

Machine Slope Operation

Test Code—SAE J897

SAE Recommended Practice
Editorial change May 1978

THIS IS A PREPRINT WHICH IS
SUBJECT TO REVISIONS AND
CORRECTIONS. THE FINAL
VERSION WILL APPEAR IN THE
1979 EDITION OF THE SAE
HANDBOOK.

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096



PREPRINT

**S. A. E.
LIBRARY**

SAENORM.COM : Click to view the full PDF of j897_197805

MACHINE SLOPE OPERATION TEST CODE— SAE J897

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved June 1964.

Editorial change May 1978.

Purpose—The purpose of this code is to provide a field procedure to determine the ability of a machine to operate statically and dynamically on sloping surfaces.

Depending upon the objective of the test, any item listed as specified is to be selected at the discretion of either the manufacturer, the test agency, the customer, or a combination of these parties.

Scope—This code applies to mobile work machines and their combinations with mounted and/or trailed equipment.

Facilities and Apparatus

Facilities—The static test course shall consist of facilities to permit placing the machine on a specified sloping surface. (Components of machine may be at a different angle than the specified slope because of the suspension system). The dynamic test course may be used.

The dynamic test course shall be uniform in grade and sufficiently long and wide to permit ready maneuverability on either axis of orientation. The course as specified should be maintained in good condition consistent with the objective of the test. Use of seat belts and ROPS is advised on critical slopes and maneuvers.

Apparatus—Means to measure:

Time: ± 0.05 minute.

Temperature: $\pm 2^{\circ}\text{C}$.

Barometric pressure: ± 0.3 kPa.

Rotational speed: $\pm 2\%$ of max.

Length: $\pm 0.5\%$ of max.

Tire pressure: $\pm 3\%$ of max.

Track adjustment: $\pm 5\text{mm}$.

Oil pressure: $\pm 10\text{kPa}$.

Slope: $\pm 0.5\%$.

Mass: $\pm 3\%$ of max.

Procedure—Prior to test operation a complete check of the machine should be made to assure specified mass, mass distribution, lubrication, coolant, and fuel. All adjustments, including governor, brakes, clutches, tire pressure, or track adjustment, should be set as recommended by the manufacturer.

If the machine has not previously been used it should be "limbered-up", as recommended by the manufacturer. Any malfunction or maladjustment that may develop during limbering-up should be corrected before proceeding further.

Prior to recording test data the machine shall be operated until reasonably stable temperatures have been attained in all lubricants and functional components.

Static Test—Tilt the machine at the specified slope with the longitudinal axis oriented with the forward end upgrade. The machine should be secured in position by application of brakes or use of wheel chocks. Idle the engine and auxiliary equipment if specified, continuously for specified period. Record the following at the specified intervals.

Engine rpm.

Coolant temperature (cylinder head temperature on air cooled engines).

Abnormal noise.

Oil pressure and temperature.

Observed "hot spots."

Observed oil or coolant leaks.

Special observations as required for auxiliary equipment.

The test shall be considered terminated at the time any specified critical temperature is reached, noise is indicative of component failure, engine stalls, oil pressure becomes erratic or drops below the minimum recommended by the manufacturer or the specified time interval elapses.

Repeat the test successively with longitudinal axis of the machine oriented on the slope as follows:

(a) With the forward end of the machine downgrade.

(b) With the forward end of the machine at 90 deg to the right of the inclination of the slope.

(c) With the forward end of the machine 90 deg to the left of the inclination of the slope.

Dynamic Test—With the front of the machine upgrade, it shall be maneuvered alternately forward and reverse continuously for a specified time interval. Speed shall be kept uniform and controlled within the range of the slowest gear selection for both forward and reverse movement. Record the following for the specified interval.

Coolant temperature (cylinder head temperature on air cooled engines).

Abnormal noise.

Oil pressure and temperature with corresponding engine rpm.

Apparent "hot spots."

Observed oil or coolant leaks.

Special observations as required for auxiliary equipment.

Number of cycles.

The test shall be considered terminated at the time any specified critical temperature is reached, noise is indicative of component failure, engine stalls, oil pressure becomes erratic or drops below the minimum recommended by the manufacturer or the specified time interval elapses.

Repeat the test exactly in the remaining three directions.

Computations and Records—Records will be summarized in accordance with Fig. 1, Machine Slope Operation Data Summary Sheet.

TESTING AGENCY		LOCATION		DATE						
MACHINE: Make	Model	Type	Ser No.							
ATTACHMENTS										
WEIGHT: Prime Mover	Trid Eq	Payload	Total							
ENGINE: Make	Power	Model	Ser No.							
(rpm) High Idle	Low Idle	Full Load								
Coolant Capacity (L)	Crankcase Oil Capacity (L)									
TRANSMISSION: Make	Model	Ser No.								
CONVERTER: Make	Model	Ser No.								
OPERATING GEAR	TOTAL GEAR REDUCTION									
TEST COURSE DESCRIPTION AND LOCATION										
ALTITUDE		HUMIDITY								
AMBIENT TEMP.		BAROMETRIC PRESSURE								
TIRES: Position	Size	Ply Rating	Type	Pressure	Condition					
TRACK: Width Type Condition Adjustment										
Test No.	1	2	3	4	5	6	7	8	9	10
Direction	%									
Grade or Slope	m									
Test Distance (half cycle)	min									
Engine Speed	rpm									
Oil Pressure (max/min)	kPa									
Oil Temperature	C									
Coolant Temp (max/min)	C									
Machine Speed	km/h									
Cycles										
REMARKS:										
OBSERVERS:										

FIG. 1—MACHINE SLOPE OPERATION DATA
SUMMARY

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.