SIEMENS-ALLIS

Switchgear

INSTRUCTIONS

PORTABLE TEST SET

TYPE PTS - 3

FOR

TYPE LA LOW VOLTAGE POWER CIRCUIT BREAKERS

STATIC OVERCURRENT TRIP SYSTEM

18X10366
December, 1978

TABLE 1

STATIC TRIP II

RATING TABLE – AMPERES

Breaker Type And Frame Size	Tripping XMFR Rating (Primary)	Long Time Element Calibrated Pick-Up Settings							Max. Cont. Rating	Ground Element Calibrated Pick-Up Settings			
		A	B	C	D	E	F	G		15%	25%	50%	100%
LA-600A	80	40	50	60	70	80	90	100	100	- - -	- - -	40	80
600	200	100	125	150	175	200	225	250	250	30	50	100	200
Amperes	400	200	250	300	350	400	450	500	500	60	100	200	400
	600	300	375	450	525	600	675	750	600	90	150	300	600
LA-800A	80	40	50	60	70	80	90	100	100	- - -	- - -	40	80
800	200	100	125	150	175	200	225	250	250	30	50	100	200
Amperes	400	200	250	300	350	400	450	500	500	60	100	200	400
	600	300	375	450	525	600	675	750	750	90	150	300	600
	800	400	500	600	700	800	900	1000	800	120	200	400	800
LA-1600A	200	100	125	150	175	200	225	250	250	- - -	50	100	200
1600	400	200	250	300	350	400	450	500	500	60	100	200	400
Amperes	800	400	500	600	700	800	900	1000	1000	120	200	400	800
	1600	800	1000	1200	1400	1600	1800	2000	1600	240	400	800	1600
LA-3000A	2000	1000	1250	1500	1750	2000	2250	2500	2500	300	500	1000	2000
3000	3200	1600	2000	2400	2800	3200	3600	4000	3000	480	800	1600	3200
Amperes													
LA-4000A													
4000	4000	2000	2500	3000	3500	4000	4500	5000	4000	600	1000	2000	4000
Amperes													
Secondary Pick-Up Current-Amperes		0.50	0.625	0.75	0.875	1.00	1.125	1.25	- - - -	0.15	0.25	0.25	1.00

General Notes

1. The "Tripping XFMR Rating" values represent the primary value to the current transformer ratio in amperes. The secondary value is one ampere.

2. The pick-up seetings of the long time element are continuously adjustable and are calibrated at points "A" through "G" as shown in the rating table.

3. The pick-up settings of the instantaneous and short time delay elements are continuously adjustable and are calibrated at 3, 5, 8 and 12 multiples of the long time pick-up setting.

4. The pick-up settings of the ground elements are continuously adjustable and are calibrated in percent of the tripping transformer rating as shown in the rating table.

5. The long time element has 6 bands which are field selectable. The time delay at 6 multiples of pick-up is as follows:

Band 1 — 1.12 seconds	Band 4 — 9 seconds
Band 2 — 2.25 seconds	Band 5 — 18 seconds
Band 3 — 4.5 seconds	Band 6 — 36 seconds

6. The short time element and ground element have 3 bands which are calibrated at minimum, intermediate and maximum, but are continuously adjustable.

7. The maximum interrupting time is the maximum length of time that fault current flows, including arcing time.

8. The lower limit of ground fault recognition is 25 amperes for LA-600A and LA-800A breakers and 40 amperes for an LA-1600 breaker.

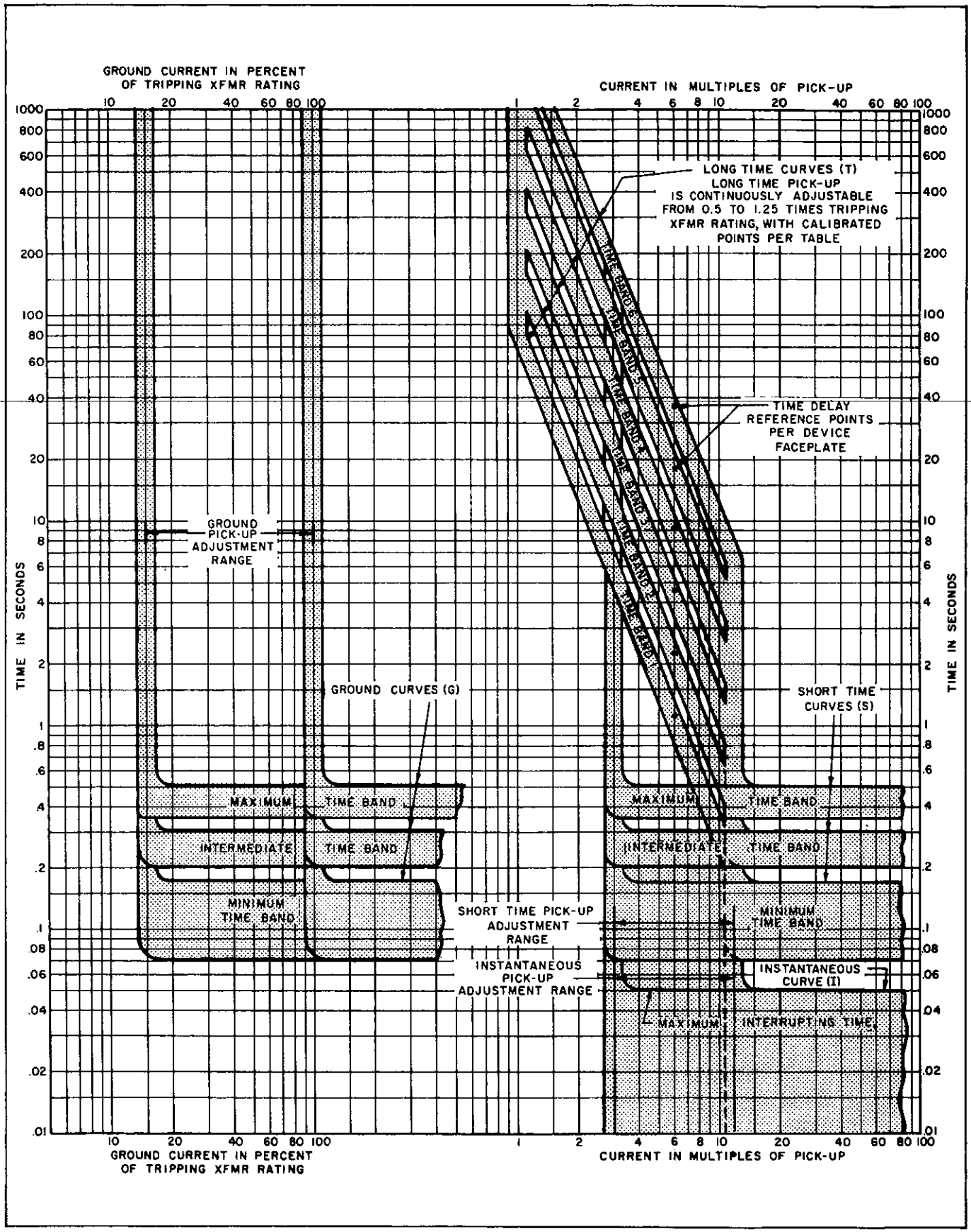


Figure 6. — Time-Current Curves - Static Trip II

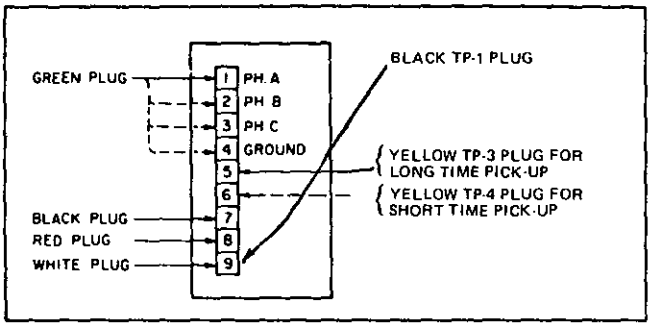


Figure 8C. — Test Connections Models 4WAG and 4WDG

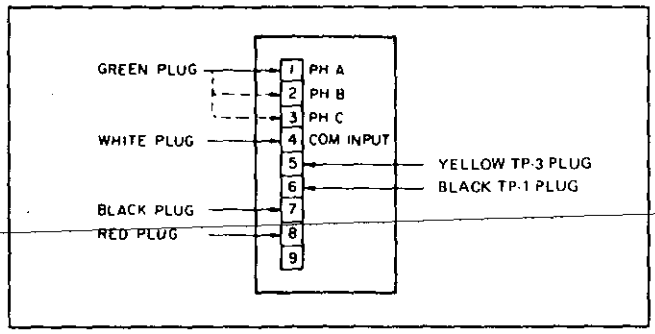


Figure 8D. — Test Connections Models C, C1 and C2

erence dots (knob counter-clockwise against stop) are black and the calibration dots are red. On first generation trip devices the reference dots are red and the calibration dots are black on some models and white on others.

Test Procedures

Keeping the above differences in mind and making careful reference to the appropriate connection diagram on Figure 8A to 8D, the test instructions in "Testing Static Trip on the Breaker" (omitting the connection instructions in each case), can be used for testing first generation trip devices also. Compare the test results with Table 2 and Figures 9A, 9B, 11 and 12 as applicable.

Bench Testing

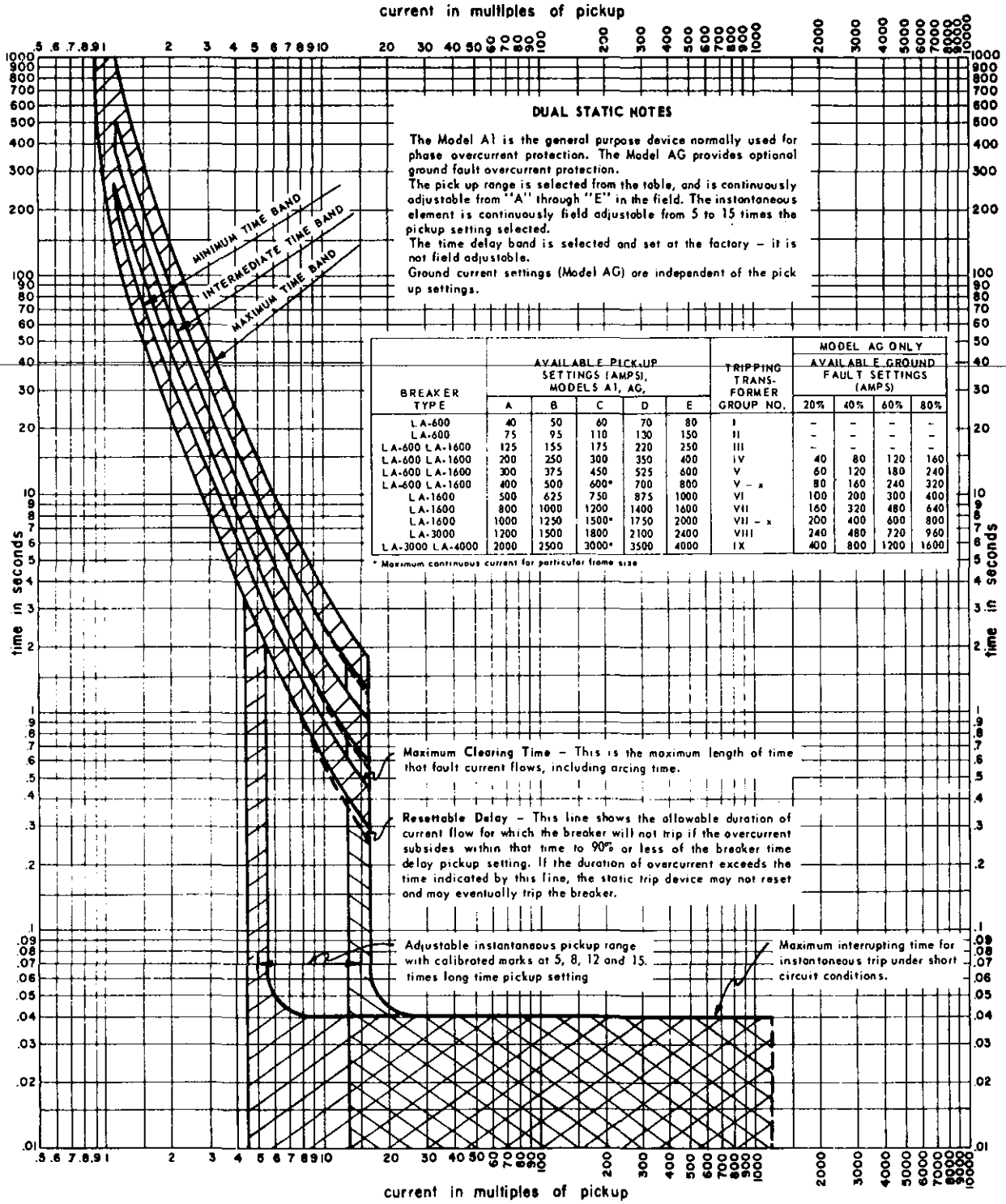
The alligator clips described previously are also used to make connections to the first generation trip devices for bench testing, so connections and procedures are the same as when testing with the device on the circuit breaker.

TABLE 2

TRIP RATING TABLE — FIRST GENERATION STATIC TRIPS

Breaker Type	Models A3, AG2, 4WAG, D2, DG1, 4WDG — Long Time Delay Elements Available Pick-Up Settings (Amperes)					Tripping Transformer Group No.	Models AG2 and DG1 — Long Time Delay Element Available Ground Fault Settings (Amperes) — Percent of "A" Pick-Up				Models 4WAG and 4WDG — Inst. or Short Time Delay Available Ground Fault Settings (Amperes) — Percent of "A" Pick-Up			
	A	B	C	D	E		20%	40%	60%	80%	20%	40%	60%	80%
LA-600	40	50	60	70	80	I	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
LA-600	75	95	110	130	150	II	- - -	- - -	- - -	- - -	- - -	30	45	60
LA-600 LA-1600	125	155	175	220	250	III	- - -	- - -	- - -	- - -	25	50	75	100
LA-600 LA-1600	200	250	300	350	400	IV	40	80	120	160	40	80	120	160
LA-600 LA-1600	300	375	450	525	600	V	60	120	180	240	60	120	180	240
LA-600 LA-1600	400	500	600	700	800	V-x	80	160	240	320	80	160	240	320
LA-1600	500	625	750	875	1000	VI	100	200	300	400	100	200	300	400
LA-1600	800	1000	1200	1400	1600	VII	160	320	480	640	160	320	480	640
LA-1600	1000	1250	1500	1750	2000	VII-x	200	400	600	800	200	400	600	800
LA-3000	1200	1500	1800	2100	2400	VIII	240	480	720	960	240	480	720	960
LA-3000 LA-4000	2000	2500	3000			IX	400	800	1200	1600	400	800	1200	1600
LA-3000	2000	2500	3000	3500*	4000*	IX-x	400	800	1200	1600	400	800	1200	1600
LA-4000	2000	2500	3000	3500	4000	X	400	800	1200	1600	400	800	1200	1600
Secondary Pick-Up Current-Amperes	0.50	0.625	0.75	0.875	1.00	- - - -	0.10	0.20	0.30	0.40	0.10	0.20	0.30	0.40

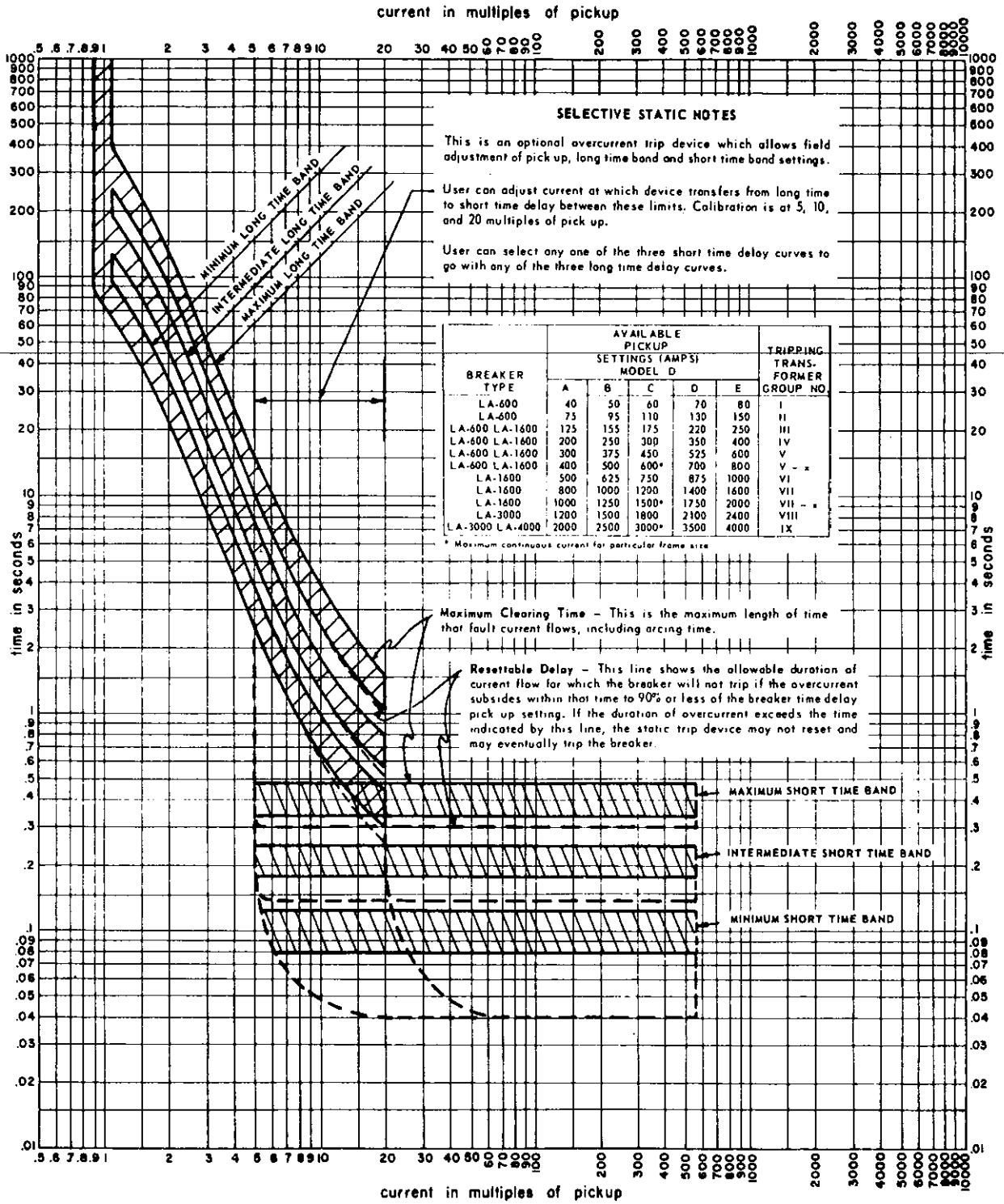
*Maximum continuous current for LA-600 is 600A, LA-1600 is 1600A, LA-3000 is 3000A, and LA-4000 is 4000A.



BREAKER TYPE	AVAILABLE PICK-UP SETTINGS (AMPS), MODELS A1, AG, A	B	C	D	E	TRIPPING TRANSFORMER GROUP NO.	MODEL AG ONLY AVAILABLE GROUND FAULT SETTINGS (AMPS) 20%	40%	60%	80%
LA-600	40	50	60	70	80	I	–	–	–	–
LA-600	75	95	110	130	150	II	–	–	–	–
LA-600 LA-1600	125	155	175	220	250	III	–	–	–	–
LA-600 LA-1600	200	250	300	350	400	IV	40	80	120	160
LA-600 LA-1600	300	375	450	525	600	V	60	120	180	240
LA-600 LA-1600	400	500	600*	700	800	V – x	80	160	240	320
LA-1600	500	625	750	875	1000	VI	100	200	300	400
LA-1600	800	1000	1200	1400	1600	VII	160	320	480	640
LA-1600	1000	1250	1500*	1750	2000	VII – x	200	400	600	800
LA-3000	1200	1500	1800	2100	2400	VIII	240	480	720	960
LA-3000 LA-4000	2000	2500	3000*	3500	4000	IX	400	800	1200	1600

* Maximum continuous current for particular frame size

Figure 9A. – Time Current Curves - Models A, A1, A2, AG, AG1



BREAKER TYPE	AVAILABLE PICKUP SETTINGS (AMPS) MODEL D A	B	C	D	E	TRIPPING TRANSFORMER GROUP NO.
LA-600	40	50	60	70	80	I
LA-600	75	95	110	130	150	II
LA-600 LA-1600	125	155	175	220	250	III
LA-600 LA-1600	200	250	300	350	400	IV
LA-600 LA-1600	300	375	450	525	600	V
LA-600 LA-1600	400	500	600*	700	800	V – x
LA-1600	500	625	750	875	1000	VI
LA-1600	800	1000	1200	1400	1600	VII
LA-1600	1000	1250	1500*	1750	2000	VII – x
LA-3000	1200	1500	1800	2100	2400	VIII
LA-3000 LA-4000	2000	2500	3000*	3500	4000	IX

* Maximum continuous current for particular frame size

Figure 9B. – Time Current Curves - Models D, D1

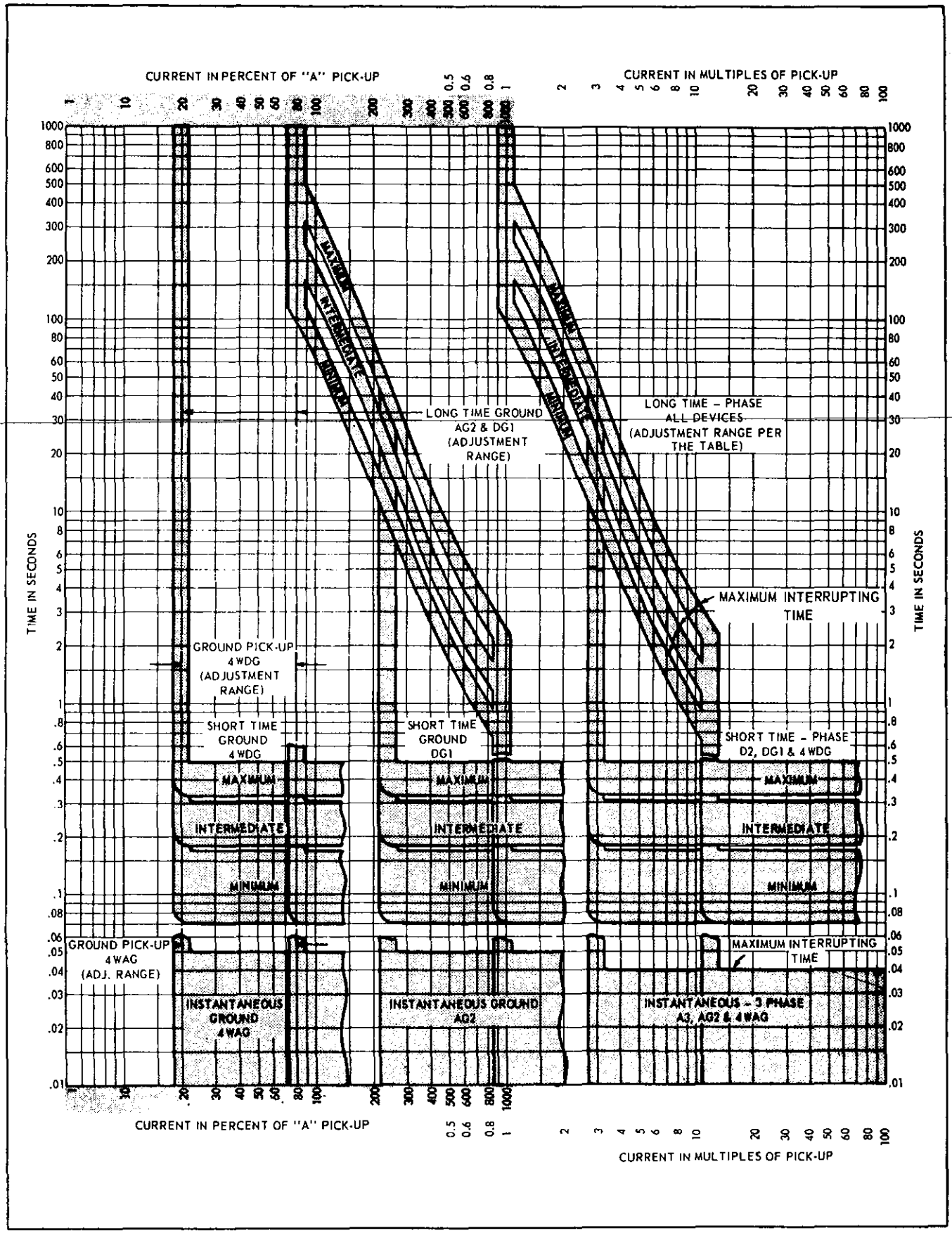


Figure 10. — Time Current Cruves - Models A3, AG2, D2, DG1, 4WAG, 4WDG

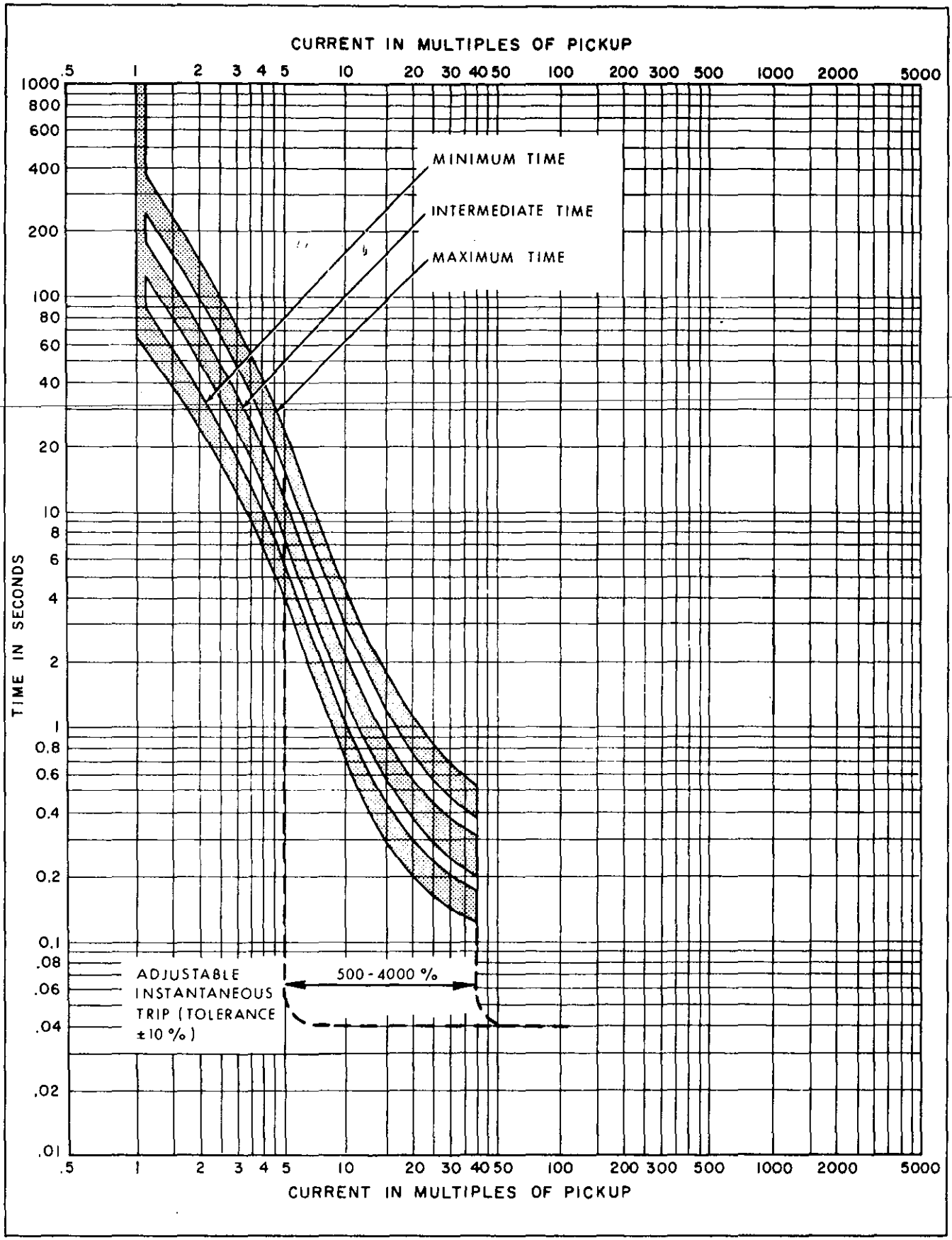


Figure 11. — Time Current Curves - Models C, C1, C2

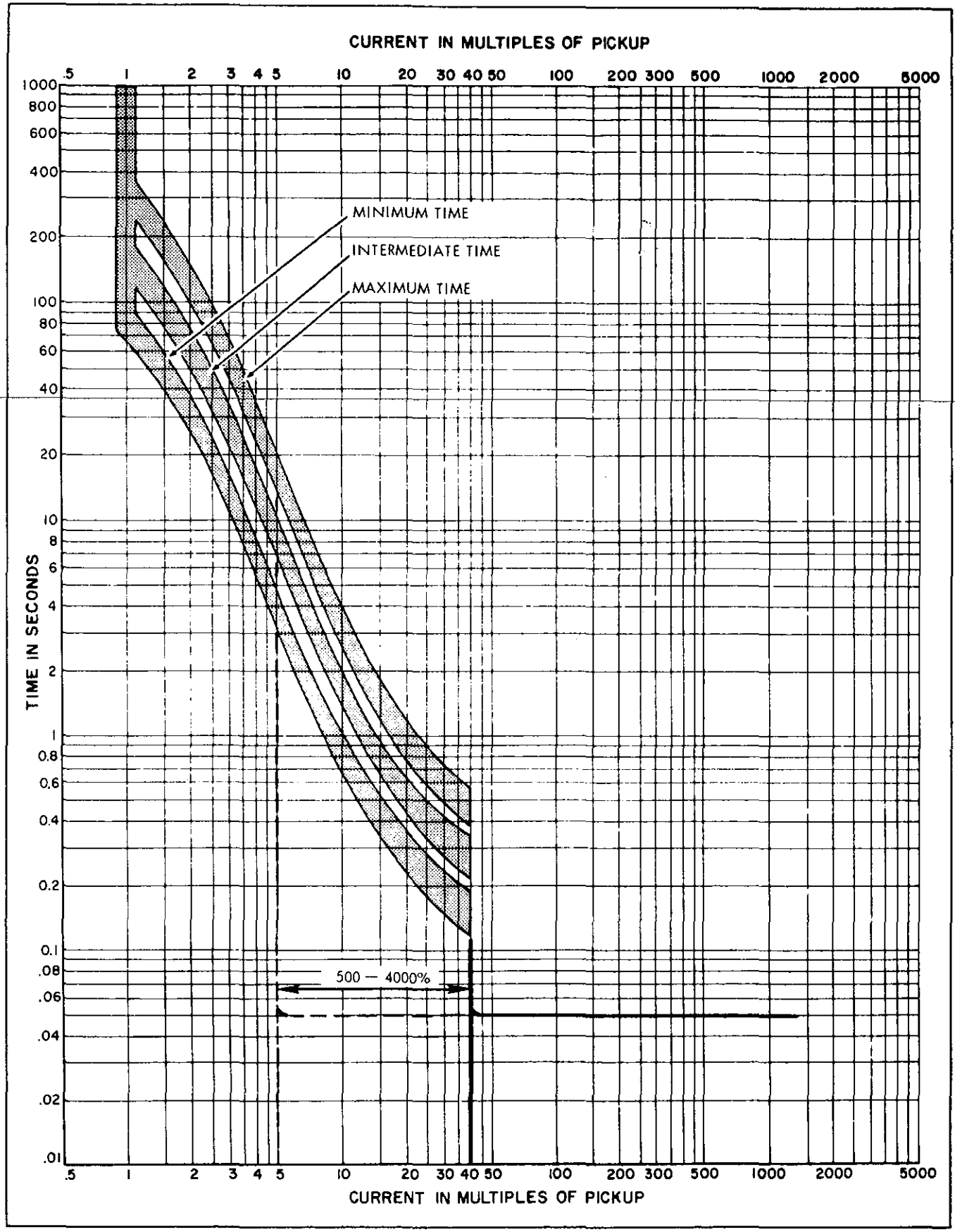


Figure 12. — Time Current Curves - Model C3

4. Slowly increase the current by rotating the "INTERNAL POWER CONTROL" in a clockwise direction. Increase the current until the "LONG TIME" pick-up light comes ON; this should be at 0.5 ampere ± 10%. The sampling rate of the digital ammeter is such that the control must be moved very slowly to accurately determine the pick-up current of the trip device.

5. Decreasing the current slightly should cause the light to go OUT.

6. Repeat the tests for the other phases and settings and compare with Table 3A.

TABLE 3

Breaker Type & Frame Size	Tripping XMFR Rating (Primary)	Long Time Element Calibrated Pick-Up Settings						Max. Cont. Rating
		A	B	C	D	E	F	
LA-600	80	40	50	60	70	80	90	90
600	200	100	125	150	175	200	225	225
Amperes	400	200	250	300	350	400	450	450
	600	300	375	450	525	600	675	600
LA-800	800	400	500	600	700	800	900	800
LA-1600	200	100	125	150	175	200	225	225
1600	400	200	250	300	350	400	450	450
Amperes	800	400	500	600	700	800	900	900
	1600	800	1000	1200	1400	1600	1800	1600
LA-3000								
3000	2000	1000	1250	1500	1750	2000	2250	2250
Amperes	3000	1500	1880	2250	2630	3000	3380	3000
LA-4000								
4000	4000	2000	2500	3000	3500	4000	4500	4000
Amperes								

"LimiTrip" **Rating Table — Amperes**

General Notes

1. The "Tripping XFMR Rating" values represent the primary value of the sensor transformer in amperes. The secondary value is one ampere.

2. The pick-up settings of the long time element are switch selectable at calibrated points "A" thru "F" as shown in the rating table.

3. The pick-up settings of the instantaneous and short time delay elements are switch selectable at 3, 6, 8 and 12 multiples of the long time pick-up setting.

4. The long time element has 4 bands that are switch selectable. The time delay at 4 multiples of pick-up is as follows:

Band 1 — 2.25 seconds
Band 2 — 4.5 seconds
Band 3 — 9 seconds
Band 4 — 18 seconds

5. The short time element has 3 time delay bands which are switch selectable (minimum, intermediate and maximum).

6. The maximum interrupting time is the maximum length of time that fault current flows, including arcing time.

7. Instantaneous maximum interrupting time may be greater when breakers are closed in on a fault depending on actual fault conditions. The maximum potential increase for a 3-phase fault is 0.01 seconds and for a single-phase ground fault is 0.02 seconds.

TABLE 3A

LONG TIME PICK-UP SETTING	A	B	C	D	E	F
PICK-UP CURRENT, AMPS	.50	.625	.75	.875	1.00	1.125

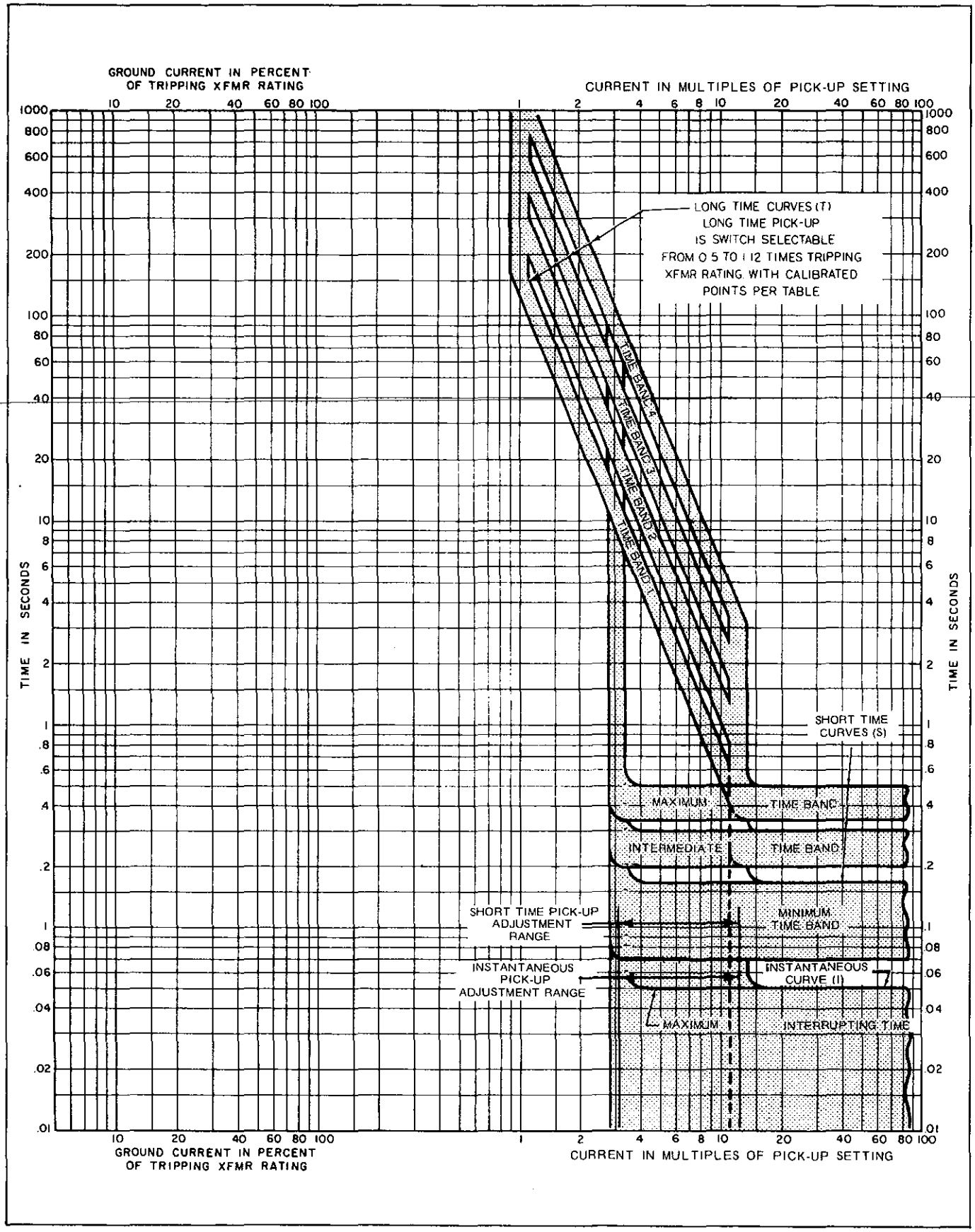


Figure 14. — LimiTrip Time/Current Curves