



Automatic Transmission In-Vehicle Dinghy Tow Cooling

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. To provide a common test procedure for evaluating the cooling of the transmission during dinghy tow operation. Dinghy towing is where the vehicle is towed forward behind a recreational vehicle (RV) with all four wheels on the ground in neutral.

1.2 Foreword. This test procedure has been developed to validate the cooling of the transmission during dinghy towing. During dinghy towing, the engine is not running and hence, the transmission pump is not running. The transmission is driven by the wheels and generates some heat due to parts rotating in oil. The normal transmission oil cooling system does not function during this operation. The only cooling is from airflow around the transmission. There is limited airflow inside the engine compartment while dinghy towing behind a large RV. This test validates if the transmission sump temperature is acceptable while dinghy towing at highway speeds.

1.3 Applicability. Vehicles with a requirement for dinghy tow capability. Primarily used for North American and Australian vehicles.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14264 GMW15845

2.3 Additional References.

Transmission Subsystem Technical Specification (SSTS) for towing procedure requirements

Manufacturer's Instructions for towing device (as applicable)

3 Resources

3.1 Facilities. An area where a vehicle can be dinghy towed at 113 km/h (70 mph).

3.2 Equipment.

3.2.1 General.

3.2.1.1 Temperature measuring and recording equipment as described in Appendix A. Refer to GMW15845 for proper test vehicle instrumentation procedure.

3.2.1.2 Towed vehicle with production representative under body pans, fender liners and any other component that affects air flow to and around the powertrain.

3.2.1.3 Towing vehicle must be a commercial RV with a vehicle width of 259 cm (102 in) and a rear body height of 274 cm (9 ft) or greater. A service truck may be substituted if similar in cross sectional area and the rear face of the service body is flat.

3.2.1.4 Towed vehicle towing requirements/procedure. Refer to the Vehicle Technical Specification (VTS)/Subsystem Technical Specification (SSTS)/Component Technical Specification (CTS).

3.2.1.5 Commercial rock shield **skirt** to attach to the rear bumper of the towing vehicle.

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3.2.1.6 Commercial tow bar and tow bar mount. If commercial tow bar mounts are not currently available for the towed vehicle, a mount may be fabricated. When building a mount, try to minimize modification of the fascia or any parts which may affect airflow to the engine compartment and/or transmission.

3.2.1.7 Safety chain(s)/cable(s). Chain(s)/cable(s) used to connect the towing and towed vehicles as a secondary coupling system.

3.2.1.8 Steering wheel clamping device if required by towing instructions (Owner's Manual and towing device manufacturer's instructions).

3.3 Test Vehicle/Test Piece.

3.3.1 Driveline Components.

3.3.1.1 Transmission/Transaxle (rear/front wheel drive (RWD/FWD) final drive) with the highest numerical gear ratios for the released powertrain combination.

3.3.1.2 Axles (rear drive only) with the highest numerical gear ratio for the released powertrain combination.

3.3.1.3 Transfer case as applicable.

3.3.1.4 Released tires with the shortest static loaded radius for the powertrain combination.

3.4 Test Time.

Calendar time: 1 day

Test hours: 5 hours

Coordination hours: 2 hours

3.5 Test Required Information. The characteristics of the transmission sump temperature during dinghy towing are required.

3.6 Personnel/Skills. Technicians qualified to install instrumentation and a driver for the towing vehicle who is capable of operating the data acquisition system.

4 Procedure

4.1 Preparation.

4.1.1 Test Engineer Preparation.

4.1.1.1 Prescribe per VTS the maximum safe temperature that the transmission, transfer case and rear axle can achieve during the tests. The transmission automatic transmission fluid (ATF) sump temperature should not exceed 132 °C if not specified.

4.1.1.2 Refer to the VTS/SSTS/CTS to determine the powertrain requirements/procedure for flat towing and the gear placement of the transmission and/or transfer case. These may include instructions for:

- Removing fuses
- Shifting the transmission and/or transfer case into a shift gate position
- Starting the vehicle prior to the beginning of dinghy towing cycle
- Starting the vehicle at each towing vehicle fuel stop
- Limitations to speed/time/distance while towing the vehicle

4.1.2 Towed Vehicle Preparation.

4.1.2.1 Insure all under body pans, fender liners and any other component that affects air flow to and around the powertrain are in place.

4.1.2.2 Install thermocouples and instrumentation. See Appendix A for a list of mandatory and optional measurement values to collect.

4.1.2.3 Safety inspect vehicle.

4.1.2.3.1 Check fluids and level off as required. Different oil levels may be requested and need to be documented.