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STA/STEP	PROCEDURE	REMARKS
2.3.2	(Continued)	
g.	Connect GCTA connector of LPV/LCRU cable to GCTA control unit.	
h.	On TV camera, LM PWR Switch - OFF.	
i.	Disconnect LM/TV cable from TV camera and rest connector on tripod handle.	
j.	Remove TV camera from LM tripod and install on GCTA azimuth/elevation unit.	
k.	Connect GCTA control unit connector to TV camera.	
2.3.3	16 mm Data Acquisition Camera Installation	Figure 2-14.
a.	Remove camera and staff from LM.	
b.	Assemble camera and staff into single unit.	
c.	Insert staff into receptacle on LRV right inboard handhold.	
d.	Verify staff locked in place by pulling up on the camera without depressing the push button on end of handhold. Camera staff should not move vertically.	
2.3.4	Low Gain Antenna Installation	Figure 2-14.
a.	Remove low gain antenna from LM stowage location.	
b.	Insert low gain antenna staff on LRV left inboard handhold.	
c.	Verify staff locked in vertically by pulling up on staff without depressing button on end of handhold. Low gain antenna staff should not move vertically.	

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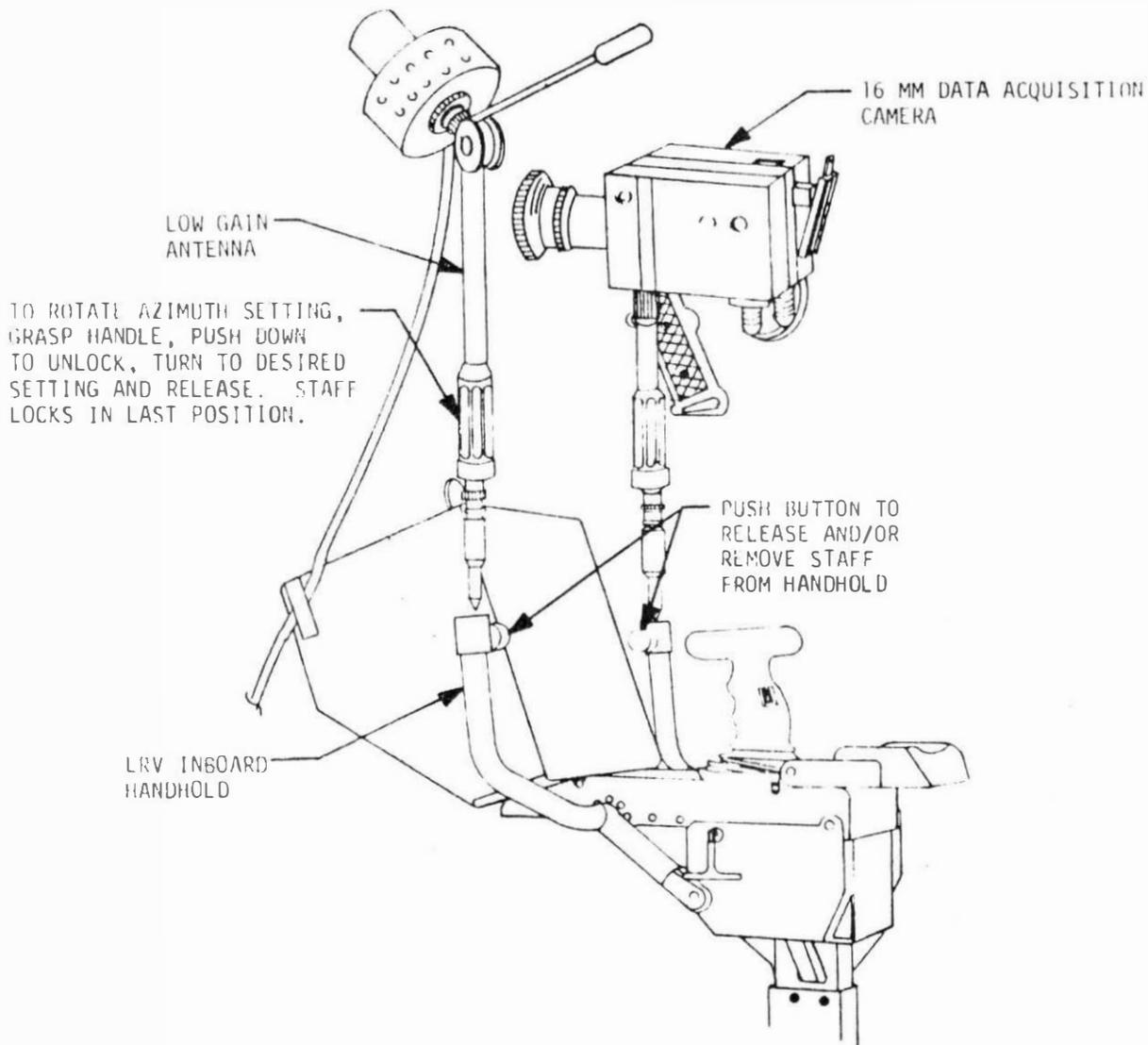


FIGURE 2-14 16 MM DAC AND LOW GAIN ANTENNA INSTALLATION

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STA/STEP	PROCEDURE	REMARKS
2.3.4	(Continued)	
	d. Route low gain antenna cable to LCRU and secure to LRV with strap on console and clips on forward chassis.	Figure 2-15.
	e. Connect low gain antenna cable to LCRU.	
2.3.5	High Gain Antenna Installation.	Figure 2-13.
	a. Remove high gain antenna from LM stowage position.	
	b. Insert high gain antenna staff into the mounting receptacle on the left front corner of the LRV and lock.	Alignment marks are provided on HGA staff locking collar.
	c. Unfold and lock HGA staff.	
	d. Remove and discard optical sight retaining clamp.	
	e. Open and lock HGA dish.	
	f. Connect HGA cable to the LCRU.	
	g. Activate LCRU/GCTA and perform communication checks as required.	
	h. Deactivate LCRU/GCTA until needed.	
2.3.6	Aft Payload Pallet Installation	
	a. Release the pallet support post tiedown on LRV aft chassis.	Figure 2-16.
	b. Erect pallet support post.	
	c. Remove pallet from LM.	

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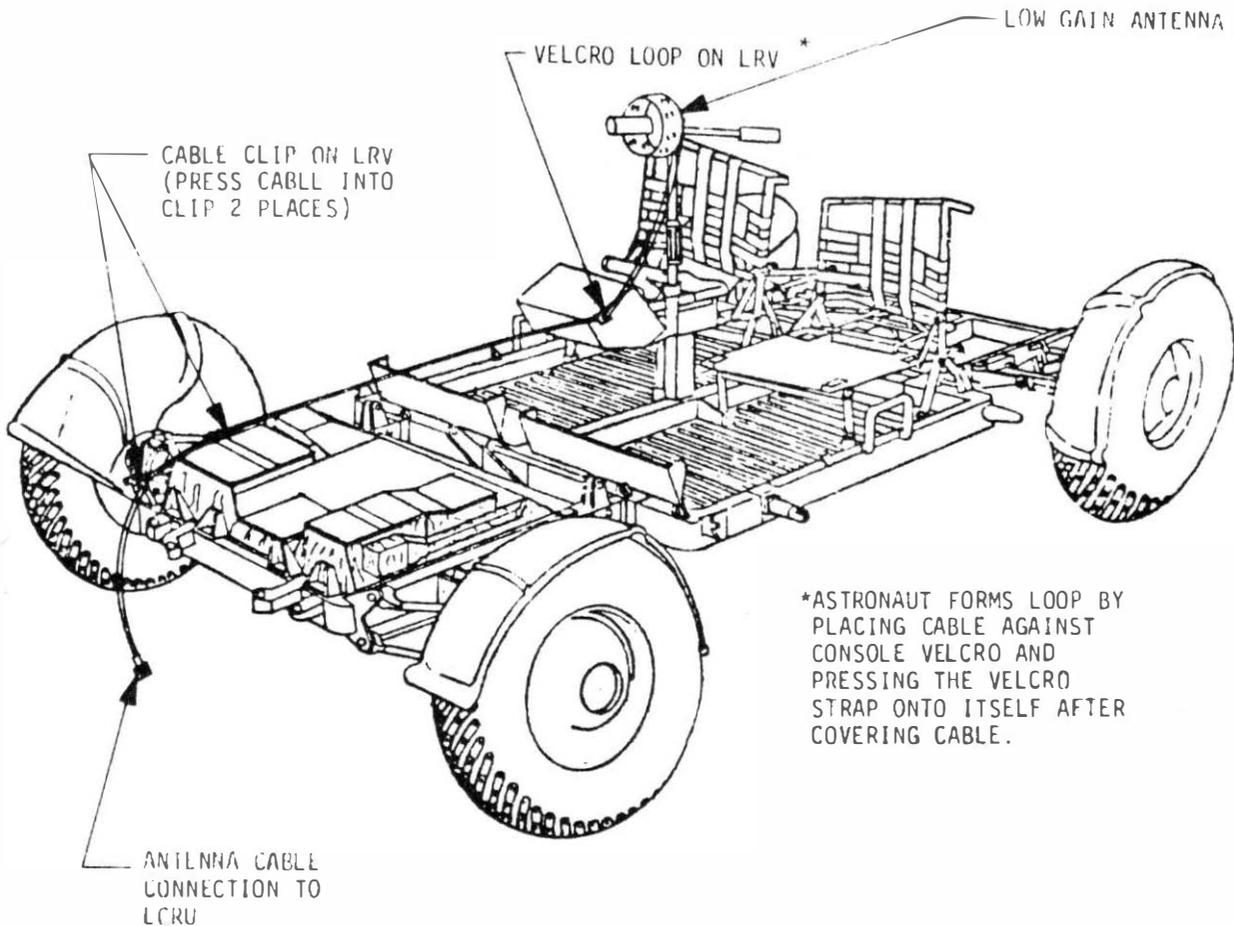


FIGURE 2-15 LCRU LOW GAIN ANTENNA CABLE INSTALLATION ON LUNAR SURFACE

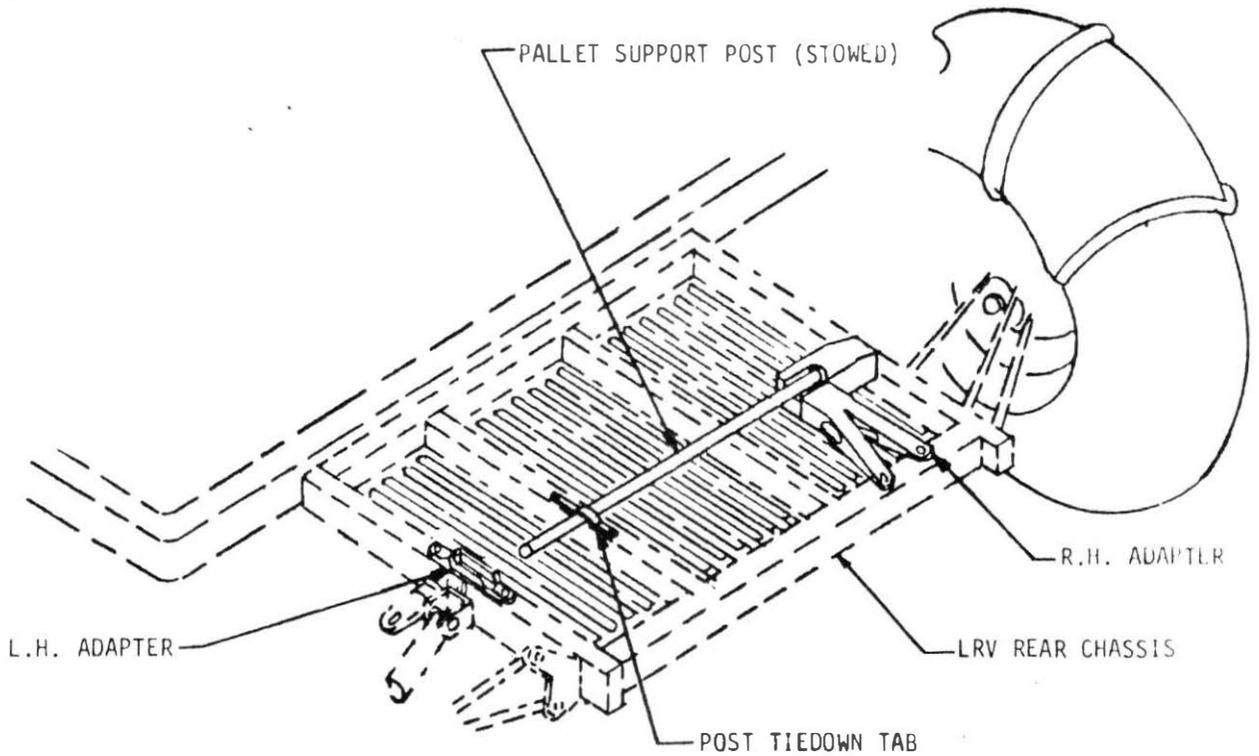


FIGURE 2-16 LRV REAR PAYLOAD PALLET ADAPTERS

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STA/STEP	PROCEDURE	REMARKS
2.3.6	(Continued)	
	d. Connect pallet to pallet support post.	
	e. Rotate pallet about support post until pallet locks in pallet adapter on LRV LH aft chassis.	Figure 2-17.
2.3.7	Buddy SLSS Installation	
	a. Remove BSLSS bag from LM.	
	b. Release BSLSS support strap on back of right seat.	
	c. Feed strap through BSLSS bag handle and secure to PLSS support velcro on front of back seat.	Figure 2-18.

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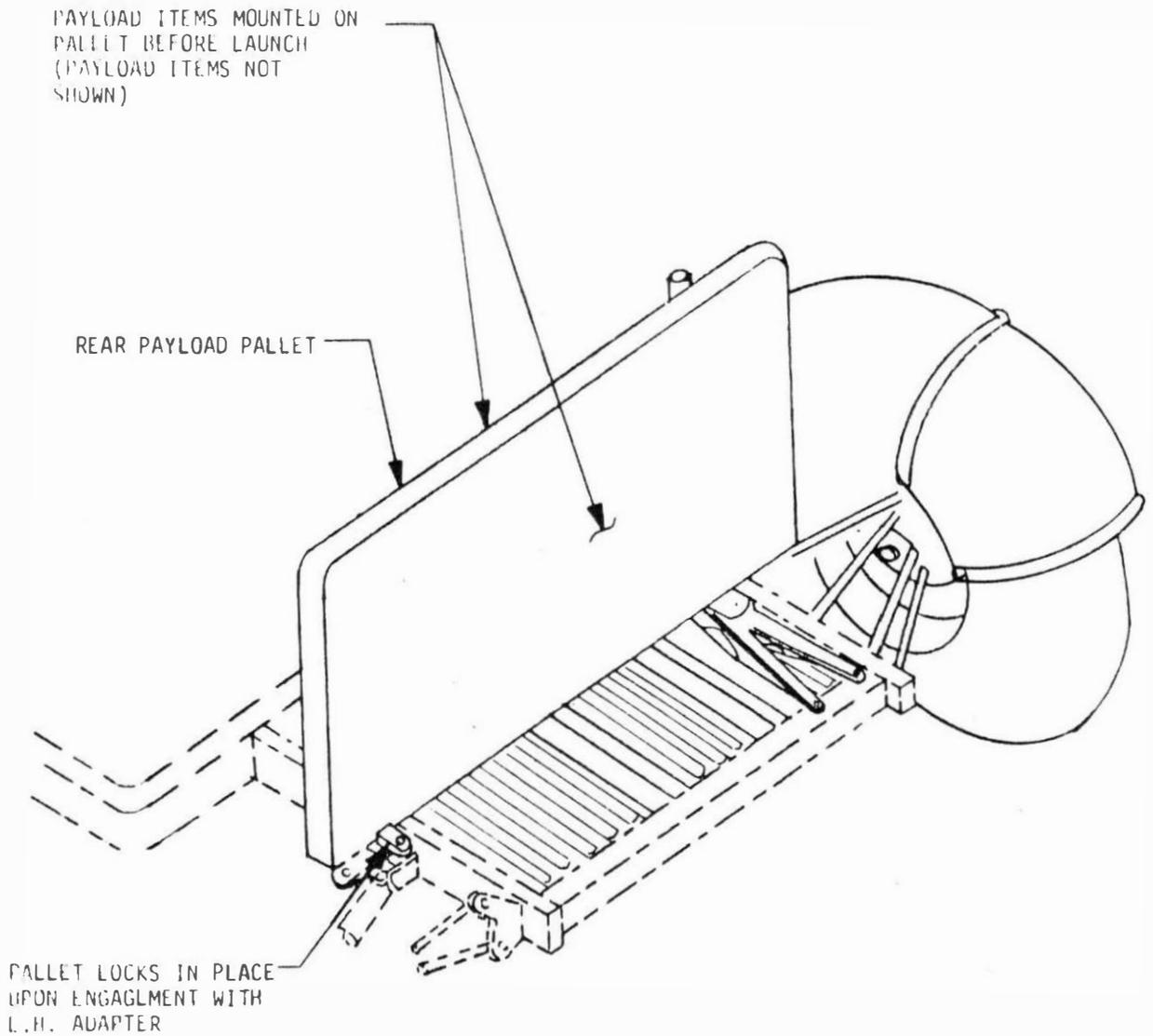


FIGURE 2-17 REAR PAYLOAD PALLET INSTALLED

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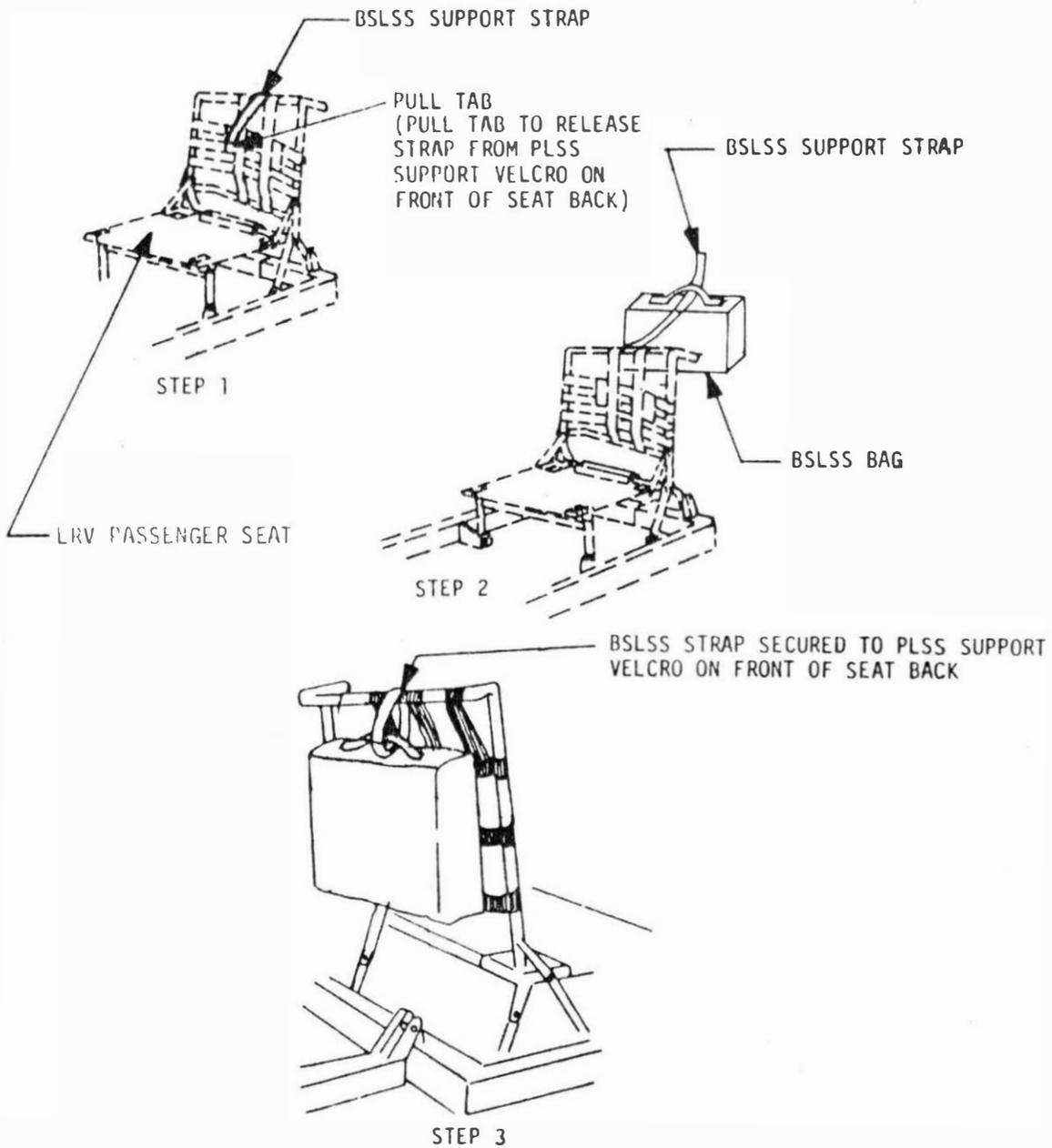


FIGURE 2-18 BUDDY SLSS INSTALLATION

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STA/STEP	PROCEDURE	REMARKS
2.4	<p>PRE SORTIE CHECKOUT AND PREPARATION</p> <p>a. Verify battery and SPU dust covers closed.</p> <p>b. Verify hand controller in parking brake and neutral throttle position and reverse inhibit switch is on (pushed down).</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>Do not grasp the 16 MM Data Acquisition camera staff or low gain antenna staff during ingress. The handholds are designed for ingress by grasping the handhold horizontal and vertical members below the payload staffs.</p> <p>c. LRV driver ingress LRV left seat and fasten seat belt.</p> <p>d. Other crewman ingress LRV, and fasten seat belt.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>Do not grasp the 16 MM Data Acquisition camera staff or low gain antenna staff during ingress. The handholds are designed for ingress by grasping the handhold horizontal and vertical members below the payload staffs.</p> <p>NOTE: If this is the first LRV sortie and this procedure sequence immediately follows initial payload loading (2.3) and LRV post deployment checkout (2.2), then at this point the C/D panel is in a power down configuration in accordance with step 2.2.ad. If this is the case then step 2.4 need only be a verification as it has been previously accomplished.</p>	<p>Board left seat first and verify parking brake set prior to other crewman boarding. Do not board both seats simultaneously.</p>

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STA/STEP	PROCEDURE	REMARKS
2.4	<p>(Continued)</p> <p style="text-align: center;">CAUTION (Continued)</p> <p>the corresponding drive enable switch is not selected to an active PWM, then full power will be applied to the corresponding drive motor when the hand controller is released from brake position. Should this condition occur the hand controller should be immediately returned to park brake position.</p> <p>q. DRIVE POWER LF Switch - BUS A.</p> <p>r. DRIVE POWER RF Switch - BUS A.</p> <p>s. DRIVE POWER LR Switch - BUS D.</p> <p>t. DRIVE POWER RR Switch - BUS D.</p> <p>u. Drive LRV to level area (<math>\pm 6^\circ</math> pitch) near the LM.</p> <p>v. Deploy SUN SHADOW DEVICE (SSD).</p> <p>w. Deploy Vehicle Attitude Indicator to read roll.</p> <p>x. Park down sun (within <math>\pm 3^\circ</math> per SSD) and level (within <math>\pm 6^\circ</math> roll) and set brake.</p> <p>y. Report sun shadow device readings and LRV pitch and roll angles.</p> <p>z. Fold (or reset) Sun Shadow Device (SSD).</p>	<p>The PWM select switch was verified in "BOTH" position in step 2.2.b.</p> <p>The drive enable switches were set to active PWM positions in steps 2.4.1 and 2.4.m.</p> <p>Front wheels operate from Battery No. 1.</p> <p>Rear wheels operate from Battery No. 2.</p> <p>Reset SSD to prevent it from obstructing drivers access to system reset switch.</p>

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STA/STEP	PROCEDURE	REMARKS
2.4	<p>(Continued)</p> <p>aa. Fold Vehicle Attitude Indicator to drive position (pitch read position).</p> <p>ab. Pull system reset switch from detent move momentarily to reset position and return to off.</p> <p>ac. Verify BEARING, DISTANCE, RANGE Indicators - ZERO.</p> <p>ad. Receive calculated heading from MCC.</p> <div data-bbox="596 577 845 646" style="border: 2px dashed black; padding: 5px; text-align: center; margin: 10px 0;"> <b>CAUTION</b> </div> <p style="text-align: center;">Continuous torquing of nav gyro shall not exceed 2 minutes of any 7 minute period.</p> <p>ae. Pull GYRO TORQUING Switch from detent and operate to LEFT or RIGHT for proper heading indication, then OFF.</p> <p>af. Report battery 1 and 2 Amp-Hrs.</p> <p>ag. Report battery and drive motor temperatures.</p> <p>ah. Report battery current while vehicle is in motion one time between stops.</p>	<p>Torque LEFT causes heading indication to move CCW. Torque RIGHT causes heading indication to move CW.</p>

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STA/STEP	PROCEDURE	REMARKS
2.6	LRV CONFIGURATION PRIOR TO LEAVING SCIENCE STOP	
	a. Align LGA. b. LCRU Mode Switch - PMI/WB. c. Board LRV left seat and fasten seatbelt.	
	<b>CAUTION</b>	
	Do not grasp the 16 MM Data Acquisition camera staff or low gain antenna staff during ingress. The handholds are designed for ingress by grasping the handhold horizontal and vertical members below the payload staffs.	
	d. Verify hand controller in parking brake and neutral throttle position and reverse inhibit switch is on (pushed down). e. Other crewman ingress LRV right seat and fasten seat belt.	
	<b>CAUTION</b>	
	Do not grasp the 16 MM Data Acquisition camera staff or low gain antenna staff during ingress. The handholds are designed for ingress by grasping the handhold horizontal and vertical members below the payload staffs.	
	f. Report Bearing, Distance, Range, Heading, and Battery Amp-Hour indications. g. Update Nav System to correct for drift, if required by MCC. h. <u>+</u> 15 VDC Switch - PRIM.	

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STA/STEP	PROCEDURE	REMARKS
2.6	<p>(Continued)</p> <p>i. STEERING FORWARD Switch - BUS A.</p> <p>j. STEERING REAR Switch - BUS D.</p> <div data-bbox="741 456 986 519" style="border: 2px solid black; padding: 2px; text-align: center; width: fit-content; margin: 10px auto;"> <b>CAUTION</b> </div> <p>The hand controller should be in park brake position and the drive enable switches must be set to an <u>active</u> PWM prior to setting any drive power switch to an <u>energized</u> bus. If the drive power switch is turned on and the corresponding drive enable switch is not selected to an active PWM, then full power will be applied to the corresponding drive motor when the hand controller is released from brake position. Should this condition occur the hand controller should be immediately returned to park brake position.</p> <p>k. DRIVE POWER LF Switch - BUS A.</p> <p>l. DRIVE POWER RF Switch - BUS A.</p> <p>m. DRIVE POWER LR Switch - BUS D.</p> <p>n. DRIVE POWER RR Switch - BUS D.</p>	<p>The PWM select switch determines which PWM is active. The hand controller was verified set in park brake position in step 2.6.d. The PWM select switch was verified in "BOTH" position in step 2.2.b. The drive enable switches were set to active PWM positions in steps 2.2.p and 2.2.q.</p>

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STA/STEP	PROCEDURE	REMARKS
2.7	POST SORTIE CHECKOUT  a. Park LRV cross sun from the right in view of LM windows.  b. Hand controller in parking brake position, throttle in neutral - SET BRAKE.  c. Report BEARING, DISTANCE, and RANGE.  d. Report BAT 1 and BAT 2 AMP-HR.  e. Report BAT 1 and BAT 2 VOLTS.  f. BATTERY Switch - AMPS.  g. Report battery and drive motor temperatures.  h. DRIVE POWER Switches (4) - OFF.  i. STEERING Switches (2) - OFF.  j. + 15 VDC Switch - OFF.  k. Nav Power Circuit Breaker - OPEN.  l. BUS A, BUS B, BUS C, BUS D Circuit Breakers - OPEN.  m. Crewman in right seat release and stow seat belts and egress LRV.  n. Crewman in left seat release and stow seat belts and egress LRV.  o. Align HGA.  p. LCRU mode Switch - TV RMT.	Figure 5-2.

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3	2.7	(Continued) q. Open LRV Battery and SPU Dust Covers. r. <u>Prior to LM Ingress</u> - Perform the following: LCRU Power Switch - OFF. Adjust LCRU Thermal Blankets per ground request.	



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SECTION 3

MALFUNCTION PROCEDURES

3.0 INTRODUCTION

Malfunction procedures encompass the recognition, diagnosis, and corrective action for system malfunctions. In most cases, the crew is alerted to a malfunction condition by Control and Display Panel meters or indicators. The crew will then locate, correct, or isolate the malfunction and determine its effect on the scheduled mission. In general, the procedures cover significant single failures. Double unrelated failures are not covered to prevent procedures from becoming complex and unmanageable. Malfunctions of a minor nature not requiring detailed procedures are covered in Section 2.

The malfunction procedures are arranged in logic flow diagram format and arranged by symptom routine. A three column format is used for symptom routine logic flow diagrams. A description and use of each of these columns is as follows.

3.1 SYMPTOM COLUMN

The primary purpose of the symptom column is to allow entry into the malfunction procedures. This block explains and qualifies the situation so that the reader understands the symptom or condition that exists. All symptoms are numbered in sequence starting with the number 1.

3.2 PROCEDURE COLUMN

The procedure column presents a step-by-step logic flow diagram of actions and decisions used to isolate or correct a malfunction symptom. This information is presented with several types of logic blocks. These blocks contain the procedures, decisions, and actions to locate and isolate the failure. Remote event symbols are used to reference items in the remarks column or to refer to other procedural steps.

3.3 REMARKS COLUMN

This column will include the following information:

- Amplifying additional remarks related to the symptom.
- Amplifying remarks which relate to a decision and/or action items (e.g., why a step is taken, etc.)
- Explain resultant system status or operational capability after a failure has been identified, i.e., how subsystem is degraded, can degraded subsystem support primary mission, early termination of mission, etc.
- Cautions or warnings, as necessary, to cover conditions that may exist because of a failure.

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<u>MALFUNCTION PROCEDURES</u>	<u>NO.</u>	<u>PAGE</u>
CAUTION AND WARNING FLAG ACTUATES	1	3-3
EITHER BATTERY TEMP > 125°F	2	3-3
ONE DRIVE MOTOR TEMP > 400°F	3	3-4
ABNORMAL IMBALANCE BETWEEN BAT 1 AND BAT 2 AMPS (VEHICLE ACCELERATION NORMAL OR LOW)	4	3-4
FRONT (REAR) WHEELS DO NOT RESPOND TO HAND CONTROLLER STEERING COMMANDS	5	3-5
ONE OR MORE WHEELS DRIVE WHILE IN NEUTRAL	6	3-6
LOSS OF DRIVE FROM ONE OR TWO WHEELS (COMMANDED ACCELERATION ABNORMALLY LOW)	7	3-7
COMMANDED VEHICLE SPEED ABNORMALLY HIGH (SPEED NOT VARIABLE ON ONE OR MORE WHEELS)	8	3-8
LOSS OF DRIVE FROM ALL WHEELS	9	3-9
BRAKE WILL NOT RELEASE	10	3-10
LOSS OF VOICE COMM WITH MSFN	11	3-11

TABLE 3-1 MALFUNCTION PROCEDURES

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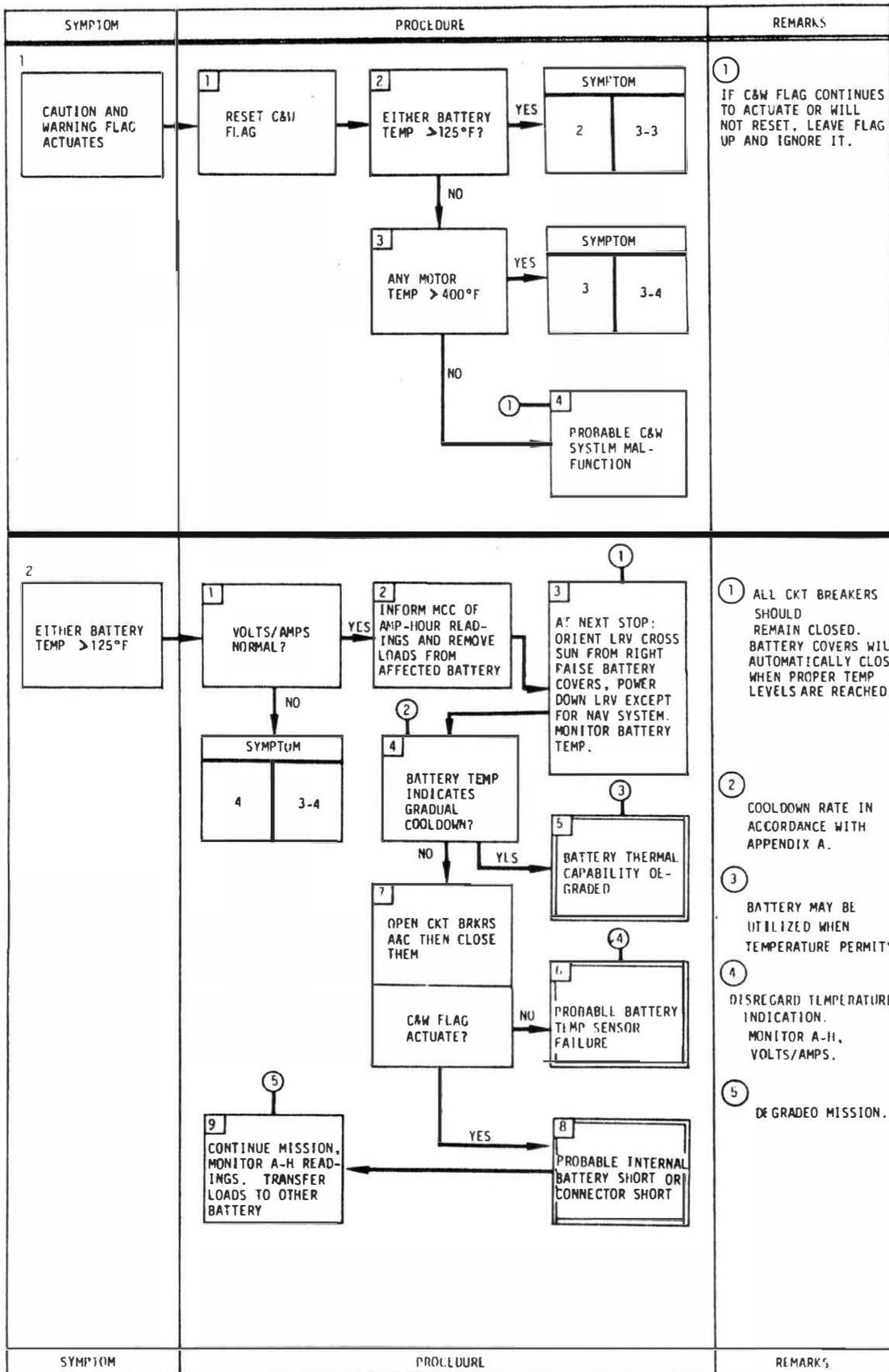


TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM

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SYMPTOM	PROCEDURE	REMARKS
<p>3</p> <p>ONE DRIVE MOTOR TEMP &gt;400°F</p>	<pre> graph TD     1[1 STOP VEHICLE FOR AFFECTED WHEEL: - DRIVE PWR OFF - DRIVE ENABLE OFF] --&gt; 2[2 DECOUPLE AFFECTED WHEEL, RESUME SORTIE]     2 --&gt; 3[3 MOTOR TEMP INDICATE GRADUAL COOLDOWN?]     3 -- YES --&gt; 4[4 MOTOR THERMAL CAPABILITY DE-GRADED]     3 -- NO --&gt; 5[5 MOTOR TEMP SENSOR FAILURE]             </pre>	<p>1 DRIVE AND BRAKING IN ACCORDANCE WITH APPENDIX A. IF WHEEL IS R.R., SPEED METER WILL NOT FUNCTION.</p> <p>2 IF REQUIRED, WHEEL CAN BE RECOUPLED WHEN TEMP. PERMITS.</p> <p>3 WHEEL CAN BE RECOUPLED AT CREW OPTION. TEMP INDICATION SHOULD BE DISREGARDED.</p>
<p>4</p> <p>ABNORMAL IMBALANCE BETWEEN BAT 1 AND BAT 2 AMPS (VEHICLL ACCELERATION NORMAL OR LOW)</p>	<pre> graph TD     1[1 ONE AT A TIME: DRIVE POWER SWITCHES (4) OFF, THEN ORIGINAL POSITION] --&gt; Q1{AMPS RETURN TO NORMAL WITH ANY DRIVE POWER SWITCH OFF?}     Q1 -- YES --&gt; 2[2 SHORT IN DRIVE MOTOR OR DRIVE PWR CIRCUITRY]     Q1 -- NO --&gt; 3[3 AFFECTED WHEEL: DRIVE PWR SW OFF DRIVE ENABLE SW OFF DECOUPLE WHEEL]     3 --&gt; 4[4 DRIVE ENABLE SWITCHES (4) - PWM 1]     4 --&gt; Q2{AMPS NORMAL?}     Q2 -- YES --&gt; 5[5 PWM 2 FAILURE]     Q2 -- NO --&gt; 6[6 PWM SELECT SWITCH - PWM 1]     6 --&gt; 7[7 DRIVE ENABLE SWITCHES (4) - PWM 2]     7 --&gt; Q3{AMPS NORMAL?}     Q3 -- YES --&gt; 8[8 PWM 1 FAILURE]     Q3 -- NO --&gt; 9[9 PWM SELECT SW - PWM 2]     9 --&gt; 10[10]             </pre>	<p>1 IF ABNORMAL CONDITION EXISTS ONLY WHEN LRV IS IN MOTION, THIS STEP MUST BE PERFORMED WITH LRV IN MOTION</p> <p>2 DO NOT ALLOW DRIVE ENABLE SWITCH TO REMAIN IN "OFF" POSITION WHILE SWITCHING, OR FULL POWER TO AFFECTED MOTOR WILL RESULT.</p>
SYMPTOM	PROCEDURE	REMARKS

TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

SYMPTOM	PROCEDURE	REMARKS
<p>4 (CONTINUED)</p>	<pre> graph TD     7[7] --&gt; 10[10 OR PWP SW (4) - ALTERNATE POSITION AMPS NORMAL?]     10 -- YES --&gt; 12[12 OPEN IN DRIVE MOTOR POWER CIRCUITRY FOR ONE BUS]     10 -- NO --&gt; 11[11 PROBABLE OPEN IN DRIVE MOTOR POWER CIRCUITRY]     11 --&gt; 13[13 DR PWR SW (4) - OFF, THEN BACK TO ORIGINAL POSITION ONE AT A TIME TO ISOLATE MOTOR NOT DRAWING AMPS]     13 --&gt; 14[14 CONTINUE MISSION MONITOR AMP-HOUR READINGS. RECONFIGURE FOR BATTERY LOAD SHARING AS REQUIRED]     13 -- NO --&gt; 14     14 --&gt; 15[15 AFFECTED WHEEL: - DRIVE PWR SW - OFF - DRIVE ENABLE SW - OFF - DECOUPLE WHEEL]     </pre>	
<p>5</p> <p>FRONT (REAR) WHEELS DO NOT RESPOND TO HAND CONTROLLER STEERING COMMANDS</p>	<pre> graph TD     1[1 FORWARD (REAR) STEERING SWITCH - ALTERNATE POSITION DO FRONT (REAR) WHEELS RESPOND TO HAND CONTROLLER?]     1 -- YES --&gt; 2[2 LOSS OF FORWARD (REAR) REDUNDANT STEERING CIRCUIT]     1 -- NO --&gt; 3[3 FORWARD (REAR) STEERING INOP]     3 --&gt; 4[4 FORWARD (REAR) STEERING SWITCH - OFF - DECOUPLE FWD (REAR) STEERING - CENTER &amp; LOCK FWD (REAR) WHEELS]     </pre>	<p>① TO REDUCE REQUIRED FORCE, STRAIGHTEN WHEELS BY PUSHING ON WHEEL WITH SMALLER TURNING ANGLE, (I.E. IF WHEELS ARE TURNED TO RIGHT, PUSH ON LEFT WHEEL TO STRAIGHTEN). - HAND TOOL PRY FORCE MAY BE REQUIRED - SIMULTANEOUS PULL FORCE MAY BE REQUIRED ON DECOUPLING RING DEGRADED OPERATION - STEERING RADIUS INCREASED IN ACCORDANCE WITH APPENDIX A</p>
SYMPTOM	PROCEDURE	REMARKS

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<p>6</p> <p>ONE OR MORE WHEELS DRIVE WHILE IN NEUTRAL</p>	<pre> graph TD     S1[1 STOP LRV DRIVE ENABLE SW (4) - PWM 1] --&gt; Q1{TRACTION DRIVE NORMAL?}     Q1 -- YES --&gt; B2[2 PWM 2 OUTPUT CIRCUITRY OR DRIVE ENABLE SWITCH FAILURE]     Q1 -- NO --&gt; S3[3 DRIVE ENABLE SW (4) - PWM 2]     S3 --&gt; Q2{TRACTION DRIVE NORMAL?}     Q2 -- YES --&gt; B4[4 PWM 1 OUTPUT CIRCUITRY OR DRIVE ENABLE SWITCH FAILURE]     Q2 -- NO --&gt; S5[5 DRIVE PWR SW (4) - OFF, THEN BACK TO ORIGINAL POSITION ONE AT A TIME TO ISOLATE ABNORMAL WHEEL]     S5 --&gt; Q3{ONLY ONE WHEEL AFFECTED?}     Q3 -- YES --&gt; B6[6 DRIVE CONTROL ELECTRONICS FAILURE]     Q3 -- NO --&gt; S7[7 OPERATE LRV BY RELEASING BRAKE MOMENTARILY TO NEUTRAL TO OBTAIN SPEED AND THEN RETURN IT TO BRAKE IN A CYCLIC MANNER]     B6 --&gt; S8[8 AFFECTED WHEEL: - DRIVE PWR SW - OFF, - DRIVE ENABLE SW - OFF, - DECOUPLE WHEEL]     S8 --&gt; R2((2))     </pre>	<p>1 DO NOT ALLOW DRIVE ENABLE SWITCH TO REMAIN IN OFF POSITION WHILE SWITCHING, OR FULL POWER TO AFFECTED MOTOR WILL RESULT</p> <p>2 IF DECOUPLED WHEEL IS RR, SPEED METER WILL NOT FUNCTION DRIVE AND BRAKING IN ACCORDANCE WITH APPENDIX A</p>
SYMPTOM	PROCEDURE	REMARKS

TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

SYMPTOM	PROCEDURE	REMARKS
<p>7</p> <p>LOSS OF DRIVE FROM ONE OR TWO WHEELS (COMMANDED ACCELERATION ABNORMALLY LOW)</p>	<pre>             graph TD                 1["1 AFFECTED WHEEL(S): DRIVE ENABLE SW - ALTERNATE POSITION"] --&gt; Q1["WHEEL DRIVE OPERABLE?"]                 Q1 -- YES --&gt; 2["2 PWA CIRCUITRY OR DRIVE ENABLE SWITCH FAILURE"]                 Q1 -- NO --&gt; 3["3 AFFECTED WHEEL(S) DRIVE POWER SW - ALTERNATE POSITION"]                 3 --&gt; Q2["WHEEL DRIVE OPERABLE?"]                 Q2 -- YES --&gt; 4["4 DRIVE PWR CIRCUITRY FAILURE"]                 Q2 -- NO --&gt; 5["5 DRIVE SYSTEM FOR AFFECTED WHEEL INOP"]                 5 --&gt; 6["6 AFFECTED WHEEL: DRIVE POWER OFF DRIVE ENABLE OFF DECOUPLE WHEEL"]                 6 --- 2_note["2"]             </pre>	<p>① DO NOT ALLOW DRIVE ENABLE SWITCH TO REMAIN IN OFF POSITION WHILE SWITCHING OR FULL POWER TO AFFECTED MOTOR WILL RESULT</p> <p>② IF DECOUPLED WHEEL IS RR, SPEED INDICATOR WILL NOT FUNCTION</p> <p>DRIVE AND BRAKING IN ACCORDANCE WITH APPENDIX A</p>
SYMPTOM	PROCEDURE	REMARKS

TABLL 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

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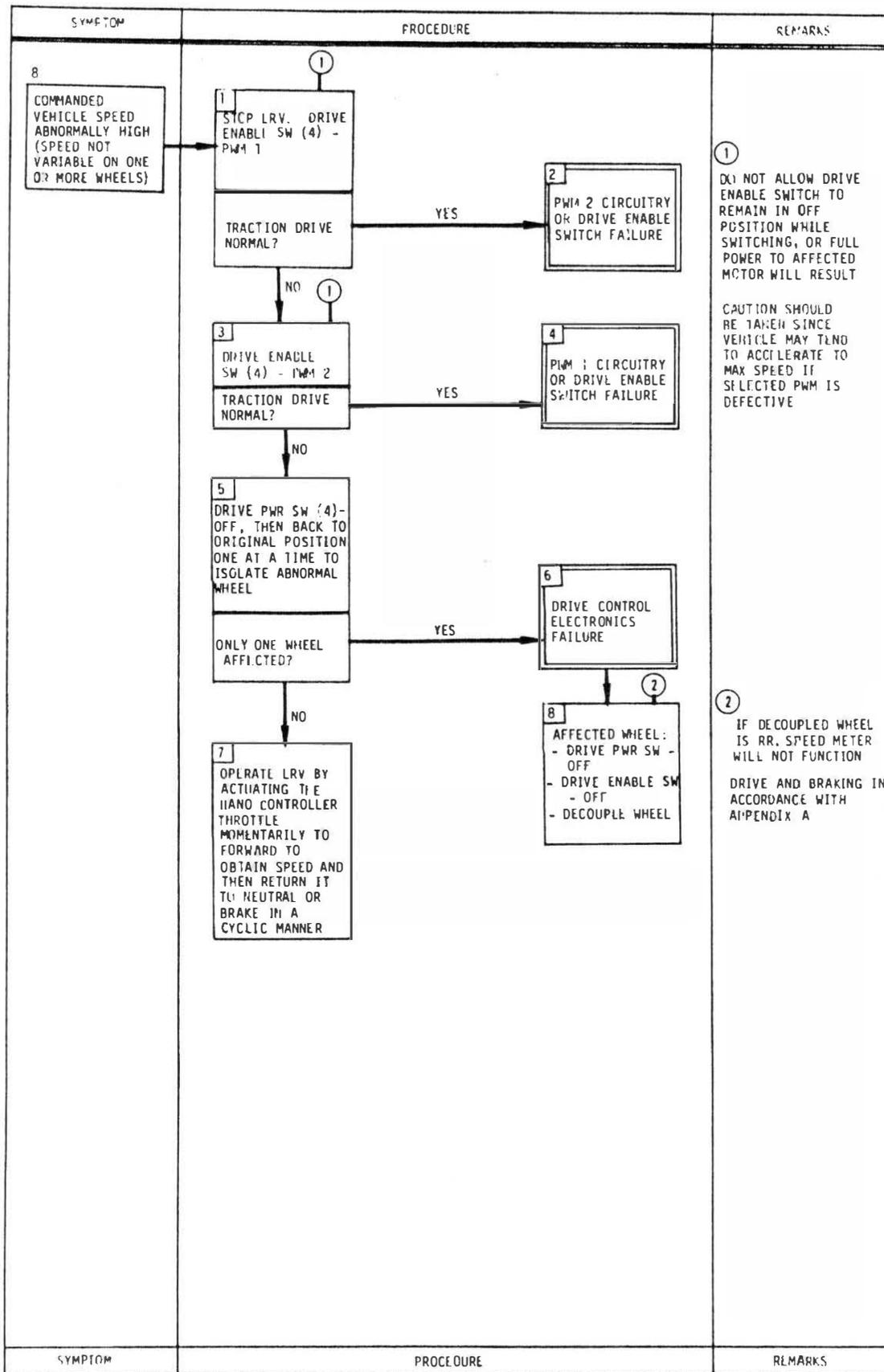


TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

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SYMPTOM	PROCEDURE	REMARKS
<p>9</p> <p>LOSS OF DRIVE FROM ALL WHEELS</p>	<pre> graph TD     Start[1]["+ 15 VDC SW - ALTERNATE POS TRACTION DRIVE OPERABLE?"] -- YES --&gt; Box2[2]["+ 15 VDC CIRCUITRY FAILURE"]     Start -- NO --&gt; Box3[3]     Box3["3 DRIVE ENABLE SW (4) - PWM 2 PWM SELECT SW - PWM 2 + 15 VDC CKT BRKR - BOTH CLOSED TRACTION DRIVE OPERABLE?"] -- YES --&gt; Box4[4]     Box3 -- NO --&gt; Box5[5]     Box5["5 DRIVE ENABLE SW (4) - PWM 1 PWM SELECT SW - PWM 1 + 15 VDC CKT BRKR - BOTH CLOSED TRACTION DRIVE OPERABLE?"] -- YES --&gt; Box6[6]     Box5 -- NO --&gt; Box7[7]     Box7["7 ONE AT A TIME: DRIVE POWER SW(4) OFF, THEN ON + 15 VDC CKT BRKR - BOTH CLOSED TRACTION DRIVE OPERABLE WITH ANY SWITCH OFF?"] -- YES --&gt; Box8[8]     Box7 -- NO --&gt; Box10[10]     Box8["8 SHORT IN DRIVE CONTROL ELECTRONICS LOADING 15 V PWR SUPPLY"] --&gt; Box9[9]     Box10["10 ONE AT A TIME STEERING POWER SW (7) OFF, THEN ON + 15 VDC CKT BRKR - BOTH CLOSED TRACTION DRIVE OPERABLE WITH EITHER OFF?"] -- YES --&gt; Box11[11]     Box10 -- NO --&gt; Box12[12]     Box11["11 SHORT IN STEERING CIRCUITRY LOADING 15 V PWR SUPPLY"] --&gt; Box13[13]     Box9["9 AFFECTED WHEEL: DRIVE PWR SW - OFF DRIVE ENABLE SW - OFF DECOUPLE WHEEL"]     Box12["12 PROBABLE BAT 1 AND 2 DEPLETION"]     Box13["13 AFFECTED STEERING POWER SW - OFF - DECOUPLE AFFECTED STEERING - CENTER &amp; LOCK WHEELS"]                     </pre>	<p>① DO NOT ALLOW DRIVE ENABLE SWITCH TO REMAIN IN OFF POSITION WHILE SWITCHING, OR FULL POWER TO AFFECTED MOTOR WILL RESULT</p> <p>② PROCEED TO NEXT STEP IF EITHER CKT BRKR WILL NOT REMAIN CLOSED</p> <p>③ STEERING DEGRADED PER APPENDIX A.</p>
SYMPTOM	PROCEDURE	REMARKS

TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

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LUNAR ROVING VEHICLE  
OPERATIONS HANDBOOK

SYMPTOM	PROCEDURE	REMARKS
<p>10</p> <div data-bbox="232 261 410 399" style="border: 1px solid black; padding: 5px; width: fit-content;">           BRAKE WILL NOT RELEASE         </div>	<div data-bbox="868 261 1047 399" style="border: 1px solid black; padding: 5px; width: fit-content;"> <sup>1</sup>            BINDING, JAMMING OR OTHER MECHANISM FAILURE         </div> <div style="text-align: center; margin: 5px 0;">  </div> <div data-bbox="868 472 1047 611" style="border: 1px solid black; padding: 5px; width: fit-content;"> <sup>2</sup>            AFFECTED WHEEL:            - DRIVE PWR OFF            - DRIVE ENABLE OFF            - DECOUPLE WHEEL         </div>	<div data-bbox="1097 430 1293 621" style="border: 1px solid black; padding: 5px; width: fit-content;"> <sup>1</sup>            DRIVE AND BRAKING IN ACCORDANCE WITH APPENDIX A             IF AFFECTED WHEEL IS RP, SPEED METER WILL NOT FUNCTION         </div>
SYMPTOM	PROCEDURE	REMARKS

TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

LS006-00?-2H  
LUNAR ROVING VEHICLE  
OPERATIONS HANDBOOK

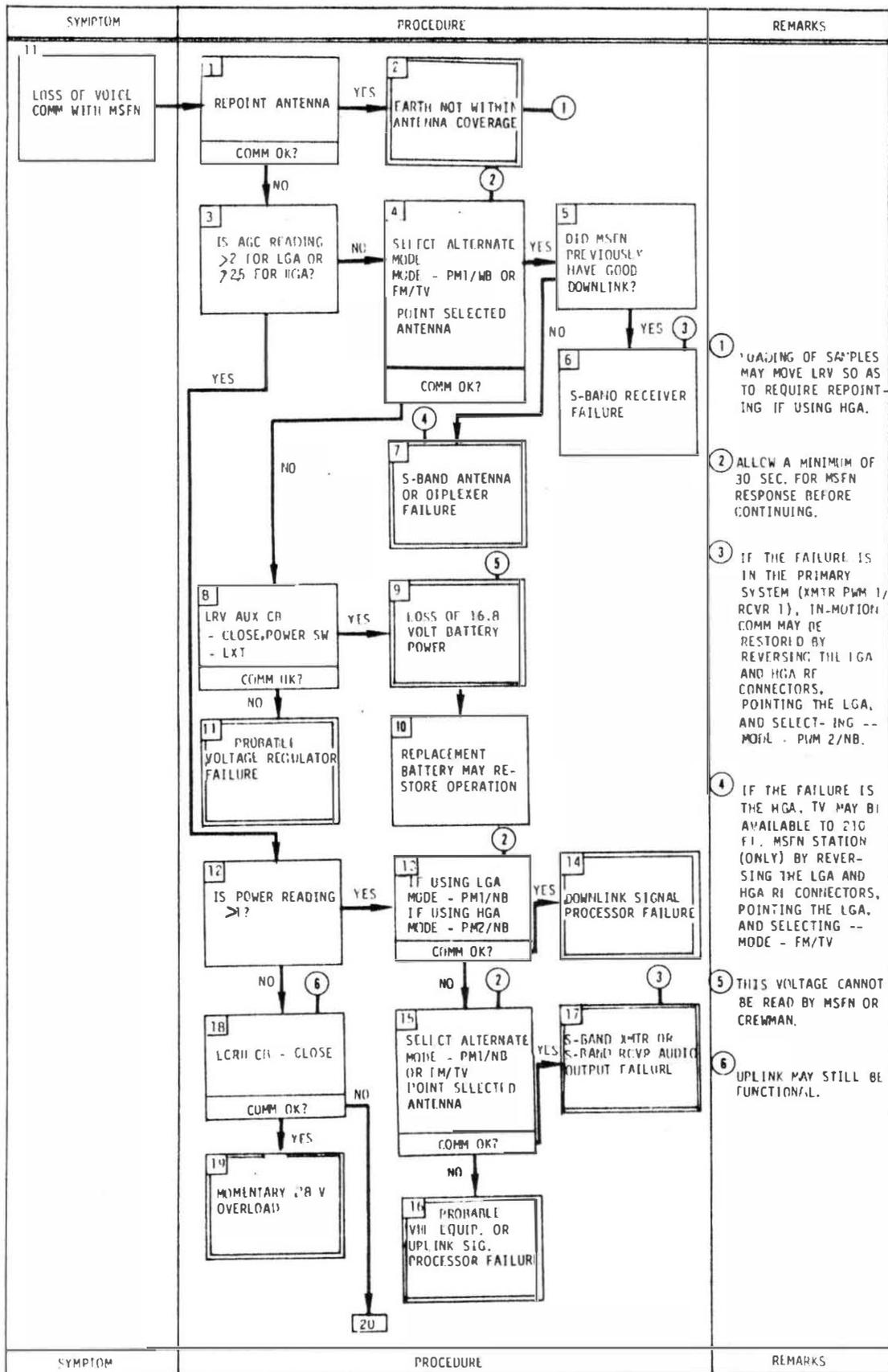


TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)

LS000-002-21  
LUNAR ROVING VEHICLE  
OPERATIONS HANDBOOK

SYMPTOM	PROCEDURE	REMARKS
<p>11 (CONTINUED)</p>	<pre> graph TD     18[18] --&gt; 20{20 DID CB REMAIN CLOSED?}     20 -- YES --&gt; 26{26 LRV AUX CB - CLOSE POWER SW - EXT COMM OK?}     20 -- NO --&gt; 21{21 SELECT ALTERNATE MODE - M/OE PM1/ WE OR F/M/TV LCRH CB - CLOSE}     26 -- YES --&gt; 28{28 LOSS OF 28 VOLT BATTERY POWER}     26 -- NO --&gt; 27{27 PROBABLE LRV 28 VOLT WIRING OPEN CIRCUIT}     28 --&gt; 29{29 REPLACEMENT BATTERY MAY RESTORE OPERATION}     21 -- YES --&gt; 23{23 POINT SELECTED ANTENNA COMM OK?}     21 -- NO --&gt; 22{22 SHORT IN 28 VOLT CIRCUIT}     23 -- YES --&gt; 24{24 S-BAND XMTR SHORTED}     23 -- NO --&gt; 25{25 PROBABLE DAMAGE TO MODE SWITCH}     22 --&gt; 6((6))     </pre>	
SYMPTOM	PROCEDURE	REMARKS

TABLE 3-2. MALFUNCTION LOGIC FLOW DIAGRAM (CONTINUED)