INSTALLING THE TEKONSHA PRODIGY™ ELECTRIC TRAILER BRAKE CONTROL IN THE BMW X5

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March 2, 2004

INTRODUCTION

The 2000 – 2004 BMW X5 SAV is rated to tow up to 6,000 lbs GVW with the factory specified hitch. Trailers this large may often be equipped with, and/or require electric trailer brakes. The X5 is one of the most advanced Sport Utility vehicles offered and requires special care and attention when installing a trailer brake controller, so as not to interfere with or damage the many complex electronic systems present on the BMW X5.

While BMW offers a factory or dealer-installed trailer towing receiver hitch and 7-pin trailer electrical wiring adapter, no factory provision has been made for installation of an electric trailer brake control.

STEP 1 – SELECT CONTROL LOCATION

The BMW X5 cockpit has very limited space for the addition of a trailer brake controller. The only suitable location I was able to identify, was to mount the unit on the left-most side of the driver's knee bolster panel. This is the only location that was found where the unit would be in its proper orientation, and keep both the display and the control switches within easy sight and reach of the driver. Unfortunately, this does add an obstacle that is sometimes in the way during entering and exiting the vehicle. Fortunately, the Tekonsha Prodigy is designed with a slide-in mounting cradle and connector that allows the unit to be removed when not in use.

Before mounting the controller I routed several of the wire harness wires to their appropriate locations. First, the black (+12V power) and the white (Ground) wires were routed to the engine compartment.

1. To access the firewall area, the driver's underdash panel was loosened and dropped (6 sheet metal screws, + 2 plastic fasteners).

2. The driver's knee bolster panel can then be removed by removing the 4 sheet metal screws along the lower edge of the instrument panel, and the additional screws exposed when the underdash panel is dropped. There is also a vinyl boot that attaches to the steering column which unsnaps from the column with plastic push-in fasteners attached to the boot. Once dropped, be careful as the OBD II connector is still attached to this panel. This can be removed by sliding the blue plastic lock to the left side of the vehicle and the OBD II connector will unsnap from the bolster. Now you have access to the underdash area.

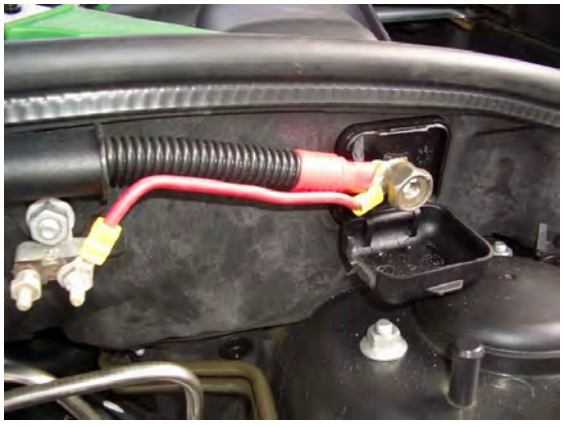
3. Working from the engine compartment side, using a wire coat hanger, or other "fishing" tool, gently push the tool through

the large grommet and along the main wiring harness to reach inside and under the dash. Be careful not to puncture or rip the grommet. Patience and persistence is required for this.

4. Once you have the tool inside, attach the black and white wires from the controller harness to the tool. Loop the end of the tool around the wires, and loop the wires back on themselves and make several wraps. Wrap the entire junction with electrical tape to secure it well. You're going to be pulling quite hard to coax the wires into and through the wire harness and grommet.

5. Moving to the engine compartment again, gently but firmly pull the wires into the engine compartment being careful not to damage any other wires or the grommet. Untape them from the tool.

6. In the engine compartment, there is a battery (+) connector mounted on the firewall. The Tekonsha controller calls for the installation of a 20A – 30A resettable circuit breaker between battery (+) and the black wire. A standard automotive-style circuit breaker was mounted to the wire



retention grommet for the battery wire. The black wire was extended with the proper crimp connector and additional #12 wire to the circuit breaker. The other side of the circuit breaker was connected to the battery (+) terminal with a large diameter ring terminal and secured.

7. The white ground wire from the controller harness also needs to be lengthened and was run along the hood release cable to an existing screw to which a ground connection was made.

8. The wires were dressed and secured with wire ties.

9. Moving back inside, the blue “output” wire from the controller wire harness was also extended to reach to the rear of the vehicle. Again, please be sure to observe the appropriate wire gauge and splice connector. The wire was routed underneath the “dead peal”, under the carpeting along both the front and rear left door sills, under the rear seat bottom and into the cargo area. (NOTE: When I took these photos, I also ran the red wire to the cargo area, thinking I could find a suitable brake light connection there.

This was not to be. So, please disregard the red wire shown in these photos.)

10. Here, it was dressed along existing wiring to the rear panel where the BMW trailer connector wiring is attached. If possible, obtain a matching male terminal pin for the existing BMW connector and add it to the connector to complete the circuit to the blue wire in the BMW connector. I used a Molex terminal pin which was similar, available, and worked in my connector. If this is not available, you will have to cut the blue wire from the BMW connector and splice it to the blue wire you have just routed.

11. Again, dress and secure this wire with wire ties.

12. Finally, the most difficult connection – the red wire that senses brake engagement. Before I go into how this was accomplished, some system explanation is in order. Normally, this wire connects to a conventional brake light switch that

connects the brake light circuit to +12V when the brake switch is depressed. That is the case on most vehicles, but not on the BMW X5. The BMW X5 has a special Hall Effect switch on the brake pedal that does not switch power itself. It is essentially a sensor that sends information to numerous systems on the X5, including the ABS system, the cruise control, the Lighting Control module, and others. So, it is NOT possible to connect directly to the brake switch on the X5.

13. Next, I tried to locate a suitable brake light signal that could be used to trigger the brake control circuit. Since the X5 has separate brake and turn signal bulbs, connecting to one of the brake lights seemed to be feasible. Upon further investigation, I found that BMW sends signals to the brake lights when the lights are on for lamp outage detection. Connecting to the brake lights directly could interfere with this function, and possibly even trigger the brake control when the lights were turned on, so this is not advised.

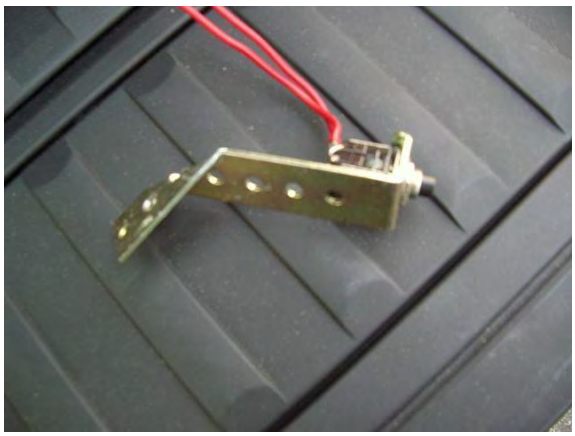
14. Next, a connection to the CHMSL (center stop lamp) might be possible. But, I was unable to easily locate a convenient location to pick up this signal and confirm that it was suitable.

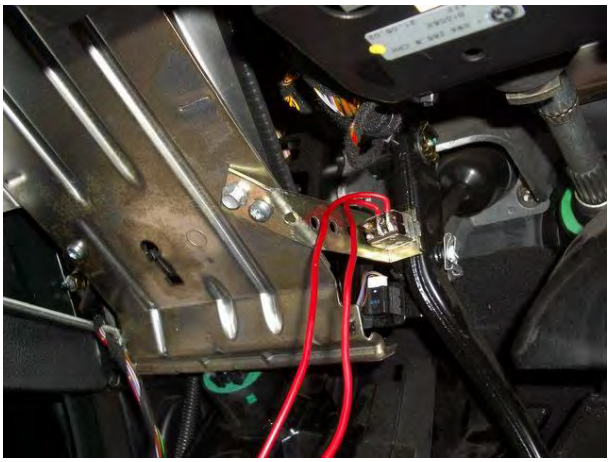
15. Finally, a connection to the brake/turn lamp output of the trailer connector seemed possible. But that signal puts both the functions of turn signal and brake lamp on one bulb to be compatible with trailer wiring. Thus the brakes would then pulse with the turn signal or emergency flashers. So again, not recommended, as it would be nearly impossible to drive with the 4 way flashers engaged.

16. Rumor has it that BMW does recommend a connection to one of the outputs of the Lighting Control Module (LCM) that is mounted behind the glove compartment above the passenger footwell. Calls to several dealers and a visit to BMW's and others' websites produced no useful information on this possibility. An cursory investigative look at the LCM also did not produce an obvious solution.

17. The solution chosen was to add an additional mechanical switch to the brake pedal. This switch needs to be normally open when the brake pedal is not in use, and normally closed when the brake pedal is depressed. A simple bracket was fabricated and a suitable switch mounted to detect brake pedal movement.

18. The red wire from the brake control harness is connected to one side of this switch, and a wire spliced into the black wire (+12V) is connected to the other side of the switch.





19. Now that the wiring is complete, the unit can be mounted and tested. I used 4 sheet metal screws to secure the plastic mounting cradle to the knee bolster. Since this will be a permanent installation, I was not concerned about drilling through the leather. If you want to remove the controller frequently as I do, you will need to remove and disable the connector lock feature as it is very difficult to unlock once the unit is in the cradle. A long, thin screwdriver is needed to unlock the connector once the module is in the cradle and the connector is locked to the module. If you disable the connector lock feature, always be sure your device is firmly connected for each use and confirm this through the devices' visual display.

20. Finally, replace all the removed panels, clean up and take a test drive to set the controller to work with your trailer. Happy Trailering!

Addendum:

Information from the 1st Page of BMW's Tow Bar Installation Instructions:

"A connection pin for retrofitting (electric brake) is provided on plug X393S. If an electrical brake is desired for the trailer, it can be retrofitted. For the latest list of recommended brake controllers contact BMW Service Hotline. The signal pick-off for brake (the input to the brake controller) may only take place on plug X12, Pin 10. This plug, X12, is to the Light Control Module (LCM), the wire color is black and yellow. The male pin (BMW P/N 61 13 1 376 195) should be used at the mating plug of X393S. Be sure to observe this information."