COMBINED TESTS OF SELECTORS
USING THE AUXILIARY TEST SET S4GS-393

1. GENERAL

1.01 This section describes the methods of applying relay-timing, speed of rotary, and pulsing tests on selectors.

1.02 These tests do not apply to coin-control selectors, or certain types of repeated-dialing toll-transmission selectors.

1.03 The tests described are based on the use of the J94713A (SD-90418-01) relay-timing test set as modified by Drawing HS-1602 or DS-90022-01, and the J34717A (SD-31481-01) pulsing test set when controlled by the S4GS-393 auxiliary test set.

1.04 The timing requirements given in the circuit-requirement table for the particular feature under test shall be employed, or, if not covered therein, the requirements given in the Bell System Practices covering timing requirements shall be used.

1.05 When testing the first selectors in a line-switch office, the master switch having access to the selector shall be rotated to pick up the disengaged plungers.

1.06 When testing incoming selectors, the associated trunks shall be made busy in the approved manner during the tests.

1.07 The test covers:

(a) Combined Tests of Selectors

1.08 If an "out-of-service" failure is encountered on any switch, that switch shall be made busy in the approved manner until the trouble is cleared.

1.09 Before any switch on which a failure was encountered is returned to service, it shall be given a complete retest as outlined under Test (A). Any items detected on the retest shall be cleared in the approved manner.

2. APPARATUS

Test (A)

2.01 Auxiliary test set, S4GS-393.

2.02 Relay-timing test set, J94713A (SD-90418-01), modified per Drawing HS-1602 or DS-90022-01.

NOTE: When using relay-timing test set SD-90418-01 Issue 8 or later, the VB potentiometer must be adjusted according to Bell System Practices to provide a 0.375-second V-M interval for making selector speed-of-rotary tests.

2.03 Pulsing test set, J34717A (SD-31481-01).

2.04 One cord, M24B, equipped with two P321CCE Jones plugs.

2.05 One test set, 32A.

2.06 One cord, P5B, equipped with one black-shelled No. 310 plug, one gray-shelled No. 310 plug, and one No. 240H plug.

2.07 Three cords, P3K, equipped with No. 310 plugs.

2.08 Three battery-supply cords, P2J (only two required where battery and ground jacks are not available).

2.09 One cord, W2M, equipped with one No. 310 plug and two No. 59 cord tips (not required where battery and ground jacks are available).

2.10 One plug, No. 258D.

2.11 Two KS-6320 orange sticks.

2.12 One cord, W1U.

3. PREPARATION

Test (A)

3.01 Connect 48-volt battery and ground to the BAT-GRD jack of the auxiliary test set, using a P2J cord. If a battery- and ground-supply jack is not available, use the W2M cord, connecting the No. 59 cord tip of the tip (white) conductor to a spare 48-volt battery fuse or to the equipment side of a fuse in service, and the sleeve (red) conductor to ground. The fuse selected shall not exceed 5 amperes, nor be less than 3 amperes.

© The Pacific Telephone and Telegraph Company, 1963

NOTE: To avoid possible grounding of the battery supply, connect the cord to the test set first, and when disconnecting the set, remove the cord from the test set last.

3.02 Using the multiple BAT-GRD jacks on the test sets, connect the battery and ground to the relay-timing test set first and then to the pulsing test set with the two P2J cords.

3.03 Connect the A, B, and SW jacks of the auxiliary test set to the similarly designated jacks of the pulsing test set, using three P3K cords.

3.04 Insert the 258D plug into the V-M jack of the relay-timing test set.

3.05 Insert the No. 310 plug of the 32A test set into the ADV jack of the auxiliary test set.

3.06 Insert the black-shelled No. 310 plug of the P5B cord into the BK jack of the auxiliary test set and the gray-shelled No. 310 plug into the GR jack.

3.07 Connect the auxiliary test set to the relay-timing test set by inserting the Jones plugs of the M24B cord into the Jones sockets of these sets.

3.08 Operate the B key of the relay-timing test set to the position corresponding to the release timing requirement for the B-position relay of the equipment under test. Set the A and B dial indicators of the relay-timing test set opposite a blank position on the dial. Operate the NOR-AUX KEY of the relay-timing test set, if provided, to the AUX position.

3.09 Operate the LP and LK keys of the pulsing test set to the values specified in the Bell System Practices covering pulsing tests. Check that the 6PPS and PR keys are normal.

3.10 Observe that all of the 498AJ (red) keys of the auxiliary test set are in the nonoperated position. The key is in the nonoperated position when the arrow points length-wise to the set. Operate the A, BR, CH, LPP, and LKP keys of the auxiliary test set.

3.11 Operate the one BH key that corresponds to the hold timing requirement for the B-position relay of the equipment under test. All other BH keys shall be in the nonoperated position.

3.12 Operate the one CR key that corresponds to the release timing requirement for the C-position relay of the equipment under test. All other CR keys shall be in the nonoperated position.

3.13 Operate the SEL-CONN key to the SEL position.

3.14 Operate the ROT key.

NOTE: When using relay-timing test set SD-90418-01 Issue 8 or later, the VB potentiometer must be adjusted according to Bell System Practice to provide a 0.375-second V-M interval for making selector speed-of-rotary tests.

3.15 When testing nondigit-absorbing selectors and digit-absorbing selectors arranged to absorb digit one, set the 0-10 switch of the test set to the 0 position. When testing other digit-absorbing selectors, set the 0-10 switch to the digit that the selector under test is arranged to absorb.

3.16 If the selector is arranged to absorb digit one, remove the switch cover and, using a KS-6320 orange stick, make the normal-post springs inoperative by blocking the normally open contacts to remain open and short the normally made contacts by means of a W1U cord. After each selector is tested, remove the KS-6320 orange stick and the W1U cord, and replace the cover.

4. METHOD

Test (A)

4.01 Depress and hold the white key of the 32A test set until the NORM lamp of the auxiliary test set lights. Immediately release the white key.

4.02 Insert the 240H plug into the test jacks of the switch under test. Adjust the sleeve-wiper contact of the 240H plug to made positive contact with sleeve-wiper terminal. If the BSY lamp of the auxiliary test set lights at this time or at any time during the tests, remove the plug from the test jacks until the equipment is again idle. Momentary flashes of the BSY lamp while tests are in progress should be disregarded.

4.03 If the switch is idle, momentarily depress the white key of the 32A test set.

4.04 The test set should advance automatically through the various tests. Lamps on the test set will light to indicate

the test being performed. When testing digit-absorbing selectors other than those arranged to absorb digit one, the selector will pulse to the level of the digit to be absorbed and release before the speed-of-rotary test and the loop and leak pulsing tests are applied. Observe the selector for the operations shown in Table A.

4.05 Upon completion of the test operations shown in Table A, the selector will release and the test set will restore to normal, lighting the NORM lamp. Remove the 240H plug from the selector test jacks. If no further tests are to be made, disconnect the test-set cords and return the test sets to their regular storage locations.

CAUTION: TO AVOID DAMAGE TO THE JONES PLUG AND SOCKET, REMOVE PLUG ONLY BY DIRECT PULL AT RIGHT ANGLES TO THE MOUNTING SURFACE.

5. REPORTS

5.01 The required record of this test shall be entered on Form P2295 Routine Test Record (Using auxiliary test set per S4GS-393). Sample forms are shown in Figures 1 and 2.

Table A

Test-Set Lamp	Switch Operation
A	When the selector is seized, the A relay should operate and the test set immediately advance to the next test. Failure of the set to advance indicates that a sleeve ground was not received from the selector. This generally is the result of an improperly adjusted A relay.
BH	The selector should step up one level and cut in. Failure to cut in indicates that the B relay did not meet the hold timing requirement.
BR	The selector should step to the first level three times and release each time. If the selector should step to the first level and cut in, the B relay did not meet the release timing requirement.
CH	The selector should step up three levels and release. If the selector cuts in on the first or second level, the C relay failed to meet the hold timing requirement.
CR	The selector should step to the first level and cut in. If the selector does not cut in, the C relay failed to meet the release timing requirement.
ROT	The selector should step to the first level and rotate to at least the ninth terminal before the next pulse of the test set. This test is then repeated a second time. If the wipers do not reach the ninth rotary, terminal, the selector rotary speed is incorrect.
LPP	The selector should step smoothly to the ninth level and cut in. If selector cuts in on any level other than the ninth or fails to reach the ninth level, a pulsing failure is indicated.
LKP	The selector should step smoothly to the ninth level and cut in. If the selector cuts in on any level other than the ninth or fails to reach the ninth level, a pulsing failure is indicated.
RW	During the LKP test, the selector-wiper polarity is tested. If the selector does not release from the LKP test and the RW lamp is lighted, reversed polarity is indicated.

BSP 226-300-900PT
BSP 226-405-900PT

ROUTINE TEST RECORD

(Using Auxiliary Test Set Per S4GS-393)

P-2295 (7-63)

PAGE NO. 1

OFFICE		SELECTOR TEST A		ASSIGNED TO	SHIFT
IVANHOE		CONNECTOR TEST B		RAYMOND	DAY

FROM BAY	FROM SW	TO BAY	TO SW	TOTAL UNITS	TO BE STARTED	TO BE COMPLETED
502	1	502	160	148	7-25-63	7-30-63

EQUIPMENT BAY	EQUIPMENT SW	TROUBLE APPEARANCE A OPR	B HOLD	B RLS	C HOLD	C RLS	E HOLD	E RLS	ROT	LPP	LKP	REV WIPER	TR	OTHER
502	1								✓					
	4				✓									
	6								✓					
	9				✓									
	11				✓									
	18								✓					
	12	✓												
	38								✓					
	43								✓					
	60		✓											
	62								✓					
	67			✓										
	68		✓											
	71								✓					
	76										✓			
	109								✓					
	128								✓					
			RETEST FAILURES											
502	1								✓					
	9								✓					
TOTAL		1	2	1	3				11		1			

Actual Size 8-1/2" by 11"

PROGRESS REPORT

DATE	FROM BAY	FROM SW	TO BAY	TO SW	TEST TIME MINUTES	TESTER	DATE	FROM BAY	FROM SW	TO BAY	TO SW	TEST TIME MINUTES	TESTER
7-26	502	1	502	160	180	R							

TROUBLE FOUND OR DISPOSITION

EQUIPMENT BAY	EQUIPMENT SW	STEPS TAKEN TO CLEAR TROUBLE (Give Details of Procedures Followed)	TROUBLE CODE	RETEST	CLEARED BY	TROUBLE CLEARING TIME	DATE
502	1	Milli & adj "E" Relay	AR	Fails	R		7-26
	1	Adj Rot. Int. Spring	ROSA	OK	"		"
	4	Milli & adj "C" Relay	AR	OK	"		"
	6	Adj Rot. Int. Spring tension	ROSA	OK	"		"
	9	Milli & Adj "C" Relay	AR	Fails	"		"
	9	Adj Rot. Int. Spring	ROSA	OK	"		"
	11	Milli & Adj "C" Relay	AR	OK	"		"
	18	Adj Rotary Magnetos	RSM	OK	"		"
	12	Milli & Adj "A" Relay	AR	OK	"		"
	38	Adj Rot Mag Ret Spring	ROSA	OK	"		"
	43	Milli & Adj "E" Relay	AR	OK	"		"
	60	Milli & Adj "B" Relay	AR	OK	"		"
	62	Adj Rot Panel Guide & Rot. Mag.	ROSA	OK	"		"
	67	Milli & Adj "B" Relay	AR	OK	"		"
	68	Milli & Adj "B" Relay	AR	OK	"		"
	71	Adj Rot Int Spring	ROSA	OK	"		"
	76	Milli & Adj "A" Relay - Mag OK	AR	OK	"		"
	109	Adj Rot Int & Rot Ret Spring	ROSA	OK	"		"
	128	Milli & adj "E" Relay	AR	OK	"		"
		TOTAL TROUBLE CLEARING TIME =	185	MIN.			

Actual Size 8-1/2" by 11"