INSPECTION REQUIREMENTS

SWITCHES

197 AND 198 (STEP-BY-STEP) TYPES

GENERAL EQUIPMENT REQUIREMENTS

COMMON SYSTEMS

TABLE 800-669-186

Lot Range			A	B	C	D	E	F	G	H	I	J
Lot Size (number of switches in inspection lot)			1 75	76 200	201 300	301 500	501 600	601 800	801 1000	1001 2000	2001 3000	3001 4000
Sample Size (switches) (see note 1)			All	50	85	120	130	160	170	195	230	260
Selected Item (see note 2) ROTARY, VERTICAL, AND RELEASE MECHANISM (For requirements, refer to Section 030-705-702 and Division 800.)	Basis for Counting Defects	Allowable Per Cent Defective for Lot	Allowable Defect Numbers									
			AN	AN	AN	AN	AN	AN	AN	AN	AN	AN
1. Numerical and Group Designations	-	-	Record all defects found. See note 3.									
2. Loose Assembly of Parts (w)	Switch	5	0	0	2	3	3	4	5	6	7	8
3. Switch Covers: Fit, Finish, Damage (w)	"	5	0	0	2	3	3	4	5	6	7	8
4. Position of Adjusting Screws	"	6	0	1	2	3	4	5	6	7	9	10
5. Freedom of Shaft to Return to Vertical Normal	"	4	0	0	1	2	2	3	3	4	5	6
ROTARY REQUIREMENTS												
6. Rotary Dog Alignment	"	6	0	1	2	3	4	5	6	7	9	10
7. Rotary Armature Play	"	4	0	0	1	2	2	3	3	4	5	6
8. Rotary Pawl Play	"	4	0	0	1	2	2	3	3	4	5	6
9. Vertical Position of Rotary Armature	"	4	0	0	1	2	2	3	3	4	5	6
10. Rotary Pawl Alignment (see note 4)	"	4	0	0	1	2	2	3	3	4	5	6
11. Rotary Magnet Position: (a) Rotary Dog and Ratchet Tooth Clearance	"	5	0	0	2	3	3	4	5	6	7	8
12. (b) Armature Strike Both Magnet Cores	"	6	0	1	2	3	4	5	6	7	9	10
13. Rotary Pawl Front Stop Position	"	5	0	0	2	3	3	4	5	6	7	8
14. Rotary Pawl Guide Position	"	4	0	0	1	2	2	3	3	4	5	6
15. Normal Pin Position	"	7	0	1	3	5	5	7	8	9	11	12
16. Rotary Armature Backstop Position	"	4	0	0	1	2	2	3	3	4	5	6
17. Rotary Armature Unoperated Core Gap	"	5	0	0	2	3	3	4	5	6	7	8
18. Shaft Spring Bracket Position	"	4	0	0	1	2	2	3	3	4	5	6
19. Shaft Spring Tension: Restoring Tension	"	5	0	0	2	3	3	4	5	6	7	8
VERTICAL REQUIREMENTS (197-TYPE SWITCHES ONLY)												
20. Vertical Pawl Play	"	4	0	0	1	2	2	3	3	4	5	6
21. Vertical Armature Play	"	4	0	0	1	2	2	3	3	4	5	6

TABLE 800-669-186 (CONT)

Lot Range				A	B	C	D	E	F	G	H	I	J
Lot Size (number of switches in inspection lot)				1 75	76 200	201 300	301 500	501 600	601 800	801 1000	1001 2000	2001 3000	3001 4000
Sample Size (switches)(see note 1)				All	50	85	120	130	160	170	195	230	260
Selected Item (see note 2) ROTARY, VERTICAL, AND RELEASE MECHANISM (For requirements, refer to Section 030-705-702 and Division 800.)		Basis for Counting Defects	Allowable Per Cent Defective for Lot	Allowable Defect Numbers									
				AN	AN	AN	AN	AN	AN	AN	AN	AN	AN
22. Vertical Pawl Position		Switch	4	0	0	1	2	2	3	3	4	5	6
23. Clearance Between Vertical Pawl Finger and Vertical Pawl Guide		"	4	0	0	1	2	2	3	3	4	5	6
24. Clearance Between Vertical Pawl and Vertical Teeth		"	5	0	0	2	3	3	4	5	6	7	8
25. Double Dog Play		"	4	0	0	1	2	2	3	3	4	5	6
26. Vertical Magnet Position: Vertical Pawl Clearance With Magnet Electrically Operated	SI		5	0	0	2	3	3	4	5	6	7	8
27. Vertical Magnet Position: Armature Strikes Both Magnet Cores		"	6	0	1	2	3	4	5	6	7	9	10
28. Vertical Armature Unoperated Core Gap		"	5	0	0	2	3	3	4	5	6	7	8
29. Horizontal Alignment of Vertical Dog		"	6	0	1	2	3	4	5	6	7	9	10
30. Vertical Alignment of Vertical Dog		"	6	0	1	2	3	4	5	6	7	9	10
31. Depth of Engagement of Vertical Dog		"	7	0	1	3	5	5	7	8	9	11	12
32. Horizontal Alignment of Stationary Dog		"	7	0	1	3	5	5	7	8	9	11	12
33. Vertical Alignment of Stationary Dog		"	7	0	1	3	5	5	7	8	9	11	12
34. Depth of Engagement of Stationary Dog		"	7	0	1	3	5	5	7	8	9	11	12
VERTICAL POSITION REQUIREMENTS (198-TYPE SWITCHES ONLY)													
35. Clearance Between Vertical Dog and Vertical Ratchet		"	6	0	1	2	3	4	5	6	7	9	10
36. Position of Stationary Dog		"	4	0	0	1	2	2	3	3	4	5	6
DOUBLE DOG SPRING AND RELEASE REQUIREMENTS													
37. Alignment of Double Dog Spring		"	6	0	1	2	3	4	5	6	7	9	10
38. Double Dog Spring Tension		"	4	0	0	1	2	2	3	3	4	5	6
39. Clearance Between Rotary Dog and Rotary Teeth		"	7	0	1	3	5	5	7	8	9	11	12

TABLE 800-669-186 (CONT)

Lot Range				A	B	C	D	E	F	G	H	I	J
Lot Size (number of switches in inspection lot)				1 75	76 200	201 300	301 500	501 600	601 800	801 1000	1001 2000	2001 3000	3001 4000
Sample Size (switches)(see note 1)				All	50	85	120	130	160	170	195	230	260
Selected Item (see note 2) ROTARY, VERTICAL, AND RELEASE MECHANISM (For requirements, refer to Section 030-705-702 and Division 800.)		Basis for Counting Defects	Allowable Per Cent Defective for Lot	Allowable Defect Numbers									
				AN	AN	AN	AN	AN	AN	AN	AN	AN	AN
40. Release Armature Pin Position: Release Link Drops Over Double Dog Release Tooth		Switch	4	0	0	1	2	2	3	3	4	5	6
41. Release Armature Pin Position: Release Link Does Not Latch Double Dog With Gauge Inserted		"	4	0	0	1	2	2	3	3	4	5	6
42. Clearance Betweeen Release Armature Pin and Double Dog		"	6	0	1	2	3	4	5	6	7	9	10
43. Straightness of Contact Springs		"	6	0	1	2	3	4	5	6	7	9	10
44. Contact Alignment		"	4	0	0	1	2	2	3	3	4	5	6
ROTARY INTERRUPTER SPRING REQUIREMENTS													
45. Contact Pressure		"	6	0	1	2	3	4	5	6	7	9	10
46. Contact Separation		"	7	0	1	3	5	5	7	8	9	11	12
VERTICAL INTERRUPTER SPRING REQUIREMENTS													
47. Interrupter Arm Play		"	6	0	1	2	3	4	5	6	7	9	10
48. Clearance Between Interrupter Arm Stud and Interrupter Spring		"	6	0	1	2	3	4	5	6	7	9	10
49. Contact Separation		"	7	0	1	3	5	5	7	8	9	11	12
50. Contact Pressure		"	6	0	1	2	3	4	5	6	7	9	12
VERTICAL OFF-NORMAL SPRING REQUIREMENTS													
51. Off-Normal Finger Clearance (a) First Rotary Step		"	7	0	1	3	5	5	7	8	9	11	12
52. (b) Last Rotary Step		"	6	0	1	2	3	4	5	6	7	9	10
53. Contact Separation		"	4	0	0	1	2	2	3	3	4	5	6
54. Clearance Between Lever Stud and First Lever Spring		"	4	0	0	1	2	2	3	3	4	5	6
55. Clearance Between Lever Spring and Stud of Next Lever Spring		"	4	0	0	1	2	2	3	3	4	5	6
56. Contact Pressure		"	4	0	0	1	2	2	3	3	4	5	6
CAM SPRING (10TH OR 11TH ROTARY STEP SPRINGS) REQUIREMENTS													
57. Clearance Between Lever Spring Studs and the Rotary Ratchet and Cam Collar		"	4	0	0	1	2	2	3	3	4	5	6

TABLE 800-669-186 (CONT)

Lot Range			A	B	C	D	E	F	G	H	I	J
Lot Size (number of switches in inspection lot)			1 to 75	76 to 200	201 to 300	301 to 500	501 to 600	601 to 800	801 to 1000	1001 to 2000	2001 to 3000	3001 to 4000
Sample Size (switches) (see note 1)			All	50	85	120	130	160	170	195	230	260
Selected Item (see note 2) ROTARY, VERTICAL, AND RELEASE MECHANISM (For requirements, refer to Section 030-705-702 and Division 800.)		Basis for Counting Defects	Allowable Per Cent Defective for Lot	Allowable Defect Numbers									
				AN	AN	AN	AN	AN	AN	AN	AN	AN	AN
58. Clearance Between Cam and Lever Spring Stud		Switch	4	0	0	1	2	2	3	3	4	5	6
59. Contact Pressure		"	5	0	0	2	3	3	4	5	6	7	8
60. Contact Separation		"	4	0	0	1	2	2	3	3	4	5	6
61. Clearance Between Lever Spring and Stud of Next Lever Spring		"	4	0	0	1	2	2	3	3	4	5	6
RELEASE CONTACT SPRING REQUIREMENTS													
62. Contact Separation (Figures 500-505 incl.)		"	5	0	0	2	3	3	4	5	6	7	8
63. Contact Pressure (Figures 500-505 incl. and Contact Follow Fig. 501)		"	7	0	1	3	5	5	7	8	9	11	12
ROTARY OFF-NORMAL SPRING REQUIREMENTS													
64. Clearance Between Lever Spring Stud and Associated Parts		"	5	0	0	2	3	3	4	5	6	7	8
65. Relation of Buffer Spring to Adjacent Lever Spring		"	5	0	0	2	3	3	4	5	6	7	8
66. Contact Sequence		"	5	0	0	2	3	3	4	5	6	7	8
67. Contact Separation		"	4	0	0	1	2	2	3	3	4	5	6
68. Contact Follow		"	4	0	0	1	2	2	3	3	4	5	6
69. Contact Pressure		"	5	0	0	2	3	3	4	5	6	7	8
70. Clearance Between Cam and Buffer Spring		"	5	0	0	2	3	3	4	5	6	7	8
NORMAL POST SPRING REQUIREMENTS (springs operated by normal post cam and rollers)													
71. Position of Normal Post Spring Assembly		"	5	0	0	2	3	3	4	5	6	7	8
72. Position of Normal Post Cam Teeth		"	4	0	0	1	2	2	3	3	4	5	6
73. Normal Post Cam Play		"	5	0	0	2	3	3	4	5	6	7	8
74. Normal Post Spring Assembly Mounting Bracket Position		"	5	0	0	2	3	3	4	5	6	7	8

TABLE 800-669-186 (CONT)

Lot Range				A	B	C	D	E	F	G	H	I	J
Lot Size (number of switches in inspection lot)				1 to 75	76 to 200	201 to 300	301 to 500	501 to 600	601 to 800	801 to 1000	1001 to 2000	2001 to 3000	3001 to 4000
Sample Size (switches) (see note 1)				All	50	85	120	130	160	170	195	230	260
Selected Item (see note 2) → ROTARY, VERTICAL, AND RELEASE MECHANISM (For requirements, refer to Section 030-705-702 and Division 800.)		Basis for Counting Defects	Allowable Per Cent Defective for Lot	Allowable Defect Numbers									
				AN	AN	AN	AN	AN	AN	AN	AN	AN	AN
75. Relation of Normal Post Cam to Rollers		Switch	5	0	0	2	3	3	4	5	6	7	8
76. Contact Pressure		"	5	0	0	2	3	3	4	5	6	7	8
77. Spring Tension		"	5	0	0	2	3	3	4	5	6	7	8
78. Contact Sequence Between Springs on Either Side of the Normal Post		"	5	0	0	2	3	3	4	5	6	7	8
79. Contact Separation		"	5	0	0	2	3	3	4	5	6	7	8
80. Bank Contacts - Cleaned and Treated			5	0	0	2	3	3	4	5	6	7	8
81. Position of Banks: Bank Rod and Collar Assembly Secure		"	5	0	0	2	3	3	4	5	6	7	8
82. Position Banks: Location of Banks		"	5	0	0	2	3	3	4	5	6	7	8
83. Wiper Assembly Position		"	5	0	0	2	3	3	4	5	6	7	8
84. Vertical Alignment of Wiper Springs		"	4	0	0	1	2	2	3	3	4	5	6
85. Wiper Springs Forming		"	6	0	1	2	3	4	5	6	7	9	10
86. Position of Wiper Tips on Bank Contacts		"	4	0	0	1	2	2	3	3	4	5	6
87. Normal Position of Wiper Tips		"	5	0	0	2	3	3	4	5	6	7	8
88. Wiper Spring Tension		"	7	0	1	3	5	5	7	8	9	11	12
89. Centering of Wipers on Bank Contacts	SI	"	4	0	0	1	2	2	3	3	4	5	6
90. Alignment of Wipers with Bank Levels: Clearance at Rotary Normal		"	4	0	0	1	2	2	3	3	4	5	6
91. Alignment of Wipers with Bank Levels: Centering With Contact Levels	SI	"	6	0	1	2	3	4	5	6	7	9	10
92. Loose Assembly of Parts (w)		"	5	0	0	2	3	3	4	5	6	7	8
COMMUTATOR WIPERS													
93. Horizontal Alignment of Commutator Wipers		"	5	0	0	2	3	3	4	5	6	7	8

TABLE 800-669-186 (CONT)

Lot Range			A	B	C	D	E	F	G	H	I	J
Lot Size (number of switches in inspection lot)			1 to 75	76 to 200	201 to 300	301 to 500	501 to 600	601 to 800	801 to 1000	1001 to 2000	2001 to 3000	3001 to 4000
Sample Size (switches) (see note 1)			All	50	85	120	130	160	170	195	230	260
Selected Item (see note 2) ROTARY, VERTICAL, AND RELEASE MECHANISM (For requirements, refer to Section 030-705-702 and Division 800.)		Basis for Counting Defects	Allowable Per Cent Defective for Lot	Allowable Defect Numbers									
				AN	AN	AN	AN	AN	AN	AN	AN	AN	AN
94. Centering of Commutator Wiper on Commutator Contacts		Switch	5	0	0	2	3	3	4	5	6	7	8
95. Commutator Wiper Tension		"	5	0	0	2	3	3	4	5	6	7	8
96. Clearance Between Commutator Wiper and Associated Commutator Contacts		"	5	0	0	2	3	3	4	5	6	7	8
97. Relation of Commutator Wiper Tips to Commutator Contacts: Parallelism of Contacting Surfaces		"	5	0	0	2	3	3	4	5	6	7	8
98. Relation of Commutator Wiper Tips to Commutator Contacts: Overlap of Contacts		"	5	0	0	2	3	3	4	5	6	7	8
99. Clearance Between Backstop and Commutator Wiper		"	5	0	0	2	3	3	4	5	6	7	8
100. Loose Assembly of Parts (w)		"	5	0	0	2	3	3	4	5	6	7	8
SLEEVE CUT OFF JACKS													
101. Clearance Between Springs and Mounting Bracket		"	5	0	0	2	3	3	4	5	6	7	8
102. Contact Separation		"	5	0	0	2	3	3	4	5	6	7	8
103. Contact Pressure		"	5	0	0	2	3	3	4	5	6	7	8
TEST JACKS													
104. Contact Pressure		"	5	0	0	2	3	3	4	5	6	7	8
105. Contact Separation		"	5	0	0	2	3	3	4	5	6	7	8
LUBRICATION (For requirements, refer to Section 030-705-706.)													
106. Lubrication	SI	"		All Samples: The lubrication shall meet the intent of the requirement.									

AN = Allowable Number of defects in sample.

SPOTTINESS TABLE

Size of Subsample	3 25	26 70	71 125	126 175	176 200	201 250	251 300
SN	3	7	11	15	17	21	25
SN = Spottiness Number (applying to Subsample)							

Note 1: Where features of the switch mechanism are not common to all switches in the specified inspection lot, a sufficient number of switches having the features must be included to meet the sample size requirements associated with the AN numbers used.

Note 2: Inspection for the step-by-step switch mechanism may be limited to the items designated SI (Selected Item). In determining the need for extension of inspection to the remaining items, three separate groups shall be considered and shall consist of the following items: Group 1—Items 1 through 79 and 101 through 105; Group 2—Items 81 through 92; Group 3—Items 93 through 100 and 80 and 106. Extension of inspection to the remaining items in Group 2 for lots in lot range A shall be made only when one or more defects are found on more than one of the selected items in the Group. For lots in lot ranges B through J, the extension shall be made for Group 3 items only when the AN is exceeded for more than one selected item. Extension of inspection to the remaining items in Groups 2 and 3 for lots in lot range A shall be made when one or more defects are found for the selected item. For lots in lot ranges B through J, the extension shall be made for Group 2 and 3 items when the AN is exceeded for the selected item.

Note 3: For each type of defect recorded, sufficient additional inspection shall be made to insure elimination of the irregularity in the equipment involved.

Note 4: Inspection for this item shall be limited to 197-type switches arranged to take ten vertical steps. In case the AN for this item is exceeded in any lot, inspection for the position of the top edge of the rotary pawl shall also be extended to all 197-type switches in the installation arranged for 5 vertical steps.

Requirements for items marked with a "w" are based on accepted standard of workmanship.

For detailed explanation and use of tables, refer to Section 800-668-180.

REASONS FOR REISSUE

To reduce the sample size requirements based on the process average quality of the manufactured product and to reduce the number of selected items.