DECELERATION LIGHTS

By providing a visual warning that your vehicle is slowing down, you can help motorists behind you to react more safely

Transit buses have been equipped with accessory braking devices for many years. Most often, these devices are either electromagnetic retarders or transmission retarders. Despite slow-speed operation, transit vehicles have been subject to a high incidence of rear-end collisions. Although it sounds strange, drivers reported that they did not see the bus stopping. Today, deceleration lights have become common in transit applications. Deceleration lights are not common on highway vehicles such as trucks and coaches. Presumably this is because of a relatively low incidence of rear-end collisions.

Recreational vehicles also are not usually equipped with deceleration lights. Since the late 1980s, Prevost Car Inc. has used a red rear center Cyclops brand braking light. Initially it illuminated singularly when the second pair of Jake Brake solenoids were activated (in the 8V92 engine) as well as when the service brakes were applied. Some law enforcement officers thought this was a defective brake light, so wiring was changed to illuminate the Cyclops as well as the service brake lights when the Jake Brake was activated. At times, this led truckers to believe the coach driver was “riding the brakes.”

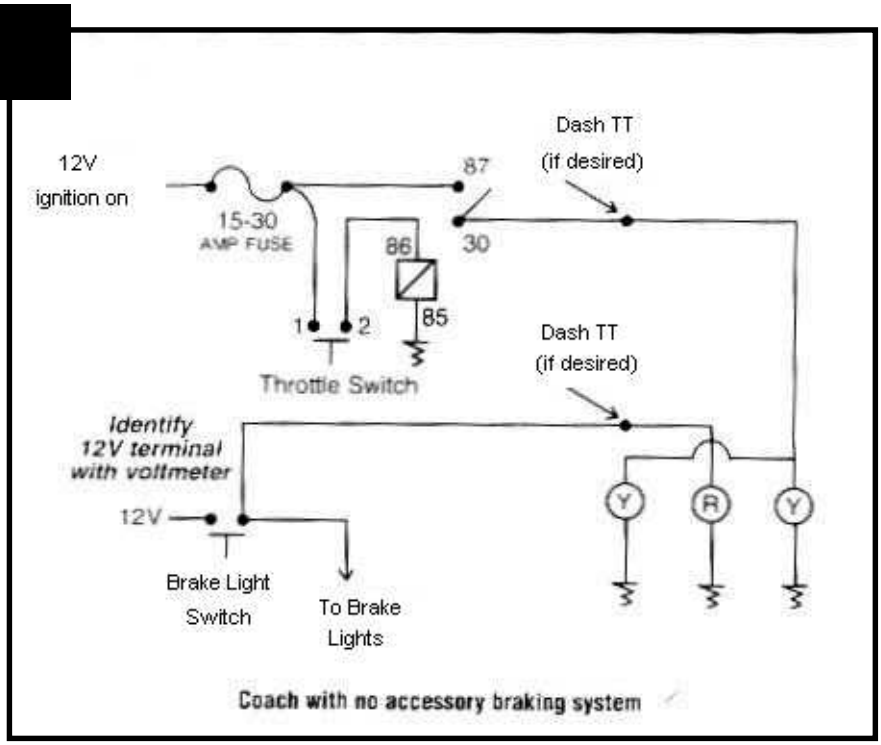
We, too, were faced with sudden stops when we did not recognize that a leading vehicle was slowing, and we wanted to improve the awareness of following motorists to recognize when we were decelerating. Our 1986 Prevost was equipped with a Jake Brake but no deceleration lights. Because we did not have a Cyclops, we built a circuit to utilize the rear amber turn signal lights. Both illuminate when the second set of Jake Brake solenoids are activated but still function as turn signals whether or not the Jake Brake itself is active.

Today a significant number of motorhomes are equipped with either engine or exhaust brakes. The efficiency of these braking systems is enhanced by high rpm operation. The Allison World transmission automatically downshifts to maximum allowable rpm during accessory braking operations, which leads to very effective decelerating forces. Without warning signals, this deceleration can surprise trailing motorists.

In the diagrams that appear in this article, we have shown wiring circuits that can be used to add deceleration lights to coaches with varying configurations. Diagram A is for a coach with no accessory braking system. Diagram B is for a coach that has an accessory braking system with red only turn and brake signals. Diagrams A and B also show wiring for a center Cyclops brake light if desired. Diagram C is for a coach that has an accessory braking system with red brake lights and amber turn signals. **Important:** If the coach is equipped with an antilock braking system (ABS), consult the ABS manufacturer before making any changes to the existing brake light wiring. Diagram D shows the dash-mounted Tell Tale monitors for brake light and deceleration light illumination.

One can use the existing brake lights as deceleration lights rather than adding the amber lights. All this requires is connecting a wire with a diode from the accessory brake activating solenoid to the place where the brake light switch is wired to the brake lights. However, our concern with this option is that trailing motorists may believe you are “riding the brakes” and become desensitized to the deceleration. If you are coasting in a “no fuel” condition with the accessory braking system activated, the brake lights will be illuminated, if you then need to brake rapidly, the trailing motorist will not see a signal change, and may not appreciate that you have significantly increased your deceleration by applying the service brakes.

DIAGRAM A



Parts:

Throttle switch or clutch switch
Amber lamp assemblies (two)
Red lamp assembly (one)
15- to 30-amp fuse and holder
(use smallest working value)
12-volt, 30-amp single-pole
single-throw (SPST) relay
14- to 16-gauge wire as needed

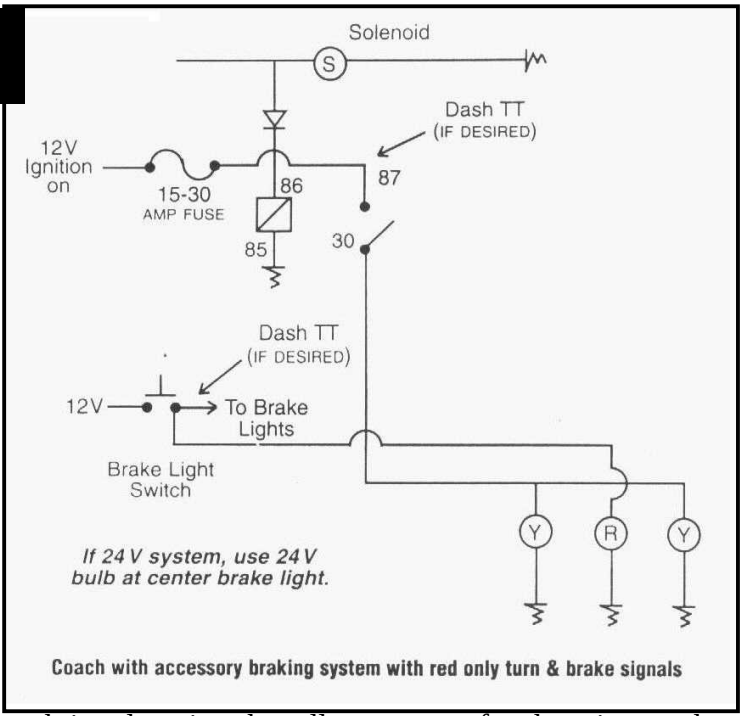
Procedure:

1. Mount the throttle switch so that it is activated during a no-fuel condition, either in the engine compartment or at the accelerator pedal linkage, according to the manufacturer's recommendations.
2. Mount lamp assemblies on the rear center of the coach in a location that allows access for the wires to the lamp assemblies. try to mount them higher than the OEM service lights, similar to the way the center brake light is mounted on automobiles. Ideally, the lamp assemblies should be high enough to be visible above a towed vehicle.
3. Using a 15- to 30-amp fuse, connect the 12-volt-DC ignition "on" source to terminal 87 on relay and to terminal 1 of throttle switch.
4. Connect terminal 2 of throttle switch to terminal 86 of relay.
5. Connect terminal 85 of relay to ground.
6. Connect a wire from terminal 30 to amber lamp assemblies hot leads, which are usually black.
7. Connect other wires from lamp assemblies, which are usually white, to ground.
8. Connect wire from brake light switch terminal without 12 volts to red lamp assembly hot lead, which is usually black.
9. Connect other wire from red lamp assembly, which is usually white, to ground.

Testing the system:

1. With ignition "on," apply service brakes. Both brake lights and red center brake light should illuminate. Release brakes.
2. Activate turn signals. Each turn signal should blink; the center brake light should not.
3. With throttle in no-fuel position, amber lights should be illuminated. Push throttle slightly; amber lights should be off.
4. Turn ignition "off."

DIAGRAM B



Coach with accessory braking system with red only turn & brake signals

Parts:

Three-amp diode
Amber lamp assemblies (two)
Red lamp assembly (one)
15- to 30-amp fuse and holder
(use smallest working value)
12-volt, 30-amp SPST relay
14- to 16-gauge wire as needed

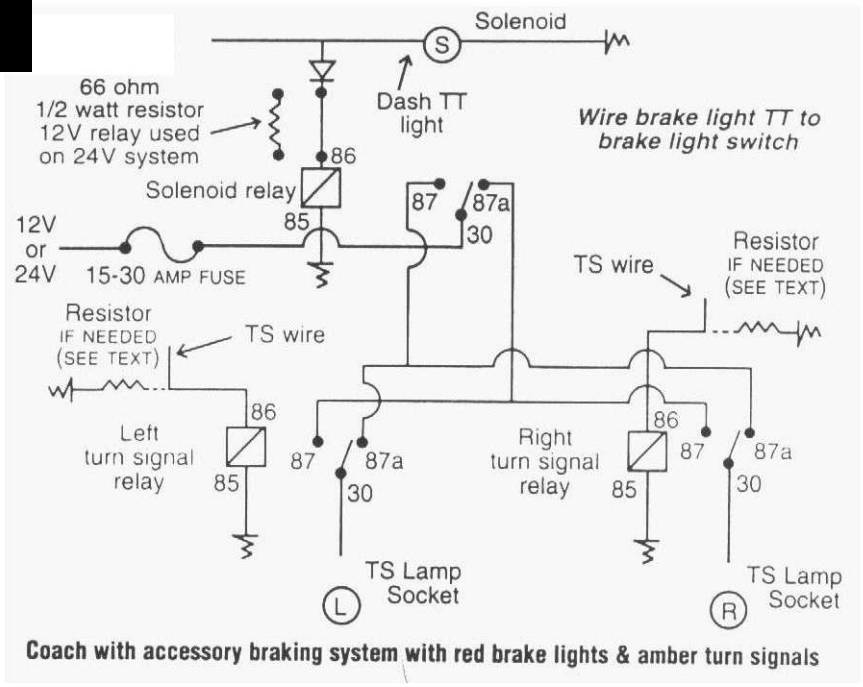
Procedure:

1. Mount lamp assemblies on rear center of coach in a location that allows access for the wires to the lamp assemblies. Try to mount higher than OEM service lights, similar to the way the center brake light is mounted on automobiles. ideally, the lamp assemblies should be high enough to be visible above a towed vehicle.
2. Identify the wire running to the activating solenoid(s) of the accessory brake. If equipped with a Jake Brake, use the high position solenoid. This will allow the system to be deactivated when the Jake Brake setting is either low or medium, if you wish to have the system active for all settings, use the low position solenoid.
3. To protect all OEM circuits, a diode is used to isolate the added relay and wiring. Orient the diode with the black stripe away from the solenoid. Attach a 3-inch wire to the solenoid end of the diode. Attach a wire long enough to reach the relay to the end with the black stripe. Solder wire leads to the diode and insulate with heat-shrink tubing.
4. Connect the 3-inch lead to the activating solenoid wire using a line tap or solder connection.
5. Connect the long lead to terminal 86 on the relay.
6. Connect terminal 85 to ground.
7. Connect 12-volt-DC, ignition “on” source with 15- to 30-amp fuse to terminal 87 on relay.
8. Connect a wire from terminal 30 to amber lamp assemblies’ hot leads, which are usually black.
9. Connect other wires from lamp assemblies, which are usually white, to ground.
10. Connect wire from brake light switch to red lamp assembly hot lead, which is usually black
11. Connect other wire from red lamp assembly, which is usually white, to ground.

Testing the system:

1. With ignition “on,” apply service brakes. Both brake lights and center brake light should illuminate. Release brakes.
2. Activate turn signals. Each should blink; center brake light should not.
3. Turn on the accessory braking system. When the solenoid is activated, the amber lights should illuminate. This will vary according to the type of accessory brake system and its installation. To activate the Jake Brake solenoid, put the transmission in neutral, rev the engine to 1,500 rpm, and then release the throttle. Many Pacbrake installations use a foot switch to activate the solenoid. It may be necessary to test-drive the vehicle and have a helper observe the lights.
4. Turn off the accessory braking system. The amber lights should remain off in a no-fuel condition.

DIAGRAM C



Coach with accessory braking system with red brake lights & amber turn signals

Parts:
Three-amp diode
15- to 30-amp fuse and holder-(use smallest working value)
Three 12-volt, 30-amp single-pole double-throw (SPDT) relays
14- to 16-gauge wire as needed
Resistors

Procedure:

1. Identify the wire going to the activating solenoid(s) of the accessory brake. If equipped with a Jake Brake, use the high position solenoid. This will allow the system to be deactivated when the Jake Brake setting is either low or medium. If you wish to have the system active for all settings, use the low position.

2. To protect all OEM circuits, a diode is used to isolate the added relay and wiring. Orient the diode with the black stripe away from the solenoid. Attach a 3-inch wire to the solenoid end of the diode. To the end with the black stripe, attach a wire long enough to reach the relay. Solder wire leads to the diode and insulate with heat-shrink tubing.

3. Connect the 3-inch lead to the activating solenoid wire using a line tap or solder connection.

4. Connect the long lead to terminal 86 of the solenoid relay.

5. Connect terminal 85 of all three relays to ground.

6. Connect 12-volt-DC, ignition “on” source with 15- to 30-amp fuse to terminal 30 of solenoid relay.

7. Remove turn signal bulbs from sockets of the rear lamp assemblies.

8. Activate turn signals and hazard lights. If system functions normally with and without the rear bulbs, proceed to step #12. If system does not function normally (altered blink rate, failure to blink, or altered intensity), proceed to step #9.

9. Measure the resistance of the turn signal bulb, and obtain two resistors of approximately the same value (20- to 25-watt rating).

10. Temporarily install a resistor on each side from the 12-volt-DC lead of the turn signal socket to ground.

11. Test turn signal and hazard light operation with the turn signal bulbs still removed. It should function normally.

12. Identify the 12-volt-DC wire going to each turn signal bulb. A separate ground wire may or may not be present.

13. Cut the 12-volt-DC wire. Do not cut the ground wire.

How the system works. With the ignition on, 12 volts DC is present at terminal 87A of the solenoid relay and terminal 87 of each signal relay. When a turn signal is used, the turn signal relay is activated, causing 12 volts DC to pass from terminal 87 to terminal 30 and then to the turn signal bulb. When the accessory brake solenoid is activated, 12 volts DC passes from terminal 30 through terminal 87 of the solenoid relay to terminal 87A of both turn signal relays, then to terminal 30 and the corresponding turn signal bulbs. Both turn signal lamps illuminate. If a turn signal is used while the solenoid relay is active, the connection between terminals 87A and 30 of the turn signal relay is broken each time the turn signal relay is activated by the turn signal circuit. This allows the turn signals to blink “off.

14. Attach the end going to the lamp socket to terminal 30 of the right and left signal relays.

15. Attach the remaining cut end to terminal 86 of the right and left signal relays, permanently attaching the resistor (if required from step #9) between terminal 86 and ground. This resistor will become hot with prolonged turn signal operation. Be sure to isolate from surrounding components. We recommend a hardware cloth shield.

16. Connect wires as follows: left signal relay, terminal 87 to right signal relay, terminal 87 to solenoid relay, terminal 87A.

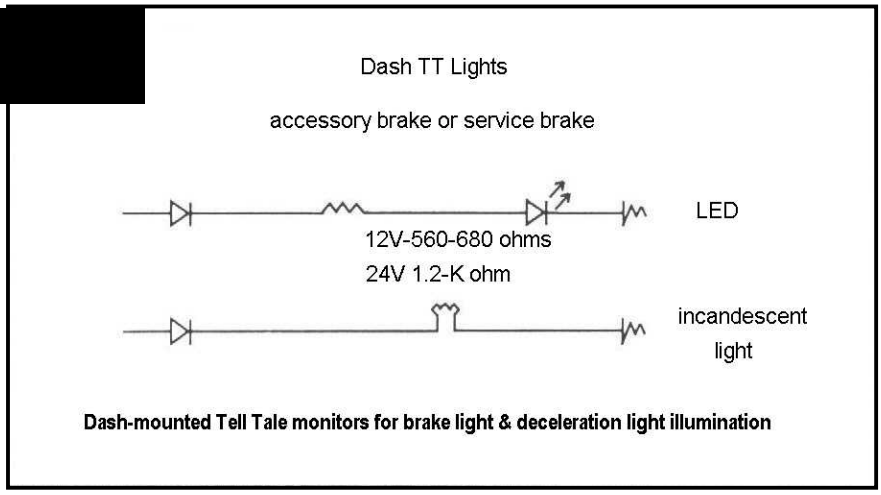
17. Connect wires as follows: left signal relay, terminal 87A to right signal relay, terminal 87A to solenoid relay, terminal 87.

18. Reinstall turn signal bulbs.

Testing the system:

1. Turn ignition "on."
2. Activate right and left turn signals; they should function normally.
3. Activate hazard lights. They should function normally.
4. Activate accessory brake solenoid as previously discussed. Both amber lights should illuminate.
5. Activate accessory brake solenoid with one turn signal on. One signal should blink; the other should remain on continuously.
6. Test the opposite side as above

DIAGRAM D



Dash-mounted Tell Tale monitors for brake light & deceleration light illumination

Diagrams A, B, and C include a notation indicating the insertion point for the Tell Tale lights (Diagram D). Please refer to pages 132 and 133 of the 1996 RadioShack catalog, where you will find choices for Tell Tale lamp assemblies and LED5. You may use either. When using LEDs in a 12-volt system, a 560-ohm or 680-ohm resistor should be used in series with the LED. In a 24-volt system, a 1.2-K resistor should be used. No resistors are required with 12-volt or 24-volt incandescent bulbs. A 3-amp diode is used to isolate the Tell late from the rest of the circuit.

Parts sources. Your local auto supply store will have 14- to 16-gauge wire, and some stores carry a selection of light assemblies. Throttle or clutch switches are available from Pacbrake or Jake Brake dealers.

From P.U.M.A, (601 N. West St. #207, Wichita, KS 67203; 800-333-7862):

Amber lamp assemblies: Hella #90431, #65290M, or #90411
Red lamp assemblies: Hella #90430, #65333A, or #90410
12-volt, 30-amp SPDT relay: #66200
12-volt, 30-amp SPST relay: #87106S (may use #66200)
Optional relay base: #87123
Optional ¼-inch terminals: #87272

From RadioShack*:*

Tell Tale lamp assemblies or LEDs: a variety can be found in the RadioShack catalog.
Resistors: ½ watt, 560-ohm, 680-ohm, or 1.2-K ohm; a variety can be found in the RadioShack catalog.
3-amp diode: #276-1141, 15- to 30-amp fuse and holder: #270-1213, or #270-1216