Rain Tracker RT-50A Troubleshooting Procedure

Motor Switching Applications

This procedure is for Rain Tracker installations that apply current directly to the wiper motor. For example, HSS (Hot Side Switching) and GSS (Ground Side Switching) applications. If the installation required external resistors, see the "External Component Applications" procedure.

Notes on wiring

- Did you get the instructions from our website at www.raintracker.com? If you did not, check that first.
- If you did and its not operating properly, go through the procedure.
- If you checked and the instructions did not include your vehicle, a few notes:
  - You can test for wire function and use the instructions included in the kit
  - Sometimes, previous years are the same as current years. Check for this.
  - Access to the vehicle wiring diagram is always very helpful. Try to obtain a wiring diagram for your vehicle.

Following this procedure will save you time.

1. Check that the Rain Tracker is getting power and ground

Use a multi-meter or test lamp. Unplug the Rain Tracker interface (J1) so you can put the test probes into the connector.

Symptom	*Check*
12 V Present?	**Go to step 2**
No 12V	If possible, check the ground with a multi-meter. There should be no more than a couple ohms from the Rain Tracker ground (black wire) to a good chassis ground. (Such as the connection on the outside metal sleeve of the cigarette lighter.)

2. Check how the system behaves in each of the manual modes.

With the Rain Tracker activation switch off:

Symptom	*Check*
Manual off, slow, and fast and wash work as before	**Go to step 3**
Manual slow does not work	Check the connections to the SLOW relay, both the motor and the switch side. (PPL and BLU on the Rain Tracker.) If the system is responding to water but <u>manual</u> slow is not working, then the problem is probably the SNC connection. (PPL wire from the Rain Tracker.)
Wipers run all the time	Could be a damaged Rain Tracker interface module. See "Bypassing the Rain Tracker" on the next page.
Fast speed is slower than it should be	There is some wiring error that is shorting the wiper motor slow and fast windings together. For example, the power diode (YEL & WHT) from the Rain Tracker is not wired in place. Be sure to correct this as it wears the wiper motor out.
Fast does not work	Did you cut the FAST wire, rather than Tee into it?
Wash does not work	The Rain Tracker does not control wash. Did you cut a wire you should not have?

Bypassing the Rain Tracker
If you are still having trouble with the system in manual modes, try this diagnostic:
Remove the Rain Tracker interface module. Use a stiff wire to connect the BLU and GRN wires together at the Rain Tracker interface connector. Connected this way, the wiper system should behave just as it did from the factory. If it does not, there is some problem with the interface wiring.

3. Verify that the interface can make the wiper motor run—Pulse the Rain Tracker activation switch.

With the ignition on, turn on the activation switch for a few seconds. Each time you do this, the wipers should run slow once.

Symptom	*Check*
Wipers run slow for one wipe when you pulse the switch	**Go to step 4.**
A simple test for wiring can eliminate problems quickly	This test is done with the Rain Tracker module unplugged from the interface connector (J1) and the vehicle on. For HSS applications: Using a stiff wire as a jumper, on the Rain Tracker connector, connect YEL to BLU. Wired correctly, the wipers will run slow. To check fast, connect YEL to PNK. Wired correctly, the wipers will run fast. Since the module is unplugged, the wipers will not run home. You can plug in the module to run the wipers back home. For GSS applications: Using a stiff wire as a jumper, on the Rain Tracker connector, connect WHT to BLU. Wired correctly, the wipers will run slow. To check fast, connect WHT to PNK. Wired correctly, the wipers will run fast. If you do not get the expected result, check the corresponding wires. Check the connection on the BLU wire. Also, check the connection on the YEL (WHT on GSS applications) which connects to the RED power wire (GND wire for GSS applications). If you get the expected results, please proceed with the procedure.
I cannot hear a relay click inside the Rain Tracker interface module when I pulse the wiper switch	You probably have a problem with the power, ground, or activation switch. Check to see that the activation switch is working: there should be about 12V at the activation switch / mode reader (GRY wire) coming into the Rain Tracker.

I can hear a relay click in the interface module, but the wipers do not run	Check the wiring around the SNO terminal, and the power diode (GRN, WHT, YEL wires from the Rain Tracker.) Check for this especially common problem: the Switch and Motor side connections to the Rain Tracker are reversed. The PPL wire from the Rain Tracker should go to the switch side of the break you made in the SLOW wire. The BLU wire from the Rain Tracker should go to the motor side. Check for proper wire gauge. For all of these sorts of application (motor-switching applications) the connections are fairly heavy gauge wire-18 AWG or thicker- in the vehicle. If you have connected the Rain Tracker to any thin wires in the vehicle, you probably have connected to a wrong wire. Could you have connected to some wire other than SLOW? • For Hot-Side Switching systems: check that the SLOW wire goes to +12V for manual slow mode, ground for off mode. • For Ground-Side Switching systems: check that the SLOW wire goes to 0 for manual slow mode, +12V for off mode.
I hear a short buzzing	The connection to the slow has likely been switched. Make sure you have the PPL wire from the Rain Tracker going to the switch side of the vehicle slow wire and the BLU is going to the motor side.
Wipers stop on the middle of the windshield or I when I spray water the wipers “step” to make a complete wipe.	Some vehicles have digital systems that do not run the wipers direct from the switch. The wires run through the computer first. When the wipers are operated with the Rain Tracker, the computer does not know to run the wipers home. To fix the problem, tie the Rain Tracker CAM wire to the CAM wire at the wiper motor. This will allow the system to run the wipers back home. Check the SNC connection (PPL wire from the Rain Tracker). Be sure it is going to the switch side, not the motor side. Some applications will do this if you try to run both the Rain Tracker and the intermittent mode simultaneously. Keep the factory system off when running the Rain Tracker.
The wiper fuse just blew!	If you use the Hot Side Switching Diagram for a Ground Side Switching system, or the other way around, you will be shorting power to ground, causing the fuse to blow or breaker to trip.

4. Diagnosing Sensor problems.

- **If you skipped straight to this step, go back and systematically go through the procedure from the beginning, eliminating more common problems.**
- The sensor adjusts itself to the windshield when it powers up. To be sure that it has done this, turn the ignition off and then on.
- Place the existing wiper switch in manual off, and activate the Rain Tracker system
- See how the system responds to a spray bottle or garden hose.

Symptom	*Check*
Common Sensor Problem	One of the most common calls we get for tech support is for sensor coupler issues. When you install the coupler on the windshield, be sure to follow instructions closely. You may think you did it perfectly, but problems still arise. Be sure there are no bubbles or other obstructions in the sensor tape. The problems can be two fold: it can can cause false trips or inhibit what the sensor "sees". Depending on the location of the bubble, it may or may not cause a problem. Also, small bubbles that did not cause a problem initially may now cause problems. This is because, over time, heat from the sun may cause the bubbles to get bigger.
System does not respond to water at all.	Did you mount the sensor so that the double-stick tape wets out against the glass? • The sensor will not see through the red release-liner tape— you must remove it, and actually install the sensor using the procedure in the installation manual. • You cannot just tape the sensor against the glass without mounting it. • The tape must be fully 'wetted out' (appears black from outside the vehicle)—you cannot lightly tack the sensor to the glass. • Verify that there is 12V getting to the sensor. Check by unplugging the sensor, putting two wires (resistor leads are a good choice) into the sensor cable, and check with a multi-meter.
Sensor responds barely at all.	Is the sensor mounted too far in the shade band? From the mid 90's on, most US vehicles come with infrared-absorbing shade bands. The Rain Tracker sensor can be mounted on the edge, but not deeply within, the shade band. Is the windshield an infrared reflective type? These are very rare, on some Chevy venture vans, 1995-2001. You can see the yellowish coating ending near the edge of the windshield, and usually built-in antennas. The windshield logo may read "Sun Gate"
Wipers keep wiping without water	A few follow-up wipes are normal. These are to clear water that might have blown off the hood but might have missed the sensor. The Rain Tracker (as well as the rest of the wiper system) works better with good wiper blades. Extremely worn wiper blades will cause the system to over-wipe. In such cases, replace the blades. The sensor will be fooled by vibration; if you tap on the sensor, it will run the wipers. Don't tap on the sensor. False wipes due to vibration / road bumps are almost always caused by an unsecured sensor cable. Use a cable tie to secure the sensor cable to the mirror mount. On vehicles that wipe from the center out (e.g. recent Chrysler vans) having the sensor too close to the edge of the wipe pattern will make the system wipe too much. Center-out wipers are more prone to the wipers making more follow-up wipes; it is more important to keep the blades clean. If the vehicle engine is not running, the wipers can run so slowly as to cause the wiper blades to fool the sensor. Try the test with the engine running. Follow up wiping can be excessive under conditions just about the freezing. These conditions are rare, and the Rain Tracker still should not cause smearing.

Wipers never completely stop wiping-- very long intermittent	If the wipers never completely stop, replace the wiper blades (they were due for it, weren't they?). Clean the area just over the Rain Tracker sensor, and polish the glass with a soft cloth. Check each of the conditions listed above.
Rain Tracker does not respond fast enough	Note that it is normal for the wipers to speed up and slow down over several seconds. Real rain storms do not start or stop instantly. The Rain Tracker should respond appropriately to a real rain storm. With a spray bottle demonstration, it will appear to respond too slowly.
Sensitivity too low	Rain-X or car waxes can makes the sensor too insensitive. You can use Rain-X or any other hydrophobic coating, but clean the area just over the Rain Tracker sensor, and polish the glass with a soft cloth. If the sensitivity is not to the driver's liking, you may adjust it. See the installation manual.
Sensor appears to actually slow down with more water	This can happen in installations with external resistors. (Usually not HSS or GSS applications!) Check to make sure that the external component values are correct. This condition can be tricky to diagnose because it looks like a sensor problem. Use an ohmmeter to check the value of the external resistors.
Sensitivity too high	If the sensitivity is not to the driver's liking, you may shift it up or down using the procedure shown in the installation manual. The sensitivity detects darkness and increases the sensitivity a little at night. On vehicles that wipe from the center out (e.g. recent Chrysler vans) having the sensor too close to the edge of the wipe pattern will make the system wipe too much.
No amount of water will make the system run fast	Are you doing this in bright sunlight? Note that the Rain Tracker will not run the wipers fast when in bright sunlight. The Rain Tracker is intentionally less sensitive in very bright conditions, which are often due to road spray. This is to prevent smearing. If possible, have an assistant spray the sensor, and listen for the FAST relay click when the sensor is being sprayed hard. If you hear this, you know the system is trying to make the wipers run fast, and the problem is in the interface wiring. Check the wiring around the FAST terminals—the PNK and ORN wires from the Rain Tracker. Check to see that you properly cut the SLOW motor winding—you do not just Tee into it. If you just Tee into SLOW, the Rain Tracker shorts the SLOW and FAST windings together when it tries to make the wipers run fast. This slows the wipers down enough so it can look like it cannot run the system fast. Could you have chosen the wrong wire for FAST? • For Hot-Side Switching systems: check that the FAST wire goes to +12V for manual fast mode, ground for off mode. • For Ground-Side Switching systems: check that the FAST wire goes to 0 for manual fast mode, +12V for off mode. • For external-component applications, see if the behavior of the FAST wire is appropriate for the switch.
Responds to water, but Fast speed is slower than it should be	There is probably some wiring error that is shorting the wiper motor slow and fast windings together. For example, the power diode (YEL & WHT) from the Rain Tracker is not wired in place. Be sure to correct this, as it wears the wiper motor out.

Sensor wipes for no reason	False wipes should be rare. Sometimes the Rain Tracker will see the first droplets of water before the driver notices. On very hot, humid days, water can drip down from the air conditioning units of the vehicles ahead. This can cause enough tiny drops to trigger the Rain Tracker. Also, there can simply be tiny droplets of water in the air in extreme humidity—the Rain Tracker detects water droplets as small as about two one-hundredths of an inch. Simply turn the Rain Tracker off under such conditions. If the Rain Tracker is left on all the time regardless of weather, some things can hit the sensor perfectly, e.g. bugs, that cause a false trip. This should be so rare that it barely happens.
Wipers wipe when I drive over bumps	Check to be sure that the sensor is securely snapped into the Rain Tracker coupler. This can happen if the sensor cable has a long way to go to reach the headliner, and is not secured. Solution: secure the sensor cable to the mirror mount base with a cable tie.
Wipers wipe when I tap the sensor	Stop tapping the sensor. Properly installed, the sensor is immune to normal vehicle vibration.
Late First Wipe	As with all rain sensors (including those sold on new cars), there will be times when enough water has hit the windshield that you would like the wiper to wipe, but none has yet hit the sensor. These cases should be infrequent enough that they are easily ignored. The Rain Tracker is better in this respect than most rain sensors in the new-car market.