1	OFF
40	加固缝样式 	1：无加固缝 2：锥形加固缝 3：直线加固缝 4：圆形加固缝	1	2

0298B - 0300B 1647B 0301B

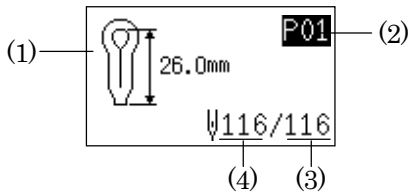
5-4. 用试送布模式确认缝纫花样

试送布模式是在上轴停止的状态下，仅送布台和缝纫时一样可以工作。使用该模式便宜对机针与其它部件之间还有其它各相关联部件之间的位置关系进行确认。

1 按下试送布模式。



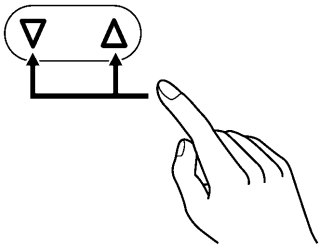
0410B



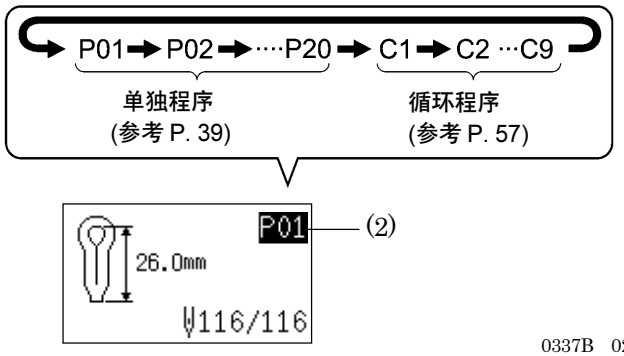
在显示窗显示了缝纫针迹的形状(1)、程序号码(2)、总针数(3)、残余针数(4)等。

0230B

2 选择希望的程序号(2)。



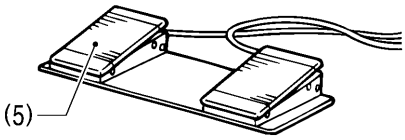
0413B



0337B 0230B

每按一次△键，程序号(2)就会按图的顺序切换。(按▽键正好相反，即为逆顺序。)

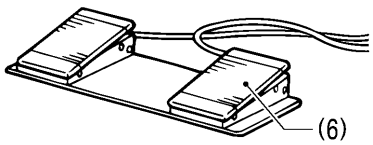
3 按下压布开关(5)。



0419B

压布夹下降。

4 按启动开关(6)。

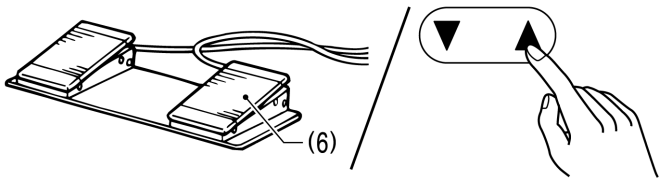


0420B

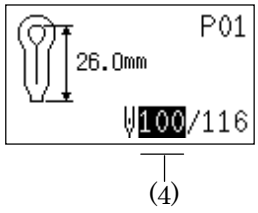
送布台将会移动到缝纫开始的位置处。

0231B

5 按启动开关(6)或是按▲键，开始试送布缝纫。



(每按一次缝纫 2 针。)
(如果一直按着的话将会连续缝纫。)



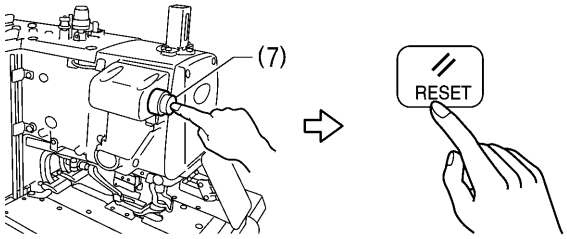
- 显示窗显示的残余针数(4)每次减少 2 针。
- 到达最后一针时蜂鸣器会鸣响。
- 试送布模式，不进行剪线和切刀动作。

0421B

(下一页继续)

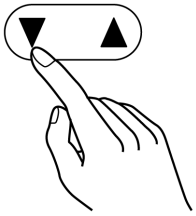
6 **[希望试送布终止送布台回到布料设定位置时]**

按下暂停开关(7)，然后再按 RESET 键。



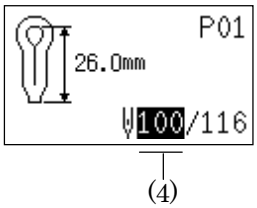
0422B

[试送布中，想要送布台回到前面的缝纫位置时]



0423B

(每按一次会倒退 2 针。)



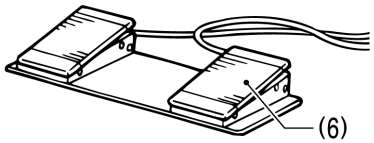
0231B

显示窗显示的残余针数(4)每次会增加 2 针。

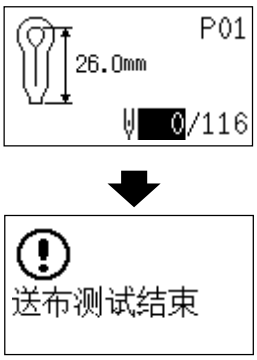
[到达最后一针时蜂鸣器鸣响时]

按下启动开关(6)。

* 等送布台回到布料设定位置为止一直按着。



0424B



0232B

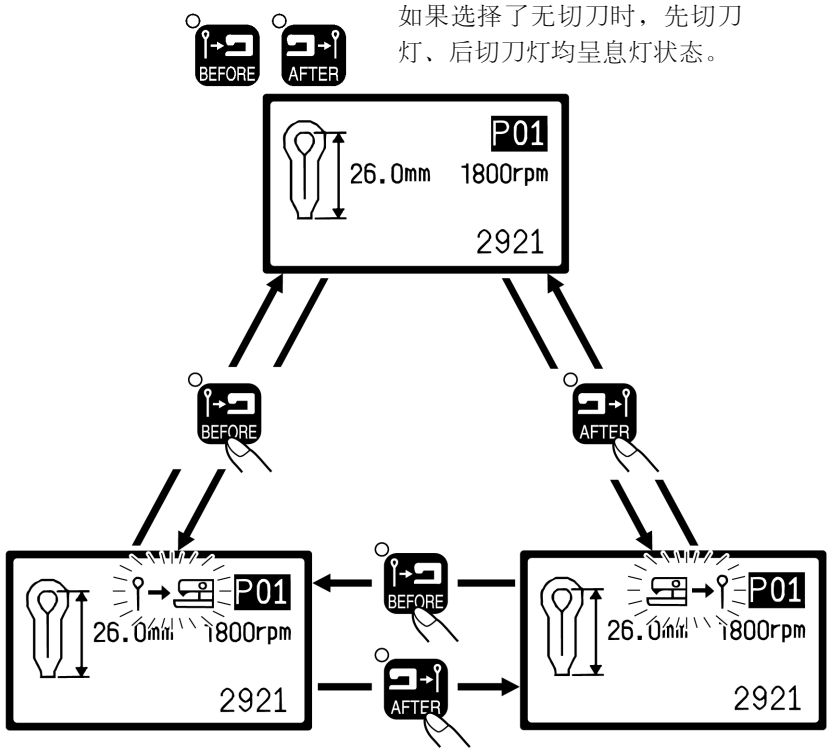
1654B

5-5. 切刀动作的切换

0310B
0425B

无切刀
不实行切刀动作。

如果选择了无切刀时，先切刀灯、后切刀灯均呈息灯状态。



先切刀
在切刀动作实施后，再进行缝纫工作。

在选择了先切刀时，先切刀灯会点亮。

后切刀
在缝纫工作完成后，才实施切刀动作。

在选择了后切刀时，后切刀灯会点亮。

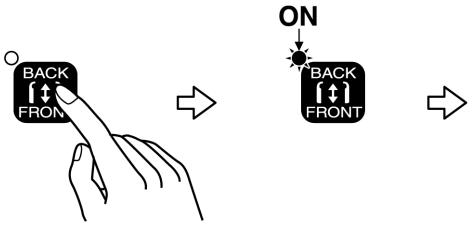
0308B
0309B

在自动模式、试送布模式或是手动模式的待机状态下，按 BEFORE 键或是 AFTER 键。
每按一下各键，切刀动作如图所示进行切换。

5-6. 布料设定位置的切换法

因为能够将送布台比标准的布料设定位置更向前移动，所以比较容易进行布料设置。
特别是使用后切刀时，循环时间被缩短。

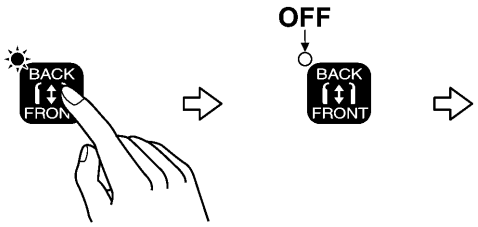
[要移动送布台到跟前时]
在自动模式、试送布模式或是手动模式的待机状态时、
按 FRONT/BACK 键。



送布台将会移到跟前(缝纫开始位置)。

0426B

[要移动送布台到后面(标准的布料设定位置)时]
再一次按 FRONT/BACK 键。



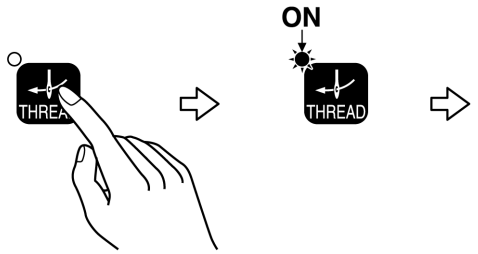
送布台将会回到后面(标准的布料设定位置)。

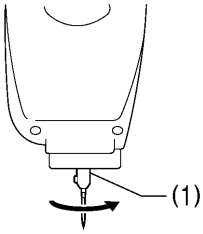
0427B

5-7. 穿线模式的使用法

在穿面线时使用。(关于穿面线的方法具体请参考「4-2. 面线的穿线法」)如果切换成穿线模式时，针杆在(θ送布)180° 度的回转后，XYθ送布马达的励磁将被切断。这样一来，针杆和送布台将可以自由移动，所以较容易地穿面线。
还有在穿线模式时，即使按了启动开关(或是踩了脚踏板)缝纫机也不会转动，所以很安全。

1 在自动模式、试送布模式或是手动模式的待机状态时、
按 THREAD 键。





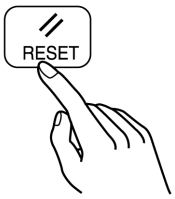
- 夹线盘变成开放状态。
- 蜂鸣器鸣响，针杆(θ送布)(1)回转 180° 度。此后，XYθ送布马达的励磁将被切断。

0428B 0257B 0529B

2 穿面线。

- 3 分钟后，夹线盘关闭。

3 穿面线完成后，按 RESET 键。



- 针杆和送布台在进行原点捡出后，返回到布料设定位置。
- 夹线盘关闭。

0429B

6. 缝纫机的使用法(缝制篇)

⚠ 注意

发生下列情况时，请切断电源。
否则误按下启动开关时，缝纫机动作会导致受伤。

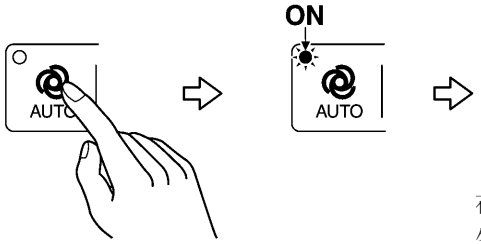
· 交换机针时
· 缝纫机不使用，或人离开缝纫机时

缝纫过程中，不要触摸任何运动部件或将物件靠在运动部件上，因为这会导致人员受伤或缝纫机损坏。

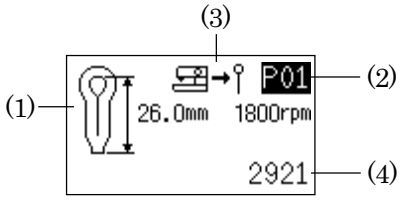
6-1. 自动缝纫(自动模式)

· 初次进行自动缝纫时，请务必进行试缝。
· 在气温较低的环境下使用缝纫机时，请进行多次试缝操作，以便使马达加温。

1 按下自动模式。



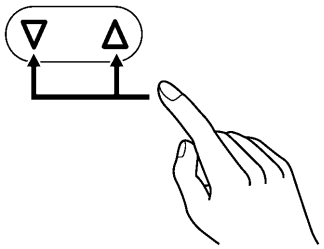
0430B



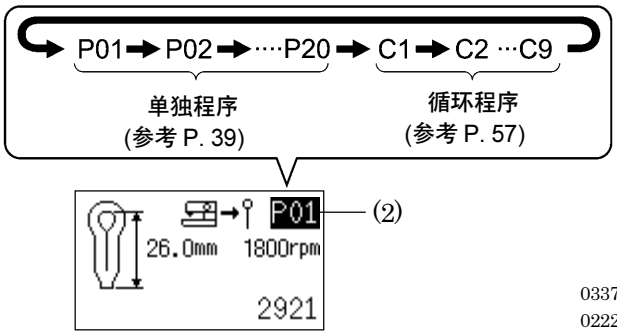
在显示窗显示了缝纫针迹的形状(1)、程序号码(2)、切刀动作(3)、生产量计数(4)等。

0222B

2 选择希望的程序号(2)。



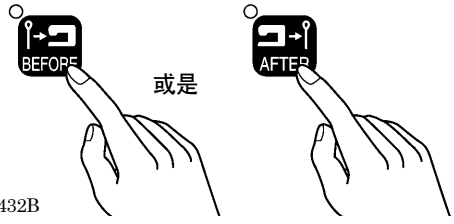
0413B



0337B
0222B

每按一次△键，程序号(2)就会按图的顺序切换。(按▽键正好相反，即为逆顺序。)

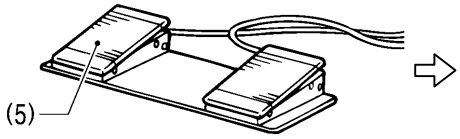
3 选择所希望的切刀动作(先切刀 / 无切刀 / 后切刀)。



0432B

* 有关切刀动作的切换方法具体请参考「5-5. 切刀动作的切换」

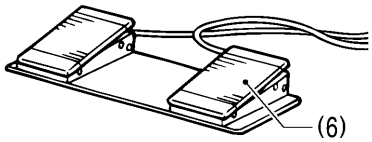
4 在压布夹的下面放入要缝制的布料后，按下压布开关(5)。



压布夹下降。

0419B

5 按启动开关(6)。



缝纫开始。

* 缝纫完成后，压布夹上升。另外，显示窗显示生产量计数器值会增加“1”。

0420B

6 如果要反复缝制时，请反复操作上述的第 4～5 的步骤。

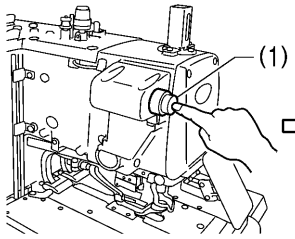
6-2. 暂停开关的使用法

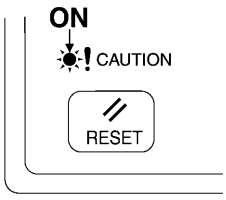
6-2-1. 自动缝纫中的暂停

暂停开关一般是在发生断线等情况时为了让缝纫机停车而使用。

＜暂停的方法＞

在缝纫中，按下暂停开关(1)。



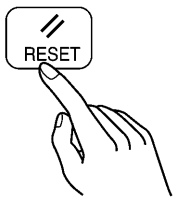


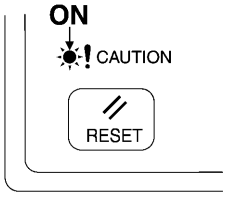
缝纫机将停车，蜂鸣器会鸣响。

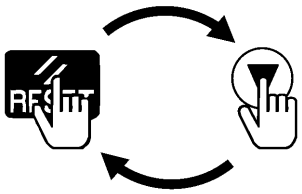
0436B 0582B

＜解除暂停的方法(不进行接着缝纫时)＞

1 按 RESET 键。





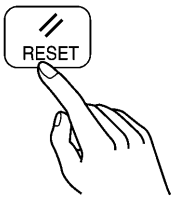


(被交替表示。)

0437B 蜂鸣器停止。 0438B

2 消除异常原因。

3 再次按下 RESET 键。

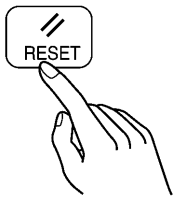


针杆和送布台在进行原点捡出后，返回到布料设定位置。

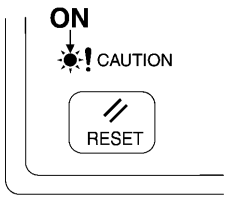
0392B

＜解除暂停的方法(进行接着缝纫时)＞

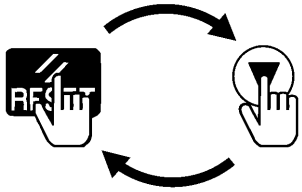
1 按 RESET 键。



0437B



蜂鸣器停止。



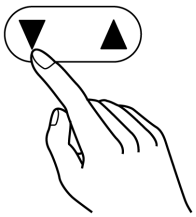
(被交替表示。)

0438B

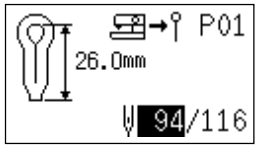
2 消除异常原因。

*如果面线发生断线等情况时，可以按 THREAD 键进入穿线模式。

3 按一次▼键。

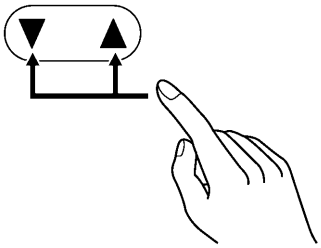


0423B



0482B

4 按▲键或是▼键，决定缝纫再开的位置。

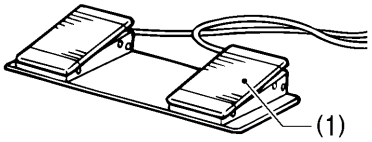


*如果面线发生断线等情况时，可以按 THREAD 键进入穿线模式。

- 按▲键向前进，按▼键倒退。
- 如果一直按着的话将会连续前进(或倒退)。

0439B

5 按启动开关(1)。



0440B

重新开始自动缝纫。

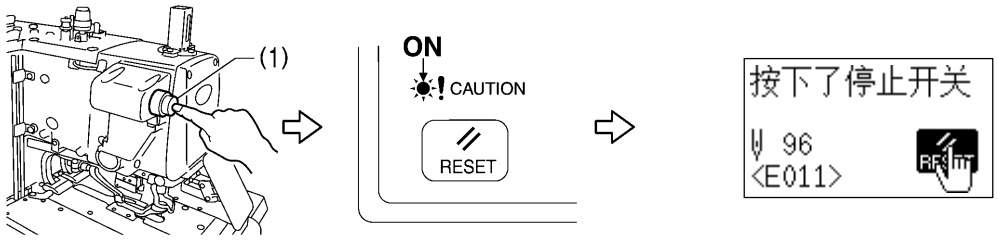
[注意]

如果在上轴马达启动前或是在停止后按了暂停开关时，就不能接着缝纫。

6-2-2. 手动缝纫或是试送布缝纫的中断

＜中断方法＞

在手动缝纫中或是在试送布模式动作中，按下暂停开关(1)。



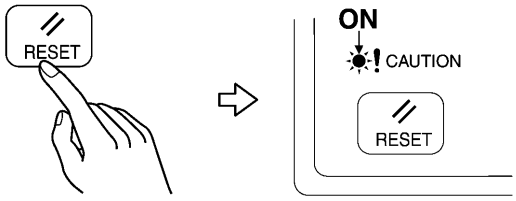
蜂鸣器会鸣响。

0436B

0582B

＜解除中断表示的方法＞

按 RESET 键。



- 蜂鸣器停止。
- 针杆和送布台在进行原点捡出后，返回到布料设定位置。

0437B

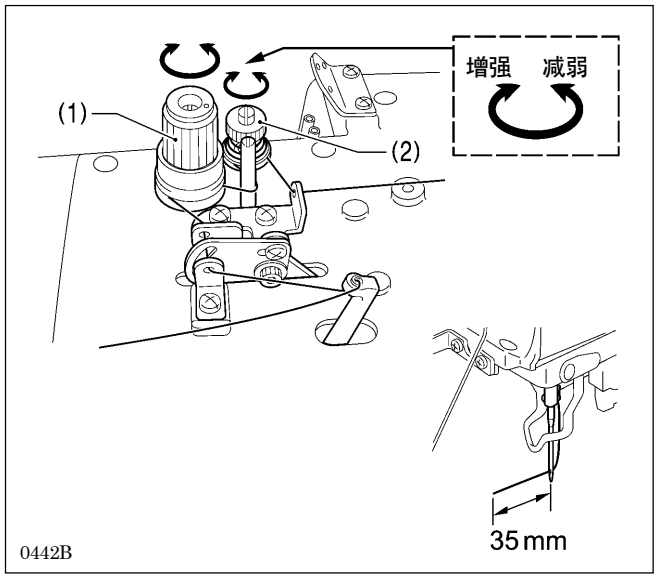
6-3. 调整线的松紧

根据缝纫物的情况，有必要对夹线器进行调整。

［参考值］

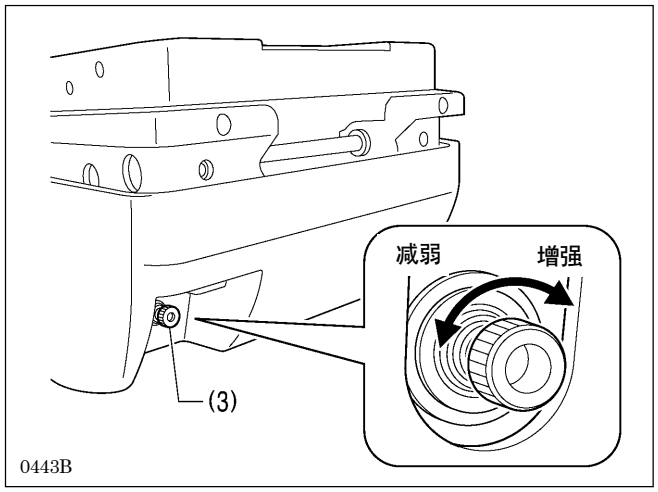
布料	毛料 2 层＋衬里	劳动布 3 层
使用缝线	涤特纶线#30	纤维线#50
机针	DO x 558-NY2 #14	DO x 558-NY2 #18
面线张力(N)	0.6	1.0
底线张力(N)	0.3	0.3
挑线弹簧强度(N)	0.05	0.07
挑线弹簧行程(mm)	8	8

* 上述记载的面线张力是指面线从挑线杆穿线孔拉出时的张力，而底线张力是指底线从转盘板机针孔拉出时的张力。



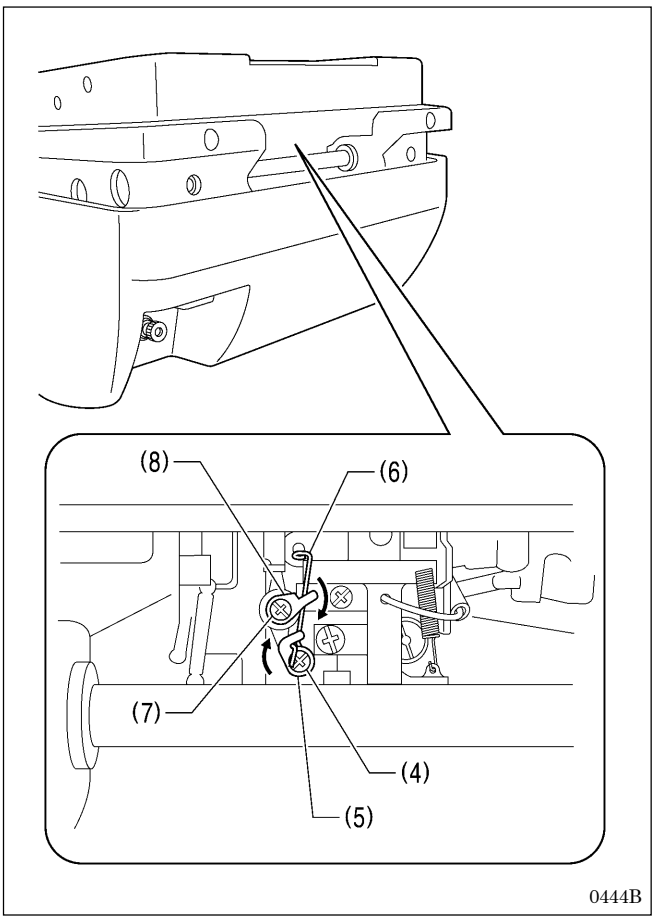
<面线张力的调整>

1. 旋转调节螺母(1)，进行调节。
2. 面线的残留量为 35mm 左右，旋转调节螺母(2)(副夹线器)进行调节。
   * 顺时针方向回转时面线的残留量减少，逆时针方向回转时面线的残留量增多。



<底线张力的调整>

旋转调节螺母(3)，进行调节。



＜挑线弹簧强度和行程的调节＞

强度的调节

1. 松开螺钉(4)，回转 L 挑线弹簧支架(5)进行调节。
   * 如按箭头所示方向回转挑线弹簧(6)，其张力增强。
2. 调节完了后，拧紧螺钉(4)。

行程的调节

1. 松开螺钉(7)，回转 L 挑线弹簧导向(8)进行调节。
   * 如按箭头所示方向回转挑线弹(6)，其行程变大。
2. 调节完了后，拧紧螺钉(7)。

7. 缝纫机的使用法(操作盘: 上级篇)

7-1. 循环程序的使用方法

在单独程序(P01～P20)中，对被登录的缝纫花样进行组合，并能登录成连续实行的“循环程序”。如果预先登录好已决定了的按顺序缝制花样的循环程序，则会便宜使用。

循环程序

最多登录数	9(C1～C9)
最大步数	9(同样的单独程序可多次被选择。)

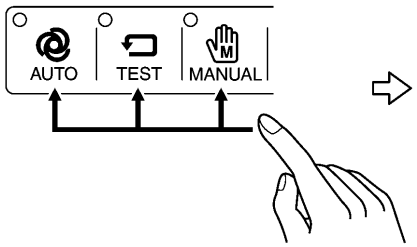
程序示例

在这里，切刀动作有的 3 步单独程序 P01，和无切刀动作的 1 步程序 P03 组成的循环程序，将该程序设定为 C 1 作为例子来说明。

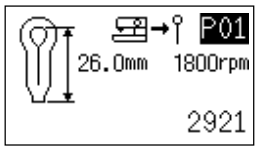
例: 循环程序 C1 的设定内容

步号	步号 1	步号 2	步号 3	步号 4
单独程序号	P01	P01	P01	P03
切刀动作	有	有	有	无

1 按下列键，选择任何一个缝纫模式。
(在这里选择了自动模式。)

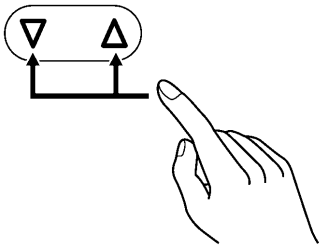


0445B

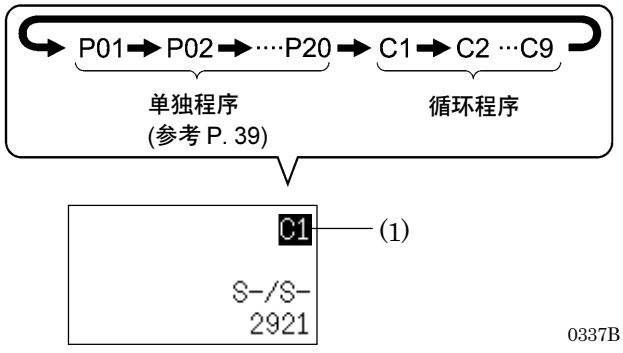


0222B

2 选择循环程序号 C1(1)。



0413B



0337B
0307B

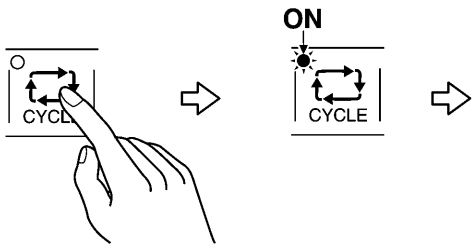
每按一次△键，程序号(1)就会按图的顺序切换。(按▽键正好相反，即为逆顺序。)

[注意]

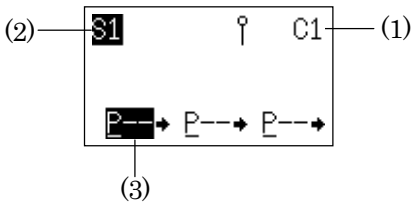
选择了单独程序的状态时，就不能进入循环程序模式。

3 按下循环程序模式。

0263B



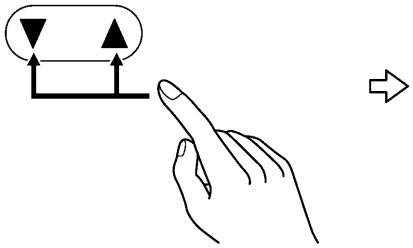
0446B



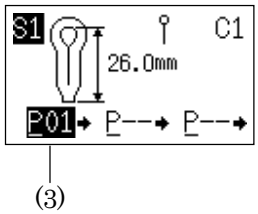
(1) 循环程序号
(2) 步号
(3) 选择了的步号 1 中被设定的内容(程序号，切刀动作的有无)

4 把步号 1 的内容(3)设定为“P01”。

0237B

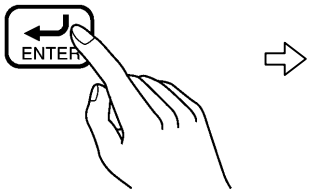


0414B



- “P”的“_”是有切刀动作之意。
- “P--”的“--”是未设定状态之意。
  如果设定了“--”的话，以后的步号中的内容均会被删除。

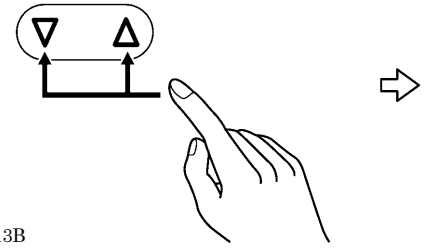
5 确定已更改了的内容。



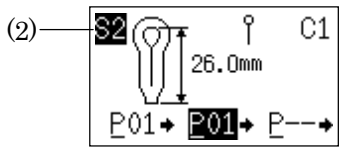
0415B

步号 1 的内容(3)将从闪烁变成亮灯。

6 将步号(2)变成“2”。



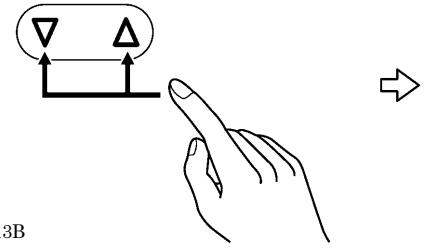
0413B



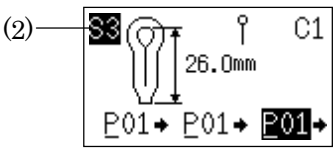
0238B

7 重复上述的 4～5 的顺序，将步号 2 的内容和步号 1 相同设定为“P01”。

8 将步号(2)变成“3”。



0413B

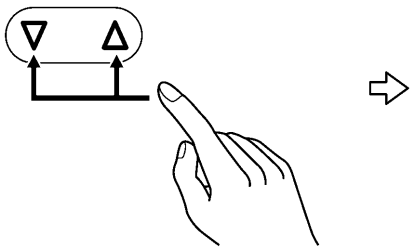


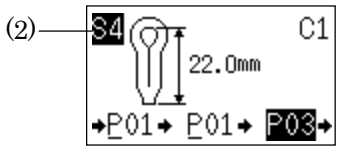
0239B

9 重复上述的 4～5 的顺序，将步号 3 的内容和步号 1 相同设定为“P01”。

(下一页继续)

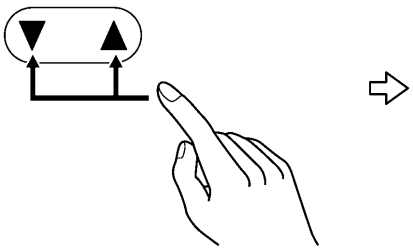
10 将步号(2)变成“4”。

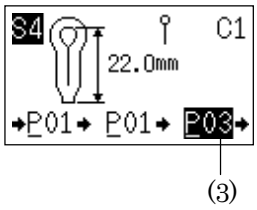




0413B 0240B

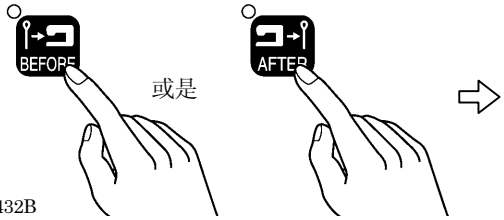
11 将步号 4 的内容(3)设定为“P03”。

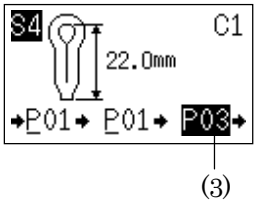




0414B 0598B

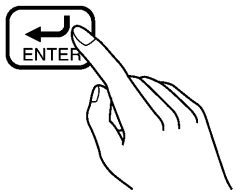
12 按 BEFORE 键，或是 AFTER 键，将(3)处的“P”改成“P”。(“无切刀动作”的设定。)





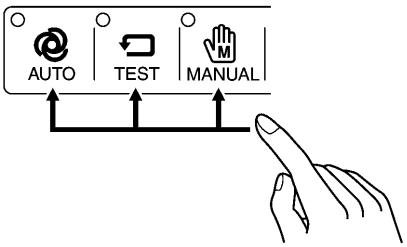
0432B 0510B

13 确定已更改了的内容。



0415B

14 按下列任何一个键，循环程序模式终了。



0445B

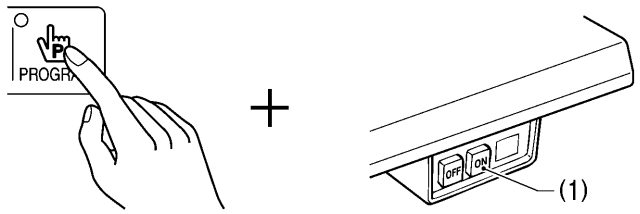
【注意】

选择了循环程序进行自动缝纫时，对于切刀动作来说，现在选择了的切刀动作(先切刀或是后切刀)还将继续适用。

7-2. 存储开关的设定方法

在操作盘的功能中，出厂时,使用存储开关来预先设定好的参数。根据自己的要求，能够随时更改这些存储开关的设定内容。存储开关的内容，对各程序均通用有效。各存储开关的号码和其相关内容具体请参考「7-2-1. 存储开关一览表」。

1 按着 PROGRAM 键，同时再按电源开关 ON 侧(1)。

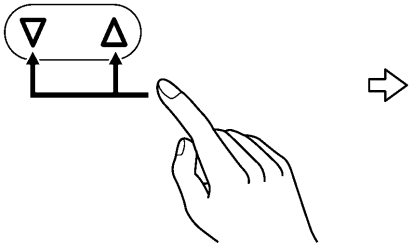


0447B

(2) 存储开关的号码
(3) 被选择了的号码的内容
(4) 设定值

0588B

2 选择想要变更的存储开关的号码(2)。

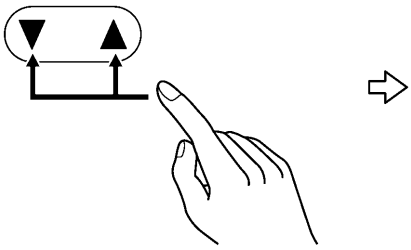


0413B

0589B

3 改变设定值(4)。

0590B



0414B

* 改变设定值时，(4)会变成闪烁表示。
* 如想将设定值回复到初始值时，按 RESET 键。

4 确定已更改了的内容。

0590B

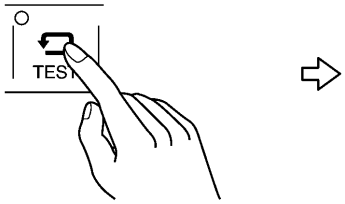
0415B

* 将存储开关的内容内存后，(4)会从闪烁变成亮灯。

5 如想更改其他的存储开关的号码的内容时，重复上述的 2～4 的顺序操作。

6 存储开关模式终了。

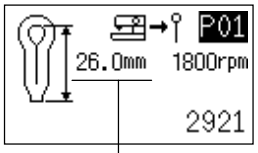
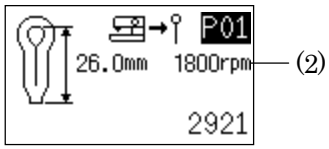
0591B



0448B

* 回到一般的缝纫机启动时状态。

7-2-1. 存储开关一览表

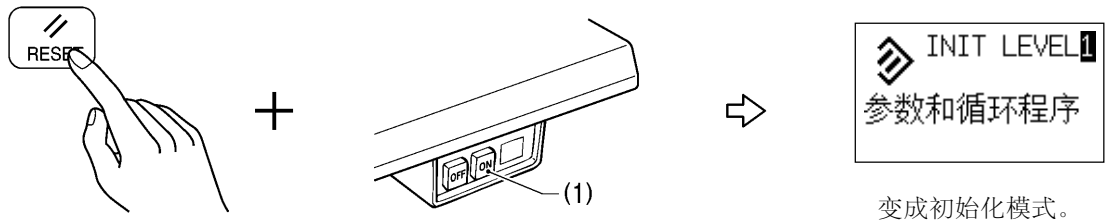
号码	内容	设定范围	初始值
001	**1 踏板/2 踏板的切换** 1：按下启动开关，压布夹下降，缝纫机启动。 2：先按下压布开关，压布夹下降，再按启动开关，缝纫机启动。	1：1 踏板 2：2 踏板	2
300	**对 F 键的功能作用** 在设定值 OFF 时：按着 F 键时，会显示帮助的画面。 设定值 1～40 时：变成第 7 号的快捷键。按下时，可叫出设定好了的号码(对应的参数号码)的参数。	OFF、1～40	OFF
301	**自动模式时的参数显示** 在自动模式时，设定在显示部(1)被显示的参数的内容。  (1) 0222B	1：纽孔锁缝长度 2：节距	1
302	**自动模式时的参数显示** 在自动模式时，设定在显示部(2)被显示的参数的内容。  (2) 0222B	3：缝纫速度 4：针数	3
303	**画面显示窗的对比度** 其值越大表示对比度变强。	0～30	15

7-3. 数据的清除(初始化)

在正常的情况下缝纫机不工作时的原因，有可能是因存储开关等的内存数据被异常设定。此时，进行下列的操作，将内存数据进行初始化，可以回复到正常运转。

1 按着 RESET 键，同时再按电源开关 ON 侧(1)。

0596B

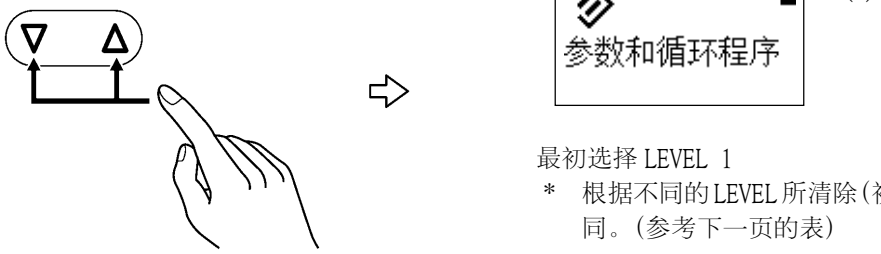


0449B

变成初始化模式。

2 从 1～3 中选择初始化 LEVEL(1)。

0596B



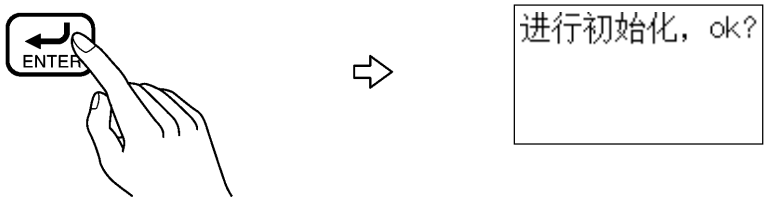
0413B

最初选择 LEVEL 1

* 根据不同的LEVEL所清除(初始化)的内容也有所不同。(参考下一页的表)

3 [要进行初始化]

0597B



0415B

4 [要执行初始化]

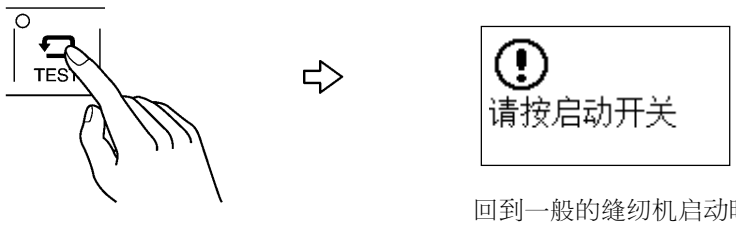
在被表示“执行中”时初始化开始。

* 想要停止初始化的执行时，按 RESET 键。

0415B

5 [初始化模式终了]

0591B



0448B

回到一般的缝纫机启动时状态。

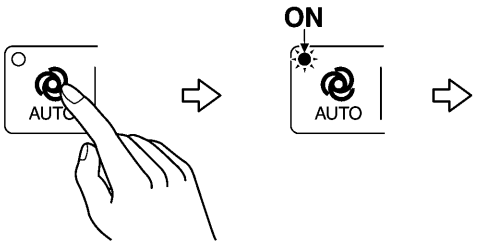
初始化 LEVEL 和清除及被初始化的内容

	LEVEL1	LEVEL2	LEVEL3
程序内容 (参数)	初始值	—	初始值
循环程序	清除	—	清除
存储开关	—	初始值	初始值
程序号	—	—	1
参数号码	—	—	1
生产量计数器	—	—	0
模式	—	—	程序
布料放置位置	—	—	里面放置
切刀动作	—	—	OFF

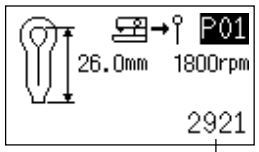
7-4. 生产量计数器的设定更改的方法

生产量计数器，在自动模式时显示部的右下角被显示。每缝制 1 花样计数器上被增加“1”的数值。

1 按成自动模式。



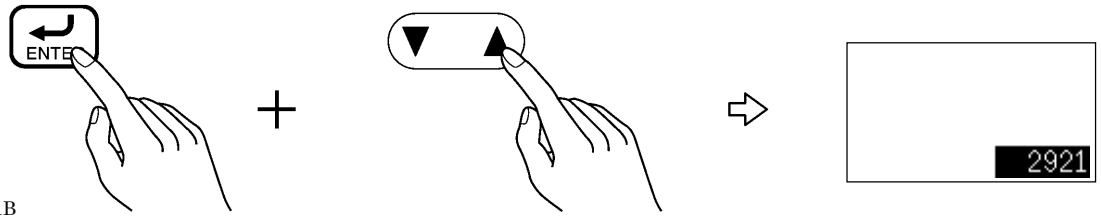
0430B



生产量计数器

0222B

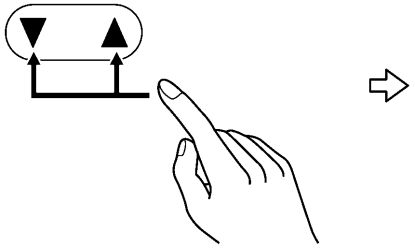
2 在待机状态时，先按着 ENTER 键再按▲键。



0451B

0262B

3 设定计数值(1)。



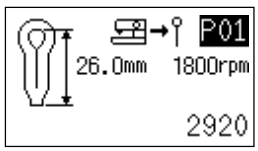
0414B

0599B

* 计数值被更改时，(1)将被表示为闪烁。
* 想回到“0”时，按 RESET 键。

4 确定已更改了的值。

0415B



回到自动模式。

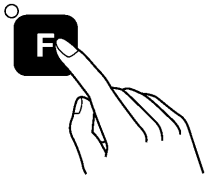
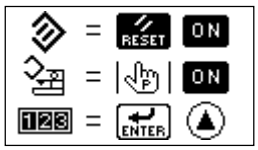
0600B

【注意】

计数值(1)在闪烁中如按了 AUTO 键，将不变更而回到自动模式。

7-5. 帮助画面的表示方法

帮助画面里用图表示了进入“数据初始化模式”，“存储开关设定模式”，以及“生产量计数器设定模式”的方法。(详细参考下表）。

1	在自动模式、试送布模式、手动模式、程序模式、循环程序模式的各待机状态时 按 F 键。   * 按着 F 键时，会显示帮助的画面。 0452B 0303B
2	放开 F 键，恢复原状。

【注意】

由于存储开关的设定变更 F 键作为快捷键被使用时，有可能不能显示帮助的画面。如要显示帮助画面，请将存储开关 300 号设定为 OFF。(具体参考「7-2. 存储开关的设定方法」)

帮助画面的图标的意义

显示图标	意义	操作方法
= RESET ON	进入数据初始化模式的方法	按着 RESET 键，同时再按电源开关 ON 侧
= P ON	进入存储开关设定模式的方法	按着 PROGRAM 键，同时再按电源开关 ON 侧
123 = ENTER ▲	进入生产量计数器设定模式的方法	在自动模式待机状态，按着 ENTER 键，同时再按▲键。

0304B
0305B
0306B

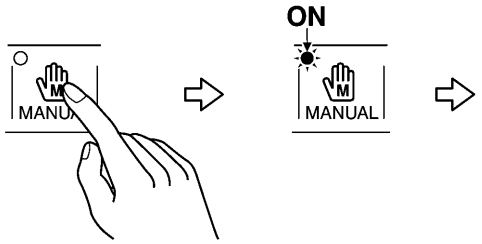
7-6. 手动缝纫(手动模式)

⚠ 注意

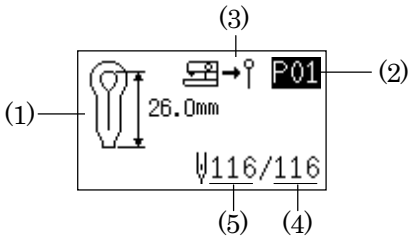
在手动缝纫中因锤子有工作，请不要将手放在锤子的旁边。
会导致受重伤的原因。

用手转动手轮，送布台能一针一针的移动。这对进行分纱器的同步调整时会比较方便。(具体参考「9-10. 分纱器的同步调整」)

1 按成手动模式。



0433B

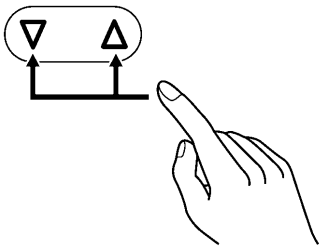


0225B

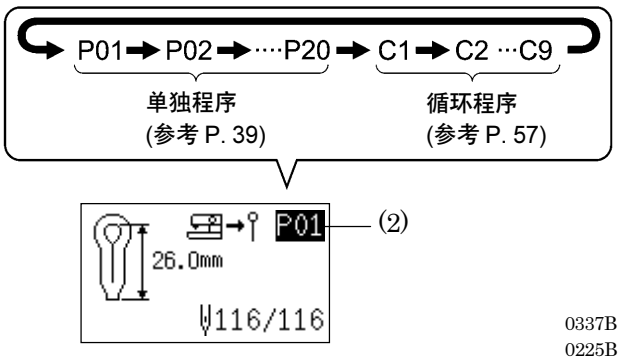
在显示窗显示了缝纫针迹的形状(1)、程序号码(2)、切刀动作(3)、总针数(4)、残余针数(5)等。

0230B

2 选择希望的程序号(2)。



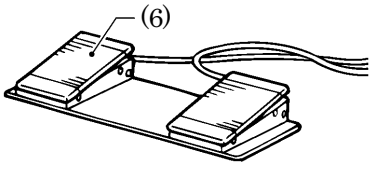
0413B



0337B
0225B

每按一次△键，程序号(2) 就会按图的顺序切换。(按▽键正好相反，即为逆顺序。)

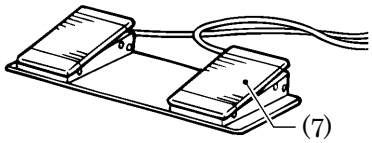
3 在压布夹的下面放入缝制布料，按下压布开关(6)。



0531B

放下压布夹。

4 按启动开关(7)。



0532B

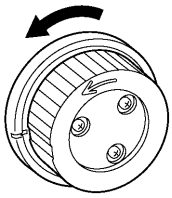
将送布台移动到缝纫开始的位置。

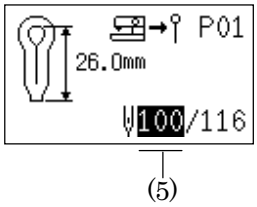
[注意]

将切刀动作设定为「先切刀」时，因锤子的移动请一定注意安全。

5 上轴手轮向左回转。

0226B





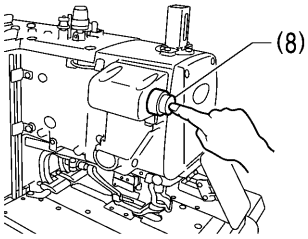
(5)

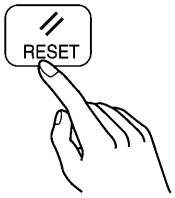
- 上轴的连动将送布台移动到下一个缝纫位置。
- 上轴手轮每回转半圈(针杆上下 1 次)显示窗显示的残余针数(5)就会减少 1 针。

[注意]
如上轴手轮逆转的话，将不会形成针迹的形状，请不要将手轮逆转。

0435B

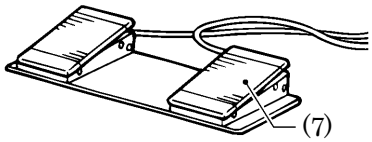
6 **[如想中止手动缝纫，送布台回到布料放置位置时]**
按暂停开关(8)，然后再按 RESET 键。





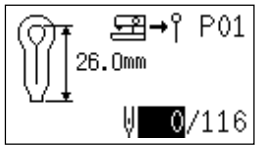
0533B

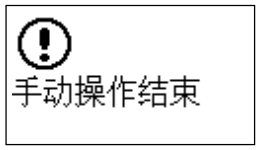
[在到达最后一针时蜂鸣器会鸣响]
针杆在针上位置停止状态，按启动开关(7)。



(请一直按着，直到送布台回到
布料放置位置为止。)

0227B
0595B





(进行切线动作，送布台回到布料放置位置。)

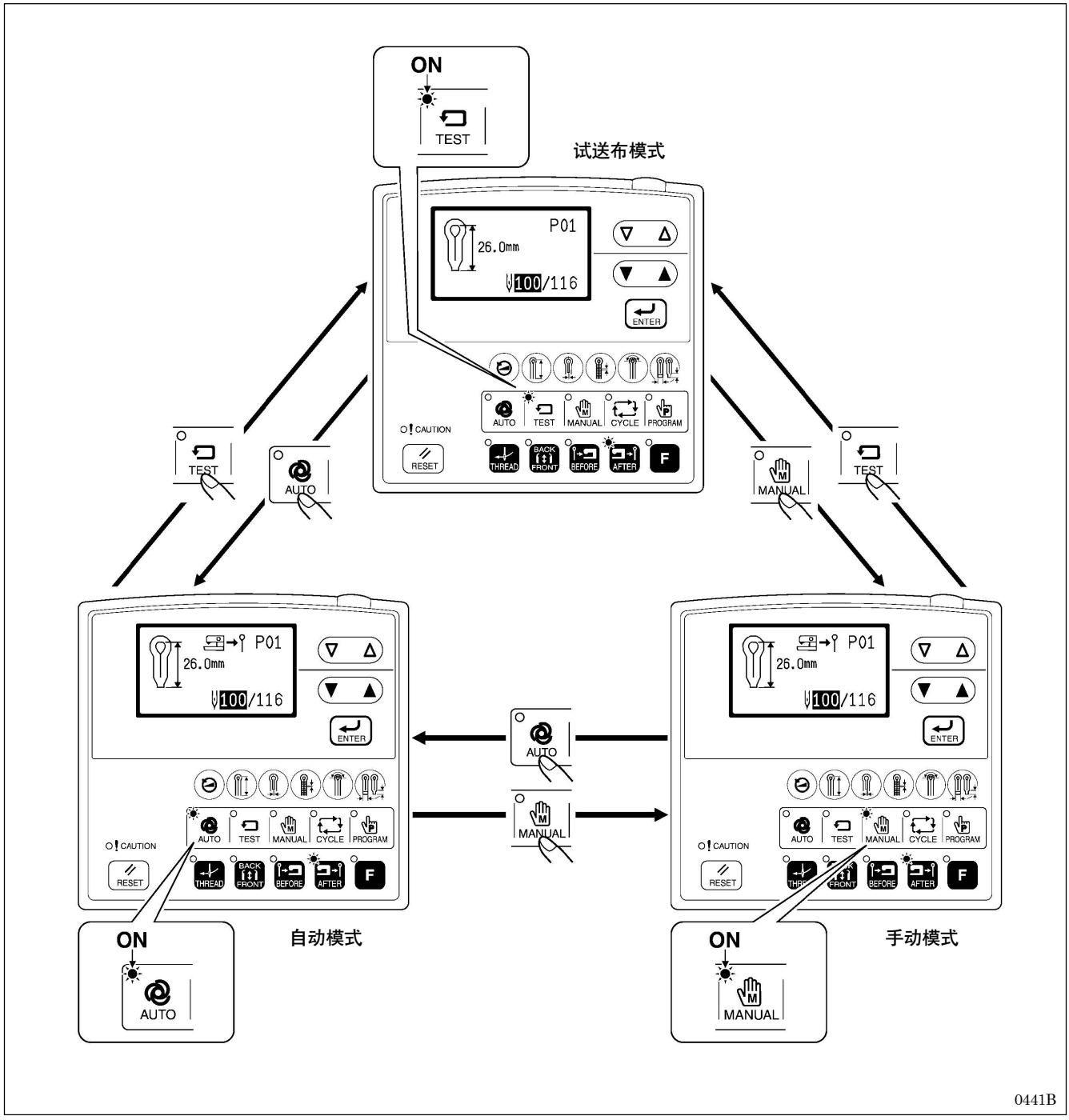
[注意]
将切刀动作设定为「后切刀」时，因锤子的移动请一定注意安全。

0532B

7-7. 在缝纫中途缝纫模式的切换

在自动缝制中、手动缝制中或是试送布模式中的工作中解除了暂定(中断)的状态时，可以按下自己所希望的模式键随意移动到该模式。

每按一次各键缝纫模式将会如图所示进行切换。



8. 清扫和点检

⚠ 注意

清洁前请关闭电源开关。
否则如果误按启动开关，缝纫机动作会导致受伤。

使用润滑油时,务必戴好保护眼镜和保护手套等，以防润滑油落入眼中或沾在皮肤上，这是引起发炎的原因。
另外，润滑油不能饮用，否则会引起呕吐和腹泻。
将油放在小孩拿不到的地方。

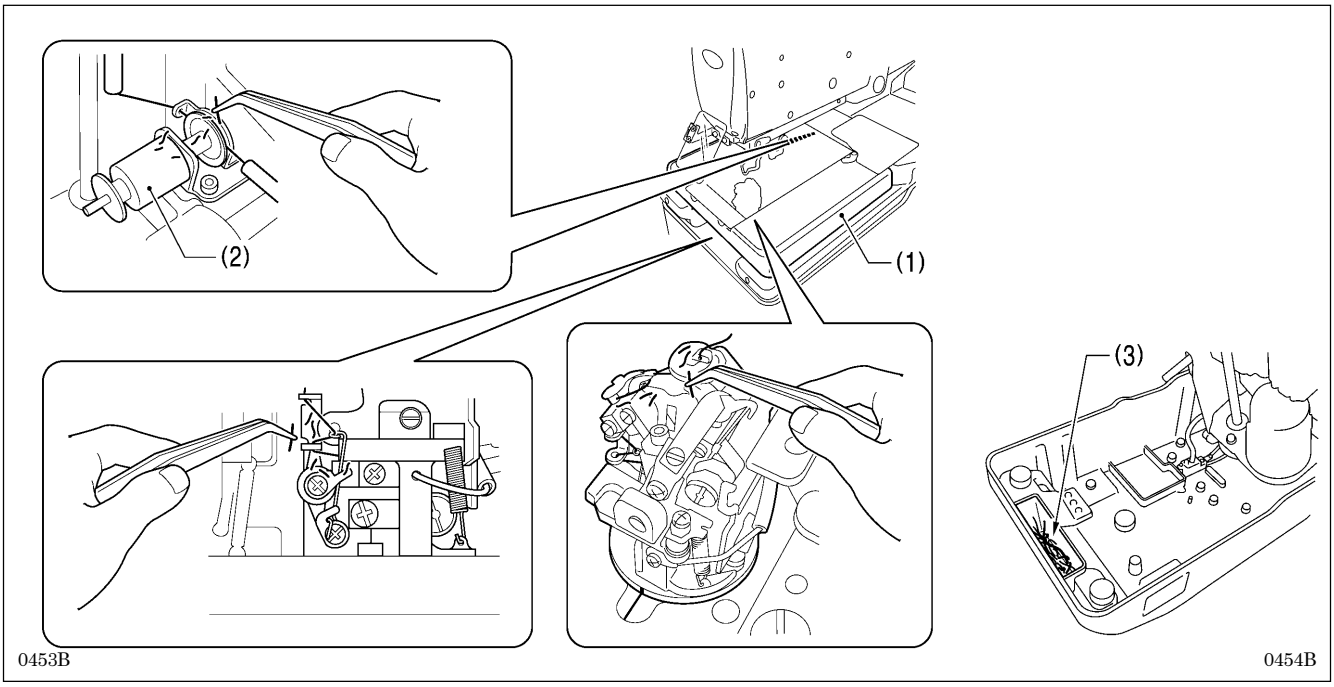
8-1. 每日的清扫和点检

为了保持缝纫机的性能，及能够长期使用，请每日进行下列的清扫和点检。另外，如缝纫机长时间没被使用时，也要进行下列的清扫和点检后再使用缝纫机。

8-1-1. 清扫

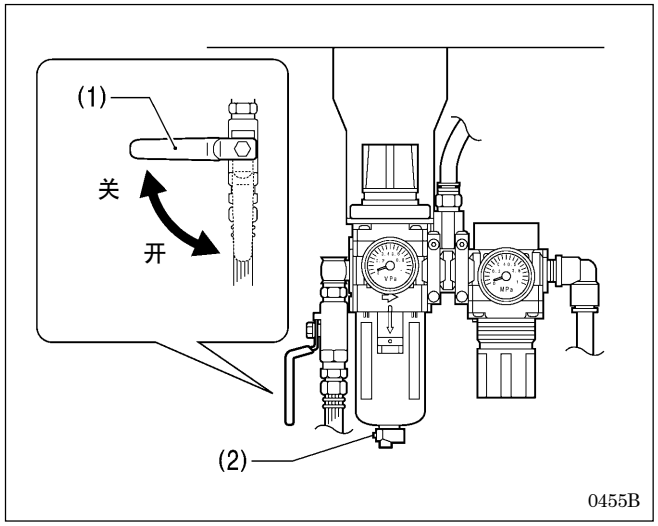
[注意]

在缝纫机头部倒下的状态下，请别使用空气枪。容易使缝纫机内部附着线屑，成为发生缝纫机故障的原因。



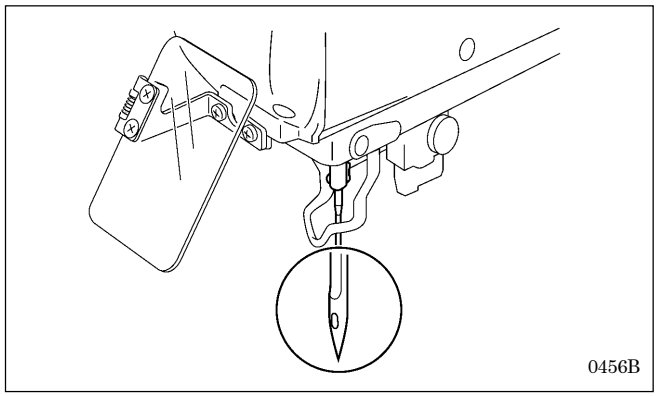
1. 关闭电源开关。
2. 回转空气阀停止供气，然后按下按钮，释放残留的空气。
   (具体请参考「3-16. 气压的调节」)
3. 将压布板拆下。(具体请参考「3-19. 压布板的拆除和安装法」)
4. 清除线道(面线・底线・芯线)附近的附着的线头和灰尘等。
   * 特别是弯针附近的线道要每天清除附着的线头和灰尘等。
5. 将送布台(1)向前移动，清除芯线电磁铁(2)附近的附着的线头和灰尘等。**＜仅限-02 规格＞**
6. 倒下缝纫机头部，清除底板台中的线头回收槽(3)中积聚的线屑。

8-1-2. 空气过滤器的点检



1. 关闭空气阀(1)。
2. 按下按钮(2)，释放排泄管内残留的空气和水。
3. 释放完了后打开空气阀(1)。

8-1-3. 机针的点检

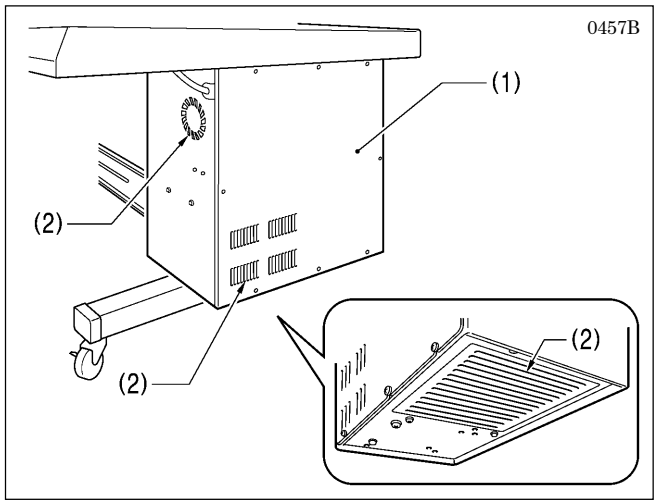


缝纫前，请一定要确认机针的针尖有否折断或弯曲。

8-2. 每月一次的清扫和点检

关于每月一次的定期清扫和点检进行说明。

8-2-1. 控制箱的换气口的清扫

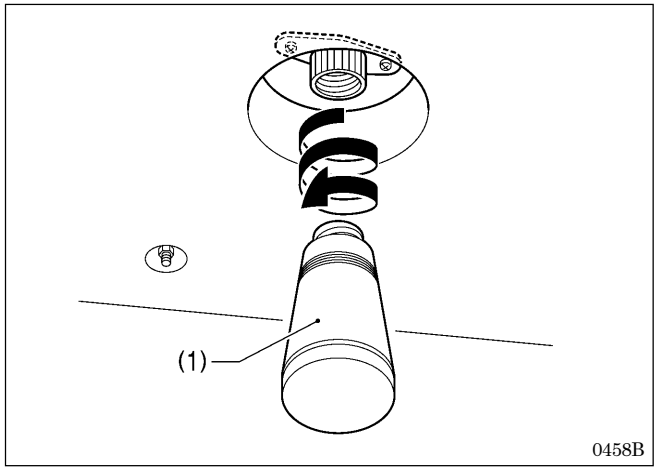


请使用扫除机对控制箱(1)的空气换气口(2)的过滤网进行清扫。

8-3. 随时进行的清扫和点检

下面对随时进行的清扫和点检进行说明。

8-3-1. 清除润滑油

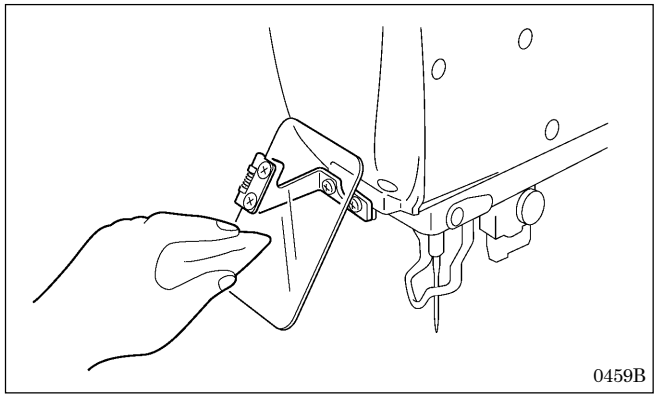


1. 当油壶(1)内积满了废油时，请拆下油壶(1)，并清除里面的废油。
2. 清除完后，将油壶(1)拧回到原来位置。

[注意]

请遵守废油处理法规，正确处理废油。
如废油有洒到地上时，请一定抹拭干净。

8-3-2. 护眼板的清洁



护眼板污秽时，请用软布将其擦拭干净。

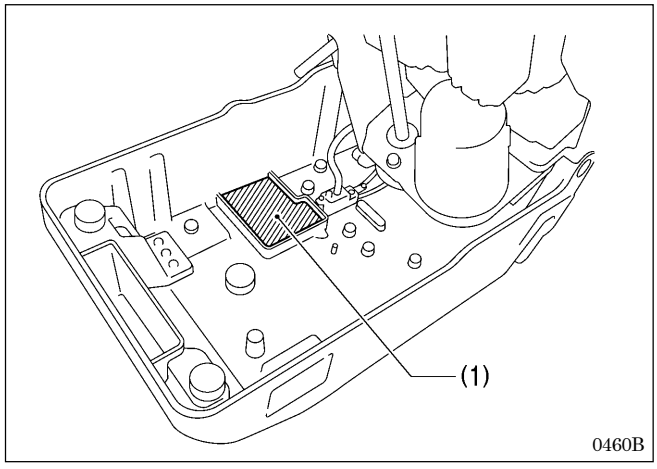
[注意]

请勿使用有机溶液如汽油或信纳水(稀释剂)清洁护眼板。会成为护眼板变色、变形、退化的原因。

8-3-3. 加油

参考「3-20. 供油」请随时进行加油。

8-3-4. 清除废水



1. 倒下缝纫机头部。
2. 因为来自压缩机的空气，根据状态的不同可能会在底板座部(1)里积水，请吸出积水。

[注意]

如果有积水的话,请按「8-1-2. 空气过滤器的点检」进行检查。如果点检完还会积水的话，有可能是汽缸出现故障了，推荐安装自动排泄管(市场销售品)。

9. 标准调整

⚠注意

只有经过训练的技术人员才能进行缝纫机的维修、保养和检查。

与电气有关的维修、保养和检查请委托购买商店或电气专业人员进行。

发生下列情况时，请关闭电源。并拔下电源线插座。否则误按启动开关时，缝纫机动作会导致受伤。
- 检查、调整和维修
- 更换弯针、切刀等易损零部件

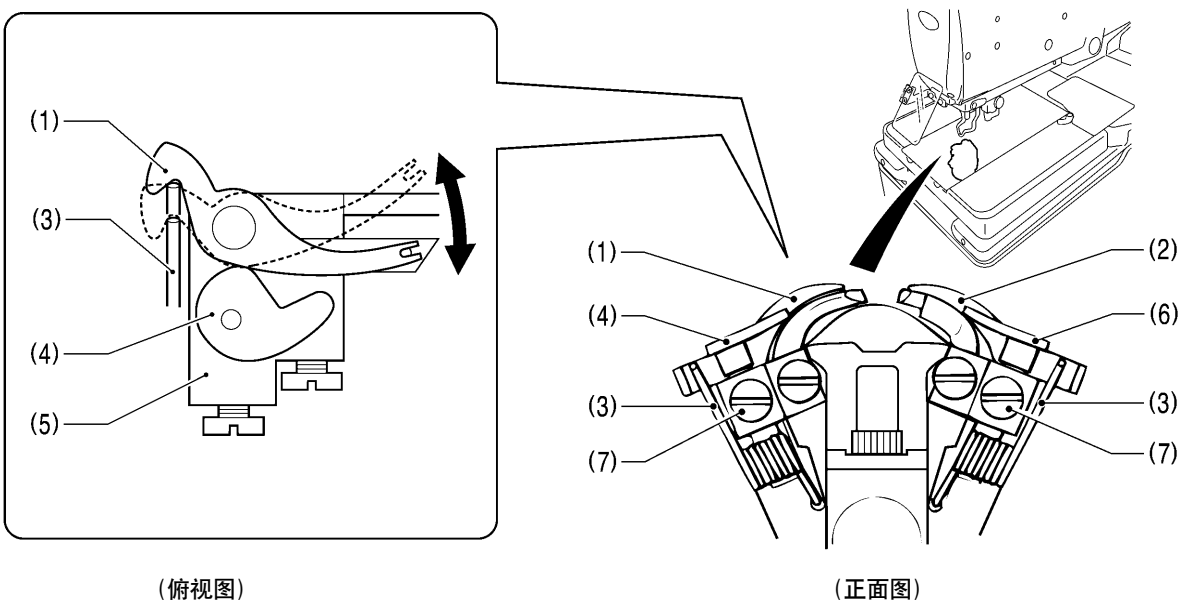
在检查、调整和修理任何使用气动装备之前，请先断开气源,并等压力表指针下降到「0」为止。

在必须接上电源开关和气源开关进行调整时，务必十分小心遵守所有的安全注意事项。

取下的安全保护装置，必须要安装。且请务必安装在原位上,并检查能否正常的发挥作用。

9-1. 分纱器和弯针高度的调整

分纱器的高度

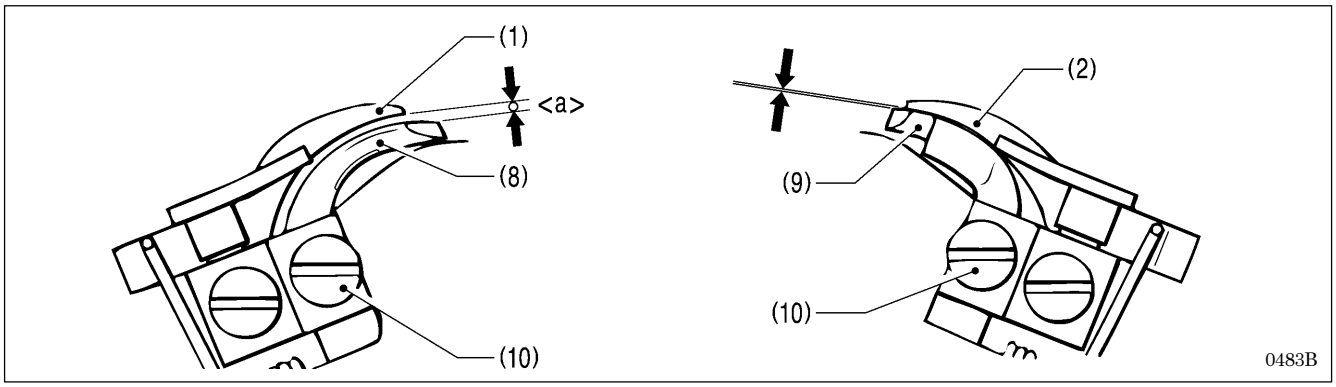


（俯视图）　　（正面图）

0481B

1. 拆除压布板。(具体请参考「3-19. 压布板的拆除和安装法」)
2. 确认下述之事。
   - 左叉板 L(1)靠弹簧(3)进行移动，调整左叉板挡块 L(4)和 LS 支架基座(5)之间，使其能无松动地平滑移动。
   - 右叉板 R(2)靠弹簧(3)进行移动，调整右叉板挡块 R(6)和 LS 支架基座(5)之间，使其能无松动地平滑移动。
3. 如果不能够平滑移动或是有过大的间隙时，松开螺钉(7)，将左叉板挡块 L(4)或是右左叉板挡块 R(6)上下移动来进行调整。
4. 调整终了后，将螺钉(7)拧紧。

弯针的高度



请将有孔弯针(8)以及弯针 R(9)的位置按以下情况进行调整。

- 有孔弯针(8)和左叉板 L(1)之间的间隙约为底线(弯针线)的线粗<a>左右。
- 弯针 R(9)和右叉板 R(2)之间的间隙尽可能小(不可碰到)。

＜调整方法＞

1. 松开螺钉(10)，将有孔弯针(8)、弯针 R(9)分别上下移动来进行调整。
2. 确认左叉板 L(1)和右叉板 R(2)依靠弹簧(3)之力能进行平滑作动。
3. 调整终了后拧紧螺钉(10)。

9-2. 针迹幅宽(缝纫宽度)的调整

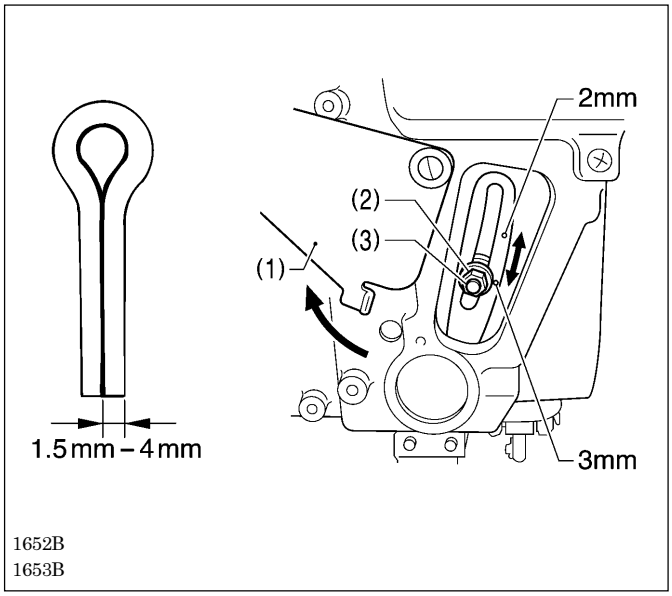
针迹幅宽是在 1.5㎜～ 4 ㎜ 之间可以进行调整。出厂时设定为 3㎜。

* 针迹幅宽在 3.2㎜ 以上时，请交换转盘板(选购件)。

[注意]

如果更换了转盘板，请重新进行以下调整。

「9-20. 压布板的位置调整」、「9-21. 布料开口量的调整」



1. 将盖(1)回转，打开。
2. 使用附件扳手，将调整针迹幅宽用的螺母(2)松开。
3. 调整螺钉(3)可沿着长槽上下调整。
   * 向上移动时，针迹幅宽变小。
   * 向下移动时，针迹幅宽变大。
   * 在针迹幅宽 2㎜ 和 3㎜ 的位置附有钢印。请将钢印和调整螺钉(3)的中心对齐。
4. 调整终了后，将调整用的螺母(2)拧紧后，盖上盖(1)。

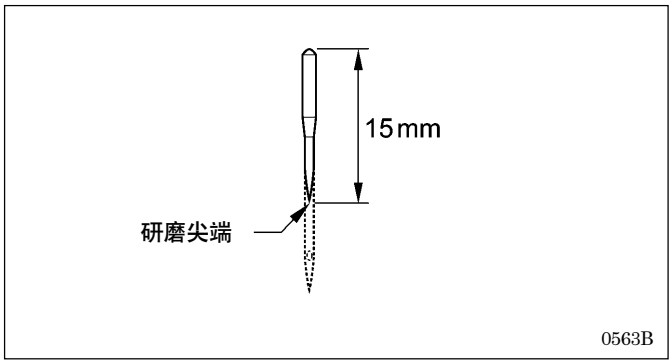
[注意]

- 针迹幅宽有很大的改变时，请再次调整以下各项目。
  「9-4. 机针和弯针的同步调整」、「9-5. 弯针幅度的调整」、「9-6. 针杆高度的调整」、
  「9-7. 弯针和机针之间的间隙调整」、「9-8. 机针护架的调整」、「9-9. 分纱器的安装位置的调整」、
  「9-10. 分纱器的同步调整」
- 钢印是针迹幅宽的大致上的位置，请按针尖落在纸上的正确的针迹幅宽测定法来测定。

9-3. 针摆基线位置的调整

短的调整针的准备

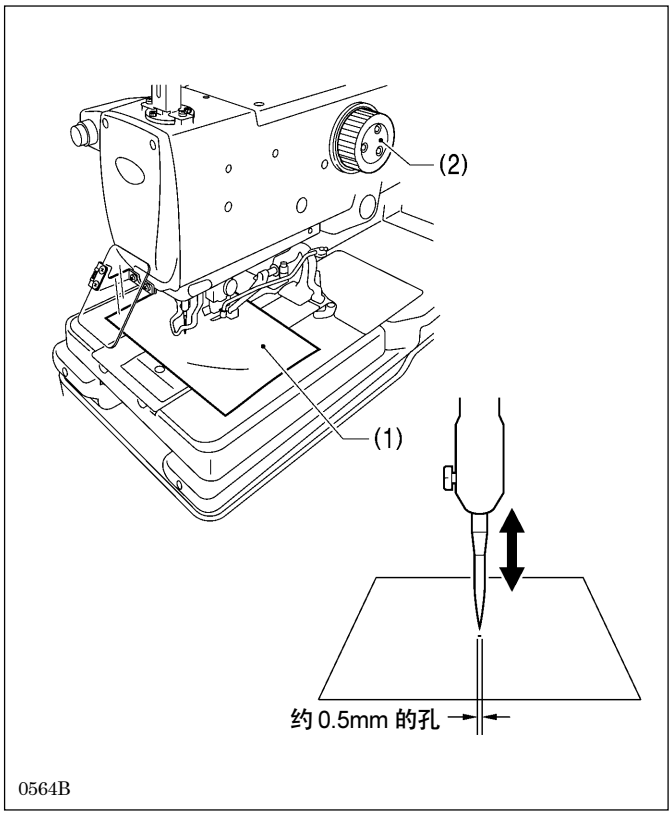
为了在纸上一边落针一边确认钉的小孔，请预先准备好下记的短的机针。



1. 将已有的机针用研磨机等研磨掉机针的尖端部，使机针的长度为 15㎜。
2. 研磨机针的尖端。

[注意]

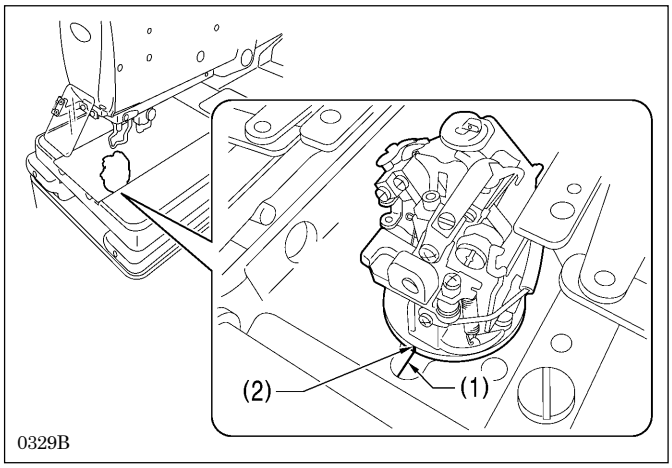
研磨机针以使针尖位于中间位置。



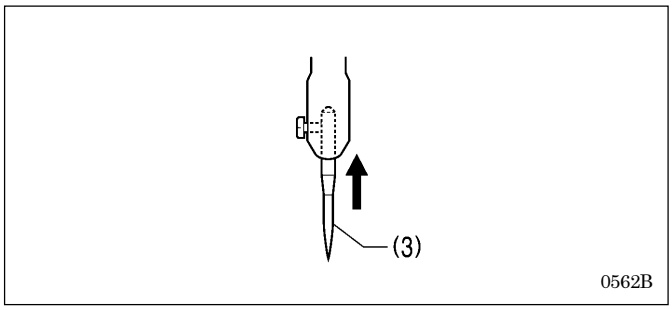
3. 将纸(1)放进压布夹下。
4. 回转上轴手轮(2)，将机针调到最低位置。
5. 针调到最低位置时，用机针的针尖在纸(1)上钉约 0.5㎜的小孔，将机针上下移动来调整机针的按装位置。

针摆基线位置的调整

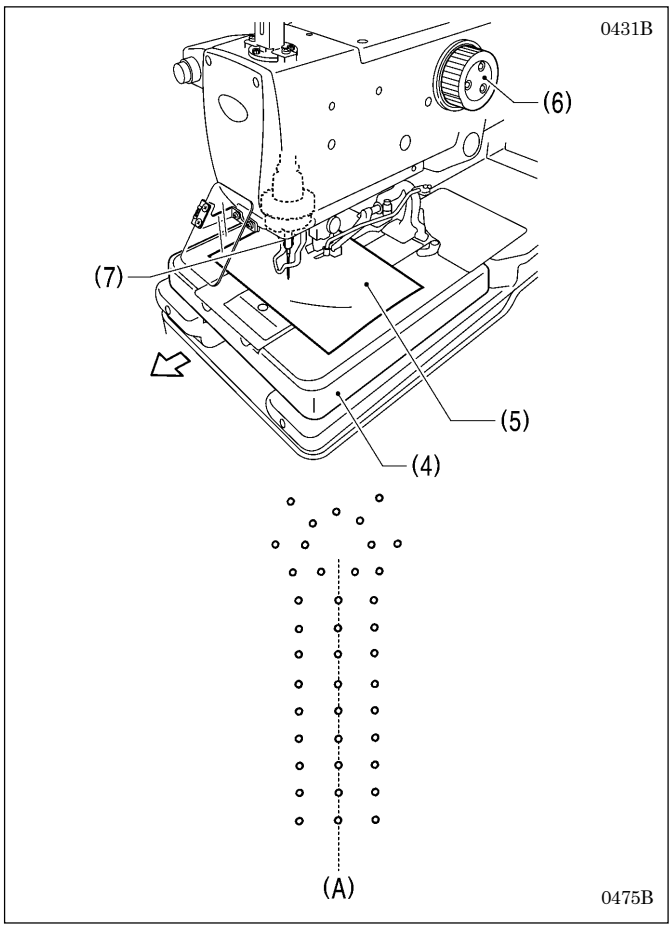
针摆的基线是在针摆的内侧。
即使针迹幅宽改变针摆基线(内针基线)也不会改变，仅仅只是外侧落针改变而已。



1. 将针杆齿轮基座(θ)移到原点位置。
   * 底板部的钢印(1)和弯针座的钢印(2)一致的位置是针杆齿轮基座(θ)的原点位置。

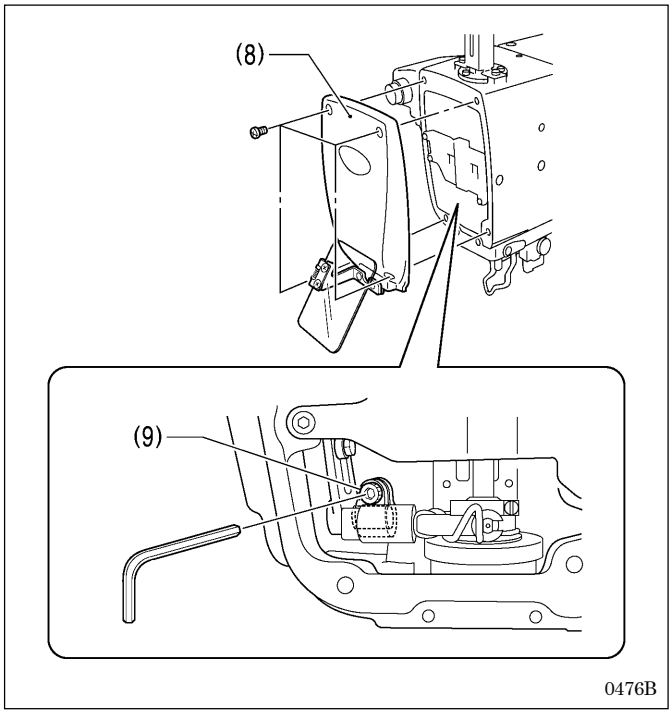


2. 安装上短的调整针(3)。
   (参考前一页「短的调整针的准备」)



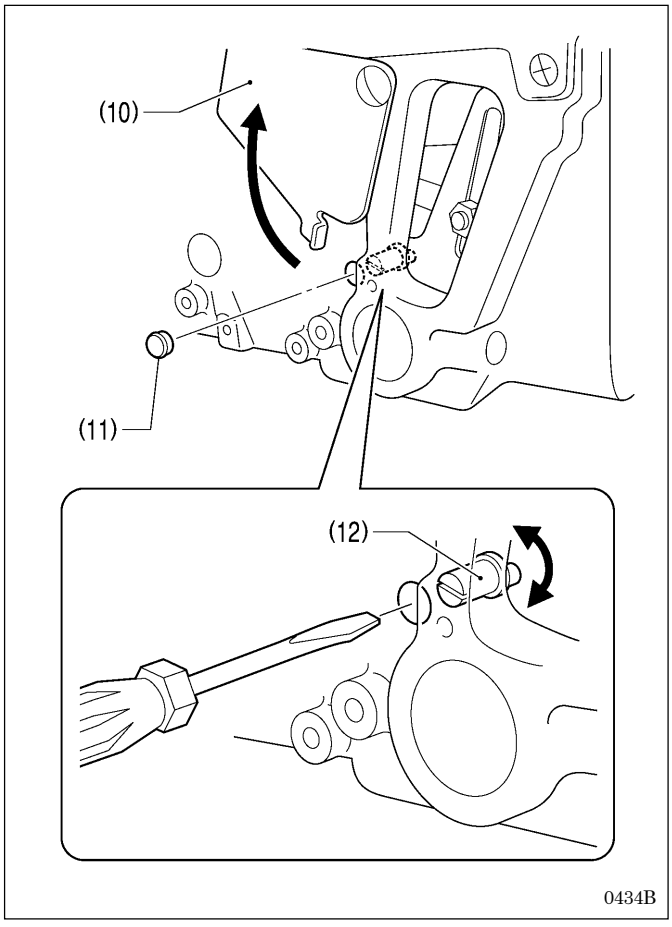
3. 用手将送布台(4)移动到前面(缝纫开始点的附近)。
4. 将纸(5)放进压布夹下。
   * 请固定好，不可移动。
5. 回转上轴手轮(6)，在纸(5)上开一个小孔似的将机针的针尖下降。
6. 然后将上轴手轮(6)反方向回转，回到原来的位置(针上位置)。
7. 用手将针杆齿轮基座(针杆)(7)回转 180° 度。
8. 回转上轴手轮(6)，在纸(5)上开一个小孔似的将机针的针尖下降。
   * 如果与内侧的落针(A)不一致的话，请按下一页的 9～12 顺序进行调整。

(下一页继续)



<针摆基线位置的调整>

9. 取下面板(8)，松开螺栓(9)。



10. 打开盖(10)，取下橡皮塞(11)。
11. 使用一字起子插入孔中，回转针摆偏心销(12)来调整。
12. 拧紧螺栓(9)。
13. 直到与内侧的落针一致为止，从复 4～12 的顺序。
14. 调整终了后，按橡皮塞(11)，盖(10)，面板(8)的顺序一一装上，恢复原来的形状。

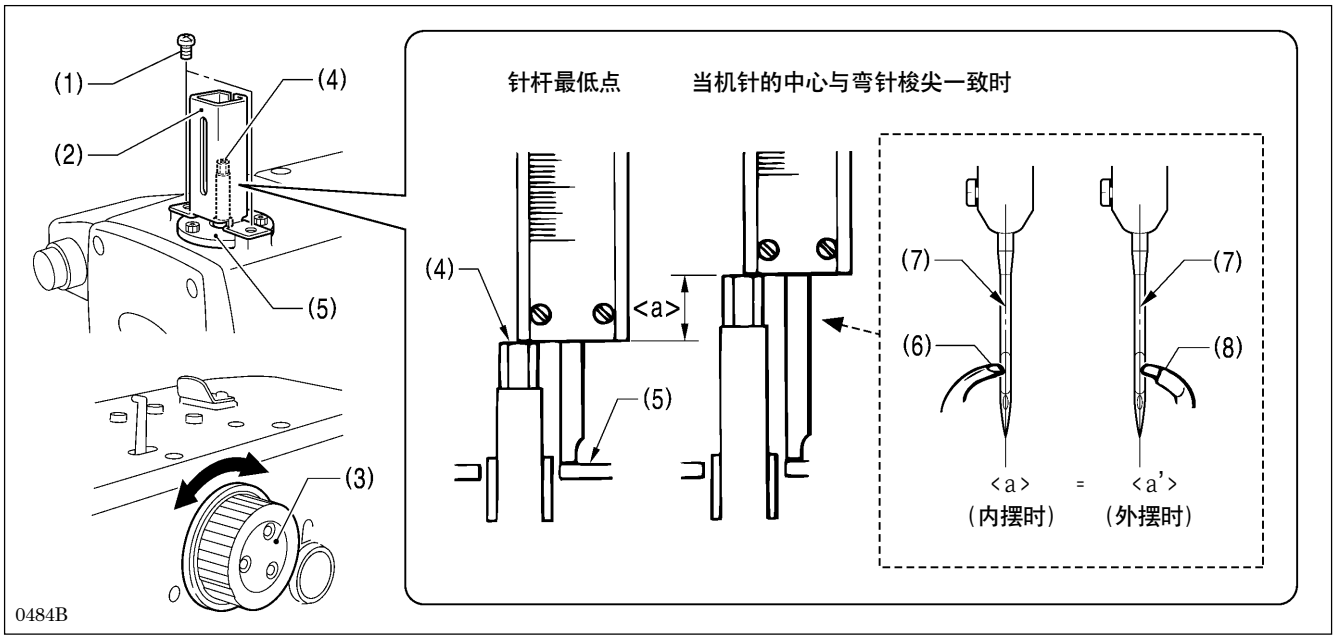
9-4. 机针和弯针的同步调整

[参考]

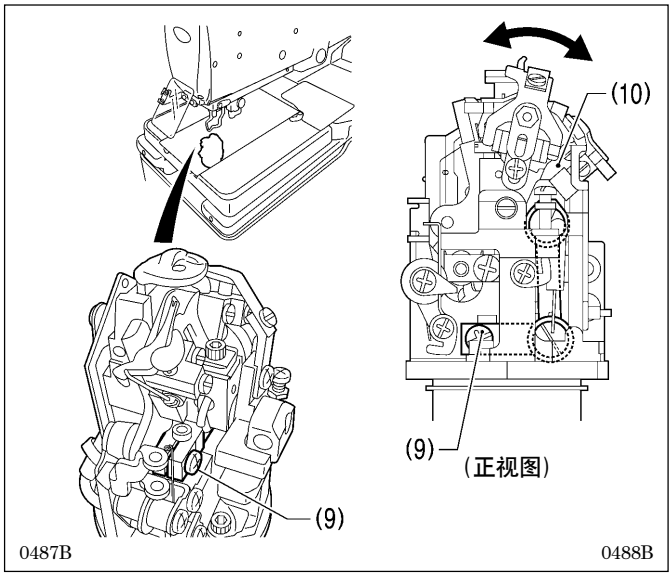
针杆在上轴手轮回转一周时针落运动 2 次。左侧(切刀切断侧)的针落运动称为“内摆”、右侧的针落运动称为“外摆”。还有，针杆从最下点上升时，左右各自的弯针梭尖和机针的中心一致为止的运动量称为“弯针幅度”。

必须使左右的弯针幅度一样。在此，将左右的弯针幅度成为一样，分别进行调整。

* 在此调整前，请先设定针迹幅宽(缝纫宽度)。(参考「9-2. 针迹幅宽(缝纫宽度)的调整」)



1. 取下螺钉(1)[2 个]，取出针杆导向(2)。
2. 回转上轴手轮(3)，设定针杆在内摆的针杆最下点。
3. 使用游标卡尺测定从针杆前端(4)到针杆轴套压座(5)表面为止的高度。
4. 接着，回转上轴手轮(3)，使有孔弯针(6)的梭尖和机针的中心(7)成为一致。
5. 和顺序 3 同样，使用游标卡尺测定从针杆前端(4)到针杆轴套压座(5)表面为止的高度。
6. 算出从顺序 5 得到的数据和顺序 3 得到的数据之差值<a>。
7. 重复顺序 2～6，与内摆时同样的算出外摆时的差值<a'>。
   * 内摆时有孔弯针(6)的梭尖和机针的中心(7)一致，外摆时弯针 R(8)的梭尖和机针的中心(7)一致。

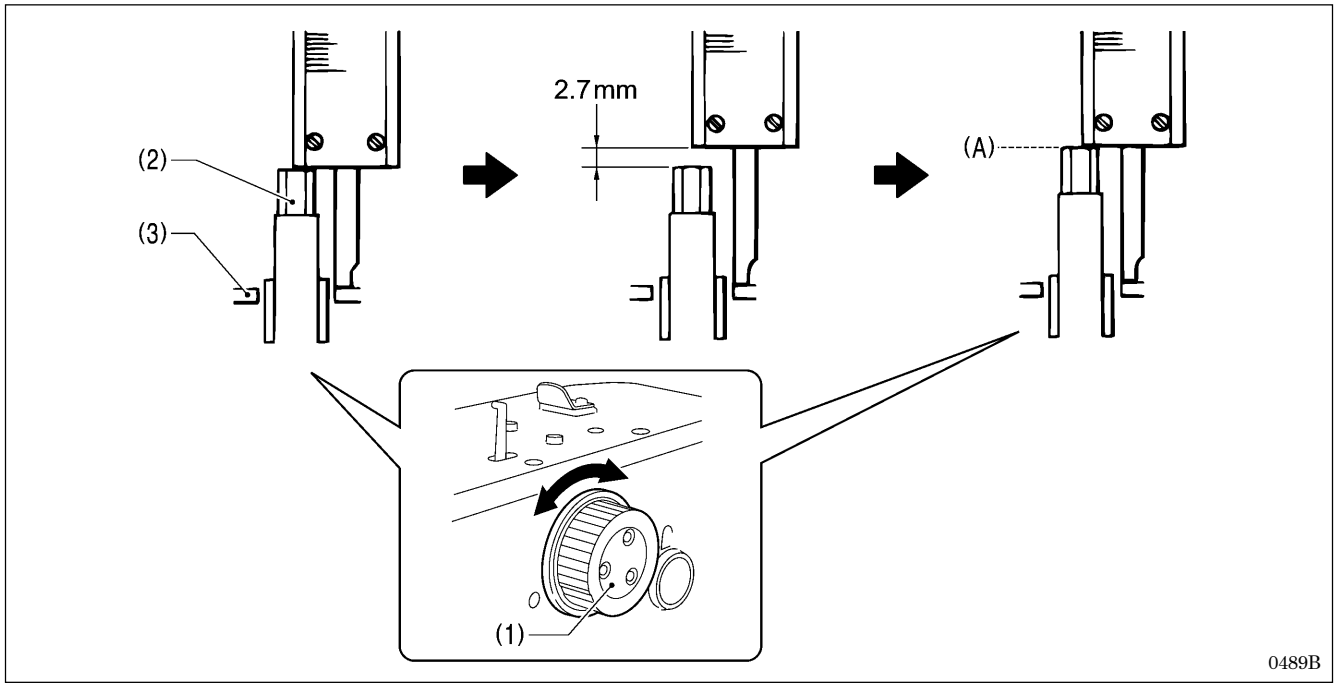


8. 松开螺钉(9)。
9. 为了使尺寸<a>和尺寸<a'>一样，将 LS 支架基座(10)左右移动(按箭头方向)进行调整。
10. 调整终了后，拧紧螺钉(9)。

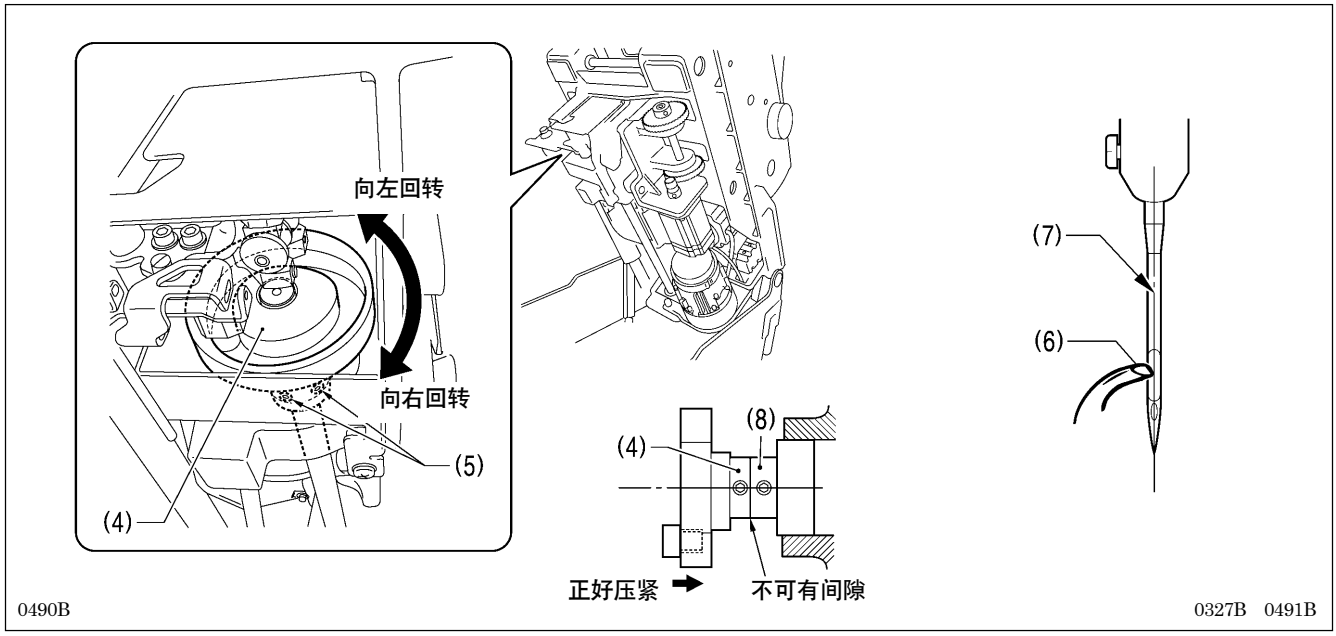
9-5. 弯针幅度的调整

弯针幅度的标准值为 2.7㎜。(根据布料、缝线而改变此值的情况也是有的。)

* 在此调整前，请先进行「9-4. 机针和弯针的同步调整」。



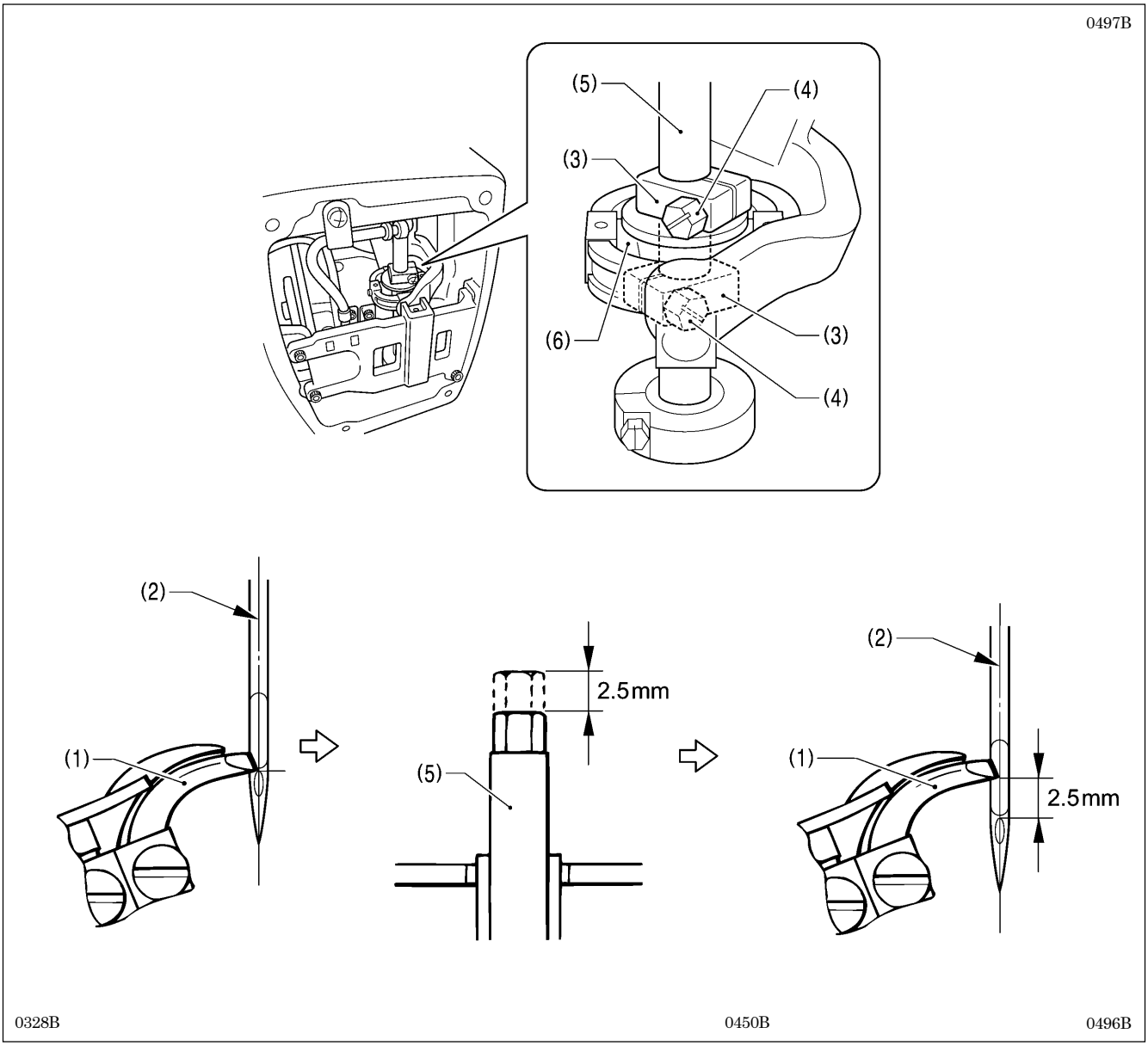
1. 回转上轴手轮(1)，设定针杆在内摆的针杆最下点。
2. 在此位置处，使用游标卡尺测定从针杆(2)的前端到针杆轴套压座(3)表面为止的高度。
3. 将上述顺序 2 得到得数据加上数值 2.7㎜，和游标卡尺一致。
4. 回转上轴手轮(1)，使针杆(2)的前端碰到游标卡尺的端面(A)为止，停止上轴手轮(1)的回转。



5. 倒下缝纫机头部。
6. 松开下轴凸轮(4)的定位螺钉(5)[2 个]。
7. 在停止上轴手轮(1)的状态下，回转下轴凸轮(4)，调整到有孔弯针(6)的梭尖和机针的中心(7)一致为止。
8. 调整终了后，下轴凸轮(4)用轴承套(8)的端面压住，然后将定位螺钉(5)[2 个]拧紧。

9-6. 针杆高度的调整

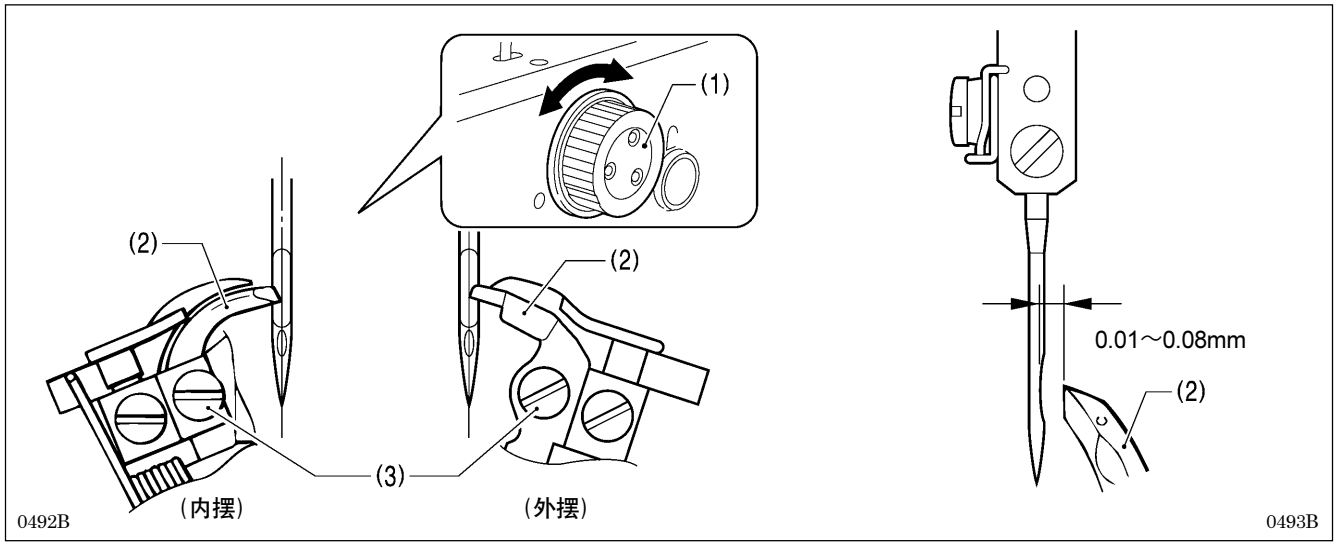
弯针幅度的标准值为 2.5㎜。(根据布料、缝线而改变此值的情况也是有的。)



1. 取下面板。
2. 回转上轴手轮，在内摆时，在机针的中心(2)处，将有孔弯针(1)的梭尖和针孔的上端一致。
3. 松开上下针杆抱箍(3)的螺钉(4)[2 个]。
4. 从有孔弯针(1)的梭尖和针孔的上端一致的位置处，针杆(5)向下降 2.5㎜。
5. 为了使针杆的回转平滑，调整上下的针杆抱箍(3)和针杆水平连杆(6)之间的间隙，使机油能渗入的程度的间隙，不可太松动。
6. 调整终了后，拧紧螺钉(4)[2 个]，安装上面板。

9-7. 弯针和机针之间的间隙调整

机针号码改变了时，一定要确认机针和弯针的梭尖之间的间隙，请进行必要的调整。该调整应分内摆和外摆两方面来进行。



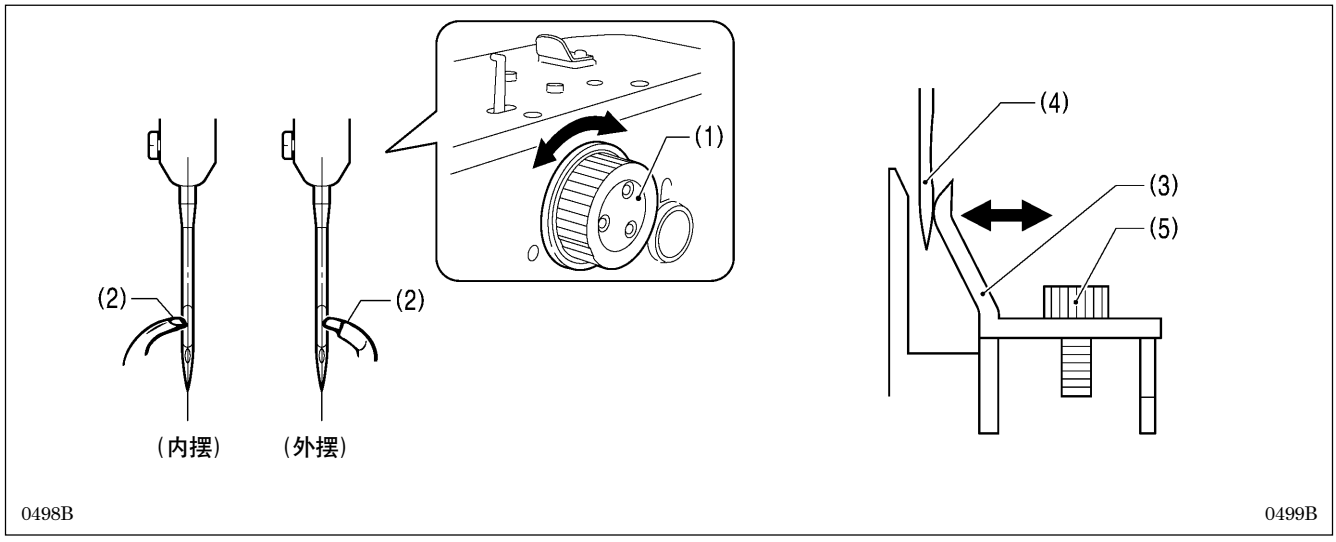
回转上轴手轮(1)，将左右各弯针的梭尖(2)与机针的中心一致时，机针和弯针的梭尖(2)之间的间隙为 0.01～0.08㎜，松开螺钉(3)进行调整。

* 该间隙当弯针座回转中(360°度之间)时是必须要有的一定量的间隙。如果间隙不一样，请调整针杆回转中心。(针杆回转中心在出厂时已调整完了。)

* 进行该项调整时，请与「9-9．分纱器的安装位置的调整」也同时进行调整。

9-8. 机针护架的调整

机针号码改变了时，请一定要确认机针护架的位置，相应的作必要的调整。该调整应分内摆和外摆两方面来进行。

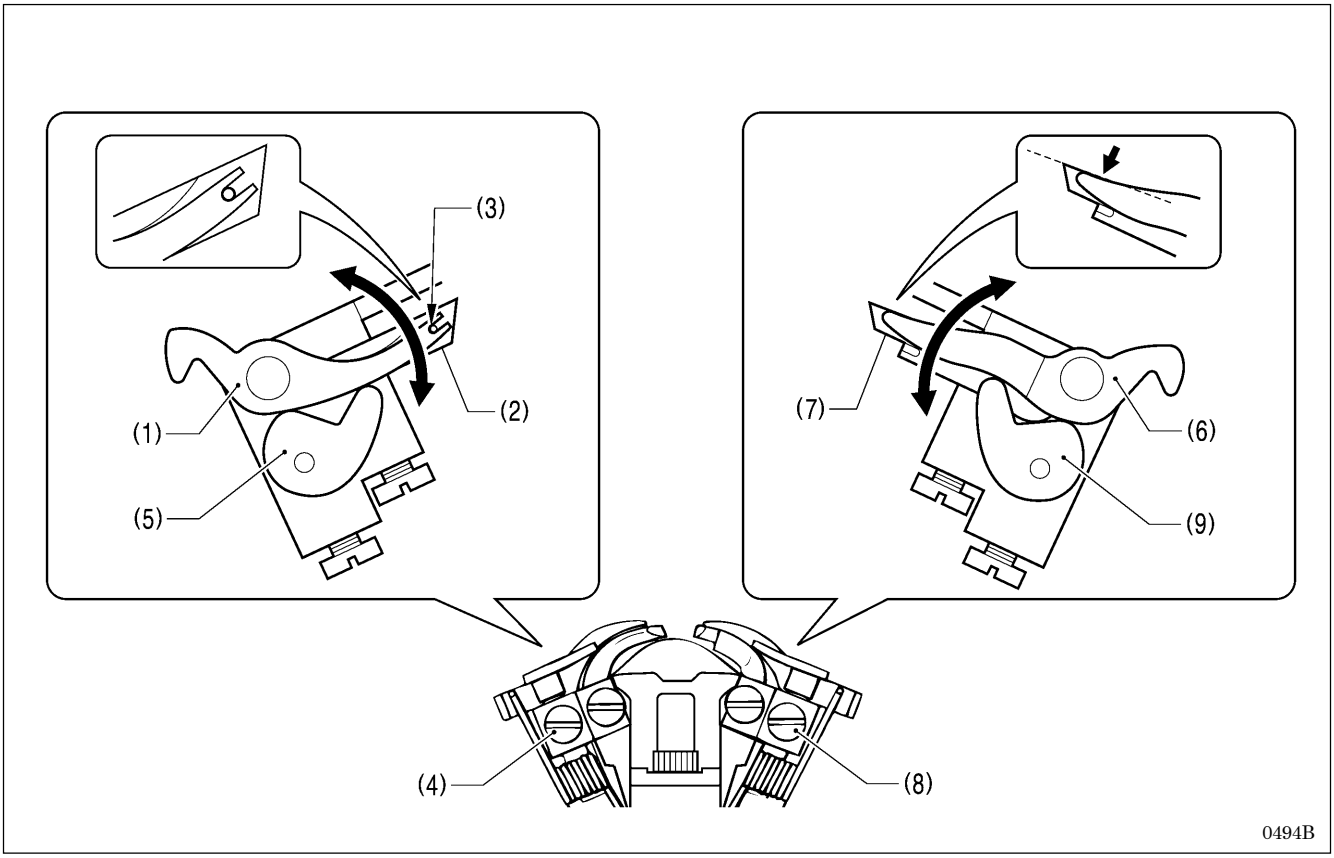


回转上轴手轮(1)，将左右各弯针的梭尖(2)与机针的中心一致时、机针护架(3)和机针(4)正好要接触到似的，松开螺钉(5)进行调整。

[注意]

机针护架不可过度的碰到机针，会给机针增加一定的负担，造成断针的原因。相反，机针如没被护住弯针的梭尖和机针发生干涉，是产生跳针的原因。

9-9. 分纱器的安装位置的调整



1. 左叉板 L(1)的前端的 U 字部和有孔弯针(2)的底线导向孔(3)的位置关系，如图所示，松开螺钉(4)，对左叉板挡块 L(5)进行调整。
2. 调整终了后，拧紧螺钉(4)。
3. 右叉板 R(6)的前端和右弯针 R(7)的梭尖的上端对齐，松开螺钉(8)，对右叉板挡块 R(9)进行调整。
4. 调整终了后，拧紧螺钉(8)。

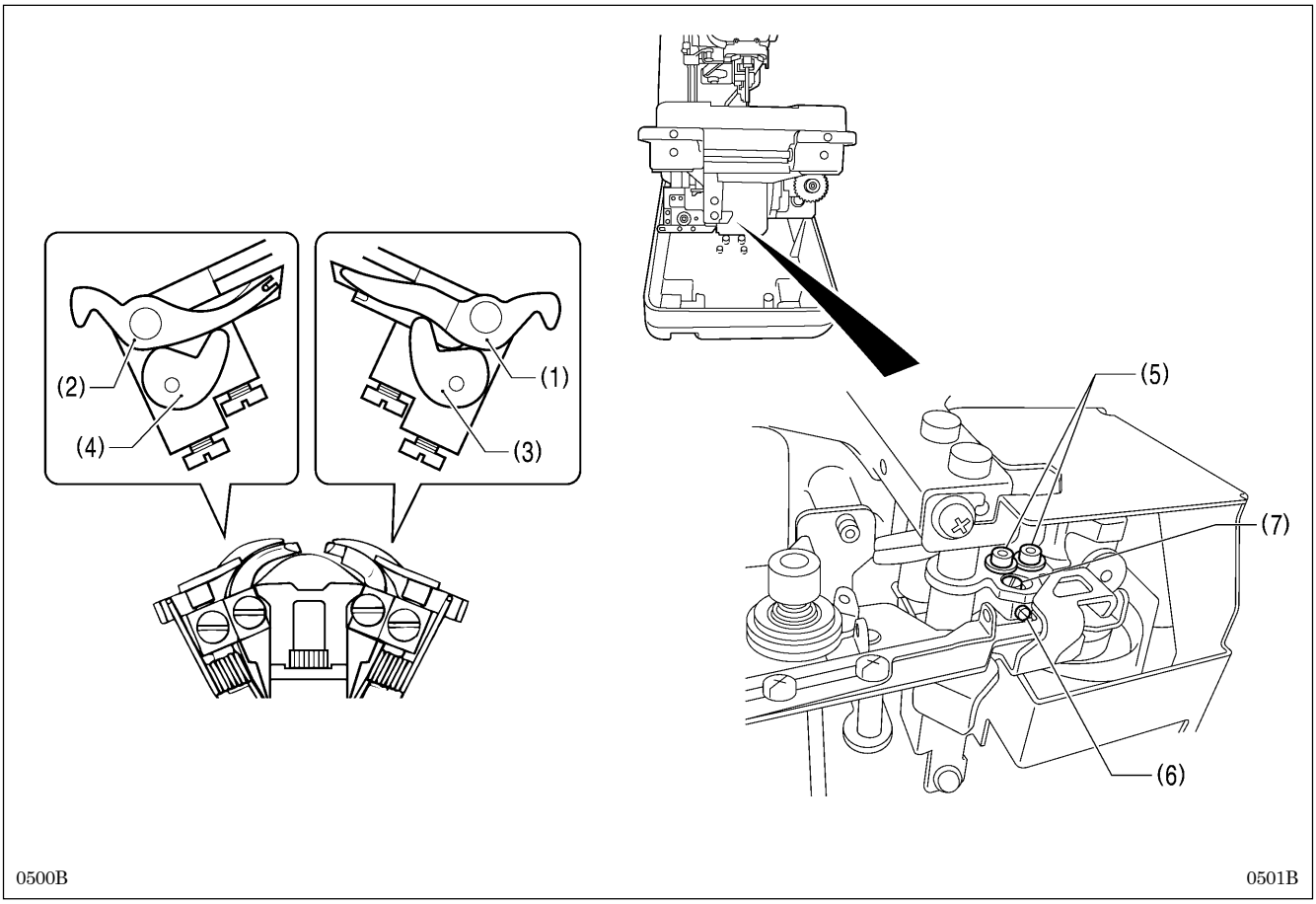
[注意]

左叉板 L(1)和右叉板 R(6)不可比各自的有孔弯针(2)和右弯针 R(7)更高。会产生跳针和断针的原因。

9-10. 分纱器的同步调整

在针杆抵达最低点前，右叉板 R(1)(内摆时)以及左叉板 L(2)(外摆时)分别应接触到右、左叉板挡块(3)、(4)并必须立即停止。

* 使用手动模式进行调整较为容易。

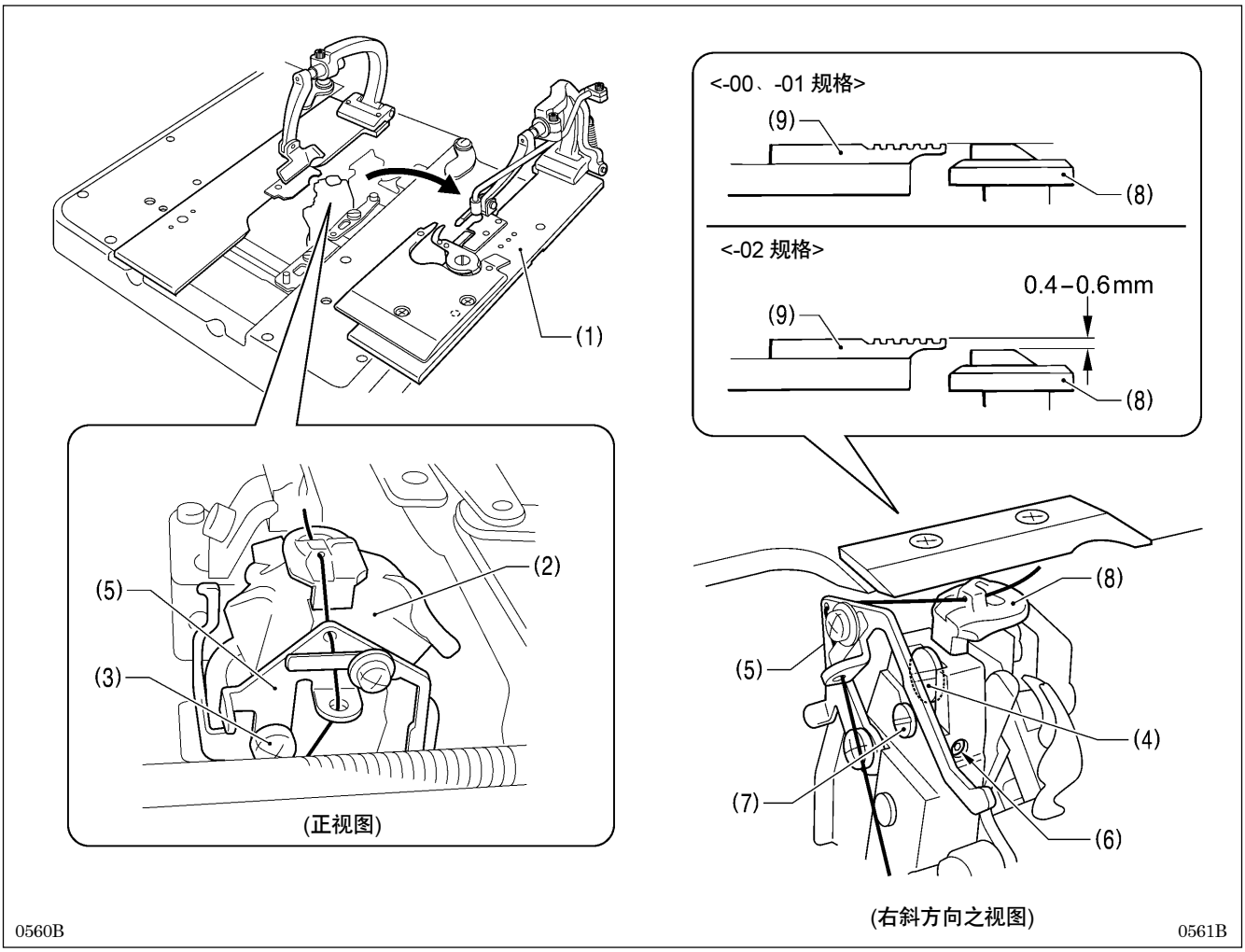


1. 倒下缝纫机机头。
2. 松开螺钉(5)[2 个]、然后再松开螺钉(6)。
3. 回转偏心销(7)进行调整。
4. 调整终了后，按顺序拧紧螺钉(6)和螺钉(5)[2 个]。

[注意]

右叉板 R(1)和左叉板 L(2)不可和机针发生干涉。

9-11. 转盘板的高度的调整



1. 取下右侧的压布板(1)。
2. 回转弯针座(2)，使其如图所示之位置。
3. 松开螺钉(3)，因要回转螺钉(4)，预先将芯线导向C(5)移动到不妨碍处。
4. 将螺钉(4)松开约 10 圈。
5. 松开螺钉(6)。
6. 回转上下销(7)，将转盘板(8)按以下所述的高度进行调整。

   <-00、-01 规格时>

   将转盘板(8)表面调整到和针板(9)表面同样的高度。

   <-02 规格时>

   将转盘板(8)表面调整到比针板(9)表面低 0.4～0.6㎜ 的位置。

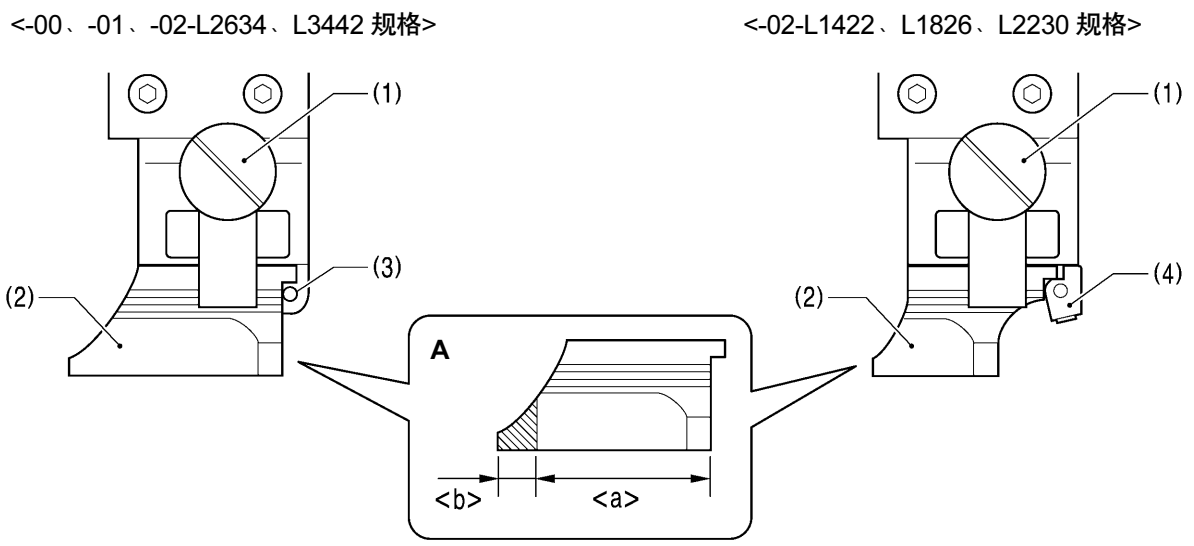
   [注意]

   ・ 如果转盘板(8)的位置过高，与动刀可能会发生干涉易产生伤痕。

   ・ 将转盘板(8)从上面稍稍向下压来进行调整。如果转盘板(8)是浮着的情况下进行调整的话，没法得到正确的结果。
7. 调整终了后，将松开的螺钉和移动了的零部件归位。

9-1 2. 切刀剪切长度的改变(锤子的更换)

切刀剪切长度是由锤子的长度来决定的。要改变切刀剪切长度时，请修正锤子或是更换锤子。

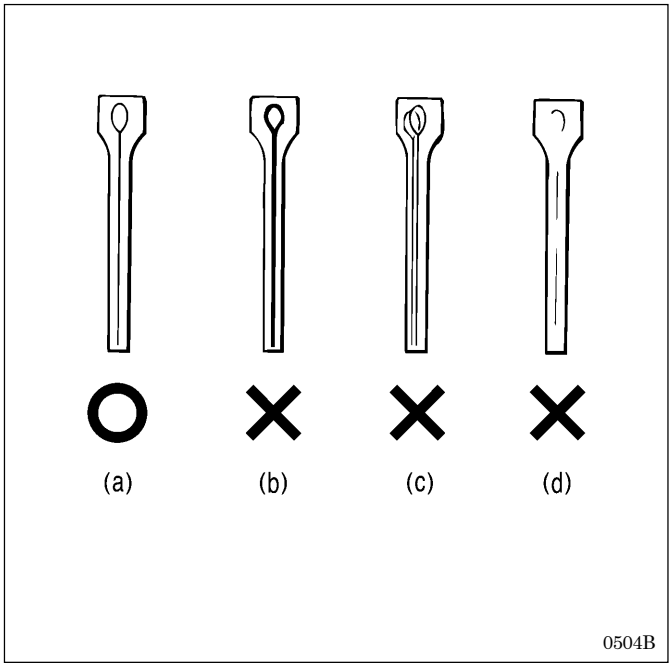


1. 松开螺钉(1)，取出锤子(2)。
2. **[锤子的修正时（参考图 A）]**
   切刀剪切长度＋1.5㎜=<a>，将<b>部用磨床进行修磨，来修正锤子。
3. **[更换、安装锤子时]**
   压紧锤子位置定位销(3)(或是调整垫(4))，拧紧螺钉(1)。

[注意]

如果要更换和现在使用的切刀不一样号码的切刀时，请将锤子一起更换。同样的锤子使用 2 种以上的切刀时，因为锤子附有不同的刃痕，会不能正确地切断布料，造成切刀破损的原因。

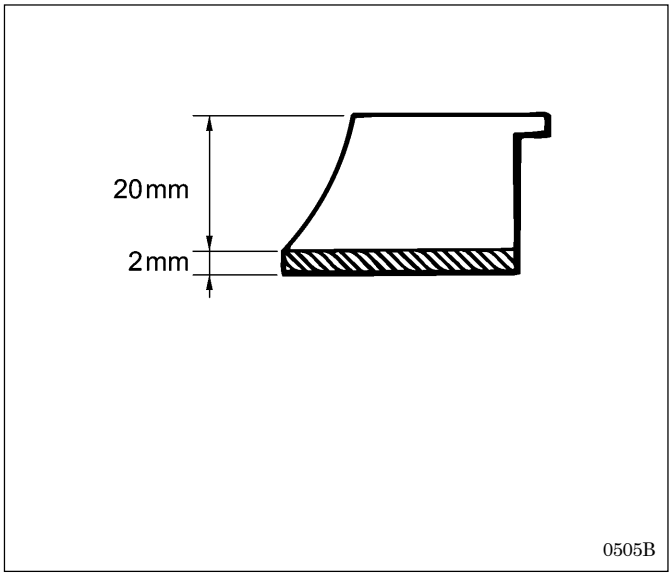
9-13. 锤子和切刀的接触面的调整



<调整顺序>

1. 取出锤子。(取出方法请参考前一页所述)
2. 确认锤子和切刀的接触面。参考左图所示，当切刀的接触面如(b)～(d)所示的情况，切刀的接触面均留有切刀的痕迹时需要修正切刀的接触面。
   (a) 正确的切刀痕迹
   (b) 切刀痕迹为过深的沟痕
   (c) 因为使用了不同的切刀而出现双重切刀痕迹
   (d) 切刀痕迹不是完整的，仅有部分划痕
3. 尽管锤子被正确的修正了，但布料还是没被正确地切断时，同时检查切刀刀刃的摩耗情况。
   * 请更换切刀。
   * 如果交换了切刀，请别使用旧的锤子。易产生切刀刃尖的破损。

9-13-1. 锤子和切刀的接触面的修正方法



为了正确地切断布料，必须将切割压力均匀地施加在整个锤子上。为使切刀的刃痕迹均匀修磨锤子和切刀的接触面。

* 锤子可修磨到 20㎜ 高度为止。
* 修正请使用工具(平锉刀)来进行修正。

双重切刀痕迹或是部分切刀痕迹的锤子的修复

1. 将锤子在台虎钳上夹紧固定。
2. 使用细牙平锉刀将切刀痕迹锉平。

切刀痕迹过深沟痕的锤子的修复

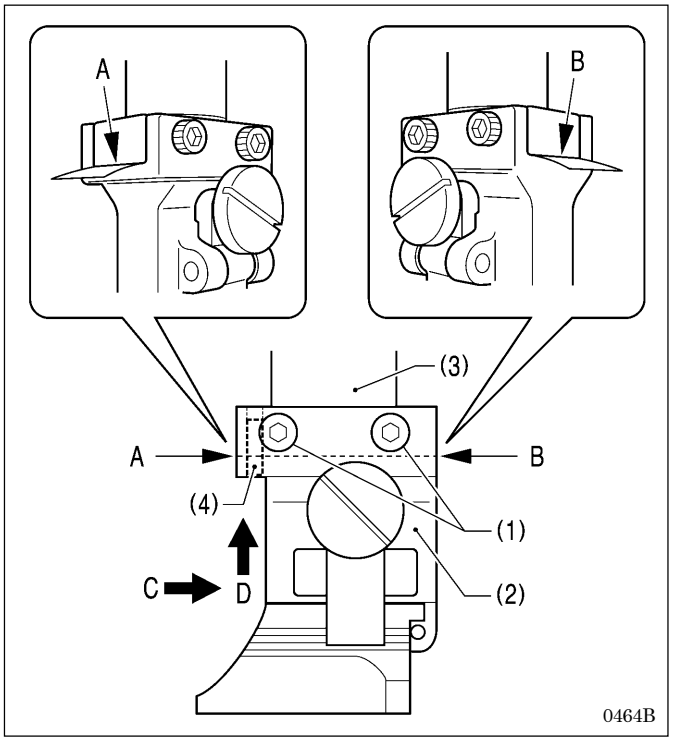
1. 将锤子在台虎钳上夹紧固定。
2. 使用细牙平锉刀将沟痕锉成均一的浅纹状为止。

* 修复完成后，安装上锤子。

9-1 3-2. 锤子和切刀的啮合调整

用颜色笔涂色锤子和切刀的啮合面，使切刀痕迹看得更明显。

1. 来回操作锤子三次。每次在锤子上刻划一个切刀痕迹。
2. 如切刀痕迹不均一的刻划在锤子上时，修正锤子。(有关修正方法参考前一页)
3. 反复按顺序 1～2 进行操作，直到切刀痕迹均一的刻划在锤子上为止。

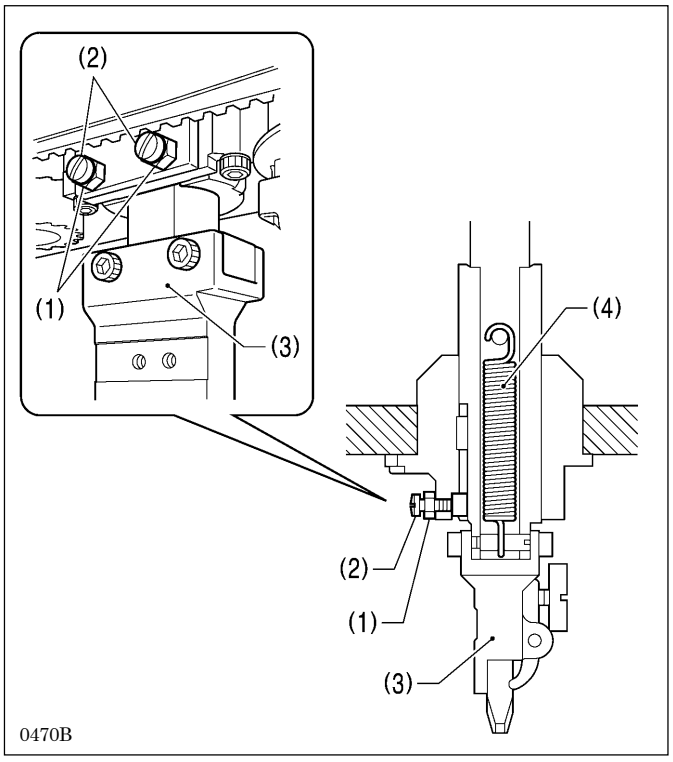


<使用薄纸等来调整啮合的方法>

使用以下的方法也可以进行啮合的调整。

1. 松开螺钉(1)[4 个]。
2. 锤子安装基座(2)和切刀动作轴(3)之间具有的间隙 A 和 B 任意一方放入薄纸等来进行调整。
3. 拧紧螺钉(1)[4 个]。
   * 将螺钉按如图所示的箭头 C 的方向一边推向锤子安装基座(2)，一边向上方用力推，在锤子安装基座(2)和切刀动作轴(3)之间没有的间隙的情况下拧紧。(根据该操作，锤子安装基座(2)的销(4)在切刀动作轴(3)的孔侧面被碰压到，确定了其位置。)

9-1 4. 锤子的回转间隙调整

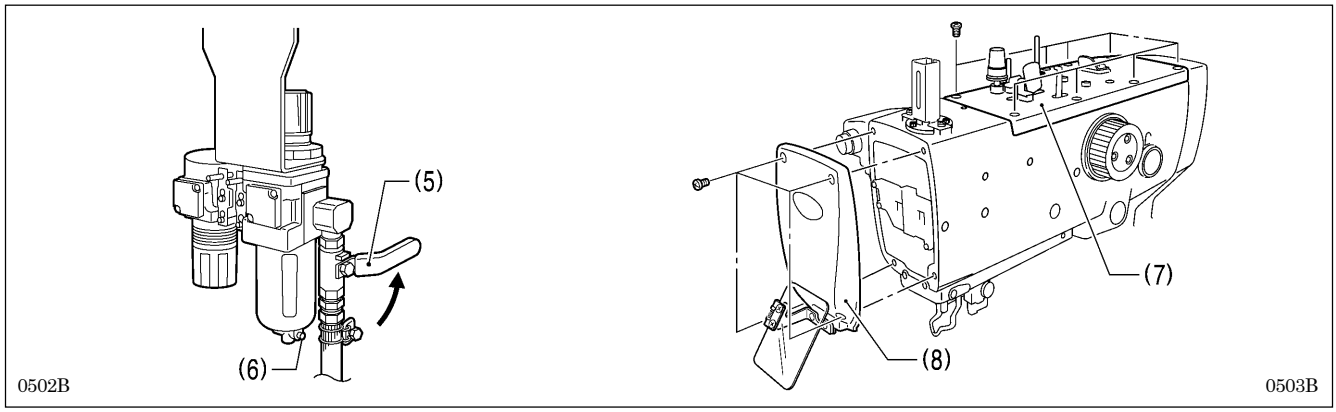


当锤子的回转方向间隙过大时，进行以下的调整。

1. 松开螺母(1)[2 个]。
2. 稍稍拧紧螺钉(2)[2 个]，一边确认间隙一边进行调整。
3. 仅仅用手压下锤子安装基座(3)时，确认内藏的返回弹簧(4)确实能返回。
   * 如不能返回时，有可能与压布夹等的互相干涉返回弹簧已损坏。
4. 调整终了后，拧紧螺母(1)[2 个]。

9-15. 切刀动作轴与动作轴压杆成为一体之驱动方法

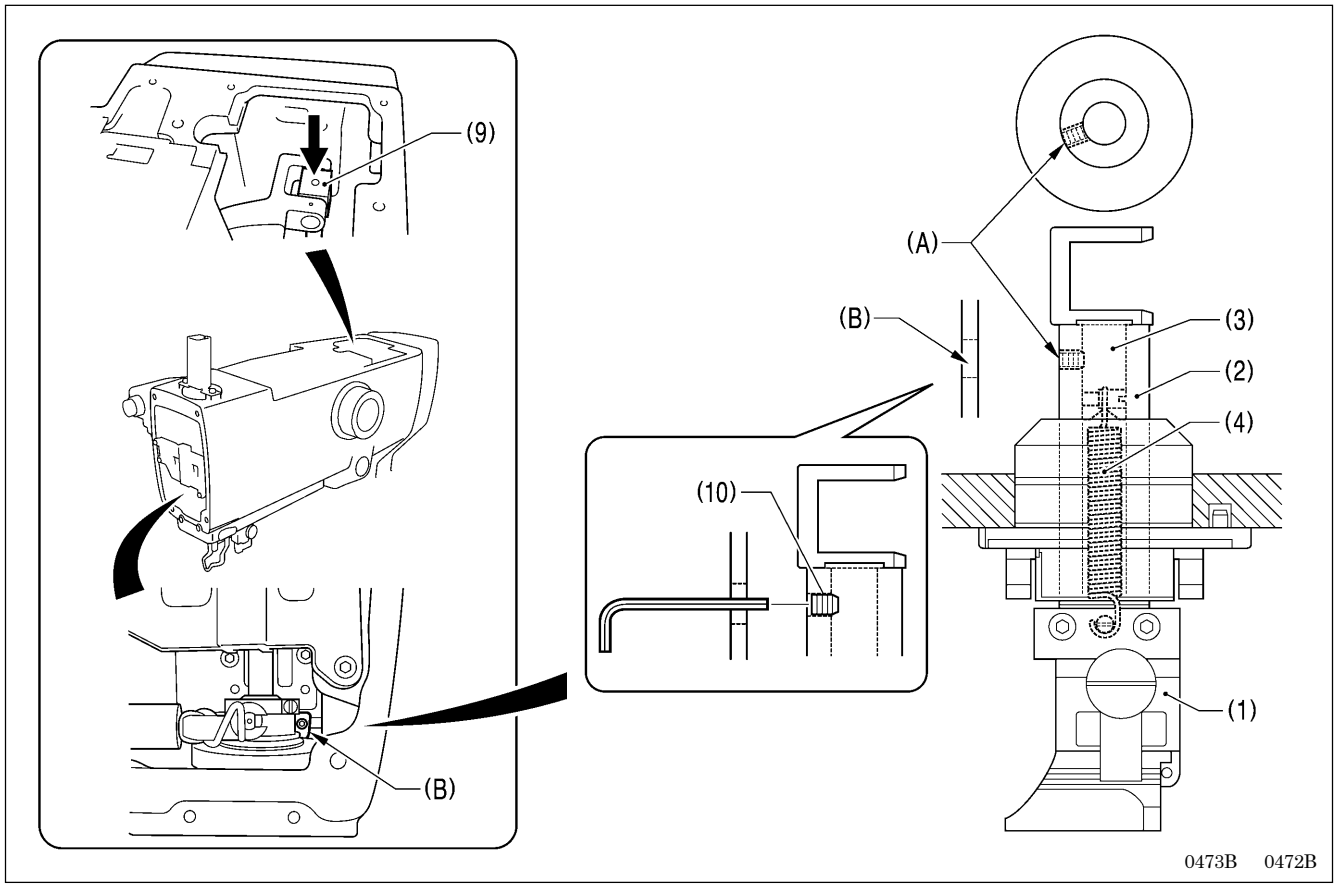
如果要在布料上与已剪切好了的圆头形钮孔对齐进行再缝纫时，用手压下锤子安装基座(1)为了使其能合上该位置，切刀动作轴(2)和动作轴压杆(3)用返回弹簧(4)连接在一起。如果该返回弹簧(4)已损坏时，或是想要切刀的返回速度加快时，可将切刀动作轴(2)和动作轴压杆(3)连成一体来驱动。



1. 空气阀手柄(5)向箭头方向回转，关闭压缩空气的供给。
2. 按下按钮(6)将残余空气放弃。

   [注意]

   如果空气放弃后，锤子因自重有可能会下降。
3. 取下上盖(7)和面板(8)。



4. 压下气缸连杆(9)，切刀动作轴(2)的螺纹部(A)和面板内的(B)部保持一致。
5. 使用市场上销售的螺钉(10)[M6、长度 6mm 以下]，将(A)部和(B)部拧紧固定。

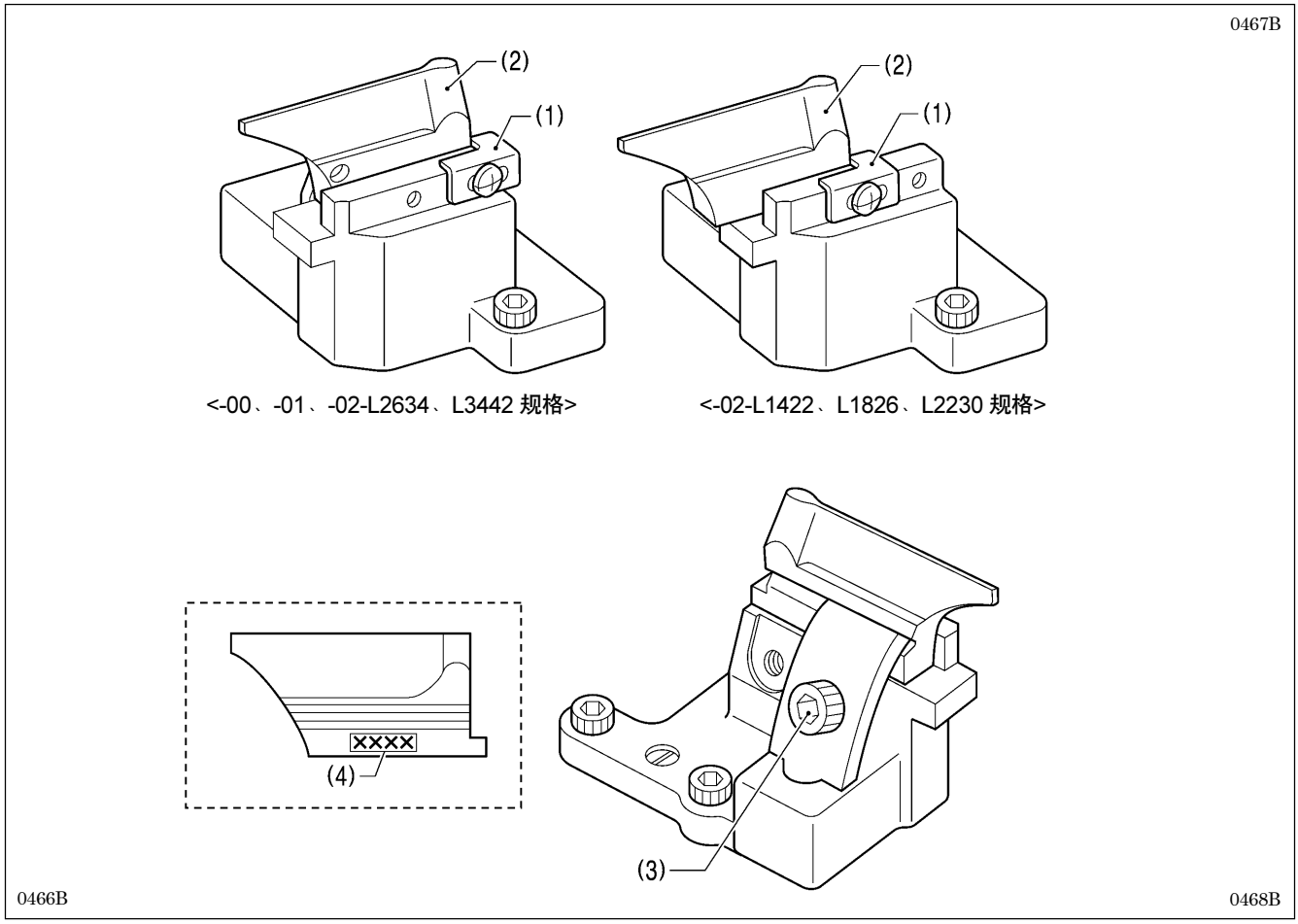
   * 请确认螺钉(10)是否确实被固定。如果螺钉有松动的话，从切刀动作轴(2)表面飞出会成为损坏的原因。
6. 装上面板(8)和上盖(7)，打开空气阀手柄(5)，供给压缩空气。

9-16. 切刀更换方法和位置的调整

9-16-1. 切刀更换的方法

⚠ 注意

请不要启动安装了的切刀和锤子号码和程序设定了的切刀和锤子号码不同的缝纫机。
会造成零部件和机针破损和受伤的原因。



1. 确认了定位板(1)和切刀(2)之间没有间隙后，松开螺栓(3)，取下切刀(2)。
2. 将要安装的新的切刀紧靠定位板(1)，拧紧螺栓(3)。

[注意]

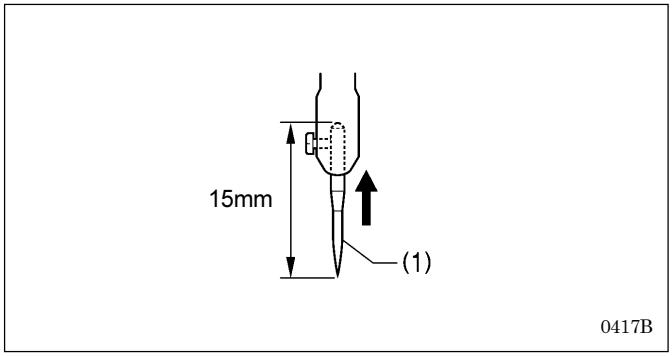
- 在更换切刀时，请更改参数设定，应和记载在切刀侧面的切刀号码(4)相对应的切刀形状一致。(具体请参考「5-3. 程序的设定方法」)
- 请将切刀和锤子配套使用。同样的锤子使用 2 种以上的切刀时，因为锤子附有不同的刃痕，会不能正确地切断布料，造成切刀破损的原因。

9-16-2. 切刀位置的微调整

调整切刀的位置，使其能在缝纫位置内侧和扣眼孔圆头部周围整齐的剪切布料。

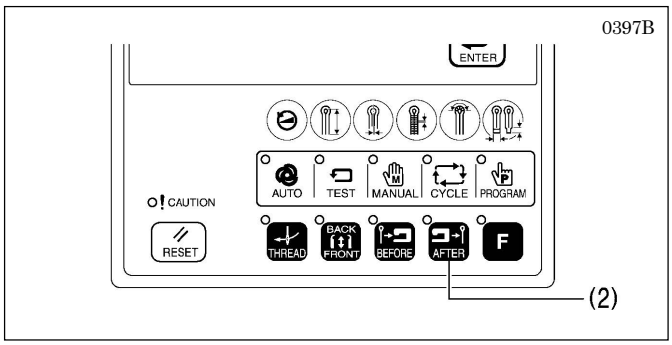
* 在进行该项调整之前，请确认「9-3. 针摆基线位置的调整」确实已完了。

* 对于切刀的位置，前后、倾斜均可分别单独进行调整。

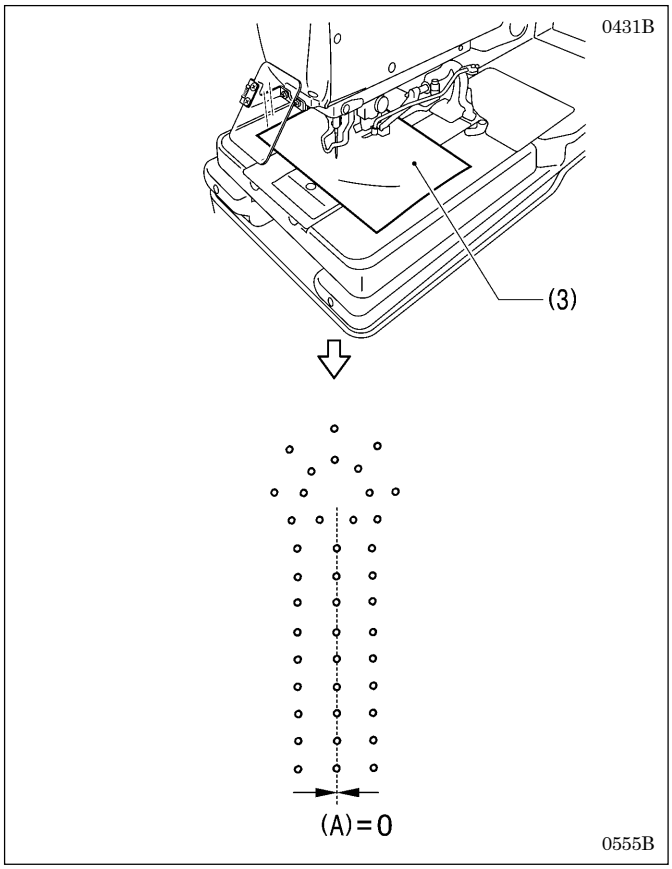


<调整的顺序>

1. 安装上短的调整针(1)。
   (有关短的调整针(1)参考「9-3. 针摆基线位置的调整」)
2. 工作台后面的锤子压力调整用的压力调节器设定压力为 0.2MPa 左右。(参考「9-17.剪切压力的调整」)
   * 这都是为了在切刀位置调整时，锤子没有重叠的切刀痕迹和针落确认用的纸不被切断。



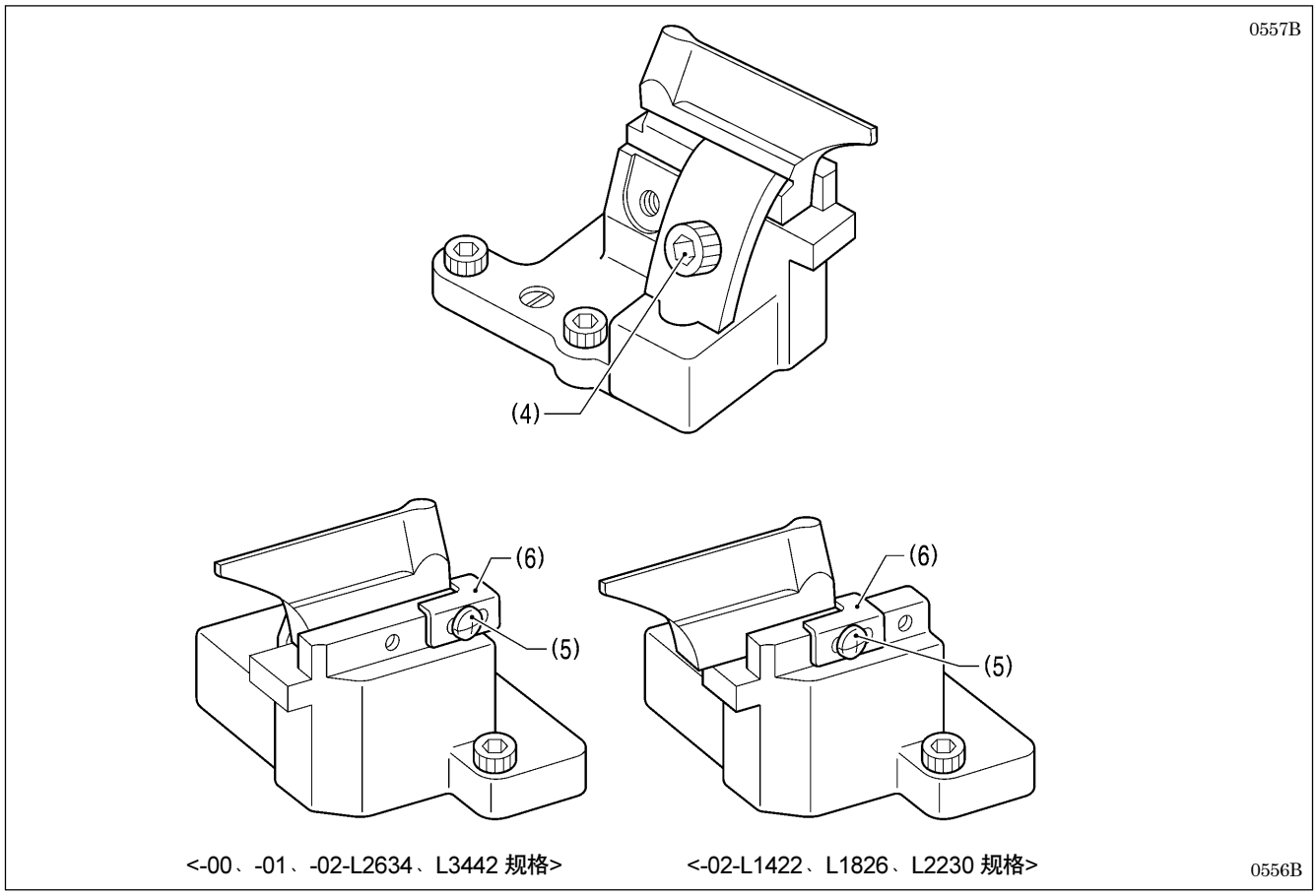
3. 按下操作盘上的 AFTER(后切刀)键(2)，设定“后切刀”。



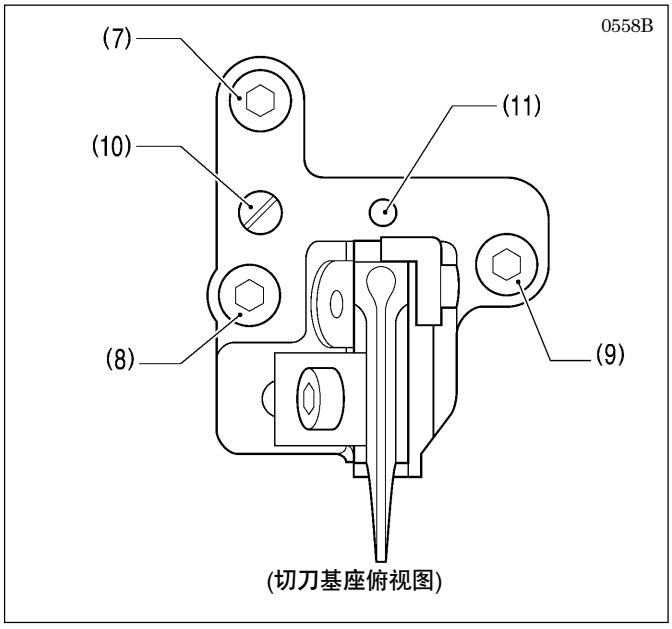
4. 将纸(3)设置在压布夹下。
5. 启动缝纫机、描画圆头形钮孔的落针针迹。
6. 确认圆头形钮孔的落针针迹和切刀切割的位置均一并且重合。
   * 在参数设定时如将切刀间隔的值(A)设定为 0 时，确认将会变得较为容易。(参考「5-3. 程序的设定方法」参照)
7. 如果不是均一时，请切断电源，按 8～13 的顺序进行调整。
   * 调整终了后，重复 4～6 顺序进行确认，如需再次进行调整时按顺序 7 以后的顺序。

(下一页继续)

<前后方向的位置调整>



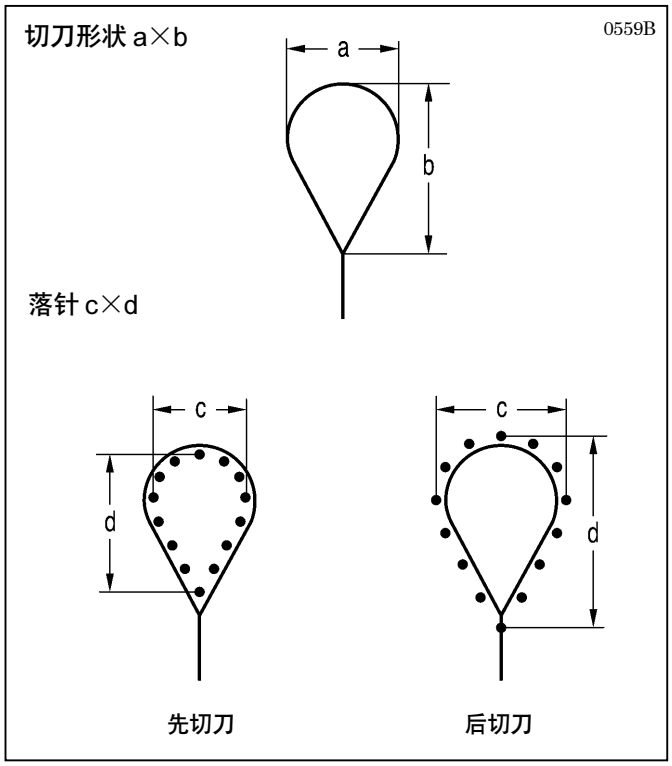
8. 松开定位螺栓(4)和螺钉(5)，对切刀位置前后方向进行调整。
9. 决定了切刀位置后，用力拧紧螺栓(4)。
10. 将定位板(6)紧靠切刀，拧紧螺钉(5)。
    * 因为定位板(6)的位置是表示现在切刀位置的目标位置，所以定位板(6)必须紧靠切刀。



<倾斜的调整>

11. 松开螺栓(7)、(8)、(9)。
12. 回转偏心销(10)来进行调整。
    * 也可以支点(11)为回转中心进行微调。
13. 调整终了后、按螺栓(9)、(8)、(7)的顺序拧紧。

[参考]：圆头部的落针和切刀的形状关系

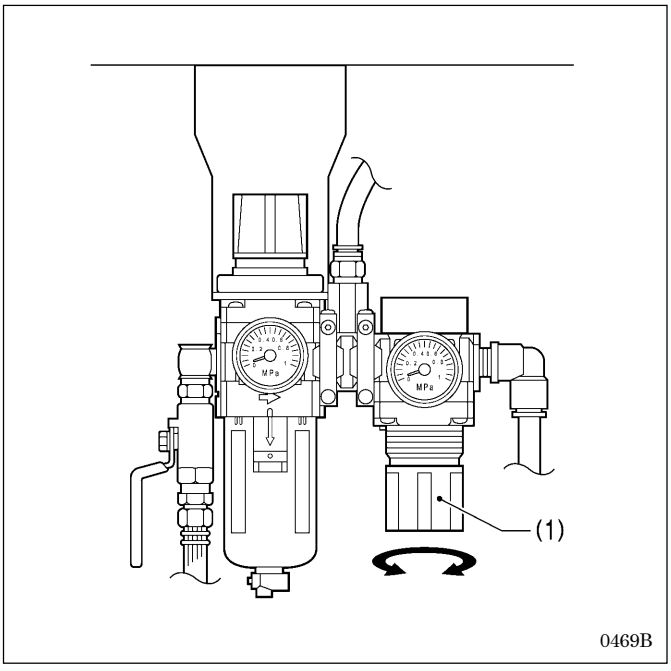


在「先切刀」和「后切刀」之间进行切换时，对于切刀形状内侧的落针如图所示，自动进行变更。

切刀No.	切刀形状 a×b	落针 c×d	
		先切刀	后切刀
1	2.1×3.2	1.7×2.7	2.5×3.8
2	2.8×4.3	2.4×3.9	3.2×4.9
3	3.0×4.6	2.6×4.1	3.4×5.2
4	3.2×5.4	2.8×4.9	3.6×6.0
5	直线形	直线形	直线形
6	3.8×4.3	3.4×3.8	4.2×4.9

* 无切刀落针位置的默认设置与先切刀相同。您还可以通过更改参数设置将落针位置设置更改为与后切刀相同的位置。(请参阅「5-3-1. 参数一览表」中的第 33 号。)

9-17. 剪切压力的调整



将剪切压力设定为能剪切布料的最低压力。

* 请设定在 0.1MPa～0.6MPa 的之间。(出厂时设定为 0.4MPa。)

<调整的方法>

调整安装在工作台板后面的气锤压力用的压力调节器，回转调节器的旋扭(1)，调整气压。

[注意]

- 不要将剪切压力调到需要的以上。这会成为气锤磨损或切刀损坏的原因。
- 即使出现布料没完全切断的情况时，也请别随便提高剪切压力。
  请检查切刀和锤子之间的啮合。(具体请参考「9-13-2. 锤子和切刀的啮合调整」)

9-18. 压布夹提升量的调整

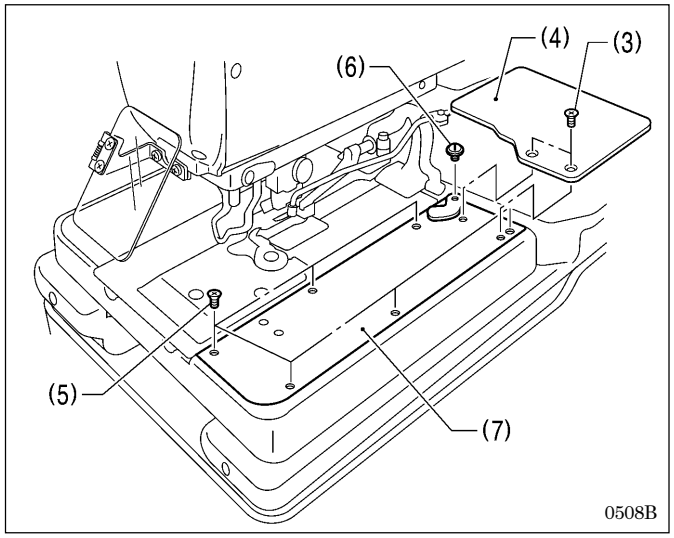
按以下值对压布夹提升量<a>进行调整。

<-00，-01 规格>: 12mm

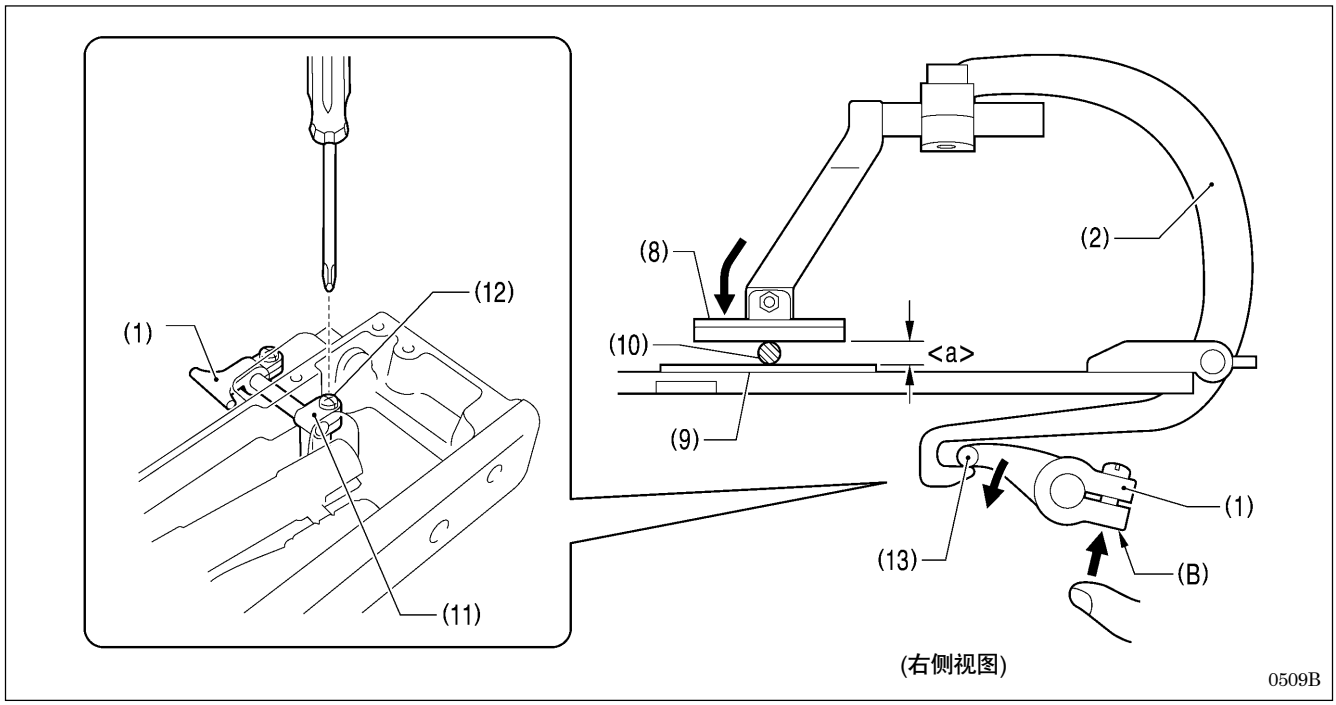
<-02 规格>: 16 mm

* 压布夹提升量<a>包含曲柄杆 B(1)和夹杆(2)的间隙。

* 调整时请将左右压布夹分别进行。(下述是对右侧压布夹提升量的调整方法进行说明。)



1. 拧下螺钉(3)[2 个]，拆下送布台盖 U(4)。
2. 拆下螺钉(5)[6 个]和段螺钉(6)，取下右侧送布台盖 R(7)。



3. 压布夹 R(8)的支点处和针板(9)之间插入 12㎜ 或是 16㎜ 的量块或是量规(10)。
4. 松开压脚驱动手柄(11)的固定螺钉(12)。
5. 如图所示为了使曲柄杆 B(1)的前端部分(13)靠紧夹杆 R(2)的尾端部分，向上按(B)部。
6. 保持顺序 5 的情况下，拧紧螺钉(12)。

[注意]

请一定要确认压布夹 R(8)确实是将量块或是量规(10)压着。

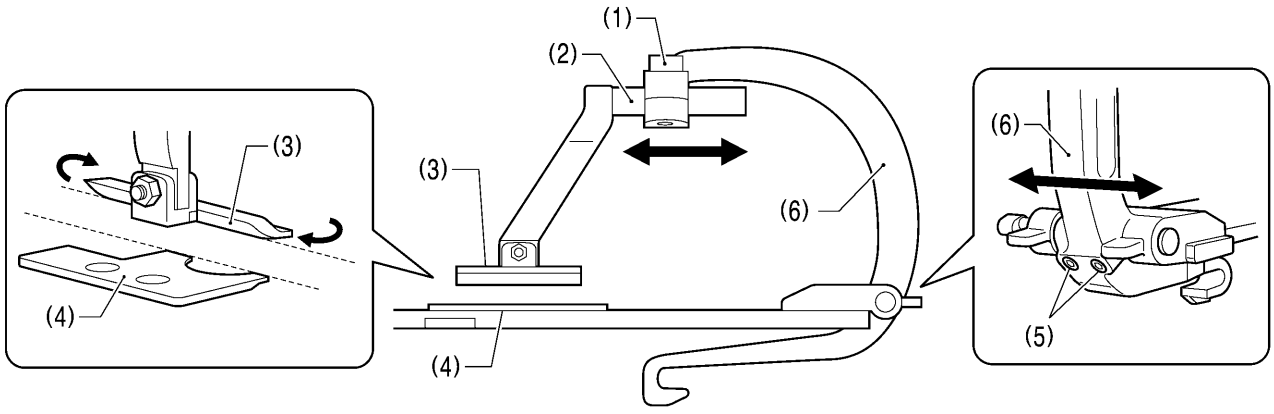
7. 安装上右侧的送布台盖 R(7)和送布台盖 U(4)。

* 将左侧的压布夹提升量用同样的方法进行调整。

9-19. 压布夹的位置调整

在前后以及左右的方向相对针板调整压布夹的位置。

* 为使左右的压布夹位置的落针成为均匀的间隔，分别对其进行调整。(下述是对右侧压布夹位置的调整方法进行说明。)



(右侧视图)

0511B

<前后方向>

1. 松开螺栓(1)，调整夹臂(2)的前后位置。
2. 接着调整压布夹R(3)的侧面与针板(4)的侧面成平行状。
3. 调整终了后，拧紧螺栓(1)。

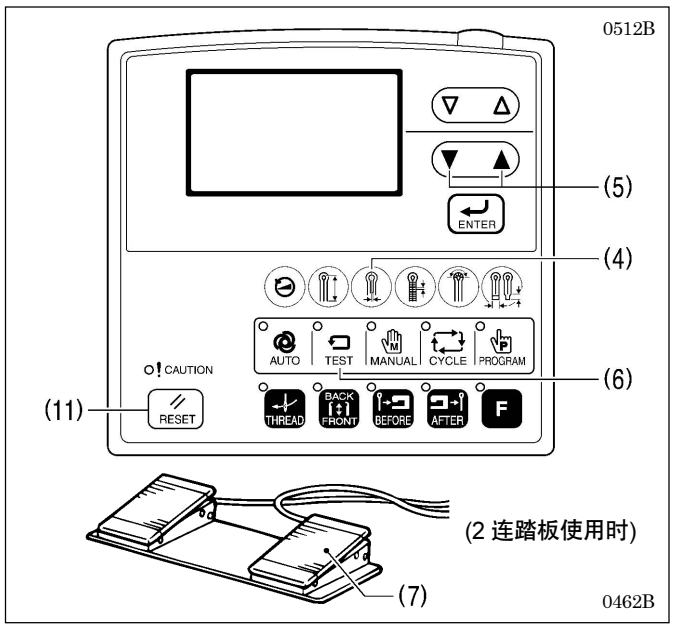
<左右方向>

1. 松开螺钉(5)[2个]，调整夹杆(6)的左右位置。
2. 调整终了后，拧紧螺钉(5)[2个]。

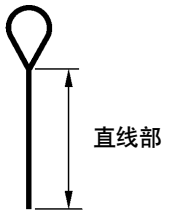
* 请将左侧的压布夹位置以同样的方法进行调整。

9-20. 压布板的位置调整

在缝纫过程中以免转盘板(1)和针板(2)相互接触到，调整压布板(3)的位置。
标准设定为转盘板(1)和针板(2)之间的间距为0.8mm(切刀间隔为“0”时)。
* 请分别对左右压布板进行调整。(下述是对右侧压布板(3)的位置调整方法进行说明。)
* 调整时，请在安装有压布板(3)的情况下进行调整。



1. 在设定参数时将切刀间隔设定为0值。(具体参考「5-3. 程序的设定方法」)
   * 如按下快捷 3(4)，然后按▲/▼键(5)可以改变设定值。
2. 按 TEST 键(6)进入试送布模式，开始试送布工作。(参考「5-4. 用试送布模式确认缝纫花样」)
3. 继续按着启动开关(7)，直到送布台移到缝纫形状的直线部的位置时，放开启动开关(7)。



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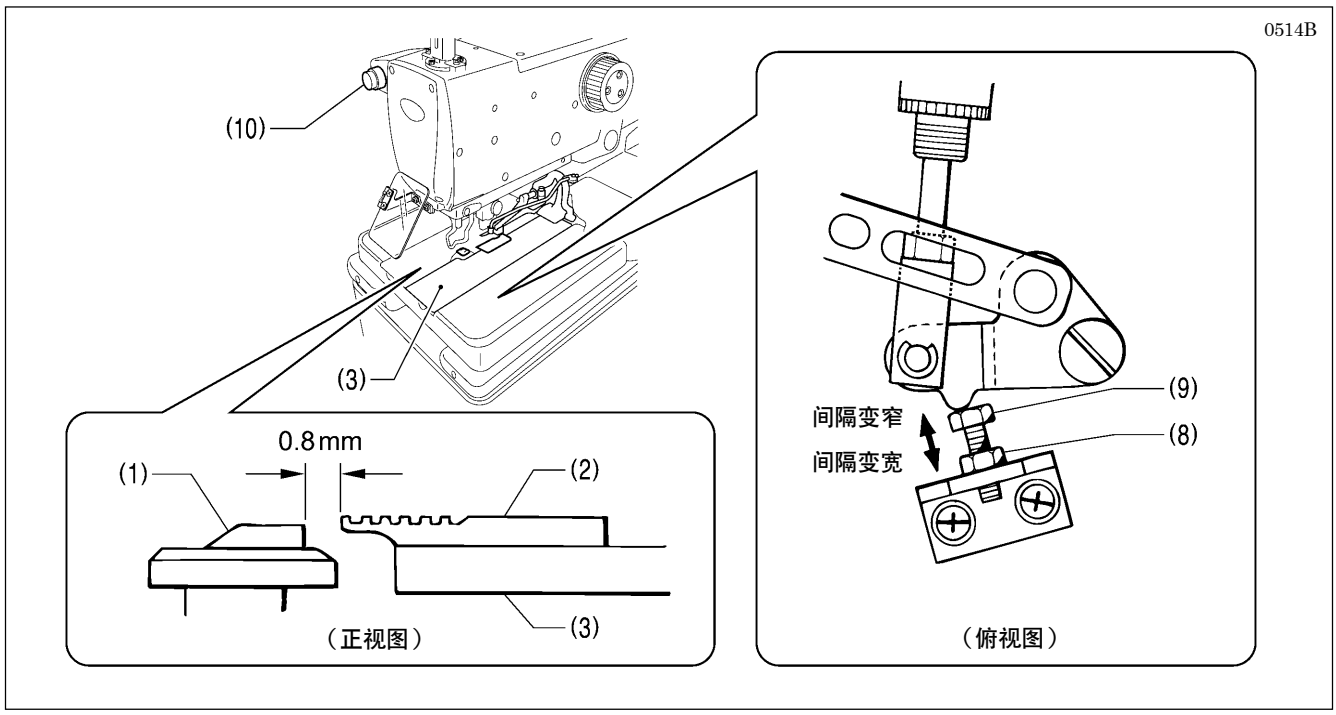


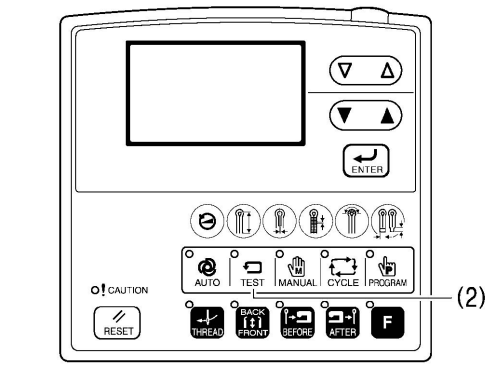
4. 确认转盘板(1)和针板R(2)之间的间距为0.8mm。
5. 如果不是0.8mm时，松开螺母(8)，然后回转螺栓(9)进行调整。
6. 调整终了后，拧紧螺母(8)。
7. 按下暂停键(10)，再按下 RESET 键 (11) 结束试送布模式。

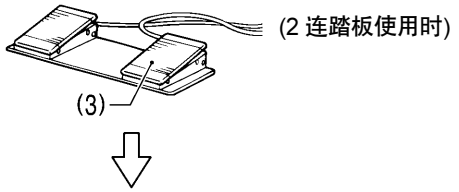
* 请将转盘板(1)和针板L之间的间距以同样的方法进行调整。

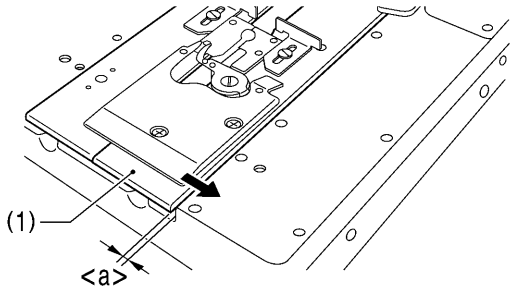
9-21. 布料开口量的调整

将压布板(1)开口量调整到左右均等。

* 布料开口量一般单侧为 0.8mm 以上。



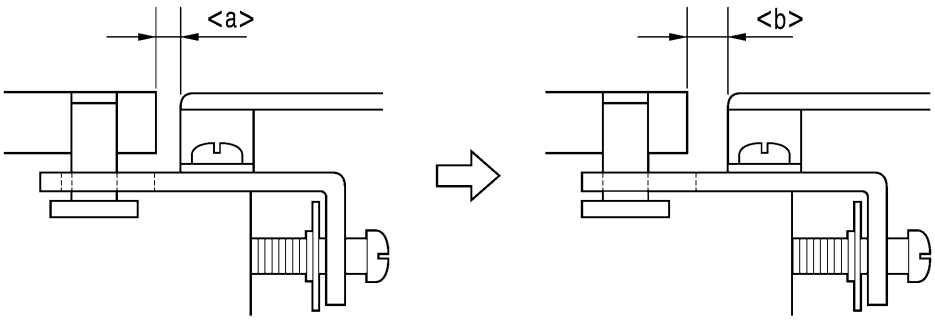




<布料开口量的测定方法>

1. 按下 TEST 键(2)进入试送布模式，开始试送布工作。(具体参考「5-4. 用试送布模式确认缝纫花样」)

2. 踩下启动开关(3)。
   * 送布台移动，确认压布板(1)分别向左右张开。作为该张开的量<a>。



布料开口量=<b>−<a>

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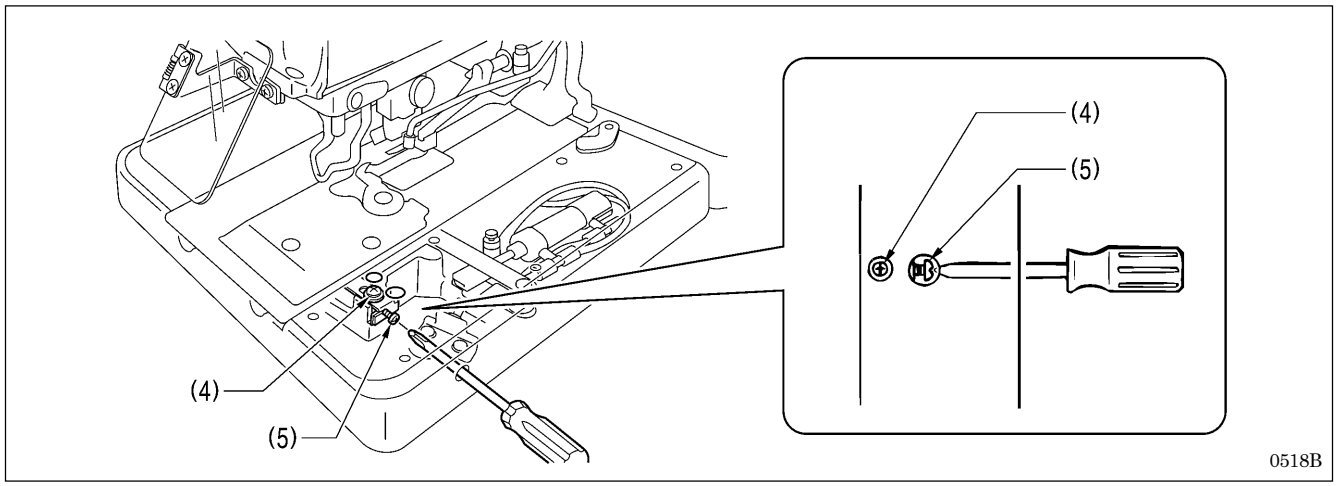
3. 使用游标卡尺来测量<a>值(左右均要)。
4. 切断缝纫机电源。
   * <a>的间距变宽。作为该开口量<b>。
5. 降下压布夹使用游标卡尺来测量<b>(左右均要)。
   (布料开口量=<b>−<a>)
6. 分别计算左右布料开口量。
7. 如果左右布料开口量不均等、或是单侧的布料开口量不满 0.8mm 时，要进行调整。(下一页参考)

<布料开口量的调整方法>



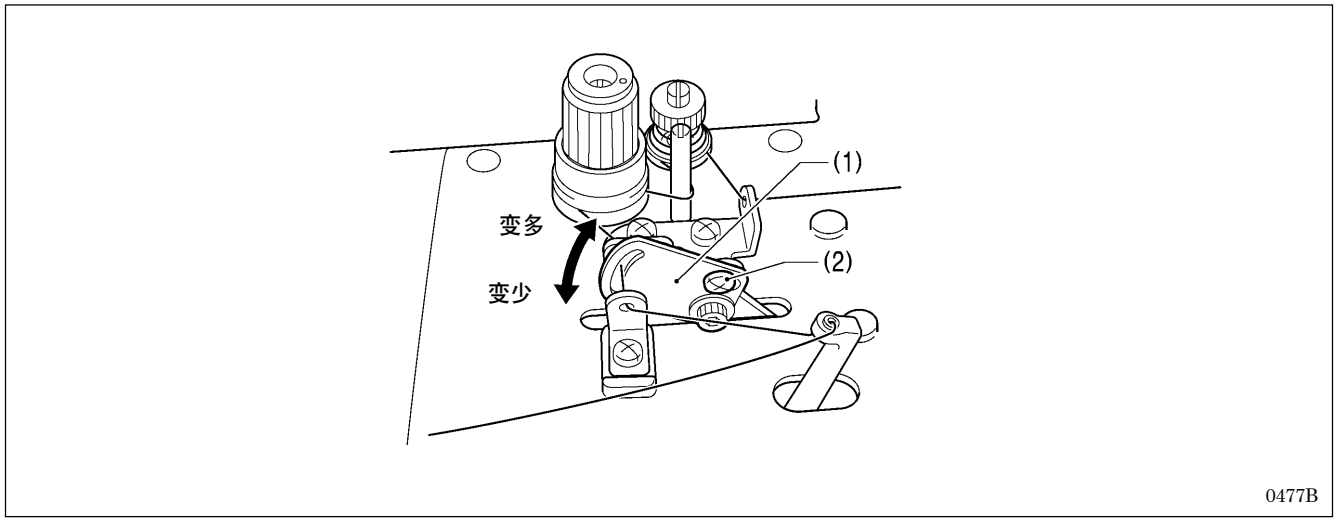
8. 松开螺钉(4)。
9. 将起子插入送布台侧面的缺口处，回转调整螺钉(5)，调整开口量。
10. 拧紧螺钉(4)后，再一次进行开口量的测定。
11. 直到左右布料开口量变成均匀为止，重复顺序 2～10。

9-22. 面线的放出量的调整

在缝纫开始时，根据面线放出量的不同缝纫针迹也会有异，为了保证形成正确的缝纫针迹，对确保面线量是有必要。

[参考]

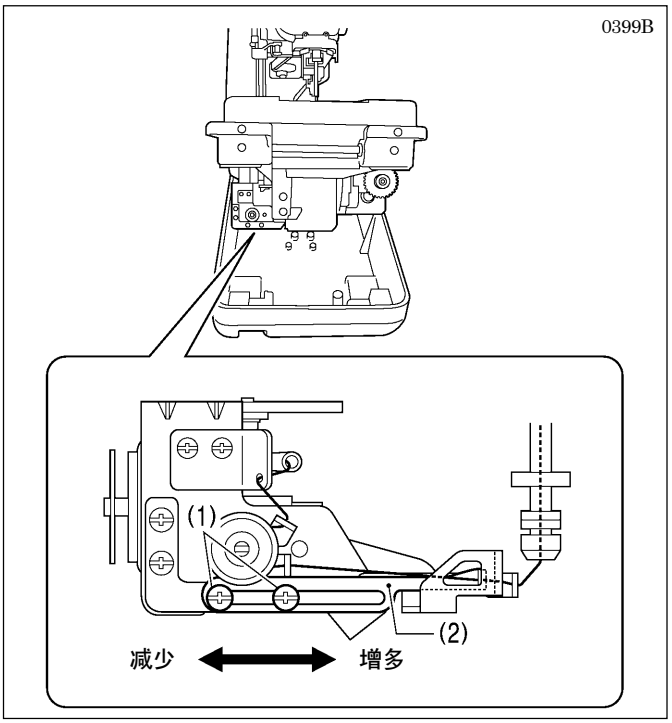
取线手杆(1)在缝纫终了时同时工作，按下启动开关送布台被空送同时被解除。



1. 松开螺钉(2)。
2. 上下转动取线手杆(1)来调整面线的放出量。
3. 调整终了后，用力拧紧螺钉(2)。

9-23. 底线的放出量的调整 <只有-01 规格>

为了保证使第 1 针缝纫针迹形成正确的针迹，底线的线夹必须夹住底线，加上第 1 针的面线由有孔弯针捞起之后一直到左叉板 L 被打开为止，底线在这段时间里必须有张力。



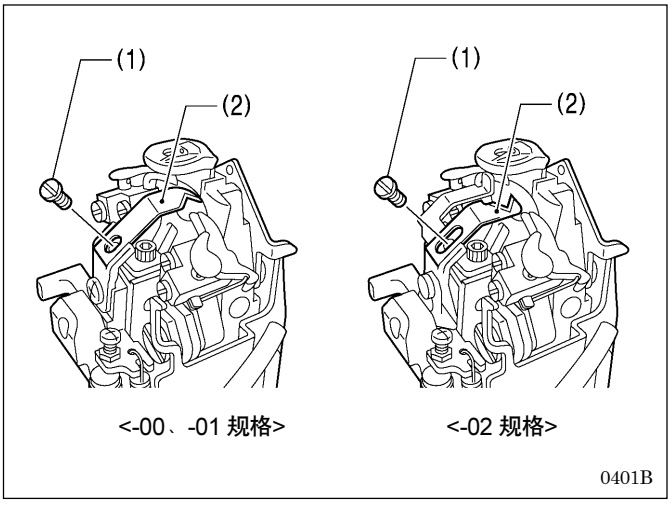
1. 自动缝纫终了后，切换成手动模式，按下启动开关。(具体参考「7-6. 手动缝纫(手动模式)」)
2. 回转上轴手轮，确认底线的状态。

<有调整的必要时>

3. 切断电源，倒下缝纫机。
4. 松开螺钉(1)[2 个]，按箭头方向调整底线导向 C(2)。
   * 向右移动时底线的放出量增多，向左移动时底线的放出量减少。
5. 调整终了后，用力拧紧螺钉(1)[2 个]。

9-24. 上动刀的交换和调整的方法

9-24-1. 上动刀的交换

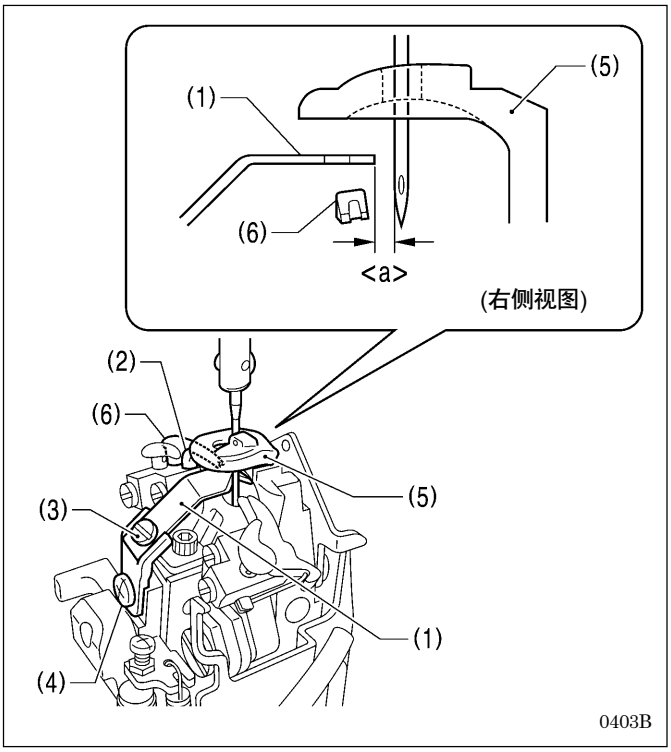


1. 拧下螺钉(1)，取出上动刀(2)。
2. 安装上新的上动刀，用螺钉(1)固定、拧紧。

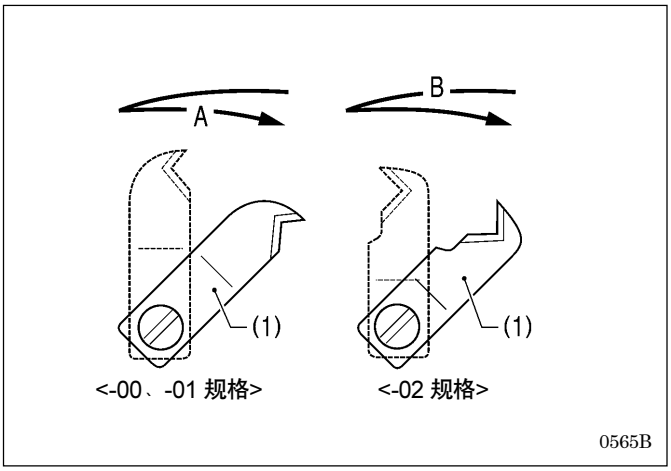
9-24-2. 上动刀的调整

上动刀(1)在弯针 L(2)的前面，被调整成只切断一根面线。如果面线环线的 2 根(前面和后面)都切断的话，面线的线残余量会变的太短，缝纫开始时，会发生跳针现象。

* 使用手动模式进行该调整时，可对面线动作的每一步进行确认，所以比较方便。



1. 回转上轴手轮，将机针设置在外摆的最下点。
2. 松开螺钉(3)，调整上动刀(1)尖端和机针之间的间隙<a>在 0.1～0.4㎜ 之间。
3. 回转上轴手轮，将机针设置在外摆的最上点(机针停止位置)。
4. 松开螺钉(4)，上动刀(1)在转盘板(5)和左叉板 L(6)之间、请调整在两方面均不碰到的位置上。
5. 用手左右移动上动刀(1)，确认转盘板(5)和左叉板 L(6)之间均不碰到。
6. 调整终了后按顺序拧紧螺钉(4)和螺钉(3)。



[参考]：面线被切断之时序

<-00、-01 规格>

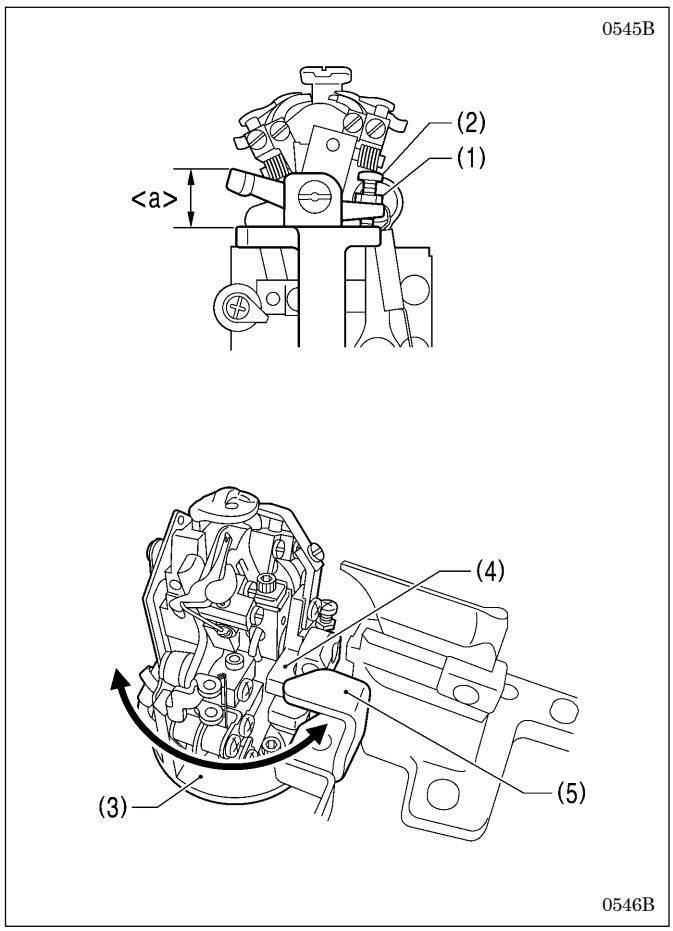
上动刀(1)在回到原来位置时，在 A 位置上面线被切断。

<-02 规格>

上动刀(1)在已移出来时，在 B 位置上面线被切断。

9-24-3. 切线杆基座的位置的调整

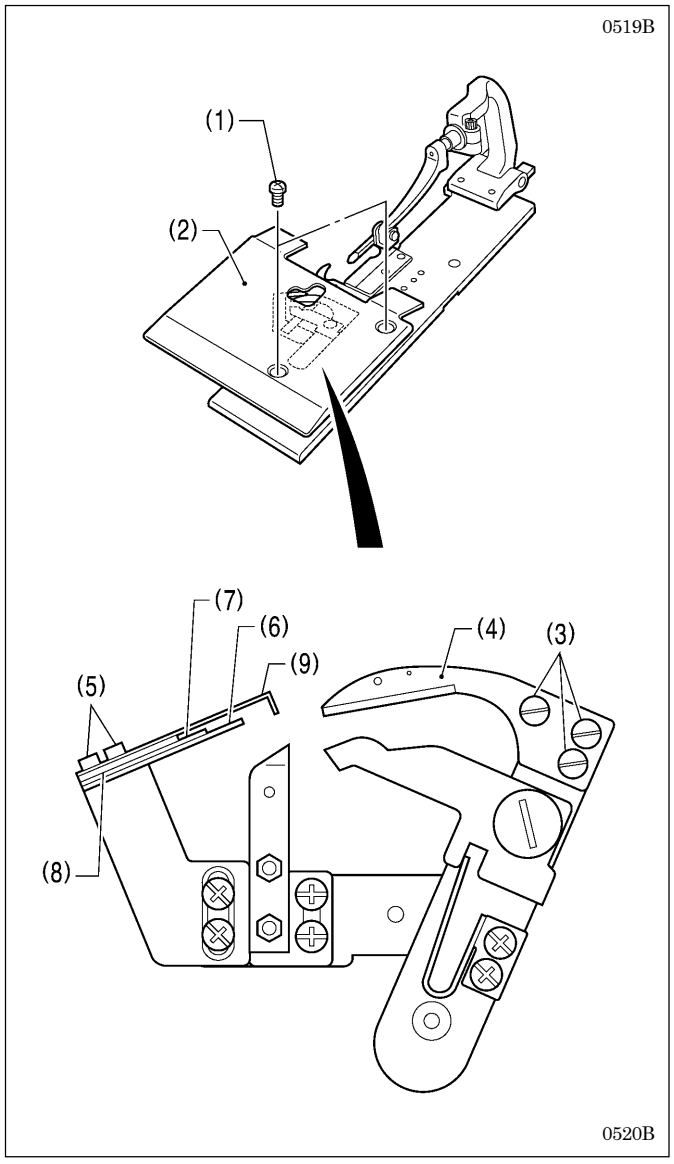
在针迹幅宽为最大的外摆时，必须将机针调整到和上动刀没有干涉的位置处。



1. 松开螺母(1)。
2. 回转螺钉(2)，如图所示,将<a>调整到 12㎜。
3. 回转弯针座(3)，将切线杆基座(4)调到切线用气锤(5)的下面，确认与其他的无干涉。
4. 调整终了后，用力拧紧螺钉(2)。

9-25. 动刀和定刀的交换和调整(用于底线和芯线) <-01 规格>

9-25-1. 动刀和定刀的交换



1. 旋下螺钉(1)[2 个]，取出压板 U(2)。

<动刀的交换>

2. 旋下螺钉(3)[3 个]，取下动刀(4)。
3. 安装上新的动刀，用螺钉(3)[3 个]固定、拧紧。

<定刀的交换>

4. 旋下螺钉(5)[2 个]、取下定刀(6)。
5. 按顺序将新的定刀(6)、定刀压簧(7)、定刀压簧U(8)、和线导向板(9)安装上，并用螺钉(5)[2 个]将其固定，拧紧。

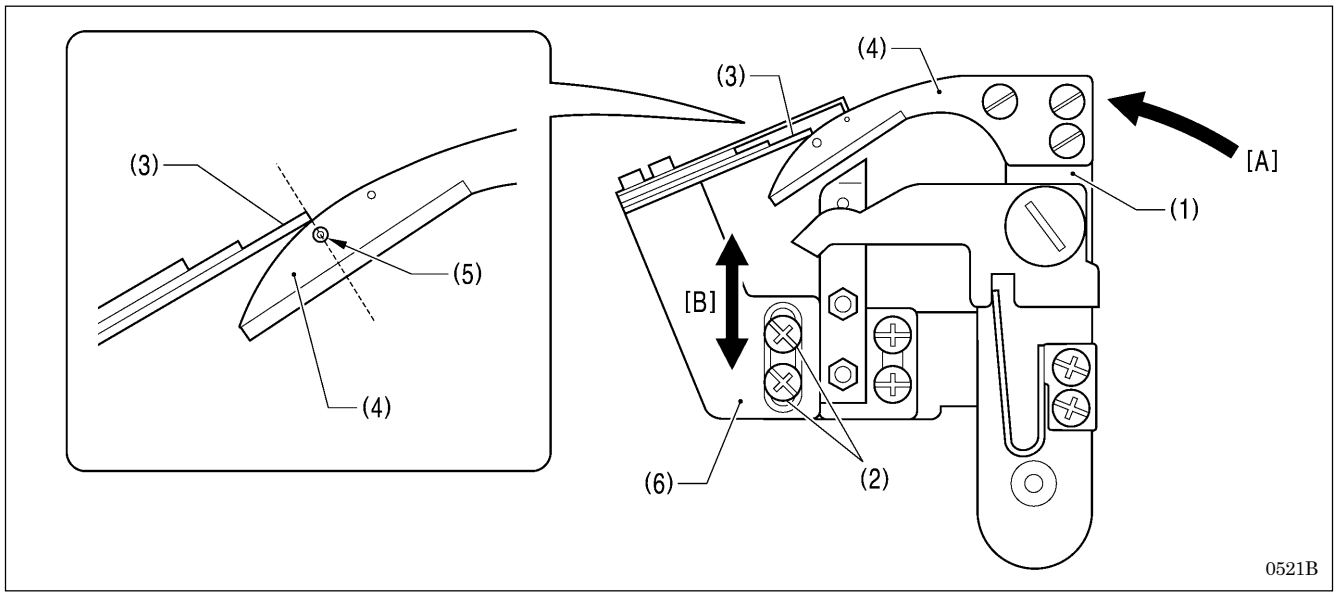
* 交换以后，请从「9-25-2. 刃压的调整」到「9-25-5. 挡线的调整」为止进行调整。调整终了后，请装上压板 U(2)。

9-25-2. 刃压的调整

为了使缝线安定，能够剪断，需调整恰当的刃压。

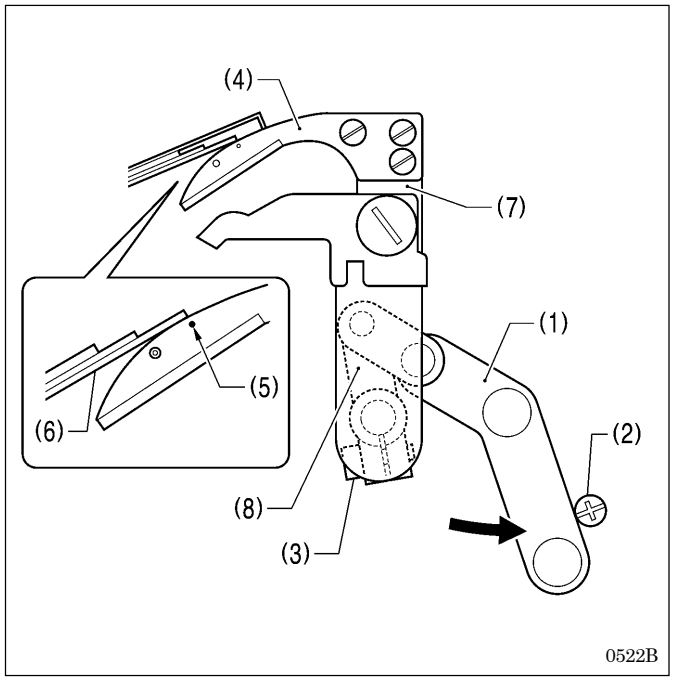
[注意]

不可使刃压过高。过高容易引起定刀和动刀异常磨损及破损。



1. 切线臂(1)向箭头[A]的方向按到底。
2. 松开螺钉(2)[2 个]。
3. 切线臂(1)按到底的状态下，为了将定刀(3)的前端和动刀(4)的最初接触的位置正好是在钢印(5)的正上面的位置，沿着定刀安装台(6)的导向槽按箭头[B]的方向上下调整。
4. 调整终了后，拧紧螺钉(2)[2 个]。

9-25-3. 啮合量的调整



1. 切线连接杆(1)按箭头方向回转直到碰到螺钉(2)为止。
2. 松开螺栓(3)。
3. 在动刀(4)上的钢印(5)的正上面的位置处，为了让定刀(6)的前端的到来，调整切线臂(7)的位置。
4. 调整终了后，拧紧螺钉(3)。

[注意]

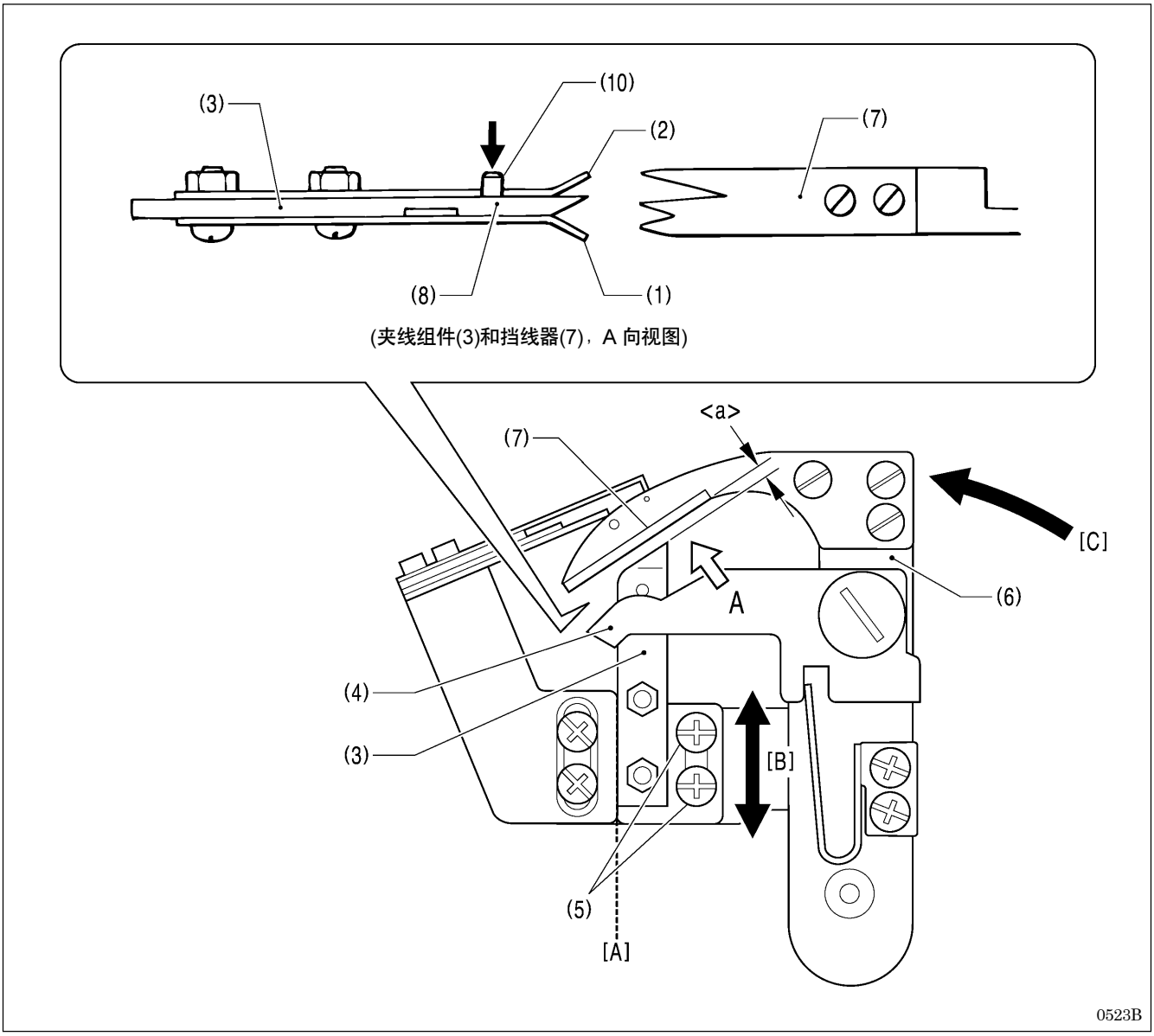
- 在拧紧螺栓(3)时，调整切线杆臂(8)和切线臂(7)不可有间隙并能圆滑的回转。
- 啮合量如太少的话会发生底线夹不住的不良现象，成为缝纫开始时的缺针，跳针的原因。

9-25-4. 夹线组件和分线器的调整

有必要确定底线确实夹在夹线 D(1)之中，芯线确实夹在夹线 U(2)之中。为此，请确认夹线组件(3)被安装在恰当的位置、及夹线分线器(4)在适当地作动。

[注意]

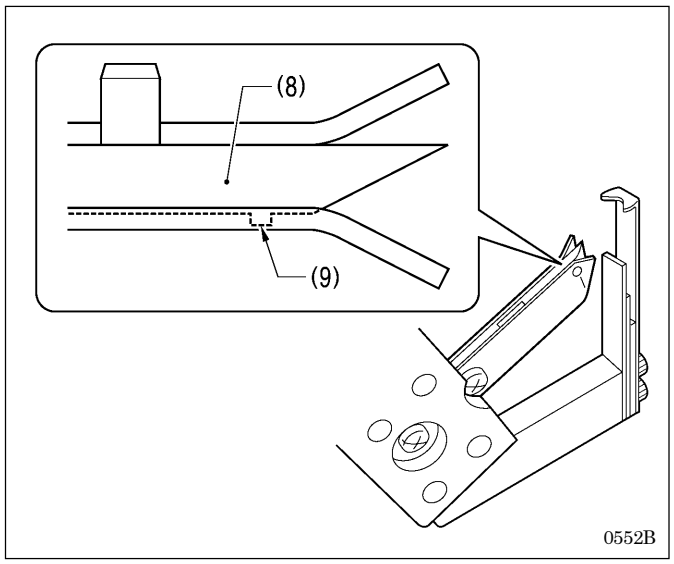
在缝纫开始时，下线必须确实被夹在夹线 D(1)上。



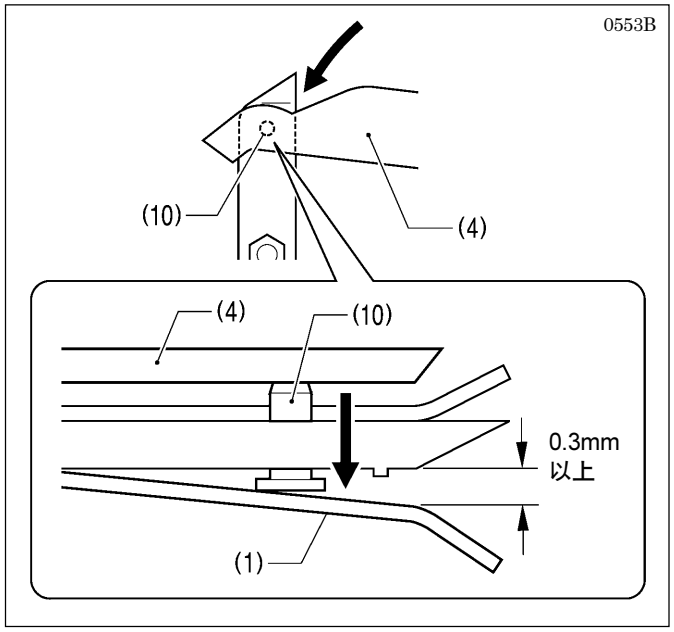
1. 松开螺钉(5)[2 个]，沿着虚线[A]将夹线组件(3)的位置按箭头[B]的方向进行调整。
   * 切线臂(6)沿箭头[C]的方向回转时，夹线组件(3)在不碰到挡线器(7)的前提下，请将此间隔<a>尽可能调整到最小为止。

[注意]

- 此间隔<a>如太大的话，会发生底线夹不住的不良现象，成为缝纫开始时的缺针，跳针的原因。
- 夹线组件(3)如被安装成斜的话，夹线 D(1)会碰到转盘板而打不开，发生底线夹不住的不良现象，成为缝纫开始时的缺针，跳针的原因。

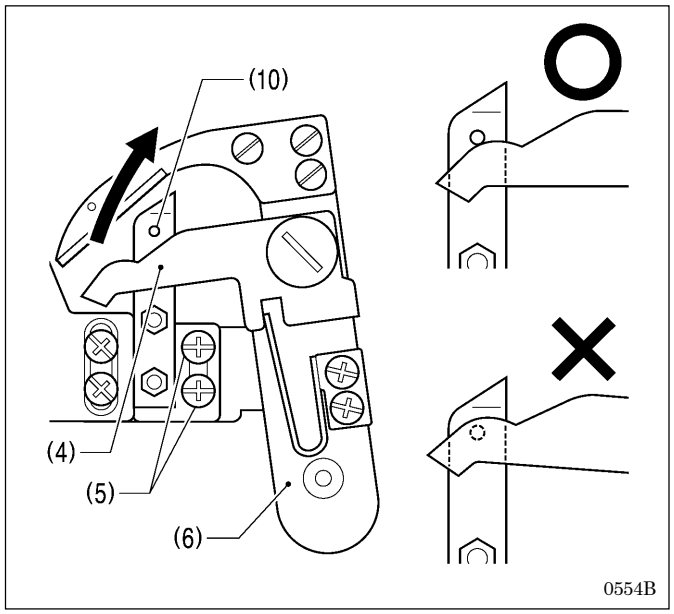


2. 底线超过夹线M(8)上的突起部分(9)，必须确定被夹住。为此请确认下列(a)、(b)、(c)的动作的确实被执行。



(a)因夹线分线器(4)压下夹线分线器销(10)，夹线D(1)被打开0.3 mm以上。

(b)在线被切断的瞬间之前，夹线D(1)被关闭。



(c)在线被切断后切线臂(6)恢复时，夹线分线器(4)为了不超过夹线分线器销(10)，只是避过它，所以夹线D(1)不打开。

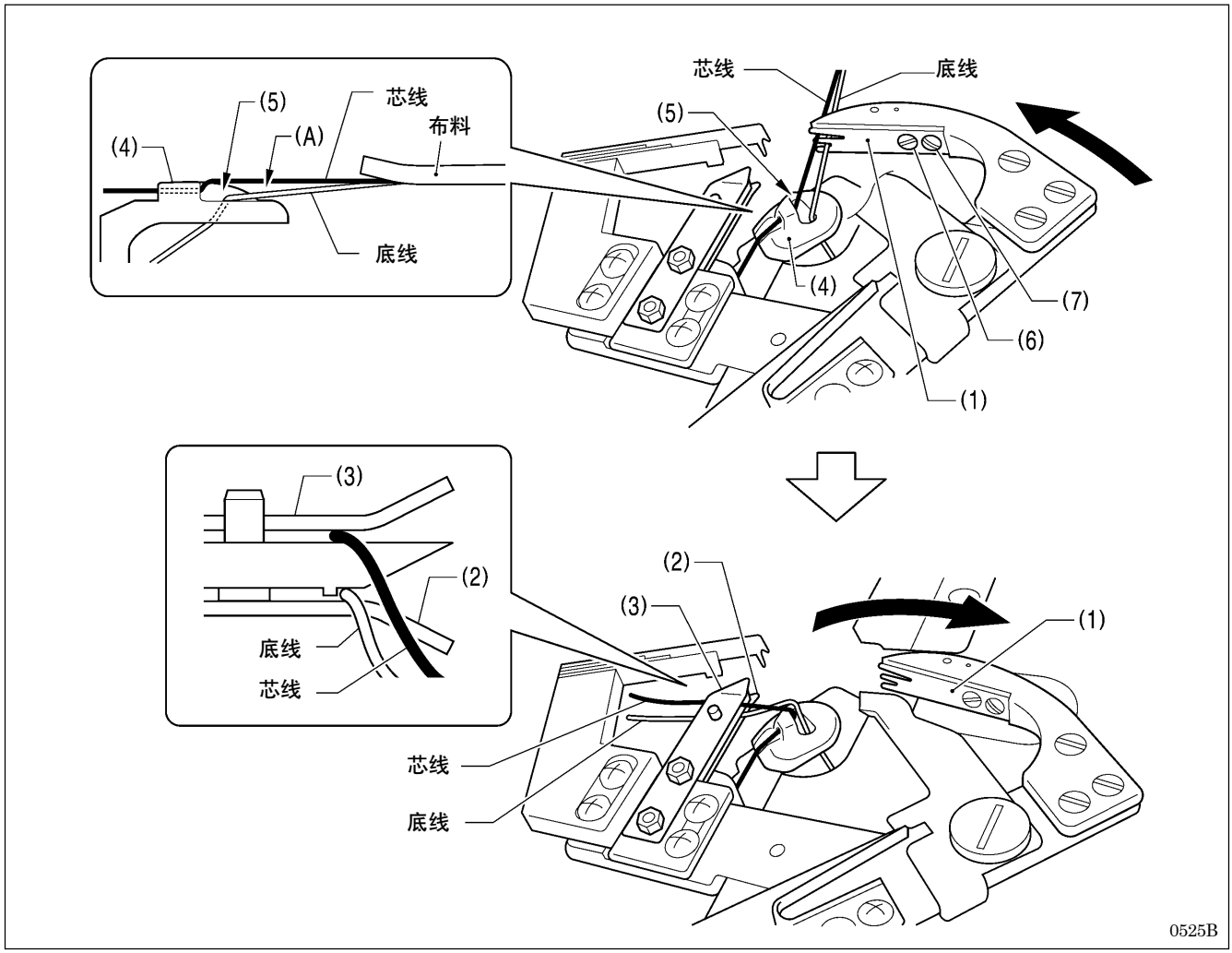
3. 调整和确认终了后，拧紧螺钉(5)[2个]。

9-25-5. 挡线器的调整

底线和芯线由于挡线器(1)确实被分开引导，底线被导向到夹线 D(2)中、芯线被导向到夹线 U(3)中。且必须能顺畅地被导入。

[参考]：挡线器的原理

切线臂在作动之际，转盘板(4)回转 45° 度。由此芯线从转盘板(4)的凸出部(5)处穿入，因底线和芯线有一个高低差，所以在缝纫最后一针之间形成了一个三角形状(A)，在该三角形状(A)中挡线器(1)被导入，将底线和芯线分开。



<调整方法>

* 使用手动模式进行该调整时，可对底线的切线动作的每一步进行确认，所以比较方便。

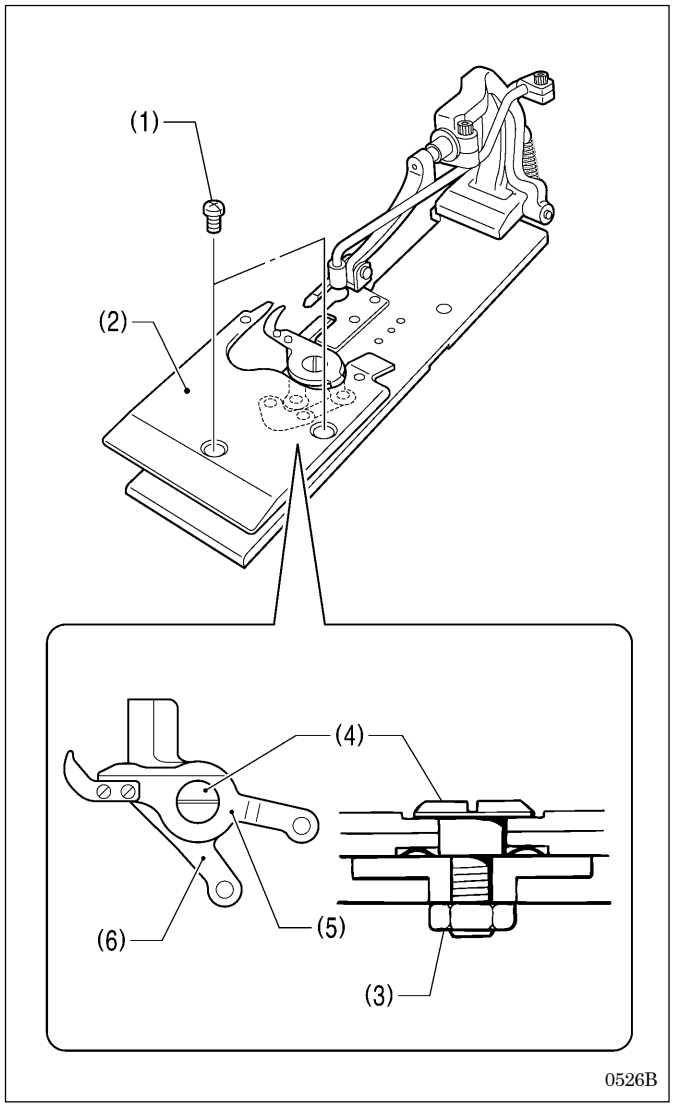
1. 在参数设定时针迹节距设定为 2.0 mm，总针数尽可能少。(具体请参考「5-3. 程序的设定方法」)
2. 使用手动模式，踩下启动开关后，用手回转上轴手轮缝纫到最后一针为止。
   (具体请参考「7-6. 手动缝纫(手动模式)」)
3. 机针在针上位置停止的情况时，启动开关每一次踩一下。
   * 切线动作会每一步进行一次。
4. 松开螺钉(6)和螺钉(7)，以螺钉(6)为支点回转挡线器(1)来进行调整。
5. 调整终了后，拧紧螺钉(6)和螺钉(7)。

[注意]

当转盘板(4)的高度改变时，最后一针－底线－芯线之间的三角形状(A)也会有变化，所以请对挡线器(1)进行调整。

9-26. 动刀和定刀的交换和调整(用于底线和芯线) <-02 规格>

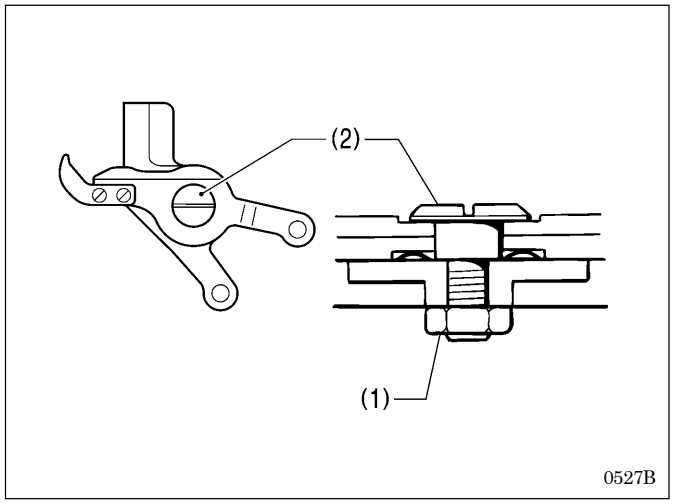
9-26-1. 动刀和定刀的交换



1. 旋下螺钉(1)[2 个]，取出压板 U(2)。

2. 拧下螺母(3)。
3. 取下段螺钉(4)，取出左动刀L (5)和右动刀R (6)。
4. 安装上新的动刀，用段螺钉(4)固定。
5. 刃压的调整(参考下述)完了后，再将螺母(3)拧上。
6. 安装上压板 U(2)。

9-26-2. 刃压的调整



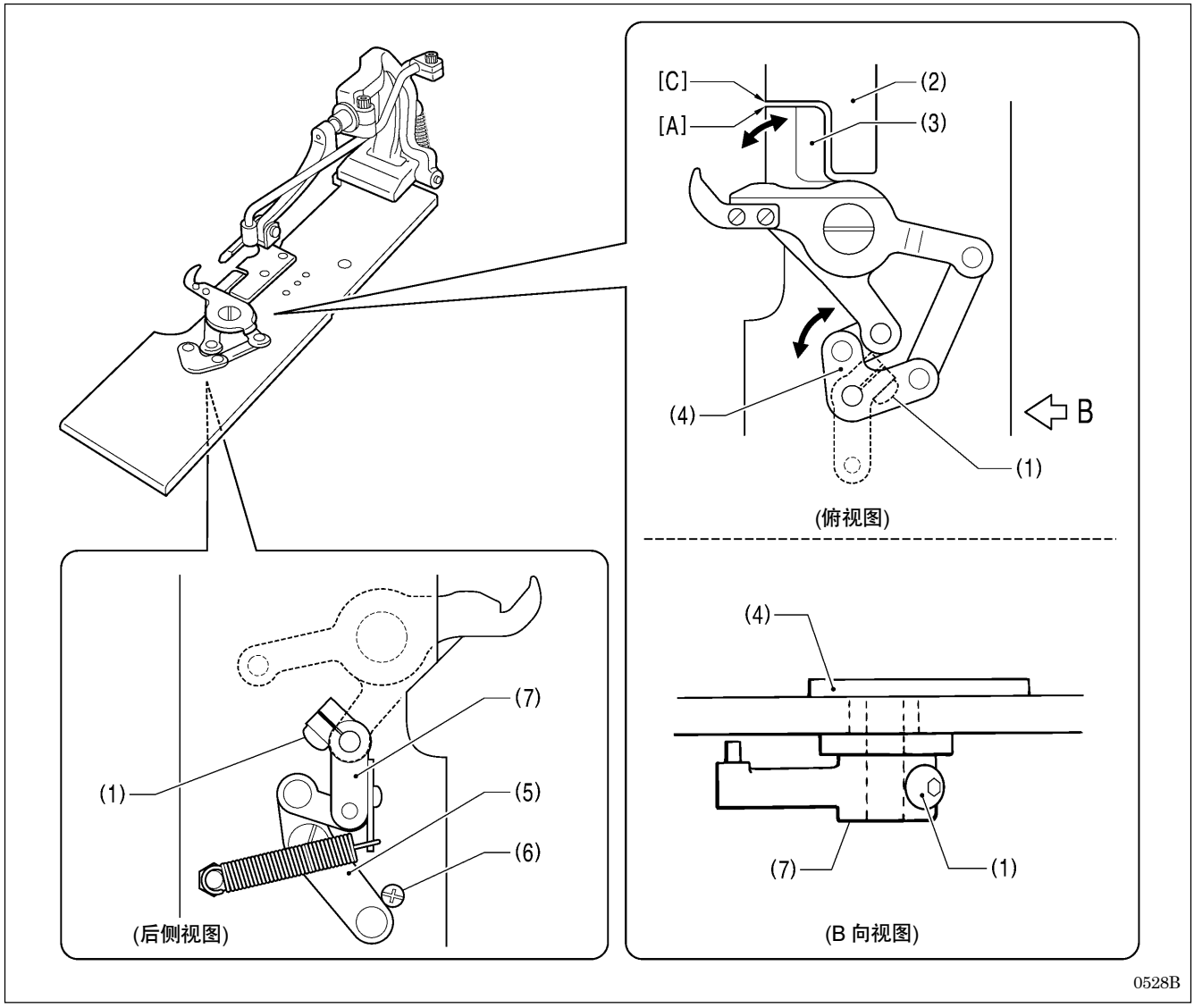
为了确保能进行剪线，将刃压调整到最小。

1. 松开螺母(1)。
2. 回转段螺钉(2)来调整刃压。

   [注意]

   段螺钉(2)过度拧紧的话动刀会不能作动。将段螺钉(2)慢慢回转回来，一直回到动刀能顺畅回转的位置为止进行调整。
3. 调整终了后，用力拧紧螺母(1)。

9-26-3. 动刀组件安装位置的调整



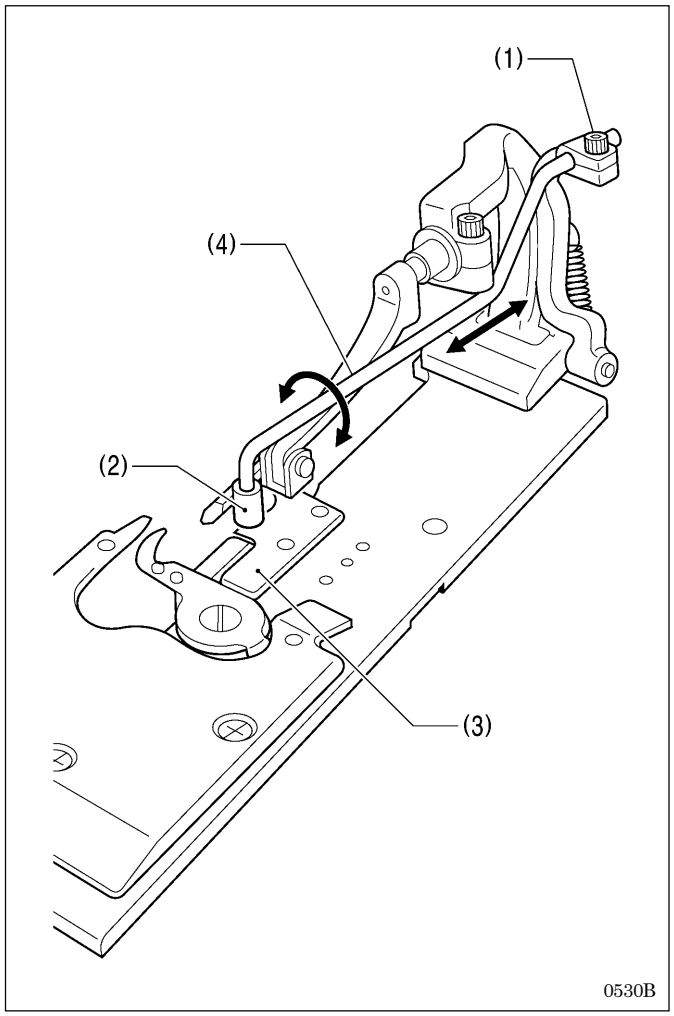
1. 取出压板 U。(具体请参考「9-26-1. 动刀和定刀的交换」)
2. 松开螺钉(1)。
3. 回转动刀驱动板(4)，使右动刀 R(3)的刀刃尖端[A]部和针板(2)的角部[C]对齐为止。
4. 让切线连接杆 J 组(5)碰到螺钉(6)为止回转切线杆臂 B(7)，拧紧螺钉(1)。
5. 调整终了后，安装上压板 U。

[注意]

确认动刀驱动板(4)和切线杆臂 B(7)不可有间隙并能圆滑的回转。

9-26-4. 辅助压杆位置的调整

剪断底线、芯线、压布夹提升同步的工作。辅助压杆是为了安定在剪线过程中不移动缝纫布料、及剪线长度一样而被安装的。



1. 松开螺钉(1)。
2. 为了让压扣(2)移到针板(3)上，和缝纫布料对齐，调整辅助压杆(4)的安装位置。
3. 调整终了后，用力拧紧螺栓(1)。

9-27. 芯线残留量的调整 <只有-02 规格>

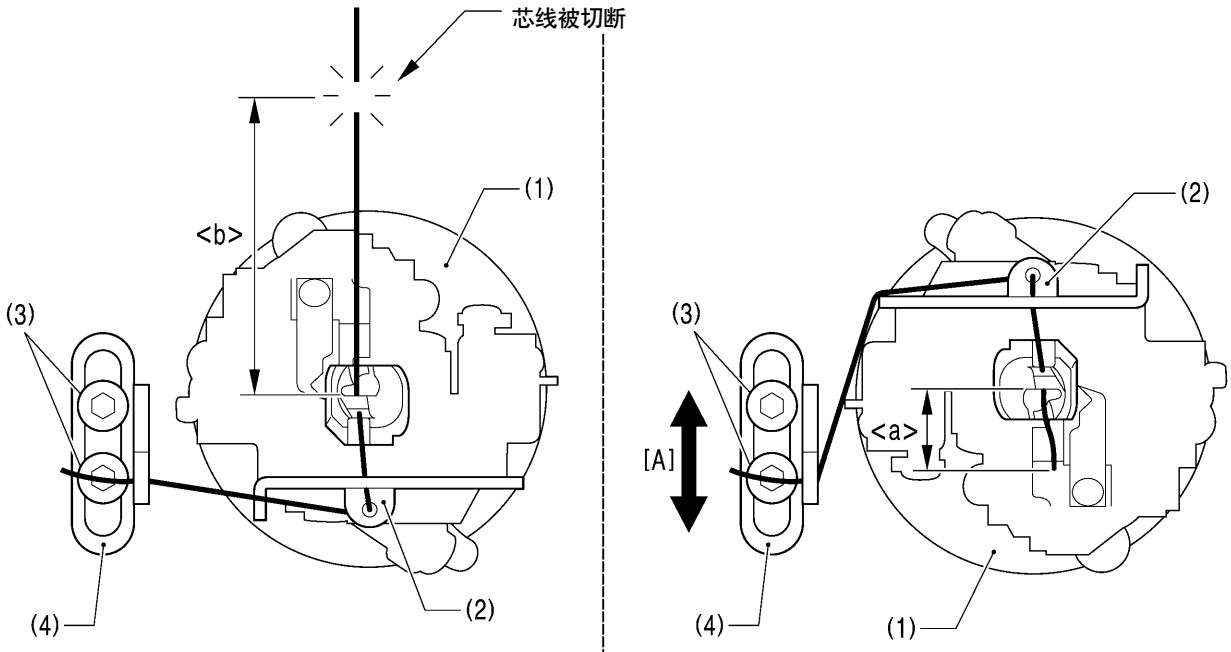
在缝纫开始时由于最初的 2～3 针迹被纠绕，使布料被压住，芯线依次被引出。为此，送布台在缝制位置，有时对芯线有很强的张力，芯线残留量(下图<a>)如果非常短，芯线有可能会从针迹处脱落。
在此，芯线在缝纫开始时被确实卷进针迹中，在此情况下进行调整，芯线从针迹中被引出的量尽可能变得短些为佳。

[参考]：芯线引出的原理

芯线引出是指在芯线被切断后，弯针座(1)从回转 180° 度到回复 0° 度时，芯线导向 C-J(2)进行拉出芯线的作用。

在以下的情况下必须进行芯线残留量的调整。

- 改变纽孔锁缝长度时（为了使芯线在原点被切断，改变<b>的长度。随之芯线残留量<a>也将被改变。）
- 芯线的种类，芯线的张力等改变时(芯线残留量<a>将被改变。)

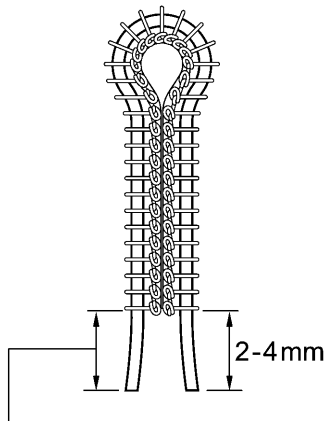


弯针座回转 180° 度时　　弯针座回到 0° 度时

(俯视图)

0547B

0548B



缝纫终了时的芯线残留量是根据切线而一定的。

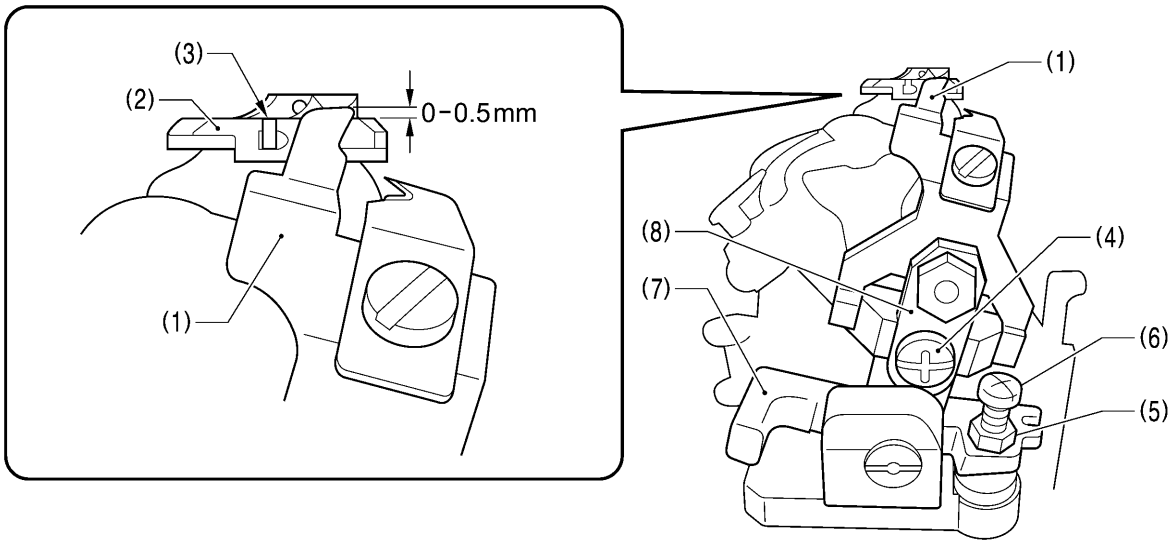
<调整方法>

1. 松开螺钉(3)。
2. 按箭头[A]方法移动芯线导向 J(4)，调整缝纫开始时的芯线长出开始针迹的 2～4㎜ 左右。
3. 调整终了后，用力拧紧螺钉(3)。

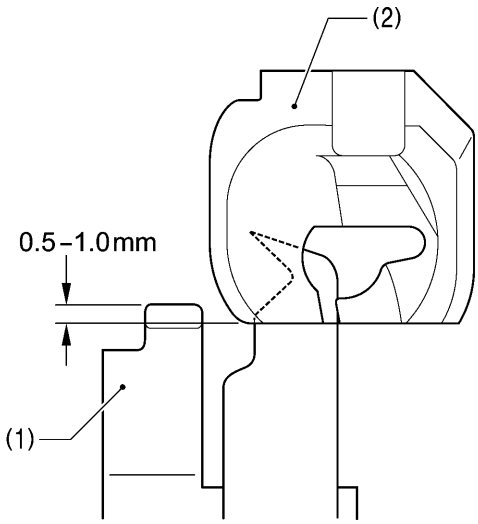
9-28. 底线压板位置的调整 <只有-02 规格>

调整底线压板(1)，使其确实夹住底线。

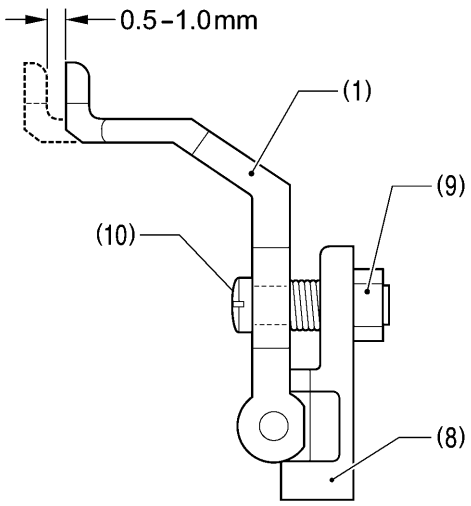
0549B
0550B
0551B



(正视图)



(俯视图)

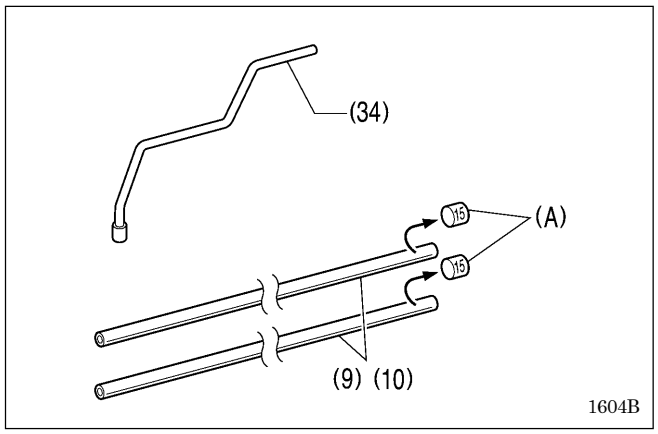


(右视图)

1. 为了使从转盘板(2)的线槽部上面(3)到底线压板(1)的顶部高度差约为0.5㎜左右，松开螺钉(4)，上下进行调整。
2. 确认底线压板(1)不可堵住 转盘板(2)前面的槽。
   * 如果堵住时，松开螺母(5)后，回转螺钉(6)来调整。
3. 切线杆基座B(7)在作动的情况下，调整转盘板(2)前面和底线压板(1)重叠0.5～1.0㎜之间。
   * 必须要调整时，拆下底线压板座(8)，松开螺母(9)后，回转螺钉(10)来调整。
4. 调整终了后，松开了的螺母(5)和螺母(9)均一一拧紧后, 再安装上底线压板座(8)。

9-29. 在左侧安装（更换）辅助压杆

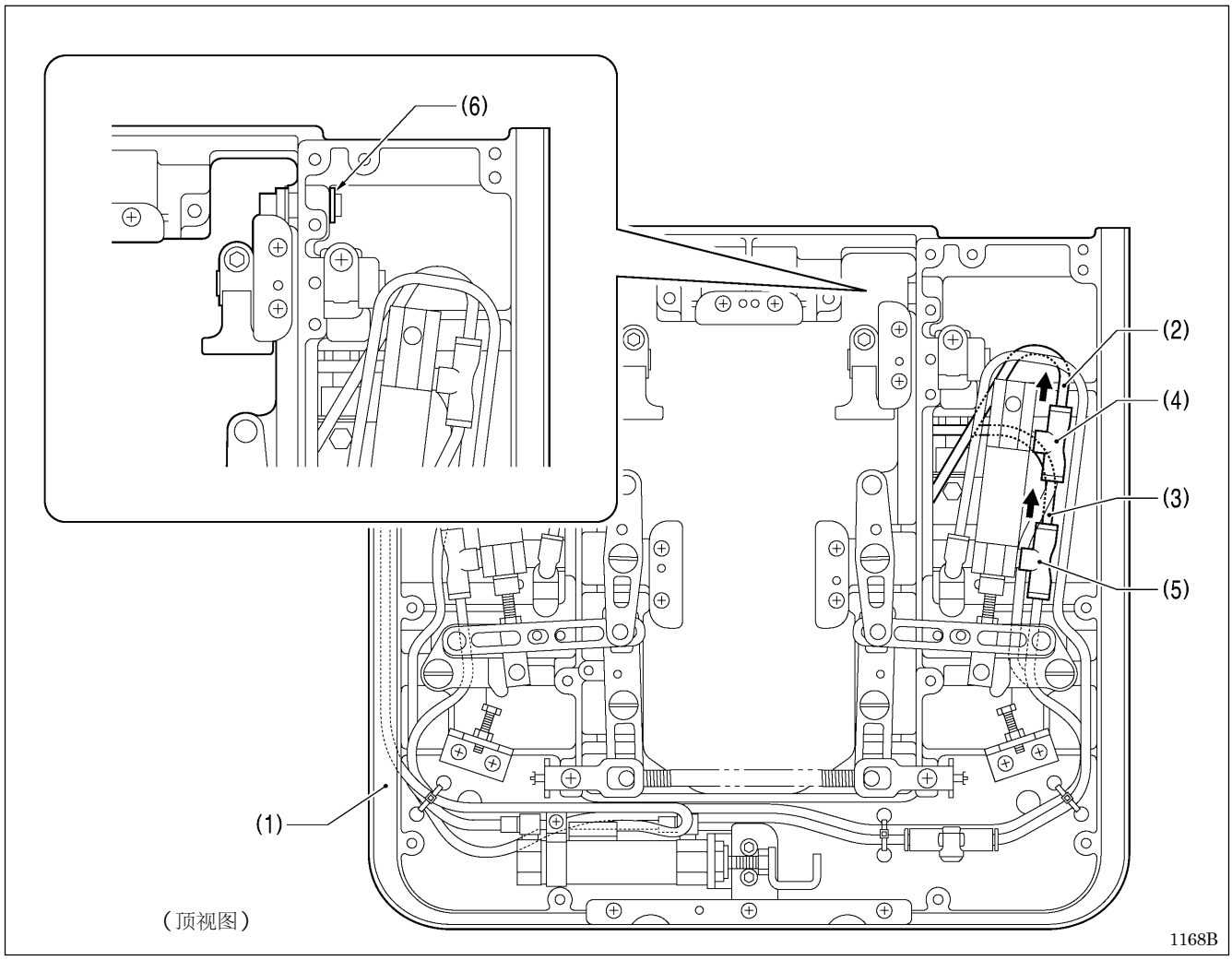
如有必要，可从右侧卸下辅助压杆并安装在左侧。在这种情况下，需要以下可选部件。



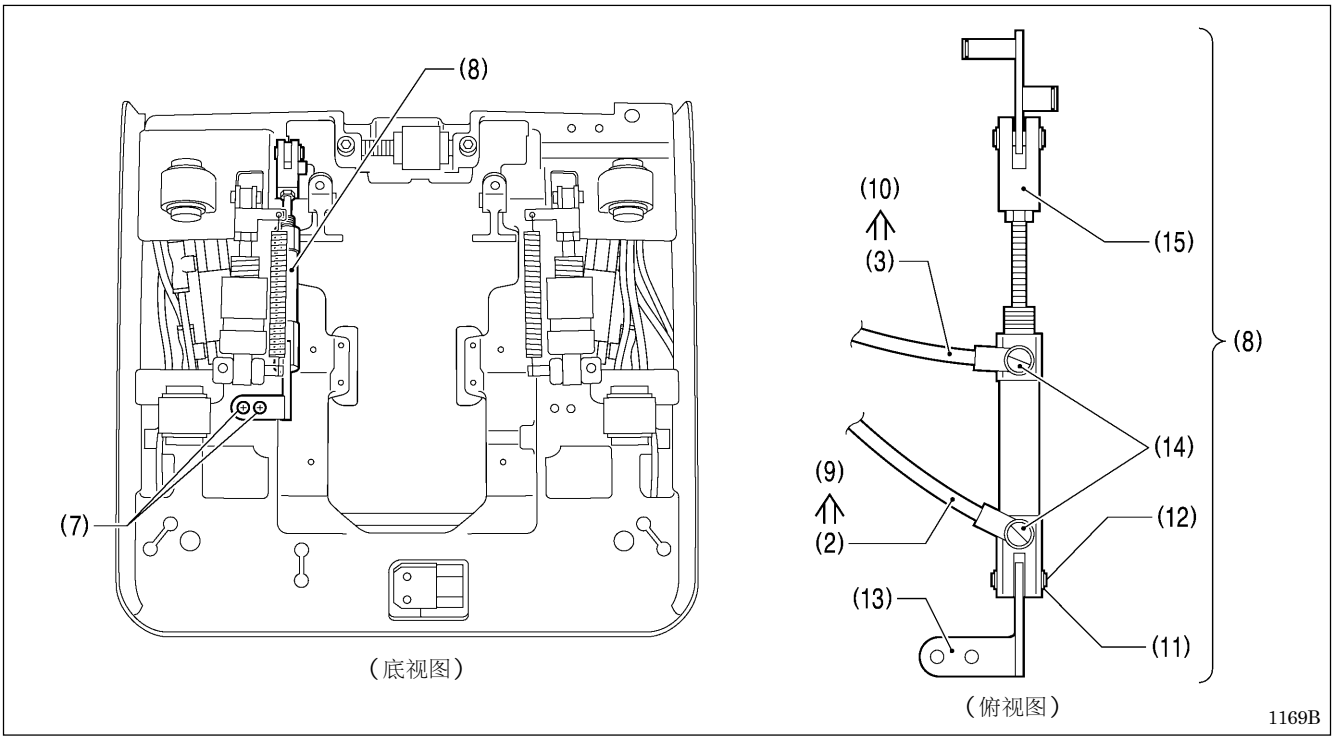
要在左侧安装辅助压杆，首先准备好以下选件。

参考编号	代码	数量	部件名称
(34)	SA9132001	1	辅助压杆 L 组件
(9) (10)	SA5683001	2	空气导管（外径 4 mm，内径 2.5mm，长度 750 mm）

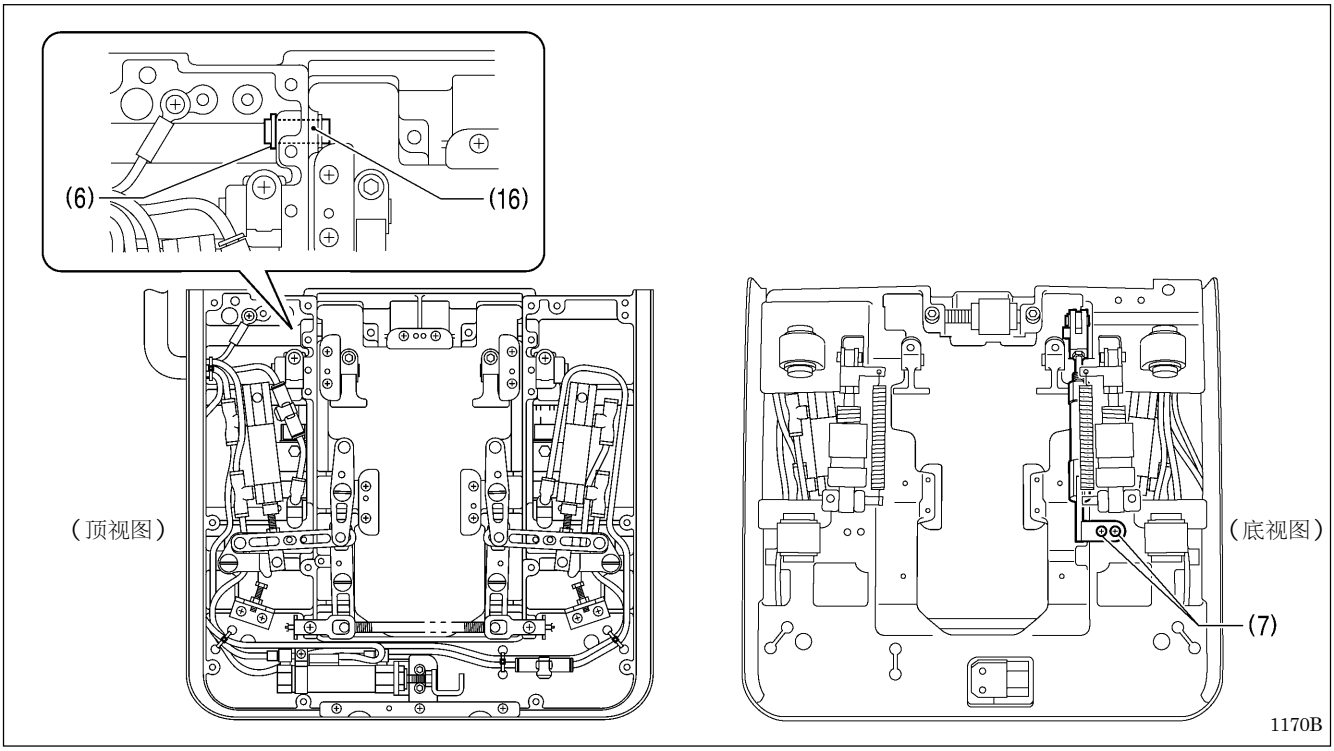
* 在使用空气导管(9)和(10)之前，请确保取下粘附物(A)。



1. 停止进气并放出空气。(请参阅「3-16. 气压的调节」。)
2. 从底板台上卸下送料台装置(1)。(请参阅维修手册中的「5-3. 送布关系」。)
3. 从管接头(4)和(5)断开连接的空气管(2)和(3)。
4. 卸下挡圈 C(6)。



5. 卸下两个螺钉(7)，然后卸下辅助压杆气缸组件(8)。
6. 将空气导管(2)和(3)更换为可选的空气导管(9)和(10)。
7. 卸下挡圈 C(11)并拉出轴(12)。
8. 按如图所示方向将轴(12)插入到辅助压杆 S 支架(13)中，然后装上挡圈 C(11)。
9. 调整管接头(14)和气缸连杆(15)的位置使其如图所示处于相对位置。



10. 将辅助压杆气缸杆销的轴(16)插入到送布台的孔中，然后装上挡圈 C(6)。
11. 拧紧两个螺钉(7)。

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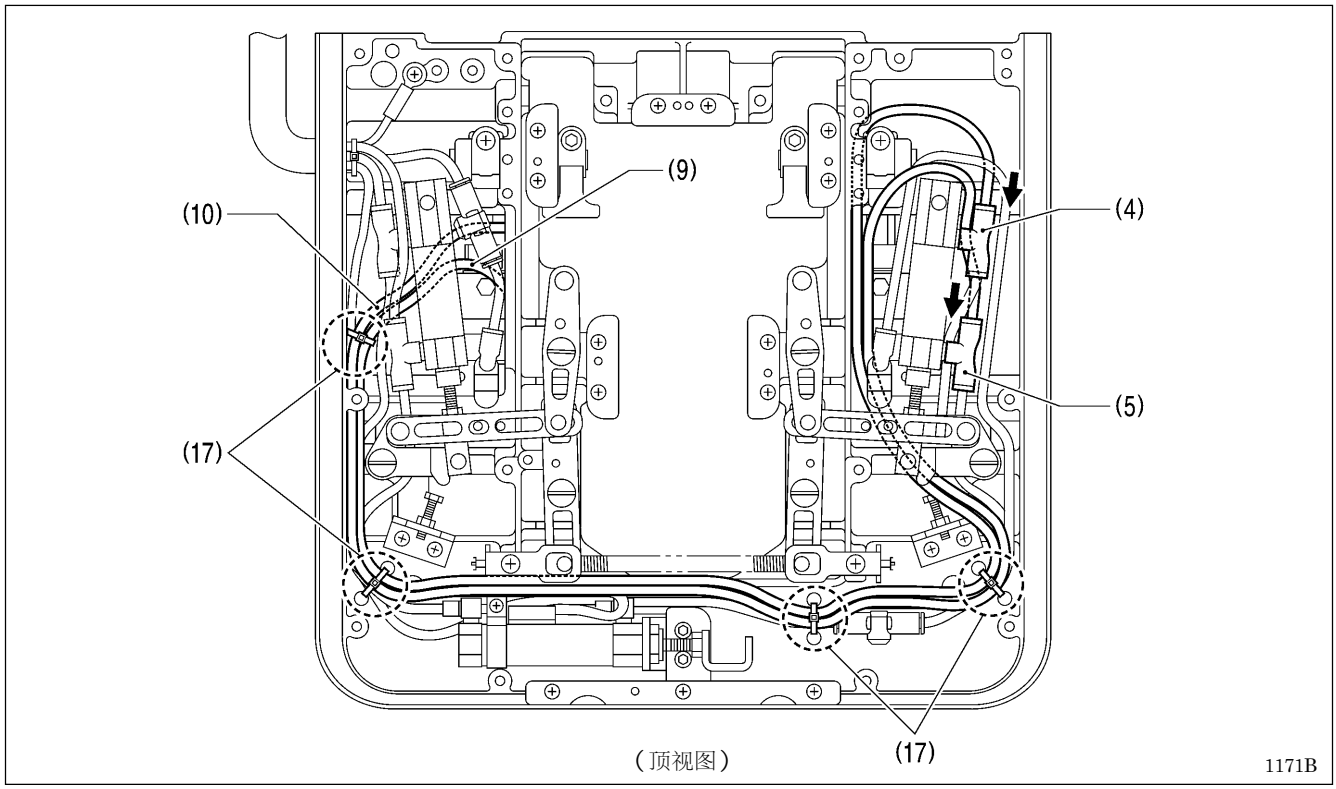
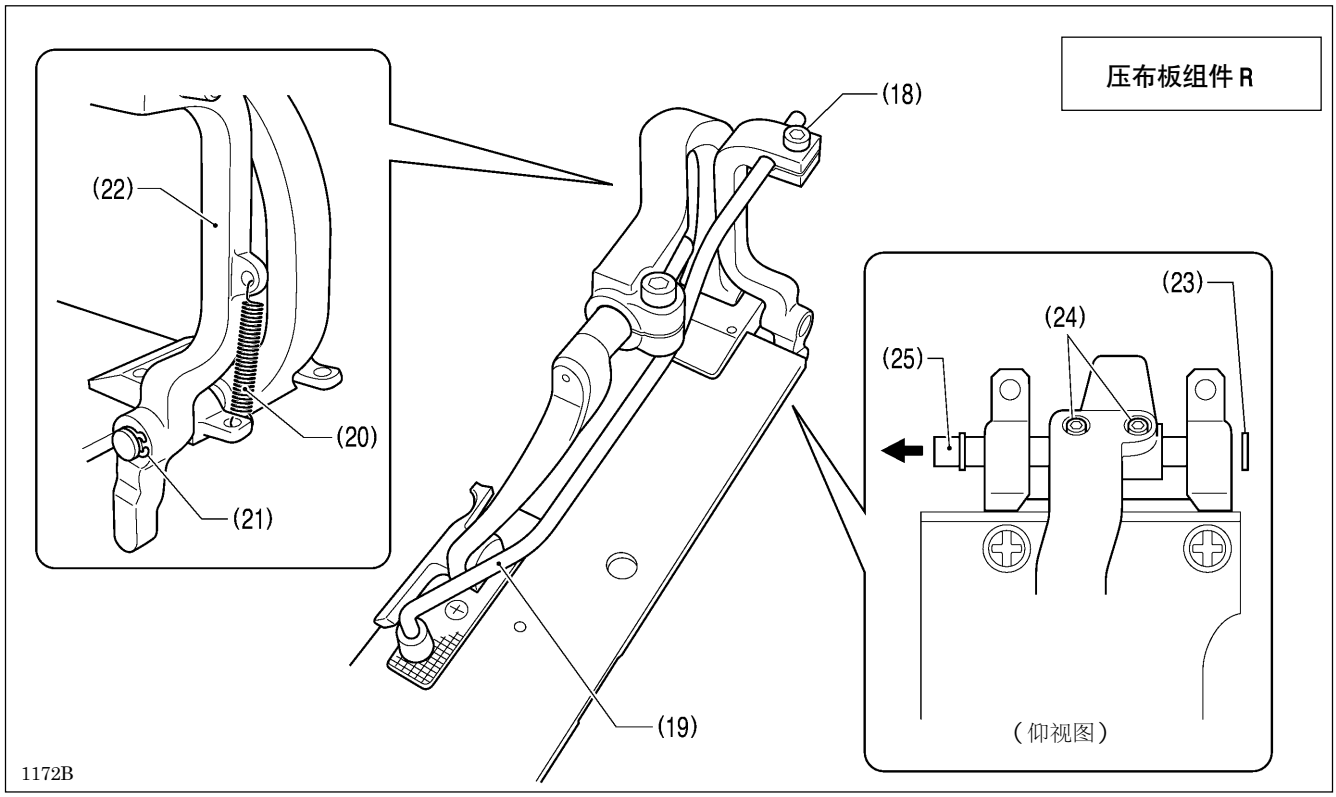
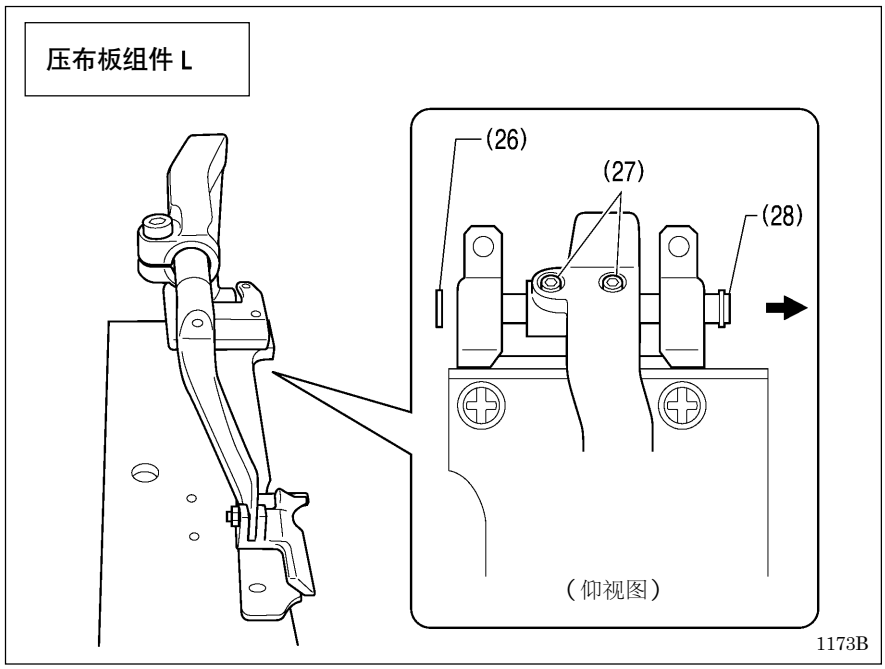


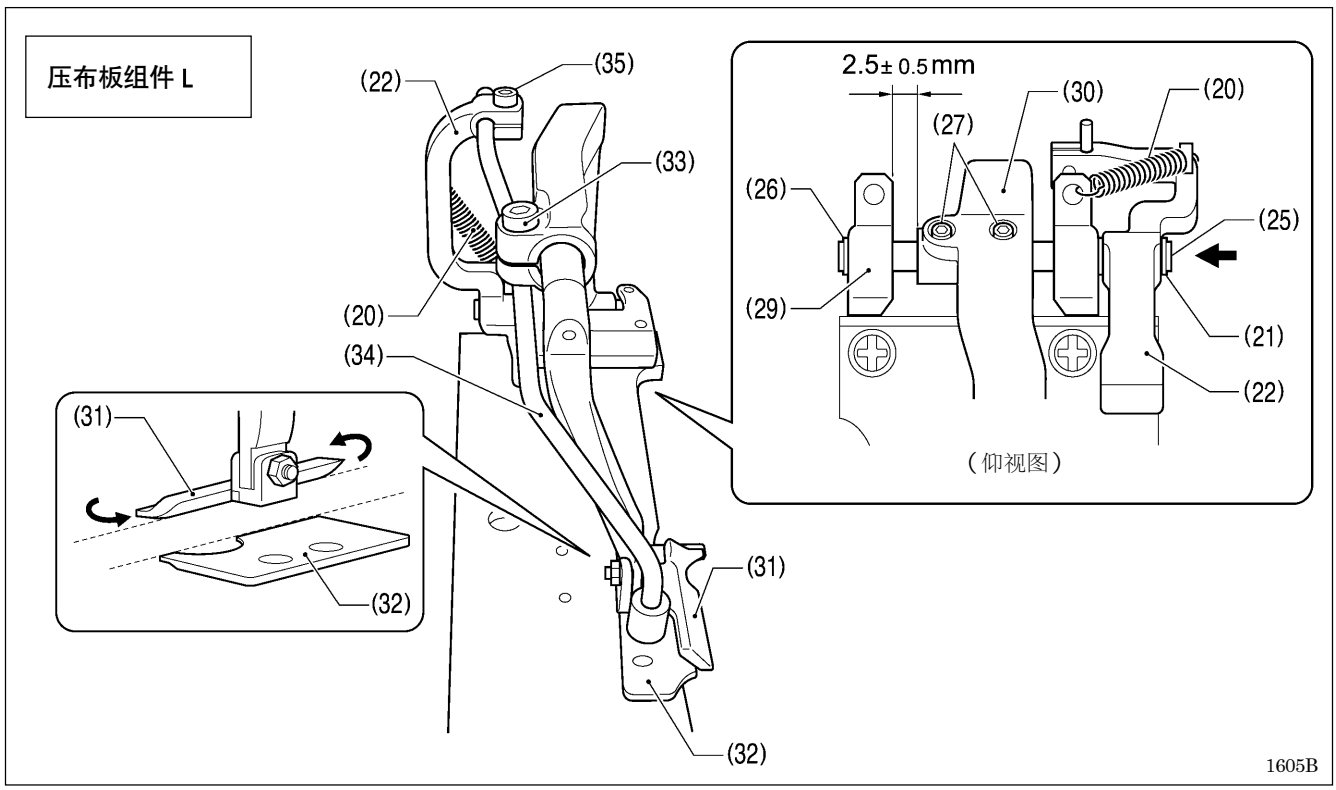
12. 如图所示分布管子线路，然后将空气导管(9)连接到管接头(4)并将空气导管(10)连接到管接头(5)。
13. 如图所示，使用四个撑轮圈带(17)在四个位置紧固空气导管(9)和(10)。



14. 松开两个定位螺栓(18)，然后卸下辅助压杆组件(19)。
15. 卸下回复弹簧(20)。
16. 卸下挡圈 C(21)，然后卸下辅助压杆臂(22)。
17. 卸下挡圈 C(23)，松开两个固定螺钉(24)，然后按箭头所示的方向卸下支点轴 J(25)。



18. 卸下挡圈 C(26)，松开两个固定螺钉(27)，然后按箭头所示的方向卸下支点轴(28)。



19. 按箭头所示的方向插入支点轴 J(25)，然后安装挡圈 C(26)。
20. 如图所示将辅助压杆臂(22)放在支点轴 J(25)上，然后安装挡圈 C(21)。
21. 拧紧两个固定螺钉(27)以使夹轴承受板(29)和夹杆 L(30)之间的空隙保持为 2.5 ±0.5 mm。
    * 检查此时压布夹 L(31)的各边与针板 L(32)是否对齐。如果没有对齐，松开定位螺栓(33)并进行调节。
22. 将辅助压杆组件 L(34)安装到辅助压杆臂(22)上，然后通过拧紧定位螺栓(35)将其固定。(请参阅「9-26-4. 辅助压杆位置的调整」。)
23. 将回复弹簧(20)装到辅助压杆臂(22)和夹轴承受板(29)。

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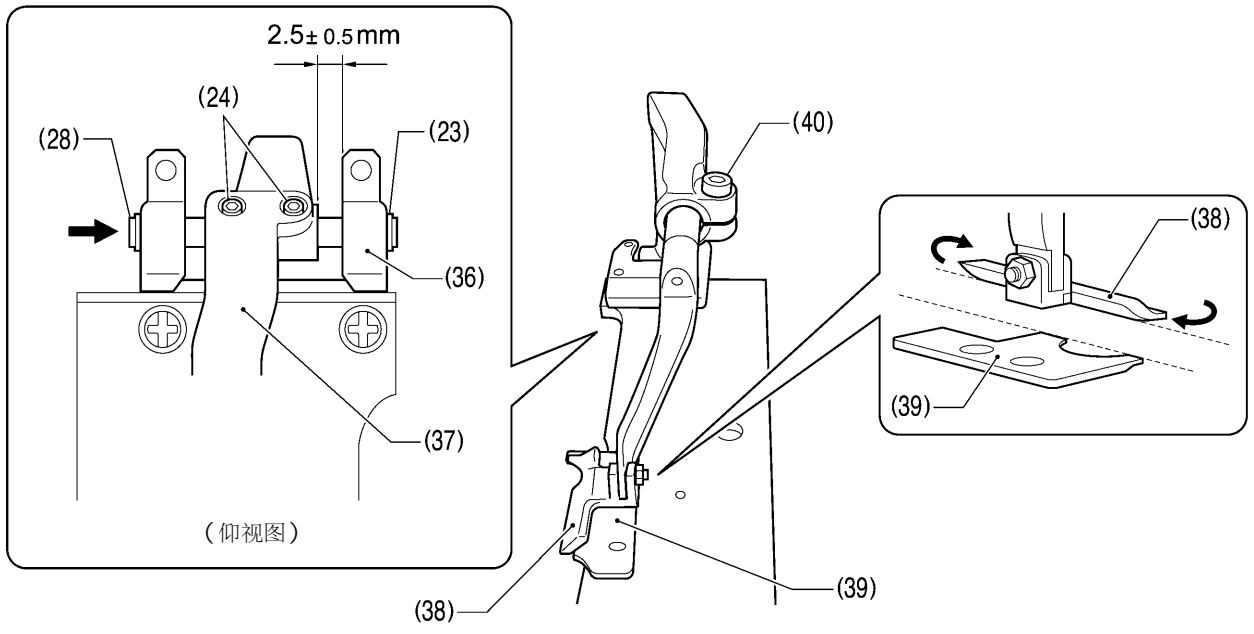
压布板组件 R



24. 按箭头所示的方向插入支点轴(28)，然后安装挡圈 C(23)。
25. 拧紧两个固定螺钉(24)以使夹轴承受板(36)和夹杆 R(37)之间的空隙保持为 2.5 ±0.5 mm。
    * 检查此时压布夹 R(38)的各边与针板 R(39)是否对齐。如果没有对齐，松开定位螺栓(40)并进行调节。

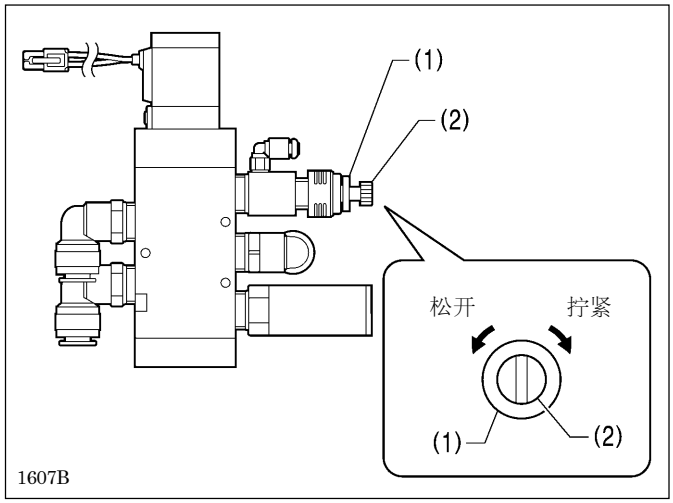
9-30. 调节节流阀

按如下说明调节各阀门的节流阀。

9-30-1. 调节切刀阀门的节流阀

[注意]：切刀阀门节流阀的功能

当气锤升起时，从切刀活塞放出的空气可流入文吐里管用于收集切屑。您可以通过调节切刀阀门的节流阀来调节放出的空气量。其结果是，增加或减少节流阀的开口量将改变切屑收集性能，同时还会改变气锤提升速度（循环时间）。遵循下面的步骤进行正确的调节。



<调节方法>

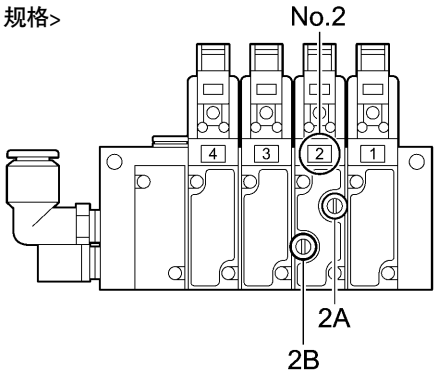
1. 松开固定螺母(1)。
2. 从完全紧固位置转动八圈，拧松节流阀调节螺钉(2)。
3. 调节后，拧紧固定螺母(1)以紧固节流阀调节螺钉(2)使其无法转动。

* 如果没有正确调节节流阀调节螺钉(2)，则会出现以下问题。

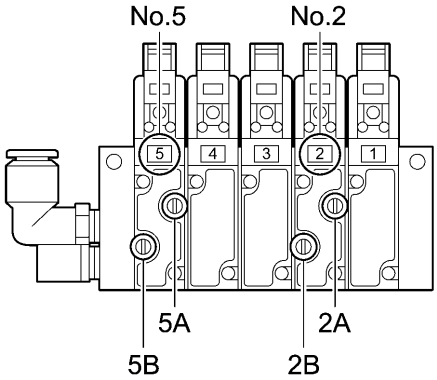
节流阀调节螺钉(2) 转动圈数	问题
如果松开八圈以上	流入文吐里管的空气量将减少，并且因此将降低切屑收集性能。(如果松开过多，则将会出现切屑堵塞情况。)
如果松开少于八圈	流入文吐里管的空气量将增加，并且因此将提高切屑收集性能，但气锤提升速度将下降。(循环时间将变长并且工作效率将下降。) **[注意]：** 转动约六圈后气锤提升速度将变得过慢。如果想要赋予切屑收集性能最高的优先级，则将其调节为转动 6 到 8 圈的范围内，同时不断检查气锤操作。

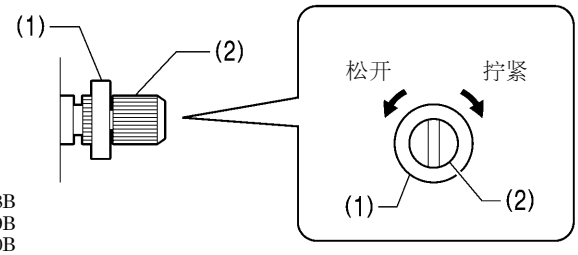
9-30-2. 调节电磁阀的节流阀

<用于-00 规格>



<用于-01 和-02 规格>





1608B
1609B
1610B

[注意]：各阀门用途

标签编号	电磁阀用途
1	用于面线挑线
2	用于面线剪线
3	用于铺布（+ 用于辅助压杆 *1）
4	用于压布夹
5*2	用于底线剪线

*1: 辅助压杆仅用于 -02 规格。

*2: 在-00 规格中没有标签编号 5 的电磁阀。

- 使用 2 号阀门（图中的 2A 和 2B）的节流阀调节螺钉来调节面线剪线活塞的运行速度。
- 使用 5 号阀门（图中的 5A 和 5B）的节流阀调节螺钉来调节底线剪线活塞的运行速度。

遵循下面的步骤进行正确的调节。

<调节方法>

1. 松开固定螺母(1)。
2. 在节流阀调节螺钉(2)完全拧紧的情况下，参考下面的“调节指南”松开节流阀的调节螺钉(2)。
3. 调节后，拧紧固定螺母(1)以紧固节流阀调节螺钉(2)使其无法转动。

<调节指南>

阀门	节流阀调节螺钉转动圈数	问题
2 号阀门（节流阀调节螺钉：2A 和 2B）	如果松开九圈以上	运行将变快，但如果过快，振动将加剧并且将出现噪音。
	如果松开少于九圈	运行将变慢并且切刀性能将下降。 对于-02 规格，可能出现底线压脚故障。
5 号阀门（节流阀调节螺钉：5A 和 5B）	如果松开七圈以上	运行将变快，但如果过快，则可能会在线处理过程中出现捆线，并且可能出现剪线错误。
	如果松开少于七圈	运行将变慢，而循环时间将增加并且可能会显示错误代码。

10. 缝纫菊花孔

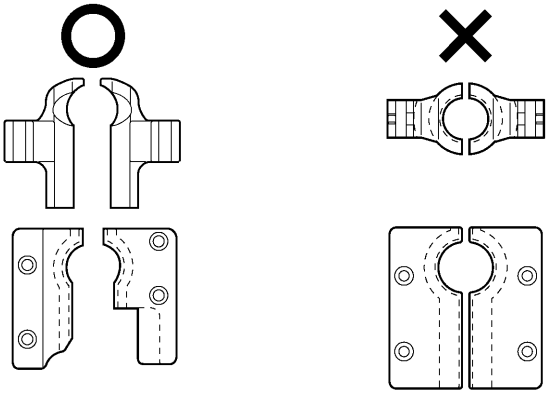
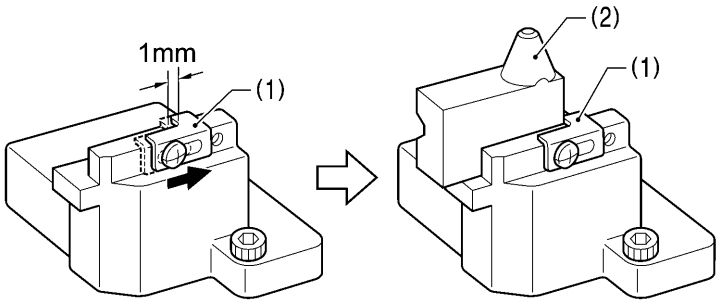
对于-00 和-01 规格，建议您在缝纫时使用专用部件。(请参阅零件手册。)

<如果使用-02 规格的缝纫机>

建议您转用-00 或-01 规格的缝纫机。

或者，如果主控制程序(MN)的版本为 1.3.00 或更高版本，则可进行简单缝纫。不过，可能会受限制，因此在使用该缝纫机前请确保您了解这些限制。

<使用 -02 规格的缝纫机缝纫菊花孔时的限制>

	限制	要注意和了解的要点
1	对针板和压布夹使用-02 规格的标准部件。  1611B	请注意，压布夹范围将变小并且布料上的可缝纫范围将增加。
2	底线剪线机制将不起作用。	由于该机制的操作方式，剪线性能将变得不稳定，因此该机制将被设置为禁用。
3	唯一可用的布料设置位置为“前面”。	如果选择“后面”设置位置，当缝纫结束后拉出布料时将导致底线和芯线缠在剪线切刀上，因此不能使用此设置。
4	将用于安装切刀的定位板(1)位置向后移动 1 mm，然后安装菊花孔切刀(2)。  1612B	为了将缝合位置与标准压布夹匹配，菊花孔的缝合位置会向后移动 1mm。因此，切刀的安装位置也应后移。

<切刀压力>

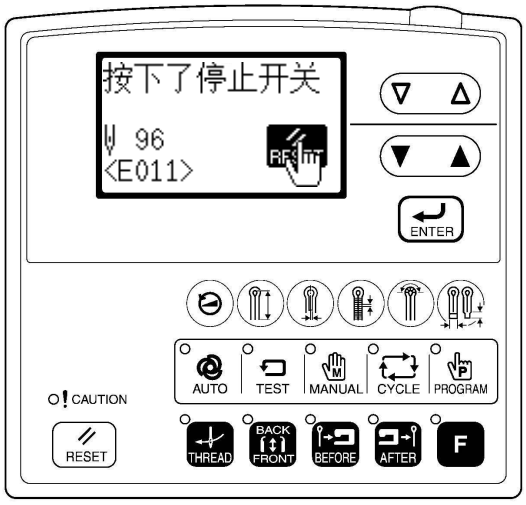
切割区域将小于圆头形状，因此建议您降低切刀压力。

11. 误码表

⚠危险

打开控制箱盖时，先关闭电源开关并将电源插头从插座上拔下后，至少等待 5 分钟后，再打开控制箱盖。
触摸带有高电压的区域将会造成人员受伤。

万一缝纫机发生错误时，蜂鸣器会鸣叫，在显示窗会显示误码及错误信息。
请按处理方法找出原因排除故障。



0582B
0461B

开关方面的故障

在参考页中印有“＊”符号的项目，请让受过训练的技术人员来处理。

误码	原因	处理方法	参考页
E010	在待机中按了暂停开关。	请释放暂停开关(改成 OFF)。	1
E011	在缝纫中按了暂停开关。	请按 RESET 键解除错误。 ＊ 按▼键移动送布台，可以继续接着缝纫。	36 53
E015	一直按着暂停开关吗? 暂停开关接触不良。	关闭电源，如果没有按着暂停开关时，请确认暂停开关。	19*
E016	暂停开关接触不良。	关闭电源，请确认主基板上的暂停开关的插头 P13 是否正确插入。	19*
E024	按了启动开关。	请释放启动开关(改成 OFF)。	14-16
E025	接通电源后，一直按着启动开关吗? 启动开关接触不良。	关闭电源，请确认是否按了启动开关。如果没有按，请检查主基板上的启动开关的插头 P6 是否正确的插入。	14-16 19*
E034	按了压布开关。	请释放压布开关(改成 OFF)。	14-16
E035	一直按着压布开关吗? 压布开关接触不良。	关闭电源，请确认压布开关。	14-16
E050	接通电源后，检出机头向后倾斜着。	关闭电源，将机头竖起。 请确认主基板上的安全开关的插头 P9 是否正确的插入。	11 19*
E051	缝纫机启动中，检出机头向后倾斜着。	关闭电源，将机头竖起。 请确认主基板上的安全开关的插头 P9 是否正确的插入。	11 19*
E055	接通电源时，检出机头向后倾斜着。	关闭电源，将机头竖起。 请确认主基板上的安全开关的插头 P9 是否正确的插入。	11 19*
E065	接通电源时，是否一直按着操作盘的键? 或是键不良。	关闭电源，请确认有没有一直按着键。	36 37

上轴马达方面的故障

在参考页中印有“＊”符号的项目，请让受过训练的技术人员来处理。

误码	原因	处理方法	参考页
E110	针上位置停止错误。	请回转手轮直到错误表示消失为止。	38
E111	针上位置停止错误。	关闭电源，请确认电源马达基板上的信号检出器插头 P5 以及主基板上的针摆感应器插头 P10 是否正确插入。	19* 20*
E120	不能确认针下信号。	关闭电源，请确认电源马达基板上的信号检出器插头 P5 的接续。	20*
E130	缝纫机马达异常停止了? 信号检出器不良。	关闭电源，请回转手轮确认缝纫机有没有被锁住。 请确认电源马达基板上的上轴马达插头 P4 和信号检出器插头 P5 是否正确的插入。	20*
E131	信号检出器的接续不良。	关闭电源，请确认电源马达基板上的信号检出器插头 P5 是否正确的插入。	20*
E132	检出了缝纫机马达的异常回转。	关闭电源，请回转手轮确认缝纫机有没有被锁住。 请确认电源马达基板上的上轴马达插头 P4 和信号检出器插头 P5 是否正确的插入。	20*
E133	缝纫机马达的停止位置不良。	关闭电源，请回转手轮确认缝纫机有没有被锁住。 请确认电源马达基板上的上轴马达插头 P4 和信号检出器插头 P5 是否正确的插入。	20*
E140	在缝纫中缝纫机马达逆回转了。	关闭电源，请回转手轮确认缝纫机有没有被锁住。 请确认电源马达基板上的上轴马达插头 P4 和信号检出器插头 P5 是否正确的插入。	20*
E150	缝纫机马达异常升温? 温度感应器不良。	关闭电源，请回转手轮确认缝纫机有没有被锁住。 请确认电源马达基板上的上轴马达插头 P4 和信号检出器插头 P5 是否正确的插入。	20*

送布台方面的故障

在参考页中印有“＊”符号的项目，请让受过训练的技术人员来处理。

误码	原因	处理方法	参考页
E200	X 送布马达的原点不能检出。 X 送布马达异常? 或是 X 原点感应器接续不良。	关闭电源，请确认 PMD 基板的 X 送布马达插头 P10 和主基板的 X 脉冲马达编码器插头 P20 是否正确的插入。	19* 20*
E201	X 送布马达异常异常停止了。	关闭电源，请确认 X 送布方向是否有异常。	*
E210	Y 送布马达的原点不能检出。 Y 送布马达异常? 或是 Y 原点感应器接续不良。	关闭电源、请确认 PMD 基板的 Y 送布马达插头 P8 和主基板的 Y 脉冲马达编码器插头 P4 和感应器插头 P8 是否正确的插入。	19* 20*
E211	Y 送布马达异常异常停止了。	关闭电源，请确认 Y 送布方向是否有异常。	*
E220	θ 送布马达的原点不能检出。 θ 送布马达异常? 或是 θ 原点感应器接续不良。	关闭电源、请确认 PMD 基板的 θ 送布马达插头 P3 和主基板的 θ 送布马达编码器插头 P5 是否正确的插入。	19* 20*
E221	θ 送布马达异常异常停止了。	关闭电源，请确认 θ 送布方向是否有异常。	*

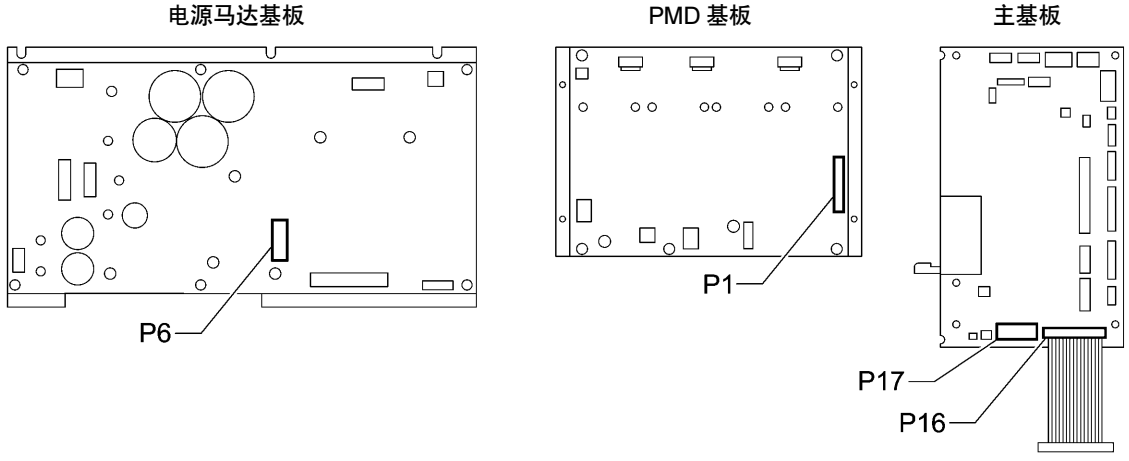
通信或是记忆存储方面的故障

在参考页中印有“＊” 符号的项目，请让受过训练的技术人员来处理。

在参考页中印有“＊＊”符号的项目，请向购买商店询问。

误码	原因	处理方法	参考页
E401	接通电源时，检出了主基板和电源马达基板之间的接续错误。	关闭电源，请确认主基板上的插头 P17 和电源马达基板上的插头 P6 是否正确的插入。	19* 20* 120*
E403	接通电源时，检出了主基板和 PMD 基板之间的接续通信错误。	关闭电源，请确认主基板上的插头 P16 和 PMD 基板上的插头 P1 是否正确的插入。	19* 20* 120*
E410	检出了主基板和操作盘基板之间的通信错误。	关闭电源，请确认主基板上的操作盘插头 P1 是否正确的插入。	19*
E411	检出了主基板和电源马达基板之间的通信错误。	关闭电源，请确认主基板上的插头 P17 和电源马达基板上的插头 P6 是否正确的插入。	120*
E420	没有插入 CF 卡。 (没有任何信息被表示出来。)	关闭电源，请在控制箱的 CF 卡的插入口处插入 CF 卡。	**
E422	在读入 CF 卡时发生了错误。	请确认 CF 卡上是否有数据。	**
E424	CF 卡的容量不足。	请使用新的 CF 卡。	**
E425	在写入 CF 卡时发生了错误。	请使用指定的 CF 卡。	**
E430	主基板的闪存异常。	关闭电源，请再一次重新接通电源。	38
E440	主基板的 EEPROM 异常。	关闭电源，请再一次重新接通电源。	38
E450	不能从机头存储器内读取机型选择数据。	关闭电源、请确认电源马达基板的机头存储器的插头 P3 是否正确的插入。	20*
E451	不能从机头存储器内存对数据进行反馈。	关闭电源，请再一次重新接通电源。	38
E480	主基板的 RAM 异常。	关闭电源，请再一次重新接通电源。	38

【各基板和插头的位置】



0535B

软件相关的错误

在参考页中印有“＊”符号的项目，请让受过训练的技术人员来处理。

误码	原因	处理方法	参考页
E569	检测到主设备与马达之间的程序版本错误。	按 RESET 键以清除该错误。 * 当安装了不同型号的电源设备马达主基板时会显示此错误。 尽快更换为 ST-9820 适用的电源设备马达主基板。	20*
E580	检测到 EEPROM 版本错误。	关闭电源并进行 3 级初始化。	62
E581	检测到存储开关版本错误。	关闭电源并进行 2 级初始化。	62
E582	检测到参数数据版本错误。	关闭电源并进行 1 级初始化。	62

装置方面的故障

在参考页中印有“＊” 符号的项目，请让受过训练的技术人员来处理。

误码	原因	处理方法	参考页
E630	底线剪线装置不工作? 底线剪线感应器异常。	关闭电源，请确认主基板上的阀接线插头和感应器插头是否正确的插入。	19*
E650	气锤下降了? 气锤位置感应器异常。	关闭电源，请确认主基板上的气锤阀接线插头和气锤位置感应器插头是否正确的插入。	19*
E651	气锤不下降? 气锤位置感应器异常。	关闭电源，请确认主基板上的气锤阀接线插头和气锤位置感应器插头是否正确的插入。	19*

基板方面的故障

在参考页中“＊” 符号的项目，请让受过训练的技术人员来处理。

误码	原因	处理方法	参考页
E700	电源电压异常上升。	关闭电源，请确认输入电压。	23*
E701	缝纫机马达驱动电压异常上升。	关闭电源，请确认电压。	20*
E705	电源电压异常下降。	关闭电源，请确认输入电压。	23*
E710	检出了缝纫机马达的异常电流。	关闭电源，请确认缝纫机是否有异常。	*
E719	检出了 PMD 基板的异常。	关闭电源，请确认 PMD 基板。	20*
E740	冷却风扇不工作。	关闭电源，请确认主基板上的冷却风扇感应器插头是否正确的插入。	19*

如果上述误码以外的错误出现了或是出现了上述误码也按上述处理方法处理了仍然不能解决问题时，请向经销商咨询。

12. 故障检修

- 如果发现缝纫机有问题时，首先，请先确认穿线方法和机针的安装是否正确。
- 请在要求维修或服务前，先检查以下各项。
- 如果以下方法仍然不能解决问题，请关闭电源开关，向受过训练的技术人员或经销商咨询。

⚠注意

在作业之前，请先关闭电源开关，并将电源插头从插座上拔下。
如果误按启动开关，缝纫机动作会导致受伤。

现　象	原　因	措　施	参考页
断线	线张力太强	适当地调整线张力	55
	机针的安装方法不正确	按正确的方向安装机针	30
	和机针相比线太粗	选择使用符合机针的线	55
	机针和弯针的关系不匹配	调整机针和弯针的间隙、针杆高度、弯针和分纱器的高度	71，78 79
	机针、弯针、分纱器、转盘板和线道有损伤或毛刺	对各零部件进行研磨、或更换	
	穿线不正确	在线道上正确穿线	31 - 34
跳针	面线张力太强、或太弱	适当地调整面线张力	55
	机针尖折断或弯曲	换用新机针	30
	机针和弯针尖之间的间隙不正确	正确地调整机针和弯针尖之间的间隙	79
	机针、弯针和分纱器的关系不匹配	正确地调整三者之间的关系	71 76 - 81
	机针和机针护架调整不正确	正确地调整机针护架	79
	弯针尖变钝	用油石修理或更换新的弯针	
	机针的安装方法不正确	按正确的方向安装机针	30
	机针过细	选择符合缝制条件的机针	55

现　象	原　因	措　施	参考页
断、折针	机针弯曲	交换新的机针	30
	机针、弯针和分纱器的关系不匹配	正确地调整三者之间的关系	71 76 - 81
	机针和机针护架调整不正确	正确地调整机针护架	79
	机针过细	选择符合缝制条件的机针	55
面线未切断	上动刀的刀锋不利	更换新的上动刀	96，97
	气压太小，上动刀不能切到底	调整气压	25
	上动刀勾不住面线	安装面线弯针在最后前一针处切断	97
	最后一针因跳针上动刀勾不住面线	参考“跳针”一栏，防止跳针	122
	上动刀的位置不正确	调整上动刀的位置	97
底线未切断	动刀的刀锋不利	更换新的动刀	99，104
	空气压太小，动刀不能切到底	调整气压	25
	动刀的位置不正确	调整动刀、扫线器的位置	100，103 105
	剪底线用的刃压太弱	调整到恰当的刃压	100，104
缝纫开始时缺针	底线夹不住	调整底夹线(-01 规格)、或是底线压板(-02 规格)	101，103 108
	面线在剪线后残留长度太短	调整副夹线器	55
	面线放出量不足	调整面线放出量	95
	面线环不均匀。	设置慢起针和加固缝。	42，43
切孔不良	裁剪压力过小	调整到恰当的裁剪压力	90
	切刀和气锤接触不佳	修磨气锤面	84
	切刀的刀锋不利	更换新的切刀	87
线不够紧密	面线张力太强、或太弱	适当地调整面线张力	55
	底线张力太强、或太弱	适当地调整底线张力	55
	挑线弹簧的强度和行程的不合适	调整挑线弹簧的强度和行程	55

ST-9820

ELECTRONIC EYELET BUTTON HOLER

ENGLISH

Thank you very much for buying a SUOTE sewing machine. Before using your new machine, please read the safety instructions and the explanations given in the instruction manual.

With industrial sewing machines, it is normal to carry out work while positioned directly in front of moving parts such as the needle and thread take-up lever, and consequently there is always a danger of injury that can be caused by these parts. Follow the instructions from training personnel and instructors regarding safe and correct operation before operating the machine so that you will know how to use it correctly.

SAFETY INSTRUCTIONS

[1] Safety indications and their meanings

This instruction manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people.
The meanings of these indications and symbols are given below.

Indications

DANGER	The instructions which follow this term indicate situations where failure to follow the instructions will result in death or serious injury.
CAUTION	The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

Symbols

 ····· This symbol (△) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken.
(For example, the symbol at left means “beware of injury”.)

 ····· This symbol (⃠) indicates something that you must not do.

 ····· This symbol (●) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.
(For example, the symbol at left means “you must make the ground connection”.)

[2] Notes on safety

DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the cover of the control box. Touching areas where high voltages are present can result in severe injury.

CAUTION

Environmental requirements

Use the sewing machine in an area which is free from sources of strong electrical noise such as electrical line noise or static electric noise.
Sources of strong electrical noise may cause problems with correct operation.

Any fluctuations in the power supply voltage should be within ±10% of the rated voltage for the machine.
Voltage fluctuations which are greater than this may cause problems with correct operation.

The power supply capacity should be greater than the requirements for the sewing machine's power consumption.
Insufficient power supply capacity may cause problems with correct operation.

The pneumatic delivery capability should be greater than the requirements for the sewing machine's total air consumption.
Insufficient pneumatic delivery capability may cause problems with correct operation.

The ambient temperature should be within the range of 5°C to 35°C during use.
Temperatures which are lower or higher than this may cause problems with correct operation.

The relative humidity should be within the range of 45% to 85% during use, and no dew formation should occur in any devices.
Excessively dry or humid environments and dew formation may cause problems with correct operation.

In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet.
Lightning may cause problems with correct operation.

Installation

Machine installation should only be carried out by a qualified technician.

Contact your SUOTE dealer or a qualified electrician for any electrical work that may need to be done.

The sewing machine weighs approximately 120 kg.
Installation of the sewing machine and adjustment of the table height should be carried out by four or more people.

Do not connect the power cord until installation is complete. If this is not done, the sewing machine may operate if the start switch is pressed by mistake, which could result in serious injury.

Hold the machine head with both hands when tilting it back or returning it to its original position.
In addition, do not subject the machine head to extra force while it is tilted back.
If this is not observed, the machine head may become unbalanced and fall over (together with the table), and serious injury or damage to the sewing machine may result.

Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

All cords should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples.
If this is not observed, fire or electric shocks may result.

Install belt covers to the machine head.

If using a work table which has casters, the casters should be secured in such a way so that they cannot move.

Be sure to wear protective goggles and gloves when handling the lubricating oil, so that it does not get into your eyes or onto your skin.
If care is not taken, inflammation can result.
Furthermore, do not drink the lubricating oil. Diarrhea or vomiting may result.
Keep the oil out of the reach of children.

⚠ CAUTION

Sewing

This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.

The sewing machine should not be used for any applications other than sewing.

Be sure to wear protective goggles when using the machine.
If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.

Turn off the power switch at the following times. If this is not done, the sewing machine may operate if the start switch is pressed by mistake, which could result in serious injury.
- When threading the needle
- When replacing the needle
- When not using the machine and when leaving the machine unattended

If using a work table which has casters, the casters should be secured in such a way so that they cannot move.

Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.

Do not touch any of the moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.

If an error occurs in machine operation, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest SUOTE dealer or a qualified technician.

If the machine develops a problem, contact your nearest SUOTE dealer or a qualified technician.

Cleaning

Turn off the power switch before carrying out this operation. If this is not done, the sewing machine may operate if the start switch is pressed by mistake, which could result in serious injury.

Be sure to wear protective goggles and gloves when handling the lubricating oil, so that it does not get into your eyes or onto your skin.
If care is not taken, inflammation can result.
Furthermore, do not drink the lubricating oil. Diarrhea or vomiting may result.
Keep the oil out of the reach of children.

Maintenance and inspection

Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.

Ask your SUOTE dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.

Turn off the power switch and disconnect the power cord at the following times. If this is not done, the sewing machine may operate if the start switch is pressed by mistake, which could result in serious injury.
- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the loopers and knife

Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to “0” before carrying out inspection, adjustment and repair of any parts which use the pneumatic equipment.

Hold the machine head with both hands when tilting it back or returning it to its original position.
In addition, do not subject the machine head to extra force while it is tilted back.
If this is not observed, the machine head may become unbalanced and fall over (together with the table), and serious injury or damage to the sewing machine may result.

If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

Use only the proper replacement parts as specified by SUOTE.

If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

[3] Warning labels

The following warning labels appear on the sewing machine.
Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest SUOTE dealer.

1

⚠ 危 険		⚠ 危 険	
	高電圧部分にふれて、大けがをすることがある。電源を切り、5分たってからカバーをはずすこと。		触摸高压电部分，会导致受伤。在切断电源5分钟后，再开启盖罩。
⚠ DANGER	⚠ GEFAHR	⚠ DANGER	⚠ PELIGRO
Hazardous voltage will cause injury. Turn off main switch and wait 5minutes before opening this cover.	Hochspannung verletzungsgefahr! Bitte schalten sie den hauptschalter aus und warten sie 5 minuten, bevor sie diese abdeckung öffnen.	Un voltage non adapte provoque des blessures. Eteindre l'interrupteur et attendre 5 minutes avant d'ouvrir le capot.	Un voltaje inadecuado puede provocar las heridas.Apagar el interruptor principal y esperar 5 minutos antes de abrir esta cubierta.

2

⚠ 注 意
触摸运动部分,易造成受伤。所以在装上安全保护装置后,再进行缝纫操作。在切断电源后,进行穿线,更换梭芯,机针和做清扫,调整工作。
⚠ CAUTION
Moving parts may cause injury. Operate with safety devices. Turn off main switch before threading, changing bobbin and needle,cleaning etc.

3 Do not touch the knife or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.

Safety devices
Devices such as eye guard, finger guard, needle bar guard, needle guide cover and belt cover

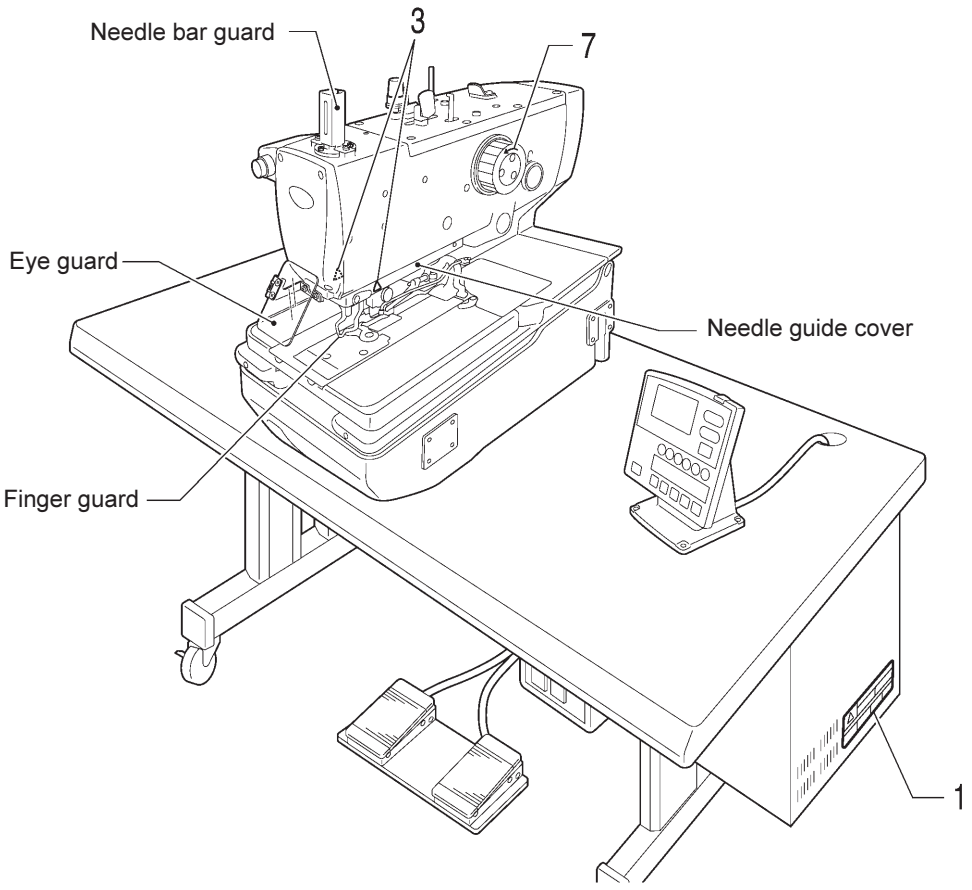
4 Be careful not to get your hands caught when returning the machine head to its original position after it has been tilted.

5 Be careful not to get your hands caught when moving the feed base backward.

6 Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

7 Direction of operation

8 High temperature warning display



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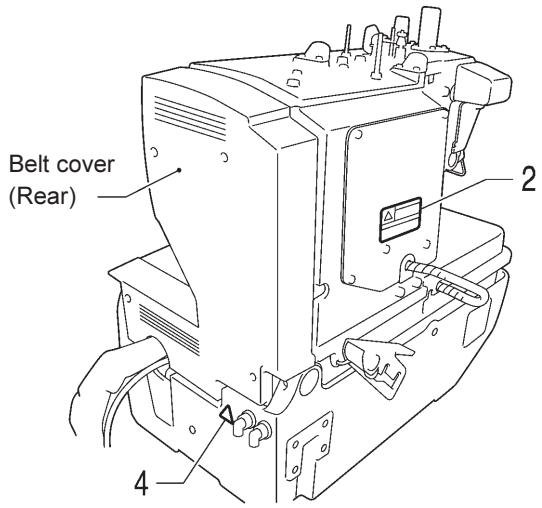
0332B



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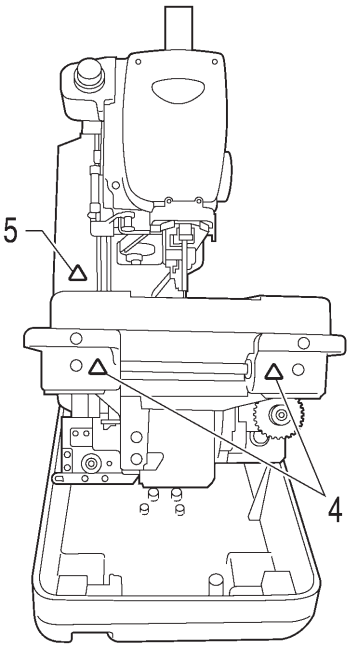

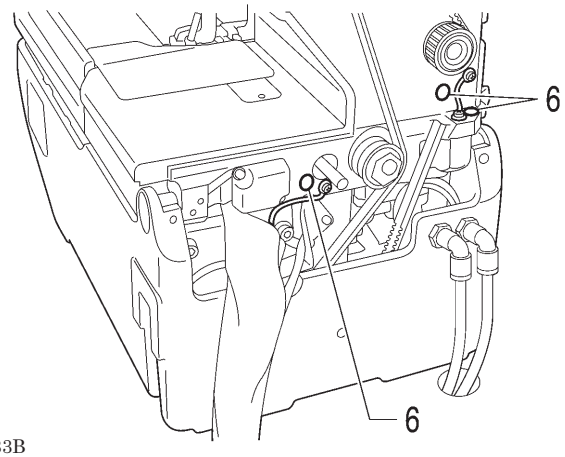

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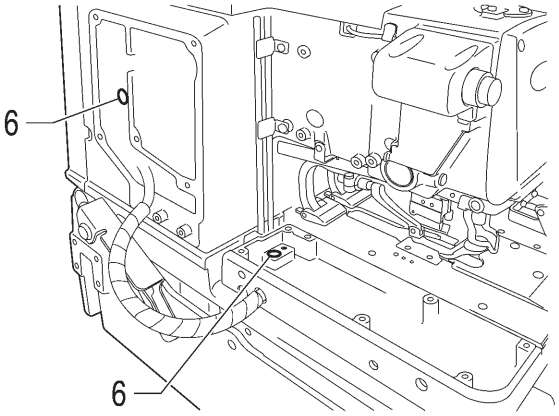

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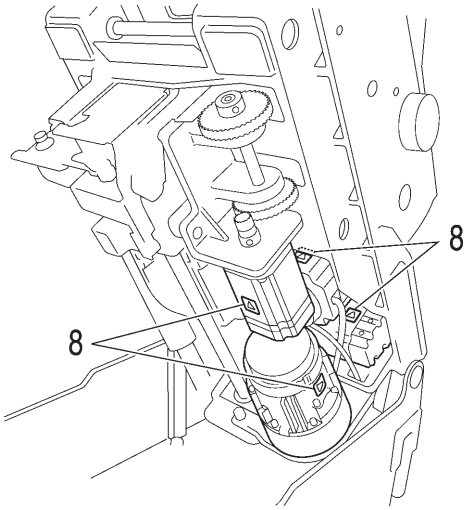

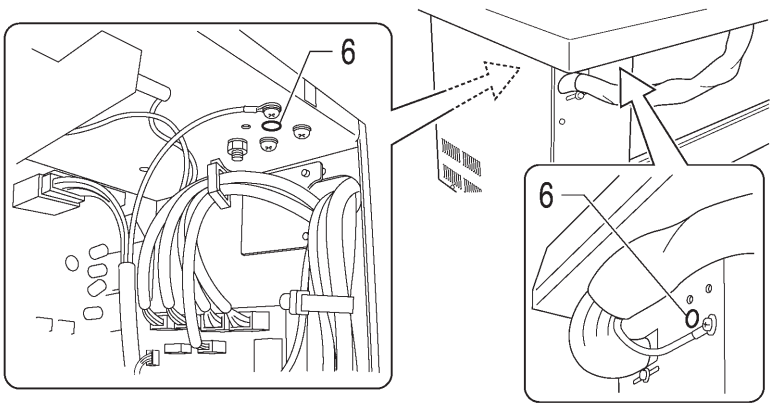

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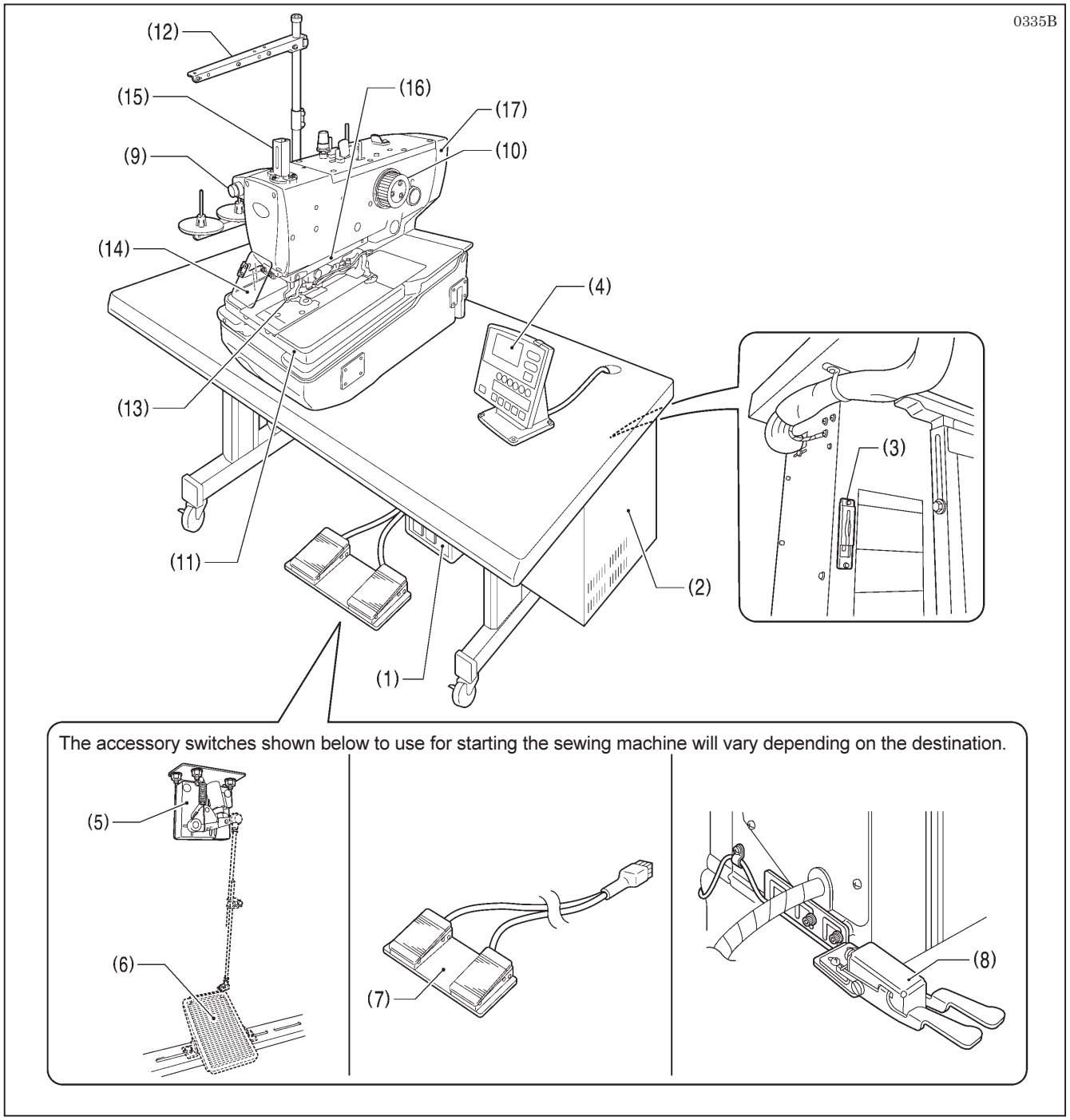
CONTENTS

1. NAMES OF MAJOR PARTS



(1) Power switch
(2) Control box
(3) CF slot*
(4) Operation panel
(5) Treadle unit
(6) Treadle (commercially-available)

Safety devices:
(13) Finger guard
(14) Eye guard
(15) Needle bar guard

(7) 2-pedal foot switch
(8) Hand start switch
(9) STOP switch
(10) Upper shaft pulley
(11) Feed base
(12) Cotton stand

(16) Needle guide cover
(17) Belt cover

*: CF™ is a trademark of SanDisk Corporation.

2. MACHINE SPECIFICATIONS

2-1. Specifications

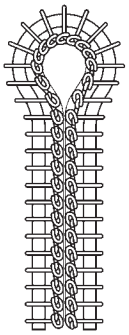
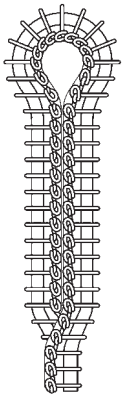
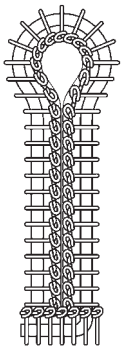
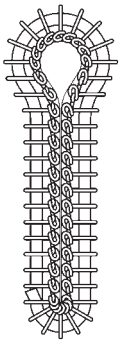
	Thread trimmer	Lower thread trimmer	
		Long type	Short type
-00	O	-	-
-01	O	O	-
-02*1	O	-	O

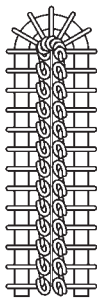
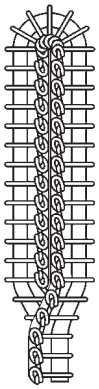
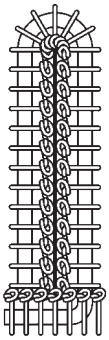
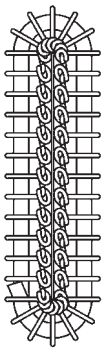
*1: -02 specifications are divided into L1422 to L3422 specifications depending on the sewing lengths, so please specify the sewing length when ordering.

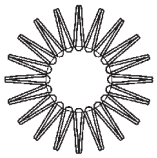
*2: This is not covered by specification designations, but compatibility is possible by replacement of gauge parts. (Ask the place of purchase for details.)

SPECIFICATIONS	ST-9820-00	ST-9820-01	ST-9820-02
Use	Men's clothes, ladies' clothes		Jeans and work clothes
Sewing speed	1,000 - 2,500 rpm (Setting possible in units of 100 rpm)		
Sewing shape	Without bartack Taper bartack Straight bartack Round bartack Circular stitch	Without bartack Taper bartack Straight bartack Round bartack Circular stitch	Without bartack Taper bartack Straight bartack Round bartack Circular stitch
Sewing length	Eyelet buttonholes: 8 - 50 mm Straight buttonholes: 5 – 50 mm	Eyelet buttonholes: 8 - 42 mm Straight buttonholes: 5 - 42 mm	L1422: 14 - 22 mm *2 L1826: 18 - 26 mm L2230: 22 - 30 mm L2634: 26 - 34 mm *2 L3442: 34 - 42 mm *2
Stitch pitch	0.5 - 2.0 mm		
Zigzag width	1.5 - 5.0 mm (Max. 4.0 mm with mechanism, Max. 1.0 mm with software)		
Taper bartack length	0 - 20 mm		
Work clamp height	Standard 12 mm (up to 16 mm possible)		16 mm
Starting method	Foot switch (treadle type, 2-pedal type) or hand start switch		
Feed mechanism	Intermittent feed by three pulse motors (X, Y, θ)		
Needle	DO x 558 80 - 120 Nm (Schmetz 558)		
Safety devices	Built-in emergency stop function and automatic stopping device which stops the machine when the safety circuit is activated		
Upper shaft motor	AC servo motor (4-pole, 550 W)		
Air pressure	Main regulator: 0.5 MPa Hammer pressure regulator: 0.4 MPa		
Air consumption	43.2 l/min (8 cycles/min)		
Power supply	Single-phase 100V/220V, Three-phase 200V/220V/380V/400V 400 VA		
Weight	Machine head: Approx. 120 kg, Operation panel: Approx. 0.6 kg Control box: 14.2 - 16.2 kg (Varies depending on destination)		

2-2. Sewing shapes

Eyelet buttonhole			
			
Without bartack	Taper bartack	Straight bartack	Round bartack

Straight buttonhole			
			
Without bartack	Taper bartack	Straight bartack	Round bartack

Circular stitch


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3. INSTALLATION

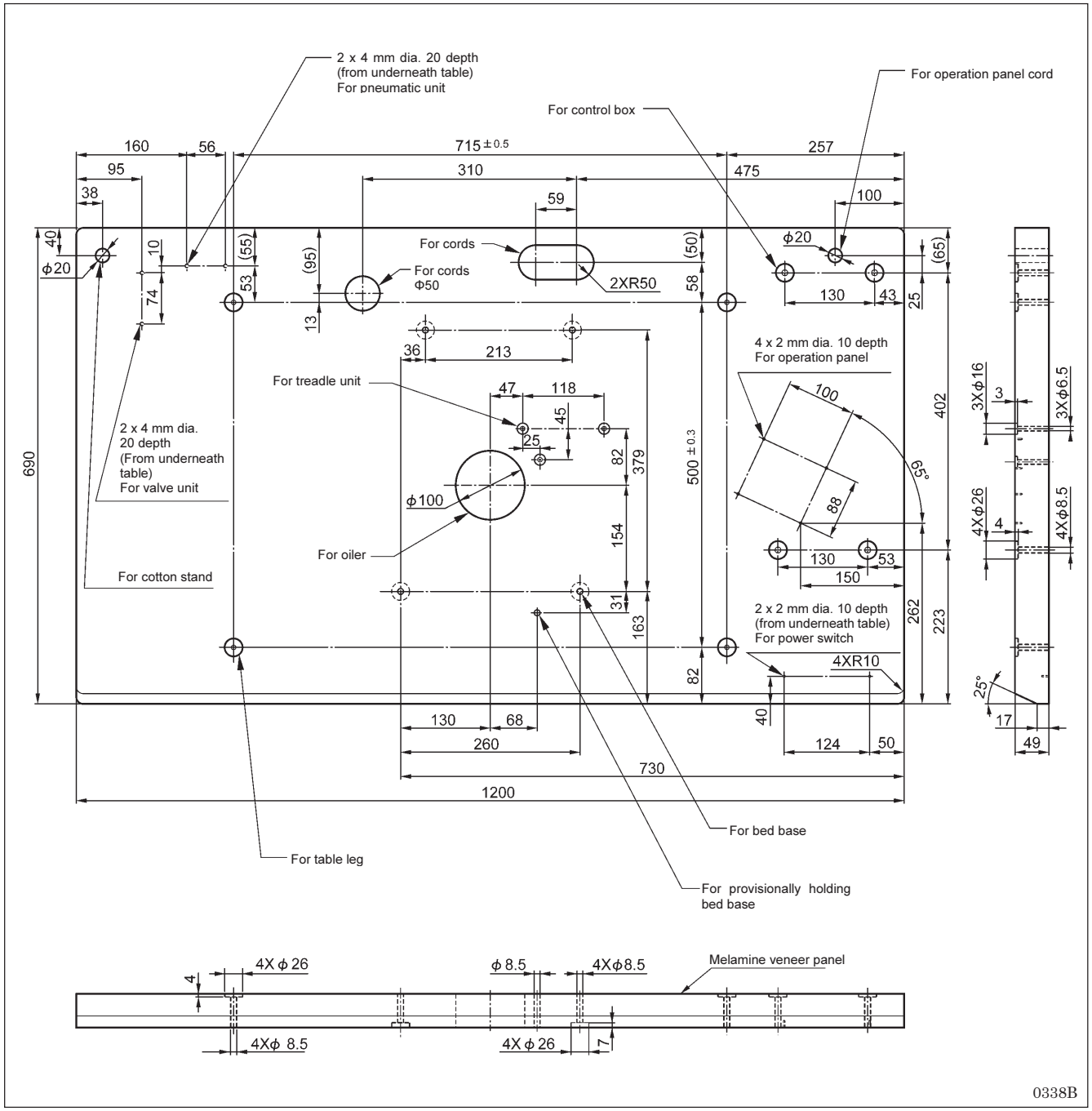
⚠ CAUTION

- Machine installation should only be carried out by a qualified technician.
- Contact your SUOTE dealer or a qualified electrician for any electrical work that may need to be done.
- The sewing machine weighs approximately 120 kg. Installation of the sewing machine and adjustment of the table height should be carried out by four or more people.
- Do not connect the power cord until installation is complete. If this is not done, the sewing machine may operate if the start switch is pressed by mistake, which could result in serious injury.
- Hold the machine head with both hands when tilting it back or returning it to its original position. In addition, do not subject the machine head to extra force while it is tilted back. If this is not observed, the machine head may lose balance and fall over (together with the table), and injury or damage to the sewing machine may result.
- All cords should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples. If this is not observed, there is the danger that fire or electric shocks could occur.
- Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.
- Install the safety covers to the machine head and motor.

3-1. Table processing diagram

- Use a table with legs which is strong enough to bear the weight of the sewing machine (120 kg) and which can also withstand vibration. Use a table with a top thickness of 49 - 60 mm.
  NOTE:
  If the thickness of the table exceeds 60 mm, the accessory bolts and the cables coming from the machine head may not be long enough.
- If using casters, use ones which can bear the total weight of sewing machine and table.
- Check that the control box is at least 10 mm away from the leg. If the control box and the leg are too close together, it may result in incorrect sewing machine operation.
- The method of processing the table varies depending on whether the machine head is sitting on the table or embedded into the table. Refer to the processing diagrams for each respective setting-up method and drill the holes as appropriate.

3-1-1. When setting up on top of the table

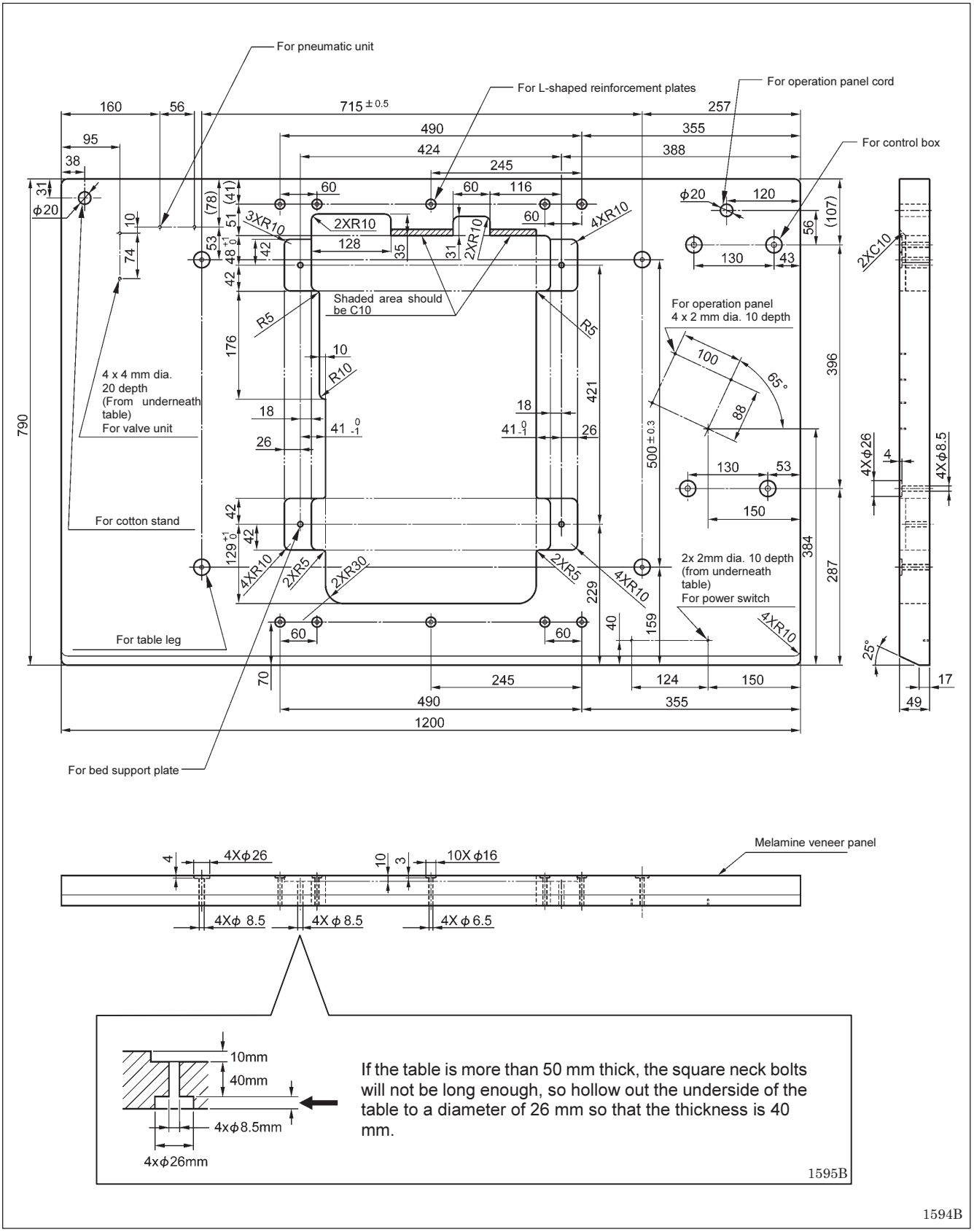


3-1-2. When embedding into the table

When embedding the machine head into the table, some extra components will be required, so contact the place of purchase for further details.

NOTE:

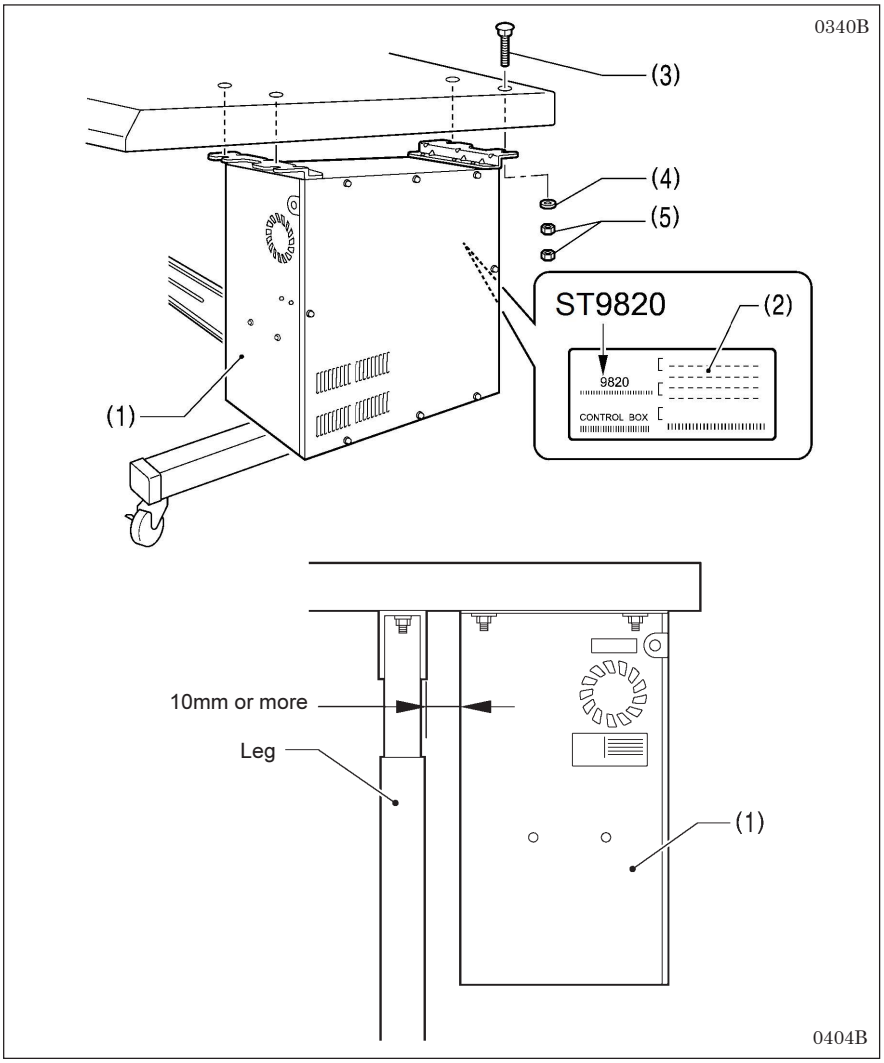
When embedding the machine head into the table, be sure to install the L-shaped table reinforcement plates. (Refer to “3-3. Installing the table reinforcement plates (embedded installation only)”.)



3-2. Installing the control box

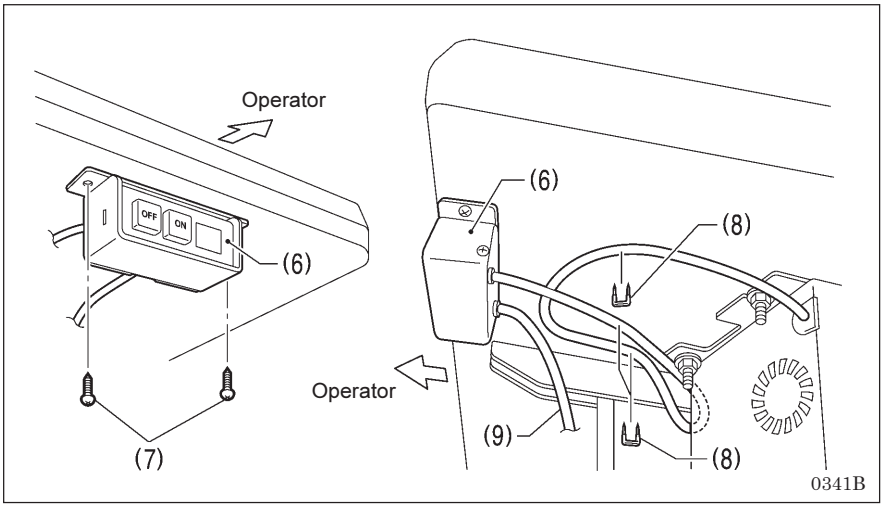
CAUTION

Before installing the control box, take steps to make sure that the control box does not fall down.
If this is not done, injury to feet or damage to the control box may result.



Before installing the control box (1), check that the model plate (2) on the control box (1) is “ST9820” to indicate that it is an ST-control box for ST-9820 sewing machines.
(1) Control box
(3) Bolts [4 pcs.]
(4) Plain washers [4 pcs.]
(5) Nuts [8 pcs.]

NOTE:
Check that the control box (1) is at least 10 mm away from the leg. If the control box (1) and the leg are too close together, it may result in incorrect sewing machine operation.

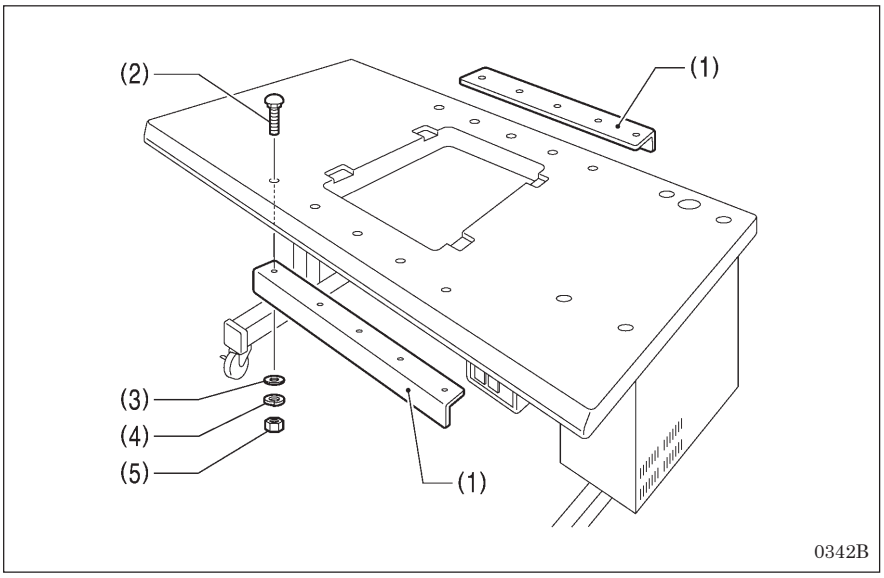


(6) Power switch
(7) Screws [2 pcs.]
(8) Staples [5 pcs.]

* Use the remaining two staples to secure the power cord (9) in a position that matches the position of the wall outlet.

NOTE:
Take care when tapping in the staples (8) to make sure that they do not pierce the power cord (9).

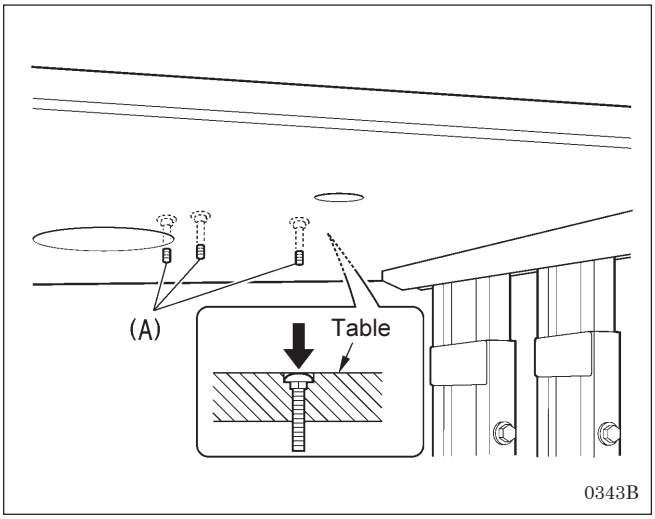
3-3. Installing the table reinforcement plates (embedded installation only)



(1) L-shaped reinforcement plates [2 pcs.]
(2) Bolts [10 pcs.]
(3) Plain washers [10 pcs.]
(4) Spring washers [10 pcs.]
(5) Nuts [10 pcs.]

3-4. Installing the machine head

3-4-1. When setting up on top of the table



<Only when using the treadle>
Before installing the machine head, install the three treadle mounting bolts (A) to the table.

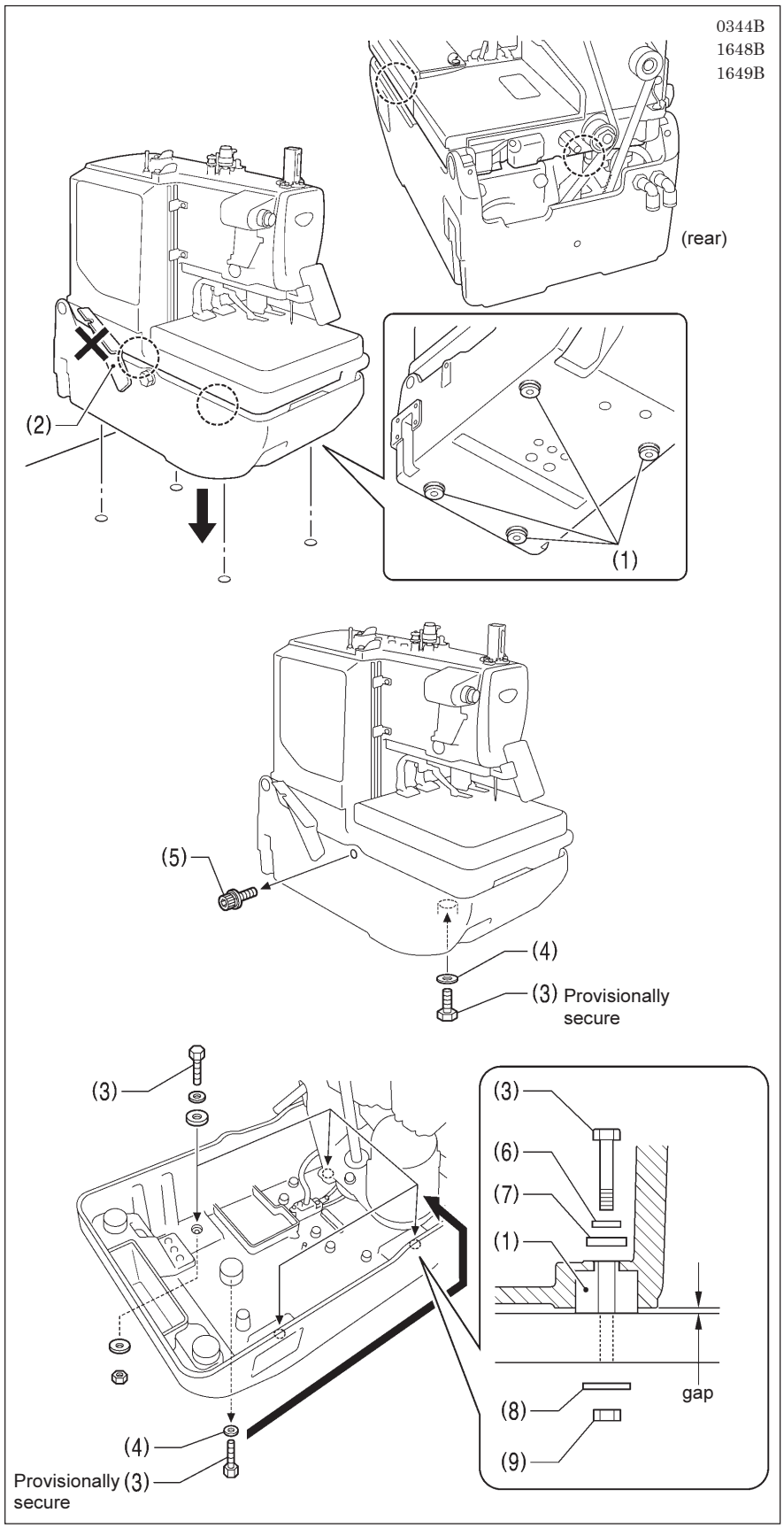
* Insert the bolts (A) securely so that their heads do not protrude out from the top of the table.

(Refer to “3-12. Installing the treadle unit (when using the treadle)”.)

(Continued on next page)

⚠ CAUTION

Always be sure to install the stopper bolt before tilting back the machine head in step 4 below. If this is not done, the machine head will tip over and fall down, and injury or damage to the machine head may result.



1. Check that the four bed base cushions (1) have all been installed to the bottom of the bed base, and then place the machine head onto the table.

   NOTE:
   - When placing the machine head onto the table, have four or more people hold the machine head by the places indicated by the four ◌ locations in the illustration.
   - Do not hold by the head support lever (2).

2. Use one of the four bolts (3) and a plain washer (4) to provisionally secure the bed base to the table from underneath the table.
3. After provisionally securing the bed base, remove the fixing bolt (5).
4. Tilt back the machine head, and then install the remaining three of the four bolts (3) to the other three places in the bed base. (Refer to "3-5. Tilting back and returning the machine head" for details on tilting back the machine head.)

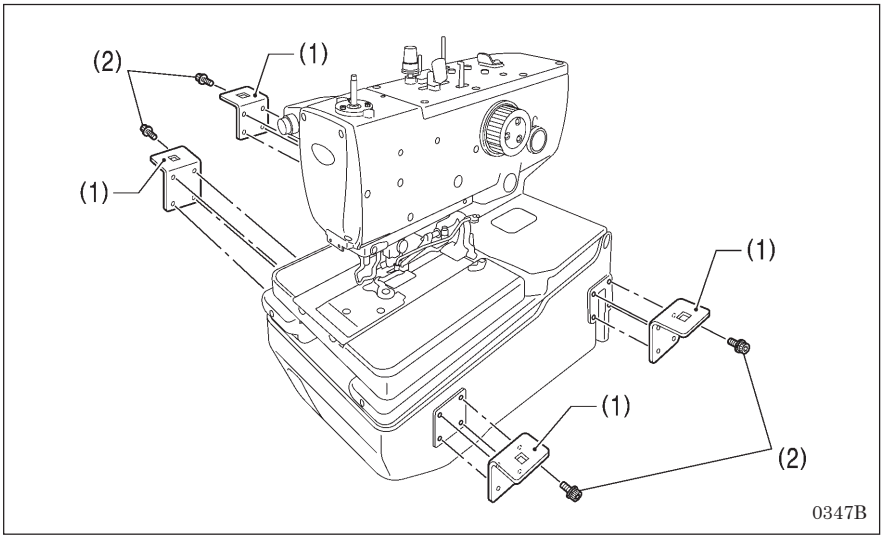
   (6) Washers [4 pcs.]
   (7) Rubber sheets [4 pcs.]
   (8) Washers (large) [4 pcs.]
   (9) Nuts [4 pcs.]

   NOTE:
   Do not over tighten the bolts (3) so much that a gap is produced between the table and the bed base.

5. Remove the bolt (3) and washer (4) that were used to provisionally secure the bed base, and install them to the one remaining location.

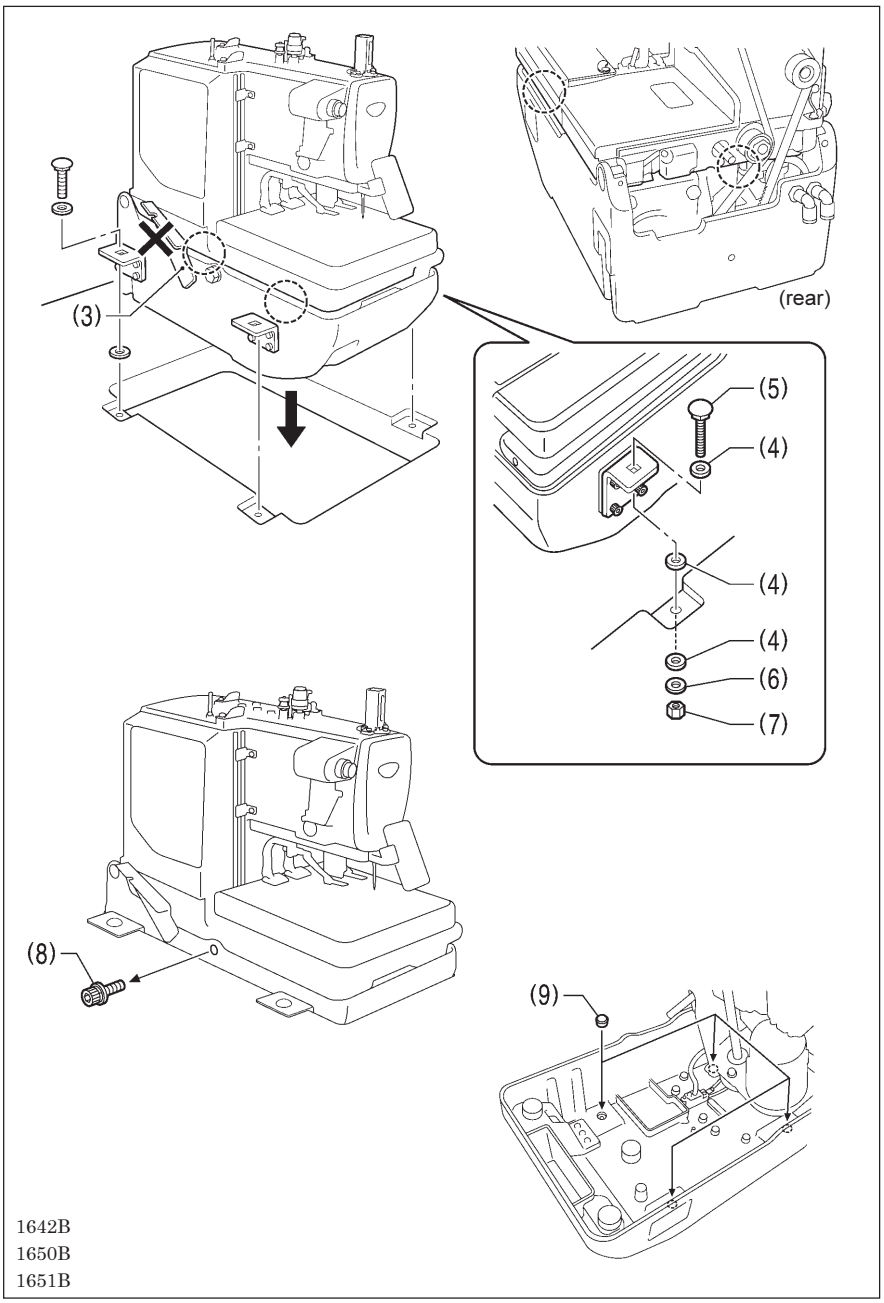
NOTE:
The fixing bolt (5) is needed when moving the machine head, so store it in a safe place.

3-4-2. When embedding into the table



(1) Bed support plates [4 pcs.]
(2) Bolts [16 pcs.]

* Install so that they are horizontal to the bed base.



NOTE:

- When placing the machine head onto the table, have four or more people hold the machine head by the places indicated by the ◌ locations in the illustration.
- Do not hold by the head support lever (3).

(4) Rubber sheets [12 pcs.]
(5) Bolts [4 pcs.]
(6) Washers (large) [4 pcs.]
(7) Nuts [4 pcs.]

After installing the machine head, remove the fixing bolt (8).

Tilt back the machine head and install the rubber caps (9) to the four holes in the bed base.

NOTE:

- The fixing bolt (8) is needed when moving the machine head, so store it in a safe place.
- Be sure to use the rubber sheets (4). If they are not used, the amount of vibration will be excessive.

3-5. Tilting back and returning the machine head

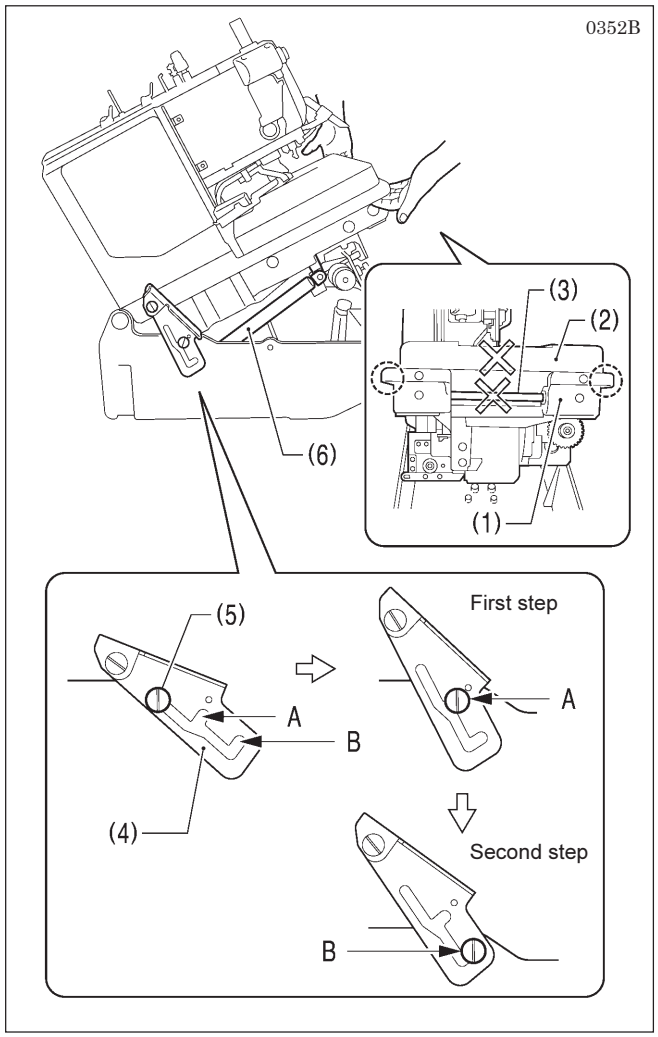
CAUTION

Hold the machine head with both hands when tilting it back or returning it to its original position. In addition, do not subject the machine head to extra force while it is tilted back. If this is not observed, the machine head may lose balance and fall over (together with the table), and injury or damage to the sewing machine may result.

Do not hold the feed base (2) and the feed guide shaft (3). If this is not observed and the feed base (2) or feed guide shaft (3) come off, the machine head may fall down and injury or damage to the machine head may result.

The machine head can be tilted back and returned to one of two heights.

NOTE:
Always be sure to turn off the power switch before tilting back and returning the machine head.



Tilting back the sewing machine head

1. Hold the bed (1) at both sides (at the places indicated by ◌ in the illustration) with both hands.
2. **To tilt back to the first step:**
   Gently lift up the machine head until the head support lever (4) securely engages section A of the hinge support shaft (5) (until a click is heard).
3. **To tilt back to the second step:**
   Remove the head support lever (4) from section A of the hinge support shaft (5), and then gently lift up the machine head until the head support lever (4) securely engages section B.

   NOTE:
   The machine head will be momentarily stopped by the gas spring (6) immediately before it rises to the second step, but it will not be locked at this point. Lift the machine head until the head support lever (4) securely engages section B of the hinge support shaft (5).

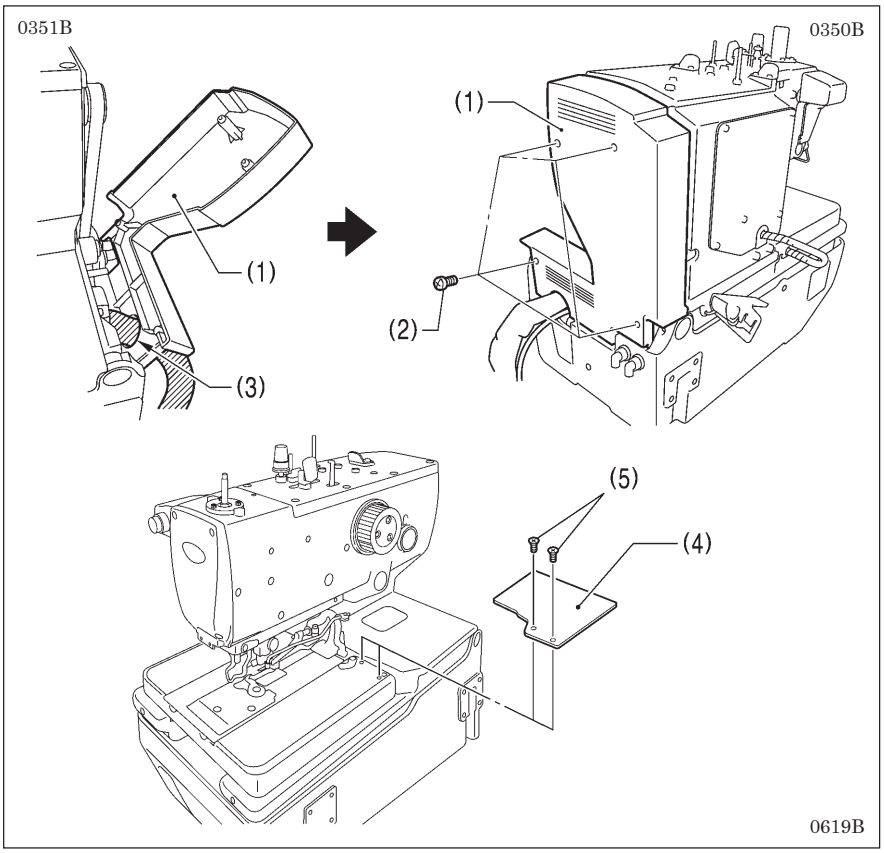
CAUTION

Be sure to check that the head support lever (4) and the hinge support shaft (5) are engaged. If they are not engaged, the machine head may suddenly return to its original position and injury may result.

<Returning the machine head to its original position>

1. **To return the machine head from the second step:**
   After lifting up the machine head, remove the head support lever (4) from section B of the hinge support shaft (5), and then hold the bed at both sides and gently return it to its original position.
   * The machine head will start returning until the gas spring (6) starts to operate, so support the machine head securely with both hands.
   * When the machine head is returned to the first step, the head support lever will lock onto section A.
2. **To return the machine head from the first step:**
   After gently lifting up the machine head, remove the head support lever (4) from section A of the hinge support shaft (5), and then hold the bed at both sides and gently return it to its original position.

3-6. Installing the belt cover and feed bar cover U



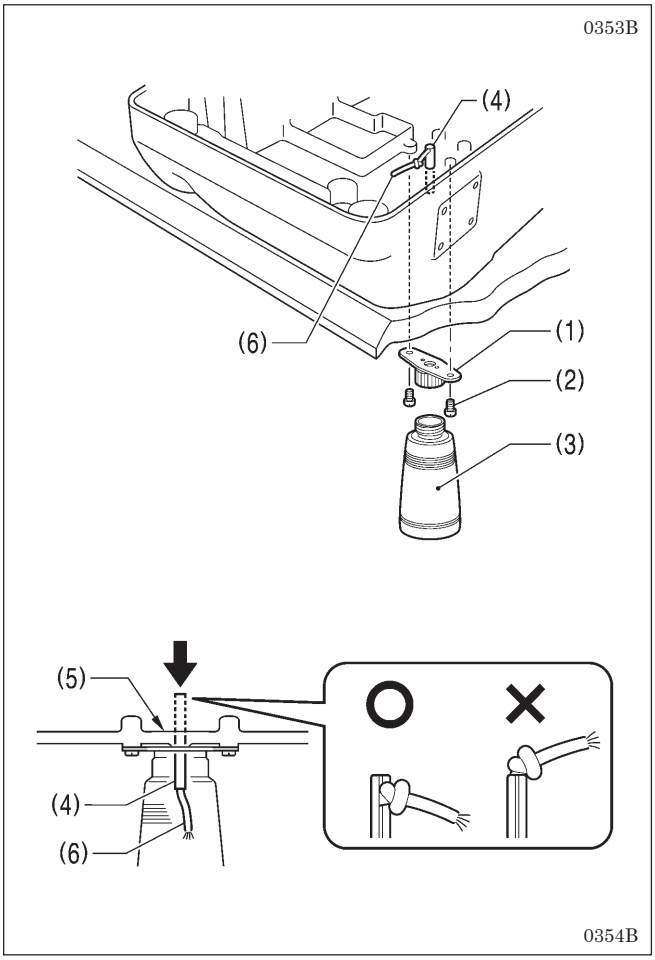
(1) Belt cover
(2) Screws [4 pcs.]
- Before installing the belt cover, pass the cords through the belt cover notch (3).

NOTE:
- Be careful not to clamp the cords when installing the belt cover. If care is not taken, the belt cover and cords may become damaged.
- If using the embedded installation method, check that the belt cover (1) does not touch the table when the machine head is tilted back.

(4) Feed bar cover U
(5) Screws [2 pcs.]

NOTE:
If the screws (5) are tightened too much, the feed bar cover U (4) may become cracked.

3-7. Installing the oiler



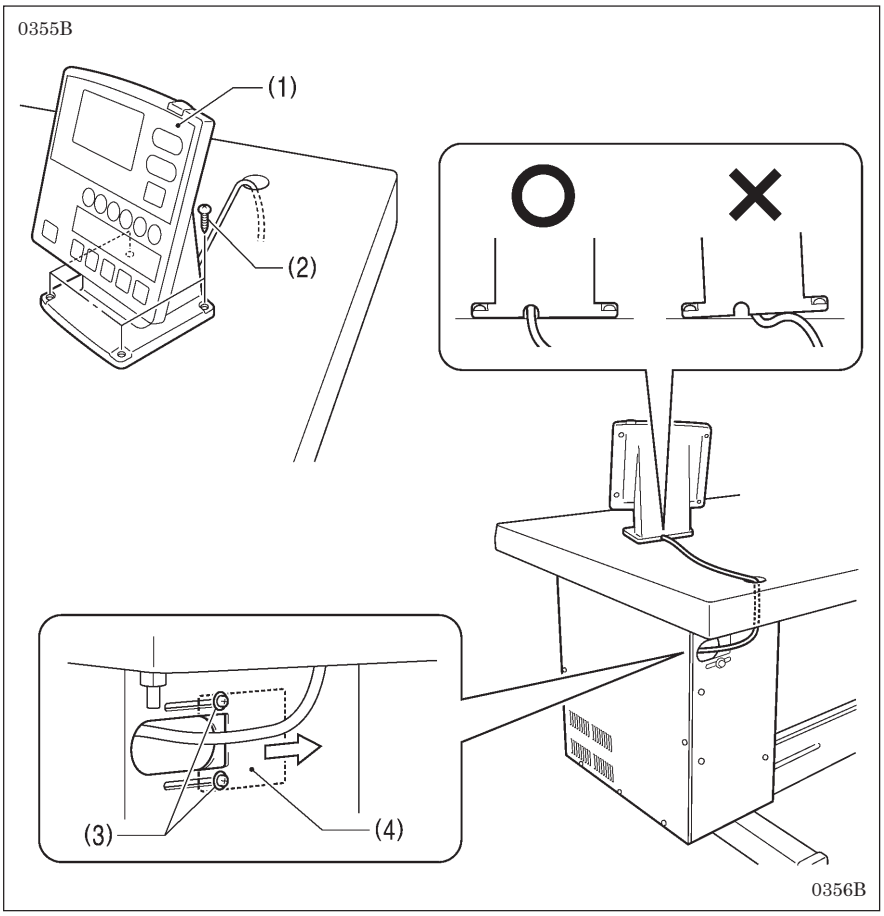
The oiler should be installed while the machine head is tilted back.
(Refer to “3-5. Tilting back and returning the machine head”.)

(1) Dust oiler support
(2) Screws [2 pcs.]
(3) Oiler
(4) Oiler spring pin

- Use a hammer or similar to tap the pin (4) so that its head is flush with the base of the oil pan (5).

  NOTE:
  When tapping in the pin (4), check that the knot in the wick (6) is below the top of the pin (4) as shown in the illustration at left. If the knot is above the pin (4), it may become hit by the hammer and this may cause the wick (6) to break.
- Once installation is complete, return the machine head to its original position.

3-8. Installing the operation panel

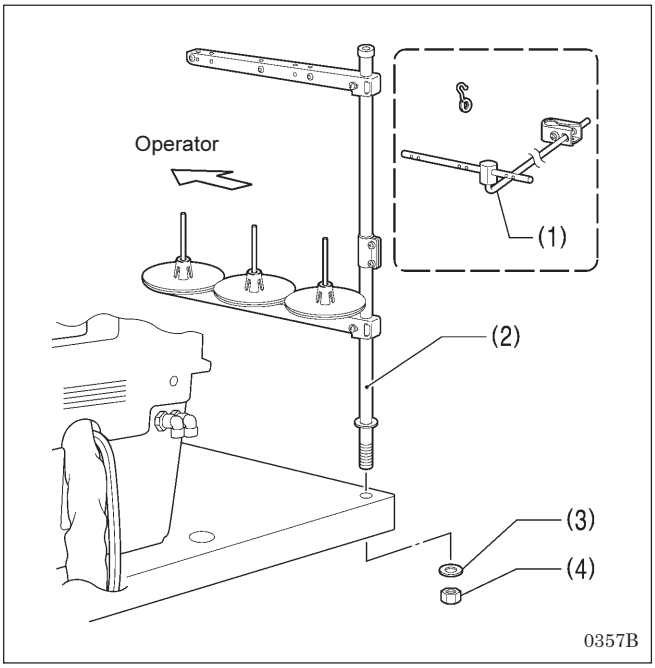


(1) Operation panel
(2) Screws [4 pcs.]

1. Pass the cord of the operation panel (1) through the table hole.
2. Loosen the two screws (3) at the rear of the control box, open the cord presser plate (4) in the direction of the arrow, and pass the cord through the hole into the box. (Refer to “3-1. Table processing diagram” for details on the installation position for the operation panel.)

NOTE:
Check that the operation panel cord is not being clamped when screwing the operation panel into the table. The cord may become damaged if it is clamped.

3-9. Installing the cotton stand



Install the cotton stand so that it is at the far left of the table when looking from the front of the sewing machine.

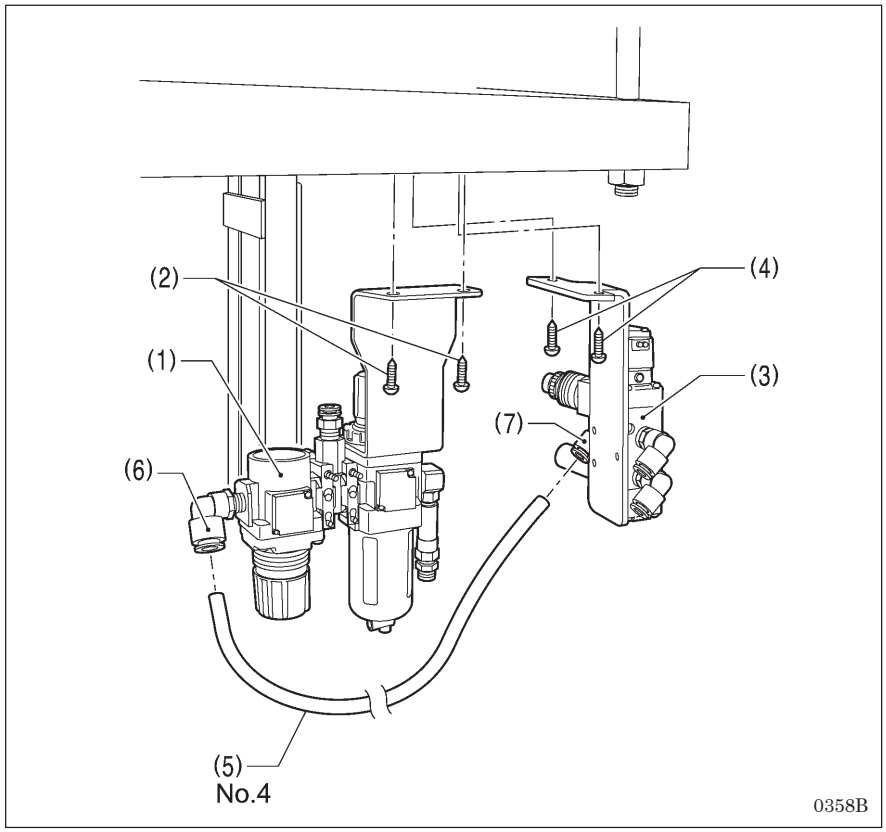
* Do not use the thread guide (1) which is provided a an accessory with the cotton stand.

(2) Cotton stand
(3) Washer
(4) Nut

NOTE:

- Tighten the nut to secure the cotton stand firmly so that it will not move.
- The cotton stand can also be installed on the far right side of the table, but if this is done, the threading method will change. (Refer to “4-5. Threading the thread when the cotton stand is installed on the right side”.)

3-10. Installing the air unit and valve unit



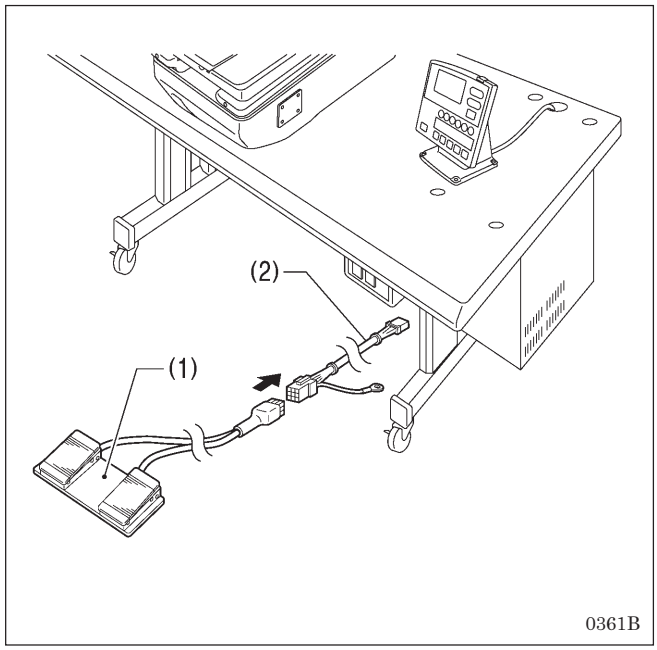
Install to the underside of the table. (Refer to “3-1. Table processing diagram” for the installation positions.)

(1) Air unit
(2) Screws [2 pcs.]
(3) Valve unit
(4) Screws [2 pcs.]
(5) Air tube No. 4

Insert air tube No. 4 (5) into the joint (6) and the joint (7).

NOTE:
- Install the air unit (1) so that it does not touch the table leg.
- Be careful to avoid injury from items such as sewing machine parts and the corners of table drawers during installation.

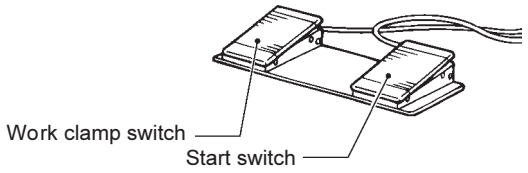
3-11. Installing the 2-pedal foot switch (when using the 2-pedal foot switch)



(1) 2-pedal foot switch
(2) Foot switch conversion harness

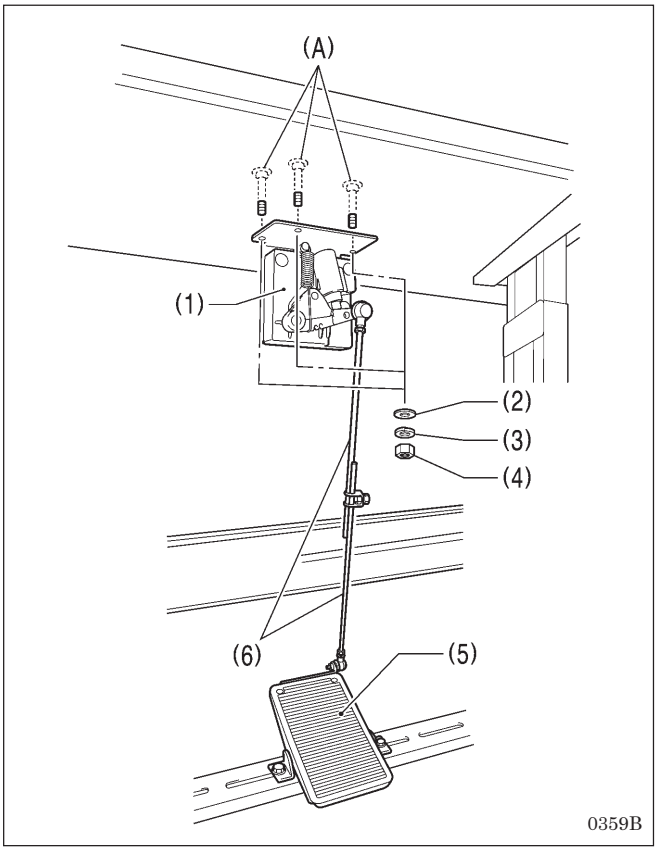
Pass the connector of the foot switch conversion harness (2) into the control box through the hole in the rear of the control box. (Refer to “3-8. Installing the operation panel”.)

<2-pedal foot switch operation method>
When the work clamp switch (left side) is depressed, the work clamp will be lowered, and when the start switch (right side) is depressed, the sewing machine will start.



3-12. Installing the treadle unit (when using the treadle)

3-12-1. When setting up on top of the table



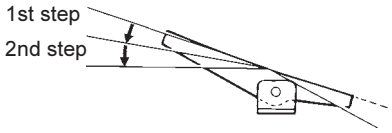
NOTE:
Before installing the machine head, install the three treadle unit mounting bolts (A) to the table. (Refer to "3-4-1. When setting up on top of the table".)

(1) Treadle unit
(2) Plain washers [3 pcs.]
(3) Spring washers [3 pcs.]
(4) Nuts [3 pcs.]

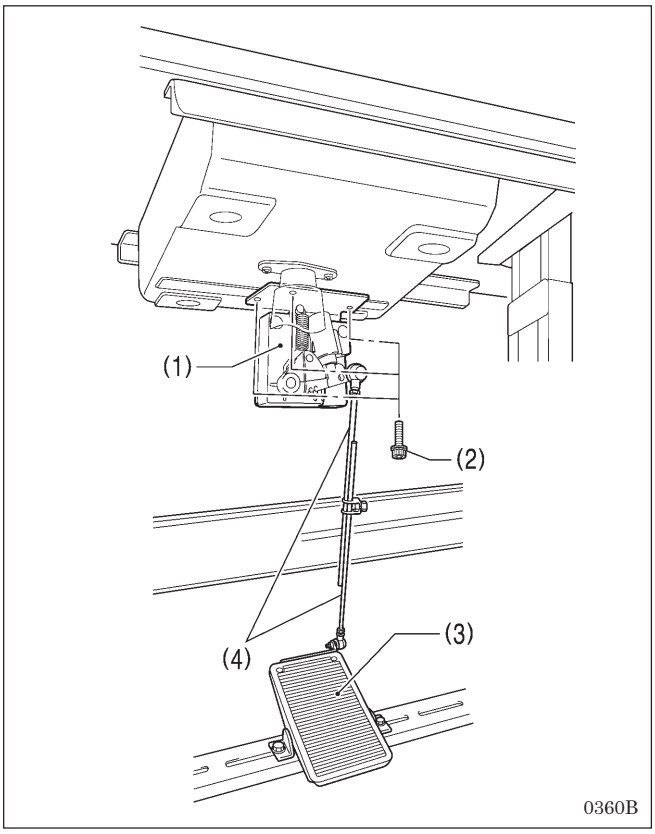
Pass the connector of the treadle unit (1) into the control box through the hole in the rear of the control box. (Refer to "3-8. Installing the operation panel".)

* Use a commercially-available treadle (5) and connecting rod (6).

<Treadle operation method>
When the treadle (5) is depressed to the 1st step, the work clamp will be lowered, and when it is depressed to the 2nd step, the sewing machine will start.



3-12-2. When embedding into the table

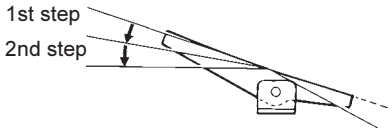


(1) Treadle unit
(2) Screws [3 pcs.]

Pass the connector of the treadle unit (1) into the control box through the hole in the rear of the control box. (Refer to "3-8. Installing the operation panel".)

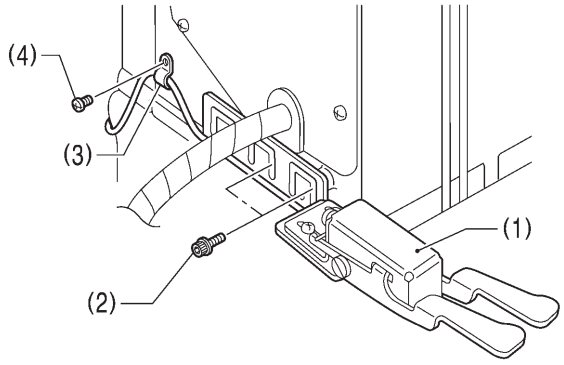
* Use a commercially-available treadle (3) and connecting rod (4).

<Treadle operation method>
When the treadle (3) is depressed to the 1st step, the work clamp will be lowered, and when it is depressed to the 2nd step, the sewing machine will start.

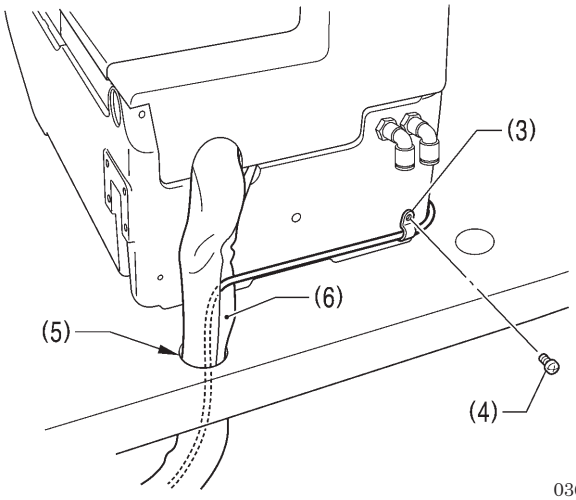


3-13. Installing the hand start switch (when using the hand start switch)

0362B

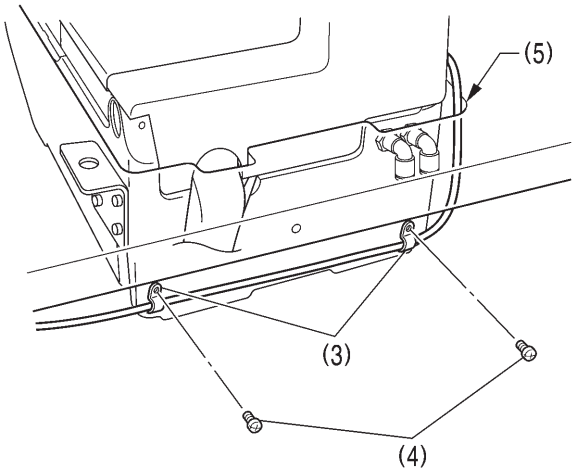


[When setting up on top of the table]



0363B

[When embedding into the table]



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(1) Hand start switch
(2) Screws [2 pcs.]
(3) Cord holders [3 pcs.]
(4) Screws [3 pcs.]

* When setting up on top of the table, use only two of the cord holders (3) and screws (4).

Pass the cord of the hand start switch (1) through the table hole (5), and pass the connector into the control box through the hole in the rear of the control box. (Refer to “3-8. Installing the operation panel”.)

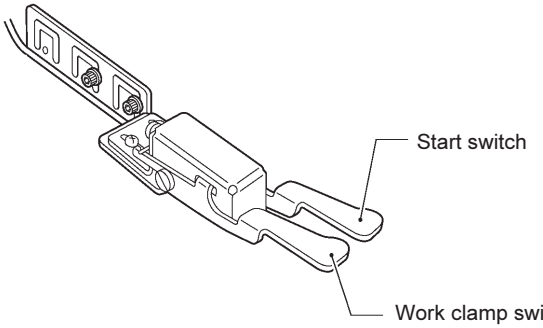
[When setting up on top of the table]

Insert the cord into the quick tube (6), and then pass it through the table hole (5).

* This is to prevent damage from the cord rubbing against the table hole (5) when the machine head is tilted back and returned.

<Hand start switch operation method>

When the work clamp switch (left side) is depressed, the work clamp will be lowered, and when the start switch (right side) is depressed, the sewing machine will start.



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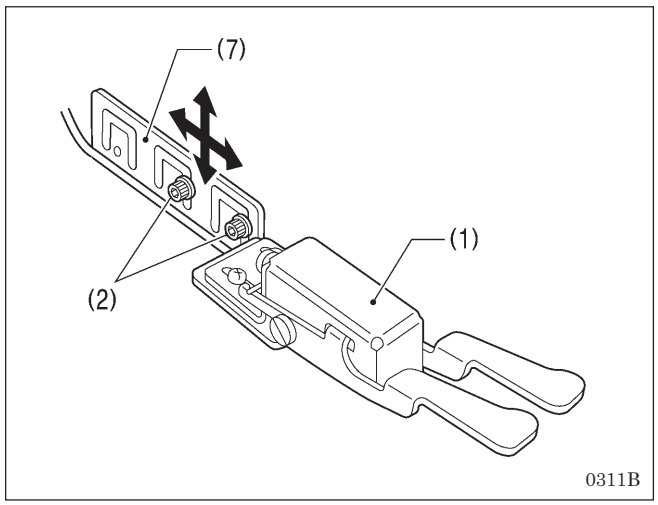
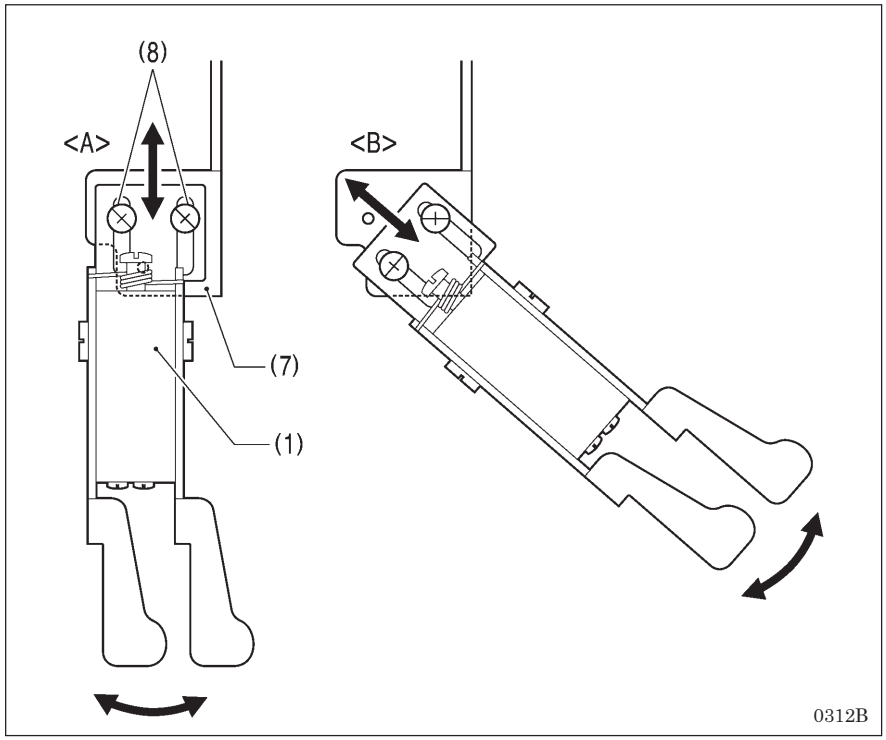


<Adjusting the hand start switch position>
Adjust the position of the hand start switch (1) as follows so that it is in an easy-to-use position.

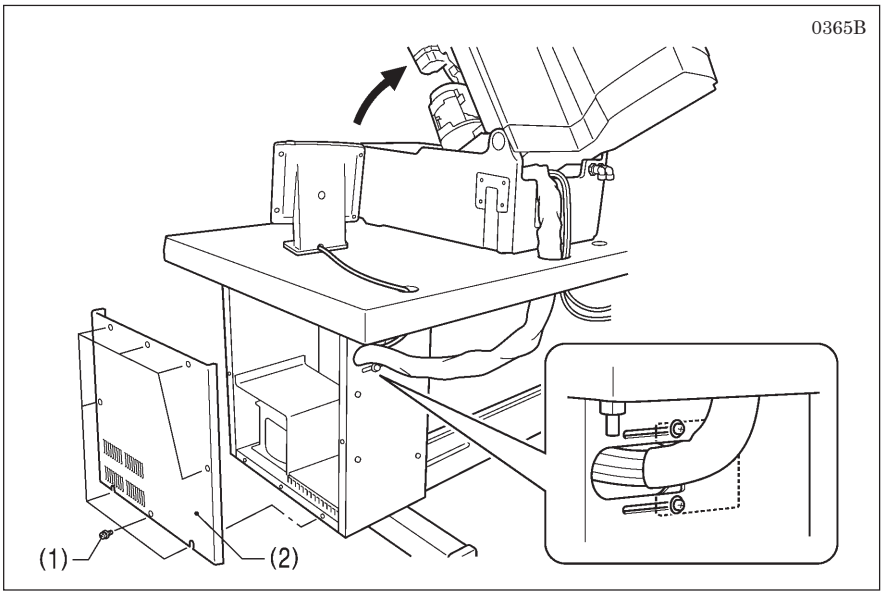
[Forward/back and vertical position]
1. Loosen the two screws (2), and then move the hand start switch mounting plate (7) forward, back, up or down to adjust its position.
2. Once adjustment is complete, securely tighten the screws (2).



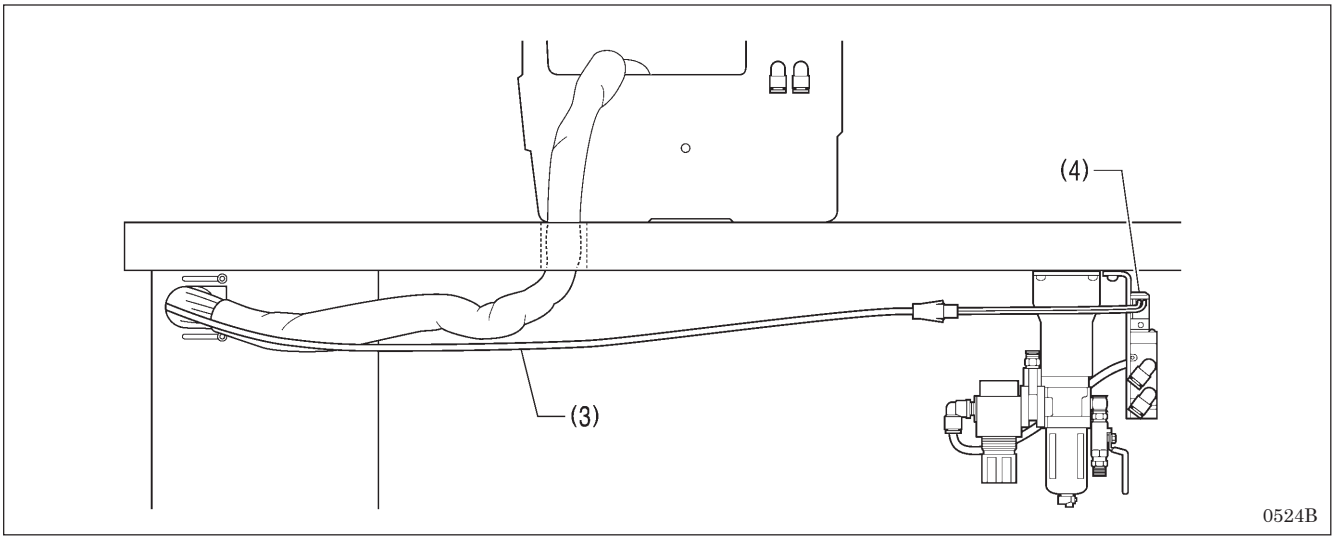
[Forward/back and sideways position]
- The hand start switch mounting plate (7) has three screw holes in it. You can select the installation position from either <A> or <B> shown in the illustration by changing the screw holes used by the screws (8).
- In addition, when the screws (8) are loosened, the hand start switch (1) can be moved forward, back and sideways to adjust its position. Once adjustment is complete, securely tighten the screws (8).

3-14. Connecting the cords

3-14-1. Connecting the connectors inside the control box



1. Remove the eight screws (1), and then remove the control box cover (2).
2. Gently tilt back the machine head.
3. Pass the cord bundle through the table hole, and then pass it into the control box through the hole in the rear of the control box.



4. Pass the hammer valve harness (3) into the control box through the hole in the rear of the control box.

(4) Hammer valve

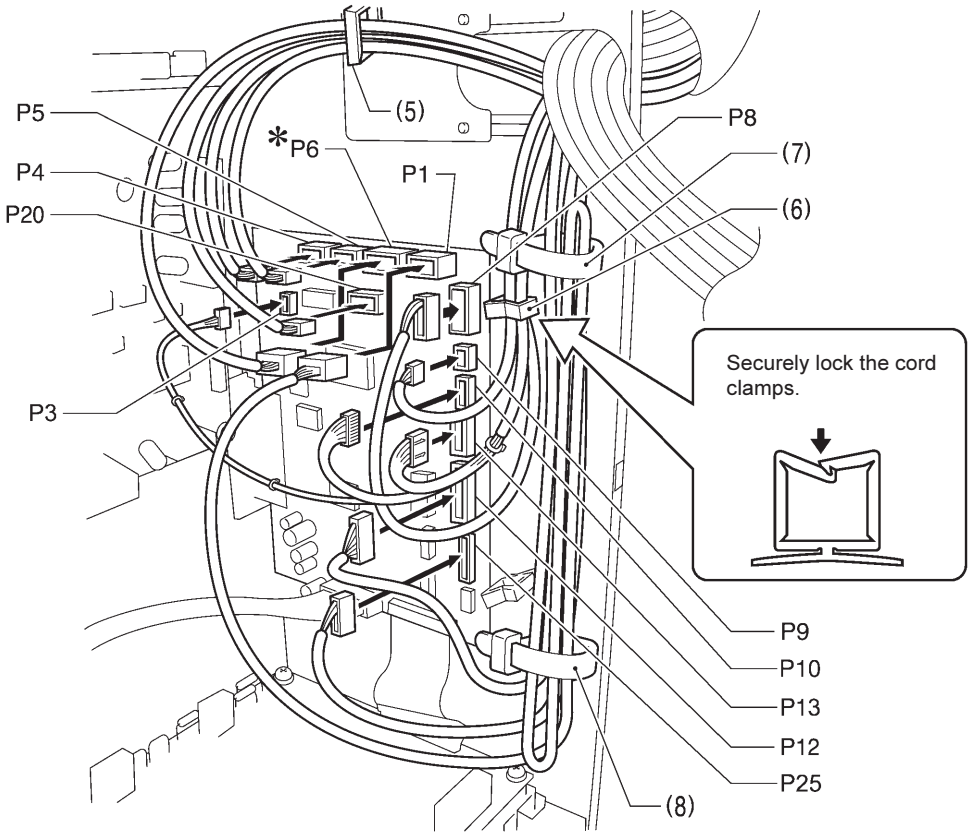
5. Insert each of the connectors as shown in the illustration and table on pages 19 and 20.

NOTE:

- Check that the connectors are facing the correct way, and then insert them firmly until they lock into place.
- Secure the cables with fastening bands and cord clamps, while being careful not to pull on the connectors.

(Continued on next page)

<Main P.C. board>

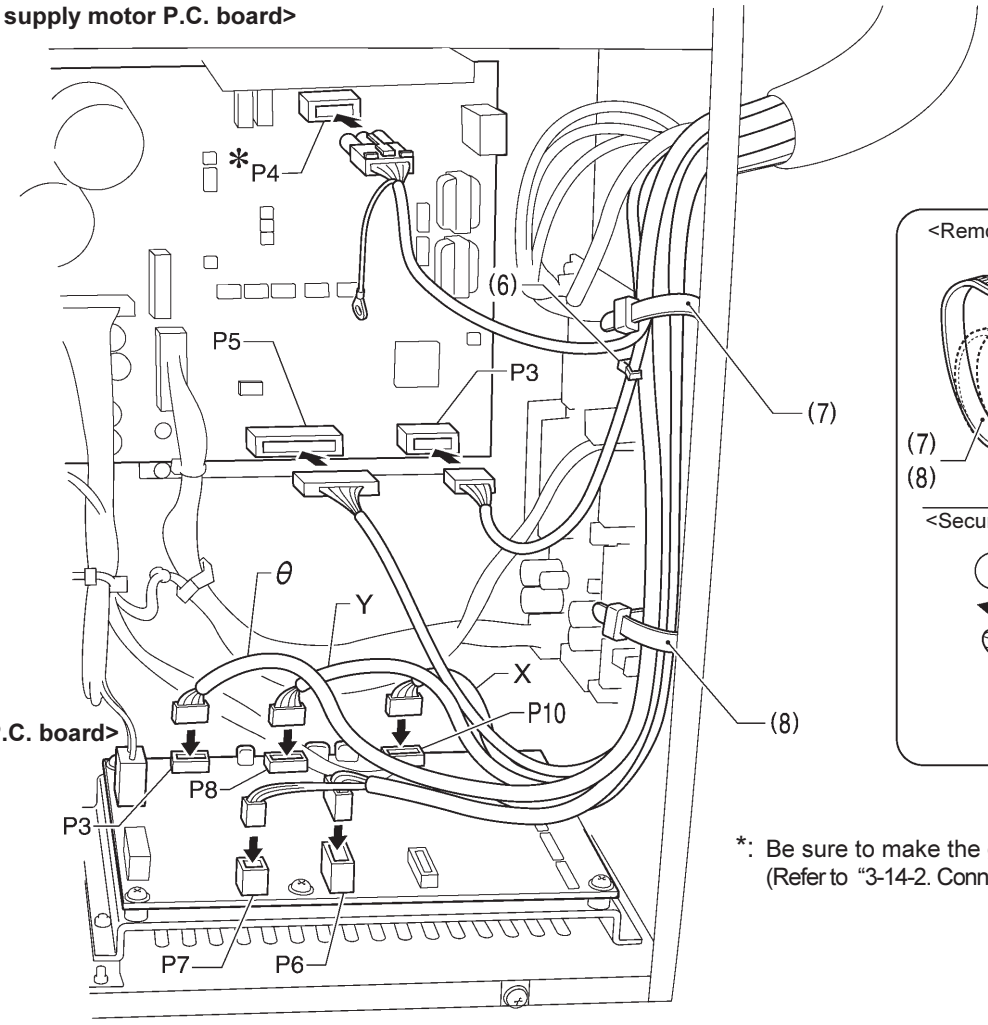


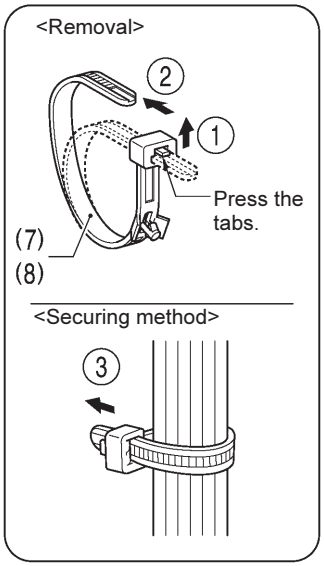
* <If using the 2-pedal foot switch>
Be sure to make the ground connection. (Refer to "3-14-2. Connecting the ground wire".)

Connectors	At main P.C. board Insertion location	Cord clamp
X pulse motor encoder 5-pin white	P20 (X-ENC)	(5)
Y pulse motor encoder 5-pin blue	P4 (Y-ENC)	(5)
θ-feed motor encoder 5-pin black	P5 (P-ENC)	(5)
Treadle, 2-pedal foot switch, hand start switch 10-pin	P6 (FOOT)	(5)
Operation panel 8-pin	P1 (PANEL)	(7), (8)
Hammer position sensor	P3 (CUTTER)	(6)
Machine head safety switch 3-pin	P9 (HEAD-SW)	(6)
(Y home position, cooling fan) sensor 12-pin	P8 (SENSOR1)	(6)
STOP switch 6-pin	P13 (HEAD)	(6)
(Zigzag check, low thread trimming OFF) sensor 6-pin	P10 (SENSOR2)	(6)
Valve harness 12-pin	P12 (AIR1)	(7), (8)
Hammer valve harness 10-pin	P25 (AIR2)	(7), (8)

0366B

<Power supply motor P.C. board>





<PMD P.C. board>

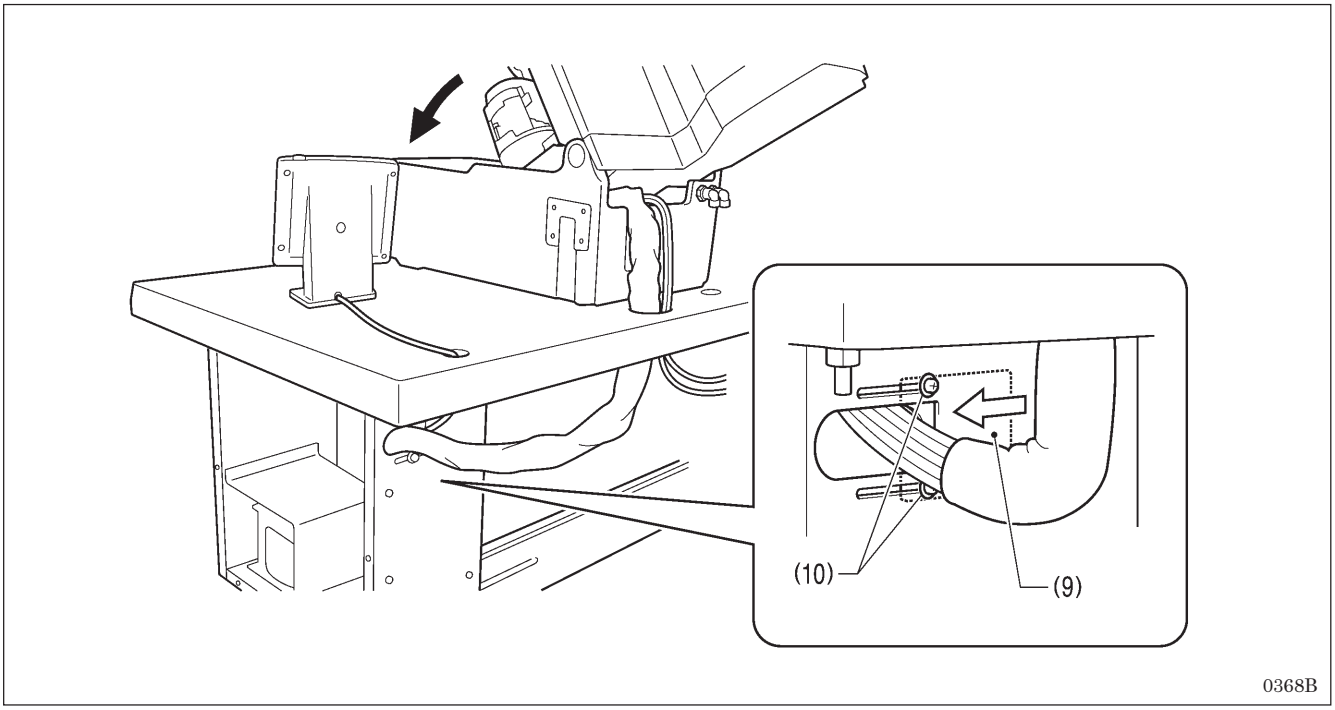
*: Be sure to make the ground connection. (Refer to "3-14-2. Connecting the ground wire".)

Connectors	At power supply motor P.C. board Insertion location	Cord clamp
Machine head memory 7-pin	P3 (HEAD-M)	(6)
Upper shaft motor 3-pin	P4 (UVW)	(7)
Synchronizer 14-pin	P5 (SYNC)	(7), (8)
Connectors	**At PMD P.C. board Insertion location**	**Cord clamp**
θ-feed motor 4-pin black	P3 (PPM)	(7), (8)
(Gimp clamp, lower tension release) solenoid 6-pin	P6 (SOL1)	(7), (8)
Upper tension release solenoid 4-pin	P7 (SOL2)	(7), (8)
Y-feed motor 4-pin blue	P8 (YPM)	(7), (8)
X-feed motor 4-pin white	P10 (XPM)	(7), (8)

NOTE:
Route the X-feed, Y-feed and θ-feed motor harnesses so that they do not touch the PMD P.C. board.

0367B

(Continued on next page)



6. Close the cord presser plate (9) in the direction of the arrow, and secure it by tightening the two screws (10).

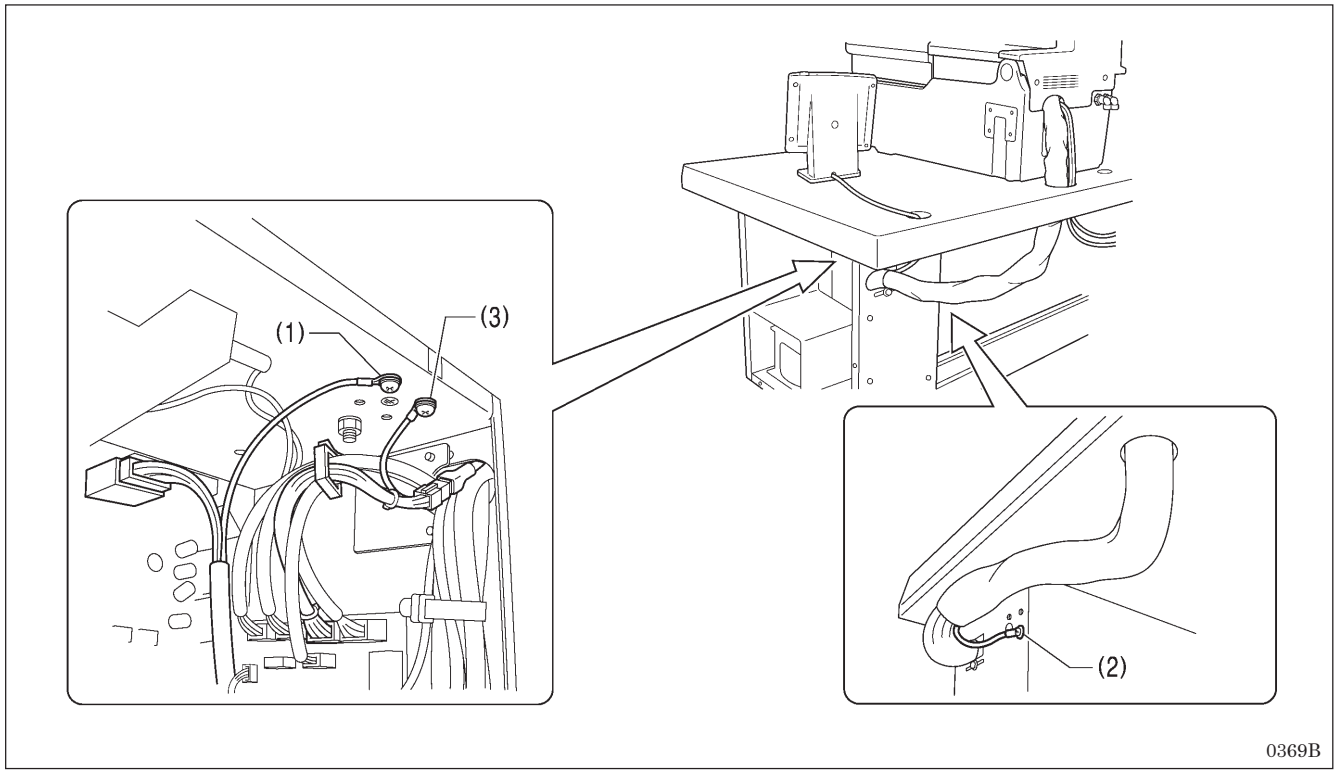
   NOTE:
   - Make some slack in the cords outside the control box so that the cords do not get pulled too tightly inside the control box.
   - Securely close the cord presser plate (9). If dust gets inside the control box, it may cause problems with operation.

7. Check that the cords do not get pulled, and then gently return the machine head to its original position.

3-14-2. Connecting the ground wire

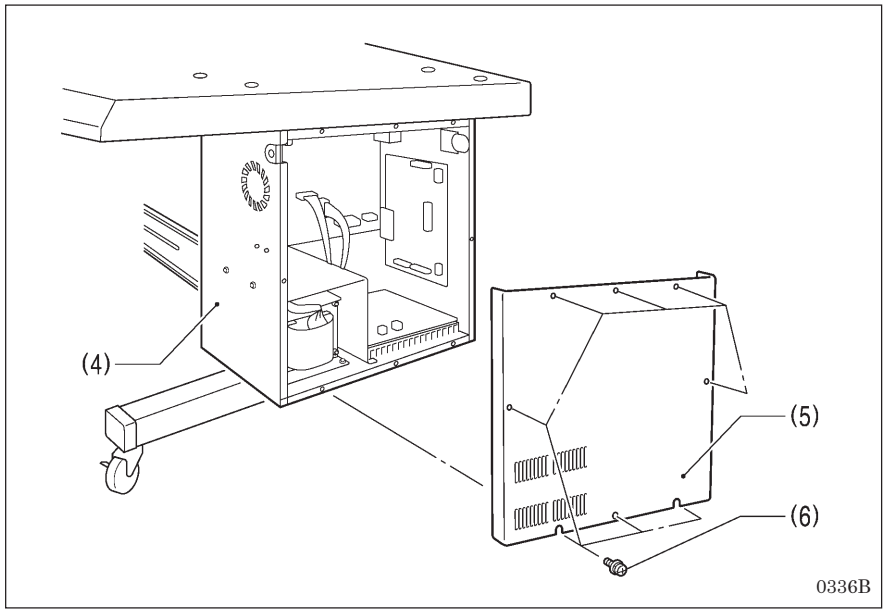
⚠ CAUTION

Be sure to connect the ground.
If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



(1) Ground wire from upper shaft motor harness
(2) Ground wire from the machine head
(3) Ground wire from foot switch conversion harness of 2-pedal foot switch (when using 2-pedal foot switch)

NOTE:
Make sure that the ground connections are secure in order to ensure safety.



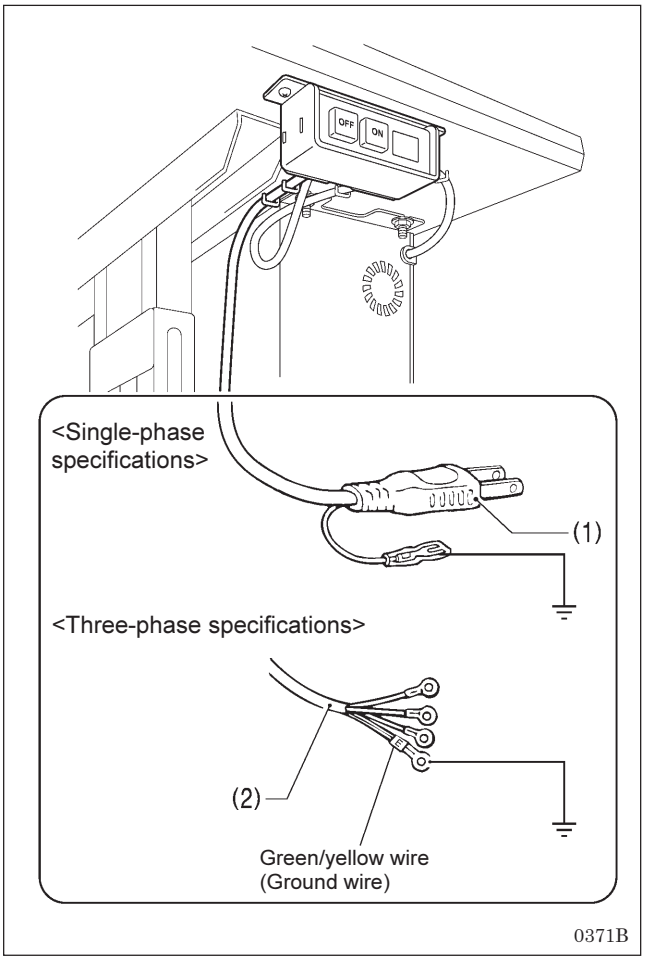
Secure the cover (5) of the control box (4) by tightening the eight screws (6). Check that the cords are not clamped by the cover at this time.

<For European destinations>
For European destinations, there are other ground wire connection locations in addition to those mentioned above. Refer to the CE instruction manual for further details.

3-14-3. Connecting the power cord

CAUTION

Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



<For single-phase specifications>
Insert the power cord plug (1) into a wall outlet.

<For three-phase specifications>
1. Attach an appropriate plug to the power cord (2). (The green and yellow wire is the ground wire.)
2. Insert the power plug into a properly-grounded AC power supply.

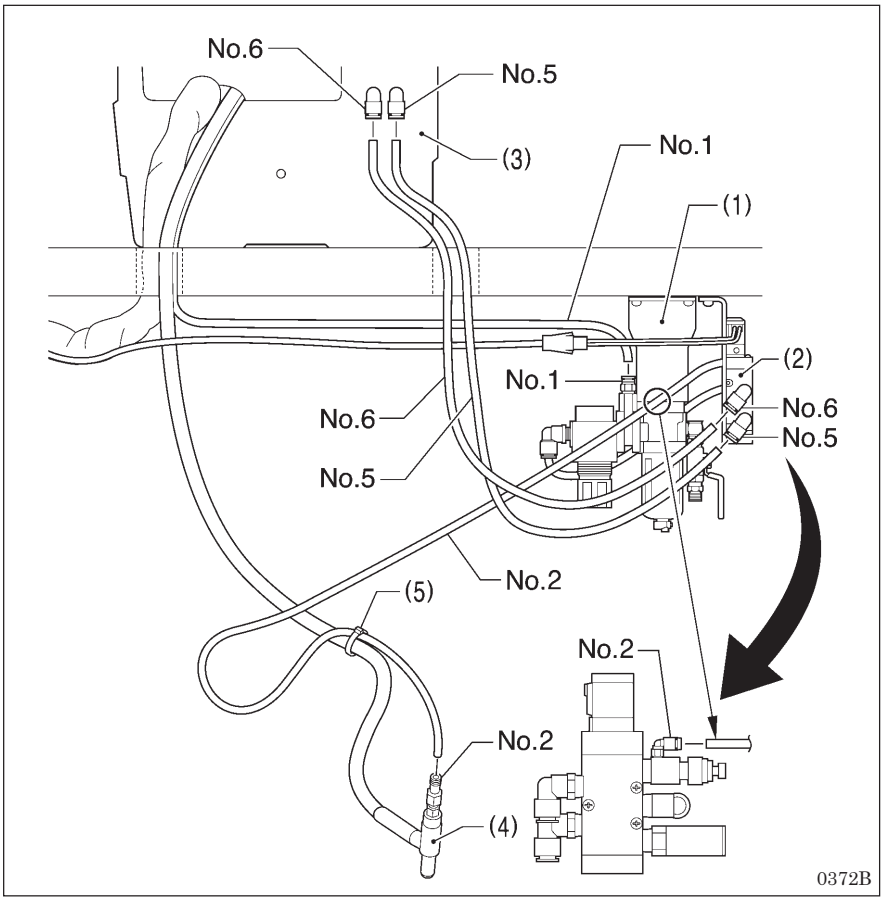
* The inside of the control box uses single-phase power.

NOTE:
Do not use extension cords. They may cause problems with correct operation of the sewing machine.

3-14-4. Connecting the air tubes

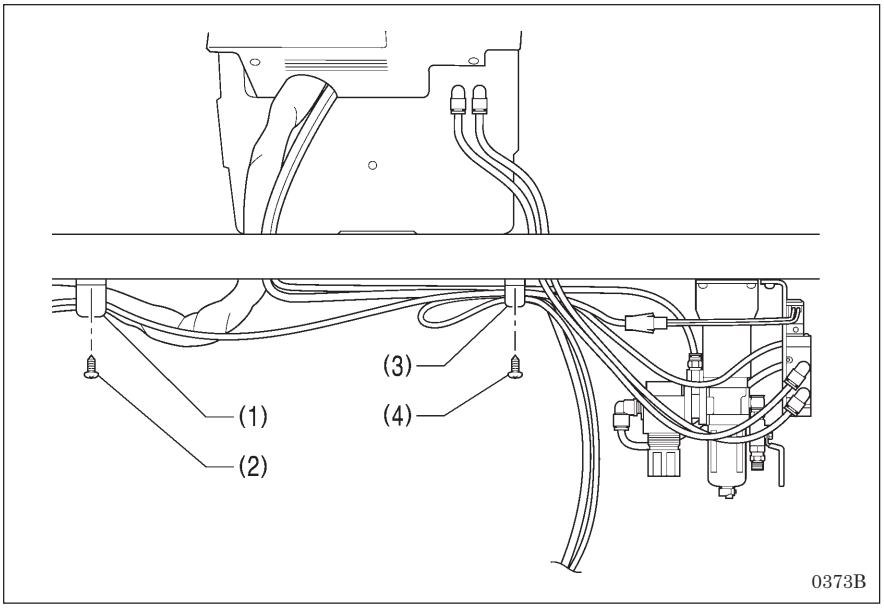
CAUTION

Do not switch the insertion locations for air tube No. 5 and No. 6 by mistake. If they are not connected correctly, the hammer may be lowered when the power is turned on or when the air cock is opened, and serious injury may result.



1. Insert air tube No. 1 coming from the machine head into the nipple for the air unit assembly (1). (The numbers appear on the air tubes coming from the sewing machine.)
2. Insert accessory air tube No. 5 and No. 6 into the nipples of the solenoid valve assembly (2) and bed base (3). (When setting up the machine head on top of the table, pass the air tubes through the table hole.)
3. Insert accessory air tube No. 2 into the nipples of the solenoid valve assembly (2) and venturi tube (4).
4. Bind the air tubes together using fastening bands (5).

3-14-5. Securing the cords

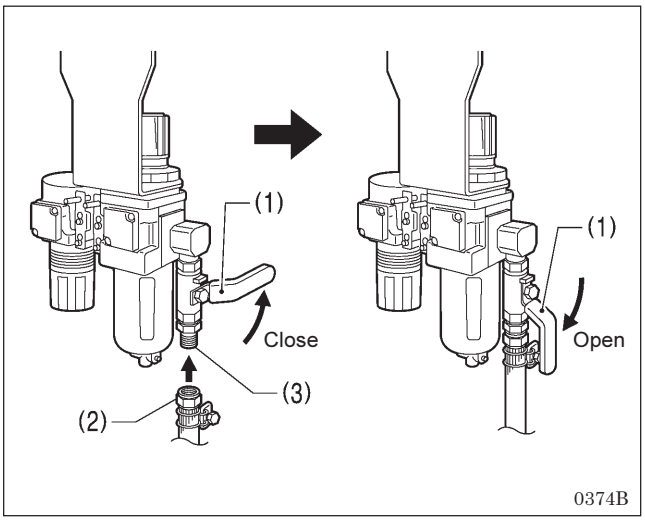


NOTE:
Secure the cords while leaving enough slack in them so that they do not get pulled when the machine head is tilted back.

1. Pass the cord bundle and the hammer valve harness through the accessory cord holder (large) (1), and secure the cord holder (large) (1) to the underside of the table with the screw (2).
2. Pass the air tubes and the valve cords through the accessory cord holder (small) (3), and secure the cord holder (small) (3) to the underside of the table with the screw (4).

3-15. Installing the air hose

Connect the air hose coming from the compressor to the air unit which is installed underneath the table.



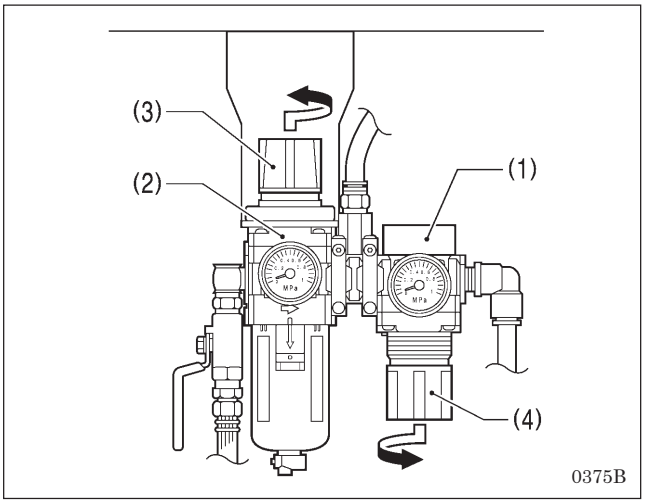
1. Close the cock (1).
2. Turn the nut (2) at the end of the air hose and connect it to the valve (3).
3. Open the cock at the compressor.
   * Check that no air is leaking from the valve connection.
4. Open the cock (1).
   (The meter pointer will turn clockwise.)
5. Adjust the air pressure.

NOTE:

Turn the cock (1) gently to open it. If this is not done, the air cylinder may operate too suddenly.

3-16. Adjusting the air pressure

Adjust the hammer pressure adjustment regulator (1) to the minimum pressure setting which will allow cutting of the article being sewn.
To set to the standard pressure, adjust the main regulator (2) to 0.5 MPa.

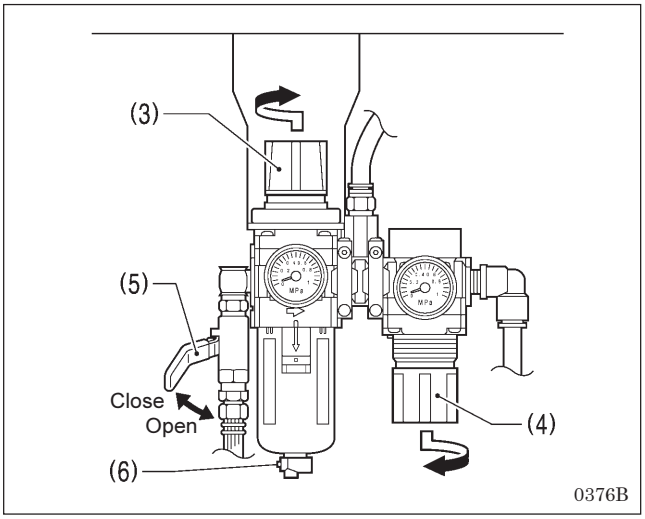


<Increasing the air pressure>

1. Lift up the knob (3) of the main regulator (2) and turn it gently to adjust the pressure.
   * When the knob (3) is turned in the direction of the arrow, the air pressure will increase.
2. Pull down the knob (4) of the hammer pressure adjustment regulator (1) and turn it gently to adjust the pressure.
   * When the knob (4) is turned in the direction of the arrow, the air pressure will increase.

NOTE:

The hammer pressure adjustment regulator (1) is already adjusted to a pressure of 0.4 MPa. Do not increase the pressure if it is not necessary to do so. If the pressure is too high, the sharpness of the knife will deteriorate and the knife may become damaged.



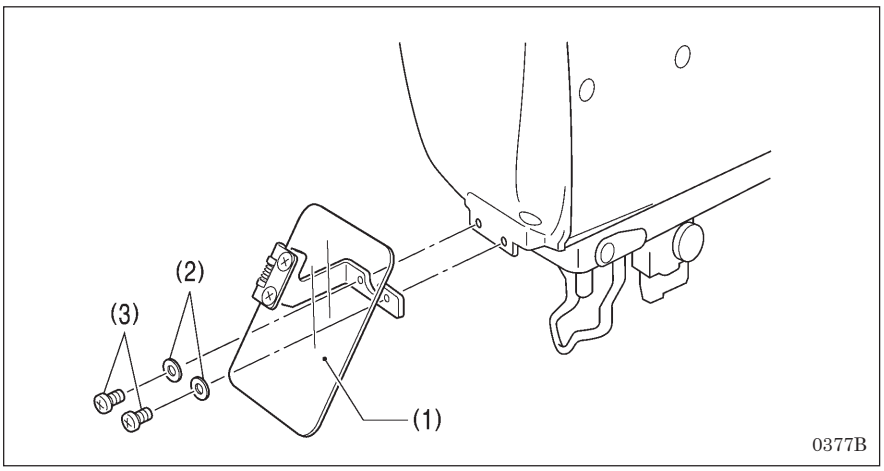
<Decreasing the air pressure>

1. Close the air cock (5). (The pointer will stay at the high position on the scale.)
2. Press the button (6).
   The air pressure inside the bowl will be released and the pointer will move down.
3. To decrease the air pressure, lift up the knob (3) or pull down the knob (4) and turn it in the direction of the arrow.
4. Open the cock (5).
   Air will enter the bowl and the pointer will move.
5. Repeat steps 1 to 4 until the desired air pressure is obtained.

3-17. Installing the eye guard

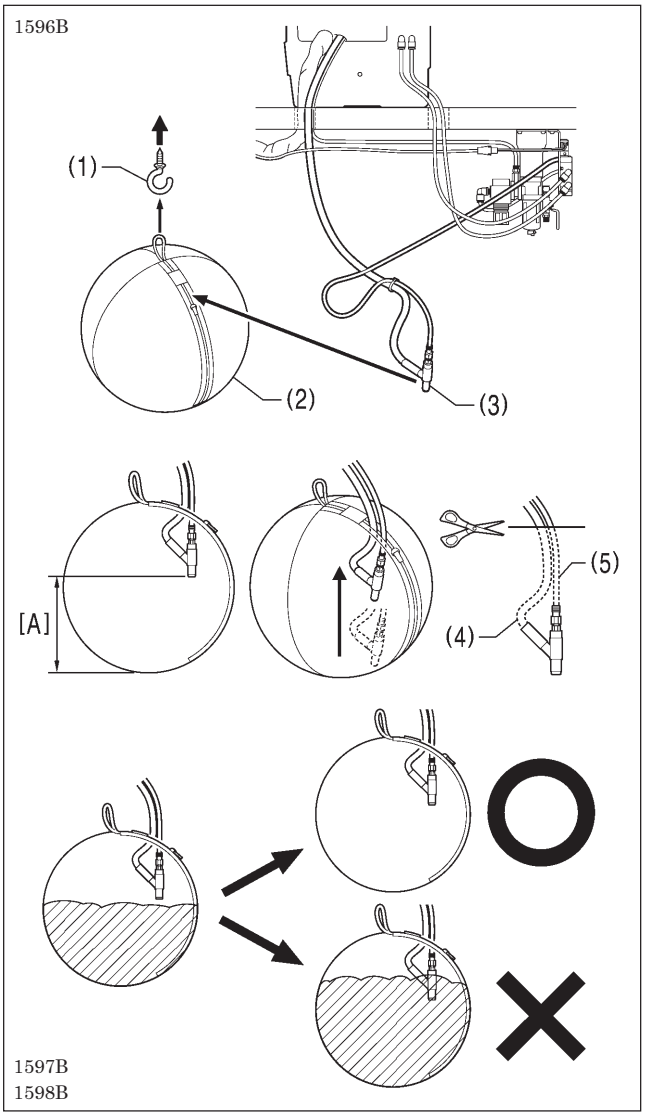
CAUTION

Attach all safety devices before using the sewing machine.
If the machine is used without these devices attached, injury may result.



(1) Eye guard assembly
(2) Plain washers [2 pcs.]
(3) Screws [2 pcs.]

3-18. Installing the dust bag



1. Install the hook (1) underneath the table in a convenient-to-use position.
2. Install the dust bag (2) to the hook (1).
3. Open the chuck of the dust bag (2) and insert the venturi tube (3).
4. Close the chuck.

The longer the distance [A] from the bottom of the dust bag to the venturi tube (3), the greater the amount of cutting scraps that the dust bag can hold. To increase the amount of cutting scraps that can be held, adjust so that the distance [A] becomes longer.
Cut the knife trash tube (4) and air tube (5) shorter if necessary.

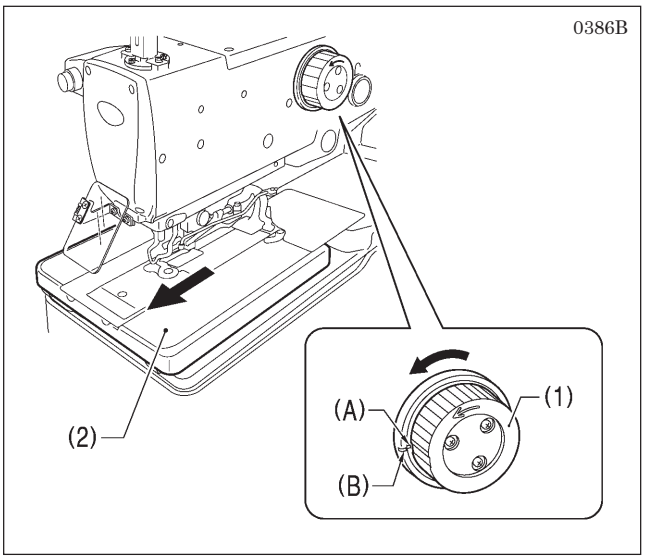
* The efficiency for sucking in the cutting scraps will increase if the knife trash tube (4) and air tube (5) are made shorter.

NOTE:

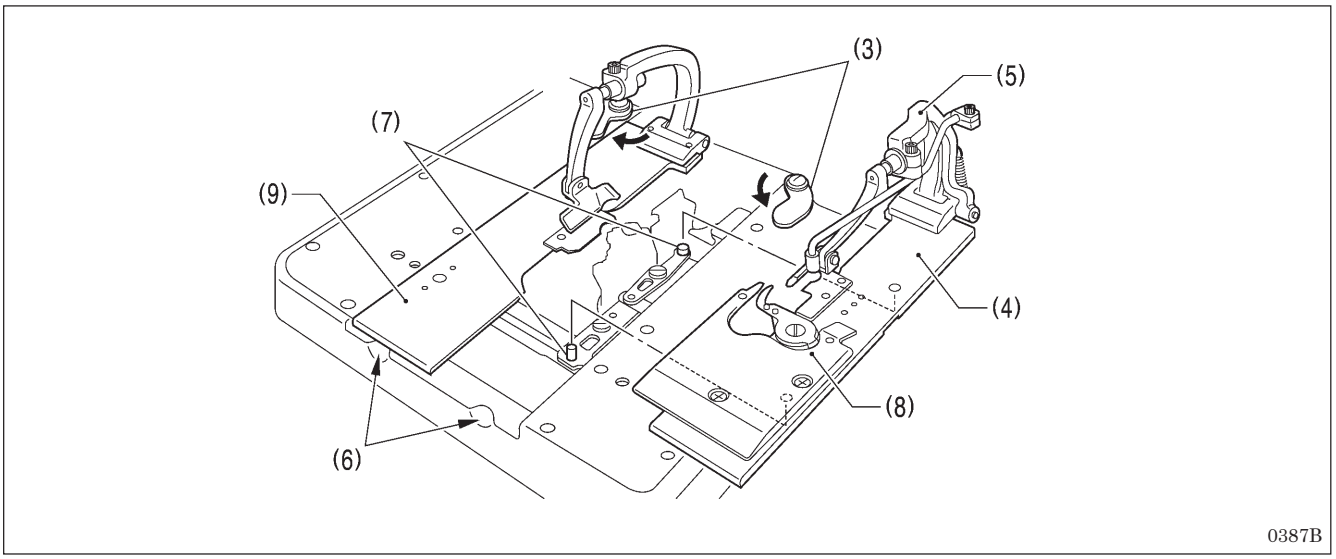
Throw away the cutting scraps before they reach the tip of the venturi tube (3). If they cover the tip of the venturi tube, the inside of the knife trash tube (4) will become blocked.

3-19. Installing and removing the work clamp plates

<Removal>



1. Turn the upper shaft pulley (1) forward to align the mating mark (A) on the pulley with the notch (B) in the machine head.
   * The needle will be set to the needle up stop position.
2. Move the feed base (2) forward.



3. Push the left and right plate pressers (3) in the directions of the arrows (toward the outside).
4. While holding the clamp lever (5), insert a finger into the notch (6) and push up the right work clamp plate (4) to remove it from the pin (7).
5. Pull the right work clamp plate (4) forward to remove it.
   NOTE:
   Move the feed base (2) to a position where the work clamp plate JU (8) can be removed without touching the needle, and then lift up the right work clamp plate (4) and remove it.
6. Remove the left work clamp plate (9) in the same way as for the right work clamp plate (4).

<Installation>

Install by carrying out the “Removal” procedure given above in reverse.

3-20. Lubrication

⚠ CAUTION

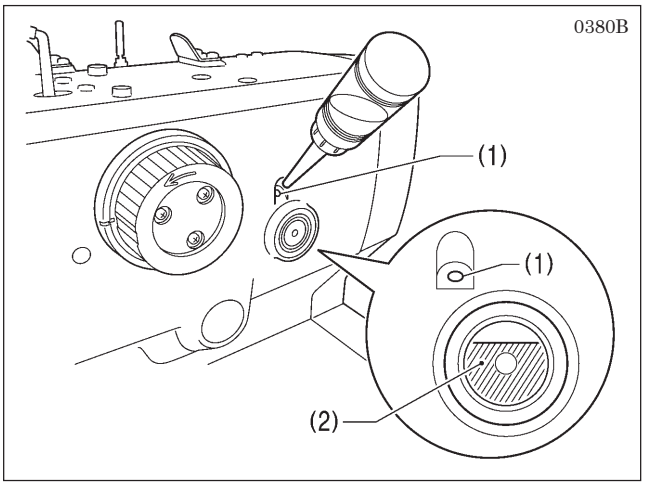
Turn off the power switch before carrying out this operation.
If this is not done, the machine may operate if the start switch is pressed by mistake, which could result in serious injury.

Be sure to wear protective goggles and gloves when handling the lubricating oil, so that it does not get into your eyes or onto your skin. If care is not taken, inflammation can result.
Furthermore, do not drink the lubricating oil. Diarrhea or vomiting may result.
Keep the oil out of the reach of children.

NOTE:
Use only the lubricating oil <NIPPON OIL CORPORATION Sewing Lube 10N; VG10> specified by SUOTE.
* If this type of lubricating oil is difficult to obtain, the recommended oil to use is Exxon Mobil Essotex SM10, VG10.

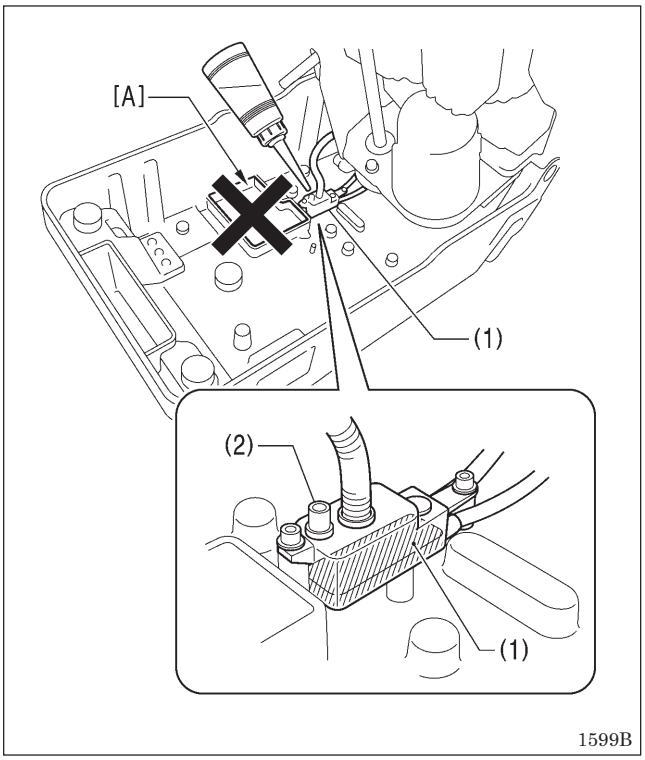
3-20-1. Adding oil

The sewing machine should always be lubricated and the oil supply replenished before it is used for the first time, and also after long periods of non-use.



<Filling the arm oil tank>
Pour lubricating oil in through the lubricating hole (1) in the arm oil tank. Use the oil gauge window (2) to check the oil amount, and pour in the oil until the oil gauge window (2) is about 8/10ths covered.

NOTE:
- If the oil level in the oil gauge window drops to cover about 1/3rd of the window, be sure to add more lubricating oil. If this is not done, problems such as seizing may occur.
- Be careful not to add too much lubricating oil. If too much lubricating oil is added, it may overflow inside the sewing machine.



<Adding oil to the bed oil tank (sub tank)>
1. Tilt back the machine head.
2. Pour lubricating oil in through the lubricating hole (2) of the sub tank (1) without letting it overflow.

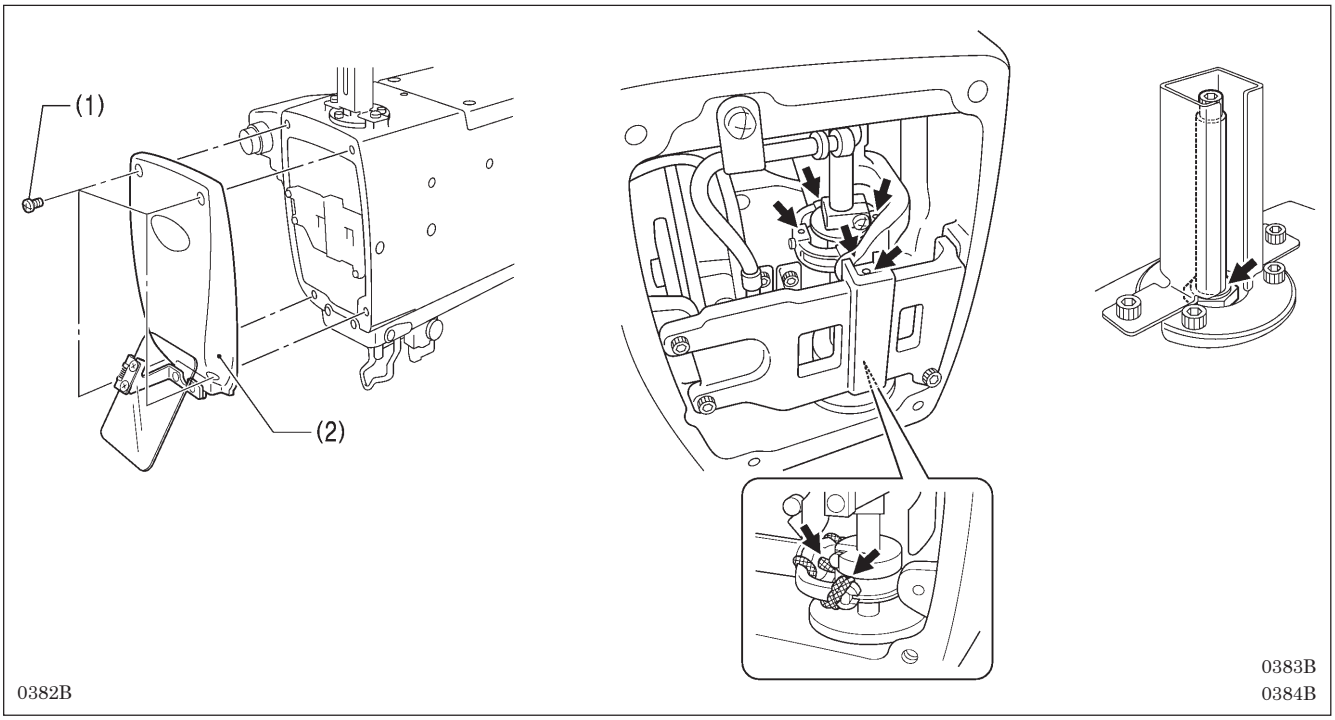
* During normal use, oil will be fed automatically from the arm oil tank, so it is not necessary to add oil.

NOTE:
- Do not add any oil to the area marked [A]. This part is a tank for collecting the water that is discharged from the air valve inside the side plate.
  If any water has collected in this tank, drain it out. (Refer to “8-3-4. Draining water”.)

3-20-2. Lubrication

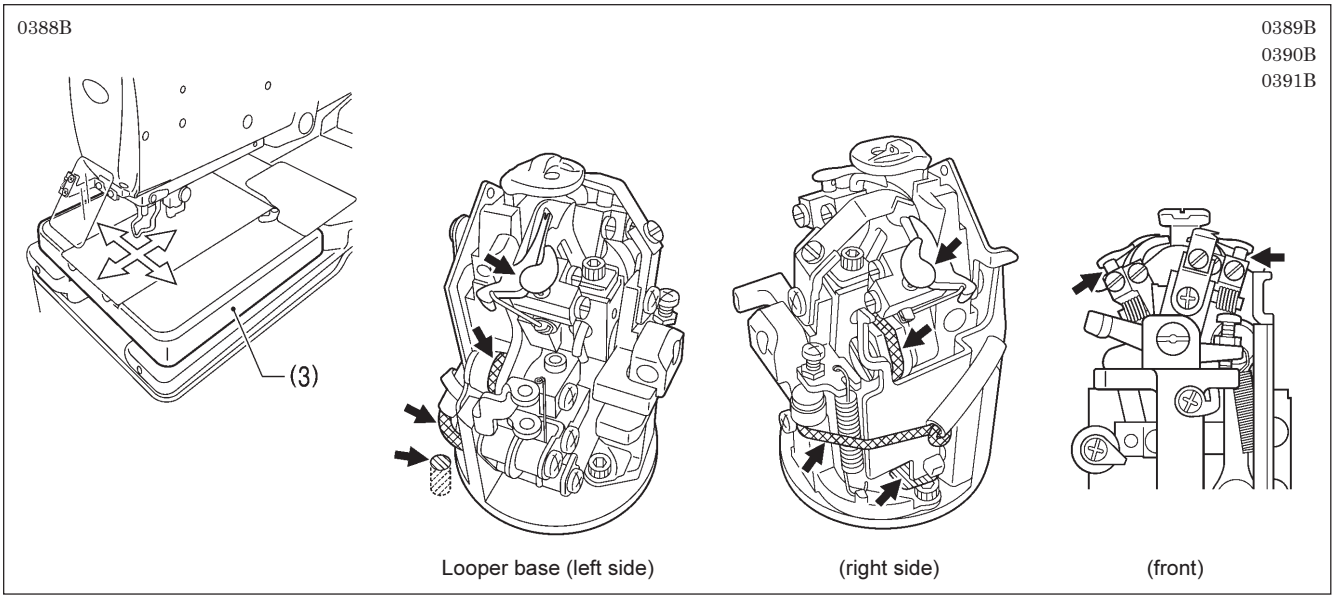
- When using the sewing machine for the first time, and also after long periods of non-use, lubricate the sewing machine in the places indicated by arrows in the illustration below.
- Oil may get onto the thread while lubrication is being carried out. Carry out a test sewing to ensure that your material does not get stained with oil.

<Lubricating the needle bar>



1. Loosen the four screws (1) and then remove the face plate (2).
2. Add 2 - 3 drops of oil in the places indicated by the arrows.
3. Once lubrication is complete, install the face plate (2).

<Oiling the looper, spreader and looper base>



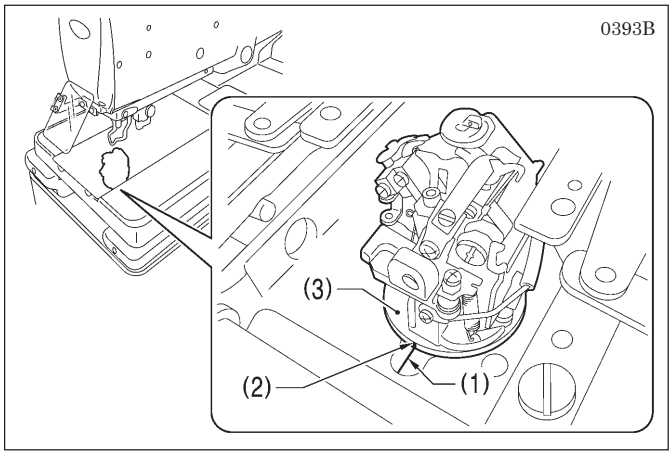
1. Remove the left and right work clamp plates. (Refer to “3-19. Installing and removing the work clamp plates”.)
2. Move the feed base (3) to a position where it will not interfere with lubrication.
3. Turn the looper base and add 2 - 3 drops of oil in the places indicated by the arrows.
4. Once lubrication is complete, install the work clamp plates.

4. PREPARATION BEFORE SEWING

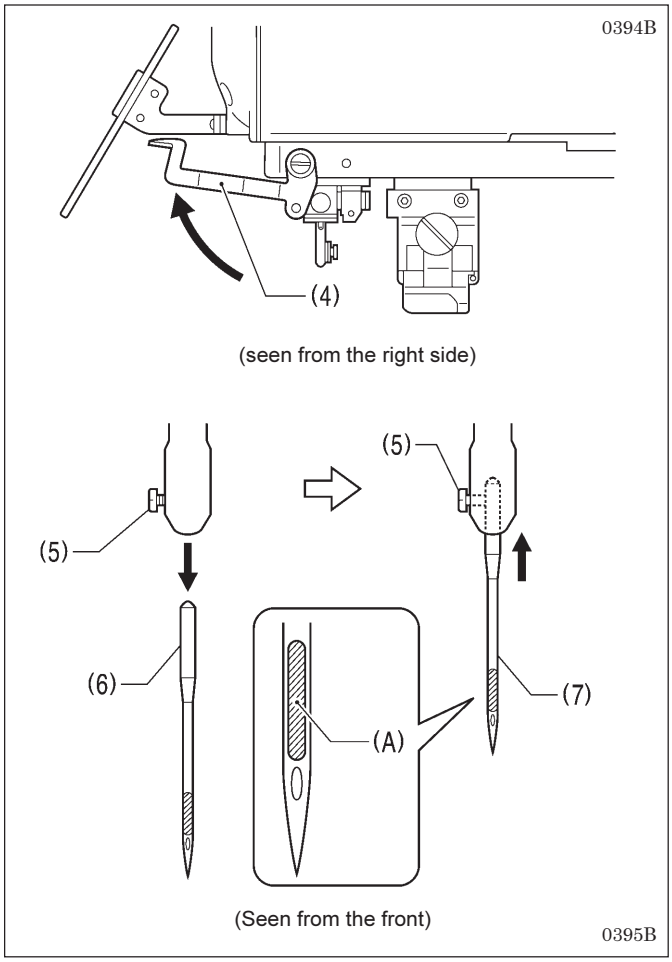
4-1. Installing the needle

⚠ CAUTION

Turn off the power switch before installing the needle.
Otherwise the machine may operate if the start switch is pressed by mistake, which could result in serious injury.



1. Remove the work clamp plates. (Refer to “3-19. Installing and removing the work clamp plates” for details on removing the plates.)
2. Check that the index mark (1) on the bed is aligned with the index mark (2) on the looper base.
   * If they are not aligned, turn the looper base (3) until they are aligned.



3. Raise the finger guard (4).
4. Loosen the set screw (5), and then remove the needle (6).
5. Insert the new needle (7) as far as it will go, with the hollow (A) facing toward the front.
6. Securely tighten the set screw (5).
7. Lower the finger guard (4).

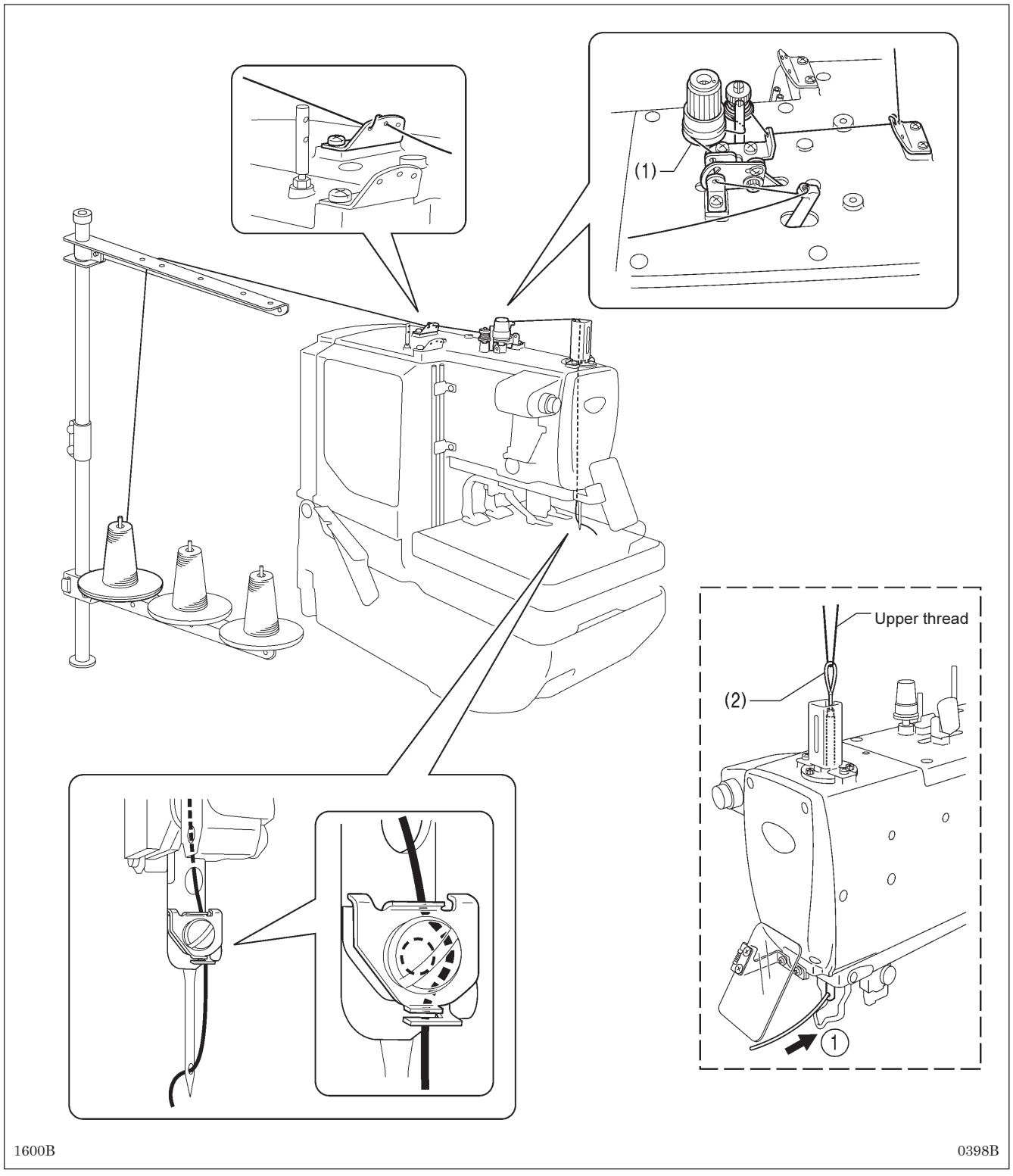
NOTE:
Do not tighten the set screw (5) while the needle has been removed. If the set screw (5) is tightened, it may damage the inside of the needle bar and it may not be possible to insert the needle.

<Recommended needle>
DO x 558 80 - 120 Nm (Schmetz 558)

4-2. Threading the upper thread

Thread the upper thread correctly as shown in the illustration below.

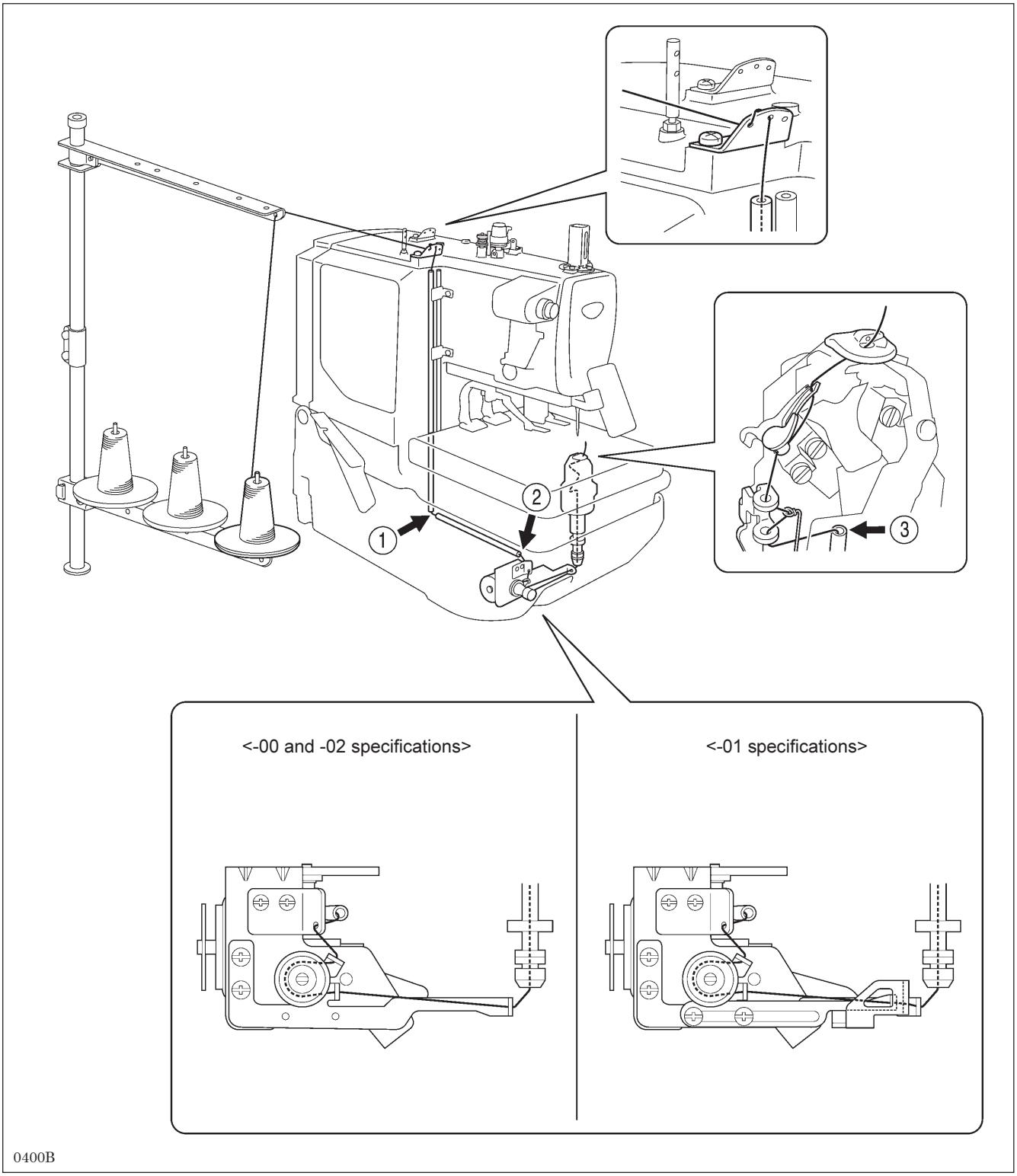
* The illustration below shows the method when the cotton stand is installed on the left side. If the cotton stand is installed on the right side, the threading method will be different. Before threading, refer to “4-5. Threading the threads when the cotton stand is installed on the right side”.
* When using threading mode for threading, the tension discs (1) will open so that the thread can be threaded more easily. (Refer to “5-7. Using threading mode”.)
* Use the accessory threader (2). (① in the illustration shows the position for inserting the threader.)



4-3. Threading the lower thread

When threading the lower thread, first remove the work clamp plates, and then thread the lower thread correctly as shown in the illustration below.
(Refer to “3-19. Installing and removing the work clamp plates” for details on removing the work clamp plates.)

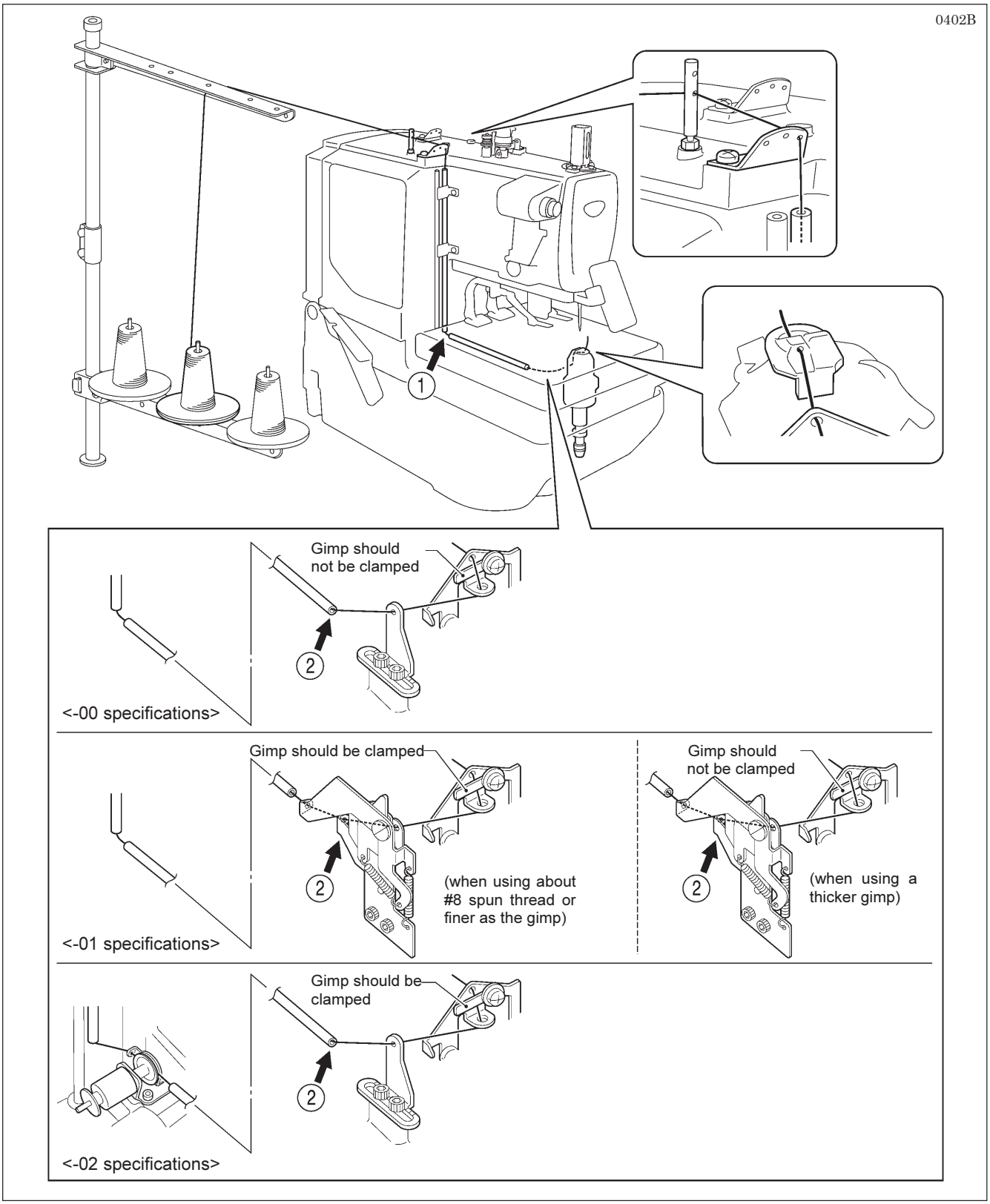
* The illustration below shows the method when the cotton stand is installed on the left side. If the cotton stand is installed on the right side, the threading method will be different. Before threading, refer to “4-5. Threading the threads when the cotton stand is installed on the right side”.
* (① - ③ in the illustration show the positions for inserting the threader.) (Refer to “4-2. Threading the upper thread” for details on using the threader.)



4-4. Threading the gimp

When threading the gimp, first remove the work clamp plates, and then thread the gimp correctly as shown in the illustration below. Once threading has been completed, install the work clamp plates. (Refer to “3-19. Installing and removing the work clamp plates”.)

* The illustration below shows the method when the cotton stand is installed on the left side. If the cotton stand is installed on the right side, the threading method will be different. Before threading, refer to “4-5. Threading the threads when the cotton stand is installed on the right side”.
* ① - ② in the illustration show the positions for inserting the threader. (Refer to “4-2. Threading the upper thread” for details on using the threader.)

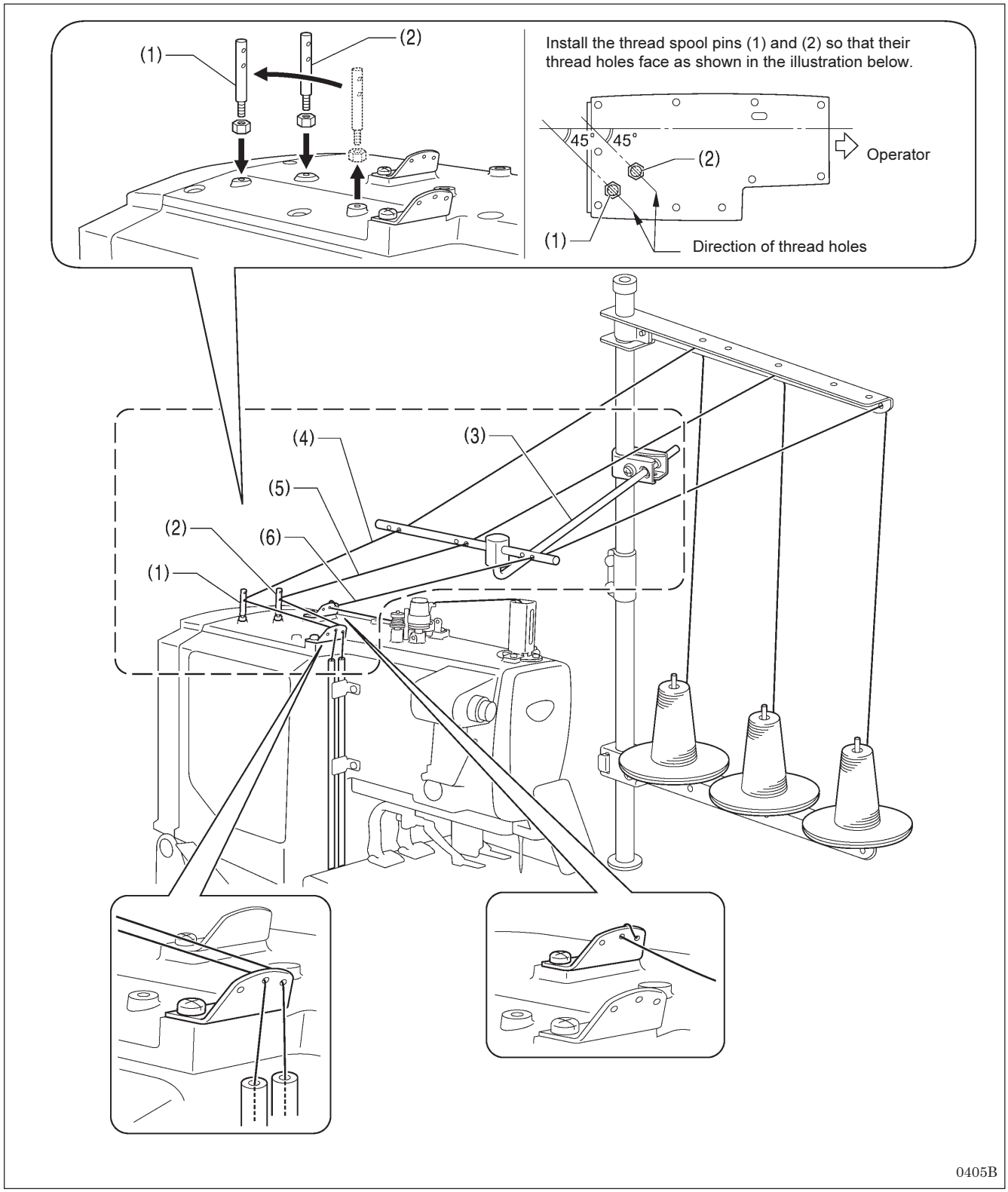


4-5. Threading the threads when the cotton stand is installed on the right side

When the cotton stand is installed on the right side, thread the threads through the parts shown inside the dotted lines below. The parts outside the dotted lines should be threaded in the same way as when the cotton stand is installed on the left side. Refer to “4-2” to “4-4” for details on threading each of the threads.

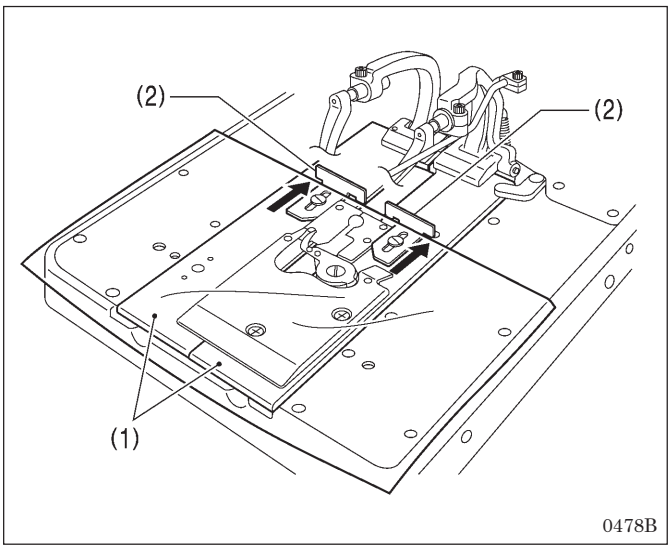
- Before threading any of the threads, move the thread spool pin (1) to the position shown in the illustration, and then install the accessory thread spool pin (2).
- When installing the cotton stand on the right side, it is recommended that you use the accessory thread guide (3).

(4) Lower thread
(5) Gimp
(6) Upper thread



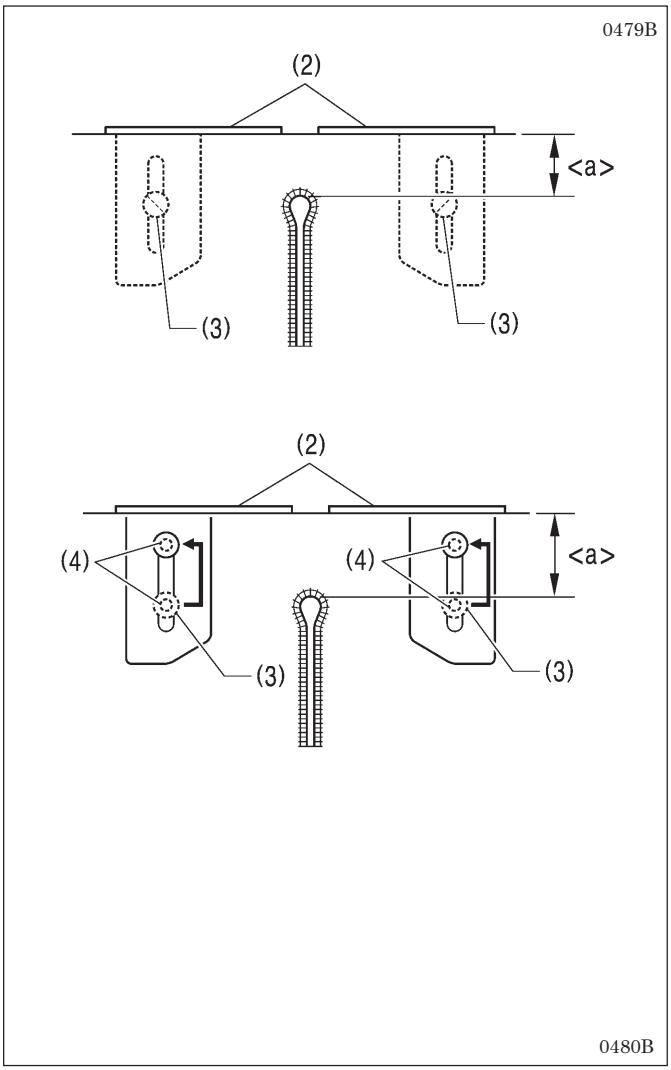
4-6. Setting the material

Cloth guides (2) are attached to the left and right work clamp plates (1). The material can be set so that it is vertical and parallel to the sewing machine by aligning the edges of the material with the cloth guides (2). In addition, the width (sewing margin) between the edge (top edge) of the material and the sewing pattern can be adjusted by changing the installation positions of the cloth guides (2).



Setting the material

Set the material so that its edges are aligned with the cloth guides (2) as shown in the illustration.



Adjusting the sewing margin

<For -00 and -01 specifications>

1. Loosen the screws (3) at the left and right, and then move the cloth guides (2) forward or back to adjust the sewing margin <a>.
   * <a> can be adjusted to between 10 - 30 mm.
2. Once adjustment is complete, securely tighten the screws (3).

<For -02 specifications>

There are two installation holes (4) for the left and right screws (3), one at the front and one at the back.

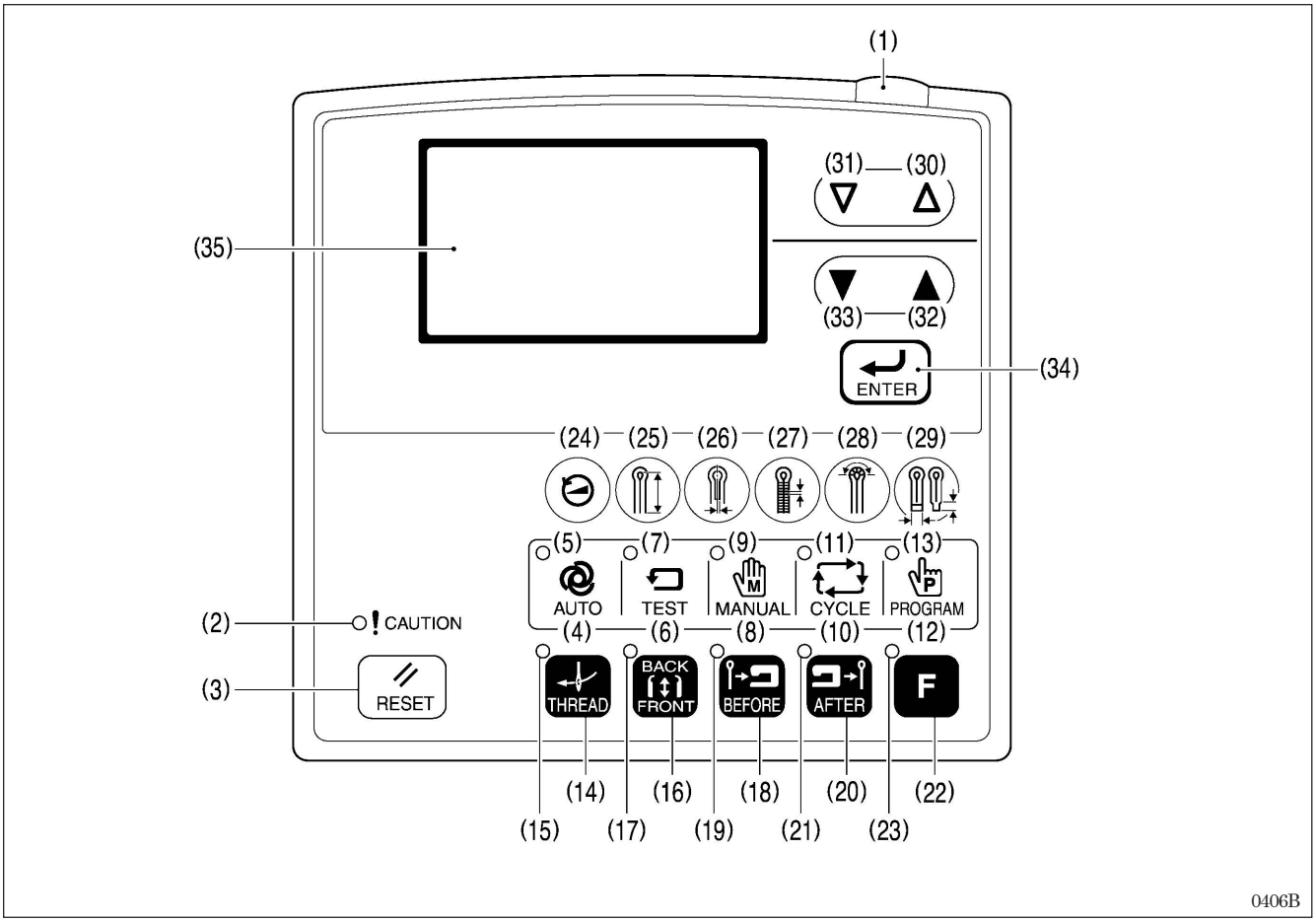
1. Move the screws (3) to whichever installation hole (4) is needed.
2. With the screws (3) loosened, move the cloth guides (2) forward or back to adjust the sewing margin <a>.
   * Adjustment range for <a>
     The following adjustment ranges can be obtained by changing the installation holes (4).

Specifications	Adjustment range
L1422	10 - 50 mm
L1826	10 - 46 mm
L2230	10 - 42 mm
L2634	10 - 38 mm
L3442	10 - 30 mm

3. Once adjustment is complete, securely tighten the screws (3).

5. USING THE SEWING MACHINE (OPERATION PANEL: BASIC OPERATION)

5-1. Name and function of each operation panel item



(1) Power indicator
Illuminates when the power is turned on.

(2) CAUTION indicator
Illuminates when an error occurs.

(3) RESET key
Press to reset errors, and to clear the production counter value.

(4) AUTO key
This key is used to start automatic mode.

(5) AUTO indicator
Illuminates during automatic mode.

(6) TEST key
This key is used to start test mode.

(7) TEST indicator
Illuminates during test mode.

(8) MANUAL key
This key is used to start manual mode.

(9) MANUAL indicator
Illuminates during manual mode.

(10) CYCLE key
This key is used to start cycle program mode.

(11) CYCLE indicator
Illuminates during cycle program mode.

(12) PROGRAM key
This key is used to start program mode.

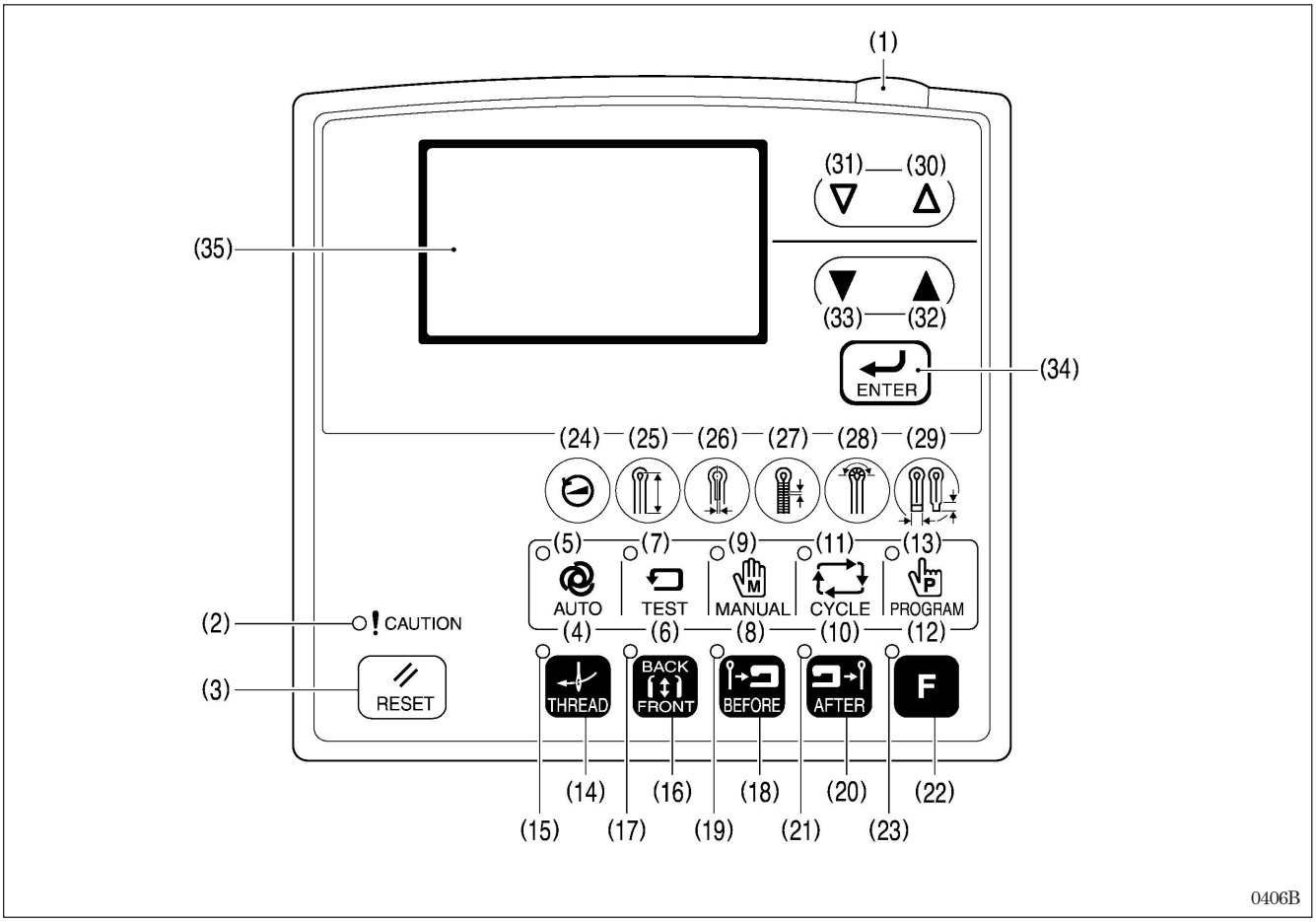
(13) PROGRAM indicator
Illuminates during program mode.

(14) THREAD key
This key is used when threading the threads.

(15) THREAD indicator
Illuminates when the THREAD key is pressed (while threading is in progress).

(16) FRONT/BACK key
This key is used to switch the material setting position to “front” or “back”.

(17) FRONT indicator
Illuminates when the material setting position is set to “front”.



(18) BEFORE key
This key is used to set cutting operation to cutting before sewing.

(19) BEFORE indicator
Illuminates when cutting operation is set to cutting before sewing.

(20) AFTER key
This key is used to set cutting operation to cutting after sewing.

(21) AFTER indicator
Illuminates when cutting operation is set to cutting after sewing.

(22) F key
This key is used to display the help screen.

(23) F indicator
Illuminates while a CF card is being read from or written to.

(24) Shortcut 1 key
This key is used to change the sewing speed.

(25) Shortcut 2 key
This key is used to change the sewing length.

(26) Shortcut 3 key
This key is used to change the cutting spacing.

(27) Shortcut 4 key
This key is used to change the stitch pitch.

(28) Shortcut 5 key
This key is used to change the number of stitches sewn for eyelets.

(29) Shortcut 6 key
This key is used to change the bartack length.

(30) △ key
This key is used to increase the values for program numbers and parameter numbers.

(31) ▽ key
This key is used to decrease the values for program numbers and parameter numbers.

(32) ▲ key
This key is used to increase the values for parameter settings and memory switch settings.

(33) ▼ key
This key is used to decrease the values for parameter settings and memory switch settings.

(34) ENTER key
This key is used to spply the values for parameter settings and memory switch settings.

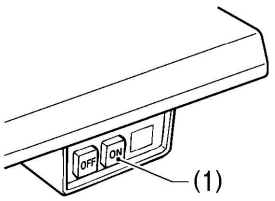
(35) Display
This shows program numbers and messages.

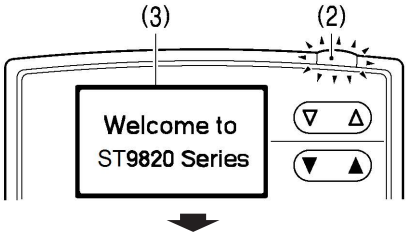
5-2. Starting the sewing machine

[The display examples are for a -01 specification sewing machine.]

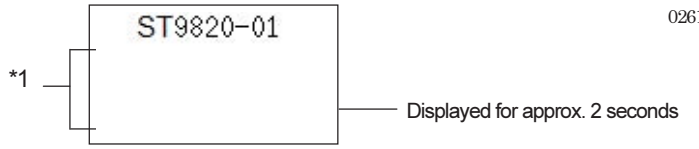
1 Push the power switch (1) to the ON side.

The power indicator (2) will illuminate and the contents of the panel display (3) will switch in the order shown below.

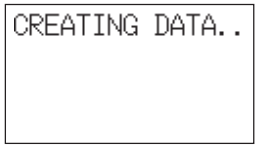




0407B



0261B



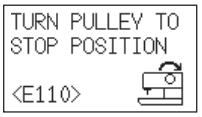
0314B

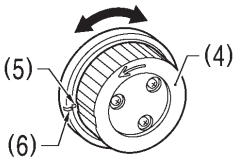
<For 2-pedal foot switch/hand start switch specifications>

<For treadle specifications>

0311B
0312B

NOTE:
If "E110" is displayed, turn the upper shaft pulley (4) by hand to align the index mark (5) on the pulley with the notch (6).



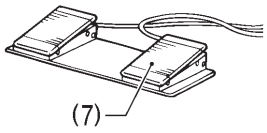


0313B
0408B

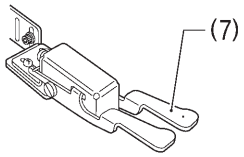
2 Press the start switch (7).

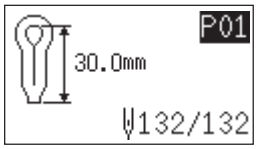
0409B
0506B
0507B
0229B

<For 2-pedal foot switch specifications>



<For hand start switch specifications>





[During test mode]

<For treadle specifications>
Depress the treadle.

- The feed base will move to the material setting position.
- The panel display will switch to the standby condition *2 for the mode (automatic mode, manual mode, test mode, cycle program mode or program mode) that was active when the sewing machine was last turned off.

*1: If settings for an optional device have been made, the icon for the optional device will appear here.

Indexer	Cut length changeover device	Upper thread nipper device	Upper thread breakage detector	Air pressure detector
				

*2: The "standby condition" is the name for the period from the point after switching to one of these modes until the first operation occurs.

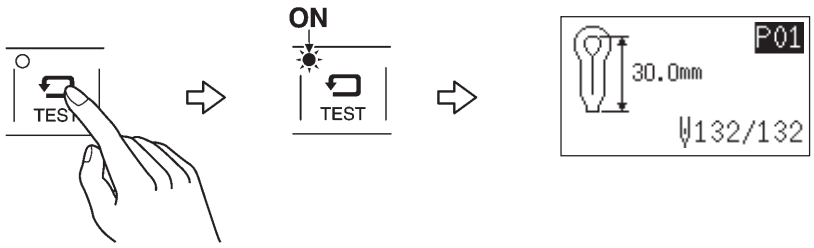
0264B−0267B
1644B

5-3. Program setting method

It is recommended that you register patterns that are sewn frequently as programs. After programs have been registered, you can retrieve the desired sewing patterns simply by selecting a program number, which eliminates the need to set the pattern each time.

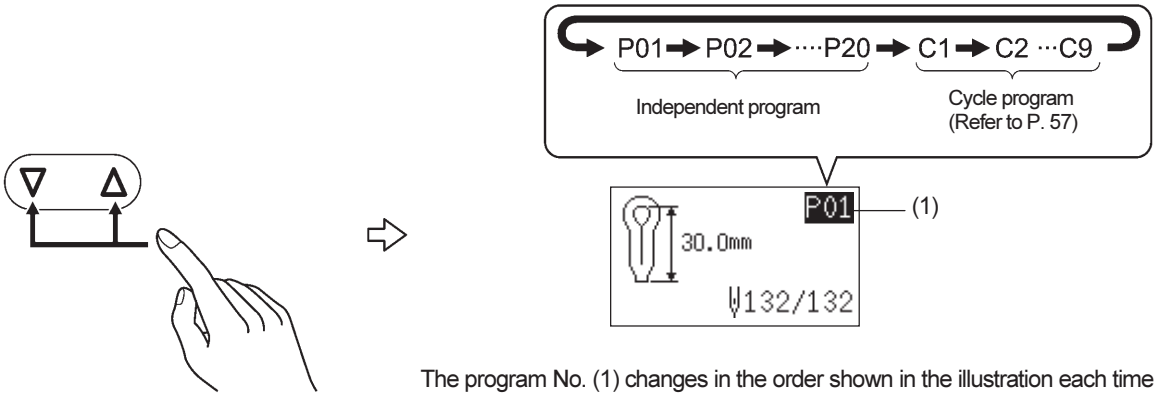
- Normally up to 20 programs can be registered, and their contents can be changed at any time. The contents can be set by changing the parameters for each item.
- At the time of shipment from the factory, temporary contents are set for programs P01 to P20. (The contents are the same for all programs from P01 to P20.) Follow the method given below to change the contents of a program before using it.

1 Switch the mode to test mode.



0410B 0229B

2 Select the program number from P01 to P20 (1) to select the program that you would like to change.

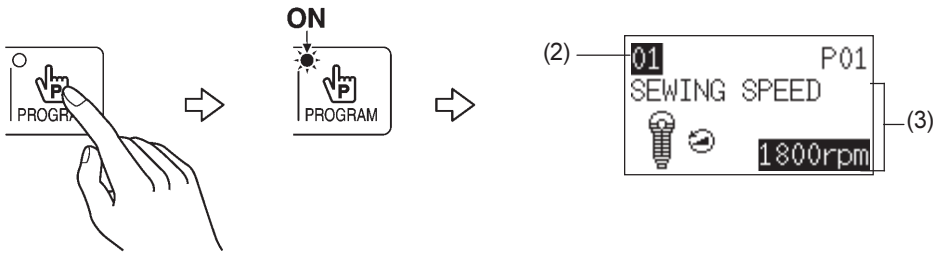


The program No. (1) changes in the order shown in the illustration each time the △ key is pressed. (The ▽ key changes the order in the opposite direction.)

NOTE:
Program mode is not available if a cycle program has been selected.

0413B 0337B 0229B

3 Switch to program mode.

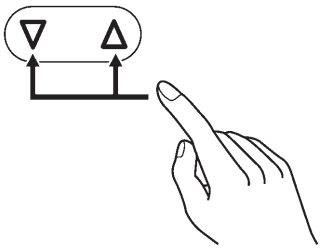


The parameter number (2) that was last selected and the setting (3) for that parameter will appear in the display.

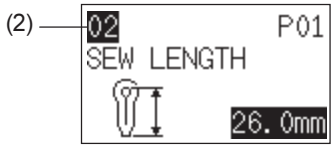
* You can also start program mode by pressing a shortcut key. In this case, the parameter number that corresponds to the shortcut key will be selected. (Refer to the next page.)

0412B 0315B

4 Select the parameter number (2) for the parameter that you would like to change. (Refer to "5-3-1. Parameter list".)

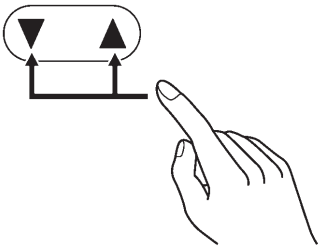


0413B

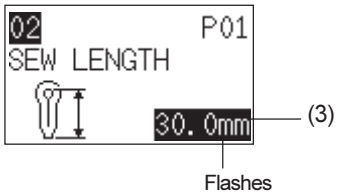


0316B

5 Change the setting (3) for the parameter.



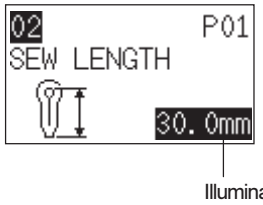
0414B



* The flashing display means that the setting has not yet been applied.
* You can make the initial setting appear in the display by pressing the RESET key.

0317B

6 Apply the changed setting.



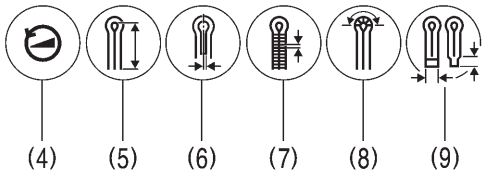
* The display will change from flashing to illuminated, and this means that the setting has been applied.
* You can cancel the setting change by pressing the △, ▽, AUTO, TEST or MANUAL key without pressing the ENTER key.

0415B

0317B

7 Repeat steps 4 - 6 above to change other parameters.

Shortcut keys



0416B

The shortcut keys have the following six often-used parameters registered into them.

- You can retrieve a desired parameter simply by pressing the corresponding shortcut key.
- These operations can be carried out from any mode (automatic, manual, test and program mode) except cycle program mode.

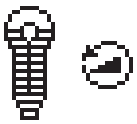
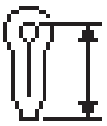
(4) Sewing speed (Parameter No. 01)
(5) Sewing length (Parameter No. 02)
(6) Cutting spacing (Parameter No. 03)
(7) Stitch pitch (Parameter No. 04)
(8) No. of eyelet stitches (Parameter No. 05)
(9) Bartack length (Parameter Nos. 06, 08, 10)*

*: Loads the parameter number corresponding to the bartack shape for parameter No. 40.

5-3-1. Parameter list

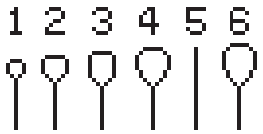
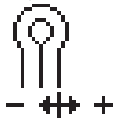
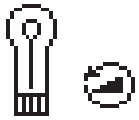
NOTE:

- It may not be possible to change some setting values or some settings may be invalid because of the settings for other parameters.
- If any parameters have been changed, operate the sewing machine in test mode and check that there is no obstruction between the needle and other parts and also between other parts before carrying out actual sewing.

No.	Setting	Setting range	Unit	Initial value
01	Sewing speed 	1,000 - 2,500 rpm	100	1,800 rpm
02	Sewing length (*1) 	<-00 specifications>: Eyelet buttonholes: 8 - 50 mm Straight buttonholes: 5 - 50 mm <-01 specifications>: Eyelet buttonholes: 8 - 42 mm Straight buttonholes: 5 - 42 mm <-02 specifications> (L1422): 14 - 22 mm (L1826): 18 - 26 mm (L2230): 22 - 30 mm (L2634): 26 - 34 mm (L3442): 34 - 42 mm	0.5	<-00 specifications>: 25 mm <-01 specifications>: 25 mm <-02 specifications> (L1422): 18 mm (L1826): 22 mm (L2230): 26 mm (L2634): 30 mm (L3442): 38 mm
03	Cutting space 	-0.3 - 0.5 mm	0.05	0.2 mm
04	Stitch pitch 	0.5 - 2.0 mm	0.1	1.0 mm
05	No. of eyelet stitches 	4 - 20 stitches	1	9 stitches
06	Taper bartack length 	1 - 20 mm	1	6 mm
07	Offset 	0.5 - 2.0 mm	0.1	1.5 mm
08	Straight bartack length 	2.0 - 6.0 mm (up to 3.0 mm on one side)	0.1	5.0 mm

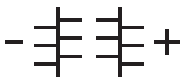
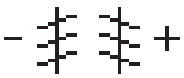
0268B - 0275B

*1: The sewing length setting range and initial value vary depending on the machine sub-class.

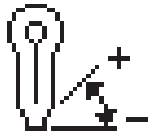
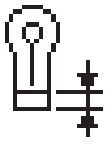
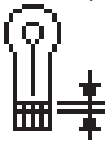
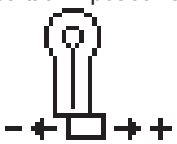
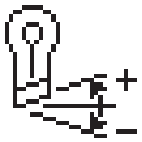
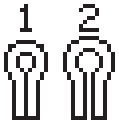
No.	Setting	Setting range	Unit	Initial value
09	No. of straight bartack stitches 	5 - 18 stitches	1	7 stitches
10	No. of round bartack stitches 	5 - 17 stitches	1	7 stitches
11	Eyelet pattern 	1 - 6 (Once the knife has been replaced, check the knife number for the replacement knife and then select an appropriate eyelet pattern.)	1	2
12	Zigzag width adjustment 	-1.0 - 1.0 mm	0.1	0.0 mm
13	Eyelet deceleration speed (*2) 	-600 - 0 rpm	100	0 rpm
14	Straight bartack speed (*3) 	1,000 - 2,500 rpm	100	1,800 rpm
15	Number of slow start stitches 	0 - 3 stitches	1	0 stitches
16	Slow start speed (*4) 	400 - 1,500 rpm	100	700 rpm

0276B - 0283B

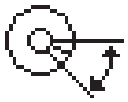
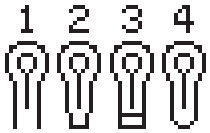
*2: The standard eyelet deceleration speed is the value that has been set by parameter No. 01 (sewing speed).
*3: If the sewing speed is set to a speed that is slower than the straight bartack speed, the straight bartack speed used for sewing will be the same as the normal sewing speed.
*4: If the sewing speed is set to a speed that is slower than the slow start speed, the slow start speed used for sewing will be the same as the normal sewing speed.

No.	Setting	Setting range	Unit	Initial value
17	X cutting position correction value 	-0.5 - 0.5 mm	0.05	0.0 mm
18	Y cutting position correction value 	-0.7 - 0.7 mm	0.05	0.0 mm
19	No. of tying stitches at the sewing start 	0 - 4 stitches	1	0 stitches
20	No. of tying stitches at the sewing end 	0 - 4 stitches	1	0 stitches
21	X correction value 	-1 - 6	1	0
22	Y correction value 	-1 - 6	1	0
23	θ 1 correction value 	-3 - 3	1	0
24	θ 2 correction value 	-3 - 3	1	0

0284B - 0291B

No.	Setting	Setting range	Unit	Initial value
25	Taper bartack angle 	-5 - 5	1	0
26	Straight bartack width correction value 	-1.0 - 0.0 mm	0.1	0.0 mm
27	Straight bartack overlap amount 	0.0 - 2.0 mm	0.1	1.0 mm
28	Straight bartack X position alignment 	-1.0 - 1.0 mm	0.1	0.0 mm
29	Straight bartack angle correction value 	-3 - 1	1	0
30	Spare (For future version upgrades)			
31	Stitch pitch for taper bartack tying stitches at the sewing end 	20% - 100% of stitch pitch	5	100%
32	No. of round bartack overlap stitches 	1 - 4 stitches (within 45 degrees)	1	1 stitch
33	Stitch pattern for no cutting 	1: Same stitch pattern as for cutting before sewing 2: Same stitch pattern as for cutting after sewing	1	1

0292B−0294B 0471B 0295B 1645B 0297B 1646B

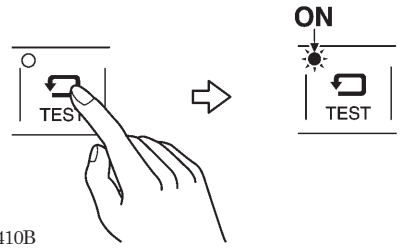
No.	Setting	Setting range	Unit	Initial value
34	Circular stitch knife size 	2 - 5 mm	1	2
35	No. of circular stitch stitches 	8 - 100 stitches	1	20
36	No. of circular stitch overlap stitches 	1 - 5 stitches (within 45 degrees)	1	2
37	Sub hammer  * This is only enabled when the cut length changeover device is being used.	OFF : Hammer ON : Sub hammer	-	OFF
38	Spare (For future version upgrades)			
39	Program copy	OFF, 1 - 20 (Specify the program number for the copy source)	1	OFF
40	Bartack shape 	1: Without bartack 2: Taper bartack 3: Straight bartack 4: Round bartack	1	2

0298B - 0300B 1647B 0301B

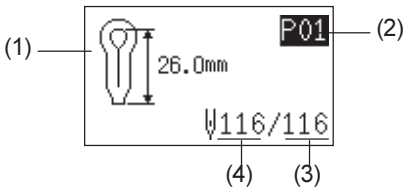
5-4. Checking the sewing pattern in test mode

Test mode can be used to make only the feed base move in the same way as during normal sewing, but with the upper shaft stopped. This mode is useful for checking the positions of the needle and other parts and of the other parts relative to each other.

1 Switch the mode to test mode.



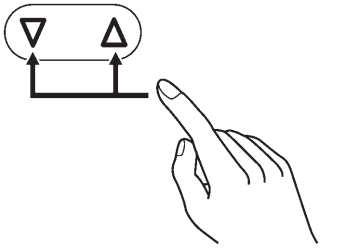
0410B



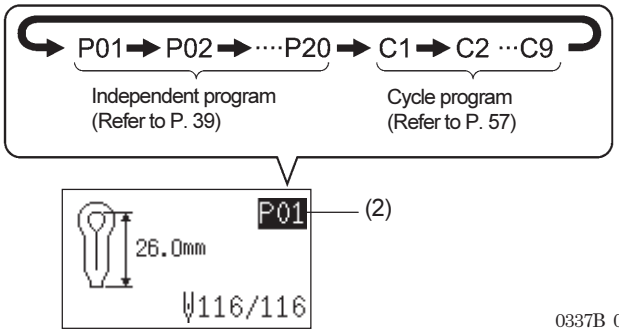
The sewing shape (1), program number (2), total number of stitches (3) and number of remaining stitches (4) will appear in the display.

0230B

2 Select the desired program number (2).



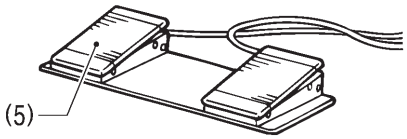
0413B



0337B 0230B

The program No. (2) changes in the order shown in the illustration each time the △ key is pressed. (The ▽ key changes the order in the opposite direction.)

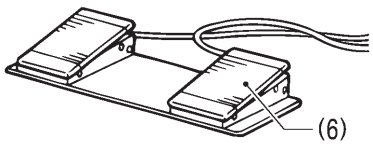
3 Press the work clamp switch (5).



0419B

The work clamps will be lowered.

4 Press the start switch (6).

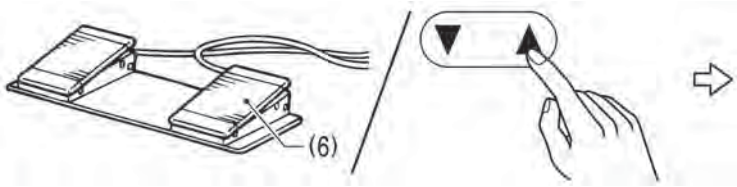


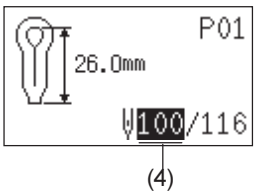
0420B

The feed base will move to the sewing start position.

5 Press the start switch (6) or the ▲ switch to start test feeding.

0231B





(The feed base will move forward by 2 stitches each time the switch or key is pressed.)
(The feed base will move quicker if you keep the switch or key pressed down.)

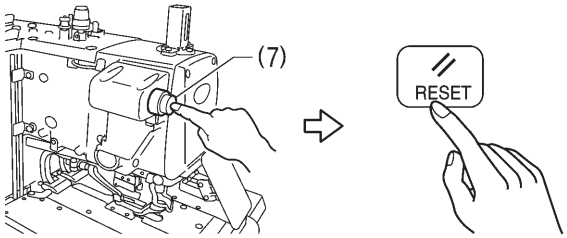
- The number of remaining stitches (4) on the display will decrease by 2 each time.
- When the final stitch is reached, the buzzer will sound.
- Thread trimming and cutting operation will not be carried out in test mode.

0421B

(Continued on next page)

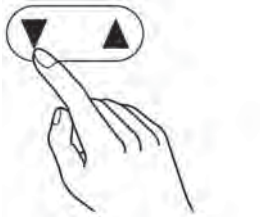
6 **[If you would like to pause test feeding and return the feed base to the material setting position]**

Press the STOP switch (7) and then press the RESET key.



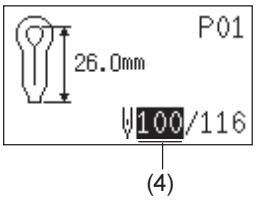
0422B

[If you would like to return the feed base to the previous sewing position during test feeding]



0423B

(The feed base will move backward by 2 stitches each time.)



(4)

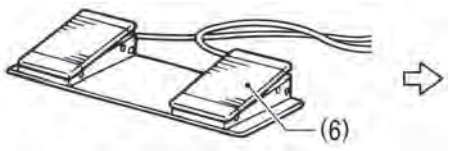
0231B

The number of remaining stitches (4) on the display will increase by 2 each time.

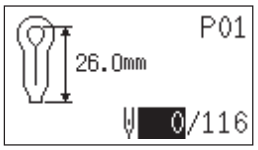
[Once sewing continues to the final stitch and the buzzer sounds]

Press the start switch (6).

* Keep pressing until the feed base returns to the material setting position.



0424B



0232B

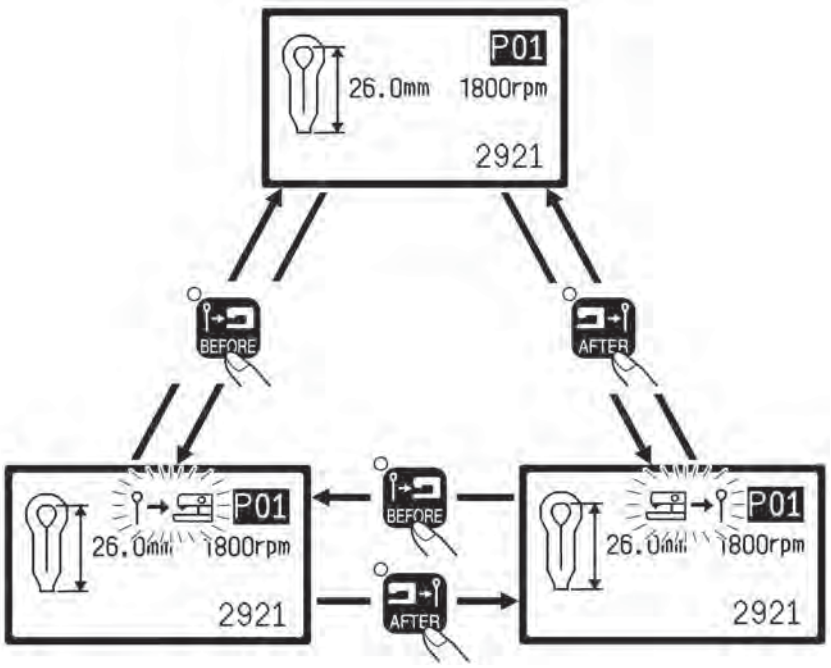
0318B

5-5. Switching cutting operation

0310B
0425B

No cutting
Cutting operations are not carried out.

When “No cutting” is selected, the cutting before sewing indicator and the cutting after sewing indicator will both switch off.



Cutting before sewing
Sewing is carried out after cutting has been carried out.

When cutting before sewing is selected, the cutting before sewing indicator illuminates.

Cutting after sewing
Cutting is carried out after sewing has been carried out.

When cutting after sewing is selected, the cutting after sewing indicator illuminates.

0308B
0309B

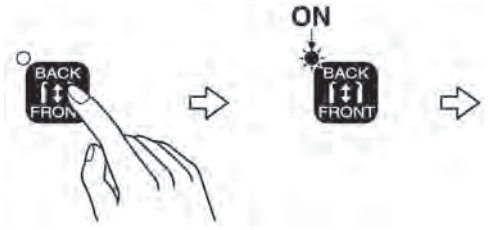
Press the BEFORE or AFTER key during the standby condition in automatic mode, test mode or manual mode.
The cutting operation changes as shown in the illustration each time a key is pressed.

5-6. Changing the material setting position

The feed base can be moved forward from the standard material setting position. This can make it easier to set the material in place. Cycle time will be reduced with this setting, particularly if cutting after sewing is selected.

[To move the feed base forward]

Press the FRONT/BACK key during the standby condition in automatic mode, test mode or manual mode.

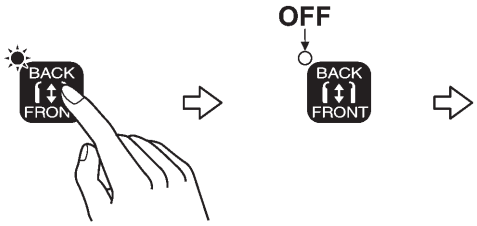


0426B

The feed base will move forward (to the sewing start position).

[To move the feed base backward (standard material setting position)]

Press the FRONT/BACK key once more.



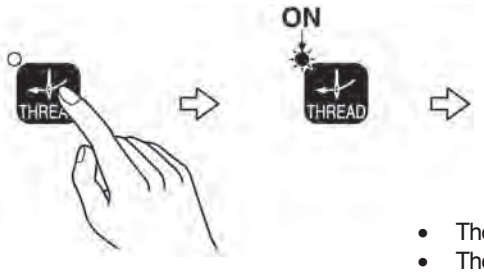
0427B

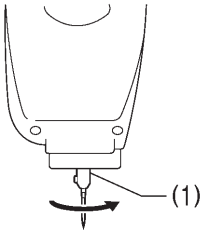
The feed base will move backward (to the standard material setting position).

5-7. Using threading mode

This is used to thread the upper thread. (Refer to “4-2. Threading the upper thread” for details on using the threader.)
When the sewing machine switches to threading mode, the needle bar (θ feed) turns 180 degrees, and then the energization of the X, Y and θ feed motors is stopped. This allows the needle bar and feed base to move freely, in order to make threading of the upper thread easier.
In addition, threading mode is safe because the sewing machine will not operate when the start switch is pressed (or the treadle is depressed).

1 Press the THREAD key during the standby condition in automatic mode, test mode or manual mode.





- The tension discs will open.
- The buzzer will sound, and then the needle bar (θ feed) (1) will turn 180 degrees. After this, energization of the X, Y and θ feed motors will be stopped.

0428B 0319B 0529B

2 Thread the thread.

- After 3 minutes have passed, the tension discs will close.

3 Once the upper thread has been threaded, press the RESET key.

- After the home positions are detected, the needle bar and feed base will return to the material setting position.
- The tension discs will close.

0429B

6. USING THE SEWING MACHINE (SEWING OPERATION)

⚠ CAUTION

Turn off the power switch before carrying out the following operations.
If this is not done, the machine may operate if the start switch is pressed by mistake, which could result in serious injury.

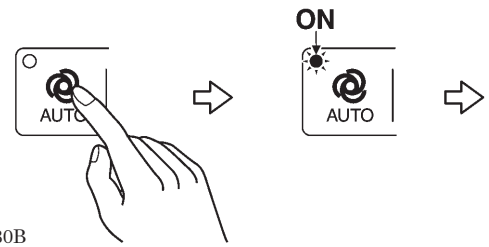
- When replacing the needle
- When not using the sewing machine and when leaving the sewing machine unattended

Do not touch any of the moving parts or press any objects against the sewing machine while sewing.
If this is not observed, it may result in personal injury or damage to the sewing machine.

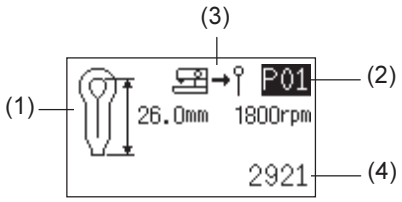
6-1. Automatic sewing (automatic mode)

- When carrying out automatic sewing for the first time, be sure to carry out a test sewing first.
- In addition, if using the sewing machine when the ambient temperature is cold, carry out several test sewing operations to allow the motor to warm up.

1 Switch the mode to automatic mode.



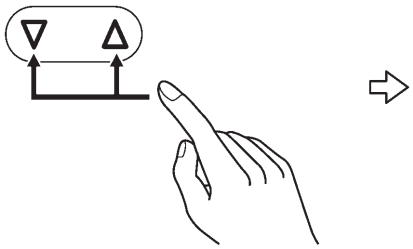
0430B

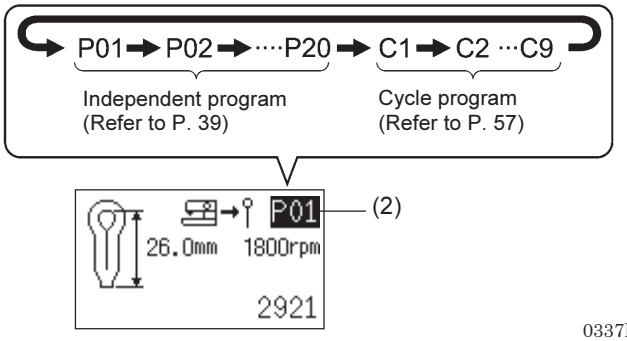


The sewing shape (1), program number (2), cutting operation (3) and production counter (4) will appear in the display.

0222B

2 Select the desired program number (2).



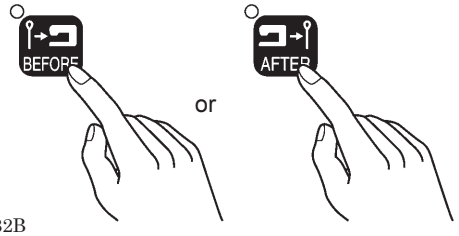


0337B
0222B

The program number (2) changes in the order shown in the illustration each time the △ key is pressed. (The ▽ key changes the order in the opposite direction.)

0413B

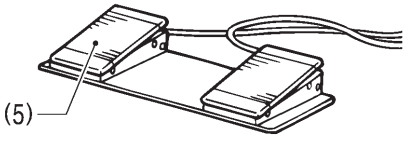
3 Select the desired cutting operation (Cutting before sewing/No cutting/Cutting after sewing).



0432B

* Refer to “5-5. Switching cutting operation” for details on switching the cutting operation.

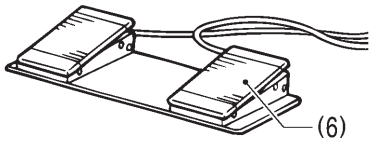
4 Place the material to be sewn under the work clamps, and then press the work clamp switch (5).



The work clamps will be lowered.

0419B

5 Press the start switch (6).



0420B

Sewing will then start.
* When sewing is finished, the work clamps will be raised. In addition, the production counter value appearing in the display will increase by 1.

6 To repeat the sewing operation, repeat steps 4 and 5 above.

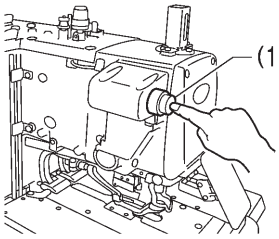
6-2. Using the STOP switch

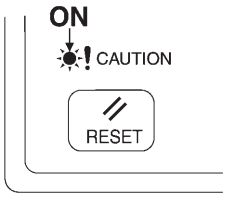
6-2-1. Pausing sewing during automatic sewing

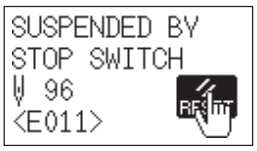
The STOP switch is used to stop the sewing machine if a problem occurs such as a thread breakage.

<Pausing sewing>

Press the STOP switch (1) while sewing is being carried out.





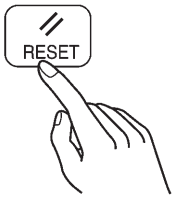


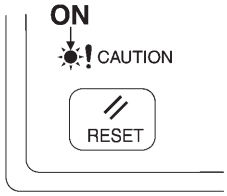
The sewing machine will stop and the buzzer will sound.

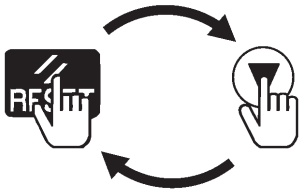
0436B 0320B

<Clearing the pause (when not continuing from the point where sewing was paused)>

1 Press the RESET key.







(The display will change alternately.)

0437B The buzzer will stop sounding. 0438B

2 Eliminate the cause of the problem.

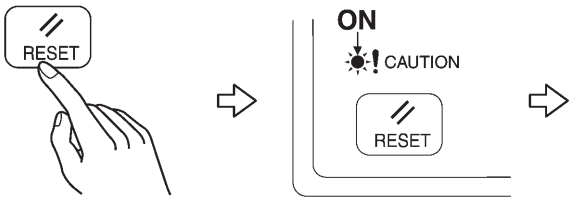
3 Press the RESET key once more.

After the home positions are detected, the needle bar and feed base will move to the material setting position.

0392B

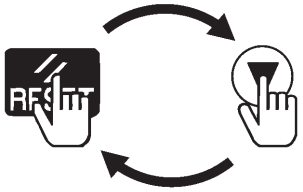
<Clearing the pause (when continuing from the point where sewing was paused)>

1 Press the RESET key.



0437B

The buzzer will stop sounding.



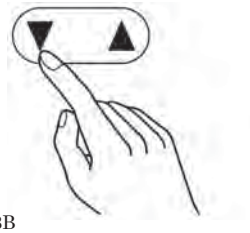
(The display will change alternately.)

0438B

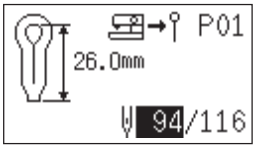
2 Eliminate the cause of the problem.

* If a problem such as an upper thread breakage has occurred, you can press the THREAD key to switch to threading mode.

3 Press the ▼ key once.

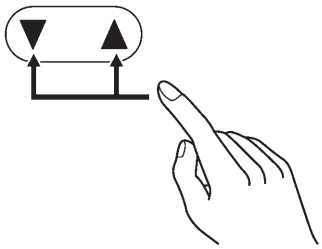


0423B



0482B

4 Press the ▲ and ▼ keys to determine the position to resume sewing.

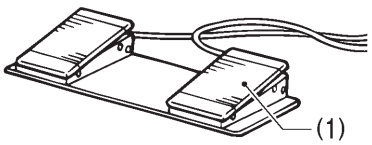


* If a problem such as an upper thread breakage has occurred, you can press the THREAD key to switch to threading mode.

- The ▲ key moves forward, and the ▼ key moves backward.
- (The feed will move quicker if you keep the key pressed down.)

0439B

5 Press the start switch (1).



0440B

Automatic sewing will resume.

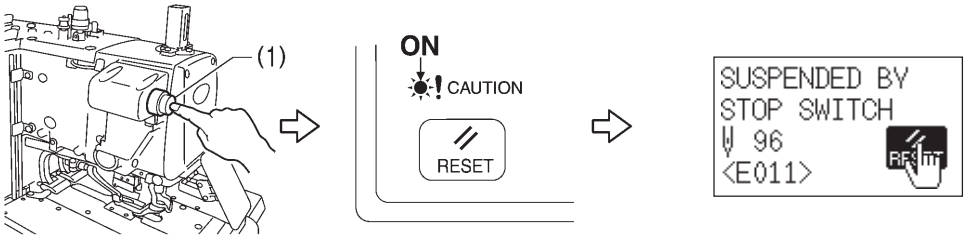
NOTE:

If the STOP switch is pressed before the upper shaft motor starts operating or after it has stopped, it will not be possible to continue sewing from the point where sewing was paused.

6-2-2. Canceling manual sewing or test feeding

<Canceling method>

Press the STOP switch (1) while manual sewing or test feeding is being carried out.

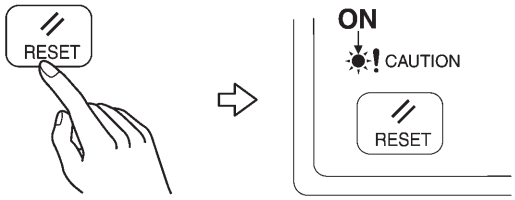


The buzzer will sound.

0436B 0320B

<Clearing the suspended display>

Press the RESET key.



- The buzzer will stop sounding.
- After the home positions are detected, the needle bar and feed base will move to the material setting position.

0437B

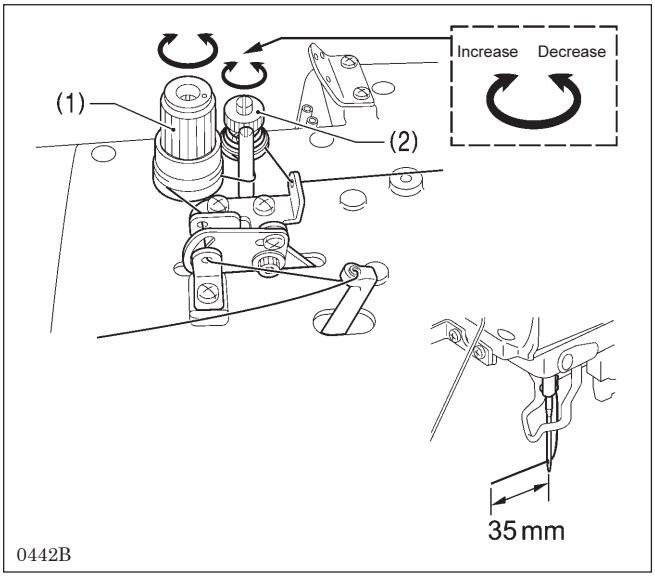
6-3. Adjusting the thread tension

The thread tension needs to be adjusted in accordance with the articles being sewn.

[Reference thread tensions]

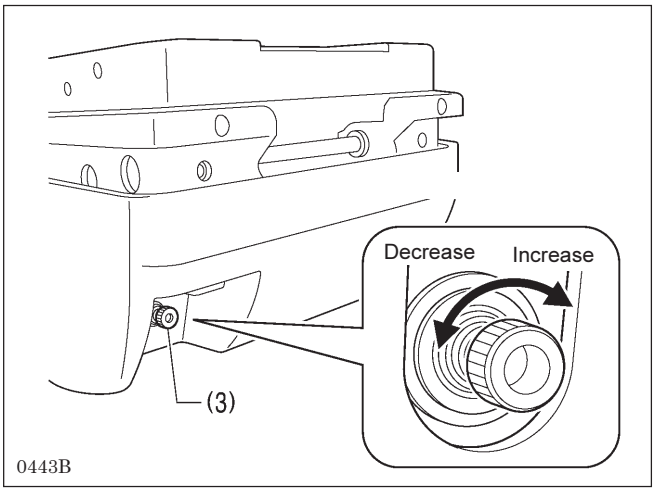
Material	Woollen material (2 layers) + padding	Denim (3 layers)
Thread used	#30 synthetic thread	#50 spun thread
Needle	DO x 558 Nm90	DO x 558 Nm110
Upper thread tension (N)	0.6	1.0
Lower thread tension (N)	0.3	0.3
Thread take-up spring tension (N)	0.05	0.07
Thread take-up spring stroke (mm)	8	8

* The upper thread tension given above is the tension when the upper thread is pulled out from the thread path hole of the thread take-up lever, and the lower thread tension is when the lower thread is pulled out from the needle hole in the throat plate.



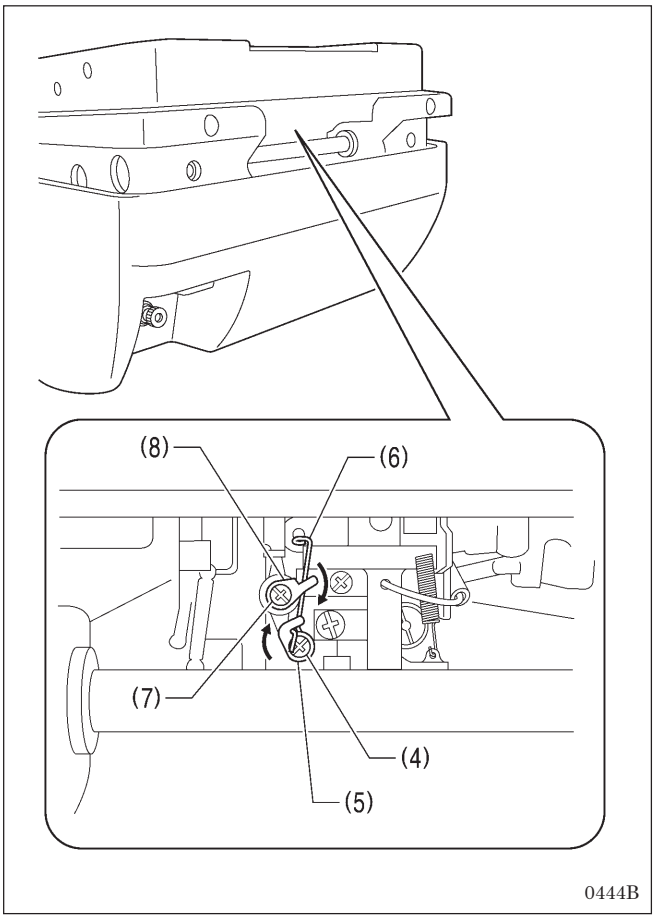
<Upper thread tension adjustment>

1. Adjust by turning the tension nut (1).
2. Turn the tension nut (2) (sub tension) to adjust so that the upper thread trailing length is about 35 mm.
   * When the tension nut (2) is turned clockwise, the upper thread trailing length will decrease, and when it is turned counterclockwise, the length will increase.



<Lower thread tension adjustment>

Adjust by turning the tension nut (3).



<Lower thread take-up spring tension and stroke adjustment>

Tension adjustment

1. Loosen the screw (4), and then turn the L thread take-up spring support (5) to adjust the tension.
   * When turned in the direction of the arrow, the tension of the thread take-up spring (6) will increase.
2. Once adjustment is complete, tighten the screw (4).

Stroke adjustment

1. Loosen the screw (7), and then turn the L thread take-up spring guide (8) to adjust the stroke.
   * When turned in the direction of the arrow, the stroke of the thread tension spring (6) will increase.
2. Once adjustment is complete, tighten the screw (7).

7. USING THE SEWING MACHINE (OPERATION PANEL: ADVANCED OPERATION)

7-1. Using cycle programs

The sewing patterns which have been registered in independent programs (P01 - P20) can be combined to register “cycle programs” so that they can be run continuously. When sewing the sewing patterns in a certain order, it can be useful to record them in a cycle program beforehand.

Cycle programs

Max. no. of recordable programs	9 (C1 - C9)
Max. no. of steps	9 (the same independent program can be selected several times)

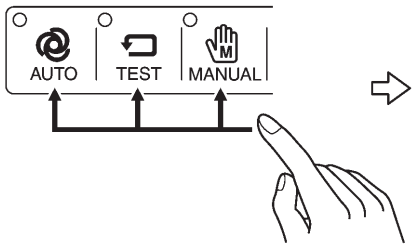
Program example

The following shows an example of storing a cycle program into cycle program C1 that consists of three steps of independent program 01 with cutting operation on, and one step of independent program 03 with cutting operation off.

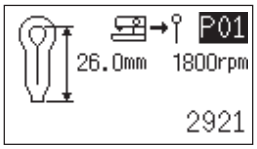
Example: Setting contents for cycle program C1

Step number	Step 1	Step 2	Step 3	Step 4
Independent program number	P01	P01	P01	P03
Cutting operation	Yes	Yes	Yes	No

1 Press one of the following keys to select a sewing mode.
(In this example, automatic mode is selected.)

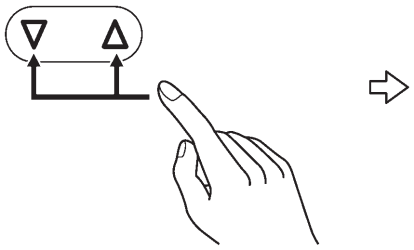


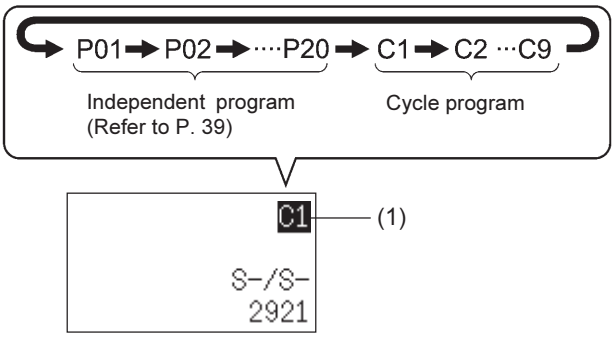
0445B



0222B

2 Select cycle program number C1 (1).





0337B
0307B

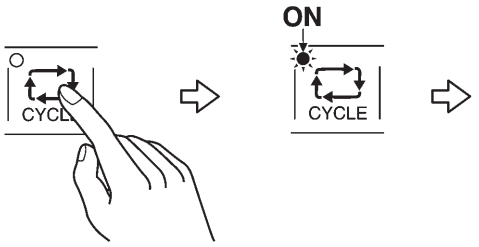
The program number (1) changes in the order shown in the illustration each time the △ key is pressed. The ▽ key changes the order in the opposite direction.

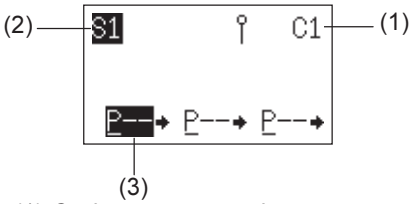
NOTE:
Cycle program mode is not available if an independent program has been selected.

0413B

3 Switch to cycle program mode.

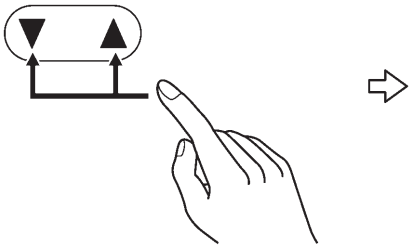
0263B





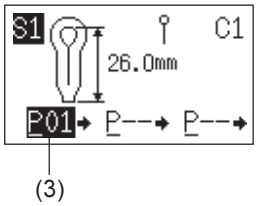
(1) Cycle program number
(2) Step number
(3) Contents (program number, cutting operation) set for the selected step number 1

4 Set the contents (3) for step 1 to "P01".



0414B

0237B



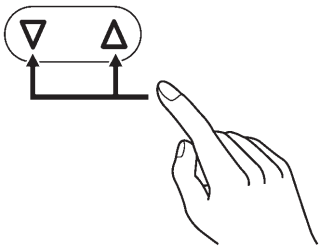
* The "_" in "P" means that cutting operation is set to be on.
* The "--" in "P--" means that no setting has been made. When "--" is set, the contents for all subsequent steps are cleared.

5 Apply the changed contents.

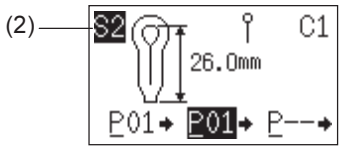
0415B

The contents (3) for step 1 will change from flashing to steadily illuminated.

6 Set the step number (2) to "2".



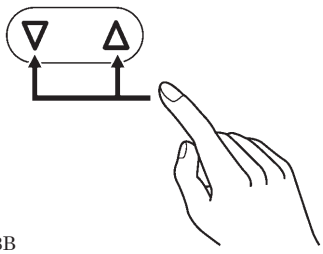
0413B



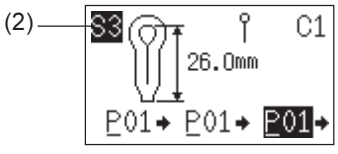
0238B

7 Repeat steps 4 and 5 above to set the contents for step 2 of the cycle program to "P01", the same contents as for step 1.

8 Set the step number (2) to "3".



0413B

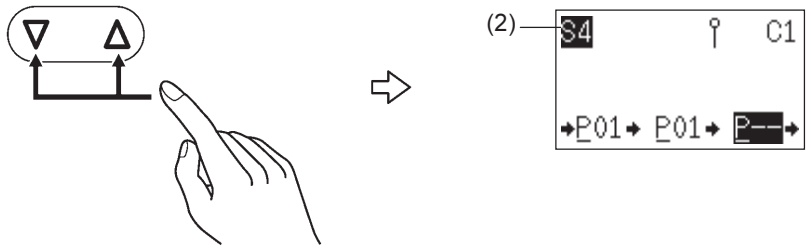


0239B

9 Repeat steps 4 and 5 above to set the contents for step 3 of the cycle program to "P01", the same contents as for step 1.

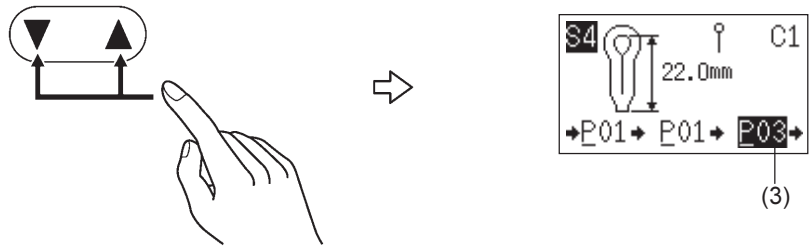
(Continued on next page)

10 Set the step number (2) to “4”.



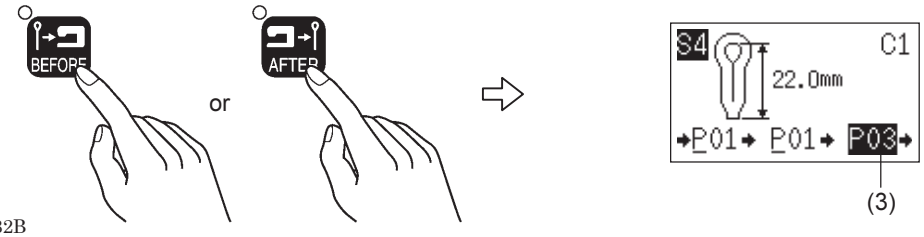
0413B 0240B

11 Set the contents (3) for step 4 to “P03”.



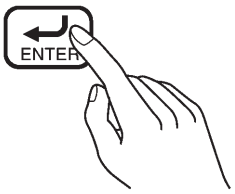
0414B 0598B

12 Press the BEFORE key or the AFTER key to change the “P” to “P”. (This sets “no cutting operation”.)



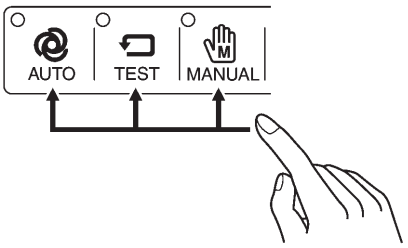
0432B 0510B

13 Apply the changed contents.



0415B

14 Press one of the following keys to exit cycle program mode.



0445B

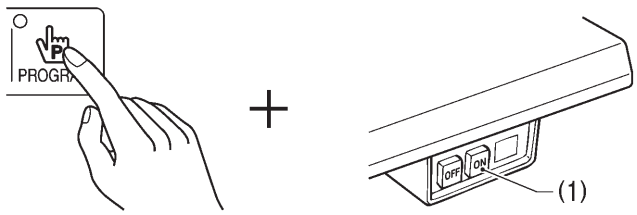
NOTE:

When a cycle program is selected for automatic sewing to be carried out, the cutting operation used is the operation that is currently selected (cutting before sewing or cutting after sewing).

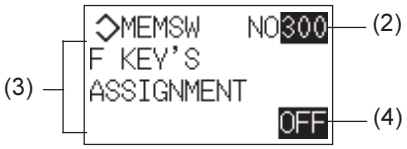
7-2. Setting memory switches

The functions of the operation panel include some that are set by memory switches at the time of shipment from the factory. You can change the settings for these memory switches if required. The settings for the memory switches are valid for all programs. Refer to “7-2-1. List of memory switch settings” for details on memory switch Nos. and settings.

1 While pressing the PROGRAM key, push the POWER switch (1) to the ON side.



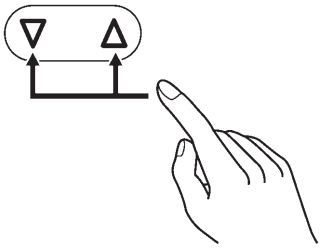
0447B



(2) Memory switch number
(3) Setting for selected number
(4) Setting range

0321B

2 Select the memory switch (2) that you would like to change the setting for.

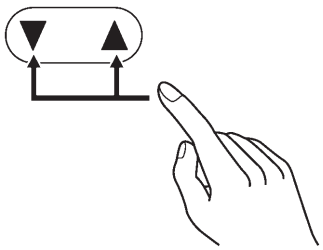


0413B

0322B

3 Change the setting value (4).

0323B

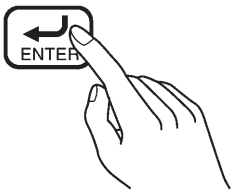


0414B

* When the setting value is changed, (4) will start flashing.
* If you would like to return the setting to the default value, press the RESET key.

4 Apply the changed setting.

0323B



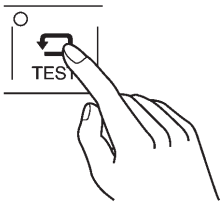
0415B

* The setting for the memory switch will be stored and (4) will stop flashing and illuminate steadily.

5 To change the settings for other memory switch Nos., repeat the operations in steps 2 - 4 above.

6 Exit memory switch mode.

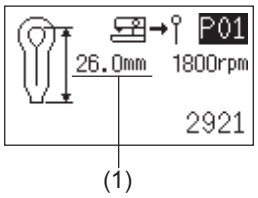
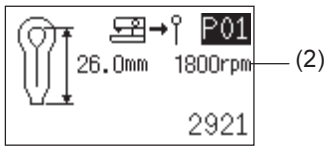
0311B



0448B

* Normal sewing machine operation will then be possible.

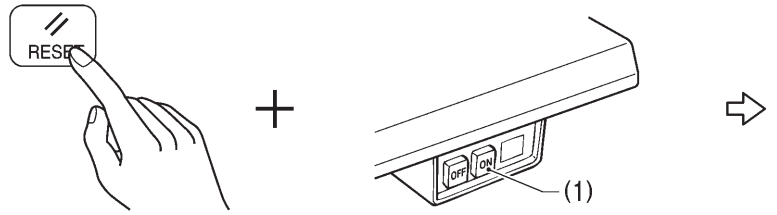
7-2-1. List of memory switch settings

No.	Setting items	Setting range	Default value
001	Switching between 1-pedal and 2-pedal operation 1: When the start switch is pressed, the work clamps are lowered and the sewing machine starts operating. 2: When the work clamp switch is pressed, the work clamps are lowered. After that, the sewing machine starts operating when the start switch is pressed.	1: 1-pedal operation 2: 2-pedal operation	2
300	Assignment of functions to the F key If the setting is OFF: The help screen will be displayed while the F key is being pressed. If the setting is 1 - 40: The 7th shortcut key will be enabled. When it is pressed, the parameters for the specified setting number (corresponding to the parameter number) will be retrieved.	OFF, 1 - 40	OFF
301	Parameter display during automatic mode Sets the parameter settings that appear in the display (1) during automatic mode. 	1: Sewing length 2: Pitch	1
302	Parameter display during automatic mode Sets the parameter settings that appear in the display (2) during automatic mode. 	3: Sewing speed 4: Number of stitches.	3
303	Display screen contrast The contrast becomes stronger as the value is increased.	0 - 30	15

7-3. Resetting the data (initialization)

If the sewing machine stops operating normally, the cause may be that an incorrect memory setting may have been made by means of memory switches, for instance. In such cases, it may be possible to restore normal operation by following the steps given below to initialize the memory setting data.

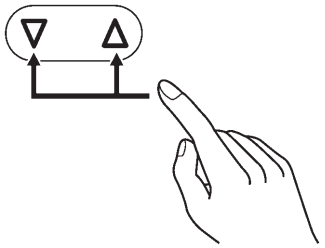
1 While pressing the RESET key, push the POWER switch (1) to the ON side. 0324B



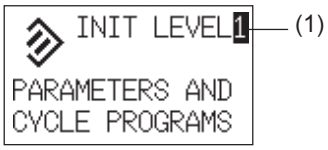
0449B

The mode will switch to initialization mode.

2 Select the initialization level (1) from 1 to 3. 0324B



0413B

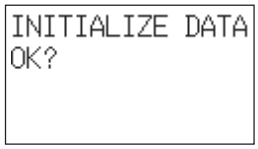


Level 1 is selected as the default.

* The settings that are reset (initialized) will vary depending on the initialization level selected. (Refer to the table on the next page.)

3 **[To proceed with initialization]** 0325B

0415B



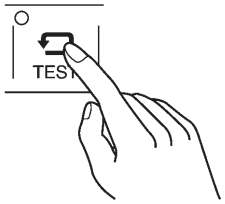
4 **[To carry out initialization]**

“INITIALIZING” will be displayed and initialization will start.

* If you would like to cancel the initialization procedure, press the RESET key.

0415B

5 **[To exit initialization mode]** 0311B



0448B

Normal sewing machine operation will then be possible.

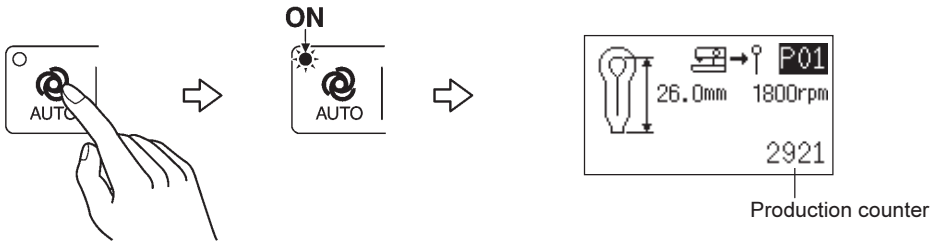
Initialization level and settings that are reset or initialized.

	Level 1	Level 2	Level 3
Program settings (Parameter)	Default value	-	Default value
Cycle programs	Reset	-	Reset
Memory switch	-	Default value	Default value
Program No.	-	-	1
Parameter No.	-	-	1
Production counter	-	-	0
Operating mode	-	-	Program
Material setting position	-	-	Set back
Cutting operation	-	-	OFF

7-4. Changing the production counter setting

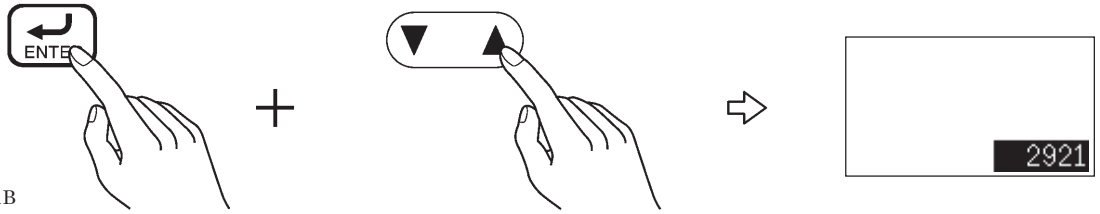
The production counter is displayed at the bottom-right of the screen during automatic mode. The counter value increases by 1 each time a pattern is sewn.

1 Switch the mode to automatic mode.



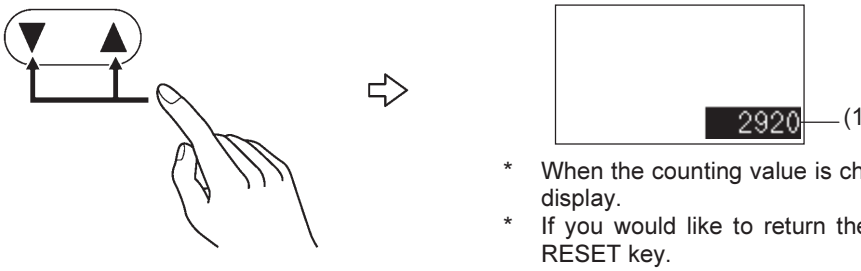
0430B 0222B

2 While the sewing machine is at standby, hold down the ENTER key and press the ▲ key.



0451B 0262B

3 Set the counting value (1).



0599B

0414B

* When the counting value is changed, (1) will flash in the display.
* If you would like to return the setting to “0”, press the RESET key.

4 Apply the changed setting.

The mode will return to automatic mode.

0415B 0600B

NOTE:

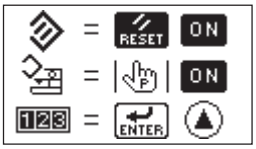
If you press the AUTO key while the counting value (1) is flashing, the mode will return to automatic mode and the setting will not be changed.

7-5. Displaying the help screen

The help screen is a screen which uses graphics to show how to switch the sewing machine to data initialization mode, memory switch setting mode and production counter setting mode. (Refer to the table below for details.)

1 Press the F key while the sewing machine is in standby during automatic mode, test mode, manual mode, program mode or cycle program mode.

0452B



* The help screen will be displayed while the F key is being pressed.

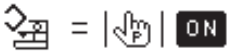
0303B

2 When the F key is released, the display will return to the normal display.

NOTE:

If the F key has been assigned as a shortcut key by changing the memory switch settings, it will not be possible to display the help screen. To display the help screen, change the setting for memory switch No. 300 to OFF. (Refer to "7-2. Setting memory switches".)

Meaning of help screen symbols

Symbol	Meaning	Operation method
	How to switch to data initialization mode	While holding down the RESET key, push the POWER switch to the ON side.
	How to switch to memory switch setting mode	While holding down the PROGRAM key, push the POWER switch to the ON side.
	How to switch to production counter setting mode	While the sewing machine is at standby in automatic mode, hold down the ENTER key and press the ▲ key.

0304B
0305B
0306B

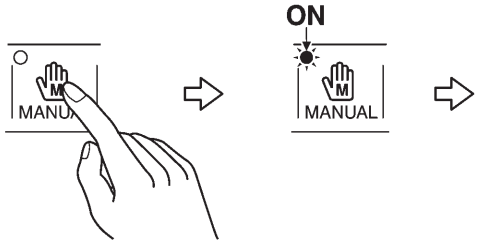
7-6. Manual sewing (manual mode)

CAUTION

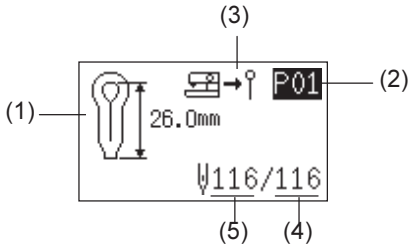
The hammer may operate during manual mode, so do not put your hands near the hammer at this time. If care is not taken, injury may result.

You can turn the upper shaft pulley by hand to move the feed base one stitch at a time. This is useful to do when adjusting the spreader timing. (Refer to “9-10. Adjusting the spreader timing”.)

1 Switch the mode to manual mode.



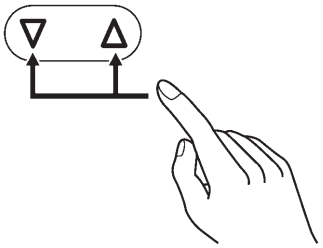
0433B



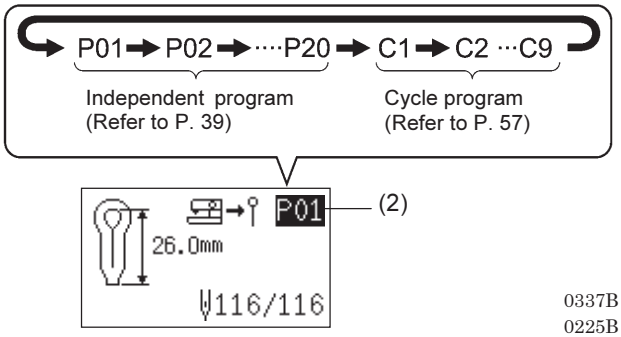
0225B

The sewing shape (1), program number (2), cutting operation (3), total number of stitches (4) and number of stitches remaining (5) will appear in the display.

2 Select the desired program number (2).



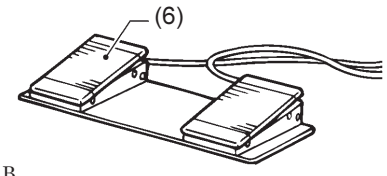
0413B



0337B
0225B

The program number (2) changes in the order shown in the illustration each time the △ key is pressed. (The ▽ key changes the order in the opposite direction.)

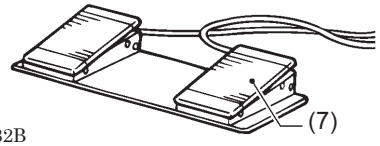
3 Place the material to be sewn under the work clamps, and then press the work clamp switch (6).



0531B

The work clamps will be lowered.

4 Press the start switch (7).



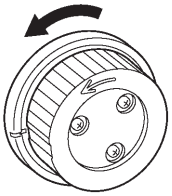
0532B

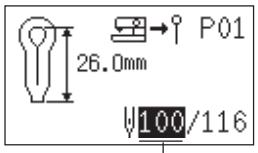
The feed base will move to the sewing start position.

NOTE:
If cutting operation is set to “Cutting before sewing”, the hammer will operate.

5 Turn the upper shaft pulley by hand.

0226B





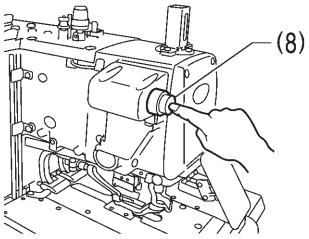
(5)

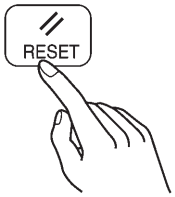
- The feed base will move to the next sewing start position in accordance with the rotation of the upper shaft.
- The number of remaining stitches (5) in the display will decrease by 1 each time the upper shaft pulley is rotated half a turn (when the needle bar moves up and down once).

NOTE:
If the upper shaft pulley is turned in the reverse direction, no seam will be formed, so do not turn it in the reverse direction.

0435B

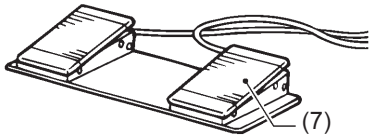
6 **[If you would like to pause manual sewing and return the feed base to the material setting position]**
Press the STOP switch (8) and then press the RESET key.





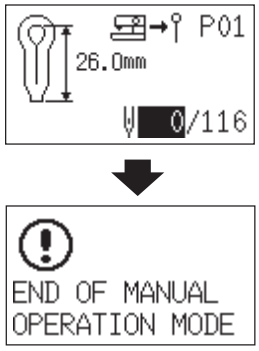
0533B

[Once sewing continues to the final stitch and the buzzer sounds]
When the needle bar is at the needle up stop position, press the start switch (7).



(Keep pressing until the feed base returns to the material setting position.)

0227B
0326B



Thread trimming will be carried out and the feed base will return to the material setting position.)

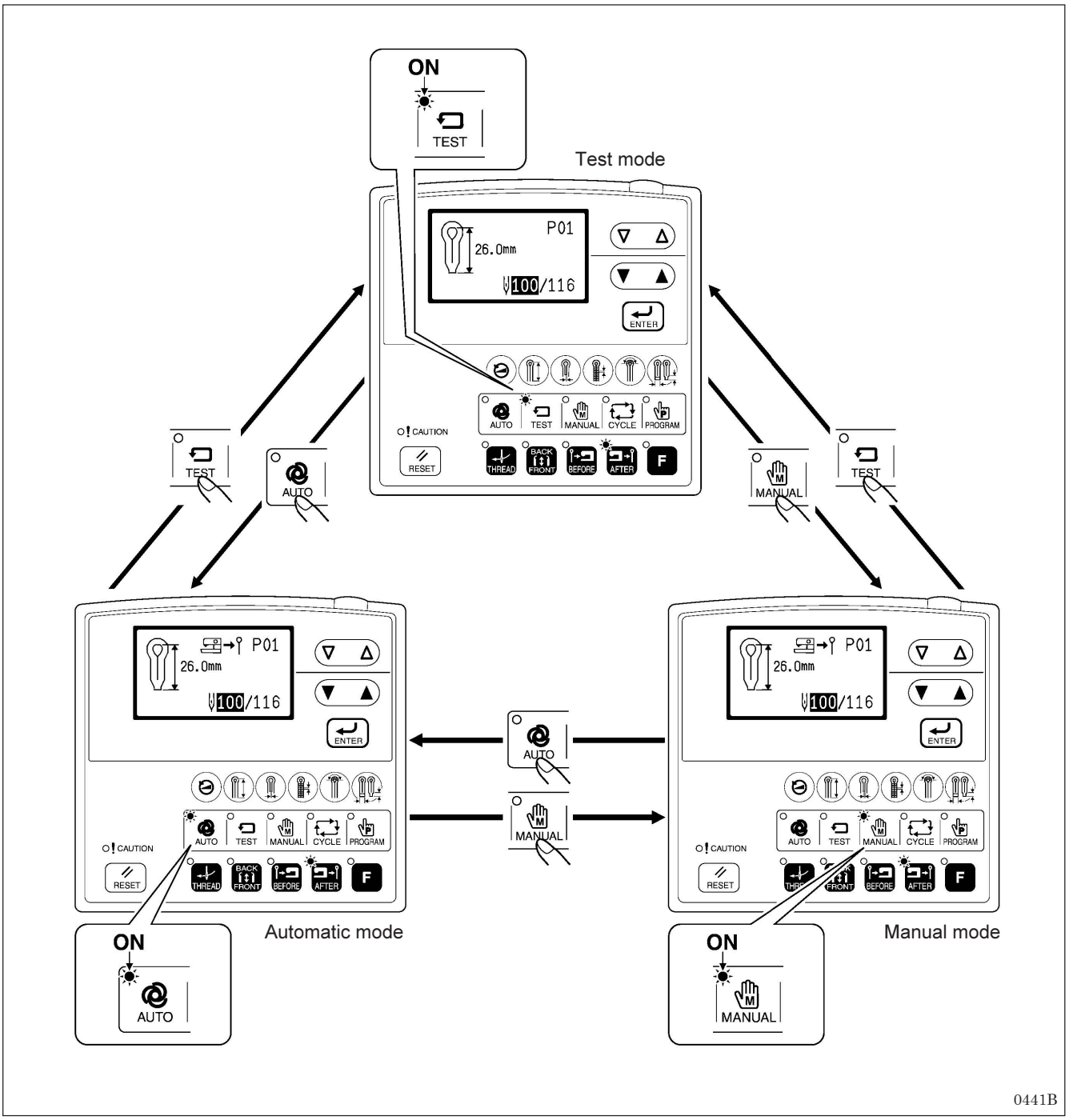
NOTE:
<u>If cutting operation is set to “Cutting after sewing”, the hammer will operate.</u>

0532B

7-7. Switching the sewing mode while sewing is in progress

If a stop (or interruption) has been cleared during automatic sewing, manual sewing or test mode, you can switch the mode to the desired mode by pressing the corresponding mode key.

The sewing mode changes as shown in the illustration each time a key is pressed.



8. CLEANING AND INSPECTION

⚠ CAUTION

Turn off the power switch before carrying out this operation.
Turn off the power switch before starting any cleaning work, otherwise the machine may operate if the start switch is pressed by mistake, which could result in serious injury.

Be sure to wear protective goggles and gloves when handling the lubricating oil, so that it does not get into your eyes or onto your skin.
If care is not taken, inflammation can result.
Furthermore, do not drink the lubricating oil. Diarrhea or vomiting may result.
Keep the oil out of the reach of children.

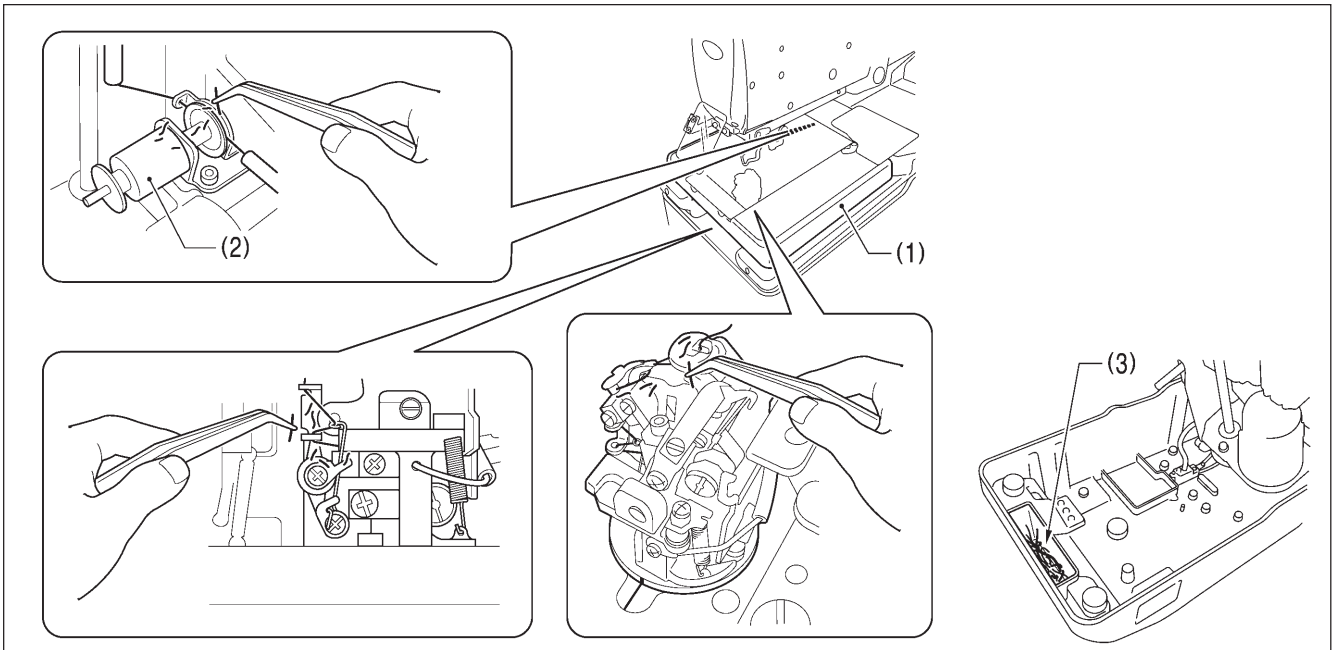
8-1. Daily cleaning and inspection

The following cleaning operations should be carried out each day in order to maintain the performance of this machine and to ensure a long service life. Furthermore, if the sewing machine has not been used for a long period of time, carry out the following cleaning procedures before using it again.

8-1-1. Cleaning

NOTE:

Do not use the air gun while the machine head is tilted back. Thread scraps may get inside the machine head and cause problems with operation.



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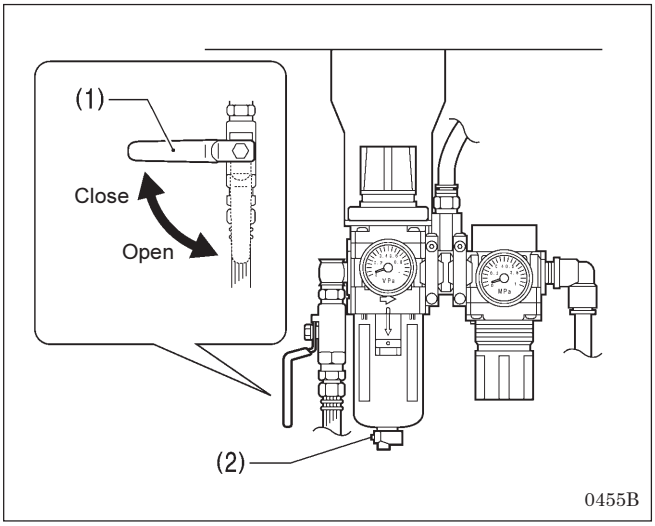
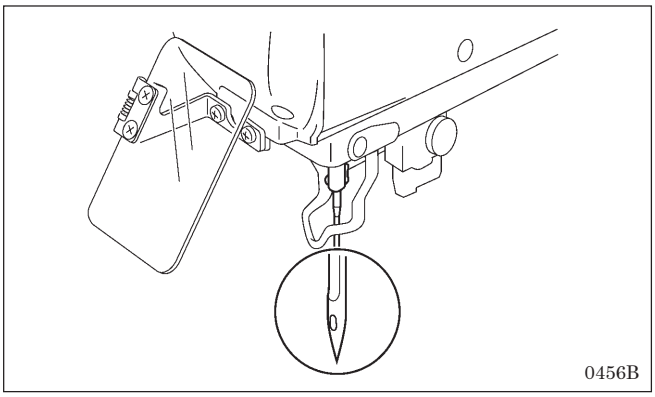
1. Turn off the power switch.
2. Turn the air cock to stop the flow of air, and then press the button to release the air.
   (Refer to “3-16. Adjusting the air pressure ”.)
3. Remove the work clamp plates. (Refer to “3-19. Installing and removing the work clamp plates”.)
4. Remove any thread scraps and dust, etc. from the thread paths for the upper thread, lower thread and gimp.
   * In particular, the looper thread path should be cleaned every day to keep it free from thread scraps and dust.
5. Move the feed base (1) by hand and remove any thread scraps and dust from around the gimp solenoid (2). **<For -02 specifications only>**
6. Tilt back the machine head and remove any thread scraps that have collected in the thread scrap collection pocket (3) in the bed base.

8-1-2. Checking the air filter



1. Close the air cock (1).
2. Press the button (2) to release the air and water that have collected inside the drain.
3. Once the air and water have been released, open the air cock (1).

8-1-3. Checking the needle

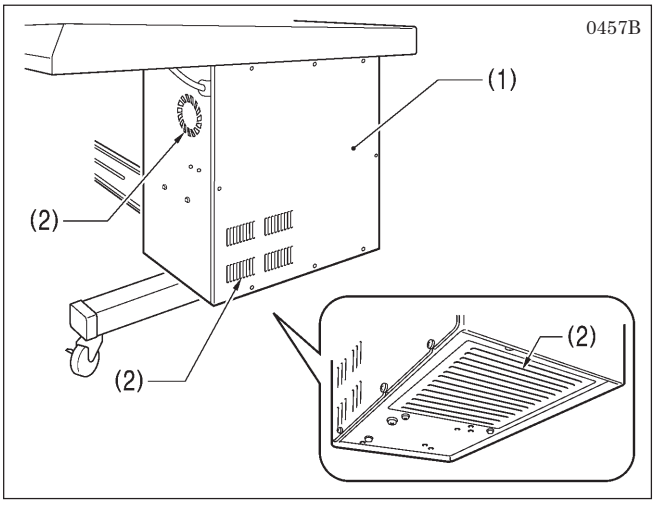


Always check that the tip of the needle is not broken and also the needle is not bent before starting sewing.

8-2. Monthly cleaning and inspection

This section describes the cleaning procedures that should be carried out periodically about once a month.

8-2-1. Cleaning the control box air inlet port

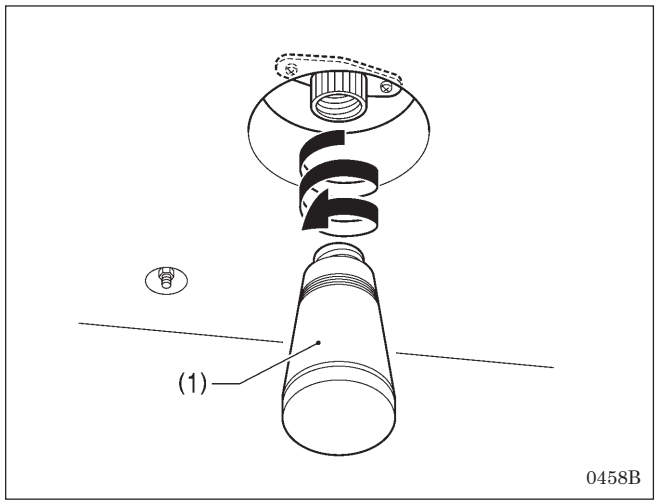


Use a vacuum cleaner to clean the filters in the air inlet ports (2) of the control box (1).

8-3. Cleaning and inspection as required

This section describes the cleaning procedures that should be carried out not regularly but when required.

8-3-1. Draining lubricating oil



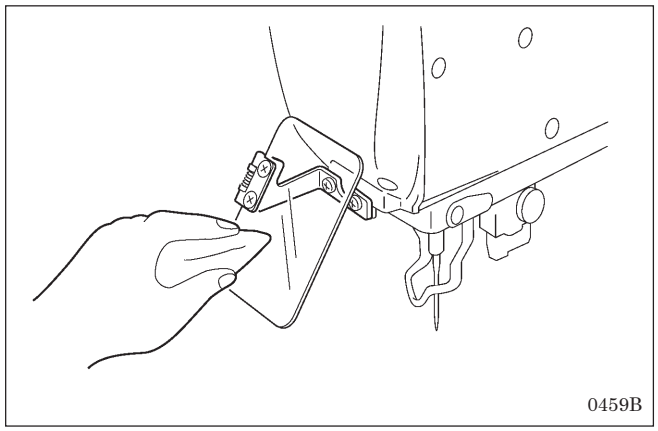
1. When the oiler (1) has filled with oil, turn the oiler (1) to remove it, and drain the oil.
2. After draining the oil, return the oiler (1) to its original position.

NOTE:

Dispose of waste oil correctly in accordance with local regulations.

If any of the oil spills onto the floor by mistake, wipe it all up carefully.

8-3-2. Cleaning the eye guard



Wipe the eye guard clean with a soft cloth.

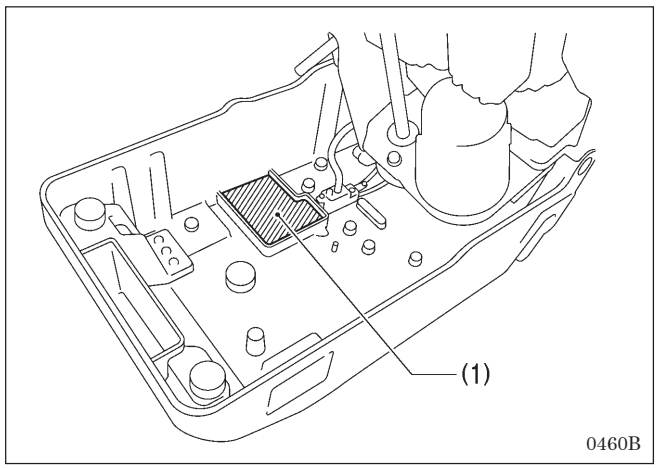
NOTE:

Do not use solvents such as kerosene or thinner to clean the eye guard. They may cause discoloration or deterioration of the eye guard.

8-3-3. Lubrication

Lubricate the machine head when required while referring to “3-20. Lubrication”.

8-3-4. Draining water



1. Tilt back the machine head.
2. Water may collect in the bed base (1) depending on the condition of the air coming from the compressor, so drain this water if necessary.

NOTE:

If water collects in the bed base (1), carry out the inspections in “8-1-2. Checking the air filter”. If water still continues to collect, there may be a problem with the air cylinder, so it is recommended that you install an automatic drain (commercially-available).

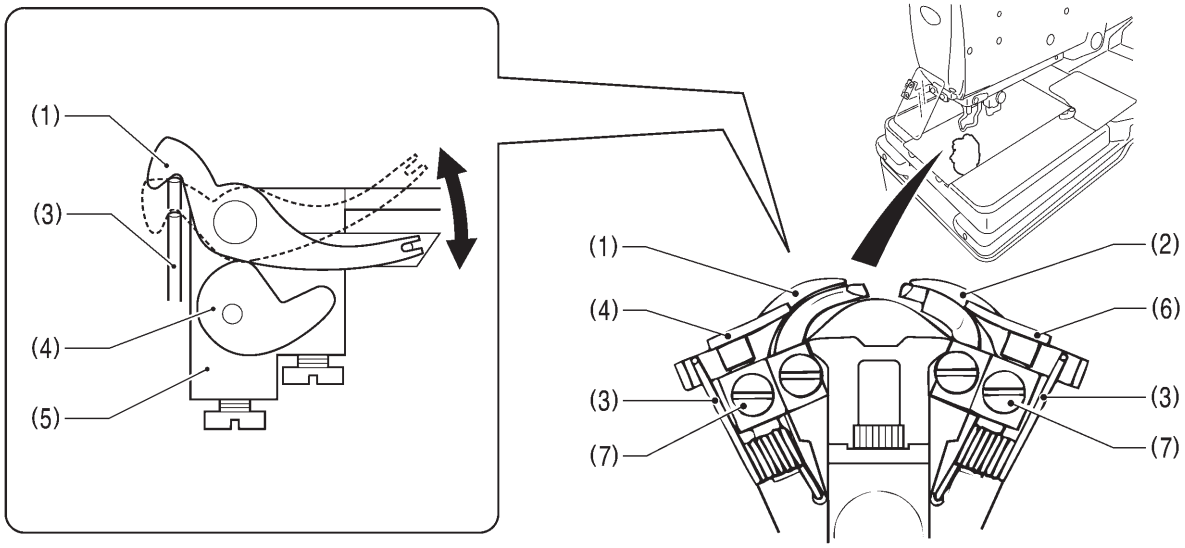
9. STANDARD ADJUSTMENTS

⚠ CAUTION

- Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.
- Ask your SUOTE dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.
- Turn off the power switch and disconnect the power cord at the following times.
  If this is not done, the sewing machine may operate if the start switch is pressed by mistake, which could result in serious injury.
  - When carrying out inspection, adjustment and maintenance
  - When replacing consumable parts such as the loopers and knife
- Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to “0” before carrying out inspection, adjustment and repair of any parts which use the pneumatic equipment.
- If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.
- If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

9-1. Adjusting the heights of the spreaders and loopers

Spreader height



(When seen from directly above) (When seen from the front)

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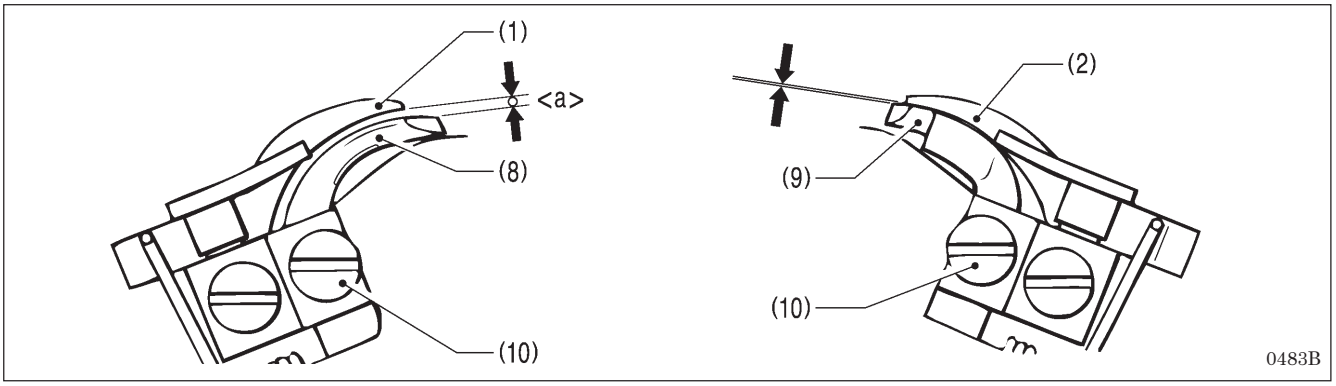
1. Remove the work clamp plates. (Refer to “3-19. Installing and removing the work clamp plates”.)
2. Check the following.
   - Check that the spring (3) causes the spreader L (1) to move smoothly without any play between the spreader stopper L (4) and the LS holder base (5).
   - Check that the spring (3) causes the spreader R (2) to move smoothly without any play between the spreader stopper R (6) and the LS holder base (5).
3. If the spreaders do not move smoothly or if there is play in their movement, loosen the set screws (7) and move the spreader stopper L (4) or spreader stopper R (6) up or down to adjust.
4. Once adjustment is complete, securely tighten the set screws (7).

Looper height



Adjust so that the positions of the eye looper (8) and the looper R (9) are as follows.

- The clearance <a> between the eye looper (8) and the spreader L (1) should be equal to the thickness of the lower thread (looper thread).
- The clearance between the looper R (9) and the spreader R (2) should be as small as possible (so that the two parts do not touch).

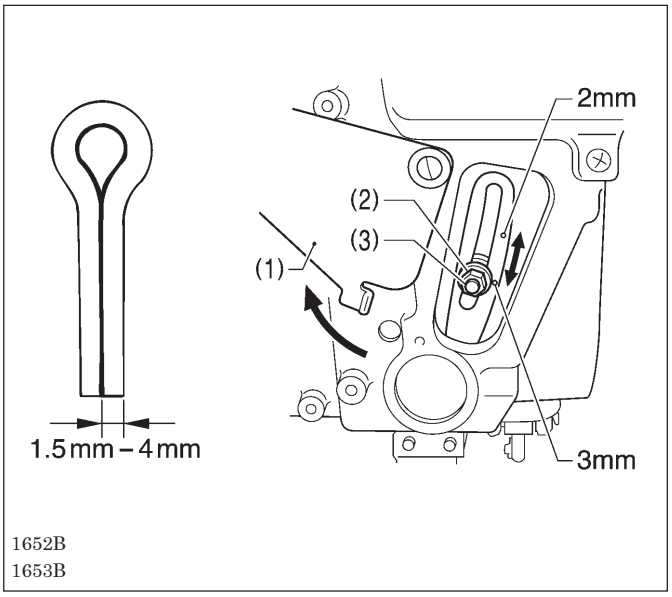
<Adjustment method>

1. Loosen the set screws (10), and then move the eye looper (8) or the looper R (9) up or down to adjust.
2. Check that the spreader L (1) and the spreader R (2) move smoothly by the force of the springs (3).
3. Once adjustment is complete, securely tighten the set screws (10).

9-2. Adjusting the zigzag width (stitch width)

The zigzag width can be adjusted to between 1.5 - 4 mm. It is set to 3 mm at the time of shipment from the factory.

* If the zigzag width is set to 3.2 mm or more, replace the throat plate (optional part).
NOTE:
If the throat plate has been replaced, carry out the following readjustments.
“9-20. Adjusting the positions of the work clamp plates”, “9-21. Adjusting the cloth opening amounts”.



1. Turn the cover (1) to open it.
2. Use the accessory socket wrench to loosen the zigzag width adjustment nut (2).
3. Move the adjustment screw (3) up or down along the slot to adjust.
   * The zigzag width becomes smaller as the adjustment screw (3) is moved upward.
   * The zigzag width becomes larger as the adjustment screw (3) is moved downward.
   * There are index marks at the 2 mm and 3 mm zigzag width positions. Align the middle of the adjustment screw (3) with the index marks.
4. Once adjustment is complete, securely tighten the adjustment nut (2), and then close the cover (1).

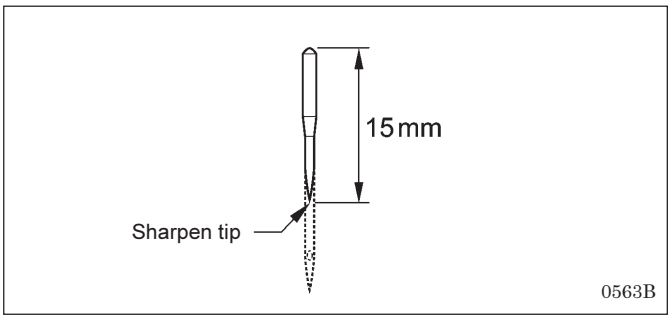
NOTE:

- If the zigzag width has been increased, carry out the following readjustments.
  “9-4. Adjusting the needle and looper timing”, “9-5. Adjusting the looper stroke”, “9-6. Adjusting the height of the needle bar”, 9-7. Adjusting the clearance between the loopers and needle”, “9-8. Adjusting the needle guard”, “9-9. Adjusting the spreader installation positions”, “9-10. Adjusting the spreader timing”.
- The index marks are a guide to the zigzag width. Lower the needle onto a piece of paper or similar to accurately measure the zigzag width.

9-3. Adjusting the zigzag base line position

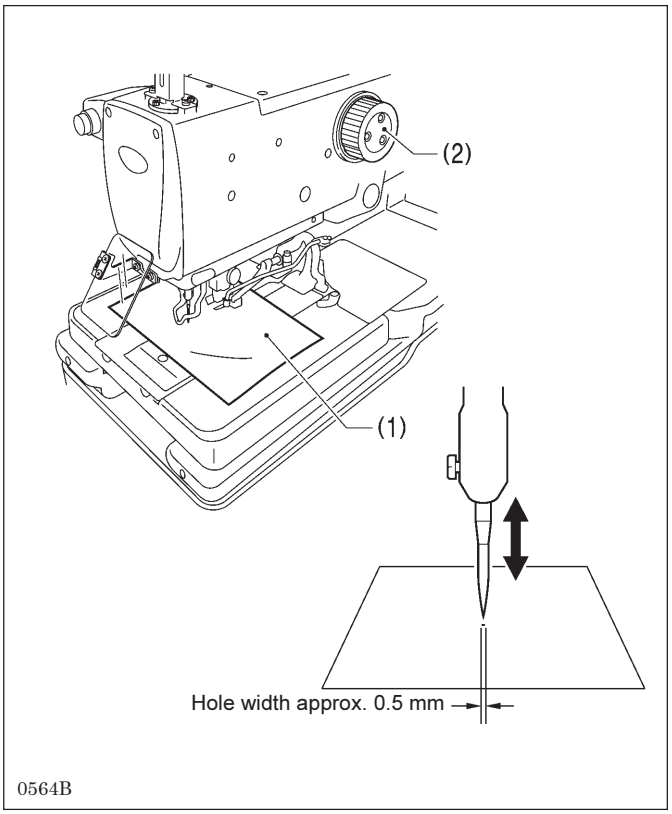
Preparing a short customized needle

Prepare a short needle as described below in order to make very small holes in a piece of paper while checking the needle drop position.



1. Use a grinder or similar to grind the tip of the currently-used needle until the length of the needle is 15 mm.
2. Sharpen the tip of the needle.

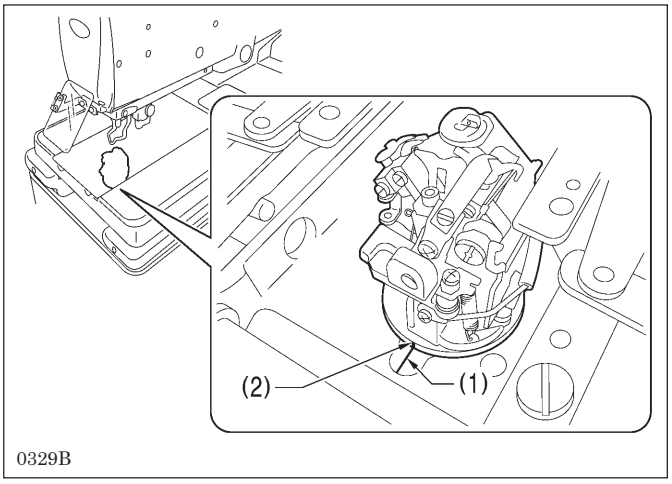
NOTE:
Sharpen the needle so that the tip of the needle is in the middle.



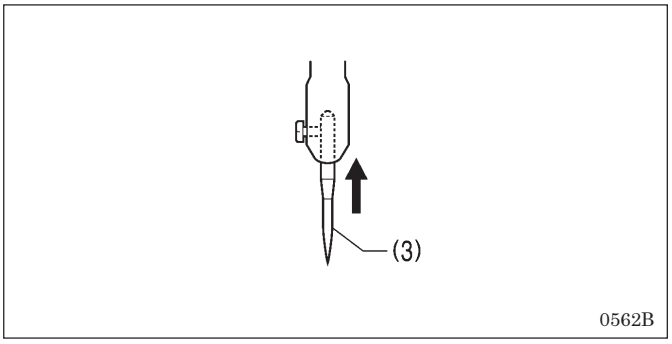
3. Place a piece of paper (1) underneath the work clamps.
4. Turn the upper shaft pulley (2) to set the needle to its lowest position.
5. Move the needle up or down to adjust the installation position of the needle so that the tip of the needle makes a hole with a width of about 0.5 mm in the paper (1) when the needle comes to the needle down position.

Adjusting the zigzag base line position

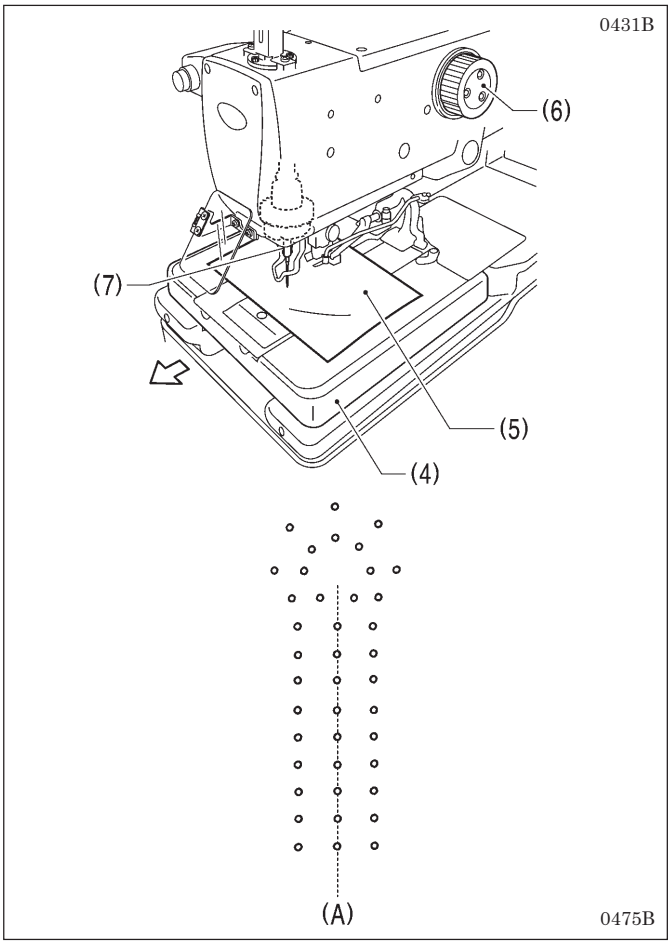
The zigzag base line is on the inside of the zigzag.
If you change the zigzag width, only the outer needle drop position will change, and the zigzag base line (inner base line) will not change.



1. Move the needle bar guard block (θ) to the home position.
   * The home position for the needle bar guard block (θ) is when the bed index mark (1) and the looper base index mark (2) are aligned.

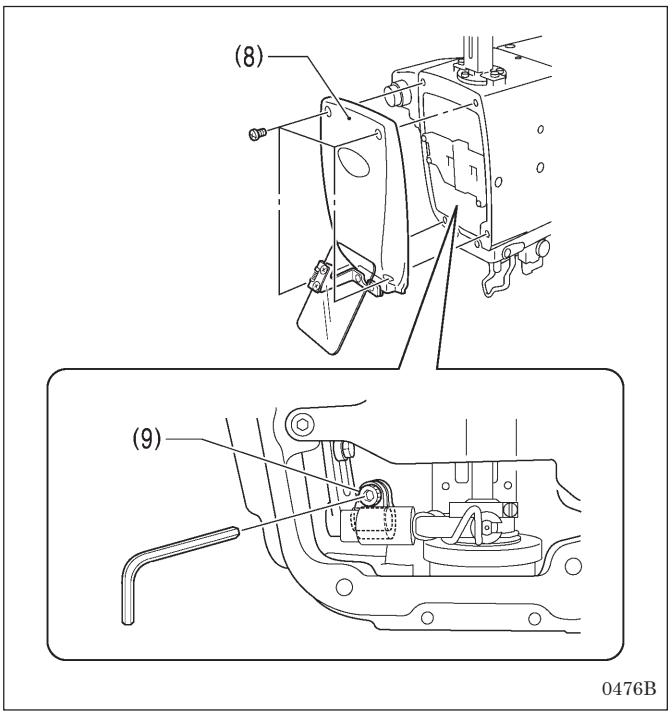


2. Install the short customized needle (3). (Refer to “Preparing a short customized needle” on the previous page.)



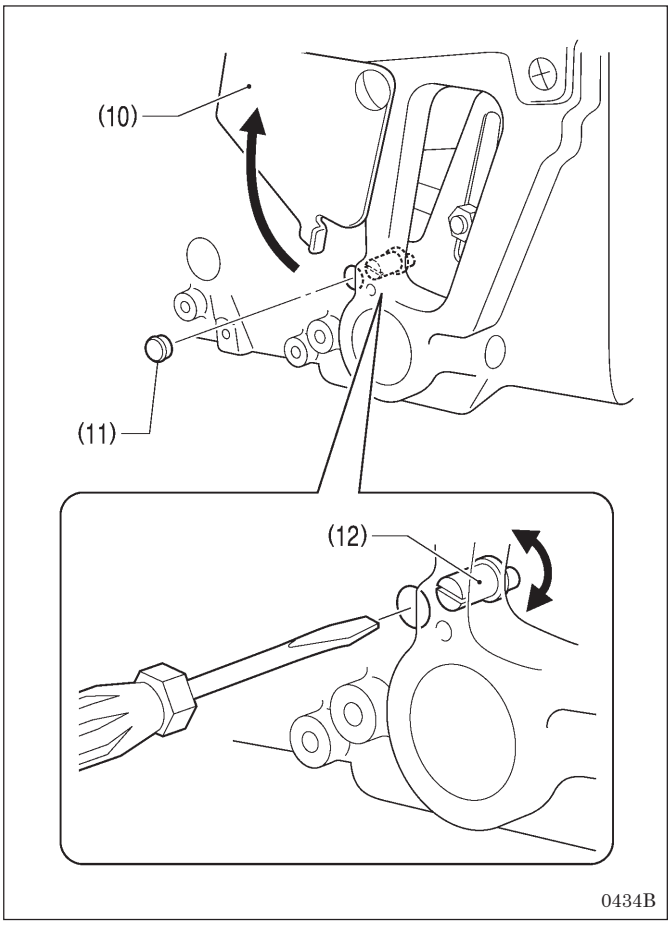
3. Move the feed base (4) forward (to near the sewing start position) by hand.
4. Place a piece of paper (5) underneath the work clamps.
   * Secure the piece of paper so that it will not move.
5. Turn the upper shaft pulley (6) to lower the needle so that it makes a small hole in the paper (5).
6. Turn the upper shaft pulley (6) in reverse to return the needle to its original position (needle up position).
7. Turn the needle bar guard block (needle bar) (7) by hand 180 degrees.
8. Turn the upper shaft pulley (6) to lower the needle so that it makes a small hole in the paper (5).
   * If the inner needle drop positions (A) are not aligned, carry out the adjustments in steps 9 - 12 on the next page.

(Continued on next page)



<Zigzag base line position adjustment>

9. Remove the face plate (8), and then loosen the socket bolt (9).



10. Open the cover (10), and then remove the cap (11).
11. Insert a flat-tipped screwdriver into the hole and turn the zigzag eccentric pin (12) to adjust the zigzag base line position.
12. Tighten the socket bolt (9).
13. Repeat steps 4 - 12 until the inner zigzag base line is aligned correctly.
14. Once adjustment is complete, return the cap (11), cover (10) and face plate (8) to their original positions.

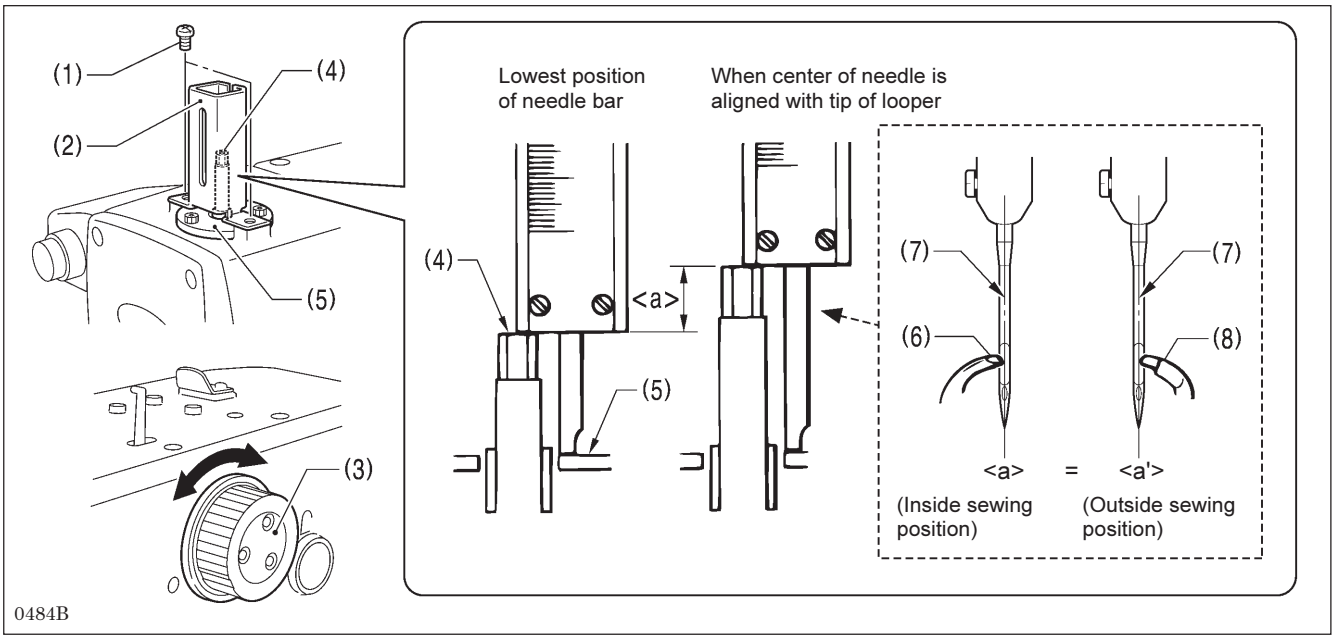
9-4. Adjusting the needle and looper timing

NOTE:

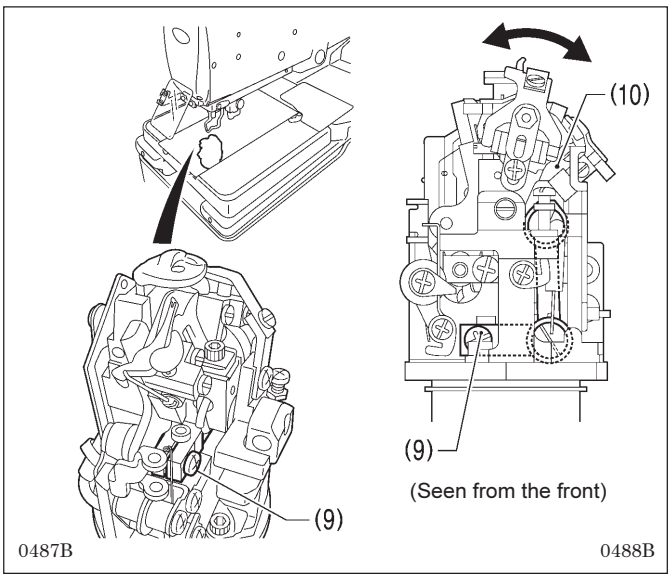
The needle bar moves through two needle drop cycles for each single turn of the upper shaft pulley. The needle drop movement toward the left side (knife cutting side) is called the "**inside sewing position**", and the needle drop movement toward the right is called the "**outside sewing position**". In addition, the amount of movement involved when the needle bar rises from its lowest position until the tip of the looper at either the left or right is aligned with the center of the needle is called the "**loop stroke**".

The left and right loop strokes must be the same as each other. This section describes the adjustments to be carried out so that the left and right loop strokes are the same.

* Before carrying out these adjustments, set the zigzag width (stitch width). (Refer to "9-2. Adjusting the zigzag width (stitch width)".)



1. Remove the two screws (1), an then remove the needle bar guard (2).
2. Turn the upper shaft pulley (3) to set the needle bar to its lowest position at the inside sewing position.
3. Use calipers to measure the length from the edge of the needle bar (4) to the top of the needle bar bush holder base (5).
4. Next, turn the upper shaft pulley (3) until the tip of the eye looper (6) is aligned with the needle center (7).
5. In the same was as in step 3, use calipers to measure the length from the edge of the needle bar (4) to the top of the needle bar bush holder base (5).
6. Calculate the difference <a> between the value obtained in step 5 and the value obtained in step 3.
7. Repeat steps 2 - 6 and calculate the difference <a'> for the outside sewing position in the same way as for the inside sewing position.
   * For the inside sewing position, align the tip of the eye looper (6) with the needle center (7), and for the outside sewing position, align the tip of looper R (8) with the needle center (7).

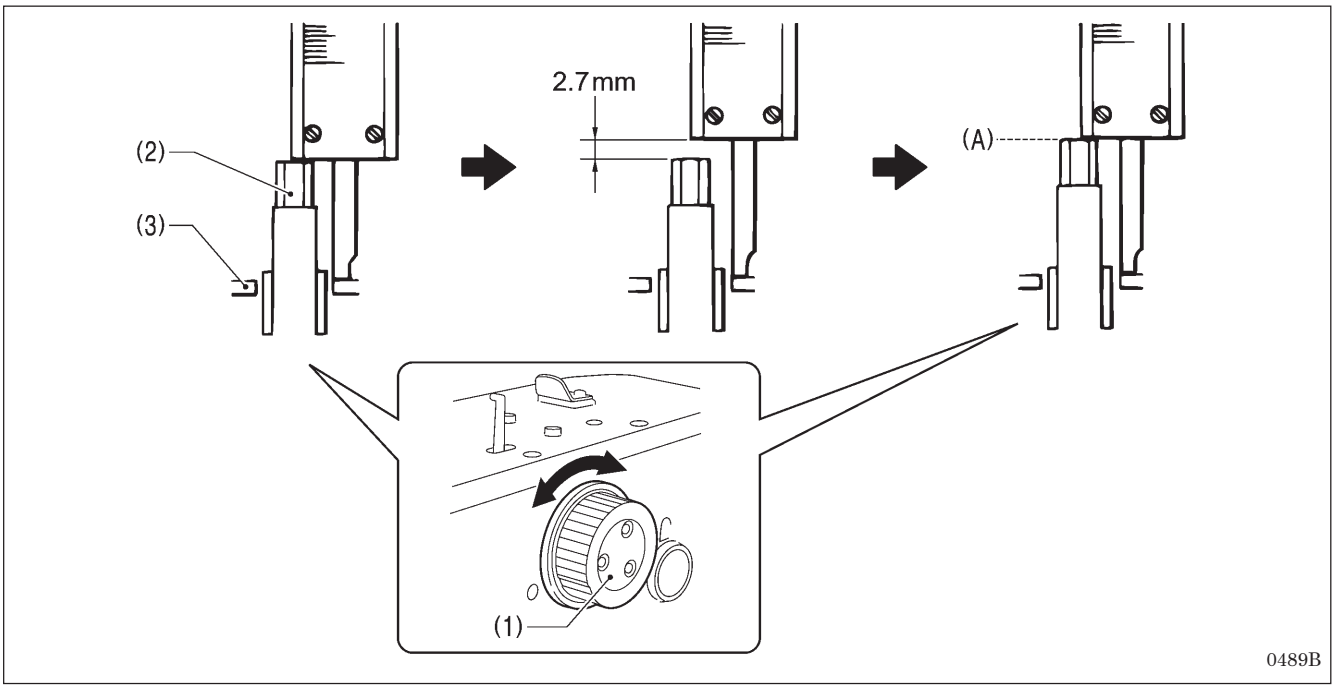


8. Loosen the screw (9).
9. Move the LS holder base (10) to the left or right to adjust so that length <a> and length <a'> are the same.
10. Once adjustment is complete, securely tighten the screw (9).

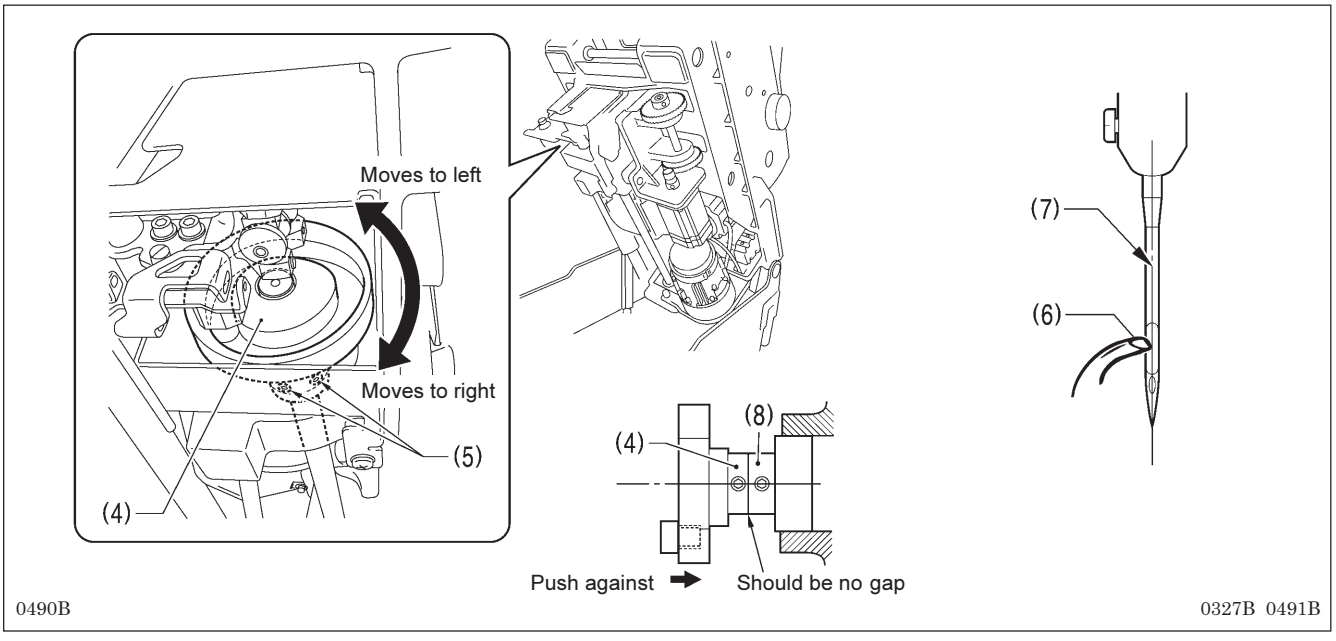
9-5. Adjusting the looper stroke

The standard looper stroke is 2.7 mm. (It may be preferable to change this depending on the material and thread.)

* Carry out the adjustment in “9-4. Adjusting the needle and looper timing” before making this adjustment.



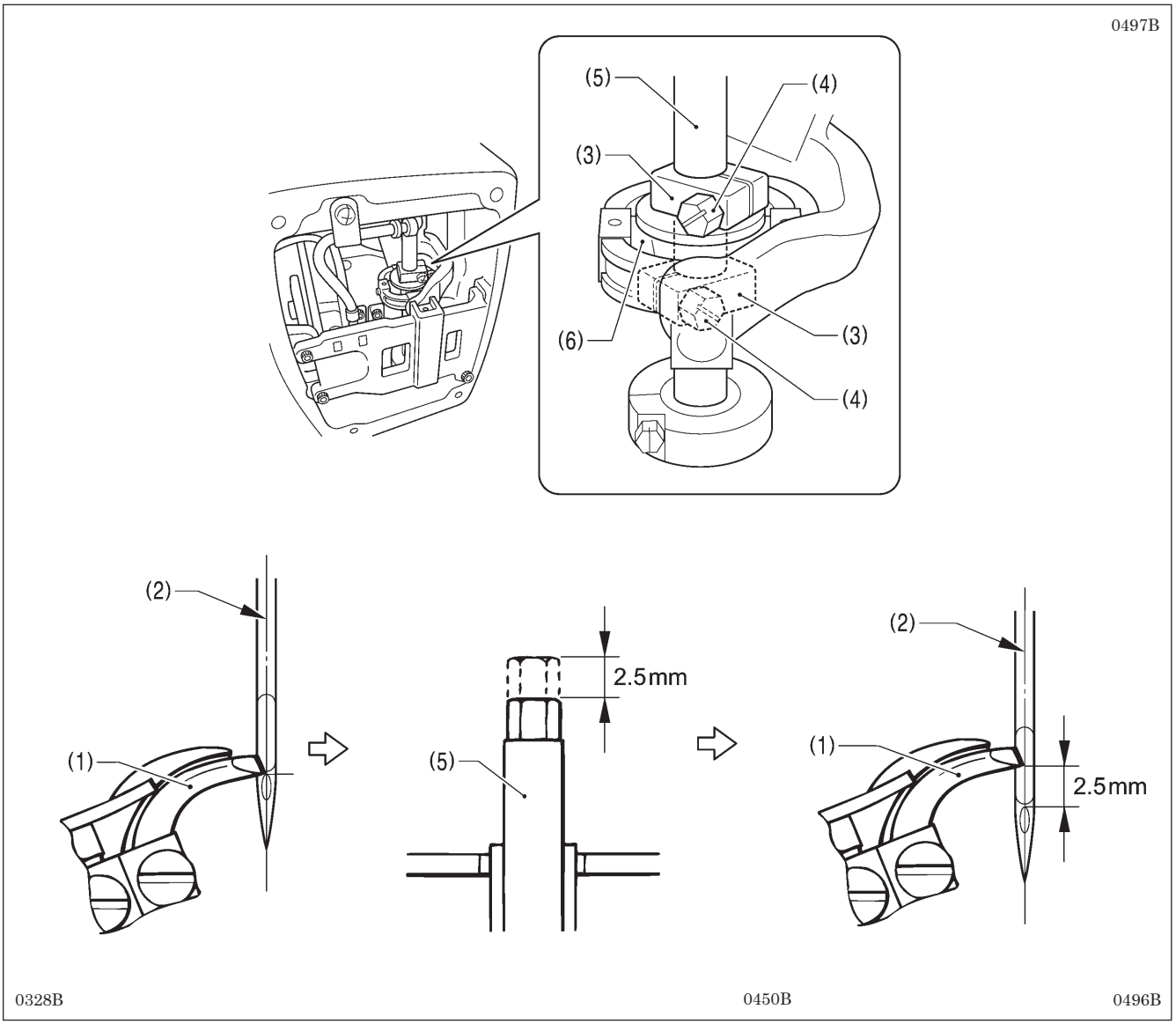
1. Turn the upper shaft pulley (1) to set the needle bar to the needle drop position at the inside sewing position.
2. At this position, use calipers to measure the length from the edge of the needle bar (2) to the top of the needle bar bush holder base (3).
3. Add 2.7 mm to the value obtained in step 2 above, and set the width of the calipers to the resulting value.
4. Turn the upper shaft pulley (1) until the edge of the needle bar (2) touches the edge of the calipers, and stop turning the upper shaft pulley (1) at that point (A).



5. Tilt back the machine head.
6. Loosen the two set screws (5) of the lower shaft cam (4).
7. With the upper shaft pulley (1) stopped, turn the lower shaft cam (4) to adjust so that the tip of the eye looper (6) is aligned with the needle center (7).
8. Once adjustment is complete, push the lower shaft cam (4) against the surface of the bearing collar (8), and then securely tighten the two set screws (5).

9-6. Adjusting the height of the needle bar

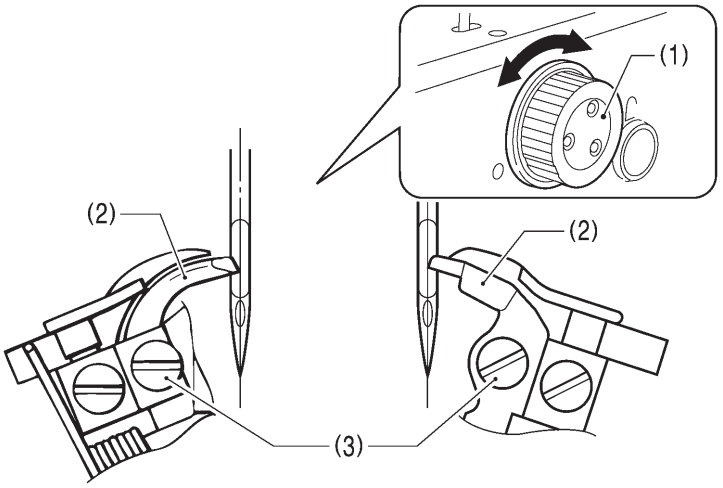
The standard height for the needle bar is 2.5 mm. (It may be preferable to change this depending on the material and thread.)



1. Remove the face plate.
2. Turn the upper shaft pulley until the tip of the eye looper (1) is aligned with the top edge of the needle hole in the needle center (2) when the needle is at the inside sewing position.
3. Loosen the two screws (4) of the top and bottom needle bar clamps (3).
4. Lower the needle bar (5) 2.5 mm from the position where the tip of the eye looper (1) is aligned with the top edge of the needle hole.
5. In order to make the needle bar turn smoothly, adjust so that there is no play in the needle bar, but so that there is enough of a gap between the needle bar clamps (3) and the needle bar feed rock link (6) for oil to get into.
6. Once adjustment is complete, securely tighten the two screws (4) and install the face plate.

9-7. Adjusting the clearance between the loopers and needle

If the needle count has been changed, always be sure to check the clearance between the needle and the loopers, and adjust the clearances if necessary. These adjustments should be made for both the inside sewing position and outside sewing position.



(Inside sewing position) (Outside sewing position)

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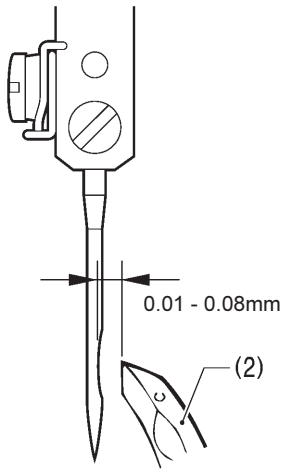

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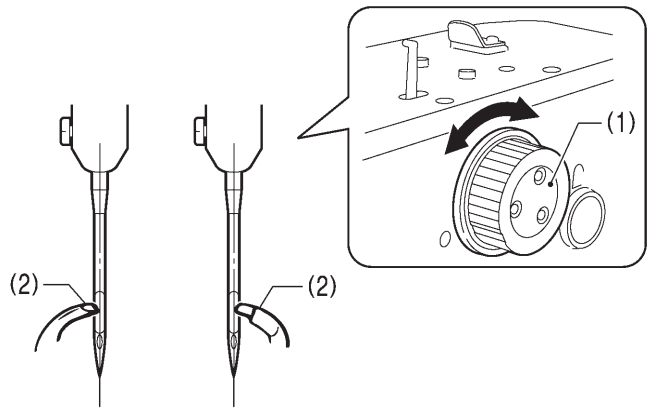
Turn the upper shaft pulley (1) so that the tips of both the left and right loopers (2) are aligned with the needle center, and then loosen the set screws (3) and adjust the clearances between the needle and the tips of the loopers (2) to 0.01 - 0.08 mm.

* These clearances must be uniform while the looper base is rotating (through 360 degrees). If they are not uniform, adjust the center of rotation of the needle bar. (The center of rotation is already adjusted at the time of shipment from the factory.)
* After making this adjustment, carry out the adjustment procedures given in “9-9. Adjusting the spreader installation positions”.

9-8. Adjusting the needle guard

If the needle count has been changed, always be sure to check the position of the needle guard, and adjust the position if necessary. This adjustment should be made for both the inside sewing position and outside sewing position.



(Inside sewing position) (Outside sewing position)

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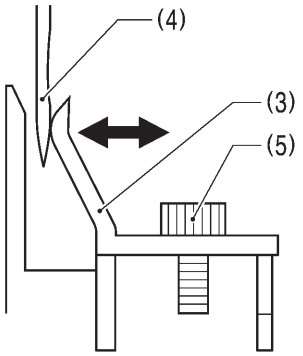

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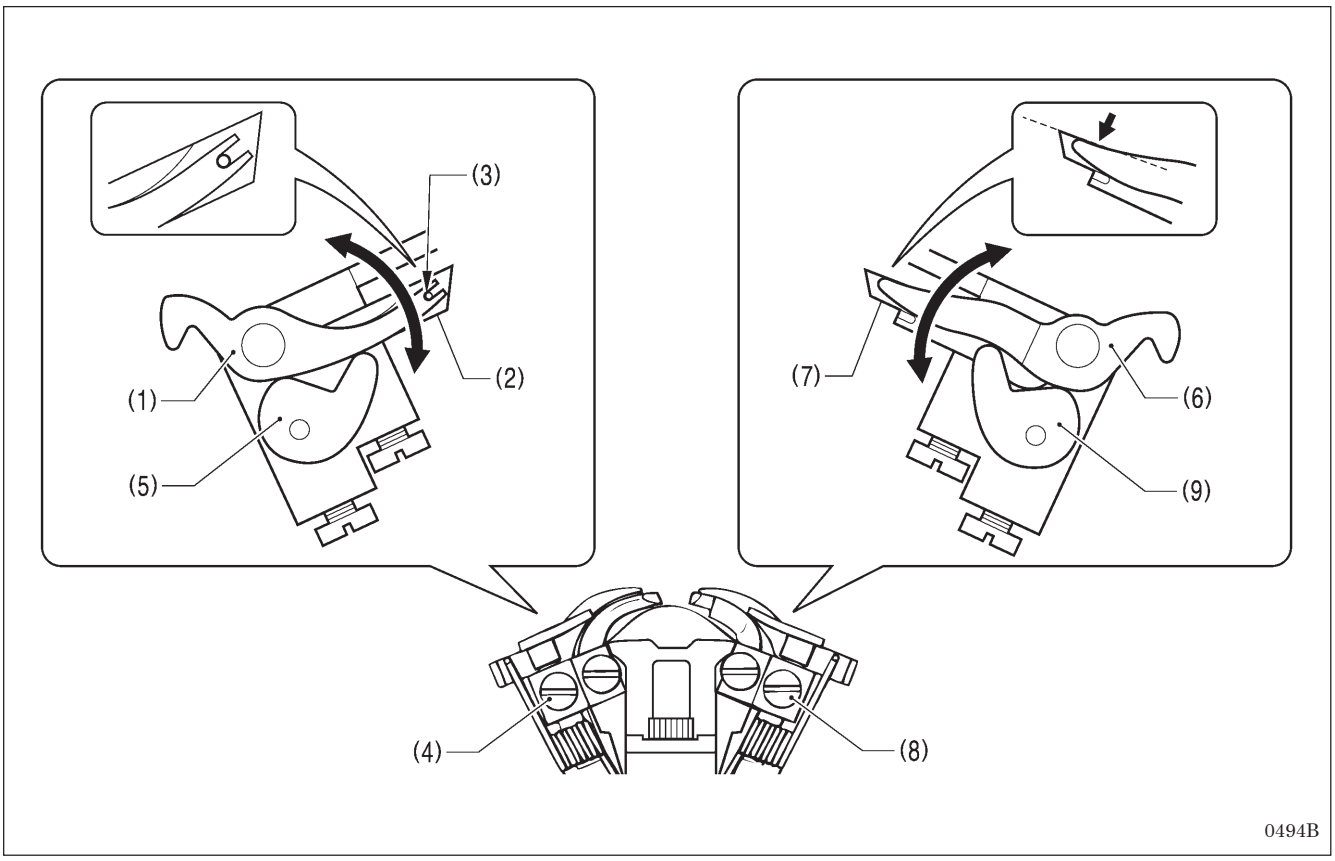
Turn the upper shaft pulley (1) so that the tips of both the left and right loopers (2) are aligned with the needle center, and then loosen the screw (5) and adjust the needle guard (3) so that it touches the needle (4).

NOTE:

If it crosses the needle more than necessary, it will place a load on the needle and this may cause the needle to break. Alternatively, if it does not cross the needle at all, the tips of the loopers will interfere with the needle and skipped stitches may occur.

9-9. Adjusting the spreader installation positions



1. Loosen the set screw (4) and adjust spreader stopper L (5) so that the relative positions of the U-shaped part at the tip of spreader L (1) and the lower thread guide hole (3) in the eye looper (2) are as shown in the illustration below.
2. Once adjustment is complete, tighten the set screw (4).
3. Loosen the set screw (8) and adjust the spreader stopper R (9) so that the top edge of the tip of spreader R (6) is aligned with the top edge of the tip of looper R (7).
4. Once adjustment is complete, tighten the set screw (8).

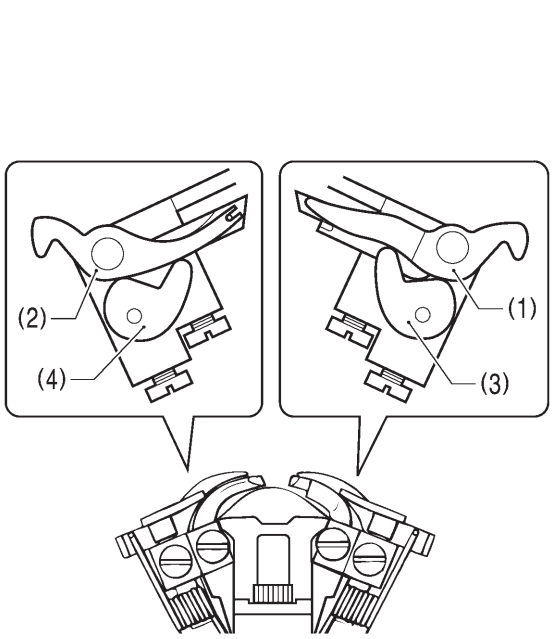
NOTE:

Spreader L (1) and spreader R (6) should not protrude above the eye looper (2) or looper R (7) respectively. If they do, skipped stitches or needle breakages may occur.

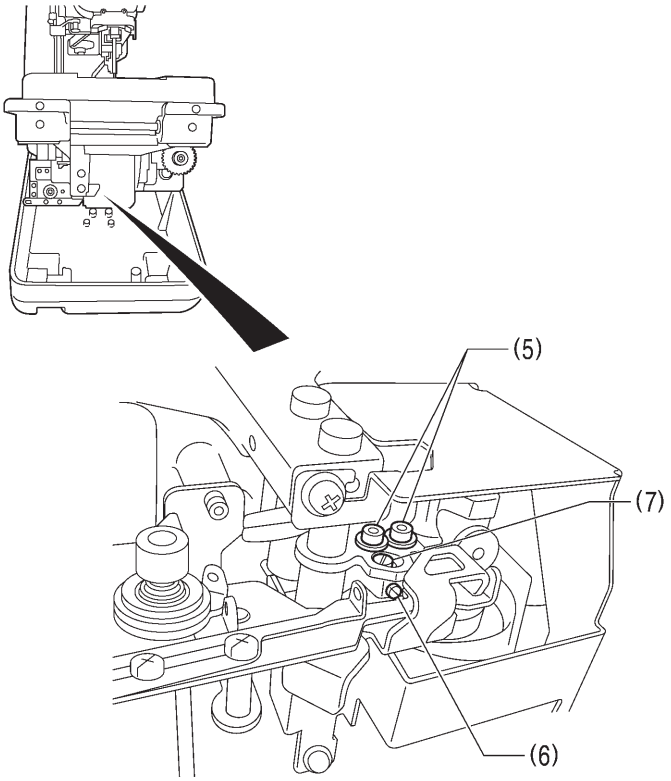
9-10. Adjusting the spreader timing

Spreader R (1) (at inside sewing position) an spreader L (at outside sewing position) must touch the spreader stoppers (3) and (4) respectively and stop moving immediately before the needle bar reaches its lowest position.

* Adjustment can be carried out more easily if it is done in manual mode.



0500B



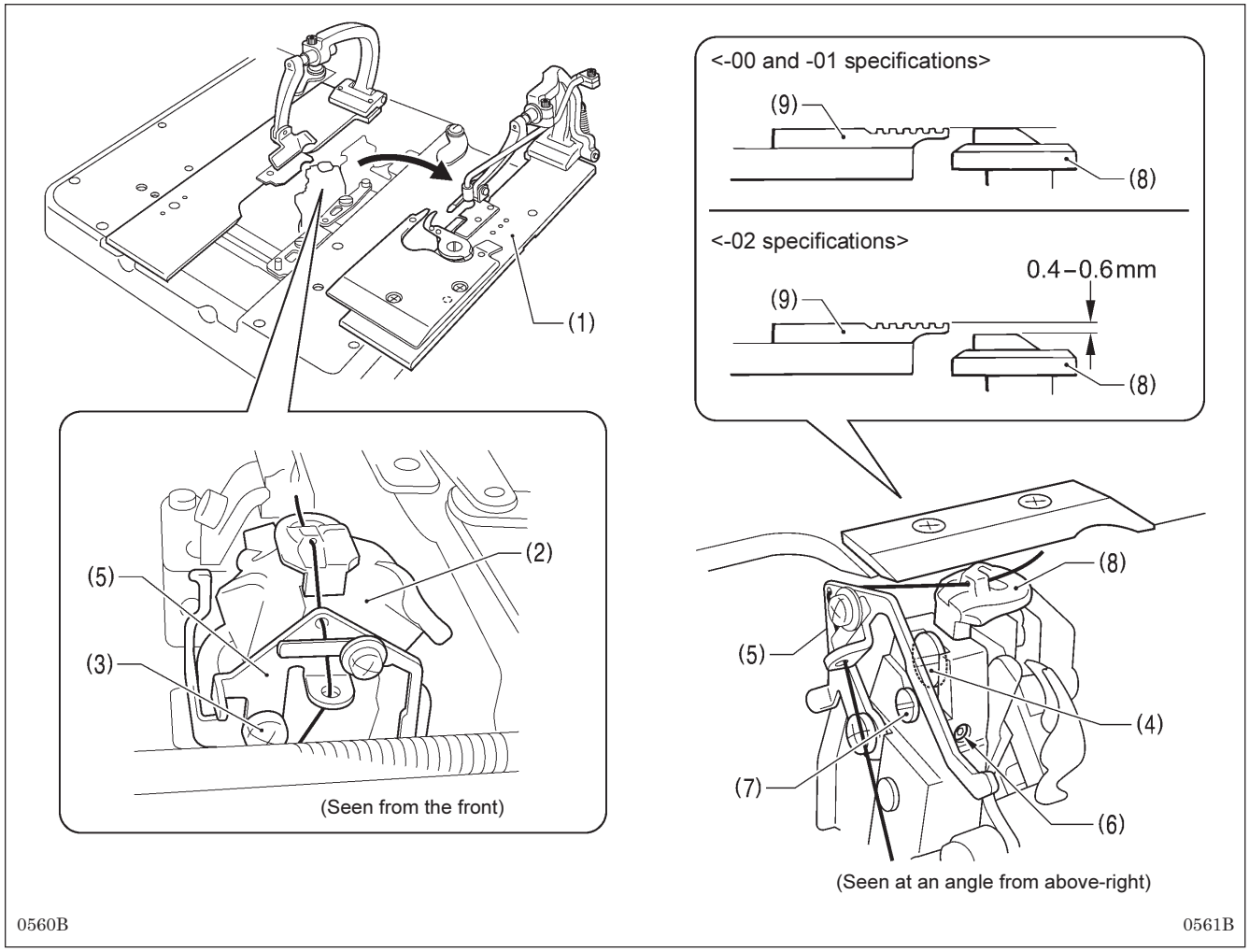
0501B

1. Tilt back the machine head.
2. Loosen the two screws (2), and then loose the set screw (6).
3. Turn the eccentric pin (7) to adjust.
4. After adjusting, tighten the set screw (6) and the two screws (5) in that order.

NOTE:

Make sure that spreader R (1) and spreader L (2) do not obstruct the needle after adjustment.

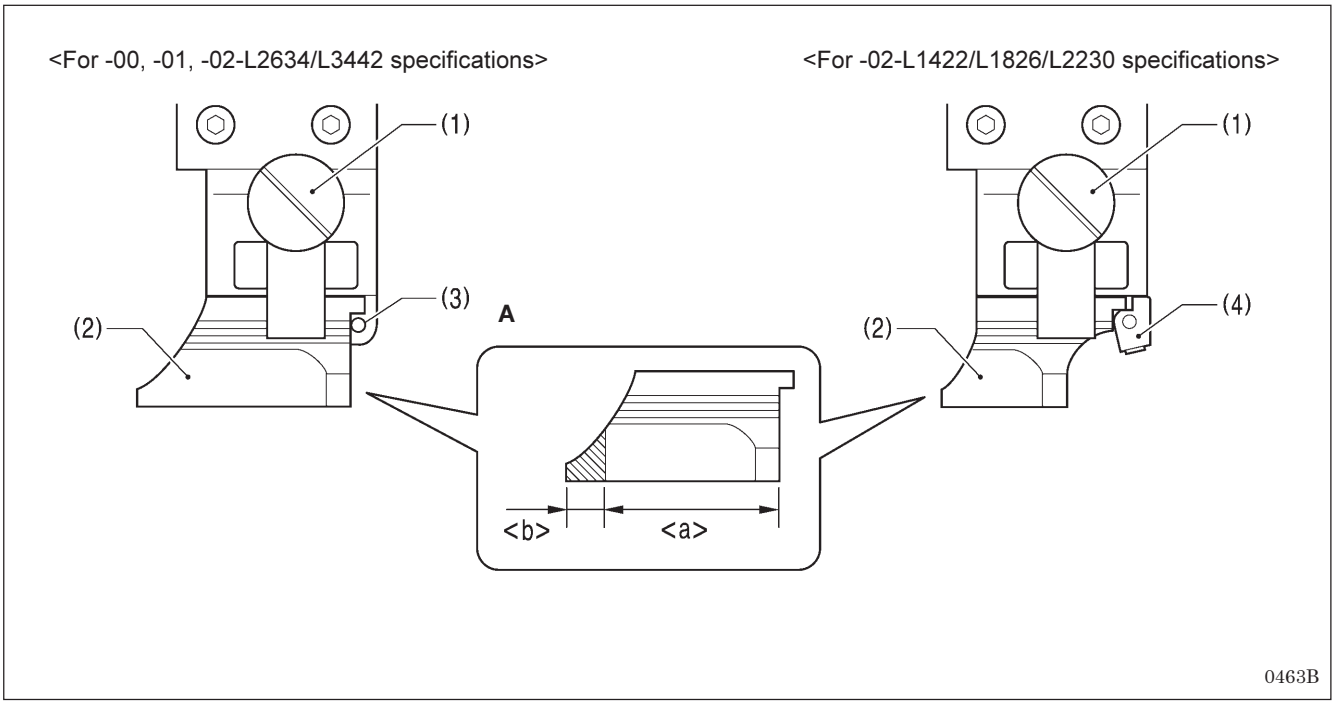
9-11. Adjusting the height of the throat plate



1. Remove the right-side work clamp plate (1).
2. Turn the looper base (2) so that it faces as shown in the illustration.
3. Loosen the screw (3), and then move gimp thread guide C (5) to a position where it will not obstruct turning of the screw (4).
4. Loosen the screw (4) by about 10 turns.
5. Loosen the set screw (6).
6. Move the vertical pin (7) to adjust the height of the throat plate (8) as follows.
   <For -00 and -01 specifications>
   Adjust so that the top of the throat plate (8) and the top of the needle plate (9) are at the same height.
   <For -02 specifications>
   Adjust so that the top of the throat plate (8) is 0.4 - 0.6 mm lower than the top of the needle plate (9).
   NOTE:
   - If the position of the throat plate (8) is too high, it may obstruct the movable knife and damage it.
   - Press down gently on the throat plate (8) from above while adjusting it. If the adjustment is carried out while the throat plate (8) is lifted up, the correct adjustment result will not be obtained.
7. Once adjustment is complete, tighten the screws that were loosened and return all other parts to their original positions.

9-12. Changing the cutting length (Replacing the hammer)

The cutting length is determined by the length of the hammer. File or replace the hammer in order to change the cutting length.

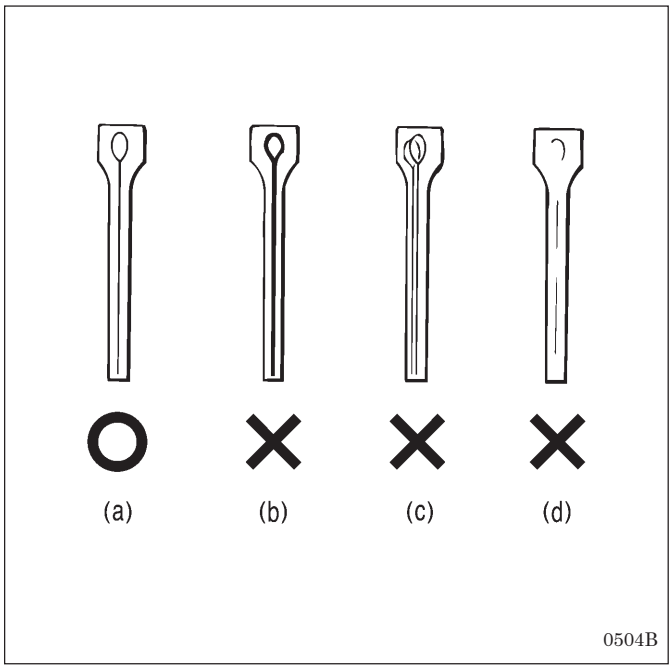


1. Loosen the knob screw (1), and then remove the hammer (2).
2. **[If grinding the hammer (Refer to Figure A)]**
   Use a grinder to grind section <b> of the hammer so that cutting length + 1.5 mm = <a>.
3. **[If installing a new hammer]**
   Push the hammer against the positioning pin (3) (or the hammer spacer (4)), and then tighten the knob screw (1).

NOTE:

If the knife that was being used previously is replaced by a knife with a different number, replace the hammer also. If the same hammer is used for two or more different types of knife, different knife incisions will be formed on the hammer, and this may cause problems with the accurate cutting of the material or may damage the knife.

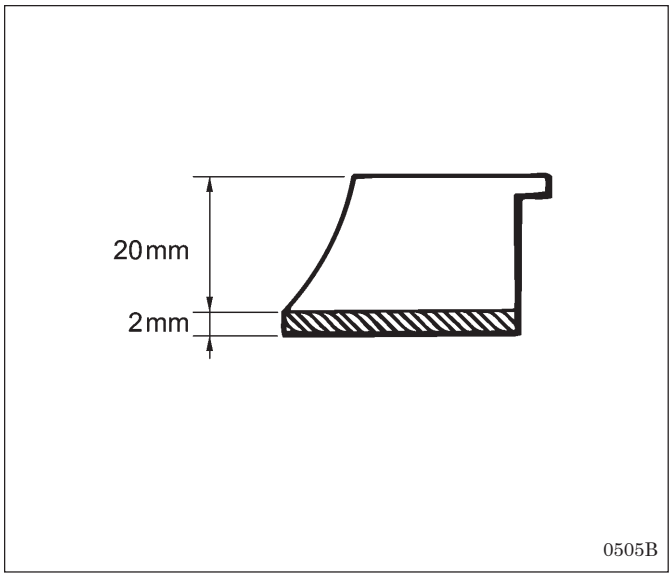
9-13. Adjusting the cutting surface of the hammer



<Adjustment procedure>

1. Remove the hammer. (Refer to the previous page for instructions on removing the hammer.)
2. Check the cutting surface of the hammer. Refer to the illustration at left, and if the cutting surface looks like (b) - (d), file the cutting surface so that the knife incision is made evenly on the cutting surface.
   (a) Knife incision is correct
   (b) Knife incision is too deep
   (c) A different knife was used which produced an overlapping knife incision
   (d) Partial knife incision which is not being made completely
3. If the material cannot be cut cleanly even though the hammer has been ground correctly, also check whether the tip of the knife is worn.
   * If the tip is worn, replace the knife.
   * Do not use the old hammer after the knife has been replaced. If the same hammer is used, it may damage the tip of the knife.

9-13-1. Filing the cutting surface of the hammer



The cutting pressure over the whole of the hammer should be uniform so that the material will be cut cleanly. File the cutting surface of the hammer so that the knife incision will be uniform over the whole of the hammer.

* The hammer can be filed until a height of 20 mm remains.
* Use a flat file for filing the hammer.

Filing the cutting surface of the hammer on which the knife incision is overlapping or has shifted

1. Grip the hammer in a vise.
2. Use the flat file to file the cutting surface of the hammer until the knife incision disappears.

Filing the cutting surface of the hammer in which knife incision is deep

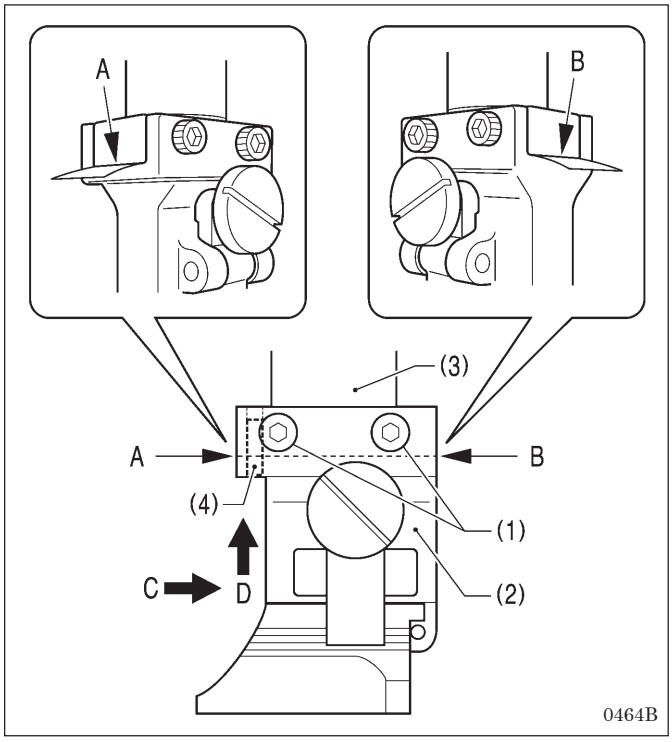
1. Grip the hammer in a vise.
2. Use the flat file to file the cutting surface of the hammer smoothly until a single knife incision can still be seen faintly.

* Once filing is complete, install the hammer.

9-13-2. Adjusting the contact between the knife and the hammer

The knife incision can be seen more clearly if the cutting surface of the hammer is filled over with a marker pen or similar.

1. Operate the hammer three times with the knife making a mark on it each time.
2. If the knife incision is not uniform, file the hammer. (Refer to the previous page for details on filing the hammer.)
3. Repeat steps 1 and 2 until the knife incisions are uniform.

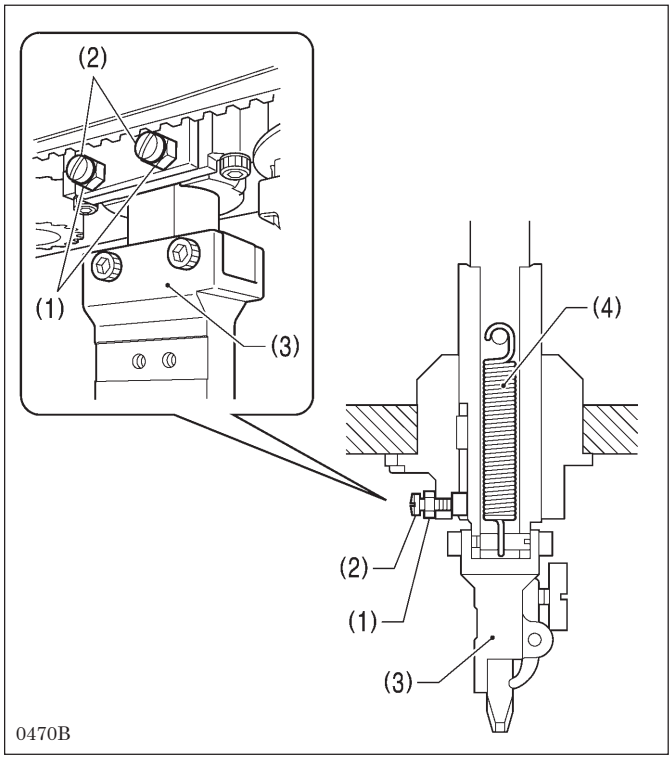


<Contact adjustment method using thin paper>

The following method can also be used to adjust the contact.

1. Loosen the four screws (1).
2. Insert some thin paper into either of the gaps A or B between the hammer bracket (2) and the cutter driving shaft (3).
3. Tighten the four screws (1).
   * Push the hammer bracket (2) in the direction of arrow C and firmly upward in the direction of D shown in the illustration so that there is no gap between the hammer bracket (2) and the cutter driving shaft (3), and then tighten the screws.
   (This operation will position the hammer bracket (2)) accurately by pushing the pin (4) of the hammer bracket (2) against the hole side of the cutter driving shaft (3).)

9-14. Adjusting the axial play of the hammer

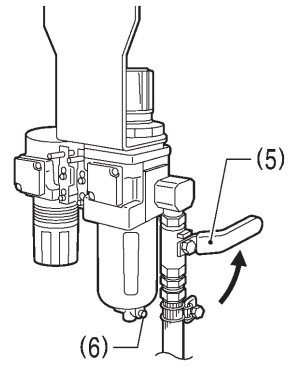


If there is too much axial play in the hammer, carry out the following adjustment.

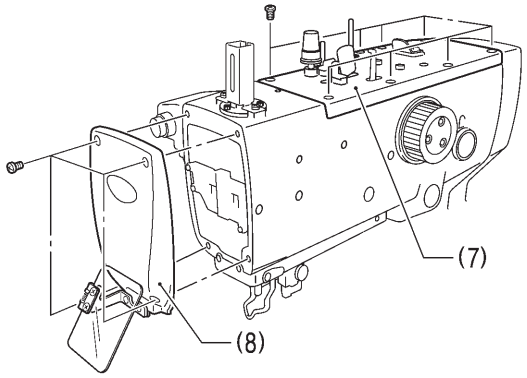
1. Loosen the two nuts (1).
2. Tighten the two screws (2) slightly to adjust while checking the amount of play.
3. When the hammer bracket (3) is pushed downward by hand, check that the built-in extension spring (4) causes it to return correctly.
   * If the hammer bracket (3) does not return correctly, it may obstruct the work clamps and damage may result.
4. Once adjustment is complete, tighten the two nuts (1).

9-15. Making the cutter driving shaft and driving shaft presser move together

The cutter driving shaft (2) and driving shaft presser (3) are linked by an extension spring (4) so that the hammer bracket (1) can be positioned by being pushed down by hand when aligning the needle with an eyelet buttonhole that has already been made in the material in order to resume sewing. If this extension spring (4) has been damaged, or if the return speed of the cutter is too slow, the cutter driving shaft (2) and the driving shaft presser (3) can be made to move together as a single unit.

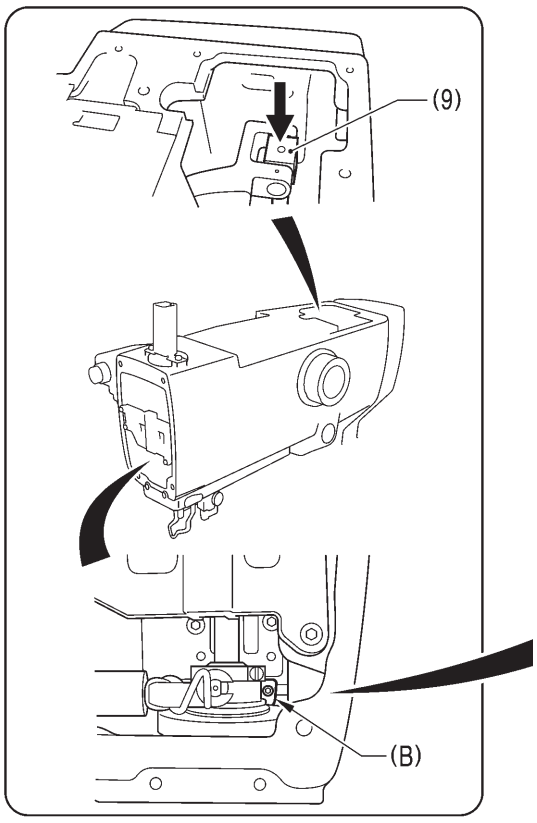


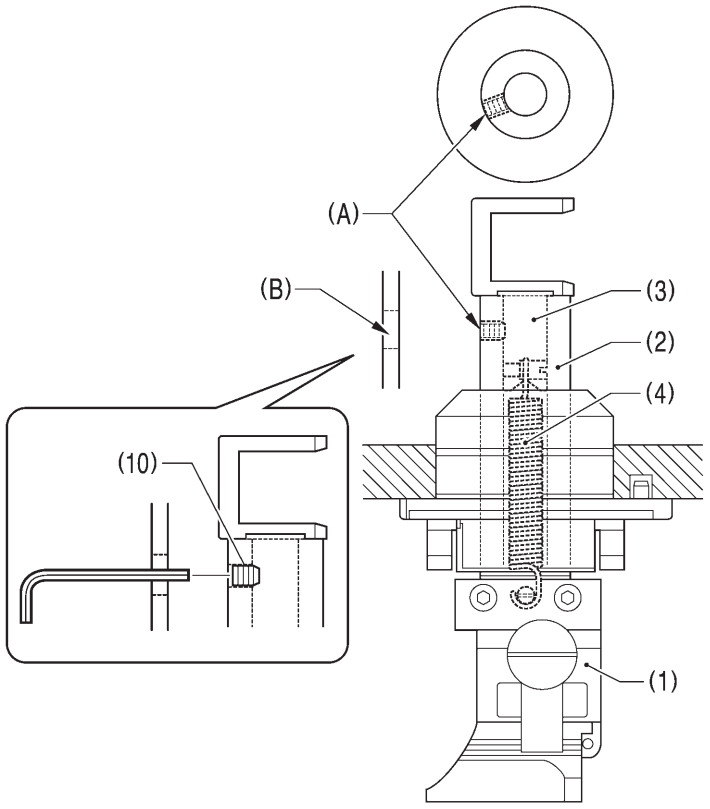
0502B



0503B

1. Turn the cock (5) in the direction of the arrow to close it and stop the supply of air.
2. Press the button (6) to release the air.
   NOTE:
   When the air is released, the hammer may lower by its own weight.
3. Remove the upper cover (7) and the face plate (8).





0473B 0472B

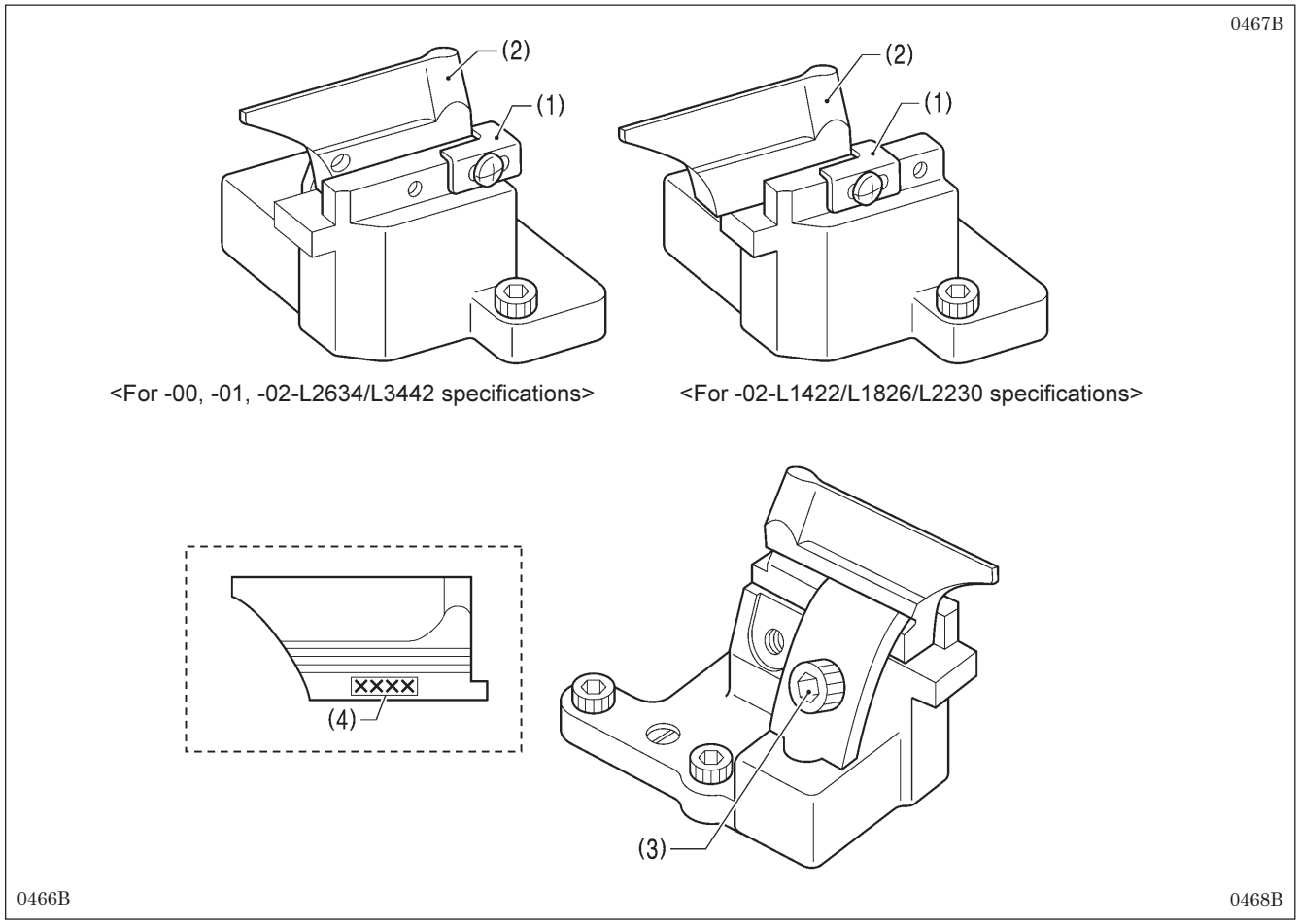
4. Lower the cylinder rod (9) to align the screw (A) of the cutter driving shaft (2) with (B) inside the face plate.
5. Use a commercially-available set screw (6) (M6 with a length of 6mm or less) to secure (A) and (B) together.
   * Tighten the set screw (10) securely. If the set screw (10) is loose and protrudes from the surface of the cutter driving shaft (2), damage may result.
6. Install the face plate (8) and the upper cover (7), and then open the cock (5) to resume the supply of air.

9-16. Replacing the knife and adjusting its position

9-16-1. Replacing the knife

CAUTION

Do not operate the sewing machine while a knife and hammer with numbers that are different from those which have been set in programs.
If this is not observed, damage to sewing machine parts or the needle or serious injury may occur.



1. Check that there is no gap between the block stopper plate (1) and the knife (2), and then loosen the socket bolt (3) and remove the knife (2).
2. Place the new knife to be installed against the block stopper plate (1), and then tighten the socket bolt (3).

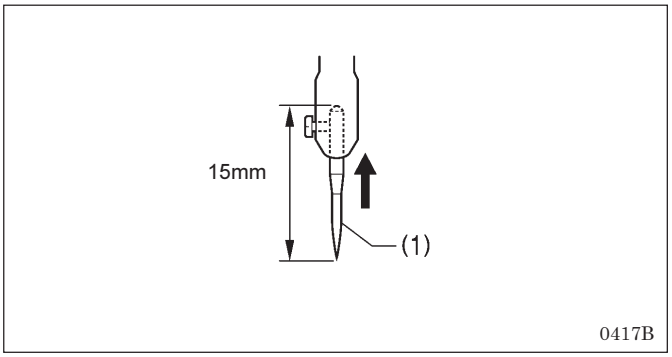
NOTE:

- When replacing the knife, use the parameter settings to change the eyelet pattern to the pattern that corresponds to the knife number (4) that is given on one side of the knife. (Refer to “5-3. Program setting method”.)
- Replace the knife and hammer as a set. If the same hammer is used for two or more different types of knife, different knife incisions will be formed on the hammer, and this may cause problems with the accurate cutting of the material or may damage the knife.

9-16-2. Making fine adjustments to the knife position

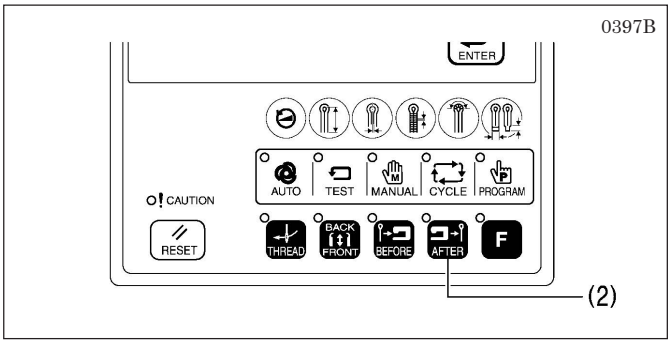
Adjust the knife position so that it cuts the material cleanly at the inside sewing position and around the eyelet.

* Before carrying out this adjustment, check that the procedure in “9-3. Adjusting the zigzag base line position” has been completed correctly.
* The knife position can be adjusted independently in the forward/back direction and tilt direction.

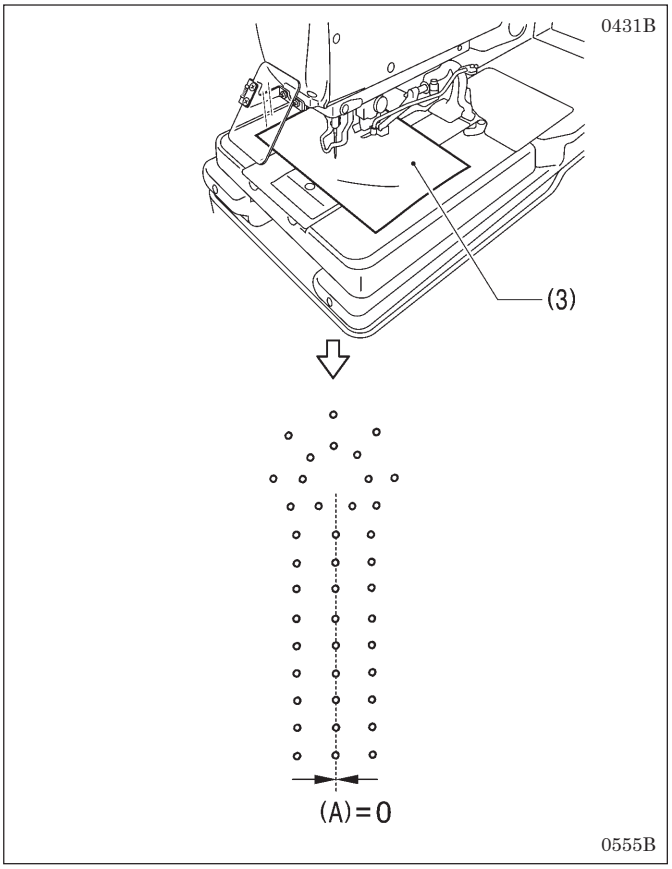


<Adjustment procedure>

1. Install the short customized needle (1). (Refer to “9-3. Adjusting the zigzag base line position” for details on the short customized needle (1).)
2. Set the air pressure at the hammer pressure adjustment regulator on the underside of the table to about 0.2 MPa. (Refer to “9-17. Adjusting the cutting pressure”.)
   * This is so that the knife will not make several overlapping incisions in the hammer and so that the paper for checking the needle drop does not become pierced while adjusting the knife position.



3. Press the AFTER key (2) on the operation panel to set the cutting method to “cutting after sewing”.

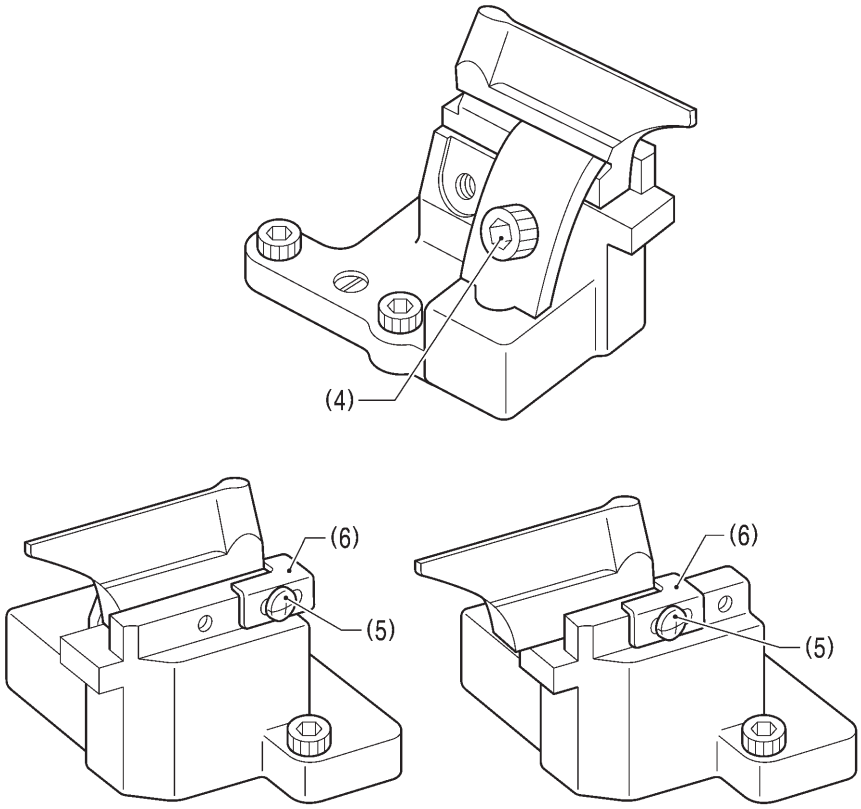


4. Place a piece of paper (3) underneath the work clamps.
5. Start the sewing machine and trace the needle drop position around the eyelet hole.
6. Check that the needle drop positions around the eyelet hole and the knife cutting position overlap uniformly.
   * Checking will be easier if the cutting position value (A) in the parameter settings is set to “0”. (Refer to “5-3. Program setting method”.)
7. If they do not overlap uniformly, turn off the power and carry out the adjustment in steps 8 - 13.
   * Once adjustment is complete, repeat steps 4 - 6 to check, and if further adjustment is needed, repeat step 7.

(Continued on next page)

<Forward/back position adjustment>

0557B

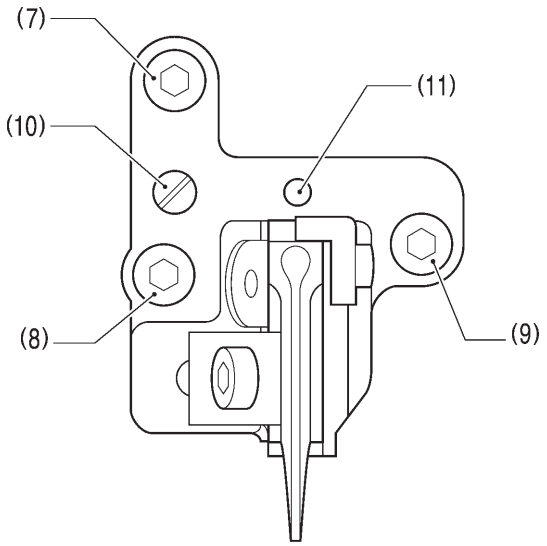


<For -00, -01, -02-L2634/L3442 specifications> <For -02-L1422/L1826/L2230 specifications>

0556B

8. Loosen the socket bolt (4) and the screw (5), and move the knife position forward or back to adjust.
9. Once the knife position has been determined, securely tighten the socket bolt (4).
10. Push the block stopper plate (6) against the knife, and then tighten the screw (5).
    * The block stopper plate (6) is a guide for showing the current position of the knife, so be sure to move the block stopper plate (6) so that it is touching against the knife.

0558B

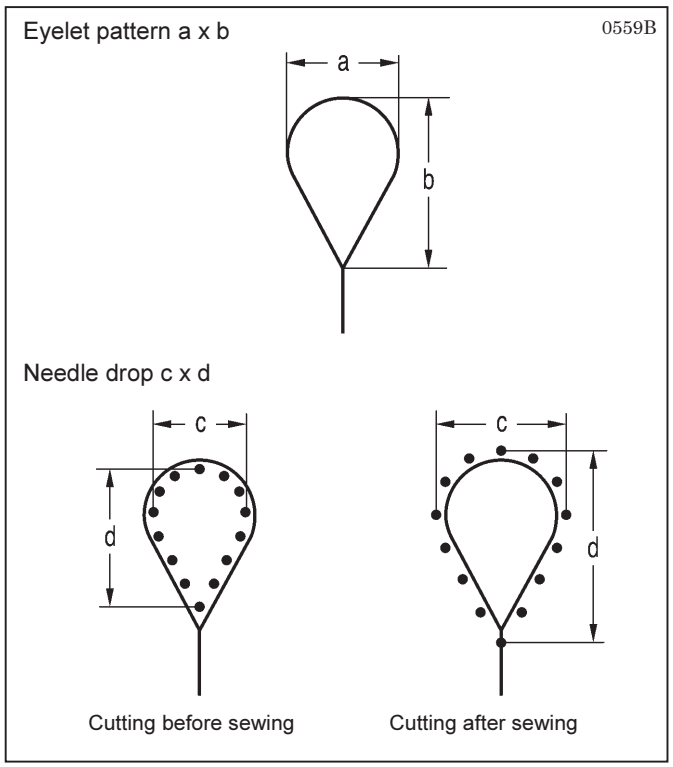


(Seen from directly above the knife base)

<Tilt adjustment>

11. Loosen the socket bolts (7), (8) and (9).
12. Turn the eccentric pin (10) to adjust.
    * Make fine adjustments by turning centering on the pivot (11).
13. Once adjustment is complete, tighten the socket bolts (9), (8) and (7) in that order.

NOTE: Relationship between needle drop position and eyelet pattern at the eyelet

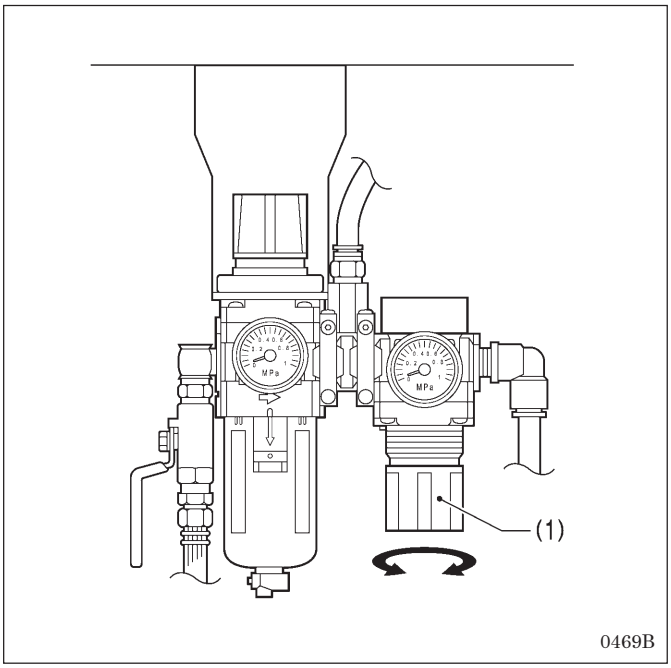


When switching between cutting before sewing and cutting after sewing, the needle drop position at the inside sewing position will change automatically in accordance with the eyelet pattern as shown in the illustration.

Knife No.	Eyelet pattern a x b	Needle drop c x d	
		Cutting before sewing	Cutting after sewing
1	2.1 x 3.2	1.7 x 2.7	2.5 x 3.8
2	2.8 x 4.3	2.4 x 3.9	3.2 x 4.9
3	3.0 x 4.6	2.6 x 4.1	3.4 x 5.2
4	3.2 x 5.4	2.8 x 4.9	3.6 x 6.0
5	Straight	Straight	Straight
6	3.8 x 4.3	3.4 x 3.8	4.2 x 4.9

* The default setting for the needle drop position for no cutting is the same as for cutting before sewing. You can also change the needle drop position setting to the same position as for cutting after sewing by changing parameter settings. (Refer to No. 33 in “5-3-1. Parameter list”.)

9-17. Adjusting the cutting pressure



Set the cutting pressure to the minimum pressure that still allows the material to be cut.

* Set to between 0.1 - 0.6 MPa. (It is set to 0.4 MPa at the time of shipment from the factory.)

<Adjustment method>

Turn the knob (1) of the hammer pressure adjustment regulator on the underside of the table to adjust the air pressure.

NOTE:

- Do not increase the cutting pressure more than necessary. If the pressure is too high, it will wear out the hammer and damage the knife.
- If the material cannot be cut cleanly, do not increase the cutting pressure to too high a pressure.
  Check the timing between the knife and the hammer. (Refer to “9-13-2. Adjusting the contact between the knife and the hammer”.)

9-18. Adjusting the work clamp lift amounts

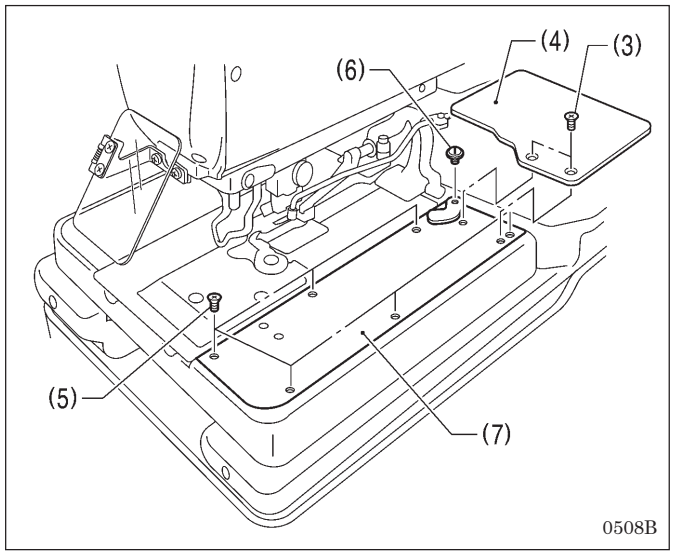
Adjust the work clamp lift amount <a> to one of the values given below.

<For -00, -01 specifications>: 12 mm

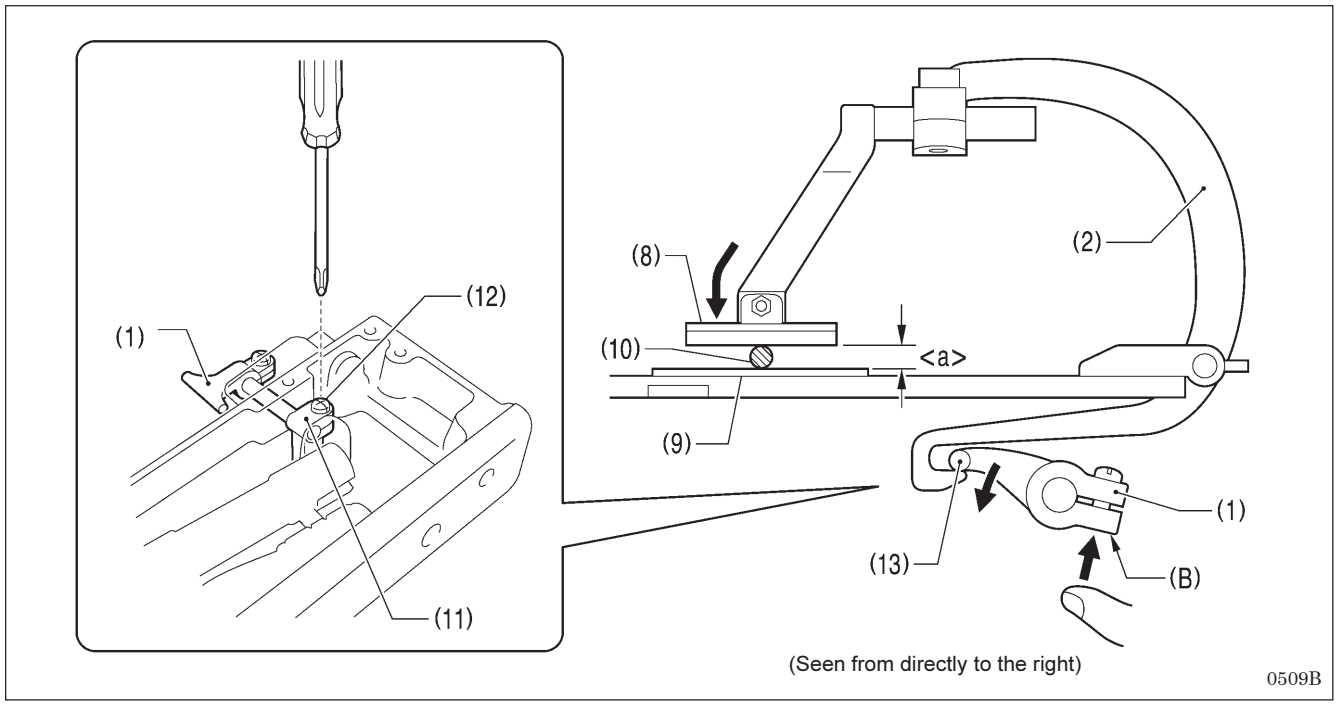
<For -02 specifications>: 16 mm

* The work clamp lift amount <a> is the value which includes the play in crank lever B (1) and the clamp lever (2).

* Carry out adjustment for both the left and right work clamps. (The following describes how to adjust the lift amount for the right-side work clamp.)



1. Remove the two screws (3), and then remove feed base cover U (4).
2. Remove the six screws (5) and the shoulder screw (6), and then remove feed base cover R (7) at the right side.



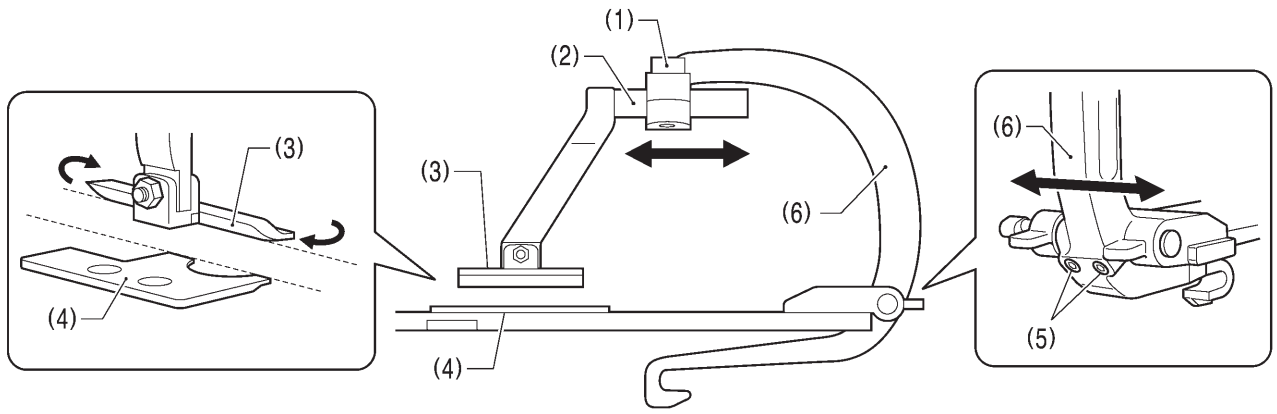
3. Insert a block with a thickness of 12 mm or 16 mm or a gauge (10) in between the support point of work clamp R (8) and the needle plate (9).
4. Loosen the screw (12) of the clamp driving lever (11).
5. Push section (B) of crank lever B (1) upward so that the tip (13) is pressed against the end of clamp lever R (2) as shown in the illustration.
6. While holding the parts in the position in step 5, tighten the screw (12).
   NOTE:
   Check that work clamp R (8) is pressed securely against the block or the gauge (10).
7. Install feed base cover R (7) and feed base cover U (4).

* Adjust the lift amount for the left-side work clamp in the same way.

9-19. Adjusting the work clamp positions

The positions of the work clamps relative to the needle plate can be adjusted forward, back and sideways.

* Adjust the left and right work clamps so that they are both positioned at an equal distance from the needle drop position. (The following describes how to adjust the position of the right-side work clamp.)



(Seen from directly to the right)

0511B

<Forward/back adjustment>

1. Loosen the socket bolt (1), and then move the position of the clamp arm (2) forward or back to adjust.
2. Next, adjust so that the side of work clamp R (3) is parallel to the side of the needle plate (4).
3. Once adjustment is complete, tighten the socket bolt (1).

<Sideways adjustment>

1. Loosen the two set screws (5), and then adjust the sideways position of the clamp lever (6).
2. Once adjustment is complete, tighten the two set screws (5).

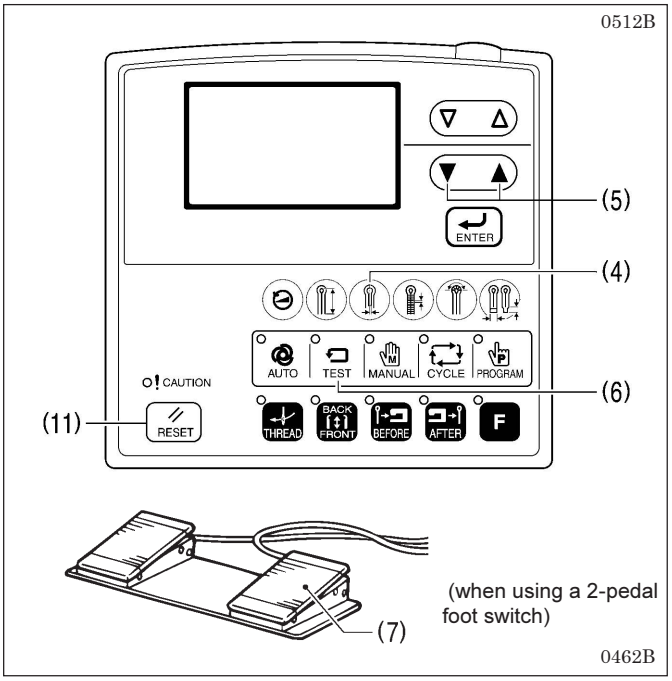
* Adjust the position for the left-side work clamp in the same way.

9-20. Adjusting the positions of the work clamp plates

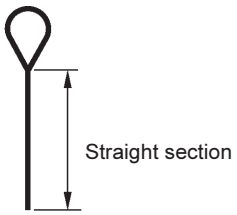
Adjust the positions of the work clamp plates (3) so that the throat plate (1) and needle plates (2) do not touch during sewing. The standard adjustment is when there is a gap of 0.8 mm between the throat plate (1) and the needle plates (2) (when the cutting space is set to "0").

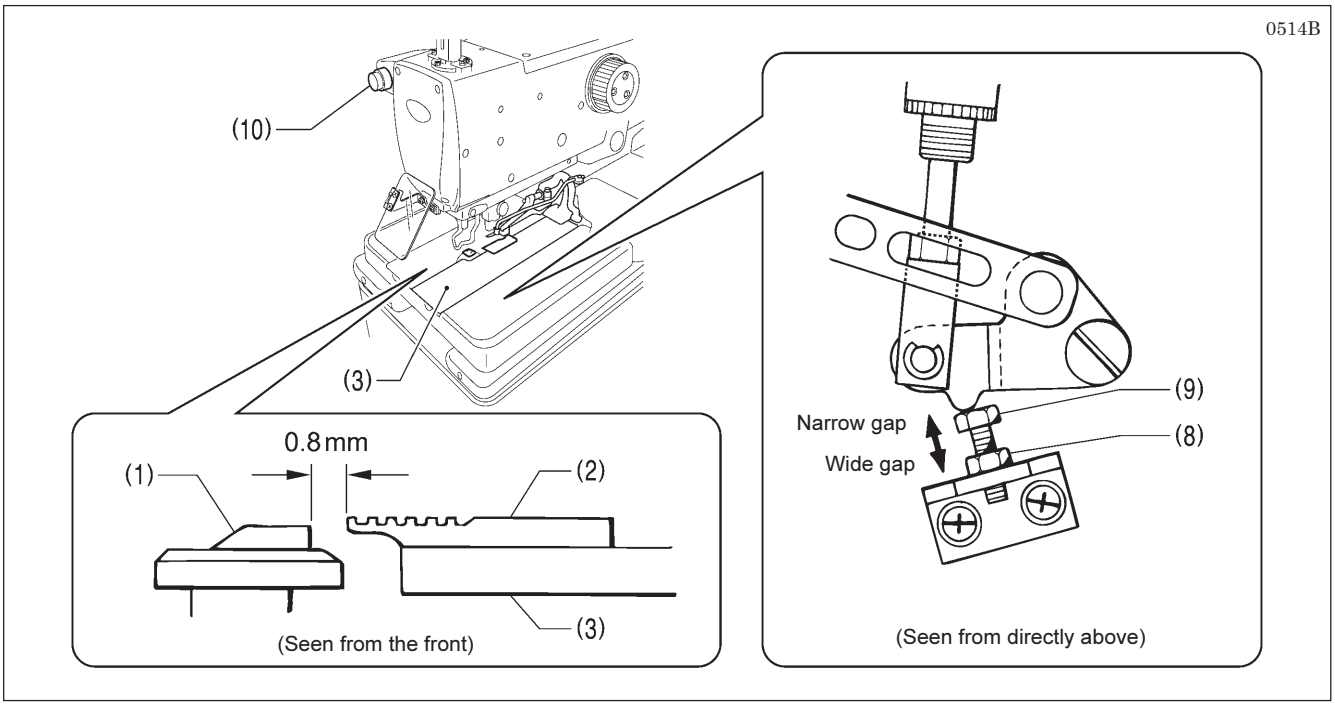
* Carry out adjustment for both the left and right work clamps. (The adjustment method described below is for the position of the right-side work clamp plate (3).)

* Carry out adjustment with the work clamp plates (3) installed.



1. Use the parameter settings to set the cutting space to “0”. (Refer to “5-3. Program setting method”.)
   * If you press shortcut key 3 (4), you can then change the value simply by pressing the ▲/▼ keys (5)
2. Press the TEST key (6) to turn on test mode, and then start test operation. (Refer to “5-4. Checking the sewing pattern in test mode”.)
3. Press and hold the start switch (7) until the feed base moves to the position where the straight section of the sewing shape is sewn, and then release the start switch (7).





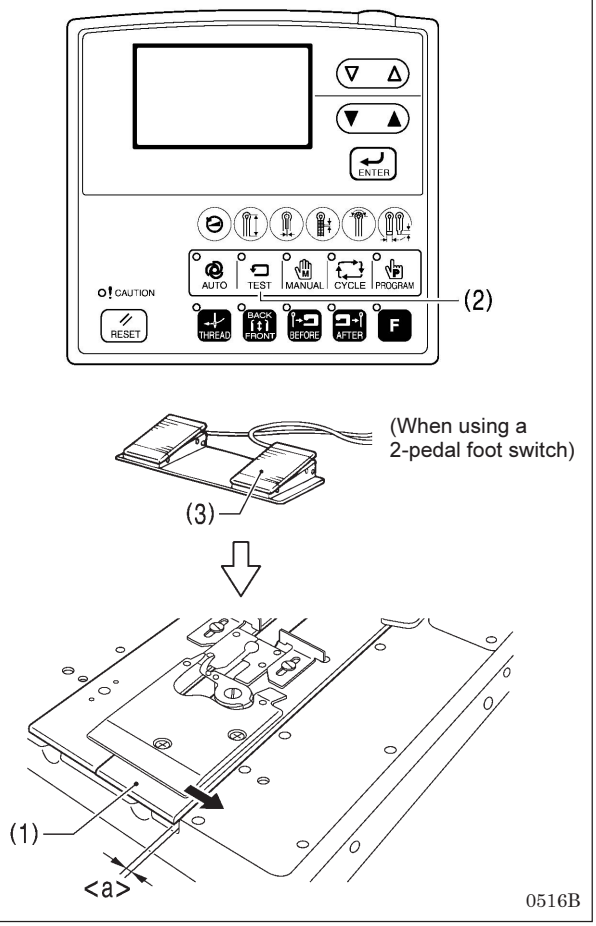
4. Check that there is a gap of 0.8 mm between the throat plate (1) and needle plate R (2).
5. If there is not a gap of 0.8 mm, loosen the nut (8), and then turn the bolt (9) to adjust.
6. Once adjustment is complete, tighten the nut (8).
7. Press the STOP switch (10), and then press the RESET key (11) to end test mode.

* Adjust the gap between the throat plate (1) and needle plate L in the same way.

9-21. Adjusting the cloth opening amounts

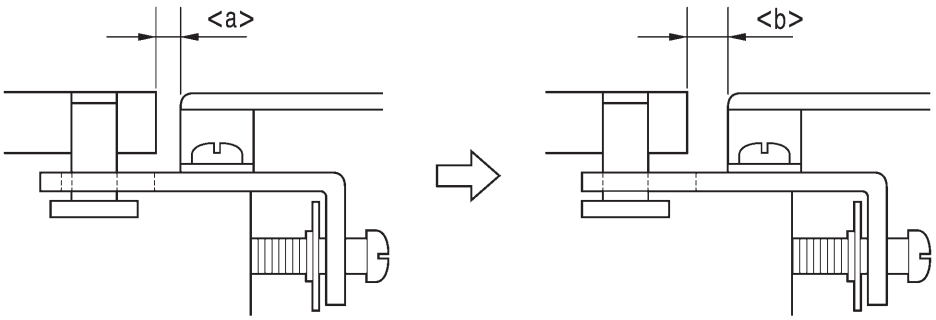
Adjust so that the opening amounts for the left and right work clamp plates (1) are equal.

* The cloth opening amounts should always be 0.8 mm or more on each side.



<Opening amount measurement method>

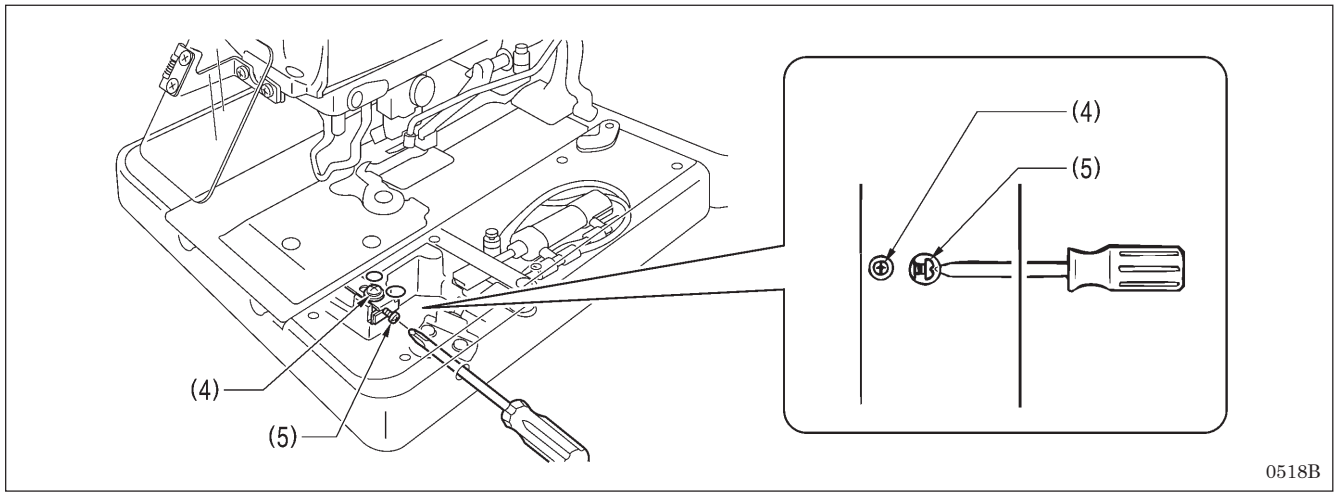
1. Press the TEST key (2) to turn on test mode, and then start test operation. (Refer to “5-4. Checking the sewing pattern in test mode”.)
2. Depress the start switch (3).
   * Check that the feed base moves and that the work clamp plates (1) at left and right both open. This opening amount is <a>.



3. Use calipers to measure <a> (at both left and right).
4. Turn off the power for the sewing machine.
   * The gap <a> will become wider. This opening amount is <b>.
5. Lower the work clamps, and then use calipers to measure <b> (at both left and right).

   (Cloth opening amount = <b> - <a>)
6. Calculate the cloth opening amounts for both sides.
7. Carry out adjustment if the two cloth opening amounts are not the same, or if the cloth opening amount at either side is lower than 0.8 mm. (Refer to following page.)

<Cloth opening amount adjustment>



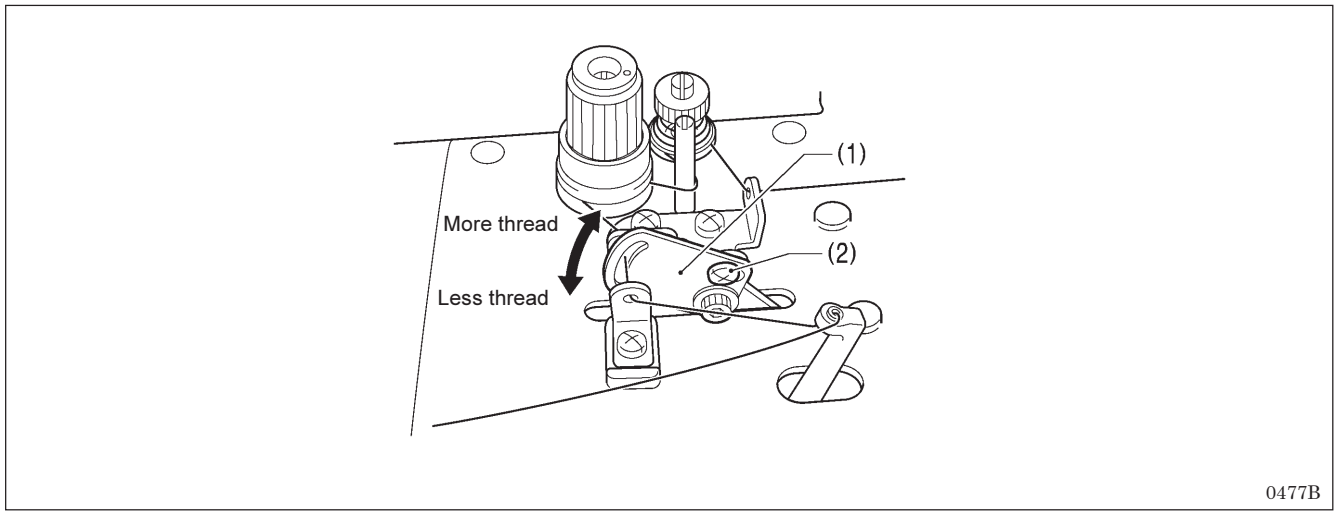
8. Loosen the screw (4).
9. Insert a screwdriver into the notch in the side of the feed base, and turn the adjustment screw (5) to adjust.
10. After tightening the screw (4), measure the opening amounts once more.
11. Repeat steps 2 - 10 until the left and right cloth opening amounts are equal to each other.

9-22. Adjusting the upper thread feeding amount

It is necessary for enough of an upper thread feeding amount to be maintained so that the amount of upper thread is sufficient for stitches to be formed accurately at the sewing start.

NOTE:

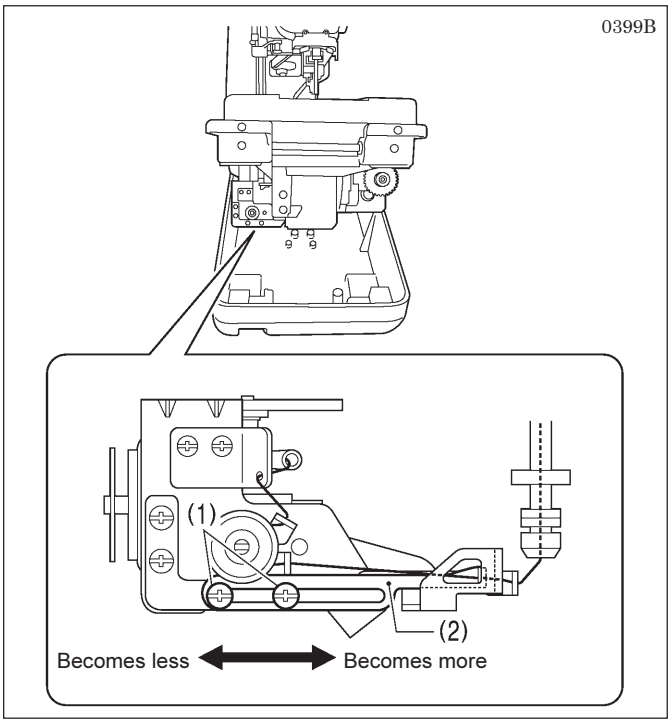
The thread take-up lever (1) operates at the same time as sewing ends, and it stops operating at the same time as the feed base starts moving when the start switch is pressed.



1. Loosen the screw (2).
2. Move the thread take-up lever (1) up or down to adjust the upper thread feeding amount.
3. Once adjustment is complete, securely tighten the screw (2).

9-23. Adjusting the lower thread feeding amount <-01 specifications only>

It is necessary for enough tension to be applied to the lower thread during the time from when the upper thread is picked up by the eye looper at the first stitch until spreader L finishes opening, without the lower thread being pulled out by the thread nipper, so that the first stitch can be sewn correctly at the sewing start.



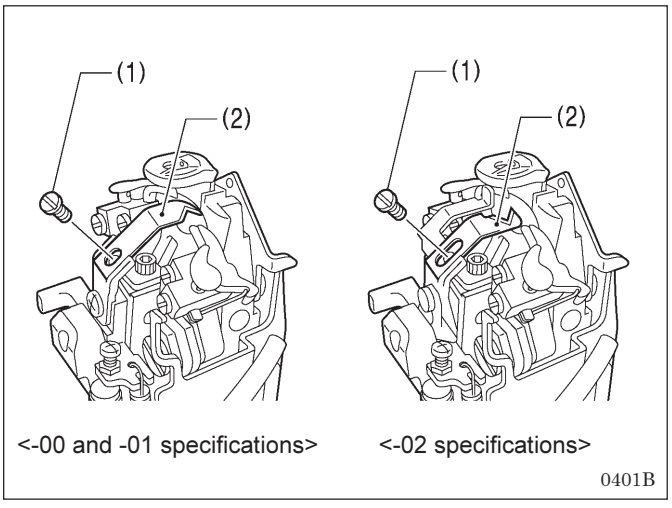
1. After automatic sewing is finished, switch to manual mode and then press the start switch. (Refer to “7-6. Manual sewing (manual mode)”.)
2. Turn the upper shaft pulley and check the condition of the lower thread.

<If adjustment is necessary>

3. Turn off the power, and then tilt back the machine head.
4. Loosen the two screws (1), and then move lower thread guide C (2) in the direction of the arrow to adjust.
   * If it is moved to the right, the lower thread feeding amount will increase, and if it is moved to the left, the amount will decrease.
5. Once adjustment is complete, securely tighten the two screws (1).

9-24. Replacing and adjusting the upper movable knife

9-24-1. Replacing the upper movable knife

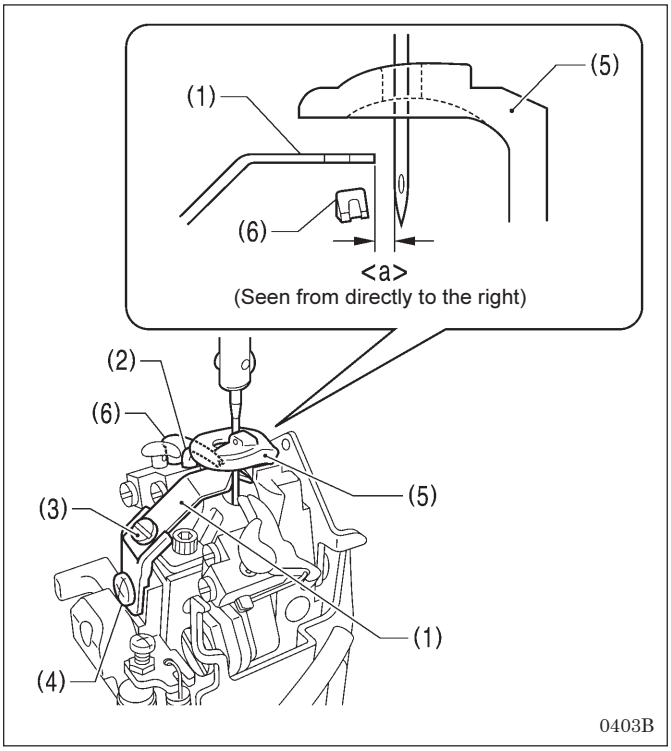


1. Remove the screw (1), and then remove the upper movable knife (2).
2. Install the new upper movable knife with the screw (1).

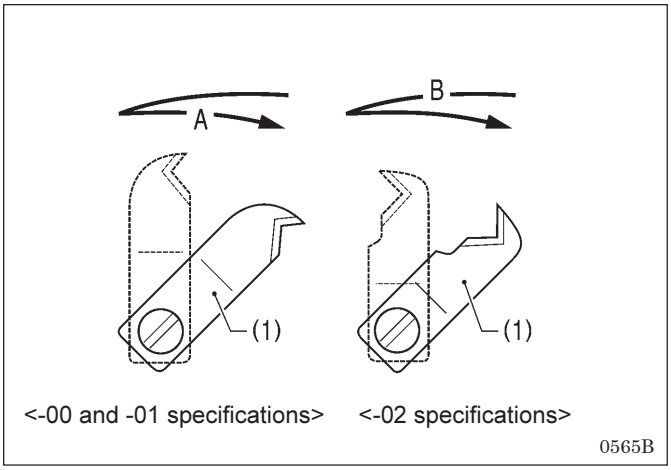
9-24-2. Adjusting the upper movable knife

The upper movable knife (1) is adjusted so that only the upper thread that is in front of looper L (2) is cut. If two of the upper thread loops (front and back) are cut, the upper thread trailing length will become too short and skipped stitches may occur at the sewing start.

* If this adjustment is carried out in manual mode, the upper thread trimming operation can be checked step by step, which will make adjustment easier.



1. Turn the upper shaft pulley to set the needle to the lowest position at the outside sewing position.
2. Loosen the screw (3), and then adjust the gap <a> between the tip of the upper movable knife (1) and the needle to 0.1 - 0.4 mm.
3. Turn the upper shaft pulley to set the needle to its highest position (needle up stop position) at the outside sewing position.
4. Loose the screw (4), and then adjust the position of the upper movable knife (1) so that it is in between the throat plate (5) and spreader L (6) without touching either of them.
5. Move the upper movable knife (1) sideways by hand and check that it does not touch either the throat plate (5) or spreader L (6).
6. Once adjustment is complete, tighten the screws (4) and (3) in that order.



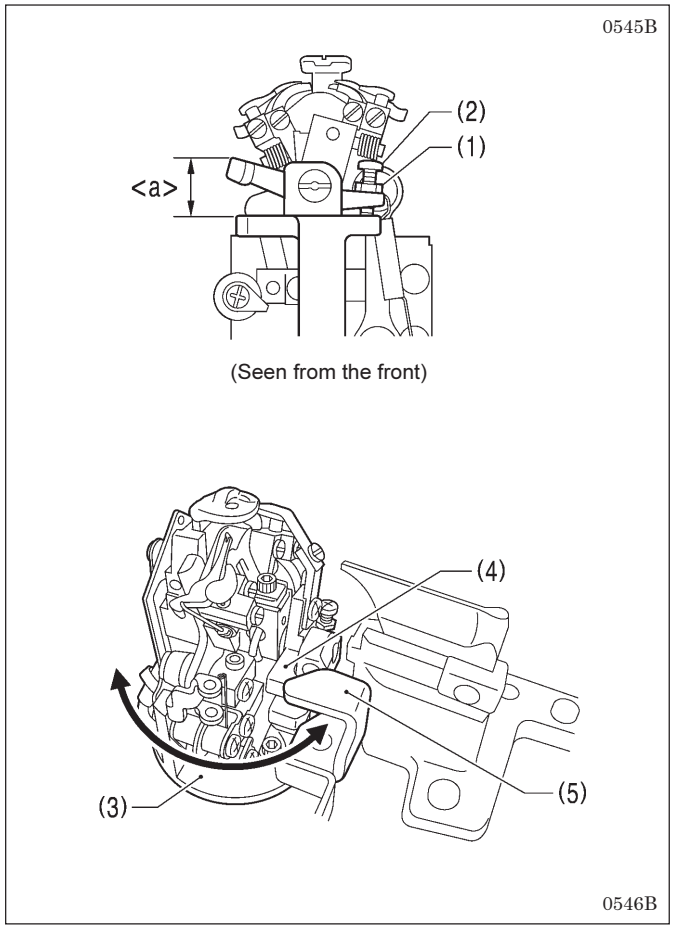
NOTE: Upper thread trimming timing

<-00 and -01 specifications>
When the upper movable knife (1) has returned to its original position, the upper thread is trimmed at position A.

<-02 specifications>
When the upper movable knife (1) starts moving, the upper thread is trimmed at position B.

9-24-3. Adjusting the position of the thread trimmer lever bracket

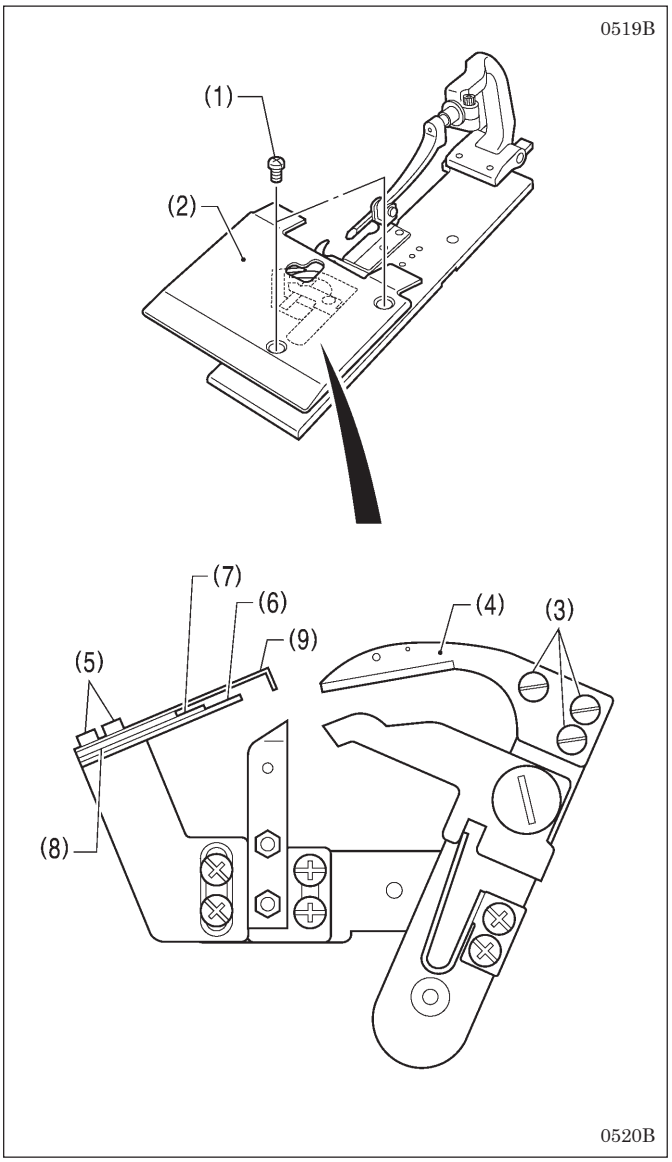
The position of the needle must be adjusted so that it does not obstruct the upper movable knife when it is at the maximum zigzag width for the outside sewing position.



1. Loosen the nut (1).
2. Turn the screw (2) to adjust <a> in the illustration to 12 mm.
3. Turn the looper base (3) and check that the thread trimmer lever bracket (4) moves underneath the thread trimmer hammer (5) without obstructing any other parts.
4. Once adjustment is complete, securely tighten the screw (2).

9-25. Replacing and adjusting the movable knife and fixed knife (for the lower thread and gimp) <-01 specifications>

9-25-1. Replacing the movable knife and fixed knife



1. Remove the two screws (1), and then remove work clamp plate U (2).

<Movable knife replacement>

2. Remove the three screws (3), and then remove the movable knife (4).
3. Install the new movable knife, and then tighten the three screws (3).

<Fixed knife replacement>

4. Remove the two screws (5), and then remove the fixed knife (6).
5. Install the new fixed knife (6), fixed knife plate spring (7), fixed knife plate spring U (8) and thread guide plate (9) on top of each other in that order, and then tighten the two screws (5).

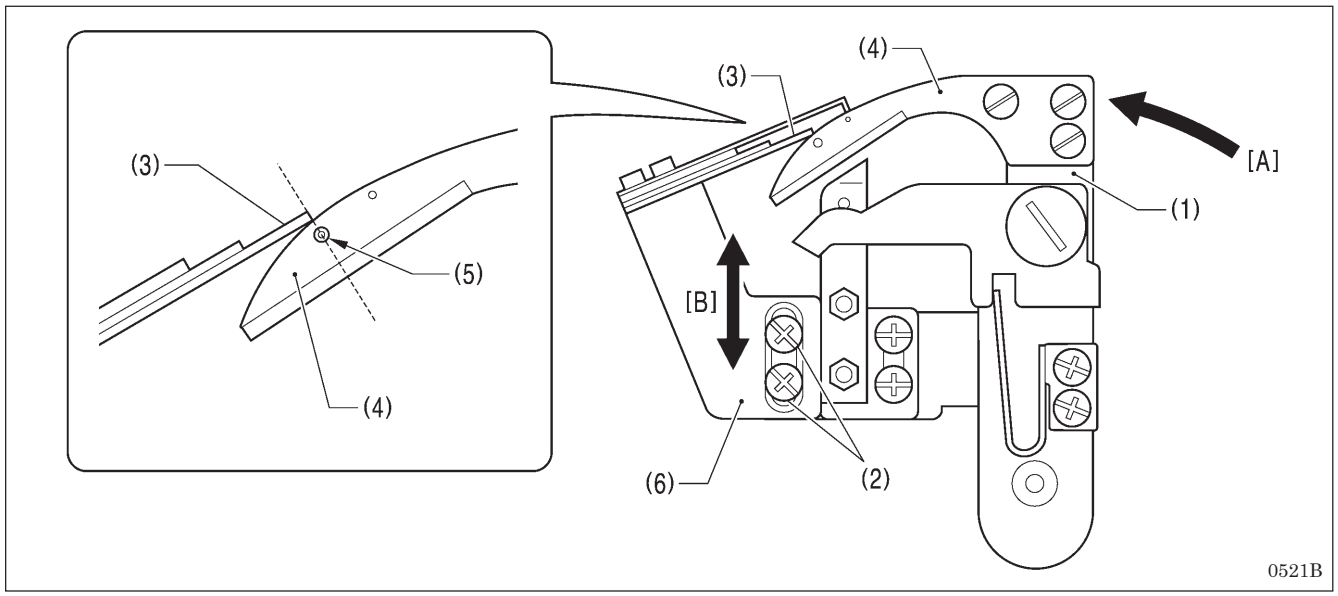
* After replacing the knives, carry out the adjustments from “9-25-2. Adjusting the cutting pressure” to “9-25-5. Adjusting the thread handler”. Once adjustment is complete, install work clamp plate U (2).

9-25-2. Adjusting the cutting pressure

Adjust the cutting pressure to a suitable pressure so that the threads are trimmed cleanly.

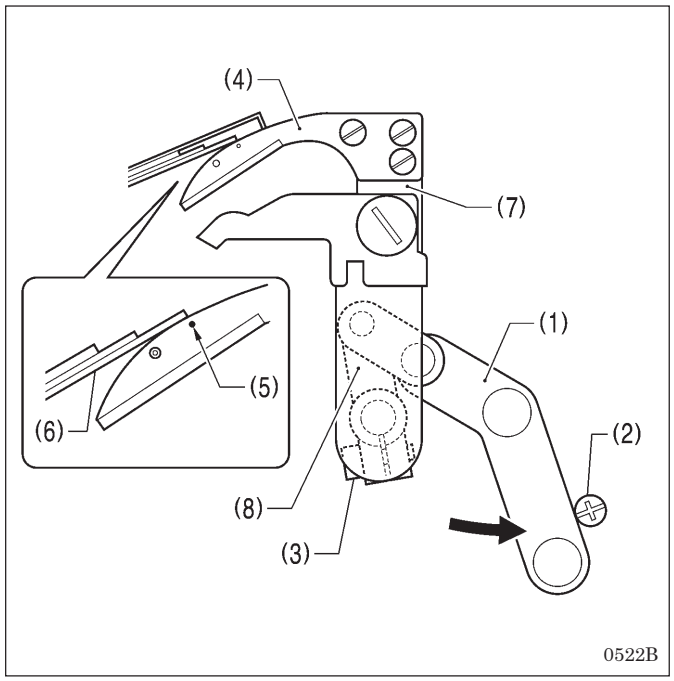
NOTE:

Do not apply excessive pressure. Excessive pressure will cause the fixed knife and movable knife to become worn or damaged.



1. Push the thread trimmer arm (1) as far as it will go in the direction of the arrow [A].
2. Loosen the two screws (2).
3. With the thread trimmer arm (1) pushed as far as it will go, move the fixed knife setting bracket (6) along the guide groove in the direction of arrow [B] to adjust so that the position where the tip of the fixed knife (3) and the movable knife (4) first start touching is immediately above the mark (5).
4. Once adjustment is complete, securely tighten the two screws (2).

9-25-3. Adjusting the meshing amount



1. Turn the thread trimmer link lever (1) in the direction of the arrow until it touches the screw (2).
2. Loosen the socket bolt (3).
3. Adjust the position of the thread trimmer arm (7) so that the tip of the fixed knife (6) is directly above the index mark (5) on the movable knife (4).
4. Once the adjustment is complete, securely tighten the socket bolt (3).

NOTE:

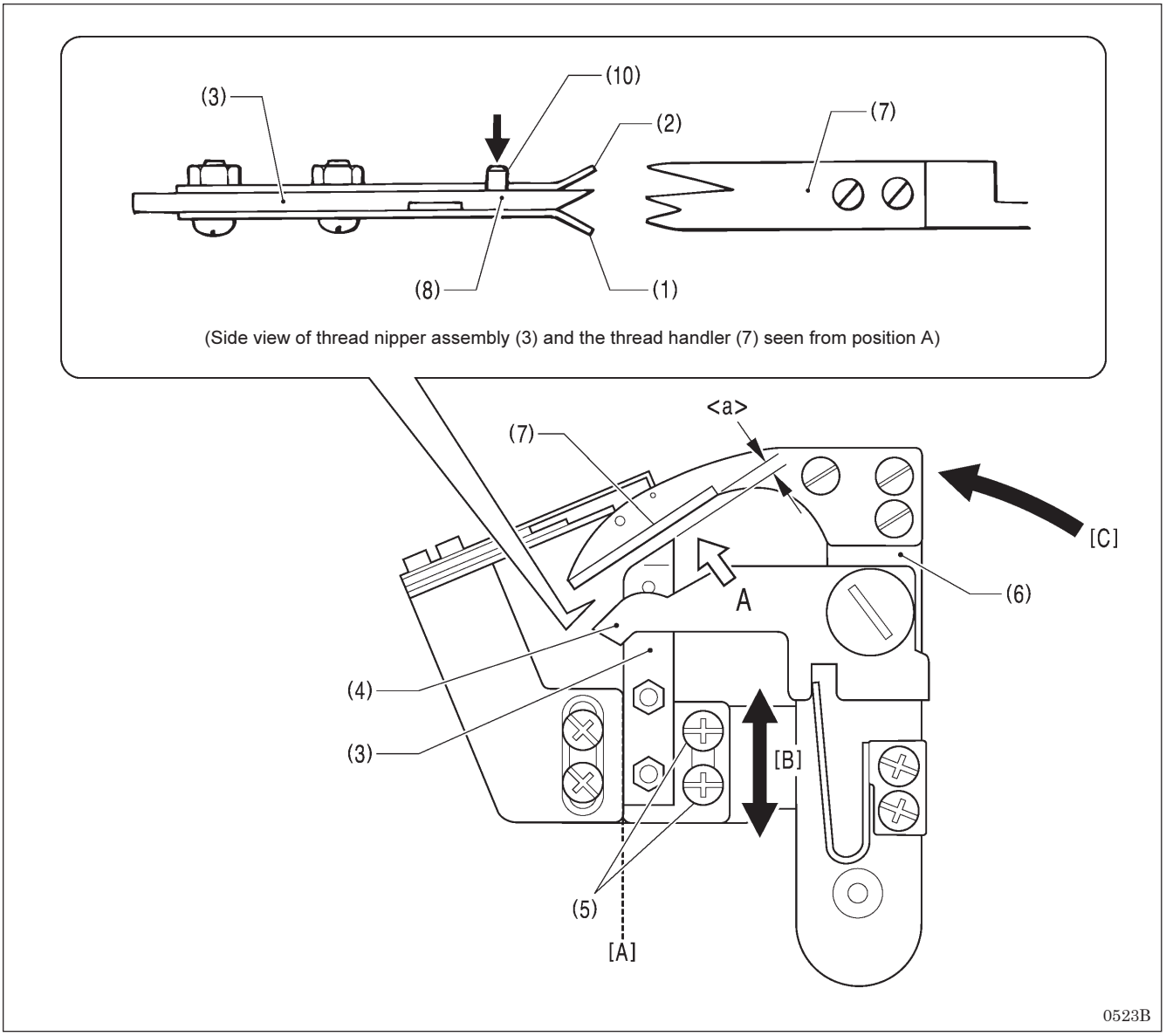
- When tightening the socket bolt (3), check that the thread trimmer lever arm (8) and the thread trimmer arm (7) move smoothly with no play.
- If the meshing amount is too small, problems with the lower thread nipper will occur and the thread will be pulled out at the sewing start.

9-25-4. Adjusting the thread nipper assembly and opener

The lower thread must pass through thread nipper D (1) and the gimp thread must pass through thread nipper U (2). Therefore, check that the thread nipper assembly (3) is installed in the correct position and that the thread nipper opener (4) moves correctly.

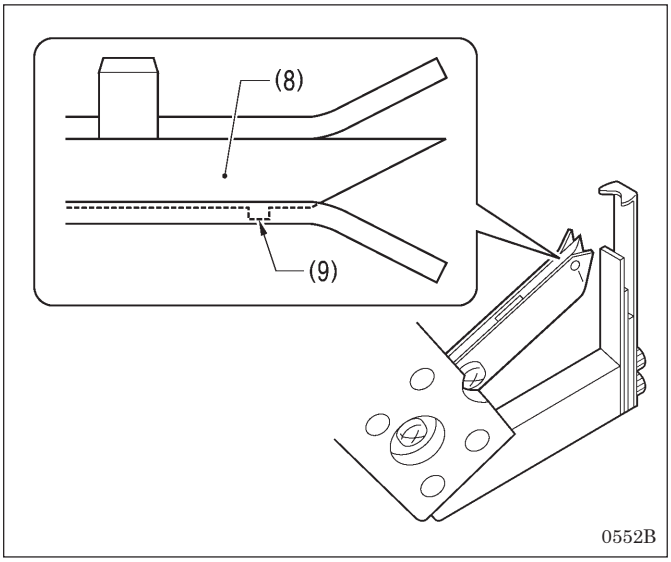
NOTE:

The lower thread must be securely held by thread nipper D (1) at the sewing start.

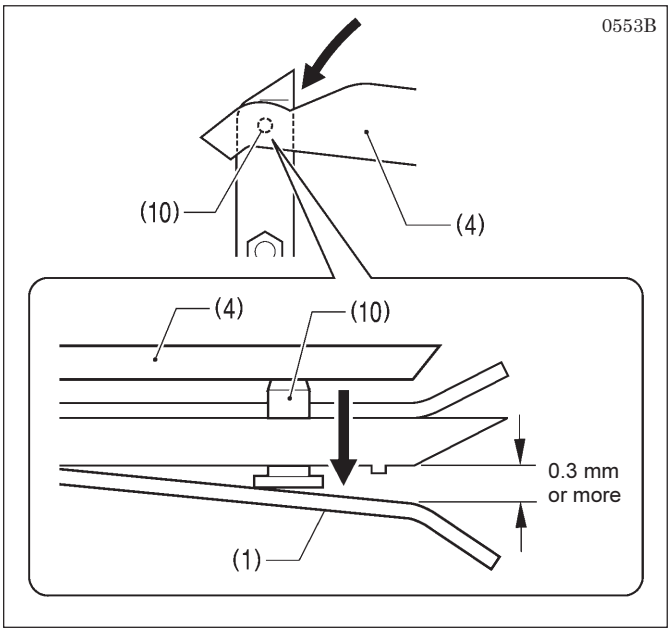


1. Loosen the two screws (5), and then move the thread nipper assembly (3) along the dotted line [A] in the illustration in the direction of the arrow [B] to adjust.
   * Adjust so that the gap <a> between the thread nipper assembly (3) and the thread handler (7) is as narrow as possible without the two parts touching when the thread trimmer arm (6) is turned in the direction of the arrow [C].

   NOTE:
   - If the gap <a> is too wide, problems with the lower thread nipper will occur and the thread will be pulled out at the sewing start.
   - If the thread nipper assembly (3) is installed at an angle, thread nipper D (1) may touch the throat plate and fail to open, and problems with the lower thread nipper will occur and the thread will be pulled out at the sewing start.

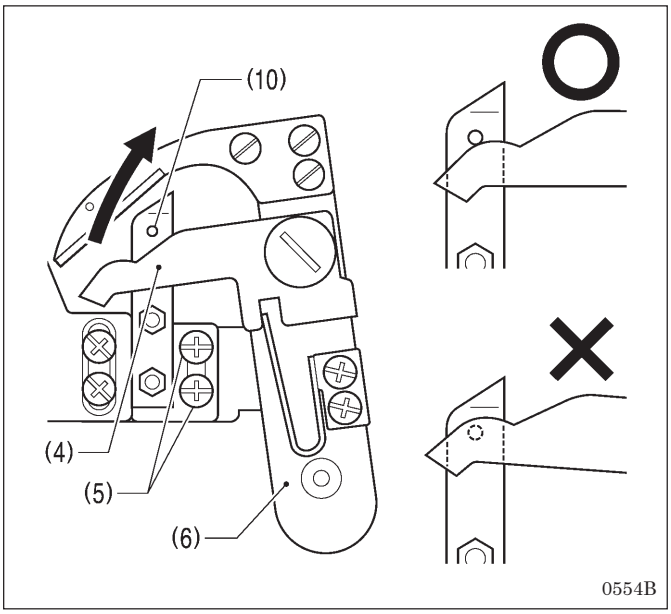


2. The lower thread must go over the projection (9) on thread nipper M (8) and be held securely. To make sure this happens, check that the operations in (a), (b) and (c) below are all correct.



(a) Thread nipper D (1) should open by 0.3 mm or more when the thread nipper opener (4) pushes down on the opener pin (10).

(b) Thread nipper D (1) should close immediately before the thread is trimmed.



(c) Thread nipper D (1) should not open when the thread trimmer arm (6) returns after thread trimming, so that the thread nipper opener (4) returns without going over the opener pin (10).

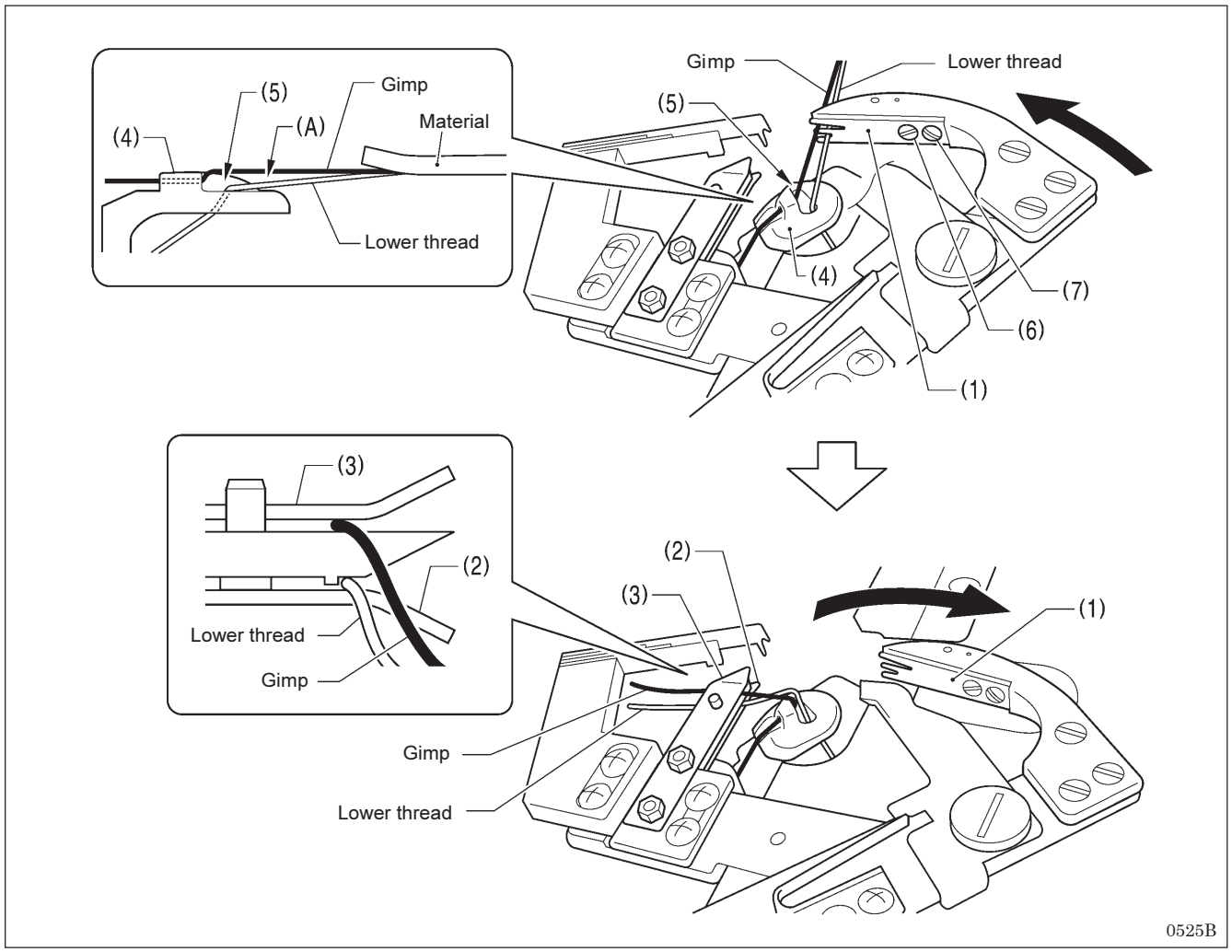
3. Once adjustment is complete, securely tighten the two screws (5).

9-25-5. Adjusting the thread handler

The lower thread and gimp are securely separated and guided by the thread handler (1), after which the lower thread needs to go smoothly into thread nipper D (2), while the gimp needs to go smoothly into thread nipper U (3).

NOTE: Principle of the thread handler

When the thread trimmer arm operates, the throat plate (4) turns 45 degrees. This causes the gimp to sit on top of the projection (5) of the throat plate (4) so that a difference in height is created between the lower thread and the gimp, and a triangular shape (A) is formed between the two threads and the final stitch. The thread handler (1) goes into this triangular shape (A) to separate the lower thread and gimp.



<Adjustment method>

* If this adjustment is carried out in manual mode, the lower thread trimming operation can be checked step by step, which will make adjustment easier.

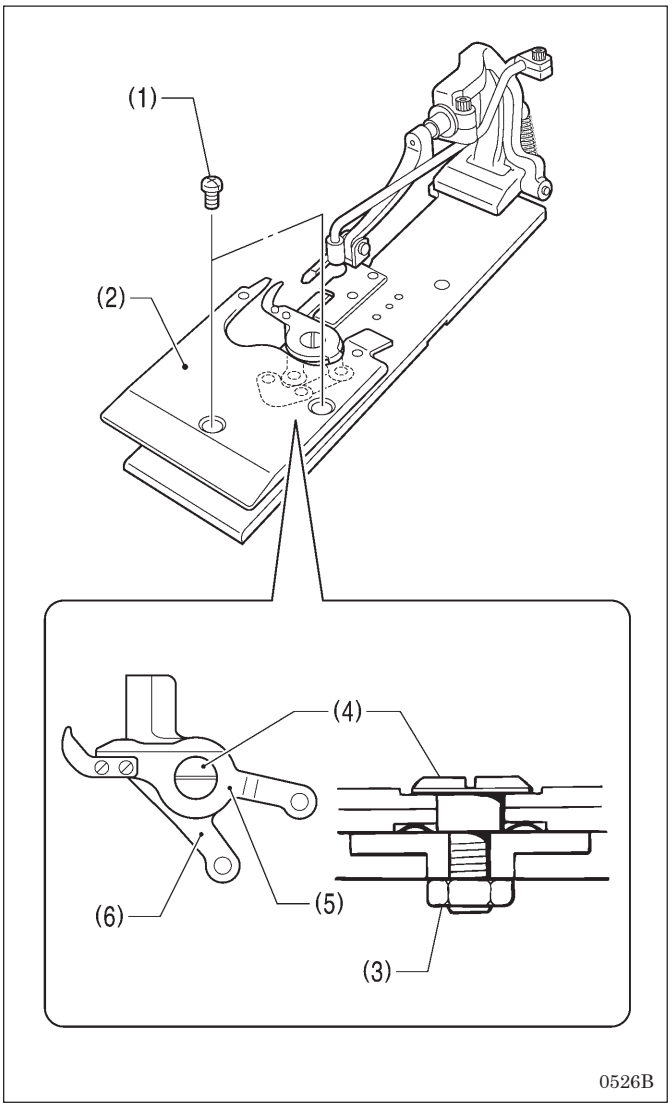
1. Use the parameter settings to set the stitch pitch to 2.0 mm and reduce the total number of stitches. (Refer to “5-3. Program setting method”.)
2. In manual mode, depress the start switch, and then turn the upper shaft pulley to sew manually as far as the final stitch. (Refer to “7-6. Manual sewing (manual mode)”.)
3. With the needle bar at the needle up stop position, depress the start switch one press at a time.
   * The thread trimming operation will be carried out one step at a time.
4. Loosen the pan screw (6) and the screw (7), and then use the pan screw (6) as a pivot to turn the thread handler (1) to adjust.
5. Once adjustment is complete, securely tighten the pan screw (6) and the screw (7).

NOTE:

If the height of the throat plate (4) has been changed, the triangular shape (A) defined by the final stitch, lower thread and gimp will change, and so you should adjust the thread handler (1).

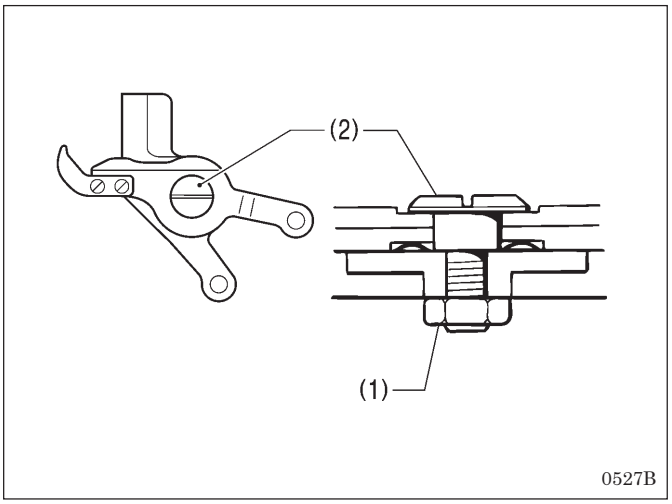
9-26. Replacing and adjusting the movable knife and fixed knife (for the lower thread and gimp) <-02 specifications>

9-26-1. Replacing the movable knife and fixed knife



1. Remove the two screws (1), and then remove work clamp plate U (2).
2. Remove the nut (3).
3. Remove the shoulder screw (4), and then remove movable knife L (5) and movable knife R (6).
4. Install the new knives, and then install the shoulder screw (4).
5. Adjust the cutting pressure (see below), and then tighten the nut (3).
6. Install work clamp plate U (2).

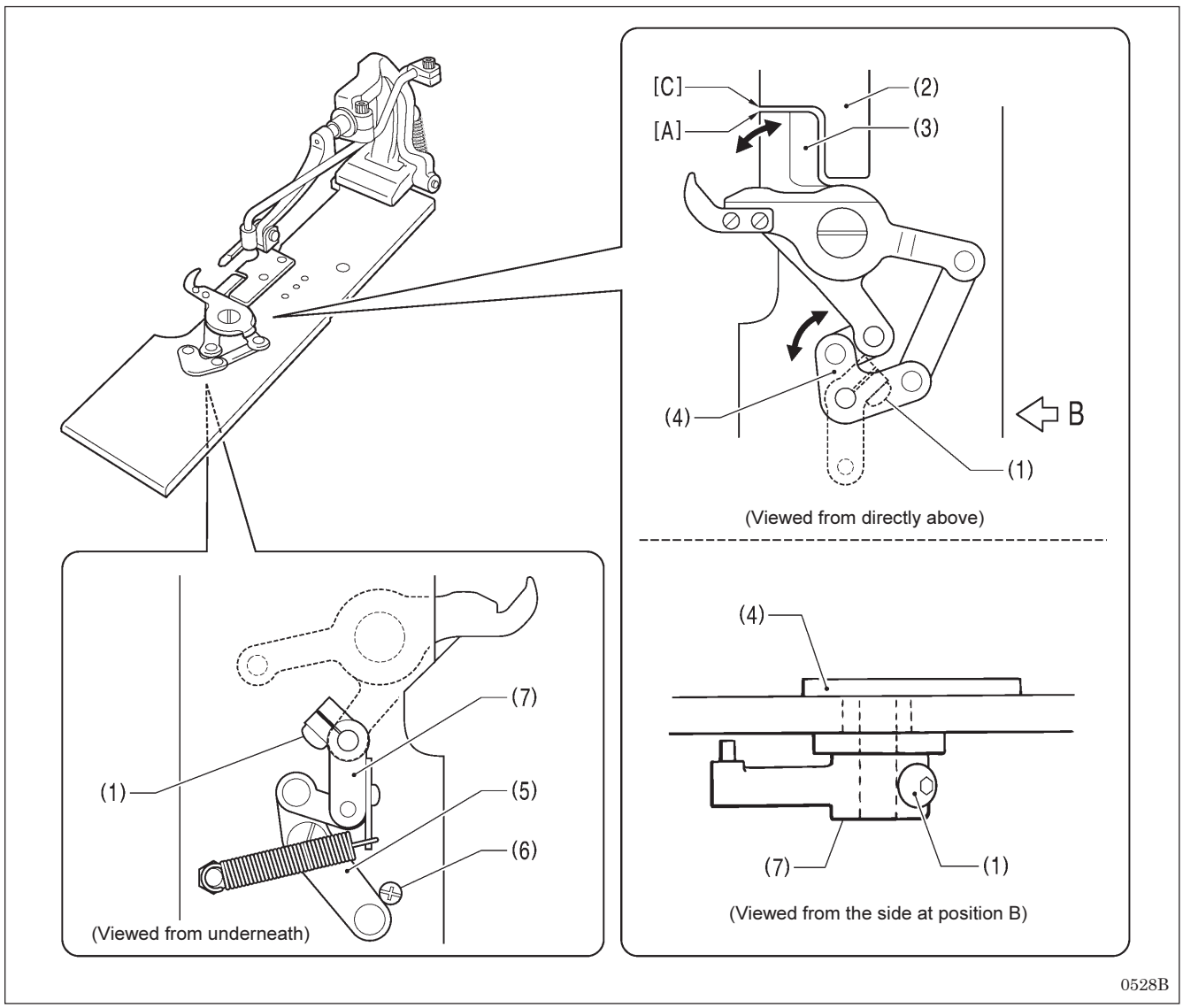
9-26-2. Adjusting the cutting pressure



Adjust the cutting pressure to the minimum pressure at which thread trimming can be carried out cleanly.

1. Loosen the nut (1).
2. Turn the shoulder screw (2) to adjust the cutting pressure.
   NOTE:
   If the shoulder screw (2) is tightened as far as it will go, the movable knives will no longer operate. Gradually loosen the shoulder screw (2) to a point where the movable knives turn smoothly.
3. Once adjustment is complete, securely tighten the nut (1).

9-26-3. Adjusting the movable knife installation position



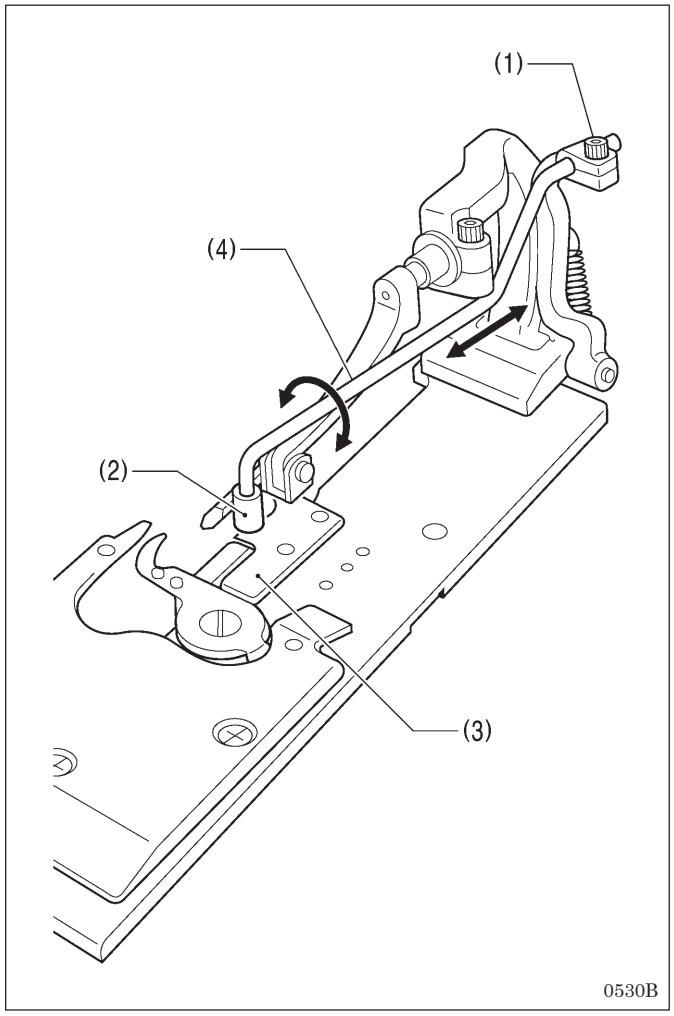
1. Remove work clamp plate U. (Refer to “9-26-1. Replacing the movable knife and fixed knife”.)
2. Loosen the screw (1).
3. Turn the movable knife driving plate (4) so that the tip [A] of movable knife R (3) and the corner [C] of the needle plate (2) are aligned.
4. Turn thread trimmer lever arm B (7) until the thread trimmer link lever J assembly (5) touches against the screw (6), and then tighten the screw (1).
5. Once adjustment is complete, install work clamp plate U.

NOTE:

Check that the movable knife driving plate (4) and thread trimmer lever arm B (7) turn smoothly with no play.

9-26-4. Adjusting the position of the auxiliary clamp

Trimming of the lower thread and gimp is carried out when the work clamps rise. The auxiliary clamp ensures that the material does not move during thread trimming, in order to maintain a stable thread length after trimming.



1. Loosen the socket bolt (1).
2. Adjust the installation position of the auxiliary clamp (4) with respect to the article being sewn so that the button clamp (2) moves above the needle plate (3).
3. Once adjustment is complete, securely tighten the socket bolt (1).

9-27. Adjusting the gimp trailing length <-02 specifications only>

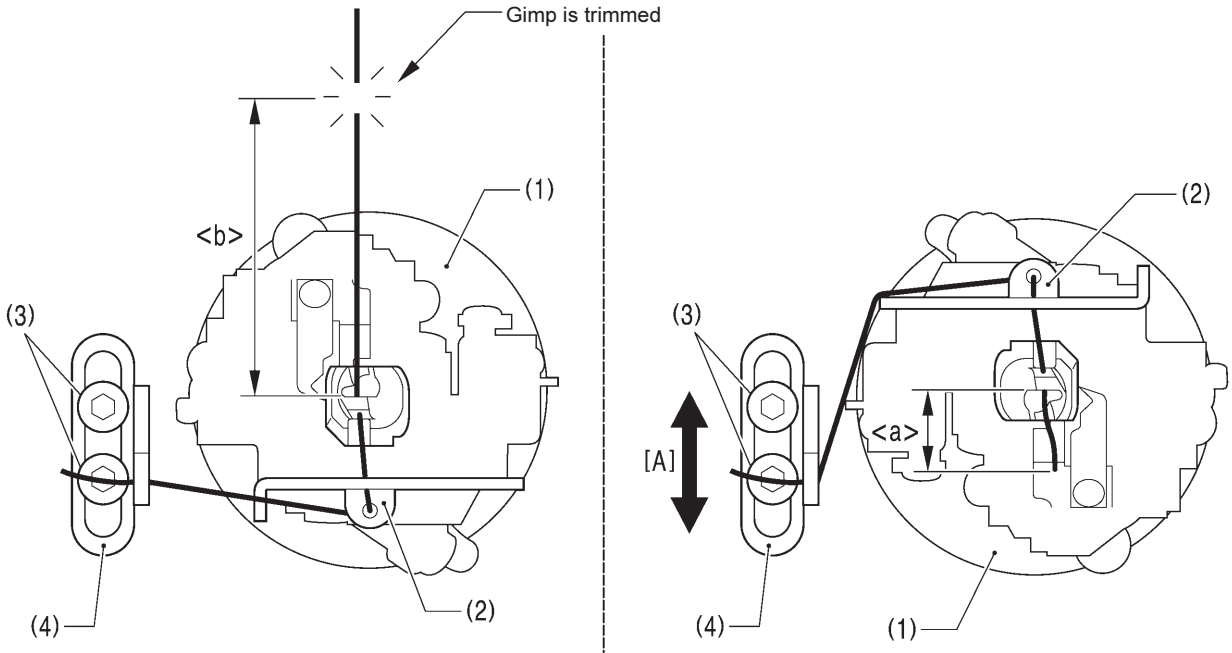
The gimp is pressed against the material by means of the twisting of the first 2 - 3 stitches at the sewing start, and is then pulled out continuously. Because of this, if strong tension is applied to the gimp when the feed base is at the sewing position and the gimp trailing length (<a> in the illustration below) becomes extremely short, the gimp may be pulled out of the stitches.
The gimp should be adjusted to as short a length as possible which will still allow the gimp to be securely wound around the stitches at the sewing start and leave a length protruding from above the stitches.

NOTE: Principle of gimp pulling

When the looper base (1) turns back from 180 degrees to 0 degrees after the gimp has been trimmed, gimp thread guide C-J (2) pulls the gimp to make it come out.

Adjustment of the gimp trailing length is necessary in the following cases.

- When the sewing length has been changed (the gimp is trimmed at the feed base home position, so the length of <b> will change. As a result, the gimp trailing length <a> will also change.)
- When the type of gimp and the gimp tension have been changed (the gimp trailing length <a> will change.)



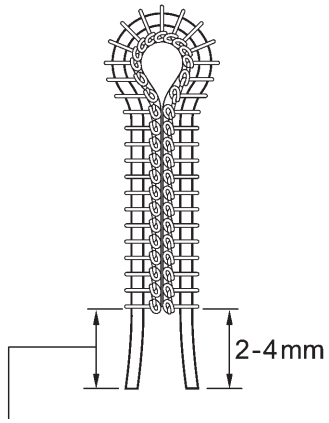
When looper base is turned 180 degrees

When looper base has returned to 0 degrees

(Seen from directly above)

0547B

0548B



The gimp trailing length at the sewing end is uniform because of thread trimming.

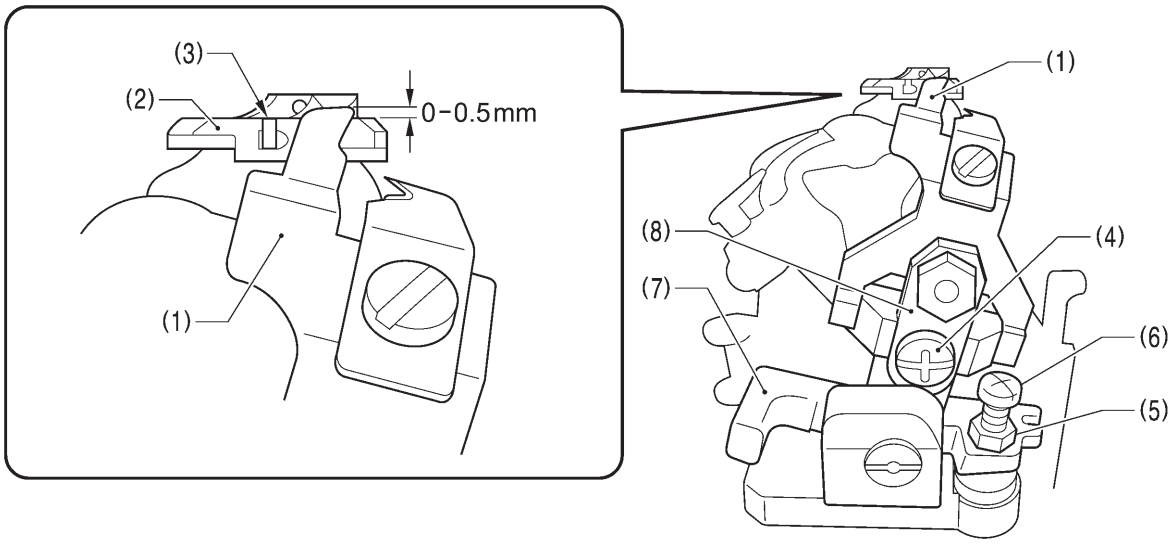
<Adjustment method>

1. Loosen the screw (3).
2. Move gimp thread guide J (4) in the direction of the arrow [A] to adjust so that 2 - 4 mm of the gimp protrudes from the seam at the sewing start.
3. Once adjustment is complete, securely tighten the screw (3).

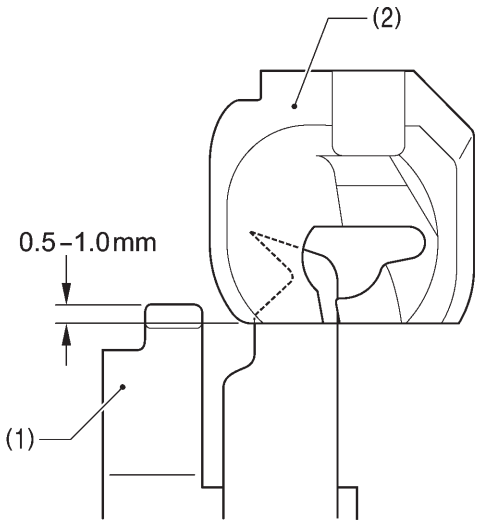
9-28. Adjusting the position of the lower thread presser <-02 specifications only>

Adjust the lower thread presser (1) so that it securely holds the lower thread.

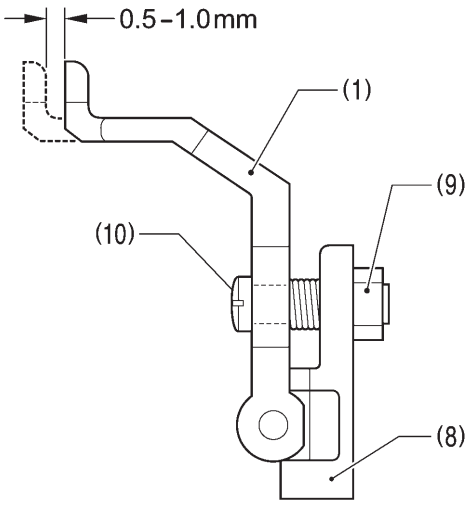
0549B
0550B
0551B



(Seen from the front)



(Seen from directly above)

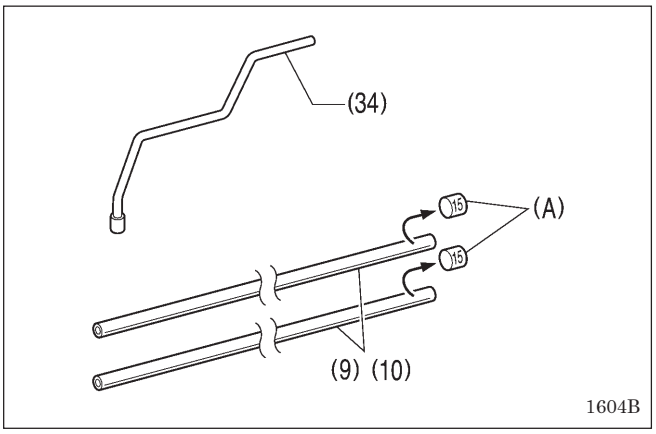


(Seen from directly to the right)

1. Loosen the screw (4) and move the lower thread presser (1) up or down to adjust so that its top projects approximately 0.5 mm from the top of the thread groove (3) in the throat plate (2).
2. Check that the lower thread presser (1) does not cover the groove at the front of the throat plate (2).
   * If the groove is covered, loosen the nut (5) and then turn the screw (6) to adjust.
3. Check that the front of the throat plate (2) and the lower thread presser (1) are overlapping by 0.5 - 1.0 mm after thread trimmer lever bracket B (7) has operated.
   * If adjustment is required, remove the lower thread presser base (8), loosen the nut (9), and then turn the screw (10) to adjust.
4. Once adjustment is complete, tighten the nuts (5) and (9) that were loosened, and install the lower thread presser base (8).

9-29. Installing (replacing) the auxiliary clamp on the left side

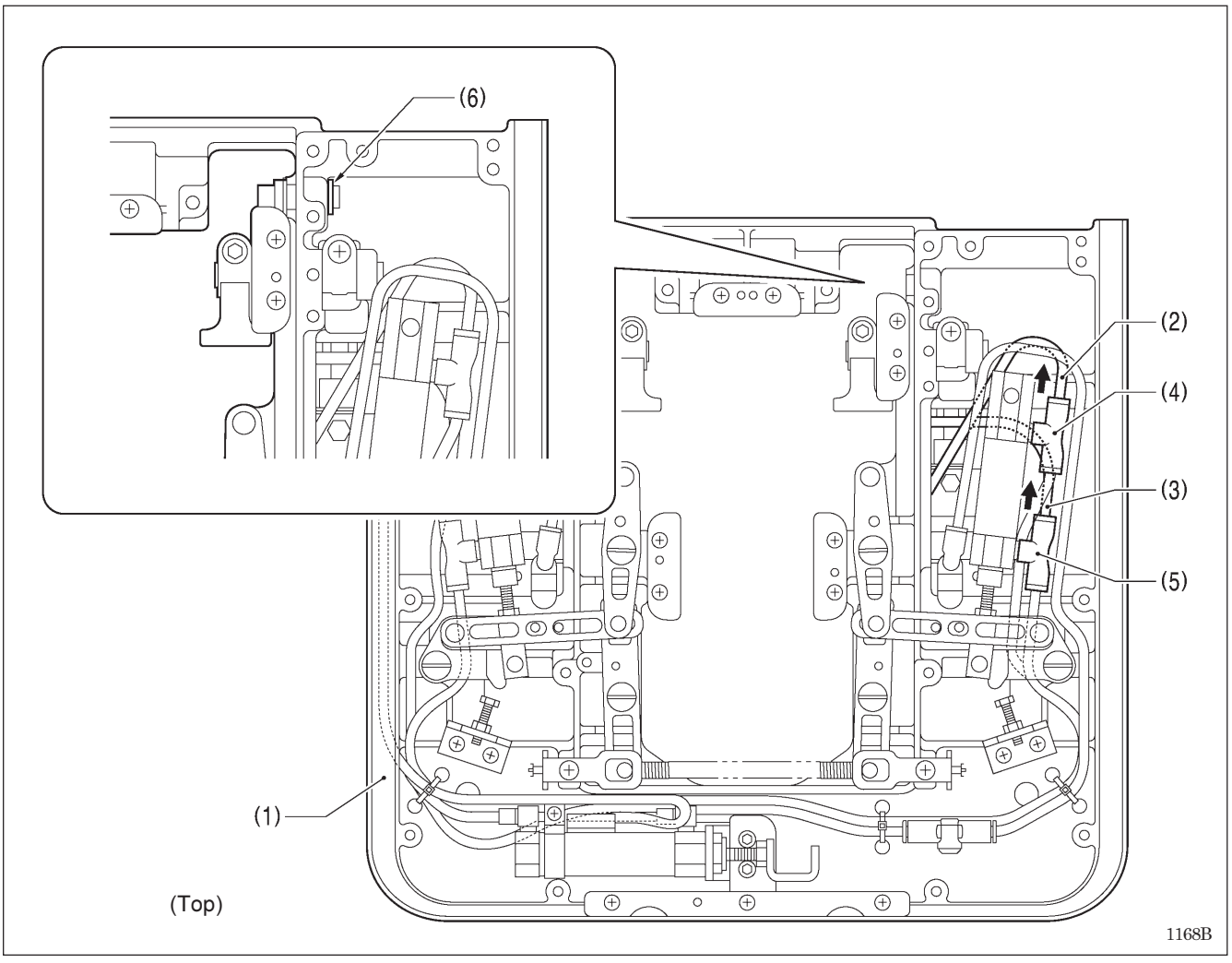
If necessary, the auxiliary clamp can be removed from the right side and can be installed on the left side instead. In this case, the following optional parts are required.



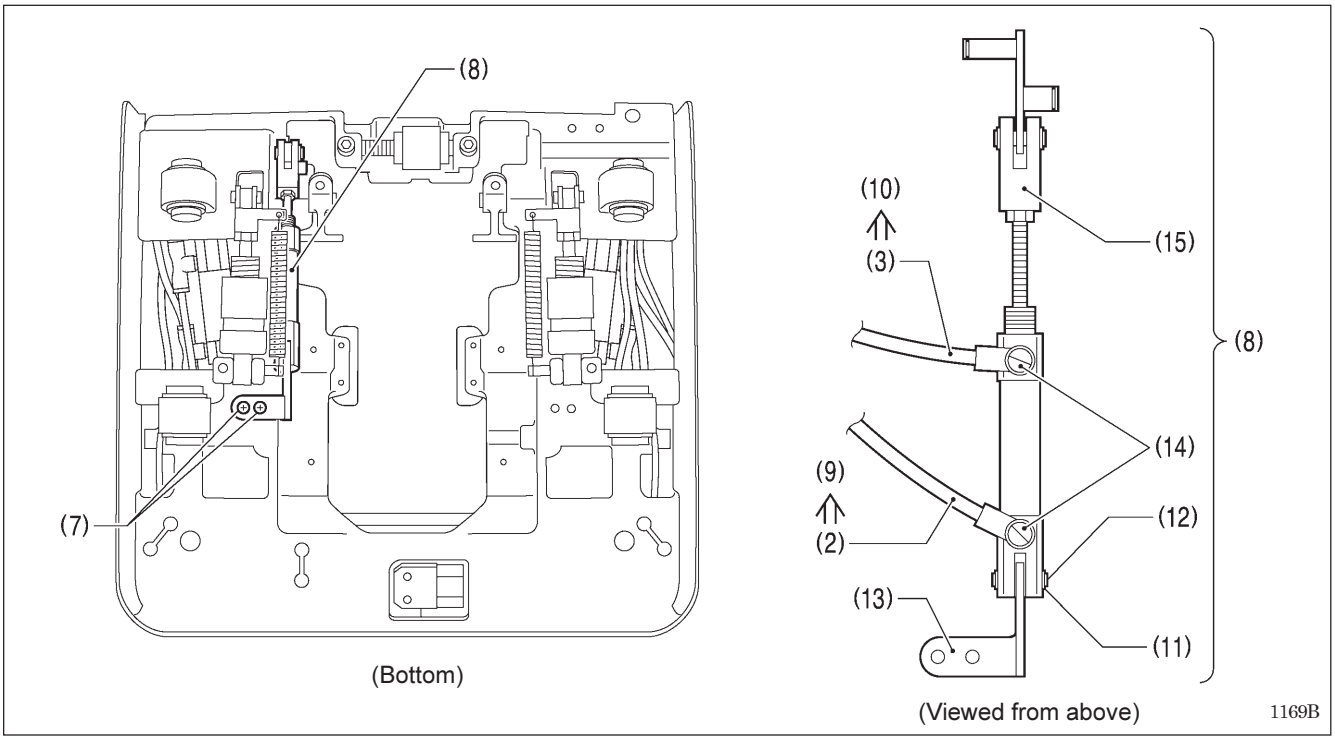
To install the auxiliary clamp on the left side, first have the following option parts ready.

Ref. No.	Code	Qty.	Part name
(34)	SA9132001	1	Auxiliary clamp L assembly
(9) (10)	SA5683001	2	Air hose (outer dia. 4 mm, inner dia. 2.5 mm, length 750 mm)

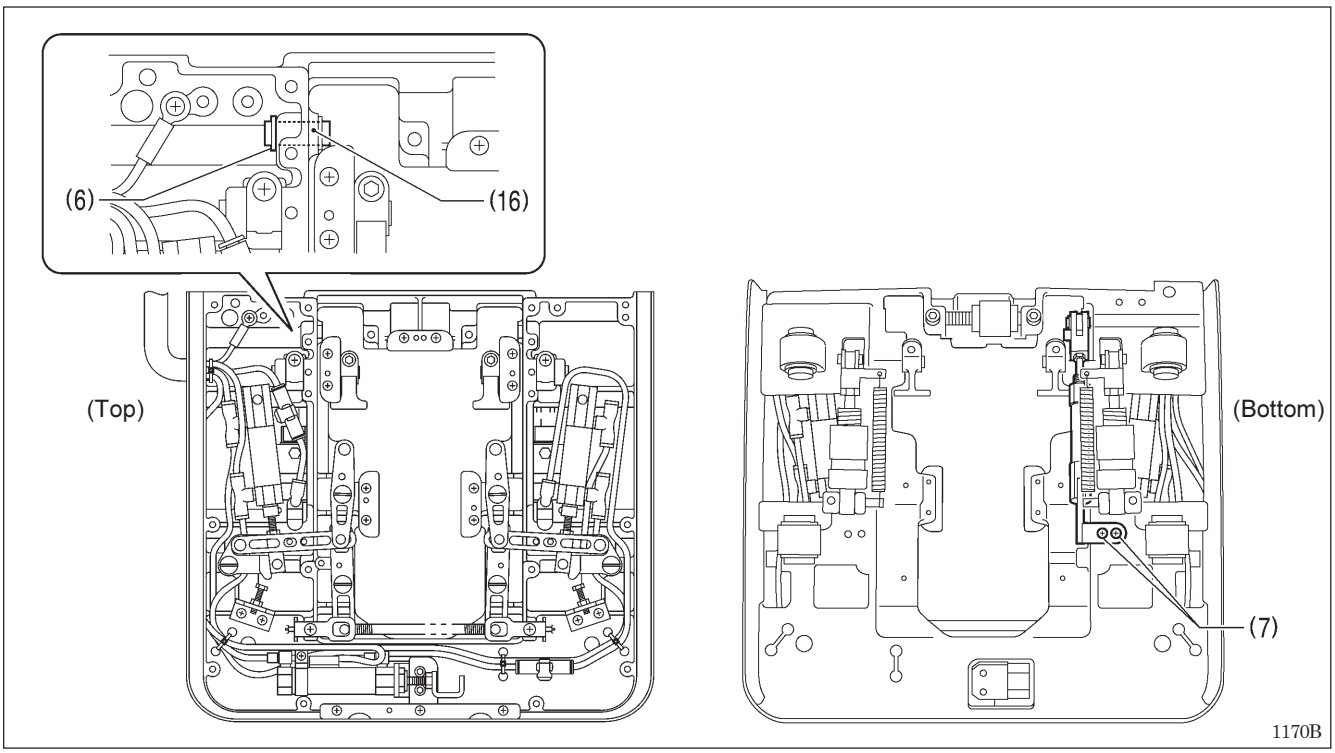
* Be sure to remove the stickers (A) before using the air hoses (9) and (10).



1. Stop the air and then bleed the air. (Refer to “3-16. Adjusting the air pressure”.)
2. Remove the feed base unit (1) from the bed. (Refer to “5-3. Feed mechanism” in the service manual.)
3. Disconnect the air tubes (2) and (3) from the joints (4) and (5).
4. Remove retaining ring C (6).

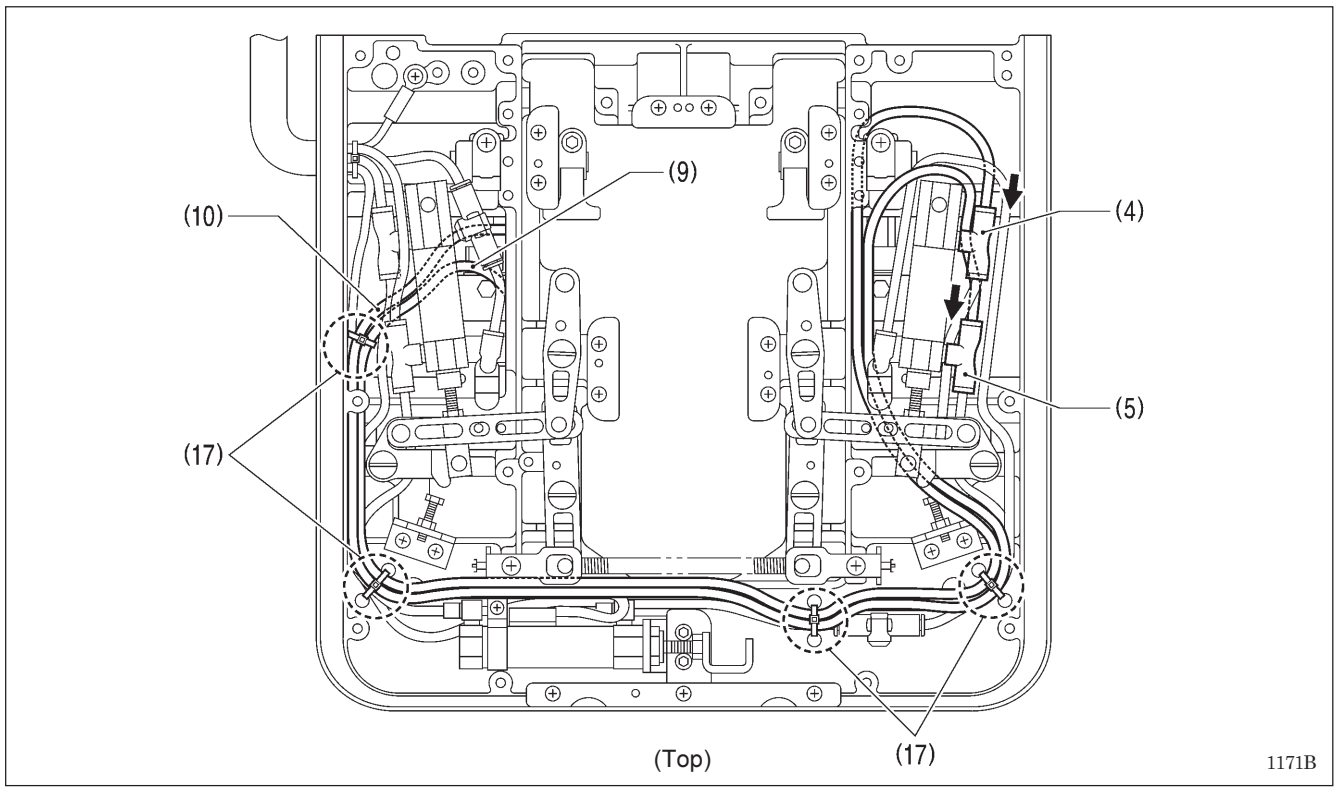


5. Remove the two screws (7), and then remove the auxiliary clamp cylinder assembly (8).
6. Replace the air hoses (2) and (3) with the optional air hoses (9) and (10).
7. Remove retaining ring C (11) and pull out the shaft (12).
8. Insert the shaft (12) into the auxiliary clamp S holder (13) in the direction shown in the illustration, and then install retaining ring C (11).
9. Set the joint (14) and the cylinder rod (15) so that they are facing as shown in the illustration.

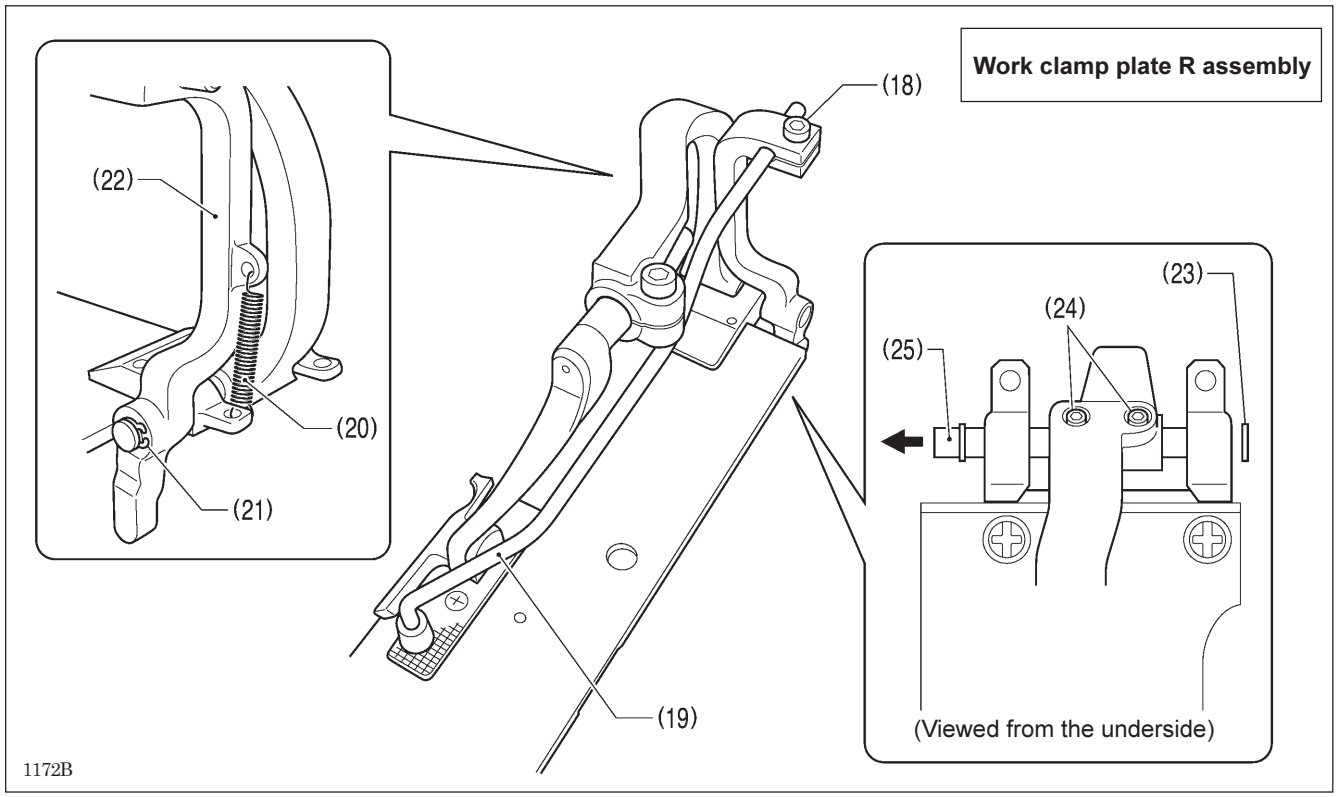


10. Insert the shaft (16) of the auxiliary clamp connecting rod into the hole in the feed base, and then install retaining ring C (6).
11. Tighten the two screws (7).

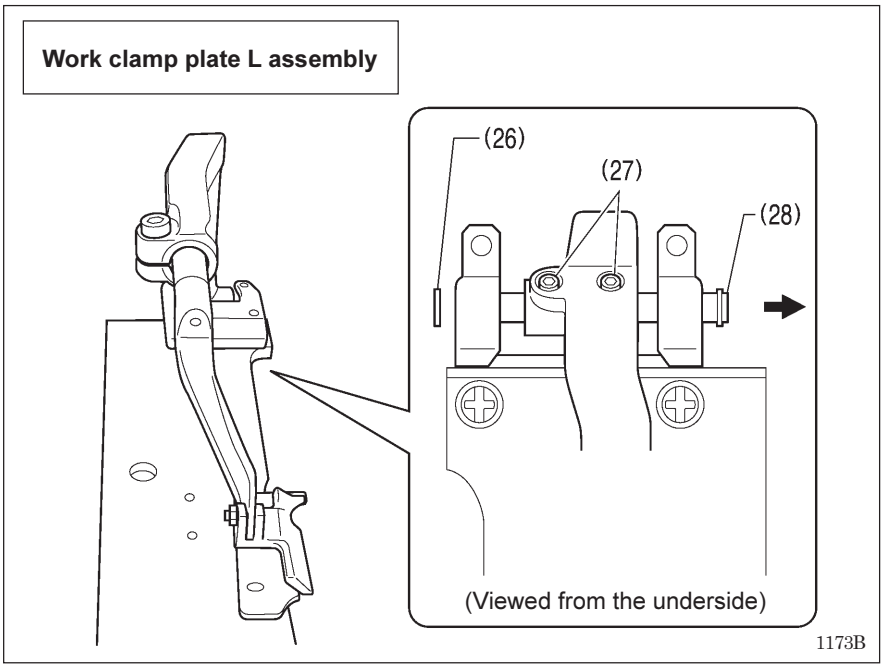
(Continued on next page)



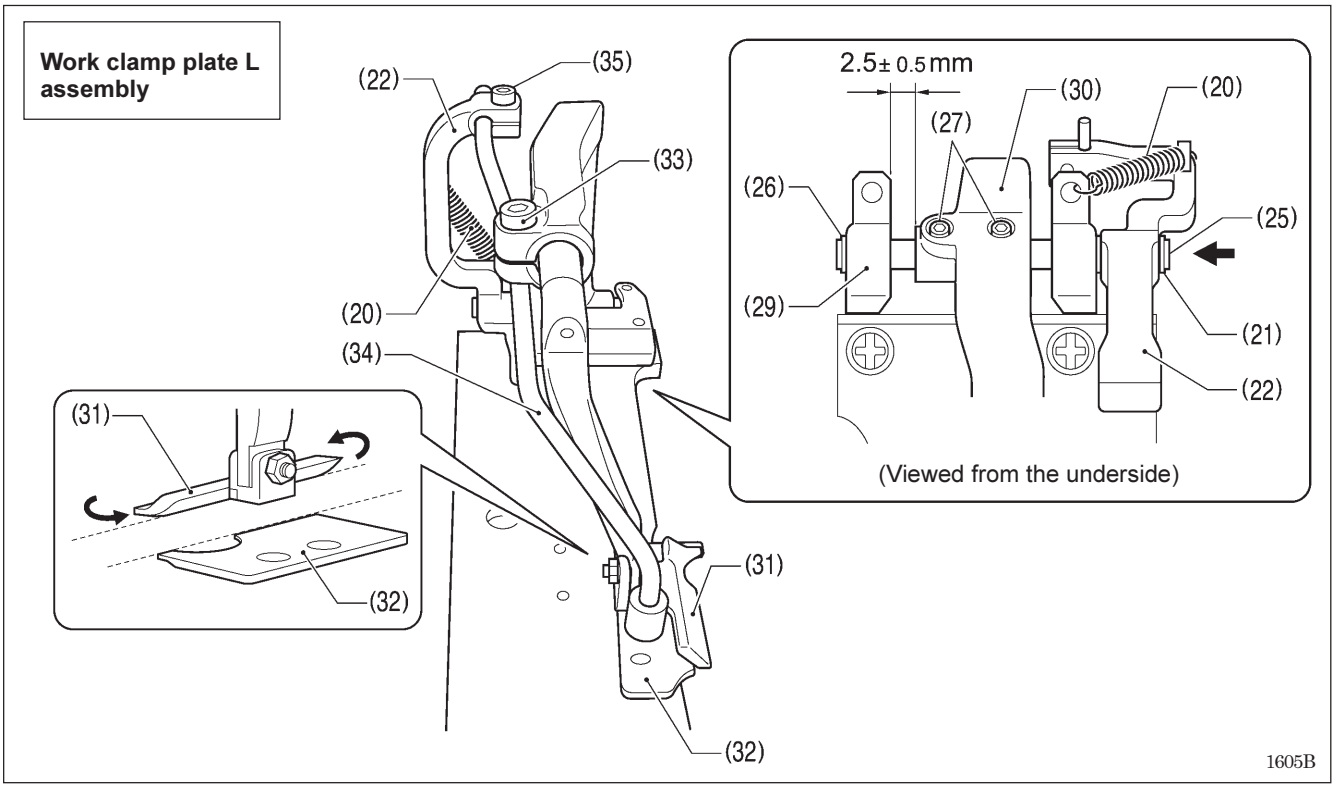
12. Route the tubes as shown in the illustration, and then connect the air hose (9) to the joint (4) and the air hose (10) to the joint (5).
13. Secure the air hoses (9) and (10) in four places using the four bead bands (17) as shown in the illustration.



14. Loosen the socket bolt (18), and then remove the auxiliary clamp assembly (19).
15. Remove the spring (20).
16. Remove retaining ring C (21), and then remove the auxiliary clamp arm (22).
17. Remove retaining ring C (23), loosen the two set screws (24), and then remove clamp fulcrum shaft J (25) in the direction of the arrow.



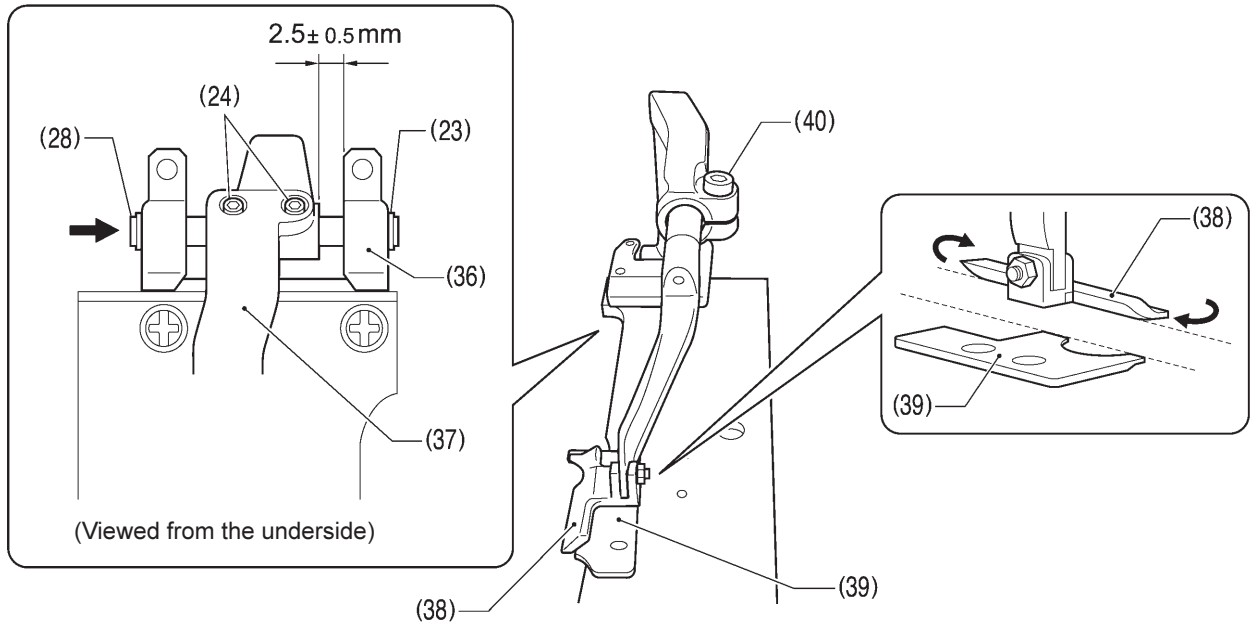
18. Remove retaining ring C (26), loosen the two set screws (27), and then remove the clamp fulcrum shaft (28) in the direction of the arrow.



19. Insert clamp fulcrum shaft J (25) in the direction of the arrow, and then install retaining ring C (26).
20. Place the auxiliary clamp arm (22) onto clamp fulcrum shaft J (25) as shown in the illustration, and then install retaining ring C (21).
21. Tighten the two set screws (27) so that the clearance between the clamp shaft holder (29) and clamp lever L (30) is 2.5 ± 0.5 mm.
    * Check that the sides of work clamp L (31) and needle plate L (32) are aligned at this time. If they are not aligned, loosen the socket bolt (33) and adjust.
22. Install the auxiliary clamp L assembly (34) to the auxiliary clamp arm (22), and then secure it by tightening the socket bolt (35).
    (Refer to “9-26-4. Adjusting the position of the auxiliary clamp”.)
23. Install the spring (20) to the auxiliary clamp arm (22) and the clamp shaft holder (29).

(Continued on next page)

Work clamp plate R assembly



1606B

24. Insert the clamp fulcrum shaft (28) in the direction of the arrow, and then install retaining ring C (23).
25. Tighten the two set screws (24) so that the clearance between the clamp shaft holder (36) and clamp lever R (37) is 2.5 ± 0.5 mm.
    * Check that the sides of work clamp R (38) and needle plate R (39) are aligned at this time. If they are not aligned, loosen the socket bolt (40) and adjust.

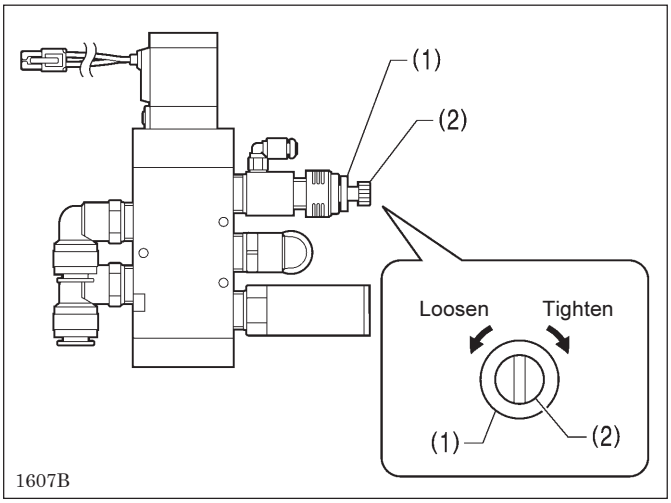
9-30. Adjusting the throttle valves

Adjust the throttle valves of each valve as follows.

9-30-1. Adjusting the throttle valve of the cutter valve

NOTE: Function of the throttle valve of the cutter valve

The air released from the cutter cylinder when the hammer is raised is used as the air which flows to the venturi tube in order to collect the cutting scraps. You can adjust the amount of this air that is released by adjusting the throttle valve of the cutter valve. As a result of this, increasing or decreasing the opening amount of the throttle valve will change the cutting scrap collection performance and also the hammer lifting speed (cycle time). Make the adjustment correctly by following the procedure below.



<Adjustment method>

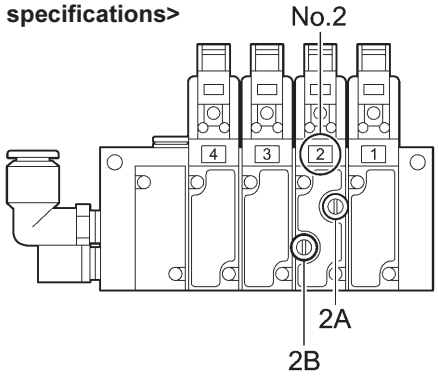
1. Loosen the fixing nut (1).
2. Loosen the throttle valve adjusting screw (2) by eight turns from the fully-tightened position.
3. After adjusting, tighten the fixing nut (1) to secure the throttle valve adjusting screw (2) so that it cannot turn.

* If the throttle valve adjusting screw (2) is not adjusted correctly, the following problems will occur.

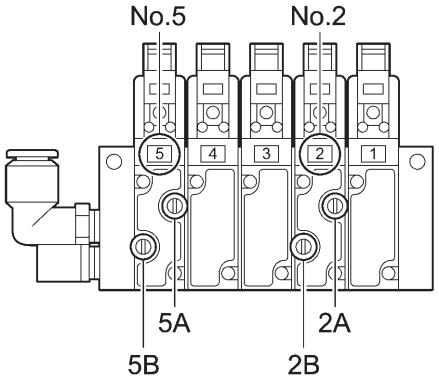
No. of turns of throttle valve adjusting screw (2)	Problem
If loosened by more than eight turns	The amount of air flowing to the venturi tube will be reduced, and so the cutting scrap collection performance will drop. (If it is loosened too far, cutting scrap blockages will occur.)
If loosened by less than eight turns	The amount of air flowing to the venturi tube will increase, and so the cutting scrap collection performance will increase, but the hammer lifting speed will decrease. (The cycle time will become longer and working efficiency will drop.) **Note:** The hammer lifting speed will tend to become too slow after about six turns. If you would like to give the highest priority to cutting scrap collection performance, adjust to within a range of 6 to 8 turns while continually checking hammer operation.

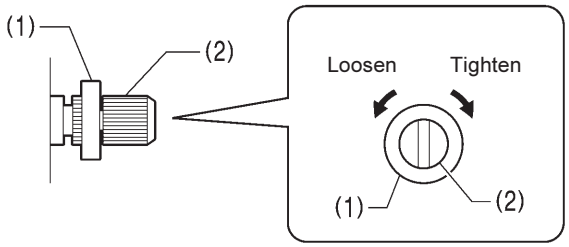
9-30-2. Adjusting the throttle vales of the solenoid valves

<For -00 specifications>



<For -01 and -02 specifications>





1608B
1609B
1610B

NOTE: Applications of each valve

Label No.	Solenoid valve application
1	For upper thread take-up
2	For upper thread trimming
3	For cloth spreading (+ for auxiliary clamp *1)
4	For work clamp
5*2	For lower thread trimming

*1: Auxiliary clamp is for -02 specifications only.
*2: The solenoid valve for label No. 5 is not present in -00 specifications.

- Use the throttle valve adjusting screws for valve No. 2 (2A and 2B in the illustration) to adjust the operating speed for the upper thread trimming cylinder.
- Use the throttle valve adjusting screws for valve No. 5 (5A and 5B in the illustration) to adjust the operating speed for the lower thread trimming cylinder.

Make the adjustments correctly by following the procedure below.

<Adjustment method>

1. Loosen the fixing nut (1).
2. With the throttle valve adjusting screw (2) tightened fully, loosen the throttle valve adjusting screw (2) while referring to the “Guide to adjustment” below.
3. After adjusting, tighten the fixing nut (1) to secure the throttle valve adjusting screw (2) so that it cannot turn.

<Guide to adjustment>

Valve	No. of turns of throttle valve adjusting screw	Problem
Valve No. 2 (Throttle valve adjusting screws: 2A and 2B)	If loosened by more than nine turns	Operation will become faster, but if it becomes too fast, shocks will become greater and noise will occur.
	If loosened by less than nine turns	Operation will become slower and cutting performance will drop. For -02 specifications, lower thread clamping errors may occur.
Valve No. 5 (Throttle valve adjusting screws: 5A and 5B)	If loosened by more than seven turns	Operation will become faster, but if it becomes too fast, bunching may occur during thread handling, and thread trimming errors may occur.
	If loosened by less than seven turns	Operation will become slower, and cycle time will increase and an error code may be displayed.

10. SEWING CIRCULAR STITCHES

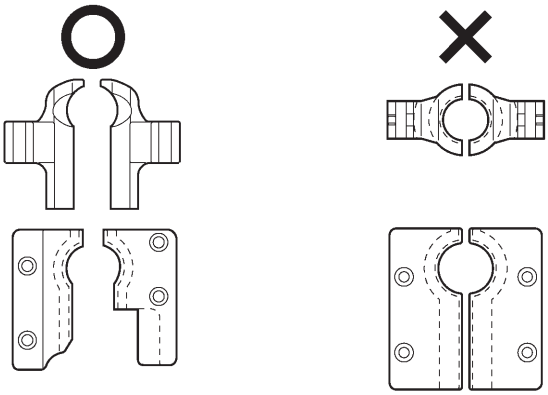
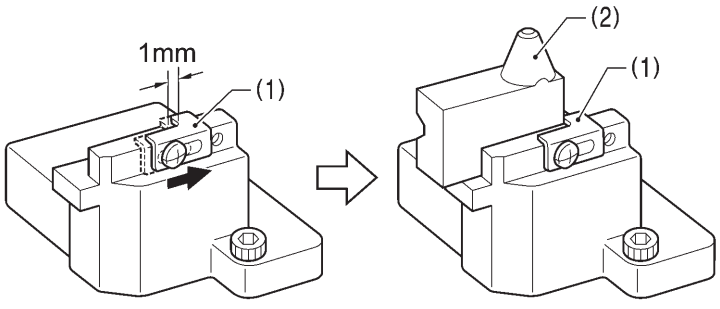
For -00 and -01 specifications, it is recommended that you use the special parts when sewing. (Refer to the Parts Book.)

<If using a -02 specification sewing machine>

It is recommended that you change to using a -00 or -01 specification sewing machine.

Alternatively, if the version of the main control program (MN) is 1.3.00 or later, simple sewing is possible. However, the following restrictions will apply, so make sure that you understand them before using the sewing machine.

<Restrictions when using -02 specification sewing machines for sewing circular stitches>

	Restriction	Points to note and understand
1	Use standard -02 specification parts for the needle plate and work clamp.  1611B	Note that the work clamp range will become smaller and the amount of play in the material will increase.
2	The lower thread trimming mechanism will not operate.	Thread trimming will become unstable because of the way the mechanism operates, so the mechanism will be set to be disabled.
3	The only material setting position available is “Front”.	The “Back” setting position would result in the lower thread and gimp getting caught on the thread trimming knife when the material is pulled out at the end of sewing, and so this setting cannot be used.
4	Move the position of the block stopper plate (1) used to install the knife back by 1 mm and install the circular stitch knife (2).  1612B	In order to match the seam position to the standard work clamp, the seam position for circular stitches is moved back by 1 mm. As a result, the knife installation position should also be moved back.

<Knife pressure>

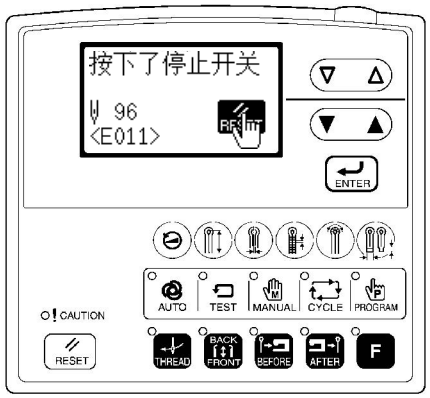
The cutting area will be smaller than for eyelet shapes, so it is recommended that you decrease the knife pressure.

11. ERROR CODES

⚠DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the cover of the control box. Touching areas where high voltages are present can result in severe injury.

If a problem should occur with the sewing machine, the buzzer will sound and an error code and error message will appear in the display.
Follow the remedy procedure to eliminate the cause of the problem.



0320B
0461B

Switch-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.

Code	Cause	Remedy	Page
E010	Stop switch was pressed during standby.	Remove your finger from the stop switch (so that it is off).	1
E011	Stop switch was pressed during sewing.	Press the RESET key to clear the error. * Press the ▼ key to move the feed mechanism so that you can continue sewing.	36 53
E015	The stop switch was still being pressed, or there is a problem with the stop switch connection.	Turn off the power, and check the stop switch if it was not being pressed at the time.	19*
E016	Problem with the stop switch connection.	Turn off the power and check the connection of the stop switch connector P13 at the main P.C. board.	19*
E024	Start switch is being pressed.	Release the start switch (so that it turns off).	14 - 16
E025	Start switch was depressed after the power was turned on, or connection of start switch is defective.	Turn off the power and check if the start switch is pressed. If the start switch is not being pressed, check the switch connector P6 at the main P.C. board.	14 - 16 19*
E034	Work clamp switch is being pressed.	Release the work clamp switch (so that it turns off).	14 - 16
E035	Work clamp switch was depressed, or connection of work clamp switch is defective.	Turn off the power and check the work clamp switch.	14 - 16
E050	Machine head tilting was detected after the power was turned on.	Turn off the power, and then return the machine head to its original position. Check the connection of the machine head safety switch connector P9 at the main P.C. board.	11 19*
E051	Machine head tilting was detected while the sewing machine was operating.	Turn off the power, and then return the machine head to its original position. Check the connection of the machine head safety switch connector P9 at the main P.C. board.	11 19*
E055	Machine head tilting was detected when the power was turned on.	Turn off the power, and then return the machine head to its original position. Check the connection of the machine head safety switch connector P9 at the main P.C. board.	11 19*
E065	An operation panel key was still being pressed when the power was turned on, or key is faulty.	Turn off the power and check that no keys are being pressed.	36 37

Upper shaft motor-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.

Code	Cause	Remedy	Page
E110	Needle up stop position error	Turn the upper shaft pulley until the point where the error display disappears.	38
E111	Needle up stop position error	Turn off the power, and check the connection of synchronizer connector P5 at the power supply motor P.C. board and zigzag sensor connector P10 at the main P.C. board.	19* 20*
E120	Needle drop signal could not be detected.	Turn off the power, and check the connection of the synchronizer connector P5 at the main P.C. board.	20*
E130	Sewing machine motor stopped due to a problem, or synchronizer is faulty.	Turn off the power, and then turn the upper shaft pulley and check if the sewing machine has locked up. Check that the upper shaft motor connector P4 and synchronizer connector P5 are connected at the power supply motor P.C. board.	20*
E131	Synchronizer is faulty.	Turn off the power, and check the connection of the synchronizer connector P5 at the power supply motor P.C. board.	20*
E132	Problem detected with sewing machine motor operation.	Turn off the power, and then turn the upper shaft pulley and check if the sewing machine has locked up. Check that the upper shaft motor connector P4 and synchronizer connector P5 are connected at the power supply motor P.C. board.	20*
E133	Sewing machine motor stopping position is incorrect.	Turn off the power, and then turn the upper shaft pulley and check if the sewing machine has locked up. Check that the upper shaft motor connector P4 and synchronizer connector P5 are connected at the power supply motor P.C. board.	20*
E140	Sewing machine motor operated in reverse during sewing.	Turn off the power, and then turn the upper shaft pulley and check if the sewing machine has locked up. Check that the upper shaft motor connector P4 and synchronizer connector P5 are connected at the power supply motor P.C. board.	20*
E150	Sewing machine motor is overheating, or temperature sensor is faulty.	Turn off the power, and then turn the upper shaft pulley and check if the sewing machine has locked up. Check that the upper shaft motor connector P4 and synchronizer connector P5 are connected at the power supply motor P.C. board.	20*

Feed mechanism-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.

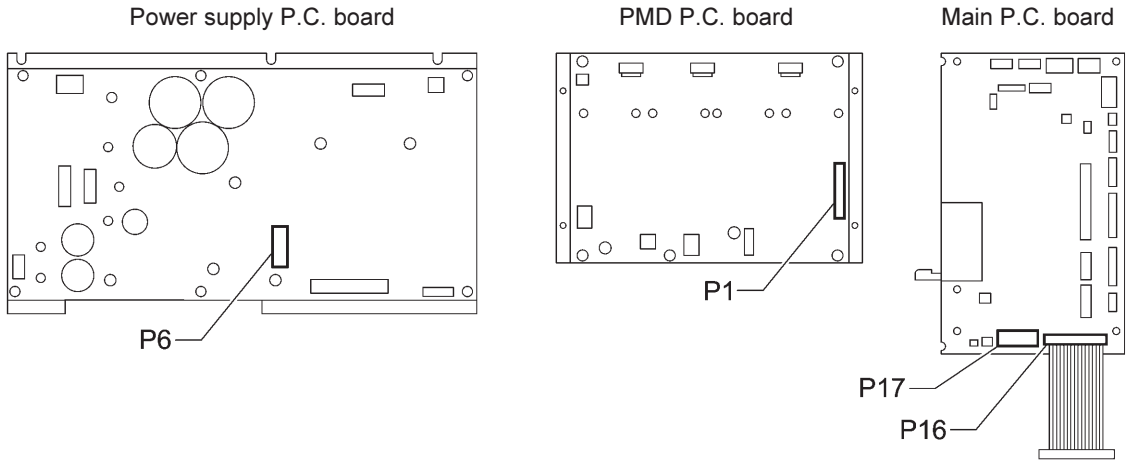
Code	Cause	Remedy	Page
E200	X-feed motor home position cannot be detected. Problem with X-feed motor or poor X home position sensor connection.	Turn off the power, and then check that the X-feed motor connector P10 is connected at the PMD P.C. board and that the X pulse motor encoder connector P20 is connected at the main P.C. board.	19* 20*
E201	X-feed motor stopped due to a problem.	Turn off the power, and then check if there are any problems in the X-feed direction.	*
E210	Y-feed motor home position cannot be detected. Problem with Y-feed motor or poor Y home position sensor connection.	Turn off the power, and then check that the Y-feed motor connector P8 is connected at the PMD P.C. board and that the Y pulse motor encoder connector P4 and sensor connector P8 are connected at the main P.C. board.	19* 20*
E211	Y-feed motor stopped due to a problem.	Turn off the power, and then check if there are any problems in the Y-feed direction.	*
E220	θ-feed motor home position cannot be detected. Problem with θ-feed motor or poor θ home position sensor connection.	Turn off the power, and then check that the θ-feed motor connector P3 is connected at the PMD P.C. board and that the θ-feed motor encoder connector P5 is connected at the main P.C. board.	19* 20*
E221	θ-feed motor stopped due to a problem.	Turn off the power, and then check if there are any problems in the θ-feed direction.	*

Communication and memory-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.
For items with "**" appearing in the "Page" column, ask the place of purchase for advice.

Code	Cause	Remedy	Page
E401	Connection error detected between the main P.C. board and power supply motor P.C. board when the power was turned on.	Turn off the power, and then check that connector P17 on the main P.C. board and connector P6 on the power supply motor P.C. board are properly connected.	19* 20* 120*
E403	Communication error detected between the main P.C. board and PMD P.C. board when the power was turned on.	Turn off the power, and then check that connector P16 on the main P.C. board and connector P1 on the PMD P.C. board are properly connected.	19* 20* 120*
E410	Communication error between main P.C. board and panel P.C. board detected.	Turn off the power, and then check that the operation panel connector P1 is connected at the main P.C. board.	19*
E411	Communication error between main P.C. board and power supply motor P.C. board detected.	Turn off the power, and then check that connector P17 on the main P.C. board and connector P6 on the power supply motor P.C. board are properly connected.	120*
E420	No CF card is inserted. (No messages are displayed.)	Turn off the power, and then insert a CF card into the CF card slot of the control box.	**
E422	Error occurred while reading CF card.	Check the data on the CF card.	**
E424	Insufficient free space on CF card.	Use a different CF card.	**
E425	Error occurred wile writing to CF card.	Use the specified type of CF card.	**
E430	Problem with flash memory on main P.C. board.	Turn the power off and then back on again.	38
E440	Problem with EEPROM on main P.C. board.	Turn the power off and then back on again.	38
E450	Model selection cannot be read from the machine head memory.	Turn off the power, and check the connection of the machine head memory connector P3 at the power supply motor P.C. board.	20*
E451	Data cannot be backed up to machine head memory.	Turn the power off and then back on again.	38
E480	Problem with RAM on main P.C. board.	Turn the power off and then back on again.	38

[P.C. board and connector positions]



0535B

11. ERROR CODES

Software-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.

Code	Cause	Remedy	Page
E569	Program version error between main and motor detected.	Press the RESET key to clear the error. * This error is displayed when a power supply motor P.C.board for a different model is installed. Replace with the power supply motor P.C.B. for the ST-9820 as soon as possible.	20*
E580	Error in EEPROM version detected.	Turn off the power and carry out level 3 initialization.	62
E581	Error in memory switch version detected.	Turn off the power and carry out level 2 initialization.	62
E582	Error in parameter data version detected.	Turn off the power and carry out level 1 initialization.	62

Device-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.

Code	Cause	Remedy	Page
E630	Lower thread trimmer does not operate, or lower thread trimming sensor is faulty.	Turn off the power, and then check that the valve harness connector and sensor connector are inserted at the main P.C. board.	19*
E650	Hammer is lowered, or hammer position sensor is faulty.	Turn off the power, and then check that the hammer valve harness connector and hammer position sensor connector are inserted at the main P.C. board.	19*
E651	Hammer is not lowered, or hammer position sensor is faulty.	Turn off the power, and then check that the hammer valve harness connector and hammer position sensor connector are inserted at the main P.C. board.	19*

P.C. board-related errors

Items with a "*" in the "Page" column should only be checked by a qualified technician.

Code	Cause	Remedy	Page
E700	Abnormal rise in power supply voltage.	Turn off the power and check the input voltage.	23*
E701	Abnormal rise in sewing machine motor drive voltage.	Turn off the power, and then check the voltage.	20*
E705	Abnormal drop in power supply voltage.	Turn off the power and check the input voltage.	23*
E710	Abnormal current detected in sewing machine motor.	Turn off the power, and then check if there are any problems with the sewing machine.	*
E719	Problem detected with PMD P.C. board.	Turn off the power, and then check the PMD P.C. board.	20*
E740	Cooling fan does not operate.	Turn off the power, and then check that the cooling fan sensor connector is connected at the main P.C. board.	19*

If an error code that is not listed above appears or if carrying out the specified remedy does not solve the problem, contact the place of purchase.

12. TROUBLESHOOTING

- If there is a problem with operation, first check that the threads are correctly threaded and that the needle is correctly installed.
- Please check the following points before calling for repairs or service.
- If the following remedies do not fix the problem, turn off the power switch and consult a qualified technician or the place of purchase.

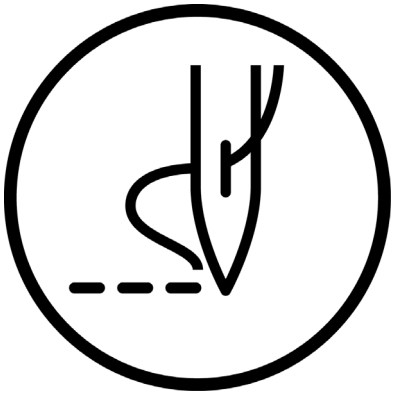
⚠ CAUTION

Turn off the power switch and disconnect the power cord before carrying out troubleshooting.
Otherwise the machine may operate if the start switch is pressed by mistake, which could result in serious injury.

Problem	Cause	Remedy	Page
Thread breaks	Thread tension is too strong.	Adjust the thread tension to the correct tension.	55
	Needle is not installed correctly.	Install the needle so that it faces correctly.	30
	Thread is too thick for the needle.	Select a thread which is suitable for the needle.	55
	Needle and looper adjustment is incorrect.	Adjust the clearance between the needle and looper, the needle bar height or the looper and spreader height.	71, 78 79
	Needle, looper, spreader, throat plate or thread path is damaged.	Repair or replace the respective part(s).	
	Thread is not threaded correctly.	Thread the thread correctly.	31 - 34
Skipped stitches occur.	Upper thread tension is too strong or too weak.	Adjust the upper thread tension to the correct tension.	55
	Needle point is broken or bent.	Replace with a new needle.	30
	Clearance between needle and looper tip is incorrect.	Adjust the clearance between the needle and looper tip.	79
	Needle, looper and spreader adjustment is incorrect.	Adjust correctly.	71 76 - 81
	Needle and needle guard adjustment is incorrect.	Adjust the needle guard.	79
	Looper tip is blunt.	Repair with an oilstone or replace the looper with a new one.	
	Needle is not installed correctly.	Install the needle so that it faces correctly.	30
	Needle is too thin.	Select a needle that is suitable for the sewing conditions.	55

Problem	Cause	Remedy	Page
Broken needle	Needle is bent.	Replace with a new needle.	30
	Needle, looper and spreader adjustment is incorrect.	Adjust correctly.	71 76 - 81
	Needle guard is covering the needle too far.	Adjust the needle guard.	79
	Needle is too thin.	Select a needle that is suitable for the sewing conditions.	55
Upper thread is not cut.	Upper movable knife is blunt.	Replace the upper movable knife with a new one.	96, 97
	Upper movable knife does not move to the full stroke because air pressure is too weak.	Adjust the air pressure.	25
	Upper movable knife is not picking up the upper thread.	Install the upper movable knife so that it cuts only one side of the upper thread loop.	97
	Upper movable knife is not picking up the upper thread because the last stitch is being skipped.	Refer to the remedies given under “Skipped stitches occur” in this troubleshooting chart.	122
	Upper movable knife position is incorrect.	Adjust the position of the upper movable knife.	97
Lower thread is not cut.	Movable knife is blunt.	Replace the movable knife with a new one.	99, 104
	Movable knife does not move to the full stroke because air pressure is too weak.	Adjust the air pressure.	25
	Movable knife position is incorrect.	Adjust the position of the movable knife or the thread handler.	100, 103 105
	Cutting pressure for lower thread trimming is too weak.	Adjust to an appropriate cutting pressure.	100, 104
Thread unravelling at sewing start	Lower thread is not being held.	Adjust the lower thread nipper (-01 specifications) or the lower thread presser (-02 specifications).	101, 103 108
	Upper thread length is too short after trimming.	Adjust the sub tension.	55
	Not enough upper thread is being fed out.	Adjust the amount of upper thread being fed out.	95
	Upper thread loops are uneven.	Set slow start and bar tacking.	42, 43
Material is not being cut cleanly.	Cutting pressure is too weak.	Adjust the cutting pressure so that it is strong enough.	90
	Knife and hammer are not contacting properly.	Grind the hammer surface.	84
	Knife is blunt.	Replace the knife with a new one.	87
Poor thread tightening	Upper thread tension is too strong or too weak.	Adjust the upper thread tension to the correct tension.	55
	Lower thread tension is too strong or too weak.	Adjust the lower thread tension to the correct tension.	55
	Tension or stroke of thread take-up spring is incorrect.	Adjust the tension and stroke of the thread take-up spring.	55

Suote



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