OPERATIONAL PERFORMANCE DATA

This section provides the performance information necessary to comply with the Operating Rules set forth by the various Regulatory Authorities.

Operators are responsible for obtaining operational approvals from their cognizant National Aviation Authority.

The AEO Takeoff Power HIGE WAT curve is shown in Part 1, Section I, Figure 1-1.

The AEO Takeoff Power HOGE WAT curve is shown in Part 1, Section IV, Figure 4-18.

The OEI 30-Minute Power climb performance data contained in Part 1, Section IV, Figure 4-15 were cross plotted to obtain the Figure 5-4 maximum takeoff and landing gross weight based on the ability of the helicopter to achieve 150 fpm climb at 1,000 ft above the takeoff surface with one engine inoperative and the remaining engine operating at OEI 30-Minute Power.

AIRFIELD TAKEOFF AND LANDING

Category A and Category B airfield takeoff and landing procedures are given in Part 1.

The Category A procedure provides zero exposure engine failure accountability during takeoff or landing when operating in accordance with the specified weight, altitude, temperature, TDP/V_{TOSS}, and field length conditions. Takeoff from airfields shorter than those specified may result in a forced landing outside the confines of the airfield, in the event of engine failure before reaching the TDP.

The Category B procedure is an AEO procedure that requires a specified horizontal takeoff distance from HIGE to 50 ft height and a specified horizontal landing distance from 50 ft height to HIGE. Single engine stay-up-ability is not assured when operating at Category B weights.

ELEVATED HELIDECK TAKEOFF AND LANDING

The following vertical takeoff and landing procedures are provided in support of elevated helideck operations where performance is available for OEI continued flight or landing at all times when operating in accordance with the Figure 5-5 takeoff and landing WAT curves.

VERTICAL TAKEOFF - ELEVATED HELIDECK

The vertical takeoff profile with scheduled dropdown is shown diagrammatically in Figure 5-6.

1. Determine the maximum takeoff gross weight and V_{TOSS} from Figure 5-5.

2. Determine the takeoff torque from Figure 5-7.
3. Set parking brake.
4. Set 30 feet TDP on the radar altimeter.
5. Arm floats (if over water).
6. Establish a wheels light hover in the takeoff position.
7. Check engine instruments.
8. Establish a vertical climb by rapidly increasing collective pitch to achieve the takeoff torque determined from step 2. Do not exceed the Takeoff Power limit (100% N_1, 100%Q, or 816°C T_5).
9. Confirm that ascending flight path is vertical; correct as necessary. At least a corner of the helideck should be visible through the chin window or lower door window (if installed) at all times.
10. Cross-check Q, T_5, and N_1, confirm Takeoff Power limit, adjust appropriately.
11. When climbing through the TDP (30 ft AGL), input longitudinal cyclic to rotate to a 22° ± 2° nose down pitch attitude in 2 or less seconds. The cyclic input defines the TDP; if an emergency, including engine failure, occurs prior to cyclic input, a reject is executed, and during or after input, a continued takeoff is performed.
12. Allow nose down pitch attitude to lessen due to translational recovery with increasing airspeed, establish 50 KIAS initially and continue acceleration to V_{BROC} airspeed, 74 KIAS.
13. Floats - OFF.
14. Retract landing gear.

SINGLE ENGINE FAILURE ON TAKEOFF - ELEVATED HELIDECK

The procedure to follow after an engine failure during a vertical takeoff depends on where in the takeoff sequence the failure occurs. If the engine fails before the TDP, the takeoff is rejected and the aircraft is landed on the helideck. The TDP is 30 feet above the takeoff surface. If the failure occurs after the TDP, the takeoff will be continued.

Rejected Takeoff

1. Sharply reduce collective to a mid-range position to minimize ballooning and excessive height.

2. With maximum height achieved and as aircraft begins to settle, increase collective to achieve Maximum Contingency OEI power and allow rotor to droop to 104-106% N_r.
3. Keep the helideck in sight at all times and adjust position as necessary with cyclic to control a vertical descent to the landing surface.

WARNING

Crosswind can cause large horizontal repositioning at the apex of the reject. Anticipate this effect and correct as required.

4. Maintain 104 to 106% N_r, fixed collective, and accept the resultant vertical descent to the helideck.
5. When closure rate and altitude dictate that contact with the landing surface is imminent, apply collective at a rate and amount sufficient to cushion the landing. A slow, gradual collective input applied at excessive altitude must be avoided.
6. Upon ground contact, lower collective slightly to prevent excessive rotor droop, neutralize cyclic position, then continue lowering collective smoothly.
7. Floats - OFF.

Continued Takeoff

1. Continue nose down pitch rotation to 22° ± 2° nose down pitch attitude in 2 or less seconds.
2. Hold collective fixed initially and then reduce as necessary to arrest droop at 94% ± 2% N_r. Do not allow rotor speed to droop below 91% N_r.
3. Allow nose down pitch attitude to lessen when passing through effective translational lift. Reduce collective slightly to result in a gradual rotor speed increase to 100% N_r.
4. Closely monitor the airspeed indicator and level the aircraft pitch attitude immediately when an indication is observed to achieve a roundout at 50 KIAS. Continue a level acceleration to V_{TOSS}.
5. Switch floats OFF and retract landing gear with a positive rate of climb established.
6. Reduce collective slowly to return rotor speed to 100% N_r and observe OEI 2½-Minute Power limits.

7. When obstacles are cleared and after passing 200 feet AGL, continue climb at OEI 2½-Minute Power and gradually accelerate to V_{BROC}, then observe 30-Minute OEI Power limits.
8. Land as soon as practicable.
9. For single engine climb or cruise at airspeeds above V_{BROC}, use 107% N_r.

APPROACH AND LANDING – ELEVATED HELIDECK

The elevated helideck approach and landing profile with scheduled dropdown is shown diagrammatically in Figure 5-8 The landing procedure employs an approach path offset at least one rotor radius to the side of the helideck to permit an un-obstructed go-around path in case of engine failure. It has been determined that the OEI balked landing dropdown will not exceed the Figure 5-5 scheduled OEI continued takeoff dropdown for the same weight, altitude, and temperature conditions.

1. Determine maximum landing gross weight and V_{TOSS} from Figure 5-5.
2. The landing gear should be down, the floats armed (if over water) at or below 74 KIAS, and the parking brake set.
3. Initiate a constant angle continually decelerating approach to the helideck, commencing at 45 KIAS at a height of 400 feet above the landing surface. For headwind components up to 20 knots, add one half of the estimated component to the 45 KIAS target. For headwind components greater than 20 knots, add 10 knots plus the difference above 20 knots to the no wind 45 KIAS target.
4. When passing through 100 feet above the helideck, allow the approach angle to flatten to a descent rate of not more than 150 feet per minute at an airspeed of 30 KIAS in zero wind or the equivalent airspeed adjusted for headwind component.
5. Continue to reduce altitude to arrive at the landing decision point (LDP), a point 25 feet above, 25 feet to the left or right of, and 150 feet (3 helicopter lengths) short of the helideck (where the closest corner of the helideck visually touches the glare shield / master caution light cluster) in level flight at 30 KIAS. At the LDP the aircraft is flared to reduce airspeed. During this flare, the pilot should maneuver the aircraft over the helideck, and complete the landing vertically or transition to hover as the ground speed is reduced to zero knots.

SINGLE ENGINE FAILURE DURING APPROACH TO AN ELEVATED HELIDECK

The procedure to follow after an engine failure during a landing approach depends on where in the landing sequence the failure occurs.

The Landing Decision Point (LDP) is defined as a point 25 feet above, 25 feet to the left or right of, and 150 feet (3 helicopter lengths) short of the helideck in level flight at 30 KIAS, the point at which the pilot begins the sidestep maneuver toward the helideck. If an engine failure occurs prior to beginning the sidestep maneuver, the pilot must perform a "Go Around". If the engine failure occurs after beginning the sidestep maneuver, the aircraft is committed to a landing and the approach must continue to touchdown.

Balked Landing (Go Around)

1. Increase collective sufficiently to droop the rotor to at least 100% N_r, but no lower than 91% N_r.
2. Gradually adjust pitch attitude to accelerate to V_{TOSS}.
3. Switch floats OFF and retract landing gear with a positive rate of climb established.
4. Reduce collective slowly to return rotor speed to 100% N_r and observe OEI 2½-Minute Power limits.
5. When obstacles are cleared, and after passing 200 ft AGL, continue climb at OEI 2½-Minute Power and gradually accelerate to V_{BROC}, then observe OEI 30-Minute Power limits.
6. Land as soon as practicable.
7. For single engine climb or cruise at airspeeds above V_{BROC}, use 107% N_r.

Single Engine Landing

1. Maneuver aircraft above landing surface.
2. Use collective to cushion touchdown. A slow, gradual collective input applied at excessive altitude must be avoided. Ensure pitch attitude is 10° or less at touchdown to provide tail clearance.
3. Upon ground contact, lower collective slightly to prevent excessive rotor droop, neutralize cyclic position, and then continue lowering collective smoothly.

S–76B OPERATIONAL PERFORMANCE DATA

MAXIMUM TAKEOFF AND LANDING GROSS WEIGHT
BASED ON 150 FPM OEI CLIMB AT 1000 FT ABOVE THE TAKEOFF SURFACE
30 MINUTE POWER **BEST ROC SPEED**

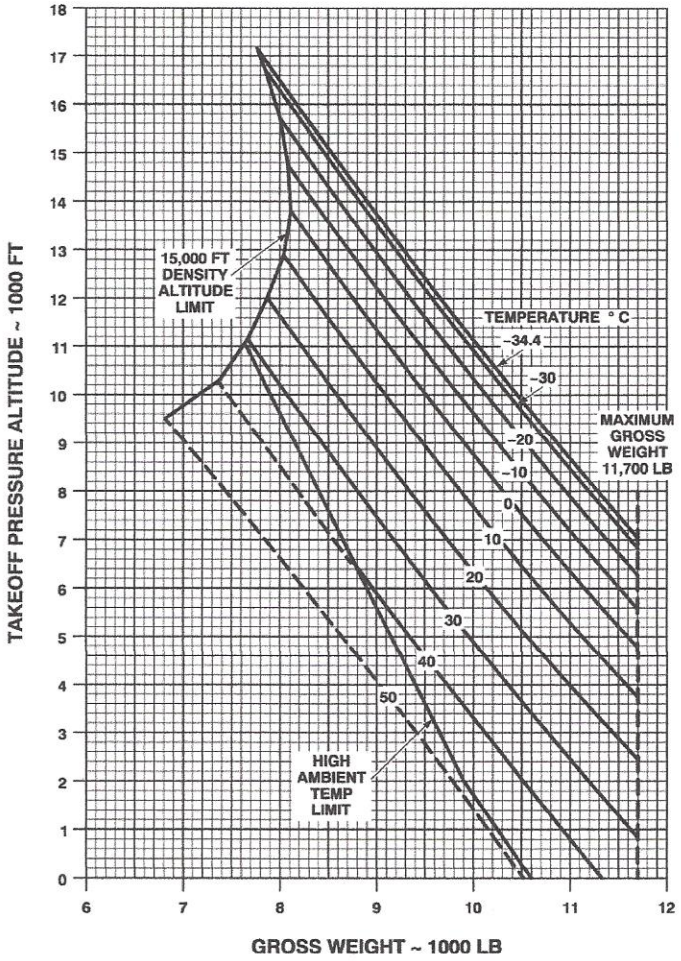

Figure 5-4. Takeoff and Landing Gross Weight Based on 150 FPM OEI Climb

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VERTICAL OPERATIONS FROM ELEVATED HELIDECK

MAXIMUM TAKEOFF AND LANDING GROSS WEIGHT
EAPS/ANTI–ICE OFF BLEED AIR OFF

REDUCE GROSS WEIGHT DETERMINED FROM CHART BY THE AMOUNT SHOWN IN THE FOLLOWING TABLE AS APPLICABLE. WITH COMPOUND CONFIGURATIONS, THE WEIGHT REDUCTIONS ARE CUMULATIVE.

CONFIGURATION	WEIGHT REDUCTION
UTILITY HOIST INSTALLED	75 POUNDS
EXTERNAL SLIDING DOOR(S) OPEN	150 POUNDS
EXTERNAL SLIDING DOOR(S) CLOSED	50 POUNDS

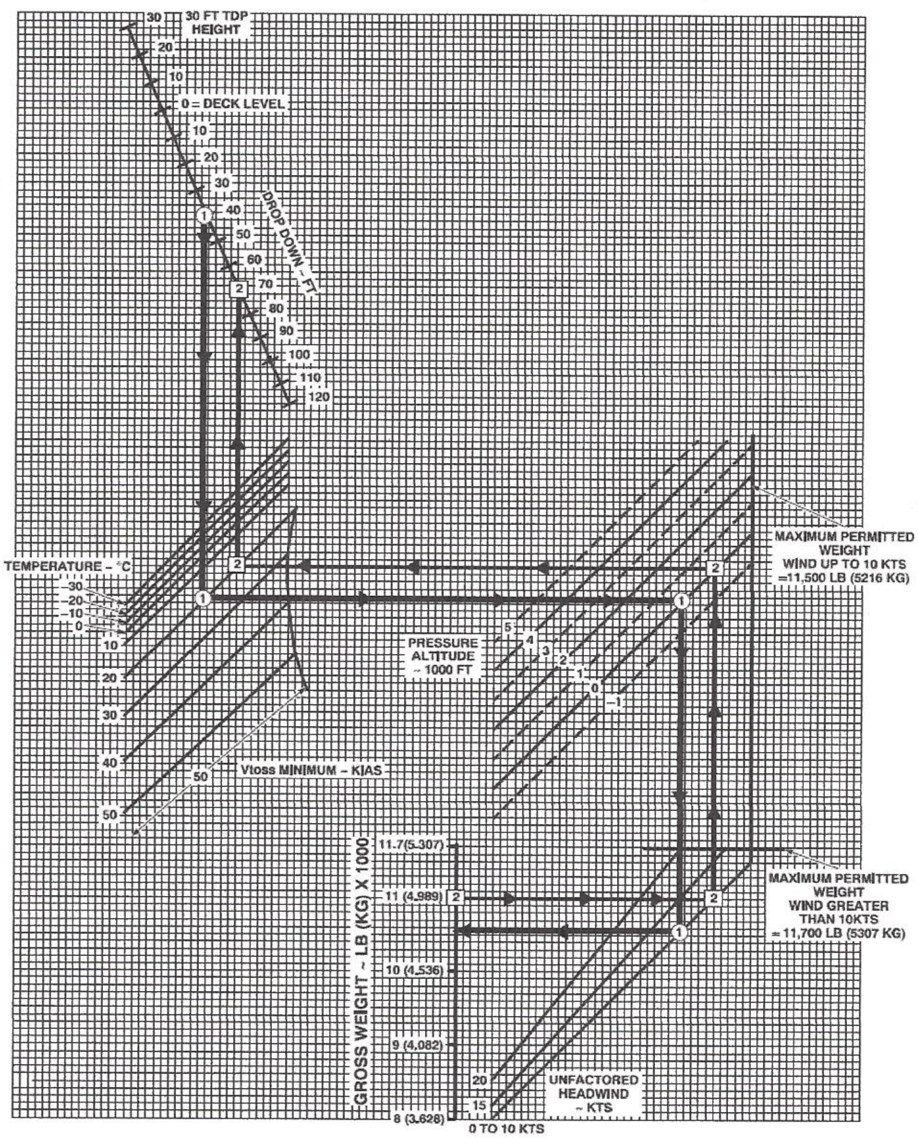

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Figure 5-5. Elevated Helideck Maximum Takeoff and Landing Gross Weight (Sheet 1 of 2)

VERTICAL OPERATIONS FROM ELEVATED HELIDECK

MAXIMUM TAKEOFF AND LANDING GROSS WEIGHT
EAPS/ANTI-ICE ON BLEED AIR OFF

REDUCE GROSS WEIGHT DETERMINED FROM CHART BY THE AMOUNT SHOWN IN THE FOLLOWING TABLE AS APPLICABLE. WITH COMPOUND CONFIGURATIONS, THE WEIGHT REDUCTIONS ARE CUMULATIVE.

CONFIGURATION	WEIGHT REDUCTION	CONFIGURATION	WEIGHT REDUCTION
UTILITY HOIST INSTALLED	75 POUNDS	EXTERNAL SLIDING DOOR(S) OPEN	150 POUNDS
		EXTERNAL SLIDING DOOR(S) CLOSED	50 POUNDS

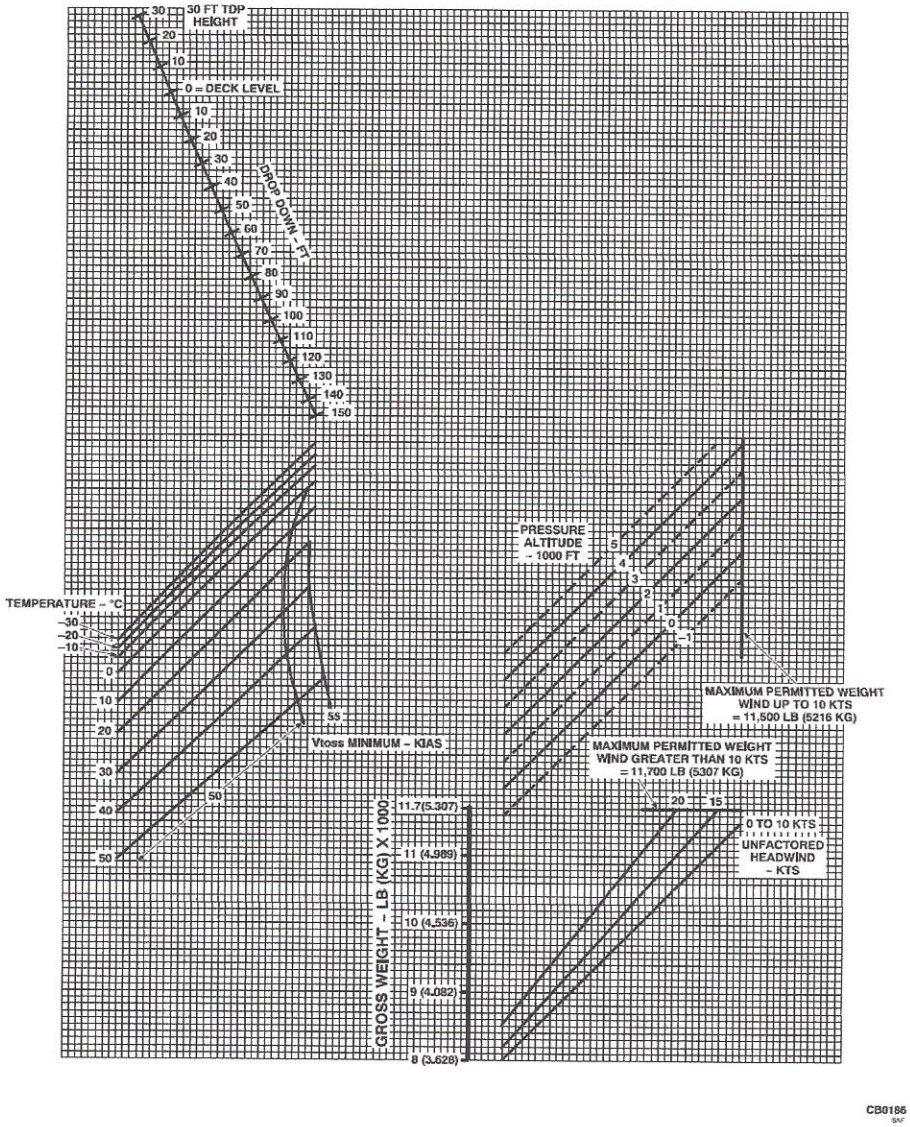

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Figure 5-5. Elevated Helideck Maximum Takeoff and Landing Gross Weight (Sheet 2 of 2)

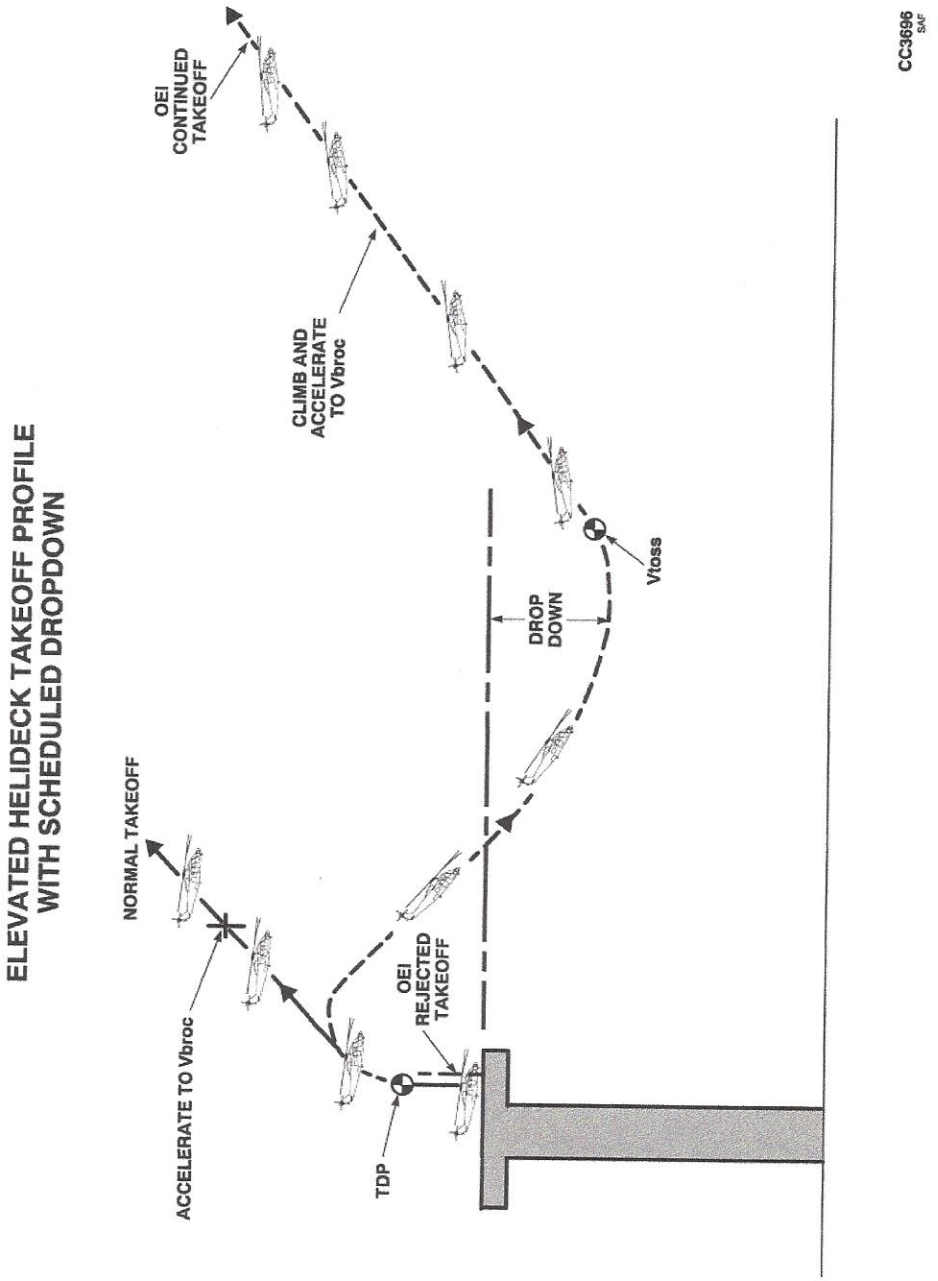

Figure 5-6. Elevated Helideck Takeoff Profile with Scheduled Dropdown

ELEVATED HELIDECK OPERATIONS
TARGET DUAL ENGINE TAKEOFF TORQUE
PT6B-36A/B ENGINE EAPS/ANTI-ICE OFF

TEMP	PRESSURE ALTITUDE						
~ °C	-1000	0	1000	2000	3000	4000	5000
0	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100
4	100	100	100	100	100	100	99
6	100	100	100	100	100	100	
8	100	100	100	100	100	100	
10	100	100	100	100	100	100	
12	100	100	100	100	100	98	
14	100	100	100	100	100	96	
16	100	100	100	100	99		
18	100	100	100	100	98		
20	100	100	100	100	96		
22	100	100	100	99	95		
24	100	100	100	97	93		
26	100	100	99	95	91		
28	100	100	98	94			
30	100	100	96	92			
32	100	99	95	91			
34	100	97	93	89			
36	99	95	91	87			
38	97	93	89				
40	96	92	87				

ABOVE 5000 FT DENSITY ALTITUDE

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Figure 5-7. Elevated Helideck Target Dual Engine Takeoff Torque (Sheet 1 of 2)

ELEVATED HELIDECK OPERATIONS
TARGET DUAL ENGINE TAKEOFF TORQUE
PT6B-36A/B ENGINE EAPS/ANTI-ICE ON

TEMP	PRESSURE ALTITUDE						
~ ° C	-1000	0	1000	2000	3000	4000	5000
0	100	100	100	100	100	100	94
2	100	100	100	100	100	98	93
4	100	100	100	100	100	97	92
6	100	100	100	100	100	96	
8	100	100	100	100	98	94	
10	100	100	100	100	97	93	
12	100	100	100	100	96	92	
14	100	100	100	99	94	90	
16	100	100	100	98	93		
18	100	100	100	96	91		
20	100	100	99	94	90		
22	100	100	98	93	89		
24	100	100	96	91	87		
26	100	99	94	90	85		
28	100	97	93	88			
30	100	95	91	87			
32	98	94	90	85			
34	96	92	88	84			
36	94	90	86	82			
38	93	89	84				
40	91	87	82				

ABOVE 5000 FT DENSITY ALTITUDE

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Figure 5-7. Elevated Helideck Target Dual Engine Takeoff Torque (Sheet 2 of 2)

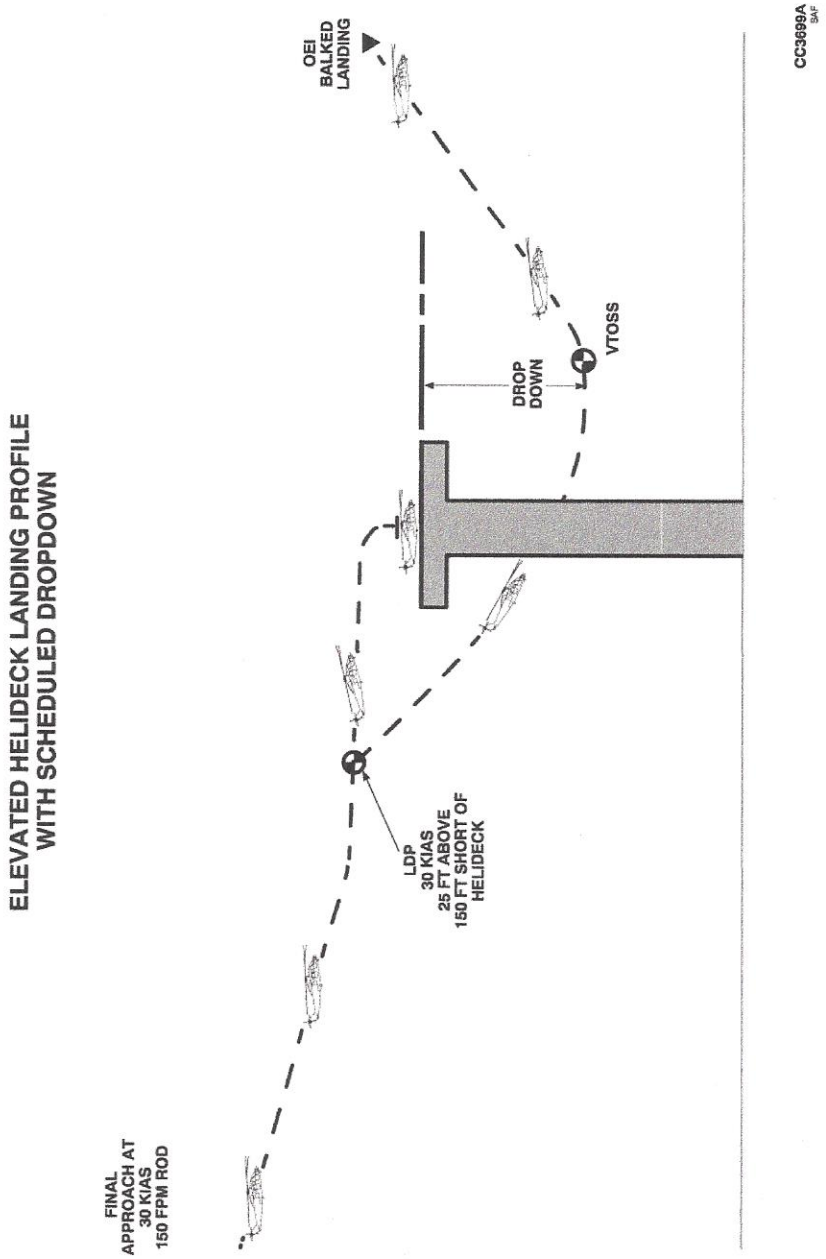

Figure 5-8. Elevated Helideck Landing Profile with Scheduled Dropdown