

Loan Top-Up (Model B) – In-Place Incremental Principal

This document explains **Model B: In-Place Loan Top-Up**, using a **complete numerical example**. It shows clearly how: - the **repayment schedule** is updated, and - the **customer repayment statement** is recorded, without refinancing or rewriting historical data.

1. Base Loan Parameters

- Original Loan Amount (Principal): **16,700,000**
 - Loan Tenure: **10 months**
 - Monthly Interest Rate: **1.67%**
 - Interest Type: Reducing balance
 - Repayment Frequency: Monthly
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2. EMI Calculation

The Equated Monthly Installment (EMI) is computed as:

$$\text{EMI} = \frac{P \times r \times (1 + r)^N}{(1 + r)^N - 1}$$

Where: - $P = 16,700,000$ - $r = 0.0167$ - $N = 10$

Resulting EMI (rounded):

EMI = 1,840,900.00

3. Original Repayment Schedule (Before Top-Up)

Installments 1–5

Inst	Opening Balance	Interest	Principal	EMI	Closing Balance
1	16,700,000	278,890	1,562,010	1,840,900	15,137,990
2	15,137,990	252,803	1,588,097	1,840,900	13,549,893
3	13,549,893	226,283	1,614,617	1,840,900	11,935,276

Inst	Opening Balance	Interest	Principal	EMI	Closing Balance
4	11,935,276	199,419	1,641,481	1,840,900	10,293,795
5	10,293,795	171,907	1,668,993	1,840,900	8,624,802

At the end of installment 5, the outstanding balance is **8,624,802**.

4. Repayment Statement (Up to Installment 5)

Event	Description	Debit	Credit	Balance
Loan Start	Loan disbursement	16,700,000	—	16,700,000
Inst 1	EMI payment	—	1,840,900	15,137,990
Inst 2	EMI payment	—	1,840,900	13,549,893
Inst 3	EMI payment	—	1,840,900	11,935,276
Inst 4	EMI payment	—	1,840,900	10,293,795
Inst 5	EMI payment	—	1,840,900	8,624,802

5. In-Place Loan Top-Up Event

- Top-Up Amount: **5,000,000**
- Timing: After installment 5
- Loan Status: Active (not refinanced, not closed)

New Outstanding Balance

$$8,624,802 + 5,000,000 = \mathbf{13,624,802}$$

6. Repayment Statement Entry for Top-Up

The top-up is recorded as a **principal increase**, not an installment.

Event	Description	Debit	Credit	Balance
Top-Up Date	Loan top-up disbursement	5,000,000	—	13,624,802

7. Repayment Schedule Update After Top-Up

Policy Applied

- Model B (In-Place Top-Up)
- Remaining tenure unchanged
- EMI recalculated

Remaining installments: **5 months**

New EMI Calculation

$$\text{EMI}_{new} = \frac{13,624,802 \times 0.0167 \times (1.0167)^5}{(1.0167)^5 - 1}$$

New EMI (rounded):

EMI = 2,867,000.00

8. Updated Repayment Schedule (Installments 6-10)

Inst	Opening Balance	Interest	Principal	EMI	Closing Balance
6	13,624,802	227,536	2,639,464	2,867,000	10,985,338
7	10,985,338	183,444	2,683,556	2,867,000	8,301,782
8	8,301,782	138,640	2,728,360	2,867,000	5,573,422
9	5,573,422	93,676	2,773,324	2,867,000	2,800,098
10	2,800,098	46,761	2,820,239	2,867,000	0.00

The loan closes exactly at zero balance.

9. Final Repayment Statement (Complete View)

Event	Description	Debit	Credit	Balance
Loan Start	Loan disbursement	16,700,000	—	16,700,000
Inst 1	EMI payment	—	1,840,900	15,137,990
Inst 2	EMI payment	—	1,840,900	13,549,893
Inst 3	EMI payment	—	1,840,900	11,935,276

Event	Description	Debit	Credit	Balance
Inst 4	EMI payment	—	1,840,900	10,293,795
Inst 5	EMI payment	—	1,840,900	8,624,802
Top-Up	Loan top-up disbursement	5,000,000	—	13,624,802
Inst 6	EMI payment	—	2,867,000	10,985,338
Inst 7	EMI payment	—	2,867,000	8,301,782
Inst 8	EMI payment	—	2,867,000	5,573,422
Inst 9	EMI payment	—	2,867,000	2,800,098
Inst 10	EMI payment	—	2,867,000	0.00

10. Key Takeaways

- A loan top-up increases the **outstanding principal** of an active loan.
- Past installments remain unchanged.
- The repayment schedule is recalculated **forward only**.
- The repayment statement records the top-up as a **separate transaction**.
- The loan amortizes cleanly to **zero balance**.

This approach is standard, practical, and suitable for real-world lending systems such as SACCOs and MFIs.