



Commercial Vehicle Safety Alliance

North American Standard Inspection Program

I N S P E C T I O N B U L L E T I N

2005-01

January 4, 2005

Trailer Brake Controller [TBC] 2005 Ford SuperDuty Vehicles

Summary

Ford Motor Company asks you to communicate with inspectors and educate them about advances in technology so inspection practices may be revised accordingly. Customer communications regarding the integrated Trailer Brake Controller [TBC] installed on the 2005 Ford SuperDuty vehicles indicate that inspection programs in some states and provinces are incorrectly ticketing vehicles for inoperative trailer brake systems because they may not fully understand the installed TBC system.

The current inspection entails using a trailer brake controller to manually activate the electric trailer brake system with the motor vehicle at rest in order to verify the operation of the trailer brakes. Please note that no regulation requires a manual activator for electric trailer brakes. However, it is common practice on most existing trailer brake controller designs and hence was available for use in the aforementioned inspection. After performing the test, it is assumed that the trailer brakes are operating correctly if the towing vehicle and trailer remains at rest with engine idling, automatic shifter in drive, and no application of vehicle service brakes.

However, the Ford TBC works differently from all currently available aftermarket trailer brake controllers because of its integration into the vehicle giving it the knowledge of the vehicle's behavior (speed, brake pressure, etc). This difference is why some inspection stations have been ticketing Ford vehicles. The Ford TBC has a manual activation device as do aftermarket controllers; but, it does not function in the exact same manner. At very low speeds, including at rest, the Ford controller sends a proportionally smaller amount of output voltage (though not zero) to the trailer brakes to provide smoother stops. This low-speed adjustment is the reason manual activation of the Ford TBC cannot be used to verify the operation of the trailer brakes.



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The TBC output voltage also is adjusted according to the gain setting – for lower gain settings (which are assumed to be the case of a lightly loaded trailer) the output voltage can be very low and, for a gain setting of zero, the voltage will be zero.

The Ford TBC manual activator is to be used to calibrate the appropriate gain setting of the TBC. This gain setting determines the maximum available output to the electric brakes. Calibration is performed by driving at speeds between 15 and 25 mph (24 and 40 km) and manually activating the trailer brakes. If they lock up, the driver is to tune the gain setting down to the level just below wheel lockup. For a heavy trailer, the gain setting may be set high; for a lightly loaded trailer the gain setting may be low, but these also will depend upon road conditions. This is the primary and only suggested use by Ford for manual operation of the Trailer Brake Controller. In addition, the Ford TBC is capable of detecting and indicating certain faults in the tow vehicle wiring and the trailer wiring/brake system to the operator.

At zero speed, the trailer brakes are operable with the Ford TBC by activating the towing vehicle brakes and therefore satisfy all applicable brake operating regulations. The trailer brakes will be controlled and operating as designed, but not at the application level that can be expected from aftermarket TBCs due to the circumstances noted above. Since Ford has evolved the state-of-the-art in TBC technology, we recommend that inspection criteria evolve to accurately assess correct trailer brake operation regardless of which TBC is used.

The first suggestion would be the use of the break-away battery on the trailer to test the trailer brakes and the emergency brake-away system as required in section 393.43 of the Federal Motor Carrier Safety Regulation and Standard 11 (b) of the Canadian National Safety Code when the towing vehicle and trailer are at rest.

The second suggestion would be to drive the towing vehicle and trailer at 15 mph (24 km), at the maximum gain setting (10.0 for Ford TBC) and manually activate the Ford TBC. If a large deceleration is felt (a "jerk") the trailer brakes are operating correctly.

If it is absolutely necessary to have a test initiated with the system at rest, a third suggestion would be to set the controller gain to maximum (10.0 for the Ford TBC) and manually activate the controller with vehicle in PARK. Have the inspector kneel beside the trailer axles and listen for the "hum" an electric trailer brake will produce when current is being sent. If the hum is present, the trailer brakes are operating and the Ford TBC is sending its speed-adjusted output.

Another suggestion for a test with the system at rest would be to disconnect the trailer wiring from vehicle. Using a wire with clip on one end and a needle on the other (rated for 30A), attach the clip end of the wire to the battery charge terminal in the vehicle connector attached to the bumper. This pin corresponds to the black wire, and when looking at the vehicle connector, is in essentially the "1 o'clock" position (or the first pin when traveling clockwise from the 12 o'clock position – refer to figure below). Then rest the trailer hookup connector so it won't move around easily and insert the needle end of the wire into the brake output pin on the trailer connector. This pin corresponds to the blue wire, and when looking at the trailer connector is in essentially the "7 o'clock" position (or, the 4th pin when traveling clockwise from the 12 o'clock position). This will essentially send 12V to the trailer to charge the trailer brakes, but will not cause any potential damage to the emergency breakaway system

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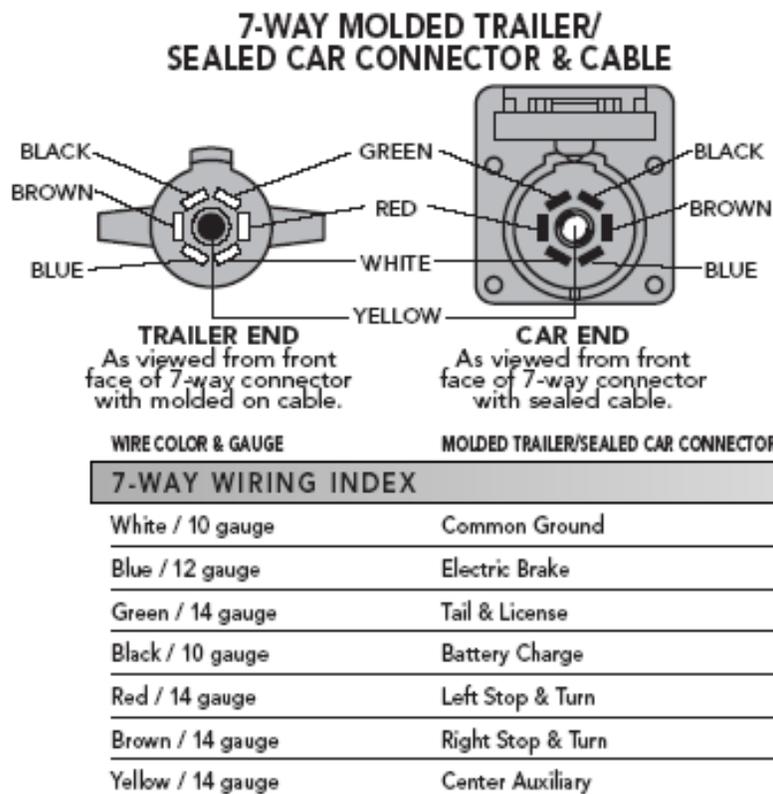
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of the trailer. Take the vehicle out of PARK with engine at idle and make sure the trailer brakes have engaged by verifying system resistance or trailer wheel lockup after the truck has traveled a short distance.

NOTE: When you disconnect the trailer, the Ford system will alert you of trailer disconnection by blinking the trailer icon (in red) on the TBC face for 30 seconds. This is normal operation of Ford TBC. The display will then be blank until the trailer is re-connected.



The Ford Integrated Trailer Brake Controller is more advanced and capable than other controllers in the market as it uses multiple pieces of vehicle information to provide smoother and more balanced stops proportional to how the vehicle is braking. It adapts to a broad variety of driving scenarios and provides significantly advanced diagnostic capabilities.

This *Inspection Bulletin* should be circulated to all inspectors and officers in the field for their information and guidance. We appreciate your time and assistance in helping resolve safety inspection issues associated with the release of this more advanced design.

