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**Civil Aviation Safety Authority**

**THE AUSTRALIAN  
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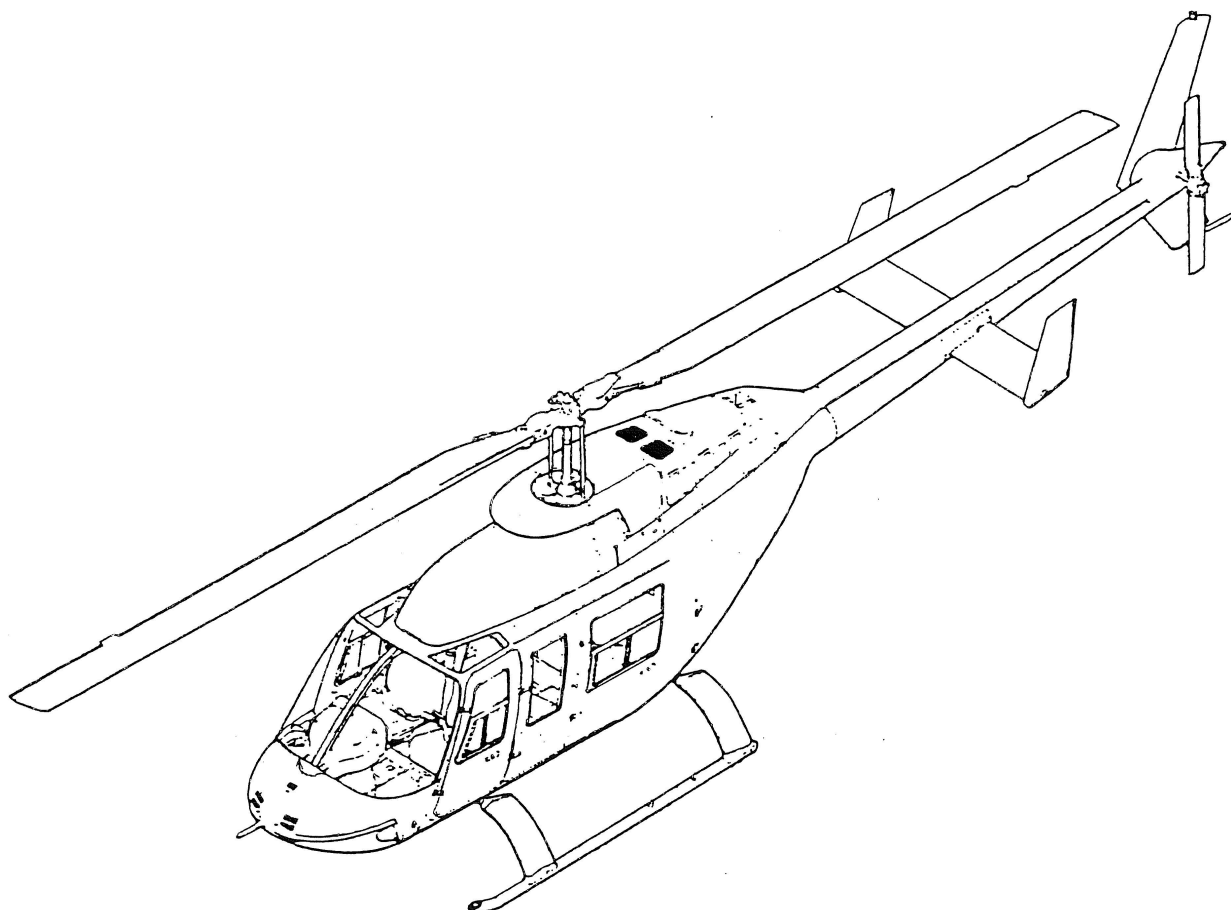
**(HELICOPTER)**

**BELL 206L-1 LONG RANGER II  
PERFORMANCE AND OPERATIONS HANDBOOK**

VERSION 2.1 NOVEMBER 1999  
REPRINTED MARCH 2016

# ***Bell***

Model 206L-1  
***LONG RANGER II***  
FLIGHT MANUAL  
(EXTRACT)



206L-1  
FLIGHT MANUAL

<b>WARNING</b>
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206L-1  
FLIGHT MANUAL

**CONTENTS**

Section 1 - Operating Limitations

Section 5 - Performance Data

Section 6 - Weight and Balance Data

Section 8 - Fuel and Oil

Section 9 - Charts



# **SECTION 1**

## **OPERATING LIMITATIONS**

### **OPERATING LIMITATIONS**

Compliance with the Limitations Section is required by appropriate operating rules. Anytime an operating limitation is exceeded, an appropriate entry shall be made in the helicopter logbook. The entry shall state which limit was exceeded, the duration of time, the extreme value attained, and any additional information essential in determining the maintenance action required.

### **BASIS OF CERTIFICATION**

This helicopter is certified under Civil Air Regulation, Part 6, Rotorcraft Airworthiness, Normal Category.

### **TYPE OF OPERATION**

In its basic configuration, the helicopter is approved as a seven place aircraft and is certified for land operation under day or night VFR non-icing conditions.

Flight operations are not permitted in falling or blowing snow to preclude engine flameout.

#### **NOTE**

All unsecured items shall be removed from cabin when any door is removed.

Flight, with any combination of door(s) OFF is approved. Refer to Airspeed Limitations.

Flight operations are approved with landing gear crosstube fairings installed or removed.

Acrobatic manoeuvres are prohibited.

### **FLIGHT WITH OPTIONAL EQUIPMENT INSTALLED**

Refer to appropriate Flight Manual Supplement(s) for additional Limitations, Procedures, and Performance Data.

## **FLIGHT CREW**

The minimum crew consists of one pilot. The right hand crew seat has been designated the first pilot station.

## **ALTITUDE LIMITATIONS**

Maximum operating Pressure altitude is 20,000 feet.

## **AIRSPEED LIMITATIONS**

### **NOTE**

All airspeed values are Indicated Airspeed (IAS)

Basic  $V_{NE}$  150 MPH (130 KIAS ) sea level to 3000 feet density altitude. Decrease  $V_{NE}$  for ambient conditions in accordance with Airspeed limitations Placard.

DOOR(S) OFF

$V_{NE}$  104 MPH (90 KIAS) with any door(s) off. Do not exceed placarded  $V_{NE}$ .

85 TO 100% TORQUE TAKEOFF POWER RANGE

$V_{NE}$  96 MPH (84 KIAS)

## **WEIGHT / C of G LIMITATIONS**

Maximum approved gross weight for takeoff and landing:

Internal 4050 pounds (1837.0 kilograms)

External 4250 pounds (1927.8 kilograms)

### **CAUTION**

Loads that result in gross weights above 4050 pounds shall be carried on the cargo hook and shall not be imposed on landing gear.

206L-1  
FLIGHT MANUAL

FRONT SEAT TOTAL WEIGHT LIMITS

Minimum 170 pounds (77.1 kilograms)

LONGITUDINAL CENTRE OF GRAVITY LIMITS

**NOTE**

Ballast as required to maintain weight empty CG within limits shown on Centre of Gravity Vs Weight Empty chart in Maintenance Manual.

Longitudinal centre of gravity limits vary between stations 118.0 (2997 mm) and 128.5 (3264 mm), depending upon gross weight. Refer to Gross weight Centre of Gravity Chart.

**NOTE**

Station 0 (reference datum) is located 55.1 inches (1400 mm) forward of forward jackpoint centreline.

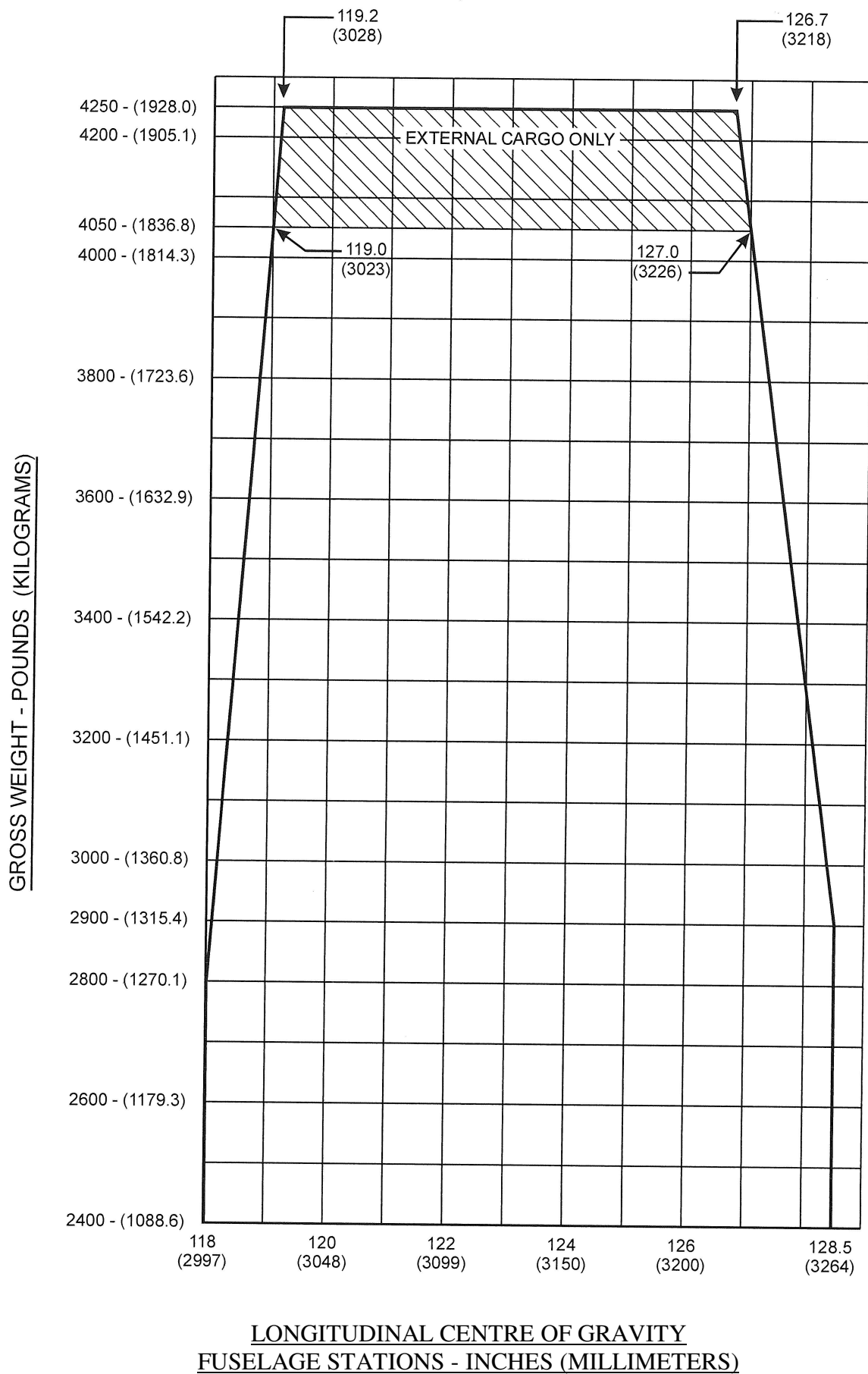
DOOR(S) OFF

Actual weight change shall be determined after doors, etc., have been removed and ballast readjusted, if necessary, to return empty weight centre of gravity to within allowable limits.

LATERAL CENTRE OF GRAVITY LIMITS

4.0 inches (102 mm) left of fuselage centre line  
3.5 inches (89 mm) right of fuselage centre line

# 206L-1 FLIGHT MANUAL



206L-1  
FLIGHT MANUAL

Placards and Stencils

AIRSPEED LIMITATIONS											
Hp $\frac{\text{ft}}{\sim 1000}$	0	2	4	6	8	10	12	14	16	18	20
OAT $\sim^{\circ}\text{C}$	$V_{NE} \sim \text{IAS} \sim \text{MPH}$										
46	150	-	-	-	-	-	-	-	-	-	-
40	150	146	-	-	-	-	-	-	-	-	-
20	150	150	145	138	131	123	116	-	-	-	-
0	150	150	150	145	138	130	123	115	108	101	93
-20	150	150	150	150	145	137	130	123	115	108	100
-40	147	142	138	132	128	123	119	114	110	105	101
-50	135	130	126	121	117	112	108	104	100	96	92

Placard with MPH airspeed indicator installed.

AIRSPEED LIMITATIONS											
Hp $\frac{\text{ft}}{\sim 1000}$	0	2	4	6	8	10	12	14	16	18	20
OAT $\sim^{\circ}\text{C}$	$V_{NE} \sim \text{IAS} \sim \text{KTS}$										
46	130	-	-	-	-	-	-	-	-	-	-
40	130	127	-	-	-	-	-	-	-	-	-
20	130	130	126	120	114	107	101	-	-	-	-
0	130	130	130	126	120	113	107	100	94	88	81
-20	130	130	130	130	126	119	113	107	100	94	87
-40	128	123	120	115	111	107	103	99	96	91	88
-50	117	113	109	105	102	97	94	90	87	83	80

Placard required with KNOTS airspeed indicator installed  
Hp is pressure altitude

206L-1  
FLIGHT MANUAL

Placards and Stencils (Cont)

SELECTIVE PASSENGER LOADING PLACARD

**THIS HELICOPTER MUST BE OPERATED  
IN COMPLIANCE WITH THE OPERATING  
LIMITATIONS SPECIFIED IN THE  
APPROVED HELICOPTER FLIGHT MANUAL.**

**MINIMUM COCKPIT WEIGHT 170 LBS.**

**SELECTIVE PASSENGER LOADING  
WHEN BOTH CREW SEATS ARE OCCUPIED  
ONLY ONE (1) MID PASSENGER IS  
PERMITTED UNLESS THERE ARE TWO (2)  
AFT PASSENGERS**

**REFER TO RFM WEIGHT AND BALANCE  
FOR ADDITIONAL LOADING INFORMATION**

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(These placards located on the inside of  
baggage compartment door)

**CARGO MUST BE SECURED IN ACCORDANCE WITH  
FLIGHT MANUAL INSTRUCTION**

**MAX ALLOWABLE WEIGHT 250 LBS.**  
**MAX ALLOWABLE WEIGHT PER SQ. FT. 86 LBS.**

## SECTION 5

# PERFORMANCE DATA

The Bell 206L-1 Long Ranger II performance data are contained in this section. The data listed on the graphs are derived from actual flight tests and are intended to provide information to be used in conducting flight operations.

### POWER CHECK PROCEDURES

The Power Check Chart indicates the minimum percent torque that must be available from an engine meeting the minimum Allison specification. The engine must develop these values in order to meet the performance data contained in this flight manual.

The takeoff power limits of the 250-C30F engine are:

Maximum Torque - 100% (5 minutes).

Maximum TOT (turbine outlet temperature) - 791°C (5 minutes)

Maximum gas producer RPM (NI) - 104%

To perform a Power Check, ensure that the PARTICLE SEP PRG switch is OFF and anti-ice is OFF. Adjust power until helicopter is stabilized in level flight at the maximum airspeed attainable within engine and airframe limits.

#### EXAMPLE:

Record the following information from cockpit instruments:

Outside Air Temperature - °C

Example 18°C

Turbine Outlet Temperature - °C

Example 740°C

Pressure Altitude - Ft.

Example 4000 ft.

Percent Torque - %

(Take your actual reading)

Enter Power Check Chart at observed OAT (Example 18°C), proceed vertically to intersection of TOT (Example 740°C) and follow horizontally to intersection with pressure altitude (Example 4000 ft), drop vertically to read chart percent torque (85%).

If actual reading of percent torque is the same or greater than the chart percent torque, engine power equals or exceeds minimum performance specification and performance data contained in this manual can be achieved.

If actual reading of percent torque is less than chart percent torque, engine power is less than minimum performance specification and all performance data contained in this manual cannot be achieved. Refer to the appropriate maintenance manual to determine cause of low power.

## **RATE OF CLIMB**

Rate of Climb Charts are presented for various combinations of power setting, and anti-ice and particle separator purge switch positions.

The rate of climb data shown in the graphs are termed 'TAPELINE RATE OF CLIMB', which means actual rate of climb. The rate of climb measured with an altimeter will show tapeline rates of climb only on a standard day, with a standard temperature lapse rate.

The following example is for use with rate of Climb - Maximum with Takeoff Power. The example is typical for use with all other Rate of Climb Charts.

### **EXAMPLE:**

Assume an ambient OAT of 10°C, a pressure altitude of 12,000 feet and a gross weight of 3600 lbs. (1632.9 kilograms) and anti-ice and particle separator purge switches - OFF

Enter temperature scale at 10°C, proceed vertically to intersection of the 12,000 feet pressure altitude curve; from this point move horizontally to the right to intersect the 3600 lb. (1632.9 Kg) gross weight line. Drop vertically and read a rate of clime of 1070 feet per minute.

### **RATE OF CLIMB - DOOR(S) OFF**

Reduce Rate of Climb Chart data 100 feet per minute when operating with any combination of door(s) OFF.

### **BEST RATE OF CLIMB**

Best Rate of Climb is:

CAS	IAS
60 MPH	66 MPH
52 kts	57 kts



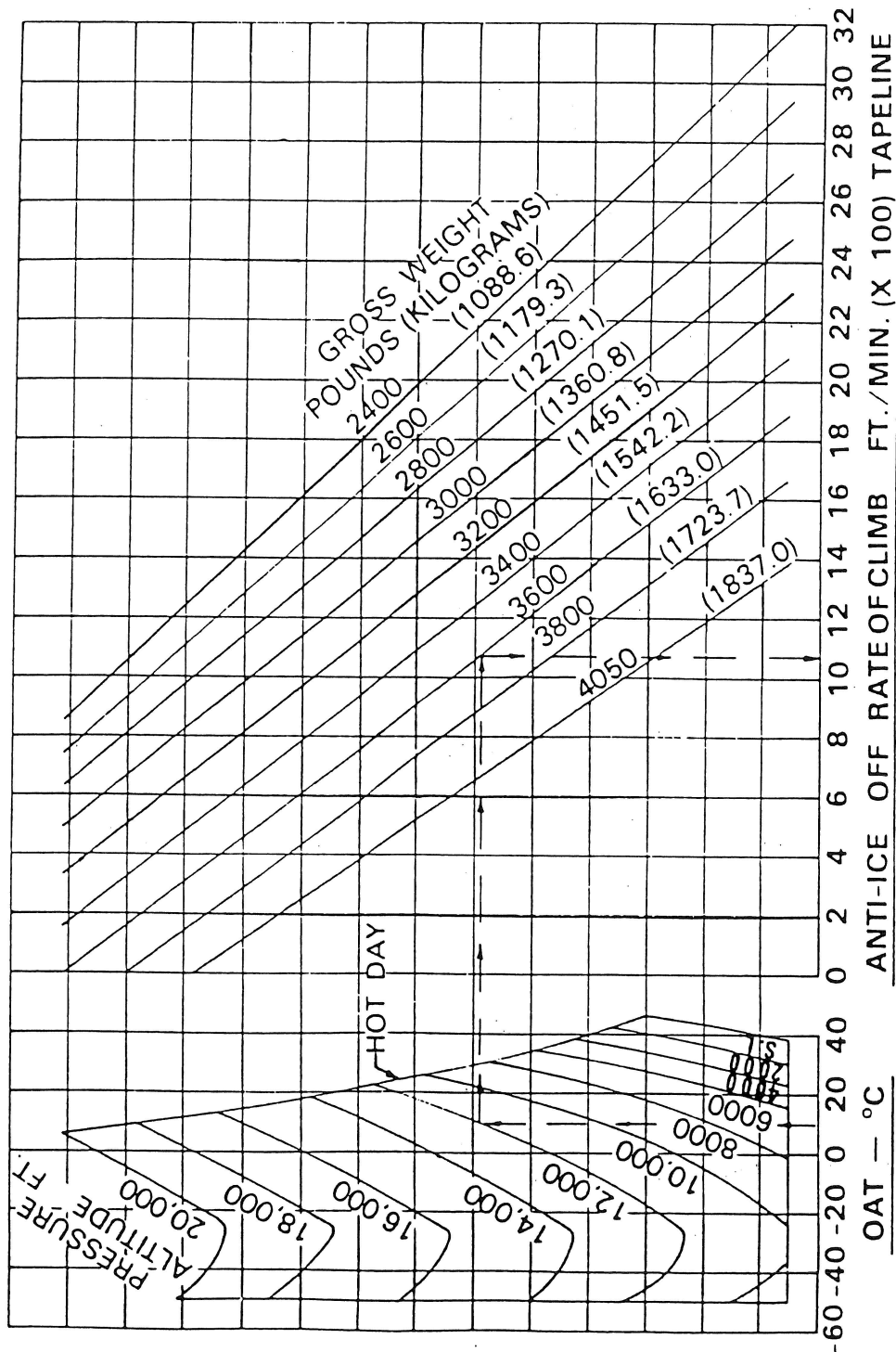
## RATE OF CLIMB — MAXIMUM

## TAKEOFF POWER

ANTI-ICE OFF

**GENERATOR 28.2 AMPS**  
**IAS 66 MPH (57 KNOTS)**

PART SEP PRG — OFF  
ENGINE RPM 100%



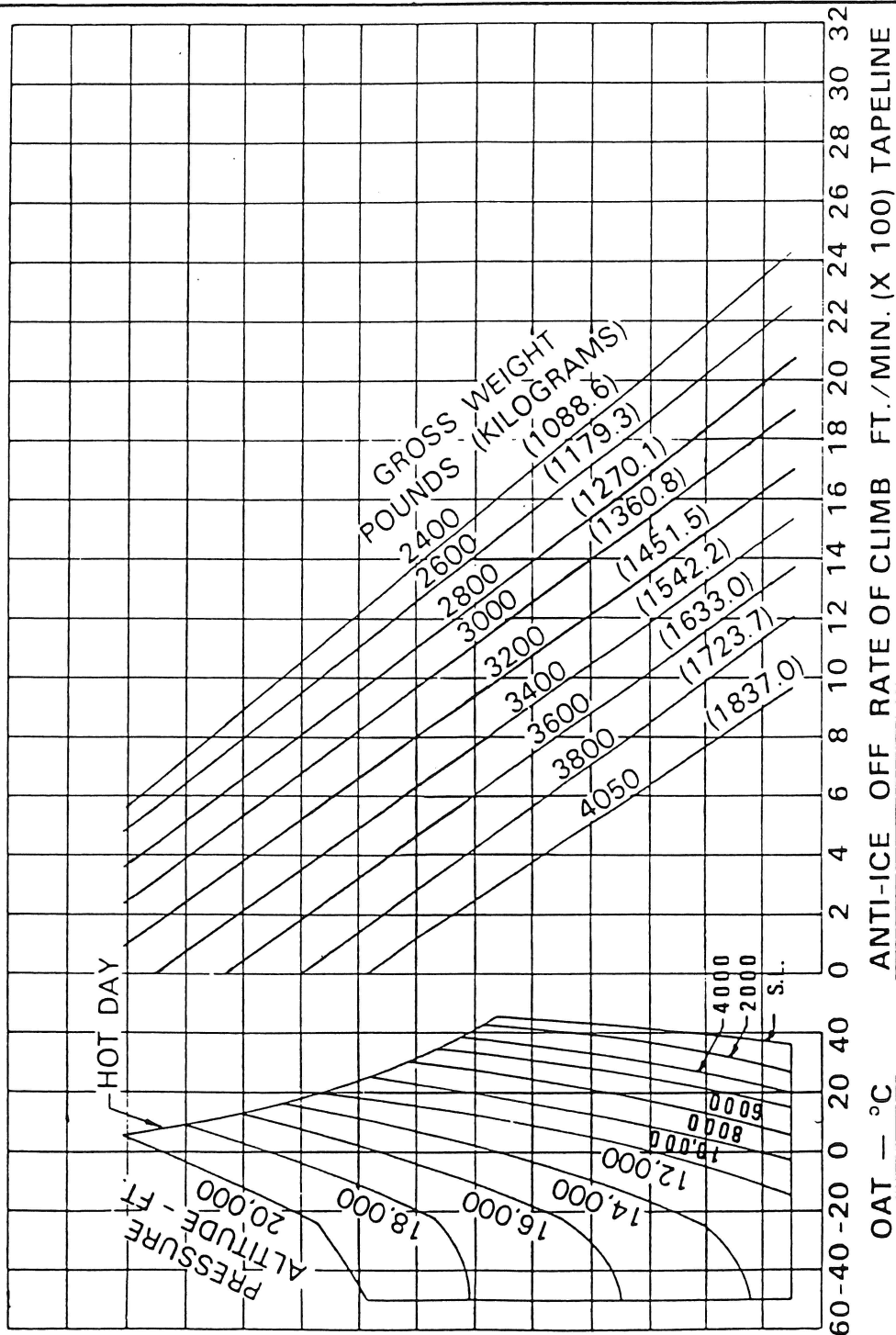
# RATE OF CLIMB — MAXIMUM

MAX CONTINUOUS POWER

ANTI-ICE OFF

GENERATOR 28.2 AMPS  
IAS 66 MPH (57 KNOTS)

PART SEP PRG — OFF  
ENGINE RPM 100%



## **OPERATION IN ALLOWABLE RELATIVE WIND**

Satisfactory stability and control has been demonstrated in relative winds of 20 MPH (17 knots) sideward and rearward at all loading conditions within Area A of Hover Ceiling Charts.

### **IGE AND OGE HOVER CEILING CHARTS**

The IGE and OGE Hover Ceiling Charts present hover performance (allowable gross weight) for various anti-ice and particle separator purge switch positions for conditions of pressure altitude and OAT. Each chart is divided into two areas.

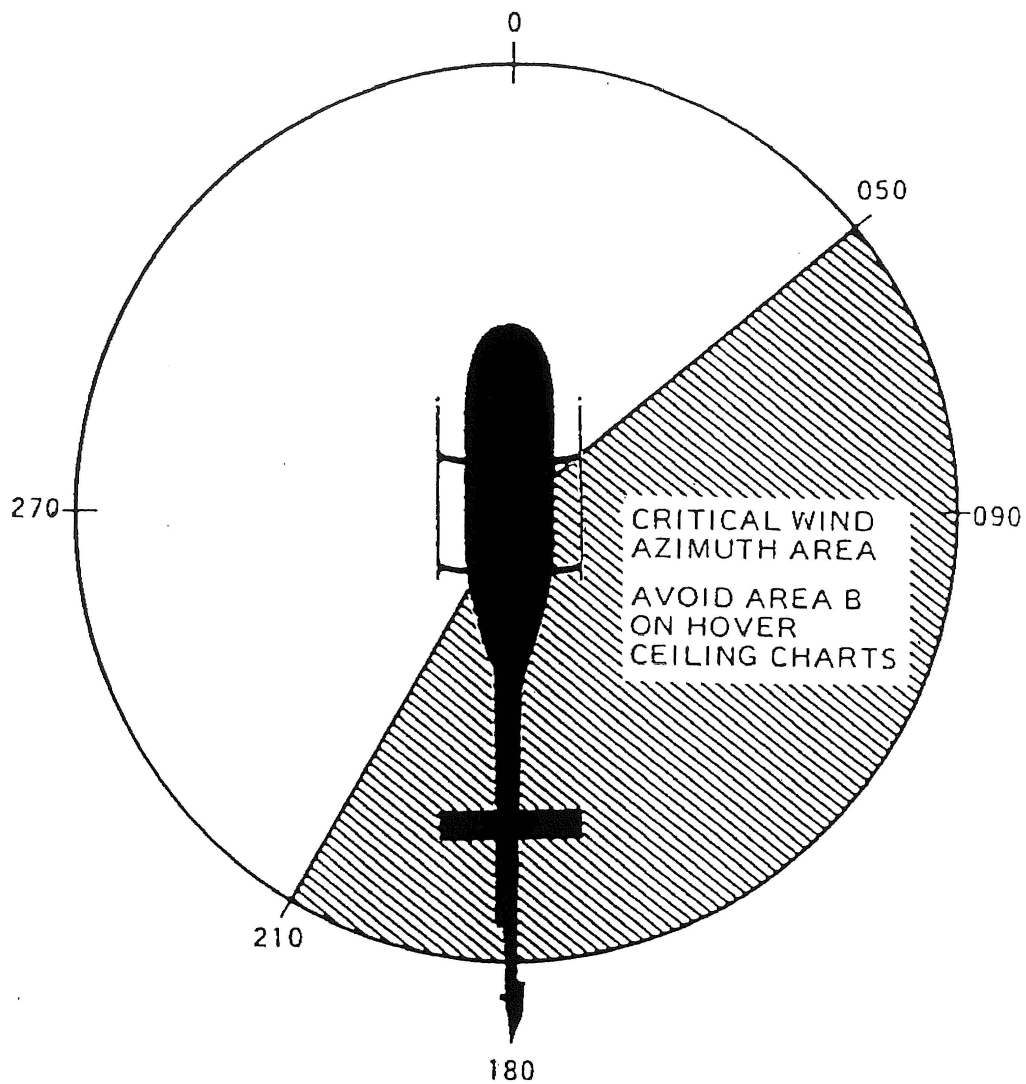
AREA A (White Area) as shown on the hover ceiling charts present hover performance for which controllability has been demonstrated in all relative wind conditions up to 20 MPH (17 knots).

#### **NOTE**

Engine TOT will rise noticeably when hovering downwind.  
Avoid hovering downwind when operating near TOT limits.

AREA B (Shaded area) as shown on hover ceiling charts present additional hover performance which can be realized in CALM WINDS or winds outside the CRITICAL RELATIVE WIND AZIMUTH AREA.

206L-1  
FLIGHT MANUAL



CRITICAL RELATIVE WIND AZIMUTH AREA

**NOTE**

Tail rotor control margin and/or control of engine temperature (TOT) may preclude operation in AREA B of the Hover Ceiling Charts when the relative wind is in the Critical Wind Azimuth Area.

## **HOVER CEILING**

The following example is for use with the Hover Ceiling in-ground-effect, takeoff power, anti-ice OFF, particle separator purge - OFF chart and is typical for use of all other Hover Ceiling Charts.

### **EXAMPLE**

What gross weight hover capability could be expected at a site having the following conditions:

Pressure Altitude = 10,000 ft.

Outside Air Temperature = 20°C

For the above example the pilot must refer to the 0°C to 46°C Hover Ceiling Charts.

From the appropriate IGE Chart obtain:

A maximum of 3430 pounds (1555.5 kilograms) for all allowable wind conditions, and a maximum of 3900 pounds (1768.7 kilograms) when wind conditions are calm or outside the critical wind azimuth area.

From the appropriate OGE Chart obtain:

A maximum of 3300 pounds (1496.6 kilograms) for all allowable wind conditions. Notice that for this example the helicopter reaches an engine limit (20°C) and a controllability limit (Area B) at the same gross weight.

### **NOTE**

The In-Ground-Effect (IGE) and Out-Of-Ground-Effect (OGE) Hover Ceiling Charts are presented separately for the temperatures from 0°C to 46°C and for temperatures from 0°C to -25°C, only for clarity of presentation.

## HOVER CEILING

IN GROUND EFFECT  
0° TO 46°C

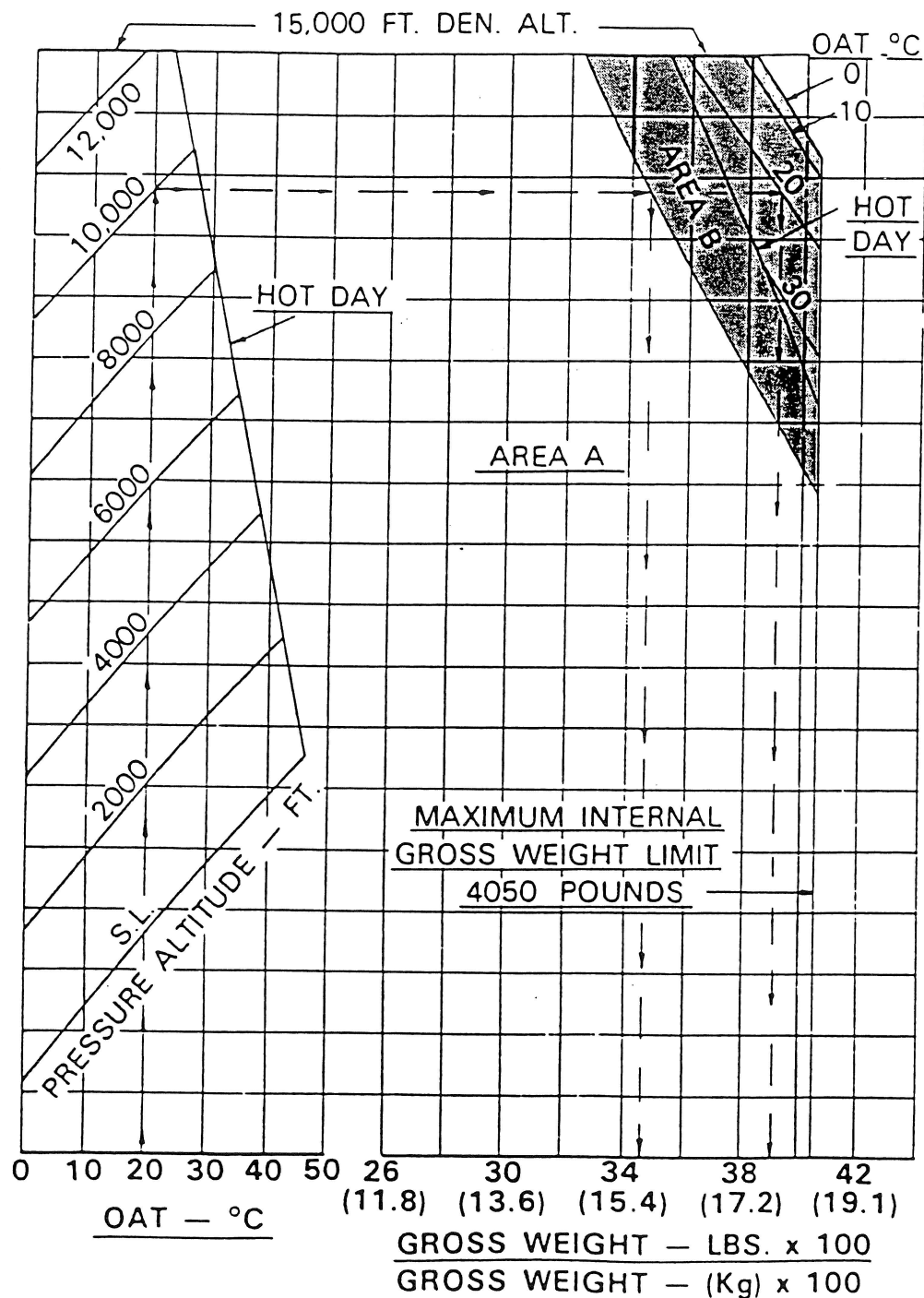
TAKEOFF POWER  
ANTI-ICE OFF

GENERATOR 28.2 AMPS

PART SEP PRG — OFF

SKID HEIGHT 2.5 FT. (0.7 METERS)

ENGINE RPM 100%



## HOVER CEILING

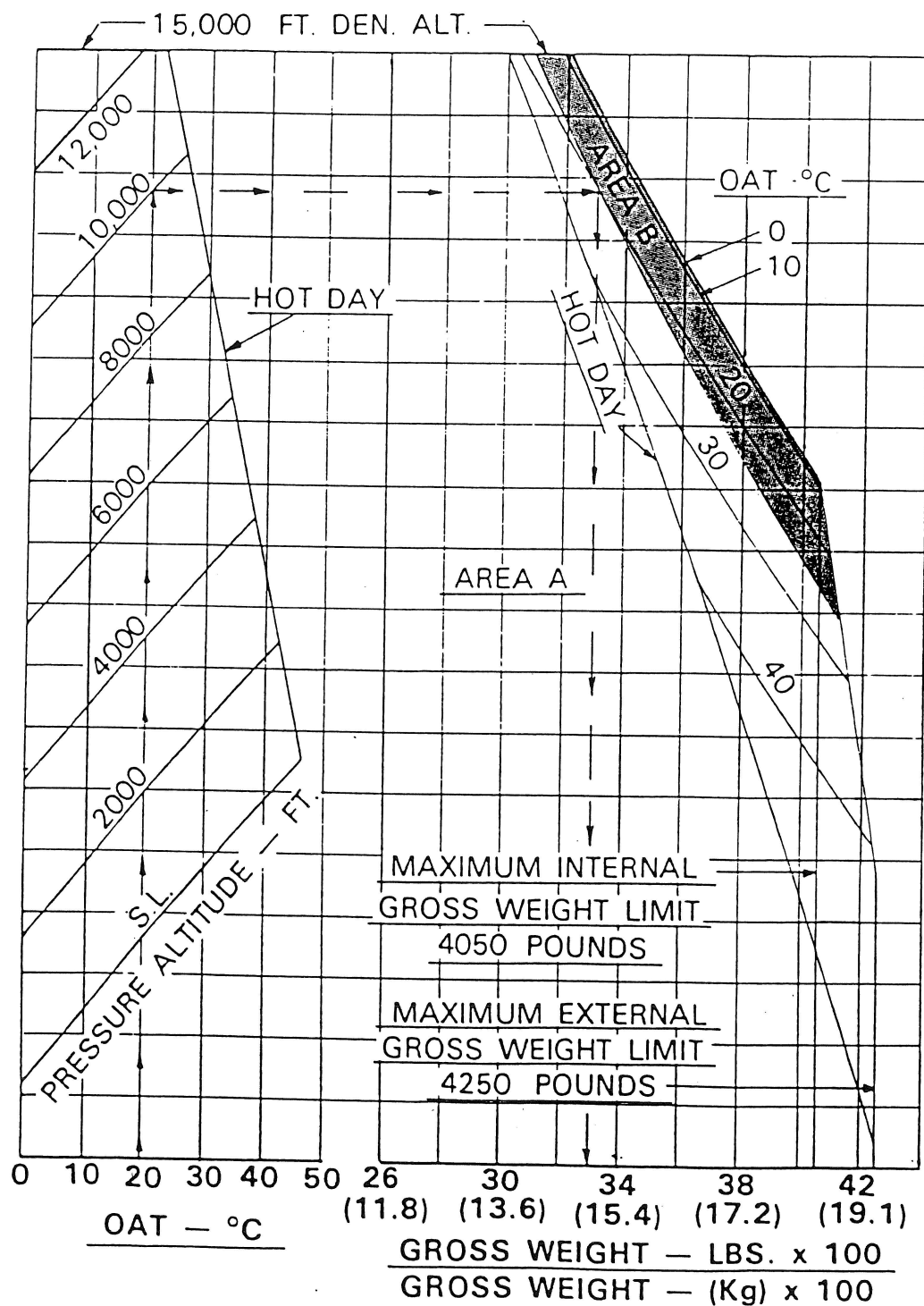
OUT OF GROUND EFFECT  
0° TO 46°C

TAKEOFF POWER  
ANTI-ICE OFF

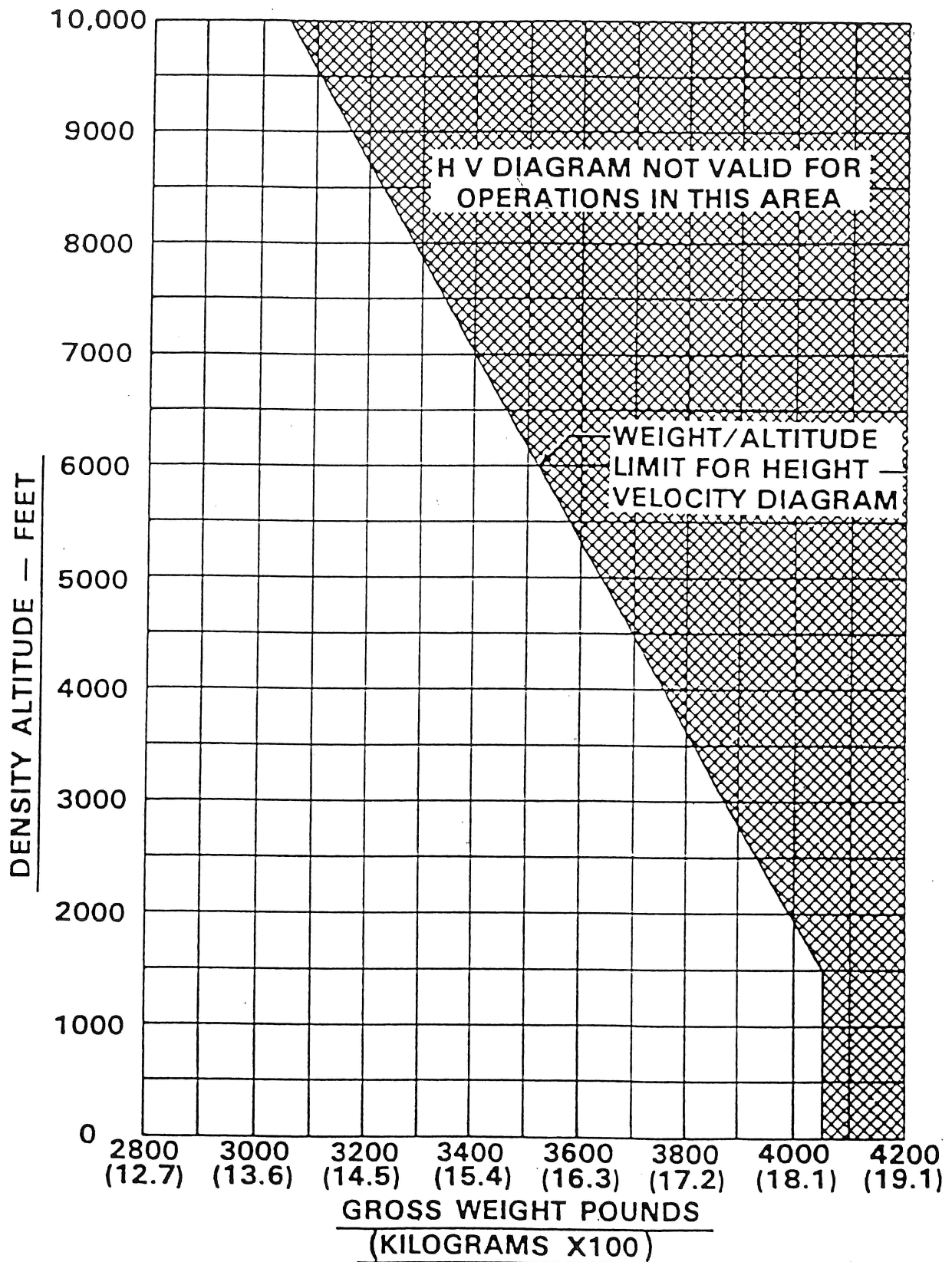
GENERATOR 28.2 AMPS

PART SEP PRG — OFF

SKID HEIGHT 40 FT. (12.2 METERS) ENGINE RPM 100%



## ALTITUDE VS GROSS WEIGHT LIMIT FOR HEIGHT-VELOCITY DIAGRAM

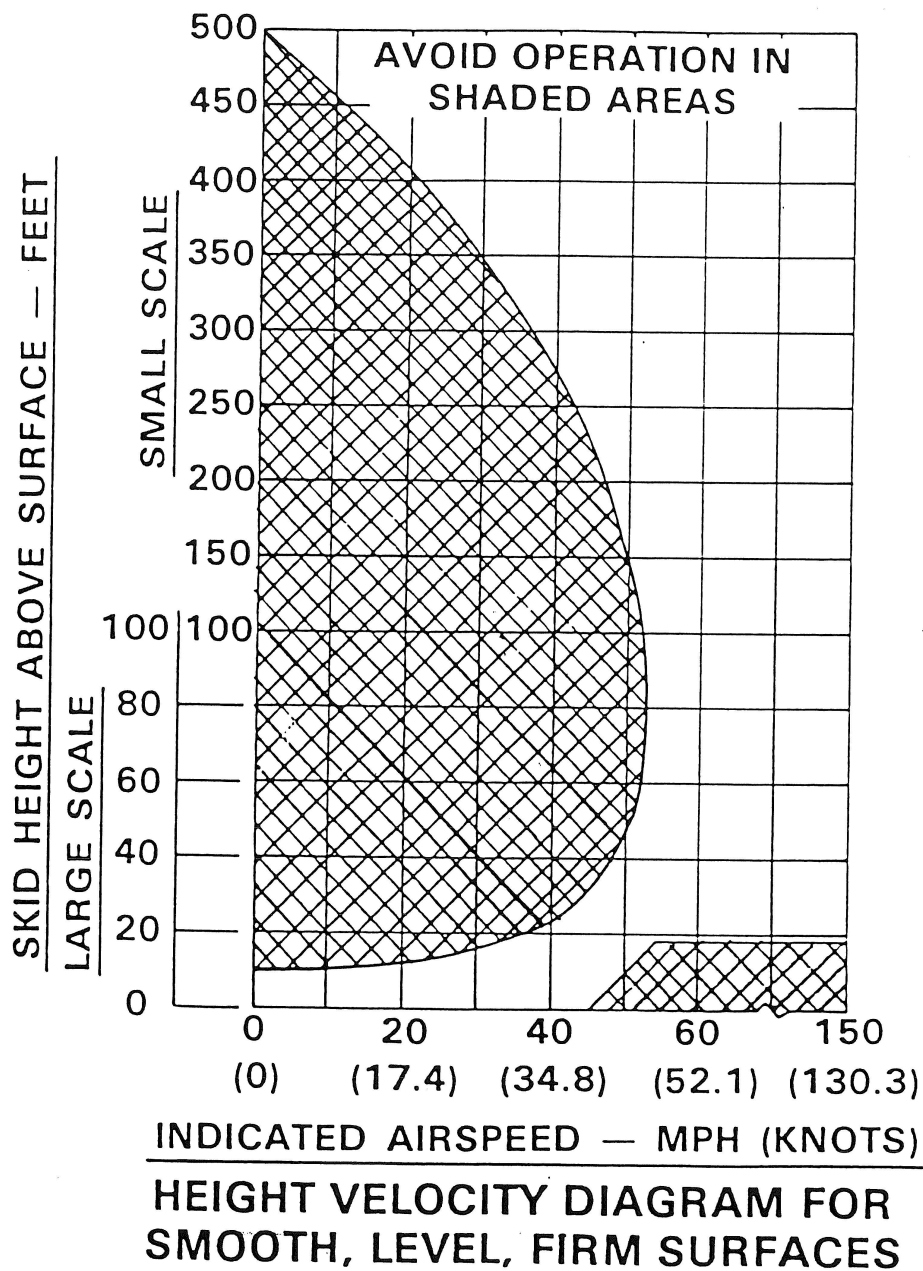




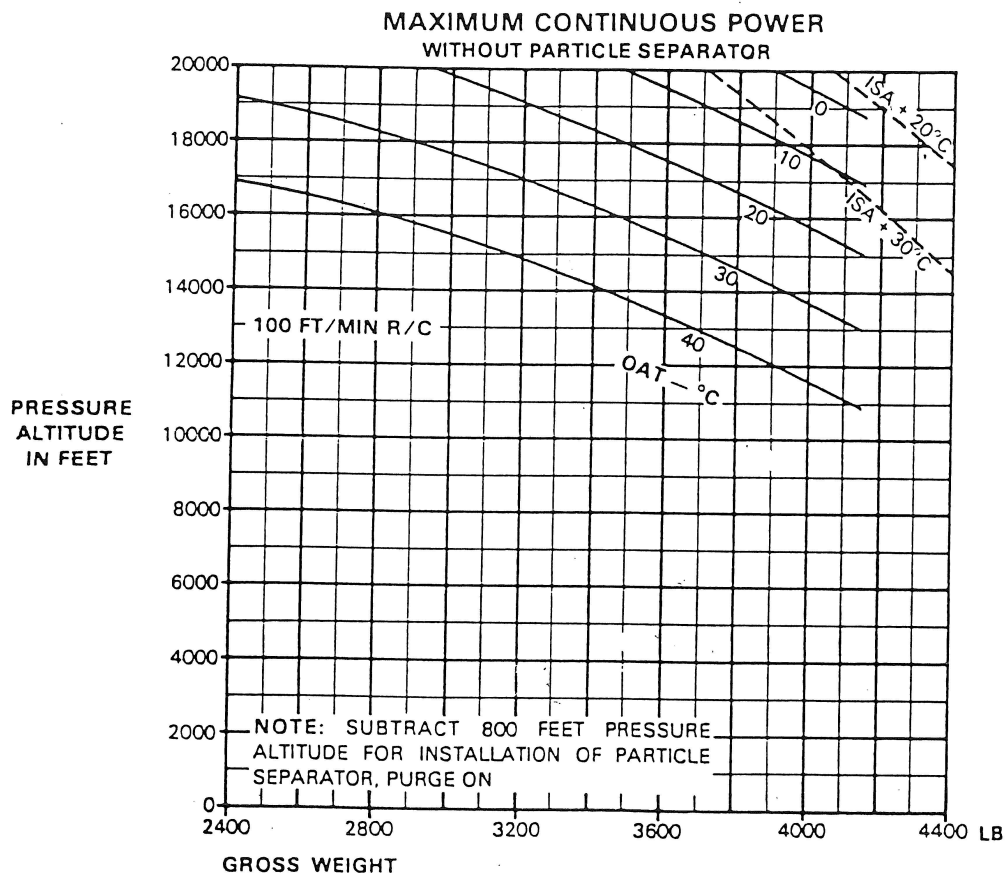
206L-1  
FLIGHT MANUAL

HEIGHT VELOCITY DIAGRAM

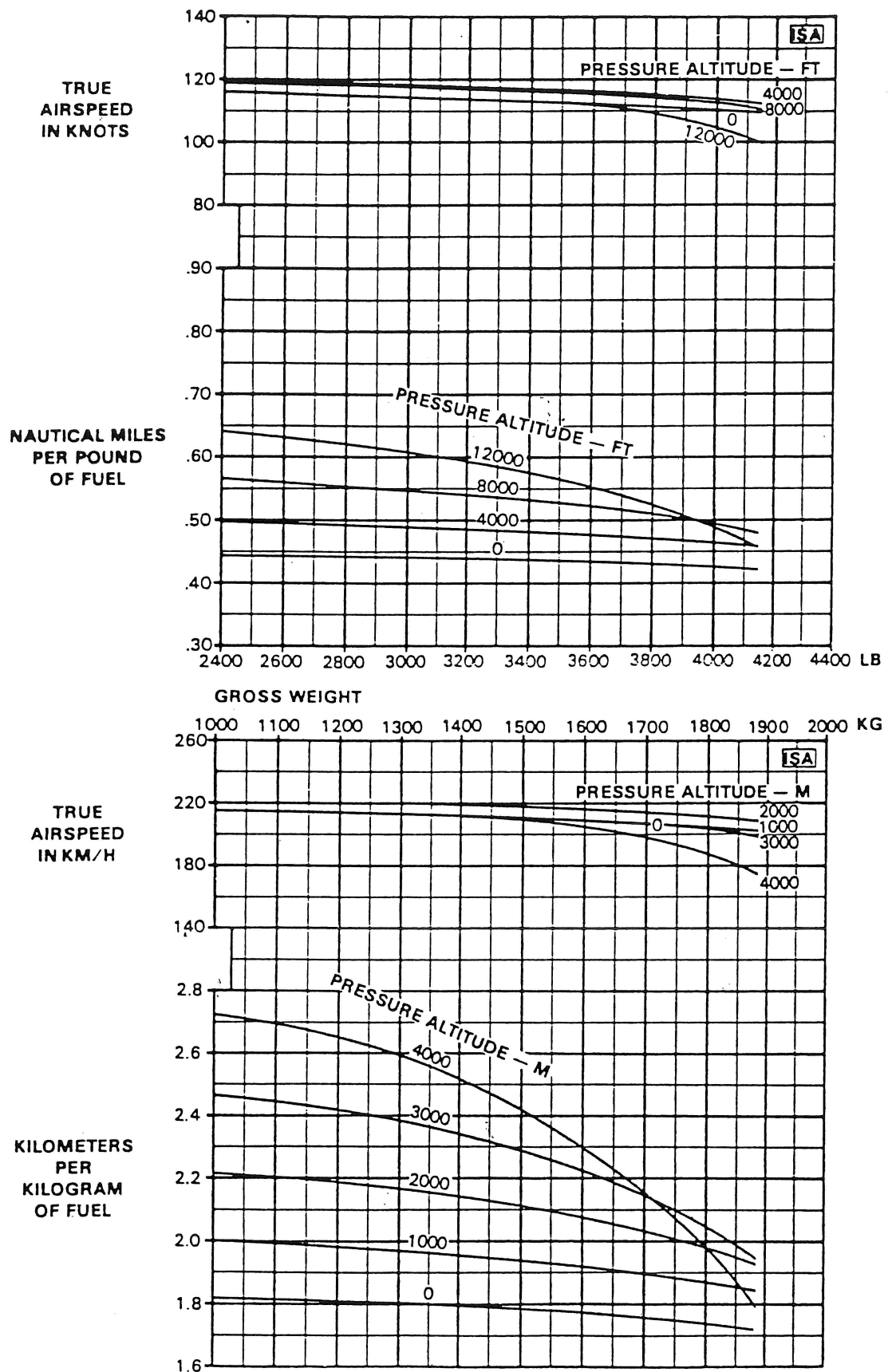
The Height-Velocity Diagram defines the conditions from which a safe landing can be made on a smooth, level, firm surface following an engine failure. The Height-Velocity Diagram is valid only when the helicopter gross weight does not exceed the limits of the Altitude Versus Gross Weight Limit for Height-Velocity Diagram.



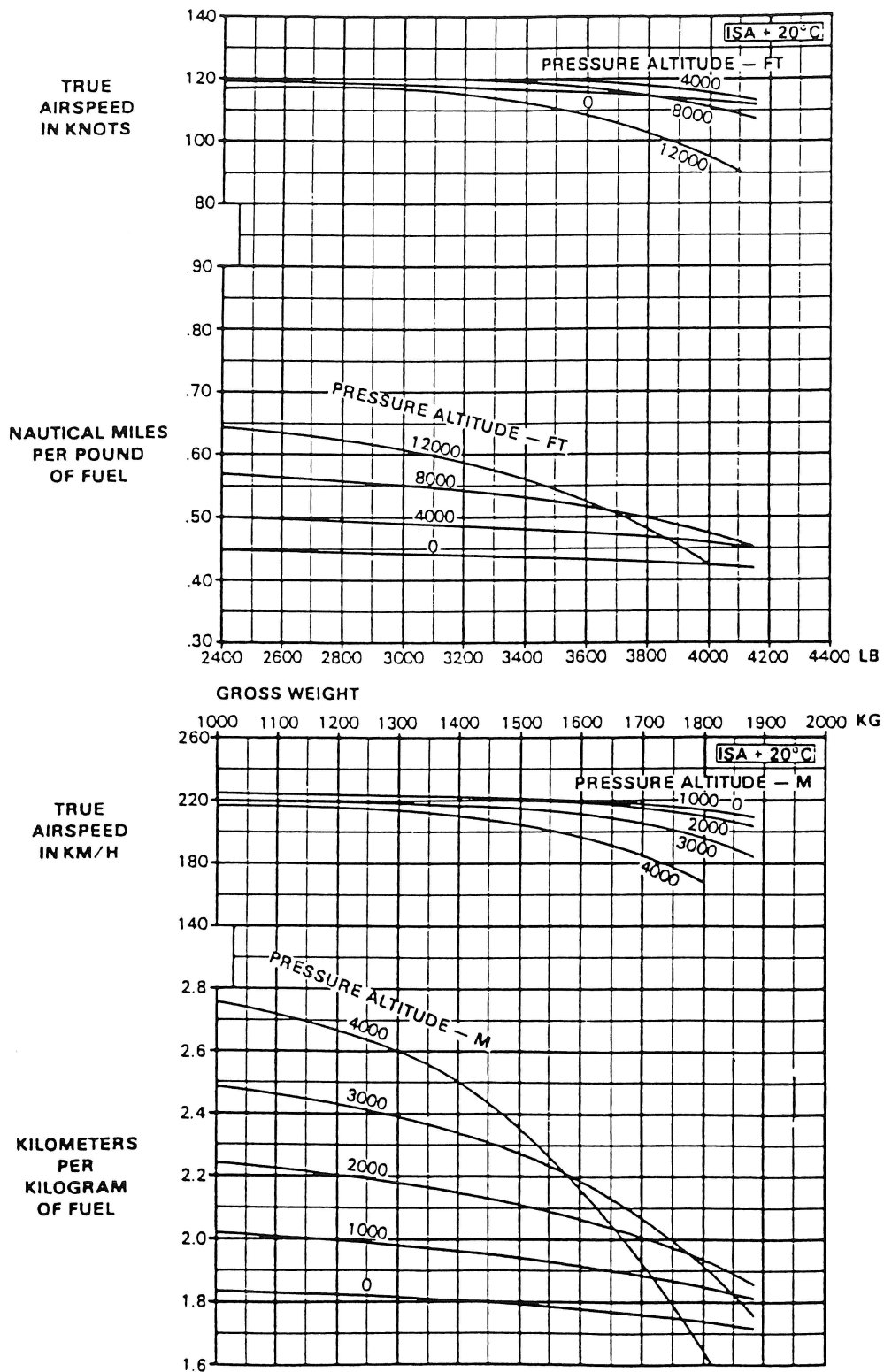
## SERVICE CEILING



## LONG RANGE CRUISE



## LONG RANGE CRUISE



## **SECTION 6**

### **WEIGHT AND BALANCE DATA**

#### **WEIGHT EMPTY CENTRE OF GRAVITY**

The empty weight consists of the basic helicopter with required equipment, optional equipment kits, transmission and gearbox oils, hydraulic fluid, unuseable fuel, undrainable engine oil, and fixed ballast. The empty weight centre of gravity shall be adjusted within the limits of the applicable Weight Empty Centre of Gravity chart.

#### **GROSS WEIGHT CENTRE OF GRAVITY**

It shall be the pilots responsibility to ensure that the helicopter is properly loaded so that the entire flight is conducted within the limits of the Gross Weight Centre of Gravity chart in Section 1. The gross weight centre of gravity may be calculated from the helicopter Actual Weight Record (historical records) and the Loading Tables in this section or in appropriate Flight Manual Supplements to assure safe loading.

#### **COCKPIT AND CABIN LOADING**

A minimum crew weight of 170 pounds (77.1 kilograms) in the cockpit is required. Passengers may be loaded in any sequence if only one crew seat is occupied. If both crew seats are occupied, only one mid passenger is permitted unless there are two aft passengers. If any doors are removed gross weight CG shall be computed.

The passenger compartment loading limit is 75 pounds per square foot.

#### **FUEL LOADING**

At the beginning of any flight with full fuel on board, the CG of the fuel moves forward as it is consumed. This occurs because fuel is consumed from the aft fuel cell first. The maximum forward CG condition of the fuel occurs when 62.5 gallons (236.6 litres / 192.8 kg) remain. The CG then begins to move aft as the fuel is consumed from the forward fuel cells. The maximum aft CG condition of the fuel occurs when 39.8 gallons (150.6 litres / 122.7 kg) remain. The CG then begins to move forward again as the remaining fuel is consumed. With normal crew and passenger loading, gross weight CG should remain within limits at any fuel quantity.

#### **BAGGAGE COMPARTMENT LOADING**

The baggage compartment is accessible from the left side of the fuselage and contains approximately 16 cubic feet of space. The baggage compartment has a load limit of 250 pounds (113.4 kg) at 86 pounds per square foot. This is a structural limit only and does not infer that the CG will remain within approved limits. When weight is loaded into the baggage compartment,

206L-1  
FLIGHT MANUAL

indiscriminate crew, passenger and fuel loading can no longer be assumed and the pilot must compute gross weight CG to assure loading within approved limits.

Loading of the baggage compartment should be from front to rear. The load shall be secured to tiedown fittings if shifting of the load in flight could result in structural damage to the baggage compartment or in gross weight centre of gravity limits being exceeded. The centre of gravity shall be computed with the load in the most adverse position.

## **WEIGHT AND BALANCE DIAGRAMS AND LOADING TABLES**

### HELICOPTER STATIONS DIAGRAM

Several significant helicopter stations are shown.

### CENTRE OF GRAVITY VS. WEIGHT EMPTY CHART

Refer to Maintenance Manual.

### FUEL LOADING TABLES

Fuel loading tables are provided for commercial jet fuels ASTM Type Jet B (JP-4) and types A and A-1 (JP-5). Fuel quantities are listed, with their moments, in 5-gallon increments from 5 gallons through to 98.4 gallons, which is total fuel capacity.

### CABIN AND BAGGAGE COMPARTMENT TABLE OF MOMENTS

This table provides the weight and moment for each passenger station location. The chart also contains a moments column for litter patient(s) and baggage compartment. Weights and their moments are listed in 10-pound increments starting with 40 pounds and ending at 350 pounds. To find moments for weights in excess of 350 pounds, calculate the weight in excess of 350 pounds. Add the appropriate moment for the excess weight to the moment for 350 pounds. This will give the desired moment for the total weight.

#### EXAMPLE:

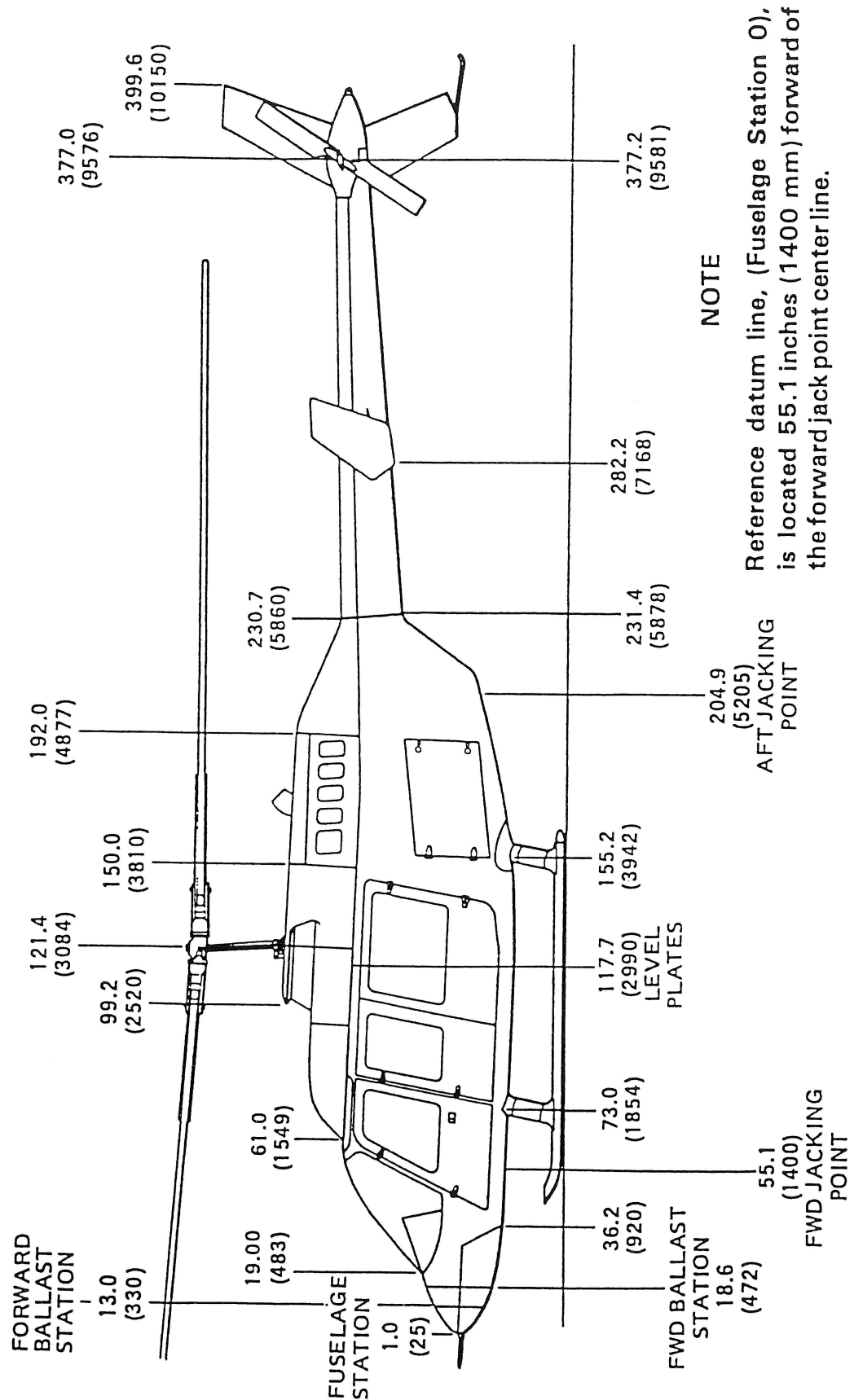
Find the moment for a 450 pound load in the aft seat

#### SOLUTION:

450 pounds - 350 pounds = 100 pounds

WEIGHT	MOMENT
350 lbs	45150
+100 lbs	12900
 TOTAL WEIGHT	 TOTAL MOMENT
450 LBS	58050

## STATIONS DIAGRAM



### NOTE

Reference datum line, (Fuselage Station 0), is located 55.1 inches (1400 mm) forward of the forward jack point center line.

206L-1  
FLIGHT MANUAL

**SAMPLE LOADING PROBLEM (ENGLISH UNITS)**

A helicopter is chartered to transport 4 passengers plus pilot and 200 pounds of baggage for a trip that will require approximately 83 gallons of Jet A or A-1 (JP-5) fuel. The 200 pound pilot will return alone. Determine gross weights and extreme CG conditions for both trips.

**OUTBOUND FLIGHT**

ITEM	WEIGHT (lbs.)	ARM / CG (INCHES)	MOMENT
Weight Empty	2250	130.8	294300
+Oil	13	205	2665
+Pilot	200	65	13000
+Forward Passenger	200	65	13000
+(1) mid Passenger	180	91	16380
+(2) Aft Passengers	320	129	41280
+Baggage	200	174	34800
Zero Fuel	3363		415425
+Fuel (JP-5) To Full	669.1	130.4	87251
Takeoff CG	4032.1	124.7	502676
-Fuel to most Fwd Fuel	-244.1		-35911
Most Forward CG	3788	123.2	466765
-Fuel to most Aft Fuel	-154.4		-13375
Most Aft CG	3633.6	124.8	453390
-Fuel to landing	-168.6		-24052
Landing CG	3465	123.9	429338

**RETURN FLIGHT**

ITEM	WEIGHT (lbs.)	ARM / CG (INCHES)	MOMENT
Weight Empty	2250	130.8	294300
+Oil	13	205	2665
+Pilot	200	65	13000
Zero Fuel	2463		309965
+Fuel (JP-5) To Full	669.1		87251
Takeoff CG	3132.1	126.8	397216
-Fuel to most Fwd Fuel	-244.1		-35911
Most Forward CG	2888	125.1	361305
-Fuel to most Aft Fuel	-154.4		-13375
Most Aft CG	2733.6	127.3	347930
-Fuel to landing	-168.6		-24052
Landing CG	2565	126.3	323878

A check of the takeoff, landing, and critical CG conditions against the Centre of Gravity VS Gross Weight chart in section 1 verified that the entire operation can be conducted within approved limits.



206L-1  
FLIGHT MANUAL

**SAMPLE LOADING PROBLEM (METRIC UNITS)**

A helicopter is chartered to transport 4 passengers plus pilot and 90.7 kg of baggage for a trip that will require approximately 312 litres of Jet A or A-1 (JP-5) fuel. The 90.7 kg pilot will return alone. Determine gross weight and extreme CG conditions for both trips.

**OUTBOUND FLIGHT**

ITEM	WEIGHT (kg.)	ARM / CG (mm)	MOMENT/100
Weight Empty	1020.6	3322.3	33907.4
+Oil	5.9	5207.0	307.2
+Pilot	90.7	1651.0	1497.5
+Forward Passenger	90.7	1651.0	1497.5
+(1) mid Passenger	81.6	2311.4	1886.1
+(2) Aft Passengers	145.1	3276.6	4754.3
+Baggage	90.7	4419.6	4008.6
Zero Fuel	1525.3		47858.6
+Fuel (JP-5) To Full	303.5		10051.9
Takeoff CG	1828.8	3166.6	57910.5
-Fuel to most Fwd Fuel	-110.7		-4136.8
Most Forward CG	1718.1	3129.8	53773.7
-Fuel to most Aft Fuel	-70.1		-1542.1
Most Aft CG	164.8	3169.4	52231.6
-Fuel to landing	-73.8		-2677.6
Landing CG	1574.2	3147.9	49554

**RETURN FLIGHT**

ITEM	WEIGHT (kg)	ARM / CG (mm)	MOMENT/100
Weight Empty	1020.6	3322.3	33907.4
+Oil	5.9	5207.0	307.2
+Pilot	90.7	1651.0	1497.5
Zero Fuel	1117.2		35712.1
+Fuel (JP-5) To Full	303.5		10051.9
Takeoff CG	1420.7	3221.2	45764.0
-Fuel to most Fwd Fuel	-110.7		-4136.8
Most Forward CG	1310	3177.6	41627.2
-Fuel to most Aft Fuel	-70.1		-1542.1
Most Aft CG	1239.9	3232.9	40085.1
-Fuel to landing	-73.8		-2677.6
Landing CG	1166.1	3207.9	37407.5

A check of the takeoff, landing, and critical CG conditions against the Centre of Gravity VS Gross Weight chart in section 1 verified that the entire operation can be conducted within approved limits.

206L-1  
FLIGHT MANUAL

**RECORD OF WEIGHT ALTERATIONS**

BELL HELICOPTER AUSTRALIA (W/O 3772)	AIRCRAFT  VH-	TYPE  BELL 206L-1	DATUM B/L_ '0' C/L of helicopter
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REWEIGH AIRCRAFT ON OR BEFORE \_\_\_\_\_ TBA \_\_\_\_\_

AIRCRAFT TYPE MAXIMUM GROSS WEIGHT \_\_\_\_\_ (INTERNAL) 1837.0 kg  
\_\_\_\_\_ (EXTERNAL) 1927.8 kg

**THIS AIRCRAFT**

AS WEIGHED EMPTY WEIGHT	1020.6 kg
AS WEIGHED EMPTY LONGITUDINAL ARM	3322.3 mm
AS WEIGHED EMPTY LONGITUDINAL MOMENT /100	33907.4 kg/mm

**MANUFACTURER'S LONGITUDINAL LIMITS**

Refer to Gross Weight Centre of Gravity chart, Section 1, Flight Manual, for longitudinal limits.

**MANUFACTURER'S LATERAL LIMITS**

Lateral limit is 102mm left of fuselage centre line and 89mm right of fuselage centre line.

**CONFIGURATION AT TIME OF WEIGHING**

Empty weight includes litter provisions, cargo hook, 2 x portable fire extinguishers, 2 x first aid kits.

206L-1  
FLIGHT MANUAL

FUEL LOADING TABLE  
ASTM TYPE JET A AND A-I (JP-50)

**U.S. GALLONS**

Gal.	Weight 6.8 lbs/gal	CG (in)	Moment (in-lbs)	Gal.	Weight 6.8 lbs/gal	CG (in)	Moment (in-lbs)
□ 0	0	0	0	60	408.0	122.8	50102
5	34.0	131.5	4471	**62.5	425.0	120.8	51340
10	68.0	135.5	9214	65	442.0	121.7	53791
15	102.0	136.4	13913	70	476.0	123.6	58834
20	136.0	137.0	18632	75	510.0	125.2	63852
25	170.0	137.4	23358	80	544.0	126.7	68925
30	204.0	138.1	28172	85	578.0	127.9	73926
*39.8	270.6	140.3	37965	90	612.0	129.0	78948
45	306.0	135.7	41524	95	646.0	129.8	83851
50	340.0	131.4	44676	△ 98.4	669.1	130.4	87251
55	374.0	127.2	47573				

**LITERS**

Litres	Weight (Kg) 0.81 Kg/Lit	CG (mm)	Moment (mm-Kg)/100	Litres	Weight (Kg) 0.81 Kg/Lit	CG (mm)	Moment (mm-Kg)/100
0	0	0	0	210	171.2	3216	5505.8
15	12.2	3282	400.4	225	183.4	3129	5738.6
30	24.5	3426	839.4	**236.6	192.8	3068	5915.1
45	36.7	3452	1266.9	240	195.6	3078	6020.6
60	48.9	3467	1695.4	255	207.8	3119	6481.3
75	61.1	3480	2126.3	270	220.0	3155	6941.0
90	73.4	3487	2559.5	285	232.3	3183	7394.1
105	85.6	3500	2996.0	300	244.5	3213	7855.8
120	97.8	3518	3440.6	315	256.7	3241	8319.6
135	110.0	3541	3895.1	330	269.0	3261	8772.1
*150.6	122.7	3564	4373.0	345	281.2	3282	9229.0
165	134.5	3470	4667.2	360	293.4	3299	9679.3
180	146.7	3381	4959.9	372.4	303.5	3312	10051.9
195	158.9	3302	5246.9				

\* Critical Fuel for Most AFT CG condition

\*\* Critical Fuel for Most FWD CG condition

**OIL**

For CG calculations use the following standard data

	WT	CG	MOMENT
English units	13 LBS	205 IN.	2665 IN LBS
Metric units	5.9 KGS	5207.0 MM	307 MM KGS / 100

206L-1  
FLIGHT MANUAL

CABIN BAGGAGE COMPARTMENT  
TABLE OF MOMENTS  
POUNDS

<b>Weight (Pounds)</b>	<b>Front Seat F.S. 65</b>	<b>Mid-Pass (Facing Aft) F.S. 91</b>	<b>Aft-Pass (Facing Fwd.) F.S. 129</b>	<b>Litter Patient(s) F.S. 108</b>	<b>Baggage F.S. 174</b>
40	2600	3640	5160	4320	6960
50	3250	4550	6450	5400	8700
60	3900	5460	7740	6480	10440
70	4550	6370	9030	7560	12180
80	5200	7280	10320	8640	13920
90	5850	8190	11610	9720	15660
100	6500	9100	12900	10800	17400
110	7150	10010	14190	11880	19140
120	7800	10920	15480	12960	20880
130	8450	11830	16770	14040	22620
140	9100	12740	18060	15120	24360
150	9750	13650	19350	16200	26100
160	10400	14560	20640	17280	27840
170	11050	15470	21930	18360	29580
180	11700	16380	23220	19440	31320
190	12350	17290	24510	20520	33060
200	13000	18200	25800	21600	34800
210	13650	19110	27090	22680	36540
220	14300	20020	28380	23760	38280
230	14950	20930	29670	24840	40020
240	15600	21840	30960	25920	41760
250	16250	22750	32250	27000	43500
260	16900	23660	33540	28080	
270	17550	24570	34830	29160	
280	18200	25480	36120	30240	
290	18850	26390	37410	31320	
300	19500	27300	38700	32400	
310	20150	28210	39990	33480	
320	20800	29120	41280	34560	
330	21450	30030	42570	35640	
340	22100	30940	43860	36720	
350	22750	31850	45150	37800	

206L-1  
FLIGHT MANUAL

CABIN BAGGAGE COMPARTMENTS  
TABLE OF MOMENTS MM - Kg  
100  
KILOGRAMS

<b>Weight (Kg)</b>	<b>Front Seat F.S. 1651.0 mm</b>	<b>Mid-Pass (Facing Aft) F.S. 2311.4 mm</b>	<b>Aft-Pass (Facing Fwd.) F.S. 3276.6 mm</b>	<b>Litter Patient(s) F.S. 2743.2 mm</b>	<b>Baggage F.S. 4419.6 mm</b>
18.1	298.8	418.4	593.1	496.5	800.0
22.7	374.8	524.7	743.8	622.7	1003.2
27.2	449.1	628.7	891.2	746.2	1202.1
31.8	525.0	735.0	1042.0	872.3	1405.4
36.3	599.3	839.0	1189.4	995.8	1604.3
40.8	673.6	943.1	1336.9	1119.2	1803.2
45.4	749.6	1049.4	1487.6	1245.4	2006.5
49.9	823.8	1153.4	1635.0	1368.9	2205.4
54.4	898.1	1257.4	1782.5	1492.3	2404.3
59.0	974.1	1363.7	1933.2	1618.5	2608.6
63.5	1048.4	1467.7	2080.6	1741.9	2806.4
68.0	1122.7	1571.8	2228.1	1865.4	3005.3
72.6	1198.6	1678.1	2378.8	1991.6	3208.6
77.1	1272.9	1782.1	2526.3	2115.0	3407.5
81.6	1347.2	1886.1	2673.7	2238.5	3606.4
86.2	1423.2	1992.4	2824.4	2364.6	3809.7
90.7	1497.5	2096.4	2971.9	2488.1	4008.6
95.3	1573.4	2202.8	3122.6	2614.3	4211.9
99.8	1647.7	2306.8	3270.1	2737.7	4410.8
104.3	1722.0	2410.8	3417.5	2861.2	4609.6
108.9	1797.9	2517.1	3568.2	2987.3	4812.9
113.4	1872.2	2621.1	3715.7	3110.8	5011.8
117.9	1946.5	2725.1	3863.1	3234.2	
122.5	2022.5	2831.5	4013.8	3360.4	
127.0	2096.8	2935.5	4161.3	3483.9	
131.5	2171.1	3039.5	4308.7	3607.3	
136.1	2247.0	3145.8	4459.5	3733.5	
140.6	2321.3	3249.8	4606.9	3856.9	
145.1	2395.6	3353.8	4754.3	3980.4	
149.7	2471.5	3460.2	4905.1	4106.6	
154.2	2545.8	3564.2	5052.5	4230.0	
158.8	2621.8	3670.5	5203.2	4356.2	

## **SECTION 8**

### **FUEL AND OIL**

#### **FUEL**

Fuels conforming to the following commercial and military specifications are approved:

ASTM D-1655, Type A, A-1, or B

MIL-T-5624, Grade JP-4 or JP-5

NATO F-40 or F-44

Refer to Fuel Limitations in Section 1

The following fuel listing is provided for the convenience of the operator (table 8-1). It shall be the responsibility of the operator and his fuel supplier to ensure that the fuel used in the helicopter conforms to one of the approved specifications above.

Refer to Allison Operation and Maintenance Manual for alternate or emergency fuels.

#### **FUEL SYSTEM SERVICING**

Total capacity: 376.3 litres (99.4 U.S. gallons).

Useable Fuel: 372.4 litres (98.4 U.S. gallons).

The fuel system contains interconnected cells that are serviced through a single fuel port located on the right side of the helicopter. A grounding jack is provided near the fuelling port. An electric sump drain is located in the aft tank and is activated by a button located at the right aft lower side of the fuselage. The battery switch must be ON (or external power applied) and the fuel valve switch must be OFF to activate the sump drain.

## **SECTION 9**

# **CHARTS AND TABLES**

### **INTRODUCTION**

The charts and tables contained on the following pages are intended to provide useful information, in this handbook, that normally is located in various and numerous other sources. The prime intent of furnishing this data is to assist in flight planning, operations and, for the purposes other than flight, transposing available information to the type desired.

206L-1  
FLIGHT MANUAL

Density Altitude Chart

