



**A Rockwell Automation Company**

## **MagneMover LITE User Manual Addendum, Wheeled Puck**

Catalog Numbers 700-1738-02, 700-1740-03

Although every effort is made to keep this document accurate and up-to-date, MagneMotion® assumes no responsibility for any errors, omissions, or inaccuracies. Information that is provided in this document is subject to change without notice. Any sample code that is referenced in this document or included with MagneMotion software is included for illustration only and is, therefore, unsupported.

MagneMotion®, MagneMover®, QuickStick®, MML™, MM LITE™, and SYNC IT™ are trademarks or registered trademarks of MagneMotion, a Rockwell Automation Company. Rockwell Automation® is a registered trademark of Rockwell Automation, Inc. All other trademarks are properties of their respective owners.

This product is protected under one or more U.S. and International patents. Additional U.S. and International patents are pending.

Copyright © 2017–2020 MagneMotion, Inc., a Rockwell Automation Company. All Rights Reserved.

The information that is included in this document is proprietary or confidential to Rockwell Automation, Inc. Any disclosure, reproduction, use, or redistribution of this information by or to an unintended recipient is prohibited.



MagneMotion, Inc.  
A Rockwell Automation Company  
139 Barnum Road  
Devens, MA 01434  
USA

Phone: +1 978-757-9100  
Fax: +1 978-757-9200

[www.magnemotion.com/](http://www.magnemotion.com/)

## Contents

About This Addendum.....	6
Purpose.....	6
Audience.....	6
Prerequisites.....	6
Reference Documents.....	6
Introduction.....	7
Overview.....	7
Wheeled Puck Option Overview.....	7
Safety.....	9
Overview.....	9
Regulatory Compliance.....	9
Safety Considerations.....	9
Symbol Identification.....	9
Label Identification and Location.....	10
Mechanical, Electrical, Magnetic Hazards.....	12
Recycling and Disposal Information.....	13
Magnet Arrays.....	13
Packaging.....	13
Design Guidelines.....	14
Overview.....	14
Vehicles.....	14
Single Wheeled Puck.....	14
Tandem Wheeled Puck.....	15
Specifications.....	16
Single Wheeled Puck.....	16
Exposed Materials, Puck.....	16
Exposed Materials, Magnet Array.....	16
Tandem Wheeled Puck.....	17
Exposed Materials, Puck.....	17
Exposed Materials, Magnet Array.....	17
Payload Envelope.....	18
Environmental Requirements.....	19
Magnet Arrays and Wheeled Pucks.....	19
Installation.....	20
Unpacking and Moving.....	20
Installing Wheeled Pucks.....	20
Operation.....	21
Motion Limitations.....	21

Configuration .....	24
Single Wheeled Puck .....	24
Tandem Wheeled Puck .....	24
Maintenance .....	25
Preventive Maintenance .....	25
Wear Points Inspection .....	26
Puck Cleaning .....	28
Puck Wear Surface Maintenance .....	30
Troubleshooting .....	31
Repair .....	32
Replace Puck Wear Surfaces .....	33
More Information .....	39
Rockwell Automation Support .....	40

## **Figures**

Figure 1: Detailed View of the MM LITE Single Wheeled Puck .....	7
Figure 2: Detailed View of the MM LITE Tandem Wheeled Puck .....	8
Figure 3: Locations of Labels on the MM LITE Single Wheeled Pucks.....	10
Figure 4: Locations of Labels on the MM LITE Tandem Wheeled Pucks.....	11
Figure 5: Single Wheeled Puck Configuration .....	14
Figure 6: Tandem Wheeled Puck Configuration .....	15
Figure 7: Single Wheeled Puck Mechanical Drawing .....	16
Figure 8: Tandem Wheeled Puck Mechanical Drawing .....	17
Figure 9: Single Wheeled Puck Payload Envelope, 2.5 kg max.....	18
Figure 10: Tandem Wheeled Puck Payload Envelope, 10 kg max.....	18
Figure 11: Vehicle Move Profile .....	21
Figure 12: Wheeled Puck Payload/Velocity Curves.....	22
Figure 13: Wheeled Puck Payload/Acceleration Curves .....	23
Figure 14: Single Wheeled Puck Wear Point Inspection.....	26
Figure 15: Tandem Wheeled Puck Wear Point Inspection.....	27
Figure 16: Single Wheeled Puck Cleaning .....	28
Figure 17: Tandem Wheeled Puck Cleaning .....	28
Figure 18: Replace Single Wheeled Puck Wear Points .....	34
Figure 19: Replace Tandem Wheeled Puck Wear Points .....	35

## **Tables**

Table 1: Labels Used on the MM LITE Single Wheeled Pucks.....	10
Table 2: Labels Used on the MM LITE Tandem Wheeled Pucks.....	11
Table 3: Wheeled Puck Preventive Maintenance Schedule.....	25
Table 4: Troubleshooting.....	31
Table 5: Repair Procedures.....	32

## About This Addendum

This document is an addendum to the *MagneMover LITE User Manual* and describes the wheeled puck vehicle option.

## Purpose

This document explains how to install, operate, and maintain the MagneMover® LITE (MM LITE™) wheeled pucks on an MM LITE transport system. Use this document in combination with the *MagneMover LITE User Manual* and other documentation that accompanies the transport system to design, install, configure, test, and operate a MagneMover LITE system. Instructor-led training classes that provide additional experience are available.

## Audience

This document is intended for all users of MagneMover LITE transport systems and provides information on how to install, configure, and operate the wheeled pucks on MagneMover LITE transport systems.

## Prerequisites

The information and procedures in this manual assume the following:

- Familiarity with personal computers and with the Windows® operating system.
- Full documentation for the transport system is available.
- All personnel operating the transport system are properly trained.

## Reference Documents

- 990000410, MagneMover LITE User Manual

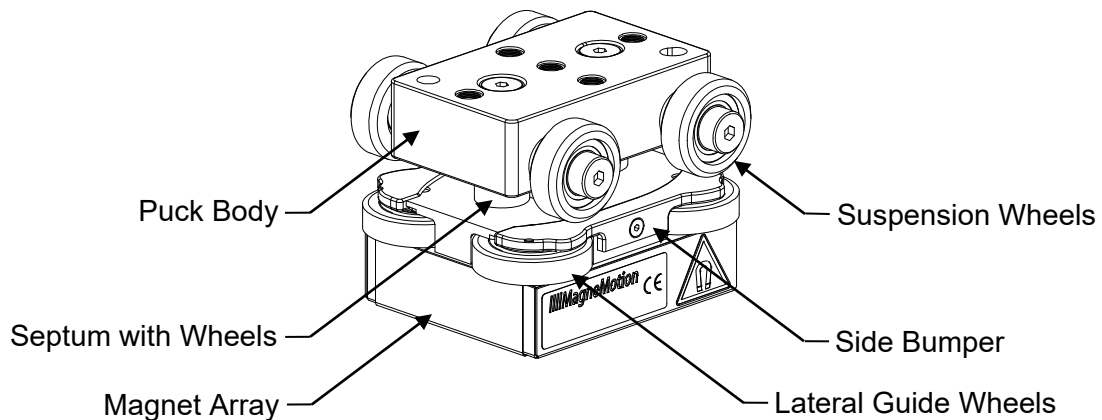
## Introduction

### Overview

This section provides an overview of the MagneMover LITE wheeled puck option (see [Figure 1](#) and [Figure 2](#)).

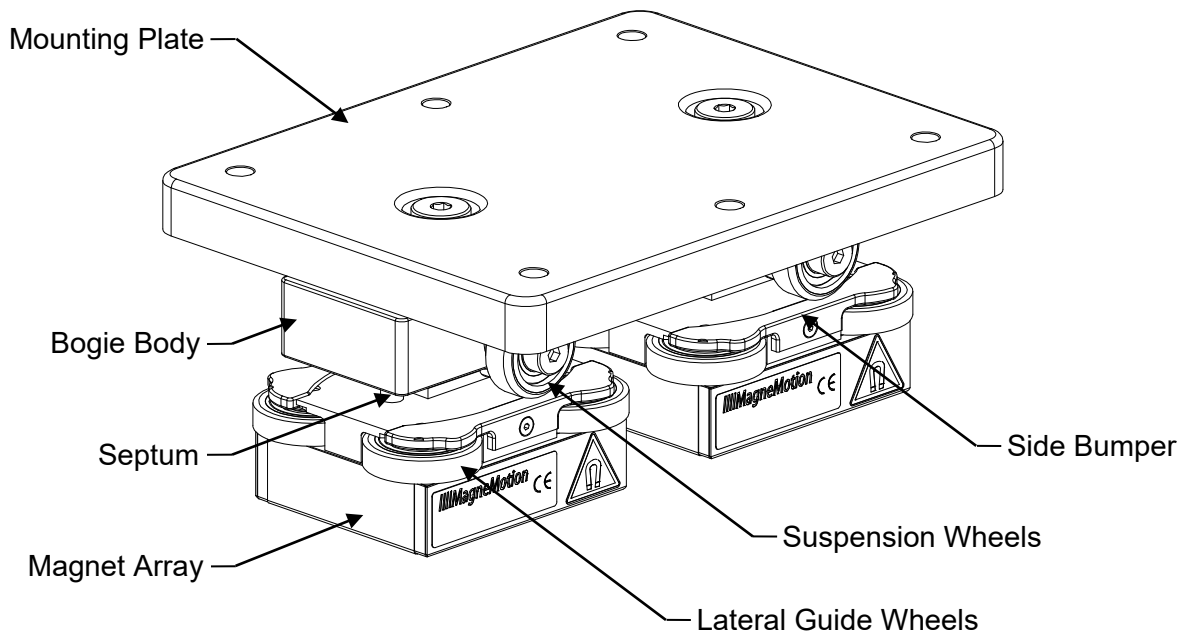
### Wheeled Puck Option Overview

The wheeled pucks ride on the integral rails and carry the payloads through the MM LITE transport system as directed. Single wheeled pucks (see [Figure 1](#)) have a magnet array that is mounted to the surface of the puck body facing the motor that interacts with the motors, which moves each vehicle independently. Tandem wheeled pucks (see [Figure 2](#)) have two independent bogies, where each bogie has a magnet array that is mounted to the surface facing the motor that interacts with the motors, which moves each vehicle independently.



*Figure 1: Detailed View of the MM LITE Single Wheeled Puck*

- **Puck Body** – Supports the magnet array and wheels, and provides a mounting surface for the payload.
- **Lateral Guide Wheels** – Makes sure that the vehicle stays centered in the track.
- **Suspension Wheels** – Provides a low friction support for the vehicle while moving. These may be referred to as ‘Payload Wheels’.
- **Septum with Wheels** – Provides guidance for the vehicle when moving through switches.
- **Side Bumpers** – Provides protection for the bottom of the rails when carrying unbalanced loads or when moving through curves at high velocity.
- **Magnet Array** – Interacts with the motors, which move the vehicle.



*Figure 2: Detailed View of the MM LITE Tandem Wheeled Puck*

- **Bogie Body** – Supports the magnet array and wheels.
- **Mounting Plate** – Supports the bogies and provides a mounting surface for the payload.
- **Lateral Guide Wheels** – Makes sure that the bogies stay centered in the track.
- **Suspension Wheels** – Provides a low friction support for the bogies while moving. These may be referred to as ‘Payload Wheels’.
- **Septum** – Provides guidance for the bogies when moving through switches.
- **Side Bumpers** – Provides protection for the bottom of the rails when carrying unbalanced loads or when moving through curves at high velocity.
- **Magnet Array** – Interacts with the motors, which move the vehicle.



## **Safety**

### **Overview**

This section describes safety guidelines for the wheeled pucks and their use in a transport system. All personnel that are involved in the operation or maintenance of the MM LITE components and system must be familiar with the safety precautions that are described in this section.

### **Regulatory Compliance**

See the *MagneMover LITE User Manual* for all regulatory compliance information.

### **Safety Considerations**

See the *MagneMover LITE User Manual* for all personnel and equipment safety information.



### **Symbol Identification**

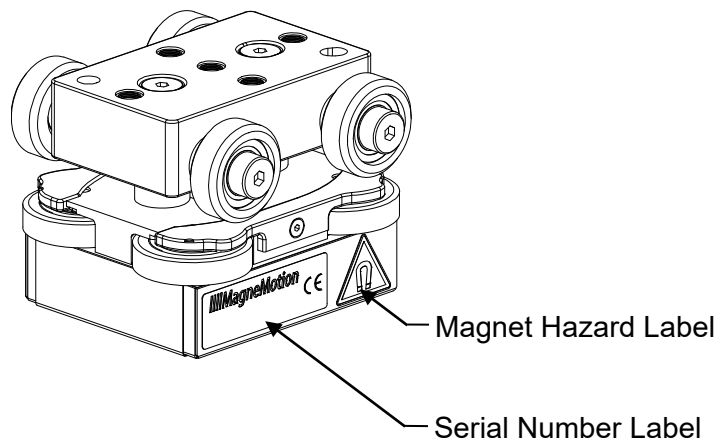
See the *MagneMover LITE User Manual* for all symbol identification and use information.

## Label Identification and Location

There are safety and identification labels on those MagneMover LITE components that require them to provide hazard identification and information about the components at the point of use. This section describes each label, identifies its location, and for safety labels identifies the hazard and possible injuries.



*Table 1: Labels Used on the MM LITE Single Wheeled Pucks*

	<p>Serial Number Label Qty: 2 Location: On the sides of the magnet array</p>
	<p>Magnet Hazard Label Qty: 2 Location: On the sides of the magnet array Hazard Type: Magnetic field Possible injuries: Pinch between magnet arrays, danger to pacemakers and other electronics</p>



*Figure 3: Locations of Labels on the MM LITE Single Wheeled Pucks*

Table 2: Labels Used on the MM LITE Tandem Wheeled Pucks

	<p>Serial Number Label Qty: 4 Location: On the sides of each magnet array</p>
	<p>Magnet Hazard Label Qty: 4 Location: On the sides of each magnet array Hazard Type: Magnetic field Possible injuries: Pinch between magnet arrays, danger to pacemakers and other electronics</p>

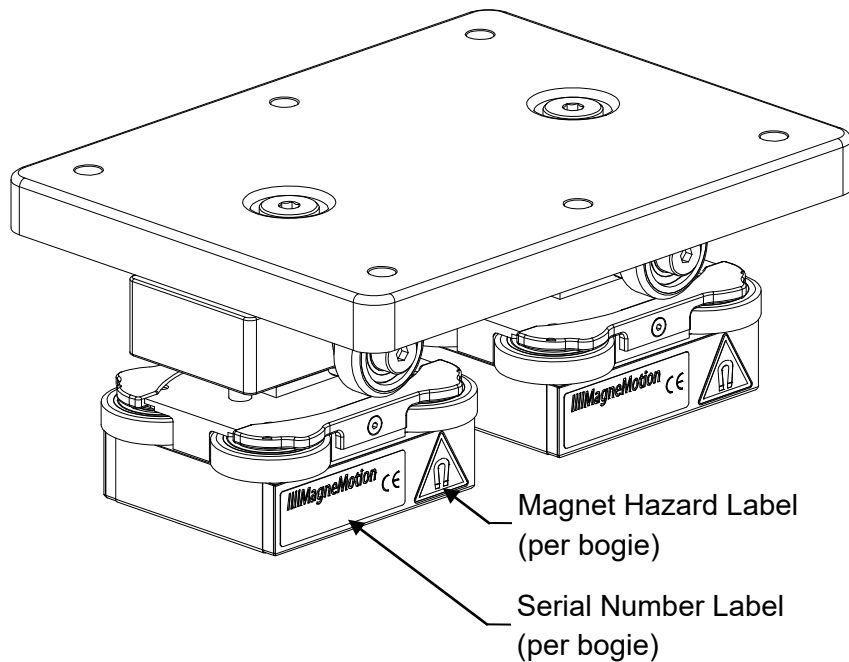




Figure 4: Locations of Labels on the MM LITE Tandem Wheeled Pucks



## Mechanical, Electrical, Magnetic Hazards


See the *MagneMover LITE User Manual* for detailed hazard and safety information.

	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>Loose Material Hazard</b></p> <p>Payloads are susceptible to vector motion forces.</p> <p>Always account for the effects of acceleration, deceleration, and directional changes upon the payload. Control forces to avoid projectile motion of the payload, limit move profiles and/or provide tooling to secure the payload to the puck body.</p>


The MagneMover LITE wheeled puck is typically used to carry larger payloads than the standard MagneMover LITE puck. Due to the higher mass being moved, the wheeled puck presents a greater crush hazard than the standard puck.


	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>Crush/Pinch Hazard</b></p> <p>All moving mechanisms have no obstruction sensors.</p> <p>Do not operate the MagneMover LITE components without barriers in place or personal injury could result in the squeezing or compression of fingers or other body parts between the mechanisms.</p>

 	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>Strong Magnets</b></p> <p>To avoid severe injury, people with pacemakers and other medical electronic implants must stay away from the magnet array on the vehicles (pucks).</p>

	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>Strong Magnets</b></p> <p>To avoid injury from strong magnetic attractive forces:</p> <ul style="list-style-type: none"><li>• Handle only one vehicle (puck) or magnet array at a time.</li><li>• Do not place any body parts, such as fingers, between a vehicle (puck) or magnet array and any ferrous material or another magnet array.</li><li>• Store unused vehicles (pucks) or magnet arrays individually in isolated packaging.</li></ul> <p>To avoid damage to watches, instruments, electronics, and magnetic media, keep metal objects, magnetic media (memory disks/chips, credit cards, and tapes) and electronics away from the magnet arrays.</p>

## Recycling and Disposal Information

 Information regarding disposal and recycling are provided in this section. The wheeled pucks use the following items that require special handling for disposal or recycling. At the end of its life, this equipment must be collected separately from any unsorted municipal waste.

 For China RoHS information, see [https://literature.rockwellautomation.com/idc/groups/literature/documents/td/pec-td003\\_-en-e.pdf](https://literature.rockwellautomation.com/idc/groups/literature/documents/td/pec-td003_-en-e.pdf) and reference Table B.

## Magnet Arrays

The magnet arrays (attached to the wheeled pucks) as the motor secondary contain Neodymium Iron Boron (NdFeB) magnets. If these magnets are being removed or replaced, they must be handled in the following manner:

Follow all safety procedures for the handling of high strength magnets (see Magnetic Hazards in the *MagneMover LITE User Manual*).

Follow all facility, local, and national procedures for the disposal of hazardous materials. All strong permanent magnets must be demagnetized before disposal.

See the *MagneMover LITE User Manual* for additional disposal information.

## Packaging

The packaging for the wheeled pucks contains the following materials. If the packaging is not being saved, it must be disposed of by following all facility, local, and national procedures for the disposal of packaging material:

- Cardboard.
- Polyethylene Foam.

## Design Guidelines

### Overview

Vehicles (pucks) carry payloads through the MagneMover LITE transport system as directed. A high-strength magnet array, described in the *MagneMover LITE User Manual*, is mounted to the surface of the vehicle closest to the motors. The magnet array interacts with the motors, which moves the vehicle.

### Vehicles

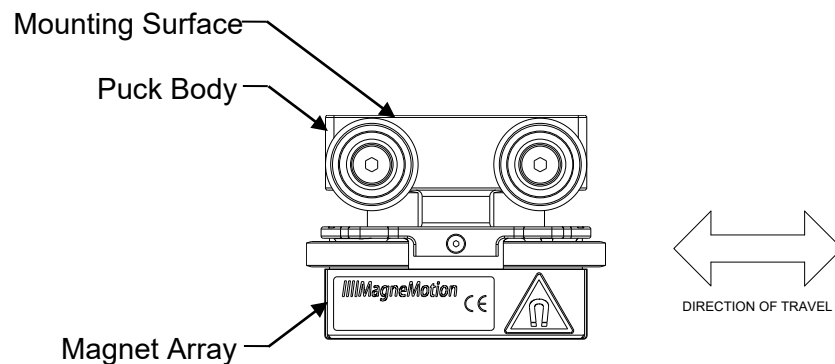
Single wheeled pucks, with one magnet array, are used when the material being moved weighs up to 2.5 kg [5.5 lb]. Tandem wheeled pucks, with two magnet arrays, are used when the material being moved weighs up to 10 kg [22.0 lb]. Contact ICT Customer Support if the load to be carried exceeds these limits.

+1 978-757-9102

[ICTSupport@ra.rockwell.com](mailto:ICTSupport@ra.rockwell.com)

### Single Wheeled Puck

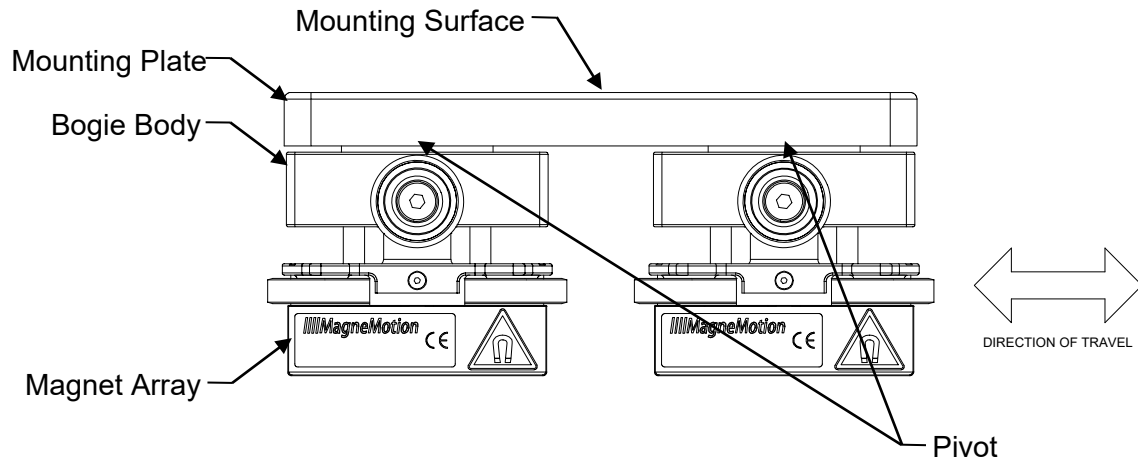
Single wheeled pucks consist of an integrated vehicle with a magnet array. These wheeled pucks are typically used in MagneMover LITE transport systems where the material being moved weighs up to 2.5 kg [5.5 lb].



*Figure 5: Single Wheeled Puck Configuration*

### Tandem Wheeled Puck

Tandem wheeled pucks consist of two independent wheeled bogies that are connected to a mounting plate by pivots, where each bogie has its own magnet array. Tandem wheeled pucks are typically used in MagneMover LITE transport systems where the material being moved weighs up to 10 kg [22.0 lb].



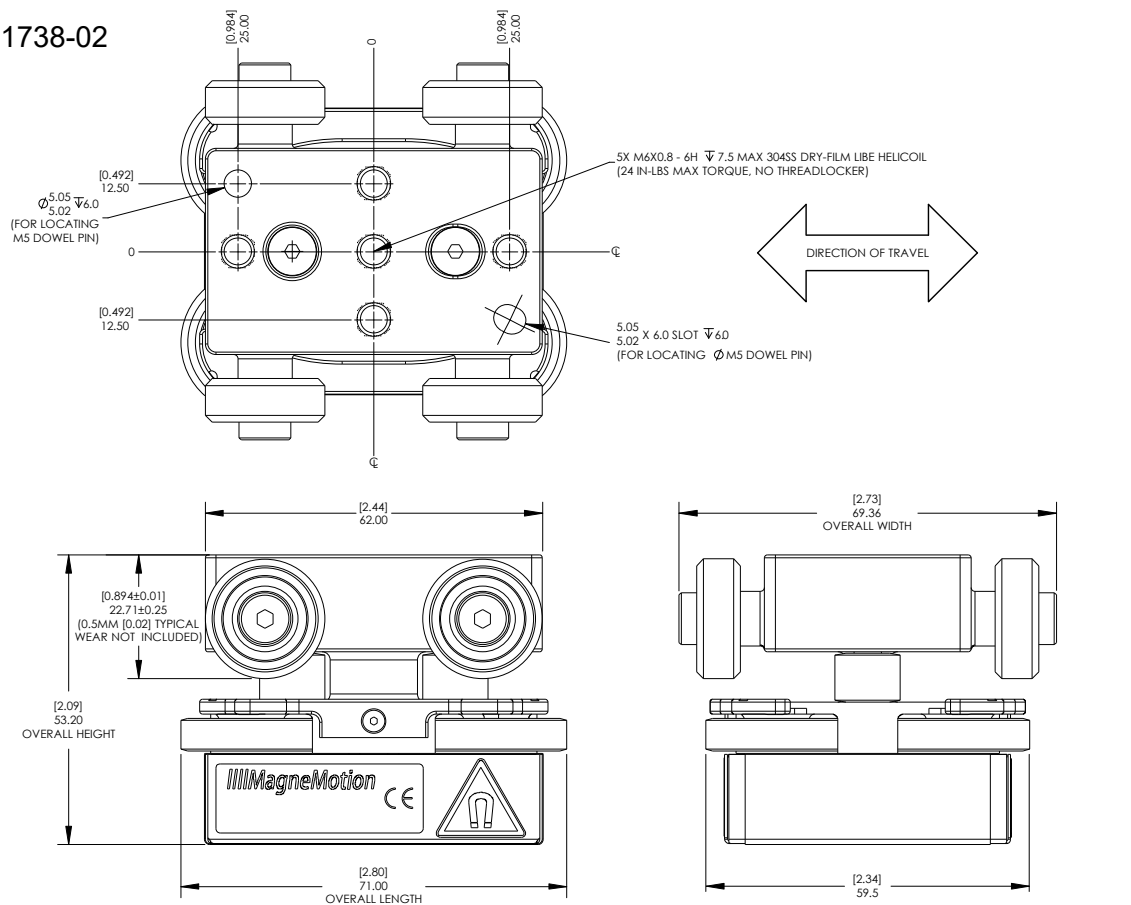
*Figure 6: Tandem Wheeled Puck Configuration*

## Specifications

All drawings within this document are generic and may not reflect specific configurations of the MagneMover LITE wheeled pucks. To obtain current drawings, contact ICT Customer Support.

### Single Wheeled Puck

700-1738-02



Weight: 0.63 kg [1.4 lb]

All Dimensions in Millimeters [Inches]

Figure 7: Single Wheeled Puck Mechanical Drawing

### Exposed Materials, Puck

- 7075-T651 Aluminum, Hard Coat Anodized.
- 6061-T6 Aluminum, Natural.
- 174-PH/18-8/304/316/440C Stainless Steel.
- PEEK.
- Polyurethane.

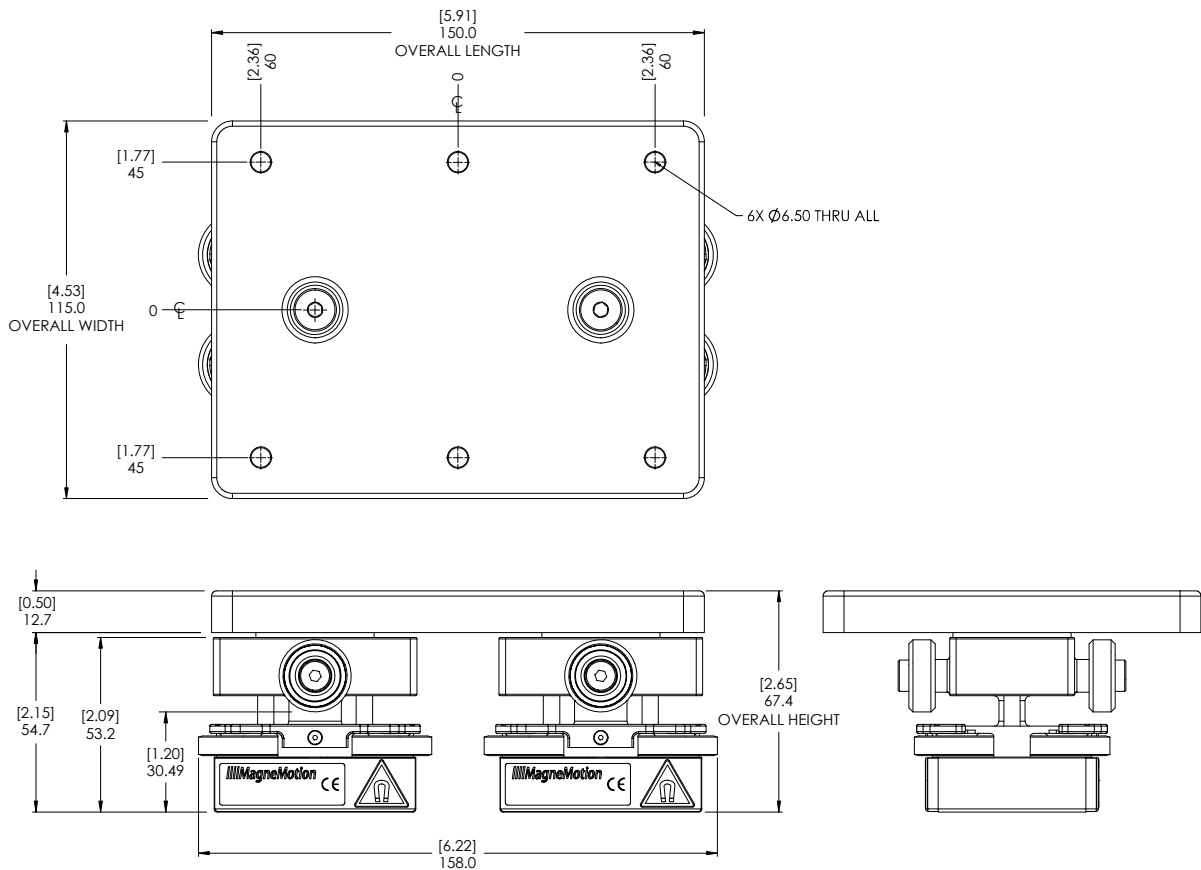
### Exposed Materials, Magnet Array

- Stainless Steel.
- 316L/316L #2 Stainless Steel.
- UHMW Polyethylene.



## Tandem Wheeled Puck

700-1740-03



Weight: 1.62 kg [3.6 lb]

All Dimensions in Millimeters [Inches]

Figure 8: Tandem Wheeled Puck Mechanical Drawing

### Exposed Materials, Puck

- 7075-T651 Aluminum, Hard Coat Anodized.
- 6061-T6 Aluminum, Natural.
- 174-PH/18-8/304/316/440C Stainless Steel.
- PEEK.
- Polyurethane.
- Igus® L280.

### Exposed Materials, Magnet Array

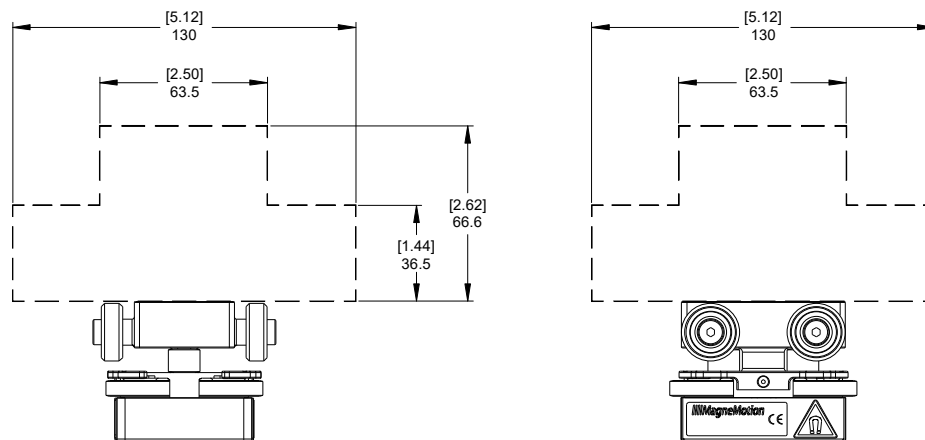
- Stainless Steel.
- 316L/316L #2 Stainless Steel.
- UHMW Polyethylene.

### Payload Envelope

For proper operation, the load being carried must fit within the payload envelope that is shown in [Figure 9](#) for the single wheeled puck and [Figure 10](#) for the tandem wheeled puck. Contact ICT Customer Support if the payload is within the weight specification but outside the envelope specification show.

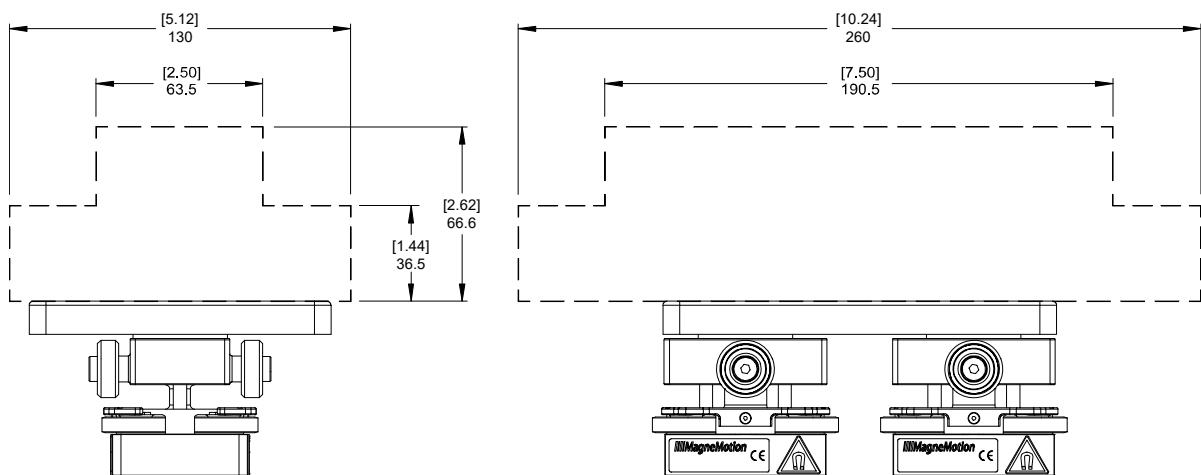
+1 978-757-9102

[ICTSupport@ra.rockwell.com](mailto:ICTSupport@ra.rockwell.com)



All Dimensions in Millimeters [Inches]

*Figure 9: Single Wheeled Puck Payload Envelope, 2.5 kg max*



All Dimensions in Millimeters [Inches]

*Figure 10: Tandem Wheeled Puck Payload Envelope, 10 kg max*

## **Environmental Requirements**

### **Magnet Arrays and Wheeled Pucks**

**Temperature:**

Operating: 0 °C to 50 °C [32 °F to 122 °F]

Storage: -18 °C to 60 °C [0 °F to 140 °F]

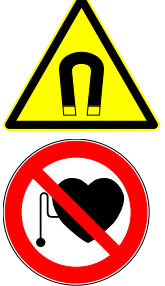
**Humidity:**


85% Maximum (relative, noncondensing)

## Installation

### Unpacking and Moving

The MagneMover LITE wheeled pucks arrive from the factory as a component ready for final installation. The *MagneMover LITE User Manual* provides the information that is required to install these components.

	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>Strong Magnets</b></p> <p>To avoid severe injury, people with pacemakers and other medical electronic implants must stay away from the magnet array on the vehicles (pucks).</p>

	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>Strong Magnets</b></p> <p>To avoid injury from strong magnetic attractive forces:</p> <ul style="list-style-type: none"><li>• Handle only one vehicle (puck) or magnet array at a time.</li><li>• Do not place any body parts, such as fingers, between a vehicle (puck) or magnet array and any ferrous material or another magnet array.</li><li>• Store unused vehicles (pucks) or magnet arrays individually in isolated packaging.</li></ul> <p>To avoid damage to watches, instruments, electronics, and magnetic media, keep metal objects, magnetic media (memory disks/chips, credit cards, and tapes) and electronics away from the magnet arrays.</p>

### Installing Wheeled Pucks

Pucks can easily be added or removed as needed once the MagneMover LITE transport system is installed. When installing the wheeled pucks on a closed-loop system, slide the pucks onto the end of an installed motor. Once all pucks are installed, slide them out of the way and install the remaining motors, see the *MagneMover LITE User Manual*.

## Operation

The MagneMover LITE system provides motion by using small pre-configured vehicles (pucks) with magnet arrays that are attached to the surface closest to the motor. MagneMotion provides several preconfigured vehicle options.

## Motion Limitations

When commanding vehicle motion with a higher acceleration rate than the motor can provide, the vehicle falls behind its ideal move profile while accelerating. [Figure 11](#) shows both the ideal move profile (solid line) and the degraded move profile (dashed line).

In addition, and more critically, the vehicle is not able to decelerate at the specified rate and overshoots its destination as shown by the dashed line in [Figure 11](#). This behavior can result in vehicles colliding with other vehicles or switch components, or loss of vehicle control as it exits the area where it has permission to move. Thus, it is important to avoid commanding a move with an acceleration that is higher than the deceleration capability of the system.

The precise deceleration capability depends on vehicle mass (including payload), center of gravity location, speed, and track geometry. Furthermore, the thrust capability of ML components varies by type, and are reduced in proximity to the gaps between motors. Straight motor sections have the highest thrust, followed by curves, and finally by switches.

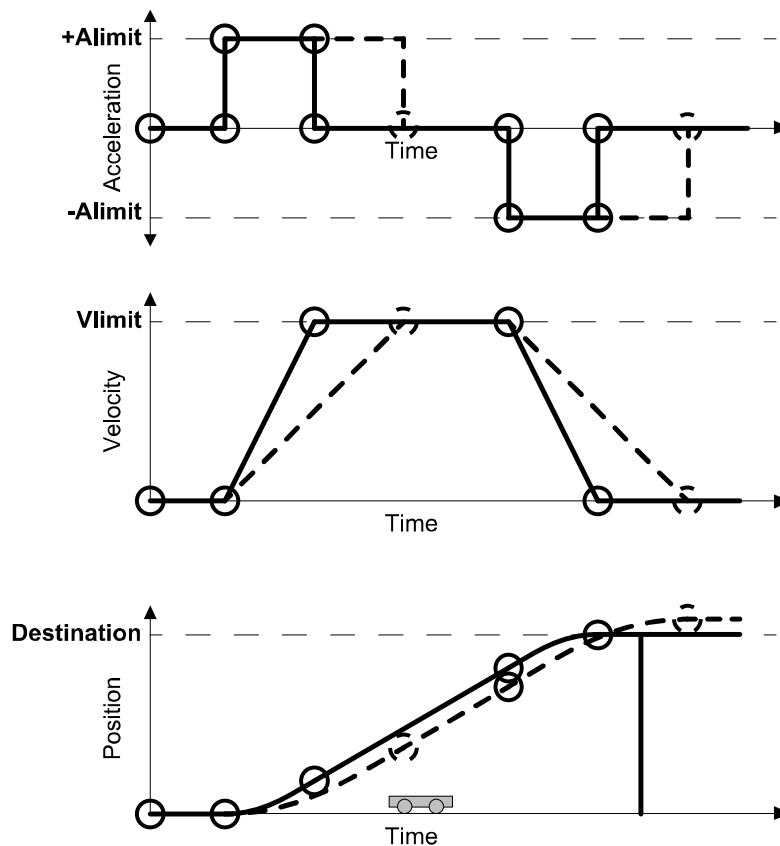


Figure 11: Vehicle Move Profile

The payload/velocity curves for the wheeled puck on curve motors and switches are shown in [Figure 12](#). Lower payload or velocity is typically required when using curves and switches as shown in the curves.

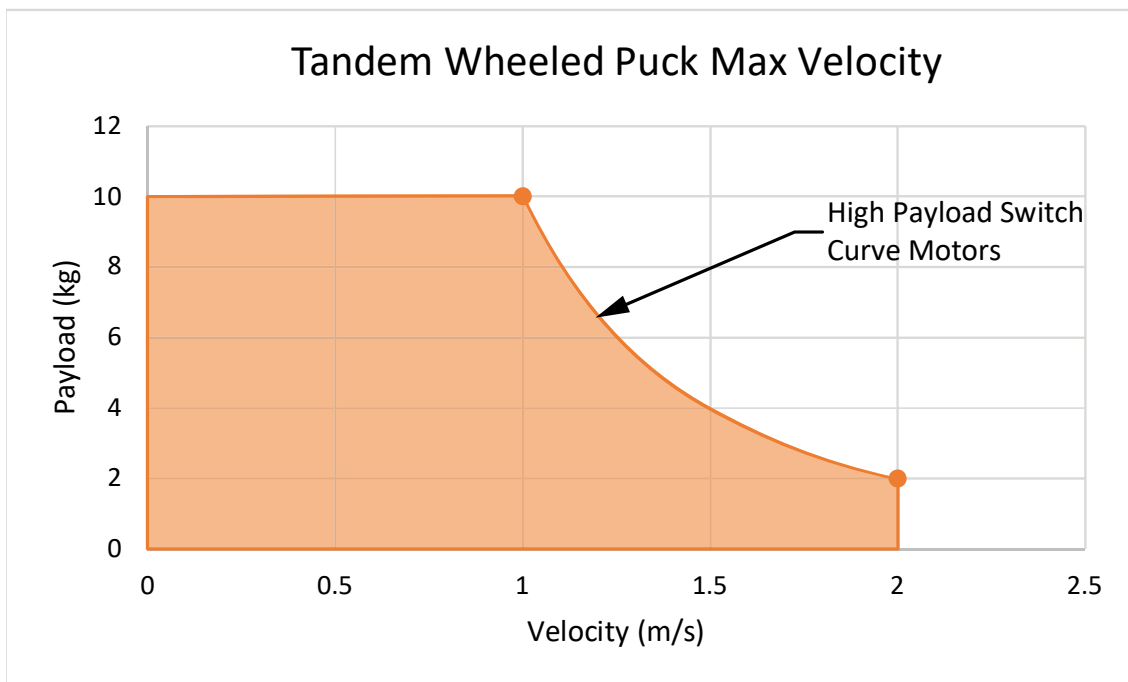
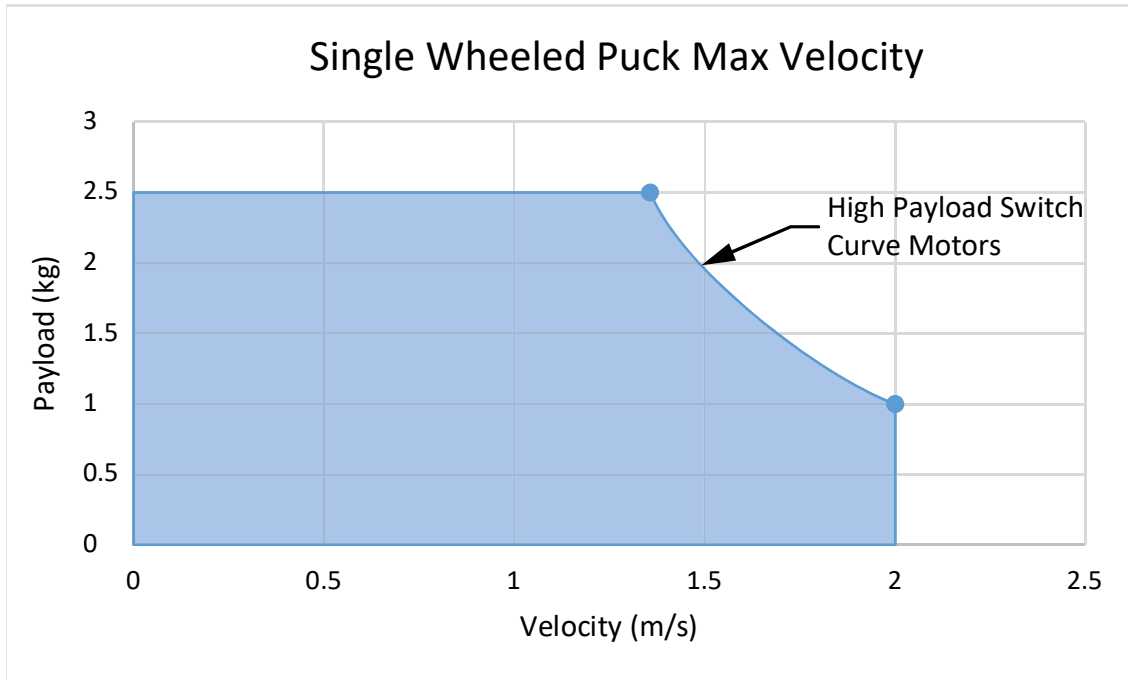


Figure 12: Wheeled Puck Payload/Velocity Curves

The acceleration/mass curve for the wheeled pucks on straight motors is shown in Figure 13. Lower payload or acceleration is typically required when using curves and switches.

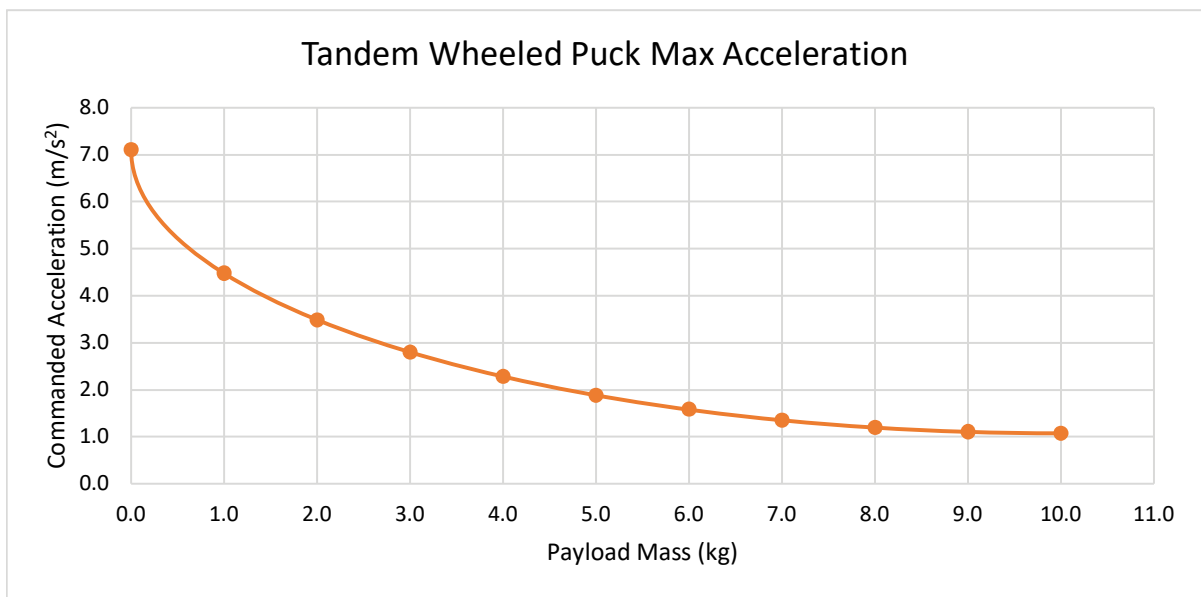
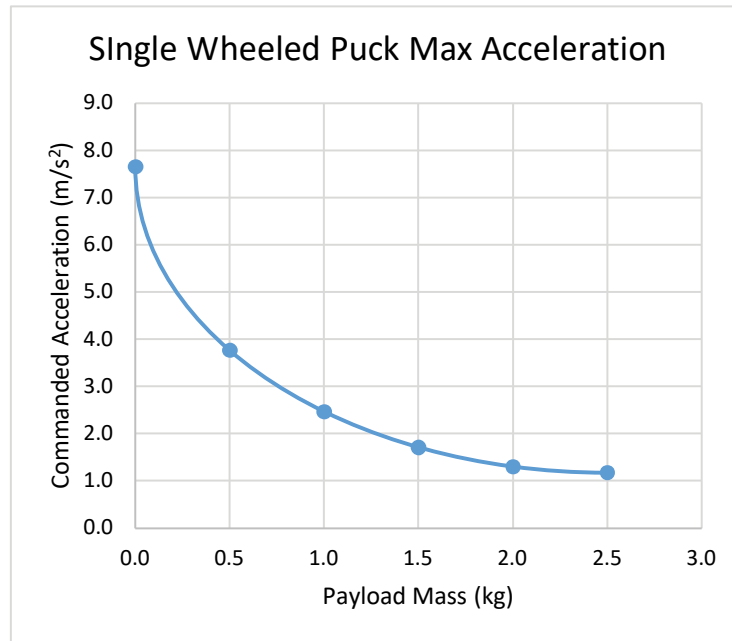


Figure 13: Wheeled Puck Payload/Acceleration Curves

## Configuration

The following settings in the Node Controller Configuration File must be changed from the default values that were assigned when creating the file with the MagneMover LITE Configurator. Leave all other settings at their default values.

### Single Wheeled Puck

#### Global Settings:

Acceleration Limit: See chart in [Figure 13](#)

Velocity Limit: See chart in [Figure 12](#)

#### Motor Defaults:

Vehicle Length: 77 mm (defined longer than the actual length to account for the corners of the vehicle in curves)

Velocity Limit: See chart in [Figure 12](#)

### Tandem Wheeled Puck

#### Global Settings:

Acceleration Limit: See chart in [Figure 13](#)

Velocity Limit: See chart in [Figure 12](#)

#### Motor Defaults:

Vehicle Length: 190 mm (defined longer than the actual length to account for the corners of the vehicle in curves)

Velocity Limit: See chart in [Figure 12](#)



## Maintenance

### Preventive Maintenance

*Table 3: Wheeled Puck Preventive Maintenance Schedule*

<b>Component</b>	<b>Maintenance Action</b>	<b>Frequency*</b>	<b>Page #</b>
Wheels	<a href="#">Wear Points Inspection</a>	3 months	<a href="#">26</a>
Wheeled Puck	<a href="#">Puck Cleaning</a>	3 months or as required	<a href="#">28</a>
Wheeled Puck	<a href="#">Puck Wear Surface Maintenance</a>	3 months or as required	<a href="#">30</a>

\* The specified frequency is based on a certified clean, inert environment. Adjust the Preventative Maintenance Schedule to account for any deviations from this environment.

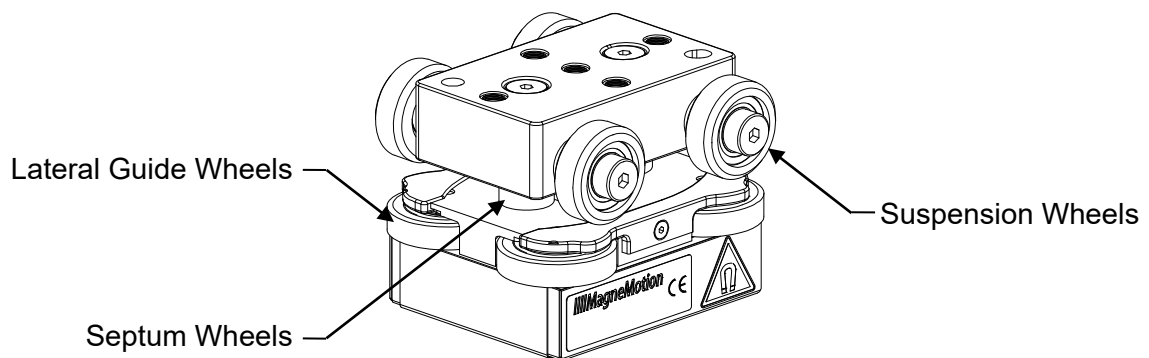
## Wear Points Inspection

The wheeled pucks that are used on the MagneMover LITE transport system must be inspected regularly to help maintain proper operation.

### Single Wheeled Pucks

The wheels on the single wheeled puck must be inspected regularly to help maintain proper operation.

1. Remove the wheeled puck from the MagneMover LITE transport system (see the *MagneMover LITE User Manual*).



*Figure 14: Single Wheeled Puck Wear Point Inspection*

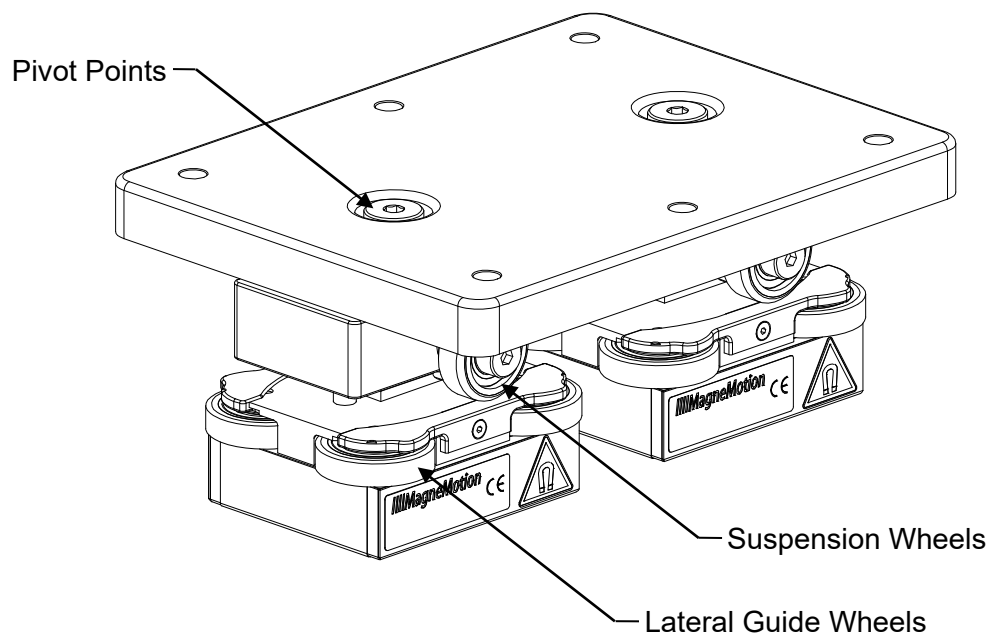
2. Inspect the wheels for high rotating friction and tread damage (see [Figure 15](#)).
  - If any wheels are showing excessive accumulation of particles, clean the wheel set, see [Puck Cleaning](#) on page 28.
  - If any wheels are showing excessive friction or tread damage, replace the wheel set, see [Replace Puck Wear Surfaces](#) on page 33.
3. Replace the puck on the transport system (see the *MagneMover LITE User Manual*).

## Tandem Wheeled Pucks

The bogie attachment points and the wheels on the bogies that are used on the tandem wheeled puck must be inspected regularly to help maintain proper operation.

**NOTE:** The bogies only have two wheels and must not be used as pucks. Additionally, a standard wheeled puck must not be used as a bogie in a tandem puck.

1. Remove the tandem wheeled puck from the MagneMover LITE transport system (see the *MagneMover LITE User Manual*).



*Figure 15: Tandem Wheeled Puck Wear Point Inspection*

2. Inspect the bogie pivot points for high rotating friction (see [Figure 15](#)).
  - If either of the pivot points are showing excessive friction, clean or replace the pivot point bearings, see [Replace Puck Wear Surfaces](#) on page 33.
3. Inspect the wheels for high rotating friction and tread damage (see [Figure 15](#)).
  - If any wheels are showing excessive accumulation of particles, clean the wheel set, see [Puck Cleaning](#) on page 28.
  - If any wheels are showing excessive friction or tread damage, replace the wheel set, see [Replace Puck Wear Surfaces](#) on page 33.
4. Replace the puck on the transport system (see the *MagneMover LITE User Manual*).

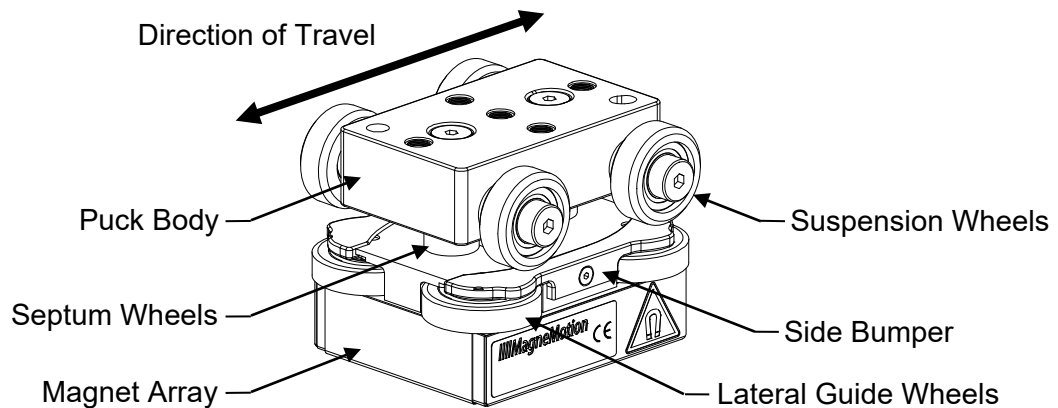
## Puck Cleaning

The wheeled pucks that are used on the MagneMover LITE transport system can need cleaning to remove any particulate buildup on the puck body and wear surfaces.

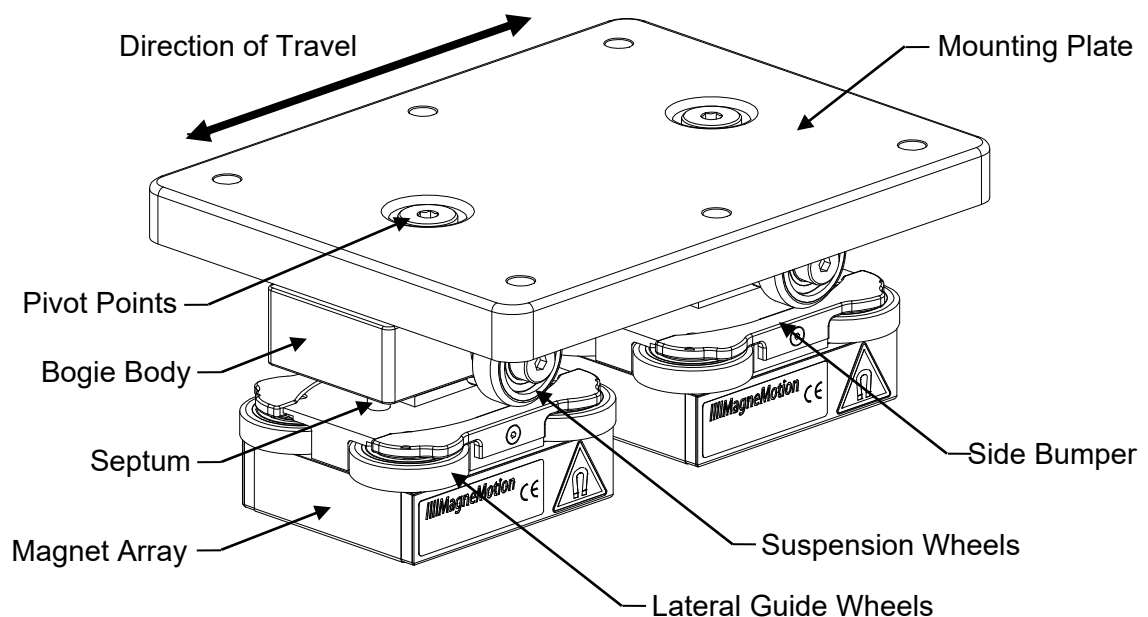
### Required Tools and Equipment

- Disposable gloves.
- Microfiber cleaning cloth.
- Deionized water.
- Isopropyl alcohol.

### Procedure



*Figure 16: Single Wheeled Puck Cleaning*



*Figure 17: Tandem Wheeled Puck Cleaning*

1. Remove the wheeled puck from the MagneMover LITE transport system (see the *MagneMover LITE User Manual*).
2. Clean the rolling surface of all wheels with clean cotton tipped swabs slightly dampened with isopropyl alcohol (squeezing the swab does not cause any alcohol to drip) by running the swab over the surface in a back-and-forth motion in the direction of travel (see [Figure 16](#) and [Figure 17](#)).
3. Clean external puck surfaces with a clean microfiber cloth slightly dampened with isopropyl alcohol (squeezing the cloth does not cause any alcohol to drip) by running the cloth over the surfaces in the direction of travel (see [Figure 16](#) and [Figure 17](#)).
4. Dry all cleaned puck surfaces with clean dry cotton tipped swabs and a clean dry microfiber cloth.
5. Replace the puck on the transport system (see the *MagneMover LITE User Manual*).

## Puck Wear Surface Maintenance

The wheeled pucks that are used on the MagneMover LITE transport system may require being rotated to make sure of even wear on the wear surfaces of the pucks. The need to rotate the pucks is especially true for pucks that are used in a transport system where all motion is in one direction, for pucks in a tandem puck configuration, or for pucks that have a cantilevered or high inertia payload. For wheeled pucks, if the wear surface wear is excessive (typically greater than 8,000 km travel for the lateral guide wheels and bumpers, and 16,000 km travel for the suspension wheels) see [Replace Puck Wear Surfaces](#) on page 33.

1. Stop all motion on the MM LITE transport system.
2. Remove the pucks from the MagneMover LITE transport system (see the *MagneMover LITE User Manual*).
3. Rotate the pucks 180°.
4. Replace the pucks on the MM LITE transport system (see the *MagneMover LITE User Manual*).

## Troubleshooting

Table 4: Troubleshooting

Symptom	Problem Description	Corrective Action*
Puck slows significantly in turns.	Suspension or lateral guide wheels have high rotating friction.	Check wheel set. Replace as necessary.
	Pivot points between bogie and linkage plate on tandem puck have high rotating friction.	Inspect and replace as necessary.
Puck slows significantly in standard switch.	Suspension or lateral guide wheels have high rotating friction.	Check wheel set. Replace as necessary.
	Pivot points between bogie and linkage plate on tandem puck have high rotating friction.	Inspect and replace as necessary.
Puck slows significantly in high payload switches.	Suspension or lateral guide wheels have high rotating friction.	Check wheel set. Replace as necessary.
	Pivot points between bogie and linkage plate on tandem puck have high rotating friction.	Inspect and replace as necessary.
Puck vibrates or motion is rough.	There is damage to the suspension wheel tread.	Check wheel set. Replace as necessary.
Puck has difficulty moving through switches.	There is damage to the suspension or lateral guide wheel.	Check wheel set. Replace as necessary.
	There is damage to the septum on a wheeled puck or bogie.	Inspect and replace the wheeled puck or bogie if necessary.
Puck has difficulty moving through high payload switches.	Damage to the suspension or lateral guide wheel.	Check wheel set. Replace as necessary.
Damage to the frog rail in the standard switch.	There is damage to the septum in a wheeled puck or bogie.	Inspect and replace frog if necessary.
		Inspect and replace the wheeled puck or bogie if necessary.

## Repair

*Table 5: Repair Procedures*

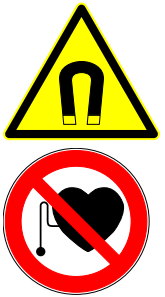
<b>Component</b>	<b>Maintenance Action</b>	<b>Page #</b>
Wheeled Puck	<a href="#">Replace Puck Wear Surfaces</a>	33




## Replace Puck Wear Surfaces

The wheels and other wear points on the pucks must be replaced once they have become worn due to extended use (typically greater than 8,000 km travel for the lateral guide wheels and bumpers, and 16,000 km travel for the suspension wheels). This procedure provides instructions for replacing worn wear points on the following pucks:

- 700-1738-02, MM LITE Puck, Wheeled, Wide Track (see [Figure 19](#))
- 700-1740-03, Wheeled Puck Assy, Tandem, HP (see [Figure 18](#))

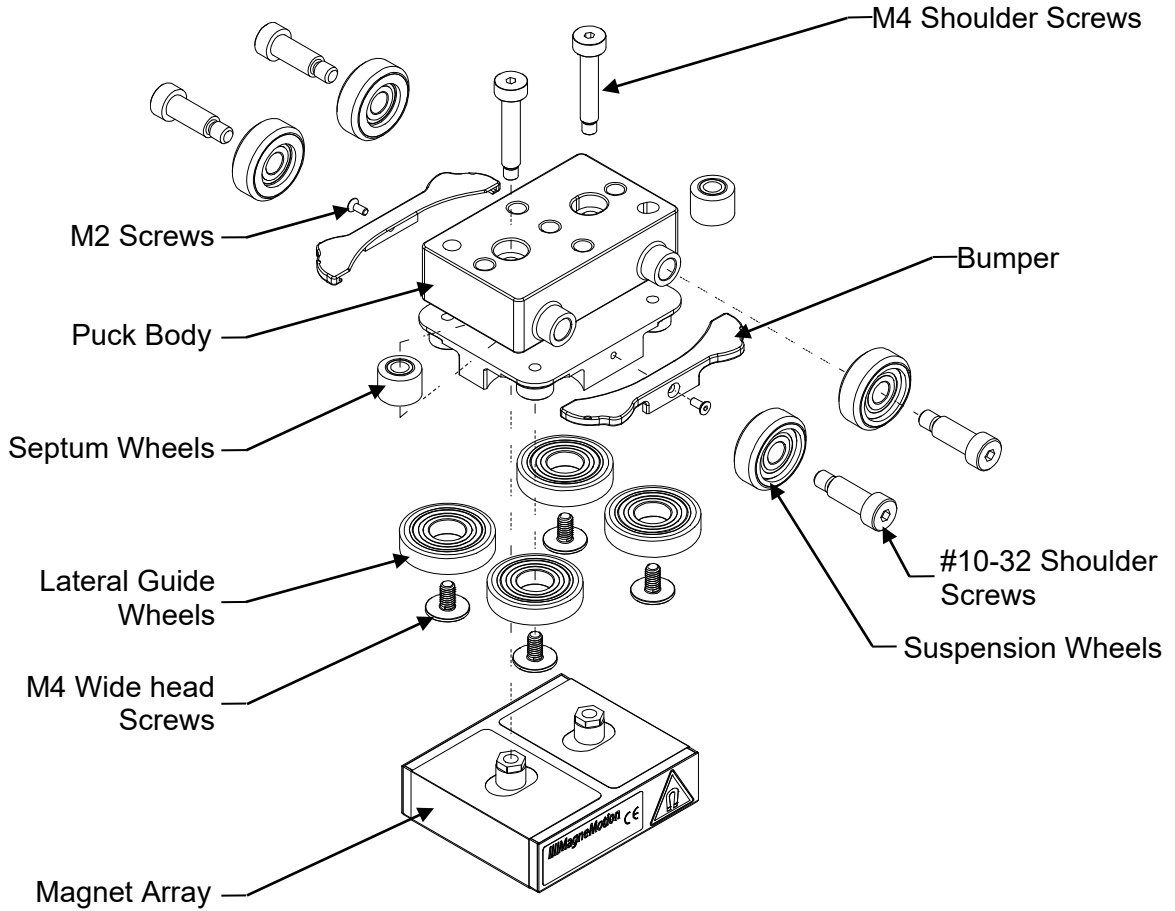
	<b>⚠ WARNING</b>
	<p style="text-align: center;"><b>Strong Magnets</b></p> <p>To avoid severe injury, people with pacemakers and other medical electronic implants must stay away from the magnets and magnet arrays.</p>

	<b>⚠ CAUTION</b>
	<p style="text-align: center;"><b>Strong Magnets</b></p> <p>To avoid injury from strong magnetic attractive forces:</p> <ul style="list-style-type: none"> <li>• Handle only one vehicle (puck) or magnet array at a time.</li> <li>• Do not place any body parts, such as fingers, between a vehicle (puck) or magnet array and any ferrous material or another magnet array.</li> <li>• Store unused vehicles (pucks) or magnet arrays individually in isolated packaging.</li> </ul> <p>To avoid damage to watches, instruments, electronics, and magnetic media, keep metal objects, magnetic media (memory disks/chips, credit cards, and tapes) and electronics away from the magnet arrays.</p>

## Required Tools and Equipment

- Torx T5 screwdriver.
- 1/8 in hex wrench.
- 2.5 mm hex wrench.
- 4 mm hex wrench.
- Loctite 243.

**Procedure**



*Figure 18: Replace Single Wheeled Puck Wear Points*

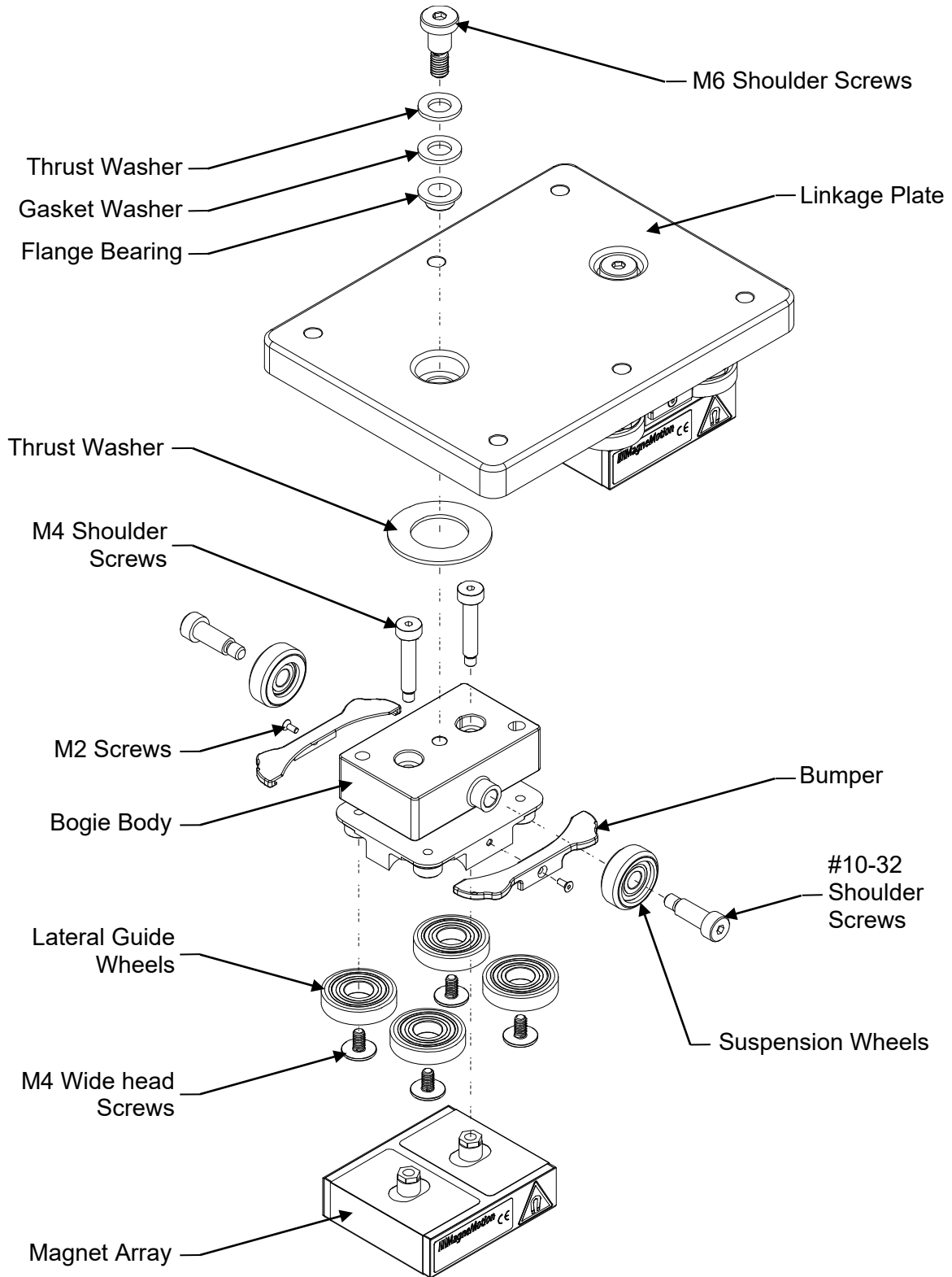


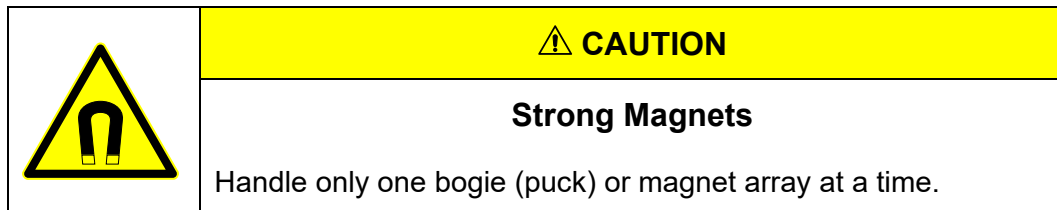
Figure 19: Replace Tandem Wheeled Puck Wear Points

1. Remove the wheeled puck from the MagneMover LITE transport system (see the *MagneMover LITE User Manual*).

2. Place the puck on a non-metallic work surface with the magnet array down. Keep the magnet arrays at least 1 m [3 ft] away from metal objects and tools.

### Remove Tandem Wheeled Puck Bogie

- A. Remove the M6 shoulder screw that secures the bogie to the linkage plate with a 4 mm hex wrench.
- B. Place the linkage plate with the remaining bogie still attached in secure packaging.



### Replace Bumpers

- A. Remove the M2 screws that secure the two bumpers onto the puck/bogie body with a T5 wrench.
- B. Remove the bumpers and dispose of properly.
- C. Install the new bumpers.
- D. Apply Loctite 243 to the previously removed M2 screws and secure the new bumpers. Tighten to 0.3 N•m [3 in•lb].

The Loctite must cure for 2 hours at 22 °C [72 °F] before using the wheeled puck.

### Replace Suspension Wheels

- A. Remove the #10 – 32 shoulder screws that secure the suspension wheels onto the puck/bogie body with a 1/8 in hex wrench.
- B. Remove the wheels and dispose of properly.
- C. Verify the threads and shoulder area of the #10 – 32 shoulder screws are clean.
- D. Insert the cleaned shoulder screws into the hub of the new wheels.
- E. Apply Loctite 243 to the threads of the #10 – 32 shoulder screws, make sure the shoulder area and wheel hub area stay clean.
- F. Locate the new wheels and secure using the #10 – 32 shoulder screws. Tighten to 2.8 N•m [25 in•lb].

The Loctite must cure for 2 hours at 22 °C [72 °F] before using the wheeled puck.

### Replace Lateral Guide Wheels

- A. Remove the two M4 shoulder screws that secure the puck/bogie body to the magnet array with a 2.5 mm hex wrench.
- B. Place the magnet array in secure packaging.
- C. Verify the threads and shoulder area of the M4 shoulder screws are clean.
- D. Flip the puck/bogie body over and remove the four M4 wide head screws that secure the four lateral guide wheels onto the puck/bogie body with a 2.5 mm hex wrench.
- E. Remove the lateral guide wheels and dispose of properly.
- F. Verify the wheel wells and axel areas for the four lateral guide wheels are clean.
- G. Insert the hub of the new wheels onto the axels.
- H. Apply Loctite 243 to the previously removed M4 wide head screws and secure the new wheels. Tighten to 0.9 N•m [8 in•lb].  
The Loctite must cure for 2 hours at 22 °C [72 °F] before using the wheeled puck.

### I. Replace Single Wheeled Puck Septum Wheels

1. Remove the two septum wheels and dispose of properly.
  2. Locate the new inner lateral guidance wheels.
- J. Apply Loctite 243 to the previously removed M4 shoulder screws.
  - K. Locate the puck/bogie body on the magnet array and secure using the M4 shoulder screws. Tighten to 1.4 N•m [12 in•lb].  
The Loctite must cure for 2 hours at 22 °C [72 °F] before using the wheeled puck.

### Replace Bogie Pivot (Tandem Wheeled Pucks Only)


- A. Replace the thrust washer on top of the bogie body.
- B. Replace the flange bearing, gasket washer, and thrust washer in the pivot point in the linkage plate.

### Replace Bogie (Tandem Wheeled Pucks Only)

**NOTE:** The bogies only have two wheels and must not be used as pucks. Additionally, a standard wheeled puck must not be used as a bogie in a tandem puck.

- A. Make sure that the flange bearing is clean and properly seated in the pivot point in the linkage plate.
- B. Make sure that the gasket washer and thrust washer are clean and properly seated in the pivot point in the linkage plate.
- C. Place the thrust washer on top of the bogie body.
- D. Apply Loctite 243 to the mounting hole for the M6 shoulder screw.

- E. Locate the linkage plate so the centering feature on the bottom aligns with the thrust washer and secure using the M6 shoulder screw. Tighten to 3.3 N•m [29 in•lb].

	<b>⚠ CAUTION</b>
	<b>Strong Magnets</b> Handle only one puck/bogie or magnet array at a time. Maintain enough space between the puck/bogie so the magnet arrays on the pucks/bogies do not attract each other.

3. Remove the second bogie and replace the wear components by repeating this procedure starting at Step 2.
4. Replace the wheeled puck on the transport system (see the *MagneMover LITE User Manual*).

---

## **More Information**

MagneMotion Website: [www.magnemotion.com](http://www.magnemotion.com)

Questions and Comments: [www.magnemotion.com/contact/](http://www.magnemotion.com/contact/)

---

## **Revision History**

<b>Rev.</b>	<b>Change Description</b>
00	Initial release
01	Added descriptions of puck features, additional configuration settings, and troubleshooting.
02	Added Loose Material Hazard, payload envelope details, thrust limitations, and acceleration curves. Updated mechanical drawings, payload/velocity curves, and configuration settings.
03/C	Removed single array vehicle and revised dual array vehicle content.
04/D	Added single wheeled puck. Updated Payload/Velocity Curves.

## Rockwell Automation Support

Use the following resources to access support information.

<b>Technical Support Center</b>	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	<a href="https://rockwellautomation.custhelp.com/">https://rockwellautomation.custhelp.com/</a>
<b>Local Technical Support Phone Numbers</b>	Locate the phone number for your country.	<a href="http://www.rockwellautomation.com/global/support/get-support-now.page">http://www.rockwellautomation.com/global/support/get-support-now.page</a>
<b>Direct Dial Codes</b>	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	<a href="http://www.rockwellautomation.com/global/support/direct-dial.page">http://www.rockwellautomation.com/global/support/direct-dial.page</a>
<b>Literature Library</b>	Installation Instructions, Manuals, Brochures, and Technical Data.	<a href="http://www.rockwellautomation.com/global/literature-library/overview.page">http://www.rockwellautomation.com/global/literature-library/overview.page</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Get help determining how products interact, check features and capabilities, and find associated firmware.	<a href="http://www.rockwellautomation.com/global/support/pcdc.page">http://www.rockwellautomation.com/global/support/pcdc.page</a>

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at [http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002\\_-en-e.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf).

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

Product certificates are located in the Rockwell Automation Literature Library: <http://www.rockwellautomation.com/global/literature-library/overview.page>

Allen-Bradley, Compact I/O, CompactLogix, ControlLogix, DH+, DriveLogix, FactoryTalk, FLEX, Logix5000, PanelBuilder, PanelView, PLC-2, PLC-3, PLC-5, POINT I/O, PowerFlex, Rockwell Automation, Rockwell Software, RSLinx, RSLogix, RSNetWorx, RSView, SLC, SoftLogix, Studio 5000, and Studio 5000 Logix Designer are trademarks of Rockwell Automation, Inc.

Trademarks not belonging to Rockwell Automation are property of their respective companies.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

---

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640  
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Copyright © 2017 – 2020 MagneMotion, A Rockwell Automation Company. All Rights Reserved.

139 Barnum Road, Devens, MA 01434, USA  
+1 978-757-9100

Publication MMI-UM026D-EN-P - May 2020  
Supersedes MMI-UM026C-EN-P

DIR 10003622192  
[www.rockwellautomation.com](http://www.rockwellautomation.com)