



**JVH ENGINEERING, INC.**  
Consulting Engineers In Industrial Automation  
[WWW.JVH.COM](http://WWW.JVH.COM)

## Predesigned Solutions

- Husky® E-Line
- Husky® D-Line
- Husky® Quadlock
- Husky® Tandem
- Husky® G-Line
- Demag / Van Dorn
- Ube Max
- Italtech
- Cincinnati / Milacron®

## Features

- **Allen-Bradley CompactLogix®**
  - CompactLogix
  - Pressure monitoring
  - Built-in temperature control
  - Advanced core features
  - Integrated quick mold change
  - Integrated sequential valve gates
  - Ethernet communications
- **Touchscreen HMI**
  - 12.5" Versaview® Industrial PC
  - Recipe Storage
  - Customizable security levels
  - Integrated RFID Reader
- **Hydraulics Upgrade**
  - High speed proportional valves
  - Valve spool feedback
- **Data Logging**
  - Setpoint Tracking
- **Digital Sensors**
  - Noiseless position sensors
  - Resolution of .005 mm
- **Turnkey Control Solutions**
  - Design & Drawings
  - Installation & Programming
  - Training & Manuals
  - Support

## Italtech Injection Molding Solution

### JVH Screen Preview



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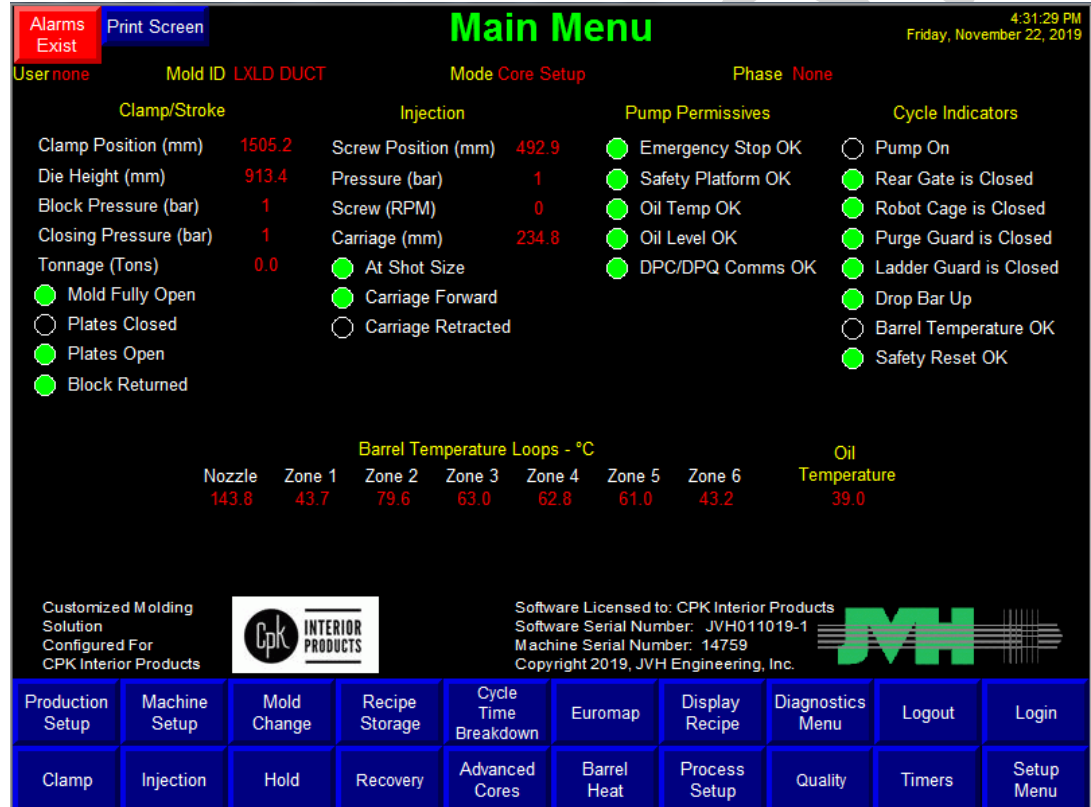
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## Preview Screens

- Process Overview
- Machine Setup
- Cycle Time Break-down
- Clamp
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- Diagnostic Trend
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## Process Overview / Main Menu



The Main Menu screen is designed to give the user a simple overview of the machine status. This screen includes all relevant temperatures, positions, pressures and indicators for basic machine operation. It is also the main hub from which many other screens are accessed. The buttons in the bottom row appear on all other profile screens allowing one-touch access to all profile parameters. The buttons on the top row exist on this screen only.

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## Machine Setup

**Machine Setup**

Alarms Exist | Print Screen | User none | Mold ID LXL DUCT | Mode Core Setup | Phase None | 4:32:55 PM Friday, November 22, 2019

Auto Lube	
<input type="checkbox"/> Manual Lube Trigger	
Cycles Between Auto Lube	100
Cycles Since Last Lube Cycle	79
Pulses Per Cycle	15
Auto Lube Timer On	3
Auto Lube Timer Off	3

Oil Temperature	
Current Temperature (°C)	39.0
Normal Operation - High Alarm (°C)	54.0
Warmed Up Temperature (°C)	43.0
Normal Operation - Low Alarm (°C)	29.0

Auto Purge Setpoints	
<input type="checkbox"/> Auto Purge Start	
Inject Forward End Position (mm)	20
Screw Rotate End Position (mm)	150
Auto Purge Counts	4

Jog Speeds		
Clamp Stroke Setup Speed (%)	Open	Close
	10.0	10.0
Injection Speed (%)	Fwd	
	18.0	

Carriage Setpoints	
Sprue Break Position (mm)	5.00
Forward Position (mm)	236.0
Back Position (mm)	1000
Carriage Speed (%)	45.0
Carriage Pressure (bar)	0

Accumulator Limits		
Accum. SP Pressure (bar)	High	Low
	150	140
Accum. Actual Pressure (bar)	0.6	

Clamp | Injection | Hold | Recovery | Advanced Cores | Barrel Heat | Process Setup | Quality | Timers | Main Menu

The machine setup screen can only be accessed from the Process Overview/Main Menu screen. This screen has a variety of information on it pertaining to lubrication, oil temperature, jogs, carriage, purging and accumulators.

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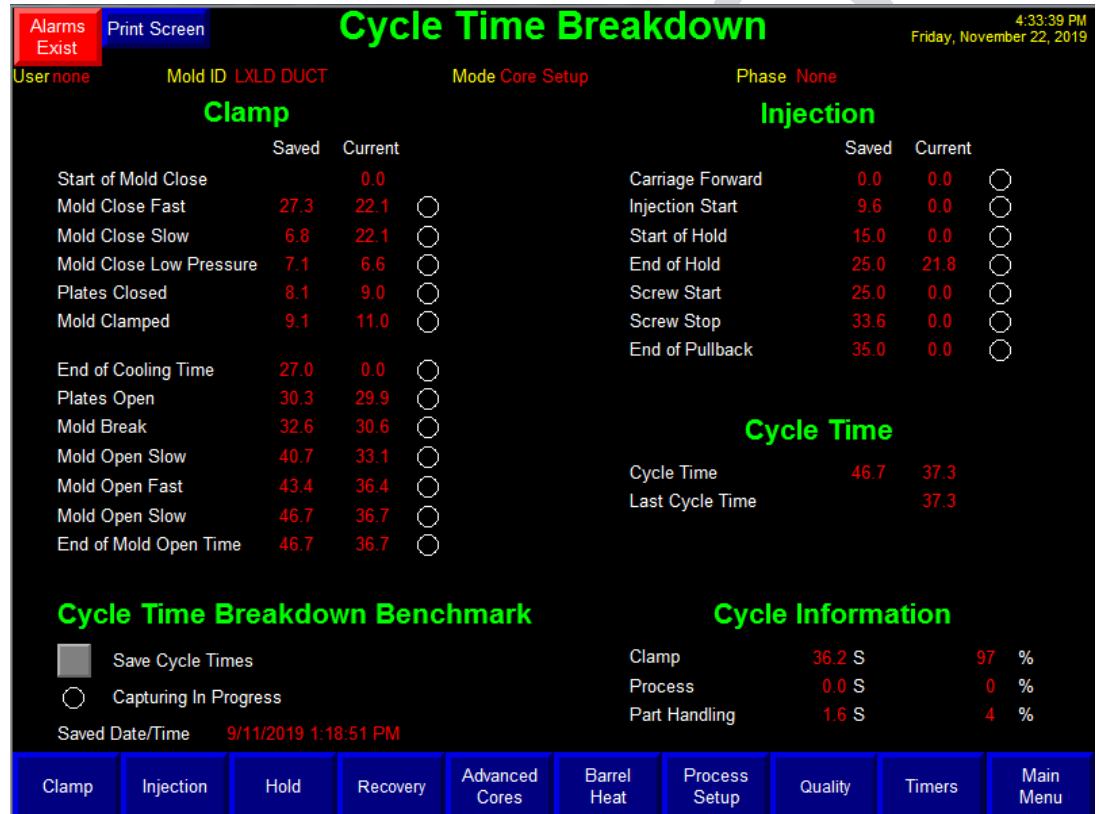
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## Cycle Time Breakdown



The cycle time breakdown screen is accessed from the Process Overview/ Main Menu screen. This screen provides the time in seconds at which each machine phase completes.

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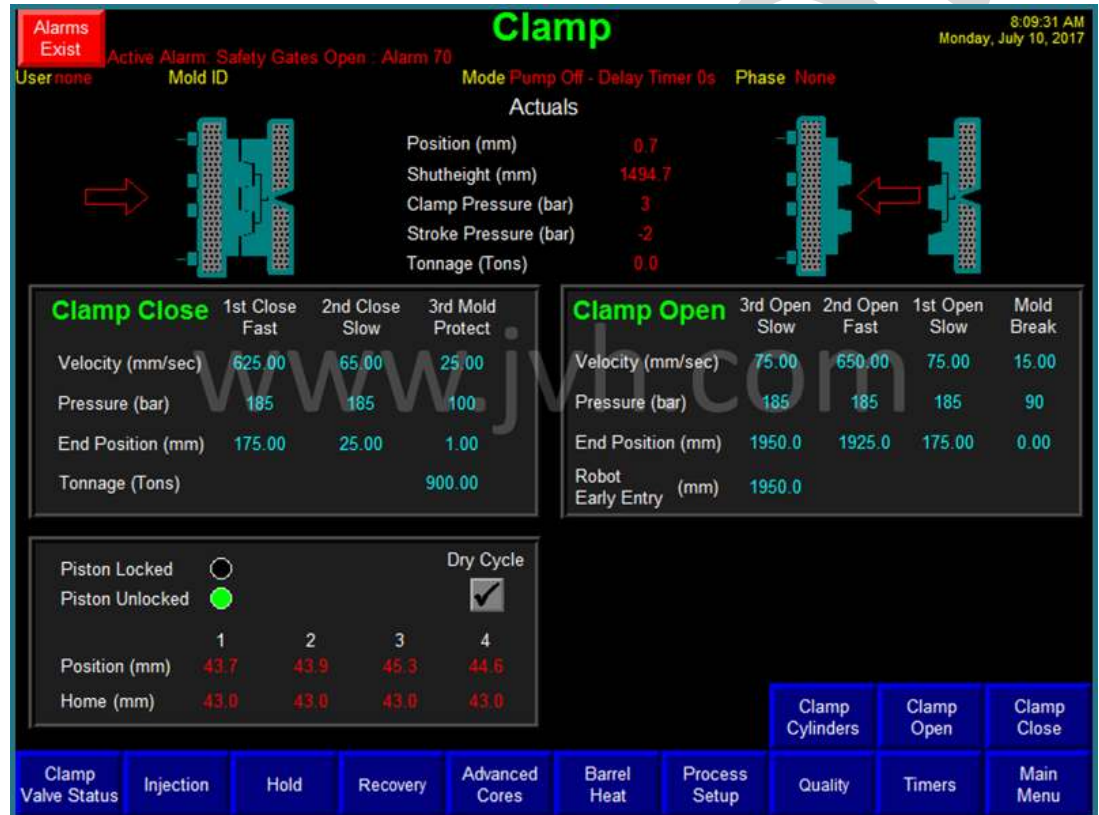
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## Clamp



The clamp screen provides all information required to configure the mold/clamp open and close profiles.

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## Clamp Close



The Clamp Close screen can be accessed by clicking on the Clamp Close button in the bottom right of the Clamp screen. This Screen provides a detailed graph of the velocity of the clamp versus its position, as well as all the relevant parameters from the Clamp screen. There is a similar screen for the clamp open direction.

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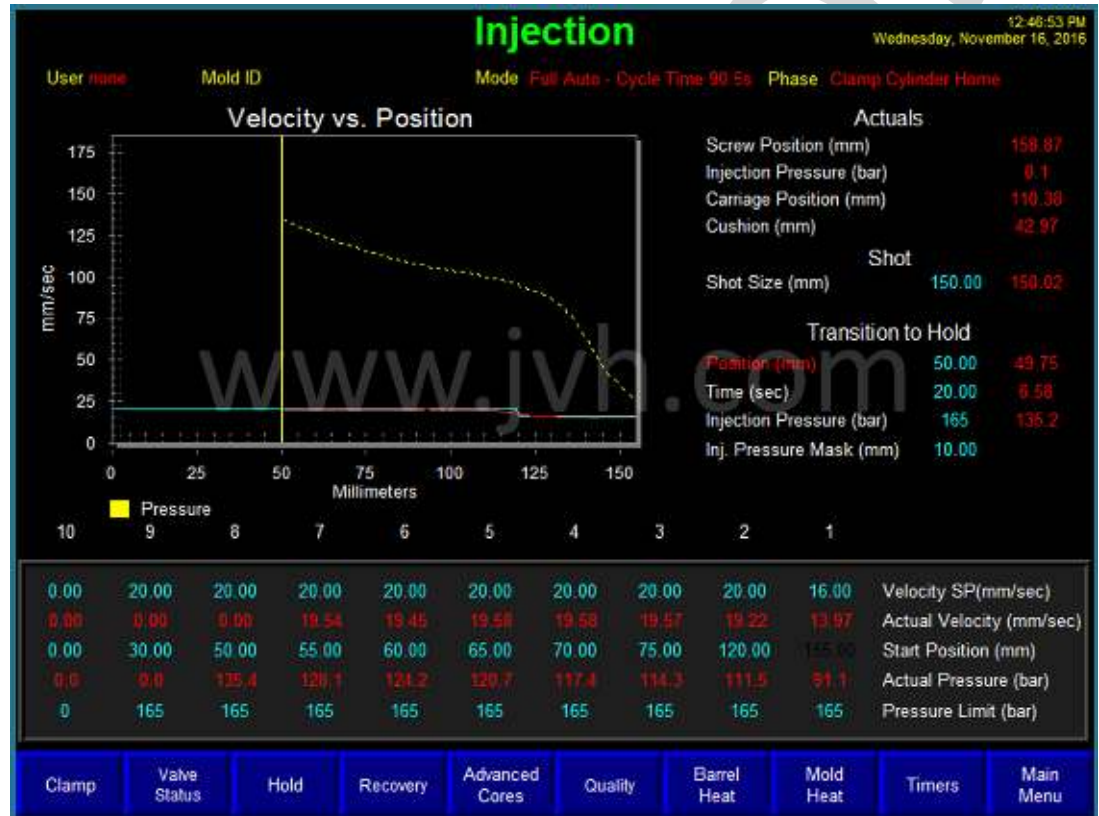
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## Injection



The injection screen contains all pertinent information to the mold fill (injection) process. There are ten segments of velocity control. The injection profile begins from the start position, displayed here in black, which is the shot size plus the post-decompress distance. The screw will travel at the given segment velocity until the next segment start position is reached. This will continue to happen until the screw has completed the injection profile or a transition parameter has been met. Transition to hold will take place based upon which transition parameter is met first (time, position, hydraulic pressure).

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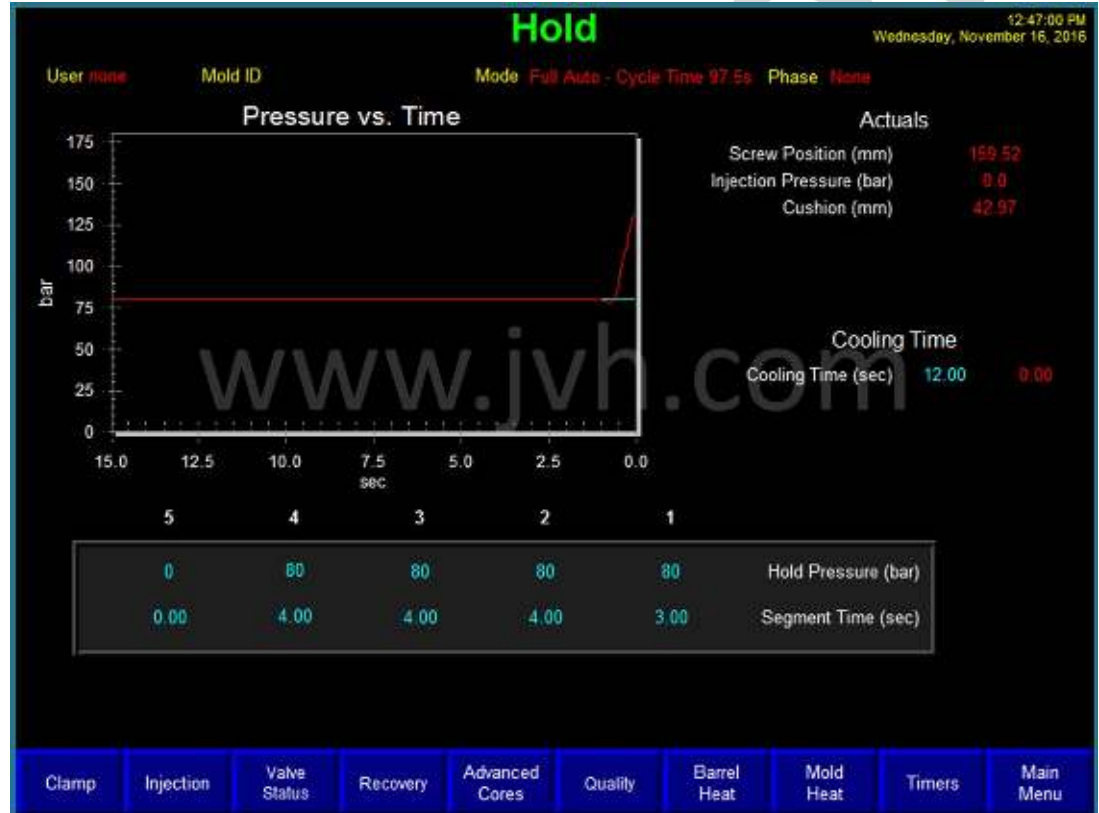
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### Hold



The hold profile begins after injection transition has occurred. This profile performs closed loop injection pressure control to hold plastic pressure on material injected into the mold.

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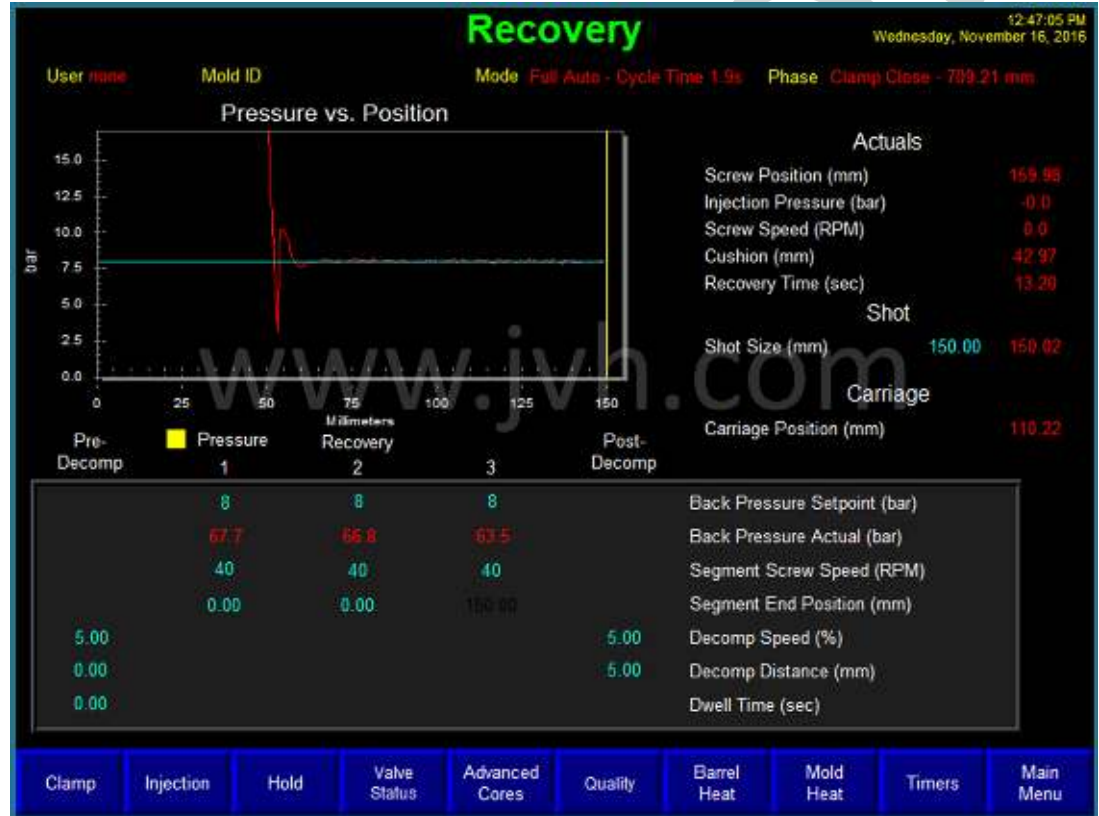
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## Recovery



The Recovery screen contains all the parameters that are relevant to building a new shot for the following cycle. Upon completion of the hold profile, pre-decompress will suck the screw back the defined distance at the set speed. Recovery, steps 1-3, will rotate the screw while holding back-pressure on the injection ram. This operation will take place until the screw reaches the defined shot size. After making shot size, post-decompress will again suck the screw back a defined distance and speed.

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## Advanced Cores

**Alarms Exist** Active Alarm: Safety Gates Open : Alarm 70  
User none Mold ID Mode Pump Off - Delay Timer 0s Phase None

**Advanced Cores** 8:11:06 AM Monday, July 10, 2017

Clear Selection	Core Set					Core Pull					Ejector Selection
	Step	Order	Output	LS	Time (sec)	Step	Order	Output	LS	Time (sec)	
<input type="checkbox"/>	1Mov	0	0	<input type="radio"/>	0.0	1Mov	0	0	<input type="radio"/>	0.0	<input type="checkbox"/>
<input type="checkbox"/>	2Mov	0	0	<input type="radio"/>	0.0	2Mov	0	0	<input type="radio"/>	0.0	<input type="checkbox"/>
<input type="checkbox"/>	3Mov	0	0	<input type="radio"/>	0.0	3Mov	0	0	<input type="radio"/>	0.0	<input type="checkbox"/>
<input type="checkbox"/>	1Sta	0	0	<input type="radio"/>	0.0	1Sta	0	0	<input type="radio"/>	0.0	<input type="checkbox"/>
<input type="checkbox"/>	2Sta	0	0	<input type="radio"/>	0.0	2Sta	0	0	<input type="radio"/>	0.0	<input type="checkbox"/>
<input type="checkbox"/>	3Sta	0	0	<input type="radio"/>	0.0	3Sta	0	0	<input type="radio"/>	0.0	<input type="checkbox"/>

Eject Back Retracted Pos (mm) Output Limit  
M/C Ejector 1.0 ☐ ☒

Eject Fwd Forward Pos (mm) Output Limit  
M/C Ejector 175.0 ☐ ☐

Machine Ejector Position (mm) 0.92

0. None (Core Disabled)	1Mov - 2Mov - 3Mov - 1Sta - 2Sta - 3Sta
1. Before Mold Closing	Ret M/C Ejector
2. During Mold Closing	
3. After Mold Closed	
4. After Clamped Up	
5. Before Unclamping	
6. Before Mold Opening	
7. During Mold Opening	
8. After Mold Open	Fwd M/C Ejector

Core Setup Mode is Enabled Mold Damage Possible

Clamp Injection Hold Recovery Advanced Cores 2 Barrel Heat Process Setup Quality Timers Main Menu

The Advanced Cores screen is the first of two core screens utilized to configure nearly any sequence of core operation.

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## Quality

12:48:06 PM  
Wednesday, November 16, 2016

**Quality**

User name:      Mold ID:      Mode: Full Auto - Cycle Time 63.1s      Phase: Clamp Decompress

	Cycle Time	Injection Time	Trans Pos	Trans Press	Max Press	Cush Size	Injection Start	Shot Length	Recovery Time	Clamp Open
Max	70.00	3.50	45.00	100	95	32.00	155.00	127.00	10.00	2350.0
Min	60.00	3.00	39.00	80	85	25.00	150.00	121.00	8.00	2250.0
Current	62.95	6.54	49.75	135.1	136.3	43.24	161.96	118.72	12.33	0.0
1	100.61	6.58	49.75	135.2	135.4	42.97	162.55	119.58	13.20	1837.1
2	71.78	6.45	49.75	132.8	132.7	42.02	160.50	118.58	13.37	1836.7
3	70.66	6.44	49.75	132.7	132.9	41.91	160.41	118.49	13.37	1836.9
4	70.83	6.44	49.75	132.0	132.0	41.44	160.37	118.93	13.53	1836.9
5	69.71	6.46	49.75	132.5	132.4	41.63	160.96	118.98	13.38	1837.3
6	69.79	6.46	49.74	132.5	132.6	41.79	160.73	118.94	13.42	1837.4
7	69.72	6.45	49.77	133.2	133.4	42.30	160.62	118.31	13.36	1837.2
8	69.47	6.44	49.75	132.7	132.9	41.68	160.38	118.71	13.44	1837.0
9	69.59	6.44	49.77	132.5	132.7	41.67	160.49	118.82	13.41	1837.0
10	69.44	6.44	49.74	132.4	132.5	41.54	160.38	118.84	13.36	1836.8
11	69.72	6.44	49.75	132.7	132.8	41.88	160.41	118.53	13.40	1837.1
12	69.51	6.45	49.75	132.8	133.0	42.08	160.59	118.52	13.33	1836.9
13	69.99	6.45	49.75	132.7	132.9	41.91	160.54	118.63	13.28	1836.9
14	69.85	6.46	49.75	132.6	132.8	41.78	160.70	118.92	13.34	1836.9
15	72.63	6.48	49.76	133.1	133.2	42.14	161.03	118.89	13.37	1836.9

Quality Log

Clamp    Injection    Hold    Recovery    Advanced Cores    Barrel Heat    Mold Heat    Timers    Main Menu

The quality screen is utilized to view the key process parameters for the last 15 cycles. Additional cycle data can be viewed by accessing the quality log screen. Minimum and maximum values can be defined for each of the 10 process parameters displayed. When any cycle contains a process parameter that falls outside of the defined minimum/maximum boundary, the parameter for that cycle is displayed in red text. This screen can be used to quickly determine if the process is running repeatably and within tolerance.

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## Diagnostic Trend



The Diagnostic Trend screen allows the operator to select up to six digital or analog outputs, as well as temperatures, and have these inputs and outputs represented visually using a live trend that records over time. Selecting a specific datum will highlight and scale the vertical axis appropriately for that value.

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## Mold Change

**Alarms Exist** **Print Screen** **Mold Change** 4:30:53 PM Friday, November 22, 2019

User none Mold ID LXL DUCT Mode Core Setup Phase None

### Mold Installation

Die Height (mm)	913.4	913.0
Carriage Fwd. Pos. (mm)	234.8	236.0
Mold Set Stroke Speed (%)	Open 10.0	Close 10.0

☐ Die Height Auto Adjust  
☐ Zero Clamp Position

### Mold Change Sequence

(Clamp Open In Setup Mode With No Mold)

1. Load New Recipe
2. Adjust Die Height to Setpoint
3. Lower In Mold
4. Close Clamp To Touch
5. With Die Height At Setpoint And Mold At Touch Zero The Clamp Position
6. Use S.S.W. To Move Plates In
7. Use S.S.W. To Apply Tonnage
8. Clamp Mold With QMC

### QMC Mode

☐ QMC Enable  
☐ QMC Tonnage Bypass  
 QMC Enabled: Signal To QMC ☐

### QMC Enable Prerequisites

Carriage At Back Position	<input type="radio"/>
All Gates Closed	<input checked="" type="radio"/>
Setup Mode	<input checked="" type="radio"/>
Tonnage Applied	<input type="radio"/>

### Actuals

Clamp Position (mm)	1505.1
Clamp Pressure (bar)	1
Tonnage (Tons)	0.0
Plates Closed	<input type="radio"/>
Plates Open	<input checked="" type="radio"/>
Block Returned	<input checked="" type="radio"/>

**Recipe Storage**

Clamp Injection Hold Recovery Advanced Cores Barrel Heat Process Setup Quality Timers Main Menu

The Mold Change screen provides a visual display for the sequence of events required to install a mold and then clamp it. Checks are in place on this screen to ensure operator security level along with interlock confirmations.

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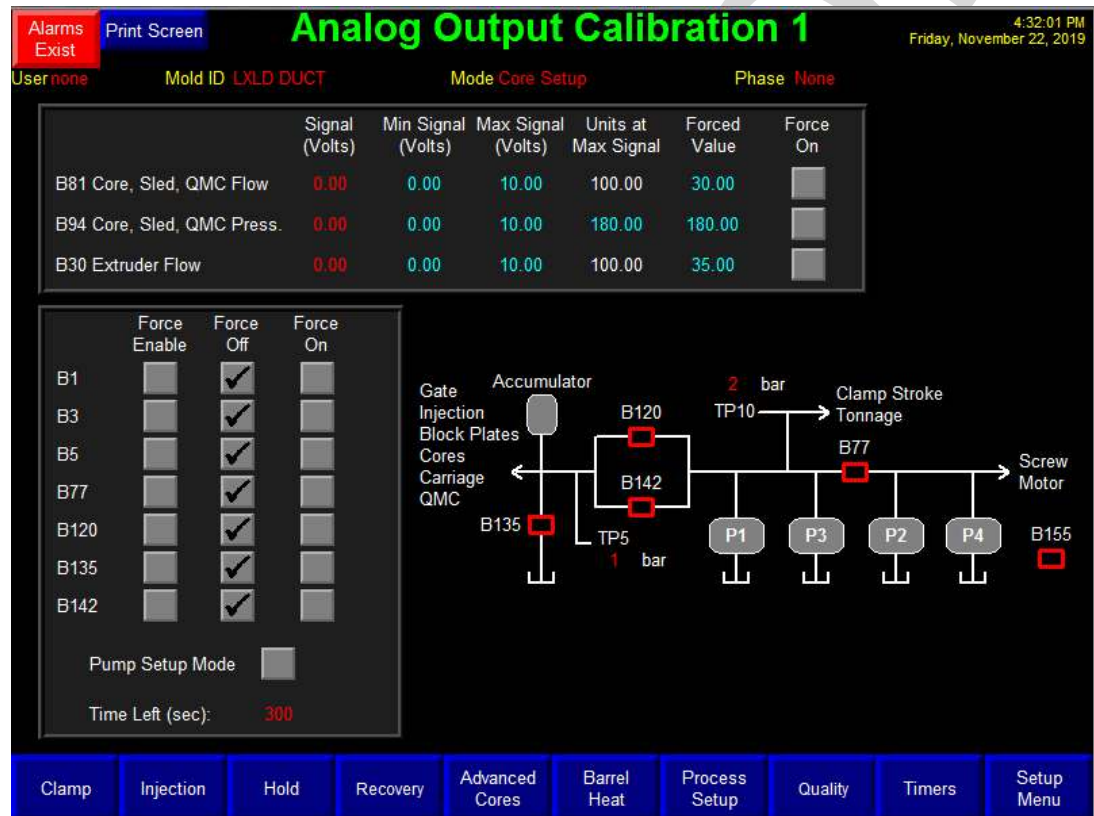
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## Pump Forcing/ Output Calibration



The Output Calibration screen is used to calibrate and force on each of the valve driver cards on the machine. For this project the original core speed and pressure, along with extruder flow valve drivers were left in use while all other valves were replaced with new stock valves that utilized onboard electronics. Also on this screen digital pump and accumulator solenoids can be forced on and off.

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