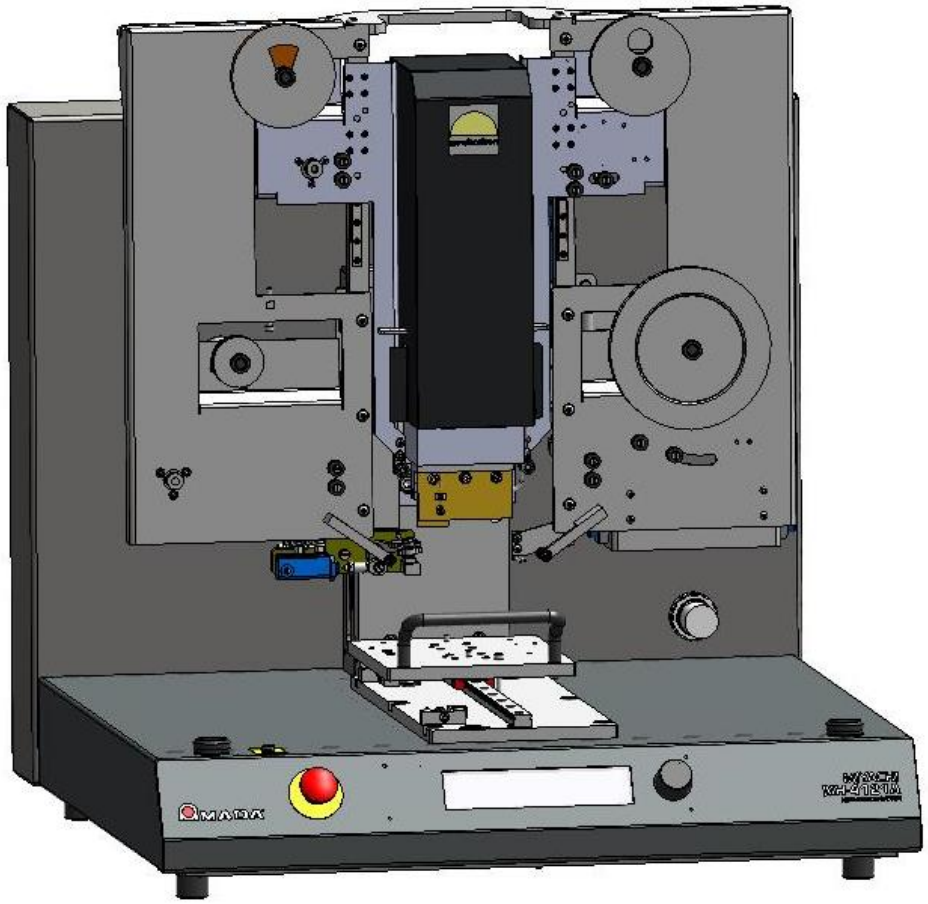
AMADA WELD TECH

USER MANUAL

ACF Laminating Systems



Models: MACFL4100 thru MACFL4400

VERSION 1.0

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Register of changes

Page	Version	Date	Author	Status	Remarks
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AMADA WELD TECH has the right to change parts of the machine at any time without prior or direct notice to the client. The content of this publication is subjected to change without notice.
For extra information as to adjustments, maintenance and repair, contact the technical department of your supplier.
This user manual has been composed with great care. However, **AMADA WELD TECH** cannot be held responsible either for any shortcomings occurring in this user manual or for their consequences.

Author: A. Alsabiry

Contents

1 GENERAL SAFETY PRECAUTIONS

These are given in the New Horizon Safety Manual. Make sure you read the safety manual before you begin work on this system.

WARNING

Read this manual carefully before doing work on the ACF laminating system. Your supplier has no liability for injuries, damage and/or excessive wear, due to incorrect maintenance, unintended use, modifications and deactivation of safety devices.

2 INTRODUCTION

This user manual is intended for the operators responsible for production processes using the ACF laminating system
This user manual makes sure new users are familiar with the operating and maintenance procedures, while experienced users may use this document as a reference work. References to other documents are made when necessary.
Operators using the machine for the first time should study this manual carefully, in particular the safety instructions given in the separate safety manual.
Additional training by **Amada Weld Tech** is recommended if the user wants to become quickly familiar with the system. The training course consists of, among other things, training in the completely independent operation of the system. Knowledge transfer should not only take place by circulating this manual among the operators, but by practicing with the equipment and doing practical work with the machine.
The manual is based on current techniques. **Amada Weld Tech** retains the right to make changes to the documentation without being obliged to alter all previous versions.
Keep this instruction manual carefully for future use.

2.1 GENERAL INFORMATION

The ACF laminating system is built for simple and efficient operation. However, you must take note of the contents of this manual and act accordingly. All personnel who work on or in the vicinity of the installation must be aware of these instructions.
In addition to the instructions in this manual, all current general safety regulations and conditions must be obeyed.

Competent persons are persons who:
- have a certain level of knowledge gained by training/education
- have certain skills necessary to operate the ACF laminating system.

The operator must be a competent person.

Qualified technicians are persons who:
- are competent
- have a certain level of technical knowledge gained by training/education

- are familiar with the techniques used in the system
- are aware of the possible risks (trained **Amada Weld Tech** personnel).

WARNING
The installation, technical maintenance, repair and removal and removal of components may only be done by qualified technicians, unless specified otherwise.

ACF laminating system operators are responsible for controlling the machine, cleaning the unit and simple maintenance operations.

The purpose of this user manual is to create a safe and an efficient interaction between man and system.

2.2 SOUND LEVEL

The sound level has been measured in accordance with the applicable Machine Directive requirements.
The A-weighted equivalent continuous sound pressure has been measured at the working place during normal operating conditions. The sound level has been measured at a distance of one meter from the machine and at a height of 1.60 m above the reference plane. The measured A-weighted equivalent continuous sound pressure level (L_{Aeq}) does not exceed 70 dB(A).

2.3 SYSTEM ENVIRONMENT

Pay particular attention to the following safety guidelines:

- Ensure a clean working environment with adequate illumination and ventilation
- Keep the control cabinets closed during normal use
- Use only original components supplied by Amada.

NOTE
Put this manual so that it is easily available when the unit is in operation.

CAUTION
If the system is removed and then installed in another place, the safety measures described in this chapter must be taken into account.

2.4 INTENDED USE

The New Horizon ACF Laminating Systems are an integral part of the Amada ACF laminating series. A pneumatic Bonding Head and standard Quick Connect Blocks with Thermo-plane Thermodes are installed. All modules are mounted on a robust, frame construction and provide easy upgrades with optional modules. The system includes different product handling features such as front-rear movement slides and rotary tables. All systems offer maximum output and are designed with ergonomic standards considered. Optional components for the Hot Bar system are Vision Alignment Modules, tape feed Interposer Modules and customized product tooling.

The conditions of use are described in this user manual. Using the system in another way then the intended use definition will exclude liability with regard to your supplier.

2.5 PRINCIPLE OF OPERATION

The ACF laminating system is a standalone system. The operator is responsible for positioning the product in the fixture, for controlling the machine, for taking the finished products out, for cleaning the unit and for simple maintenance operations.

2.5.1 Bond head unit

The principle of the laminating system is the laminating of products by controlled movements of a thermode, thus creating a known force, at a pre-set temperature and time. Refer to the related manual for the bond head.
The power for heating the thermode to a pre-set temperature and time is provided by a micro-processor controlled Uniflow4 power source. Refer to the separate manual for the Uniflow4 for setting the bonding characteristics for certain products in temperature-time tables. These are called Uniflow4 profiles.

2.5.2 The bonding cycle

A bonding cycle is defined as follows:

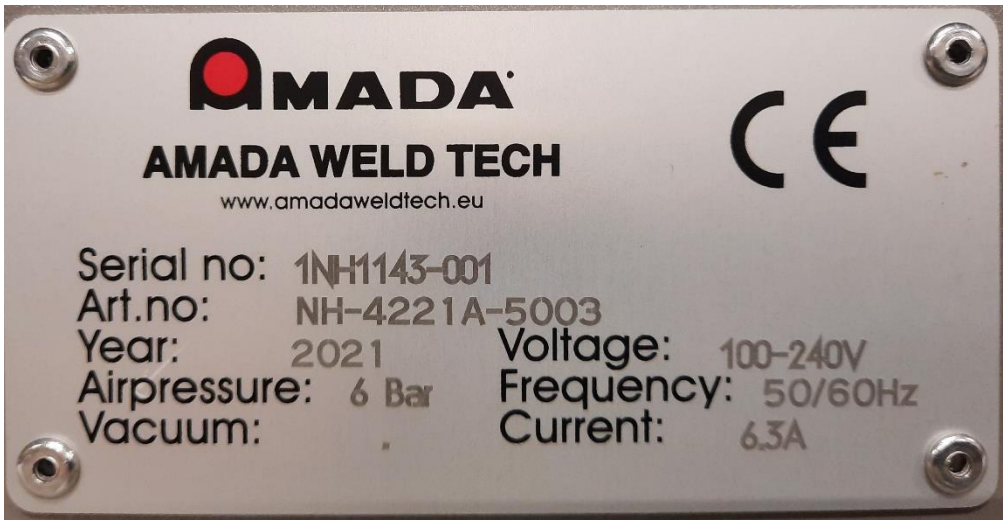
Prior to start and the thermode leaving the upper "home" position, the required heating profile has to be set. The thermode is moved down in the Z-axis until the "product level" is reached. The downward movement is continued until the pressure on the product reaches a pre-set value. The thermode is then heated until the pre-set laminating temperature is reached. The laminating operation is carried out when the thermode temperature is constant. When the pre-set time has elapsed, the thermode will be cooled down until the "lift off temperature" is reached. The thermode will move up in the Z-axis. The system is then ready for the next laminating cycle.

WARNING
The system may only be operated if all components are completely and correctly installed.

	INDICATION Put this manual in a position so that it is easily available when the unit is in operation.

2.6 IDENTIFICATION

The ACF system and this manual have been designed, constructed and tested for markets inside Europe.



CE and type plate

3 SAFETY PRECAUTIONS AND DEVICES

For a list of the system pictograms, refer to table 1 of the New Horizon Safety Manual. Make sure you obey the warning and caution instructions in the safety manual.

3.1 PROTECTION OF THE HANDS

The two-hand control must be operated by both hands and is designed in such a way that the operator is protected from crushing and burning. It also prevents the unintended starting of the bonding process.

3.2 HOT PARTS

If the thermode is touched there is a danger of burn injuries as the temperature of the thermode can rise to 600 C°. The thermode area has an optional shield and a warning pictogram is placed on the head guard.

3.3 ELECTRICAL SAFETY

The ACF laminating system is provided with a main switch mounted at the rear of the system to set the power supply to off.

The control cabinet and connection boxes contain live parts. A pictogram is mounted on the outside of the connection box to warn you of this risk. Although these live parts are protected against contact with them, proceed with caution.

3.4 EMERGENCY STOP

The ACF laminating system is equipped with one emergency stop button (A) which is mounted on the left of the front control panel. Activation of the emergency stop button will stop all processing actions and the head will move up. Power will be removed from the system immediately.

	**NOTE** Push the red emergency stop button to activate the emergency stop. Deactivate the emergency stop by turning it counter clockwise. The installed spring to will then lift the knob.

	**WARNING** The system may only be operated if all components are completely and correctly installed.

	**INDICATION** Put this manual in a position so that it is easily available when the unit is in operation.

4 DESCRIPTION OF MODULE

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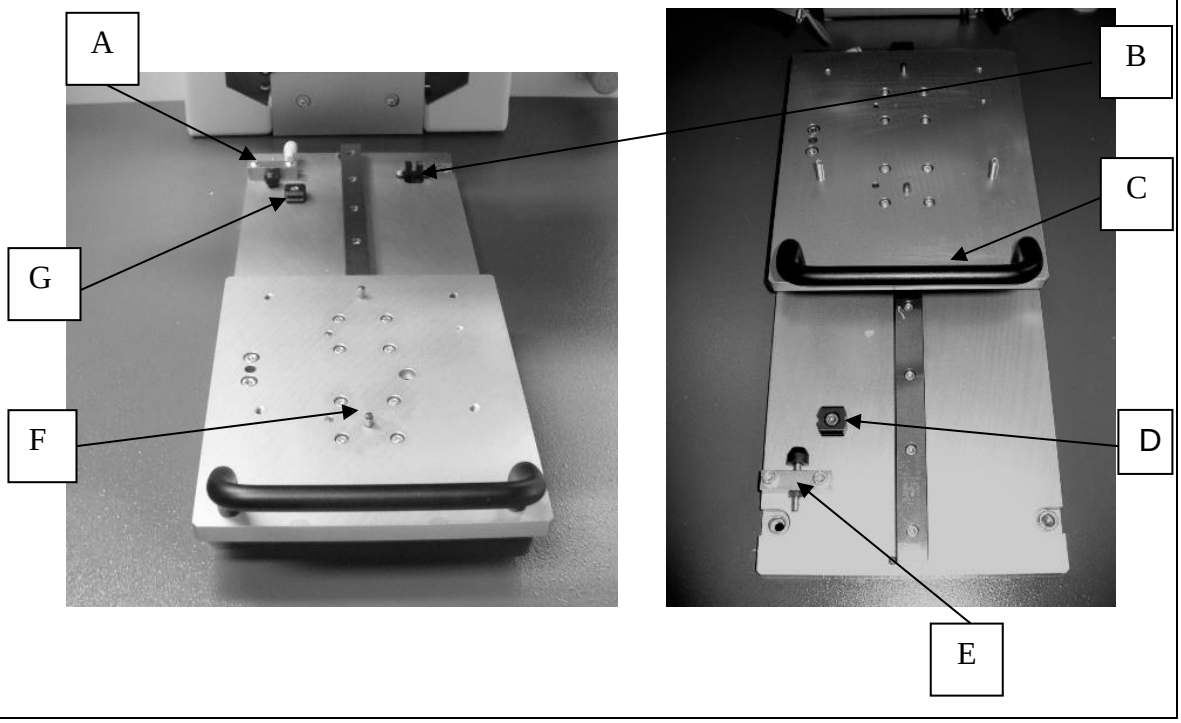
4.1 MANUAL SLIDE MACFL4200)



A. Damper at process position
B. Sensor at process position
C. Grip
D. ‘Snapper’ at load position
E. Damper at load position
F. Product table
G. ‘Snapper’ at process position

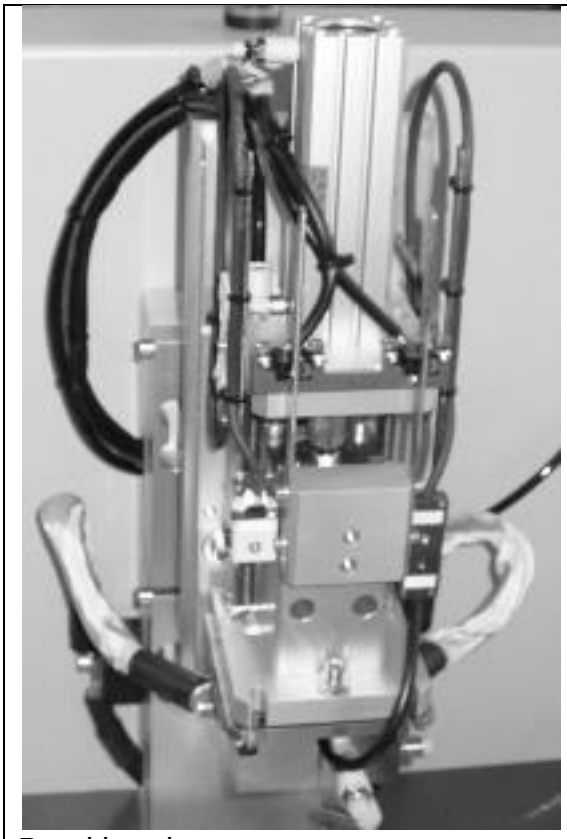
NOTE
The product fixture is mounted on the product table (E) and is customer dependent.

The product table can be moved between two fixed positions, load and process. It is retained at each end by spring-operated locks called ‘Snappers’ (D and G).

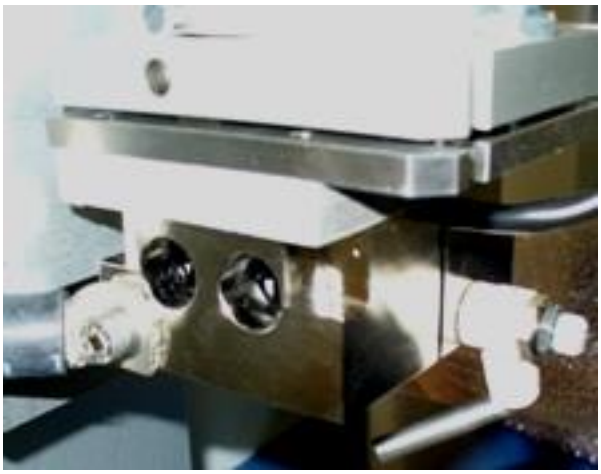
The operator moves the product table (E) to the ‘out’ (load) position and puts the product in the fixture. The operator then moves the product table to the process position under the thermode.

4.2 THE BOND HEAD AND THERMODE

The bond head has a working range of 8 to 80 Newtons and is set by the operator in accordance with the applicable process.



Bond head



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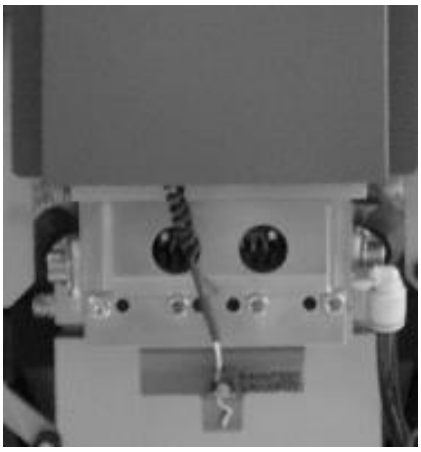
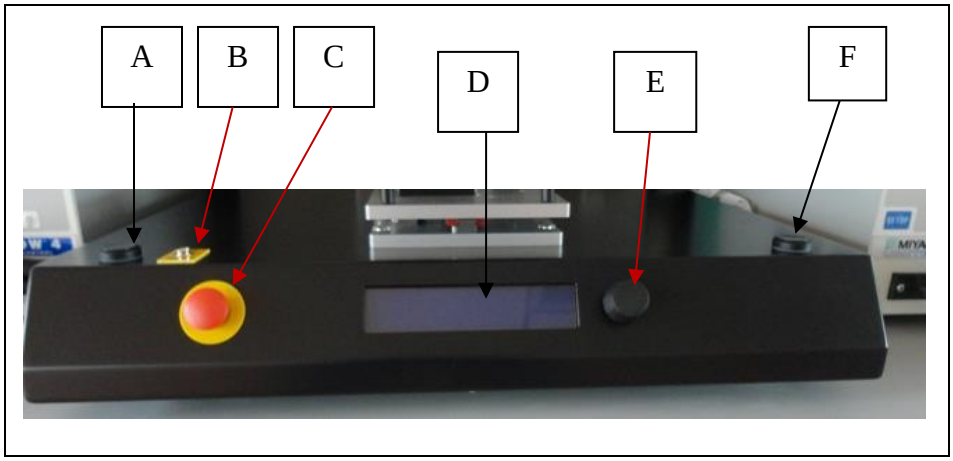


Thermode holder with a typical thermode

5 THE CONTROL PANELS

5.1 THE FRONT CONTROL PANEL



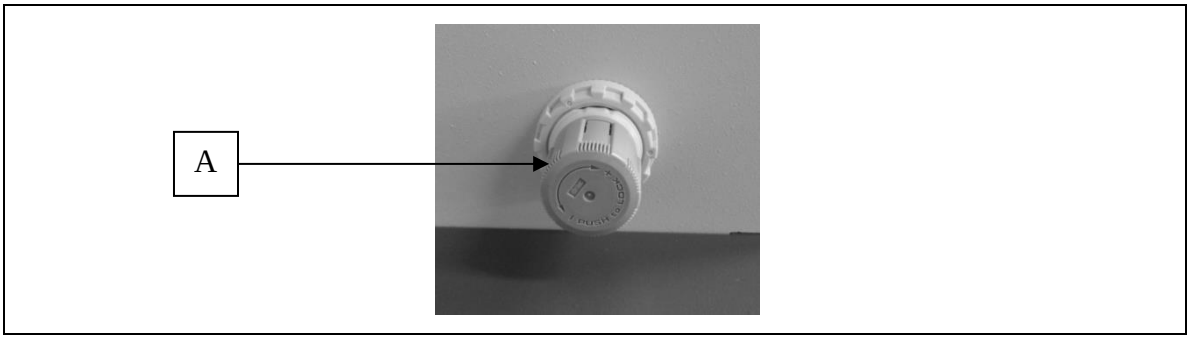
Front control panel

A. Left 2-hand button
B. ESD wrist connection
C. Emergency stop button
D. Information screen
E. Navigation control button
F. Right 2-hand button

The display (D) shows 4 lines of 20 characters. The knob (E) is used to navigate through the various menus and commands. It is also a switch, activated by pressing the knob.

Rotating the knob is called: NAV.
Pressing the knob is called: ACT.

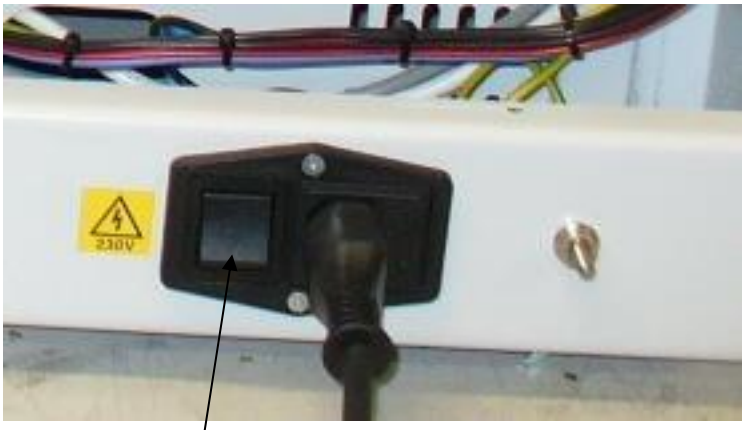
5.2 PNEUMATIC FORCE CONTROLLER



The knob (A) is used to adjust the bonding force. By turning the knob left the pressure will be decreased and by turning right the pressure will increase. An indication of the force will be shown in the operator display.

6 SYSTEM OPERATION

6.1 SYSTEM START UP



A

Set the main switch (A) on the rear of the system to on.

When the main switch on the rear of the system is set to on, the screen that follows shows:

```
AMADA MIYACHI EAPRO
New Horizon
FP Version:  TR_ 0.1.4_r15
CB Version:  TR_0.5.0_r13
```

The system can be set to production mode or service mode. Access to the service mode is available only to Amada trained qualified persons and requires the use of a password.

The screen that follows will show after the power-up screen:

```
Mode    : Standby
Message : Use NAV to scroll
Next    : Production (or Service)
P 40.5   N   OK      T: 30
```

The following modes can be selected with the NAV knob (Next):

- Service
- Production

ACT (pushing the NAV knob) will acknowledge the selection. After Production is selected, one of the screens that follow will show:

```
Mode    : Standby
Message : Use NAV to scroll
Next    : Production (or Service)
P 40.5   N   OK      T: 30
```

```
Mode    : Standby
Message : Use NAV to scroll
Next    : Production
P 38.5   NOK
```

NOTE

The figures at the bottom of the screens show the set pressure in Newtons (or other selectable units). Levels above 40 (+/- 5%) will show the value and OK; outside this level shows only NOK. If this occurs, production will not start.

The screen that follows shows when Production is selected or when Service mode is closed and production started:

```
Mode    : INIT (start buttons)
Message :
```

Messages:

- Press left start button
- Release left start button
- Press right start button
- Release right start button
- Press 2-Hand
- Release 2-HAND

Follow the instructions to test the operation of the start buttons.

	**NOTE** Pressing both buttons (start) is referred to as 2-HAND.

The screen below may show after the start button test, but only when the bond head module is not at its start position.

```
Mode    : INIT (bond head)
Message : Press 2-HAND
P 40.5   N   OK       T: 30
```

To initialise the bond head, press 2-HAND and then release both buttons.

If a pneumatic turntable is installed, the screen that follows will show:

```
Mode    : INIT (movement)
Message : Press 2-HAND
P 40.5   N   OK     T: 30
```

To initialise the movement of the turntable, press 2-HAND.

If a manual turntable or slide is installed the screen that follows will show:

```
Mode    : INIT (movement)
Message : Move slide to production pos
P 40.5   N   OK     T: 30
```

To initialise the movement, move the slide or turntable from the load position to the processing position and then back to the load position.

```
Mode    : PRODUCTION (ACF unit prepare)
Message : Press 2_HAND

P 40.0   N   OK     T: 30 (Sp 30) OK
```

The tape feeder will automatically feed one programmed length and the first Production screen will then show.

It is possible that an error screen shows during the initialisation sequence.

ERROR
Error message (n)
-
Press ACT to reset the error

.
The number (n) following the message is unique for each message. Refer to the table below.

Any error that occurs when the head is not at the home position will result in the head moving up (while the error is still active). This is done to protect the thermode and product.

After successful reset of the error for a module or when an error disables one or more modules, the initialisation procedure for that (those) module(s) is started when entering the production mode.

Error message	***Possible cause(s)***	***Possible solution(s)***
ACF CYCLE TIME OUT (2)	Transport cycle took too long	Check operation of the feeder (O) Change time-out settings (S)
ACF WINDING TIME OUT (3)	Winding the tape took too long	Check operation of the feeder (O) Change time-out settings (S)
BOND HEAD HOME TIME OUT (6)	Head not moving up fast enough	Check upper flow regulator on the head (S)
BOND HEAD HOME POSITION LOST (7)	Head expected up, but sensor not activated.	Check lower flow regulator on the head (S) Check sensor (S).
FIRE INPUT DETECTED AT HOME POS (8)	Not allowed sensor activation	Check fire sensor and cabling (S)
MOVEMENT TIME OUT (9)	Speed	Check regulators (S) Check time out setting (S)
MOVEMENT POSITION LOST (10)	Slide or turntable moved while in stable end position	Check slide or turntable (O). Check mechanics and valves (S)
EMERGENCY PRESSED (11)	Emergency stop activated	Release emergency stop button (O)

(O) refers to operator level
(S) refers to Amada trained service level

6.2 PRODUCTION MODE

	**NOTE** At this time, only the manual slide version is described. The other versions will be described when the information is available.

	**CAUTION** When the thermode is on the process target area, care must be taken not to mechanically disturb the process by putting stress or strain on either the desktop table, turntable or slide.

This caution applies to all the ACF laminating systems.

	**NOTE** Pressing both buttons (start) is referred to as 2-HAND.

During production, the messages that follow will be displayed.

```
Mode    : PRODUCTION (Idle)
Message : Load product
          Or press ACT to exit
P 4.1   N   OK        T: 30 (Sp 30) OK
```

Load product on manual slide and move to processing position. This screen shows:

```
Mode    : PRODUCTION (Idle)
Message : Press 2-HAND
          or press ACT to exit
P 4.1   N   OK        T: 30 (Sp 30) OK
```

After both buttons are pressed together, this screen shows

```
Mode    : PRODUCTION (bonding)
Message : Release 2-HAND

P 4.1   N   OK       T: 30 (Sp 30) OK
```

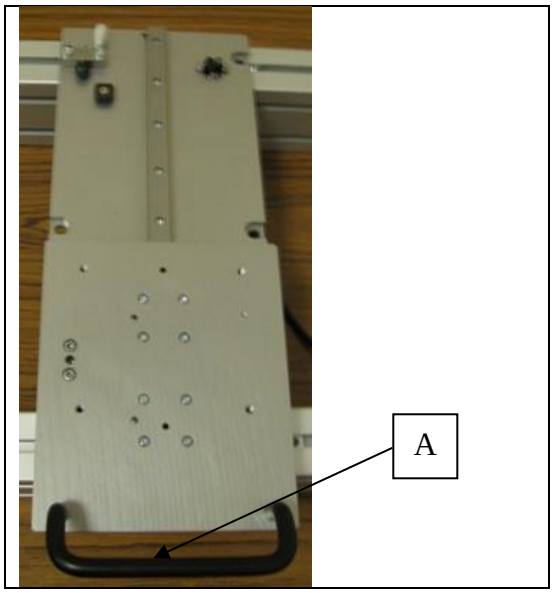
During manual operation, this screen shows after bonding is completed:

```
Mode    : PRODUCTION (ready)
Message : Remove the product

P 4.1   N   OK       T: 30 (Sp 30) OK
```

The slide is then moved to the unload position and the product removed. The sequence then starts at the Load Product screen.

6.2.1 Manual slide (System MACFL4200)



Slide load/unload position

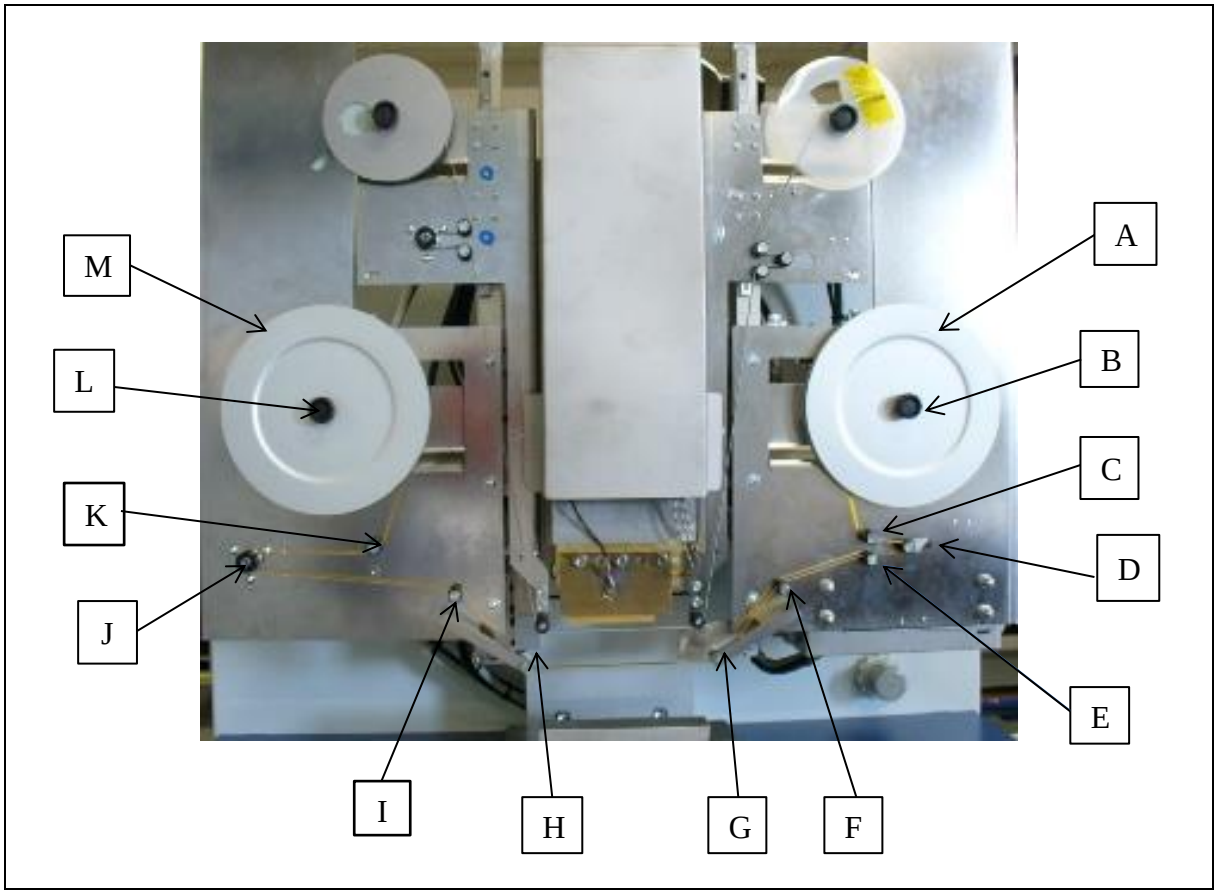
1. Use only the handle to push pull the slide to and from the load and unload positions.
2. If necessary, remove any processed part from the product holder.
3. Make sure the product holder and the next product to be processed are clean.
4. Align the parts of the product, using the vision system (option) if necessary.
5. Push the slide fully into the processed position. Make sure the slide is locked in that position.
6. Press the two-hand start buttons. Make sure the bond head moves down onto the product.

7. When minimal pressure is reached, the start buttons can be released and the heating process starts. Releasing a start button before minimal pressure is reached will result in the head moving up. Go to step 6.
8. Wait until the head has moved up.
9. Pull the slide to the load/unload position.
10. Remove the product.

6.3 SHUT DOWN THE SYSTEM

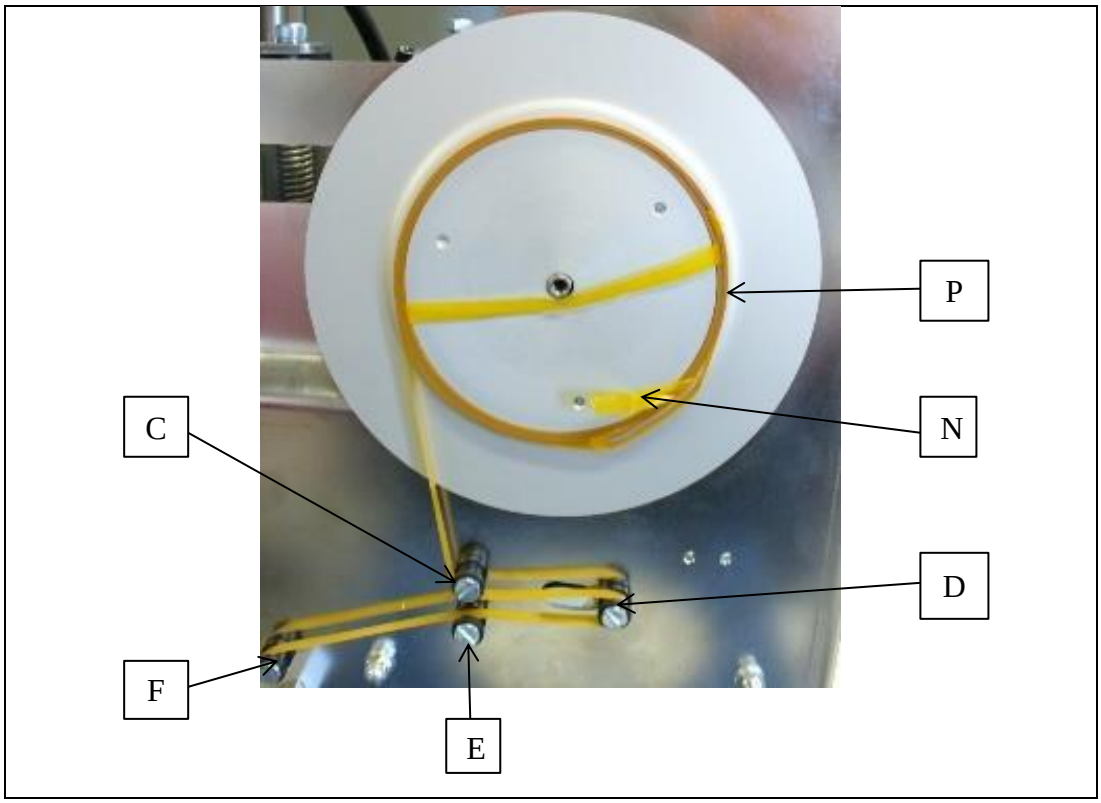
Set the main switch on the rear of the system to off.

7 REPLACE THE ACF TAPE



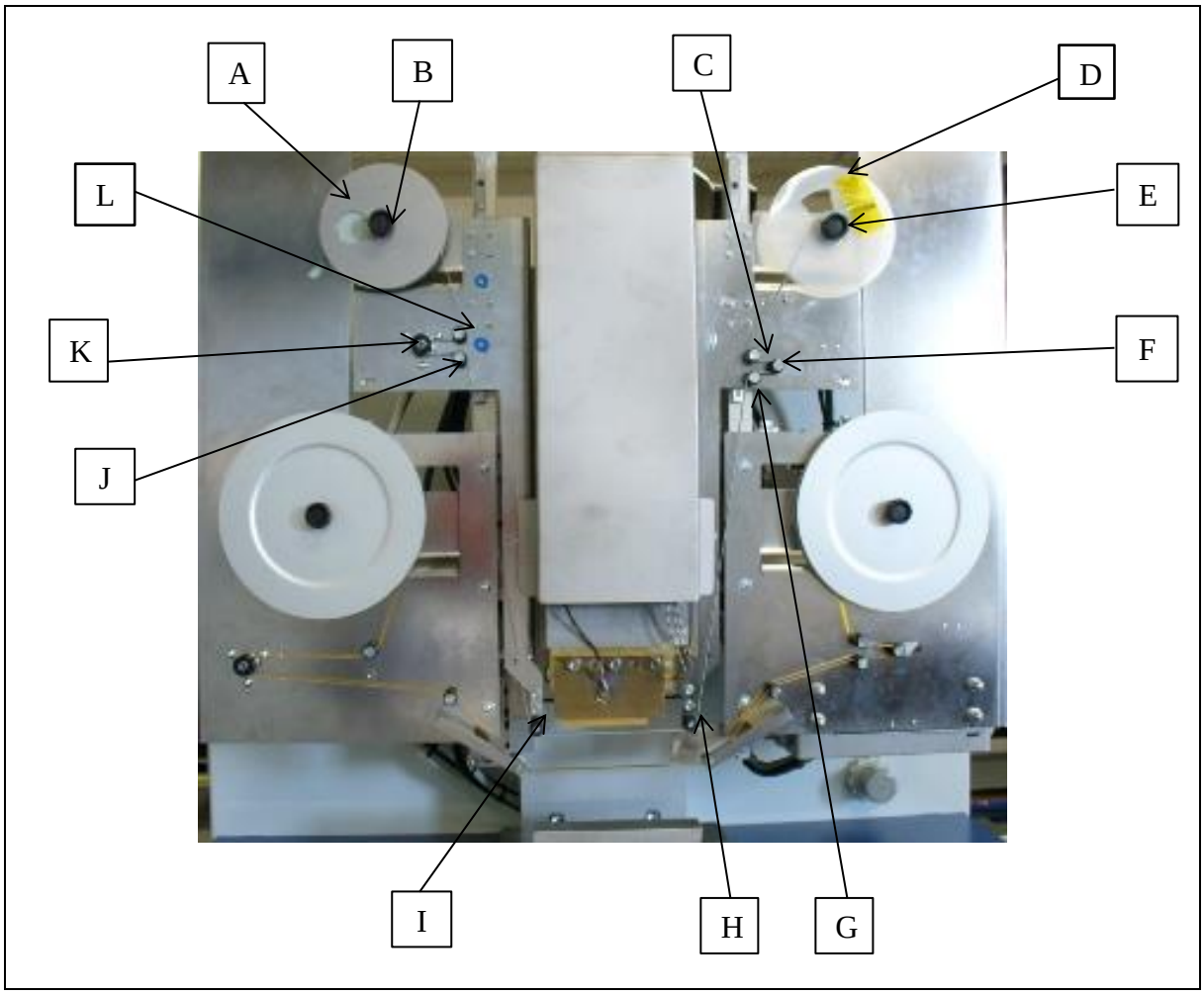
1. Make sure the air pressure is off
2. Fully loosen the left reel attachment knob (L).

3. Remove the left reel cover plate (M).
4. Remove the empty tape carrier from the centre spindle.
5. Install a new tape carrier on the left reel and carefully pull off a short section of tape.
6. Install the cover plate (M). Do not tighten the knob (L) at this time
7. Fully loosen the right reel attachment knob (B).
8. Remove the right reel cover plate (A).
9. Remove the reel of used tape and dispose of it according to local disposal instructions.
10. Feed the tape from the left reel down the roller (K).
11. Put the tape around the right and below the roller (K).
12. Pull the tape around the top and left side of the encoder roller (J).
13. Feed the tape over top of roller (I) and down to the roller (H).
14. Feed the tape below the roller (H) across to the bottom of roller (G).
15. From the bottom of roller (G), feed the tape over the top of roller (F) and up to roller (E).
16. Feed the tape over the top of roller (E) and around the right and top of tension sensor roller (D).
17. Feed the tape around the bottom and left of roller (C) up to reel carrier (P).



18. Put a few turns of tape around the reel carrier (P) and secure it with adhesive tape (N).
19. Install the right reel cover, and tighten the knob (B).
20. Turn the left reel (M) counter clockwise until the roller (D) on the ACF right dancer is at its maximum left position.
21. Tighten the knob (L) on the left spindle.

8 REPLACE THE INTERPOSER TAPE



1. Make sure the air pressure is off.
2. Remove the two locking screws (B and E) from the front of the reels.
3. Remove both reels (A and D).
4. Put a new full reel (A) on the left spindle and loosely tighten the locking screw (B).
5. Pull the used tape from the reel you removed from the right spindle and discard it. Make sure you obey the related local instructions when you discard the tape.
6. Install the empty reel (D) on the right spindle, and loosely tighten the locking screw (E).
7. Lead the tape from the left reel (A) around the right and bottom of roller (L) on and over the top and left of the encoder roller (K).
8. Feed the tape from the bottom of roller (K) down to roller (J).
9. Pass the tape from the top right of roller (J) down to roller (I).
10. Feed the tape around the left and bottom of roller (I) across to roller (H).
11. Feed the tape under and the right of roller (H) and up to roller (G).
12. Feed the tape over the left and top of roller (G) across to the roller (F) on the right dancer.
13. Feed the tape around the right of roller (F) to the bottom of roller (C).

14. Feed the tape around the left of roller (C) into the right reel (D) and feed it out through the hole to the front.
15. Use adhesive tape to attach the tape to the front plate of the right reel (D).
16. Turn the right reel (D) one full rotation clockwise and tighten the lock screw (E).
17. Turn the left reel (A) counter clockwise until the roller (F) on the right dancer is at its maximum left position and the tape is tight around the encoder roller (K).
18. Tighten the left locking screw (B).

9 PREVENTIVE MAINTENANCE (OPERATOR)

It is essential for high level performance of the system to do regular maintenance in accordance with the manufacturer's instructions. This will prevent unplanned downtime.

CAUTION
Do not replace parts yourself but contact a qualified technician

The materials, parts, and tools necessary for the maintenance of the system are not provided by **Amada Weld Tech**. Cleaning and preventive checks however, could identify possible problems.

Cleaning and preventive checks by the operator could identify and prevent possible problems.

9.1 DAILY MAINTENANCE

Item	Maintenance	Action
Fixture	- Clean and remove dust from parts	- Use damp cloth or vacuum cleaner
Heated fixture block	- Remove contamination	- Thermode cleaning module 61W0002; - Polishing disk 69C0000
Control boxes	- Clean and remove dust from parts	- Disconnect system from power supply; - Use clean cloth (& tweezers).
Power supply	- Clean and remove dust from parts	- Disconnect system from power supply; - Use damp cloth
Emergency control system	- Make sure the complete system is disconnected from the power supply	- Press the emergency stop push button

9.2 WEEKLY MAINTENANCE

Item	Parts	Action/maintenance
Electrical cables and wiring	- Clean and remove dust from parts	- Disconnect system from power supply; - Use clean cloth / clear water.

10 CALL AMADA WELD TECH

After receipt of an emergency call at **AMADA WELD TECH**, the caller will be informed of the start of the action necessary to solve the problem.
At all times the first attempt at solving the problems will be by telephone with an **AMADA WELD TECH** authorized person. We have highly qualified technicians who can help you to solve your problem.

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