CATTRON™

Remtron Pump Boss II

User Manual

9M02-8814-A001-EN

CONNECT. CONTROL. PROTECT.

	**WARNING**
	Read all safety rules and warnings before installing and operating this system.

Revision History

VERSION	DATE	NOTES
1.0		Initial Release
2.0	04/2014	Updated Styles Revised Content
2.1	08/2014	Corrected Revision Number Updated Support Facilities
2.2	07/2015	Updated Support Facilities Removed Old Service Numbers from Images
2.3	08/2019	Document rebranded and contact information updated

Contents

1. FCC Compliance Statement

Pump Boss II® series receivers have been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio-frequency energy, and if not installed and used in accordance with the user manual, it may cause harmful interference to radio communications. However, there is no guarantee that harmful interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by switching this equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna connected to the device receiving the interference
- Increase the separation between our equipment and the equipment receiving the interference
- Consult Cattron or the distributor where you purchased the system for additional help

2. Safety Rules

	**WARNING**
	READ ALL INSTRUCTIONS. Failure to follow these rules can result in serious personal injury.

2.1 Installation

- PROVIDE A SAFETY CUTOFF SWITCH. If maintenance is required, disconnect the radio from power to prevent accidental pump activation.
- USE PROPER WIRING. Loose or frayed wires can cause accidental pump activation.
- DO NOT INSTALL IN HOT AREAS. This apparatus can be damaged by heat in excess of 160°F (71°C).
- DO NOT INSTALL IN HIGH VIBRATION AREAS. The life of this apparatus might be shortened through long exposure to intense shaking or vibration.

2.2 Personal Safety

- MAKE SURE MACHINERY IS CLEAR BEFORE OPERATING. Do not activate the remote system unless it is safe to do so.
- TURN OFF THE RECEIVER POWER BEFORE WORKING ON MACHINERY. To prevent accidental machine operation, always disconnect the remote system power before doing any maintenance.

3. System Description

The Pump Boss II® system consists of a handheld transmitter, a pump-mounted receiver and an antenna.

When the operator presses a switch on the transmitter, a digital message is sent via radio waves to the receiver. The digital message contains one of millions of possible ID Codes. This unique code makes it possible for the receiver to respond only to the proper transmitter. Additional codes are also sent, making the chance of false commands less than 1 in 16 million.

The Pump Boss II® system incorporates a fail-safe 'STOP' feature, in that a loss of radio signal drops all relays within five seconds, thus shutting down the pump. When radio communications are restored, the link to the receiver is also restored and the user can command any function. During the signal loss, the receiver defaults to all functions being turned off and the user must restore any latching functions that were reset by the signal loss.

All Pump Boss II® systems incorporate the innovative 'AUTO LINK™' function that allows the receiver to 'learn' the frequency channel and address of a replacement or spare transmitter. This function allows the Pump Operator to quickly substitute a spare PBIIT transmitter in the field without the need to physically reconfigure its frequency channel and address to match that of the receiver.

Receiver relays are Poly fused at 4.5 A. If too much current is drawn through these relays, the Poly fuse will open and remain open as long as electricity is applied through the relay. Once electricity is removed, the fuse will heal itself and be ready to operate within about one minute.

Note: In units operated above 24 VDC, the relays are protected with a 7 A fuse. Such fuses can only be replaced by Cattron.

The Pump Boss II® system complies with the requirements for operation under Part 15 of the FCC rules and regulations. This means that neither the operator nor the company need apply or register for a license to operate this equipment.

Note: Any metallic objects will affect radio waves. As the result, the user may encounter difficulty operating in certain locations. Read the section on using your system so that you can get the best performance.

3.1 PBIIT Transmitter

The Pump Boss II® transmitter is housed in a molded polymer plastic case that is IP67 compliant, which stands up to extremely rugged use. A key feature is the patented Cattron switch assembly for control inputs. This long-life elastomeric keypad is ergonomically designed to provide easy operation over long periods of time with exceptional reliability. A leather holster provides added protection and convenience. An optional clear protective pouch is available from your dealer.

Pump Boss II® transmitters are designed to be very efficient, operating from two AA batteries. To ensure long battery life, the transmitters shut themselves off after one hour of inactivity. The antenna is inside the transmitter case, protecting it from damage. A bicolored self-test LED indicator provides a quick visual check of transmitter and battery status. This LED flashes GREEN when no problems are present, flashes RED and GREEN under low battery conditions, or stays SOLID RED when other problems are encountered.

Referring to Figure 1, the Pump Boss II® Transmitter incorporates a POWER 'ON' pushbutton, a 'STOP/OFF' pushbutton and a 'PUMP/OFF' two-position rocker switch. Additional rocker switch functions are also provided, as follows:

- 'FWD/REV'
- THROTTLE 'INCREASE/DECREASE'
- VOLUME 'INCREASE/DECREASE'

Note: Depending on your exact system configuration, some or all of the additional rocker switch functions may not be operational.

Figure 1: PBIIT Transmitter

3.2 PBIIR Receiver

Referring to Figure 2, the Pump Boss II® Receiver is housed in a IP67 compliant, watertight, molded polymer plastic case that stands up to extremely rugged use. Electrical connections to the receiver are made through a multi-conductor cable. The cable plug from the external antenna connects to a TNC socket on the underside of the Receiver.

The AUTO LINK™ Touch Pad switch allows the receiver to learn the ID code from a Remtron replacement transmitter. See the AUTO LINK Procedure for more information.

Figure 2: PBIIR Receiver

PBIIR Receivers use an advanced synthesized FM receiver designed to work in the presence of potential interfering signals such as those that might be encountered from pagers, cell phones, two-way radios, etc.

A microprocessor-based decoder ensures a great deal of safety as well as versatility. It receives commands on one of 81 possible frequencies that are checked against a 16-bit address code for proper identity and further tested against a 16-bit CRC check code. This ensures that only valid information meant only for the particular unit is decoded. The receiver assembly monitors and indicates its status on a continuous basis. The diagnostics are presented in a simple, easy to understand format.

The ‘POWER’ LED illuminates when power is applied to the receiver.

The ‘SIGNAL’ LED has three functions:

- It will double-flash, pause, and then repeat, indicating that the receiver is looking for a signal.
- It will flash at a slow rate when receiving a signal and at a faster rate when it receives a command.
- It will remain on with two short blink periods when the AUTO LINK™ switch is pressed on the receiver. After the receiver learns the channel and address of the replacement transmitter, the LED remains on constantly without the two blinks.

The ‘OUTPUT’ LED illuminates when the transmitter activates a command function (i.e., when a receiver relay activates).

4. Installation

Note: Pump machines vary among different manufacturers; therefore, some wiring connections may be different from those provided in this manual. If you have questions about your installation, contact Cattron Customer Service for assistance. Please have the Engineering Number (ENG #), located on the back of the transmitter label, available when contacting Cattron.

Product Wiring Configuration Sheets for the most common Pump Boss II® systems are provided in Section 6 of this manual.

	**WARNING**
	Do not install the receiver near exhaust pipes or in other hot areas.

The Pump Boss II® system consists of the following:

- Handheld transmitter
- Leather transmitter holster and strap
- Receiver with attached multi-wire cable
- Antenna with coaxial cable

4.1 Mechanical

In selecting a place to mount the receiver, consider the following points:

- Access to the wiring for the control box on your machine
- Protection from mechanical damage during towing or during use
- Select a location with a flat mounting surface
- If possible, protect the receiver from direct exposure to sun and rain; even though the receiver is weather-resistant, it is good practice to protect it from the elements

Securely mount the receiver box to the pump using the supplied hardware.

4.2 Antenna Installation

Note: Proper antenna installation is essential for peak performance of the Pump Boss II. Take care to install the antenna properly.

Two different styles of antenna are available for Pump Boss II® systems. These must be permanently attached to the pump for proper performance. The standard Antenna supplied with the system is the RCA7 Long Range Antenna. An optional Antenna Mount is available that accepts a ‘whip’ style of antenna for short-range applications.

4.3 Locating the Antenna

For best reception, the antenna must be mounted to a horizontal surface with the top of the antenna at least eight inches away from all major metal structures (vents, splash panel, exhaust, etc.). There should be a clear line of sight between the antenna and the transmitter when pumping. The top of the pump hood is an excellent mounting location.

To ensure trouble-free performance, route the cable away from sources of heat such as the engine block, exhaust manifold, and exhaust pipe. The cable is rated for a maximum temperature of 185°F (85°C). Secure the cable in an out-of-the-way location where it will not be crushed or snagged. Before mounting the antenna, make sure the cable reaches the receiver box.

4.4 RCA7 Long Range Antenna

The RCA7 Long Range Antenna is mounted directly to the pump. The antenna mounting template is shown in Figure 3 and may be photocopied for direct application to the mounting surface.

Tools Needed:

- Drill or punch for 3/16 and 5/8-inch diameter holes
- #1 Phillips screwdriver
- Center punch
- Adhesive tape (such as masking tape)

4.4.1 Installation Procedure

1. Tape the mounting hole template to the mounting surface. Locate the four hole centers on the mounting surface by punching through the paper template with the center punch.
2. Remove the template and drill the four holes as indicated on the template.

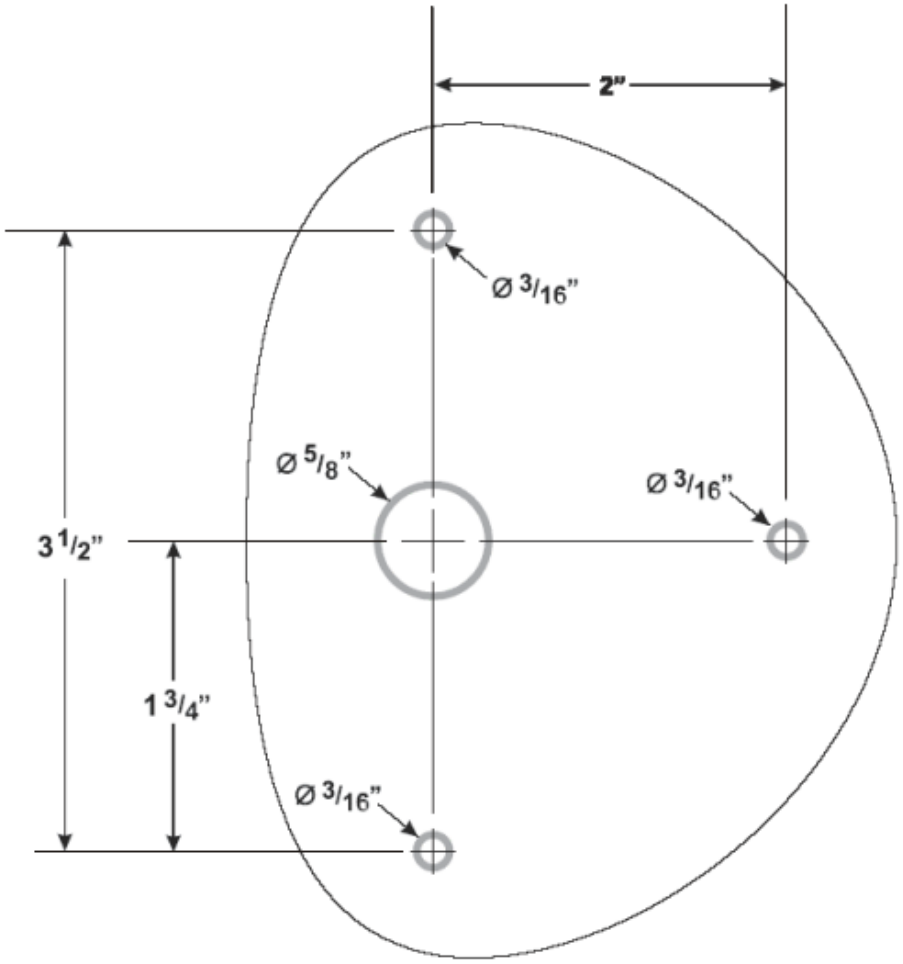


Figure 3: RCA7 Antenna Mounting Template

3. Feed the antenna cable through the center (5/8-inch diameter) hole. Insert the rubber grommet in the hole to protect the cable from chafing. Two grommets are supplied on each cable to accommodate either a 5/8-inch diameter or a 3/4-inch diameter hole. Cut off the unused grommet.
4. Secure the antenna using the #6 hardware supplied. Insert the screws through the antenna and secure with the lock washers and nuts.
5. Route the cable to the receiver and secure with cable ties.

4.5 Optional Antenna Mount

Tools Needed:

- Drill or punch for 3/4-inch diameter hole

This antenna mount accepts the whip type of antenna.

4.5.1 Installation Procedure

Referring to Figure 4:

1. Drill or punch a clean 3/4-inch diameter hole in the panel where the antenna will be mounted. Take care to make a smooth hole for the mounting surface.
2. Remove paint in a narrow ring around the underside of the hole. Note that metal-to-metal contact between the vehicle and the antenna mount provides the best performance. If the installation is on a fiberglass or other non-metallic surface, place a minimum 10-inch diameter (or square) metal plate or foil under the mount to achieve proper performance from the antenna.

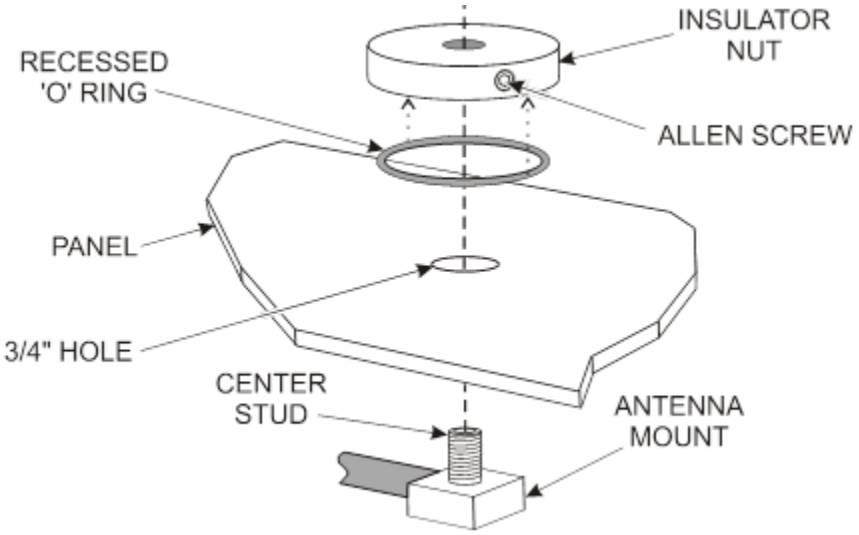


Figure 4: Optional Antenna Mount

3. Using the small Allen wrench supplied with the mount, release the Allen screw within the insulator nut and unscrew the insulator nut from the antenna mount. Ensure the ‘O’ ring is present in its recessed location on the underside of the insulator nut.
4. From the underside of the panel, insert the antenna mount (with the center stud facing upwards) into the 3/4-inch diameter hole. From the top of the panel, screw the insulator nut, complete with ‘O’ ring, onto the exposed stud. Before finally tightening the insulator nut and Allen screw, ensure the antenna mount is centered within the 3/4-inch diameter hole and that the center stud does not contact any metal.
5. Route the cable to the receiver and secure with cable ties.

5. Wiring Instructions

All electrical connections are made from the receiver to the pump with the cable supplied with the Pump Boss II® system.

Note: Individual Pump Boss II® systems have an Engineering Number (ENG #) which may be found on a label adhered to the back of the Transmitter. The same ENG # is also provided on the Wiring Configuration Sheet applicable to your product.

Product Wiring Configuration Sheets for the most common Pump Boss II® systems are provided in Section 6 of this manual. .

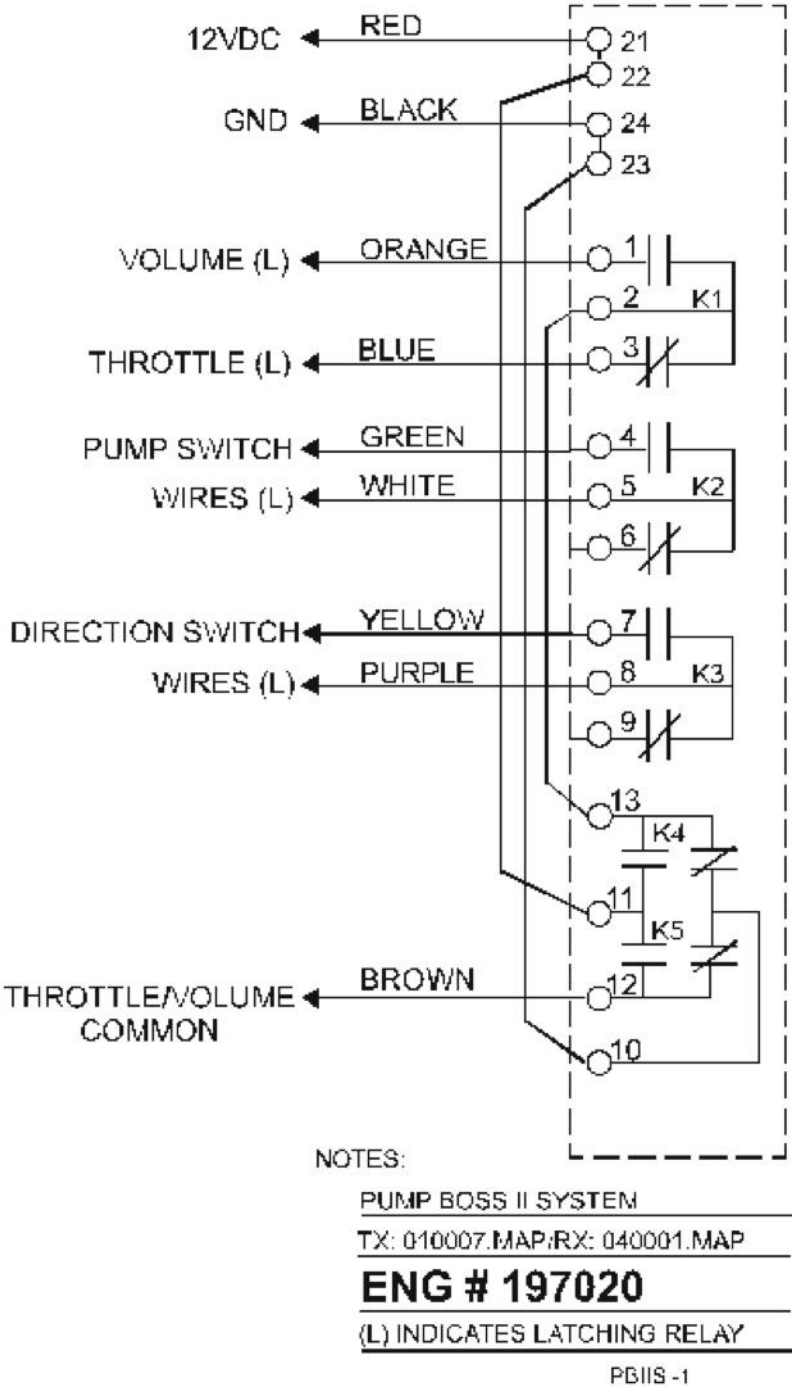
Improper installation could cause damage to the pump and/or the Remtron control system. Only qualified personnel should make all electrical installations.

For safety, disconnect the input power before installing the Pump Boss II® radio control system.

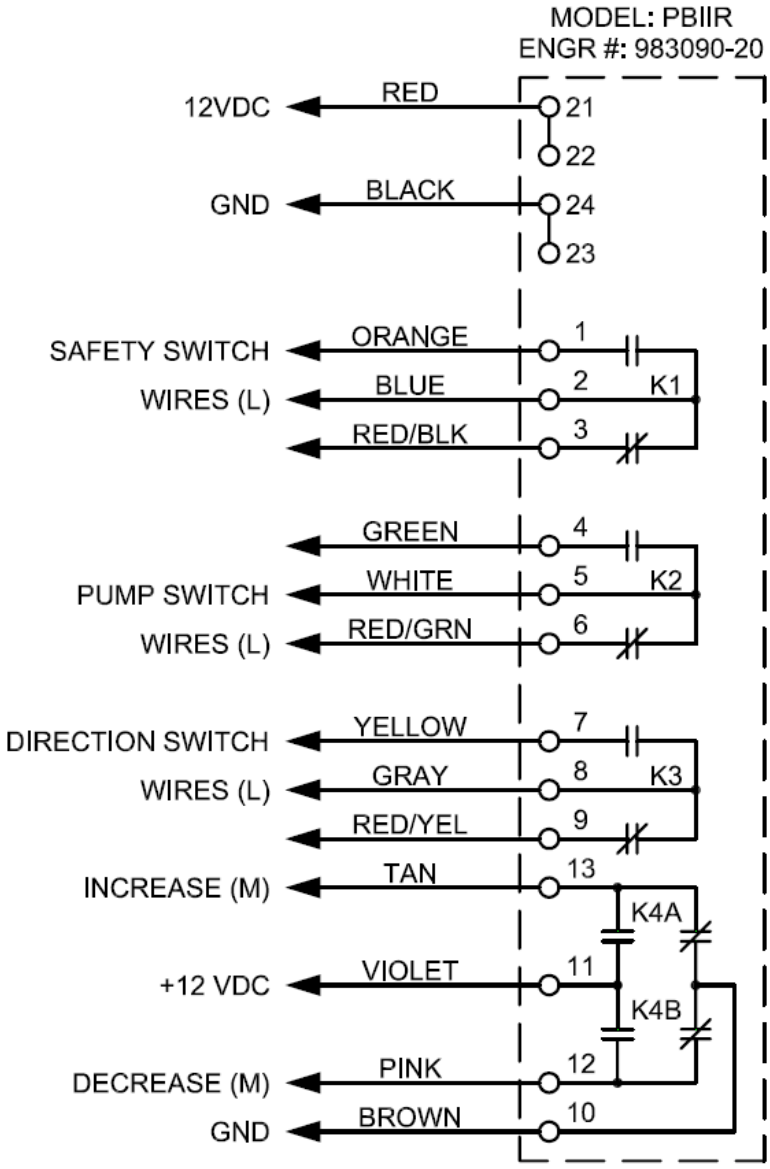
For applications involving throttle and/or volume, the PBIIR receiver utilizes an ‘H’ bridge output for motor control. This means that both sides of the motor are tied to ground when the motor is not operating. In order to operate the actuator from a local front panel control, disconnect the PBIIR receiver from the motor actuator before power is applied from another source. This can be accomplished by using a transfer relay (local/remote) or a three-throw toggle switch between the receiver from the local position actuator switch. This allows you to control the actuator from your local position only when our receiver relay(s) disconnect from the actuator.

6. Configuration Sheets

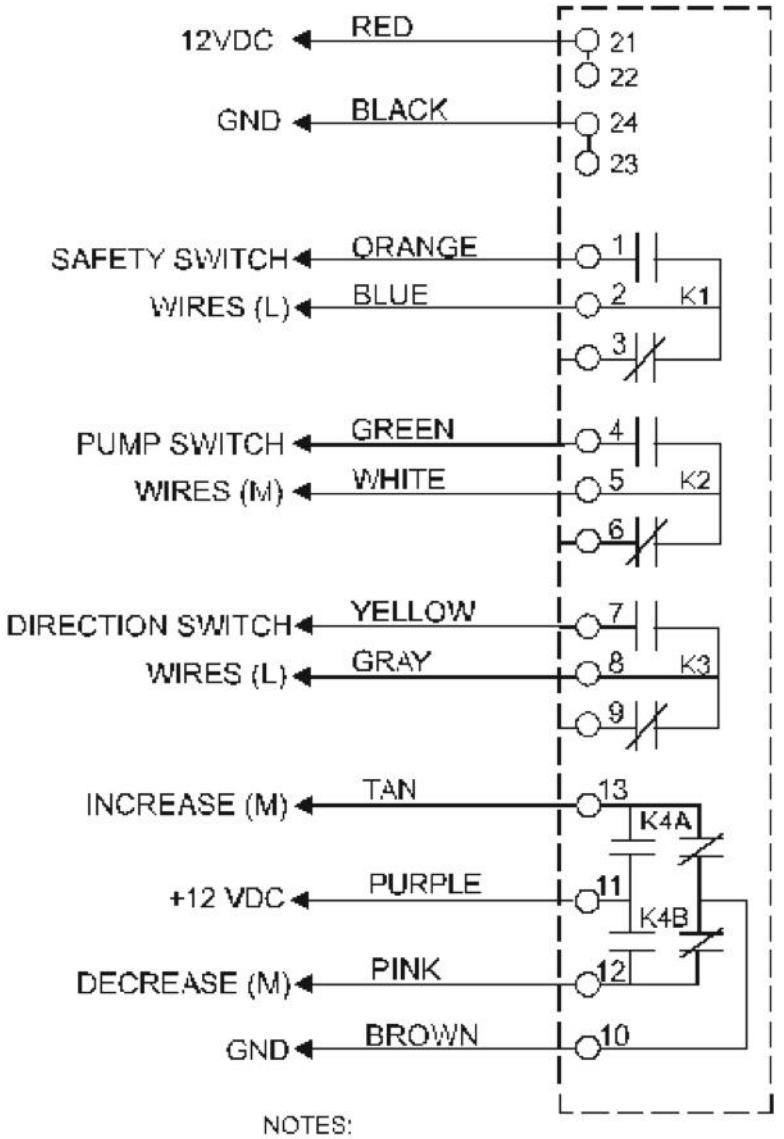
6.1 197020-10 (PBIIT) Transmitter – 197020-20 (PBIIR) Receiver



6.2 983090-10 (PBIIT) Transmitter – 983090-20 (PBIIR) Receiver



6.3 983091-10 (PBIIT) Transmitter – 983091-20 (PBIIR) Receiver



NOTES:

PUMP BOSS II SYSTEM (PUTZMEISTER)

TX: 010007.MAP RX: 040003.MAP

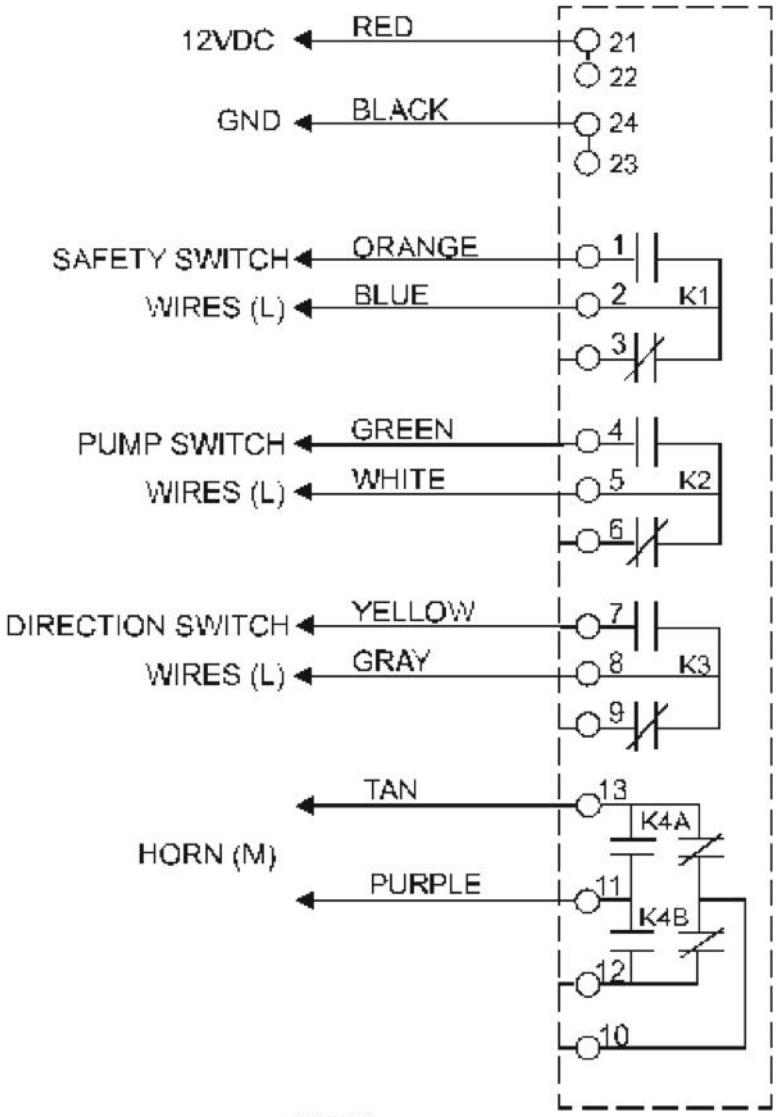
ENG # 983091

(L) INDICATES LATCHING RELAY

(M) INDICATES MOMENTARY RELAY

PBIIS -3

6.4 983092-10 (PBIIT) Transmitter – 983092-20 (PBIIR) Receiver



NOTES:

PUMP BOSS II SYSTEM (REED)

TX: 010007.MAP;RX: 040004.MAP

ENG # 983092

(L) INDICATES LATCHING RELAY

(M) INDICATES MOMENTARY RELAY

PBIIS-4

7. Using Your System

	**WARNING** Before operating the remote control system, make sure it is safe to do so. Adhere to the same safety precautions normally required for safe pump operation. DO NOT leave the transmitter unattended while the pump engine is operating.

	**WARNING** Do not operate the system until you are familiar with the operation and safety procedures for the pump.

	**WARNING** To stop the system in an emergency, press and hold the red STOP/OFF button to stop all functions.

Place the ignition switch ON to power the receiver. Verify that the receiver 'POWER' LED illuminates. If it does not illuminate, check the power connections to the receiver.

Note: The transmitter antenna is located inside the top of the transmitter case. Achieve normal range with the transmitter worn on your body. Moving the transmitter away from your body or holding it in the air can achieve extended range and operation in difficult areas. Pointing the transmitter towards the receiver provides the greatest signal.

7.1 Starting the System

Press the transmitter 'ON' switch and observe that the bicolor transmitter LED flashes GREEN. If the transmitter LED flashes RED and then GREEN, the batteries are low and should be replaced at the first opportunity. Note that when the RED 'low battery' condition is first observed, the operator has approximately eight hours of operation left before the transmitter shuts down.

Once the transmitter is switched ON, if no switches are operated within one hour, it will automatically switch itself OFF. Note that operation of any switch except the red 'STOP/OFF' switch resets the one hour timer. Operating the transmitter's 'STOP/OFF' switch shuts down the system.

Further note that when any other transmitter switch is pushed in conjunction with the 'ON' switch, the transmitter LED illuminates solid RED. This condition prevents any pump operation. First pressing the transmitter's red 'STOP/OFF' switch and then pressing the 'ON' switch will clear this condition.

7.2 Pump Operation

With the transmitter switched ON, pressing the top half of the 'PUMP/OFF' rocker switch starts the pump. Pressing the bottom half of the 'PUMP/OFF' rocker switch turns the pump OFF.

Pressing the red 'STOP/OFF' switch also shuts off the pump and the transmitter. However, the 'ON' switch and the top half of the 'PUMP/OFF' rocker switch must be pressed in sequence to reactivate the pump.

If the signal from the transmitter is lost for more than five seconds, the pump shuts off and the receiver will not recognize any commands from the transmitter. When the signal from the transmitter is restored, the top half of the 'PUMP/OFF' rocker switch must be depressed to start the pump before remote control can resume.

On all Pump Boss II transmitters, several optional rocker switches are provided. These rocker switches operate in the same manner as the 'PUMP/OFF' rocker except they may be either (M) momentary or (L) latching. Consult the configuration sheets in Section 6 and match the Engineering Number (ENG #) on the back of your transmitter to the configuration sheet with the same number for the type and switch functions of your unit.

Note: Depending on your exact system configuration, some or all of these optional rocker switch functions may not be operational.

7.3 Helpful Hints

If the Pump Boss II® system does not operate properly, check the wiring. Always make sure the electrical connections are clean and tight. Pumps vibrate, and loose wires can easily become disconnected. It is also a good idea to tie the wires from the receiver to solid points to keep them from swaying.

Pump Boss II® receivers use self-healing 4.5 A Poly fuses to protect all relays. If any of these receiver relays is overloaded, the fuse device opens to protect the unit. When it cools down, the fuse device closes, restoring normal operation to the output.

Note: In units that are operated above 24 VDC, the relays are protected with a 7 A fuse. Such fuses can only be replaced by Cattron.

7.4 System Troubleshooting

7.4.1 System Does Not Operate

1. Check the transmitter (see Transmitter Troubleshooting).
2. Make sure the receiver 'POWER' LED is illuminated. If it is not illuminated, determine if +12 VDC is present between the red and black wires of the receiver.
3. Check that the receiver 'SIGNAL' LED illuminates when the transmitter is turned on. If it does not illuminate, the transmitter may not have 'learned' the transmitter's frequency channel and address. Invoke the 'AUTO LINK™' procedure on the receiver and transmitter – refer to the AUTO LINK Procedure.
4. See if the receiver 'OUTPUT' LED illuminates when the transmitter is used to switch on a function (i.e., a receiver relay is activated). If the LED indicates the signal from the transmitter was received, the problem is usually external to the receiver.

7.4.2 Insufficient Range

1. Check that the receiver antenna is installed properly; see Antenna Installation.
2. Visually inspect the connector, connector center pin and cable for damage. The cable should have no cuts, kinks or sharp bends; it will not withstand temperatures above 185ºF (85ºC). If it is overheated, the cable will be stiff or flattened. Look for this in areas where the antenna cable is routed near the engine exhaust system.

7.5 Transmitter Troubleshooting

The transmitters have a bicolored LED status indicator to aid in troubleshooting. Due to the rough treatment it may endure, most problems are likely to occur in the transmitter. Thoroughly diagnose the transmitter before proceeding to the receiver.

	**WARNING** When testing the transmitter, the receiver may become active, resulting in system operation. Always assume the system is working and will respond when testing a transmitter.

Table 1: Transmitter Troubleshooting Chart

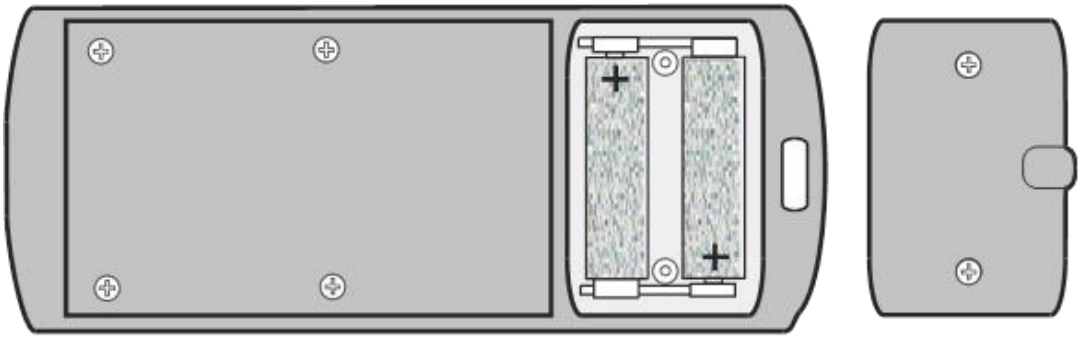
LED Indication	Possible Cause	Remedy
LED is OFF	Transmitter is off	Press ‘ON’ switch
	Batteries are dead	Replace batteries
	Transmitter failure	Call for service
LED alternating RED/GREEN	Batteries getting low	Change batteries at the next convenient opportunity
LED is on RED continuously	Switch activated with ‘START’	Activate ‘STOP’ switch then release ‘STOP’ switch; activate ‘START’ switch without touching any other switch
	Transmitter Failure	Call for service

8. Replacing the Batteries

When the batteries are getting very low, the transmitter's bicolored self-test LED indicator will alternately flash between GREEN and RED. When this occurs, or at least once a year, replace the transmitter batteries. AA alkaline batteries should be used for long battery life. Rechargeable batteries are not recommended.

Referring to Figure 5:

1. Fully release the two captive screws and remove the battery door.
2. Remove and replace the AA alkaline batteries. Be sure to observe the correct polarity.
3. Replace the battery door and secure using the two captive screws. Tighten the battery door screws until they are snug, plus half a turn.



PBIIT Transmitter with Battery Door removed

Figure 5: Changing the Batteries

9. Replacing the Transmitter

All Pump Boss II® systems incorporate the innovative ‘AUTO LINK™’ function that allows the receiver to ‘learn’ the frequency channel and address of a replacement or spare transmitter. This function allows the Pump Operator to substitute a spare PBIIT transmitter in the field without dismantling the transmitter or receiver to physically reconfigure its frequency channel and address.

9.1 AUTO LINK Procedure

Referring to

Figure 6:

1. Install fresh batteries in the Transmitter and press the ‘ON’ switch. The GREEN LED should flash.
2. Switch on the Radio Remote Receiver and check to see the ‘POWER’ LED is lit.
3. Press and hold the receiver’s ‘AUTO LINK™’ Touch Pad (switch) and observe that the ‘SIGNAL’ LED lights up with two short blinks.
4. Locate the transmitter within five feet of the receiver antenna. Press and hold the transmitter’s red ‘STOP/OFF’ button switch and observe the receiver’s ‘SIGNAL’ LED.

When the ‘SIGNAL’ LED is continuously lit (no blinks), the receiver has ‘learned’ the frequency channel and address (ID Code) of the transmitter.

Note: If the receiver’s ‘SIGNAL’ LED does not switch from blinking to solid, the old transmitter ID code will remain in receiver memory.

5. Release the receiver’s ‘AUTO LINK™’ switch, followed by the transmitter’s ‘STOP/OFF’ button switch.

The replacement transmitter’s frequency channel and address is now entered in the receiver memory. You may now proceed with Pump Operation.

Transmitter ‘ON’ switch

Transmitter ‘STOP / OFF’ switch (Press and hold during the ‘learning’ procedure

‘AUTO LINK’ switch (Press and hold during the ‘learning’ procedure

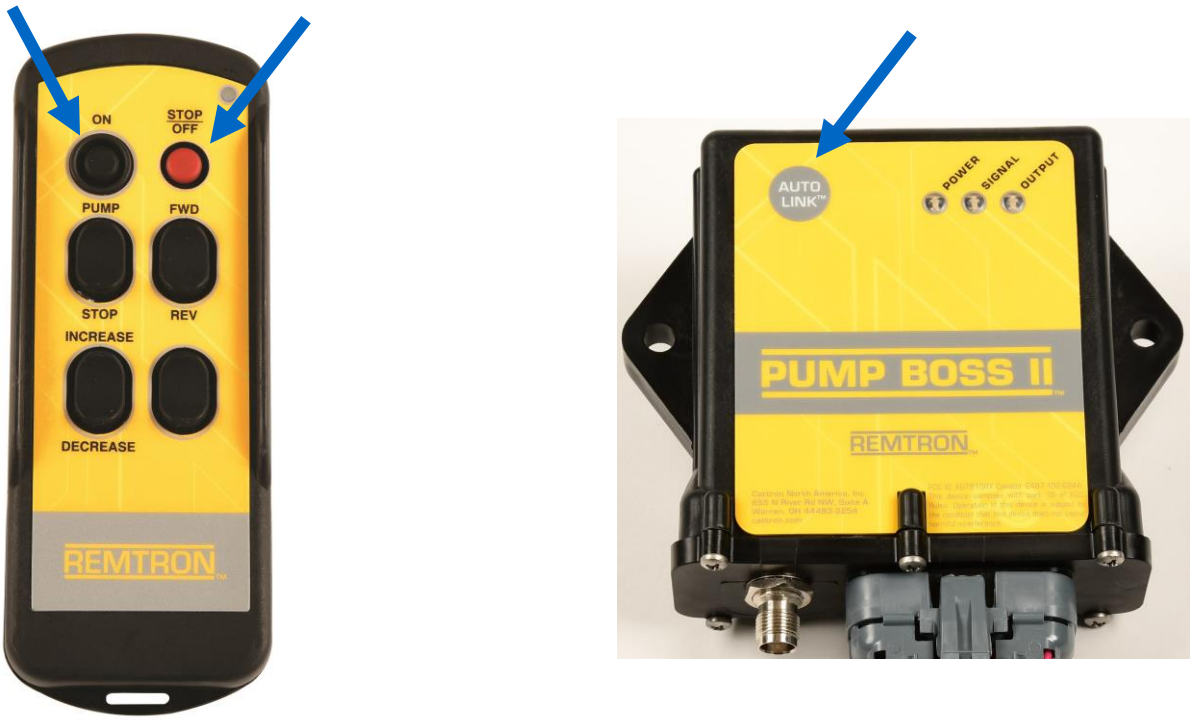


Figure 6: AUTO LINK Switching

10. Replacement Parts

Replacement parts are available from the distributor where you purchased the system or directly from Cattron.

Item	Part #
Leather holster	620022
Shoulder strap for transmitter	600008-02
Weather resistant, clear plastic carry bag for transmitter (shoulder strap not included)	620024
RCA7 900 MHz long range antenna (standard item supplied with system)	950185-01
900 MHz 12 coil whip antenna (no coax, no mount)	485022
900 MHz antenna mount with coax (no antenna)	920053

11. Warranty Statement

For service and repairs, go to www.cattron.com/contact.

Due to continuous product improvement, the information provided in this document is subject to change without notice.

Cattron Support
For remote and communication control systems support, parts and repair, or technical support, visit us online at:
www.cattron.com/contact

Cattron North America Inc., 655 N River Rd NW, Suite A, Warren, OH 44483

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