

Prodigy® RF

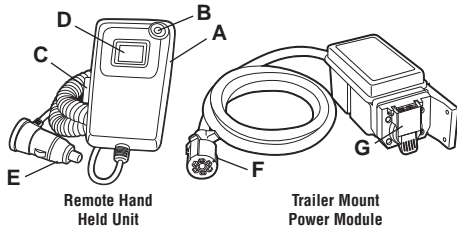
Electronic Brake Control

For 2, 4 and 6 brake applications

READ THIS FIRST:

Read and follow all instructions carefully before installing or operating the Prodigy RF. Keep these instructions with the Brake Control for future reference.

Components of Prodigy RF



- A. Power Knob
- B. Boost Button
- C. Manual Override
- D. Display
- E. Connector to Auxiliary Power Port
- F. 7-Way cable to tow vehicle
- G. Connection to trailer

Important Facts to Remember

- WARNING** The Prodigy RF may operate with reduced performance if the Remote Hand Held Unit is removed or disconnected while the trailer is in use.
- Do not mount or activate RF generating items (cell phones, two way radios) near (less than 12") to the Hand Held Unit or Power Module.
- The Prodigy RF employs an inertial sensor. It senses deceleration and generates an output that is based on deceleration, thus the term "Proportional Braking".
- The Prodigy RF will "HOLD" your trailer with 25% of power setting while you are at a standstill with brake pedal applied for longer than 5-7 seconds.
- The Prodigy RF will brake proportionally in reverse. It will apply the appropriate brake voltage based on deceleration.
- WARNING** The Gross Combined Weight Rating (GCWR) must never exceed the vehicle manufacturers recommendation.
- CAUTION** This control is not designed for use with electric-hydraulic trailer brake systems.
- CAUTION** Do not submerge or immerse Prodigy RF in water.

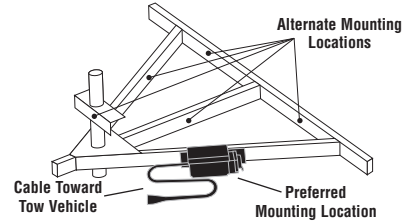
Installation Guide

Trailer Mount Power Module

Mounting Instructions

WARNING The Prodigy RF Power Module must be securely mounted to the trailer frame. Failure to install the Power Module within these constraints may cause impaired performance.

The Power Module can be mounted to any suitable surface on the trailer frame. The module cover should be approximately level, within $\pm 5^\circ$, and above the trailer frame rail. Preferred mounting location is on the side of the trailer frame rail with the 8 foot cable towards the tow vehicle.



- Select a location so that the Power Module's cover is in the UP direction.
- Use the four 1/4-14 x 1-1/4 self drilling screws (provided) to drill into the trailer frame. Snug screws securing Power Module. Tamper Resist Washer Head Screws may be used for added security.
- Secure the excess 7-Way tow vehicle and trailer wiring.

CAUTION Use of different screws may damage the Power Module, or may not provide sufficient mounting.

CAUTION Do not mount in a concealed location, or inside a metal part of the trailer. Do not place inside a utility box mounted on the trailer.

CAUTION Do not mount in a location that will interfere with a load equalizing hitch.

Connecting Power Module

Your Prodigy RF Power Module has a molded Bargman® 7-Way cable that will plug into the tow vehicle. Refer to Wiring Diagram for location of pins and function. When all connections are made, this connection supplies all power and signals to both the Power Module and to the trailer. The trailer 7-Way cable is connected directly to the 7-Way connector on the rear of the Power Module. There is no additional wiring necessary on the trailer.

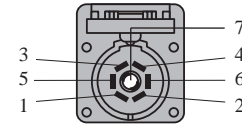
WARNING Tow vehicle Must be Capable of providing 12V @ 20A for Electric Brake Applications, Up to 6 brakes (3 axles).

CAUTION The Battery Charge to the trailer may be temporarily disconnected (approximately 5 minutes) during braking if the total current to the Trailer (Battery Charge and Electric Brake) exceeds 20 Amps. This allows for full brake power without exceeding the tow vehicles wiring capacity.

NOTE: Some factory wired tow vehicles disconnect the Battery Charge output in the 7-Way connector when the ignition is turned off. This will turn off the Power Module and the Hand Held Unit will display n.c.



Wiring Diagram



Pin No.	Function
1	Common Ground
2	Electric Brake
3	Tail & License
4	Battery Charge
5	Left Stop & Turn
6	Right Stop & Turn
7	Center Auxiliary

Remote Hand Held Unit

Plug the Hand Held Unit into any suitable 12V Auxiliary Power Port in the vehicle.

- Remote Hand Held Unit must be within easy reach of the operator.
- Do NOT operate with the Remote Hand Held Unit disconnected.

Automatic Leveling of the Sensor

The Prodigy RF will automatically acquire the proper level setting of the tow vehicle and trailer combination during the pairing operation.

Pairing Instructions

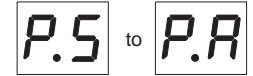
Synchronization of the Remote Hand Held Unit to the Power Module:

- Connect trailer to tow vehicle.
- Plug the Power Module 7-Way cable into the tow vehicle.
- Trailer's 7-Way connector must be disconnected from the Power Module.
- Start vehicle's engine. (Some vehicles require Key On to supply power to the 7-Way connector or Auxiliary Power Port)
- Plug the Remote Hand Held Unit into an auxiliary power source within easy reach of the operator.
- Turn the Power Knob to minimum position, Flashing 0.0.



FLASHING

- Fully depress and hold both the MANUAL OVERRIDE and BOOST BUTTON. The display will start from P.5 and end at P.A.



Once P.A has been achieved, the Manual and Boost can be released.

- Press and hold the brake pedal until the display shows flashing 0.0. for a correct pairing.



- Set the Power Knob to greater than minimum. Display now flashes n.c. (not connected).



- Re-connect the Trailer 7-Way connector to the Power Module. Display should now be .c. (connected).



NOTE: To properly identify your trailer during pairing, the 7-Way trailer plug must be disconnected from the Power Module.

Display Readings after Connecting the Prodigy RF

Once the units are connected and successfully paired, you should see the following on the two digit display:



- Initial Power to the Hand Held, without pairing or
- Power Module not powered or
- Paired, but Trailer is not connected to Power Module.

- Power Boost feature not engaged. with trailer disconnected and feature engaged.

- Manual Override Activated without trailer connected.

- Manual Override activated (with trailer), 5.4 denotes a hypothetical power output. This value is set using the power knob. Range is 0.0 to 13 volts. This is an indication of voltage output to electric brakes.

- Display will be blank during power saving mode (no motion or braking activity for at least 2 hours)

Adjusting the Power to the Trailer Brakes (Prior to setting Boost)

Brakes (Prior to setting Boost)

Once the Power Module has been securely mounted to the trailer frame and paired to the Hand Held Unit, it is necessary to set the power needed to stop the trailer during a braking event.

1. Connect trailer to tow vehicle.
2. Verify the Power Module to the Hand Held Unit have been paired.
3. Verify that all tow vehicle and trailer cables have been properly connected.
4. **CAUTION** Verify proper operation of all tow vehicle and trailer lights prior to towing.
5. With the engine running, and the Manual Override fully depressed, set the Power Knob to indicate approximately 6.0, then release the Manual Override.
6. Drive tow vehicle and trailer on a dry level paved surface at 25 mph and fully apply Manual Override.
 - ✓ If trailer brakes lock up:
 - ☐ Turn power down using power knob.
 - ✓ If braking was not sufficient:
 - ☐ Turn power up using power knob.
7. Repeat Step (6) until power has been set to a point just below wheel lock up or at a force sufficient to achieve maximum braking power.
8. Using the brake pedal, make a few low speed stops to check the power setting. Trailer braking is initiated and terminated via signals on the trailer wiring, (Left and Right Turn and Stop). When the brake pedal is released, the trailer braking will cease.

Boost Setting

The boost button was designed to allow a more aggressive setting for your trailer brakes and is available in three levels - [*b.1*], [*b.2*], [*b.3*]. Each incremental boost setting increases the sensitivity of the Prodigy RF's inertial sensor, enhancing the participation of the trailer brakes during a braking event.

The first press on the boost button displays the current setting. Boost is advanced to the next level by continuing to press the boost button.



Five seconds after setting the boost level, the display will show



indicating **Boost On** by the right most decimal.

For example: With the boost off. [*b.*], during a braking event, the power to the brakes starts out at zero and increases with deceleration. With the boost on level 1.

(Boost Setting continued)

[*b.1*], during a braking event, the power automatically starts out at approximately 13% of the power setting and increases with deceleration. With the boost on level 2. [*b.2*], or with the boost on level 3. [*b.3*], during a braking event, the power automatically starts out at approximately 25% of the power setting and increases with deceleration.

Some cases where you might want to use the boost button:

- You like the trailer braking to 'LEAD' the tow vehicle's braking
- Towing a full vs. empty trailer
- Degraded brake performance (most electric brakes require manual adjustment - see Appendix A or a dealer for adjustment or repair)

NOTE: Boost not intended to be used to take place of trailer brake adjustment or repair.

See the chart below for recommended "Boost" settings (indicated with **X**) for typical Trailer to Vehicle weight relationships.

Select your boost setting based on your towing situation, driving preference and condition of your trailer brakes.

Typical Boost Settings For Optimal Performance (with properly adjusted trailer brakes*)				
TRAILER WEIGHT compared to VEHICLE WEIGHT	<i>b.</i>	<i>b.1</i>	<i>b.2</i>	<i>b.3</i>
	BOOST "OFF" ↕ INCREASING BOOST LEVEL ↕			
Trailer weighs LESS than Vehicle	X	X		
Trailer weighs APPROXIMATELY SAME as Vehicle	X	X	X	
Trailer weighs UP TO 25% MORE than Vehicle		X	X	X
Trailer weighs UP TO 40% MORE than Vehicle			X	X
Trailer weighs OVER 40% MORE than Vehicle	WARNING Do not exceed Gross Combined Weight Rating (GCWR)			X

* Increased Boost setting may be needed if trailer brakes are worn, see Appendix A or a dealer for brake adjustment or repair.

NOTE:

1. Always warm the trailer's brakes before setting the power. Warm trailer brakes tend to be more responsive than cold brakes. To warm trailer brakes, drive a short distance (1/4 mile) at 45 MPH with manual lever engaged enough to cause trailer braking at a low level.
2. **WARNING** The power should never be set high enough to cause trailer brakes to lock up. Skidding trailer wheels can cause loss of directional stability of trailer and tow vehicle.
3. The power may need to be adjusted for different load weights and road conditions.
4. Not all trailer brakes will lock up due to various conditions. However, inability to lock up the brakes generally indicates the need for an inspection to determine the cause.
5. When the power is set correctly you should feel unified braking between the trailer and tow vehicle.

Reverse

When backing a trailer you can cancel “BOOST” and “HOLD” for a period of three minutes. This can be accomplished by pressing the boost button continuously for five seconds with the brake pedal depressed. The display will indicate:



(If “boost” was active, the right hand decimal point will also be on.) After three minutes the “BOOST” and “HOLD” features will automatically return to your previous settings.

NOTE:

Returning to your previous settings prior to three minutes can be accomplished by pressing the boost button.

Sleep Mode

To conserve power, the Prodigy RF system will enter a sleep mode 2 hours after there has been no movement or braking activity on the Power Module or Hand Held Unit.

Wake Up

1. Pressing the brake pedal in the tow vehicle or connecting/disconnecting the trailer from the Power Module will wake up both the Power Module and Hand Held Unit
2. The Hand Held Unit will wake up by any activation of the Manual, Power or Boost. However, if the Power Module does not have power or is disconnected, the Hand Held Unit will flash “n.c.” then return to the sleep mode.

Appendix A: Trailer Brake Adjustment**

Brakes should be adjusted after the first 200 miles of operation when the brake shoes and drums have “seated” and at 3000 mile intervals, or as use and performance requires. The brakes should be adjusted in the following manner:

1. Jack up trailer and secure on adequate capacity jack stands. Follow trailer manufacturers recommendations for lifting and supporting the unit. Check that the wheel and drum rotate freely.
 - ▲ **WARNING** *Do not lift or support trailer on any part of the axle or the suspension system.*
2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.
3. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.

Note: With drop spindle axles, a modified adjusting tool with about an 80 degree angle should be used.

4. Then rotate the starwheel in the opposite direction until the wheel turns freely with a slight lining drag.
5. Replace the adjusting hole cover and lower the wheel to the ground.
6. Repeat the above procedure on all brakes.
 - ▲ **WARNING** *Never crawl under your trailer unless it is resting on properly placed jack stands.*

Follow the trailer manufacturers recommendations for lifting and supporting the unit. Do not lift or place supports on any part of the suspension system.

**Note: Trailer Brake Adjustment procedures courtesy Dexter Axle.

Appendix B: FCC Information

Contains Transmitter Module
FCC ID: TBF-FREESTAR

▲ **WARNING** This device complies with Part 15 of the FCC Rules. Its operation is subject to the following conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20 cm separation distance between the antenna and all persons.

Appendix C: Patent Information

COVERED BY ONE OR MORE OF THE FOLLOWING:
U.S. PAT. 5741048, 6012780, 6068352, 6445993, 6615125
AU 716150, CA 2225644
OTHER PATENTS PENDING

Troubleshooting Chart

Display	Situation	Probable Cause
	Flashes 2 times per second.	Trailer is connected and Prodigy RF loses connection to battery ground.
	Flashes 2 times per second.	Prodigy RF “sees” an overload condition during operation.
	Flashes 2 times per second.	<ol style="list-style-type: none"> 1. Prodigy RF sees brake wire short during idle condition. 2. Use of some test lights or non-Tekonsha testers can cause this problem.
	Flashes continuously	<ol style="list-style-type: none"> 1. Power Module not connected to tow vehicle. 2. Trailer connector disconnected or corroded. 3. Key off or Loss of Battery Power from tow vehicle. 4. Trailer connected with open circuit on the brake line. 5. Loss of trailer brake magnet ground. 6. Loss of RF Communications, signal or interference. 7. Unit not paired or improperly paired.
	No display with manual or pedal activation.	<ol style="list-style-type: none"> 1. Loss of power to Prodigy RF Hand Held Unit. 2. Loss of Ground to Prodigy RF Hand Held Unit. 3. Sleep mode. To wake up, press manual or boost button. 4. Blown fuse in Hand Held Power Plug.
	No Braking Flashes Continuously	Power control set to zero.
	Power interruption while brake pedal is depressed.	<ol style="list-style-type: none"> 1. Intermittent power connection in 7-Way connector. 2. Power is applied while the manual or brake pedal is depressed.
	Pairing mode	<ol style="list-style-type: none"> 1. Pairing mode
	Flashing continuously	<ol style="list-style-type: none"> 1. Unable to pair. 2. Trailer connected while in pairing mode. Temporarily disconnect trailer from Power Module while P.A is flashing. 3. Brake pedal not depressed during pairing. 4. Unable to recognize Left / Right Turn and Stop Signals.