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Procedure

Upgrading Magnus CL to MCU

Background

This procedure explains how to upgrade a Magnus CL to MCU. This upgrade adds an MCU (Multi-Cassette Unit), a Slipsheet removal assembly to remove slipsheets between plates, a picker to pick the plates from the MCU and a Fetcher to take the plate from the picker to deliver to the load table.



Figure 1: Magnus CL machine (covers removed)

Requirements

Before starting the upgrade, use the MCU installation tools to check how level the floor is. Pay close attention to the floor where the MCU will be installed. The height of the MCU is adjusted to match the base Magnus during the installation procedure. If the floor where the MCU will be installed is higher than the floor where the base machine is located, it is possible that there will not be enough adjustment room to lower the MCU to match the base machine.

Check the "Nominal Foot Height" diagram on page 1 of the Installation procedure 725-00111A. Check the "Floor Level Qualification Procedure" on page 18 of the Site Preparation Guide, 725-00034A.

Tools Required:

- Hex keys, including T handle, keys, and hex bits to fit into a ratchet.
- Standard hand tools
- MCU installation kit and jigs, 518-00360A
- Grease (to be used on grease pads)
- Feeler gauge set with thick gauges (1mm -8mm)
- Save some of the foam packing material from the crates to be used when stacking panels etc. during the upgrade procedure. This will prevent scratches.
- Techplanet CD set or access to techplanet.creo.com. (documentation, wiring diagrams, etc.)

Procedure

This procedure should take about 3 days to install the parts. Allow an extra day to test the machine and for troubleshooting if required. The machine should be upgraded to the latest CR in advance to ensure that the machine is running the latest software.

The procedure was developed on a Right to Left machine. A Left to Right machine will be similar, and differences will be noted within the procedure. The panels on the machine will be referred to by item number on the drawing 518-00317A which is attached in appendix A. The slipsheet removal assembly panels are on drawing 518-00275A which is located in appendix B.

1. Shut down the machine and clear a work area for the panels etc. Ensure that there is a clear path to move the MCU into the room so that it can be attached to the Magnus.

2. The photograph shows a CL Magnus with the top cover removed. It is not necessary to remove the cover in the field although it improves lighting while working.

3. Remove the unload table panels and the load table rails. Stack them by the wall using the high density foam packing material on the bottom and in between to prevent scratches.

4. Prepare the MCU as shown in the photo. The MCU will need to have the plenum, picker, slipsheet detector, air bulkhead, bulkhead cover, and brackets attached. Move the MCU close to it's final position but leave enough room around the machine to work.



Figure 2 - MCU with hardware attached

5. Remove the bridge top cover and shoulder panels.





Figure 3 - Removing shoulder and side panels

6. Remove side panel and support bracket. Some machines may have a light shield (see photo). This can also be removed since it is not needed on an MCU machine.

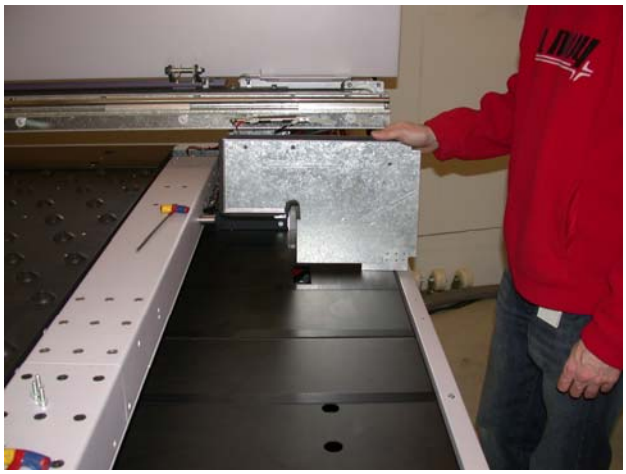


Figure 4 - Light shield

7. Remove the MAB to skin panels.



Figure 5 - MAB to skin panels

8. Remove the right shoulder support bracket.

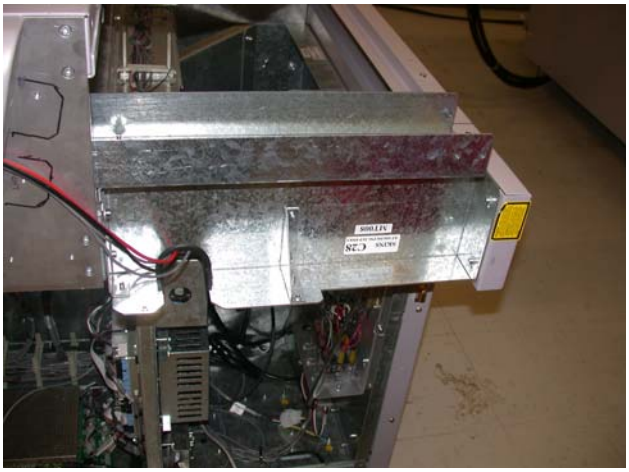


Figure 6 - Shoulder support bracket

9. Remove the rear side panel on the side of the machine as shown in figure 7. (Appendix A - item 50 on RtoL, item 60 on LtoR)

10. Remove right front side panel. (Appendix A - item 100 on RtoL, item 60 on LtoR)

11. Remove right lower shoulder panel. (Appendix A - item 170 on RtoL, item 180 on LtoR)

12. Remove the access panel ledge. (Appendix B – item 130)



Figure 7 - Removing side panels

13. Remove the front chin panel and pull-out table locks.



Figure 8 - Chin panels and pullout table locks.

14. Clip the cable ties on the hoses and move the hoses out of the way. They will later attach to the fetcher track.



Figure 9 - Hoses attached to table lock support bracket

15. Raise the bridge and remove the fetcher motor cover.

16. Remove the table lock support bracket.

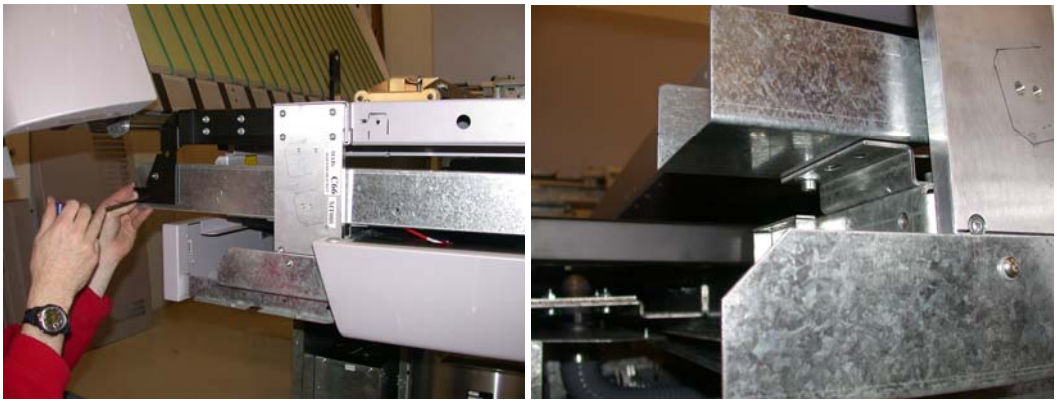


Figure 10 - Removing table lock support bracket



Figure 11 - Pull the bracket out the end of the machine

17. Remove the cable-air panel. (Appendix A – Item 40 RtoL, item 30 on LtoR)



Figure 12 - Removing the cable-air panel

18. Locate the MCU AC power cable and the wire harness as shown in the photo. The power cable may be coiled below the engine. The wire harness will have a terminator on the end. Remove the terminator and save it. The terminator is needed in case it is necessary to run the machine with the MCU electrically disconnected.



Figure 13 - MCU power cable and wire harness

19. Assemble the connector as shown in the photo. Pin #1 is written on the connector and it goes toward the top. The top of the connector body is indicated with the letter C and an arrow. (see photo)



Figure 14 - MCU umbilical connector

20. There are two connectors that go into the MCU connector body. One is wired into the engine and the other is the SSR user interface cable. The SSR user interface cable is the cable that goes from the lights on the SSR shoulder panel, 220-00372.

21. The cable from the engine goes into position 1 on the connector. The 220-00372 SSR User interface cable goes in position 2 (middle of connector body).

22. Attach the connector and power cable to the new cable/air panel as shown.

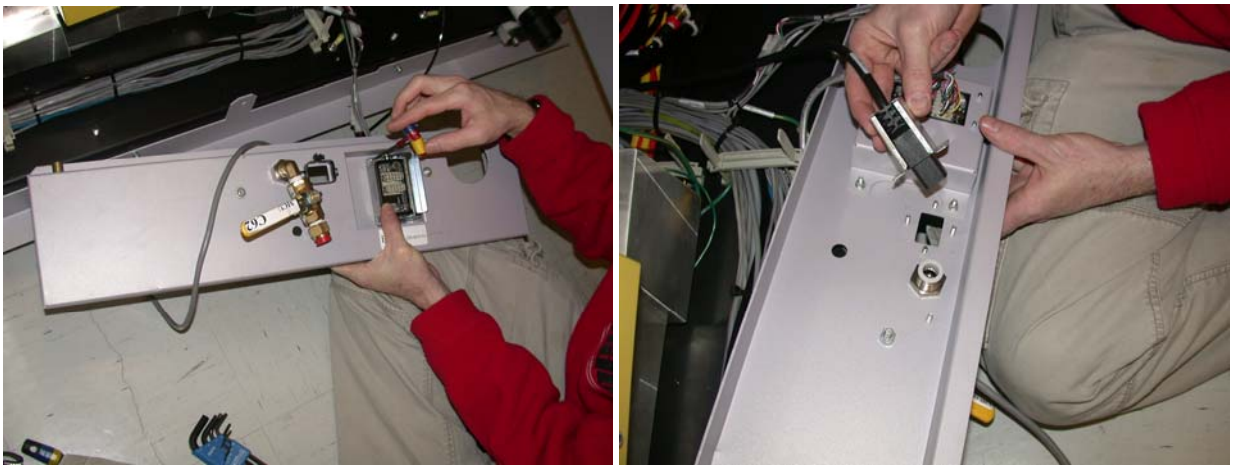


Figure 15 - Assembling the cable/air panel

23. Use 2 M4 nylock nuts and 4 M4 flat washers to attach the power cable and bracket to the panel.

24. Route the air hose from the Y connector as shown in the photo. Install a T connector as shown and attach a short hose from the Tee (55-1159) to the panel.

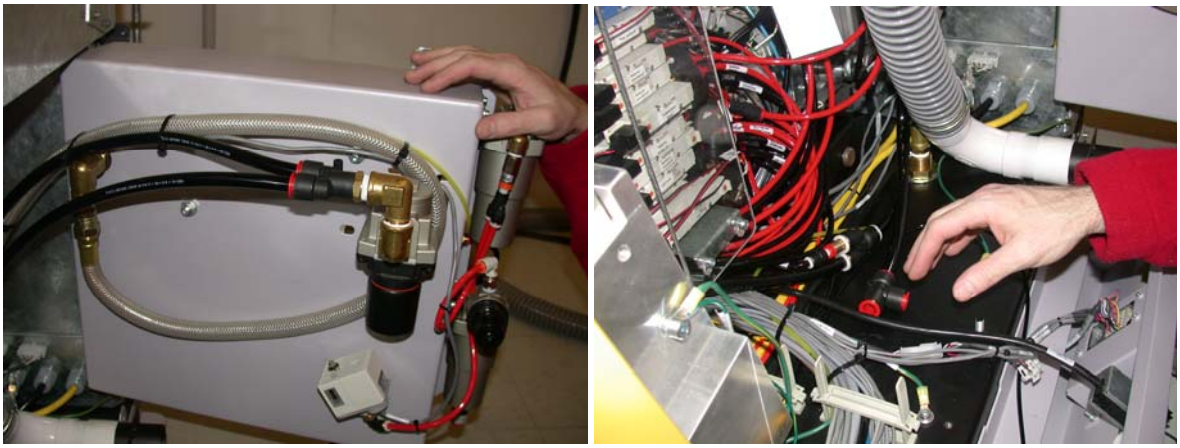


Figure 16 - MCU air hose

25. Attach the cable/air panel using 2 M5 x 12 screws and 2 belville washers.



Figure 17 - Assembling cable/air panel

26. Attach a long hose to the Tee connector and route it along the wiring trough. The hose should pass through the hole and up the next box. It should come out the top and join with the other harness.



Figure 18 - Fetcher air hose routing

27. Install the fetcher track.

28. Screw the fetcher track in place using 4 - M5 x 14 screws with belville washers. Attach the bridge support bracket to the fetcher track using 2 M5 x 20 flathead screws.





29. Route the fetcher cables and hoses down and into the track. The fetcher cables are already installed in CL machine. They should be coiled up and marked “Future expansion”. Locate the cables and attach to the fetcher cables.



Figure 19 - Fetcher air hoses and cables.

30. Attach the cables to the fetcher track cables and install the cable clamp on the fetcher carriage. The fetcher air hose splits before the fetcher as shown below. Use a 55-0956 Y connector.



Figure 20 - Fetcher air hoses and cabling

31. Install the table lock assemblies.

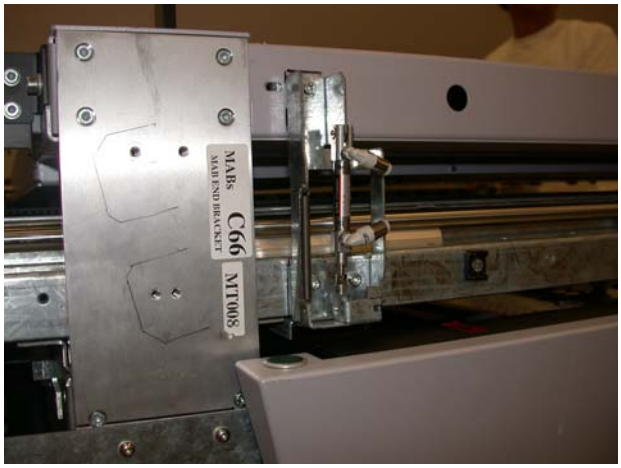


Figure 21 - Pull-out load table locks.

32. Route the cables and hoses along the fetcher track and tie wrap them in place. Be sure that the cables and hoses do not interfere with the spring on the table locks.



Figure 22 - Cable routing along fetcher track

33. Install the right shoulder panel support bracket. Route the cables through the opening at the bottom.



Figure 23 - Fetcher cable routing

34. Install the access panel ledge. Some spacers are required under it, M8 heavy washers (see photo). Bolt it in place using 3 M5 x 25 flathead screws. (Appendix B - access panel ledge is item 130 on RtoL, item 140 on LtoR)

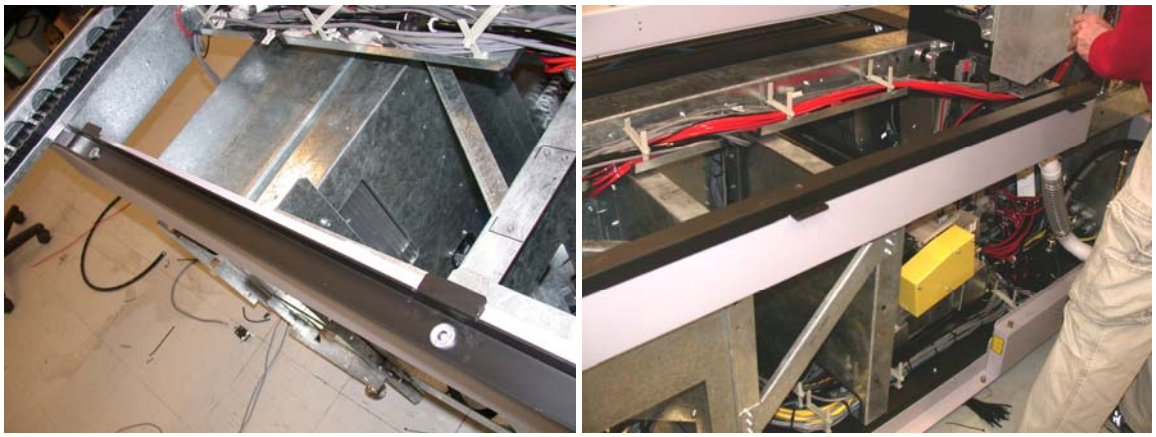


Figure 24 - Shin panel ledge installation. Heavy washers used as spacers

35. Install the right front side panel as shown in the photo.



Figure 25 - Side panel installation

36. Install the front door bracket using 2 - M5 x 16 button head screws, 2 belville and 2 heavy washers.

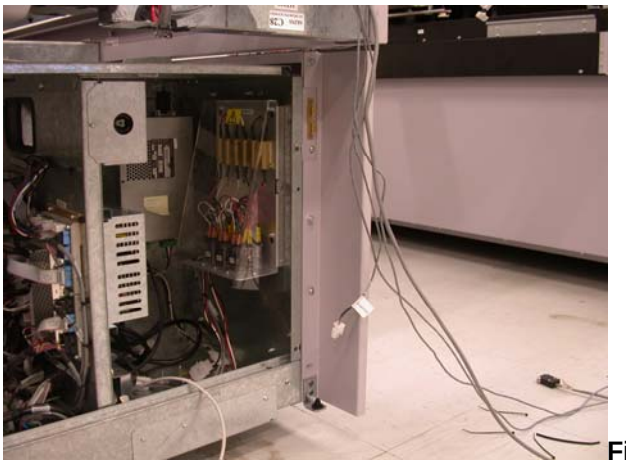


Figure 26 - Front door bracket attached to powerbox

37. Install SS Bin side panel using 2 M5 x 12 buttonheads.



38. Install the door hinge bracket on the MCU. Use M5 x 16 screws, belville, and heavy washers. 5 of each are needed, 3 on the bottom and 2 on top.

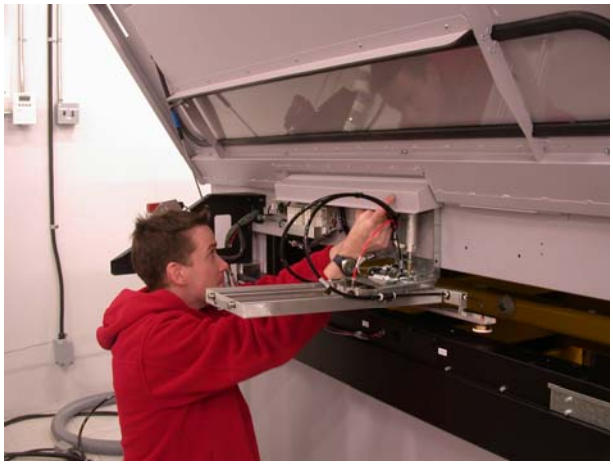


Figure 27 - Installing hinge on MCU

39. Add gas spring studs & gas spring to parts list for SSR top cover. Install SSR cover.



40. Install the picker bulkhead cover.



41. Use the grease pads under the jacks and jack the MCU up by ~10 turns.

42. Install the MCU alignment jigs.



Figure 28 - MCU alignment jigs

43. Refer to the MCU Installation Guide, **725-00111A-D pages 12a – 12b**,and align the MCU. The point where the fetcher track attaches to the MCU should be aligned perfectly and the MCU plenum should be parallel to the MABs within 1 mm.

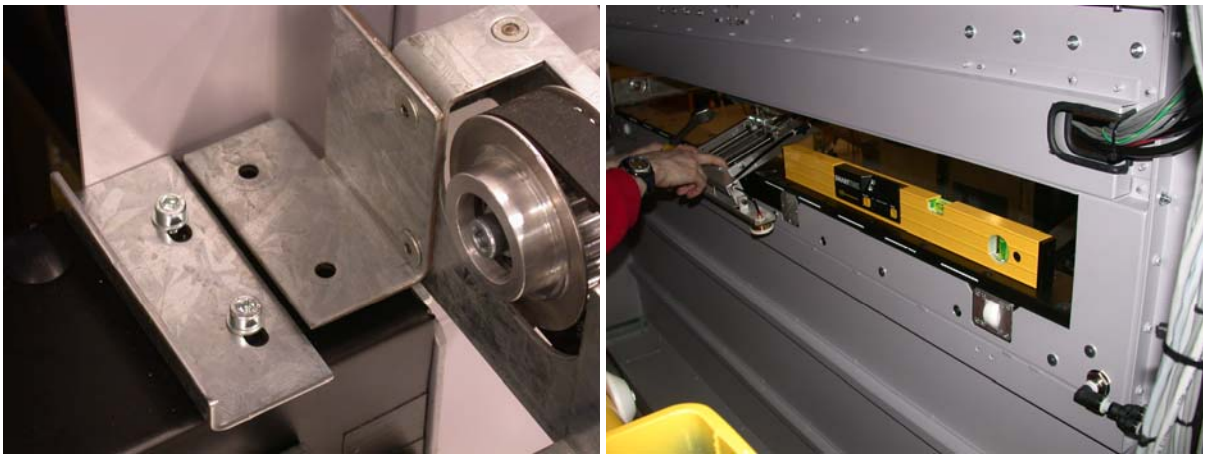


Figure 29 - MCU alignment and setup

44. Perform all alignments shown on the MCU Installation guide, pages 12a and 12b.

45. Install the SS bin guide panel on the MCU as shown below. Use 11 - M5 x 16 with heavy flat washer. (Appendix B – item 60)



Figure 30 - SS Bin Guide Panel

46. Install the access panel switch. This mounts to the Lower Shoulder Panel near the front of the machine, just behind the fetcher track on the same side of the machine as the slipsheet removal assembly. It needs 2 M4 x 20 screws, M4 split washers to mount the switch to the bracket. The bracket mounts to the machine with one M5x16 screw with one belville and one heavy washer.

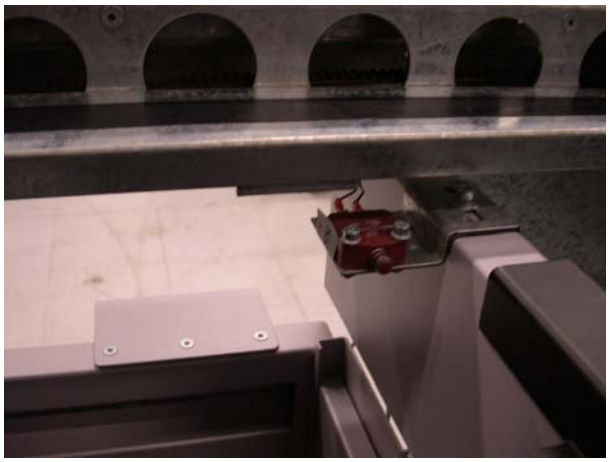


Figure 31 - SSR access panel switch

47. Install the slipsheet on bottom of plate sensor. 2 M4x12, 3 M5x16, 3 bel.

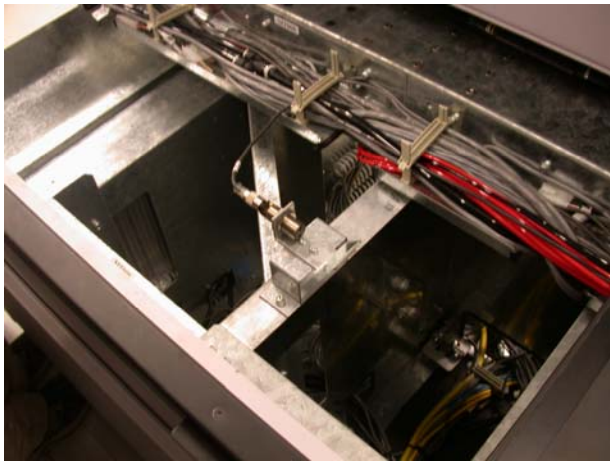


Figure 32 - Slipsheet bottom sensor

48. Install the fetcher assembly. 2 - 3/8” straight unions, 2 - 3/8” 90degree elbow unions, M5x12 + belville washer for the cable/hose clamp, 5 - M5 x 25 (or 20mm) flathead to mount fetcher to track.

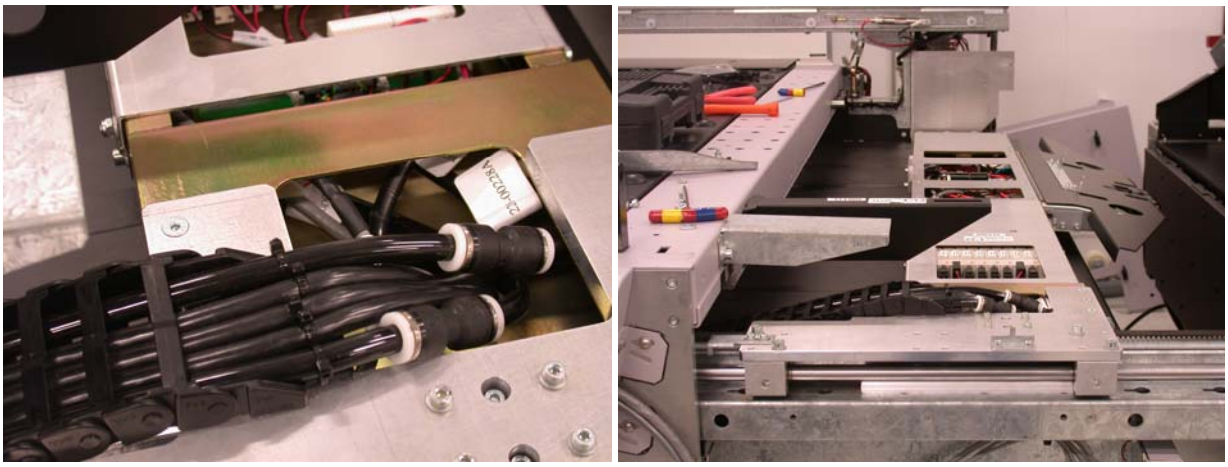


Figure 33 - Fetcher assembly details

49. Install the fetcher home and safe home sensors. They mount on the fetcher track in the holes provided. The home sensor is mounted 91mm from MCU and the safe home sensor is 249mm from MCU.

50. Install fetcher motor cover using 2 - M4x12 screws and an M5 nylock nut.

51. Install the SSR unit. Use the jacks and mount it on the MCU.

52. Connect cables to the fetcher home sensors. Fold back excess cable length if necessary.

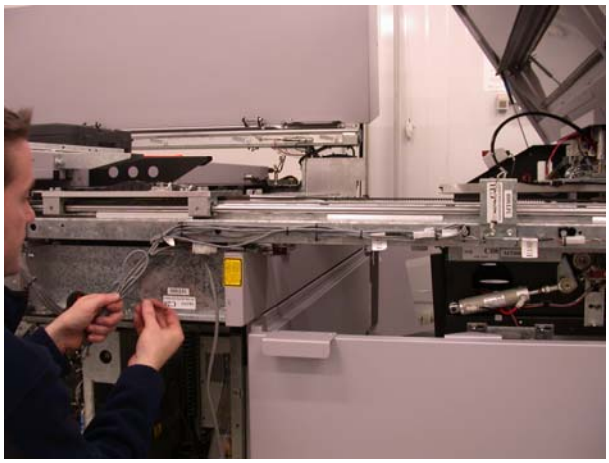


Figure 34 - Installing fetcher sensor cabling

53. Install SSR access panel and MAB to SSR panels.

54. Install SSR access cover bracket and adjust so that SSR access cover does not fall off when it is pulled back.



Figure 35 - SSR access cover and bracket

55. Mount rear SSR panel (around air filters). The brackets to hold on the panel have to be installed and properly adjusted first. 3 M5 x 12 buttonheads to install.

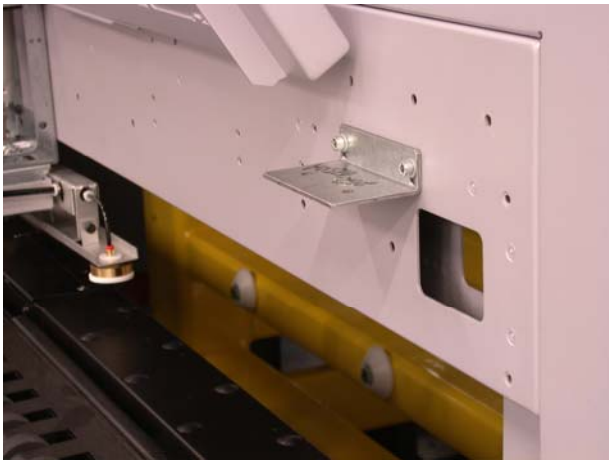


56. Install the SSR rear door as shown. Check the alignment of the Omron switch and align the catch (54-3422 – add catch to list of materials) 2 M4 x 12 buttonheads, 2 M4 nylock nuts, 2 M4 flat washers.



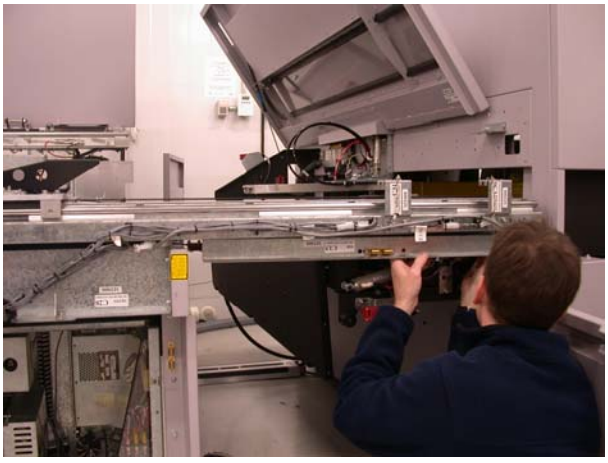
Figure 36 - SSR rear door

57. 252-03310A SSR user interface panel support bracket. Install on MCU.



58. Install the cables between the MCU and machine.

59. Install SSR front panel bracket. 4 M5 x 16 with bel and heavy washers.



60. Install SSR shoulder panel. Remove the cones from the panel first. Add the SSR top cover ledge to the shoulder panel. M4 x 14 with bels



Figure 37 - Attaching SSR cover ledge to shoulder panel

61. Latch the shoulder in place and connect the cable.



Figure 38 - Shoulder panel installed with service access support in place

62. Install the bridge shoulder panel.




63. Connect the power and turn the machine on. Verify that the MCE responds to service shell.

64. The MCU needs to be adjusted. The MCU was not integrated with a machine, so it should be assumed that all MCU adjustments should be checked and adjusted if necessary. Refer to the procedure 719-99357A-A.

65. MCU: align the cart frame to the MCU center – draw centre lines and adjust the cart until they line up.

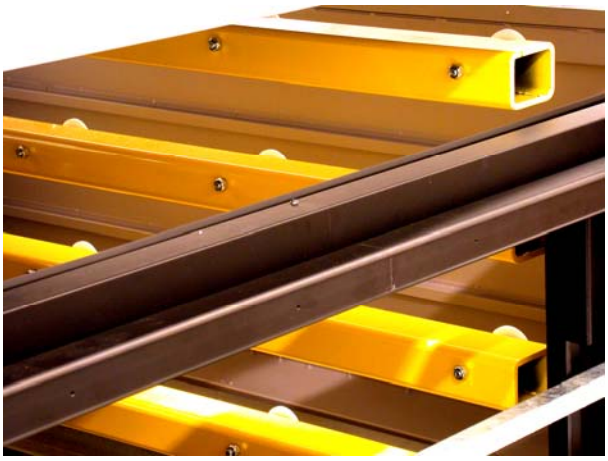


Figure 39 - Cart to MCU center

66. MCU: adjust the cassette sensors on the front to a nominal height to start. The bottom sensor should be 80mm up and the top is 127mm (measured to centre of sensor). Adjust sensors on both sides.



Figure 40 - Adjusting cassette sensors

67. Pull cart all the way out and make sure that chariot bars hit rubber bumper. Mark the side-to-side position of the wheels.



Figure 41 - Rubber bumper shown in center with cart all the way out. Side to side marked on chariot wheels

68. Adjust the lock hole bracket for the fully out position so that the locking pin will engage smoothly when locking the cart.



Figure 42 - Switch plate removed to access rear lock hole bracket.

69. Adjust side to side adjusters to minimize sideways drift of the cart.



Figure 43 - Side adjusters for cart

70. Remove the dampener and make sure that it is set to “3”. An imperial hex key is needed to loosen the setscrew. Caution: don’t remove the setscrew completely because there are spring-loaded parts behind it.



Figure 44 - dampener mounted on front of the chariot

71. Adjust the cart fully-in lock hole brackets.



72. Adjust the cart fully-in and fully-out switches.

73. Check the fork upper and lower limit switches. Adjust the tabs so that the forks stop 3-5mm from the bottom of the cabinet. Do the same adjustment to the top forks, 3-5mm at top (see photo).

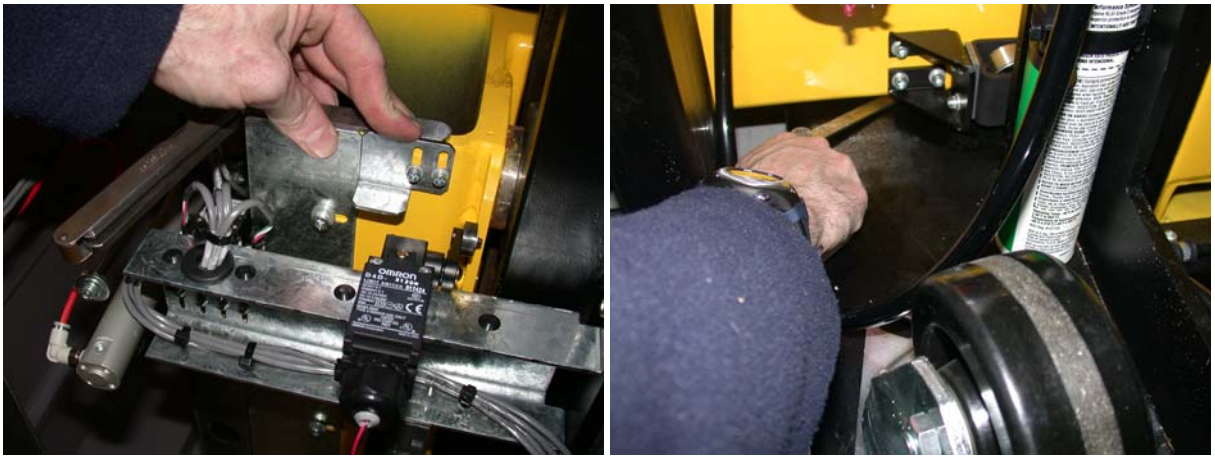


Figure 45 - Forks all the way down - bracket and measurement point. Set to 3-5 mm from bottom



Figure 46 - Forks all the way up - measurement point

74. Adjust the shutter closed position. Make sure that the tab fully engages with the interlock switch.



Figure 47 - MCU shutter - note the Omron key for the door interlock

75. Adjust the cassette eject and load/unload sensors. Refer to the MCU setup procedure 719-00357A and complete the rest of the MCU adjustments.

76. Install the cassettes.

77. Test the machine and return it to the customer.

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