13 - HRP - Troubleshooting

Haas Robot Package - Operator's/Service Manual

13.1 HRP - TROUBLESHOOTING

Introduction

This document will show you how to troubleshoot your Haas Robot Package. If you do not find the alarm or symptom on this document please perform the following and contact the service department.

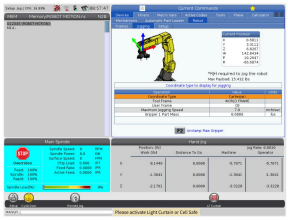
- Machine Serial Number.
- Robot Serial Number and F Number.
- Error Report at time of alarm or issue. If possible, the robot needs to be connected to the machine.
- If running Robot scheduler jobs, need all the machine programs and robot jobs. Error report only saves the current programs.
- MD Backup. See MD Backup Section below for instructions.
- Photos or video of issue.

Robot and Haas Communication Alarms

These alarms and symptoms can happen when the machine and the robot are not communicating.

ALARM / SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
9147 Robot Protocol Version Mismatch	Connecting to a robot that has been power cycled may cause a Version Mismatch. This causes all robot functions to be locked until the alarm is cleared.	Release the E-Stop and press RESET to clear the alarm. Then press the E-Stop and press F1 to connect the robot
9155 ROBOT EXCEEDED MAX PAYLOAD	Robot attempted to clamp a part which would result in exceeding the max payload allowed.	Reduce part weight. See layout drawings for the payload specifications for each robot size.
9156 ROBOT COMMAND FAILED, No subcode or other robot alarms.	Robot software was downgraded after a Robot Software Update. Example: Original Robot Software version 1.22 and downdgraded to version 1.15.	See HRP - Initialized Start section below.
9157 ROBOT SOFTWARE UPDATE FAILED	Robot Update was unsuccessful.	You must update robot software again before you can use the robot. See the Robot Software Update procedure for more information.
9158 ROBOT COMMUNICATIONS LOST	Communication with the robot has been lost.	The Robot Control MUST be power cycled. Press RESET on the machine and Power Cycle the Robot Control.
9160 ROBOT EMERGENCY STOP	The Robot Emergency Stop button was pressed either from the robot control box or the remote pendant. Or robot estop chain is broken.	Please release the Robot Emergency Stop button(s) and press reset to proceed. Verify all robot estops are released. Verify estop wiring (including external estop inputs) to robot are intact and correctly wired.
Robot motion stops and System Message & Notification **20021. 32** Robot SYST-032 ENBL signal from UOP is lost.	The FANUC control disconnected from Haas Control.	See the HRP Disconnect Alarms section below to increase the Modbus TCP Timeout & Disable DHCP.
Robot motion stops and System Message & Notification **20021. 34** Robot SYST-034 HOLD signal from SOP/UOP is lost.	The FANUC control disconnected from Haas Control.	See the HRP Disconnect Alarms section below to increase the Modbus TCP Timeout & Disable DHCP.
Robot motion stops and System Message & Notification **20021.224** Robot HOST-224 DHCP: No response from server.	The FANUC control disconnected from Haas Control.	See the HRP Disconnect Alarms section below to increase the Modbus TCP Timeout & Disable DHCP.

The Robot won't Connect to the CNC	The wiring from the interface to the Haas Control is not correct.	Make sure you have connected the terminal connectors on TB-1B in the correct order. Refer to the Robot Installation Procedure, Electrical section.
	The robot is not unlocked and activated.	The first time connecting a robot to a machine, a Robot Activation window will pop-up. This pop-up shows the Software Version of the machine, the MAC address of the robot, and the Machine Generated Code used for Machine Time Extension on the portal. **Note:** Go to the **Robot MAC Address** section to find the MAC address using a laptop.
	The CNC software is outdated.	Make sure the software is 100.20.000.1200 or higher. Refer to the Robot Installation Procedure machine requirements section.
	The Robot IP address and the CNC are mismatched.	If the Robot Software is 1.11 or lower. Upgrade the Robot control to 1.15 or higher. Contact your HFO for more information. See Robot IP Address section for more info.
	The arm moved during power off.	Connect & Calibrate Haas Robot using the video below.
	The RJ45 to USB adapter is defective.	• Make sure the USB cable is connected to the correct USB port on the main processor. • Make sure that the user USB port works by plugging a USB device and determine if the USB device gets detected, if it does not get detected follow the USB Troubleshooting Guide and troubleshoot the USB Ports. • If all the above check out correct, then unplug the RJ45 from the adaptor and connect it to the RJ45 on a laptop and make sure you are able to connect to the robot via the IPedant. If you are able to connect to the robot via the laptop then the RJ-45 to USB adapter is defective.
Robot does not jog in a straight line, It makes an arcing motion when moving in Cartesian along a single axis.	The robot joints were not lined up to the correct location when the Mastering or Quick Mastering procedure was set.	Move all joints to zero and check to see if the lines on both sides of the joint are lined up. Line the marking up on all axis and redo the Master/Quick Master procedure.

Robot does not jog. When trying to jog, a yellow warning message appears saying "Please activate Light Curtain or Cell Safe". 	The safety parameter has not been applied.	Re-upload the configuration files from HBC to receive the safety parameter.
The following errors appear when trying to connect to the iPendant from a PC: • "Disconnected From Controller" • "iPendant has never been connected"	The robot may need to be reinitialized.	Do the following steps: 1. Make a backup by following this procedure: How to Make an Image Backup 2. Reinitialize the robot by following this procedure: How to Reinitialize Robot
E-Stop alarm wont clear.	Jumper might be missing from **JP1** on the SIO PCB.	Verify the jumper is installed on the SIO PCB at **JP1.** If it is not installed, reinstall it.
Machine needs to be Manually Recovered or goes into Robot APL Recovery.	The Robot cycle was interrupted or the machine/robot was in a unsafe condition and needs to be recovered.	See the Haas Robot - APL Recovery section in HRP Operation for more information.
Machine goes into Robot APL Recovery between two scheduled jobs.	Machine motion was active when next job was started.	Add a machine dwell to the Post Run sequence in the first job. The dwell needs to be long enough to give the robot enough time to finish dropping off the part and moving to ready position. Start at around 15-20 seconds and adjusting up or down from there. The dwell is long enough if the second job is able to start and the machine does not go into Robot APL Recovery.
Alarm 391 Feature Disabled is generated commanding M180 & M181	The single switch auto window that comes from the HRP or APL can not be commanded independently.	Feature must be commanded by the robot or APL.. The customer needs to purchase an auto window install kit to get stand-alone functionality. Refer to AD documents that apply to your machine model. AD0652 - DT/DM/UMC-350 - Auto Window - Installation AD0663 - UMC 500 - 1500 Auto Window - Installation AD0669 - VMC Small - Auto Window - Installation

When activating the HRP through HBC you get a warning saying, RobotDetails "macAddress" field cannot be empty.	The MAC Address needs to be updated in the system.	Take a photo of the Haas robot serial number plate and Fanuc F Number plate. Attach the photos to the work order and contact Haas Service to have the system updated. See **HBC Registration - Missing MAC Address** section below.

Robot Command Failed Alarms

These alarms are generated when the robot fails to execute a command. A sub-alarm number indicates faults ID and is provided by FANUC robot.

ALARM / SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
• **9156.004** SRVO-004 Fence Open • **9156.037** SRVO-037 IMSTP input (Group:1) • **9156.406** SRVO-406 DCS SSO SVOFF input 1,1	The TB1-B and TB3B Connectors are plugged into the wrong location or unplugged.	Plug the connectors into the correct location. See the SRVO-004 Fence Open section below.
9156.050 Robot Command Failure SRVO-050 Collision Detect Alarm	Jogging the robot in setup mode and the center of rotation of J6 is in line with the center of rotation of J4. Then rotating W or P, will cause J4 axis to attempt to rotate at a very fast speed. This singularity point is called the wrist singularity.	Press **RESET** to clear the alarm. Do not jog the robot through this singularity point.
	The robot motion file does not have enough points producing a non-smooth motion.	Add more points to the motion file smoothing out the robot motion.
9156.406 SRVO-406 DCS SSO SVOFF input 1,1	The K9 and K10 Relays on I/O PCB are not installed.	Make sure you have the K9 and K10 relays installed on the I/O PCB. Refer to the Robot Installation Procedure, Electrical section.
	The fence is open in Run Mode.	Make sure the interlock is working and that machine is receiving the interlock input signal.
	The TB3-B wiring is damaged or miswired.	Check the wiring for the TB3-B connector. Compare the wiring of the connector to the wiring diagram.
	The DCS Cartesian Position Check Zone was not setup.	Follow the DCS Cartesian Position Check Zone procedure.
9156.037 SRVO-037 IMSTP input (Group:1)	The TB3-B wiring is damaged or miswired.	Check the wiring for the TB-3B connector. Compare the wiring of the connector to the wiring diagram.
9156.062 ROBOT COMMAND FAILED SRVO-062 BZAL alarm	The batteries in the robot arm have died.	Follow the HRP - Battery Replacement procedure to replace the batteries and follow the HRP - Quick Mastering procedure to remaster the robot.
9156.115 SRVO-115 Limit Error (Motion Group Number, Axis Number)	The linear path passes outside of the axis limit.	Re-Teach program points or use a Joint position to record the axis in a position that is in the middle of its travel limits.
9156.378 FANUC ROBOT ALARM - SFDI12 Status abnormal or **9156.378** FANUC ROBOT ALARM - SFDI22 Status abnormal	The K9 and K10 Relays on I/O PCB are not installed.	Make sure you have the K9 and K10 relays installed on the I/O PCB. Refer to the Robot Installation Procedure, Electrical section.
	A chain alarm was detected with the SFDI signal.	If a chain error is detected, correct the cause of the alarm then see the Reset Chain Error Section below.

9156.230 FANUC ROBOT ALARM - Chain 1 abnormal a,b or **9156.231** FANUC ROBOT ALARM - Chain 2 abnormal a,b	Damaged or miswired TBOP20 wires or connector. A mismatch occurred between duplicate safety signals. SRVO-230 is issued if such a mismatch that a contact connected on the chain 1 side (between EAS1 and EAS11 is closed, and a contact on the chain 2 side (between EAS2 and EAS21 is open occurs. SRVO-231 is issued if such a mismatch that a contact on the chain 1 side is open, and a contact on the chain 2 side is closed occurs.	Check that the signal cables for the fence is not damaged or miswired. TBOP20 connector and cables in the Fanuc Control Box or the Interface Box M12 connector Robot Signals. See SRVO-230/231/266/267 FENCE1/2 status abnormal section below. After the cause of the alarm is corrected then see the Reset Chain Error Section below.
9156.217 SRVO-217 E-STOP Board not found or • **9156.037** SRVO-037 IMSTP input (Group:1) • **9156.406** SRVO-406 DCS SSO SVOFF input 1,1 • **9156.217** SRVO-217 E-STOP Board not found	This alarm is generated when either the E-Stop PCB or Safety I/O PCB is missing from the Safety buss.	Check that the Safety I/O PCB is fully seated. Check the cable is connected to the E-Stop PCB & Safety I/O PCB.
9156.219 SRVO-219 Safety I/O brd fuse%d blown %s	Failed to successfully execute a robot command. A fuse on the additional Safe I/O board has blown. The TB1-B or TB3-B wiring is damaged, miswired, or plugged into the wrong location.	The number of the safe I/O device that the alarm occurs is displayed in the end the message such as (1). The safe I/O device number is displayed in DCS Safe I/O device menu. Correct the wiring issue. Replace the fuse on the additional Safe I/O board or the additional Safe I/O board. See the Fuse Replacement Section below.
9156.266 SRVO-266 FENCE1 status abnormal	Damaged or miswired TBOP20 wires or connector. A mismatch occurred between duplicate safety signals. SRVO-266 is issued if such a mismatch that a contact connected on the chain 1 side (between EAS1 and EAS11 is closed, and a contact on the chain 2 side (between EAS2 and EAS21 is open occurs. SRVO-266 is issued if such a mismatch that a contact on the chain 1 side is open, and a contact on the chain 2 side is closed occurs.	Check that the signal cables for the fence is not damaged or miswired. TBOP20 connector and cables in the Fanuc Control Box or the Interface Box M12 connector Robot Signals. See SRVO-230/231/266/267 FENCE1/2 status abnormal section below. After the cause of the alarm is corrected then see the Reset Chain Error Section below.

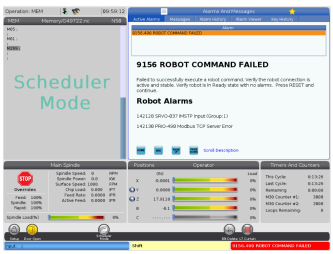
9156.267 SRVO-267 FENCE2 status abnormal	Damaged or miswired TBOP20 wires or connector. A mismatch occurred between duplicate safety signals. SRVO-266 is issued if such a mismatch that a contact connected on the chain 1 side (between EAS1 and EAS11 is closed, and a contact on the chain 2 side (between EAS2 and EAS21 is open occurs. SRVO-266 is issued if such a mismatch that a contact on the chain 1 side is open, and a contact on the chain 2 side is closed occurs.	Check that the signal cables for the fence is not damaged or miswired. TBOP20 connector and cables in the Fanuc Control Box or the Interface Box M12 connector Robot Signals. See SRVO-230/231/266/267 FENCE1/2 status abnormal section below. After the cause of the alarm is corrected then see the Reset Chain Error Section below.
9156.289 SRVO-289 Smooth Stop	The DCS Zone was not setup correctly. Cartesian Speed Check, Joint Position Check, or Joint Speed Check is Enabled when it should be Disabled.	See Disable DCS Speed Check section below for steps to disable.
9156.490 PRIO-490 Modbus TCP Server Error	Interference or faulty RJ-45 Ethernet cable.	Depending on the Robot build date the cables were not built with ferrite filters installed. Install ferrite filters PN: **64-1252** to both RJ-45 Communication cables at the electrical interface box and to the USB to Ethernet Adapter at the Main Processor PCB. See the Ferrrite Filter section below. If the alarm continues, test the cables refer to Network Cable Tester Tool procedure. If the cable passes the network cable test, see the HRP Discconect Alarms section below to increase the Modbus TCP Timeout & Disable DHCP.
9156.043 Robot Command Failed	The mode switch on the Fanuc Controller Operator Panel is incorrectly set to teaching mode when there is no teaching pendant connected.	Flip the mode switch on to Auto mode.

Fanuc Robot Alarms

These alarms are generated when the robot is at fault state. A sub-alarm number indicates faults ID and is provided by FANUC robot.

ALARM / SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
9150.219 SRVO-219 Safety I/O brd fuse%d blown %s	Failed to successfully execute a robot command. A fuse on the additional Safe I/O board has blown. The TB1-B TB3-B wiring is damaged, miswired, or plugged into the wrong location.	The number of the safe I/O device that the alarm occurs is displayed in the end the message such as (1). The safe I/O device number is displayed in DCS Safe I/O device menu. Correct the wiring issue. Replace the fuse on the additional Safe I/O board or the additional Safe I/O board. See the Fuse Replacement Section below.
9150.289 SRVO-289 Smooth Stop	The DCS Zone was not setup correctly. Cartesian Speed Check, Joint Position Check, or Joint Speed Check is Enabled when it should be Disabled.	See Disable DCS Speed Check section below for steps to disable.
9150.378 FANUC ROBOT ALARM - SFDI12 Status abnormal or **9150.378** FANUC ROBOT ALARM - SFDI22 Status abnormal	The K9 and K10 Relays on I/O PCB are not installed.	Make sure you have the K9 and K10 relays installed on the I/O PCB. Refer to the Robot Installation Procedure, Electrical section.
9150.402 FANUC ROBOT ALARM - SRVO-402 DCS Cart. position limit	This alarm is generated when the robot has a DCS Cartesian Position Check Zone setup with a speed limit and the robot is jogged outside the work zone above the speed limit.	Lower the feed rate and jog back into the DCS Cartesian Position Check Zone. Verify the work zone is setup correctly by checking the 4D DCS Display.
9150.403 SRVO-403 DCS Cart. speed limit, **9150.404** SRVO-404 DCS Joint pos. limit, or **9150.405** SRVO-405 DCS Joint speed limit	The DCS Zone was not setup correctly. Cartesian Speed Check, Joint Position Check, or Joint Speed Check is Enabled when it should be Disabled.	See Disable DCS Speed Check section below for steps to disable.
9150.488 FANUC ROBOT ALARM - SRVO-488 DCS CPC Speed Limit	This alarm is generated when the robot has a DCS Cartesian Position Check Zone setup with a speed limit and the robot is jogged outside the work zone above the speed limit.	Lower the feed rate and jog back into the DCS Cartesian Position Check Zone. Verify the work zone is setup correctly by checking the 4D DCS Display.
9152.x Robot Hit Joint Limit or robot does not jog	Jogging the robot in setup mode and the center of rotation of J6 is in line with the center of rotation of J4. Then rotating W or P, will cause J4 axis to attempt to rotate at a very fast speed, traveling past the travel limit. This singularity point is called the wrist singularity. The Joint Position will be greater than the Robot Joint Travel Limit. The Sub-Code of the alarm represents the joint number.	Connect to the robot using the Remote Pendant through the web interface. Clear the alarm and jog the robot joint away from the travel limit. Reconnect to the Haas control.

Haas Robot - Active Alarms



More than one Fanuc alarm may be present if the machine generates an alarm. Navigate to the Active Alarms tab to view all active Fanuc alarms.

Connect & Jog Haas Robot

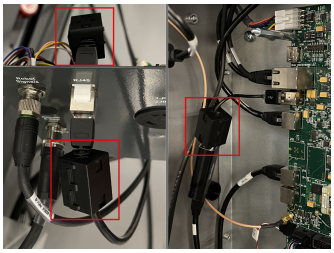
If alarm **9152.x** Robot Hit Joint Limit is generated follow the video below. Connect to the robot using the Remote Pendant through the web interface. Clear the alarm and jog the robot joint away from the travel limit. Reconnect to the Haas control.

Connect & Calibrate Haas Robot

HRP Disconnect Alarms - Modbus TCP Timeout & Disable DHCP

If robot motion stops and System Message & Notifications **20021. 32** Robot SYST-032 ENBL signal from UOP is lost, **20021. 34 Robot** SYST-034 HOLD signal from SOP/UOP is lost, or **20021.224** Robot HOST-224 DHCP: No response from server is generated in the Alarm History follow the video below. Connect to the robot using the Remote iPendant through the web interface. Verify if ferrite filters are installed on the robot signal cables and install if missing. See Ferrite Filter Installation section below for more information.

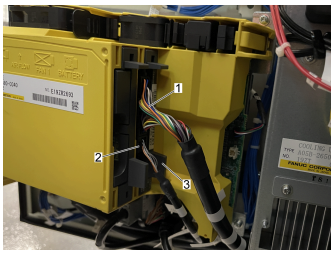
Ferrite Filter Installation



Depending on the Robot build date the cables were not built with ferrite filters installed. Install ferrite filters PN: **64-1252** to both RJ-45 Communication cables at the electrical interface box and to the USB to Ethernet Adapter at the Main Processor PCB.

HRP-1 Safety I/O PCB Fuse 1 Replacement

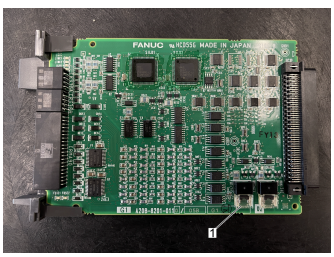
If Alarm SRVO-219 Safety I/O brd fuse1 blown (2) is generated. The TB1-B or TB3-B wiring is damaged, miswired, or plugged into the wrong location. Correct the wiring issue. Then perform the following steps to replace Fuse 1 on the Safety I/O Board. Fuse 1 A60L-0001-0290/LM10C is found in 93-3378.



1

Power down the machine and robot to access the Fanuc Control box. Open the Control door. Disconnect cables **[1]** & **[2]**.

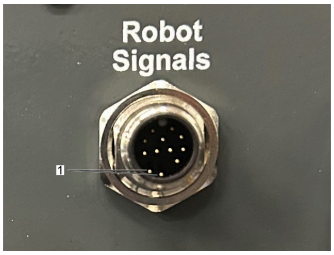
Press the tab**[3]** to release and remove the Safety I/O PCB.



2

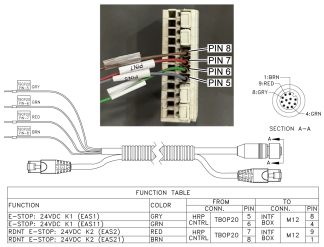
Replace Fuse 1**[1]** on the Safety I/O PCB.

SRVO-230/231 Chain1/2 abnormal & SRVO-266/267 FENCE1/2 status abnormal



This circuit connects with the Fanuc Control—starting at the Safety Relay in the Electrical Interface box and ending at **TBOP20** in the Fanuc Control box. Inspect the cables for damage.

Example: The pins on the Robot Signal cable M12 connector were bent out of place [1].

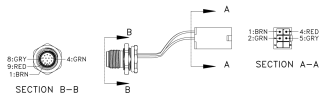


FUNCTION TABLE							
FUNCTION	COLOR	FROM CONN.		PIN	TO CONN.		PIN
E-STOP: 24VDC K1 (EAS1)	GRY	HRP CNTRL	TBOP20	5	INTF BOX	M12	8
E-STOP: 24VDC K1 (EAS11)	GRN			6			4
RDNT E-STOP: 24VDC K2 (EAS2)	RED	HRP CNTRL	TBOP20	7	INTF BOX	M12	9
RDNT E-STOP: 24VDC K2 (EAS21)	BRN			8			1

Inspect the **TBOP20** connector and pins. Inspect the M12 connector that plugs into the Electrical Interface box.

EAS1 & EAS11 are SRVO-230 Chain 1 & SRVO-266 Fence 1.

EAS2 & EAS 21 are SRVO-231 Chain 2 SRVO-267 Fence 2.



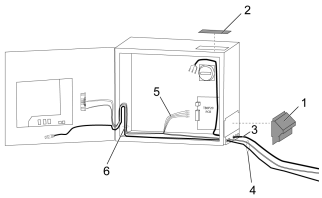
FUNCTION TABLE							
FUNCTION	COLOR	FROM CONN.		PIN	TO CONN.		PIN
RDNT E-STOP	BRN	P3	24VDC K2 14	1	P1	EAS21	1
RDNT E-STOP	RED	P3	24VDC K2 13	4	P1	EAS2	9
E-STOP	GRN	P3	24VDC K1 14	2	P1	EAS11	4
E-STOP	GRY	P3	24VDC K1 13	5	P1	EAS1	8

Inspect the M12 connector on the Electrical Interface box. Inspect the cables that plug into the Safety Relay.

EAS1 & EAS11 are SRVO-230 Chain 1 & SRVO-266 Fence 1.

EAS2 & EAS 21 are SRVO-231 Chain 2 SRVO-267 Fence 2.

Robot Control Wiring HRP-1



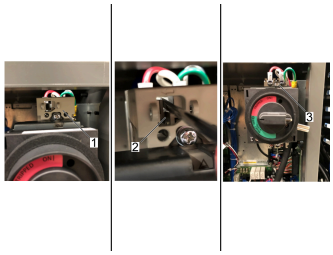
1

Robot Control Box

- Open the Robot Controller door by using a straight head screwdriver to turn the latch counter-clockwise, then turn the breaker counter-clockwise past its off position.
- Remove the cable cover [1] from the robot control box
- Remove the top cover [2]. This will make the installation of the power cable easier.
- Feed the **230VAC Power cable P/N 33-5830** [3] as shown.
- Feed the **Robot Control Signal cables P/N 33-8590** [4] as shown**.**

  Note: Make sure the Robot Control signal cables **P/N 33-8590** are as far away from the power cable as possible.

- Pull enough slack on the cable with ferrules [5] to reach the **TB0P20 PCB**, you will add connector to these wires in step 7.
- Route the **RJ45** cable and the cable with the large connector from cable **P/N 33-8590** together [6] as shown.



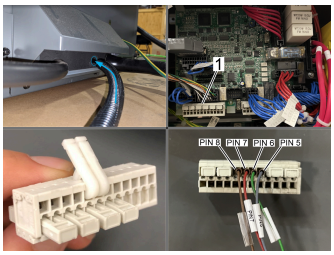
2

To connect the power cable, remove the plastic cover from above the Breaker. To remove cover, insert a straight-head screwdriver into the opening, and push the tab to the left allowing the cover to slide forward.

Connect the cables to L to 1 and N to 3. Connect the ground to the plate to the right of the Breaker.

After the power cable is connected, reinsert the plastic cover.

Robot Control Wiring HRP-2/3



1

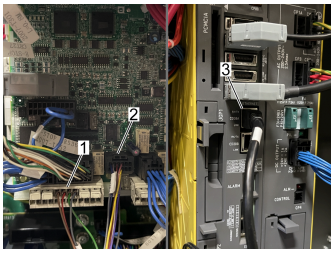
If cable **33-8591A** or **33-8592A** is not installed to the Fanuc Control box, perform the following steps:

Route the cable through the back of the Fanuc Control box.

Remove the connector at TBOP13**[1]** inside the Fanuc Control box.

Remove the jumpers and install the wires in the connector in the following order with the tool included in the Fanuc Install kit.

Note: Both tools need to be used to install the ferrules.



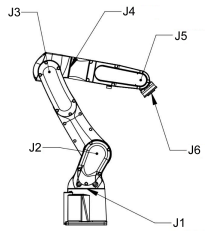
2

Install the cable labled **TBOP20** to connector **TBOP13[1]**.

Install the cable labled **CRMB2** to the connector labled **CRMB2[2]**.

Install the RJ-45 Ethernet cable labled **ENET CD38A** to the Ethernet Port 1 labled **CD38A[3]**.

HRP-1 Joint Travel Limits



Robot Joint Travel Limits

J1 (+/-170°)

J2 (+/-122.5°)

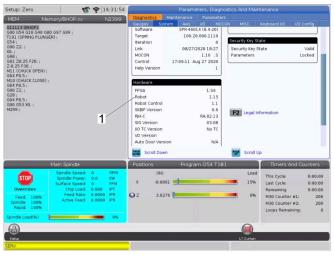
J3 (+/-215°)

J4 (+/-190°)

J5 (+/-125°)

J6 (+/-360°)

Robot IP Address



Depending on the Robot build date. The IP address of the robot control may be different then the IP address in the Haas control. If the Robot Software is **1.11** or lower. Update the ROBOT SOFTWARE to **1.15** or higher and verify the following parameters values are set correctly:

2262 Robot IP Address to **10.72.65.82**
2263 Aux IP Address to **10.72.65.77**

Recheck the connection.

Disable DCS Cartesian Speed Limit

If Alarm **9150.403** SRVO-403 DCS Cart. speed limit, **9150.404** SRVO-404 DCS Joint pos. limit, or **9150.405** SRVO-405 DCS Joint speed limit or **9150.289** Smooth Stop is generated. The DCS Zone was not setup correctly. Cartesian Speed Check, Joint Position Check, or Joint Speed Check is Enabled when it should be Disabled. Follow the steps below to disable these settings.

1
Login to the HMI Jogging Pendant from your web browser.

Navigate to the User Frame Setup view.

Navigate to DCS Menu.

Enable the pendant by hitting the ON/OFF button on the top right.

2
Depending on the alarm generated go into the enabled setting. SRVO-404 is Joint Position Check (3), SRVO-405 is Joint Speed Check (4), and SRVO-403 is Cart. Speed Check (6).

Go into No. 1.

Disable the position check No. 1 by selecting then pressing [CHOICE] at the bottom.

Press PREV 3 times to get back to the Main DCS screen.

3
Now we will apply the all the changes we made in the DCS menu. Any DCS section that was changed since last APPLY will show a RED CHGD next to it. Press APPLY at the bottom.

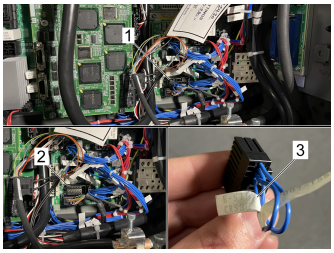
Enter 1111 for the Master Code.

This will take you to another menu that will show you the changes made in the DCS menu since last apply. Press OK if all changes are correct.

Close the HMI Pendant Window.

Cycle power on the robot controller by turning the power switch OFF, waiting 5 seconds then back ON.

HRP-1 Teach Pendant Plug Location



Remove the Teach Pendant Jumper**[1]** labled E-STOP CRS36 **[3]** from the E-STOP Board.

Plug the Fanuc Teach Pendant Cable in to this location**[2]**.

Note: When finished using the Fanuc Teach Pendant, replace the Jumper on the E-STOP Board.

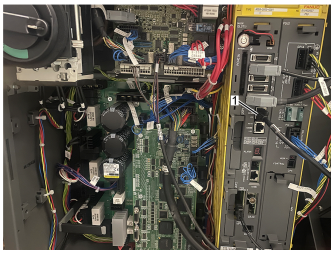
HRP-1 RJ45 Plug Location for iPendant

Remove the RJ45 cable**[1]** labled **CD38B** from Port 1 on the Fanuc Control Box door.

Plug in the RJ45 cable connected to the laptop to the plug location **CD38A**.

Note: When finished using the Fanuc iPendant, plug in the cable labled **CD38B**.

HRP-2/3 RJ45 Plug Location for iPendant



Remove the RJ45 cable**[1]** from plug location **CD38A** in the Fanuc Control Box.

Plug in the RJ45 cable connected to the laptop to the plug location **CD38A**.

Note: When finished using the Fanuc iPendant, reconnect the RJ45 cable that was removed to the plug location **CD38A**.

HRP - Initialized Start

If Alarm **9156** ROBOT COMMAND FAILED with no subcodes or other robot alarms. Perform the following steps.

Note: A Fanuc Teach Pendant is required to perform an Initialized Start.

1. Take a MD Backup of the current condition. See Fanuc Memory Device (MD) Backup section below.

Warning: If a MD Backup is not taken before precedeing, the robot will need to be recovered.

2. Power off the robot by rotating the Robot Circuit Breaker.

3. Press and hold the **F1** and **F5** keys

4. Turn on the Robot Circuit Breaker while holding the **F1** and **F5** keys until the Boot Menu is displayed.

5. On the boot menu select **INIT START**.

6. Restore ROBOT_ACTIVATION and SYSMAST.SV files. Follow the Instructions linked below.

RESTORE ROBOT_ACTIVATION AND SYSMAST.SV FILES

Fanuc Memory Device (MD) Backup

To create a Memory Device (MD) backup of the robot. Connect to the Fanuc Control with a laptop and iPendant. See Connect & Jog Robot video above.

Insert the thumb drive with the MD backup into the USB port in the black door on the controller (UD1:) or USB port on the teach pendant (UT1:).

Navigate to the Navigate pendant.

Set the default device to the device you want. The two options are UT1: for the Fanuc Teach Pendant or UD1: for the USB port on the front of the Fanuc Control Box.

- Press MENU and then File.
- Press F1, **[TYPE]**. Select **File**.
- Press F5, **[UTIL]**. Select **Set Device**.
- Navigate to the Device you want to save the backup to, UT1: or UD1:.
- Press F4, **[BACKUP]**. If you do not see **[BACKUP]**, press **[FCTN]** and select **RESTORE/BACKUP**.
- Select **All of Above** and press **[ENTER]**.
- It will prompt you select the backup operation you want to perform. Press F4**, [YES]** to back up the current file.
- The backup process will take a few minutes to complete.

Fanuc iPendant RJ45 to USB Ethernet Adapter Settings

If the laptop used to connect to the Fanuc control does not have a RJ45 Ethernet port. Use a RJ45 to USB adapter PN: **33-0636** to connect to the laptop. Follow the video to change the adapter settings and confirm connection.

Restore Fanuc Memory Device (MD) Backup

1

Note: A Fanuc Teach Pendant is required to restore a MD Backup.

Warning: If a MD Backup is not taken before precedeing, the robot will need to be recovered.

Insert the thumb drive with the MD backup into the USB port in the black door on the controller (UD1:) or USB port on the teach pendant (UT1:).

Perform a Controlled Start:

- Cycle power to the Fanuc controller.
- Before the robot starts to power back up, hold **PREV** and **NEXT** on the teach pendant to be taken to the Configuration Menu when the controller is booting up.
- Type **3** and press **ENTER** to initiate a Controlled Start.

Once the teach pendant boots back up:

- Press the **MENU** button then select **File** and press **ENTER.**
- On the FILE menu, press **F5 [UTIL]**. If **[UTIL]** is not shown above F5, press **NEXT** until **[UTIL]** is shown and then press **F5.**
- Select Set Device.
- Select USB Disk (UD1:) or (UT1:) depending on USB port.

2

Navigate to the directory in which your MD backup is stored. If there is a folder within a folder. Navigate until there is a list of files that contain the back up.

- If [RESTOR] is not shown above F4, press FCTN, then select RESTORE/BACKUP to toggle between restore and backup.
- Press **F4** [RESTOR].
- Select the type of restore action that you want: **All of above.**

You will be prompted with “Restore from Ud1: (OVERWRT)?”.

- Press **F4** YES.

The TP will show “Accessing device. PREV to exit.” for about 30-60 seconds, then the restore will commence. Once it begins, typical restore time is ~2-6 minutes, depending on the contents of your robot.

As many files as possible will be restored. Once the restore is complete, you will need to perform a Cold Start:

- Press **FCTN**
- Select **START (COLD)**

Reset the DCS Zone.

Reset Chain Error

A chain alarm was detected with the SFDI signal. Check whether the circuitry connected to the dual input signal (SFDI) is faulty.

Warning: If this alarm is issued, do not reset the chain error alarm until the failure is identified and repaired. If robot use is continued with one of the duplicate circuits being faulty, safety may not be guaranteed when the other circuit fails.

A mismatch occurred between duplicate safety signals. SRVO-230/266 is issued if such a mismatch that a contact connected on the chain 1 side (between EAS1 and EAS11 is closed, and a contact on the chain 2 side (between EAS2 and EAS21 is open occurs. SRVO-231/267 is issued if such a mismatch that a contact on the chain 1 side is open, and a contact on the chain 2 side is closed occurs.

Chain Error Reset Procedure:

Warning: Do not perform this operation until the cause of the alarm is corrected.

Method 1:

- Press the emergency stop button.
- Press the screen selection key on the teach pendant.
- Select **[0 NEXT PAGE]** on the teach pendant.
- Press **[6 SYSTEM]** on the teach pendant.
- Press **[7 SYSTEM SETTING]** on the teach pendant.
- Find "28" Chain Error Reset Execution.
- Press **F3** on the teach pendant to reset "Chain Error".

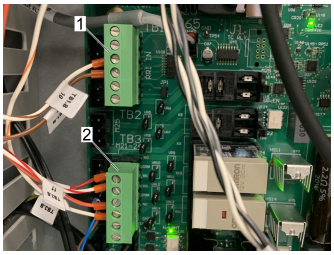
Method 2:

1. Press the screen selection key on the teach pendant.

2. Select **[4 ALARM]** on the teach pendant.

3. Press **F4 [CHAIN RESET]** on the teach pendant.

SRVO-004 Fence Open

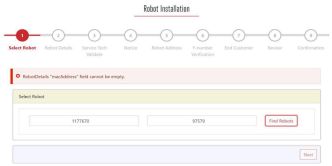


Plug the connectors into the correct location according the Electrical Diagram.

TB1-B**[1]** is the connector on the right.

TB3-B**[2]** is the connector on the right.

HBC Registration - Missing MAC Address



When activating the HRP through HBC you get a warning saying, RobotDetails "macAddress" field cannot be empty.

The MAC Address needs to be updated in the system.

Take a photo of the Haas robot serial number plate and Fanuc F Number plate. Attach the photos to the work order and contact Haas Service to have the system updated.

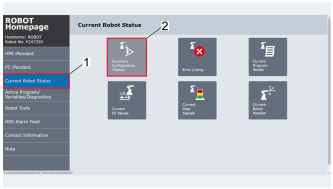
HRP-1 - SN Plate**[1]** and F Number Plate**[2]**

HRP-2/3 - SN Plate**[3]** and F Number Plate**[4]**

Robot MAC Address

1

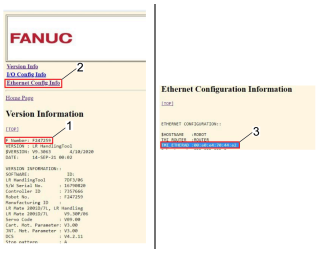
Follow this video to connect a laptop to the robot.



2

Once connected to the robot on the laptop, select Current Robot Status **[1]** from the menu on the left.

Then click Summary Configuration/Status **[2]**.

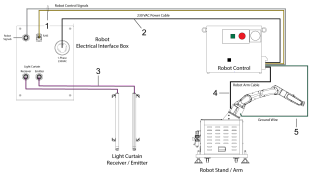


3

At this point the F number **[1]**, if needed, can be found on this page.

Click the Ethernet Config Info link **[2]** and the MAC address can be found on this page at **[3]**.

Robot With Light Curtain



Robot Electrical Box to Robot Control

- Connect the Robot Control Signal Cables [1] **P/N 33-8590A** to the Robot Electrical Interface Box.

Robot Power

- Connect the 230VAC Power Cable [2] **P/N 33-8530** to the Robot Electrical Interface Box.

Light Curtain

- Connect the Light Curtain cables [3] to the Receiver/ Emitter connections at the Robot Electrical Interface box.
- Connect the Robot Control Cable [4] to the Robot Arm.

Ground Wire

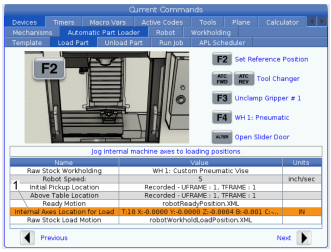
- Connect the Ground Wire [5] from the Chassis of the Robot Control to the Robot mount.

Dual Gripper Can Not Reach The Vise On UMC Platter

1

In order for the dual grippers to reach the vise, the B axis may need to be tilted away from the robot.

This is the case for all UMCs with HRP-2.



2

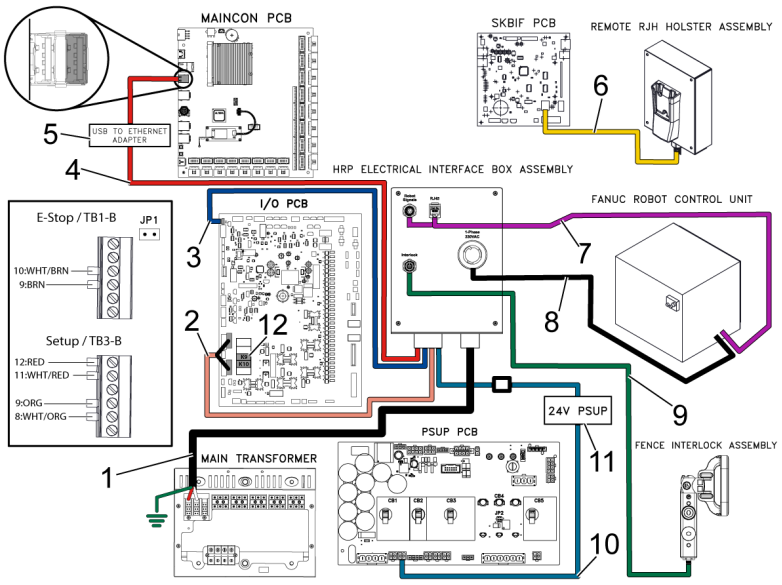
Once a loading position is determined, the loading position can be saved by going to **Current Commands -> Devices -> Automatic Part Loader -> Load part [2] -> Internal Axes Location for Load [1].** Press **F2** to set the current position of the machine as the loading position.

More information about setting up HRP templates can be found at HRP - OPERATIONS.

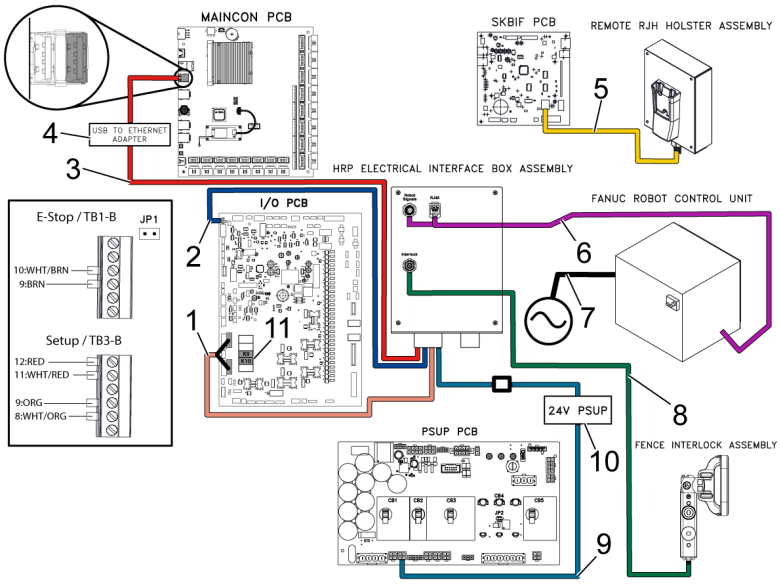
If the load and unload locations need to be different, custom templates will need to be used. HRP - OPERATIONS - 9.3 - CUSTOM TEMPLATE.

Electrical Diagrams

HRP-1 Wiring Diagram



HRP-2/3 Wiring Diagram


MAINCON PCB
SKBIF PCB
REMOTE RJH HOLSTER ASSEMBLY
USB TO ETHERNET ADAPTER
HRP ELECTRICAL INTERFACE BOX ASSEMBLY
I/O PCB
FANUC ROBOT CONTROL UNIT
E-Stop / TB1-B
JP1
10:WHT/BRN
9:BRN
Setup / TB3-B
12:RED
11:WHT/RED
9:ORG
8:WHT/ORG
24V PSUP
PSUP PCB
FENCE INTERLOCK ASSEMBLY
1
2
3
4
5
6
7
8
9
10
11