## MAINTENANCE TECHNICAL SUPPORT CENTER HEADQUARTERS MAINTENANCE OPERATIONS UNITED STATES POSTAL SERVICE Maintenance Management Order

**SUBJECT:** Tray Sorting Machine NovaSort Preventive Maintenance Guidelines

DATE: September 30, 2013

NO: MMO-095-13

TO: All TSM Sites

FILE CODE: TM

pmur: mm13049ae

This Maintenance Management Order (MMO) provides Preventive Maintenance Guidelines for the Tray Sorting Machine (TSM). This bulletin applies to Acronym TSM, Class Code CA.

The workhours indicated in the workload estimate (Attachment 1) reflect the *maximum* annual workhours required to maintain each system. Management may modify task frequencies to address local conditions.

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

### 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.

### WARNING

Steps contained in this bulletin may require the use of Personal Protective Equipment (PPE). Refer to the current Electrical Work Plan (EWP) MMO for appropriate PPE requirements.

For questions or comments concerning this bulletin contact the MTSC HelpDesk, either online at **MTSC>HELPDESK>Create/Update Tickets** or call (800) 366-4123.

Robert E. Albert Manager Maintenance Technical Support Center HQ Maintenance Operations

Attachments: 1. Summary of Workload Estimate

- 2. TSM Master Checklist 03-TSM-CA-001-M: Daily
- 3. TSM Master Checklist 03-TSM-CA-002-M: Monthly
- 4. TSM Master Checklist 03-TSM-CA-003-M: Quarterly
- 5. TSM Master Checklist 03-TSM-CA-004-M: Annually

#### ATTACHMENT 1

#### SUMMARY

### WORKLOAD ESTIMATE

### FOR TSM SYSTEM

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#### SUMMARY WORKLOAD ESTIMATE FOR TSM

#### NOTE

Since this equipment contains multiple units of unknown quantity, the workload estimate cannot be provided in a traditional roll-up table. For this guideline, the annual work hours are derived from local site-specific entries made in an electronic Work Hour Estimator Program (eWHEP) worksheet. Refer to eWHEP for further guidance.

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### **ATTACHMENT 2**

### **TSM MASTER CHECKLIST**

03-TSM-CA-001-M

### DAILY

Time Total: 5 minutes Plus 3 min. per train

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Maintenance Checklist	WORK EQUIPME CODE ACRONY						PMEN DNYN	Т 1			CLA CO	ASS DE	N	IUMBI	ER	TYPE
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Equipment Nomenclature	Equ	ipme	nt Mo	del				В	ulletir	n Filer	name		Occur	rence		
Tray Sorting Machine	Tray Sorting Machine								mr	n13	049a	е		D	aily	,
NovaSort																

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	S
Component	110		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.

	1			-		
SAFETY	1.	COMPLY WITH ALL SAFETY PRECAUTIONS.	3	All		
STATEMENT		Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shutdown and lockout 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.				
		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 FOR EWP/PPE:				
		Steps contained in this bulletin may require the use of Personal Protective Equipment (PPE). Refer to the current Electrical Work Plan (EWP) MMO for appropriate PPE requirements.				
CLIENT	2.	Check for Trolley Faults.	3 per	9		
COMPUTER		NOTE	train			
		Log-in to the client computer on the maintenance platform and check for excessive trolley faults. Preferably, at the end of mail processing after the inventory has been cleared.				
		<ol> <li>Using the appropriate software commands check all trolleys on each train for excessive "Still Loaded" and "No Discharge" faults.</li> </ol>				
		2. Take note and disable from operation each trolley with an excessive number of faults.				
		3. Log-off the client computer.				

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Equipment Nomenclature	Equipment Model							В	Bulletir	ı Filer	ename Occurrence						
Tray Sorting Machine		mm13049ae							Daily								
NovaSort																	

Part or	Item	Task Statement and Instruction	Est.	Min. Skill		Threshold	S
Component	NU		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
CLEAN-UP	3.	CLEAN-UP.	2	All			
		Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all defective trolleys to your supervisor.					

MMO-095-13	Maintenance Technical Support Center													
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Maintenance Checklist	WC CO	RK DE			E	QUIPMENT ACRONYM	-		CLA CO	ASS DE	N	UMBE	ĒR	TYPE
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Equipment Nomenclature Tray Sorting Machine NovaSort	Equi	pmer	nt Mo	del			Bulleti Mr	n File n13	name 049a	e	Dccurr	rence D	aily	,

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	S
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### **ATTACHMENT 3**

### **TSM MASTER CHECKLIST**

#### 03-TSM-CA-002-M

#### MONTHLY

Time Total: 90 minutes per train Plus 2 minutes per trolley

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Tray Sorting Machine									mm13049ae Mor						nth	ly	
NovaSort																	

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	s
Component	No		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.

SAFETY	1.	COMPLY WITH ALL SAFETY PRECAUTIONS.	3	All		
STATEMENT		Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shutdown and lockout 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.				
		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 FOR EWP/PPE:				
		Steps contained in this bulletin may require the use of Personal Protective Equipment (PPE). Refer to the current Electrical Work Plan (EWP) MMO for appropriate PPE requirements.				
TRAIN	2.	Take Train out of Service.	10	9		
		<ol> <li>On the maintenance platform, log-in at the client computer.</li> </ol>				
		<ol> <li>Go to the Main Graphic User screen and click on "F12", NovaSort.</li> </ol>				
		3. Click on Control Panel.				
		<ol> <li>Under Select Train, click on the tug number to be shutdown for inspection / maintenance.</li> </ol>				
		<ol> <li>Under Select Segment Group and Route for moving, click on the desired train destination (i.e. Maintenance, Parking or Maintenance / Parking).</li> </ol>				

U.S. Postal Service								IDE	INTIF	ICATI	ION					
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Tray Sorting Machine								mm13049ae				Monthly			ly	
NovaSort																

Part or	Item	Task Statement and Instruction	Est.	Min. Skill	Ţ	Thresholds	;
Component	NO		Req	Lev	Run	Pieces	Freq.
			(min)		Hours	Fed (000)	
		6 Verify there is room for the incoming train on					
		the maintenance platform.					
		7. Click on "Move To".					
		8. To confirm, click on "Yes".					
		9. Click on "OK".					
		<ol> <li>Observe that the selected train moves to and stops on the maintenance platform.</li> </ol>					
		<ol> <li>On the Control and Display Panel at the rear of the tug, switch the Manual/Auto switch to the "MANUAL" position.</li> </ol>					
		<ol> <li>Depress the blue "SHUTDOWN" switch located on the Control and Display Panel and wait until the lamp is continuously illuminated and the "STARTUP" lamp is "OFF".</li> </ol>					
BRANCH RAIL	3.	Take Branch Rail out of Service.	3	All			
		Locate the disconnect panel that is designated for the maintenance branch the tug is parked on. Lockout electrical power by placing the disconnect lever in the "OFF" position and install a LOCKOUT/TAGOUT device.					
TRAIN	4.	General Cleaning.	15	7			
		1. Open the hood of the tug drive unit and the control unit covers, and secure the control unit covers with the rod that is in the inside of the covers.					
		2. Clean the tug and all trolleys.					
		<ol> <li>Visually check for loose debris and loose or damaged components.</li> </ol>					
TUG COLLECTOR	5.	Clean and Inspect Tug Collector Shoes.	4	7			
SHUES		NOTE					
		Refer to Figure 1 when performing this procedure.					
		<ol> <li>Unplug and open the collector shoe hinge plate.</li> </ol>					
		2. Clean collector shoe assemblies.					

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NovaSort															

Part or	Item	Task Statement and Instruction	Est.	Min.		Threshold	S
Component	INO	(Comply with all current safety precautions)	Req	Lev	Run	Pieces	Freq.
			(min)		Hours	(000)	
		3 Check collector shoe arms for freedom of					
		movement (smooth full range of motion) and for signs of uneven wear, pitting due to arcing.					
		<ol> <li>Check conductors, spade connectors, flexible cables and other electrical connections for tightness, damage, chaffing, discoloration, or overheating.</li> </ol>					
		<ol> <li>Using a spring scale, measure the contact pressure of each pair of collector shoes making sure the pressure is 7 Newtons (25.2 ounces-force).</li> </ol>					
		6. Close the collector shoe hinge plate.					
Terminal Plugs <sup>4</sup> Push or Pull fr this point for co pressure test	om	Figure 1. Collector Shoe Assembly		► C	Collecto	r Shoes Cable	

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Tray Sorting Machine NovaSort		Equipment Model							mn	n13	049a	е		N	loi	nth	У

Part or	Item	Task Statement and Instruction	Est.	Min. Skill	-	Thresholds	;
Component	NO		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
TUG DRIVE,	6.	Check Tug Drive, Guide, and Tension Wheels.	5	7			
GUIDE, AND TENSION		<ol> <li>Check wheels for damage, misalignment, and excessive wear.</li> </ol>					
WHEELS		<ol> <li>Measure pinch wheel springs, outside to outside dimension should be 60mm (~ 2.362 inches), adjust if necessary.</li> </ol>					
DRIVE BELT	7.	Check Drive Belt.	1	7			
		<ol> <li>Check drive belt for wear, frayed edges, pieces missing, etc.</li> </ol>					
		<ol> <li>Inspect wheels for damage, misalignment, and excessive wear.</li> </ol>					
		3. Check the drive belt for looseness.					
GEAR REDUCER	8.	Check Gear Reducer Oil.	4	7			
		CAUTION					
		Do not allow the gear oil to come in contact with the drive belt or drive wheels.					
		Remove the pipe plug in the rear of the gear reducer and check for the presence of oil.					
		NOTE					
		A small amount of oil should drain out as this plug is loosened. If no oil drains out, add oil (Mobil Oil Corp. 600 W. Super Cylinder Oil, AGMA Compound 7) as required through the vent plug opening.					
RAIL BRUSH	9.	Check Rail Cleaning Brush.	1	7			
		Check the rail cleaning brush in front of the drive unit to ensure contact with the rail, adjust if necessary.					
TROLLEYS	10.	Check NovaSort Trolleys.	2 per	7			
		<ol> <li>Manually check the trolley trip mechanism (ensure that the CAM followers are in place and move freely).</li> </ol>	trolley				
		2. Check and clean all sensors and caboose reflector with a clean dry towel.					
		3. Check the AS-I cables for damage.					

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Part or	Item	Task Statement and Instruction	Est.	Min. Skill		Threshold	s
Component	NO		Req	Lev	Run	Pieces	Freq.
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		4. Check the tow bar between the trolleys, including the retaining clip on the clevis pin.					
		<ol> <li>Check all trolley wheels for freedom of movement. Check the two (2) adjustable wheels for proper clearance. Make adjustments as necessary.</li> </ol>					
		<ol> <li>Check wheels for damage, misalignment, and excessive wear.</li> </ol>					
		7. Clean if necessary.					
		WARNING					
		Be cautious when working around or on equipment when power has been applied.					
BRANCH RAIL	11.	Return Branch Rail to Service.	3	All			
		Remove LOCKOUT/TAGOUT device from the disconnect panel and place the disconnect in the "ON" position.					
TROLLEY	12.	Test Trolley Functionality using OP3 Unit.	20	9			
FUNCTIONALITY		NOTE					
		The Trolley Test Program (TTP) is part of the standard Train PLC Software. There is no need to change EEPROM and/or download additional software.					
		NOTE					
		To perform the trolley tests, use either a standalone OP3 unit with the trolley testing software installed or the OP3 unit in the back panel of the tug.					
		The functions of the TTP are:					
		<ul> <li>solenoid activation up</li> <li>solenoid activation down</li> <li>infrared sensor transmit</li> </ul>					
		Trolley status can be observed on the OP3 display. The possible messages are:					
		<ul> <li>trolley top centered (CENT)</li> <li>trolley loaded (LOAD)</li> <li>receiver up or down (RX UP or RX DOWN)</li> </ul>					

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Tray Sorting Machine									mn	n13	049a	е		Ν	/loi	nth	ly
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Part or	Item	Task Statement and Instruction	Est.	Min.		Threshold	s
Component	NO		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
		CAUTION Testing can only be performed while the tug is in the MANUAL operating mode and the E-STOP mushroom button located at the front of the tug is pressed.					
		<ol> <li>TEST PREPARATION:</li> <li>Press the Enter button to get into the test mode. This has to be done whenever one of the two basic screens (with a short description of the F-key) appear.</li> </ol>					
		SIEMENSCOROS OP3Fault ResetLamp TestService $\leftarrow$ F1/1F2/2F3/3F4/4F5/567890ShiftEnter					
		Figure 2 2. Press the Forward (→) button twice and the following Screen will appear.					
		SIEMENS       COROS OP3         Log Out       Test       Edit         F1/1       F2/2       F3/3       F4/4       F5/5       ←       →         6       7       8       9       0       Shift       Enter					
		Figure 3 3. To activate the test, press the Shift and F3 / 3 buttons at the same time, and the Test Screen will appear.					

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Part or	Item		Task	Statement	and Ir	nstruction	n		Est.	Min.	-	Threshold	S
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	C	hoose th	ne partic	<u>′.</u> :ular trol	ley th	nat will	ested by						
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Part or Component	Item	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	S
Component			Req	Lev	Run	Pieces	Freq.
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		Enter trolley number zero if an abbreviated test is desired. An abbreviated test is one where the receive and transmit infrared units, located on the side of the trolley, are tested using an infrared transmitter and receiver Beam Tracker. To activate the trolley infrared transmitters press the Shift and F3 / 3 buttons (F3) at the same time. This will activate all the trolley transmitters. These transmitters will remain on until the tug is taken out of MANUAL mode or either the Forward ( $\rightarrow$ ) or Reverse ( $\leftarrow$ ) buttons are pushed. To test receive infrared units and tipper solenoids, as well as the functionality of the mechanical tipper comments.	1				
		mechanical tipper assembly, activate the upper and then the lower IR receivers with the Beam Tracker. The result will be that the upper and lower tipper arms will move out, respectively.					
		OPERATING INSTRUCTIONS (Standard Test):					
		Testing tipper solenoids:					
		To test the firing of tipper solenoids use the function keys. Press the Shift and F1 / 1 buttons (F1), when attempting to fire the DOWN solenoid. Press the Shift and F2 / 2 buttons (F2), when attempting to fire the UP solenoid. In either case, after the command to fire a solenoid has been given, a pulse to fire the solenoid will be high for two seconds. When the solenoids fire they are loud enough to be audible.					
		Testing the infrared trolley transmitter:					
		Press the Shift and the F3 / 3 buttons (F3) at the same time to activate the trolley infrared transmitter. There are three photo windows located on the side of the trolley. The center photo window is the transmitter. After activation, it will transmit an infrared beam for three seconds.					
		Received tipper signal:					
		There are three photo windows on the side of every trolley. The center one is a transmitter and the outer two are receivers. The top receiver fires the up solenoid when it receives an infrared signal. The bottom one fires the down solenoid					

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Tray Sorting Machine								mr	n13	049a	е			Мо	nth	ly
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Item	lask Statement and Instruction	Est.	Min.	Т	hresholds	5
NO	(Comply with all current safety precautions)	Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
	when an infrared signal is received. In either case, an acknowledgment message will appear in the variable field {message 1}. This message will be either RX DOWN {message 1} if the down solenoid is activated or RX UP {message 1} if the up solenoid is activated.					
13.	Emergency Stop Test.	1	7			
	NOTE					
	This procedure will test the Emergency "E" Stop on the front of the tug.					
	<ol> <li>With the Manual/Auto switch in the "MANUAL" position, depress the "E-STOP mushroom switch on the front of the tug.</li> </ol>					
	2. The E-STOP mushroom switch illuminates.					
	<ol> <li>On the Control and Display Panel of the tug, depress the forward and then the reverse momentary switches. The tug should NOT move.</li> </ol>					
	<ol> <li>Go to the front of the tug and pull the E- STOP mushroom switch out.</li> </ol>					
14.	Collision Avoidance Sensor Test.	6	9			
	NOTE					
	There is no extra PLC software necessary for testing and/or adjusting the FR 85 collision avoidance sensor. All tests and adjustments are made on the sensor.					
	PREPARATION:					
	Check each protection area by moving the caboose within the range of each protection area (See Figure 7).					
	13. 14.	No       (Comply with all current safety precautions)         (Comply with all curre	No       (Comply with all current safety precautions)       Time Req (min)         Req (min)       when an infrared signal is received. In either case, an acknowledgment message will appear in the variable field (message 1). This message will be either RX DOWN (message 1) if the down solenoid is activated or RX UP (message 1) if the up solenoid is activated.         13.       Emergency Stop Test.       1         Image: This procedure will test the Emergency "E" Stop on the front of the tug.       1         1.       With the Manual/Auto switch in the "MANUAL" position, depress the "E-STOP mushroom switch on the front of the tug.       1         2.       The E-STOP mushroom switch illuminates.       3         3.       On the Control and Display Panel of the tug, depress the forward and then the reverse momentary switches. The tug should NOT move.       6         4.       Go to the front of the tug and pull the E-STOP mushroom switch out.       6         14.       Collision Avoidance Sensor Test. NOTE       6         MOTE       There is no extra PLC software necessary for testing and/or adjusting the FR 85 collision avoidance sensor. All tests and adjustments are made on the sensor.       6         PREPARATION:       To perform the sensor test / adjustment, you only need a standard caboose, which is at the end of each train. The caboose and the tug have to be on the same rail for proper testing / adjustment of the FR 85. Place the caboose in front of the train.       Check each protection area by moving the caboose within the range of each protection a	No       (Comply with all current safety precautions)       Time Req (min)       Skill Lev         When an infrared signal is received. In either case, an acknowledgment message will appear in the variable field {message 1}. This message will be either RX DOWN {message 1} if the down solenoid is activated or RX UP {message 1} if the down solenoid is activated.       1       7         13.       Emergency Stop Test.       1       7         Image: Note of the top of the top.       1       7         Image: Note of the top of the top.       1       7         Image: Note of the top of the top.       1       7         Image: Note of the top of the top.       1       7         Image: Note of the top of the to	No       Time (Comply with all current safety precautions)       Time Req (min)       Skill Lev       Run Hours         When an infrared signal is received. In either case, an acknowledgment message will appear in the variable field (message 1). This message will appear in the variable field (message 1). This message will be either RX DOWN {message 1} if the down solenoid is activated or RX UP {message 1} if the down solenoid is activated.       1       7         13.       Emergency Stop Test.       1       7         IMANUAL "position, depress the "E-STOP mushroom switch on the front of the tug.       1       7         1.       With the Manual/Auto switch in the "MANUAL" position, depress the "E-STOP mushroom switch on the front of the tug.       1       7         2.       The E-STOP mushroom switch illuminates.       3.       0 no the Control and Display Panel of the tug, depress the forward and then the reverse momentary switches. The tug should NOT move.       6       9         14.       Collision Avoidance Sensor Test. NOTE       6       9       9         14.       Collision Avoidance sensor. All tests and adjustments are made on the sensor.       6       9         15.       There is no extra PLC software necessary for testing and/or adjusting the FR 85 collision avoidance sensor. All tests and adjustments are made on the sensor.       6       9         14.       Collision Azoidance sensor test / adjustment, you only need a standard caboose, which is at the end of each train. The ca	No       Time (Comply with all current safety precautions)       Time Still Reg Uev       Iter Procest Reg Uev         When an infrared signal is received. In either case, an acknowledgment message will appear in the variable field (message 1). This message will be either RX DOWN (message 1) if the down solenoid is activated or RX UP (message 1) if the down solenoid is activated or RX UP (message 1) if the down solenoid is activated.       1       7         I3.       Emergency Stop Test.       1       7         I3.       Emergency Stop Test.       1       7         I4.       Onte Manual/Auto switch in the "MANUAL" position, depress the "E-STOP mushroom switch on the front of the tug.       1       7         I5.       NOTE       1       7         I5.       NOTE       1       7         I5.       NOTE       1       7         I6.       Stop on the front of the tug.       1       7         I7.       NOTE       1       7         I7.       I6.       9       1         I7.       I7       1       7         I7.       I7       1       7         I7.       I7       1       7         I7.       I7       1       7         I7       I7       1       7       1

U.S. Postal S	Service						IDENTIFICA	TION								
Maintenance	Chec	klist	WORK CODE		EQL	JIPMENT RONYM			LASS	NU	MBER	TYPE				
	31100		0 3	TS	M			C C		0	0 2	М				
Equipment Nomenclature Tray Sorting NovaS	Mach ort	ine	Equipme	nt Model			Bulletin Fi	lename 3049a	ae	Occurre	NUMBER TYI					
		1														
Part or Component	Item No	(	Task Comply wi	Statemen th all curre	it and Inst ent safety	ruction precautio	ns)	Est. Time	Min. Skill		Threshold	ls				
								Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.				
		Fig Fig TESTING 1. Swi ens 2. Swi pos of e 3. Sele jpos of e 3. Sele jpos of e 3. Sele jpos of e 3. Sele jpos of e 4. Pos ahe met prot refle inch Che SP- mov prot ADJUST	ure 6. C FR 85 G: tch tug t itch tug t itch the t itch	ollision , Part #: o MANU olleys ar ug PLC- w the re ection a esired p protection 6). The rea LED reas, se ecting fc nt of the 38 inche reas 2, 3 istance beck / te protecti ED illum n the rai rea. NO	Avoida Avoida 150-03 JAL. Pre- re addre Key into rea can rotection on area selected sepective caboli (caboli sensor s) to ch 3,4,5,a of 1.5 m ach-in p on area inates v nge of the <b>DE</b> h LED caboli Ca	ince Se 80-001 ess "Shu essed ze o the ST e operat be teste o the ST e operat be teste o the ST e operat be teste d protect e yellow e availa e 7 below e availa eck / tea and 6. P neters (~ orotectic to ensu while ca he respection to ensu while ca he respection to ensu	tdown" to button nsor nsor oP ing point ed / set. ble w. aight nce of 3.5 ach-in lace / 59 on area 1. ire the boose is ective									
		follow	ving the i	instructio	ons belo	W.	зог бу									

U.S. Postal Service								IDE	ENTIF	ICATI	ION						
Maintenance Checklist	WC CC	DRK DDE			E	Equif Acro	PMEN DNYM	Г			CL/ CC	ASS DE		N	JMBE	ER	TYPE
	0	3	Т	S	Μ						С	Α		0	0	2	М
Equipment Nomenclature	Equ	ipme	nt Mo	del				E	Bulletir	n Filer	name		Occ	urr	ence		
Tray Sorting Machine									mr	n13	049a	е			Мо	nth	ly
NovaSort																	

Part or	Item	Task Statement and Instruction	Est.	Min. Skill		Threshold	ls
Component	NO		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
		<ol> <li>Position the caboose at the specified distance for the protection area to be taught- in. Push the teach-in button until the yellow Protection Area LED stops blinking (approximately 3 seconds) and stays continuously on. The desired operation point is taught-in now.</li> </ol>					
		<ol> <li>Check the switching point by removing the reflector and re-approaching to the taught-in operation point.</li> </ol>					
		3. For example, for protection area 2 with a 3.5m set point, move the reflector beyond the protection range (further than 5m). At this time, SP-Limit and SP-Teach LEDs should both be off. Move the reflector into the protection range, e.g. 4m, at this time SP-Limit should illuminate and SP-Teach should be off. Continue to move the reflector inward to the taught-in point (3.5m) and check that SP-Limit and SP-Teach are both lit.					
		<ol> <li>After checking / adjusting all areas, switch the tug PLC-Key into the RUN position.</li> </ol>					
		<ol><li>Press "Start Up" and check the configuration of the trolleys at the CP 342-2 's LEDs.</li></ol>					

U.S. Postal Service							IDE	NTIF	CATI	ON						
	WORK			E	QUIP	MENT	-			CLA	ASS		NU	JMBE	ER	TYPE
Maintenance Checklist	CODE				ACRO	DNYM				CO	DE					
	0 3	Т	S	Μ						С	Α		0	0	2	Μ
Equipment Nomenclature	Equipme	Equipment Model						ulletir	ı Filer	name		Occ	curre	ence		
Tray Sorting Machine	- 1					mn	n13	049a	е			Мо	nth	ly		
NovaSort																

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Thresholds	S
Component	110		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
		<pre>skapit dod provide and 1 - 20 provide angle op 27 schedul ton provide angle op 27 schedu ton provide angle op 27 schedul ton provide angle op 27 schedul</pre>					
DETECTION SENSOR	15.	Obstacle Detection Sensor Test.NOTEThe scanning distance of the obstacle detection sensor is adjustable to 700mm.The two sensors are focused 50mm horizontal out of the left and right edges of the rail and 50mm above the rail (see Figure 8 below). Use the Obstacle Detection Adjustment Tool, Siemens SEN 2219, for testing / adjusting the obstacle detection sensors.	6	9			

MMO-095-13	Maintenance Technical Support Center											
U.S. Postal Service		TION			1050	T) (D)						
Maintenance Chec	Klist CODE ACRONYM	CL	ASS DDE	NUN	IBER	TYPE						
Equipment Nomenclature Tray Sorting Mach NovaSort	0     3     T     S     M     Image: Second state st	C lename 3049a	A Ne	0 Occurren	0 2 <sup>ce</sup> Ionth	М   <b>у</b>						
Dort or	Tool Statement and Instruction	Гat	Min	т	brachala							
Component No	(Comply with all current safety precautions)	Est. Time Req (min)	Skill Lev	Run Hours	Pieces Fed (000)	Freq.						
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U.S. Postal Service								IDE	INTIF	CAT	ION					
Maintenance Checklist	WC	RK			E		MEN.	Т			CL/		N	UMB	ER	TYPE
	00			_	, 				1		- 00		-	1 -	-	
	0	3	Т	S	Μ						С	Α	0	0	2	M
Equipment Nomenclature	Equ	Equipment Model						В	ulletir	ı Filer	name		Occur	rence		
Tray Sorting Machine									mn	n13	049a	е		Мо	nth	ly
NovaSort																

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Thresholds	S
Component	110		Req	Lev	Run	Pieces	Freq.
			(min)		Hours	Fed (000)	
		TESTING					<b>_</b>
		1 Move the Adjustment Tool away from the					
		sensor and re-approach to the sensor again. The Output Signal indicator (yellow LED) should illuminate 700 to 650 mm in front of the sensor. Repeat for both sensors.					
		<ol> <li>If the yellow LED does not illuminate within the specified distance, follow the adjustment procedure below.</li> </ol>					
		ADJUSTING:					
		<ol> <li>Reposition the Adjustment Tool 700mm in front of the tug.</li> </ol>					
		2. Loosen the sensor bracket mounting bolts.					
		<ol> <li>Position the mounting bracket so that the scanning beam shines within the window indicated on the Adjustment Tool. See Figure 8.</li> </ol>					
		<ol><li>Tighten the bracket mounting bolts.</li></ol>					
		<ol> <li>Turn the Sensitivity adjustment potentiometer counter clockwise until the yellow LED illuminates.</li> </ol>					
		<ol><li>Recheck the sensor by following the testing procedures above.</li></ol>					
		WARNING					
		Be cautious when working around or on equipment when power has been applied.					
TRAIN	16.	Return Train to Service.	5	9			
		<ol> <li>Ensure the E-STOP mushroom switch on the tug is out.</li> </ol>					
		<ol> <li>Place the tug Manual/Auto switch in the "AUTO" position.</li> </ol>					
		<ol><li>Log-in at the client computer on the maintenance platform.</li></ol>					
		<ol> <li>Go to the main Graphic user screen and click on "F12", NovaSort.</li> </ol>					
		5. Click on the Control Panel.					

U.S. Postal Service								ID	ENTIF	ICAT	ION						
Maintenance Checklist	WC CC	ORK DDE			E	EQUIF ACR(	MEN <sup>.</sup> MYM	Т			CL/ CC	ASS DE		N	JMBE	ĒR	TYPE
	0	3	Т	S	Μ						С	Α	(	)	0	2	Μ
Equipment Nomenclature	Equ	ipme	nt Mc	odel				E	Bulletir	n Filer	name		Occ	urr	ence		
Tray Sorting Machine									mr	n13	049a	е			Мо	nth	ly
NovaSort																	

Part or Component	Item	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	s							
Component	140		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.							
		<ol> <li>Under Select Train, click on the tug number to be restarted.</li> <li>Click on "START".</li> </ol>												
		8. To confirm, click on "YES".												
		9. Click on "OK".												
		10. Observe that the train automatically enters the loop when there is a break in traffic.	n "OK". re that the train automatically enters p when there is a break in traffic.											
CLEAN-UP	17.	Clean-Up. WARNING	3	All										
		Discard or dispose of chemical-soaked rags according to MSDS and in accordance with local procedures.												
		Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to your supervisor.												

### ATTACHMENT 4

#### **TSM MASTER CHECKLIST**

### 03-TSM-CA-003-M

#### QUARTERLY

Time Total: 57 minutes per train

U.S. Postal Service								IDE	ENTIF	ICAT	ION						
Maintenance Checklist	WC CO	)rk )de			E	equif Acro	PMEN ONYN	Т 1			CL/ CC	ASS DE		NU	JMBE	ĒR	TYPE
	0	3	Т	S	Μ						С	Α	(	)	0	3	М
Equipment Nomenclature	Equ	Equipment Model							Bulletiı	n Filer	name		Occ	urr	ence		
Tray Sorting Machine									mr	n13	049a	е		(	Qua	rte	rly
NovaSort																	

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	S
Component			Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.

SAFETY	1.	COMPLY WITH ALL SAFETY PRECAUTIONS.	3	All		
STATEMENT		Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shutdown and lockout 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.				
		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 FOR EWP/PPE:				
		Steps contained in this bulletin may require the use of Personal Protective Equipment (PPE). Refer to the current Electrical Work Plan (EWP) MMO for appropriate PPE requirements.				
TRAIN	2.	Take Train out of Service.	10	9		
		1. On the maintenance platform, log-in at the client computer.				
		<ol> <li>Go to the Main Graphic User screen and click on "F12", NovaSort.</li> </ol>				
		3. Click on Control Panel.				
		<ol> <li>Under Select Train, click on the tug number to be shutdown for inspection / maintenance.</li> </ol>				
		<ol> <li>Under Select Segment Group and Route for moving, click on the desired train destination (i.e. Maintenance, Parking or Maintenance / Parking).</li> </ol>				

U.S. Postal Service								IDE	NTIF	ICATI	ON					
Maintenance Checklist	WORK EQUIPM CODE ACROI							Т 1			CLA CO	ASS DE	N	UMB	ER	TYPE
	0 3 T S M										С	A	0	0	3	М
Equipment Nomenclature	Equ	ipmer	nt Mo	del				В	ulletir	n Filer	name		Occurrence			
Tray Sorting Machine									mn	n13	049a	e	(	Qua	rte	rly
NovaSort																

Part or	Item	Task Statement and Instruction	Est.	Min.	· .	Threshold	S
Component	No	(Comply with all current safety precautions)	Time	Skill	<u> </u>	<u> </u>	
I			Req (min)	Lev	Run Hours	Pieces Fed	⊢req.
		<u> </u>				(000)	
[		6. Verify there is room for the incoming train on		1			
		the maintenance platform.	l	ļ			
		7. Click on "Move To".		ļ			1
		8. To confirm, click on "Yes".		ļ			1
		9. Click on "OK".		ļ			
		10. Observe that the selected train moves to and stops on the maintenance platform.					
		11. On the Control and Display Panel at the rear of the tug, switch the Manual/Auto switch to the "MANUAL" position.					
		<ol> <li>Depress the blue "SHUTDOWN" switch located on the Control and Display Panel and wait until the lamp is continuously illuminated and the "STARTUP" lamp is "OFF".</li> </ol>					
BRANCH RAIL	3.	Take Branch Rail out of Service.	3	All	<u>†                                    </u>	1	1
		Locate the disconnect panel that is designated	l	ļ			
		for the maintenance branch the tug is parked on.		ļ			
		Lockout electrical power by placing the disconnect lever in the "OFF" position and install		ļ			
		a LOCKOUT/TAGOUT device.		ļ			
GEAR REDUCER	4.	Change Gear Reducer Oil.	20	7	<u>†                                    </u>	1	†
		WARNING					
		Handling of oil and waste oil should be in accordance with the MSDS (Material Safety Data Sheet) for that specific product. In addition, all local, state, and federal regulations should be observed when storing and disposing of oil and waste.					
		NOTE	l	ļ			
		Change the oil in the gear reducer every 2,500 operating hours					
		<ol> <li>Secure access to any of the fill plugs located in the lower body of the gear reducer.</li> </ol>					
		2. Follow manufacturer's instructions for the vacuum kit (Siemens SEN 8671) and remove the oil from the gear reducer using					

IDENTIFICATION U.S. Postal Service EQUIPMENT NUMBER WORK CLASS TYPE **Maintenance Checklist** CODE ACRONYM CODE 0 3 Т S Μ С Α 0 0 3 Μ Equipment Nomenclature Bulletin Filename Equipment Model Occurrence Tray Sorting Machine mm13049ae Quarterly NovaSort Thresholds Part or Item Task Statement and Instruction Est. Min. Component No (Comply with all current safety precautions) Time Skill Pieces Run Freq. Req Lev Hours Fed (min) (000)the vacuum kit. CAUTION Using the drain plug to drain the oil is not recommended. This is to prevent the possibility of oil leakage onto the drive wheels. 3. Refill the gear reducer with four pints of Mobil 600W Super Cylinder Oil, AGMA Compound 7 (Siemens Part No. 200-1128-001). 4. Reinstall fill plug and wipe-up any excess oil. TUG DRIVE 5. Clean Tug Drive Wheels. 10 7 WHEELS Using soap and water and clean the two drive wheels. Ensure that the entire face of each wheel is clean. NOTE To disengage the electric brake on the tug, the contactor CON 1 can be manually engaged, or the mechanical override on the brake can be opened. WARNING Be cautious when working around or on equipment when power has been applied.

Return Branch Rail to Service.

the "ON" position.

Remove your LOCKOUT/TAGOUT device from the disconnect panel and place the disconnect in

Maintenance Technical Support Center

3

All

**BRANCH RAIL** 

6.

MMO-095-13

U.S. Postal Service								IDE	INTIF	CAT	ON					
Maintonanco Chocklist	WC	RK			E			Г			CL/		N	JMBE	ER	TYPE
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	0 3 T S M										С	Α	0	0	3	М
Equipment Nomenclature	Equipment Model								ulletin	Filer	name	(	Occurrence			
Tray Sorting Machine									mn	า13	049a	е	(	Qua	rte	rly
NovaSort																

Part or Component	Part or         Item         Task Statement and Instruction           Component         No         (Comply with all current safety precautions)		Est. Time	Min. Skill		Threshold	S
			Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
TRAIN	7.	Return Train to Service.	5	9			
		<ol> <li>Ensure the E-STOP mushroom switch on the tug is out.</li> </ol>					
		<ol> <li>Place the tug Manual/Auto switch in the "AUTO" position.</li> </ol>					
		<ol><li>Log-in at the client computer on the maintenance platform.</li></ol>					
		<ol> <li>Go to the main Graphic user screen and click on "F12", NovaSort.</li> </ol>					
		5. Click on the Control Panel.					
		<ol> <li>Under Select Train, click on the tug number to be restarted.</li> </ol>					
		7. Click on "START".					
		8. To confirm, click on "YES".					
		9. Click on "OK".					
		<ol> <li>Observe that the train automatically enters the loop when there is a break in traffic.</li> </ol>					
CLEAN-UP	8.	Clean-Up.	3	All			
		Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to your supervisor.					

MMO-095-13	Maintenance Technical Support Center															
U.S. Postal Service								IDE	INTIF	ICAT	ON					
Maintenance Checklist	WC CO	DRK DE			E	QUIF ACR(	MEN NYM	Г			CLASS CODE			NUMB	ER	TYPE
	0	3	Т	S	Μ						С	A	0	0	3	Μ
Equipment Nomenclature Tray Sorting Machine NovaSort	Equi	ipmer	nt Mo	del				B	Bulletin mn	n Filer n13	name 049a	е	Occu	rrence Qua	arte	rly

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	S
Component	i i i		Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.

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### ATTACHMENT 5

#### **TSM MASTER CHECKLIST**

### 03-TSM-CA-004-M

#### ANNUALLY

Time Total: 24 minutes per train

U.S. Postal Service								IDE	ENTIF	ICAT	ION						
Maintenance Checklist	WC CO	)RK )DE			E	equif Acro	PMEN ONYN	Т 1			CL/ CC		NU	JMBE	ĒR	TYPE	
		3	TSM								C A		C	)	0	4	М
Equipment Nomenclature	Equ	ipmeı	nt Mo	del				E	Bulletiı	n Filer	name		Occurrence				
Tray Sorting Machine									mr	n13	049a	е			4nr	nual	lly
NovaSort																	

Part or Component	Item No	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	S
Component			Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.

SAFETY	1.	COMPLY WITH ALL SAFETY PRECAUTIONS.	3	All		
STATEMENT		Disconnect power and apply lockouts when required by this instruction. Refer to current local lockout procedures to properly shutdown and lockout 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.				
		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 FOR EWP/PPE:				
		Steps contained in this bulletin may require the use of Personal Protective Equipment (PPE). Refer to the current Electrical Work Plan (EWP) MMO for appropriate PPE requirements.				
TRAIN	2.	Take Train out of Service.	10	9		
		1. On the maintenance platform, log-in at the client computer.				
		<ol> <li>Go to the Main Graphic User screen and click on "F12", NovaSort.</li> </ol>				
		3. Click on Control Panel.				
		<ol> <li>Under Select Train, click on the tug number to be shutdown for inspection / maintenance.</li> </ol>				
		<ol> <li>Under Select Segment Group and Route for moving, click on the desired train destination (i.e. Maintenance, Parking or Maintenance / Parking).</li> </ol>				

U.S. Postal Service								IDE	NTIF	ICATI	ON					
Maintenance Checklist	WORK EQU CODE AC						MEN NYM	T			CLA CO	ASS DE	N	UMBE	ĒR	TYPE
	0	3	Т	S	Μ						С	Α	0	0	4	Μ
Equipment Nomenclature	Equipment Model								ulletir	n Filer	name	(	Occurrence			
Tray Sorting Machine									mn	n13	049a	е	4	Anr	nual	ly
NovaSort																

Part or	Item	Task Statement and Instruction	Est.	Min.	Thresholds		
Component	INU		Req	Lev	Run	Pieces	Freq.
			(min)		Hours	Fed (000)	
		Verify there is room for the incoming train on			1		
		the maintenance platform.					
		7. Click on "Move To".					
		B. To confirm, click on "Yes".					
		9. Click on "OK".					
		0. Observe that the selected train moves to and stops on the maintenance platform.					
		1. On the Control and Display Panel at the rear of the tug, switch the Manual/Auto switch to the "MANUAL" position.					
PLC CPU BATTERY	3.	Replace PLC Processor Module Battery.	3	10			
		WARNING					
		The PLC battery must be replaced with the PLC processor energized to prevent losing the data in the processor internal memory. ELECTRICAL SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN PERFORMING THIS PROCEDURE.					
		<ol> <li>Raise the control unit on the left side of the tug and secure with the rod on the inside of the hood.</li> </ol>					
		2. Locate the PLC CPU module.					
		<ol> <li>On the front of the CPU is a hinged cover. Open the cover and on the left side is the battery.</li> </ol>					
		<ol> <li>Disconnect the white connector (with the red and black wires attached) from the post.</li> </ol>					
		<ol> <li>Remove the battery and install a new battery.</li> </ol>					
		6. Secure the connector to the post.					
		7. Insert the battery in the battery holder.					
		3. Close the cover on the CPU.					
		9. Secure the hood rod and close the tug hood.					

MMO-095-13 Maintenance Technical Support Center U.S. Postal Service EQUIPMENT ACRONYM CLASS CODE WORK NUMBER TYPE **Maintenance Checklist** CODE S 0 3 Т Μ С 0 0 4 Μ А Equipment Nomenclature Bulletin Filename Equipment Model Occurrence **Tray Sorting Machine** mm13049ae Annually NovaSort

Part or Component	Item	Task Statement and Instruction	Est. Time	Min. Skill		Threshold	s
Component		(Comply with all current safety precautions)	Req (min)	Lev	Run Hours	Pieces Fed (000)	Freq.
F				•d			1
		WARNING					
		The replaced battery must be disposed					
		of in accordance with local EPA					
		contact your District Environmental					
		Compliance Coordinator.			L		
		WARNING					
		Be cautious when working around or on equipment when power has been applied.					
TRAIN	4.	Return Train to Service.	5	9			
		<ol> <li>Ensure the E-STOP mushroom switch on the tug is out.</li> </ol>					
		<ol> <li>Place the tug Manual/Auto switch in the "AUTO" position.</li> </ol>					
		<ol> <li>Log-in at the client computer on the maintenance platform.</li> </ol>					
		<ol> <li>Go to the main Graphic user screen and click on "F12", NovaSort.</li> </ol>					
		5. Click on the Control Panel.					
		<ol> <li>Under Select Train, click on the tug number to be restarted.</li> </ol>					
		7. Click on "START".					
		8. To confirm, click on "YES".					
		9. Click on "OK".					
		10. Observe that the train automatically enters the loop when there is a break in traffic.					
CLEAN-UP	5.	Clean-Up.	3	All			
		WARNING					
		Discard or dispose of chemical-soaked rags according to MSDS and in accordance with local procedures.					
		Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to your supervisor.					