



Haas Automation, Inc.

Automatic Part Loader

Next Generation Control
Operator's Manual Supplement
96-8040
Revision A
September 2019
English
Original Instructions

Haas Automation Inc.
2800 Sturgis Road
Oxnard, CA 93030-8933
U.S.A. | HaasCNC.com

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Covering Haas Automation, Inc. CNC Equipment

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Each CNC Machine and its Components (collectively, "Haas Products") are warranted by Manufacturer against defects in material and workmanship. This warranty is provided only to an end-user of the CNC Machine (a "Customer"). The period of this limited warranty is one (1) year. The warranty period commences on the date the CNC Machine is installed at the Customer's facility. Customer may purchase an extension of the warranty period from an authorized Haas distributor (a "Warranty Extension"), any time during the first year of ownership.

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This warranty is Manufacturer's sole and exclusive warranty, and is in lieu of all other warranties of whatever kind or nature, express or implied, written or oral, including, but not limited to, any implied warranty of merchantability, implied warranty of fitness for a particular purpose, or other warranty of quality or performance or noninfringement. All such other warranties of whatever kind are hereby disclaimed by Manufacturer and waived by Customer.

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Manufacturer will not be liable to Customer or any other person for any compensatory, incidental, consequential, punitive, special, or other damage or claim, whether in an action in contract, tort, or other legal or equitable theory, arising out of or related to any Haas product, other products or services provided by Manufacturer or an authorized distributor, service technician, or other authorized representative of Manufacturer (collectively, "authorized representative"), or the failure of parts or products made by using any Haas Product, even if Manufacturer or any authorized representative has been advised of the possibility of such damages, which damage or claim includes, but is not limited to, loss of profits, lost data, lost products, loss of revenue, loss of use, cost of down time, business good will, any damage to equipment, premises, or other property of any person, and any damage that may be caused by a malfunction of any Haas product. All such damages and claims are disclaimed by Manufacturer and waived by Customer. Manufacturer's sole liability, and Customer's exclusive remedy, for damages and claims for any cause whatsoever shall be limited to repair or replacement, at the discretion of Manufacturer, of the defective Haas Product as provided in this warranty.

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This Certificate supersedes any and all other agreements, promises, representations, or warranties, either oral or in writing, between the parties or by Manufacturer with respect to subject matter of this Certificate, and contains all of the covenants and agreements between the parties or by Manufacturer with respect to such subject matter. Manufacturer hereby expressly rejects any other agreements, promises, representations, or warranties, either oral or in writing, that are in addition to or inconsistent with any term or condition of this Certificate. No term or condition set forth in this Certificate may be modified or amended, unless by a written agreement signed by both Manufacturer and Customer. Notwithstanding the foregoing, Manufacturer will honor a Warranty Extension only to the extent that it extends the applicable warranty period.

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This warranty is transferable from the original Customer to another party if the CNC Machine is sold via private sale before the end of the warranty period, provided that written notice thereof is provided to Manufacturer and this warranty is not void at the time of transfer. The transferee of this warranty will be subject to all terms and conditions of this Certificate.

Miscellaneous

This warranty shall be governed by the laws of the State of California without application of rules on conflicts of laws. Any and all disputes arising from this warranty shall be resolved in a court of competent jurisdiction located in Ventura County, Los Angeles County, or Orange County, California. Any term or provision of this Certificate that is invalid or unenforceable in any situation in any jurisdiction shall not affect the validity or enforceability of the remaining terms and provisions hereof, or the validity or enforceability of the offending term or provision in any other situation or in any other jurisdiction.

Customer Feedback

If you have concerns or questions regarding this Operator's Manual, please contact us on our website, www.HaasCNC.com. Use the "Contact Us" link and send your comments to the Customer Advocate.

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Customer Satisfaction Policy

Dear Haas Customer,

Your complete satisfaction and goodwill are of the utmost importance to both Haas Automation, Inc. and the Haas distributor (HFO) where you purchased your equipment. Normally, your HFO will rapidly resolve any concerns you have about your sales transaction or the operation of your equipment.

However, if your concerns are not resolved to your complete satisfaction, and you have discussed your concerns with a member of the HFO's management, the General Manager, or the HFO's owner directly, please do the following:

Contact Haas Automation's Customer Service Advocate at 805-988-6980. So that we may resolve your concerns as quickly as possible, please have the following information available when you call:

- Your company name, address, and phone number
- The machine model and serial number
- The HFO name, and the name of your latest contact at the HFO
- The nature of your concern

If you wish to write Haas Automation, please use this address:

Haas Automation, Inc. U.S.A.
2800 Sturgis Road
Oxnard CA 93030
Att: Customer Satisfaction Manager
email: customerservice@HaasCNC.com

Once you contact the Haas Automation Customer Service Center, we will make every effort to work directly with you and your HFO to quickly resolve your concerns. At Haas Automation, we know that a good Customer-Distributor-Manufacturer relationship will help ensure continued success for all concerned.

International:

Haas Automation, Europe
Mercuriusstraat 28, B-1930
Zaventem, Belgium
email: customerservice@HaasCNC.com

Haas Automation, Asia
No. 96 Yi Wei Road 67,
Waigaoqiao FTZ
Shanghai 200131 P.R.C.
email: customerservice@HaasCNC.com

Declaration of Incorporation

Product: Automatic Parts Loader

Serial Number: _____

Manufactured By: Haas Automation, Inc.

2800 Sturgis Road, Oxnard, CA 93030 **805-278-1800**

We declare, in sole responsibility, that the above listed product, to which this declaration refers, cannot function independently and does not change the function of the machine it is attached to. The Automatic Parts Loader, when incorporated into Haas CNC Lathes (turning centers) or VMC (vertical machining center), complies with the regulations as outlined in the CE directive for machinery:

- Machinery Directive 2006 / 42 / EC
- Electromagnetic Compatibility Directive 2014 / 30 / EU
- Low Voltage Directive 2014 / 35 / EU
- Additional Standards:
 - EN 60204-1:2006 / A1:2009
 - EN 614-1:2006+A1:2009
 - EN 894-1:1997+A1:2008
 - CEN 13849-1:2015

RoHS2: COMPLIANT (2011/65/EU) by Exemption per producer documentation.

Exempt by:

- a) Large scale stationary industrial tool.
- b) Lead as an alloying element in steel, aluminum, and copper.
- c) Cadmium and its compounds in electrical contacts.

Person authorized to compile technical file:

Jens Thing

Address:

Haas Automation Europe
Mercuriusstraat 28
B-1930 Zaventem
Belgium

USA: Haas Automation certifies this machine to be in compliance with the OSHA and ANSI design and manufacturing standards listed below. Operation of this machine will be compliant with the below-listed standards only as long as the owner and operator continue to follow the operation, maintenance, and training requirements of these standards.

- *OSHA 1910.212 - General Requirements for All Machines*
- *ANSI B11.5-1984 (R1994) Lathes*
- *ANSI B11.19-2010 Performance Criteria for Safeguarding*
- *ANSI B11.22-2002 Safety Requirements for Turning Centers and Automatic Numerically Controlled Turning Machines*
- *ANSI B11.TR3-2000 Risk Assessment and Risk Reduction - A Guideline to Estimate, Evaluate, and Reduce Risks Associated with Machine Tools*

CANADA: As the original equipment manufacturer, we declare that the listed products comply with regulations as outlined in the Pre-Start Health and Safety Reviews Section 7 of Regulation 851 of the Occupational Health and Safety Act Regulations for Industrial Establishments for machine guarding provisions and standards.

Further, this document satisfies the notice-in-writing provision for exemption from Pre-Start inspection for the listed machinery as outlined in the Ontario Health and Safety Guidelines, PSR Guidelines dated November 2016. The PSR Guidelines allow that notice in writing from the original equipment manufacturer declaring conformity to applicable standards is acceptable for the exemption from Pre-Start Health and Safety Review.



All Haas CNC machine tools carry the ETL Listed mark, certifying that they conform to the NFPA 79 Electrical Standard for Industrial Machinery and the Canadian equivalent, CAN/CSA C22.2 No. 73. The ETL Listed and cETL Listed marks are awarded to products that have successfully undergone testing by Intertek Testing Services (ITS), an alternative to Underwriters' Laboratories.



Haas Automation has been assessed for conformance with the provisions set forth by ISO 9001: 2015. Scope of Registration: Design and Manufacture of CNC Machines Tools and Accessories, Sheet Metal Fabrication. The conditions for maintaining this certificate of registration are set forth in ISA's Registration Policies 5.1. This registration is granted subject to the organization maintaining compliance to the noted standard. The validity of this certificate is dependent upon ongoing surveillance audits.

Original Instructions

User's Operator Manual and other Online Resources

This manual is the operation and programming manual that applies to all Haas Lathes.

An English language version of this manual is supplied to all customers and is marked **"Original Instructions"**.

For many other areas of the world, there is a translation of this manual marked **"Translation of Original Instructions"**.

This manual contains an unsigned version of the EU required **"Declaration Of Conformity"**. European customers are provided a signed English version of the Declaration of Conformity with Model Name and Serial Number.

Besides this manual, there is a tremendous amount of additional information online at: www.haascnc.com under the Service section.

Both this manual and the translations of this manual are available online for machines up to approximately 15 years old.

The CNC control of your machine also contains all of this manual in many languages and can be found by passing the **[HELP]** button.

Many machine models come with manual supplement that is also available online.

All machine options also have additional information online.

Maintenance and service information is available online.

The online **"Installation Guide"** contains information and check list for Air & Electrical requirements, Optional Mist Extractor, Shipping Dimensions, weight, Lifting Instructions, foundation and placement, etc.

Guidance on proper coolant and Coolant Maintenance is located in the Operators Manual and Online.

Air and Pneumatic diagrams are located on the inside of the lubrication panel door and CNC control door.

Lubrication, grease, oil and hydraulic fluid types are listed on a decal on the machine's lubrication panel.





How to Use This Manual

To get the maximum benefit of your new Haas machine, read this manual thoroughly and refer to it often. The content of this manual is also available on your machine control under the HELP function.

IMPORTANT: Before you operate the machine, read and understand the Operator's Manual Safety chapter.

Declaration of Warnings

Throughout this manual, important statements are set off from the main text with an icon and an associated signal word: "Danger," "Warning," "Caution," or "Note." The icon and signal word indicate the severity of the condition or situation. Be sure to read these statements and take special care to follow the instructions.

Description	Example
Danger means that there is a condition or situation that will cause death or severe injury if you do not follow the instructions given.	 <i>DANGER:</i> No step. Risk of electrocution, bodily injury, or machine damage. Do not climb or stand on this area.
Warning means that there is a condition or situation that will cause moderate injury if you do not follow the instructions given.	 <i>WARNING:</i> Never put your hands between the tool changer and the spindle head.
Caution means that minor injury or machine damage could occur if you do not follow the instructions given. You may also have to start a procedure over if you do not follow the instructions in a caution statement.	 <i>CAUTION:</i> Power down the machine before you do maintenance tasks.
Note means that the text gives additional information, clarification, or helpful hints .	 <i>NOTE:</i> Follow these guidelines if the machine is equipped with the optional extended Z-clearance table.

Text Conventions Used in this Manual

Description	Text Example
Code Block text gives program examples.	G00 G90 G54 X0. Y0.;
A Control Button Reference gives the name of a control key or button that you are to press.	Press [CYCLE START] .
A File Path describes a sequence of file system directories.	<i>Service > Documents and Software >...</i>
A Mode Reference describes a machine mode.	MDI
A Screen Element describes an object on the machine's display that you interact with.	Select the SYSTEM tab.
System Output describes text that the machine control displays in response to your actions.	PROGRAM END
User Input describes text that you should enter into the machine control.	G04 P1.;
Variable n indicates a range of non-negative integers from 0 to 9.	Dnn represents D00 through D99.

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Chapter 1: APL Introduction

1.1 APL Introduction

This manual outlines the unique features and functions of the Automatic Parts Loader. Refer to your Lathe Operator's Manual for control operation, programming, and other general lathe information.

F1.1: Automatic Parts Loader (APL)



APL installation instructions can be found on www.haascnc.com under the service section.



CAUTION:

Only authorized and trained personnel may operate this equipment. You must always act in accordance with the Operator's manual, safety decals, safety procedures and instructions for safe machine operation. Untrained personnel present a hazard to themselves and the machine.

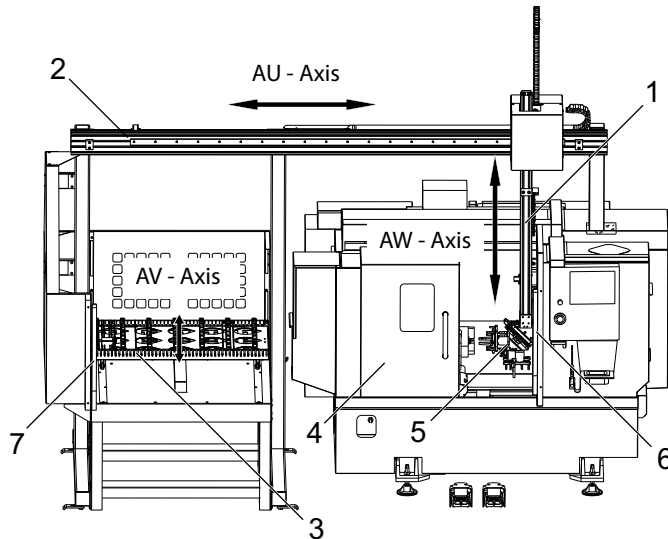


CAUTION:

Do not operate this machine until you have read all warnings, cautions, and instructions.

1.2 APL - Overview

F1.2: APL Overview Diagram.



1. AW-Axis [1] this axis moves the ram up and down.
2. AU-Axis [2] this axis moves across the ram left to right.
3. AV-Axis [3] this axis moves the table front to back.
4. Auto door
5. Grippers
6. Light Curtain Sensor
7. Light Curtain Sensor



NOTE:

*The APL is equipped with a light curtain sensor, which will stop the APL motion any time it senses the operator moved into the light curtain zone. If a program is running it will not be interrupted by the light curtain. **[CYCLE START]** will continue APL motion.*

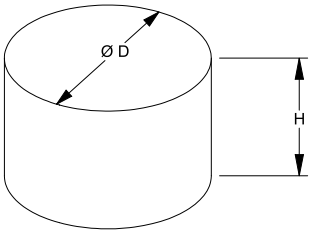
1.3 APL - Specifications

T1.1: APL Specifications

	Inch	Metric
Axis Travels (AU, AV, AW)	111" x 28" x 46"	2819 x 711 x 1168 mm
Rapids (AU)	1417 in/min	36 m/min
Rapids (AV)	118 in/min	3 m/min
Rapids (AW)	1417 in/min	36 m/min
Maximum Part (Diameter x Length)	5.8" x 5.0"	147 x 127 mm
Maximum Part Weight Per Gripper	10 lb	4.5 kg
Table Size (Length x Width)	48" x 28"	1219 x 711 mm
Table Load Capacity	1000 lb	454 kg
Gripper Rotation	90°	90°

Part Size Specifications

F1.3: Slug Maximum Part Size

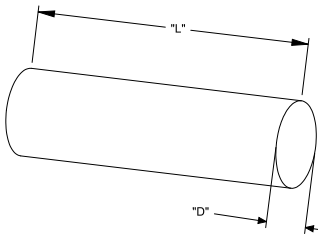


T1.2: Slug Maximum Part Size

Specification	ST-10/15	ST-20/25
Height (H)	Less than or equal to 5.0 in (127 mm)	Less than or equal to 5.0 in (127 mm) *see note
Diameter (D)	Less than or equal to 5.8 in (147 mm)	Less than or equal to 5.8 in (147 mm)
Weight	Less than or equal 10 lbs (4.6 kg) Per Part	


NOTE:

When indexing between the finished and raw part grippers during reloading, long parts may require the gantry to index over the APL table.

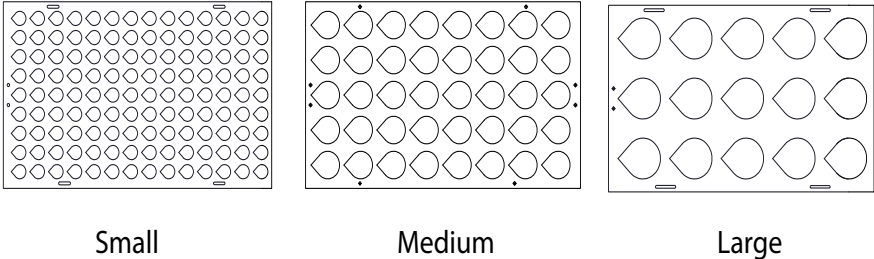
F1.4: Bar Maximum Part Size

T1.3: Bar Maximum Part Size

Specification	ST-10/15	ST-20/25
Length (L)	Less than or equal to 6.0 in (152 mm)	Less than or equal to 8.0 in (203 mm)
Diameter (D)	Less than or equal to 4.0 in (102 mm)	Less than or equal to 4.0 in (102 mm)
Weight	Less than or equal 10 lbs (4.6 kg) Per Part	

IMPORTANT: Depending on the machine size, turret style, and part-specific tooling used, 1 - 3 turret stations may be required to be empty to allow Gantry clearance. Please review your specific application with an Application Engineer at your local HFO if there is any doubt regarding your application's compatibility.

Standard Bar Templates

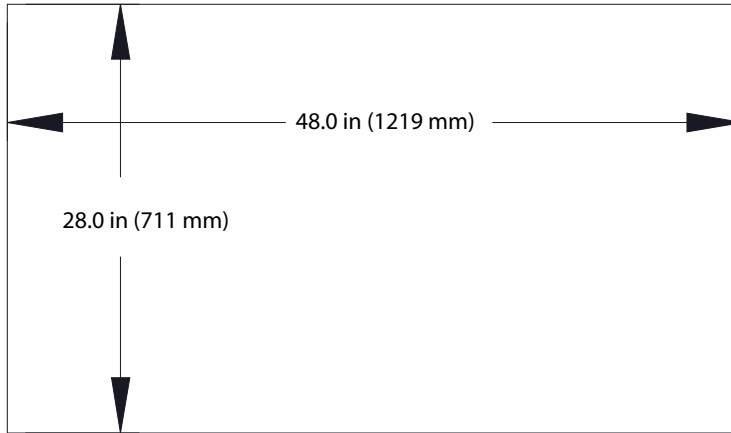
F1.5: Standard Slug Templates



T1.4: Standard Slug Templates

Template	Diameter Range	Rows	Columns	Maximum Parts
Small	0.97 - 2.1 in (24.6 - 53.3 mm)	9	14	126
Medium	2.0 - 4.1 in (50 - 104 mm)	5	8	40
Large	4.0 - 5.0 in (100 - 150 mm)	3	5	15

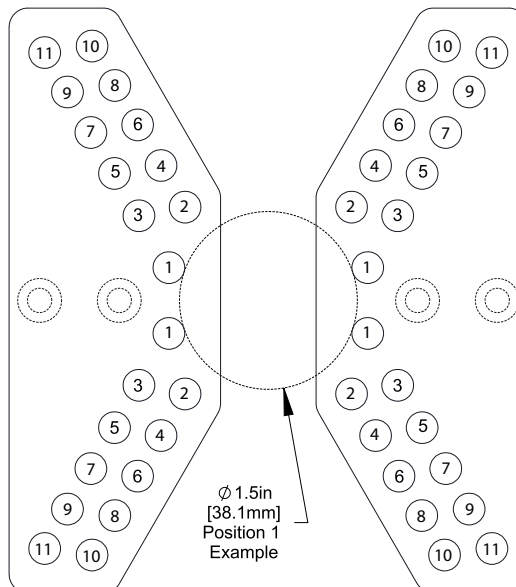
F1.6: Custom Slug Templates



Custom templates can be made by the user with the following requirements:

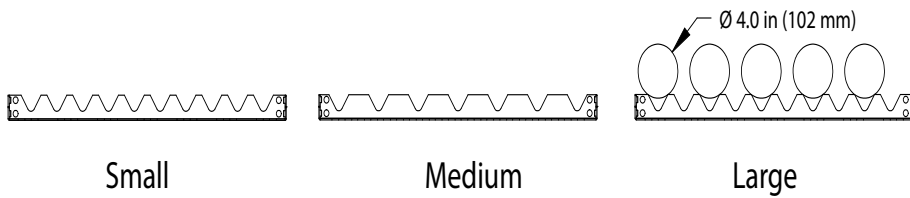
1. Allow adequate space between rows and columns for gripper clearance.
2. All rows must have equal spacing.
3. All columns must have equal spacing (but can be different than row spacing).

F1.7: Puck Grippers Specifications



T1.5: Puck Grippers Specifications

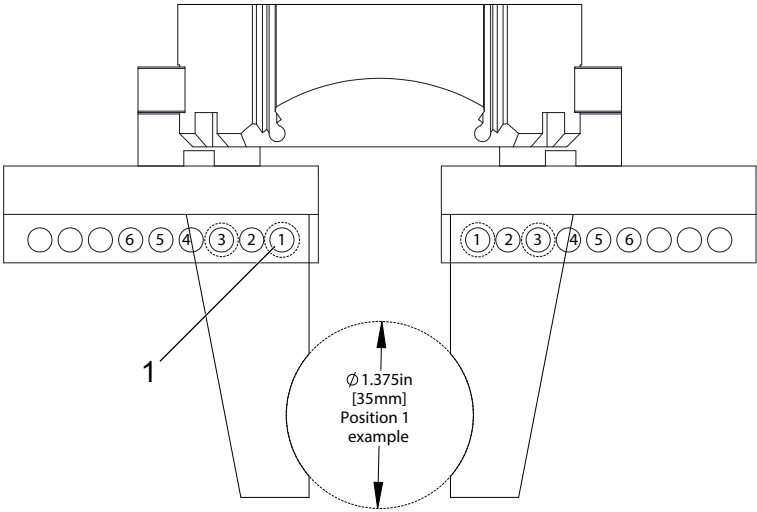
Position	Min Diameter (Inch)	Max Diameter (Inch)	Min Diameter (Metric)	Max Diameter (Metric)
1	0.97	1.69	24.6	42.9
2	1.66	2.1	42.2	53.3
3	2.06	2.68	52.3	68.1
4	2.61	3.03	66.3	76.9
5	3	3.56	76.2	90.4
6	3.53	3.95	89.7	100.3
7	3.92	4.45	99.6	113
8	4.43	4.84	112.5	112.9
9	4.83	5.34	122.7	135.6
10	5.33	5.74	135.4	145.8
11	5.72	6.22	145.3	158

F1.8: Standard Bar Templates - Side / Row View

T1.6: Standard Bar Templates

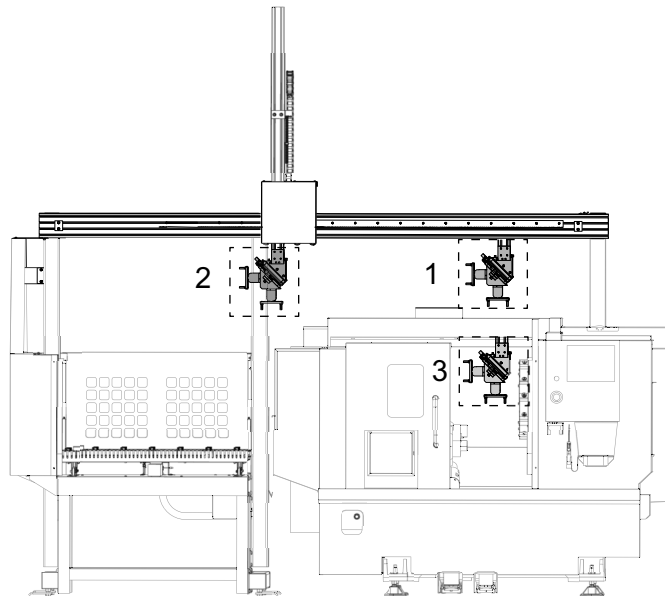
Template	Diameter Range	Length Range	Rows	Columns
Small	0.85 - 1.5 in (21.6 - 38.1 mm)	ST-10/15 Less than 6.0 in (152 mm) ST-20/25 Less than 8.0 in (203 mm) Limited by Weight	10	Varies with length
Medium	1.5 - 2.75 in (38.1 - 70 mm)		7	
Large Uses the small bar template. Skips every other row.	2.75 - 4.0 in (70 - 102 mm)		5	

F1.9: Finger Grippers Specifications - The position specifies the inner hole [1] of the gripper fingers.



T1.7: Finger Grippers Specifications

Position	Min Diameter (Inch)	Max Diameter (Inch)	Min Diameter (Metric)	Max Diameter (Metric)
1	0.848	1.522	23.5	38.6
2	1.464	2.147	37.2	54.4
3	2.081	2.772	52.9	70.4
4	2.697	3.397	68.5	86.3
5	3.314	4.022	84.2	102.1
6	3.93	4.647	99.8	118.1

F1.10: Recommended Gripper Swap Safe Locations

1. ST-10/15
2. ST-20/25
3. This location is dependent on part size.

Chapter 2: APL Installation

2.1 Lathe APL - Installation

The Lathe APL installation procedure is located on the website click on the following link: [Haas Automatic Parts Loader - Lathe - Installation](#). You can also scan the code below with your mobile device to go directly to the procedure.



Chapter 3: APL Operation

3.1 APL Settings

The following settings affect how the APL operates.

3.1.1 372 - Parts Loader Type

This setting turns on the Automatic Parts Loader (APL) in **[CURRENT COMMANDS]** under the Devices tab. Use this page to set up the APL.

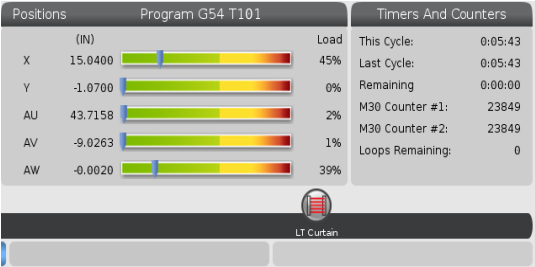
3.1.2 375 - APL Gripper Type

This setting chooses the type of gripper attached to the Automatic Parts Loader (APL).
 APL Gripper has the functionality of gripping raw and finished parts on an outer diameter or inner diameter, in addition to being able to swap between them.

3.1.3 376 - Light Curtain Enable

This setting enables the Light Curtain. When the Light Curtain is enabled, it will prevent APL motion if it detects something in an area too close to the APL axes.
 If the light curtain beam is obstructed the machine will go into a Light Curtain Hold condition; the CNC program will continue to run and the machine's spindle and axes will continue to move but the AU, AV and AW axes will not move. The machine will remain in Light Curtain Hold until the light curtain beam is unobstructed and the Cycle Start button is pressed.

F3.1: Light curtain Icon Display



When the light curtain beam is obstructed the machine will go into a Light Curtain Hold condition and the Light Curtain icon will appear on the screen. The icon will disappear when the beam is no longer obstructed.

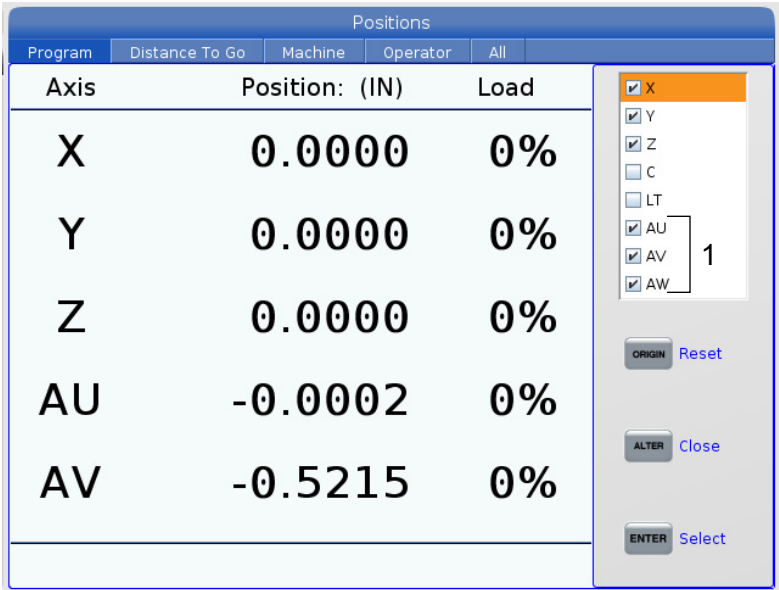
NOTE:

You can operate the machine in standalone mode with the light curtain disabled. But the light curtain must be enabled in order to run the APL.

3.2 Jog the APL

To jog the APL axes you need to make them visible in the Position screen.

F3.2: Axes Position Display



1. Press **[POSITION]**.
2. Press **[ALTER]**.
3. Select the AU, AW and AV [1] axis.
4. Press **[ALTER]** to close the pop up window.
5. To jog an APL axis. Press **[AU]**, **[AW]** or **[AV]** and then **[HANDLE JOG]**.

3.3 APL Setup

The following sections will help you set up the APL.

3.3.1 Automatic Part Loader - Template

The Template page allows to setup the grid patter and part information to run the APL.

Press **[CURRENT COMMANDS]**, **Devices**, arrow down to **Automatic Part Loader** and navigate **Template**.

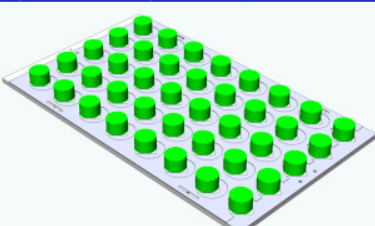
F3.3: Template Display

Current Commands

Devices Timers Macro Vars Active Codes ATM Calculator Media

Mechanisms Automatic Part Loader


Template Load Part Unload Part Run Job



Enter Table Grid Pattern and Part Information

	Operation	Value	Units
1	Part Type	SLUG	
2	Number of Stacked Parts	1	
3	Number of Rows	1	
4	Number of Columns	2	
5	Distance Between Rows	5.2500	IN
6	Distance Between Columns	5.7500	IN

Max # Parts: 2

Next 

1. **Part Type** - Enter 0 for a Slug or 1 for a Bar.
2. **Number of Stacked Parts** - Enter the number of stacked parts per pocket.
3. **Number of Rows** - Enter the number of rows you want to use on the table.
4. **Numbers of Columns** - Enter the number of columns you want to use on the table.
5. **Distance Between Rows** - Enter the incremental distance between the rows.
6. **Distance Between Columns** - Enter the incremental distance between the columns.

F3.4: Stacked Parts Option Display

Current Commands

Devices Timers Macro Vars Active Codes ATM Calculator Media

Mechanisms Automatic Part Loader

Template Load Part Unload Part Run Job

1

n
...
2
1

Enter Number of Stacked Parts per Pocket

Operation	Value	Units
Number of Stacked Parts	2	
Number of Rows	3	
Number of Columns	4	
Distance Between Rows	5.2500	IN
Distance Between Columns	5.7500	IN
7 — Raw Stock Height	0.0394	IN
8 — Finish Part Height	0.0394	IN

Max # Parts: 22

9 — Next

7. Raw Stock Height - Enter the raw stock height.



NOTE: This option is only available when the number of stacked parts is greater than 1.

8. Finish Part Height - Enter the finish part height.



NOTE: This option is only available when the number of stacked parts is greater than 1.

9. Press the [RIGHT] arrow to go to the next page.

3.3.2 Automatic Part Loader - Load Part

The Load Part page allows to setup APL Ram pick up and load position.

Press [CURRENT COMMANDS], Devices, arrow down to Automatic Part Loader and navigate to Load Part.

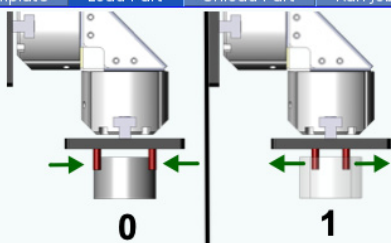
F3.5: Load Part Display

Current Commands

Devices Timers Macro Vars Active Codes ATM Calculator Media

Mechanisms Automatic Part Loader

Template Load Part Unload Part Run Job



ENTER Set Value

F3 Clamp Gripper # 1

F4 Rotate Gripper Arm

(0) for OD or (1) for ID

Operation	Value	Units
1 Gripper Clamp Type	OD	
2 Gripper Clamp Delay	2	Sec
3 Initial Pickup Location	AU:0.0300 AV:-3.1000 AW:-39.8502	IN
4 Above Door Location	AU:110.2362 AW:-2.8861	IN
5 Safe Axes Location for Load	T:3 X:0.0000 Y:-2.0079 Z:0.0000	IN
6 Chuck Load Location	AU:107.0362 AW:-43.4561	IN

Previous Next

1. **Gripper Clamp Type** - Enter 0 for OD or 1 for ID clamping.
2. **Gripper Clamp Delay** - Enter the number of seconds to delay after the jaws have been commanded to move.
For the next operations the following commands are available:
 - Press **[TURRET FWD]** or **[TURRET REV]** to index the tool changer.
 - Press **[INSERT]** to move to above table.
 - Press **[F2]** to set the reference position.
 - Press **[F3]** to clamp/unclamp gripper #1.
 - Press **[F4]** to rotate the gripper arm.
3. **Initial Pickup Location** - This field is used to set the initial pickup location, follow the on screen instructions to set the values.
4. **Above Door Location** - This field is used to set the position of grippers above the door, follow the on screen instructions to set the values.

**NOTE:**

Jog APL to a location above the door, the RAM must clear door and turret.

5. **Safe Axes Location for Load** - This field is used to set the Tool Changer and Axes to a safe location for the APL to load the part. Follow the on screen instructions to set the values.

**NOTE:**

Machines with Y-Axis we recommend to Jog the Y-Axis about 2" in the negative direction to get maximum clearance.

6. **Chuck Load Location** - This field is used to set the APL position to load the part into the chuck. Follow the on screen instructions to set the values.

3.3.3 Automatic Part Loader - Unload Part

The **Unload Part** page allows to setup APL Ram pick up and drop position.

Press [**CURRENT COMMANDS**], **Devices**, arrow down to **Automatic Part Loader** and navigate to **Unload Part**.

F3.6: Unload Part Display

Current Commands

Devices Timers Macro Vars Active Codes ATM Calculator Media

Mechanisms Automatic Part Loader

Template Load Part Unload Part Run Job

0 1

ENTER Set Value

F3 Clamp Gripper # 2

F4 Rotate Gripper Arm

(0) for OD or (1) for ID

Operation	Value	Units
1 — Gripper Clamp Type	OD	
2 — Gripper Clamp Delay	2	Sec
3 — Gripper Rotate Delay	3	Sec
4 — Chuck Pick Up Location	AU:106.9512 AW:-43.4276	IN
5 — Gripper Swap Location	AU:110.2362 AW:-2.4393	IN
6 — Table Drop Off Location	AU:0.1200 AV:-3.1900 AW:-39.6844	IN
Chuck Clamp Delay Time	2	Sec

Previous Next

1. **Gripper Clamp Type** - Enter 0 for OD or 1 for ID clamping.
2. **Gripper Clamp Delay** - Enter the number of seconds to delay after the jaws have been commanded to move.

For the next operations the following commands are available:

- Press [**TURRET FWD**] or [**TURRET REV**] to index the tool changer.
- Press [**INSERT**] to move to above table.
- Press [**F2**] to set the reference position.
- Press [**F3**] to clamp/unclamp gripper #2.
- Press [**F4**] to rotate the gripper arm.

- 3. **Gripper Rotate Delay** - Enter the number the seconds to delay after commanding the gripper to rotate.
- 4. **Chuck Pick Up Location** - This field is used to set the APL positions to pick up the part. Follow the on screen instructions to set this field.



NOTE: Jog APL to a location above the door, the RAM must clear door and turret.

- 5. **Gripper Swap Location** - This field is used to position the APL Grippers to a safe swap location. Follow the on screen instructions to set this field.



NOTE: For large parts see the APL specifications section for safe gripper swap location recommendations.

- 6. **Table Drop Off Location** - This field is used to set the part drop off location on the table. Follow the on screen instructions to set this field.




F3.7: Air Blast Option Fields

Current Commands

Devices Timers Macro Vars Active Codes ATM Calculator Media

Mechanisms Automatic Part Loader

Template Load Part Unload Part Run Job



ENTER Set Value

F3 Clamp Gripper # 2

F4 Rotate Gripper Arm

Length of Air Blast to clean chips off rotating jaws

Operation	Value	Units
Gripper Rotate Delay	3	Sec
Chuck Pick Up Location	AU:36.6311 AW:-11.1538	IN
Gripper Swap Location	AU:0.0000 AW:0.0000	IN
Table Drop Off Location	AU:0.8711 AV:-1.5900 AW:-8.6438	IN
7 Air Dwell	Off	Sec
8 Chuck Rotation Speed	Off	RPM
9 Chuck Clamp Delay Time	2	Sec

Previous 10 Next

- 7. **Air Dwell**- Enter the number of seconds to turn on the spindle air blast after the part has been removed.



NOTE:

This field will only show if the machine is equipped with the air blast option.

8. **Chuck Rotation Speed** - Enter the speed at which the spindle will turn during air blast.



NOTE:

This field will only show if the machine is equipped with the air blast option.

9. **Chuck Clamp Delay Time** - Enter the dwell time before the APL gripper releases the part.
10. Press the **[RIGHT]** arrow to go to the next page.

3.3.4 Automatic Part Loader - APL Mode - Save/Load/New Job

The **Run Job** tab allows you to load/run and save a job. It also shows the current APL mode status.

F3.8: Run Job Display

The screenshot shows the 'Run Job Display' window. At the top, there's a 'Current Commands' bar with tabs: Devices, Timers, Macro Vars, Active Codes, ATM, Calculator, and Media. Below this is a 'Mechanisms' bar with tabs: Automatic Part Loader, Template, Load Part, Unload Part, and Run Job. The 'Run Job' tab is active, displaying '1 — Job: 5012019APLFR.XML'. On the left, a table shows job parameters:

2 —	Current Part	0
3 —	Next Part	1
4 —	Completed Parts	5
5 —	Total Parts	2
6 —	Rapid Override	100%
7 —	Slow Rapid Distance	0.5 IN
8 —	Slow Rapid Override	20%
9 —	Current State	IDLE_STATE

On the right, there's a diagram of two circles. At the bottom, there's an 'INSERT APL Mode On' button and four function key buttons: F2 New Job, F3 Save Job, and F4 Load Job, along with a 'Previous' button.

1. This tab shows the current job that the APL is running.



NOTE:

The Job file name will turn red if the job is not saved.

How to Save the current Job Once you have completed filling in the values on the Template, Load Bar and Load Part tabs.

- Type in the desired job name on the input bar.
- Press **[F3]**. Select the location where you want to save the file.
- Press **[ENTER]** to save the file.



NOTE:

The job file is a XML file.

How to Load a Job To load a previous job:

- Press **[F4]** to load a job.
- Find and highlight the job XML file you wish to load.

- Press **[ENTER]** to load the file.

How to Start a New Job To start a new job:

- Press **[F2]**.
- A popup window will show “Are you sure you want to clear?”
- Press **[Y]**.

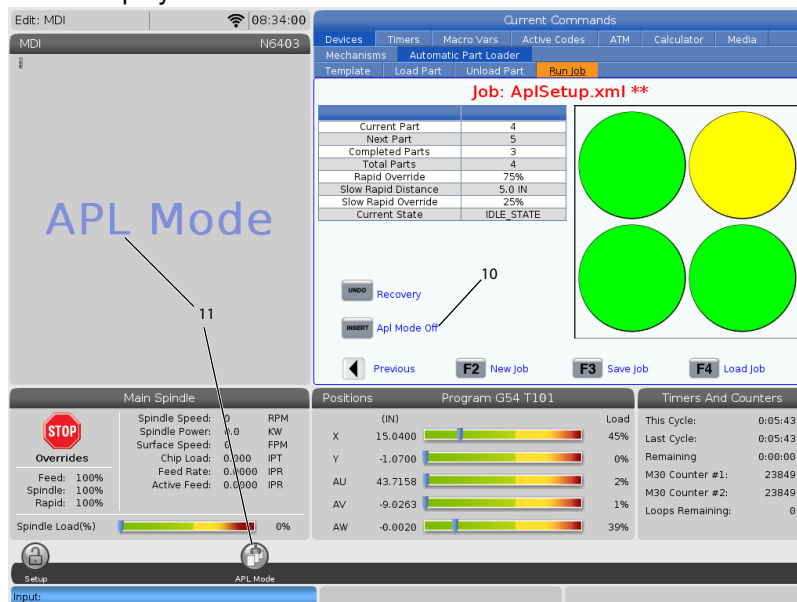


NOTE:

This will reset the values in the Template, Load Part, Unload Part etc. back to factory values.

2. **Current Part**- This field can be updated so that the sequence will start at this point.
 3. **Next Part** - This counter shows the next part.
 4. **Completed Parts** - This counter shows the amount of completed parts. This field can be reset with **[ORIGIN]**.
 5. **Total Parts** - This field can be changed. The sequence will run until total parts = completed parts. This would allow of running of a partial table.
 6. **Rapid Override** - This shows the current rapid override status.
 7. **Slow Rapid Distance** - When the APL is this distance from picking up or dropping off a part (either from table or spindle) the speed will drop to the Slow Rapid Override setting.
 8. **Slow Rapid Override** - When the APL is the Slow rapid distance from picking up or dropping off a part (either from table or spindle) the speed will drop to this setting.
 9. **Current State** - This shows the APL current state.
- APL Mode**

F3.9: APL Mode Display



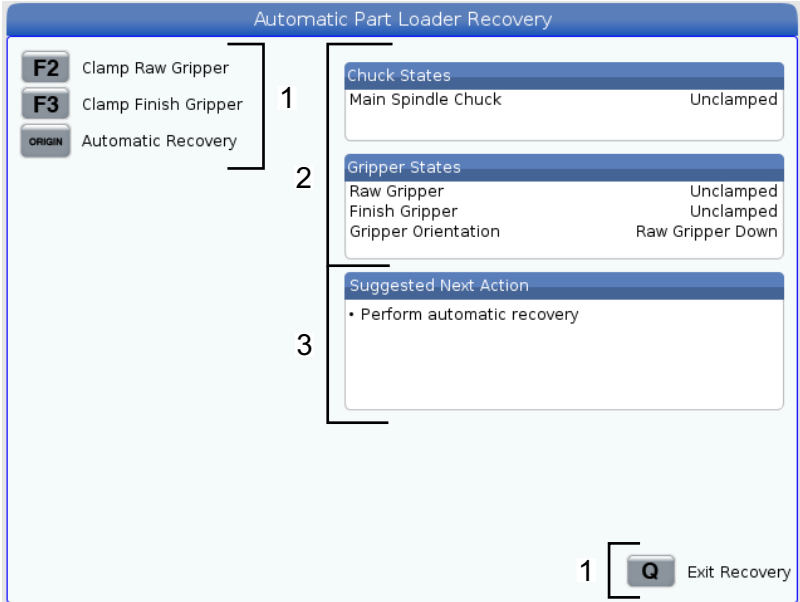
10. Press **[INSERT]** to turn ON/OFF the **APL Mode**. When the machine is in **APL Mode** the control will load the next part when the machine executes an **M299** code. Refer to “M299 APL / Part Load / or Program End” on page 25 for more information. Refer to M299 APL / Part Load / or Program End for more information.
11. The **APL Mode** overlay and **APL Mode** icon appear on the screen when the machine is in APL mode.

3.4 APL Recovery

If the Automatic Part Loader cycles get interrupted you must enter **[RECOVER]** mode to correct or complete the cycle.

Press the **[RECOVER]**, the recovery page will display the Chuck, Gripper, status.

F3.10: Automatic Part Loader Recovery Display: APL Functions [1], APL status [2], Message Box [3].



- [F2] Clamp Raw Gripper.** This will clamp the raw gripper.
- [F3] Clamp Finish Gripper.** This will clamp the finish gripper.
- [ORIGIN] Automatic Recovery.** This will attempt to recover the APL automatically.
- [Q] Exit Recovery.** This will exit the APL recovery display.

Chapter 4: APL Programming

4.1 M299 APL / Part Load / or Program End

During APL mode, use a M299 instead of an M30 at to have the APL load parts automatically. Refer to the APL set up section.

When not running in APL mode the M299 takes the place of an M30 or M99 at the end of a program.

Also when running in Memory or MDI mode, pressing **[CYCLE START]** to run the program, the M299 will behave the same as an M30. It will stop and rewind the program back to the beginning.

F4.1: APL Mode screen

To run in APL mode, Press **[CURRENT COMMANDS]**, navigate to **Devices**, arrow to **Automatic Parts Loader** and navigate to **Job Run** tab.

Press **INSERT** to put run a program in APL Mode.

The following is a example of a program using the M299 code:

```
%000010 (APL LOAD UNLOAD)
G00 G53 X0 Y0 Z0
T101
M19 P90.
G54
G00 Z1.5
X0.
G98
G01 Z-0.5 F50.
G04 P1.
M11
M10
G04 P1.
M11
M10
G04 P1.
G00 Z1.5
G00 G53 X0. Y0.
G00 G53 Z0
M299 (PART SWAP)
%
```


Chapter 5: APL Maintenance

5.1 APL Maintenance

Keep your APL running at peak performance while avoiding unplanned downtime. A maintenance program allows you to manage your schedule rather than getting caught with untimely surprises. This page shows the recommended maintenance intervals.

Maintenance Item	Interval
Grease the AU and AW axes rollers.	Six Months

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