

TABLE 4.3-5
SERVICE MODULE RCS LOADING PARAMETERS AND CALCULATIONS - QUAD C

<u>Fuel</u>		<u>Oxidizer</u>	
<u>Secondary Fuel</u>		<u>Secondary Oxidizer</u>	
A.	Loading Temperature ($^{\circ}$ F) _____	A.	Tank Volume (in^3) @ 0.0 PSIG _____
B.	Tank Volume (in^3) @ 0.0 PSIG _____	A1.	Liquid Line Volume (in^3) _____
B1.	Liquid Line Volume (in^3) _____	B.	Tank Stretch Factor (in^3/PSI) 0.045
C.	Tank Stretch Factor (in^3/PSI) 0.034	<u>Primary Oxidizer</u>	
D.	Initial Weight of Bleed Unit Prior to Loading (lb) _____	C.	Tank Volume (in^3) @ 0.0 PSIG _____
E.	Final Weight of Bleed Unit After Loading (lb) _____	C1.	Liquid Line Volume (in^3) _____
*F.	Resulting Load (lb) (Item D less Item E) _____	D.	Tank Stretch Factor (in^3/PSI) 0.088
G.	Specification Nominal Load at $70 \pm 5^{\circ}$ F (lb) _____	<u>PV Parameters for Combined Primary and Secondary Oxidizer Tanks</u>	
H.	Volume of GHE-GSE Line (in^3) _____	E.	Volume of GHE-GSE Line (in^3) _____
I.	Volume of S/C GHE Line (in^3) _____	F.	Volume of S/C GHE Line (in^3) _____
J.	GSE Line Pressure (PSIG) _____	G.	GSE Line Pressure (PSIG) _____
K.	Bladder Pressure (PSIG) _____	H.	Bladder Pressure (PSIG) _____
L.	Stabilized Equilibrium Pressure (PSIG) _____	I.	Stabilized Equilibrium Pressure (PSIG) _____
M.	Primary Liquid Close-Out Pressure (PSIG) _____	J.	Loading Temperature ($^{\circ}$ F) _____
N.	Specification Ullage @ A Above Maximum _____	K.	Oxidizer Density (lb/in^3); solve equation (4) below where T = Temperature @ J above _____
	Minimum _____	L.	Specification Value @ Temperature J above (lb) Maximum _____
			Minimum _____
O.	Ullage Volume (in^3). Solve the following equation by substituting the values contained in the indicated steps. _____	M.	PV Calculated Oxidizer Load (lb); solve equation (5) and (6) below by substituting the values contained in the above indicated steps where U = Volume of tank gas (in^3) in both tanks and He system, and F_o = PV calculated oxidizer load for both tanks _____
	$\text{Ullage Volume} = H \left(\frac{J - L}{L - K} \right) - (C + S)(L + K + 14.7) + S(M) - I$		± 2.3
<u>Primary Fuel</u>			
P.	Loading Temperature ($^{\circ}$ F) _____	N.	Specification Nominal Value @ Temperature J above (lb) _____
Q.	Tank Volume (in^3) @ 0.0 PSIG _____	(4)	$\text{Oxidizer Density} = 0.451591(10^{-4}) (11.8 - T) + 0.05475906$
R.	Liquid Line Volume (in^3) _____	(5)	$U = E \left(\frac{G - I}{I - H} \right) - (B + D)(I + H + 14.7)$
S.	Tank Stretch Factor (in^3/PSI) 0.0652	(6)	$F_o = K(A + C + A1 + C1 - U + F)$