BASEWEST

Operating & Calibration Instructions

Model TS-453 Test Set

A380 Escape Slide Lighting Systems

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BASEWEST INC.
4240 116th Terrace N • Clearwater FL 33762
Tel: 727/573-2700 • Fax: 727/573-4307
E-mail: info@basewest.com

www.basewest.com

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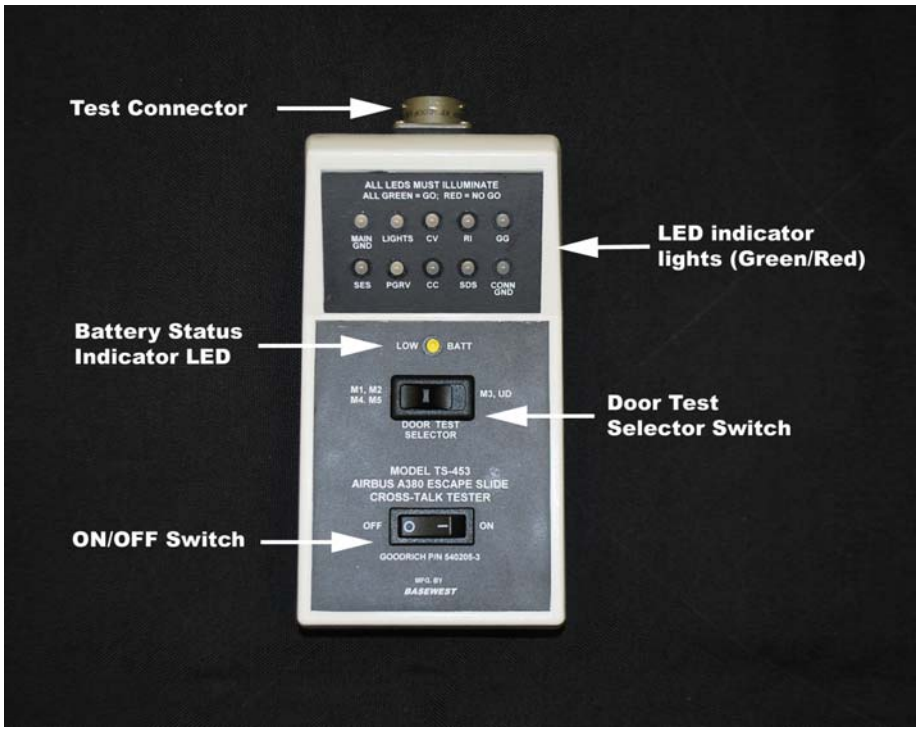
1.0 GENERAL

This manual covers the operation and calibration of the Model TS-453 Test Set for the Airbus A380 escape slide lighting system. The Model TS-453 is designed to test for short circuit conditions and/or electrical cross-talk in escape slide lighting circuits and aircraft interface harnesses.

This device is a GO/NO-GO tester that does not provide parametric electrical readings.



2.0 THEORY OF OPERATION

2.1 The Model TS-453 Test Set detects short circuits and/or electrical cross-talk conditions in A380 escape slide lighting systems and electrical interface harnesses by verifying each of the ten different circuits against all other circuits connected via the interface. Testing is conducted relative to nominal threshold values of 2 MΩ and 6.7KΩ depending on particular circuit at test. Circuit selection, sequencing, and testing are controlled by a microprocessor in the device.

2.2 After proper hook-up and activation per the operating instructions, the TS-453 conducts a self-test to confirm readiness for test. When the self-test is complete, testing of the connected interface harness and systems will commence automatically. The test set cycles automatically through each of the ten circuit tests (described in Appendix A), illuminating each of the indicator LEDs, in order, left to right, top to bottom as the circuit test is completed. The following indications are provided:

- If all ten indicator LEDs in the top panel illuminate and remain ON, a proper test has been accomplished. Otherwise, there is a fault in the instrument and it must be checked and repaired before proceeding.
- If all ten indicator LEDs in the top panel illuminate and remain GREEN, the interface harness and attached system is "GO" and has tested good for release to service.
- If one or more of the ten indicator LEDs in the top panel illuminates RED, the interface harness and attached system is "NO GO" and may not be released to service. The RED-illuminated indicator LED will indicate the particular circuit that either a short circuit or cross-talk condition has been detected.

2.4 Power is provided by a non-rechargeable 9V battery located in a compartment accessible from the bottom of the instrument case. If the "LOW BATT" indicator light on the main panel illuminates, the battery should be replaced before testing is conducted.

3.0 OPERATING INSTRUCTIONS

3.1 Connect the A380 interface harness and system to be tested to the TS-453 test set via the 26-pin connector at the top of the instrument.

3.2 Slide the Door Test Selector switch to proper position for the interface harness under test, as indicated:

- LEFT Position = M1, M2, M4, or M5 doors
- RIGHT Position = M3 or Upper Deck (UD) doors

3.3 Turn the test set ON via the rocker switch on the instrument panel. All LEDs on the top indicator light panel will activate and perform a self-test in the following sequence:

- Three RED flashes with increasing intensity
- Three GREEN flashes with increasing intensity

NOTE: if any LED fails to flash in this sequence, the test unit must be removed from service and repaired prior to any testing.

3.4 Immediately after the self-test, the TS-453 will commence automatic testing of the connected system via the interface harness. The progress of this test can be confirmed by observing that each indicator LED turns ON, in sequence left to right, top to bottom, as the individual circuits are tested. The LEDs remain ON until the test is complete and the test set is turned OFF. The following are the test indications:

- All LEDs illuminate GREEN and remain ON – This indicates that no short circuit or cross-talk conditions have been detected in any of the circuits (e.g., there is an open circuit condition with a resistance of nominally 2 MΩ and for some special cases 6.7KΩ), and that the interface harness under test is "GO" and released for service.
- One or more LEDs illuminate RED – This indicates that there is an electrical closed/short circuit or cross-talk condition below the threshold resistance of

nominally 2 MΩ or 6.7KΩ in the circuit under test and the interface harness and connected system under test is “NO GO” and may not be released to service.

NOTE: Any deviation from these indications, including flickering of LED indicator lights requires that the test set, the interface harness, and/or the connected systems are suspected of a fault and must be checked and re-tested before returned to service.

3.5 After the test is completed, turn the TS-453 OFF via the rocker switch. All LED’s will revert to OFF, and the device is automatically re-set for the next test.

4.0 CALIBRATION PROCEDURE

4.1 Calibration may be performed by the user, a third party calibration facility, or BaseWest, at the user’s option. Calibration is recommended to be performed on an annual basis, but user experience and calibration requirements may indicate a different calibration schedule.

4.2 Remove all connections to the connector interface.

4.3 Turn the unit face down and remove the four screws attaching the back of the case. Note: opening the unit will void any existing calibration.

4.4 Turn the unit face up and slightly separate the front of the case enough to have access to Trimpot R1 located on the bottom left side of the main PCB which is attached to the back cover.

4.5 Set the Door Test selector to M1,M2,M4,M5 and turn the unit on.

4.6 Allow the TS-453 to remain ON for at least 20 seconds after a test sequence has completed. At that time, the test set will automatically cycle to a calibration mode. While in this mode, the TS-453 can be calibrated in the following manner:

- Connect an ammeter between Pins Y(-) and Z(+)
- Read 2.40 +/- 0.05 µA (microamps). If the reading is not in that range, Adjust Trimpot R1 at Main PCB until reading is under limits.

4.7 Turn the unit OFF and turn back ON, allow the TS-453 to remain ON for at least 20 seconds after the test sequence has completed. At that time verify Ammeter reading of 2.40 +/- 0.05 uA between Pins Y(-) and Z(+).

4.8 Properly position the back and front of the case, close the unit and replace the four screws. Note that attention should be taken not to pinch any internal wires or disconnect the Ribbon cable.

5.0 TEST SET GO/NO-GO CHECK HIGH RESISTANCE

5.1 The following GO/NO-GO check procedure can be performed on the TS-453, with reference to Chart 1, below. This is the same procedure used for final inspection at the factory. This check requires the BaseWest P/N 7-6045 test load.

Chart 1 - TS-453 Test Set GO/NO-GO High Resistance Check

Circuit to be Tested	Door Selector Test Switch	7-6045 Test Load: Install BLUE and WHITE Wire Pins into the indicated TS-453 Connector Contact(s)	
		BLUE PIN	WHITE PIN
MainGND	M1, M2, M4, M5	X	P,R,A,B,C,D,T,U,E,F,b,V,S,a,c,W
MainGND	M3, UD	G	P,R,A,B,C,D,T,U,E,F,S,a,c,W
Lights	M1, M2, M4, M5	M, K, or L	P,R,A,B,C,D,T,U,E,F,b,V,S,a,c,W
CV	M1, M2, M4, M5	P, R, A, or B	M,L,K,J,G,H,C,D,T,U,E,F,b,V,S,a,c,W
RI	M1, M2, M4, M5	J, or H	P,R,A,B,C,D,T,U,E,F,b,V,S,a,c,W
GG	M1, M2, M4, M5	C, D, T, or U	M,L,K,J,G,H,P,R,A,B,E,F,b,V,S,a,c,W
SES	M1, M2, M4, M5	E or F	P,R,A,B,M,L,K,J,G,H,C,D,T,U,b,V,S,a,c,W
PGRV	M1, M2, M4, M5	b or V	P,R,A,B,M,L,K,J,G,H,C,D,T,U,E,F,S,a,c,W
CC	M1, M2, M4, M5	S or a	P,R,A,B,M,L,K,J,G,H,C,D,T,U,E,F,b,V,c,W
SDS	M1, M2, M4, M5	c or W	P,R,A,B,M,L,K,J,G,H,C,D,T,U,E,F,b,V,S,a

5.2 With the unit turned OFF, place the Door Selector Test switch into the position indicated for the circuit to be tested per Chart 1.

5.3 Place the BLUE wire pin contact on the 7-6045 test load into any of the TS-453 connector contacts listed under “BLUE Pin” in Chart 1 for the circuit to be tested.

5.4 Place the WHITE wire pin contact on the 7-6045 test load into any of the TS-453 connector contacts listed under “WHITE Pin” in Chart 1 for the circuit to be tested.

5.5 Select the “2.5 MΩ (GREEN)” setting on the 7-6045.

5.6 Turn the TS-453 ON via the rocker switch. Wait for the unit to complete its automatic self-test and circuit test procedures.

- The LED indicator light for the circuit under test should illuminate GREEN, along with all of the other indicator LEDs on the top panel.

5.7 Turn the TS-453 OFF via the rocker switch.

5.8 Select the “1.8 MΩ (RED)” setting on the 7-6045.

5.9 Turn the TS-453 ON again via the rocker switch. Wait for the unit to complete its automatic self-test and circuit test procedures.

- The LED indicator light for the circuit under test should illuminate RED; all other indicator LEDs on the top panel should illuminate GREEN.

5.10 Repeat steps 5.2 through 5.9 for any number of combinations of circuits and/or pin-outs, as required by the user use Appendix A for reference.

6.0 TEST SET GO/NO-GO CHECK LOW RESISTANCE

6.1 The following GO/NO-GO check procedure can be performed on the TS-453, with reference to Chart 2, below. This check requires the two resistor loads of: a) 4.12 K ohms for RED (NO-GO) and b) 28.0 K ohms for GREEN (GO) indication. (Resistor load should be placed across test circuit contacts)

Chart 2 - TS-453 Test Set GO/NO-GO Low Resistance Check

Circuit to be Tested	Door Selector Test Switch	7-6045 Test Load: Install BLUE and WHITE Wire Pins into the indicated TS-453 Connector Contact(s)	
		BLUE PIN	WHITE PIN
MainGND	M1, M2, M4, M5	X	M, or L
MainGND	M3, UD	G	K, or L
Lights	M1, M2, M4, M5	M, K, or L	J, or H, or X
Lights	M3, UD	M, K, or L	J, or H, or X
RI	M1, M2, M4, M5	J, or H	M, or K, or L
RI	M3, UD	J, or H	M, or K, or L

6.2 With the unit turned OFF, place the Door Selector Test switch into the position indicated for the circuit to be tested per Chart 2.

6.3 Place the blue wire pin of the 7-6045 into any of the TS-453 connector contacts listed under “BLUE PIN” in Chart 2 for the circuit to be tested.

6.4 Place the white wire pin of the 7-6045 into any of the TS-453 connector contacts listed under “WHITE PIN” in Chart 2 for the circuit to be tested.

6.5 “GO” Check: Select the 28.0 KΩ (GREEN) Load.

6.6 Turn the TS-453 ON via the rocker switch. Wait for the unit to complete its automatic self-test and circuit test procedures.

- The LED indicator light for the circuit under test should illuminate GREEN, along with all off the other indicator LEDs on the top panel.

6.7 Turn the TS-453 OFF via the rocker switch.

6.8 "NO-GO" Check: Select the less than 4.12 KΩ (RED) Load. Reconnect it to the same contacts on the TS-453 that were previously selected in 6.3 and 6.4.

6.9 Turn the TS-453 ON again via the rocker switch. Wait for the unit to complete its automatic self-test and circuit test procedures.

- The LED indicator light for the circuit under test should illuminate RED; all other indicator LEDs on the top panel should illuminate GREEN.

6.10 Repeat steps 6.2 through 6.9 for any number of combinations of circuits and/or pin-outs, as required by the user, use Appendix A for reference.

7.0 CARE & MAINTENANCE

7.1 The TS-453 test set is a sensitive electronic instrument; it should be treated and protected with appropriate care.

- **Do not drop or crush the instrument**
- **Do not apply external electrical inputs**
- **Keep instrument away from all fluids**
- **Protect from extreme temperatures, weather/rain**

7.2 The device is designed for handheld use in a shop environment and is not designed to withstand a drop to the ground or to survive excessive compression loads.

7.3 The device is not water or fluid resistant; do not allow the device to sit in standing fluids or subject to splash or rain.

7.4 Surface cleaning only with a slightly damped cloth (water or alcohol) is recommended. DO NOT use other solvents or cleaners.

APPENDIX A – CIRCUIT TEST PROTOCOLS

The charts provided in this appendix detail the specific circuits that are tested during each automated test cycle. This is provided as a reference only, but may be used to select specific circuits for the GO/NO-GO check in Sections 5.0 and 6.0 (Highlighted cells are for 6.7KΩ threshold see section 6.0 TEST SET GO/NO-GO CHECK LOW RESISTANCE for details). If there are any questions, please contact BaseWest.

Chart 2 - Main Ground Circuit Test

	M1, M2, M4, M5		M3, UD	
	vs		vs	
Lights	X	M	G	K
	X	L	G	L
CV	X	P	G	P
	X	R	G	R
	X	A	G	A
	X	B	G	B
RI	-	-	-	-
	-	-	-	-
	-	-	-	-
GG	X	C	G	C
	X	D	G	D
	X	T	G	T
	X	U	G	U
SES	X	E	G	E
	X	F	G	F
PGRV	X	b	-	-
	X	V	-	-
CC	X	S	G	b
	X	a	G	V
SDS	X	c	G	c
	X	W	G	W

Chart 3 - Lights Circuit Test

Lights Test	M1, M2, M4, M5						M3, UD					
	vs		vs		vs		vs		vs		vs	
CV	M	P	K	P	L	P	M	P	K	P	L	P
	M	R	K	R	L	R	M	R	K	R	L	R
	M	A	K	A	L	A	M	A	K	A	L	A
	M	B	K	B	L	B	M	B	K	B	L	B
RI	M	J	K	J	L	J	M	J	K	J	L	J
	-	-	-	-	-	-	-	-	-	-	-	-
	M	H	K	H	L	H	M	H	K	H	L	H
GG	M	C	K	C	L	C	M	C	K	C	L	C
	M	D	K	D	L	D	M	D	K	D	L	D
	M	T	K	T	L	T	M	T	K	T	L	T
	M	U	K	U	L	U	M	U	K	U	L	U
SES	M	E	K	E	L	E	M	E	K	E	L	E
	M	F	K	F	L	F	M	F	K	F	L	F
PGRV	M	b	K	b	L	b	-	-	-	-	-	-
	M	V	K	V	L	V	-	-	-	-	-	-
CC	M	S	K	S	L	S	M	b	K	b	L	b
	M	a	K	a	L	a	M	V	K	V	L	V
SDS	M	c	K	c	L	c	M	c	K	c	L	c
	M	W	K	W	L	W	M	W	K	W	L	W
Main GND	M	X	K	X	L	X	-	-	K	G	L	G

Chart 4 - CV Circuit Test																
CV Test	**M1, M2,M3, M4, M5 UD**								**M3, UD**							
	vs		**vs**		**vs**		**vs**		**vs**		**vs**		**vs**		**vs**	
Lights	P	M	R	M	A	M	B	M	P	M	R	M	A	M	B	M
	P	L	R	L	A	L	B	L	P	L	R	L	A	L	B	L
	P	K	R	K	A	K	B	K	P	K	R	K	A	K	B	K
RI	P	J	R	J	A	J	B	J	P	J	R	J	A	J	B	J
	P	G	R	G	A	G	B	G	-	-	-	-	-	-	-	-
	P	H	R	H	A	H	B	H	P	H	R	H	A	H	B	H
GG	P	C	R	C	A	C	B	C	P	C	R	C	A	C	B	C
	P	D	R	D	A	D	B	D	P	D	R	D	A	D	B	D
	P	T	R	T	A	T	B	T	P	T	R	T	A	T	B	T
	P	U	R	U	A	U	B	U	P	U	R	U	A	U	B	U
SES	P	E	R	E	A	E	B	E	P	E	R	E	A	E	B	E
	P	F	R	F	A	F	B	F	P	F	R	F	A	F	B	F
PGRV	P	b	R	b	A	b	B	b	-	-	-	-	-	-	-	-
	P	V	R	V	A	V	B	V	-	-	-	-	-	-	-	-
CC	P	S	R	S	A	S	B	S	P	b	R	b	A	b	B	b
	P	a	R	a	A	a	B	a	P	V	R	V	A	V	B	V
SDS	P	c	R	c	A	c	B	c	P	c	R	c	A	c	B	c
	P	W	R	W	A	W	B	W	P	W	R	W	A	W	B	W
Main GND	P	X	R	X	A	X	B	X	P	G	R	G	A	G	B	G

Chart 5 - RI Circuit Test										
RI Test	**M1, M2, M4, M5**						**M3, UD**			
	vs		**vs**				**vs**		**vs**	
Lights	J	M	H	M	-	-	J	M	H	M
	J	K	H	K	-	-	J	K	H	K
	J	L	H	L	-	-	J	L	H	L
CV	J	P	H	P	-	-	J	P	H	P
	J	R	H	R	-	-	J	R	H	R
	J	A	H	A	-	-	J	A	H	A
	J	B	H	B	-	-	J	B	H	B
GG	J	C	H	C	-	-	J	C	H	C
	J	D	H	D	-	-	J	D	H	D
	J	T	H	T	-	-	J	T	H	T
	J	U	H	U	-	-	J	U	H	U
SES	J	E	H	E	-	-	J	E	H	E
	J	F	H	F	-	-	J	F	H	F
PGRV	J	b	H	b	-	-	-	-	-	-
	J	V	H	V	-	-	-	-	-	-
CC	J	S	H	S	-	-	J	b	H	b
	J	a	H	a	-	-	J	V	H	V
SDS	J	c	H	c	-	-	J	c	H	c
	J	W	H	W	-	-	J	W	H	W
Main GND	-	-	-	-	-	-	-	-	-	-

Chart 6 - GG Circuit Test																
GG Test	**M1, M2,M3, M4, M5 UD**								**M3, UD**							
	vs		**vs**		**vs**		**vs**		**vs**		**vs**		**vs**		**vs**	
Lights	C	M	D	M	T	M	U	M	C	M	D	M	T	M	U	M
	C	L	D	L	T	L	U	L	C	L	D	L	T	L	U	L
	C	K	D	K	T	K	U	K	C	K	D	K	T	K	U	K
RI	C	J	D	J	T	J	U	J	C	J	D	J	T	J	U	J
	C	G	D	G	T	G	U	G	-	-	-	-	-	-	-	-
	C	H	D	H	T	H	U	H	C	H	D	H	T	H	U	H
CV	C	P	D	P	T	P	U	P	C	P	D	P	T	P	U	P
	C	R	D	R	T	R	U	R	C	R	D	R	T	R	U	R
	C	A	D	A	T	A	U	A	C	A	D	A	T	A	U	A
	C	B	D	B	T	B	U	B	C	B	D	B	T	B	U	B
SES	C	E	D	E	T	E	U	E	C	E	D	E	T	E	U	E
	C	F	D	F	T	F	U	F	C	F	D	F	T	F	U	F
PGRV	C	b	D	b	T	b	U	b	-	-	-	-	-	-	-	-
	C	V	D	V	T	V	U	V	-	-	-	-	-	-	-	-
CC	C	S	D	S	T	S	U	S	C	b	D	b	T	b	U	b
	C	a	D	a	T	a	U	a	C	V	D	V	T	V	U	V
SDS	C	c	D	c	T	c	U	c	C	c	D	c	T	c	U	c
	C	W	D	W	T	W	U	W	C	W	D	W	T	W	U	W
Main GND	C	X	D	X	T	X	U	X	C	G	R	G	T	G	U	G

Chart 7 - SES Circuit Test								
SES Test	**M1, M2, M4, M5**				**M3, UD**			
	vs		**vs**		**vs**		**vs**	
Lights	E	M	F	M	E	M	F	M
	E	K	F	K	E	K	F	K
	E	L	F	L	E	L	F	L
RI	E	J	F	J	E	J	F	J
	E	G	F	G	-	-	-	-
	E	H	F	H	E	H	F	H
CV	E	P	F	P	E	P	F	P
	E	R	F	R	E	R	F	R
	E	A	F	A	E	A	F	A
	E	B	F	B	E	B	F	B
GG	E	C	F	C	E	C	F	C
	E	D	F	D	E	D	F	D
	E	T	F	T	E	T	F	T
	E	U	F	U	E	U	F	U
PGRV	E	b	F	b	-	-	-	-
	E	V	F	V	-	-	-	-
CC	E	S	F	S	E	b	F	b
	E	a	F	a	E	V	F	V
SDS	E	c	F	c	E	c	F	c
	E	W	F	W	E	W	F	W
Main GND	E	X	F	X	E	G	F	G

Chart 8 - PGRV Circuit Test					
PGRV Test	**M1, M2, M4, M5**				**M3, UD**
	vs		**vs**		
Lights	b	M	V	M	In this mode PGRV indicator is set by default to GREEN since in M3/UD mode there are no pins assigned for a pin by pin verification.
	b	K	V	K	
	b	L	V	L	
RI	b	J	V	J	
	b	G	V	G	
	b	H	V	H	
CV	b	P	V	P	
	b	R	V	R	
	b	A	V	A	
	b	B	V	B	
GG	b	C	V	C	
	b	D	V	D	
	b	T	V	T	
	b	U	V	U	
SES	b	E	V	E	
	b	F	V	F	
CC	b	S	V	S	
	b	a	V	a	
SDS	b	c	V	c	
	b	W	V	W	
MGND	b	X	V	X	

Chart 9 - CC Circuit Test								
CC Test	**M1, M2, M4, M5**				**M3, UD**			
	vs		**vs**		**vs**		**vs**	
Lights	S	M	a	M	b	M	V	M
	S	K	a	K	b	K	V	K
	S	L	a	L	b	L	V	L
RI	S	J	a	J	b	J	V	J
	S	G	a	G	-	-	-	-
	S	H	a	H	b	H	V	H
CV	S	P	a	P	b	P	V	P
	S	R	a	R	b	R	V	R
	S	A	a	A	b	A	V	A
	S	B	a	B	b	B	V	B
GG	S	C	a	C	b	C	V	C
	S	D	a	D	b	D	V	D
	S	T	a	T	b	T	V	T
	S	U	a	U	b	U	V	U
SES	S	E	a	E	b	E	V	E
	S	F	a	F	b	F	V	F
PGRV	S	b	a	b	-	-	-	-
	S	V	a	V	-	-	-	-
SDS	S	c	a	c	b	c	V	c
	S	W	a	W	b	W	V	W
MGND	S	X	a	X	b	G	V	G

Chart 10 - SDS Circuit Test								
SDS Test	**M1, M2, M4, M5**				**M3, UD**			
	vs		**vs**		**vs**		**vs**	
Lights	c	M	W	M	c	M	W	M
	c	K	W	K	c	K	W	K
	c	L	W	L	c	L	W	L
RI	c	J	W	J	c	J	W	J
	c	G	W	G	-	-	-	-
	c	H	W	H	c	H	W	H
CV	c	P	W	P	c	P	W	P
	c	R	W	R	c	R	W	R
	c	A	W	A	c	A	W	A
	c	B	W	B	c	B	W	B
GG	c	C	W	C	c	C	W	C
	c	D	W	D	c	D	W	D
	c	T	W	T	c	T	W	T
	c	U	W	U	c	U	W	U
SES	c	E	W	E	c	E	W	E
	c	F	W	F	c	F	W	F
PGRV	c	b	W	b	-	-	-	-
	c	V	W	V	-	-	-	-
CC	c	S	W	S	c	b	W	b
	c	a	W	a	c	V	W	V
MGND	c	X	W	X	c	G	W	G

Chart 11 - Case Ground Circuit Test		
M1, M2, M3, M4, M5, UD		
Circuits	**vs**	
Case GND vs k	Case GND	K
Lights	Case GND	M
	Case GND	L
CV	Case GND	P
	Case GND	R
	Case GND	A
	Case GND	B
RI	Case GND	J
	Case GND	G
	Case GND	H
GG	Case GND	C
	Case GND	D
	Case GND	T
	Case GND	U
SES	Case GND	E
	Case GND	F
PGRV	Case GND	b
	Case GND	V
CC	Case GND	S
	Case GND	a
SDS	Case GND	c
	Case GND	W
Case GND vs X	Case GND	X