

Reverse-A-Matic™ RM60 Operator's Manual

Operation of the Reverse-A-Matic™

The Reverse-A-Matic™ System (R-A-M) is a stand-alone trailer module designed to automatically control the backup lights & alarm, to activate lift axles and control steer axles. The Reverse-A-Matic™ module and sensor are to be installed on a trailer.

Features

- Senses trailer direction and speed.
- Speed Sensitive steer axle control.
- SPIF Infrastructure Friendly Compliant 2005/2006
- Requires NO MANUAL CONTROL from the cab.
- Emergency 4-Way Flasher lift control feature.
- Activates after eight inches in reverse.
- Bulb Check output for Enhanced Semi-Trailer braking systems.

When in reverse, it will

- Turn on trailer backup lights.
- Activate trailer backup alarm system.
- Lift the trailer lift axle for ease of manoeuvring.
- Secure a steer axle.
- Can activate a dome light inside the trailer.
- Can power a reverse radar system.

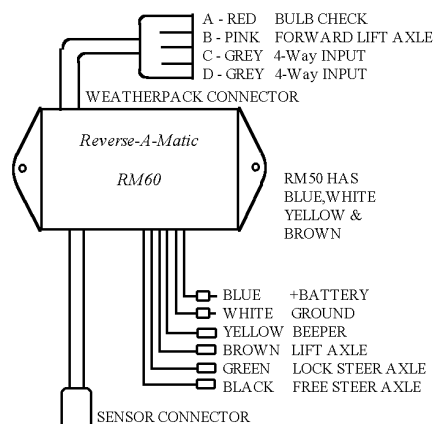
When travelling forward, it will

- Automatically lower a lift axle after 100 feet.
- Pulls out the trailer locking pin for free steering.
- Lock the steer axle above 60KPH for straight operation on the Highway.
- Monitors 4-way flashers and speed to lift an axle for emergency traction.

Model RM60 OUTPUTS

The Reverse-A-Matic RM60 has six outputs & two inputs. All of the features of the original RM50 are incorporated into the RM60.

Function	Colour	In/Out
Bullets Connectors		
12 Volt Input	Blue	Input
Ground	White	
Beeper	Yellow	Output
Lift Axle Control.	Brown	Output
SteerAxle Power to Lock	Green	Output
SteerAxle Power to Free	Black	Output
Sensor Connector		
Sensor Interface	-	Input
WeatherPack Connector		
Bulb Check Feature	A – Red	Output
Forward Lift Axle	B – Pink	Output
4-Way Input	C – Grey	Input
4-Way Input	D – Grey	Input



Backup Lights and Alarm System Yellow Wire

The backup lights and alarm will come on and remain on whenever the trailer is moving in reverse. The backup lights will turn off five seconds after the truck has stopped, or if the truck has moved forward. Large back-up flood lights can be controlled by the Reverse-A-Matic. by connecting the Beeper output to an external relay to supply enough current to the lights.

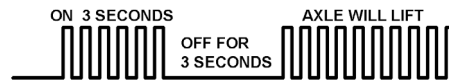
Lift Axle Brown Wire

The Brown wire will activate the lift axle when the trailer is reversing. The lift axle will remain up until the truck has moved 100 feet forward without stopping. Once the lift axle is down it shall remain disengaged whenever travelling forward. The lift axle will lower when power is disconnected from the trailer or when the ignition is turned off.

Emergency 4-Way Flasher Forward Lift Axle PINK Wire,

The Forward lift axle has the same function as the Brown wire functions except it will also raise the axle using the 4-way flashers. This feature is to transfer weight for greater traction on the tractor tandem axles. This will only happen when the 4-Way flashers activation sequence is started. It will only lift the forward axle while the 4-way are ON & the speed is under 60 Km/H. If the trailer goes above 60 Km/H then the axle will lower and the activation sequence must be repeated. The PINK wire will lift the forward axle with the 4-Ways, the Brown wire will not.

Emergency 4-Way Flasher Activation ON-OFF-ON (3 Seconds each)



To operate the forward lift axle, the 4-Way flashers must be turned ON for 3 seconds or more, then turned OFF for about 3 seconds, then turned ON again. The axle will remain up until the 4-Way flashers are turned OFF or if the trailer goes above 60 Km/H. This double activation sequence prevents unintentional or accidental lifting of the axle if the 4-Way flashers are turned ON for other reasons. This Forward Lift Axle function is designed to meet SPIF regulations for emergency drive traction.

Steer Axles

The operation of Steer axles are to follow the road freely. Most steer axles have a locking pin that needs to be inserted to lock the axle and hold it for straight operation. The axle may be lifted or locked when reversing. The Reverse-A-Matic will lock the axle in reverse so that it does not track sideways. Steer axles can be controlled in two ways, Normally Locked and Normally Free. The Reverse-A-Matic RM60 provides an output for each method.

1. Normally Locked (Power to Free) BLACK Wire

A Normally Locked Steer axle will have the locking pin inserted by a spring or mechanical force. It will be locked if the trailer has no power or no air. This requires Power to Free the axle

The **Black Wire** is Power to Free and will provide +12 volts out to the locking pin control solenoid to pull the pin and free to steer the axle when the trailer is going forward less than 60 KPH. It will be zero volts in reverse and forward faster than 60 KPH so that the axle will be locked.

2. Normally Free. (Power to Lock) GREEN Wire

A Normally Free Steer axle will have the locking pin pulled out by a spring or mechanical force. It will be free to steer if the trailer has no power or no air. This requires Power to Lock the axle

The **Green Wire** is Power to Lock and will provide +12 volts out to the locking pin control solenoid to insert the pin and lock the axle when the trailer is in reverse or when it is travelling forward faster than 60 KPH. It will be zero volts when going forward less than 60 KPH so that the axle will be free to steer.

If the wiring or unit ever fails or if there is no power or no air on the trailer, then the axle will be in its normal condition. This is a safety feature of the Reverse-A-Matic RM60 and is the reason that there are two outputs.

6 Second Delay for Steer PinLock

Steer axles may be liftable. If so, the lift axle output should be used to lift them. The steer axle control is for the locking pin only. There is a 6 second delay in locking the Steer axle in reverse. This allows the axle to lift first and straighten out before the pin is inserted.

STEER AXLE LOCKING SPEED

The Reverse-A-Matic model RM60 will lock the steer axle in reverse and on the Highway. The speed is determined by the wheels on the trailer. The size of the tire will effect the speed at which the steer axle will lock. Please check the chart below for estimated threshold speeds. These are +/-3%.

Tire Diameter Versus Speed Conversion Chart

Tire Diameter (Inches)	Lock-Up Speed KPH	Unlock Speed KPH
39.0	55.8	51.5
39.5	56.5	52.2
40.0	57.2	52.9
40.5	57.9	53.5
41.0	58.7	54.2
41.5	59.4	54.8
42.0	60.1	55.5
42.5	60.8	56.2
43.0	61.5	56.8
43.5	62.2	57.5
44.0	62.9	58.2

The Reverse-A-Matic uses a speed threshold, it will be locked above the Lock-Up speed and Unlocked below the Unlock Speed.

The Reverse-A-Matic also use a distance threshold, this is to reduce frequent locking and unlocking of the pin. It will unlock quickly when slowing down because a trailer can brake faster than it can accelerate.

SPIF Regulations

Please check regulations in ONTARIO REG. 413/05 and steer axle controls to ensure that the Reverse-A-Matic installation and your trailer configuration meets all codes. Not every installation will require all of the functions of the Reverse-A-Matic RM60

BULB CHECK Feature- The RED WIRE

The Reverse-A-Matic RM60 has a bulb check feature for compliance with Enhanced Semi-Trailer Braking Systems. The Red Wire will provide power out to a warning light to perform the bulb check when the trailer is powered up. The light will flash three times. The light will only flash when the vehicle is going less than 5 km/h.



Reverse-A-Matic™ RM60

ENHANCED SEMI-TRAILER BRAKING SYSTEMS

Air Tank Monitoring and the Bulb Check

The Bulb Check feature is provided to make it easy to connect all of the air pressure switches, one per air tank, to the required warning light at the front of the trailer. This is required for five and six axle trailers as part of the enhanced Semi-Trailer Braking systems. Two conductor daisy chain cable assemblies are available from Wheel Monitor to run 12 volts and the bulb check output to each pressure sensor. The cables have male bullets on one end and double female on the other to connector to the sensor and to the next cable in line. Each pressure switch is connected in parallel with 12 volts and the Warning light connected, the bulb check is connected to the light also. The pressure switches should be Normally Closed when no air pressure is present. The Bulb Check Wire must be run to the front of the trailer to connect the LED Light. The LED light should be grounded.

Wheel Monitor can provide N.C. Pressure switches, connector cables, the daisy chain cables for easy installation. The switches trip at about 70 to 75 lbs.

Installation Options	
Dropout Wiring Harness	Option
Enhanced Semi-Trailer Braking System Components	
75 lbs. N.C. Pressure Switch 1/tank	5 or 6 axles
3' Pressure Switch Cable 1/switch	5 or 6 axles
10' Daisy Chain Cable 1/switch	5 or 6 axles
4-Way Flasher Connection Cables	
50' Weatherpack Cable	Option
10" WeatherPack Cable	Option
Diagnostic Tool	Option

5 Amp Fuse And Protection Circuits

The power input to the R-A-M Module is fused with an automatic reset fuse. The fuse is rated for 5 amps of continuous current. If tripped it will reset itself. If the current is too large the unit will shut down. Output relays are normally open and are now protected from inductive pulses with an internal diode.

All of the Reverse-A-Matic inputs are protected.

Auxiliary Functions

The Beeper output may also be used as an automatic light switch to light the trailer for night visibility. The lights will turn off 5 seconds after the trailer stops. When used with an external relay it can be used to supply more power for larger lights. Do Not exceed 5 amps without an external relay. The Beeper output is great for back-up flood lights, while the lift axle output is good for an internal trailer dome light.

Special Requirements ?

The Reverse-A-Matic system is a versatile module and can be adapted for individual needs or concerns. This can be done with external components or specially configured modules. Contact Wheel Monitor for more information.

Drop Out Wiring Harness

Wheel Monitor can provide a drop out wiring harness that has connections needed for installation. The Reverse-A-Matic is connected at one end, and provides bullet connectors for functions at the other end. The bulb check and 12 volt power can be run starting at the unit or drop our harness. Simple daisy chain wiring can be run to connect the air brake monitoring system with automatic bulb check built in.

Diagnostic Tool (NEW)

Wheel Monitor has a Reverse-A-Matic Diagnostic and Installation Tool now available. It can be used to test the sensor, the module and the entire system without removing the unit from the trailer.

The diagnostic tool will test:

- Sensor Functions
- Sensor Wiring
- Sensor Alignment
- Module Functions
- Module Wiring
- Sensor Simulation
- Reverse & Forward testing
- Over 60 Km/H testing
- 4-Way Flasher Simulation



Great for troubleshooting or installation. Contact Wheel Monitor for more information.

The Diagnostic LED (NEW)

A Diagnostic light now tells the installer that the unit is working correctly. Read the LED on the module.

--- Power 1 second ON, 1 second OFF
 ----- Operating ON - Normal operating mode
 - - - - - Check 1/3 second ON, 1/3 second OFF

Power - The unit has power and is waiting for wheel movement. Turn the wheel to operate.

Operating - The unit is operating properly and reading the wheel movement.

Check - Please check the installation, there may be a problem with wiring or the sensor.

Problems to Check :

- No Light = No Power
- SLOW FLASHING ONLY, (will not go solid).
- The module is not reading wheel movement.
- The sensor might be disconnected.
- The sensor might not be close enough to read the ABS tone ring. See installation.
- The sensor or sensor wiring may be defective.

FAST FLASHING

- Short circuit on one or more of the outputs.
- Too much current, the maximum is 5 amps.
- For high current it may flash for five minutes.
- Sensor Mounting, make sure the sensor is close to the teeth and square to the ABS ring.

SOLID LIGHT, BUT UNIT NOT WORKING

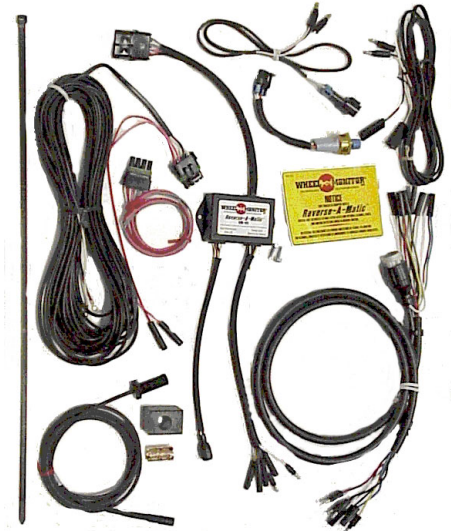
- Sensor Alignment is not checked by the module. The sensor must be pointing outward from the center of the axle.

Operation & Installation Manual

NOTICE:

The Yellow Instruction Decal MUST be installed on the trailer and a copy of the operators manual MUST be supplied upon trailer delivery.

Reverse-A-Matic System & Accessories



Electrical Characteristics	Units	
Supply Voltage	12 Volts	
Maximum Supply Voltage	16 Volts	
Minimum Supply Voltage	9 Volts	
Reverse Voltage	-24 Volts	
Output/Input Voltage	9 - 16 Volts	
Supply Current, No Output	50 MA	
Output Current	5 Amps	
Fuse, Automatically Resets	5 Amps	
Temperature	Min	Max
Sensor	-40 °C	+150 °C
Module	-40 °C	+85 °C
Storage	-40 °C	+85 °C
Operation – Wheel Revolutions		
Reverse Activation – ON	1/16 Rev	
Steer Axle Locking	See Chart	
Beeper Turns OFF		
After Stopping	5 Seconds	
Environment Design	J1455	
Minimum Wheel Speed	0.3 Km/h	
Maximum Wheel Speed	200 Km/h	

Operation of Reverse-A-Matic RM60 Outputs	Steer Axle RM60			Lift Axle	FORWARD Lift Axle	Beeper Lights
	Axle	BLACK	GREEN	BROWN	PINK	YELLOW
Power Up, ON 1 second		ON	ON	ON	ON	ON
Default before moving	Default	OFF	OFF	OFF	OFF	OFF
Reverse (8 inches)	LOCKED	6s Delay OFF	Delay ON	ON – UP	ON – UP	ON
Stopped	LOCKED	6s Delay OFF	Delay ON	ON – UP	ON – UP	ON
Stopped 6 Seconds	LOCKED	OFF	ON	ON – UP	ON – UP	OFF
Forward (3 Feet) after reversing	FREE	ON	OFF	ON – UP	ON – UP	OFF
Forward 100 Feet after reversing	FREE	ON	OFF	OFF – Down	OFF – Down	OFF
Forward above 60KPH, more than 100 Feet	LOCKED	OFF	ON	OFF – Down	OFF – Down	OFF
Forward Under 50 KPH	FREE	ON	OFF	OFF – Down	OFF – Down	OFF
Forward Under 50 KPH, 4-Way Flashers ON	FREE	ON	OFF	OFF – Down	ON – UP	OFF
Power OFF / Disconnected	Default*	OFF	OFF	OFF – Down	OFF – Down	OFF

* Default is the Safety position of the pinlock when no power or air is applied.

WARRANTY

WHEEL MONITOR INC. warrants that the Reverse-A-Matic™ wheel direction sensor system will be free from defects in material and workmanship for a period of one (1) year from the date of purchase. WHEEL MONITOR INC. agrees to repair or replace, free of charge, any Reverse-A-Matic™ wheel direction sensor system which fails, through defect in material or workmanship, within such period. If the Customer within the warranty period gives WHEEL MONITOR INC. written notice of any alleged defect, WHEEL MONITOR INC. will, at its sole discretion, repair or replace the same free of charge. Any Reverse-A-Matic™ wheel direction sensor system repaired or replaced under the warranty shall have the same warranty as new products, but does not extend the warranty of the original system. No warranty is made with respect to: (a) failure not reported to WHEEL MONITOR INC.

within the warranty period, (b) failures or damage due to misapplication, lack of proper maintenance, abuse, improper installation or abnormal conditions of temperature, moisture, dirt or corrosive matter, etc., (c) failures due to operation, either intentional or otherwise in an improper manner, or (f) any product which has been altered by anyone other than an authorized representative of WHEEL MONITOR INC.. WHEEL MONITOR INC. shall not be liable for any expenses incurred by the Customer in an attempt to correct any allegedly defective Reverse-A-Matic™ wheel direction sensor system.

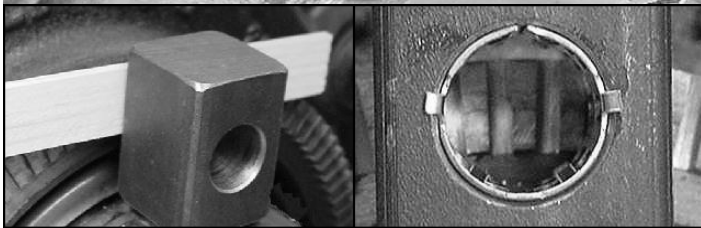
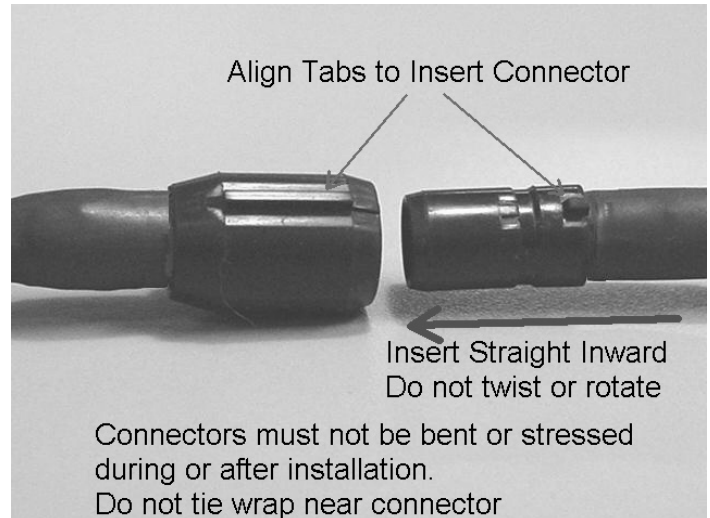
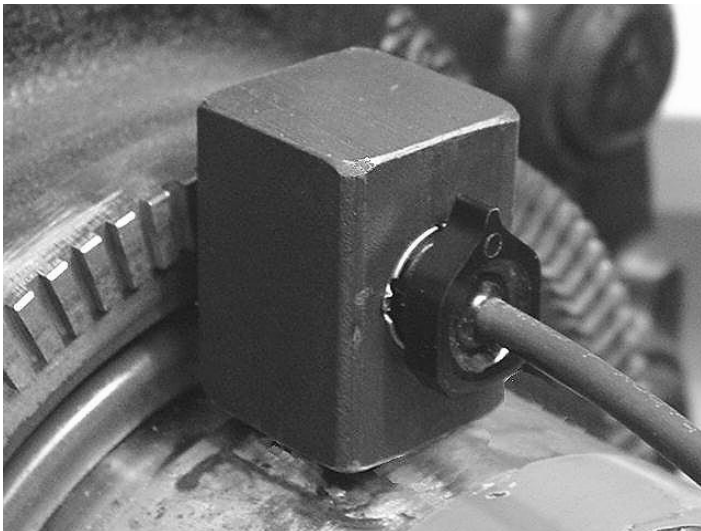
It is understood that WHEEL MONITOR INC. has no special knowledge of the Customer's operation or requirements and Customer agrees that the Reverse-A-Matic™ wheel direction sensor system is purchased because of the independent determination by the Customer of its suitability for intended use.

EXCEPT AS SPECIFICALLY SET OUT ABOVE, THE WHEEL MONITOR INC. REVERSE-A-MATIC™ WHEEL DIRECTION SENSOR SYSTEM IS PROVIDED AS IS WITHOUT WARRANTY OF ANY KIND. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, WHEEL MONITOR INC. FURTHER DISCLAIMS ALL WARRANTIES, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NONINFRINGEMENT. THE ENTIRE RISK ARISING OUT OF THE USE OR PERFORMANCE OF THE REVERSE-A-MATIC™ WHEEL DIRECTION SENSOR SYSTEM REMAINS WITH CUSTOMER.

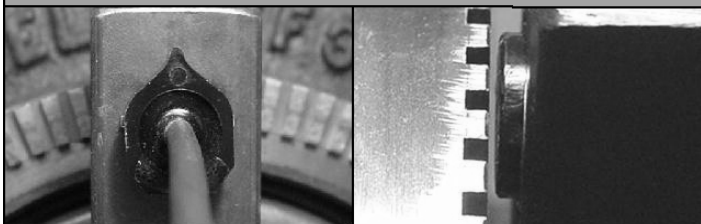
TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL WHEEL MONITOR INC. OR ITS SUPPLIERS BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE, OR OTHER DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS) ARISING OUT OF THIS AGREEMENT OR THE USE OF OR INABILITY TO USE THE REVERSE-A-MATIC™ WHEEL DIRECTION SENSOR SYSTEM, EVEN IF WHEEL MONITOR INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. WHEEL MONITOR INC.'S TOTAL LIABILITY FOR ANY DIRECT DAMAGES SHALL NOT EXCEED FIVE DOLLARS (\$5.00). BECAUSE SOME STATES/JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

NOTE: A warning label is supplied with the Reverse-A-Matic System, it is intended to identify that the unit is installed on the vehicle and must be affixed to the vehicle. Failure to affix proper label may void this warranty. Failure to affix this warning label may represent a hazard to public safety. A copy of this operator's manual must be delivered to the end user to ensure proper familiarity with the operations of the Reverse-A-Matic system. MODIFICATIONS TO THE MODULE OR SENSOR OR INSTALLATION DAMAGE WILL VOID THIS WARRANTY. DO NOT REMOVE ANY CONNECTORS, CUT OR STRIP ANY WIRES, PAINT OR MODIFY THE MODULE OR SENSOR IN ANY WAY.

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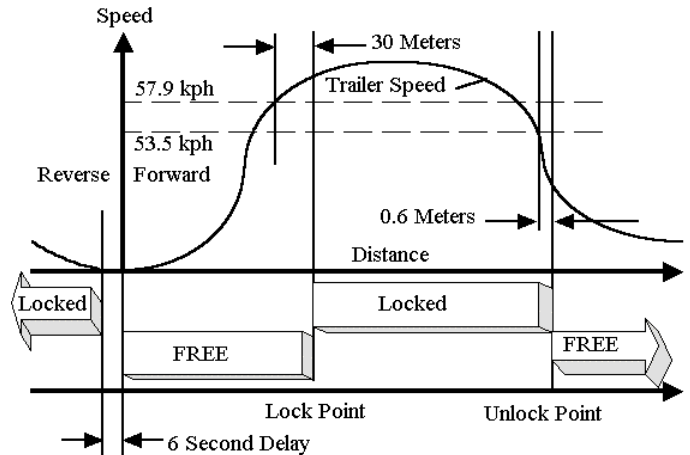


Block Mounting Reverse-A-Matic Sensor Mounting Diagrams Sensor Alignment, Outward ABS Ring Alingment Sensor Gap



The Steer Axle Will Lock at these Speeds and Distances

Based on 40.5 inch tire diameter , refer to chart for conversion



Reverse-A-Matic™ RM60 REVERSE-A-MATIC™ RM60 Mounting Instructions

The *R-A-M* unit and installation kit consists of a sensor block, sensor, barrel clip, mounting screws, and a control module. The control module must be connected to the sensor. The control module wiring must be connected to the constant power blue wire, the white ground wire.

Mounting of the *R-A-M* system may require welding the sensor block to the axle, drilling holes for the control unit, soldering and running wires to the steer axle solenoid and to a backup alarm and/or lights.

Sensor Mounting

1. The *R-A-M* directional sensor must be mounted on the left side of the trailer (driver's side).
2. Do not mount the *R-A-M* sensor on a lift axle.
3. The *R-A-M* sensor should be mounted on one of the two tandem axles. The axle must have an ABS brake exciter ring (forward axle preferred). The block fits 7.05" or 7.64" Diameter rings.
4. Disconnect the 7 pin plug (J-560 Connector) from the tractor. Remove the tires and brake drum from the hub following proper safety procedures and wear safety glasses.
5. Select a spot on the axle to weld the sensor block near the exciter ring so there is sufficient room to mount the sensor into the block from behind.
6. Locate the sensor block near the ABS exciter ring. It should be at least 45 degrees away from an ABS sensor if present on that axle.
7. The sensor hole must be in line with the center of the exciter ring teeth. The block will fit different heights, if it is too high or too low then turn the block over and recheck the alignment.
8. The block must be parallel to the ring and approximately 0.125 inches away. Insert a fiber spacer between the block and the ring for the correct spacing during welding.
9. Clamp the block in place for welding. **NOTE:** The barrel clip and sensor should not be in the block when welding.
10. **NOTE:** Do not connect the ground terminal of the welder to the hub, this may cause the welding current to pass through the wheel bearing and damage it. Connect the ground terminal to the axle near the work. (Take special care not to splatter weld or touch the ABS exciter ring with the welder. Use a weld blanket or suitable cover shield.)
11. Weld the sensor block to the axle housing. Make sure it is parallel to the exciter ring.
12. The Block must be protected from corrosion. Apply some anti-seize compound inside the sensor mounting hole.
13. Gently push the barrel clip into the block from the rear until the tabs touch the block. The barrel clip must be installed with the tabs on the inboard side of the sensor block.
14. Gently push the sensor into the sensor clip from the rear. **The tab on the sensor must be pointing away from the center of the axle.**
15. Push sensor body forward toward the ABS exciter ring. The gap between the teeth on the ring and sensors should not exceed 0.016 inches (.41mm) when finished.
16. Tie wrap the sensor cable safely to the axle, avoid interference with the operation of the brakes and ensure the cable is not strained. Run the cable along the axle and Tie wrap the sensor cables to the air brake lines every 25 to 30 cm (12 inches).

Module Mounting

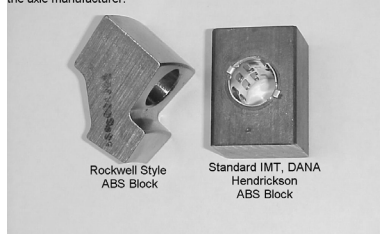
17. Install the *R-A-M* module on the inside of the lower slider frame rail or suitable location on the slider box. Drill two holes 5/32 diameter and use the self-tapping screws included or use appropriate mounting hardware.
18. Connect the sensor to the control module. Make sure the connectors fit together properly. The connectors must not be strained or bent.
19. Run wires from the blue wire and white wire of the trailer's main harness to the *R-A-M*.

20. A dropout wiring harness is available from Wheel Monitor for connecting the Blue and White wires to the trailer's wiring harness. It has weatherpack connectors so it can be inserted into the main harness. It is easy to install and will provide bullet connectors for the *R-A-M* module and ground.
21. Run wires from a backup alarm and/or an axle control solenoid to the *R-A-M* module.
22. Run all wires along the airline supply (line caddie) to the module.
23. Connect the blue wire to the 12 volt battery supply wire. Connect the white wire to the ground wire. (Do not use the chassis for ground. All wires should be joined to the main ground wire)
24. Connect the yellow wire to a backup alarm and/or backup lights.
25. Connect the brown wire to the axle control solenoid. Connect the Pink wire to the forward lift axle. The pink wire will be activated by the Emergency 4-Way flasher input, only the forward lift axle can be raised by the 4-ways.
26. Connect the BLACK -OR- the GREEN wire to the steer axle pinlock control solenoid. Please refer to the wire description section to select which wire is correct for your trailer. **They are opposite.**
27. **Note:** All connections must be watertight. Wires not used need to be shrink wrapped or taped up.
28. **The WARNING LABEL included in the kit must be applied to the trailer.** This will warn the operator of the unit and 4-way activation.

Operational Test of R-A-M™ System

1. Connect the 7 pin plug (J-560 Connector) to the tractor. Use D.C. power only. **Battery chargers do not supply proper D.C. Power.**
2. *ALL R-A-M* outputs will come on for one second when the unit is powered up. This is an operational test to confirm the unit is working. The Bulb Check will flash three times.
3. Rotate the wheel hub more than one-sixteenth of a revolution in reverse (clockwise) and observe that the Beeper (YELLOW), Lift axle (BROWN) and the Steer axle (GREEN or BLACK) operate correctly. The lift axle should lift and/or the steer axle should lock. YELLOW, BROWN and GREEN will have 12 volts, Black will have Zero Volts
5. Stop and wait about 5 seconds and observe that the backup alarm turns off while the lift axle control remains on.
6. Turn the hub ¼ turn forward (counter clockwise) and observe that the beeper turns off and the steer axle Unlocks. YELLOW, GREEN are now zero Volts while BROWN and BLACK are 12 Volts
7. Rotate the hub nine continuous revolutions forward (counter clockwise) and observe that the axle control turns off. The lift axle will go down. YELLOW, GREEN and BROWN are now zero Volts while BLACK is 12 Volts.
8. To test the speed control functions requires the wheel be spinning at more than 60 KPH for nine revolutions. This can be done using the RAM Diagnostic tool. This test should be performed with a test light while driving on the road.
9. Lift the forward axle using the 4-Way flashers Activation Sequence, ON-OFF-ON, (3 seconds) the forward axle should lift. Use a tractor or the RAM Diagnostic tool to apply the signal.
10. Document your results. Install the drum and tires.

The Reverse-A-Matic is supplied with a square ABS block. If you have a Rockwell style axle, a proper block is available from your supplier. With any axle it often easier to have an extra ABS block pre-installed by the axle manufacturer.



Operation & Installation Manual

We recommend that a light be installed on the side of the trailer as an axle status indicator to the driver. A side marker lamp may be connected to the *R-A-M* output already connected to the axle control solenoid. The other side of the marker lamp should be connected to ground wire.

Quick Check

If all the outputs come on for one second when the trailer was powered up, then the *R-A-M* module is working. Check the sensor alignment. If not check the power to the unit

Check Electrical Connections

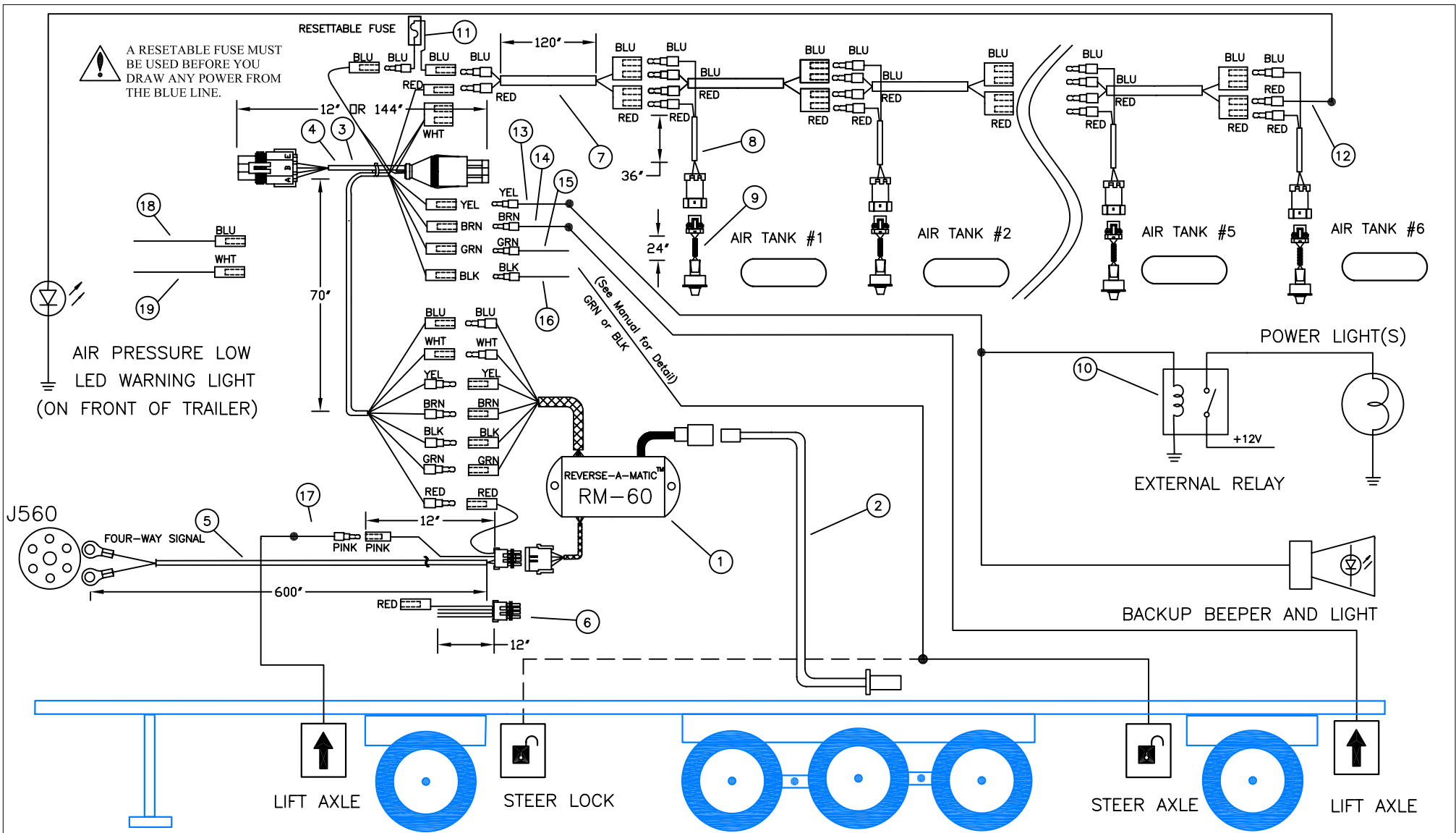
1. Check that all connections are sound and are made to the correct locations. Ensure the sensor cable connector is pushed all the way into its mating connector.
2. Check the input power. Measure the voltage from blue to white coming from the trailer, It should be around 9 to 16 volts **D.C.**
3. Measure with the meter set to **AC**, it should be very low. If the trailer is connected to a battery charger, there **MUST** be a good battery connected or the unit will not function correctly.
4. *ALL R-A-M* outputs will come on for one second when the unit is powered up. This is an operational test to confirm the unit is functioning. If they are coming on randomly, then the power to the unit may be intermittent.
5. If one of the backup alarm or the lift axle/steer axle control is not functioning, then the wiring may not be correct. Disconnect the output control bullet and measure the voltage while the unit is re-tested. The output should be 9 to 16 volts D.C. If it is correct, then the wiring or connections are incorrect. If the wires are shorted to ground, it will cause the Reverse-A-Matic's internal fuse to trip. Also insure that the backup alarm, lights and lift/steer axle are functioning properly.
6. If the lift axle/steer axle control is not functioning, check the air supply to the lift axle and/or to the pinlock.

Check Sensor Alignment

7. The sensor may need to be re-aligned. Check to make sure the sensor is centered on the ABS exciter ring. If it is too high or too low then the sensor will not be able to read the teeth on the ring.
8. Sensors can be tightened in the clip by removing and spray painting the outside.
9. Check the Gap between the sensor and the exciter ring, it should be **less than 1/32** of an inch (0.7mm).
10. If the wheel or the bearings have excessive wheel play, then the sensor may not be able to read the teeth on the ABS exciter ring. If so, an inspection of the wheel bearing should be performed.
11. The sensor tab should be pointing away from the center of the axle. If it is not, then rotate it and check operation of the unit again.
12. If the unit is still not functioning then rotate the sensor 15 degrees counter clockwise and check operation of the unit again.
13. If the unit is still not functioning then rotate the sensor back. Rotate 15 degrees clockwise and check operation of the unit again. Repeat with 30 degrees of rotation if required.
14. If after following this installation and trouble shooting guide, and the unit is still not functioning properly, please call Wheel Monitor at 1-(905)-641-0024. Ask for service and we will be pleased to
15. to assist you further.

Servicing Maintenance

An examination of the sensor, the sensor mounting, all electrical connections and the control module should be done on the *Reverse-A-Matic™* system on a regular basis. An operational test of the unit should be performed and documented every three months.



NOTE:

1. THE REAR STEER AXLE LOCK MAY BE REQUIRED BY REGULATION.
2. THE FORWARD STEER AXLE LOCK IS NOT REQUIRED BY REGULATION.
3. THESE ARE ELECTRICAL CONNECTIONS ONLY, PNEUMATIC ROUTING IS NOT INCLUDED IN THIS DIAGRAM.
4. NOT ALL REVERSE-A-MATIC™ CONNECTIONS MAY BE REQUIRED FOR ALL INSTALLATIONS.

ITEM	PART#	DESCRIPTION	REMARK	ITEM	PART#	DESCRIPTION	REMARK
1	200506-600EM	RM60 REVERSE-A-MATIC™ OEM		13	200580	MALE BULLET YELLOW-17"	OPTIONAL
2	200512-SENSOR	RAM2053 REVERSE-A-MATIC™ SENSOR		14	200581	MALE BULLET BROWN-17"	OPTIONAL
3	200521	WMDWH4108 7 BULLET SHORT HARNESS	OPTIONAL	15	200582	MALE BULLET GREEN-17"	OPTIONAL
4	200576	WMDWH2112 7 BULLET LONG HARNESS	OPTIONAL	16	200583	MALE BULLET BLACK-17"	OPTIONAL
5	200508	50 FOOT FOUR WAY EXTENSION CABLE	OPTIONAL	17	200584	MALE BULLET PINK-17"	OPTIONAL
6	200564	MALE 4 WAY LIFT CABLE (12 IN)		18	200585	FEMALE BULLET BLUE-17"	OPTIONAL
7	200524	WMDWH2032 DAISY CHAIN (10 FT)	OPTIONAL	19	200586	FEMALE BULLET WHITE-17"	OPTIONAL
8	200518	WMDWH2360-AIR PRESS.CON.(3FT)	OPTIONAL	20	200598	MALE BULLET BLUE	OPTIONAL
9	200519	AIR TANK PRESSURE SENSOR -8040237	OPTIONAL	21	200599	MALE BULLET WHITE	OPTIONAL
10	200578	EXTERNAL RELAY MODULE	NOT INCLUDED				
11	200577	RESETTABLE FUSE					
12	200579	MALE BULLET RED -17"	OPTIONAL				

Title
REVERSE-A-MATIC™ RM60 SYSTEM WIRING DIAGRAM

Size	Number	Revision
Letter	WMRAM4042-001	Rev. C

Date: Feb 23rd, 2006 Sheet of 1

File: RM60-System-Wiring-Diagram.dwg Drawn By: T. Wang



The New Diagnostic Light

The Diagnostic LED (NEW)

A Diagnostic light now tells the installer that the unit is working correctly. Read the LED on the module.

--- --- Power 1 second **ON**, 1 second **OFF**
----- Operating ON - Normal operating mode
----- Check 1/3 second **ON**, 1/3 second **OFF**

Power - The unit has power and is waiting for wheel movement. Turn the wheel to operate.

Operating - The unit is operating properly and reading the wheel movement.

Check - Please check the installation, there may be a problem with wiring or the sensor.

Problems to Check :

- No Light = No Power

SLOW FLASHING ONLY, (will not go solid).

- The module is not reading wheel movement.
- The sensor might be disconnected.
- The sensor might not be close enough to read the ABS tone ring. See installation.
- The sensor or sensor wiring may be defective.

FAST FLASHING

- Short circuit on one or more of the outputs.
- Too much current, the maximum is 5 amps.
- For high current it may flash for five minutes.
- Sensor Mounting, make sure the sensor is close to the teeth and square to the ABS ring.

SOLID LIGHT, BUT UNIT NOT WORKING

- Sensor Alignment is not checked by the module. The sensor must be pointing outward from the center of the axle.

La Nouvelle Lumière Diagnostique

La lumière diagnostique (Nouveau)

Une lumière diagnostique indique maintenant à l'utilisateur que l'unité fonctionne correctement. Lire la LED sur le module.

--- --- --- Puissance 1 seconde allumé 1 seconde non allumé
----- Opération Allumé - le mode normal d'opération
----- Vérifier 1/3 seconde allumé 1/3 seconde non allumé

Puissance - L'unité a la puissance et attend le mouvement de roue. Faire tourner la roue pour fonctionner.

Opération - L'unité fonctionne correctement et lit le mouvement de roue

Vérifier - Veuillez vérifier l'installation, il peut y a un problème avec le câblage ou la sonde.

Problèmes à vérifier :

- Aucun léger = aucune puissance

CLIGNOTANT LENT SEULEMENT, (ne pas être plein).

- le module ne lit pas le mouvement de roue
- La sonde pourrait être débranchée
- La sonde ne pourrait pas être près d'assez pour indiquer l'anneau de dent d'ABS . Voir l'installation
- La sonde ou le câblage de sonde peut être défectueux

CLIGNOTANT RAPIDE

- Court-circuit sur un ou plusieurs des sorties
- Trop le courant, le maximum est de 5 ampères
- Trop le courant il peut clignoter pendant cinq minutes.
- Le support de sonde, s'assurent que la sonde est près aux dents et à la perpendiculaire à l'ABS anneau

LUMIÈRE PLEINE, MAIS UNITÉ NE FONCTIONNANT PAS

- L'alignement de sonde n'est pas vérifié par le module. La flèche de sonde doit être visée loin du centre de l'axe.