

EVA Checklist

STS-99 Flight Supplement

Mission Operations Directorate
EVA, Robotics, and Crew Systems
Operations Division

Final
July 23, 1999

NOTE
This supplement is to be integrated into the generic edition to provide a complete document for the specific flight. Some pages in the generic edition will be replaced with supplemental pages identified as 'TEMP'. These generic pages must be retained for use on future flights.

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



MISSION OPERATIONS DIRECTORATE

**EVA CHECKLIST
STS-99 FLIGHT SUPPLEMENT**

FINAL
July 23, 1999

PREPARED BY:

Scott A. Bleisath
Book Manager

APPROVED BY:

Randall S. McDaniel
Lead, EVA Systems Group

James V. Thornton
Chief, EVA and Crew Systems Operations Branch

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EVA CHECKLIST
STS-99 FLIGHT SUPPLEMENT

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PRE-EVA TOOL CONFIG

EMU (2):

- Waist Tether (2)
- Retractable Tether (1)
- Adj Equip Tether (1)

Location: TBD

- SRTM Latch Tool (2)
- General Purpose Caddy (2)
- Adj Fuse Tether (2)
- PGT (2)
- PGT Battery (6)
- 7/16-in Box Ratchet Wrench (1)
- 7/16-in x 2-in Ext (2)
- HS Bridge Clamp (1)
- PFR Articulating Socket (1)
- Socket Caddy (1)

Airlock:

EVA Bag:

- Adjustable Wrench
- Ratchet w/7/16-in Socket

TSA, Port:

- Adj Equip Tether (2)
- Trash Bags (2)
- Loop Pin Extractor (1)
- Ratchet w/7/16-in Socket (1)

FWD Bulkhead:

- PFR (1)

PLB Port (Bay 3):

- HS Bridge Clamp (1)
- PFR Articulating Socket (1)
- PFR (1)

Verify Airlock/Tool Stowage complete

SMDA Override, Boom Deploy/Retract:

- Configure Adj Fuse Tether (1)

Attach:

- Socket Caddy (1)
- PGT Battery (4)
- PGT w/battery 7/16-in x 2-in Ext attached (2)
- 7/16-in Ratcheting Box Wrench in GP Caddy (1)
- PFR Articulating Socket (1)

Latch Release/Closure:

- Configure Adj Fuse Tether (1)
- Attach: GP Caddy w/Latch Tool (2)

XSAR Stow:

- Configure Adj Fuse Tether (1)
- Attach: PFR Articulating Socket (1), HS Bridge Clamp (1)

SORTIE SETUP SMDA OVERRIDE, BOOM DEPLOY, BOOM RETRACT (0:40)

TIME (HR : MN)	IV	EV1	EV2
-0:25		Perform DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2	Perform DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2
0:00		Perform POST DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2	Perform POST DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2
0:15		<p>Perform AIRLOCK EGRESS, CUFF C/L, 3</p> <p><u>PAYLOAD BAY SETUP</u> TSA: Adj Equip Tether (1) MWS (1) Trash Bag (1)</p> <ol style="list-style-type: none"> 1. Retrieve, attach MWS to EMU 3. Attach Adj Equip Tether, Trash Bag to MWS 6. Close TSA Latches (four), ✓locked <p><u>WORKSITE SETUP</u></p> <ol style="list-style-type: none"> 1. Configure PFR stack (Bay 3) HS Bridge Clamp: 3rd half hole from Fwd trunnion Art Socket: Y=9, P=4 PFR: Y=11, R=A.5, P=1.5 7. Ingress PFR 	<p>Perform AIRLOCK EGRESS, CUFF C/L, 3</p> <p><u>PAYLOAD BAY SETUP</u> TSA: Adj Equip Tether (1) MWS (1) Trash Bag (1) Ratchet Caddy (1) Art Socket (1)</p> <ol style="list-style-type: none"> 2. Retrieve, attach MWS to EMU 4. Attach Adj Equip Tether, Trash Bag to MWS 5. Retrieve, attach Ratchet Caddy to MWS 7. Retrieve Fuse Tether from A/L handrail; stow between canister handrails A and B on lower standoffs <p><u>WORKSITE SETUP</u></p> <ol style="list-style-type: none"> 2. Retrieve Art Socket from Fuse Tether, install PFR Socket on Canister 3. Retrieve PFR from Fwd bulkhead 4. Translate with PFR to SRTM Canister on Stbd sill 5. Install PFR in Art Socket on Canister 6. Configure PFR in Canister PFR Socket: Art Socket: Y=3, P=1 PFR: Y=5, R=A, P=11 8. Ingress PFR

SORTIE SETUP LATCH OPENING/CLOSURE (0:40)

TIME (HR : MN)	IV	EV1	EV2
-0:25		Perform DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2	Perform DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2
0:00		Perform POST DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2	Perform POST DEPRESS (<u>DEPRESS/REPRESS</u>), CC 6-2
0:15		Perform AIRLOCK EGRESS, CUFF C/L, 3 <u>PAYLOAD BAY SETUP</u> TSA: Adj Equip Tether (1) MWS (1) Trash Bag (1) 1. Retrieve, attach MWS to EMU 3. Attach Adj Equip Tether, Trash Bag to MWS 5. Close TSA Latches (four), ✓locked 6. Retrieve, attach GP Caddy w/latch tool from Fuse Tether on A/L <u>WORKSITE SETUP</u> 1. Configure PFR Bay 3 (if reqd) HS Bridge Clamp: 3rd half hole from Fwd trunnion, if reqd Art Socket: Y=9, P=2 PFR: Y=12, R=B, P=12 4. Translate to Handrail F on tip plate	Perform AIRLOCK EGRESS, CUFF C/L, 3 <u>PAYLOAD BAY SETUP</u> TSA: Adj Equip Tether (1) MWS (1) Trash Bag (1) HS Bridge Clamp (1) 2. Retrieve, attach MWS to EMU 4. Attach Adj Equip Tether, Trash Bag to MWS 7. Retrieve, attach GP Caddy w/latch tool from Fuse Tether on A/L <u>WORKSITE SETUP</u> 2. Assist EV1 configure PFR stack (if reqd) 3. Ingress PFR (if reqd)

SORTIE SETUP X-SAR STOW (0:40)

TIME (HR : MN)	IV	EV1	EV2
-0:25 0:00	<p>A7L 1. ACTUATOR PWR – ON (tb-gray)</p> <p style="margin-left: 20px;">SM 201 SRTM DEPLOY/STOW</p> <p>√ ACTR PWR – 1</p> <p>CRT 2. If MPMC 1 ON – *:</p> <p style="margin-left: 20px;">SMDA PRI 1 ON – ITEM 1 EXEC (*)</p> <p style="margin-left: 40px;">2 ON – ITEM 3 EXEC (*)</p> <p style="margin-left: 20px;">* If SMDA 1,2 ON unsuccessful: * * On MCC GO: * * REDUNDANT SMDA ACTIVATION * * SMDA PRI 1 OFF – ITEM 2 EXEC (*) * * 2 OFF – ITEM 4 EXEC (*) * * * * SM 202 SRTM SYSTEMS * * * * COOLING LOOP PUMP 1,2 OFF – * * ITEM 3 EXEC (*) * * ACTUATOR PWR – OFF * * 200 SRTM ACT/DEACT * * * * OUTBOARD 1 OFF – ITEM 20 EXEC (*) * * MPMC 1 OFF – ITEM 12 EXEC (*) * * 2 ON – ITEM 13 EXEC (*) * * OUTBOARD 2 ON – ITEM 21 EXEC (*) * * ACTUATOR PWR – ON * * * * SM 201 SRTM DEPLOY/STOW * * SMDA BU 1 ON – ITEM 5 EXEC (*) * * 2 ON – ITEM 7 EXEC * If MPMC 2 ON – *: SMDA BU 1 ON – ITEM 5 EXEC (*) 2 ON – ITEM 7 EXEC</p>	<p>Perform DEPRESS (DEPRESS/REPRESS), CC 6-2</p> <p>Perform POST DEPRESS (DEPRESS/REPRESS), CC 6-2</p> <p>Perform AIRLOCK EGRESS, CUFF C/L, 3</p>	<p>Perform DEPRESS (DEPRESS/REPRESS), CC 6-2</p> <p>Perform POST DEPRESS (DEPRESS/REPRESS), CC 6-2</p> <p>Perform AIRLOCK EGRESS, CUFF C/L, 3</p>

SORTIE SETUP X-SAR STOW (0:40) (Cont)

TIME (HR : MN)	IV	EV1	EV2
0:00 0:05 0:15	<p style="text-align: center;">SM 202 SRTM SYSTEMS</p> <p>COOLING LOOP PUMP 1,2 OFF – ITEM 3 EXEC (*)</p> <p>A7L 3. MAST DIRECTION – DEPLOY</p> <p style="text-align: center;">SM 201 SRTM DEPLOY/STOW</p> <p>4. ✓MAST DIR – DPLY</p> <p>A7L 5. MAST ENABLE – ENA</p> <p>CRT 6. ✓MAST ENABLE – ENA</p> <p>A7L 7. MAST POWER – ON</p> <p>CRT 8. ✓MAST PWR – ON</p> <p>0:05 9. MAST POWER – OFF ENABLE – DSBL DIRECTION – ctr</p> <p>CRT 10. ✓MAST DIR – DPLY ✓ENA – DIS ✓PWR – OFF</p>	<p style="text-align: center;"><u>PAYLOAD BAY SETUP</u></p> <p>TSA: Adj Equip Tether (1) MWS (1) Trash Bag (1) Loop Pin Extractor (1)</p> <ol style="list-style-type: none"> Retrieve, attach MWS to EMU Attach Adj Equip Tether, Trash Bag to MWS Close TSA Latches (four), ✓locked <p style="text-align: center;"><u>WORKSITE SETUP</u></p> <ol style="list-style-type: none"> Reconfigure EV2's Safety Tether from Stbd slidewire to Fwd slider on Port slidewire 	<p style="text-align: center;"><u>PAYLOAD BAY SETUP</u></p> <p>TSA: Adj Equip Tether (1) MWS (1) Trash Bag (1) HS Bridge Clamp (1)</p> <ol style="list-style-type: none"> Retrieve, attach MWS to EMU Attach Adj Equip Tether, Trash Bag to MWS <p style="text-align: center;"><u>WORKSITE SETUP</u></p> <ol style="list-style-type: none"> Receive Safety Tether from EV1

SORTIE SETUP X-SAR STOW (0:40) (Cont)

TIME (HR : MN)	IV	EV1	EV2
		<ol style="list-style-type: none"> 3. Retrieve PFR stack from Bay 3 4. Translate to Xo 1080.4 with PFR stack 7. Configure PFR stack HS Bridge Clamp Xo: 1080.4 Art Socket: Y=12, P=3 PFR: Y=2, R=A, P=11 10. Ingress PFR 	<ol style="list-style-type: none"> 5. Retrieve Art Socket from TBD loc 6. Retrieve PFR from Fwd bulkhead 8. Translate Aft on Port sill to Fwd EVA strut worksite 9. Configure PFR stack HS Bridge Clamp Xo: 867.9 Art Socket: Y=2, P=10.5 PFR: Y=4.5, R=A, P=1.0 11. Ingress PFR

SRTM MANUAL LATCH RELEASE (2:00)

	IV	EV1	EV2
	<p>16. Deploy Boom 8-in</p>	<ol style="list-style-type: none"> 1. Insert latch release tool into latch 1 interface 2. Push tool inboard 20° 3. Depress manual release button; hold 4. Release inboard pressure on latch release tool; remove tool 5. Release manual release button 6. Insert latch release tool into latch 2 interface 7. Push tool inboard 20° 8. Depress manual release button; hold 9. Release inboard pressure on latch release tool; remove tool 10. Release manual release button 11. Insert latch release tool into latch 3 interface 12. Push tool inboard 20° 13. Depress manual release button; hold 14. Release inboard pressure on latch release tool; remove tool 15. Release manual release button 17. Manually close latches: fore, aft, lower (apply inboard pressure to latch mechanism until manual release button “pops” up) 	<p>18. Egress PFR</p>

SRTM MANUAL SMDA OVERRIDE (1:00)

	IV	EV1	EV2
		<p style="text-align: center;"><u>NOTE</u> SMDA1 is upper drive, SMDA2 is lower drive</p> <ol style="list-style-type: none"> 1. Fold down MLI to expose SMDAs; secure flap to Velcro strip 2. Place 7/16-in Ratcheting Box Wrench on disengage bolt 4. Rotate bolt 180° until "DISENGAGE" visible 5. Repeat operation if dual override reqd 7. Fold up, secure MLI over SMDAs 	<p style="text-align: center;"><u>NOTE</u> If one SMDA remains engaged, it is not necessary to reengage failed SMDA at end of EVA</p> <ol style="list-style-type: none"> 3. Place 7/16-in Socket on drive bolt; load drive bolt in stow direction (cw) <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">CAUTION Drive bolt may back drive while releasing load on drive bolt</p> </div> <ol style="list-style-type: none"> 6. Release load slowly on drive bolt

SRTM MANUAL MAST DEPLOY (2:00)

	IV	EV1	EV2
	<p>11. A7L ✓MAST DEPLOY tb – gray</p>	<p><u>NOTE</u> SMDA1 is upper drive, SMDA2 is lower drive</p> <ol style="list-style-type: none"> 1. Fold down MLI to expose SMDAs; secure flap to Velcro strip 2. Place 7/16–in Ratcheting Box Wrench on disengage bolt 4. Rotate bolt 180° until “DISENGAGE” visible 5. Repeat operation on other SMDA <p>7. Configure PGT (B,CCW3,1,10.5)</p> <ol style="list-style-type: none"> 9. Drive SMDA EVA bolt with PGT to fully deployed position (5000 turns). Change out PGT batts as reqd <p><u>NOTE</u> Switch out driving during mast deploy as reqd to avoid hand fatigue</p> <ol style="list-style-type: none"> 12. Place 7/16–in Ratcheting Box Wrench on bolt; turn until “ENGAGE” visible on SMDA1 14. Place 7/16–in Ratcheting Box Wrench on bolt; turn until “ENGAGE” visible on SMDA2 	<p><u>NOTE</u> If one SMDA remains engaged, it is not necessary to reengage failed SMDA at end of EVA</p> <ol style="list-style-type: none"> 3. Place socket on drive bolt; load drive bolt in cw (stow) direction <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><u>CAUTION</u> Drive bolt may back drive while releasing load on drive bolt</p> </div> <ol style="list-style-type: none"> 6. Release load slowly on drive bolt 8. Configure PGT (B,CCW3,1,10.5) 10. Drive SMDA EVA bolt with PGT to fully deployed position (5000 turns). Change out PGT batts as reqd <p><u>NOTE</u> Switch out driving during mast deploy as reqd to avoid hand fatigue</p> <ol style="list-style-type: none"> 13. Hold load on SMDA1 with ratchet, in ccw (deploy) direction <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><u>CAUTION</u> Drive bolt may back drive while releasing load on drive bolt</p> </div> <ol style="list-style-type: none"> 15. Release pressure on drive bolt on SMDA1 16. Fold up MLI and secure over SMDAs

SRTM MANUAL MAST RETRACT (2:00)

	IV	EV1	EV2
	<p>11. A7L ✓LATCH CLOSED tb (two) – gray</p>	<p><u>NOTE</u> SMDA1 is upper drive, SMDA2 is lower drive</p> <ol style="list-style-type: none"> 1. Fold down MLI to expose SMDAs; secure flap to Velcro strip 2. Place 7/16–in Ratcheting Box Wrench on disengage bolt 4. Rotate bolt 180° until “DISENGAGE” visible 5. Repeat operation on other SMDA <ol style="list-style-type: none"> 7. Configure PGT (B,CW3,1,10.5) 9. Drive SMDA EVA bolt with PGT to fully retracted position (5000 turns); replace batts as necessary <p><u>NOTE</u> Switch out driving during mast retract as reqd to avoid hand fatigue</p> <ol style="list-style-type: none"> 13. Place 7/16–in Ratcheting Box Wrench on bolt, turn until “ENGAGE” visible on SMDA1 14. Place 7/16–in Ratcheting Box Wrench on bolt, turn until “ENGAGE” visible on SMDA2 	<p><u>NOTE</u> If one SMDA remains engaged, it is not necessary to reengage failed SMDA at end of EVA</p> <ol style="list-style-type: none"> 3. Place 7/16–in Socket on drive bolt; load drive bolt in deploy direction (ccw) <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><u>CAUTION</u> Drive bolt may back drive while releasing load on bolt</p> </div> <ol style="list-style-type: none"> 6. Release load slowly on drive bolt 8. Configure PGT (B,CW3,1,10.5) 10. Drive SMDA EVA bolt with PGT to fully retracted position (5000 turns); replace batts as necessary <p><u>NOTE</u> Switch out driving during mast retract as reqd to avoid hand fatigue</p> <ol style="list-style-type: none"> 12. Hold load on SMDA1 with ratchet in stow direction (cw) <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><u>CAUTION</u> Drive bolt may back drive while releasing load on bolt</p> </div> <ol style="list-style-type: none"> 15. Release pressure on drive bolt on SMDA1 16. Fold up MLI and secure over SMDAs

SRTM MANUAL LATCH CLOSURE (JAMMED LATCH) (0:40)

	IV	EV1	EV2
	<div data-bbox="317 764 678 805" style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">SM 200 SRTM ACT/DEACT</div> <p>10. ✓CAN LATCH ind</p>	<ol style="list-style-type: none"> 1. Insert latch release tool into latch 1(2,3) interface 2. Push tool inboard 20° 3. Depress manual release button; hold 4. Release inboard pressure on latch release tool; remove tool 5. Release manual release button 6. Check for FOD and manually clear if possible 7. Insert latch release tool into latch 1(2,3) interface 8. Push tool inboard 20° until manual release button “pops” up 9. Release inboard pressure on latch release tool; remove tool 11. Repeat as necessary for remaining jammed latches 	

SRTM X-SAR ANTENNA STOW (TBD TIME)

	IV	EV1	EV2
		<ol style="list-style-type: none"> 1. Remove hitch pins (three); stow pins in Trash Bag 2. Remove linkage pin sleeve; stow in Trash Bag 3. Remove linkage pin; stow in Trash Bag 4. If reqd, cut MLI at linkage tiedown location for adjustable equipment tether pass-through 5. Secure motor linkage with adj equipment tethers (as many as three tethers may be needed depending on linkage position) 6. Translate to aft EVA strut worksite with PFR, if reqd 7. Configure PFR for aft EVA strut worksite Bridge rail clamp at Xo=1096 Art Socket: Y=1, P=4 PFR: Y=12, R=A, P=12.5 8. Remove hitch pins (three) and EVA pin from stowed EVA strut 10. Rotate antenna to stowed position; attach EVA strut 12. Insert EVA pin, all hitch pins (three) to secure EVA strut (insert hitch pins 90° apart) 	<ol style="list-style-type: none"> 9. Remove hitch pins (three) and EVA pin from stowed EVA strut 11. Rotate antenna to stowed position; attach EVA strut 13. Insert EVA pin, all hitch pins (three) to secure EVA strut (insert hitch pins 90° apart)

X-SAR PAYLOAD BAY CLEANUP

	IV	EV1	EV2
		<ol style="list-style-type: none"> 1. Remove, translate PFR stack to Bay 3 stowage location 3. Configure PFR, Launch/Landing settings Art Socket: Y=3, P=12 PFR: Y=6, R=A, P=11 6. Translate to TSA 8. Remove, stow: Adj Equip Tether (1) Small Trash Bag (1) MWS (1) Loop Pin Extractor (1) <p><u>VERIFY TSA STOWAGE</u> ✓Loop Pin Extractor Caddy (1) ✓Trash Bag (2) ✓Adjustable Equipment Tether (2) ✓MWS (2) Close TSA Latches (four), ✓locked</p> <p><u>PERFORM AIRLOCK INGRESS, CUFF C/L, 4</u> ✓EMU equipment: Retractable Tether (1) Waist Tether (2) Adj Equip Tether (1)</p>	<ol style="list-style-type: none"> 2. Remove, translate PFR stack to Fuse Tether on A/L; stow HS Bridge rail clamp and Art Socket on Fuse Tether 4. Stow PFR on Fwd bulkhead 5. Retrieve, stow PFR on Fwd bulkhead 7. Translate to TSA 9. Remove, stow: Adj Equip Tether (1) Small Trash Bag (1) MWS (1) <p><u>VERIFY AIRLOCK STOWAGE</u> ✓Fuse Tether (1) ✓HS Bridge Rail Clamp (1) ✓Art Socket (1)</p> <p><u>PERFORM AIRLOCK INGRESS, CUFF C/L, 4</u> ✓EMU equipment: Retractable Tether (1) Waist Tether (2) Adj Equip Tether (1)</p>

SMDA OVERRIDE PAYLOAD BAY CLEANUP

	IV	EV1	EV2
		<ol style="list-style-type: none"> 1. Stow on Fuse Tether: PGT (1) GP Caddy w/7/16-in Ratcheting Box End Wrench 4. Retrieve Fuse Tether from Handrails A and B; temp stow on handrail near A/L 6. Configure PFR, Launch/Landing settings: Art Socket: Y=3, P=12 PFR: Y=6, R=A, P=11 8. Translate to TSA 10. Remove, stow: Adj Equip Tether (1) Small Trash Bag (1) MWS (1) <p><u>VERIFY TSA STOWAGE</u> ✓3/8-in Ratchet Caddy (1) ✓Trash Bag (2) ✓Adj Equip Tether (2) Close TSA Latches (four), ✓locked</p> <p><u>PERFORM AIRLOCK INGRESS, CUFF C/L 4</u> ✓EMU equipment: Retractable Tether (1) Waist Tether (2) Adj Equip Tether (1)</p>	<ol style="list-style-type: none"> 2. Stow on Fuse Tether: PGT (1) 3. Remove PFR from Art Socket on canister; stow on canister handrail Configure PFR: R=A, P=4.5 5. Retrieve Art Socket from canister, stow on Fuse Tether 7. Retrieve, stow PFR on Fwd bulkhead 9. Translate to TSA 11. Remove, stow: Adj Equip Tether (1) Small Trash Bag (1) 3/8-in Ratchet Caddy (1) MWS (1) <p><u>VERIFY AIRLOCK STOWAGE</u> ✓Fuse Tether (1) ✓Power Tool (2) ✓Power Tool spare batteries in bags (4) ✓Socket Caddy (1) ✓7/16-in Ratcheting Box End Wrench in GP Caddy (1) ✓EVA Bag w/Adj Wrench (1), Ratchet w/7/16 Socket</p> <p><u>PERFORM AIRLOCK INGRESS, CUFF C/L 4</u> ✓EMU equipment: Retractable Tether (1) Waist Tether (2) Adj Equip Tether (1)</p>

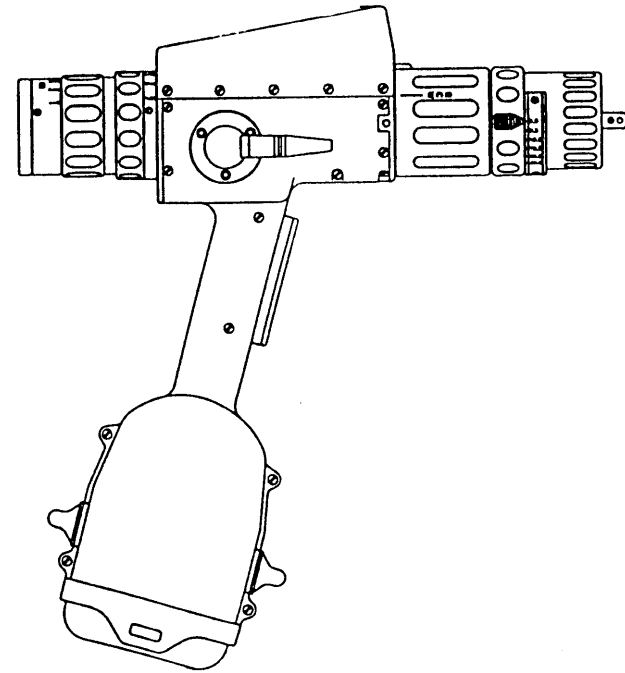
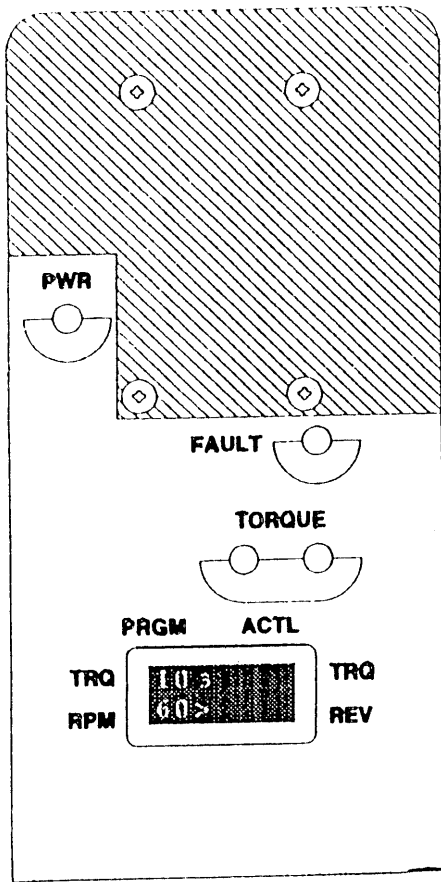
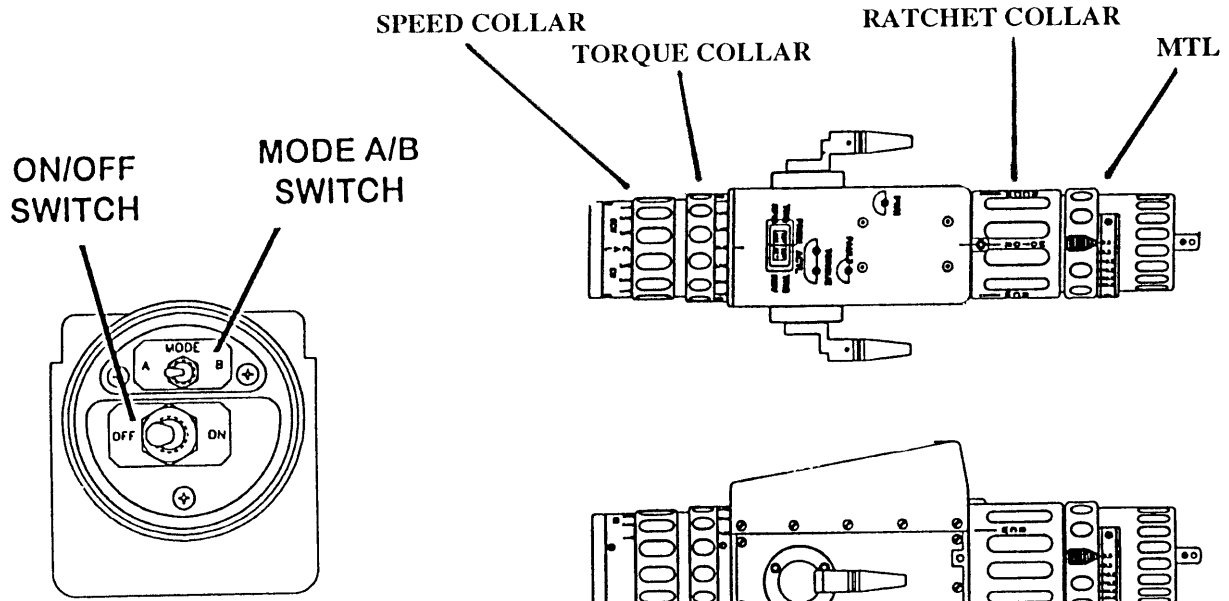
LATCH PAYLOAD BAY CLEANUP

	IV	EV1	EV2
		<ol style="list-style-type: none"> 1. Stow on Fuse Tether: GP Caddy w/SRTM Latch Tool (1) 3. Configure PFR, Launch/Landing settings: Art Socket: Y=3, P=12 PFR: Y=6, R=A, P=11 4. Translate to TSA 6. Remove, stow: Adj Equip Tether (1) Small Trash Bag (1) MWS (1) <p><u>VERIFY TSA STOWAGE</u> ✓3/8-in Ratchet Caddy (1) ✓Trash Bag (2) ✓Adj Equip Tether (2) Close TSA Latches (four), ✓locked</p> <p><u>PERFORM AIRLOCK INGRESS, CUFF C/L, 4</u> ✓EMU equipment: Retractable Tether (1) Waist Tether (2) Adj Equip Tether (1)</p>	<ol style="list-style-type: none"> 2. Stow on Fuse Tether: GP Caddy w/SRTM Latch Tool (1) 5. Translate to TSA 7. Remove, stow: Adj Equip Tether (1) Small Trash Bag (1) MWS (1) <p><u>VERIFY AIRLOCK STOWAGE</u> ✓Fuse Tether (1) ✓GP Caddy w/SRTM Latch Tool (2)</p> <p><u>PERFORM AIRLOCK INGRESS, CUFF C/L, 4</u> ✓EMU equipment: Retractable Tether (1) Waist Tether (2) Adj Equip Tether (1)</p>

PGT CHECKOUT

1. Unstow PGT
2. ✓PWR – OFF
3. Remove battery cap, install battery
4. Ratchet collar – not MTR
5. Cycle MTL settings
6. ✓MODE – A
7. Speed collar – CAL
8. Torque collar – 1
9. PWR – ON
10. ✓‘TRIG TO CAL’ on display
11. Press, release trigger to calibrate
12. ✓‘CAL PASSED’ on display
13. Ratchet collar – MTR
14. ✓Illumination of all LEDs and ‘LED TEST’ displayed
15. Press trigger and hold
✓BATT VDC \geq 36.0
16. Speed collar – 2CW
17. Press trigger and ✓drive rotates cw
18. Speed collar – 2CCW
19. Press trigger and ✓drive rotates ccw
20. To verify programmed settings, cycle MODE/torque collar/speed collar and compare with PGT SETTINGS, FS 8–23
21. PWR – OFF

PISTOL GRIP TOOL



PISTOL GRIP TOOL CONTINGENCIES

MESSAGE	CORRECTIVE ACTIONS
BATTERY HITEMP	If alternate battery avail: power off, change battery. Otherwise, power off, switch to Ratchet mode
BATTERY LOTEMP (blinking)	Drive tool with no load to increase battery temperature. If no joy and alternate battery avail: power off, change battery. Otherwise, power off, switch to Ratchet mode
BATTERY LOVOLT (blinking)	Continue using until tool is unable to deliver sufficient torque. If no joy and alternate battery avail: power off, change battery. Otherwise, power off, switch to Ratchet mode
CAL FAILED	Press, release trigger to repeat calibration. If no joy, power cycle, calibrate. If no joy, power off, switch to Ratchet mode
COLLAR ERROR	Cycle Torque and Speed collars to clear error. If no joy, power cycle, calibrate. If no joy, power off, switch to Ratchet mode
COMPAR ERROR	Cycle Torque collar and A/B mode switch. If no joy, power cycle, calibrate. If no joy, power off, switch to Ratchet mode
EEPROM WR ERR (blinking)	Power cycle, calibrate. If no joy, power off, switch to Ratchet mode
HI TORQ	If fault occurs during engagement and MTL did not slip, ignore message. Otherwise: power cycle, calibrate. If no joy, power off, switch to Ratchet mode
HICURR	Reattempt operation. If no joy, power cycle, calibrate. If no joy, power off, switch to Ratchet mode
HYBRID HITEMP	Power cycle, calibrate. If no joy, power off, switch to Ratchet mode
LO TORQ	Reattempt operation until desired torque is reached. If no joy, power cycle, calibrate. If no joy, power off, switch to Ratchet mode
LOCURR	Reattempt operation. If no joy, power cycle, calibrate. If no joy, power off, switch to Ratchet mode
LOG IS FULL (blinking)	Continue operation
MOTOR HITEMP	Power off, switch to Ratchet mode
OVER CURR	Power cycle, calibrate. If no joy, power off, switch to Ratchet mode
SLFTST FAIL X	Power cycle, calibrate. If no joy, power off, switch to Ratchet mode

To Calibrate: Ratchet collar – not MTR
 Speed collar – CAL
 Press, release trigger to cal

To Check Battery Volts: Ratchet collar – MTR
 Speed collar – CAL
 ✓LED test appears
 Press trigger to read battery volts

760XD PGSC – PGT CONNECTION (Windows 95)

1. ✓PGSC equipped with RS422 PCMCIA card and adapters (2)
2. ✓PGT PWR – OFF
3. ✓PGT battery installed
4. Ratchet collar – not MTR
5. Speed collar – CW1

CAUTION Do not over torque cover screw
--

6. Open PGT serial port cover using 3/32-in Allen Wrench attached to PGT-RS422 cable
7. Connect PGT-RS422 cable to PGT serial port
8. Connect other end of PGT-RS422 cable to COM 2 or COM 4 port of PGSC, as desired
9. PGT PWR – ON
10. ✓'NEED TO CAL' on display
11. If PGSC is not powered, PGSC pwr – on
12. At Windows desktop:
 - If entering remote software:
 13. Select SHUTTLE APPS icon
 14. Select PGT icon that corresponds to COM port selected in step 8
 15. ✓Tool Communications Check dialog box appears
 16. ✓Communication Verified
 17. ✓Intool software version 2.2
 18. Select CONTINUE

PROGRAM PGT SETTINGS (Windows 95)

1. Perform appropriate PGSC-PGT CONNECTION to enter remote software
If loading settings from a set file in C:\SPOCAPPS\PGT32\SETTINGS:
 2. Select FILE, OPEN ...
 3. Select desired settings file
 4. Make changes to settings table(s) as desired
 5. ✓Ratchet collar – not MTR
 6. Select TOOL, SEND DATA TO TOOL ... or use '↑' on tool bar
 7. ✓All sent settings – black on gray (programmed successfully)
- If saving new settings to a file, select FILE, SAVE AS ...
 8. Select FILE, EXIT
 9. Type in new file name, save
 10. Go to VERIFICATION OF PROGRAMMED PGT SETTINGS

VERIFICATION OF PROGRAMMED PGT SETTINGS

- If tool has not been calibrated:
1. PGT PWR – ON
 2. Ratchet collar – not MTR
 3. Speed collar – CAL
 4. Press, release trigger to calibrate
 5. Ratchet collar – MTR
 6. Speed collar – not CAL
 7. To verify programmed settings, cycle MODE/torque collar/speed collar and compare with PGT/FASTENER REF DATA or other desired settings table
 8. PGT PWR – OFF

PGSC – PGT DISCONNECTION (Windows 95)

1. PGT PWR – OFF

If exiting remote software, select FILE, select EXIT:

2. Disconnect PGT–RS422 cable from PGT and PGSC

<p style="text-align: center;"><u>CAUTION</u></p>

<p style="text-align: center;">Do not over torque cover screw, finger tight only</p>
--

3. Close PGT serial port cover using 3/32–in Allen Wrench attached to PGT–RS422 cable
4. Shut down PGSC as reqd
5. Stow PGT, cable

PGT SETTINGS

SETTING	TORQUE SETPOINT (FT-LB)	TORQUE WINDOW (FT-LB)	TORQUE THRESHOLD (FT-LB)	TURNS	ANGLE WINDOW	Including PGT error, means Torque Range could be
A1	2.5	± 1.0	1.0	Infinite	N/A	1.5–3.5
A2	3.8	± 1.0	1.0	Infinite	N/A	2.8–4.8
A3	4.8	± 1.0	1.5	Infinite	N/A	3.8–5.8
A4	6.3	± 1.0	2.0	Infinite	N/A	5.3–7.3
A5	7.0	± 1.0	2.0	Infinite	N/A	6.0–8.0
A6	8.3	± 1.0	2.5	Infinite	N/A	7.3–9.3
A7	9.2	± 1.0	2.5	Infinite	N/A	8.2–10.2
B1	12.0	± 1.3	3.0	Infinite	N/A	10.7–13.3
B2	16.0	± 1.7	3.0	Infinite	N/A	14.3–17.7
B3	18.4	± 1.8	3.0	Infinite	N/A	16.6–20.2
B4	19.4	± 1.9	3.0	Infinite	N/A	17.5–21.3
B5	22.0	± 2.0	3.0	Infinite	N/A	19.8–24.2
B6	24.0	± 2.0	3.0	Infinite	N/A	21.6–26.4
B7	25.5	± 2.0	3.0	Infinite	N/A	22.9–28.1

SETTING	CCW1	CCW2	CCW3	CW3	CW2	CW1
SPEED (RPM)	10	30	60	60	30	10
SLEEP TIME			5 min			
AUTO-OFF TIME			15 min			

MULTI-SETTING TORQUE LIMITER (MTL) SETTINGS
2.5
5.5
10.5
15.5
23.5
30.5

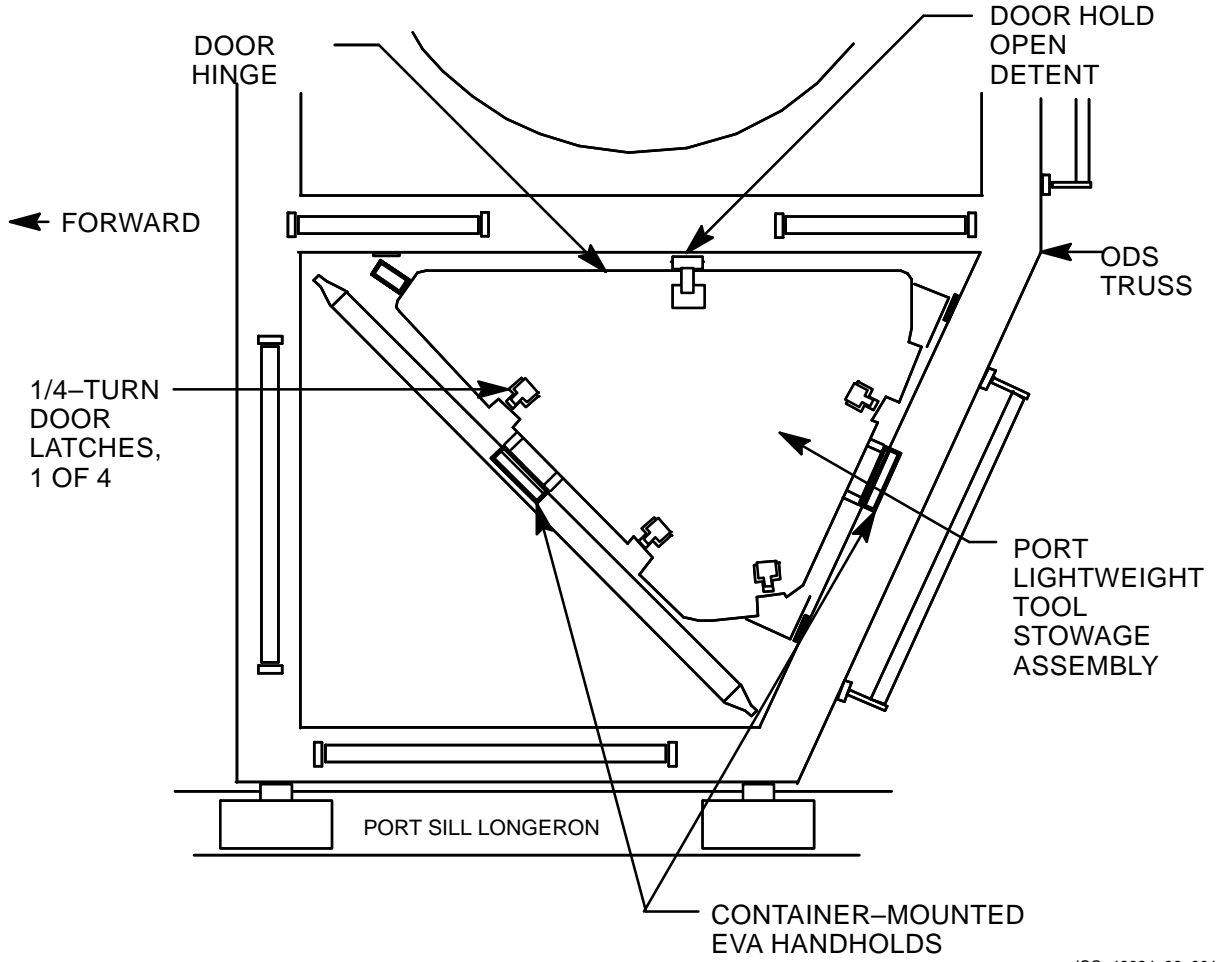
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EVA REFERENCE

PORT TOOL STOWAGE ASSEMBLY (TSA) FS 18-2

EVA REF

PORT TOOL STORAGE ASSEMBLY (TSA)



JSC-48024-96_001

EVA REF

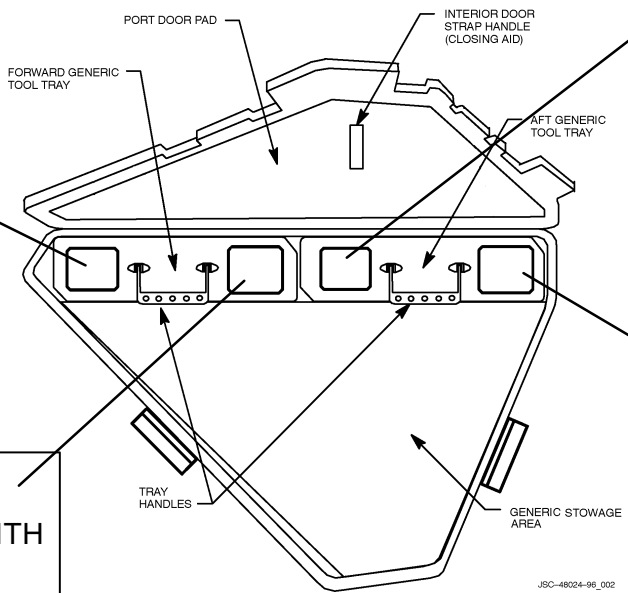
PORT TOOL STOWAGE ASSEMBLY (TSA) (Cont)

TOOLS

E. T. UMBILICAL
DOOR LATCH TOOL
LARGE CUTTER
RMS MPM WRENCH
SMALL TRASH BAGS
TUBE CUTTER

TOOLS

ADJUSTABLE TETHERS
PAYLOAD RETENTION
DEVICES
SHOULDER BRACE
RELEASE TOOL
SNATCH BLOCKS



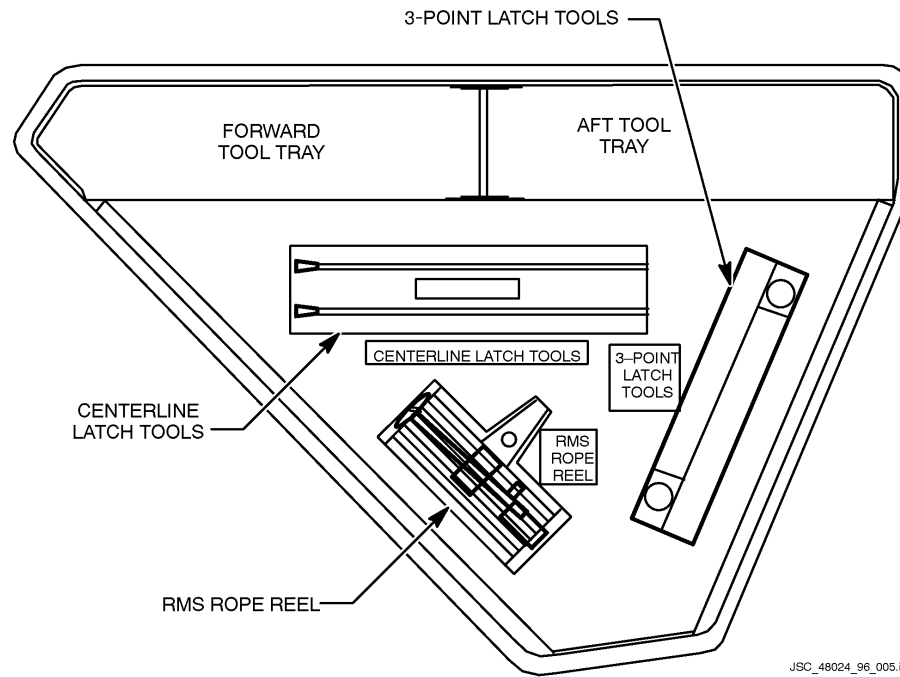
TOOL CADDIES

ADJUSTABLE WRENCH / RATCHET WITH
7/16-INCH SOCKET AND
FOUR-INCH EXTENSION
BOLT PULLER / VISE GRIP PLIERS
HAMMER / CHISEL PROBE
LOOP PIN PULLER / PDU DISCONNECT
SMALL CUTTER / NEEDLE NOSE PLIERS
THERMAL GLOVES VELCRO / TAPE

TOOL CADDIES

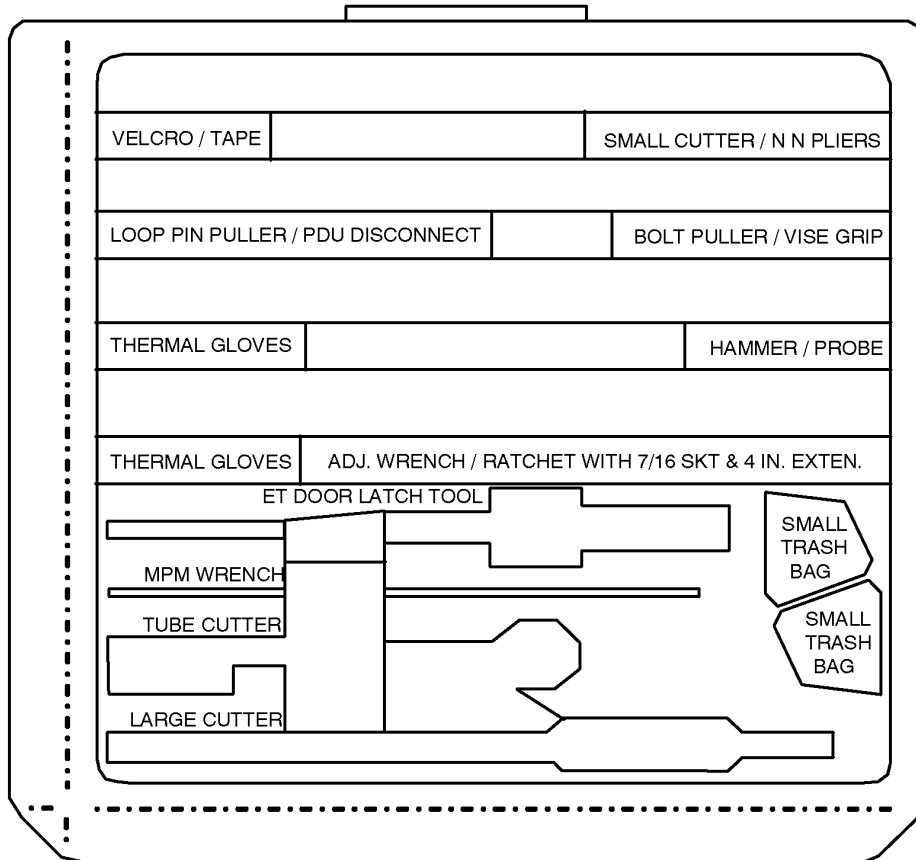
PRYBAR / FORCEPS
1/2-INCH RATCHETING
BOX WRENCH
3/8-DRIVE RATCHET /
RADIATOR DISCONNECT
EXTENSION

PORT TOOL STOWAGE ASSEMBLY (TSA) (Cont)



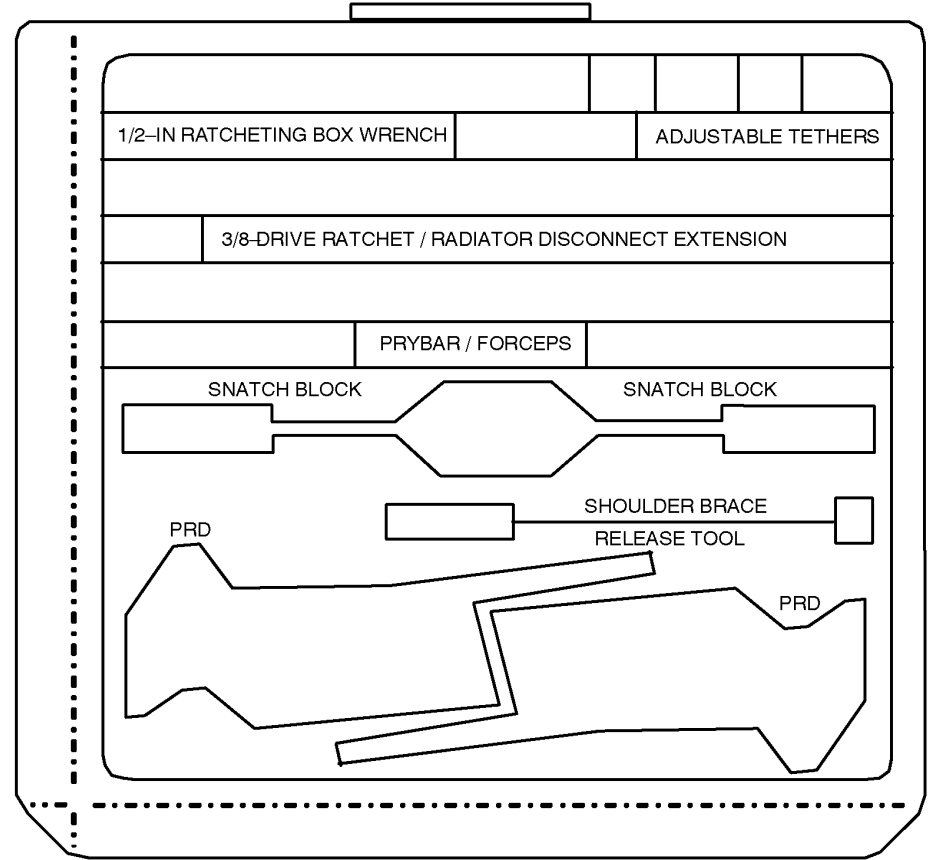
PORT TSA MAIN CUSHION

PORT TSA



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Forward Tray



JSC-48024-96_004.ii

Aft Tray

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EVA CHECKLIST

STS
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