M-205 (4-1-60)

BELL SYSTEM REPAIR SPECIFICATION

B.S.R.S. 451.905, ISSUE 6

STANDARDIZATION
PAC. N/W BELL TEL.
W - I AREA
OFFICE OF CHIEF ENGINEER

TITLE DIALS 103A and 104A

	(CHECK)
APPROVED AS ISSUED BY BELL TEL. LAB.	X
APPROVED WITH W-I AREA SUPPLEMENT	
NOT APPROVED	
W-I AREA SECTION APPROVED	

SUPPLEMENT ISSUE _____ W-I

PAGE ____ OF ____ PAGES

TEL. CO. APPROVAL A. P. ZOEBISCH
DATE 6-20=67 TITLE Plt.Staff Supvr.

Number paragraphs of supplement to correspond with B.S.R.S. Paragraphs. Before paragraph No. indicate by * when information differs from previous issue. After paragraph number indicate by: (D) for deviation; (O) optional; (L) local instruction.

M-205 (4-1-60)

BELL SYSTEM REPAIR SPECIFICATION

B.S.R.S. 451.905, ISSUE 4
STANDARDIZATION
PAC. TEL. N/W
W - I AREA
OFFICE OF CHIEF ENGINEER

TITLE DIALS - 103A and 104A

	(CHECK)
APPROVED AS ISSUED BY BELL TEL. LAB:	X
APPROVED WITH W-I AREA SUPPLEMENT	
NOT APPROVED	
W-I AREA SECTION APPROVED	

SUPPLEMENT ISSUE _____ W-I

PAGE ____ OF ____ PAGES

TEL. CO. APPROVAL H. WEISS
DATE 5-22-62 TITLE Plt. Staff Asst.

Number paragraphs of supplement to correspond with B.S.R.S. Paragraphs. Before paragraph No. indicate by * when information differs from previous issue. After paragraph number indicate by: (D) for deviation; (O) optional; (L) local instruction.

DIALS

103A AND 104A

This index lists the information that forms a part of, or supplements this specification, and indicates the authorized issues thereof.

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SUPL SPEC													
BSRS-350.001	c												General Requirements

c—Information in accordance with that currently authorized.

1. GENERAL

1.01 This specification covers the repair requirements (class C) of the 103A and 104A dials.

1.02 The applicable requirements of the specification listed on the index as SUPL SPEC shall be followed in the repair of this apparatus in addition to the requirements specified herein.

1.03 Asterisk: Requirements marked with an asterisk (*) need not be checked except in cases of failure to meet other requirements which need disassembly or readjustment of the affected parts.

1.04 Omitted on issue 4 of this page (Included in BSRS-350.001) ←

2. APPROVED STANDARDS

2.01 Omitted on issue 4 of this page (Included in BSRS-350.001) ←

3. MECHANICAL

3.01 Parts shall not be cracked, bent, broken, loose, or worn to such an extent that will prevent them from meeting the requirements of this specification.

3.02 Moving parts shall operate freely. Gears and pinions shall operate without binding.

3.03 Interior parts other than contacts shall be cleaned with a "Noncorrosive" type of cleaning fluid.

3.03A Nylon main gears shall be replaced with Delrin main gears.

Note: Nylon gears can be identified by their white color and Delrin gears by their gray color.

Fingerwheel and Motor Spring Assembly

*3.04 Motor springs shall not be pitted.

*3.05 On the 103A dial, old-style fingerwheels having the 0.125 bearing hole shall not be reused.

Base and Main Shaft Assembly

*3.06 On the 103A dial, old-style base plate and shaft assemblies having a shaft with a 0.086 inch -64 thread at the upper portion and associated screw bushing shall not be re-used.

*3.07 The movable shield covering the governor adjusting hole in the base plate shall remain securely locked in the closed position. Slight distortion of this shield is permissible, provided that this does not result in a gap of more than 0.005 inch.

*3.08 Omitted on issue 4 of this page. ←

Pawl and Pawl Mounting Screw

3.09 All dials shall be equipped with a P-11E182 pawl fastened with a P-339920 screw.

Governor Assembly

*3.10 The governor springs shall be free of sharp bends and shall be secure in the fly bar and weights.

Lubrication

3.11 A small quantity of KS-6232 lubricant, or equivalent, shall be applied to all bearings, the main shaft, and the gear and pinion teeth. Excess oil shall be removed after the pinions have been revolved.

Finger Wheel and Case

3.12 On the 104A dial, the finger wheel and case shall be free of cracks.

4. TESTS AND ADJUSTMENTS

Motor-spring Tension

*4.01 The motor spring shall have a tension of 115 ±15 grams measured tangentially on the finger-wheel projections when the finger wheel is approximately 15 degrees off normal and released slightly so as to eliminate any friction encountered in moving the finger wheel in a clockwise direction.

Note: The motor-spring tension may be obtained by winding the fingerwheel unit, when partially assembled on the main shaft, approximately 6 turns and then by moving it to the final position. The motor spring shall have a minimum 1/4-turn windup margin beyond the rotation obtained when dialing 0.

Pawl

*4.02 The force of the pawl against the bottom of a tooth space of the pulse wheel shall be a maximum 30 and a minimum 6 grams. This requirement may be considered met if the force is measured against motor-spring housing on fingerwheel with fingerwheel removed.

Dial Speed

4.03 The dial shall be capable of meeting the following speed requirements within five tries when tested at an angle of approximately 26 degrees from a horizontal position with the dial right side up. The speed shall be the average of nine complete pulses:

Pulse Per Second
11.0 max
8.5 min

*4.04 To meet the speed requirements, the governor springs shall be adjusted near the ends of the springs in such a manner that the governor weights are located approximately in the center in respect to the vertical surface of the cup. The outer surface of the weights shall be approximately concentric with and equidistant from the governor cup surface.

4.05 The dial shall not stall when the digit zero (z) is dialed and the fingerwheel is allowed to return normally to its stop position. ←←

*4.06 On the 103A dial with the bushing tightened on the shaft, the clearance between the main gear and pulse-wheel assembly hub and the underside of the fingerwheel assembly shall be not more than 0.015 inch or less than 0.005 inch when the play in the fingerwheel is taken up in the direction of maximum clearance. Spacing washers may be used to reduce this clearance. If this clearance is less than the minimum specified, the screw bushing may be backed off a maximum of 1/3 of a turn.

*4.07 On the 104A dial, the clearance between the main gear and impulse-wheel assembly hub and the under side of the fingerwheel assembly shall be not more than 0.015 inch or less than 0.005 inch when the play in the fingerwheel is taken up in the direction of maximum clearance. Spacing washers may be used to reduce this clearance.

5. CONTACT SPRING ASSEMBLY

5.01 When the fingerwheel is in the unoperated position, forcing the pulse wheel in a counterclockwise direction shall not result in opening of the pulse contacts.

*5.02 The clearance between the contact spring and the bottom of the teeth of the pulse wheel shall be at least 0.005 inch for any position of the pulse wheel.

*5.03 The pressure between the contacts when closed shall be 30 ±5 grams, measured at the contacts.

5.04 The average per cent break of the pulsing contact shall be a maximum 67.5 and a minimum 59.5 per cent with the dial operating within the speed limits specified in 4.03.

5.05 No secondary opening of the pulsing contacts shall occur later than 3 milliseconds after the contacts have closed.

*5.06 The stop spring shall be located so that the pulsing wheel does not strike the pulsing spring during the clockwise rotation of the finger wheel, and the stop spring shall drop off the edge of the associated tooth on the pulsing wheel when the finger wheel is returned slowly to normal.

*5.07 The stop spring shall be adjusted so that the spring lip shall come to rest not more than 0.015 inch from the bottom of the pulsing wheel teeth.

*5.08 A maximum of 10 grams applied to the stop spring shall cause visible lift of the spring.

6. INSULATION BREAKDOWN TEST

6.01 Dials shall be capable of withstanding an "Insulation Breakdown" test of 500 volts ac applied between the contact springs and the frame. ←