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Instruction Manual Servo feeder





AZIMUTH MACHINERY
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Azimuth Servo Feed Instruction manual





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1 Word of Caution

- ⚠ This machine is rated for **208V/60Hz** in star configuration. Make sure to properly connect the machine.
- ⚠ Before using the machine with material, make sure to perform a visual inspection and try to cycle it 5 times to verify that nothing has been damaged during transport (guarding system, etc.)
- ⚠ Never operate this machine until you've read & understood that this machine is dangerous. Placing your hands or any part of your body in this machine could lead to serious injuries or death.
- ⚠ Never operate this machine without the use of a guard or safety device that will always protect you from injuries.
- ⚠ Never work on this machine unless power is turned off and locked.

***** Never put your hands in the machine unless the power is turned off and locked out *****



Mechanical Set-up

This section covers the mechanical set-up of the servo-driven feeder. Please make sure to fully understand these instructions before attempting to make mechanical adjustments to the machine.

Adjusting the Feeder Pass Line Height

Adjusting the feeder pass line height is slightly different for direct-mount and rack-mount feeders. If your feeder is directly mounted to the bolster plate of the press, please refer to section 2.1.1 below for instructions on how to change pass line height. If your feeder is mounted to an Azimuth feeder rack, please refer to section 2.1.2.

1.1.1.1 Direct Mount

When the feeder is directly mounted to the press's bolster plate using the provided mounting plate, use the height adjustment screw to make any change to the feeder pass line height.

Please note that the screw offers a limited pass line height adjustment. However, the provided mounting plate offers different mounting hole sets for higher or lower pass lines.

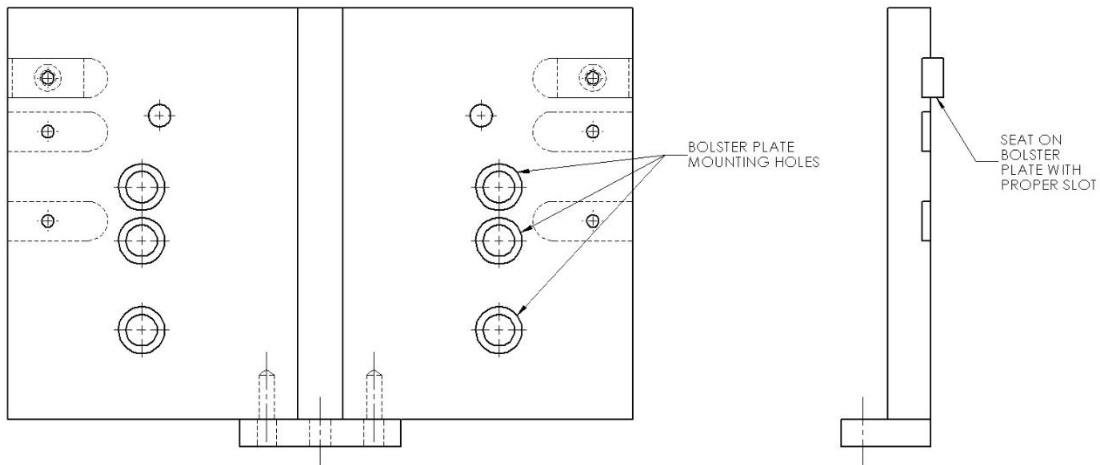


Figure 0.1 Feeder mounting plate



1.1.1.2 Rack Mount (Optional)

When the feeder is mounted on an Azimuth Feeder Rack, the pass line height can be adjusted by a wider range, using the built-in screw jack to raise or lower the feeder on the rack. Turning the handle will change the height of the pass-line. A height ruler is included on the feeder rack to approximate the current pass line height.

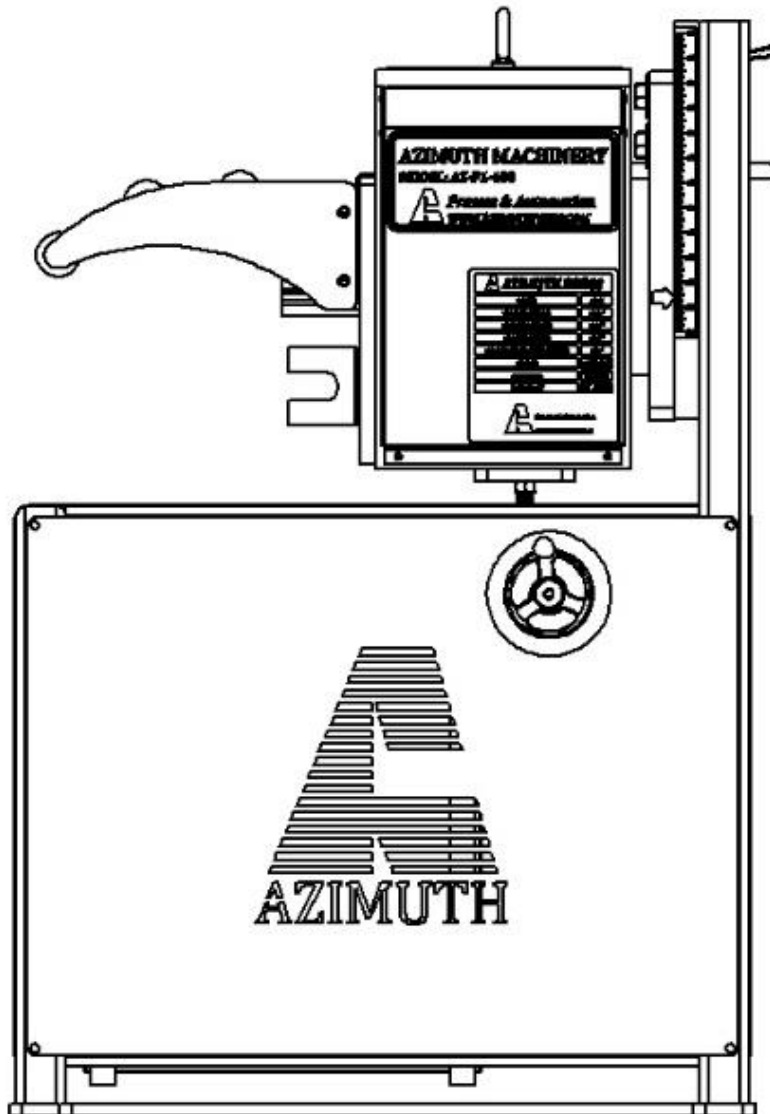


Figure 0.2 Rack-mounted feeder



2 Roller Pressure and Spacing Adjustment

To adjust the pressure and/or the spacing of the rollers on the sheet metal strip, please use the two threaded studs and nuts to compress or decompress the springs.

Before attempting to change tension of the springs, please loosen the jam nuts that sit against the main hex nuts, then turn the hex nuts evenly. **Failure to tighten both springs evenly may result in sideways feeding of the sheet metal.**

When the desired pressure and spacing are reached, tighten the jam nuts against the main hex nuts to lock the adjustment in place.

Adequate pressure is reached when there is no slippage of the sheet metal strip. Excessive pressure may cause deformation of the sheet metal.

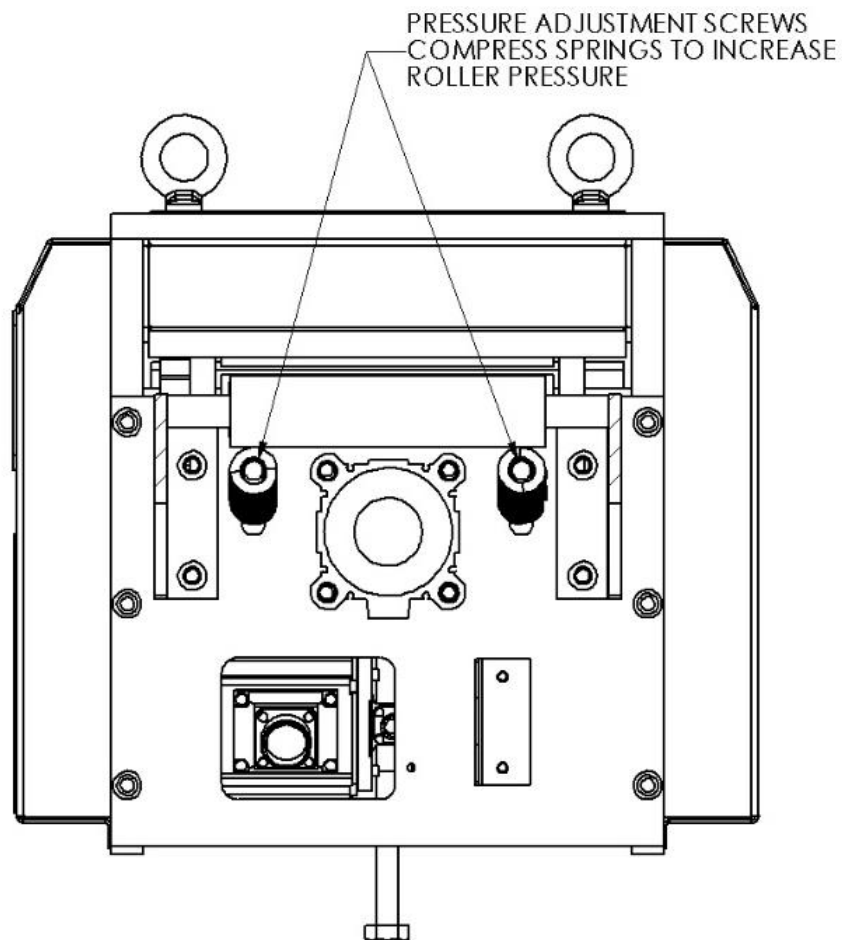


Figure 2.1 Roller pressure adjustment



3 Using the Pneumatic Pilot Release

The feeder is equipped with a pneumatic cylinder to release the pressure off the rollers.

The air pressure supplied to the cylinder **must not exceed 60 psi** (0.4 MPa). **Any higher pressure may cause damage to the feeder.**

If your air supply pressure is higher, please restrict flow completely using the feeder's pressure regulator before plugging it into the feeder, then adjust the regulator until the pressure gauge reads around 0.4 MPa (60 psi).

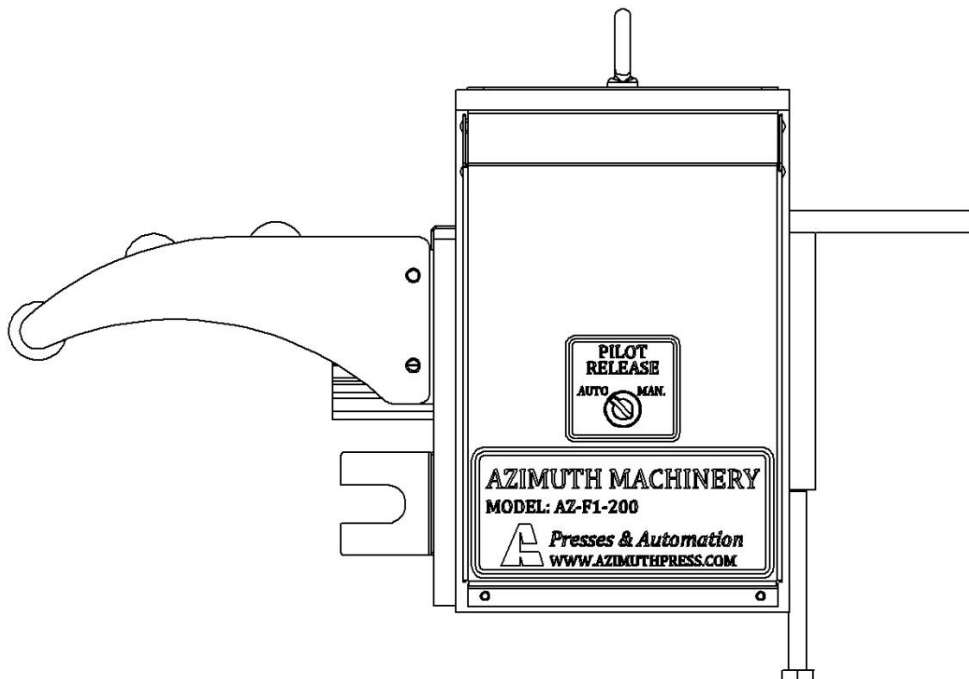


Figure 3.1 Pilot release mode switch



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Manual Release

Turning the pilot release switch to manual mode will override the signal from the HMI and will disengage the rollers' pressure, allowing you to change sheet metal coils and set-up new material. Once you are done setting-up your feeder with your new coil, turn the switch back to AUTO to enable automatic pilot release.



Figure 3.2 Manual pilot release

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Automatic Release

Automatic pilot release mode allows the HMI to send a signal to the pilot release cylinder to disengage the rollers' pressure between feed cycles, when the press is punching the metal strip.



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Feeder specification

When setting up a new coil, set the pilot release to manual mode. Feed the new material through the feeder by hand and switch the pilot release back to AUTO.

Adjust roller pressure following the instructions from section 2.2.

Model→ Parameter↓	Unit	AZ-F1-200	AZ-F1-300	AZ-F1-400	AZ-F1-600	AZ-F1-800
Coil Width	inch	7 7/8	11 13/16	15 3/4	23 5/8	31 1/2
Thickness MIN	inch	0,01				
Thickness MAX	inch	0,14				
Rolls diameter	inch	3,55				
Pilot release		Pneumatic				
MAX SPEED	inch	16 inch/s				
Std. Voltage		208VAC-3PH/480VAC-3PH				
Motor Power		2KW				
Air		40 PSI				

Table 3.1 Feeding width capacity in inches

Thickness gauge	AZ-F1-200	AZ-F1-300	AZ-F1-400
28	8.00	12.00	16.00
26	8.00	12.00	16.00
22	8.00	12.00	16.00
20	8.00	12.00	16.00
18	6.25	10.00	14.00
16	4.75	8.00	12.63
14	4.00	6.00	10.00
12	3.13	4.00	8.00
11	2.00	2.38	4.75
10	1.13	1.50	2.38



7 Adjusting Belt Tension and Checking Belt Life

The servomotor powers the rollers with a timing belt and timing pulleys. To ensure that the system runs well, it is important to periodically check the belt for excessive slack or cracks in the rubber.

Always make sure the power is off and locked before performing maintenance on the belt.

To access the timing belt compartment, undo the four bolts that hold the side guard without a pressure gauge, and remove the guard.

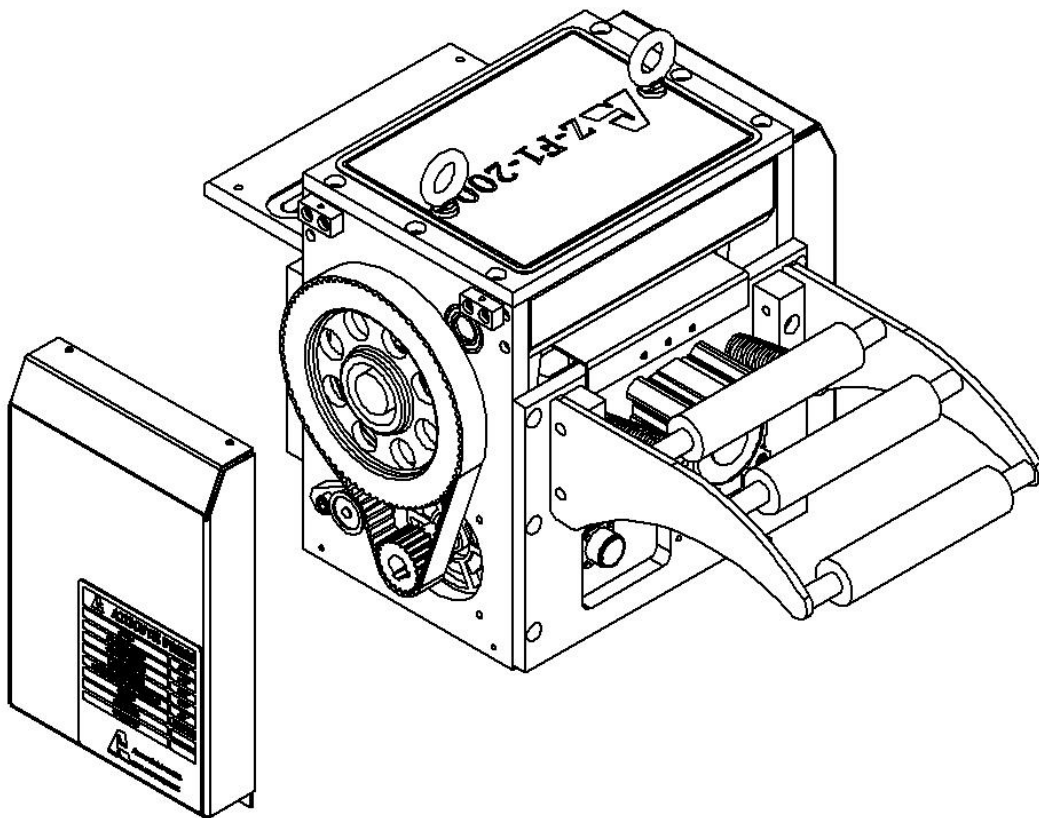


Figure 7.1 Timing belt compartment



8

Belt Tensioning

Belt tension should be checked periodically and adjusted when needed using the feeder's belt tensioner.

To put tension back in the belt, loosen the two bolts that hold the tensioner in place and push it against the timing belt.

When the tension is sufficient on the belt, tighten the two bolts of the tensioner.

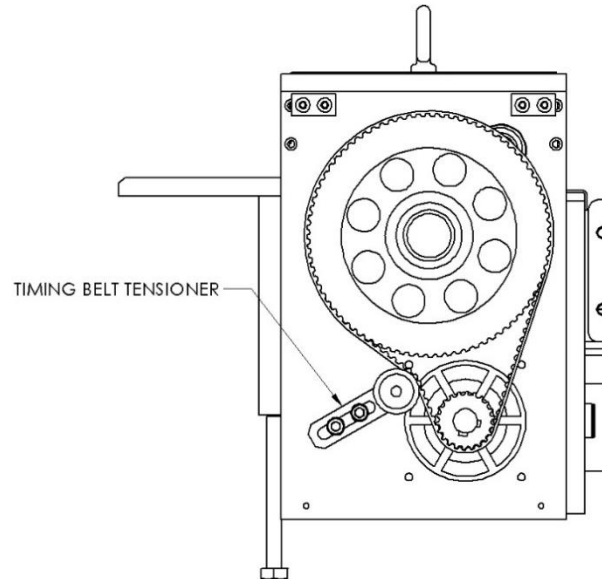


Figure 7.2 Belt tensioner

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Belt Replacement

When the belt presents clear sign of wear or damage, it is time to replace it. A cracked belt is more prone to snapping and this will cause the feeder to stop functioning. The replacement part number is **HTD 8M-800-30**.

To replace the timing belt, first loosen the two bolts on the belt tensioner, then pull the tensioner back. Remove the old timing belt and put on the new one. Push the tensioner against it and tighten the two bolts when sufficient tension is reached.



Figure 7.3 Replacement timing belt

Always put the side guard back on the feeder before operating it. The timing belt presents pinch points and could lead to injury.



10 Electrical Control

11 Main Menu

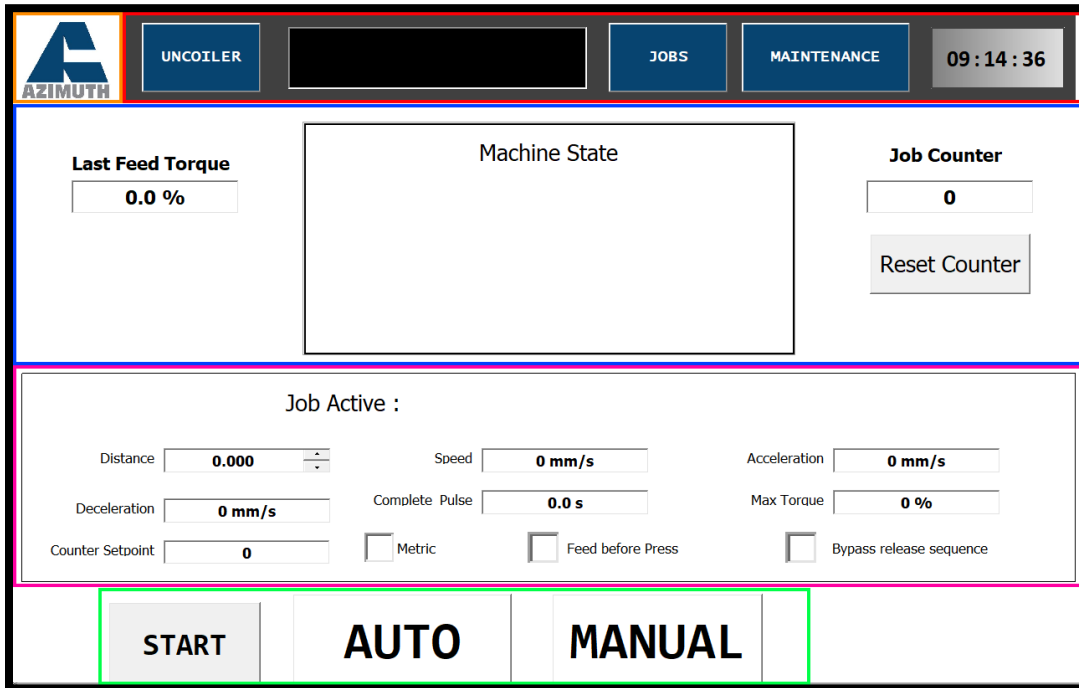


Figure 11.1 Main menu

You can always access the main screen from the navigation bar up top by pressing on the [Azimuth logo](#).

The [navigation bar](#) allows you to access the menu for the uncoiler, alarms, the programmable jobs menu, and the maintenance screen which allows you to change advanced settings. Note that a password is required to access the maintenance screen.

[Last feed torque](#) displays what the torque was for the last feed executed, note that this does not include manual jogging or micro steps. The [machine state](#) will display what the feeder is currently doing. The [job counter](#) increases every time a feed is executed.

You can also view and change information about [the current job](#), note that changing information here will not save it to the current job.

The [bottom bar](#) allows you to change the mode from auto and manual and also serves to change screens. Pressing on AUTO from the main screen will change to AUTO mode, pressing MANUAL



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from the manual screen will change to MANUAL mode. Note that both modes will reset, and you won't be able to toggle back, *when an alarm is active*. The start button allows you to start the machine when the feeder is set at feed before press.

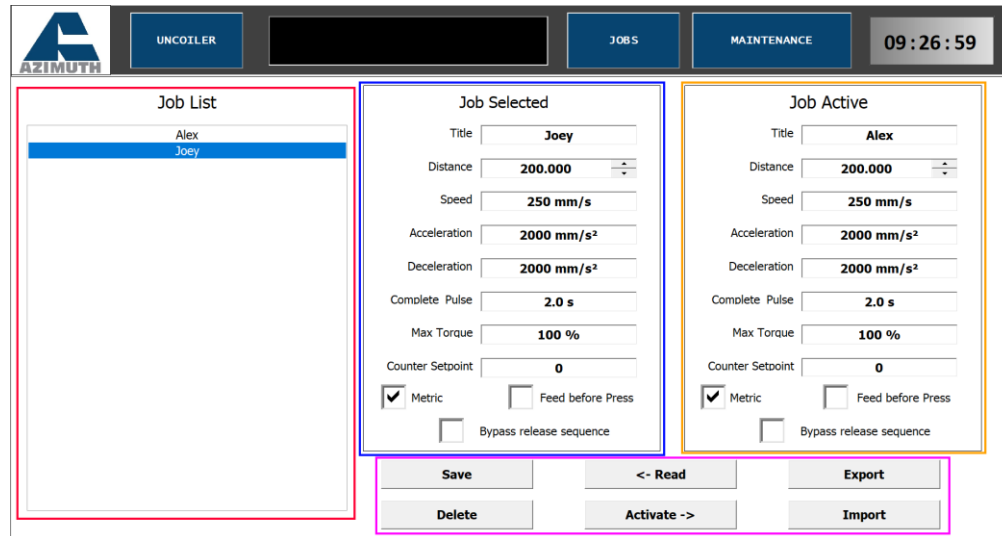


Figure 12.1 Job Screen

The **job list** shows the job that are saved in the machine.

The **selected job** shows the job which was selected in the list. If you press on the “Alex” job in the list, it will show its content.

The **active job** is the one which is currently in use by the feeder. The job selected merely shows you the content of the saved job.

The section below shows you actions that you can take on a job.

Save takes the job currently selected and saves it to the list. To **create a new job**, you must change the title and then save it.

Delete removes the job selected from the list forever. There is no way to recover it except if it was exported.

Read will take the active job and move it into the selected job, but it will not save it into the list.

Activate makes the current selected job into the active job.

Export will create a file on the HMI or on the USB stick that represents the job. This allows you to make backups.



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Import will import a job that was exported back into the job list.



Title	<input type="text" value="Joey"/>
Distance	<input type="text" value="200.000"/>
Speed	<input type="text" value="250 mm/s"/>
Acceleration	<input type="text" value="2000 mm/s<sup>2</sup>"/>
Deceleration	<input type="text" value="2000 mm/s<sup>2</sup>"/>
Complete Pulse	<input type="text" value="2.0 s"/>
Max Torque	<input type="text" value="100 %"/>
Counter Setpoint	<input type="text" value="0"/>
<input checked="" type="checkbox"/> Metric	<input type="checkbox"/> Feed before Press
<input type="checkbox"/>	<input type="checkbox"/> Bypass release sequence

Figure 12.2 Job components

Title: The name of the job.

Distance: The distance the feeder will advance. This is in metric if metric below is selected.

Speed: This is the speed at which the feeder will move. Will always be metric.

Acceleration: How quickly the feeder will reach its speed. Will always be metric.

Deceleration: How quickly the feeder will stop. Will always be metric.

Complete Pulse: After every feed cycle a pulse will be given corresponding to the amount of time give here. Check for “Feed Complete” output on the electrical schema.

Max Torque: Represents the force in percentage that the motor is allowed before giving an alarm. Note that there is also *a max torque in the maintenance menu* that applies in manual mode.

Counter Setpoint: When the feeder reaches the counter setpoint then it will stop. Leave at zero to disable.



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Metric: Check when you want the recipe to be in metric. Note that this only applies to the recipe, *to change the overall unit* you need to go to the maintenance menu. Be warned that checking metric **will not automatically convert the distance**; this needs to be done manually.

Feed before press: Selects whether the feeder starts the press or if the press starts the feeder.

Bypass release sequence: Bypasses the release part of the sequence, allowing the feeder to operate without releasing the pilot.



14 Manual Mode

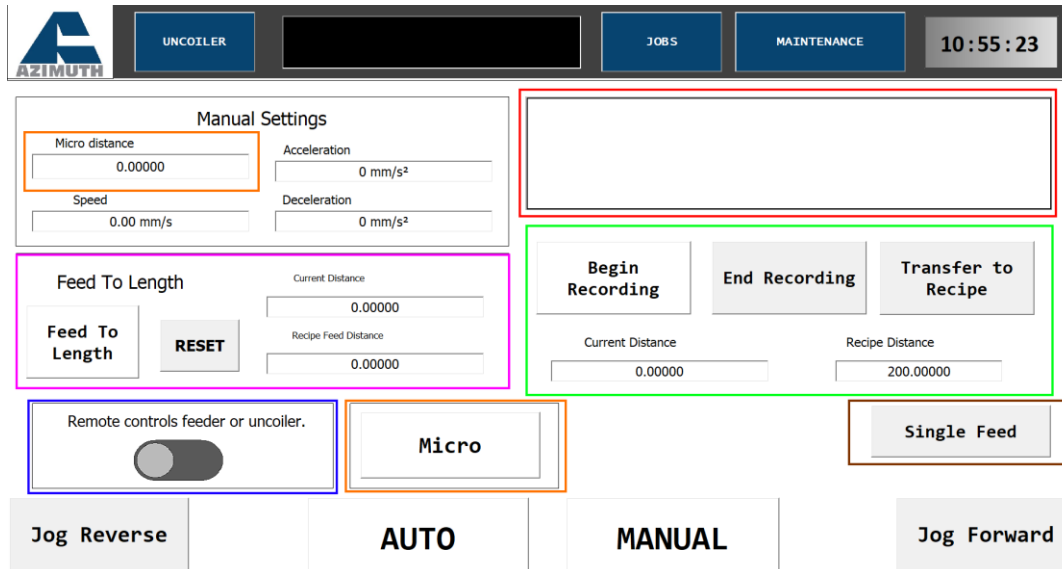


Figure 14.1 Manual mode explanation

NOTE: Manual mode must be selected for all of its controls to be accessible.

Feed To Length allows you to feed forward, but not past the total distance found in the recipe. To activate the feed to length mode then press the button and it will change color, the current distance will change from -1 to 0. Keep in mind that feed to length can go further than demanded, be careful and set a low acceleration and speed. You cannot micro step when using feed to length.

The **upper right blank box** will show state messages of the feeder, what the feeder is currently doing.

Recordings allow you to **record a distance** regardless of whether you've jogged forward or backwards. By pressing on the begin recording button the current distance will change to 0. You may then jog as you wish. Once you press end recording the total distance the feeder has moved forward will freeze and you can then transfer it to the active recipe using the button.

Micro-stepping can be activated **with the Micro button**. The feeder will then move the micro distance instead of jogging continuously when you press the button. Micro mode will be reset when selecting feed to length.

You can control whether the wireless remote moves the **uncoiler or the feeder**, should the machine have an uncoiler.



You can **execute a single feed** by maintaining the button for one second and then the entire time the feeder is moving.

15 Alarms

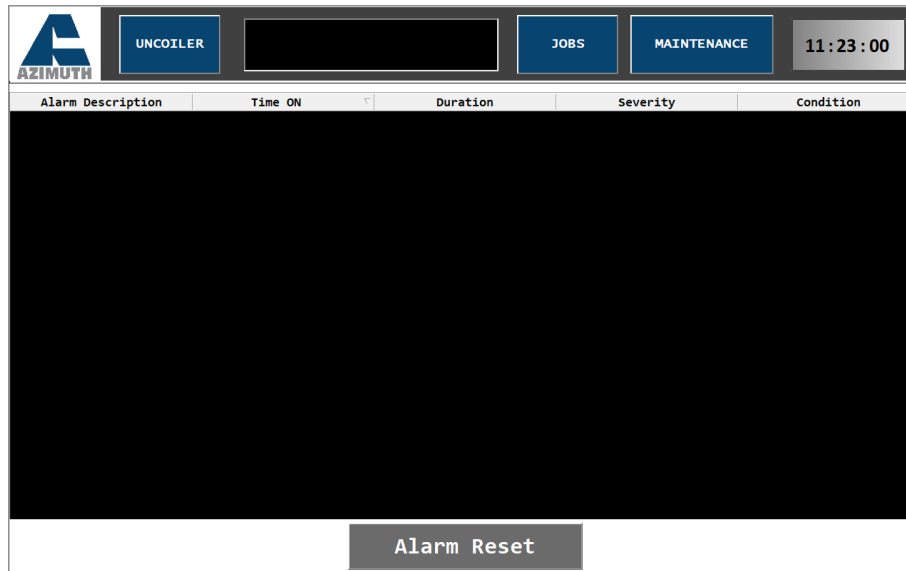


Figure 15.1 Alarm screen

The alarms screen will display alarms and allow you to reset them. Note that if the press gives out a fault signal, then the press controller will need to be reset before the alarm on the feeder.



Table 15.1 List of possible alarms

Alarm	Possible Problem	Solution
Double Feed	The feeder received a feed signal while waiting for a reset or release signal.	Make sure the controller's output are properly configured and that all wiring is properly connected.
Feed Signal Lost	The feed signal was lost during feeding.	Make sure the cam angle settings for the feed are properly set on the press controller, or increase the speed of the feeder. Make sure that all wiring is properly connected.
Max Torque	The maximum torque set in maintenance (if in Manual) or in the recipe (if in Auto) has been reached.	Inspect the mechanics of the feeder and die to make sure nothing is blocking it from operating properly. Make sure the proper material is selected. The max torque value is set too low or the machine is forcing more than it should – set it higher. Make sure a recipe is selected upon start-up.
Pilot Manual	The pilot release is manually activated.	Turn the selector on the side of the feeder to the proper position
Press Fault	The press controller is giving an error.	Clear the fault with the press controller. Make sure everything is properly wired.
Safety Activated	A safety has been activated.	Check all E-Stops and doors. Verify proper wiring.
Servo Drive Error	An error with the servo drive has occurred.	Press reset and if the error comes back then lookup the error code on the drive inside of the panel and take appropriate measures.
Single Feed Error	Single feed button has not been maintained long enough.	Make sure to maintain the single feed button all the while the feeder is feeding.
Uncoiler Auto Error	Feeder was put in Auto but the uncoiler was not.	Always put the uncoiler in Auto mode before the feeder.



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Uncoiler Pilot Error	The uncoiler pilot release is manually activated.	Turn the selector on the side of the uncoiler to the proper position
Uncoiler Overload	Uncoiler motor has been overloaded	Perform a mechanical inspection of the uncoiler to make sure nothing is blocking it.

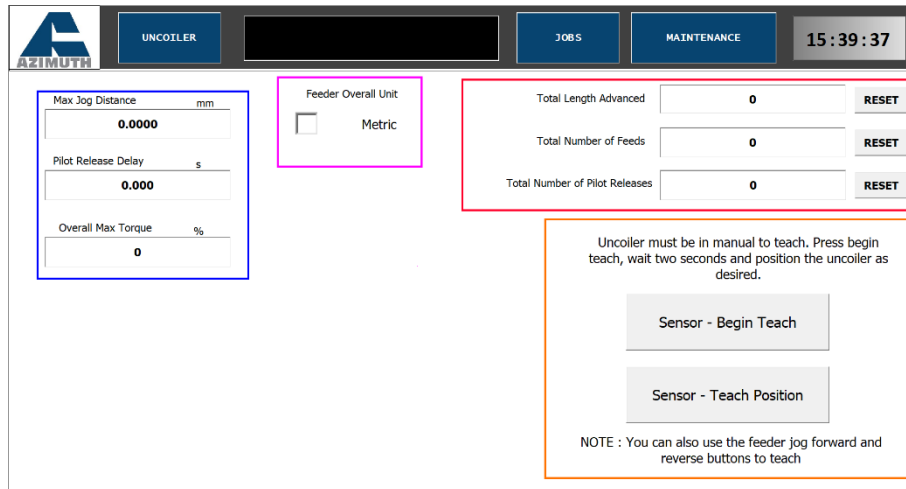


Figure 16.1 Maintenance menu

Max jog distance is the maximum the feeder can feed, in manual, while keeping the button pressed. If **the wireless remote loses its signal during a feed cycle**, it will **keep on feeding indefinitely**. This setting helps mitigate that issue by setting a limit. **Pilot release delay** is the time it takes for the pilot to go back down. It is to ensure that whenever a feed is triggered then the pilot is already back in the correct position. **Overall Max Torque** is the torque limit when the feeder is in manual mode.

Feeder Overall Unit is the unit of the feeder when it is in manual. By default, it is in inches.

There are **three counters which track different stats** on the feeder. How long the machine has fed, the total number of feeds executed and the number of pilot releases performed.

There is an experimental functionality that **allows you to reteach the setpoint position** of the sensor for the uncoiler. Use at your own risk for now.



Uncoiler (Optional)

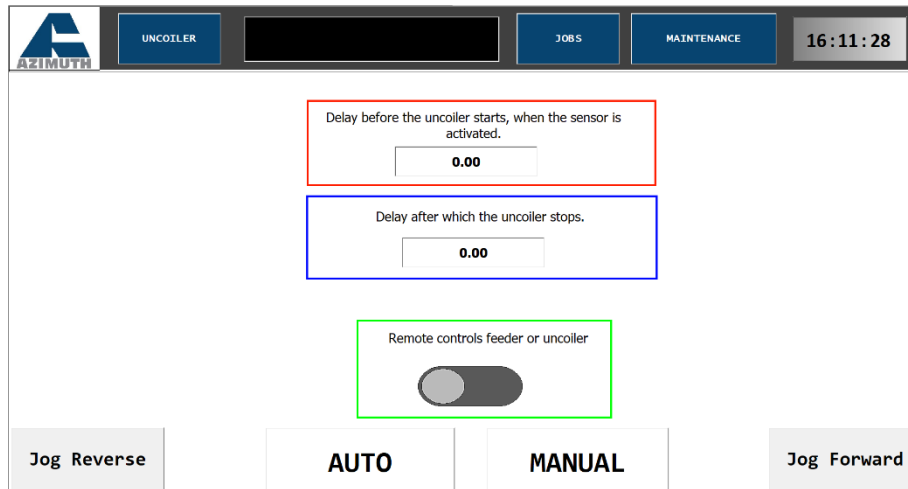


Figure 17.1 Uncoiler screen (Optional)

If your feeder comes with an uncoiler then you will be able to see this page. There are two delays that can be changed in order to modify how much the uncoiler uncoils the material and how quickly it starts. When the dancer bar below which the metal strip passes reaches a certain height then the uncoiler motor will start. This is controlled by a programmable sensor. The delay **before the uncoiler starts** when it has reached the sensor is the first parameter that can be set. The second is **how long the uncoiler motor will keep on going** after the sensor setpoint has been lost. There is an orange indicator light on the sensor itself.

You can choose whether the wireless remote controls **the feeder or the uncoiler** by toggling this switch.



18 Feeder Signals & Press Communication

Communication between the press and the feeder is done through six different signals. Four are sent from the press to the feeder, and two are sent from the feeder to the press.

The tables below explain the different signals that are exchanged between the feeder and the press.

Table 18.1 Signals from the press to the feeder

Feed	Initial signal that triggers a feed cycle from the feeder.
Reset	After a feed signal, the press must send a reset signal before the feeder can repeat.
Release	Releases the pressure on the material by operating a solenoid-controlled valve. This part of the sequence can be bypassed . Please visit section 2.3 for more detail .
Error	A fault condition has occurred in the press and therefore the feeder must stop. Please visit section 3.4 for more detail .

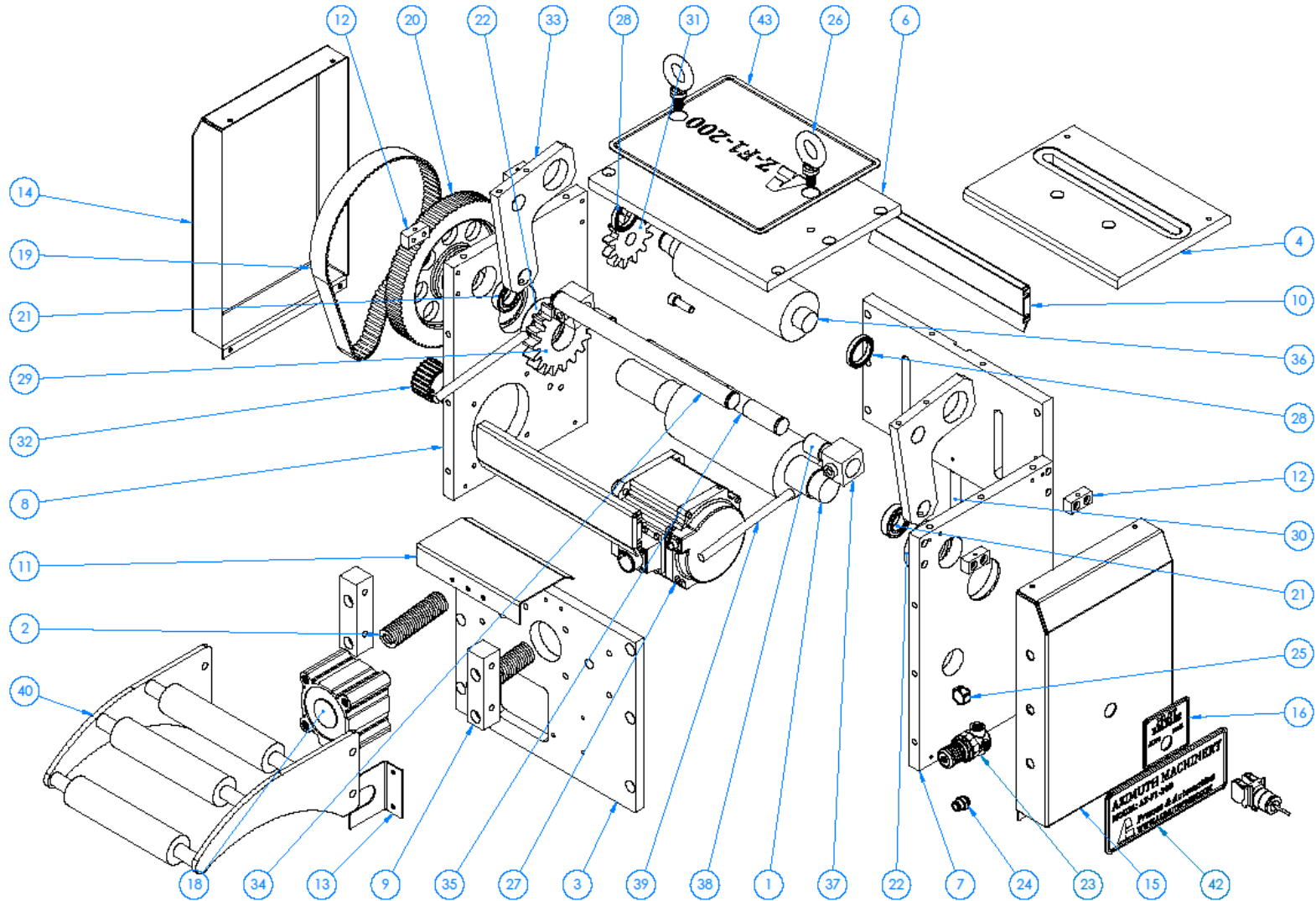
Table 18.2 Signals from the feeder to the press.

Complete Pulse	A pulse of programmable length given every time a feed is finished.
Error	A fault condition has occurred in the feeder and therefore the press must stop. Please visit section 3.4 for more detail .



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ITEM	PART NUMBER	DESCRIPTION
1	0001-AZ-FX-XXX	FIXED ROLLER
2	0002-AZ-FX-XXX	PRESSURE SPRING
3	1001-AZ-FX-XXX	FRONT PLATE
4	1002-AZ-FX-XXX	BED PLATE
5	1003-AZ-FX-XXX	BACK PLATE
6	1004-AZ-FX-XXX	TOP PLATE
7	1005-AZ-FX-XXX	SIDE PLATE
8	1006-AZ-FX-XXX	SERVO SIDE PLATE
9	1008-AZ-FX-XXX	GUIDE ROLLER MOUNT BLOCK
10	1009-AZ-FX-XXX	FRONT GUARD
11	1011-AZ-FX-XXX	GUIDE PLATE
12	1012-AZ-FX-XXX	SIDE GUARD MOUNT
13	1013-AZ-FX-XXX	CABLE TIDY PLATE
14	1014-AZ-FX-XXX	SIDE GUARD, PULLEYS SIDE
15	1014.1-AZ-FX-XXX	SIDE GUARD, PRESSURE SIDE
16	1015-AZ-FX-XXX	PILOT RELEASE PLATE
17	1016-AZ-FX-XXX	BELT TENSIONER
18	1025-AZ-FX-XXX	PNEUMATIC CYLINDER
19	1018-AZ-FX-XXX	HTD 8M-800-30 BELT
20	1019-AZ-FX-XXX	LARGE TIMING PULLEY
21	1020-AZ-FX-XXX	BALL BEARING
22	1021-AZ-FX-XXX	BALL BEARING
ITEM	PART NUMBER	DESCRIPTION
23	1022-AZ-F1-XXX	PRESSURE REGULATING VALVE
24	1023-AZ-FX-XXX	AIR CONNECTOR
25	1024-AZ-FX-XXX	PRESSURE GAUGE
26	1025-AZ-FX-XXX	EYE HOOK
27	1026-AZ-FX-XXX	SERVO MOTOR
28	1027-AZ-FX-XXX	BALL BEARING
29	1028-AZ-FX-XXX	SPUR GEAR
30	1029-AZ-FX-XXX	HEIGHT ADJUSTMENT BOLT
31	1030-AZ-FX-XXX	SPUR GEAR
32	1031-AZ-FX-XXX	SMALL TIMING PULLEY



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33	2001-AZ-FX-XXX	PRESSURE LEVER PLATE
34	2002-AZ-FX-XXX	PIVOT SHAFT
35	2003-AZ-FX-XXX	PRESSURE ADJUSTMENT SHAFT
36	2004-AZ-FX-XXX	PRESSURE ADJUSTING ROLLER
37	3001-AZ-FX-XXX	SPRING BLOCK
38	3002-AZ-FX-XXX	SPRING BLOCK BUSHING
39	3003-AZ-FX-XXX	SPRING ROD
40	5001-AZ-FX-XXX	GUIDE ROLLERS
41	278-AZ-FX-XXX	SPECIFICATIONS PLATE
42	279-AZ-FX-XXX	SIDE DECO PLATE
43	279.1-AZ-FX-XXX	TOP DECO PLATE