

# Reverse-A-Matic™ RM50

# Operator's Manual

## Operation of the Reverse-A-Matic™ RM50

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. The Reverse-A-Matic™ module and sensor are to be installed on a trailer.

### Features

- Senses trailer direction.
- Requires NO MANUAL CONTROL from the cab.
- Activates after eight inches in reverse.

### When in reverse, it will

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

### 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. The Beeper output may be connected 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.

### SPIF Regulations

Please check regulations in ONTARIO REG. 413/05 to ensure that your trailer configuration meets all codes. The Reverse-A-Matic RM50 does **NOT** meet all of the requires of SPIF regulations depending on the type of trailer and SPIF category. The Reverse-A-Matic RM60 is designed to meet the SPIF regulations and has many more features than the RM50 Module.

### 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.

### 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.

### 5 Amp Fuse

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.

### NOTICE:

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



### Diagnostic Tool (NEW)

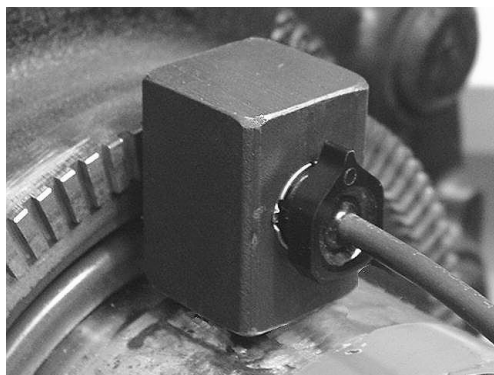
Wheel Monitor has a Reverse-A-Matic Diagnostic and Installation Tool now available. It can be used to test the sensor, the module and the entire system without removing the unit from the trailer.

The diagnostic tool will test:

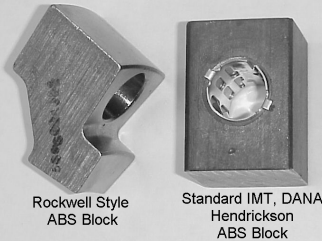
- Sensor Functions
- Sensor Wiring
- Sensor Alignment
- Module Functions
- Module Wiring
- Sensor Simulation
- Reverse testing
- Forward testing
- Over 60 Km/H testing
- 4-Way Flasher Simulation



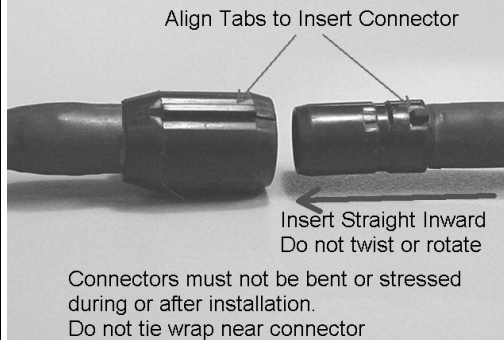
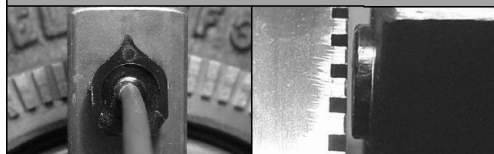
Great for troubleshooting or installation. Contact Wheel Monitor for more information.



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.



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



### Reverse-A-Matic Electrical Specifications

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	
Beeper Turns OFF		
After Stopping	5 Seconds	
Environment Design	J1455	
Minimum Wheel Speed	0.3 Km/h	
Maximum Wheel Speed	200 Km/h	

## REVERSE-A-MATIC™ RM50

### 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 lift 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.  
PN: WM-DWH-2001 for 1 foot long.  
PN: WM-DWH-2012 for 12 foot long.
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 caddy) 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.
26. **Note:** All connections must be watertight. Wires not used need to be shrink wrapped or taped up.
27. **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.
3. The Bulb Check will flash three times.
4. Rotate the wheel hub more than one-sixteenth of a revolution in reverse (clockwise) and observe that the Beeper (YELLOW), Lift axle (BROWN) operate correctly. The lift axle should lift and/or the steer axle should lock. YELLOW, BROWN will have 12 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.
7. Rotate the hub nine continuous revolutions forward (counter clockwise) and observe that the axle control turns off.
8. Document your results. Install the drum and tires.

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.

BE SURE THE BLOCK IS MOUNTED SQUARE TO THE ABS TONE RING.  
BE SURE THE BLOCK IS CENTERED ON THE TEETH OF THE RING

### 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.

#### 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 assist you further.

#### Servicing Maintenance

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