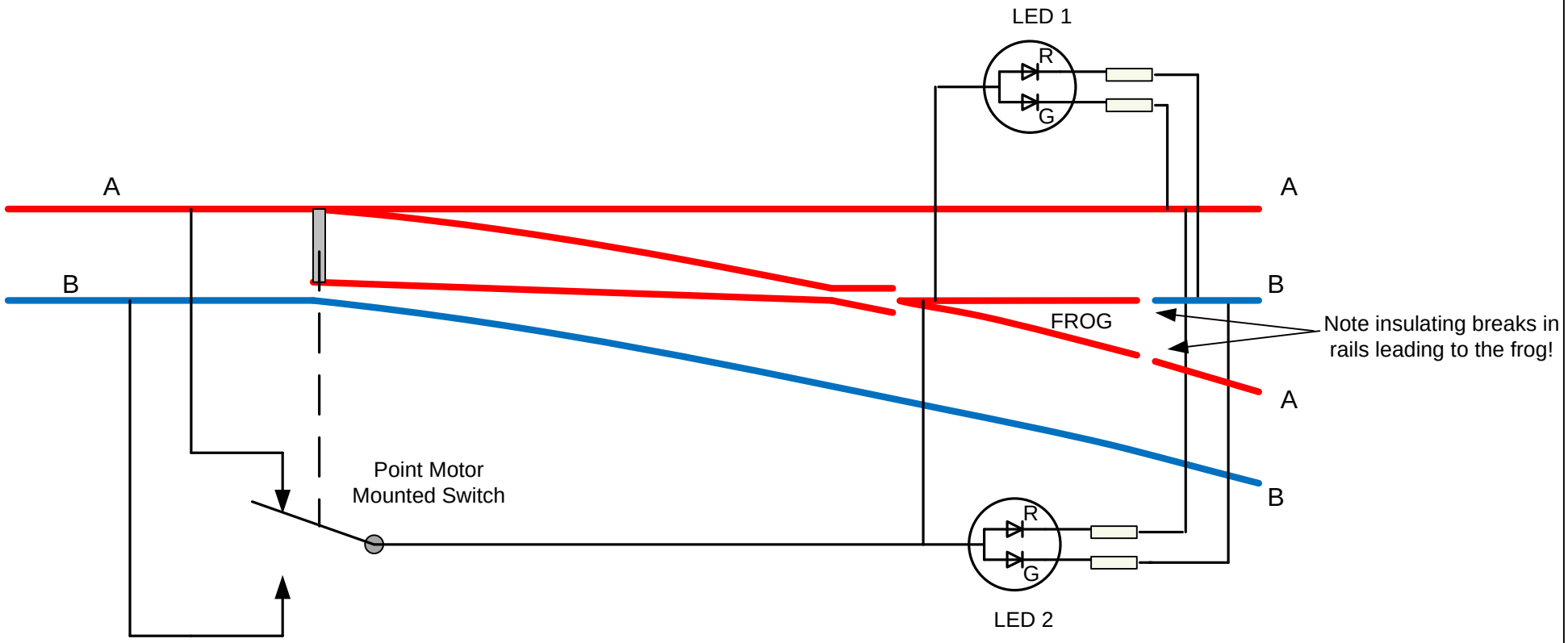


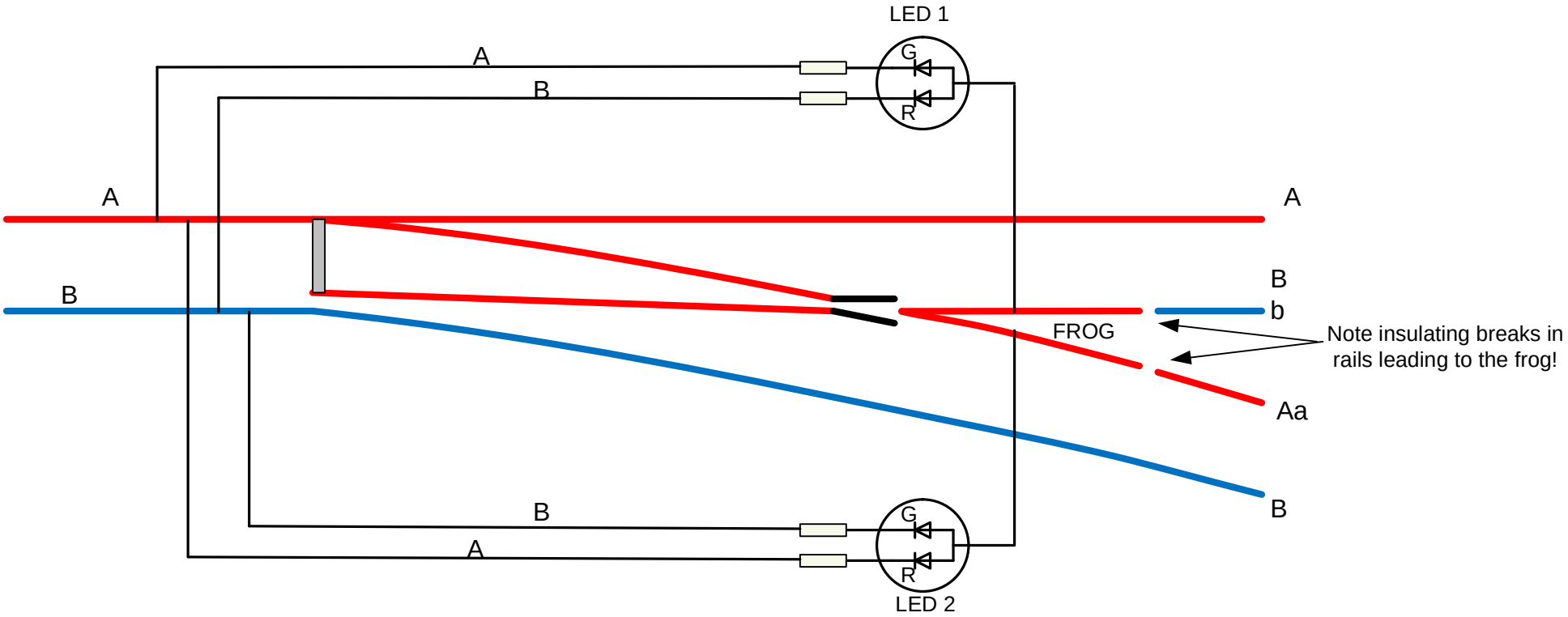
Operation. For DCC only

1 The switch mounted on the point motor connects the frog to the appropriate rail;, in the position shown the frog is connected to the A rail so it has the same voltage so powering the train to proceed

2 The LED s will indicate which way the track is set. For the point set as shown the frog voltage is as rail A so LED1 will show RED and LED 2 will show Green

3 Not suitable for DC as the polarity is determined by the rail voltage which is variable from 0 to max depending on the train speed, and of course the direction of travel.

TANNER-TREMAINE'S Engineering Services	Control of Route indication using dual LEDs Using ELECTOFROG points with point mounted switch	Client		Revision	01
		Drawing No	CTT-MR-E-001-1	Date	21 Dec 12



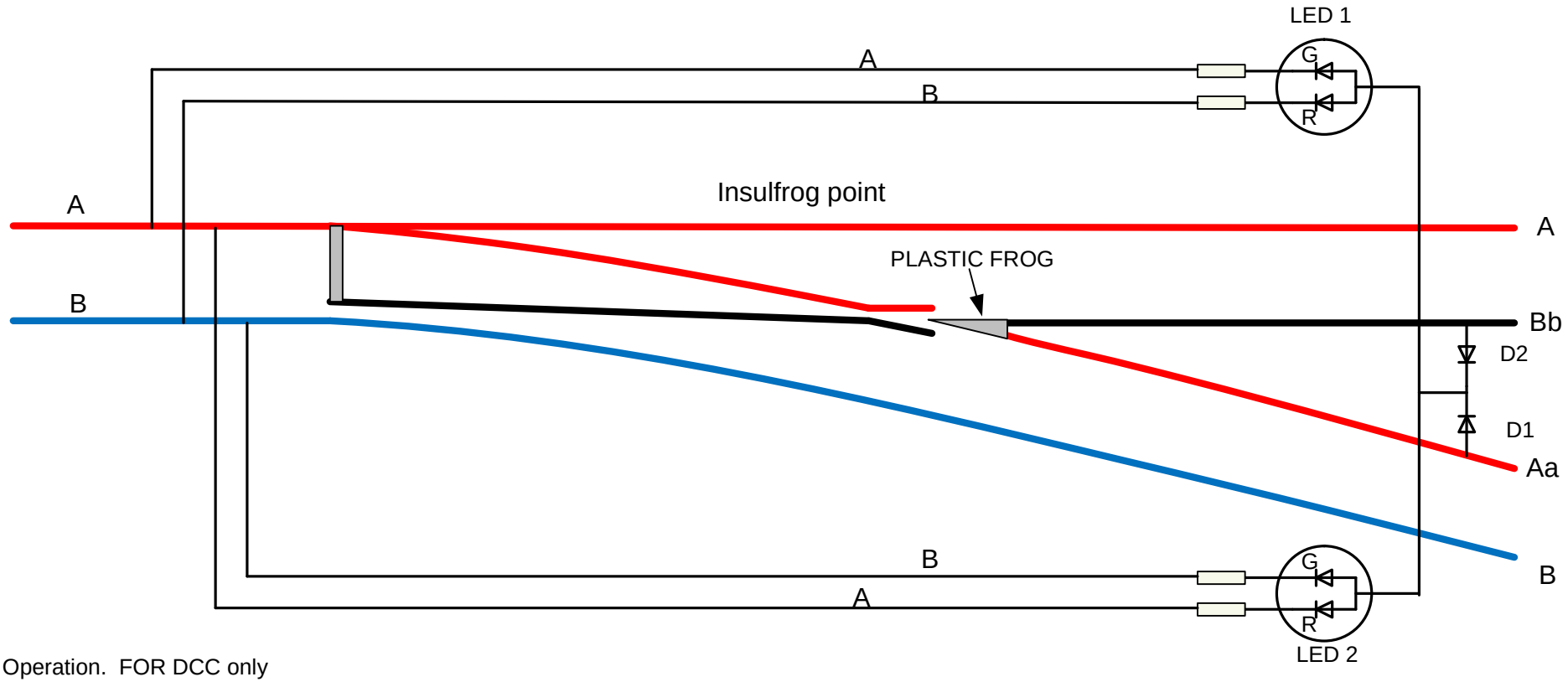
Operation. FOR DCC only

1 The polarity of the frog is determined by which way the point is set, in the position shown the frog is connected to the A rail so it has the same voltage so supplying power to the train enabling it to proceed

2 The LED s will indicate which way the track is set. For the point set as shown the frog voltage is as rail A so LED1 will show RED and LED 2 will show Green

3 Not suitable for DC as the polarity is determined by the rail voltage which is variable from 0 to max depending on the train speed, and of course the direction of travel.

TANNER-TREMAINE'S Engineering Services	Control of Route indication using dual LEDs Using ELECTOFROG points WITHOUT point mounted switch	Client	Johan Leeflang	Revision	01
		Drawing No	CTT-MR-E-001-2	Date	21 Dec 12



Operation. FOR DCC only

1 The point has a plastic insulated frog so has no voltage on it. The point switch blade connects the one rail, A as shown above and this is connected via underneath connections to the outgoing rail, called Aa so it has the same voltage and supplies power to the train enabling it to proceed through the point.

2 LED 1 is to show RED while LED2 is to show green. Now track Aa is effectively connected to rail A so Diode D1 will pass current from Rail A when on the positive half wave to the anodes of LED1, and as the red cathode is connected to the B rail it will pass the current and light up. The green cathode being connected to Rail A will be at the same polarity so will not pass any current and so will remain off.

3 LED2 will show Green as its cathode is connected to the B rail and its anode will be fed current via Diode D1 in the same way.

4 When the point is closed the other diode D2 comes into action and the LEDS are switched as required.

5 Not suitable for DC as the polarity is determined by the direction of travel of the loco, which is reversible and rail voltage which is variable from 0 to max depending on the train speed.

TANNER-TREMAINE'S Engineering Services	Control of Route indication using dual LEDs Circuit Diagram when using INSULFROG Points without switch	Client	Johan Leeflang	Revision	01
		Drawing No	CTT-MR-E-001-3	Date	21 Dec 12