# TI21 Sleeper Insulation Tester (SIT) Operating Instructions
## Bombardier Part No. 6/6/121873GA3L

## SAFETY

Observe all Safety Procedures that are in force for track possession, and for working on or near the track.

Work must be undertaken only by authorised, qualified personnel.

Before using the SIT, inspect the pick-up plate for damage that might lead to insulation failure, e.g. if any part of the encapsulated printed circuit board is visible DO NOT USE the SIT.



**CAUTION**

Do **NOT** lift the SIT above shoulder level where there are overhead power lines.

In DC electrified areas, do **NOT** touch the 3rd rail with the SIT.

Do **NOT** allow the SIT to contact voltages higher than 50V.

The audio output from the SIT may prevent the operator from hearing approaching trains - to mitigate this risk, ensure that the appropriate control measures are in place.

## INTRODUCTION

The Sleeper Insulation Tester (SIT) is designed to detect leakage of TI21 track circuit signals into the sleepers. It provides the operator with an audible and visual indication of leakage level. The SIT allows a specific TI21 frequency to be checked without interference from any other TI21 track circuits or any other frequency.

The SIT also has an AC detection mode that can be used to detect any AC signal up to approx. 3 kHz; this mode is useful to detect high levels of harmonic leakage in DC 3rd rail, electrified areas. Note that the visual indication is not available to the operator in this mode .

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## OPERATION

The SIT has three controls: MODE SELECT switch, VOLUME CONTROL and FREQUENCY SELECT switch.

The MODE SELECT switch has the following settings:

| Position | Function |
|---|---|
| OFF | SIT switched off. |
| BATT TEST | Battery test. |
| LOW GAIN<br>HIGH GAIN | Gain settings without LED indications. |
| LOW GAIN<br>HIGH GAIN | Gain settings with LED indications. |

The SIT is switched on whenever the MODE SELECT switch is moved from the OFF position. The SIT remains powered until this switch is returned to the OFF position.

The High Gain setting is normally used as this will give the most accurate readings. The low gain setting may have to be used if the TI21 signal is very high, possibly in a tuned area. Operating the SIT in the visual indication mode is optional and can be selected by using the last two gain settings; using the visual indication mode will reduce battery life. The visual indicators are mounted on the top surface of the pick-up plate. These indicators, three green, three amber & two red indicate signal strength, as follows:

first green indicator lit = minimum leakage level,
last red LED lit = maximum leakage level.

These LEDs are also used to indicate the battery status during a battery check (see later).

The VOLUME CONTROL allows the volume to be adjusted, rotating it clockwise increases the volume.

The FREQUENCY SELECT switch allows the SIT to be set for the TI21 frequency of the track circuit being checked, as follows:

| | | | | | |
|---|---|---|---|---|---|
| A | - | TI 1699 Hz | F | - | TI 2146 Hz |
| B | - | TI 2296 Hz | G | - | TI 1848 Hz |
| C | - | TI 1996 Hz | H | - | TI 2445 Hz |
| D | - | TI 2593 Hz | AC | | |
| E | - | TI 1548 Hz | | | |

## RECOMMENDED METHOD FOR USING THE SIT

The following is one method of using the SIT, Individual operators may develop their own preferences as regards using the visual indications as well as the audio, number of times that the SIT is checked that it is correctly functioning during testing, etc.

NOTE: Always check the state of the batteries before using the SIT.

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