# BRIDGE LIFTERS — 1574A AND 1574B

## 1. INTRODUCTION

**1.01** This section provides performance and usage data for the 1574A and 1574B bridge lifters. This section supplements Section AB22.095.00 which outlines the basic design considerations which are applicable to all types of bridge lifters.

## 2. DESCRIPTION

**2.01** The 1574 bridge lifters are of the saturable reactor type as illustrated in Fig. 1. The two series windings are wound on a common permalloy tape core whose saturation characteristics determine the operating performance of the device.

## 3. OPERATING CHARACTERISTICS

**3.01** The following gives the operating characteristics of the 1574-type bridge lifters:

Table I — Impedance Characteristics.

Fig. 2 — Bridging and Insertion Losses of 1574A.

Fig. 3 — Bridging and Insertion Losses of 1574B.

**3.02** The impedance and loss data provided in this section are average values and should not be relied upon for critical applications. Variations in manufacture account for about 25% deviations while series resonance between the inductance of the bridge lifter and the capacitance of the isolated line cause erratic bridging loss patterns for leakage currents above 2.0 ma.

**3.03** Fig. 4 shows the operating characteristics of the 1574A under several typical applications, and the improvement gained through its use. More complete information concerning insertion losses of bridged cable pairs is available in AB22.095.00 and AB22.090.11.

**3.04** The 1574B bridge lifter is identical to the A unit with the addition of a 5600-ohm resistor shunted across each series winding of the coil. See Fig. 1. This modification results in an improved noise tolerance. In the idle condition (large inductance) the coil becomes resonant with the line capacitance at the lower harmonics of 60 cycles. Thus, the idle bridge tap becomes a noise generator to the active portion of the loop. The 5600-ohm resistor shunted across each coil lowers the Q of the series resonant LC bridge lifter and line capacity combination. The lower Q circuit has a much lower noise (60~) voltage thereby being more tolerant to inductive influences.

**3.05** The DC resistance of each of the windings in the 1574 inductors is 12 ohms, so that 24 ohms is added to the loop resistance for each 1574 inductor in the series DC talking path.

## 4. LIMITATIONS

**4.01** The following rules should be applied to the application of 1574-type bridge lifters:

(1) Minimum line current of 12 ma.

(2) Maximum of three 1574s in series DC talking path to control DC resistance as well as transmission loss.

(3) Maximum of three lines with 1574s bridged across any working line. This means that a maximum of four lines may be bridged in the central office as long as there are no field bridges.

(4) Minimum line current for revertive calls of 12 ma in each branch. Fig. 5 will be of assistance in computing this value.

**4.02** 1574B units should only be used where 60-cycle and/or harmonic induction is known to be a problem and use of 1574As would therefore cause noise. The "B" units have considerably higher bridging losses than the "A" units and their extensive use could adversely affect the over-all transmission of the office.

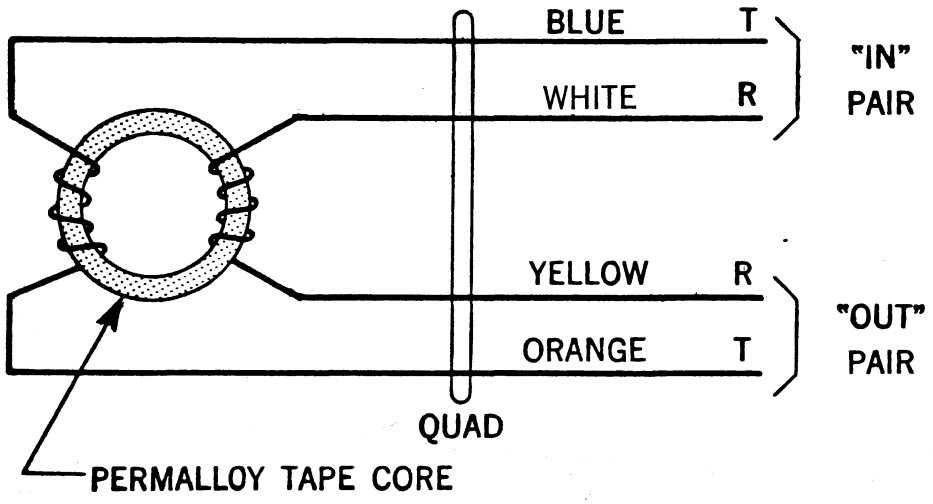
## TABLE I

### IMPEDANCE CHARACTERISTICS OF 1574A AND 1574B INDUCTORS

| Frequency | 400 | 1000 | 3000 |
|---|---|---|---|
| BIAS CURRENT | L-R | L-R | L-R |
| **1574A** | | | |
| 0.5 | 7-3200 | 6-14000 | |
| 1.0 | 5-1500 | 4-6700 | 3-43000 |
| 10.0 | .08-32 | .08-48 | .08-140 |
| 20.0 | .02-24 | .02-26 | .02-41 |
| 60.0 | .004-23 | .004-23 | .004-26 |
| **1574B** | | | |
| 0.5 | 2-7700 | .4-9700 | |
| 1.0 | 2-5700 | .5-9000 | .06-10000 |
| 10.0 | .08-35 | .08-54 | .07-310 |
| 20.0 | .02-25 | .02-28 | .02-28 |
| 60.0 | .004-23 | .004-24 | .004-25 |

L in Henrys R in Ohms

## 1574A INDUCTOR




## 1574B INDUCTOR

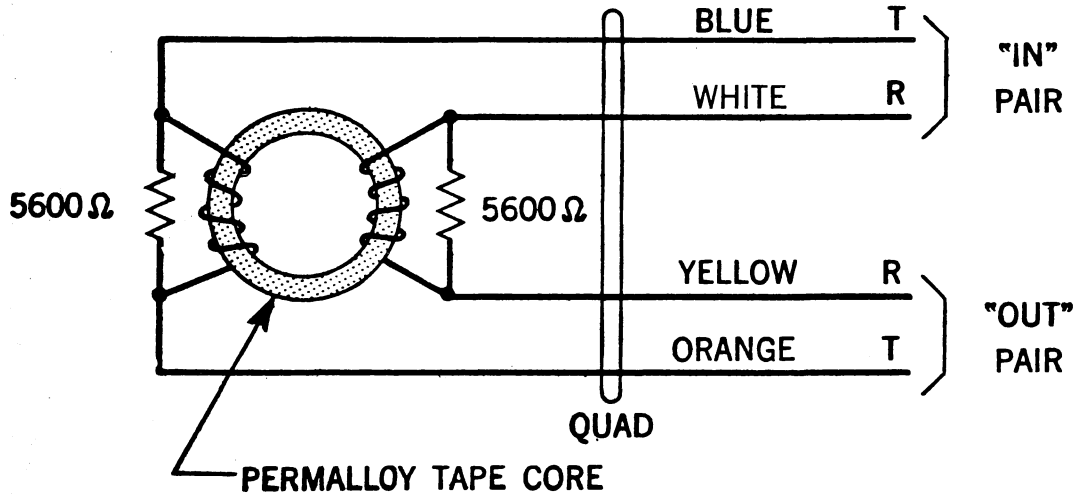



Fig. 1 – Schematic Representation of 1574-Type Inductors

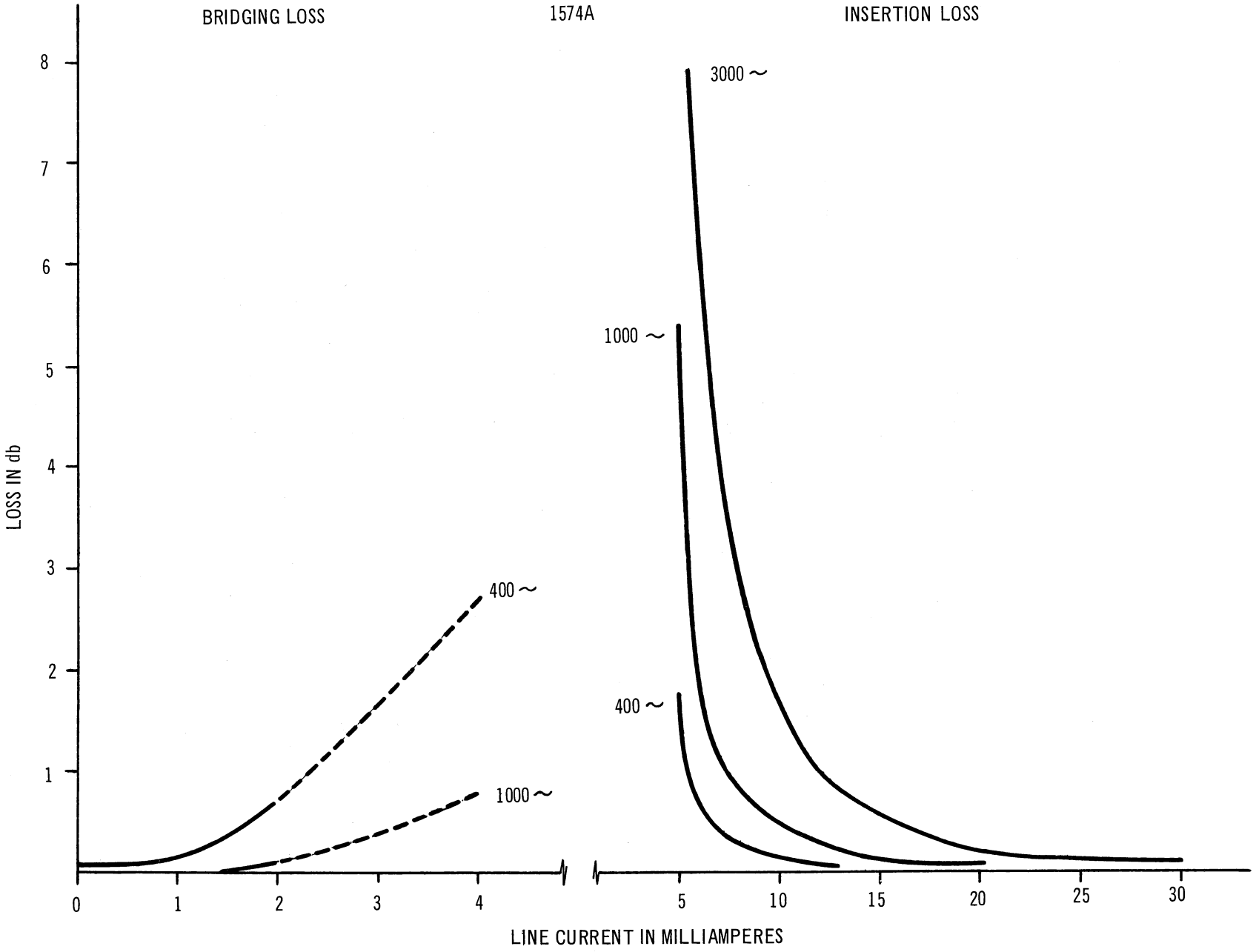



**Fig. 2 – Bridging and Insertion Losses of 1574A Inductor**

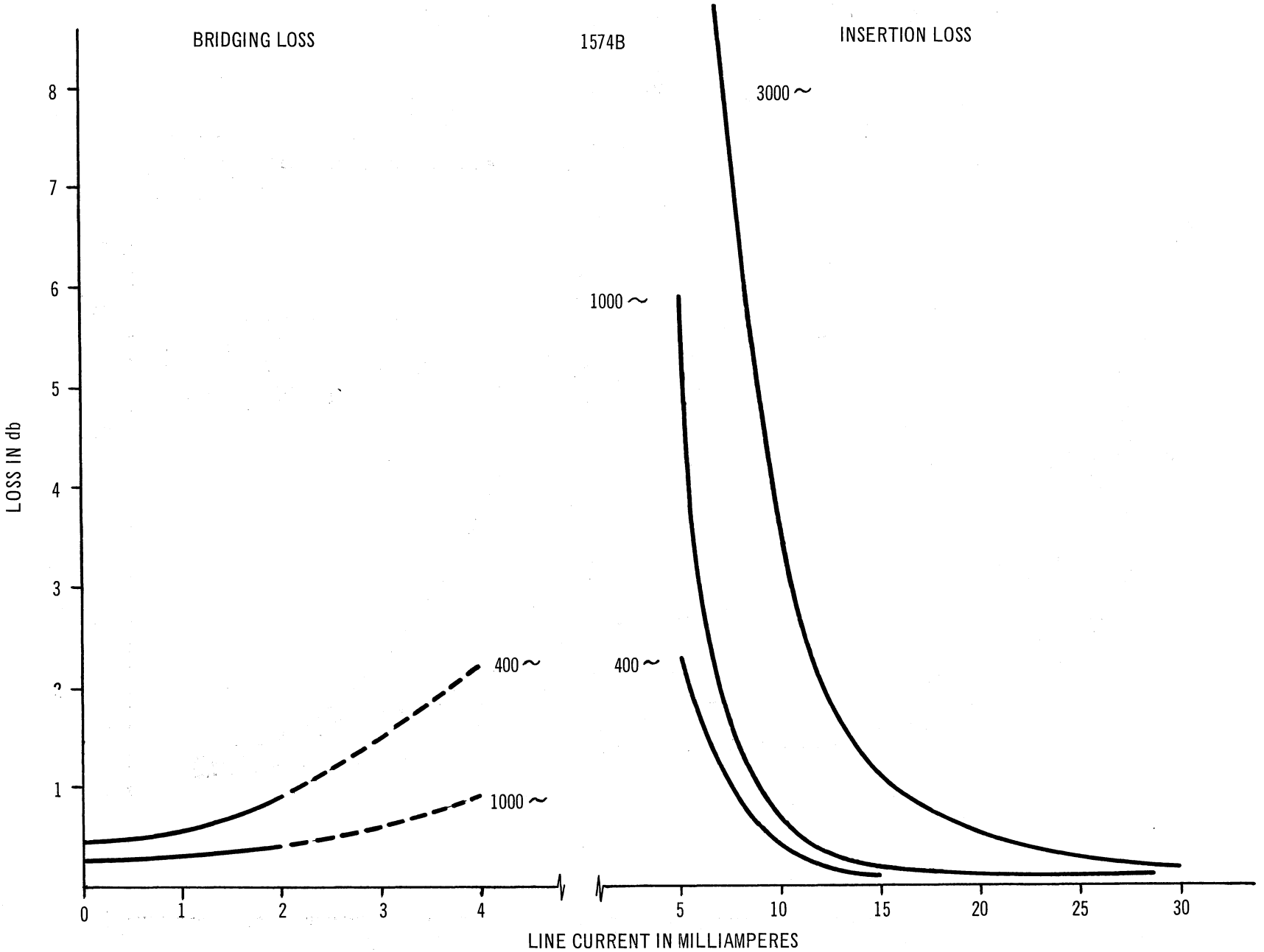
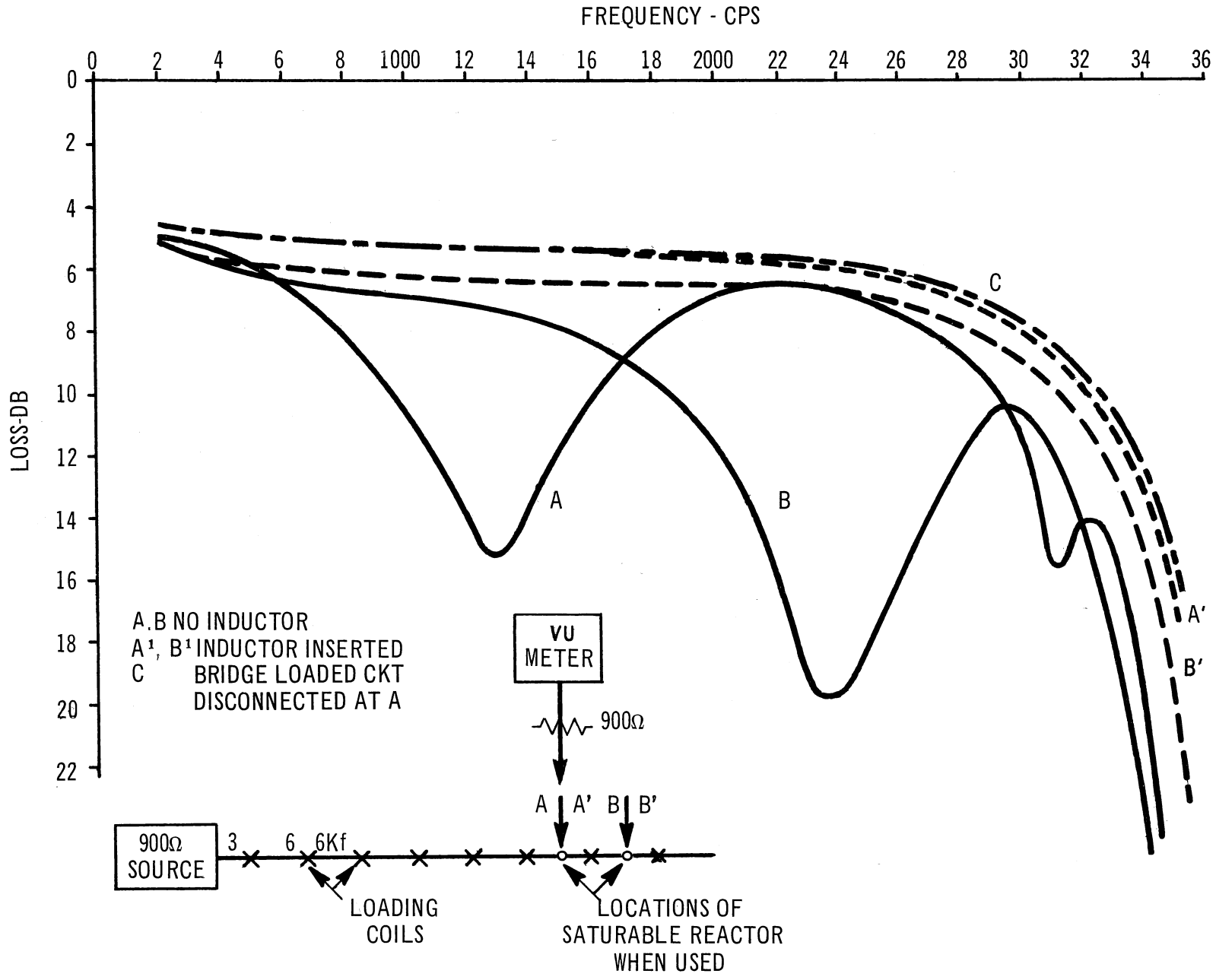
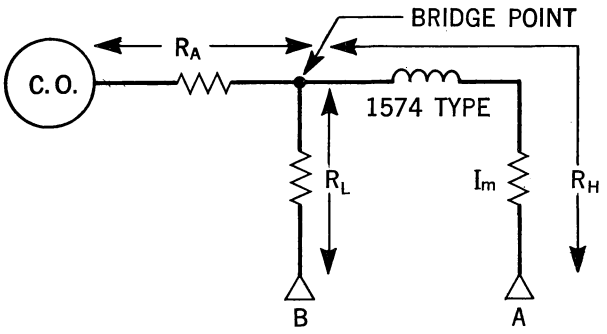



**Fig. 3 – Bridging and Insertion Losses of 1574B Inductor**




LOSS DUE TO LOADED BRIDGE TAP WITH AND WITHOUT

**Fig. 4 – 1574A Inductor Used as "Bridge Lifter"**




$R_A$* = CENTRAL OFFICE TO BRIDGE POINT – OHM
$R_L$* = LOW RESISTANCE BRANCH – OHMS
$R_H$* = HIGH RESISTANCE BRANCH "
$I_M$ = 12 MA

* VALUES "R" INCLUDE RESISTANCE OF CONDUCTORS, LOAD COILS AND INDUCTORS IN ALL CASES. RESISTANCE OF DROP WIRE SHOULD BE INCLUDED WHEN SIGNIFICANT. RESISTANCE OF SET SHOULD NOT BE INCLUDED.

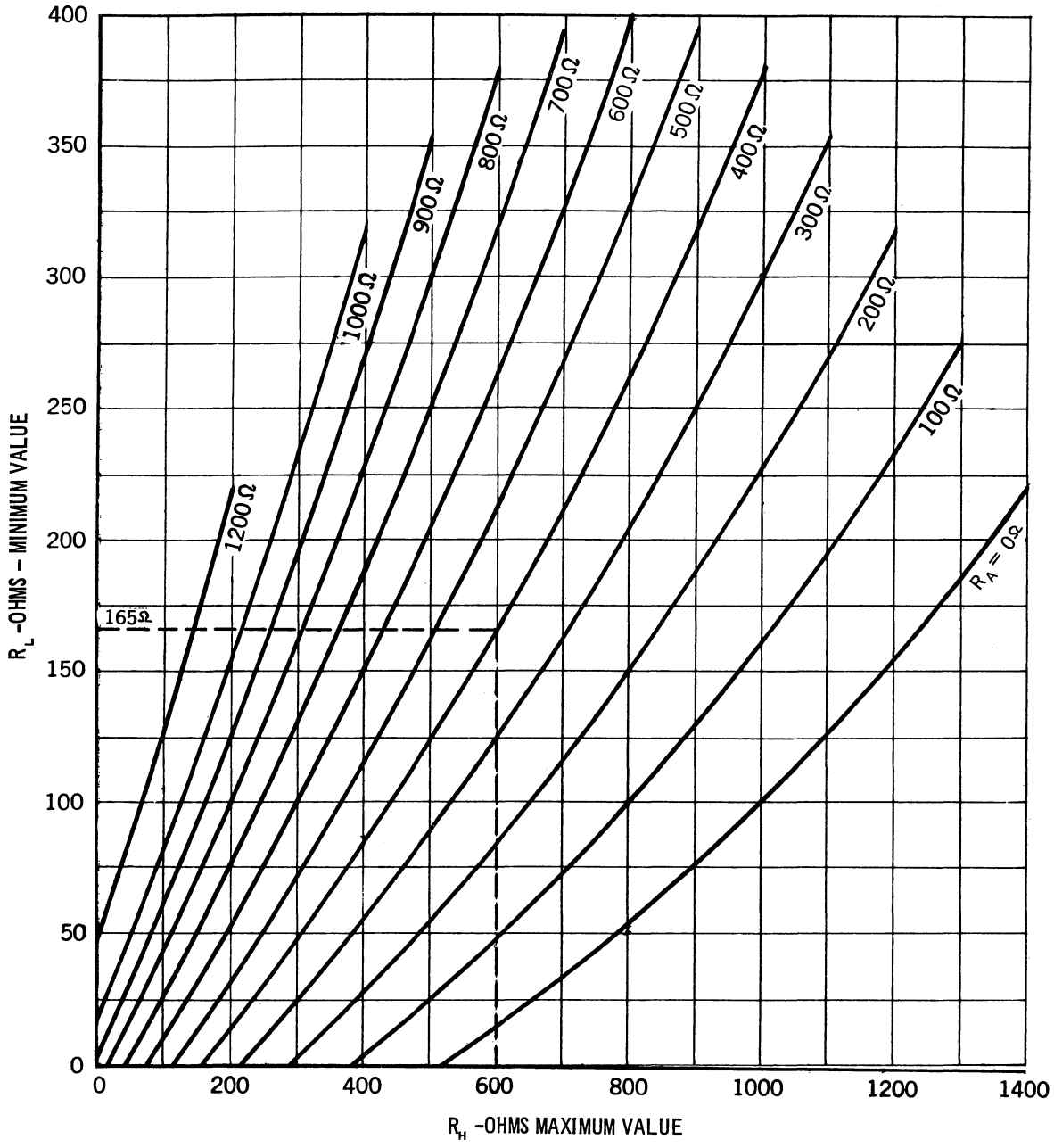



**Fig. 5 – Chart for Determining Minimum Line Current for Revertive Calls**