SURFACE VEHICLE STANDARD

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(R) Speed Control Assurance for Snowmobiles

RATIONALE

This standard has been revised to combine start and unmanned operation testing, update engine and tether cord terminology to allow for new or other technologies, move Test Equipment and Instruments into its own section, and harmonize the Speed Control System definition with 3.3 of SAE J92. This revision also removed Imperial units of measure, and changed SAE J1222 from a Recommended Practice to a Standard.

1. SCOPE

This SAE Standard provides minimum requirements and performance criteria for devices to prevent runaway snowmobiles due to malfunction of the speed control system.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J33 Snowmobile Definitions and Nomenclature

3. DEFINITIONS

3.1 RUNAWAY PREVENTION DEVICE

A device, of any type, used to automatically prevent undesirable motion of a snowmobile caused by malfunction or maladjustment of the speed control system.

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3.2 SIMULATED MALFUNCTION

A device or means of simulating the effects of malfunctions of the speed control systems such that when the operator force to actuate the throttle control is released, it will not allow the engine/motor to return to idle.

3.3 SNOWMOBILE

As defined in SAE J33.

3.4 SPEED CONTROL SYSTEM

A complete system used to control engine/motor speed. This includes the throttle control and its means to activate the speed controller, whether it is control linkage, control cable assembly, springs, and brackets or an electronic drive by wire system. Any attachment to the system that affects its operation, such as a warning light switch, safety switch, etc., shall be considered as part of the speed control system.

3.5 SPEED CONTROLLER

Devices such as carburetors, fuel injection valves, throttle bodies, electronic controls, etc., used to control the supply of energy (i.e., fuel, spark, electricity, etc.) to the engine/motor.

3.6 TETHER SWITCH

A tether switch is an engine/motor shutoff switch that is attached to the operator by the means of a device between the operator and switch. The switch is activated by separation of the tether device from the tether switch.

3.7 THROTTLE CONTROL

A hand-controlled device mounted on the steering control, either a lever type (squeeze grip) or a twist-grip type.

4. TEST EQUIPMENT AND INSTRUMENTATION

4.1 An instrument to measure snowmobile ground speed of the track(s) with an accuracy of ±10%. The snowmobile speedometer may be used.

4.2 A means to support the rear of the snowmobile off the ground that will allow the track(s) to turn freely.

4.3 Simulated malfunctions examined will include speed controller mechanism binding or sticking that will not allow the speed controller to return to its idle position.

4.3.1 Malfunction of the speed controller shall be accomplished by blocking the butterfly, slide, etc., in a position that simulates a malfunctioning condition.

4.3.2 Malfunction of the throttle control or control cable assembly shall be accomplished by fixing the speed control system in a position that simulates an open condition.

NOTE: It is recommended that all foreseeable malfunctions be tested and documented.

5. REQUIREMENT OF RUNAWAY PREVENTION DEVICE

5.1 Test for Normal Operation and Unmanned Operation

The runaway prevention device, when tested in accordance with 6.1, shall automatically interrupt power to the track(s) on removal of operator’s force from the throttle control with or without driver separation from the vehicle.

5.2 Test for Engine/Motor Starting Post Malfunction

The runaway prevention device, when tested in accordance with 6.2, shall automatically prevent the vehicle from starting or moving at any speed controller position.

5.3 Notes

NOTE 1: With the skis resting on a flat surface, track coasting is acceptable if power is so low that the track will not continue moving when lowered to a ground surface.

NOTE 2: Limp home mode (LHM) provides a mechanism to operate the vehicle at reduced engine power when a failure is detected in the speed control system. Ensure limp home mode is not engaged during starting test.

NOTE 3: The tests described in Section 6 are hazardous and need to be performed by personnel skilled in testing snowmobiles. Safety protection devices shall be used as required.

6. TEST PROCEDURE

6.1 Test for Normal Operation and Unmanned Operation

6.1.1 Verify that the snowmobile is properly set up for normal operation.

6.1.2 Support the rear of the snowmobile off the ground so the track(s) may rotate freely and start/energize the engine/motor.

6.1.3 Operate the snowmobile throttle control through its full range of operation and verify that the snowmobile drivetrain is functioning properly.

6.1.4 Operate the snowmobile to achieve a speed of 48 km/h; then install the device described in 4.3, which will retain the speed controller in the 48 km/h speed position.

6.1.5 Remove the operator's force from the throttle control or activate the tether device (if so equipped) and verify that the power to the track(s) is automatically interrupted.

6.1.5.1 The method used to verify the power to the track(s) has been interrupted shall be documented.

6.1.6 If the engine/motor stops, proceed to 6.2.

6.1.7 If the engine/motor does not stop/de-energize, verify that no power is applied to the track(s).

6.1.8 Shut off engine/motor.

6.2 Test for Engine/Motor Starting Post Malfunction

6.2.1 Attempt to start/energize the engine/motor and verify that one of the following is satisfied:

6.2.1.1 The engine/motor will not start.

6.2.1.2 The engine/motor starts and power is not applied to the track(s).

6.2.2 Remove device used to retain speed controller.

6.2.3 Verify that the snowmobile is properly set up for normal operation.

6.2.4 Start/energize the engine/motor.

6.2.5 Operate the snowmobile throttle control through its full range of operation and release it to verify that the snowmobile drivetrain is functioning properly.