

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.

A handwritten signature in black ink, appearing to read 'Wm for', is written over a faint, illegible printed name.

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

U.S. Postal Service Maintenance Checklist		IDENTIFICATION												
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER		TYPE
		0	3	T	S	M				C	A	0	0	1
Equipment Nomenclature Tray Sorting Machine NovaSort		Equipment Model						Bulletin Filename mm13049ae				Occurrence Daily		

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

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 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.	3	All			
	2.	Check for Trolley Faults. NOTE 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. 1. Using the appropriate software commands check all trolleys on each train for excessive "Still Loaded" and "No Discharge" faults. 2. Take note and disable from operation each trolley with an excessive number of faults. 3. Log-off the client computer.	3 per train	9			

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CLEAN-UP	3.	CLEAN-UP. Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all defective trolleys to your supervisor.	2	All			
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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

U.S. Postal Service Maintenance Checklist	IDENTIFICATION													
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	0	3	T	S	M					C	A	0	0	2
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Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

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 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.	3	All			
TRAIN	2.	Take Train out of Service. 1. On the maintenance platform, log-in at the client computer. 2. Go to the Main Graphic User screen and click on "F12", NovaSort. 3. Click on Control Panel. 4. Under Select Train, click on the tug number to be shutdown for inspection / maintenance. 5. Under Select Segment Group and Route for moving, click on the desired train destination (i.e. Maintenance, Parking or Maintenance / Parking).	10	9			

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		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". 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. 12. 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".					
BRANCH RAIL	3.	Take Branch Rail out of Service. 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.	3	All			
TRAIN	4.	General Cleaning. 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. 3. Visually check for loose debris and loose or damaged components.	15	7			
TUG COLLECTOR SHOES	5.	Clean and Inspect Tug Collector Shoes. NOTE Refer to Figure 1 when performing this procedure. 1. Unplug and open the collector shoe hinge plate. 2. Clean collector shoe assemblies.	4	7			

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		3. Check collector shoe arms for freedom of movement (smooth full range of motion) and for signs of uneven wear, pitting due to arcing. 4. Check conductors, spade connectors, flexible cables and other electrical connections for tightness, damage, chaffing, discoloration, or overheating. 5. 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). 6. Close the collector shoe hinge plate.					
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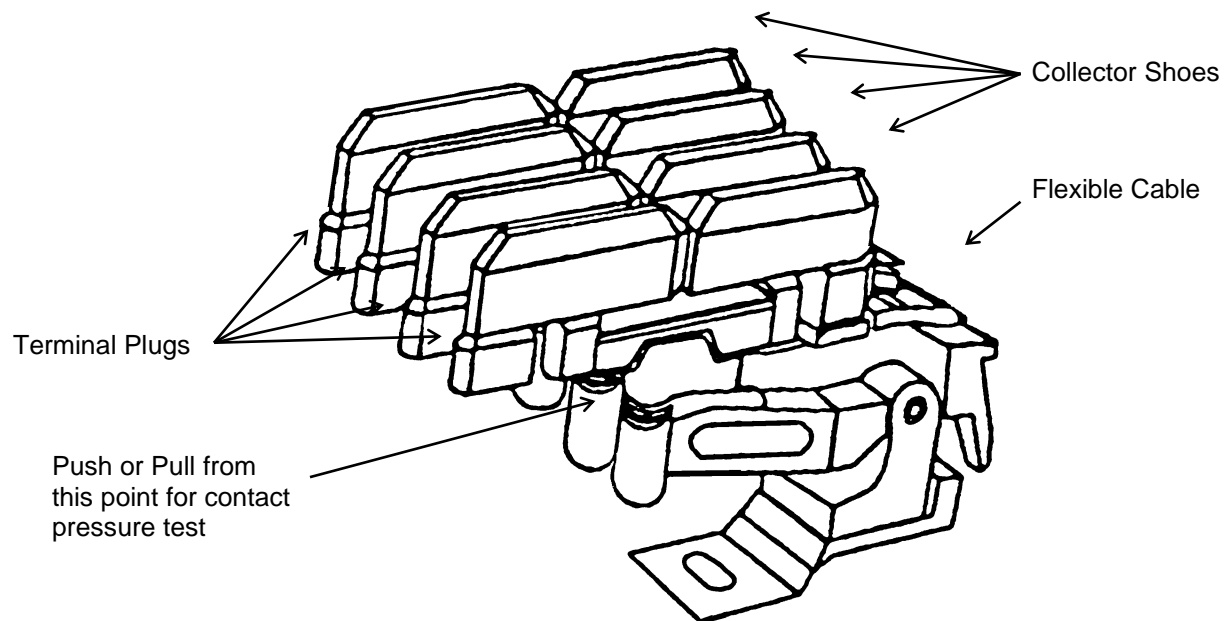


Figure 1. Collector Shoe Assembly

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TUG DRIVE, GUIDE, AND TENSION WHEELS	6.	Check Tug Drive, Guide, and Tension Wheels. <ol style="list-style-type: none"> Check wheels for damage, misalignment, and excessive wear. Measure pinch wheel springs, outside to outside dimension should be 60mm (~ 2.362 inches), adjust if necessary. 	5	7			
DRIVE BELT	7.	Check Drive Belt. <ol style="list-style-type: none"> Check drive belt for wear, frayed edges, pieces missing, etc. Inspect wheels for damage, misalignment, and excessive wear. Check the drive belt for looseness. 	1	7			
GEAR REDUCER	8.	Check Gear Reducer Oil. <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px 0;">CAUTION</div> <p>Do not allow the gear oil to come in contact with the drive belt or drive wheels.</p> <p>Remove the pipe plug in the rear of the gear reducer and check for the presence of oil.</p> <p style="text-align: center;">NOTE</p> <p>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.</p>	4	7			
RAIL BRUSH	9.	Check Rail Cleaning Brush. <p>Check the rail cleaning brush in front of the drive unit to ensure contact with the rail, adjust if necessary.</p>	1	7			
TROLLEYS	10.	Check NovaSort Trolleys. <ol style="list-style-type: none"> Manually check the trolley trip mechanism (ensure that the CAM followers are in place and move freely). Check and clean all sensors and caboose reflector with a clean dry towel. Check the AS-I cables for damage. 	2 per trolley	7			

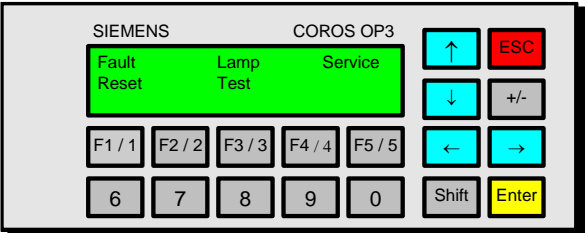
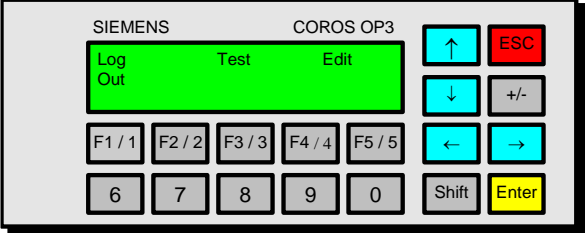
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		4. Check the tow bar between the trolleys, including the retaining clip on the clevis pin. 5. Check all trolley wheels for freedom of movement. Check the two (2) adjustable wheels for proper clearance. Make adjustments as necessary. 6. Check wheels for damage, misalignment, and excessive wear. 7. Clean if necessary.					
		<div style="border: 1px solid black; padding: 5px; text-align: center;">WARNING</div> <p>Be cautious when working around or on equipment when power has been applied.</p>					
BRANCH RAIL	11.	Return Branch Rail to Service. Remove LOCKOUT/TAGOUT device from the disconnect panel and place the disconnect in the "ON" position.	3	All			
TROLLEY FUNCTIONALITY	12.	Test Trolley Functionality using OP3 Unit. <p style="text-align: center;">NOTE</p> <p>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.</p> <p style="text-align: center;">NOTE</p> <p>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.</p> <p>The functions of the TTP are:</p> <ul style="list-style-type: none"> • solenoid activation up • solenoid activation down • infrared sensor transmit <p>Trolley status can be observed on the OP3 display. The possible messages are:</p> <ul style="list-style-type: none"> • trolley top centered (CENT) • trolley loaded (LOAD) • receiver up or down (RX UP or RX DOWN) 	20	9			

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		<div style="border: 1px solid black; padding: 5px; text-align: center;">CAUTION</div> <p>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.</p> <p>TEST PREPARATION:</p> <ol style="list-style-type: none"> 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.  <p style="text-align: center;">Figure 2</p> <ol style="list-style-type: none"> Press the Forward (→) button twice and the following Screen will appear.  <p style="text-align: center;">Figure 3</p> <ol style="list-style-type: none"> 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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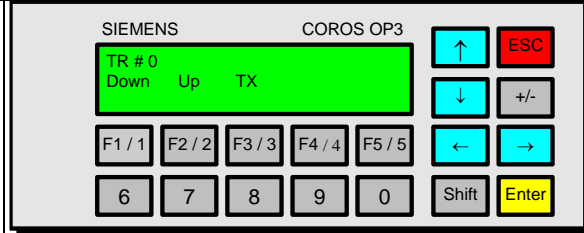


Figure 4

OPERATING INSTRUCTIONS (Fast Test):Selecting a trolley:

Choose the particular trolley that will be tested by typing the trolley number followed by the Enter button on the OP3 numeric keypad. The number entered will appear in the variable field adjacent to the text TR#. Valid trolley numbers depend on the number of trolleys attached to the tug by AS-I communication and is noted by the OP3 software. Move from Trolley Number to Trolley Number and check to see if the trolley is loaded or centered.

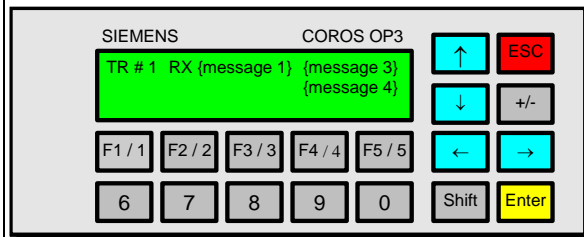


Figure 5

Trolley loaded:

When the trolley is loaded for any reason or the tray loaded sensors are blocked the message LOAD will be displayed on the OP3 in its variable field {message3}.

Tray top centered:

When the tray top is centered (horizontal), the message CENT will be displayed on the OP3 in its variable field {message 4}.

Selecting trolley number zero:

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		<p>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 (→) or Reverse (←) buttons are pushed.</p> <p>To test receive infrared units and tipper solenoids, as well as the functionality of the 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.</p> <p>OPERATING INSTRUCTIONS (Standard Test):</p> <p><u>Testing tipper solenoids:</u></p> <p>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.</p> <p><u>Testing the infrared trolley transmitter:</u></p> <p>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.</p> <p><u>Received tipper signal:</u></p> <p>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</p>					
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		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.					
EMERGENCY STOP	13.	Emergency Stop Test. NOTE This procedure will test the Emergency "E" Stop on the front of the tug. 1. With the Manual/Auto switch in the "MANUAL" position, depress the "E-STOP" mushroom switch on the front of the tug. 2. The E-STOP mushroom switch illuminates. 3. On the Control and Display Panel of the tug, depress the forward and then the reverse momentary switches. The tug should NOT move. 4. Go to the front of the tug and pull the E-STOP mushroom switch out.	1	7			
COLLISION AVOIDANCE SENSOR TEST	14.	Collision Avoidance Sensor Test. 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: 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 area (See Figure 7).	6	9			

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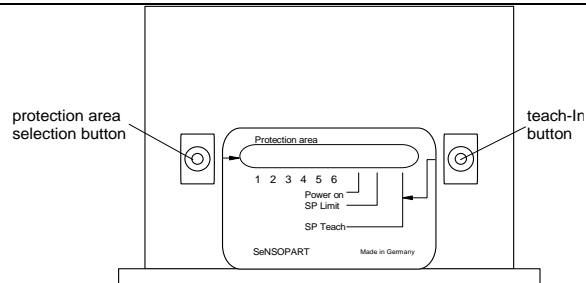


Figure 6. Collision Avoidance Sensor

FR 85, Part #: 150-0380-001

TESTING:

1. Switch tug to MANUAL. Press "Shutdown" to ensure all trolleys are addressed zero.
2. Switch the tug PLC-Key into the STOP position. Now the respective operating point of each protection area can be tested / set.
3. Select the desired protection area by pushing the protection area selection button (see Figure 6). The selected protection area is signaled by the respective yellow protection area LED. For the available protection areas, see Figure 7 below.
4. Position reflecting foil (caboose) straight ahead in front of the sensor a distance of 3.5 meters (~ 138 inches) to check / teach-in protection areas 2, 3, 4, 5, and 6. Place reflector a distance of 1.5 meters (~ 59 inches) to check / teach-in protection area 1. Check each protection area to ensure the SP-Teach LED illuminates while caboose is moved within the range of the respective protection area.

ADJUSTING:

NOTE

Should the SP-Teach LED not illuminate while moving the caboose within the prescribed distance, readjust the sensor by following the instructions below.

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		<ol style="list-style-type: none"> 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. Check the switching point by removing the reflector and re-approaching to the taught-in operation point. 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. After checking / adjusting all areas, switch the tug PLC-Key into the RUN position. Press "Start Up" and check the configuration of the trolleys at the CP 342-2 's LEDs. 					
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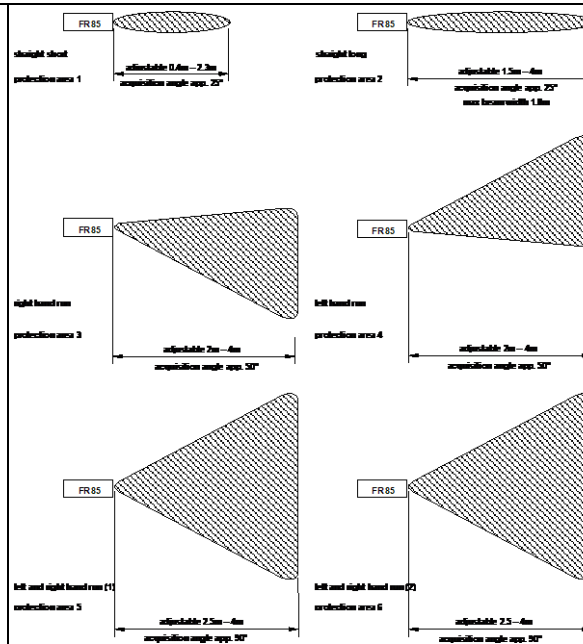


Figure 7. Protection Areas

OBSTACLE DETECTION SENSOR	15.	Obstacle Detection Sensor Test. NOTE The 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			
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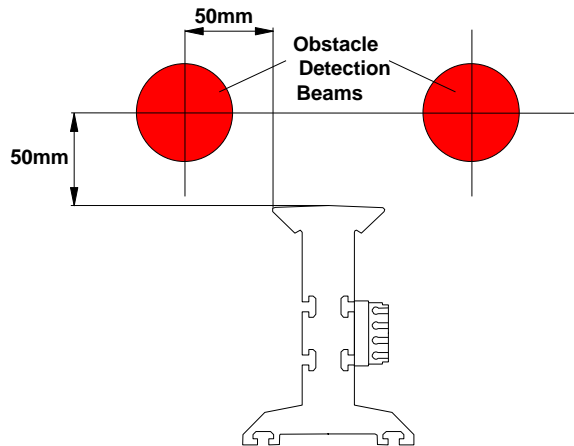


Figure 8. Detection Area

PREPARATION:

The sensor is equipped with:

- Output Signal indicator; yellow LED
- Operating Voltage indicator; green LED
- Contamination indicator; switching LED (green to red)
- Sensitivity adjustment potentiometer with numerical display

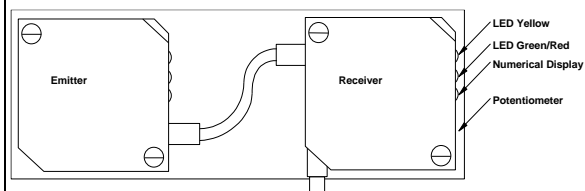


Figure 9. Obstacle Detection Sensor

Mount the Obstacle Detection Adjustment Tool 700mm (~ 27.5 inches) in front of the tug. Ensure the green LED is illuminated, indicating that operational power is supplied.

U.S. Postal Service Maintenance Checklist		IDENTIFICATION													
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER		TYPE	
		0	3	T	S	M				C	A	0	0	2	M
Equipment Nomenclature Tray Sorting Machine NovaSort		Equipment Model						Bulletin Filename mm13049ae				Occurrence Monthly			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

		TESTING: <ol style="list-style-type: none"> 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. If the yellow LED does not illuminate within the specified distance, follow the adjustment procedure below. ADJUSTING: <ol style="list-style-type: none"> Reposition the Adjustment Tool 700mm in front of the tug. Loosen the sensor bracket mounting bolts. Position the mounting bracket so that the scanning beam shines within the window indicated on the Adjustment Tool. See Figure 8. Tighten the bracket mounting bolts. Turn the Sensitivity adjustment potentiometer counter clockwise until the yellow LED illuminates. Recheck the sensor by following the testing procedures above. 					
		<div style="border: 1px solid black; padding: 2px; text-align: center;">WARNING</div> <p>Be cautious when working around or on equipment when power has been applied.</p>					
TRAIN	16.	Return Train to Service. <ol style="list-style-type: none"> Ensure the E-STOP mushroom switch on the tug is out. Place the tug Manual/Auto switch in the "AUTO" position. Log-in at the client computer on the maintenance platform. Go to the main Graphic user screen and click on "F12", NovaSort. Click on the Control Panel. 	5	9			

U.S. Postal Service		IDENTIFICATION													
Maintenance Checklist		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
		0	3	T	S	M				C	A	0	0	2	M
Equipment Nomenclature Tray Sorting Machine NovaSort		Equipment Model						Bulletin Filename mm13049ae			Occurrence Monthly				

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

		6. Under Select Train, click on the tug number to be restarted. 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	17.	Clean-Up. <div style="border: 1px solid black; padding: 5px; text-align: center;">WARNING</div> 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.	3	All			

ATTACHMENT 4

TSM MASTER CHECKLIST

03-TSM-CA-003-M

QUARTERLY

Time Total: 57 minutes per train

U.S. Postal Service Maintenance Checklist		IDENTIFICATION												
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER		TYPE
		0	3	T	S	M				C	A	0	0	3 M
Equipment Nomenclature Tray Sorting Machine NovaSort		Equipment Model						Bulletin Filename mm13049ae			Occurrence Quarterly			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

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 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.	3	All			
	2.	Take Train out of Service. 1. On the maintenance platform, log-in at the client computer. 2. Go to the Main Graphic User screen and click on "F12", NovaSort. 3. Click on Control Panel. 4. Under Select Train, click on the tug number to be shutdown for inspection / maintenance. 5. Under Select Segment Group and Route for moving, click on the desired train destination (i.e. Maintenance, Parking or Maintenance / Parking).	10	9			

U.S. Postal Service Maintenance Checklist	IDENTIFICATION														
	WORK CODE	EQUIPMENT ACRONYM						CLASS CODE	NUMBER			TYPE			
	0 3	T S M					C A	0 0 3	M						
Equipment Nomenclature Tray Sorting Machine NovaSort	Equipment Model						Bulletin Filename mm13049ae			Occurrence Quarterly					

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

		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". 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. 12. 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".					
BRANCH RAIL	3.	Take Branch Rail out of Service. 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.	3	All			
GEAR REDUCER	4.	Change Gear Reducer Oil. <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px 0;">WARNING</div> <p>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.</p> <p style="text-align: center;">NOTE</p> <p>Change the oil in the gear reducer every 2,500 operating hours</p> 1. Secure access to any of the fill plugs located in the lower body of the gear reducer. 2. Follow manufacturer's instructions for the vacuum kit (Siemens SEN 8671) and remove the oil from the gear reducer using	20	7			

U.S. Postal Service Maintenance Checklist	IDENTIFICATION													
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
	0	3	T	S	M					C	A	0	0	3
Equipment Nomenclature Tray Sorting Machine NovaSort	Equipment Model						Bulletin Filename mm13049ae				Occurrence Quarterly			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

		the vacuum kit. <div style="border: 1px solid black; padding: 2px; text-align: center;">CAUTION</div> <p>Using the drain plug to drain the oil is not recommended. This is to prevent the possibility of oil leakage onto the drive wheels.</p> <p>3. Refill the gear reducer with four pints of Mobil 600W Super Cylinder Oil, AGMA Compound 7 (Siemens Part No. 200-1128-001).</p> <p>4. Reinstall fill plug and wipe-up any excess oil.</p>					
TUG DRIVE WHEELS	5.	<p>Clean Tug Drive Wheels.</p> <p>Using soap and water and clean the two drive wheels. Ensure that the entire face of each wheel is clean.</p> <p style="text-align: center;">NOTE</p> <p>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.</p>	10	7			
		<div style="border: 1px solid black; padding: 2px; text-align: center;">WARNING</div> <p>Be cautious when working around or on equipment when power has been applied.</p>					
BRANCH RAIL	6.	<p>Return Branch Rail to Service.</p> <p>Remove your LOCKOUT/TAGOUT device from the disconnect panel and place the disconnect in the "ON" position.</p>	3	All			

U.S. Postal Service Maintenance Checklist		IDENTIFICATION													
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
		0	3	T	S	M				C	A	0	0	3	M
Equipment Nomenclature Tray Sorting Machine NovaSort		Equipment Model						Bulletin Filename mm13049ae			Occurrence Quarterly				

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

TRAIN	7.	Return Train to Service. 1. Ensure the E-STOP mushroom switch on the tug is out. 2. Place the tug Manual/Auto switch in the "AUTO" position. 3. Log-in at the client computer on the maintenance platform. 4. Go to the main Graphic user screen and click on "F12", NovaSort. 5. Click on the Control Panel. 6. Under Select Train, click on the tug number to be restarted. 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.	5	9			
	8.	Clean-Up. Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to your supervisor.	3	All			

U.S. Postal Service Maintenance Checklist	IDENTIFICATION													
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
	0	3	T	S	M					C	A	0	0	3
Equipment Nomenclature Tray Sorting Machine NovaSort	Equipment Model						Bulletin Filename mm13049ae				Occurrence Quarterly			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					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 Maintenance Checklist	IDENTIFICATION													
	WORK CODE	EQUIPMENT ACRONYM						CLASS CODE	NUMBER			TYPE		
	0 3	T S M				C A	0 0 4		M					
Equipment Nomenclature Tray Sorting Machine NovaSort	Equipment Model						Bulletin Filename mm13049ae			Occurrence Annually				

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

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 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.	3	All			
TRAIN	2.	Take Train out of Service. 1. On the maintenance platform, log-in at the client computer. 2. Go to the Main Graphic User screen and click on "F12", NovaSort. 3. Click on Control Panel. 4. Under Select Train, click on the tug number to be shutdown for inspection / maintenance. 5. Under Select Segment Group and Route for moving, click on the desired train destination (i.e. Maintenance, Parking or Maintenance / Parking).	10	9			

U.S. Postal Service Maintenance Checklist		IDENTIFICATION												
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER		TYPE
		0	3	T	S	M				C	A	0	0	4 M
Equipment Nomenclature Tray Sorting Machine NovaSort		Equipment Model						Bulletin Filename mm13049ae			Occurrence Annually			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

		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". 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.					
PLC CPU BATTERY	3.	Replace PLC Processor Module Battery. <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px 0;">WARNING</div> <p>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.</p> 1. Raise the control unit on the left side of the tug and secure with the rod on the inside of the hood. 2. Locate the PLC CPU module. 3. On the front of the CPU is a hinged cover. Open the cover and on the left side is the battery. 4. Disconnect the white connector (with the red and black wires attached) from the post. 5. Remove the battery and install a new battery. 6. Secure the connector to the post. 7. Insert the battery in the battery holder. 8. Close the cover on the CPU. 9. Secure the hood rod and close the tug hood.	3	10			

U.S. Postal Service Maintenance Checklist	IDENTIFICATION													
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
	0	3	T	S	M					C	A	0	0	4
Equipment Nomenclature Tray Sorting Machine NovaSort	Equipment Model						Bulletin Filename mm13049ae				Occurrence Annually			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds		
					Run Hours	Pieces Fed (000)	Freq.

		<div>WARNING</div> <p>The replaced battery must be disposed of in accordance with local EPA regulations. For required information, contact your District Environmental Compliance Coordinator.</p>					
		<div>WARNING</div> <p>Be cautious when working around or on equipment when power has been applied.</p>					
TRAIN	4.	Return Train to Service. <ol style="list-style-type: none"> 1. Ensure the E-STOP mushroom switch on the tug is out. 2. Place the tug Manual/Auto switch in the "AUTO" position. 3. Log-in at the client computer on the maintenance platform. 4. Go to the main Graphic user screen and click on "F12", NovaSort. 5. Click on the Control Panel. 6. Under Select Train, click on the tug number to be restarted. 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. 	5	9			
CLEAN-UP	5.	Clean-Up. <div>WARNING</div> <p>Discard or dispose of chemical-soaked rags according to MSDS and in accordance with local procedures.</p> <p>Ensure all tools, lubricants, rags, etc., are removed from the work area. Report all deficiencies to your supervisor.</p>	3	All			