



Maintenance Management Order

SUBJECT: Preventive Maintenance (PM) Guidelines for
Robotic Tray Handling System (RTHS)

DATE: June 6, 2008

NO: MMO-060-08

TO: Maintenance Manager, All RTHS Offices

FILE CODE: TM4

rrep:mm07109ac

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

This Maintenance Management Order (MMO) provides Preventive Maintenance (PM) guidelines for Robotic Tray Handling System (RTHS). This Maintenance Management Order (MMO) supersedes MMO-024-01, Preventive Maintenance (PM) Guidelines for Robotic Tray Handling System (RTHS), and MMO-104-01, Robotic Tray Handling System (RTHS) Maintenance Criteria Amendment to MMO-024-01.

The minimum maintenance skill level to perform each task on the various checklists is included in the Minimum Skill Level column. This does not preclude higher level employees from performing any of this work.

The workhours represented in this MMO reflect the maximum workhours required to maintain the equipment. Given local conditions, management may modify task frequencies.

WARNING

Various products requiring Material Safety Data Sheets (MSDS) may be utilized during the performance of the procedures in this bulletin. Ensure the current MSDS for each product used is on file and available to all employees. When reordering such a product, it is suggested that current MSDS be requested. Refer to MSDS for appropriate personal protective equipment.

WARNING

The use of compressed or blown air is prohibited. An alternative cleaning method such as a HEPA filtered vacuum cleaner, a damp rag, lint-free cloth, or brush must be used in place of compressed or blown air.

Maintenance Managers are to use these preventive maintenance guidelines when preparing the route sheets for local maintenance personnel. It is the responsibility of each

Maintenance Manager to ensure all WARNINGS, CAUTIONS, and NOTES are included with each applicable task as part of the preparation of any local route sheets.

Direct any questions or comments concerning this bulletin to the HelpDesk, Maintenance Technical Support Center, P.O. Box 1600, Norman OK 73070-1600; telephone FTS 2000 (405) 573-2123 or toll free (800) 366-4123.



Earl J. Jones
Manager
Maintenance Technical Support Center
Maintenance Policies and Programs

Attachments:

1. Summary Work Load Estimate
2. RTHS Master Checklist: 03-RTHS-AA-001-M: Daily
3. RTHS Master Checklist: 03-RTHS-AA-002-M: Weekly
4. RTHS Master Checklist: 03-RTHS-AA-003-M: Monthly
5. RTHS Master Checklist: 03-RTHS-AA-004-M: Semi-Annual
6. RTHS Master Checklist: 03-RTHS-AA-005-M: Tri-Annual

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

ATTACHMENT 1

SUMMARY

WORKLOAD ESTIMATE

FOR

RTHS ROBOT (FANUC PEDESTAL)

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

SUMMARY
WORKLOAD ESTIMATE
FOR
RTHS

	Routine Servicing (hrs/yr)	Repair* (hrs/yr)	Total Servicing & Repair Time (hrs/yr)	Reactive Time *** (hrs/yr)	Nonproductive Time ** (hrs/yr)	Total Servicing Per Machine (hrs/yr)
7 Day	114.75	34.43	149.18	298.36	14.92	462.46

* Repair estimates based on 30% of servicing.

** Based on 10% of total servicing and repair.

*** Reactive based on 200% of Service and Repair.

	Minutes	Hr/Yr
Daily	12	72.00
Weekly	18	15.60
Monthly	130	26.00
Semi-Annual	23	0.77
Tri-Annual	68	0.38

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

ATTACHMENT 2

RTHS MASTER CHECKLIST

03-RTHS-AA-001-M

DAILY

Time Total: 12 Minutes

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service		IDENTIFICATION									
Maintenance Checklist		Work Code		Equipment Acronym			Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW			Bulletin Filename MM07109AC			Frequency Daily			

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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SAFETY STATEMENT

1. **COMPLY WITH ALL SAFETY PRECAUTIONS. Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Open equipment and inspect dust conditions. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment.**

3 All
MIN

THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.

When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection.

2. **Power down and lock out power.** Power down the machine and lock out power as prescribed by the current local lockout instructions providing lockout/restore procedures.

2 9
MIN

MAIL SEARCH

3. **Perform mail search.** Perform mail search inside cell, under and around feed conveyor, and under pedestal components. Open box channel and other areas where mail may be obstructed from view and check for mail. Remove any mail pieces found. Close any areas opened for mail search. Follow local procedures for returning mail to operations for processing.

4 9
MIN

WARNING

Be cautious when working around or on equipment when power has been applied.

RESTORE POWER

4. **Restore equipment to service.** Restore equipment to service as prescribed by the current local procedure providing lockout/restore procedures.

3 9
MIN

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

ATTACHMENT 3

RTHS MASTER CHECKLIST

03-RTHS-AA-002-M

WEEKLY

Time Total: 18 Minutes

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service		IDENTIFICATION									
Maintenance Checklist		Work Code		Equipment Acronym			Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW			Bulletin Filename MM07109AC			Frequency Weekly			

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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SAFETY STATEMENT

1. **COMPLY WITH ALL SAFETY PRECAUTIONS. Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Open equipment and inspect dust conditions. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment.**

3 All
MIN

THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.

When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection.

WARNING

Be cautious when working around or on equipment when power has been applied.

SUCTION CUPS

2. **End of arm tooling suction cups.** Utilizing the teach pendant, blow out the tray suction cups as follows:
1. Press Menu button.
 2. Press 5 (I/O).
 3. Press F1 (Type).
 4. Press 4 (Robot).
 5. Press up/down arrow to each Blow option and highlight each Blow by pressing F4.
 6. Press F4 (ON). Leave ON for approximately 20 seconds.
 7. Press F5 (OFF).
 8. Press Menu button.
 9. Press 9 button.

2 9
MIN

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service Maintenance Checklist		IDENTIFICATION											
		Work Code		Equipment Acronym				Class Code		Number		Type	
		0	3	R	T	H	S	A	A	0	0	2	M
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC		Frequency Weekly					

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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MECHANICAL UNIT	3.	Power down and lock out power. Power down the machine and lock out power as prescribed by the current local lockout instructions providing lockout/restore procedures.	2 MIN	9
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	4.	Check cables.	2 MIN	9
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NOTE

Avoid disconnecting cables to servomotors, as this will require re-mastering the robot.

Observe the cables connected to the movable parts of the mechanical unit. Check cable sleeves for damage and excessive bending or twisting. Correct as necessary.

	5.	Check tray suction cups. Check tray suction cups for wear, tears, and/or disfiguring. Replace if necessary. Check suction cup screen for dirt or debris. Clean or replace if necessary.	1 MIN	9
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WARNING

Be cautious when working around or on equipment when power has been applied.

RESTORE POWER	6.	Restore equipment to service. Restore equipment to service as prescribed by the current local procedure providing lockout/restore procedures.	3 MIN	9
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GENERAL	7.	Clean up. Remove all tools, rags, lubrications, etc. from work area. Report any problems to supervisor. Initiate any necessary work orders.	5 MIN	All
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MAINTENANCE MANAGEMENT ORDER

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U.S. Postal Service		IDENTIFICATION										
Maintenance Checklist		Work Code		Equipment Acronym				Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0	2
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC		Frequency Weekly				
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level	

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MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

ATTACHMENT 4

RTHS MASTER CHECKLIST

03-RTHS-AA-003-M

MONTHLY

Time Total: 130 Minutes

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service		IDENTIFICATION										
Maintenance Checklist		Work Code		Equipment Acronym				Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0	3
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC			Frequency Monthly			

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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SAFETY STATEMENT

1. **COMPLY WITH ALL SAFETY PRECAUTIONS. Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Open equipment and inspect dust conditions. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment.**

3 All
MIN

THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.

When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection.

WARNING

Be cautious when working around or on equipment when power has been applied.

AIR CONTROL SET

2. **Air control settings.** Check for a reading of 90 to 100 PSI on the pressure gauge of the air regulator. Adjust using the regulator pressure setting knob, if needed.
3. **Lock out air supply.** Lock out air supply as prescribed by the current local lockout instructions providing lockout/restore procedures.
4. **Air filter.** Bleed and check filter. Empty and clean as required.
5. **Remove lockout on air supply.** Remove lockout on air supply as prescribed by the current local procedure providing lockout/restore procedures.

1 9
MIN
1 9
MIN
1 9
MIN

MAINTENANCE MANAGEMENT ORDER

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U.S. Postal Service Maintenance Checklist		IDENTIFICATION											
		Work Code		Equipment Acronym				Class Code		Number		Type	
		0	3	R	T	H	S	A	A	0	0	3	M
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC		Frequency Monthly					
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level		

WARNING

If necessary to power down the entire machine to perform the PM procedures, proper shut down procedures of all sub-systems are to be followed.

MAINTENANCE MANAGEMENT ORDER

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SET UP ROBOT FOR LUBE AND CLEANING	6.	Jog the robot. Jog the robot to the recommended posture for greasing (balancer shaft fully extended).	3 MIN	9
GRAPHIC UNIT INTERFACE (GUI)	7.	Power down and lock out GUI power. Power down the GUI and lock out its electrical power as prescribed by the current local lockout instructions providing lockout/restore procedures.	2 MIN	10
	8.	Power down and lock out power. Power down the machine and lock out power as prescribed by the current local lockout instructions providing lockout/restore procedures.	2 MIN	9
GUI	9.	Clean GUI. 1. Clean exterior surface of dust accumulation. 2. Check for dirt and dust accumulation in the GUI. If necessary, clean by vacuuming or wiping. 3. Check filters in door panel. Clean filters if necessary.	6 MIN	9
STANDARD OPERATOR PANEL	10.	Standard operator panel. (Grey box on outside of computer/GUI cabinet) Check the cable connection to the teach pendant for excessive twisting. Check controller and peripheral devices for abnormalities.	5 MIN	9
CONVEYOR	11.	Clean conveyor. Clean feed conveyor and bar code reader by vacuuming or brushing.	4 MIN	9
MECHANICAL UNITS	12.	Clean robot. Clean the exterior of robot axis link and axis by wiping with cloth or duster.	7 MIN	7
	13.	Hardware. Visually check for loose fasteners on robot, mounting hardware, and floor plates. Tighten any loose fasteners.	6 MIN	9

U.S. Postal Service		IDENTIFICATION									
Maintenance Checklist		Work Code		Equipment Acronym		Class Code	Number	Type			
		0	3	R	T	H	S	A	A	0	0
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW			Bulletin Filename MM07109AC		Frequency Monthly				

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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CELL	14.	Clean cell area. Sweep floor of all debris inside of safety cell. Using a clean lint-free cloth, clean all floor mounted photo sensors ensuring that they are clear. Gently dust all light barriers with a clean lint-free cloth. Clean any accumulation of dust, dirt, foreign matter, and/or debris from inside cell. Clean exterior of cell with duster.	47 MIN	7
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BALANCER ROD LUBRICATION	15.	Lubricate counter balancer shaft.	3 MIN	9
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WARNING

Discard solvent soaked materials according to local procedures to prevent spontaneous combustion.

1. Remove rod cover (boot) on counter balance shaft.
2. With a clean rag, clean the balancer shaft and the area around the bushing in the balancer housing.
3. Check the balancer shaft for excessive scoring. Check the balancer shaft bushing for an out-of-round condition. If excessive scoring or out-of-round bushing, report deficiency to supervisor to initiate replacement of balancer assembly.

WARNING

Use PVC or nitrile rubber gloves when applying Alvania RL2 lubricant.

4. Apply a thin film of Alvania RL2 grease or equivalent on the balancer shaft. Use rubber glove to apply the grease to prevent contaminants from skin (e.g. human sweat, particles, etc) and to protect skin from grease.
5. Replace rod cover (boot) on balancer assembly.
6. Grease balancer housing with Alvania RL2 grease or equivalent. Only use one pump of grease from grease gun in zerk fitting (on top and front of balancer). With a clean rag, clean any excess grease from balancer housing.

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U.S. Postal Service Maintenance Checklist		IDENTIFICATION										
		Work Code		Equipment Acronym				Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0	3
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC			Frequency Monthly			
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level	

WARNING

Be cautious when working around or on equipment when power has been applied.

MAINTENANCE MANAGEMENT ORDER

VACUUM GENERATOR FILTER	16.	Remove lockout device and jog robot. Remove lockout on robot and GUI, and jog robot to home position.	3 MIN	10
	17.	Power down and lock out power. Power down the machine and lock out power as prescribed by the current local lockout instructions providing lockout/restore procedures.	2 MIN	9
	18.	Clean filter cover. Remove filter covers from vacuum generator. Clean any dirt or dust from inside cover and housing.	6 MIN	9

WARNING

Use PVC or nitrile rubber gloves when applying Alvania RL2 lubricant.

LUBRICATE BALANCER PIVOTS	19.	Lubricate balancer pivots. Apply one pump of Alvania RL2 grease or equivalent to each zerk fitting on both ends of balancer (pivots). With a clean rag, clean any excess grease from balancer pivots.	3 MIN	9
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WARNING

Be cautious when working around or on equipment when power has been applied.

	20.	Restore equipment to service. Restore equipment to service as prescribed by the current local procedure providing lockout/restore procedures.	3 MIN	9
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MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service Maintenance Checklist		IDENTIFICATION											
		Work Code		Equipment Acronym				Class Code		Number		Type	
		0	3	R	T	H	S	A	A	0	0	3	M
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC		Frequency Monthly					
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level		

WARNING

When checking the E-Stop on robot pedestal, teach pendant must be with person performing the check.

Teach pendant E-Stop and safety interlock (dead-man switch) must be checked to confirm robot movement is disabled. Perform this check prior to entering cell.

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

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|------------------------------------|-----|--|-----------|-----|
| EMERGENCY STOP & SAFETY INTERLOCKS | 21. | Test emergency stops and safety interlocks. Check and activate each emergency stop switch to confirm proper operation. Check each safety interlock to confirm proper operation. | 16
MIN | 9 |
| CLEAN UP | 22. | Clean up. Remove all tools, rags, lubricants, etc. from work area. Report any problems to supervisor. Initiate any necessary work orders.

Ensure system is in operating status and all safety gates are operational as shown on the GUI. | 5
MIN | All |

ATTACHMENT 5

RTHS MASTER CHECKLIST

03-RTHS-AA-004-M

SEMI-ANNUAL

Time Total: 23 Minutes

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service		IDENTIFICATION										
Maintenance Checklist		Work Code		Equipment Acronym				Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0	4
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC			Frequency Semi-Annual			

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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SAFETY STATEMENT

- | | | | |
|----|---|-------|-----|
| 1. | COMPLY WITH ALL SAFETY PRECAUTIONS. Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Open equipment and inspect dust conditions. Check for suspicious dust or unusual debris. If any unusual substance is found notify supervisor prior to proceeding with any further action on the equipment. | 3 MIN | All |
| | THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED. | | |
| | When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection. | | |
| 2. | Power down and lock out power. Power down the machine and lock out power as prescribed by the current local lockout instructions providing lockout/restore procedures. | 2 MIN | 9 |

CAUTION

The 3 Volt Lithium battery (NSN 6135-04-000-3922) must be replaced within 15 minutes. If power is disconnected and the battery is removed for 15 minutes or more, the contents of the memory on the main CPU circuit board may be lost.

CONTROLLER POWER SUPPLY UNIT BATTERY

- | | | | |
|----|---|-------|---|
| 3. | 3 Volt lithium battery. Replace battery. | 4 MIN | 9 |
| | 1. Remove the old battery by squeezing the battery connector. | | |
| | 2. Install the new battery and reconnect the connector. | | |

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER

U.S. Postal Service Maintenance Checklist		IDENTIFICATION											
		Work Code		Equipment Acronym				Class Code		Number		Type	
		0	3	R	T	H	S	A	A	0	0	4	M
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC		Frequency Semi-Annual					
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level		

WARNING

Be cautious when working around or on equipment when power has been applied.

4. **Restore equipment to service.** Restore equipment to service as prescribed by the current local procedure providing lockout/restore procedures. 3 9
MIN

WARNING

If necessary to power down the entire machine to perform the PM procedures, follow proper shut down procedures for all sub-systems.

WARNING

When changing the D-cell batteries, the teach pendant must be with person performing this task.

Teach pendant E-Stop and safety interlock (dead-man switch) must be checked to confirm robot movement is disabled. This check must be performed prior to entering the cell.

CAUTION

The 1.5 volt size D Alkaline batteries must be replaced with the power ON. Removing the 1.5 volt batteries while the power is OFF will result in the loss of the current position data of each axis. Should this occur, the robot will need to be re-mastered.

1.5 VOLT
D-CELL
ALKALINE
BATTERIES

5. **1.5 volt size D alkaline batteries.** Battery replacement as follows: 6 9
MIN
1. Press an EMERGENCY STOP button to prevent any robot motion.
 2. Press Enter. Press Emergency Stop on teach

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U.S. Postal Service		IDENTIFICATION										
Maintenance Checklist		Work Code		Equipment Acronym				Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0	4
Equipment Nomenclature		Equipment Model				Bulletin Filename		Frequency				
Robotic Tray Handling System		M-410iW				MM07109AC		Semi-Annual				
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level	

pendant and carry teach pendant into cell. Confirm E-Stop and Safety interlock are functioning properly prior to entering cell.

3. Remove the battery case cap on the exterior door of the R-J2 controller (pedestal) cabinet.
4. Take out one battery at a time and replace with new battery. Pay close attention to the direction of batteries polarity when removing and replacing each battery.
5. Replace the battery case cap.

CLEAN UP

6. **Clean up.** Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to supervisor. 5 MIN All

Ensure system is in operating status and all safety gates are operational as shown on the GUI.

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ATTACHMENT 6

RTHS MASTER CHECKLIST

03-RTHS-AA-005-M

TRI-ANNUAL

Time Total: 68 Minutes

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U.S. Postal Service		IDENTIFICATION										
Maintenance Checklist		Work Code		Equipment Acronym				Class Code		Number		Type
		0	3	R	T	H	S	A	A	0	0	5
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC			Frequency Tri-Annual			

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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SAFETY
STATEMENT

1. **COMPLY WITH ALL SAFETY PRECAUTIONS. Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shut down and lock out this machine. Open equipment and inspect dust conditions. Check for suspicious dust or unusual debris. If any unusual substance is found, notify supervisor prior to proceeding with any further action on the equipment.**

3
MIN All

THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.

When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner or a damp rag must be used in place of compressed or blown air. A lint-free cloth or brush may be used on optical equipment only when other cleaning methods cannot be used. Report safety deficiencies to your supervisor immediately upon detection.

WARNING

Be cautious when working around or on equipment when power has been applied.

CROSS
ROLLER and
BUSHING
GREASING

2. **Grease cross roller bearings.** Jog robot to greasing posture as described in the M410iW Mechanical Unit Maintenance Manual, Figure 2.2.3.

45
MIN 9

WARNING

Discard solvent soaked materials according to local procedures to prevent spontaneous combustion.

WARNING

Use PVC or nitrile rubber gloves when applying Alvania RL2 lubricant.

1. Power down the machine and lock out power as prescribed by the current local lockout

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U.S. Postal Service		IDENTIFICATION										
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		0	3	R	T	H	S	A	A	0	0	5
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC		Frequency Tri-Annual				
Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req'd	Min. Skill Level	

instructions providing lockout/restore procedures.

2. Remove the cross roller ring grease inlet cap from the J3-axis cover.
3. Grease the J1-axis cross roller ring (two grease fittings), J3-axis cross roller ring, and J4-axis connection point bearing with Alvania RL2 grease or equivalent.

WARNING

Be cautious when working around or on equipment when power has been applied.

4. Remove lockout and restore power.
5. Jog all axes a minimum of 30 degrees. J1-axis should be jogged about 90 degrees. J4-axis should be jogged about 180 degrees.
6. Power down the machine and lock out power as prescribed by the current local lockout instructions providing lockout/restore procedures.
7. Remove any old expelled grease after each greasing.
8. Replace the cross roller ring grease inlet cap on the J3-axis cover.

GREASE
AXIS
REDUCERS

NOTE

The axis reducer grease replacement should occur every three years or 11,000 hours of operation, whichever occurs first. This is a detailed procedure that requires ordering the proper grease, injecting it, and capturing the expelled grease. Disposal of expelled grease must comply with all environmental laws, regulations, and policies. Due to complexity and support activities required, this activity should be performed through a work-order or contract, depending on local skill and capabilities.

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		0	3	R	T	H	S	A	A	0	0	5
Equipment Nomenclature Robotic Tray Handling System		Equipment Model M-410iW				Bulletin Filename MM07109AC			Frequency Tri-Annual			

Part or Component	Item No.	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req'd	Min. Skill Level
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|----|--|-----------|----|
| 3. | Initiate work order. Initiate work order to replace grease with correct type per FANUC Service Bulletin, FANUC service manuals and appropriate MS manual. Ensure that all safety and environmental aspects are included. This activity may require consultation, participation, and action by supervisor. | 12
MIN | 10 |
|----|--|-----------|----|

WARNING

Be cautious when working around or on equipment when power has been applied.

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|----------|--|----------|-----|
| 4. | Restore equipment to service. Restore equipment to service as prescribed by the current local procedure providing lockout/restore procedures. | 3
MIN | 10 |
| CLEAN UP | 5. Clean up. Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to supervisor. | 5
MIN | All |

MAINTENANCE MANAGEMENT ORDER

MAINTENANCE MANAGEMENT ORDER