

Section 5.5

Automatic Brake System (ABS), Optional

5.5	Automatic Brake System (ABS), Optional	5.5-2
5.5.1	Components of ABS	5.5-3
[1]	Names of Components	5.5-3
[2]	Positioning of ABS	5.5-3
[3]	Weft Braking Operation	5.5-5
5.5.2	Preparatory Operation	5.5-6
[1]	Threading a Weft	5.5-6
[2]	ABS Related Function Panel Settings	5.5-7

5.5 Automatic Brake System (ABS), Optional

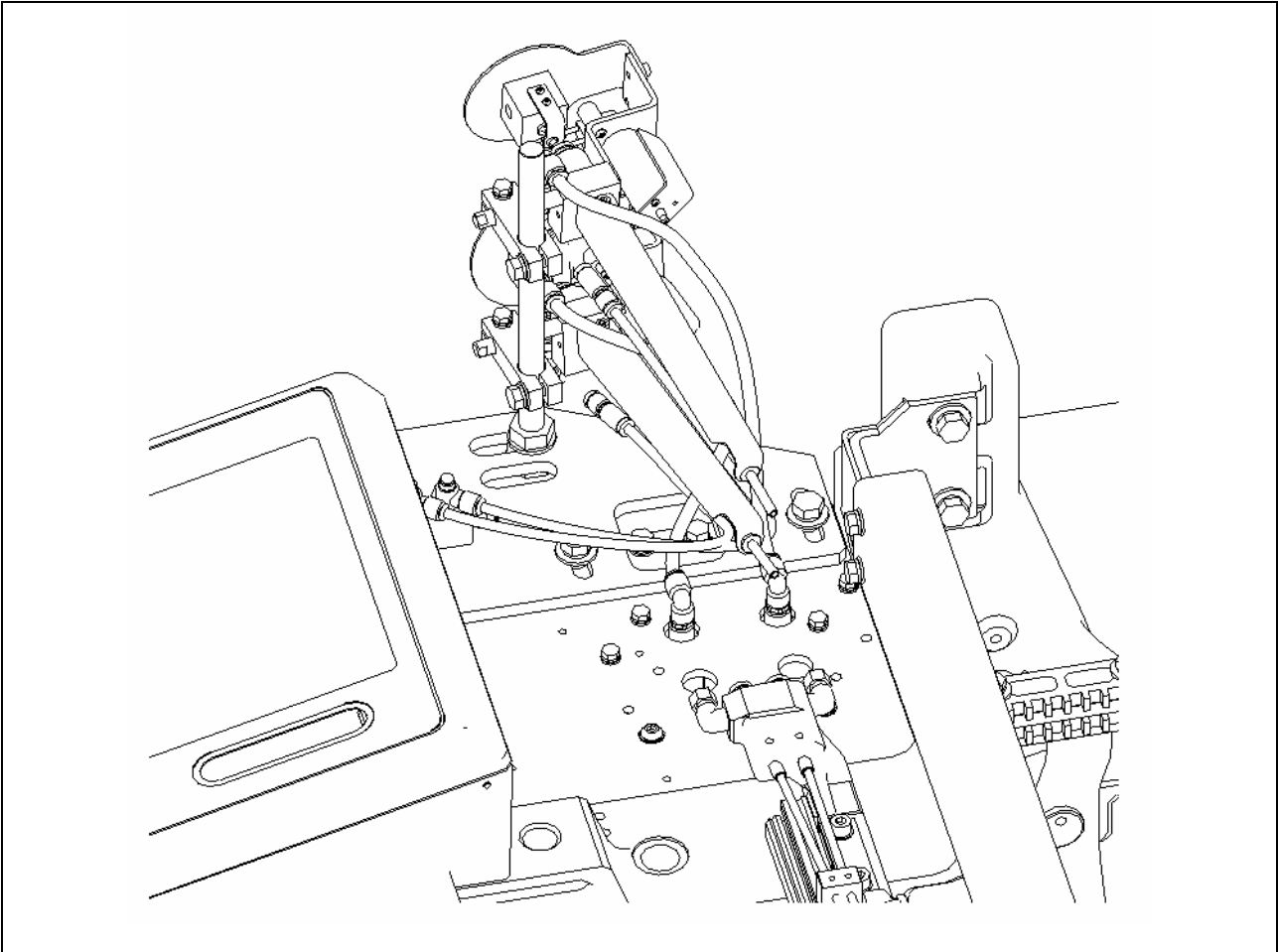
Immediately before a weft (which is released from the electric drum and inserted through warps by the main nozzle) reaches the right end of the cloth, the optional automatic brake system (ABS) operates to push the weft sideways (for applying frictional force) and then absorb the back tension applied to the weft on the weft arrival, for decreasing the weft tension.

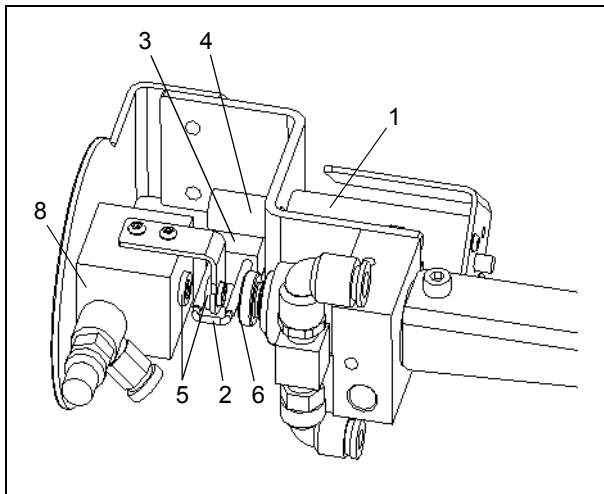
By preventing the weft from undergoing such back tension in this way, the ABS reduces weft breaks (caused between the drum and main nozzle) or weft loosening (at the left end of the machine) which may occur at the end of weft insertion.

Note that the use of the ABS will delay the weft arrival timing T_w by approx. 5-10° than without using the ABS.

Since the braking effect may vary depending upon the weft type, it will be necessary to adjust the ABS-related value on the function panel.

Especially when the sub tank pressure is 0.2 MPa (2.0 kgf/cm²) or less, be careful because T_w dispersion or springback may be caused due to an excessive braking force by the ABS compared to the traction force by the sub nozzle.

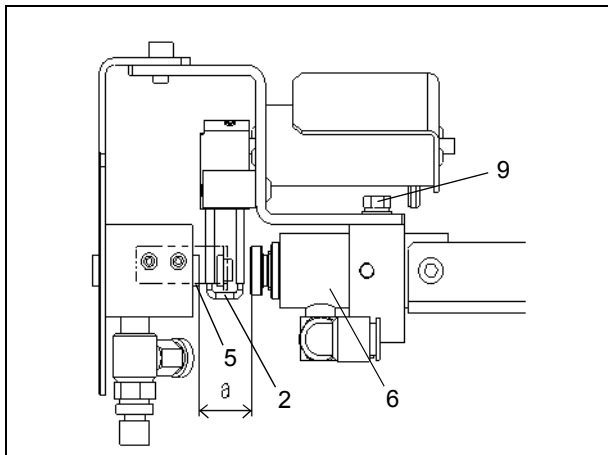




5.5.1 Components of ABS

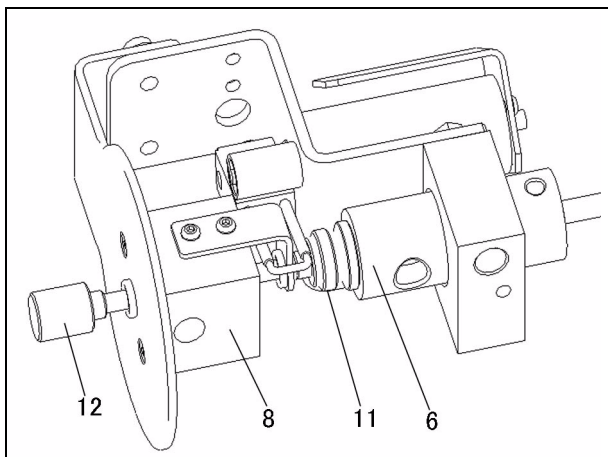
[1] Names of Components

1. Rotary solenoid
2. ABS fork
3. Holder
4. Stoppers
5. Yarn guides
6. Tandem nozzle
7. Weft
8. Weft inserting nozzle
9. Bolt
10. Speed controller
11. Thread guide
12. ABS adjusting tool
13. Bolt

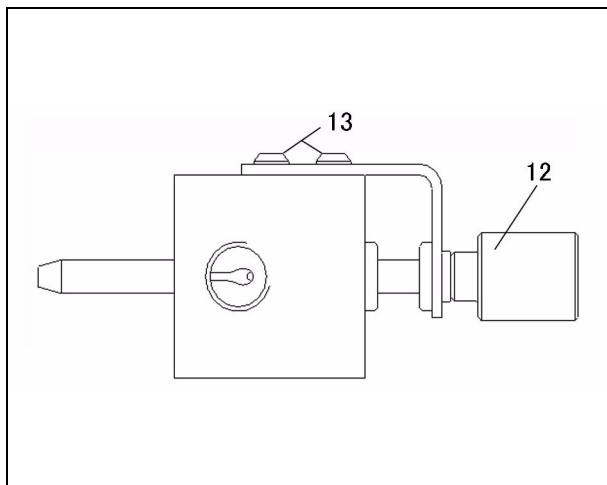


[2] Positioning of ABS

- (1) ABS body
Standard distance "a" from yarn guide 5 to the entrance of tandem nozzle 6 is 18 mm.
If it is desired to decrease the ABS effect, increase the distance within a range up to 23 mm using the following adjustment procedure.
 - 1) Loosen bolt 9.
 - 2) Insert ABS adjusting tool 12 (J8209-18050-0B) to prevent the centering between Weft inserting nozzle 8 and tandem nozzle 6 from being lost. Insert the ABS adjusting tool until its tip end comes into light contact with thread guide 11 of the tandem nozzle.
 - 3) Adjust the position of the whole ABS unit so that distance "a" falls within a range between 18 mm and 23 mm.
 - 4) Securely tighten bolt 9 that was loosened in step 1 above.

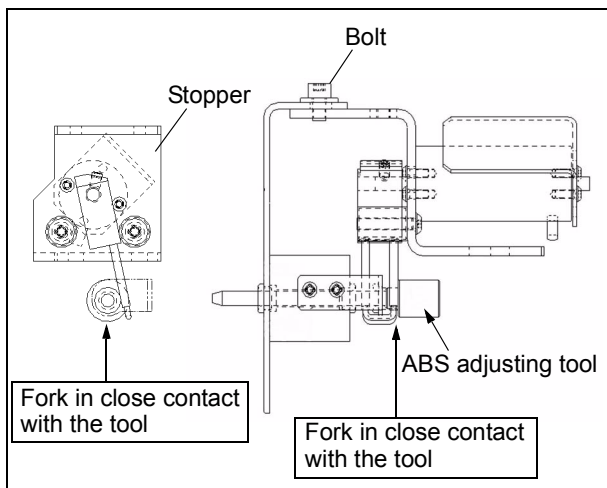


5 WEFT INSERTING MOTION

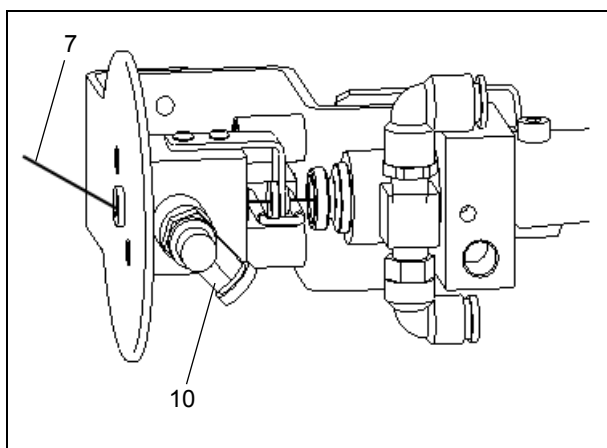


(2) ABS Ass'y

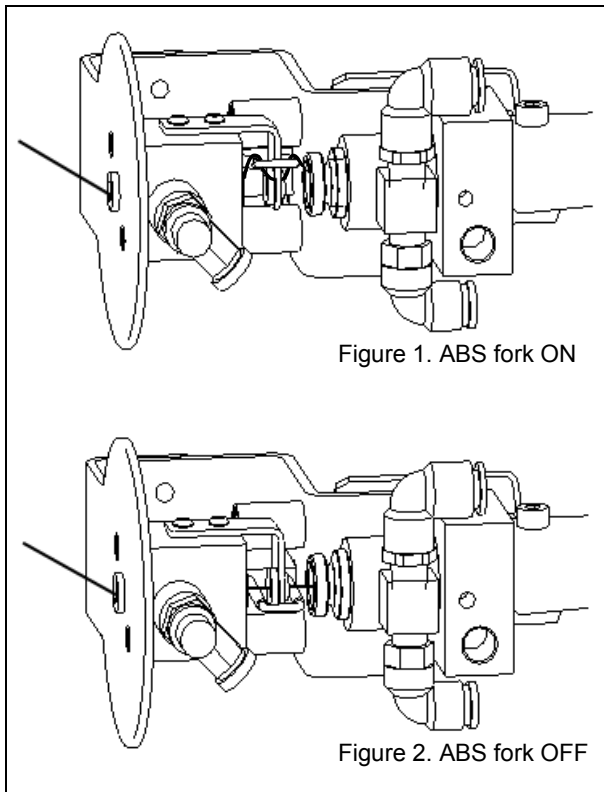
- Insert the ABS alignment jig **12** (J8209-18050-0B) to the yarn guide for yarn guide alignment and tighten the bolt **13**.



- Insert the jig to the yarn guide and tighten the bolt so that the jig end face and the jig cylindrical portion come into contact while the fork is in contact with the stopper at the upper part of the machine.



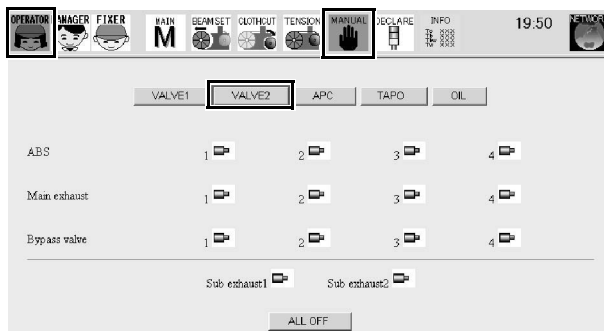
- ### (3) Weft inserting speed controller **10** is loosened by 1.5 turns from the fully closed position at the time of shipment.
- If weft insertion is hard, adjust the controller.



[3] Weft Braking Operation

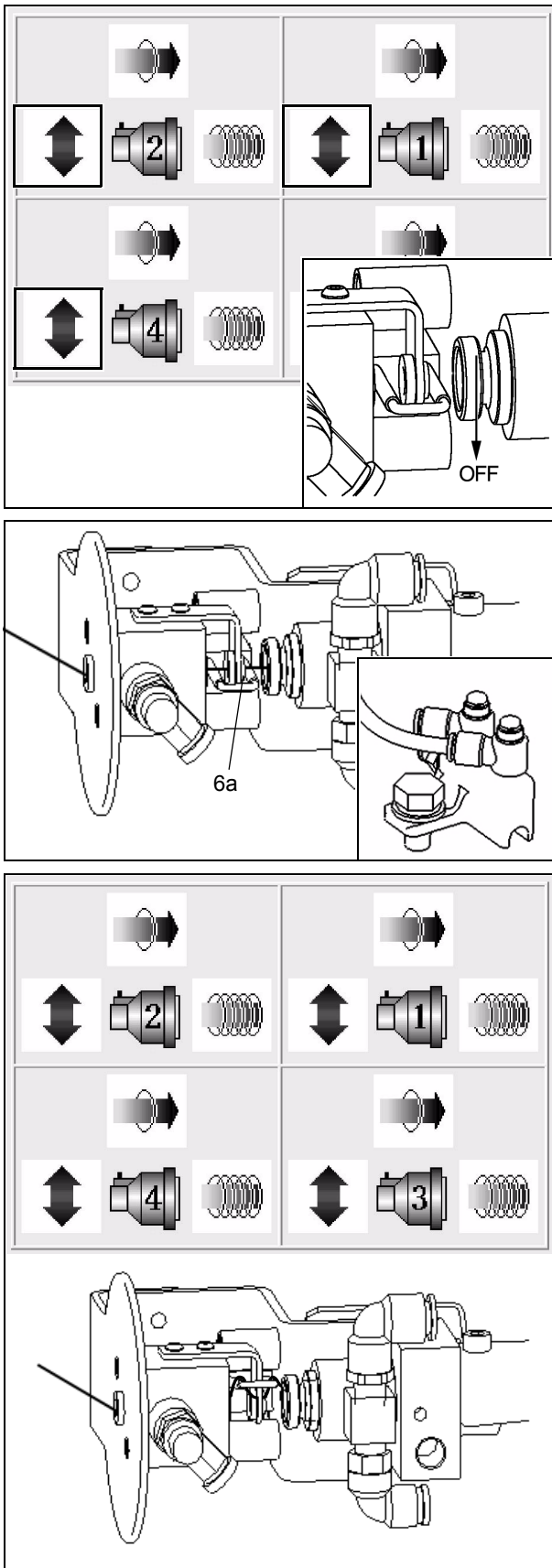
- (1) To brake a weft, the ABS fork operates as described below.
 - 1) When the machine is on halt, the ABS fork is placed in the ON position as shown in Figure 1.
 - 2) Immediately before the machine starts weft insertion, the ABS fork swings to the OFF position where a weft is inserted. (See Figure 2.)
 - 3) Immediately before the weft reaches the right end of the cloth, the ABS fork swings back to the ON position (Figure 1), thereby braking the flying weft.
 - 4) Although the ABS fork swings towards the OFF position by the back tension upon arrival of weft, it is pulled back to the ON position by the rotary solenoid and the weft insertion is complete in this state.

Check the timing when the ABS fork changes from OFF to ON as shown in Figs. 1 and 2 using the strobe to confirm that it is as set.



- (2) ABS operation check

To check the ABS operation on the function panel, touch [MANUAL] – [VALVE2] switches in the OPERATOR mode to call the screen shown at left. Then, touch ABS 1 through 4 switches sequentially in this order. The ABS is activated to bring the fork to the OFF position.



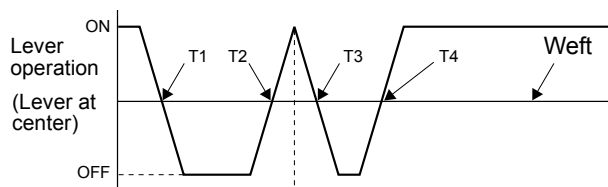
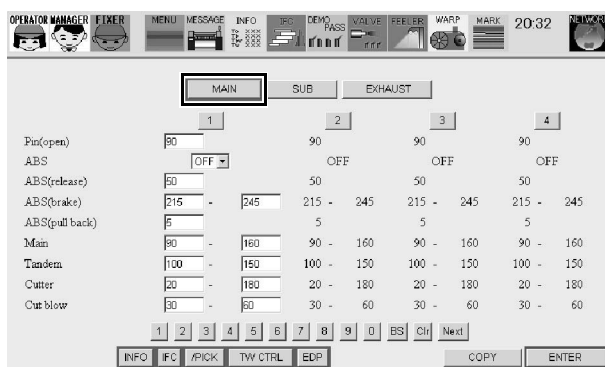
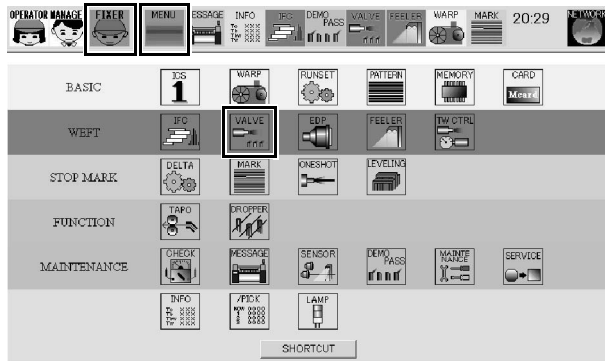
5.5.2 Preparatory Operation

[1] Threading a Weft

Thread a weft through the ABS according to the steps given below.

- (1) Release the EDP pin.
At the same time, the ABS fork swings to the OFF position.
- (2) Slightly insert the weft into yarn guide 6a and press the inserting pushbutton to insert the weft through the tandem nozzle.
 - Be sure to thread a weft as shown at left.
- (3) Touch the "Base Wind" switch.
At the same time, the ABS fork swings to the ON position.
- (4) Adjust the length of a weft yarn and thread it through the main nozzle.
- (5) Make sure that the ABS fork is placed in the ON position where the ABS fork brakes the weft.
- (6) Run the weaving machine.

CAUTION: Carefully keep hands away from the solenoid since its temperature may rise much depending on the operating condition.



[2] ABS Related Function Panel Settings

The screen shown at left appears upon pressing the Main button on the [FIXER] – [MENU] – [VALVE] screen.

The double-acting ABS provides braking and swing-back. Either braking only or swing-back only can be selected by setting.

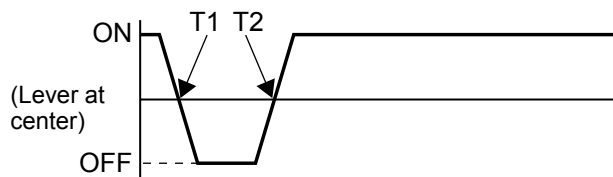
To use the ABS for both braking and swing-back, input the angles for T1 through T4.

Set the following ABS-related items by referring to the timing chart shown below.

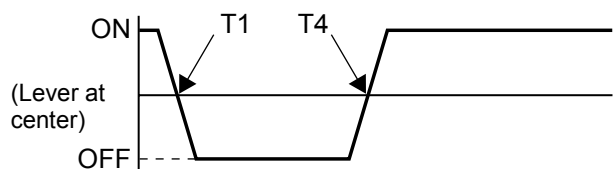
- **ABS**
Set the ABS to ON if it is to be used.
- **ABS (release) (T1)**
Input the timing to set the lever to be ready for weft insertion. The guideline for setting is the pin opening angle less 5° to 0°.
- **ABS (brake)**
Set the brake ON timing (T2) when the lever comes into contact with the weft during braking and the brake OFF timing (T3) when the brake signal is turned off. Guidelines for setting are as follows:
 Brake ON timing (T2): TW - 20°
 Brake OFF timing (T3): Brake ON timing + 30°
 The greater the angle difference between T2 and T3, the longer the braking time, that is, the greater the braking force.
 When the yarn material or the machine speed or other condition is changed, adjust these values by observing the textile weaving condition.
- **ABS (pull back)**
Input the timing (T4) when the lever is operated after cutting the inserted weft.
This operation reduces the yarn coming out from the main nozzle.
The guideline for setting is 5°.

NOTE: The actual brake ON timing is controlled based on the balloon sensor signal and according to the weft flying condition.

5 WEFT INSERTING MOTION



- To operate the ABS only for braking, set the brake OFF timing (T3) to 0. With this setting, only braking occurs without swing-back as shown at left.



- If only swing-back is desired, set the brake ON timing (T2) to 0. With this setting, only swing-back occurs without any braking as shown at left.