



Maintenance Management Order

SUBJECT: Preventive Maintenance Servicing Guidelines for
Lockheed Martin (LM) Tray Management System
(TMS) - Vertical Transfer Unit (VTU) - CIPRO Lift
TO: All LM VTU Sites

DATE: August 17, 2010
NO: MMO-083-10
FILE CODE: TM2
rorn:mm09078ae

This Maintenance Management Order (MMO) provides Operational and Preventive Maintenance Guidelines for the LM TMS VTU - CIPRO Lift. The acronym is VTU. The class code is AA.

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

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.

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.

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.

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
Maintenance Policies and Programs

Attachments:

1. Summary of Workload Estimate
2. LM TMS VTU CIPRO Lift: Master Checklist: 03-VTU-AA-501-M: Monthly
3. LM TMS VTU CIPRO Lift: Master Checklist: 03-VTU-AA-502-M: Quarterly

ATTACHMENT 1

SUMMARY

WORKLOAD ESTIMATE

FOR

LM TMS VTU CIPRO LIFT

**SUMMARY
WORKLOAD ESTIMATE**

Days	Routine Servicing (hrs/yr)	Repair* (hrs/yr)	Total Servicing & Repair Time (hrs/yr)	Nonproductive Time ** (hrs/yr)	Total Servicing Per Machine (hrs/yr)
5 Day	10.67	3.20	13.87	1.39	15.25
6 Day	10.67	3.20	13.87	1.39	15.25
7 Day	10.67	3.20	13.87	1.39	15.25

NOTES:

*Repair estimates based on 30% of servicing.

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

ATTACHMENT 2

LM TMS VTU CIPRO LIFT

MASTER CHECKLIST

03-VTU-AA-501-M

MONTHLY

Time Total: 44 Minutes

Refer to the MS-234 if additional maintenance information is required.

The time for Task 7 was based on a CIPRO unit with platform travel of 45". Time for Task 7 may vary slightly for CIPRO units with platform travel significantly different than 45".

U.S. Postal Service Maintenance Checklist	IDENTIFICATION														
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE	
	0	3	V	T	U					A	A	5	0	1	M
Equipment Nomenclature LM TMS VTU			Equipment Model CIPRO Lift						Bulletin Filename MM9078AE			Frequency 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)	Time Period

SAFETY STATEMENT

- | | | | |
|----|-------------------------------------|---|-----|
| 1. | COMPLY WITH ALL SAFETY PRECAUTIONS. | 2 | All |
|----|-------------------------------------|---|-----|
- 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.
- THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.**
- When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner, a damp cloth, lint-free cloth, or brush, must be used in place of compressed or blown air. Report safety deficiencies to your supervisor immediately upon detection.

WARNING

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

BRAKE CHECK

- | | | | |
|----|--------------|---|---|
| 2. | Check brake. | 1 | 9 |
|----|--------------|---|---|
1. Put the CIPRO in manual (MAN) mode.
 2. Jog the lift platform forward several times. While jogging the lift platform, it should start and stop abruptly, indicating proper brake operation. If there is noticeable coasting or the braking is not abrupt, notify supervisor.

CONVEYOR ROLLERS

- | | | | |
|----|---|---|---|
| 3. | Check operation of conveyor rollers (Phase 3A and/or Phase 3B). | 1 | 9 |
|----|---|---|---|
1. Use the LIFT FWD/REV button to position the lift platform at the bottom.
 2. Verify the conveyor rollers are in contact with the belt and are being driven properly (use JOG CONVEYOR button).
 3. If the operation is not smooth, check the belt, belt sheaves, position of belt sheaves, and belt tension.

U.S. Postal Service Maintenance Checklist	IDENTIFICATION																
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE			
	0	3	V	T	U					A	A	5	0	1	M		
Equipment Nomenclature LM TMS VTU			Equipment Model CIPRO Lift						Bulletin Filename MM9078AE			Frequency 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)	Time Period

4. If the belt or belt sheaves are found defective, or the belt tension or positioning of the belt sheaves is incorrect, notify supervisor.

Check operation of Phase 3B conveyor rollers. Check for broken or slipping O-rings. If these conditions exist, notify supervisor.

POWER DOWN	4.	Power down and lock out power. Power down the machine and lock out its power as prescribed by the current local lockout/restore procedures.	1	9
------------	----	--	---	---

CHAIN INSPECTION	5.	Check lift chain, drive chain, and counterweight chain tension.	3	9
------------------	----	--	---	---

1. Remove the upper and lower access panels.
2. Check the tension of each lift chain by pushing a 2 foot long framing square, or equivalent, into each lift chain at its center with the platform down. There should be 1/2" to 1" of slack in each lift chain.
3. If tension of either lift chain is incorrect, notify supervisor.
4. With the lift platform down, measure the tension in the 2 upper counterweight chains at the lift chain center, and measure the counterweight chain under the lift platform at its mid-point. Each of the 3 counterweight chains should have 1" to 3" of slack when the lift platform is down.
5. If the slack is not correct in each counterweight chain, notify supervisor.
6. Check the two (short) drive chains by placing a straight edge across both sprockets along the length of each drive chain.
7. Press down on each drive chain, midway between the 2 sprockets. There should be between 1/4" and 3/8" of slack in each chain (between the chain and the edge of the straight edge). If the slack is not correct, notify supervisor.

U.S. Postal Service Maintenance Checklist	IDENTIFICATION														
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE	
	0	3	V	T	U					A	A	5	0	1	M
Equipment Nomenclature LM TMS VTU			Equipment Model CIPRO Lift						Bulletin Filename MM9078AE			Frequency 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)	Time Period

SPROCKET
ALIGNMENT

6. **Check sprocket alignment of lift chain, drive chain and counterweight chain.** Visually check the chain and sprocket alignment of the lift chains, drive chains, and counterweight chains. Remove, if necessary, the chain guard at the top of the CIPRO to check the top counterweight chains and sprockets for proper alignment. Each chain and its sprockets should run in the same plane visually. If any of the sprockets appear to be running out, notify supervisor. Reinstall the chain guard at top of the CIPRO, if it was removed.

2 9

CARRIAGE
GUIDE ROLLERS

7. **Grease carriage guide rollers and path.**
1. Reinstall all access panels and guards previously removed.

28 9

WARNING

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

2. Restore equipment to service as prescribed by the current local lockout/restore procedures.
3. Place platform in upper position, power down the CIPRO Lift, and lock out its power as prescribed by the current local lockout/restore procedures.

WARNING

Be cautious when working around or under equipment that is suspended. Ensure a safety bar is in place to support the lift platform prior to working underneath the lift platform.

4. Remove upper and lower access panels and place a steel safety bar (approx. 1" diameter and 36" - 40" long) under platform and across CIPRO or conveyor structural members.

U.S. Postal Service Maintenance Checklist		IDENTIFICATION													
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
		0	3	V	T	U					A	A	5	0	1
Equipment Nomenclature LM TMS VTU		Equipment Model CIPRO Lift						Bulletin Filename MM9078AE				Frequency 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)	Time Period

WARNING

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

5. Wipe clean 4 bottom rollers and all upper rollers accessible through both top conveyor openings, before applying grease to rollers.
6. Check that rollers operate smoothly and the mounting bolts are secure.
7. Replace worn or damaged rollers.
8. Apply light coating of grease to 4 bottom rollers, all accessible upper rollers, and from bottom of roller paths up to highest reachable point above top of the bottom access cover.
9. Lubricate all accessible chains inside VLU with 20W non-detergent oil.
10. Remove guard(s) on back of VLU. Check counter weight track. Apply a light coating of grease to the counterweight track. Lubricate counterweight chains and sprockets with 20W non-detergent oil. Reinstall guard(s).
11. Remove steel safety bar; reinstall all access panels and guards.

WARNING

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

12. Restore equipment to service as prescribed by the current local lockout/restore procedures.
13. Move platform to down location, power down CIPRO Lift, and lock out power as prescribed by the current local lockout/restore procedures.

U.S. Postal Service Maintenance Checklist		IDENTIFICATION													
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
		0	3	V	T	U					A	A	5	0	1
Equipment Nomenclature LM TMS VTU		Equipment Model CIPRO Lift						Bulletin Filename MM9078AE				Frequency 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)	Time Period

WARNING

Be cautious when working around or under equipment that is suspended. Ensure a safety bar is in place to support the lift platform prior to working underneath the lift platform.

14. Remove lower and upper access panels and place a steel safety bar (approx. 1" diameter and 36" – 40" long) under platform and across CIPRO or conveyor structural members.
15. Clean, check, and lubricate remaining upper rollers and as much of the roller paths that can be reached from lower and upper conveyor openings and access panel(s).
16. Check and lubricate, using 20W non-detergent oil, all counterweight chains and sprockets and other chains and sprockets not previously accessible.
17. Remove steel safety bar. Reinstall all access panels and guards.

RESTORE TO SERVICE	8.	Restore equipment to service. Restore equipment to service as prescribed by the current local lockout/ restore procedures.	2	9
--------------------	----	---	---	---

SAFETY DEVICE CHECK	9.	Check emergency stop switches, safety sensors, and interlocks.	3	9
---------------------	----	---	---	---

1. Press the LIFT MOTOR PRESET button so PWR ON illuminates. Press each emergency stop switch individually, and verify the PWR ON lamp goes off each time.
2. Press the LIFT MOTOR PRESET button. Open and close each access panel and guard. Verify the PWR ON lamp goes OFF when each panel or guard is opened.
3. Place a tray in the induction port to cause a jam in the unit. Ensure that the jam indicator lamp is on. Clear the jam, and press the LIFT MOTOR PRESET button so the PWR ON lamp illuminates.

U.S. Postal Service Maintenance Checklist	IDENTIFICATION													
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
	0	3	V	T	U					A	A	5	0	1
Equipment Nomenclature LM TMS VTU			Equipment Model CIPRO Lift						Bulletin Filename MM9078AE			Frequency 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)	Time Period

CLEAN UP

10. **Clean up.** Ensure all tools, lubricants, rags, etc., are removed from the work area. Notify supervisor of any deficiencies.

1 All

U.S. Postal Service Maintenance Checklist	IDENTIFICATION														
	WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE	
	0	3	V	T	U					A	A	5	0	1	M
Equipment Nomenclature LM TMS VTU			Equipment Model CIPRO Lift						Bulletin Filename MM9078AE			Frequency 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)	Time Period

THIS PAGE BLANK

ATTACHMENT 3

LM TMS VTU CIPRO LIFT

MASTER CHECKLIST

03-VTU-AA-502-M

QUARTERLY

Time Total: 28 Minutes

U.S. Postal Service		IDENTIFICATION												
Maintenance Checklist		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER		TYPE
		0	3	V	T	U				A	A	5	0	2
Equipment Nomenclature LM TMS VTU		Equipment Model CIPRO Lift						Bulletin Filename MM09078AE			Frequency Quarterly			

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds
-------------------	---------	--	---------------------	----------------	------------

SAFETY STATEMENT

- | | | | |
|----|-------------------------------------|---|-----|
| 1. | COMPLY WITH ALL SAFETY PRECAUTIONS. | 2 | All |
|----|-------------------------------------|---|-----|
- 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.
- THE USE OF COMPRESSED OR BLOWN AIR IS PROHIBITED.**
- When cleaning is required, an alternative cleaning method such as a HEPA filtered vacuum cleaner, a damp cloth, lint-free cloth, or brush, must be used in place of compressed or blown air. Report safety deficiencies to your supervisor immediately upon detection.

WARNING

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

BRAKE INSPECTION

- | | | | |
|----|--------------|---|---|
| 2. | Check brake. | 2 | 9 |
|----|--------------|---|---|
1. Put the lift off-line by switching to MAN mode.
 2. Place an approximately 50-pound tray on the lift platform.
 3. Jog the lift forward and observe how quickly it stops. The lift should stop quickly with no noticeable coasting (less than ½ second).
 4. Power down CIPRO Lift, and lock out power as prescribed by the current local lockout/restore procedures.
 5. Remove the test tray.
 6. If lift stops slowly or slips backward when stopped, notify supervisor.

AIR SHUT OFF

- | | | | |
|----|---|---|---|
| 3. | Shut off and lock out compressed air as prescribed by the current local lockout/restore procedures. | 2 | 9 |
|----|---|---|---|

U.S. Postal Service Maintenance Checklist		IDENTIFICATION													
		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
		0	3	V	T	U					A	A	5	0	2
Equipment Nomenclature LM TMS VTU		Equipment Model CIPRO Lift						Bulletin Filename MM09078AE				Frequency Quarterly			
Part or Component		Item No	Task Statement and Instruction (Comply with all current safety precautions)								Est. Time Req (min)	Min. Skill Lev	Thresholds		

WARNING

Eye protection (goggles or face shield) must be worn when releasing fluids from the FRS bowl.

AIR REGULATOR 4. **Clean and adjust air filter regulator.** 4 9

1. Remove the bowl and filter from the filter/regulator. Clean filter with vacuum, brush, clean cloth, or paper wipe.
2. Clean inside of regulator bowl with a clean cloth or paper wipe.
3. Reinstall filter and bowl in filter/regulator.
4. Remove lockout device from compressed air source to the filter/regulator. Restore air pressure to the filter/regulator.
5. Adjust air regulator to 85 PSI pressure.

GEAR REDUCER INSPECTION 5. **Check gear reducers.** 3 9

1. Remove access panel.
2. Check for any signs of leakage around seals in lift drive gear reducer and carriage drive gear reducer.
3. If gear reducer shows signs of leakage, notify supervisor.
4. Reinstall access panel.

WARNING

Be cautious when working around or under equipment that is suspended. Ensure a safety bar is in place to support the lift platform prior to working underneath the lift platform.

SENSOR INSPECTION 6. **Clean sensors.** Using a soft, clean cloth; clean the eyes and reflectors of the 4 sensors (photo eyes) at the stop, lift carriage, lift entrance, and in-feed count positions. If any guards are removed to access the photo eyes or reflectors, ensure the guards are reinstalled. 7 9

U.S. Postal Service		IDENTIFICATION													
Maintenance Checklist		WORK CODE		EQUIPMENT ACRONYM						CLASS CODE		NUMBER			TYPE
		0	3	V	T	U				A	A	5	0	2	M
Equipment Nomenclature LM TMS VTU		Equipment Model CIPRO Lift						Bulletin Filename MM09078AE			Frequency Quarterly				

Part or Component	Item No	Task Statement and Instruction (Comply with all current safety precautions)	Est. Time Req (min)	Min. Skill Lev	Thresholds
-------------------	---------	--	---------------------	----------------	------------

AIR STOP INSPECTION 7. **Test pop-up stop operation.** Activate the air relay manually by pressing the button on the relay end of the air valve with a pen or small screwdriver. The operation of the air stop should be quick, but not so fast as to bang or pound. If required, adjust air exhaust controls for smooth operation. 1 9

LEAK, EXCESSIVE WEAR CHECK 8. **Check for signs of oil leaks or wearing parts.** Check floor for signs of oil leaks or wearing parts (metal filings or chips). 1 9

WARNING

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

AIR CYLINDER CHECK 9. **Check rodless air cylinder.** 2 9

1. Restore equipment to service.
2. With lift in MAN mode, operate manual pusher control.
3. Rodless air cylinder should extend completely and smoothly.
4. Place lift in AUTO mode.

DISPOSE OF MATERIAL 10. **Dispose of lubricant contaminated materials.** Dispose of any materials contaminated by lubricants in accordance with local hazardous waste storage and disposal regulations. 3 9

CLEAN UP 11. **Clean up.** Ensure all tools, lubricants, rags, etc., are removed from the work area. Notify supervisor of any deficiencies. 1 All