

ROTORCRAFT FLIGHT MANUAL

BHT 33108 THROUGH 33213 AND BHT36001 THROUGH 36019





BHT 33108 — 33213 AND 36001 — 36019

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ROTORCRAFT FLIGHT MANUAL

S/N 33108 — 33213

S/N 36001 — 36019

TEMPORARY REVISION FOR AIRSPEED RESTRICTION

This Flight Manual Temporary Revision mandates a reduction of airspeed until after compliance with ALERT SERVICE BULLETIN No. 412-96-89 Installation and/or Inspection of Tail Rotor Flapping Stop.

Insert these temporary revision pages opposite like numbered pages in Flight Manual.

DO NOT remove existing pages from Flight Manual.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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TEMPORARY REVISION — 16 AUGUST 1996

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ROTOR CRAFT FLIGHT MANUAL

S/N 33108 - 33213

S/N 36001 - 36019

TEMPORARY REVISION FOR MAIN ROTOR DROOP RESTRAINT PREFLIGHT CHECK

This Temporary Revision addresses Main Rotor Droop Restraint Preflight Check Procedures Per ASB 412-97-91 Reissue A.

Insert these temporary revision pages opposite like numbered pages in Flight Manual.

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BHT-412-FM-2

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GENERAL INFORMATION

ORGANIZATION

The Rotorcraft Flight Manual is divided into all acctions as follows:

Section 1 — LIMITATIONS

Section 2 -- NORMAL PROCEDURES

Section 3 — EMEAGENCY AND MALFUNCTION PROCEDURES

Section 4 PERFORMANCE

Section 6 -- OPTIONAL EQUIPMENT
SUPPLEMENTS

Section 5 = CATEGORY "A" OPERATIONS

Sections 1 through 4 contain the FAA approved data necessary to operate the basic helicopter in a safe and efficient manner.

Section 5 contains the FAA approved supplements for optional equipment, which shalf be used in conjunction with the basic Flight Manual when the respective optional equipment hits are inclailed.

Section 6 contains illustations, procedures and performance data for Catagory "A" Operations.

The Monutec(urer's Data (BHT-412-MQ-2) manual, contains information to be used in conjunction with the Flight Manual. The manual is divided into four sections

Section 1 . WEIGHT AND BALANCE

Section 2 SYSTEMS DESCRIPTION

Section 3 - OPERATIONAL INFORMATION

Section 4 — HANDLING/SERVICING/ MAINTENANCE

TERMINOLOGY

WARNINGS, CAUTIONS, AND NOTES

Warnings, couldons, and notes are used throughout this manual to emphasize important and critical instructions as follows:

WARNING

AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH, IF NOT CORRECTLY FOLLOWED, COULD RESULT IN PERSONAL INJURY OR LOSS OF LUE.

CAUTION

AN OPERATING PROCEDURE. PRACTICE, ETC., WHICH. IF NOT STRICTLY OBSERVED, COULD RESULT IN DAMAGE TO OR DESTRUCTION OF EQUIPMENT.

NOTE

An operating procedure, condition, etc., which is easontial to highlight.

BHT-412-PM-2 FAA APPROVED

USE OF PROCEDURAL WORDS

The concept of procedural word usage and intended meaning which has been adhered to in preparing this manual is as follows:

"Shalt" has been used only when application of a procedure is mandalary.

"Should" has been used only when application of a procedure is recommended.

"May" and "need not" have been used only when application of a procedure is optional.

"Will" has been used only to indicate futurity, never to indicate 8 mendatory procedure.

ABBREVIATIONS AND ACRONYMS

Abbreviations and acronyma used Inroughout this manual are defined as Ioliows:

AC Alternating Current ADI Attitude Director Indicator **AFCS** Automotic Flight Control System AGL Above Ground Level ALTN Alternate ANTI Anticolitation COLL API Actuator Position Indicator ATC Air Treffic Comret

Attitude

Automatic

AUX SYS — Auxillary System

BAT - Battery

C — Octobr

C BOX — Combining Georbox

CG - Center of Gravity

em — Camimaler(#)

CYC CTR — Cyclic Center

DC - Direct Current

DECR — Decrease

DME — Distance Messuring Equipment

ELT — Emergency Locator Transmitter

EMERG -- Emergency

ENG — Engine

ENG RPM — Engine Power Turbine RPM

(N2)

F - Februahell

FAR - Federal Aviation Regulation

FT — Force Trim or Foot/Feet

FUEL Flori Pressure
PRESS

MESS

FUEL Fuel Transfer

TRANS

GAS — Gas Producer (N1) PROD

GEN — Generator

GOV — Governor

No — Density Aftitude

M_e — Pressure Attitude

ΔП

AUTO

_	НР 1/НР 2	_	Helipilot 1/Helipilot 2	NORM	-	Normal
	H-Y	_	Height-Yelocity	GAT	_	Outside Air Temperature
_	HYDA SYS	<u>.</u>	Hydraulic System	GEI	_	One Engine Inoperative
_	IFR	· - -	Instrument Flight Rules	ODE	-	Out at Ground Effect
	IDE	_	In Ground Effect	OVRD	_	Override
_	IĠN	_	Ignliian	PART SEE	-	Particle Separator
_	IN		Inch(ea)	PNL	_	Pánel
	INCR	_	Increase	PRI	-	Primary
	INTCON	_	Interconnect	P9I	_	Pounds per Square Inch
	INY	_	Inverter	ярм	_	Revolutions Per Minute
	IMC	-	Instrument Meteorological Conditions	\$A\$	-	Stability Augmentation System
	пт	-	Interturbine Temperature	SL	_	Sea Level
	IVŞI	_	instantaneous Vertical Speed Indicator	90	_	Şquare
	KCAS	_	Knots Calibrated Airapeed	6 T BY	_	Standby
	kg	_	Kilograms	TEMP		Temperature
	KIAB		Knote Indicated Airepeed	VFR	-	VisuM FilgM Aules
	KTAS	_	Knote True Airspeed	VG	-	Vertical Gyro
	LB		Pound(s)	YHF	_	Very Nigh Frequency
	LRC	_	Long Range Cruise	YMC	-	Visual Meteorological Conditions
	LT	_	Light	Yes	_	Never Exceed Speed
_	MAG	-	Magnetic	Ytacs		Takeoff Climbout Speed
	MAX END		Maximum Endurance	Vy		Best Rate of Climb Speed
•	MCP	-	Maximum Continuous Power	WSHLD	٠.	Windshield
	र्णस			XFEED	-	Crossleed
	NON- ESNTL	_	Millimolor(s) Non Essential	XMSN	-	Tremambasion

LIST OF SECTIONS

Section 1

LIMITATIONS

Section 2

NORMAL PROCEDURES

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

Section 4

PERFORMANCE

Section 5

OPTIONAL EQUIPMENT SUPPLEMENTS

Section 6

CATEGORY A OPERATIONS

Section 1

LIMITATIONS

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Section 1

LIMITATIONS

GENERAL

Compliance with the limitations in this section is required by appropriate operating rules.

BASIS OF CERTIFICATION

This helicopter is certified under FAR Part. 29, Category "A" and "B".

TYPE OF OPERATION

The basic configured helicopter is approved as a tifteen-place helicopter and is certified for operation under day or night VFR nonicing conditions.

The IFR configured halicopter is certified for Category I IFR operation during day or night nonloing conditions.

Refer to Section 6 for additional limitation procedures and performance data for Category "A" operations.

REQUIRED EQUIPMENT

AFCS

AFCS shall be disengaged or operated in SAS mode during prolonged ground operation, except as required for AFCS check.

REQUIRED EQUIPMENT — IFR

In addition to the basic equipment required for certification, the 412-705-006 IFA Kit

shall be installed and the following equipment shall be operational for IFA flight:

Both helipilots HP 1 and HP 2 shall be engaged in ATT mode during IFA flight.

Heated pitot-static system

Pilot windshield wiper

3-Inch standby attitude indicator

Two VHF communications radios

Two navigation receivers with auxiliary equipment appropriate to intended IFA route of flight

DME equipment

ATC transponder

Marker beacon receiver

Pilot IVSI

Force trim

Roof window blackout curtains

EMERGENCY COMM panel, if installed, (single pilot only)

OPTIONAL EQUIPMENT

Refer to appropriate Flight Manual Supplement(s) for additional limitations, BHT-412-FM-2 FAA APPROVED

procedures, and performance data with optional equipment installed.

reduces V_{NE}. Refer to BHT-412-MD-2 and to Airspeed Limitations.

FLIGHT CREW

The minimum flight crew consists of one pilot who shall operate the helicopter from the right crew seat.

The left crew seat may be used for an additional pilot when the approved dual controls and copilot instrument kits are installed.

INTERNAL CARGO OPERATION

NOTE

Refer to applicable operating rules for internal cargo operations.

DOORS OPEN OR REMOVED

Helicopter may be flown with doors open or removed only with Standard Interior or Deluxe Interior installed. Flight operation is approved for the following alternative configurations during VFR conditions only:

Both crew doors removed.

Both sliding doors locked open or removed with both hinged panels installed or removed.

In all cases, door configuration shall be symmetrical for both sides of the fuselage.

NOTE

Opening or removing doors shifts helicopter center of gravity and

WEIGHT/CG

WEIGHT

Maximum gross weight for takeoff and landing is 11,900 pounds (5398 kilograms).

Refer to Weight-Altitude-Temperature Limitations chart (figure 1-1) for maximum allowable weight for takeoff, landing, and IGE hover operation.

Minimum gross weight for flight is 6400 pounds (2903 kilograms).

Minimum combined crew weight at fuselage station 47.0 is 170 pounds (77.1 kilograms).

CENTER OF GRAVITY — LONGITUDINAL

Longitudinal center of gravity limits vary from station 130 to 144, depending on gross weight. Refer to Gross Weight Center of Gravity Chart (figure 1-2).

CENTER OF GRAVITY — LATERAL

Lateral center of gravity limits are 4.5 inches (114.3 millimeters) left and right of fuselage centerline for all gross weights.

LOADING

NOTE

Refer to BHT-412-MD-2 for loading tables to be used in weight/CG computations.

NOTE ACCOMABLE GROSS WEIGHTS OBTAINED FROM THIS CHART MAY EXCEPT CONTINUOUS HOVER CAPABILITY UNDER CONTINUOUS OF SETTING HOVER COUNS CHARTS IN SECTION 4

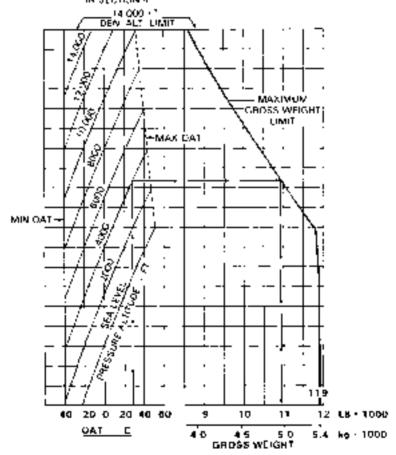


Figure 1-1. Weight-stillude-temperature limitations for takeoff, fending, and in-ground-affect management.

BHT-412-FM-2 FAA APPROVED

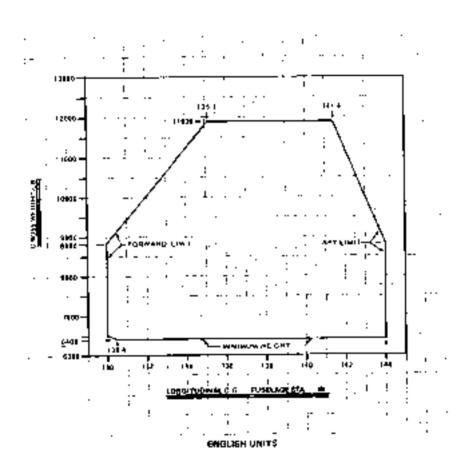


Figure 1-2. Grose weight center of gravity charts (Sheet 1 of 2).

FAA APPROVED BHT-412-FM-2

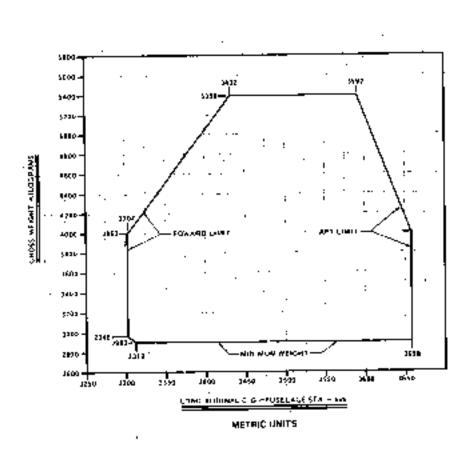


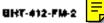
Figure 1-2. Gross weight center of gravity charts (Sheet 2 of 2).

AIRSPEED

NOTE

This limitation shall remain in effect until Alert Service Bulletin (ASB) 412-96-89 has been fully implemented.

 $\rm V_{NE}$ is 120 KIAS. Reduce all placard $\rm V_{NE}$ airspeeds by 20 KIAS.



PASSENGER LOADING

The pullboard facing seets should not be occupied unless at less four of the forward or all facing passenger agets are occupied.

The above loading does not apply if cargo or a combination of cargo and passengers are being transported, it shell then be plict responsibility to ensure helicopter is properly loaded so entire flight is conducted within the limits of gross weight center of gravity charts (figure 1-2).

INTERNAL CARGO LOADING

Maximum allowable deck touding for cargo is 100 pounds per square facil (4.9 kg/100) ag cm]. Deck mounted cargo fledown Mungs are provided and have an airframe structural capacity of 1250 pounds (587.0 kliograms) vertical and 500 pounds (225.8 kilograme) horizontal per litting. Provisions for installation of cargo fiedown Ritings are incorporated in the att cebin bulkheed and transmission support structure and have an oldrama structural capacity of 1250 pounds (567.0 kHograms) al 90 degrees to the bulkhead and 500 pounds (226.8 kilograms) in any direction. parajiel to the bulkhead. Cargo shall be bodiem inlerteer bevorggs no ve beruses that will not impade access to the cargo in the event of an emergency.

Maximum allowable baggage compartment landing is 400 pounds (181 klingrams), not to exceed 100 pounds per square foot (4.9) kg/100 sq.cm).

AIRSPEED

NOTE

All indicated strapend values in this manual require instrument part number 412-078-009-108 be installed.

Minimum IFR atrapped in 60 KtAS.

Basic V_{ee} is 140 KIAS from sea level to 3000 feet density altitude at all gross weights. Ves decreeses for ambient conditions in accordance with airapeed limitations placard (figure 1-3).

Airspand shall not exceed 105 KIAS (or placarded Y_{ME}, if leas) when operating above maximum continuous transmission. lorque (81%).

 $V_{\mu\nu}$ with only one heliptiat engaged is 115. KIAB (or placarded V_{mi}, if tess). If both helipilota are disengaged, basic V_{ec} applies.

V_{ert} for steady state autorolation is:

105 KIAS of or below 10,000 leet pressure eltitude:

O KIAS above 10,000 (ee) preasure. elijiude.

V_{es} with doors open or removed is 60 KIAS with energy attenuating passenger seate (412-706-002) installed.

V_{ue} with doors open or removed is 100 KIAS with Blanket Interior (412-705-501 or 412-705-510). Deluke Interior (412-705-500). or Utility Scale (412-706-018 or 205-706-043) Installed.

Maximum allowable sirsoeed for sideward. or rearward flight at or below 3000 lest He is 35 knots. Relat to figure 1-4 for additional timitations.

Maximum ellowable tallwind or crosewind. apeads for hover operations at or below 3000 feet H_o is 35 knots. Refer to figure 1.4. for additional limitations.

Refer to Critical Relative Wind Azimuths diagram in Section 4.

CLIMB/DESCENT

Maximum IFA rate of climb or descent is 1000 test per minute.

Maximum IFR approach alone is 5 degress.

FAA APPROVED BHT-412-FM-2

OBSERVE TEMPORARY MAXIMUM NEVER EXCEED (VNE) AIRSPEED REDLINE (MARKED AT 120 KIAS). VNE IS 20 KIAS LESS THAN THE VALUE PRESENTED ON THE AIRSPEED LIMITATION PLACARD FOR EACH AMBIENT CONDITION.

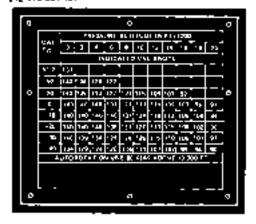
(TYPICAL)

Figure 1-3. Placards and decals

TWW A 10 MN DI 10085 2 12 MN DI 10245

FOR GAS PRODUCER INSTRUMENT MANT NAMER 712-075-037-101 1WM 8 30 MM 011 10181.

#å₹ GAS PRODUCER MSTRUMENT PART MUMBER 212-075-032-113



DU NOT DPERATE HEALT PLOTE 21 DEG COLT AIR TEMP

DO NOT APPLY ROTOR BRAKE AROVE 40% RPM

manic voic conbrat cità men wan electric i ancholenci abra ceo eta fon-par abra cas

THIS HELICOPT I I MUST BE OPERATED IN COMPLIANCE WITH THE OPERATING LIMITATIONS SPECIFIED IN THE FAA APPHOVED ROTORCHAFT FLIGHT MAN

IN ALFN POSITION MAIN FAIN INSTRUMENT ACCURACY BY CLOSING WINDOWS AIRVENTS AND TURNING HEATER OFF

(il reside le di

412-Fig-24)

Figure 1-3. Placards and decats.

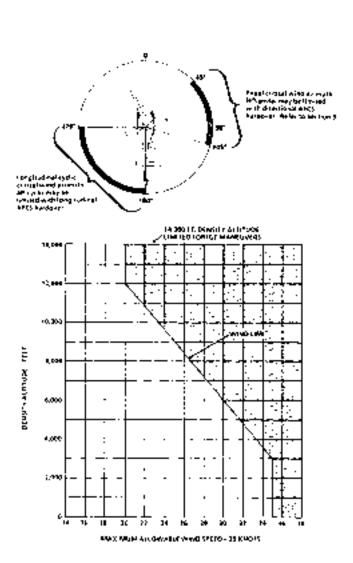


Figure 1-4. Maximum speed — aldeward and rearward fight, crosswind and taliwind at a hover.

ALTITUDE

Maximum operating pressure attitude is: 20.000 feet.

Maximum density attitude for takenti, landing, and in-ground-effect maneuvers is 14,000 feet. Refer to Weight-Allifude-Temperature Limitations chart (figure 1-1).

NOTE

Refer to applicable operating rules for high sititude oxygen requirements.

AMBIENT AIR TEMPERATURE

The maximum see level amblent air temperature for operation is *51.7°C (+125°F) and decreases with pressure altitude at the standard lapse rate of 2°C (3.6°F)/1000 feet to 20,000 feet.

The minimum ambient temperature for operation at all altitudes is -40°C (-40°F).

HEIGHT — VELOCITY

The height-valuelty limitations are critical in the event of single engine failure during takeoff, landing, or other operation near the euriste (figure 1-5). The AVOID area of the Height-Valuelty diagram defines the combinations of airspeed and height shows ground from which a sale single engine tanding on a smooth, level, firm aurisce cannot be assured.

The H-Y diagram is valid only when the Weight-Altifude-Temperature limitations are not exceeded (figure 1-1). The diagram does not define the conditions which assure continued flight following an engine fellors nor the conditions from which a safe power off landing can be made.

MANFUVERING

Aprobatic meneuvers are prohibited.

SLOPE LANDINGS

Slope (sockings are limited to side slopes not to exceed 10 degrees).

ELECTRICAL

BATTERY

Maximum battery case temperature is \$4,5°C (130°F), as indicated by Mumination of GATTERY TEMP warning light.

WARNING

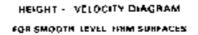
BATTERY SHALL NOT BE USED FOR ENGINE START AFTER ILLUMINATION OF SATYERY TEMP LIGHT, BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R D A N C E WITH M A N U F A C T U R E R SINSTRUCTIONS PRIOR TO RETURN TO SERVICE.

Migimum embient température for battery start when bettery and halloopter have been cold spaked is -25°C (-13°F).

GENERATOR

Continuous operation 0 to 75 smps

75 to 150 Caution Amps BHT-412-FM-2 FAA APPROYED



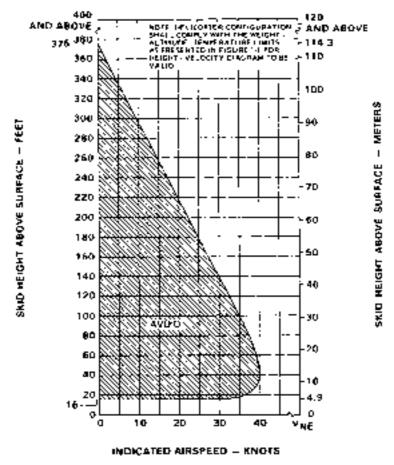


Figure 1-5. Height-velocity diagram (OEI).

61 (6.100.8%)

NOTE

During OE(operation slectrical loads may have to be reduced to remain below 150 emps.

Maximum continuous

160 amps (each)

NOTE

Ammeter readle may deflect full a calle mamentarily during generator assisted start of second angles.

ENGINE STARTER

Starter energizing times shall be limited as follows

30 seconds ON

60 seconds OFF

30 seconds ON

5 minutes OFF

30 seconds ON

15 minutes OFF

GROUND POWER STARTS

28 vdc ground power units for starting shall be (imited to 1000 amps maximum.

POWERPLANT

Profit and Whitney Aircraft of Canada, Ud. PT6T-3B

NOTE

Operation in 2 ½ minute or 30 minute OEI range in Intended for emergency use only, when one engine becomes inoperative due to an actual malfunction.

Anytime an engine is operated in an OEI range, an entry shall be made in the helicopter logbook detailing the extent of operation in excess of twin engine takeoff power limits. This does not apply to approved ITI limits for starting

GAS PRODUCER RPM

TWIN ENGINE OPERATION

Onstrument P/N 212-075-037-101)

Cantinuous

operation

Maximum continuous 100.8%

Maximum for takeoff 190.8%

(Instrument P/N 212-075-037-113)

Cantinuous

operation 57 to 101.8%

Maximum continuous 101.8%

Maximum for takeoff 101.8%

ONE ENGINE INOPERATIVE (DEI)

(Instrument P/N 212-075-037-101)

30 minute OEI 100.a

2 % manute OEI

range 100.8 to 102.4%

Maximum GÉI 102.4%

(Instrument P/N 212-075-037-118)

30 minute DÉI 101.8

2 % mmute OEI

ranga 101.8 to 103.4%

Maximum OE) 103.4%

BHT-412-FM-2 FAA APPROVED POWER TURBINE RPM (ENG RPM) 2 % minute QEI range 822 to 850 C Maximum OEL 850°C Minimum 97 W Continuous aperation 97 to 100% FUEL PRESSURE Maximum continuous 100% Operation with ENG Minamum 4 ps/ TORQUE at or below 30% 100 to 104.5% Continuous operation 4 to 35 pss Maylmum with ENG. Macemum 35 psi TORQUE at or below 30% 104.5% OIL PRESSURE INTERTURBINE TEMPERATURE **EMGINE** ((TT)) TWIN ENGINE OPERATION Manimum for idle 40 psi Operation below 79% 765 · C Maximum continuous GAS PROD RPM (N1) 40 to 80 pel Takeoff renge (6 Continuous minutes maximum) 765 to 810°C operation 80 to 115 psi Masimum transient Masimum 115 m*i (5 seconds makimumi 650 · C COMBINING GEARBOX Maximum for starting (2 teconds meximum above 960°C) 10901C Minimum for idle 40 psi Operation below 94% END RPM (N2) 40 to 60 per Continuous operation 80 to 80 pai INTENTIONAL USE OF J77 ABOVE 810°C IS PROMIBITED DURING Maximum 80 psi NORMAL OPERATIONS EXCEPT DURING START.

ONE ENGINE INOPERATIVE (OEI)

Maximum continuous
DEI 765°C
30 minute DEI range 765 to

765 to 822°C

OIL TEMPERATURE

Minimum

ENGINE

0.0

Continuous operation

0 to 115°C

Maximum

115°C

COMBINING GEARBOX

Minimum 0°C

Continuous operation

0 to 115°C

Maximum 115°C

FNGINE RESTART

Above 15,000 feet pressure attitude, restert shall be attempted in metual fuel control mode only

Below 15,000 loof pressure stitlude, restort may be attempted in either manual or automatic fuel control mode.

ENGINE TORQUE

TWIN ENGINE OPERATION

Maximum Bilowable ENG TORQUE differential is 4% during normal operation. Refer to TRANSMISSION TORQUE CIMITS.

ONE ENGINE INDPERATIVE (OE))

Maximum continuous

DEI 58.9%

30 minute OEI range 58,9 to 73.2%

Maximum OEI 73.2%

TRANSMISSION

TRANSMISSION TORQUE

THIN ENGINE OPERATION

Maximum continuous 81%

Takeoff range (5

minutes maximum) 81 to 100%

WARNING

TAKEOFF POWER SHALL NOT BE USED ABOVE 105 KIAS.

Maximum

100%

TRANSMISSION OIL PRESSURE

Minimum for Idle 30 ρgi

30 to 40 psi

40 to 70 ps/

ldie rangs

Continuéus

operation Maximum

70 041

TRANSMISSION OIL TEMPERATURE

Continuous

operation IS to 110°C

Maximum 110°C

ROTOR

ROTOR RPM — POWER ON

Minimum 97%

Continuous

operation 97 to 100%

Maximum continuous 100%

Operation with ENG TORQUE at or below

30% 100 to 104.5%

Maximum with ENG TORQUE at or below 20%

104.5%

ROTOR RPM - POWER OFF

Minimum for autoretation with gross weight below 6000 pounds (3629 kg)

80%

Power off operation with gross weight below 6000 pounds (3629 kg)

80 to 104.5%

Minimum for suterolation with gross weight at or above \$000 pounds [3629 kg]

91 A

Maximum 104.5%

ROTOR RPM — GROUND OPERATION

Minimum 77%

Minimum with slick containing indicator system independing

97%

Transient (avoid steady state operations)

26 to 77%

ROTOR BRAKE

Engine starts with rotor brake engaged are prohibited. Rotor brake application is limited to ground operation and shall not be applied until both engines are shut down and ROTOR has decreased to 40% RPM or below.

FUEL AND OIL

NOTE

Refer to BHT-412-MD-2 for fuel capacity and lists of approved fuels, oils, and vendors.

FUEL

Fuel conforming to ASTM D-1655 Type B, NATO F-40, or MIL-T-5624 Grade JP-4 may be used at all emblent temperatures.

Fuel conforming to ASTM 0-1656 Type A or A-1, NATO F-44, MIL-T-5624 Grade JP-5, MATO F-34, or MIL-T-92133 Grade JP-8, Himiled to ambient temperatures above -30°C (-22°F).

ENGINE AND COMBINING GEARBOX

Oil conforming to PWA Specification No. 521 Type I and MIL-L-7808 (NATO 0-146) may be used at all ambient temperatures.

FAA APPROVED BHT-412-FM-2

Oil conforming to PWA Specification No. 521
Type II and MIL-L-23699 (NATO 0-156), or
■ DOD-L-85734AS limited to ambient
temperatures above -40°C (-40°F).

TRANSMISSION, INTERMEDIATE AND TAIL ROTOR GEARBOX OIL

Oil conforming to DOD-L-85734AS (Turbine Oil 555), MIL-L-23699 (NATO 0-156), or MIL-L-7808 (NATO 0-148) may be used at all approved ambient temperatures.

NOTE

DOD-L-85734AS or MIL-L-23699 is recommended.

HYDRAULIC

NOTE

Refer to BHT-412-MD-2 for approved fluids and vendors.

Hydraulic fluid type MIL-H-5606 (NATO H-515) shall be used at all ambient temperatures.

WARNING

THE HELICOPTER IS NOT CONTROLLABLE WITH BOTH HYDRAULIC BOOST SYSTEMS INOPERATIVE.

Both hydraulic systems shall be operative prior to takeoff.

HYDRAULIC PRESSURE

Minimum 600 psi

Caution 600 to 900 psi

Continuous operation 900 to 1100 psi

Maximum 1100 psi

HYDRAULIC TEMPERATURE

Maximum 88°C

HEATER OPERATION

Heater shall not be operated when OAT is above 21°C (69.8°F).

HOIST PENALTY REGION

Pilot shall know C.G. at time of hoist operation to determine if C.G. is within penalty region of figure 1-7, Hoist C.G. envelope.

Each hoist operation performed is defined as an extension and retraction of hoist cable while hovering with any weight attached.

Refer to BHT-412-FMS-7 for BHT-412-FMS-26 for Bell Helicopter approved Hoists.

WARNING

THIS PENALTY REGION IS VALID FOR ALL HOIST INSTALLATIONS.

OPERATION IN PENALTY REGION AFFECTS AIRWORTHINESS LIMITATIONS OF ROTOR COMPONENTS (REFER TO BHT-412-MM).

BHT-412-FM-2 FAA APPROVED

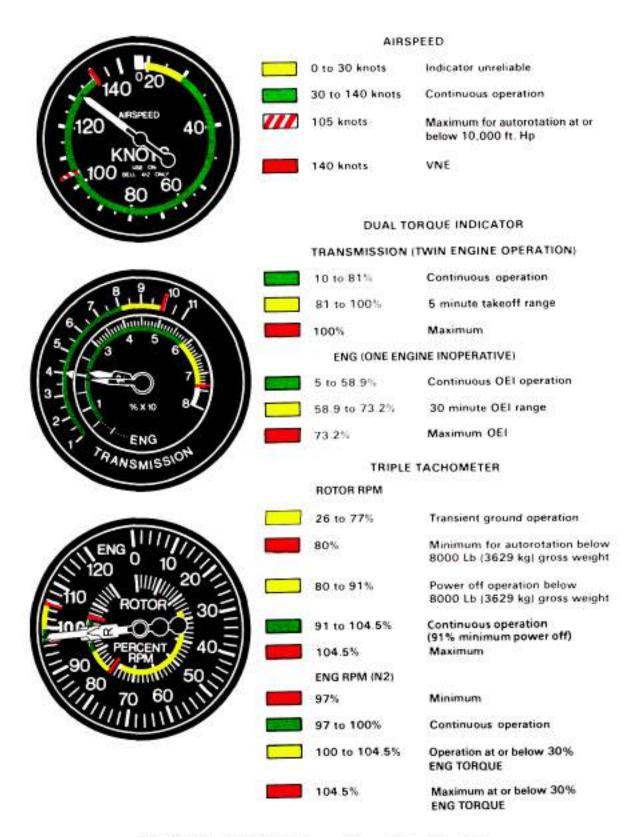


Figure 1-6. Instrument markings (Sheet 1 of 4).

FAA APPROVED BHT-412-FM-2

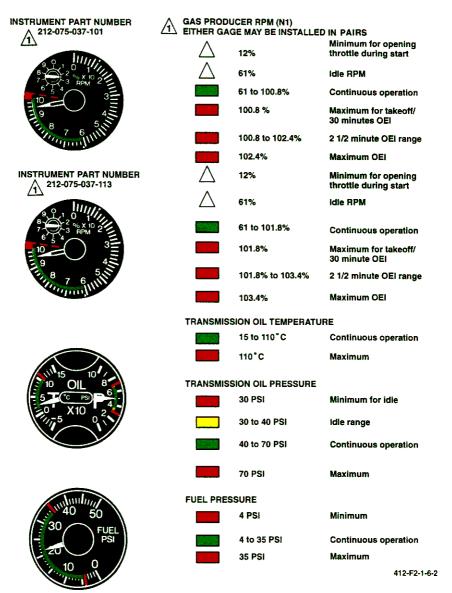


Figure 1-6. Instrument markings (Sheet 2 of 4).

BHT-412-FM-2 FAA APPROVED

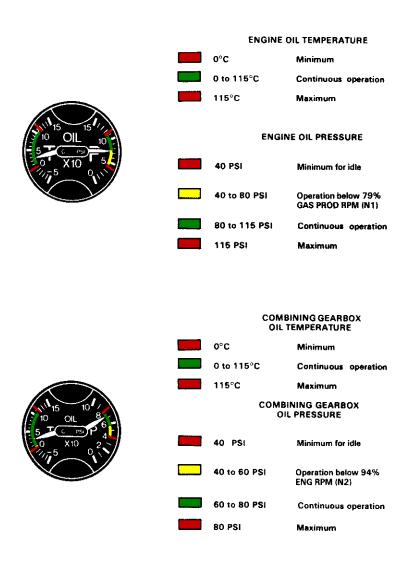


Figure 1-6. Instrument markings (Sheet 3 of 4).

FAA APPROVED BHT-412-FM-2

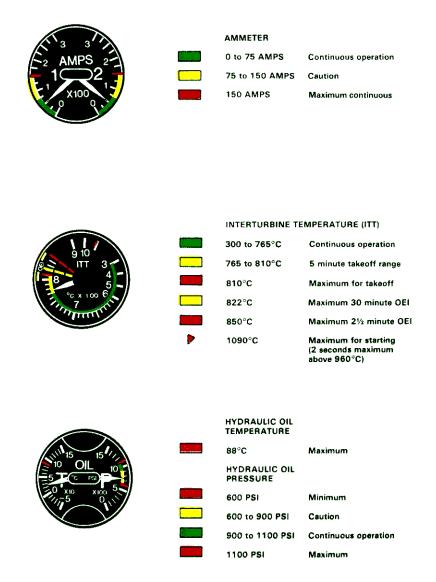
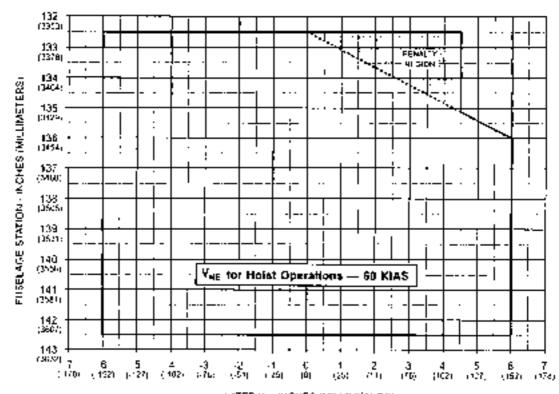


Figure 1-6. Instrument markings (Sheet 4 of 4).

Longitudinal/Lateral C.G. Envelope for Holst Operations



LATERAU INCHÉS (MILLIMÉTERS)

47278-144.4.4

Section 2

NORMAL PROCEDURES

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Section 2

NORMAL PROCEDURES

INTRODUCTION

This section contains instructions and procedures for operating the helicopter from the planning stage, through notual flight conditions. To securing the helicopter after landing.

Normal and standard conditions are essumed in these procedures. Pertinent data in other sections is reterenced when applicable.

The instructions and procedures contained herein are written for the purpose of standardization and are not applicable to all situations.

OPERATING LIMITATIONS

The minimum, normal, maximum, and cautionary operation ranges for helicopter systems and subsystems are indicated by instrument markings and placetds.

Anytime an operating (imitation is exceeded, an appropriate entry shell be made in the helicopter legbook. The entry shall state which limit was exceeded, the direction of time, the extreme value attained, and any additional information essential in determining the maintenance action required.

The limits depicted on instrument markings and placerds represent careful approximations that are substantiated by flight test data.

Refer to Section 1, LIMITATIONS, for subsystems restrictions.

FLIGHT PLANNING

Each flight should be planned adequately to ensure sale operations and to provide the pilot with the date to be used during flight. Essential weight, batence, and performance information should be compiled as follows:

Check type of flight to be performed and destination.

Select appropriate performance charte to be used.

TAKEOFF AND LANDING DATA

Refer to the LIMITATIONS section for tekeoff and landing weight limits and to the Performance section for takeoff and landing distance information.

WEIGHT AND BALANCE

Determine proper weight and belance of the helicopter sa follows:

Consult 8HT-412-MD-2 for Merruetions.

Compute Takeoff and enticipated landing gross weight, chack helicopter center of gravity (CG) locations, and determine weight of fuel, oil, payload, etc.

Ensure loading limitations listed in Section 1 are not exceeded.

PREFLIGHT CHECK

The pilot is responsible for determining whether the helicopter is in condition for sale flight. Refer to figure 2-1 for preflight chack sequence.

NOTE

The pilot walk-around and interior checks are outlined in the tollowing procedures. The prellight check is not intended to be a detailed mechanical check, but simply a guide to help the pilot check the condition of the helicopter. It may be made as comprehensive as conditions warrant, at the discretion of the pilot

All areas checked shall beclude a visual check for evidence of corrosion, particularly when helicopter is flown near or over sall water, or in areas of high industrial emissions.

BEFORE EXTERIOR CHECK

Filight planning — Completed.

Gross weight and CG Compute (refer to BHT-412-MD-2).

Publications Checked.

Portable fire extinguishers — Condition and security.

Alt luel sumps — Orein complex as follows:

FUEL TRANS switches OFF.

BOOST PUMP switches — OFF.

ENGINE 1 and ENGINE 2 FUEL switches — Off.

BAT BUS 1 switch - ON.

Aft fuel sump drain buttons (left and right) — Press.

NOTE

it sit sumps tell to drain, the sump values may be operated manually.

Forward and middle fuel sumps — Drain camples as follows:

Press-to-drain valves — Press.

Fuel filters — Drain before first flight of day as follows:

BOOST PUMP switches - ON.

ENGINE 1 and ENGINE 2 FUEL switches — ON.

Fuel litter (left and sight) — Drain samples.

ENGINE 1 and ENGINE 2 FUEL switches — OFF.

8009T PUMP switches - OFF.

BAT BUS 1 switch - DFF.

Rotor tie downs — Removed and secured.

EXTERIOR CHECK

Refer to Ngure 2-1 for areas.

CAUTION

IF HELICOPTER HAS BEEN EXPOSED TO SNOW OR ICING CONDITIONS, SNOW AND ICE SHALL BE REMOVED PRIOR TO FLIGHT.

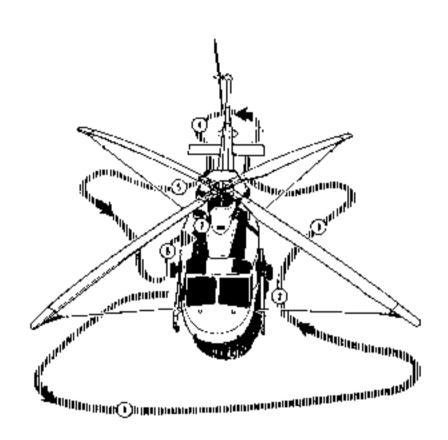


Figure 2-1 Proflight chack esquence

FUSELAGE — FRONT.

Cabro nose — Condition; all glass clean; wipers stowed.

Remote hydrautic filter oypess indicator Verify green.

Priot tube(s) — Cover(s) removed, unobstructed

Static ports (left and right) — Unobstructed.

Rotor blade (forward) — Remove (ledown Visually sheek condition and cleantiness.

Cabin nose ventilators Unobstructed.

Nose compartment door Secure.

Ballery ven1 and drain tubes — Unobstructed.

Searchlight and landing light Stowed.

Amtennes Condition and security.

2. FUSELAGE — ÇABIN LEFT Side

Copilet door — Condition and operation; glass clean Check security of emergency release handles.

Pasitlan lights — Condition.

Passenger door — Condition and operation; glass clean. Condition of popular windows.

Landing gear — Condition: handling wheels removed.

Passanger stap (If installed) — Condition and security.

FUSELAGE — AFT LEFT SIDE

Rotor biade (elt) — Remove fieldown. Visually offect condition and closelinose. No. 1 engine compartment — Check.

No. 1 engine oil level — Verify actual presence of all in eight gage Visually check oil tevel. Filter cap secured.

Governor spring Check condition.

Engine fire extinguisher—Chack bottle pressure gage and temperature range.

Combining georbox filter — Chack bypass indicator refracted.

Oil cooler blower — Unobstructed.

Access doors and engine cowling — Secured.

Drain lines — Unonstructed.

Engine exhaust ejectors — Covers removed; unobestucted

Dil coolers — Unobstructed.

4. TAILBOOM

Tailboom — Condition: access covers secured.

Tail rotor driveshaft covers Secured.

CAUTION

DO NOT BEND ELEVATOR TRAILING EDGE TAB.

Elevator -- Condition and security. Check for agring condition by moving elevator lowerd the leading edge down position.

Tell rotor (90°) gearbox -- Verify actual presence of oil in sight gage. Visually

7. CABIN TOP

Droop restrainers — Security and condition. Verify droop stop clevis is in lower position of cam plate.

FAA APPROVED

check oil level, sheat filler cap and chipdetector plug for security

Tall rolor blade — Remove tiedown. Visually check condition and cleanliness.

Tail rotor — Condition and free movement on flapping sxis.

Tail rolor yoke — Evidence of static stop contact damage (deformed static stop yield indicator).

Tall 8xid — Condition and security.

Intermediate (42°) gearbox — Verify actual presence of oil in night guage. Visually check oil level. Check filter cap and chip detector plug for security.

Elevator — Condition and security.

Tallboom - Condition.

Baggage compartment — Cargo secured, smoke detector condition, door secured.

5. FUSELAGE AFT RIGHT SIDE

Aft compariment — Check unohatructed.

Tall rotor actuator - Check.

AFCS computers — Secured, compariment door secured.

Engine fire extinguisher — Check bottle pressure gouge and temperature range.

Combining gearbox oil level - Verily setual presence of oil in sight gauge. Visually check of jevel

Oil cooler blower — Unobstructed

No. 2 engine compartment — Check.

No. 2 engine oil level — Verify actual presence of oil in sight gauge. Vigually check oil level. Filler cap accured.

Access doors and engine cowling Secured.

Fuel filler — Visually check quantity, secure cap.

6. FUSELAGE — CABIN RIGHT Side

Passenger door — Condition and operation, glass clean, condition of popout windows.

Transmission oil — Verify actual presence of oil in night gauge. Visually cheek oil level.

Position lights - Condition.

Landing gear — Condition, handling wheels removed.

Passenger step (if installed) — Condition and security.

Pilot door — Condition and operation, glass clean. Check security of emergency release handles.

7. CABIN TOP

Hub and sleeve assembly — Check condition.

Swashplate, support assembly, and collective lever — Check condition.

Main rotor pitch links — Security and condition.

Main rotor hub — Check general condition:

Meat retaining nut — Securad.

Yoke assembly — Condition.

Pitch homs — Security and condition.

Etaktomeric bearings, lead-lag dampers — Check general condition.

Blade retention bolts - Security and proper latching.

Droop restroiners — Security and condition.

Simple pendulum absorbers (II installed) — Security and condition.

Rotor blades — Visually check condition and closeliness.

Main driveshall and couplings — Condition and security, and grasse tokegs. Check Temp-Plates (four pieces each coupling) for evidence of clevaled temperature indicated by dot changing color to black.

CAUTION

IF ANY TEMP-PLATE IS MASSING OR HAS BLACK DOTS, MAINTENANCE PERSONNEL SHALL ASSIST IN DETERMINING AIRWORTHINESS PER ALERT SERVICE BULLETIN 412-93-79.

Transmission oil Hiter cap — Secured.

No. I and No. 2 hydraulic reservoirs — Visually check light levels; caps secured.

Antennels) — Condition and security.

Combining gearbox all filler cap — Secured.

Anticollision light - Condition and security.

No. 1 and No. 2 engine air intakes — Covers removed, unobatructes; check particle separator doors closed.

Engine and transmission cowling — Secured.

Fresh air inlet acreen — Unobstructed.

Rator brake reservoir cap - Security.

INTERIOR CHECK

Cable Interior - Cleantiness and security of equipment.

Corgo and baggage (If applicable) - Check security.

Protective breathing equipment (if installed) — Condition and properly serviced.

NOTE

Opening or removing doors shifts hericopter center of gravity and requese V_{HE}. Refer to BHT-412-MD-2 and to Section 1.

Passanger doors Secured.

PRESTART CHECK

PELETED

Seat and gedals - Adjust.

Seal beit and shoulder havess — Festen and adjust.

Shoulder herness inertia rest and took — Chark.

Directional control pedals — Check irradom of movement; position for engine start.

Flight controls — Position for start: triction so desired.

Transmission chip detector indicators - Check; reset it required.

Collective switches - OFF.

Lower pedestal circuit breakers IN.

Redio equipment — OFF.

COMPASS CONTROL switch(es) — MAG (eleve position).

FUEL INTOON SWILET - NORM.

PUEL TRANS switches — OFF.

BOOST PUMP switches — OFF.

FUEL XFEED switch - NORM.

EMGINE 1 and ENGINE 2 FUEL switches — DEF.

PART SEP SWIICHES - NORM.

ENGINE I and ENGINE 2 GOV switches — AUTO.

HYDR SYS NO.1 and NO.2 switches — ON.

STEP mettch (if installed) — As desired.

FORCE TRIM switch — ON, cover down.

Instrumento — Static check.

STATIC SOURCE switch (if installed) — PRI.

APPROACH PLATE AND MAP LIGHT Inobis) — OFF.

AUX BYS PITOT and STATIC switches (illinstalled) — NORM.

Altimeter(s) — Set.

Clock — Set and running.

PIRE EXT switch - OFF.

FIRE PULL handles — in (forward).

AFT DOME LIGHT resoulat and switch — OFF.

PITOT STATIC HEATERS owtich - OFF.

WIPERS switches - OFF.

CARGO RELEASE switch (if installed) — OFF.

HEATER switch - OFF.

APT OUTLET switch - OFF.

VENT BLOWER emitch - QFF.

EMERG LT switch (Kinstelled) ... DISARM.

STBY ATT switch (if installed) — TEST; check standby attitude instrument light illuminates and OFF flag retracts momentarily, than switch OFF.

WSHLD HEAT ewitches (If inetelled) — OFF.

Overhead circuit breakers -- In.

All LT rhegitate — OFF.

UTILITY LIGHT switch . OFF.

POSITION light - OFF.

ANTI COLL fight ON.

EMERG LOAD switch - NORMAL.

NON-ESNTL BUS swhole — Spring leaded to NORMAL.

INV 1 and 2 switches - . OFF.

GEN 1 and 2 switches - OFF.

IF EXTERNAL POWER IS USED ... CONNECT (1000 AMPS MAXIMUM). CHECK 27 + 1 VOLTS DC; ADJUST POWER SOURCE IF REQUIRED.

BATTERY BUS 1 and BUS 2 switches — ON; check BATTERY caution (ight illuminates.

NOTE

Teet all lights when night flights are planned or anticepated. Accomplish light teets with external power connected or during angine runup.

ROTOR BRAKE lights — Test. Pull breke ON and check that both caution lights illuminate; return to OFF and check lights extinguish.

NOTE

Rolor brake shell be off at all times when the engines ere running.

FIRE 1 and 2 warning lights less button — Press to test.

BAGGAGE FIRE warning light test button - Prose to test (verily light fleshes).

CYC CTR caution lights — Press to 1691.

Caution panel TEST awitch - PHL (All segments extinguish except CAUTION PANEL). Caution panel TEST switch — LT (All segments (lluminate).

Caution Panel RESET bullon - Press (MASTER CAUTION light extinguishes).

FUEL SYS real awitch — FWD TANK, then MID TANK; note digital and headle indications.

FUEL SYS DIQITS TEST button — Press (Digital display reads 888).

RVV 1 and 2 switches — ON.

ENGINE STARTING

NOTE

If the helicopter has been cold scaked in ambient temperatures of -16°C (0°F) or tess, both throttles will be difficult to move and follow through coupling may be increased.

Throilles - Rotate engine 1 throitle lult open, then beck against site stop. Actuals ENG 1 IDLE STOP release, roll engine throttle to full closed, then apply incition as desired. Repeat procedure using angine 2 throttle and ENG 2 IDLE STOP release.

NOTE

When either IOLE STOP release is activated, the appropriate idla stop plunger will not release if pressure is applied toward the closed position of the throttle.

Moderate frictions should be applied to overcome follow-through coupling between throttles.

RPM INCR/DECR switch — DECR for a seconds.

NOTE

Either angine may be started first; however, the following procedure is provided for starting engine 1 Nest.

ENGINE 1 START

ENGINE 1 FUEL TRANS switch — ON; check NO. I FUEL TRANS caution light extinguished.

ENGINE 1 BOOST FUMP switch - ON, check NO. 1 FUEL BOOST light sytinguished.

ENGINE 1 FUEL switch - ON. (FUEL VALVE caution light will illuminate momentally.)

Engine 1 FUEL PRESS — Chack.

Rotor Clear.

ÇAUTION

PROLONGED EXPOSURE TO AMBIENT TEMPERATURES OF OVC (32°F) OR LESS MAY FREEZE MOISTURE IN THE ENGINE FUEL CONTROL SYSTEM. MONITOR ENG RPM (N2) DURING COLD WEATHER STARTING FOR OVERSPEED, IF AN OVERSPEED APPEARS IMMIMENT, ABORT START AND CLOSE THROTTLE TO OFF POSITION.

START switch - ENG 1 position, Observa starter limitations.

Engine 1 ENGINE OIL pressure — Indicating.

Engine 1 throttle Open to lide at 12% GAS PROD RPM (N1) minimum.

Engine 1 ITT -- Monitor to avoid a hot etail. Maximum ITT during start is 1090°C, not to exceed two seconds above \$60°C IT

ITT continues to rise, about start by activating idle stop release and rolling throttle fully closed. Starter should remain engaged until ITT decreases. Do not attempt restern until corrective maintenance has been accomplished.

NOTE

)/ engine fails to start, refer to FALSE START procedures this eaction.

Collective pitch — Ensure in full down position.

CAUTION

IF STICK CENTERING INDICATOR SYSTEM IS INOPERATIVE, GROUND OPERATION SHALL BE CONDUCTED AT 87% ROTOR RPM OR ABOVE.

NOTE

On side plapes greater than five degrees, disregard CYC CTR caution lights and position cyclic as required.

Cyclic — Pealtion as necessary to sytinguish CYC CTR coution lights.

NOTE

CYC CTR caution lights are inhibited between 95 and 105% ROTOR RPM.

START switch -- Off at 55% GAS PROD RPM (N1).

GAS PROD — Check 51 ± 1% RPM (N1) when throttle is on idle stop.

NOTE

During extremely cold ambient temperatures, idle rpm will be high and the ENGINE, XMSN, and GEAR BOX OIL pressures may exceed maximum limits for up to two minutes after starting. Warm up shell be conducted at 77 - 85% ROTOR RPM at flat pitch.

Do not increase ROTOR above 85% RPM until XMSN OIL temperature is above 15°C.

ENGINE, XMAN, and GEAR BOX OIL pressures -- Check.

Engine 1 PART SEP OFF caution light Check extinguished.

CAUTION

DURING RPM INCREASE, ANY AGNORMAL INCREASE IN ONE-PER-REY VIBRATION MAY INDICATE ONE OR MORE MAIN AOTOR OROOP RESTRAINERS FAILED TO DISENGAGE FROM STATIC POSITION. VERIFY PROPER OPERATION PRIOR TO FLIGHT.

Engine 1 throitie — Increase to 77 - 85% ENG RPM (N2). Friction as desired.

NOTE

For ground operation, maintain ROTOR RPM within allowable range. Higher minimum ROTOR RPM reduces block flapping.

ROTOR RPM — Maintelo 77 - 85%, 66 desired.

IF EXTERNAL POWER IS USED, PROCEED TO ENGINE 2 START. IF BATTERY WAS USED, PROCEED AS FOLLOWS:

GEN 1 switch - ON.

AMPS 1 — Check at or below 150 amps.

ENGINE 2 START

ENGINE 2 FUEL TRANS switch ON. Check NO. 2 FUEL TRANS caution light extinguished. EMGINE 2 BOOST PUMP switch — ON. Check NO. 2 FUEL BOOST Aght out (FUEL XFEED caution tight will illuminate momentarily).

ENGINE 2 FUEL switch — ON (FUEL VALVE caution light will filuminate momentarity).

Engine 2 PUEL PRESS — Check.

START switch ENG 2 position. Observe starter limitations.

Engine 2 ENOINE OIL pressure — Indicating

Engine 2 throttle — Open to idia at 12% QAS PROD RPH (NI) minimum.

Engine 2 ITT — Monitor. Observe ITT limitations.

START awilch — Oil at 55% GAS PROD-RPM (NI).

GAS PROD — Check 51 ± 1% RPM (N1) when engine 2 (brottle is on idea stop.

CAUTION

ENSURÉ SECOND ENGINE ENGAGES AS THROTTLE IS INCREASED. A NONENGAGED ENGINE INDICATES 10 TO 15% SIMO RPM (N2) HIGHER THAN THE ENGAGED ENGINE AND NEAR ZERO 1000 CUPS. IF A NONENGAGEMENT OCCUPS, CLOSE THROTTLE OF THE NONENGAGED ENGINE. WHEN THE NONENGAGED ENGINE HAS STOPPED, SHUT DOWN THE ENGAGED ENGINE.

IF A SUDDEN [HARD] ENGAGEMENT OCCURS, SHUT DOWN BOTH ENGINES. MAINTENANCE ACTION IS REQUIRED. Engine 2 throitie — increase alowly to match Engine 1 N₂ RPM. Monitor tachometer and tarquemeter to verily engagement of second engine.

Engine 2 ENGINE OIL pressure — Check.

EMG 2 PART SEP OFF caution light — Check extinguished.

IF EXTERNAL POWER WAS USED -DISCONNECT, GEN 1 SWITCH — ON.

GEN 2 switch -- ON. (BATTERY BUS 1 will ewitch OFF automotically.)

NOTE

Only one BATTERY BUS switch (1 or 2) should remain on with both generators operating.

Caution lights — Check of extinguished tencent AFCS).

ENGINE, XMSN, and GEAR BOX OIL (amperatures and pressures - Within limits.

AMP6 1 and 2 -- Within limits.

NOTE

AMPS 2 will indicate a higher load than AMPS I until battery is fully charged.

Radios — ON as required.

ELT (II installed) — Check for inadvertent transmission.

FALSE START

ATTEMPTED ENGINE START WITH NO LIGHTOFF

When the engine lable to light off within 16 accords after the throttle has been opened.

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to little, the following action is recommended:

IDLE STOP relegan — Actuals.

Throfile -- Fully alosed.

Blarter — Dicendede.

FUEL switch - OFF.

BOOST PUMP waltch - OFF.

After GAS PROD RPM (N1) has decreased to zero, allow 30 seconds for luci to drain from engine. Conduct a DRY MOTORING RUN before attempting enother start.

DRY MOTORING RUN

The following procedure is used to clear an engine whenever it is deemed necessary to remove internally trapped fuel and vapor.

Throttle — Fully closed.

BOOST PUMP switch — QN.

FUEL switch — CN.

ION effects breaker — Pull out.

Starter — Engage for 16 seconds, then disengage.

FUEL SWIICH - OFF.

BOOST PUMP switch -- OFF.

IGN circuit breaker - Push in.

Atlew the required cooling period for the starter before proceeding. Follow normal event sequence as described on preceding pages.

SYSTEMS CHECKS

STICK CENTERING INDICATOR CHECK

CAUTION

DURING EXTREME COLD AMBIENT TEMPERATURES LIMIT CYCLIC MOVEMENTS UNTIL XMSN OIL TEMPERATURE REACHES 15°C.

CAUTION

DO NOT DISPLACE CYCLIC MORE THAN 1.8 INCHES FROM CENTER TO CHECK THE SYSTEM. IF CYC. CTR CAUTION LIGHTS DO NOT ILLUMINATE WITHIN THE 1.5 INCH DISPLACEMENT, THE SYSTEM IS INOPERATIVE.

DO NOT DISPLACE CYCLIC BEYOND POINT AT WHICH CYC. C. J.A. C. A.D.T.I.D.N. L.I.G.H.T. ILLUMINATES.

NOTE

CYC CTA caution lights are inhibited between 95 and 105% ROTOR RPM.

Cyclic — Dispises approximately 1.26 inch (31.7 mm) forward, plu, left and right. Check CYC CTR caution light filuminates as the Clara when displaced and authorists when centered.

FORCE TRIM CHECK

Flight controls — Friction oil; collective look negoved.

Cyclic and pedals — Move alightly each direction to check force gradients.

Cyclic FORCE TRIM release botton — Press; check trim releases with button pressed, reengages with button released.

FORCE TRIM switch — OFF: check frim disongages and FT OFF caution light illuminates.

FORCE TRIM ewitch - ON, cover down.

PRELIMINARY HYDRAULIC CHECK

Throttles — Sel la idie.

NOTE

Uncommended control movement or motoring with either hydraulic system off may indicate hydraulic system malfunction.

HYDR SYS NO. I switch OFF, then ON.

HYDR SYS NO. 2 switch - DFF, then ON.

ENGINE FUEL CONTROL CHECK

Throities (both) — kille.

CAUTION

DO NOT ALLOW GAS PROD TO DECREASE BELOW 60% APM (N1).

NOTE

In the vicinity of 8000 feat pressure ellitude, CAS PROD RPM (NT) may not change significantly when manual fuel control is splected.

GOV switch (ENGINE 1 or 2) — MANUAL; observe a change in GAS PROD RPM (NI) and GOV MANUAL caution (ight lituminates. Open respective throitis carefully to ensure GAS PROD RPM (NI) responds upword, then return to idle

position, Peturn GOV switch to AUTO. Check for a return to original GAS PROD RPM (N1) and GOV MANUAL eaution light extinguishes. Check second governor in like manner

Throttles (both) — increase slowly to above 85% ROTOR RPM.

FUEL CROSSFEED AND INTERCONNECT VALVE CHECK

FUEL XFEED/INTOON (as) switch — TEST BUS 1 and hold.

NOTE

After turning either boost pump off, FUEL BOOST caution light should illuminate on falled side only.

ENGINE 1 BOOST PUMP switch — OFF. Chack engine 1 FUEL PRESS decreases, then returns to normal. (This indicates crossined valve has been opened by bus no. 1 power and check valve is functioning properly). Return switch to QN.

FUEL INTOON switch — OPEN, Check FUEL INTOON caution light itiuminates then extinguishes. (This indicates interconnect valve has been opened by bus no. I power and valve is functioning properly).

FUEL INTOON switch — OVAD CLOSE. Check FUEL INTOON caution light litural pages then extinguishes.

FUEL XFEED/INTOON less switch — TEST BUS 2 and hold.

ENGINE 2 BOOST PUMP switch -- OFF. Check engine 2 FUEL PRESS decreases, then returns to normal. Return switch to ON.

PUEL INTOON switch - OPEN. Check FUEL INTOON caution light illuminates then extinguishes. (This indicates that the interconnect valve has been opened by

bus no. 2 power and that the value is functioning properly).

FUEL INTOON switch — NORM. Check FUEL INTOON caution light litiminates then extinguishes.

FUEL XFEED/INTOON test switch NORM.

FUEL XFEED switch - OVRD CLOSE.

ENGINE 1 BOOST PUMP switch — QFF, Check FUEL PRESS drope to zero on affected system. Return switch to ON. Repeat procedure for ENGINE 2 BOOST PUMP switch.

FUEL XFEED switch - NORM.

ELECTRICAL SYSTEMS CHECK

DC VOLTS — Check 27 + 1 volts,

AC VOLTS - Check 104 to 122 volts.

AMPS 1 and 2 — Check within limits:

E GEN 1 and 2 switches — OFF

EMERG LOAD switch — EMERG LOAD. Check that the following Items remain operational:

One hallpligt

One NAV-COM

Penel lights

ICS fights

Excential anging inclinments

Essential novigation instruments

EMERG LOAD switch - NORMAL

GEN 1 and 2 switches — DN

IMY 1 switch — DFF; check INVERTER 1 caution light illuminates. Check no. 1 and no. 2 AC VOLTS for indication that inverter 2 has assumed all ac loads. Return IMY 1 switch to OM.

INV 2 switch — OFF; check INVERTER 2 couling light eleminates. Check no. 1 and no. 2 AC VOLTS for indication that invader 1 has assumed all ac loads. Return INV 2 switch to ON.

EMERG LT switch (if installed) — TEST, check all emergency lights illuminate Switch to ARM; check lights dim to faint blow.

STBY ATT switch (It installed) - ON.

AFCS CHECK

NOTE

Yarification of AFCS actuator centering is necessary. Failure of the actuators to center could result in reduced control margins and abnormal centrol positions.

NOTE

If fost slaving is desired, center ADI roll trim knob, then push and hold VG FAST ERECT button until stillude indicator displays zero degrees bank angle Use of VG FAST ERECT button will disengage the respective helipliot.

Pilot and copilot altitude indicators — Erect and set as necessary

WARNING

IF AFCS IS LEFT ENGAGED IN ATT MODE DURING GROUND OPERATION, IT CAN DRIVE THE CYCLIC STICK TO A CONTROL STOP.

HP 1 and HP 2 buttons — ON. Observe ATT light alluminates, APIs center, and AFCS caution light extinguishes.

NOTE

CYC CTR caution Nights may illuminate momentarily during cyclic control checks.

Move cyclic lorward, alt, right, left. Observe APIs do not move.

SYS 2 builton - Prese and hold.

Move cyclic forward, att, right left Observe APIs do not move.

SYS 2 button - Release.

Cyclic ATTO TRIM switch — Right for 2 seconds, than aft for 2 seconds. Observe APIs move right, up.

\$YS 2 button — Press and hold. Observe \$YS 2 actualors agree.

Cyclic FDRCE TRIM release button — Press. Observe APIs move to center.

SYS 2 bullon — Release Observe SYS I actuators centered.

SASJATT bullon - Press Observe SAS light Illuminates.

Move cyclic right, lott, forward, and aft. Observe APIs move to corresponding direction.

Displace right pedal, then left. Observe vaw API moves right, left.

SYS 2 button — Press and hold.

Move cyclic right, left, forward, and all.

Observe API+ move in corresponding direction.

SYS 2 button Release.

ENGINE RUNUP

CAUTION

IF HELICOPTER IS SITTING ON ICE OR OTHER SLIPPERY OR

LOOSE SURFACE, ADVANCE THROTTLES SLOWLY 10 PREVENT ROTATION OF HELICOPTER.

Engine 1 throttle - Fully open

ENG - 9(ab)lized at 95 ± 1% RPM (N2).

Engine 2 throtale — Fully open. Check no. 1 engine increases 2% ENG RPM (N2) and both engines stabilize at 97 ± 1% ENG RPM (N2)

RPM INCR/DECR switch — Full INCR. Check ENG does not exceed 101.5% RPM (N2), Set at 100% ENG RPM (N2).

CABIN HEATER CHECK

GAS PROD Check 75% RPM (N1) minimum (both anglaes).

Thermostet knob Fully COLD.

CAUTION

HEATER SWITCH SHALL BE TURNED OFF WHEN HEATED AIRFLOW DOES NOT SHUT OFF AFTER THERMOSTAT IS TURNED TO FULLY COLD, HEATER AIR LINE LIGHT ILLUMINATES. OR CABIN HTR CIRCUIT BREAKER TRIPS

CAUTION

DO NOT OPERATE HEATER 480VE 21°C DAT. FAA APPROYED BHT-412-FM-2

HEATER switch — ON.

VENT BLOWER switch - ON.

Thermostat spiting — Increase and observe heated sirflow

DEFOG lever — ON; check sirflow is diverled from pedestal outlets to windshield nozzies. Noturn lever to OFF.

AFT OUTLET switch — ON; check siniow distributed equally between padestal outlets and aft outlets. Return switch to OFF.

NOTE

Heater operation affects partormance. Refer to Mover Celling and Rate of Climb charts for NEATER ON to Section 4.

HEATER switch — As desired.

VENT BLOWER switch - As desired.

HYDRAULIC SYSTEMS CHECK

NOTE

The HYDRAULIC SYSTEMS CHECK is to determine proper operation of the hydraulic actuators for each flight control system. It abnorms forces, unequal forces, control binding or motoring are encountered, it may be an indication of a majunctioning light control actuator.

FORCE TRIM switch - OFF.

Collective — Fully down, friction removed.

ROTOR — Sel to 100% RPM.

Cyclic — Centered, Iriction removed.

HYDR 5Y5 NO. 1 switch — OFF, Check NO. 1 HYDRAULIC caution light and MASTER

CAUTION light informate and eyetem 1 pressure drops to zero.

Cyclic Check normal operation by moving cyclic forward, att, left, and right approximately one inch Center cyclic.

Collective — Check for normal operation by increasing cultective control 1 to 2 inches. Repeat 2 to 3 times as required. Return to tally down position.

Pedate — Displace slightly left and right. Note an increase in torce required to mave padal in each direction.

MYDR SYS NO. 2 switch — OFF, Check hydrawite system 2 remains operational, and system 1 remains off.

HYDR SYS NO. 1 switch — ON. Check NO. 1 MYDRAULIC caution light extinguishes, and system 1 regains normal pressure. Check NO. 2 HYDRAULIC caution light fluminates and system 2 pressure drops to zero.

Cyclic — Check normal operation by moving cyclic forward, etc. 16%, and right approximately one inch. Center cyclic.

Collective — Check for normal operations by increasing collective control 1 to 2 inches. Repeat 2 to 3 times as required. Return to fully down position.

Pedele — Displace slightly left and right. Note the padale are new hydraulicelly broated.

HYDR \$YS NO. 2 switch — ON. Check NO. 2 HYDRAULIC caudion light extingulation, system 2 pressure returns to normal, and hydraulic eyetem 1 remains operational.

Cyclic and collective friction — Set as desired.

FORCE TRIM switch - ON.

WARNING

BOTH HYDRAULIC SYSTEMS SHALL BE OPERATIONAL PRIOR TO TAKEOFF.

NOTE

System 1 will normally operate 10 to 20°C cooler than system 2.

BEFORE TAKEOFF

Engine, gearbox, transmission, hydraulic, and electrical instruments - · Within operating ranges.

Caution and warning lights — Exlinguished.

WARNING

MODERATE FRICTION SHALL BE APPLIED TO OVERCOME FOLLOW-THROUGH COUPLING BETWEEN THROTTLES.

Throtties - Fully open. Adjust frictions.

ENG — 100% RPM (N2) for both engines.

Flight instruments — Check operation and set.

POSITION Highle — As required.

ANTI COLL light - Check ON.

PITOT STATIC HEATERS switch — ON-Check summeter for load Indication, Leave ON in visible moleture when temperature is below 4.4°C (40°F), OFF if not required.

Radio(s) - Check functioning.

Cyclic control — Centered or alighily into the wind.

EMERGENCY COMM panel — (If installed) Check for single pilot operations.

AFCS — Select ATT or SAS mode so dealred (ATT mode shall be used during IFR Hight. SAS mode recommended for ground operation, haver, and takeoffs.

FORCE TRIM switch — ON in ATT mode. as desired in SAS mode.

STEP awitch (if installed) - - As desired.

Passenger soat beits — Fastened.

All doors — Secured.

POWER ASSURANCE CHECK

Power assurance check should be performed daily. (Refer to Section 4.)

PROLONGED GROUND OPERATION

NOTE

For prolonged ground operation, AFCS shell but be operated in ATT mode.

CAUTION

MINIMUM ACTOR -- 97% RPM FOR GROUND OPERATION WITH STICK CENTERING INDICATOR SYSTEM INOPERATIVE.

NOTE

Minimite blade flapping by mainteining bighast rator RPM (Ng) within allowable range.

ROTOR RPM — 77 - 85% or above, as desired.

Cyclic — Position as necessary to extinguish CYC CTA caudion lights.

NOTE

On side slopes greater than five degrees, maintain 100% ROYOR RPM, CYC CTR caution lights are whiblised.

TAKEOFF



DURING LIFTOFF TO HOVER, ANY ABNORMAL INCREASE IN ONE PER REY VIBRATION MAY INDICATE ONE OR MORE MAIN ROTOR DROOP RESTRAINERS FAILED TO DISENGAGE FROM PROPER OPERATION PRIOR TO FLIGHT.

NOTE

When AFCS is in ATT mode, the FORCE TRIM release button should be pressed before liftely (to trim sclustors to center positions) and should be held until desired climbout attitude is attained.

ENG - 100% RPM (N2).

Area - Clear.

Hover power — Check torque required to haver at tour test skid height.

NOTE

Downwind Takeoifs are not recommended since the published takeoff distance performance will not be achieved.

Ouring takenif, pitch attitude must be adjusted commensurate with power application to prevent entering the AVOID area of the Height-Velocity diagram. Forque shall not exceed 15% above IQE hover power white accelerating to Takeoff Chimbout Safety Speed, [Refer to Section 4.)

Gyelle control — Apply forward eyelic to accelerate amountily.

Callective — Adjust as desired alter reaching V_{TOCs} (46 KIAS).

AIRSPEED — Within limits (50 KIAS minimum for IFR).

IN-FLIGHT OPERATION

NOTE

With the simple pandulum absorber kit, vibration isolation is most effective in cruise flight at 97% ENG RPM (N2).

ENG - 87 to 100% RPM (N2).

AIRSPEED Within limits.

Engine, georbox, and transmission instruments — Within limits.

NOTE

Maximum plich attitude capability of etandby attitude indicator is ± 50 degraces.

Rufes to applicable operating rules for high allifolds oxygen requirements.

MANEUVERING WITH AFCS IN SAS MODE

Use normal pilot control techniques.

MANEUVERING WITH AFCS IN ATT MODE

Press cyclic FORCE TRIM release button and maneuver as desired. Release button when desired efficiely is resched. Helipitot will hold attitude until ratrimmed to new attatude. Attitude may size be adjusted with cyclic ATTO TRIM switch.

For momentary stitlude changes, manual cyclic movement may be used; however, AFCS actuators may be saturated to limit authority when cyclic is moved menually.

NOTE

inflight use of VG FAST ERECT builton will disengage the respective helipilo) and decouple the automatic Highl control modes.

BEFORE LANDING

Fright controls — Adjust Injetion as desired.

AFCS — Engage ATT or SAS mode as desired.

FORCE TRIM switch — ON in ATT mode, as desired in SA5 mode.

Throfflee — Fully open.

ENG - 100% APM (H2).

Flight path — Stay clear of AVOID aren of Height-Valority diagram (Refer to Section 1). For landing distance information in the event of engine failure during approach, refer to Section 4.

STEP switch (if installed) — As desired.

CAUTION

RUN ON LANDINGS MAY RESULT IN ROLL OSCILLATIONS WHILE ON THE GROUND. IF THIS OCCURS, LOWERING COLLECTIVE FULLY DOWN OR DISENGAGING HP? AND HP? WILL STOP THE OSCILLATIONS.

AFTER LANDING

Collective — Fully down.

Pedals — Centered.

FORCE TRIM switch ON.

AFC6 — SAS mode.

CAUTION

MINIMUM ROTOR — 97% RPM FOR GROUND OPERATION WITH

STICK CENTERING INDICATOR SYSTEM INOPERATIVE.

Stick centering check — Complete, Center cyclic and friction on necessary to extinguish CYC CTR caution lights.

NOTE

On side slopes greater than five degraces, distrepard CYC CTR caution lights and position cyclic as required.

ENGINE SHUTDOWN

HP 1 and HP 2 — Disengage, Check helipilet lights extinguish, AFCS and MASTER CAUTION lights libusinete

Cyclie — Frictioned as desired. Maintain cyclic etick as near center as possible at all reter speeds.

NOTE

For ground operation, maintain ROTOR RPM within allowable range. Higher minimum ROTOR RPM reduces blade liepping.

Throttles — Reduce to 77 - 65% ROTOR RPM, as desired.

ITT — Stabilize for one minute.

ELT (it installed) — Check for inadvertent transmission.

STBY ATTO awitch (If installed) - OFF.

EMERG LT switch (if installed) — (HSARM.

Engine instruments — Within limits.

IDLE STOP release awitch — ENG 1 position

Engine I throitis — Fully closed. Check. ITT and GAS PROD RPM (N1) decressing.

BATTERY BUS 1 switch - ON.

IDLE STOP release switch — ENG 2 position.

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Engine 2 throttle Fully closed Check ITT and GAS PROD RPM (N1) decreasing.

GEN 1 and 2 switches - DFF.

INV 1 and 2 switches - OFF.

ENGINE 1 and 2 FUEL switches -- DFF.

ENGINE 1 and 2 BOOST PUMP switches — OFF.

ENGINE 1 and 2 FUEL TRANS switches

Radios — OFF.

WARNING

OO NOT USE COLLECTIVE TO SLOW ROTOR RPM. USE OF COLLECTIVE TO SLOW ROTOR CAN CAUSE EXCESSIVE FLAPPING AND/OR CONING.

CAUTION

AVOID RAPID ENGAGEMENT OF ROTOR BRAKE IF HELICOPTER IS ON ICE OR OTHER SLIPPERY OR LOOSE SURFACE TO PREVENT ROTATION OF HELICOPTER.

Rotor brake — As desired. Apply at or bolow 40% POTOR RPM. Return to stowed position after main rotor stops.

P(lot — Remain at flight controls until rator has come to a camplete stap.

Lighting and miscellaneous switches OFF.

BATTERY BUS 1 and BUS 2 switches — DEF.

Collective down lock — Secured as desired.

AFTER EXITING HELICOPTER

If conditions require, perform the following:

NOTE

Refer to BMT-412-MD-2 for additional information.

Check general condition of droop restraint system and verify droop restraint arms are angaged in the lower desent of cam window

Install main rotor blade hedown socks on blades and secure to mooring points.

Install tall rotor fledown strap and escure to vertical fin.

Instell exhaust covers, engine inlet protoctive plugs, and pital tube covers.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

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Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

INTRODUCTION

The following procedures contain the indications of equipment or system failure or maifunction, the use of emergency features of primary and backup systems, and appropriate warnings, eautions, and explanatory notes. Table 3-1 lists fault conditions and corrective actions required for Mumination of red warning tights. Table 3-2 addresses mailunction procedures associated with yellow caution. lights.

All corrective action procedures listed herein assume the pilal gives first priorily. to alterall control and a safe flight path.

The helicopter should not be operated following any emergency landing or shutdown until the cause of the malfunction has been determined and corrective maintenance action taken.

DEFINITIONS

The following terms indicate the degree of urgancy in landing the helicopter.

LAND AS SOON AS Land without delay at POSSIBLE

the negrost suitable area (i.e., open field) at which a sale approzeh and landing is reasonably beauced

LAND AS SOON AS PRACTICAL

The duration of the light and landing site are at the discretion of the pilot. Extended flight beyond the nearest approved landing recommended.

The following terms are used to describe the operating condition of a system, subsystem, assembly, or component.

Attacted Falls to operate in

the intended or usual MADONE.

Normal Operates in the intended or usual

mencet.

Table 3-1. Weming lights

PANEL WORDING	FAULT COMMITION	CORRECTIVE ACTION
FIRE PULL (1 or 2)	Fire Indication in No. 1 or No. 2 engine compariment.	Pull Riumhated FIRE PULL hangle, Select MAIN His extinguisher, Close (hroibe of affected angline, Select REBERVE fire extinguisher if necessary, Land as agon as possible.
BAGGAGE FIRE	Smoka in baggage compartment.	Reduce power to minimum required. Land as soon as possible. Inspect fallboom was for damage.
ENG OUT (1 or 2)	QAS PROD abnormally low, below 53 ± 2% RPM (N1), on No. 1 or No. 2 angine.	Check ENG TORQUE, GAS PROD RPM (N1), ENG RPM (N2), and ITT. Adjust power and AIRSPEED (65 KIAS). Resel remaining ENG RPM (N2) to normal range. Close throttle of affected angine. Refer to ENGINE FAILURES and RESTART IN PLIGHT procedures. Land as soon as practical.
YMSN OIL	Transmission oil pressure below limit.	Reduce power, Land as abon as possible.
XMSM OIL TEMP	Transmission of I temperature above timet.	Reduce power. Check XMSM QIL temperature. If not within fimits, land se seen as possible.
C BOX OIL PRESSURE	Combining granbos oil pressure below normal.	Reduce power. Land as soon as possible.
C BOX TEMP	Combining gearbox off temperature above limit.	Reduce power. Check GEAR BOX Oil, lamperature. If not within limits, lend as soon as possible.

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Table 3-1. Warning lights (Conf)

PANEL PANEL	FAULT CONDITION	CORRECTIVE ACTION
BATTERY TÉMP	Battery case temperature above limb.	SATTERY BUS 1 and BUS 2 switch OFF, Land as soon as practical.
		WARNING
		BATTERY SHALL NOT BE USED FOR ENGINE START AFTER ILLUMINATION OF RATTERY TEMPLIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R D A N C E WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO RETURN TO SERVICE.
ROTOR BRAKE	Rotor brake linings not retracted.	Check rotor brake handle fully up in detent. If light remains on, land as soon as possible.
PANEL WORDING	Table 3-2. Caution FAULT CONDITION	lights
OIL PRESSURE (EMO 1 or 2)	Engine oil pressure below limit.	Shut down affected engine, FUEL INTCON switch — OPEN, Land as soon as practical.
DC GENERATOR (ENG 1 or 2)	Fallure of do generator.	GEN RELD and GEN RESET circuit breakers — Check in. GEN switch (allected generator) — RESET, then ON. II light remains on. lurn GEN switch OFF.
		II No. 2 generator talled: BATTERY BUS 2 switch — OFF, BATTERY BUS 1 switch — ON.

Table 3-2. Caution lighte (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
		II roncesential bus power le required: NON-ESNTL BUS ewitch — MANUAL DC AMPS — Monitor.
		Il both generatora fail:
		CAUTION
		DO NOT SELECT EMERG LOAD AT PRESSURE ALTITUDES ABOVE 5000 FEET, BOTH FUEL BOOST PUMPS WILL BECOME INOPERATIVE, RESULTING IN POSSIBLE FUEL STARVATION.
		EMERG LOAD switch — As required. Land as soon as practical.
PART SEP OFF (ENG. 1 of 2)	door closed or alreadt	Check ENG 1 (or 2) RPM and PART SEP circuit breakers in.
	breaker but lice and duet protection system inoperative.	Move PART SEP SWIICH IN OVAD OH.
NO. 1 FUEL BOOST/ NO. 2 FUEL BOOST	Furt boost pump failure has occurred	Il precidal, descend below 5000 feet H _p , to prevent possible (ue) starvation in the event remaining boost pump falls.

Table 3-2. Caution lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
	NOTE	FUEL INTOON SWITCH - OPEN.
	It either tool boost pump falls, and the FUEL XFEED awitch is in NORM position. the crossined valve is opened automatically by a pressure switch, allowing	CAUTION IF EITHER BOOST PUMP FAILS,
	oliher boost pump to furnish fuel to both engines.	USABLE FUEL WILL BE APPROXIMATELY 50 POUNDS LESS THAN INDICATED.
		Land se soon es preciscal.
NO. (FUEL FILTER/ NO. 2 FUEL FILTER	Fuel filler is postially blocked	Land se soon es practical.
FUEL LOW (Leas then 100 lbs. difference between No. 1 and No. 2 fuel guantities)	Fuel level on left or right cells at or below 190 pounds.	Plan tending.
	NOTE	NOTE
	The FUEL LOW light will not illuminate for the affected side when fuel quantity indication maifunction occurs. Refer to FUEL QUANTITY: MIDICATION.	Interconnect valve will open automatically when fuel fevel in opposite eide decresses to 190 pounds (as indicated by illumination of FUEL INTCON caution light). This will allow the lust to equality in the lower aft cells to equalize, if either boost pump fells, usable fuel will be approximately 50 pounds test than indicated. This fuel will be evallable
		boost pump. FUEL INTCON caution light can be
FUEL LOW (100 lbs. or more difference between		FUEL INTOON caution light can be extinguished by placing FUEL

Table 3-2. Caulion lights (Conf)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
GOV MANUAL (ENG	Engine governor in manual mode.	TORQUE, ITT, and APM must be controlled with throttle.
ENGINE CHIP (ENG 1 or 2)	Metal particles in engine oil.	Reduce power and shut down angine se soon as practical to minimize engine damage. Land as soon as practical.
FUEL VALVE (ENG 1 or 2)	Fuel valve not properly sested or circuit breaker out.	Check FUEL VALVE circuit breekere in Land 46 soon 46 practical, it on ground, cycle FUEL switch.
NO. 1 GEN OVHT/ NO. 2 GEN OVHT	Denerator overheating.	GEN switch OFF.
CAUTION PANEL	Caution panel Inoperative.	Check MASTER CAUTION circuit breaker in. Monitor aircraft instruments. Land as soon seprentical.
NO. 1 INVERTER/ NO. 2 INVERTER	Failure of ac power inverter;	Check both as volumeters to determine that remaining inverter sutometically assumed load for failed inverter.
		Check INV PWR circuit breakers in. Reangage HP 1 or HP 2, Guiding (FR Night, if both invertors fail, land as soon as practical; or continue hight under VFR, if dealred.
	or	
NÓ. 2 INVERTER	EMERG LOAD switch to EMERG LOAD position	Place EMERG LOAD switch in NORMAL position, it electrical load shadding is not required.
EXTERNAL POWER	External power receptedle door open.	Check external power door closed,
DOOR LOCK	Passanger door(s) or begange compartment door not secured	Check doors escured.
BATTERY	Both BATTERY switches/ relays in the same position.	Tivin one BATTERY switch ON. other OFF. If tight remains on, reverse BATTERY switch positions.
C BOX CHIP	Metal particle in combining georbox oil.	Reduce power. Land as econ as prectical.

Table 3-2. Caution lights (Cont)

PANÉL WORDING	FAULT CONDITION	CORRECTIVE ACTION
XMSN CHIP	Metal particles in transmission oil (one or more remote XMSN CHIP indicators impeed).	Reduce Power. Land 89 800n 83 practical.
42/90 BOX CHIP	Metal particles in 42° or 90° ges/box oil.	Land se soon as practical.
NO 1 HYDRAULICA NO. 2 HYDRAULIC	Hydraulic pressure below timit or temperature above timit.	Verity fault and offected system from gage readings. Turn of affected system. Land se soon a possible.
NO 1 FUEL TRANS/ NO. 2 FUEL TRANS	Fuel transfer pump or ejector pump matfunction (no fuel transfer from lower forwerd and middle cells to lower aft cell); or	in. Check FUEL TRANS switch
	Check velve malfunction allowing fuel to leak from	CAUTION
	alt to mid cell after normal transfer is complete (total tuel 600 pounds or less).	IF EITHER TRANSFER PUMP FAILS USABLE FUEL WILL BE 25 POUND LÉGS THAN INDICATEO.
	NOTE	if light remains filuminated: FUEL TRANS switch — OFF.
	PUEL TRANS (Ight will remain illuminated after fuel transfer with two guentity indication	
	mailunction. Refer to FUEL	CAUTION
	GUANTITY INDICATION MALFUNCTION.	FUEL TRAPPED IN MID CELL I UNUSABLE AND MUST B SUBTRACTED FROM TOTAL FUE OTY INDICATION.
		Monitor MID TANK quantity periodically, Plan landing.

Table 3-2. Caution lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
FuEL INTCON (Switch in NORM position).	Fuel interconnect valve not fully closed. (Automatic valve opening is normal if FUEL LOW (ight is also bluminated.)	Check FUEL INTOOM circuit breakers (both) in. FUEL INTOON witch — OPEN, then NORM.
FUEL INTCOM (Switch in OPEN position.	FUEL Interconneol valve not fully open or FUEL INTCON circuit breakers out.	Check FUEL INTOOM circult breakers in: FUEL INTOON switch — OVAD CLOSE, then OPEN.
FUEL XFRED	Fuel prossited valve not lully open or closed, or FUEL XFEED elecusions breakers out.	Check FUEL XFEED circuit breakers (both) in. Cycle FUEL XFEED switch.
HEATER AIR LINE	Heater mixing valve mellunction.	Turn HEATER switch OFF immediately.
APCS	Automatic flight control system hardover;	Reduce AIRSPEED to 115 KIAS or below. Check AFCS control panel. If either helipilot is oif, attempt to a witch ON. (Refer to AFCS malfunction procedures.)
	or Loss of sc power to HP 1 or HP 2:	
	or Lose of attribute gyro input to HP 1 or HP 2 (possible disengencement of either or	During IFA flight, if both MP 1 and MP 2 are felled and will not reset. fend as soon as practical; or continue flight under VFR. If desired.
	both helipflots.)	
	or Auto Irim malfunction. Displacement between HP 1 and MP 2 actuators at least 50 percent travel.	Reduce A)RSPEED to 115 KIAS or below. Chack between position panel. If APIs are centered, depress 8YS 2 button to chack HP 2 actuator displacement. Turn off affected system.

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Table 3-2. Caution lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
FT OFF	Force (rim Inaparative.	Check FORCE TRIM switch ON and FORCE TRIM circuit breaker in. During IFR flight, if eystem remaine inoperative, land as soon as prectical; or continue liight under vFR, if desired. Pilot may increase cyclic iriction to provide additional cyclic stabilization.
CYC CTR	Cyclic not centered.	Center cyclic.
RPM (with su(fic) or RPM (without sudic)	ROTOR RPM at or below 95%. or ROTOR RPM at or above 105%,	Adjust collective pitch and/or RPM iNCR/DECR switch as required. Refer to ENGINE FUEL CONTROL MALFUNCTION procedures.

FIRE

ENGINE FIRES

PUDICATIONS

FIRE 1 PULL or FIRE 2 PULL handle illuminated.

ENGINE FIRE DURING START

PROCEDURE-

Abort start of affected engine as follows:

Throttle Closed.

FUEL XFEED switch - OVRO CLOSE.

SDOST PUMP which - OFF.

FUEL awitch · · OFF.

Appropriate FIRE PULL handle -- Pull.

FIRE EXT switch . MAIN.

If FIRE warning light remains on more (hap 10 seconds: FIRE EXT switch — RESERVE.

Complete engine shutdown.

Exit helicopter.

ENGINE FIRE DURING TAKEOFF OR LANDING

PROCEDURE:

The premary concern for the pilot is safety of the passengers and erew. The decision whether to begin an approach, or continue the takeout is based on landing site availability. Proceed as follows:

AIRBPEED - 46 KIAS minimum.

Collective — Reduce (allifude) permitting).

Appropriate FIRE PULL handle — Pull.

FIRE EXT switch - MAIN.

(f FIRE warning light remains on more than 10 seconds: FIRE EXT switch — RESERVE.

ENG — Set al 100% RPM (N2) II possible.

Land as soon as possible.

Complete angine ehuldown.

Esit helicopter.

ENGINE FIRE IN FLIGHT

PROCEDURE:

initiate emergency descent immediately if possible.

Shut down affected engine as follows:

Collective — Reduce (slillude permitting).

Appropriate FIRE PULL handle — Pull.

Throttle — Closed.

FIRE EXT switch - MAIN.

FUEL XFEED AWIGH - OYRO CLOSE.

BOOST PUMP switch - QFF.

FIFE switch - OFF

FUEL INTOON switch — OPEN.

(I FIRE warning light remains on more than 10 seconds: FIRE EXT switch — PESERVE.

ENG (unaffected engine)— Set at 100%. RPM (N2) if possible.

Land as soon as possible.

if a fanding site is not readily evailable, proceed as follows: FIRE PULL handle in (10 provide Nre protection for unaffected engine).

GEN switch (affected angine) - OFF.

NON-EBHTL BUS switch - As desired.

If No. 2 engine was shut down:

BATTERY BUS 2 wellch - OFF:

BATTERY BUS 1 wellch — ON.

After landing, proceed as follows:

Complete engine ehutdown.

Exit helicopter.

SMOKE OR FUMES IN CABIN

INDICATIONS:

Smoke, toxic fumes, etc., in cabin.

PROCEDURE:

YENT BLOWER switch ON.

Yents and windows - Open.

it additional ventilation is required:

AIRSPEED — Reduce to 60 KIAS or lees.

Paecenger doors — Open.

If time and pilitude permit and the source is suspected to be electrical, attempt to identify and isolate the affected system.

Land as soon as possible.

ENGINE FAILURES

SINGLE ENGINE FAILURE

ENG RPM (N2) of the normally operating angine is allowed to droop to 97% during transition from twin angine operation to single engine operation, When the best rate of climb airspeed (70 KIAS) is obtained, ENG RPM (N2) should be increased to 100% if possible.

Flight can be continued on remaining engine until a destrable tanding site is available. There are certain combinations of gross weight, attitude, and cold ambient temperatures at which a single engine approach will result in the OEI forque limit being exceeded. A run-on landing at 20 to 30 KIAS is recommended

CAUTION

RUN ON LANDINGS MAY RESULT IN ROLL OSCILLATIONS WHILE ON THE GROUND. IF THIS O'C CURS. LOWERING COLLECTIVE FULLY DOWN OR DISENGAGING HP / AND HP Z WILL STOP THE OSCILLATIONS.

Loss of an engine white hovering at high gross weight and extremely cold conditions will most likely result in exceeding the DEI torque limit. If an overtorque is observed or suspected, an appropriate log back entry shall be made. Refer to Performance charts in Section 4.

NOTE

If an engine restort is to be attempted, rater to ENGINE RESTART IN MALFUNCTION PADCEDURES.

INDICATIONS:

ENG 1 OUT or ENG 2 OUT warning light illuminated.

QAS PROD below 53% RPM (N1) and decreasing.

ENG below 85% RPM (N2) and decreasing.

ITT below 400°C and decreasing.

ENG 1 or ENG 2 OIL PRESSURE, DC GENERATOR, and PART SEP OFF caution lights illuminated.

PROCEOURE:

WARNING

IF CORRECTIVE ACTION IS NOT (NIT) ATED IMMEDIATELY, ROTOR RPM CAN DECAY EXCESSIVELY.

CAUTION

DURING COLD WEATHER OPERATIONS, CAREFULLY MONITOR JORGUF OF THE NORMAL ENGINE WHEN ONE ENGINE FAILS OR IS SMUT DOWN IN FLIGHT.

Collective Reduce as required to maintain ROTOR RPM and power within OE) (Imits.

AIRSPEED 70 KIAS.

APM switch · · INCR: set ENG RPM (N2) at 100% if possible.

Throttle (effected engine) — Closed.

BOOST PUMP switch (affected engine).

OFF.

FUEL switch (effected engine) - DFF.

FUEL XFEED awitch - OVRD CLOSE.

FUEL INTOON switch - OPEN.

GEN switch (affected engine) — OFF.

NON-ESNTL BUS switch - As desired.

If No. 2 angine falled:

BATTERY BUS 2 switch - OFF;

BATTERY BUS 1 switch . ON.

MASTER CAUTION light Reset.

Attitude - - Descend below 5000 (i H_a (ii possible).

Land as soon as practical.

DUAL ENGINE FAILURE

INDICATIONS:

ENG 1 OUT and ENG 2 OUT warning lights illummated.

RPM caution light illuminated.

Rotor rom audio on.

GAS PROD below 53% APM (N1) and decreasing (both engines).

EMG below 85% RPM (N2) and decreasing (both engines).

ITT below 400°C and decreasing (both engines).

ENG 1 and ENG 2 OIL PRESSURE, DC GENERATOR, and PART SEP OFF caution lights illuminated.

PROCEDURE:

WARNING

IF CORRECTIVE ACTION IS NOT INITIATED IMMEDIATELY. ROTOR RPM CAN DECAY EXCESSIVELY.

Collective pitch — Reduce. Establish autoroletive glide at 70 to 90 KIAS.

NOTE

AIRSPEED for best angle of glide in autorotation is 90 KIAS, and AIRSPEED for minimum rate of descent is 70 KIAS. Autorotational rate of descent is a function of AIRSPEED and ROTOR RPM and is virtually unaffected by gross weight and density attitude.

Accomplish autorotative landing.

If time parmits before landing and a restart will not be attempted, proceed as follows:

Throttles (both) Clased.

FUEL switches (both) — OFF.

BOOST PUMP switches (both) - OFF.

FUEL TRANS switches (both) — OFF.

After landing, complete shuldown.

TAIL ROTOR FAILURES

The key to successful handling of a latirotar emergency lies in the pilot's ability to quickly recognize the type of malfunction and to salect the proper emergency procedure. Following is a discussion of some types of fail roter malfunctions and their probable effects.

COMPLETE LOSS OF TAIL ROTOR THRUST

INDICATIONS:

This is a situation involving a break in the drive system. Such as a severed drivenhaft, wherein the tell rotor slope turning and delivers no thrust. A failure of this type in powered flight will result in the nose of the helicopter swinging to the right (left side slip) and usually a roll of the fuselage. Nose down attitude may slee be present. The severity of the install reaction will be affected by sirepeed, density although, gross weight center of gravity, and power being used.

LOSS OF T/R THRUST AT HOVER

PROCEDURE:

Close throttles immediately and make a hovering autorotation landing. Yawing can be expected on fouchdown.

LOSS OF T/R THRUST IN CLIMB

The degree of right yow upon failure will be greater than that experienced in level tilght due to the higher power and anti-torque settings.

PROCEDURES:

Close throttles and lower collective pitch immediately. Establish a glide speed slightly above normal eutorotation approach speed.

If a turn is required to reach a more desirable place to land or to align into the wind, make it to the right if possible. A turn to the right can be more nearly streamlined by the use of a little power.

Once aligned for landing, yaw can be controlled in the following menner:

Right Yew

It the nose yaws right with power off, a pulse of up-collective will produce more friction in the mast thrust bearings, creating a left moment. The greater the ingular of the pulse, the more the response will be.



DO NOT ALLOW ROTOR RPM TO DECAY BELOW MINIMUM LIMITS.

Moving the collective upward abruptly increases rotor loading. Do not hold collective up, as rotor ipm will decrease lower than deskrable, it is assemble that the collective be returned to the down position for autorotation. The cycle is one pulse. The pulse should be rapid (up and down) but should not be used at low allitudes.

Left Year

If the nose years left with power off, a elight addition of power should arrest it. Further increase in power results in more right year response

Landing



RUN ON LANDINGS MAY RESULT IN ROLL OSCILLATIONS WHILE ON THE GROUND. IF THIS OCCURS, LOWERING COLLECTIVE FULLY DOWN OR DISENGADING HP J AND HP 2 WILL STOP THE OSCILLATIONS.

During the final stages of the approach, a mild flare should be executed and ell power to the rotor should be off. Maimain helicopter in a slight flare and use collective amouthly to execute a soft, alightly nose-high lending. Landing on the

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all portion of the skids will tend to correct side drift. If helicapter starts to turn, move cyclic as necessary to follow the turn until helicapter comes to a complete stop. This technique will, in most cases, result in a sur-on type funding.

CAUTION

FOR ZERO GROUND SPEED LANDING, THE FLARE AND THE ABRUPT USE OF COLLECTIVE MAY CAUSE THE NOSE TO YAW LEFT DO NOT CORRECT WITH THROTTLE. ALTHOUGH APPLICATION OF THROTTLE WILL RESULT IN YAWING TO THE RIGHT, ADDITION OF POWER IS A VERY STRONG RESPONSE MEASURE AND IS TOO SENSITIVE FOR THE PILOT TO MANAGE PROPERLY, DD NGT ADD POWER AT THIS TIME. SLIGHT YAWING UPON TOUCHDOWN AT ZERO GROUND SPEED MAY BE EXPECTED.

LOSS OF T/R THRUST IN LEVEL FLIGHT OR DESCENT

PROCEDURE:

Close throttles and reduce collective pitch immediately. Attain an airspeed slightly above the normal autorolative gilde speed.

If althude permits with AIRSPEED above 50 KIAS, throttle and collective may be gently applied to determine if some degree of powered Hight can be resumed. However, although the properties of powers are although the appropriate of the enter autorotation and continue descent to a landing.

The landing technique is the same as prescribed for the climb condition above.

LOSS OF TAIL ROTOR COMPONENTS

The loss of any fall notor components will result to a forward center of gravity shift. Other than sadditional nose down pitching, this situation would be quite similar to complete loss of tall potor thrust, as discussed above.

TAIL ROTOR FIXED PITCH FAILURES

INDICATIONS:

Tail rotor pitch change control failures are characterized either by a lack of directional response when a padal is pushed or by focked pedals. If pedals cannot be moved with a moderate amount of force, do not attempt to apply a maximum effort, since a more serious maximum effort, since a more serious maximum could result.

FIXED PITCH FAILURE AT HOVER

PROCEDURE:

Do not close throttics unless a severe right yew occurs. If pedala lock in any position at a hover, landing from a hover can be accomplished with greater salery under power controlled hight rather than by closing throttiles and entering autorotation.

FIXED PITCH FAILURE IN FLIGHT

If tail rotor fixed pitch fallure occurs during climb (left pedal applied), cruise (approximately neutral pedala), and descent (right pedal applied), a descent and landing can be effected safely by use of power and throttle climpts.

PROCEDURES-

If the helicopter is in a trimmed condition when the multimetion is discovered,

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engine power and airspeed should be noted and sircraft flown to a suitable landing area.

Combinations of ENG TORQUE, ROTOR RPM, and AIRSPEED will correct or aggravate yew attitude and these should be adjusted as required to control yew during landing.

Right Pedal Locked Forward of Neutral

Power should be reduced and ENG RPM (N2) maintained within the green arc. This will help streamline the helicopter in flight. Right turns are easier than left turns. ARSPEED should be maintained at or above 60 KIAS.

Execute a normal to steep approach adjusting the power as necessary to minimize or prevent right yaw. Maintele ENG RPM (N2) and an AIRSPEED of 66 KIAS during the initial part of the approach.

At 60 to 75 feet AGL and when the landing area can be made, start a slow deceleration to errive at the intended landing point with AIRSPEED at about 26 KIAS.

At 2 to 5 feet AGL, slowly reduce throttle to overcome yew effect and sillow helicopter to settle. When aligned with the landing area, allow helicopter to touch down.

CAUTION

RUN ON LANDINGS MAY RESULT IN ROLL DSCILLATIONS WHILE ON THE GROUND. IF THIS OCCURS, LOWERING COLLECTIVE FULLY DOWN OR DISENGAGING HP / AND MP / WILL STOP THE OSCILLATIONS.

After ground contact, use collective and throatin as necessary to maintain alignment with landing strip, and to minimize forward speed. If helicopter starts to turn, move cyclic as necessary to follow the turn until helicopter comes to a complete stop.

Left Pedal Locked Forward of Meteral.

Reduce power and mainten ENG RPM (N2) within the green arc. Normal turns can be safely made under these conditions, although the nose may be displaced to the left.

On final approach, begin a slow deceleration so as to prive at a point about four to five feet above the intended foundown area as affective translational lift is leaf

Apply collective pitch to stop the rate of descent and forward speed, and to align the hallcopter with the intended landing path. Aliew helicopter to touch down at near-zero ground speed, maintaining alignment with throttle

Pedals Locked in Heuiral

Reduce power and maintain ENG RPM (N2) within the green arc. Normal lurns can be easily made under these conditions.

Execute a normal to shallow approach, holding AIRSPEED at 60 KIAS during the initial part of the approach. Adjust power as necessary to minimize or prevent right yaw.

At 50 to 75 test AGL and when the landing area can be made, start a deceleration to arrive at the intended landing point with AIRSPEED at 25 KIAS.

At 2 to 5 feet AGL, use throttle slowly as necessary to maintain alignment with the landing eree and to control yew; do not allow helloopter to settle until alignment to settle until alignment to settle until alignment to settle down.

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RUN ON LANDINGS MAY RESULT IN ROLL OSCILLATIONS WHILE ON THE GROUND. IF THIS OCCURS, LOWERING OCCULECTIVE FULLY DOWN OR DISENGAGING HP | AND HP 2 WILL STOP THE OBCILLATIONS.

Atter ground contact, one collective and throttle as necessary to minimize forward spend and to maintain alignment. Move cyclic as necessary to follow the turn until helicopter has come to a complete stop.

LOSS OF PITCH CHANGE CONTROL LINKAGE

INDICATIONS:

In this type of failure, the pitch-change mechanism is broken at some point and the tall rotor will assume a blade angle determined by the secodynamic and counterbalance forces.

PROCEDURES:

The corrective action procedures are described in FIXED PITCH FAILURES, above The specific procedure to be used depends on the year change experienced.

MAIN DRIVESHAFT FAILURE

WARNING

FAILURE OF THE MAIN DRIVESHAFT TO THE TRANSMISSION WILL RESULT IN COMPLETE LOSS OF POWER TO THE MAIN ROTOR. ALTHOUGH THE COCKPIT INDICATIONS FOR A DRIVESHAFT FAILURE ARE SOMEWHAT COMPARABLE TO A DUAL ENGINE FAILURE, IT IS IMPERATIVE THAT AUTOROTATIVE FLIGHT PROCEDURES BE ESTABLISHED IMMEDIATELY. FAILURE TO REACT IMMEDIATELY TO THE LOW ROTOR RPM AUDIO SIGNAL CAUTION LIGHT AND TACHOMETER INDICATION WILL RESULT IN LOSS OF CONTROL.

IMPICATIONS:

Left yaw.

Rapid decrease in ROTOR RPM.

Rapid Increase in ENG RPM (N2).

illumination of rotor RPM caution light with audio.

Possible increase in noise due to:

Overspeeding engine turbines.

Overspeeding combining gearbox.

Orlyechaft breakage.

PROCEDURE:

Collective — As required to establish suborotalive descent.

Airapaed — Establish eirapaed for minimum rate of descent (70 KIAS) or maximum glide (90 KIAS).

Throttles - Close, if time permits.

Controls - As required for autorotative landing.

ENGINE HOT START

INDICATIONS:

A hat start is caused by a combination of excessive fuel in the combustion chember and delayed fuel ignition. A hat start may be syldeness by furner emitting from the gabgust and/or excessive ITT indication internal and external demage can result.

PAGCEDURE:

Abort start of affected engine as follows:

Throitie — Closed; keep élarier ongagéd.

FUEL EWIIGH - OFF.

BOOST PUMP switch — QFF.

Starter — Continue to energize until IVT decreases.

Complete shuldown.

Exit helicapter and check for damage.

If ITT limits for starting were exceeded, refer to Engine Maintenance Manual for inspection requirements.

ENGINE RESTART IN FLIGHT

The conditions which would werrant on attempt to restart the engine would probably be a flampout, caused by a malfunction of the automatic mode of the fuel control unit. The decision to attempt an engine restant during flight is the pilota responsibility.

CAUTION

IF THE CAUSE OF ENGINE FAILURE IS OBVIOUSLY MECHANICAL AS EVIDENCED BY ABNORMAL SOUNDS, DO NOT ATTEMPT A RESTART.

PROCEDURE:

Position controls of attected engine to attempt restart so follows:

Throttle — Closed.

ROOST PUMP switch — ON.

FUEL XFEED switch - NOAM.

FUEL awtich - ON.

GOY switch - MANUAL.

GEN switch OFF.

CAUTION

OEI PERFORMANCE CAN BE AFFECTED DURING GENERATOR ASSISTED START (WITH BOTH BATTERY SWITCHES OW).

For nonsesisted battery start (if No. 1 engine leited):

BATTERY BUS 2 switch - OFF.

BATTERY BUS 1 awitch — QN.

START switch — ENG 1; observe starter limitations.

ENGINE Oil, pressure — indicating a rise.

CAUTION

WHEN RESTARTING ENGINE IN MANUA! FUEL CONTROL MODE, CAREFULLY MONITOR (TT.

Thro(tie — Open slowly at 12% GAS PROD RPM (NI) until ITT begins to rise. Do not open throttle further until ITT and GAS PROD RPM (NI) stabilize.

\$TART switch - Contered at 55% GAS PROD RPM (N1).

CAUTION

WHEN OPERATING IM MANUAL FUEL CONTROL MODE, MAKE SLOW, SMOOTH, COORDINATED THROTTLE AND COLLECTIVE MOVEMENTS TO A VOID COMPRESSOR STALL, OVERTEMP, UNDERSPEED/OVERSPEED, AND POSSIBLE DRIVETRAIN DAMAGE.

Throttle — increase slowly; edjust as required to control TORQUE, ITT, and GAS PROD RPM (N1).

NOTE

II TORQUE of elfected engine is controlled stightly (approximately 4%) below TORQUE of permal engine, ROTOR RPM will be governed within jimils automatically by normal engine.

GEN switches (both) - ON.

BATTERY BUS 2 switch - ON.

FUEL TRANS switch (affected engine) — ON

FUEL INTOON switch - MORM.

Land as soon as practical.

If restart was unsuccessful, secure affected engine as prescribed in SMGLE ENGINE FAILURE procedure.

ENGINE FUEL CONTROL MALFUNCTIONS

Components of each engine (set control system subject to mellianction are the manusi fuel control unit, the automatic fuel control unit (containing the gas producer turbine governor), the power turbine governor, and the torque control unit, inflight determination of which component

has mailtunctioned is virtually impossible and is irrelevant to the required corrective action. The pilot, therefore, is tasked with interpreting the abnormal indications only so fer as to determine which angine has been affected, and which way, in order to perform the proper corrective action.

The primary indications of a fuel control failure usually will be a TOROUE apilit and an accompanying increase or decrease in ENG RPM (N2) and ROTOR RPM Normal deviations of ROTOR RPM from the governed setting may occur when large colloctive changes are made but should not be confused with fuel control failure, unless a large steady-state TOROUE split occurs. The indications of TOROUE, 5AS PROD RPM (N1), and IFT alone will not distinguish a high side failure from a low side failure. The triple technometer must be checked for high or low ENG/ROTOR RPM indications.

The indications of a high side or a low side fuel control failure will vary in accordance with the specific cause of failure and the total power demand at the time of failure.

HIGH SIDE FUEL CONTROL FAILURE

If there is a low power demand (less than single engine power available) at the time of high side failure, ROTOR RPM and ENG RPM (N2) of the effected engine will increase considerably above the governed value. TORQUE, ITT, and GAS PROD RPM (N1) of the sifected engine will also increase. As ENG RPM (N2) and ROTOR RPM increase above the governed value, the normal angine will reduce power to keep itself from overspeeding, and will indicate significantly lower TORQUE, ITT, and GAS PROD RPM (N1) than the allected engine.

If there is a high power demand (greater than single engine power systable) at the time of high side failure, ROTGA RPM and ENG RPM (N2) of the sitested engine will surge initially, along with TORGUE, ITT, and GAS PROD RPM (N1). As ENG RPM

(N2) and ROTOR RPM increases the normal engine will reduce power to keep literal from overspeeding. The affected engine then tries to essume all of the load, which is beyond its capability due to the high power demand. ENG RPM (N2) of the affected engine (and ROTOR RPM) will then decrease and rejoin the ENG RPM (N2) of the normal engine, steplitzing at or eligibility above the governed value as the normal engine adjusts power output to share the load.

UNDICATIONS:

High ENG RPM (N2) and AOTOR RPM. possibly with RPM caution light.

Delinite TORQUE split (proportional to power demand).

High GAS PROD RPM (N1), ITT, and TORQUE on affected engine.

Acturn of ENG APM (N2) and ROTOR RPM to governed value (if power demand is very high).

PROCEDURE:

CAUTION

IF CORRECTIVE ACTION IS NOT INITIATED INMEDIATELY, ROTOR RPM CAN OVERSPEED EXCESSIVELY.

Collective — Adjust as necessary to maintain ROTOR RPM.

Affected engine — Identity.

Throttle (affected engine) — Reduce to maintain TORQUE at or elightly below TORQUE of normal engine.

Throttle Inclions — Tighten on normal engine; reduce on affected engine.

Throttle (affected angine) — Reduce to idle.

GOV switch (affected engine) — MANUAL.

CAUTION

WHEN OPERATING IN MANUAL FUEL CONTROL MODE, MAKE SLOW, SMOOTH, COORDINATED THROTTLE AND COLLECTIVE MOVENESS TO A VOID COMPRESSOR STALL, OVERTEMP, UNDERSPEED, OVERSPEED, AND POSSIBLE DRIVETRAIN DAMAGE.

Throitis (affected engine) — Increase elowly Adjust (prottis and collective as required to maintain TORQUE of affected engine slightly below TORQUE of normal angine.

MASTER CAUTION light — Resct.

Land as goon as prectical.

LOW SIDE FUEL CONTROL FAILURE

If there is a low power demand (less than single engine power evaluable) at the time of low side failure, ROTOR RPM and ENG RPM (N2) of the affected engine will decrease and stabilize at or slightly below (he governed value, TORODE, ITT, and GAS PROD RPM (N1) of the effected engine will also decrease. As ROTOR RPM decreases, the normal engine will increase TORODE output to assume the food. If power demand is near zero, there may not be a alignificant TORODE split.

if there is a high power demand (greater than single engine power available) at the time of low side failure, ROTOR RPM will decrease along with ENG RPM (N2), TORQUE, ITT, and GAS PROD RPM (N1) of the effected engine. As ROTOR RPM

decreases, the normal engine will increase to maximum power to sesume the load, causing algorithms increases in TORQUE, ITT, and GAS PROP RPM (N1), while ENG RPM (N2) will remain below the governed value.

INDICATIONS:

Low ENG RPM (N2) and ROTOR RPM (possibly with RPM caution light and audio if power demand is in eacess of single engine power evallable).

TORQUE split (proportional to power demand).

Low GAS PROD RPM (N1), ITT, and TORQUE on allacted engine.

PROCEDURE:



IF CORRECTIVE ACTION IS NOT INITIATED IMMEDIATELY, ROTOR RPM CAN DECAY EXCESSIVELY.

Collective — Adjust as necessary to maintein ROTOR RPM.

AIRSPEED - 65 KIAS.

Affected engine — Identity.

Throttle frictions - Tighten on normal angine; reduce on affected angine.

Throttle (affected engine) - Reduce to idle.

GOY switch (affected engine) — MANUAL



WHEN OPERATING IN MANUAL FUEL CONTROL MODE, MAKE

SLOW, SMOOTH, COORDINATED THROTTLE AND COLLECTIVE MOVEMENTS TO AVOID COMPRESSION STALL, OVERSPEED, AND POSSIBLE DRIVETRAM DAMAGE.

Throttle (effected engine) — increase showly. Adjust throttle and collective as required to maintain torque of effected engine slightly below torque of normal engine.

MASTER CAUTION light - Reset.

Land as soon as practical.

GOVERNOR ACTUATOR FAILURE (FULL INCREASE)

INDICATIONS:

ENG RPM (N2) and ROTOR RPM increase to approximately 101%.

RPM INCR/DECR syntah Inoperative.

PROCEDURE:

If this failure occurs during takeoff or landing, no immediate corrective action is necessary to complete alther maneuver.

As soon as practical, roll back both throules to maintain 97 to 100% ENG APM (N2). Further adjustment of collective and throttles simultaneously will allow full power at pilot's discretion.

Land as soon as practical.

ELECTRICAL POWER FAILURES

DC POWER FAILURE

INDICATIONS:

DC GENERATOR caution light illuminales.

All lighting and avionics on nonestabilial buses inoperative.

PROCEDURE:

GEN FIELD and GEN RESET circuit breakers — Check in.

GEN switch (affected generator) - RESET, then ON:

If generator remains inoperative, proceed as follows:

GEN switch (affected generator) - OFF.

MASTER CAUTION light — Reset

H No. 2 générator failed:

BATTERY BUS 2 switch — OFF:

BATTERY BUS 1 switch - ON.

NON-ESNTL BUS switch — MANUAL.

DC AMPS — Monitor, if load exceeds limit:

MON-ESNITL BUS switch — As desired, Switch all unnecessary equipment as required.

If both generators (aif and neither will reset, proceed as follows:

CAUTION

OO NOT SELECT EMERG LUAD AT PRESSURE ALTITUDES ABOVE 5000 FEET BOTH FUEL BOOST PUMPS WILL BECOME INOPERATIVE. RESULTING IN POSSIBLE FUEL STARVATION.

EMERG LOAD switch . As desired.

NOTE

A fully charged battery provides electrical power for approximately 30 minutes under normal conditions. With EMERG LOAD switch in EMERG LOAD position, the battery provides approximately 90 minutes of electrical power.

Land as soon as practical.

AC POWER FAILURE

INDICATIONS:

NO. 1 or NO. 2 INVERTER caution light illuminates.

Possible loss of power to certain at instruments (with no INVERTER caution light).

PROCEDURES:

If either INVERTER caution light Highworks, proceed as follows:

AC VOLTS - Check to determine that remaining inverter has assumed all ac loads.

INV PWA alread breakers . Check in ..

HP t or HP 2 button (affected system) -Press to reengage helipitot. If power is lost only to certain ac instruments, but INVERTER coulton lights ramain out, proceed as follows:

AC FEEDERS circuit breakers (8 each) -- Check in.

During IFA flight, if both inverters fell, land as soon as practicel; or continue flight under VEA, if desired.

HYDRAULIC SYSTEM Failure

This helicopter has two independent hydraulic boost systems, both of which supply power to the flight control system for the main rotor. The tall rotor control system is powered by system 1 only.

If a hydrautic system failure occurs shortly after the helicopter has been cold scaked at ar below 25°C (+13°F), some resistance may occur when the cyclic is less control position extremes. This resistance can be overcome by increased pilot ellort.

INDECATIONS:

- NO. 1 or NO. 2 HYDRAULIC caution light
- Abnormal (low, high, or fluctuating)
 hydraulic pressure in affected system
- Posa-ble high temperature in affected system.
- Increased pedat forces (it system 1 failed).
- increased cyclic lorces pear control extremes (cold weather only).

PROCEDUAE

If either hydraulto system falls, or if system temperature or pressure exceeds limits, proceed so follows:

WARNING

DO NOT EXTEND FLIGHT WITH FAILED HYDRAULIC SYSTEM. THE HELICOPTER IS MOT CONTROLLABLE WITH BOTH HYDRAULIC SYSTEMS INOPERATIVE.

DURING COLD WEATHER OPERATION AVOID HIGH RATES OF CLIMB. MAKE APPROACHES AND LANDINGS INTO THE WIND. AVOID EXTENDED HOVERING AND DO NOT HOVER WITH THE WIND COMING FROM THE AFT LEFT QUADRANT

Affected system | Identify positively.

HYDR 9Y8 switch (effected system) -- OFF.

MASTER CAUTION light - Reset.

Land as soon as possible.

AFCS MALFUNCTIONS

The automatic flight control system can be attacted by mailunctions of pilot or copilot attitude gyro, either inverter, or by other electrical impliunctions. Failure of No. 1 hydrautic system will render your SAS interpretate but will not attact pitch or roll SAS or ATT mode functions. Failure of No. 2 hydrautic system will not affect AFCS.

If both helipitots are disengaged, the following procedures do not apply.

AFCS FAILS TO ENGAGE OR DISENGAGES

INDICATIONS:

- AFCS caution light alluminated.
- HP 1 or HP 2 off (button not illuminated).

Possible erratic API indications on HP 1 or HP 2.

Possible ATT (lag displayed on pilot or copilot attitude indicates.

Possible Illumination of NO. 1 or NO. 2. INVERTER caution light.

NOTE

if inverter 1 or 2 fails. HP 1 or HP 2 will disengage, but can be reengaged by pressing respective button on AFC9 control panel.

PROCEDURE:

AIRSPEED — Reduce to 115 KIAS or less.

INV 1 and 2 emitches — ON; check NO. 1 and NO. 2 INVERTER courlon lights extinguished.

Pilot and copilet ADIs — Check ATT flags retracted, indicators functioning properly.

Check the following ejecuit breakers in:

CAUTION

DO NOT ATTEMPT TO RESET ANY CIRCUIT BREAKER MORE THAN ONCE.

BNV 1 PWR and INV 2 PWR

AC FEEDERS (6)

NO. 1 and NO. 2 ESNTL BUS FEEDERS. (ON MAIN DC)

AFCS (No. 1 and No. 2)

AFCS 26Y (No. 1 and No. 2)

AFC\$ 115Y (No. 1 and No. 2)

PILOT ATT 5Y6 and CPLT ATT SYS

HP 1 or HP 2 button (affected system) — Press to reengage.

If either halipitot will not reengage, or if abnormal control disturbance occurs, proceed as follows:

Affected nelipilot — Disangego.

ul (FR, land se eoon se practical; or continua flight under VFR, if dealred.

if both helipilots fall to reengage, proceed as follows:

AIRSPEÉD — As dosired.

If IFA, land as soon as practical; or continue light under VFA, if desired.

AFCS FAILS TO HOLD ATTITUDE

PROCEDURE:

FORCE TRIM wwitch - Check ON.

SAS/ATT bullon — Check ATT light lituminated.

If mallunchen paraists, follow procedure for AFCS FAILS TO ENGAGE OR DISENGAGES.

AFCS HARDOVER OR ABNORMAL CONTROL DISTURBANCE

PROCEDURE:

WARNING

IF HP 1 OR HP 2 FAILS OR IS DISENGAGEO, REDUCE AIRSPEED TO 116 KIAS OR LESS.

8HT-412-FM-2

- Cyclic FORCE TRIM release button — Press; correct helicopter attitude with cyclic and padels, then release button.
- AIRSPEED Reduce to 116 KIAS or less.
- Actuator position indicators Check both systems. If any API shows maximum displacement or errallo operation of any actuator, switch affected helipitol OFF.
- If IFR, land as soon as practical, or continue flight under VFR, If desired.

AUTOTRIM RUNAWAY

An autoimm runnway can occur only when both HP 1 and HP 2 are ON in ATT mode.

INDICATIONS:

An autotrim runeway in Highl will be evidenced by the cyclic elick being driven in a direction apposite to the actuator position indications (HP 1 or HP 2). This condition occurs because the spring actuators will be driven to limit authority to compensate for the autotrim runeway. When the actuators are saturated (on slope), the helicopter will respond to the runeway trim command; however, with both HP 1 and HP 2 operative, the autotrim will be cut off automatically two seconds shar actuator saturation.

PROCEDURE:

- Cyclia FORCE TRIM release button — Depress to center actualors and retrim to desired attitude.
- AIRSPEED Reduce to 115 KIAS or less.

NOTE

It is préferable la lurn HP 2 off la relain yeu stabilization.

- HP 2 or HP 1 OFF.
- 4. APIS Monitor for proper sperition.
- If IFR, fand as soon as precised; or continue flight under VFR, if desired.

STICK CENTERING INDICATOR FAILURE

INDICATIONS:

CYC CTA caution lights left to illuminate when cyclic is displaced 1.5 inches or more from center position white RPM caution light is illuminated.

PROCEDURE:

Meiniain ROTOR between 97 and 100% RPM for ground operation before beginning ENGINE SMUTDOWN procedures.

COMMUNICATION SYSTEM

INTERCOM FAILURE

INDICATION:

Weak recoption in headast.

No reception in headest.

PROCEDURE:

Check headset connection.

Varity volume and ICS controls set properly.

Cycle ICS circuit breaker out and in.

For single pilot operations only with Emergency Communications penol installed:

> Plug headset into EMERGENCY COMM jack (above and behind pilot position).

> Select desired radio on copilot ICS panel.

Key selected radio with EMERGENCY COMM switch (on center padasis).

COMMUNICATION RADIO FAILURE

INDICATION:

Weak reception in headset

No reception in headest.

PROCEDURE:

Verify proper radio selectes.

Verify volume properly edjusted.

Verify frequency properly set,

Cycle appropriate circuit breaker out and in.

CABIN HEATER MALFUNCTION

A mailtunction in the blood air heater controls may or may not cause heater to become inoperative.

INDICATIONS:

- HEATER AIR LINE caution light illuminates.
- Hented eirflow does not shut off when thermostal knob is turned to fully COLD position.

PROCEOURE:

- HEATER switch OFF immediately.
- CABIN MTR circuit breaker Check; if out, do not reset.

FUEL QUANTITY INDICATIONS MALFUNCTION

INDICATION:

FUEL GTY indication goes to zero from a previously normal condition. (Possible

power fallure to the (uel signa) conditioner.)

NOTE

A power failure to the signal conditioner will disable the FUEL LOW coutton light and after the FUEL TRANS caution indication for affected fuel system. Relet to table 3-2.

PROCEDURE:

FUEL GTY circuit breaker Recycle. (Attacled side.)

FUEL INTOON SWIICH - OPEN.

NOTE

Allow sufficient time for fuel levels to equalize. Approximate fuel loads may be obtained by doubling remaining lust quantity indicated.

STATIC PORT OBSTRUCTION

INDICATION

Erratic readings from the AIRSPEED indicator, VERTICAL SPEED indicator, and altimeter when operating helicopter in rain with STATIC SOURCE switch in PRI position.

PROCEDURE

- Windows and Yents Close.
- HEATER switch OPF.
- STATIC SOURCE switch ALTN.

NOTE

This procedure selects an alternate static source (cabin air) for pilot side instruments only.

Section 4

PERFORMANCE

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Section 4

PERFORMANCE

INTRODUCTION

The performance data presented herain are derived from the engine manufacturer's specification power for the engine less installation losses. These data are applicable to the basic helicopter without any optional equipment which would appreciably affect lift, drag, or power available.

POWER ASSURANCE CHECKS

Power Assurance Check charts (figure 4-1) are provided to determine if the engines can produce installed specification power.

A power assurance check should be performed daily, Additional checks should be made if unusual operating conditions or indications arise. The hour check is performed prior to takeoff, and the in-flight check is provided for periodic in-flight monitoring of engine performance. Either power assurance check method may be selected at the discretion of the pilot. It is the pilots responsibility to eccomplish the procedure safety, considering passenger load, terrain being everflown, and the qualifications of persons on board to easist in watching for other air traffic and to recom power check data.

If either engine does not meet the requirements of the hover or the in-flight power assurance check, published performence may not be achievable. The cause of engine power loss, or excessive ITT or GAS PROD RPM (N1) should be determined as soon as practical. Refer to Engine Maintenance Manual.

DENSITY ALTITUDE

A Density Attitude Chart (ligure 4-2) is provided to aid in palculation of performance and limitations. Canalty altitude (Ha) is an expression of the density of the air in terms of height above sea level; hence, the less dense the sir, the higher the density stitleds. For elandard conditions of temperature and pressure, density attitude is the same as pressure attitude (M_e). As temperature increases above standard for any altitude. the density attitude will also increase to values higher than pressure eithude. The chart expresses density althode as a function of pressure altitude and temperature.

The chart also includes the inverse of the aquate root of the density ratio (1/4a), which is used to calculate KTAS by the relation:

KTAS = KCAS x 1/4a

EXAMPLE:

If the emblent temperature is -15°C and the pressure altitude is 6000 feet, find the density attitude, 11%, and true airspend for 100 KCAS.

Solution:

- Enter the bottom of the phart at -15°C.
- Move vertically upward to the 6000 foot pressure attitude line.
- c. From this point, move horizontally to the left and read a density shiftede of 4000 feet and move horizontally to the right and read 1/10 equals 1.05.
- d. True airepeed = KCA6 \times 1/4e = 100 \times 1.05 = 106 KTAS.

HÖVER CEILING IGE

Adequate cyclic and directional control are available at the gross weights allowed by the Hover Ceiling IGE obserts to relative winds up to 36 knots from any direction at or below 3000 feet H₀. Improved control margins will be echieved by avoiding winds in the critical relative wind sylmethy areas (figure 4-3).

The Hover Celling in Ground Effect charts (figure 4-4) provide the maximum allowable group weights for hovering IGE at all pressure affiliums and outside air imperature conditions with heater on or off. Conversely, the hover celling attitude can be determined for any given grose weight.

HOVER CEILING OGE

The Mover Calling Out of Ground Effect charts (ligure 4-5) plovide mealmum weights for hovering OGE at all pressure altitude and outside air temperature conditions with heater th or off.

CAUTION

OGE HOVER OPERATION MAY RESULT IN VIOLATION OF HEIGHT-YELOCITY LEMITATIONS.

Some of the OGE haver calling charts are divided into two areas as follows:

AREA A (uncheded area) as shown on the hover calling charte presents hover performance for which estimatory cyclic and directional control have been demonstrated in relative winds of 35 knots from any direction at or below 3000 feet from any direction at or below 3000 feet achieved by avoiding winds in the critical reletive wind azimuth areas (ligure 4-3).

AREA B (shaded area) so shown on hoyer colling obserts presents additional hover performance which can be achieved in

MÓDEL 412 POWER ASSURANCE CHECK (HOVER) PTET-3B ENGINE (WITH CAS PRODUCER GAGE P/N 212-073-037-101)

HEATER/ECU - OFF

1-PROTTLES: TEST ENGINE — FUEL OPEN, PRICTIONED OTHER ENGINE — IDLE.

ENG = 97% RPM (N2)

COLLECTIVE PITCH = INCREASE INTIL TIGHT ON SKIPS OF HOVERING, DO NOT EXCEED 810* ITT OR 100.6% GAS PROD RPM (N1)

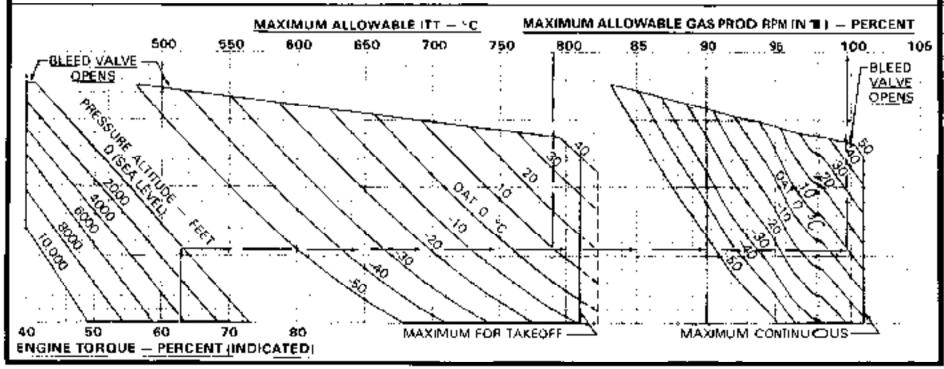
STABILIZE POWER ONE MINIJTE, THEN RECORD PRESSURE ALTITUDE, DAT. ENGINE TORQUE, ITT, AND GAS PROD RPM IN 1).

ENTER CHART AT INDICATED ENGINE TOROUS, MOVE UP TO INTERSECT PRESSURE ALTITUDE. PROCEED TO THE RIGHT TO INTERSECT OUTSIDE AIR TEMPERATURE. THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWARDS ITT AND GAS PRODIREMINT:

IF INDICATED ITT OR GAS PROD FROM INTI EXCECUS MAX ALLOWABLE, REPEAT CHI⊑CK, STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENCOME.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PRODIEPM (NIT AFTER STABILIZING GROUP MINUTES, PUBLISHED PERFORMANCE MAY NOT HE ACHIEVABLE, CAUSE SHOULD BEE DETERMINED AS SOON AS PRACTICAL.



412472-4-4-1

Figure 4-1. Power assurance check (Sheet 1 cmf 4)

MODEL 412 POWER ABSURANCE CHECK (IN-FLIGHT) PTST-3B ENGINE (WITH GAS PRODUCER GAGE PM 212-075-037-101)

ESTABLISH CEVEL FLIGHT ABOVE TORY FRAT AGE AIRSPEAD 100 KIAS ICA VNC IT LESS!

BEAUSHORUS OF

THROUGES

THEST ENGINE — PULL OPEN, HAIDFIONEO OF HER ENGINE — OECREASE SLOWLY UNTIL TEST ENGINE TORQUE IS WITHIN TEST RANGE, DO NOT EXCHED 8415°C ITT OR 100.8% GAS PROD RPM IN11.

ENG 97% RPM IN2L

STABILIZE POWER ONE MINUTE IN LEVEL FLIGHT. THEN RECORD PRESSURE ALTITUDE, OAT, ENGINE TORQUE, ITT, AND GAS PRODIEM IN 11.

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT PRESSURE ALTITUDE, PROCED TO THE RIGHT TO INTERSECT OUTSIDE ARE TEMPERATURE, THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLE ITT AND GAS PROD RPM (N1)

IF INDICATED ITT OR GAS PRODIRPM EXCEEDS MAX ACLOWABLE, REPEAT CHECK, STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PROD RPM (N1) AFTER STABILIZING FOUR MINUTES, PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DEFERMINED AS SOON AS PRACTICAL.

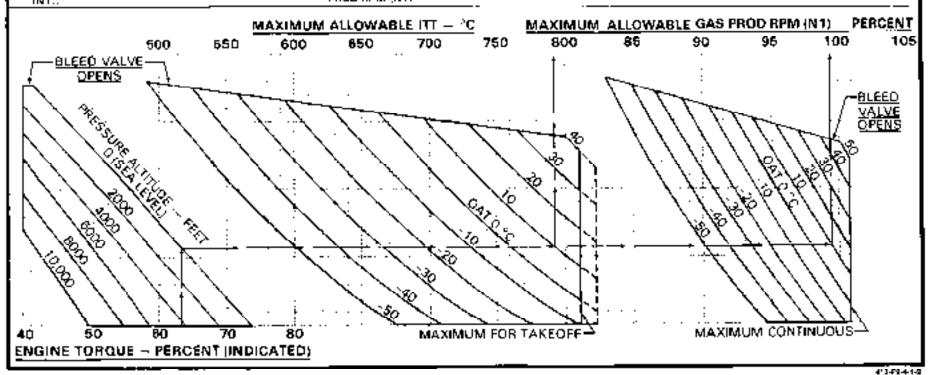


Figure 4-1. Power assurance check (Short 2 of 4)

MODEL 412 POWER ASSURANCE CHECK (HOVER) PTST-38 ENCIME (WITH CAS PRODUCER) GAGE PN 212-075-037-413).

HEATER/EQU - OFF

THROTTLES.
TEST ENGINE — FULL OPEN, FRICTIONED.
OTHER ENGINE — IDLE.

ENG - 97% FPM (N2).

COLLECTIVE PITCH —INCREASE UNTIL LIGHT ON SKIDS OF HOVERING, DO NOT EXCEED \$10° ITT OF 101.8% GAS PROD RPM (N1).

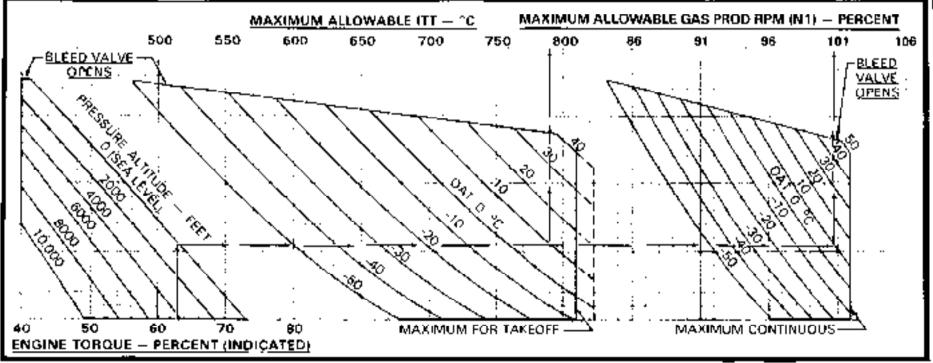
STABILIZE POWER ONE MINUTE, THEN RECORD PRESSURE ACTIONS, OAT, ENGINE TORQUE, ITT AND GAS PROD RPM (N.H.

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT PRESSURE AITHTUDE. PROCEED TO THE HIGHT TO INTERSECT OUTSIDE AIR TEMPERATURE. THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLETT AND GAS PRODURM INTO

IF INDICATED ITT OR GAS PROD RPM (N.1) EXCEEDS MAX. ALLOWABLE, REPEAT CHECK, STABILIZING COWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE

IF EITHER ENGINE EXCEEDS ALLOWABLE IFT OR GAS PRODIRPM (N1) AFTER STABILIZING FOUR MINUTES. PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DETERMINED AS SOON AS PRACTICAL



412-724-1 3

Figure 4-1. Power assurance chack (Sheer 3 of 4)

MODEL 412 POWIN ASSURANCE CHECK (PHFLIGHT) PTST-38 ENCINE (WITH BAS PRODUCEN GAGE PIN 212-073-037-113)

ESTABLISH LEVEL FLIGHT ABOVE 1000 FEET AGL.

AIHSPEED - 100 KIAS (OR VNE, IF LESS).

HEATER/ECU - OFF.

THROTTLES

TEST ENGINE — FULL OPEN, FRICTIONEO
OTHER ENGINE — DECREASE SLOWLY UNTIL TEST
FINGINE TORQUE IS WITHIN TEST RANGE, DO NOT
EXCEED 810*C ITT OR 101.8% GAS PROD HPM (N1)

FNG - 97% RPM IN 2).

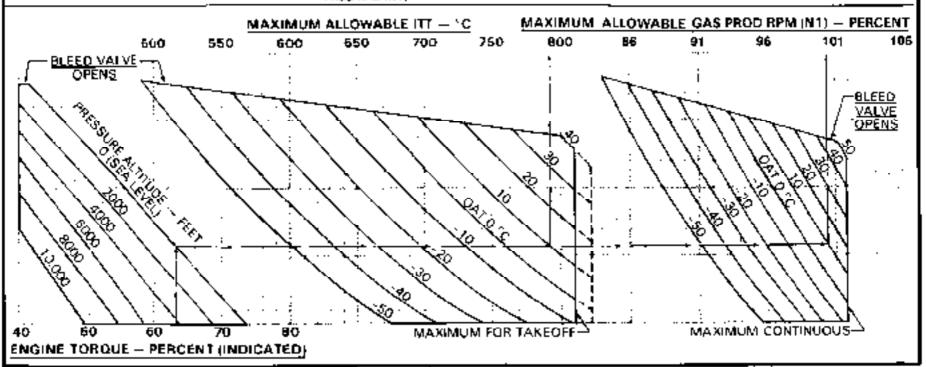
STABILIZE POWER ONE MINUTE IN LEVEL PLIGHT. THEN RECORD PRESSURE ALTITUDE, CAT. ENGINE TORQUE, ITT, AND GAS PROD RPM (NT).

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT PRESSURE AITITUDE, PROCEED ID THE RIGHT TO INTERSECT OUTSIDE AIR TEMPERATURE. THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLE ITT AND GAS PROD RPM INTI

IF INDICATED IFT OR GAS PROD RPM FX(FFI)S MAX. ALLOWABLE, HEPEAT CHECK STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PROD RPM (N.T.) AFTER STARIN IZING FOUR MINUTES, PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DETERMINED AS SOON AS PRACTICAL.



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Figure 4-1. Power sesimmes check (Sheet 4 of 4)

FA4 APPROVED BHT 412 FM 2

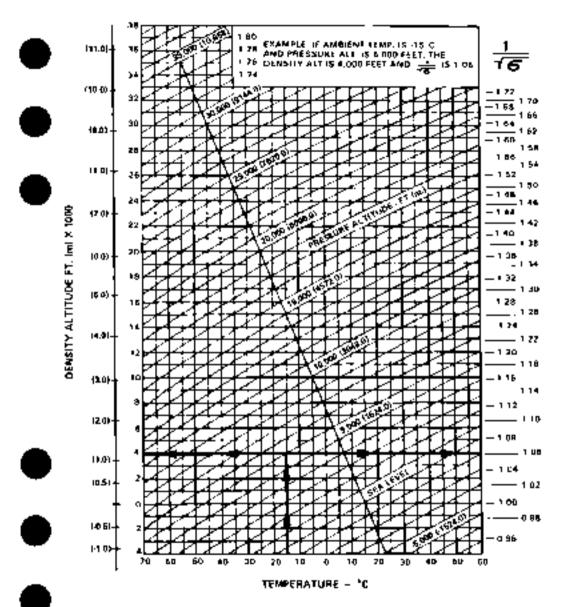


Figure 4.2. Density attnute

BHT-412-FM-2 FAA APPROYED

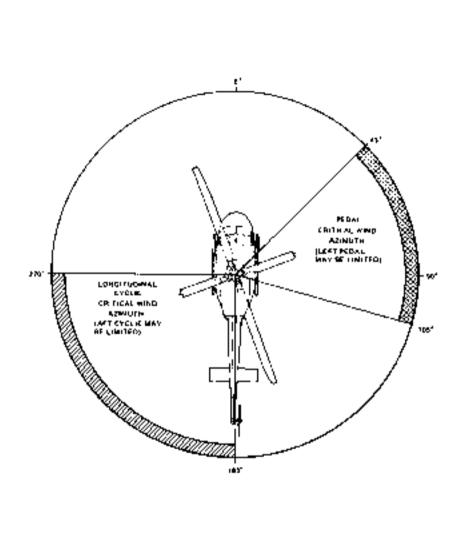


Figure 4-3. Critical relative wind extractive

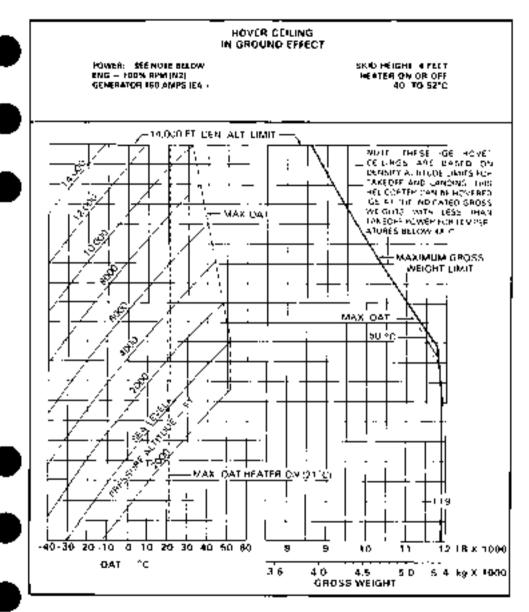


Figure 4-4. Hover calling in ground effect (\$heet 1 of 2)

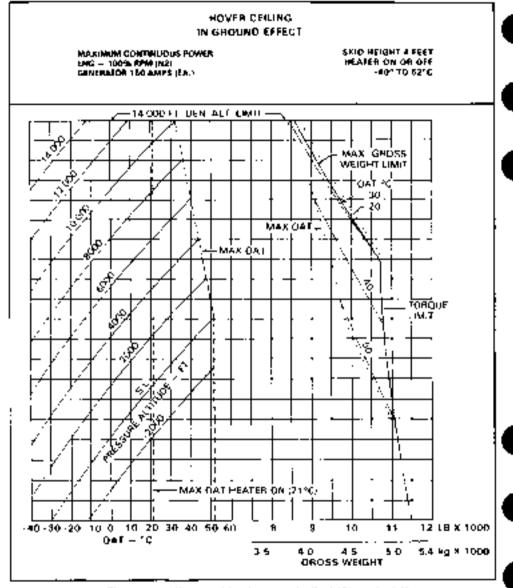


Figure 4-4. Hover calling in ground affect (Sheet 2 of 2)

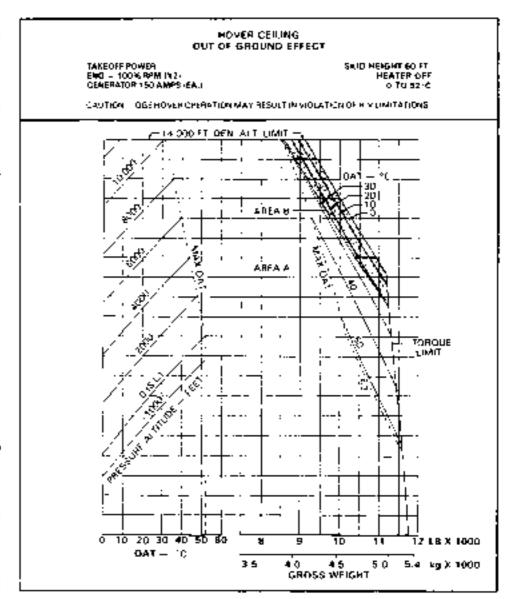
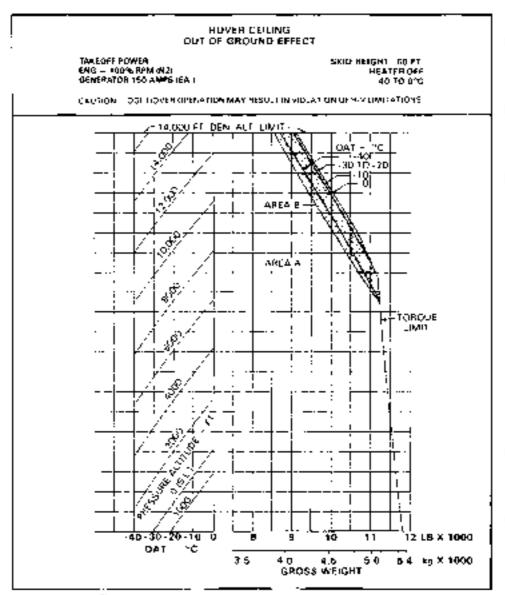


Figure 4-5. Mover ceiling out of ground effect (Sheel 1 of 5)



Pigure 4-5. Hover calling out of ground effect (Sheet 2 of 8)

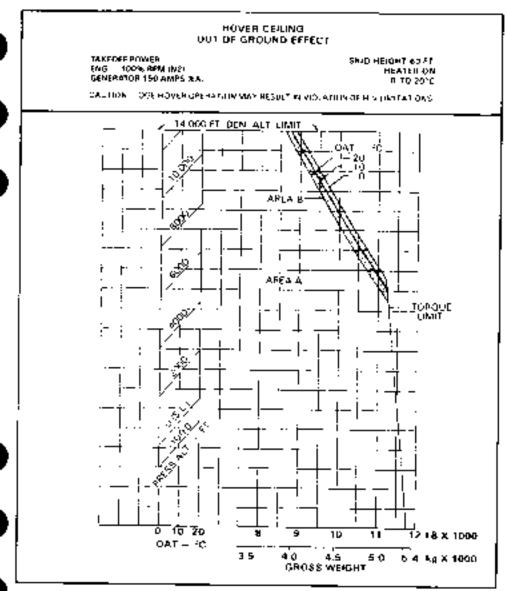


Figure 4-5. Hover ceiling out of ground effect (Sheet 3 of 8)

BHT-412-FM-2 FAA APPROYED



TAKECOF POWER ENG = 100% HPM (N.2) CENEHARDH 150 AMPS (EA.) SKID HEIGHT GO FT HEAREN DN -40 ILL N°C

CAUTION - GGS HOVER OPERATION MAY RESULT IN WITH A HIDA OF A VILINITIA HIGHS.

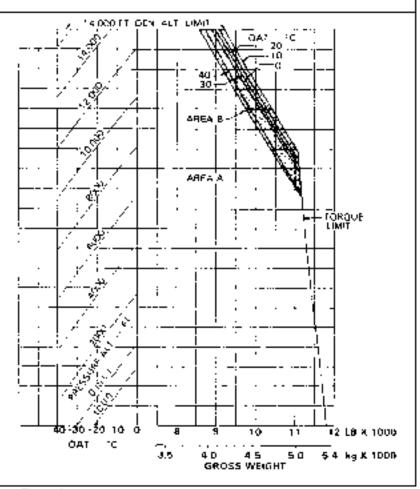


Figure 4-5. Hover celling out of ground effect (Sheet 4 of 8)

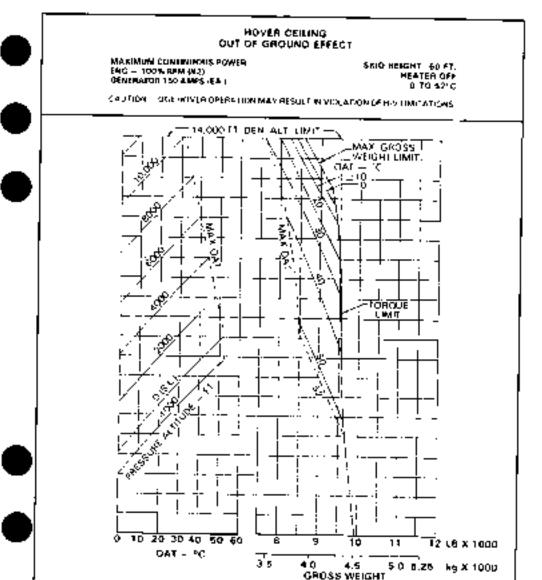


Figure 4-5. Hover calling out of ground affect (Sheet 5 of 8)

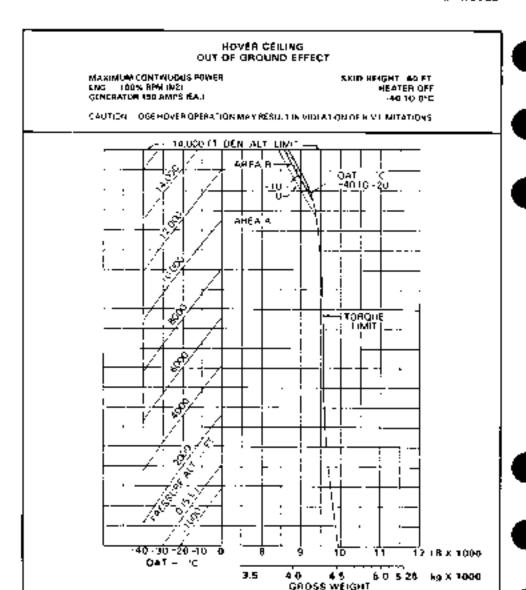


Figure 4-5. Hover ceiting out of ground effect (Sheet 6 of 8)

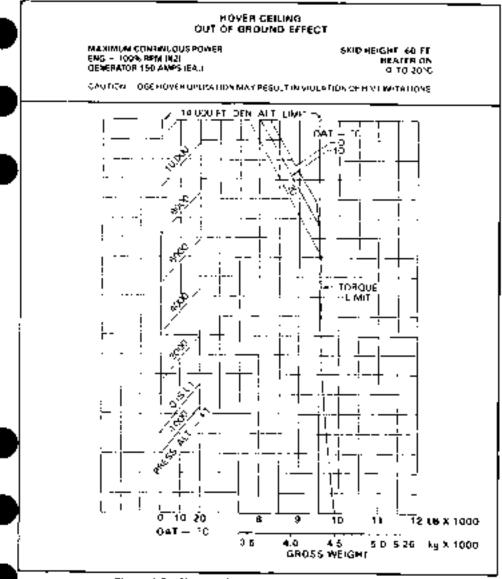


Figure 4-5. Hover selling out of ground affect (\$heet 7 of 8)



MAXIMUM CONTINUOUS POWER ENG = 100% APM [N7] GENERATOR \$50 AMPS [CA 2 Skill MEIGHT BO FT MEATINGN 40 TO 01C

CAUTION - OFF HOMER DATEST ON MAY RESULT IN VIOLATION DE HIM LIMITATIONS.

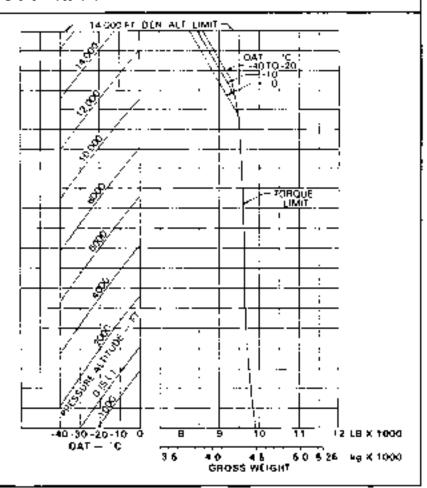


Figure 4-5. Hover calling out of ground effect (Sheet 8 of 6)

FAA APPROVED BHT-412-FM-2

colon winds or winds outside the critical relative wind azimuth areas.

NOTE

Tell rater or cyclic control margin may preclude operation in AREA B of the hover ceiling charts when the relative wind is in the respective critical wind asimuth area.

TAKEOFF DISTANCE

The Takeoff Distance charts (figure 4-6) provide lakeoff distances required to clear a 50 foot or 15 meter obstacle in a zero wind condition, using a takeoff flight path which will evoid the critical areas of the Height-Velocity diagram (Section 1). Takeoff is initiated from a hover at 4 feet (1,2 meters) skid height with climbout speed of 46 knots.

NOTE

Downwind takeoffs are not recommended because the published (gheolf distance performance cannot be achieved.

LANDING DISTANCE

The Single Engine Landing Distance chart (figure 4-7) provides the landing distances required to clear a 50 foot (15 moler) obstacle for all outside air temperatures, pressure sittludes, and gross weights. Landing distances are based on an approach condition of 45 KIAS and 500 feat per minuty rate of descent and zero wind.

TWIN ENGINE RATE OF CLIMB

The Twin Engine Rate of Climb charts (figure 4-8) provide the rates of climb that

can be obtained at all outside air temperatures/pressure aititudes/gross weight combinations with heater on or off at maximum continuous power and takeoff nower.

NOTE

All rate of climb data are based on changes in true sillitude (pressure stitude corrected for nonsiendard temperature).

SINGLE ENGINE RATE OF CLIMB

The Single Engine Role of Climb charts (figure 4-9) provide the rates of climb that can be obtained at all outside air temperatures/pressure attitudes/grossweight combinations with heater off at maximum continuous power and 30 minute DEI power.

NOTE

Published single engine partormance is intended for emergency use only when one angine becomes inoperative due to an actual replication. Routing operation in 2 1/2 minute or 30 minute OE1 range can affect engine service (Ne.

AIRSPEED CALIBRATION

The Airepeed Calibration chart (ligure 4-10) provides calibrated sirepeeds for all indicated eirepeeds during level flight, climb and autorolation.

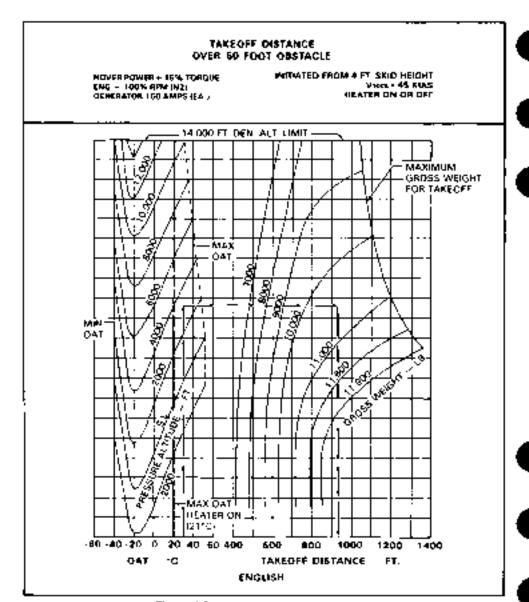


Figure 4-6. Tatooff dietance (Sheel 1 of 2)

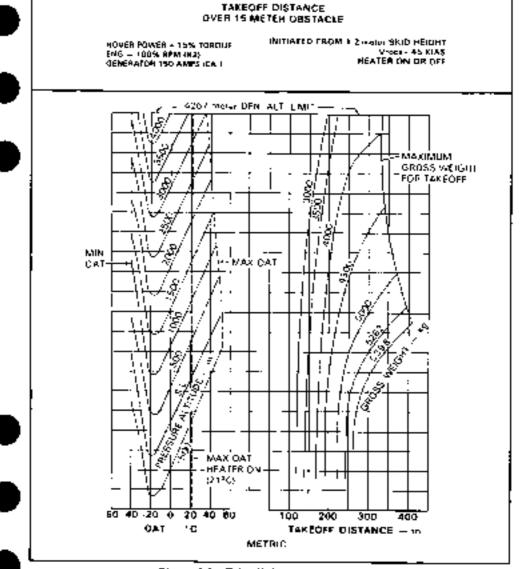


Figure 4-6. Takeoff distance (Sheet 2 of 2)

DHT-412-FM-2 FAA APPROVED

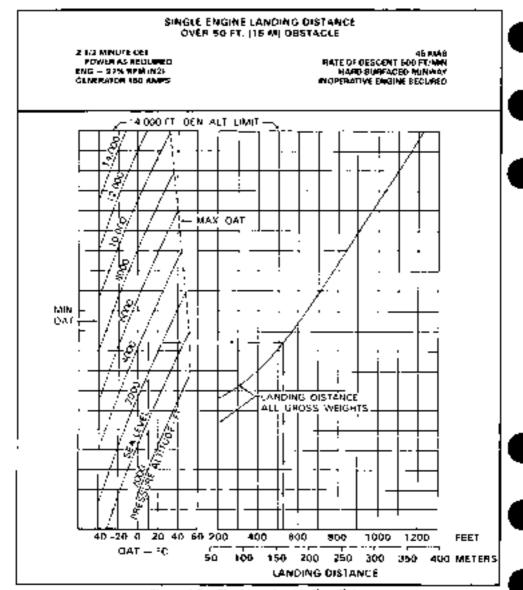


Figure 4-7. Single engine landing distance

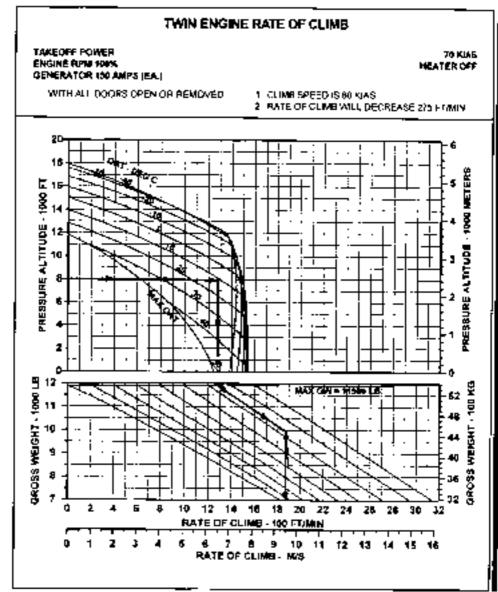


Figure 4-8. Two angine rate of climb (Sheet 1 of 4)

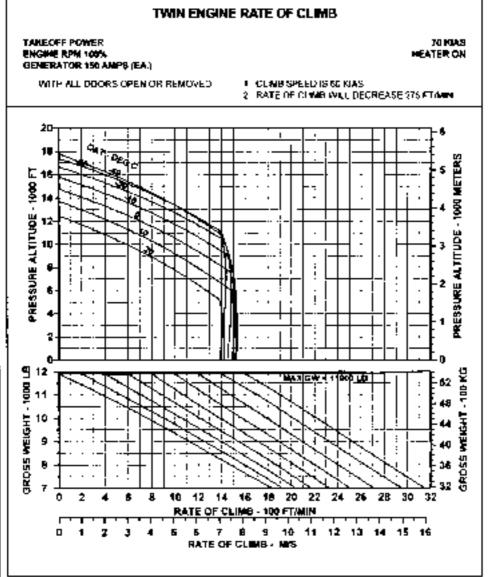


Figure 4-8. Twin angine rate of climb (Sheet 2 of 4).



MARMUM CONTINUOUS POWER ENCINE RPM 100% GENERATOR 150 AMPS (EA.) 70 KIAS HEATER OFF

WITH ALL DOORS OPEN OR REMOVED.

- 1 COMB SPEED S 60 KIAS
- 2 RATE OF CUMB WILL DECREASE 275 FT MIN.

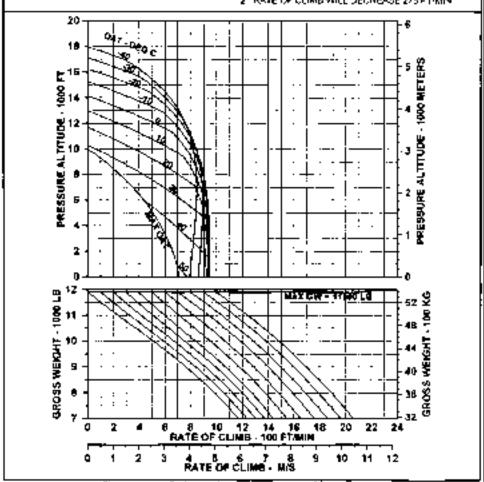
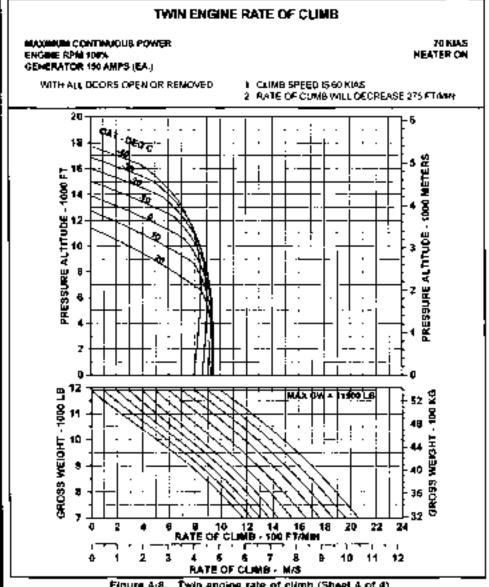


Figure 4-8. Twin engine rate of climb (Sheet 3 of 4)



SINGLE ENGINE RATE OF CLIMB 30 MINUTE POWER 70 KIAS ENGINE RPM 87% HEATER OFF GENERATOR 150 AMPS WITH ALL DOORS OPEN OR REMOVED. 1. CLAMS SPEED IS 60 MAS. 2. RATE OF CLIMB WILL DECREASE 275 FT/MW. **Z**0 16 PRESSURE AL TITUDE - 1000 METERS PRESSURE ALTITUDE - 1000 FT GROSS WEBGHT - 1000 LB 4 6 8 10 12 RATE OF CLIMB - 100 FTMIN 20 Q 3 10 PATE OF CLIMB - M/S

Figure 4-9. Single engine rate of climb (Sheet 1 of 2)

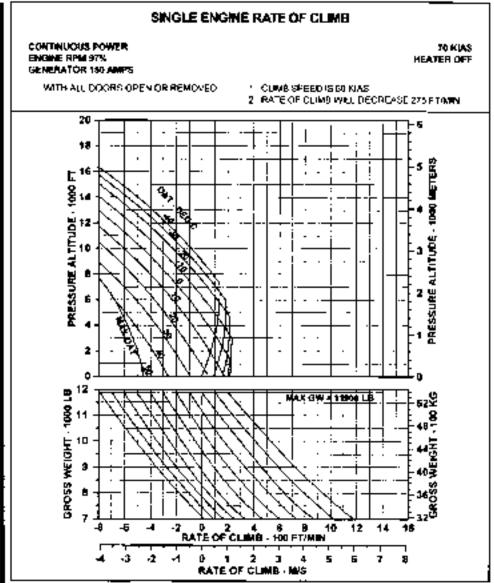


Figure 4-9. Single engine rate of climb (Sheet 2 of 2).

PILOT & COPILOT AIRSPEED SYSTEM CALIBRATION

CLIMB LEVEL FLIGHT, BUTCHISTATION

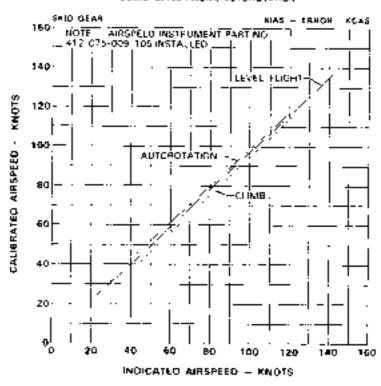


Figure 4-10. Airspeed calibration

4-11. NOISE LEVELS

4-11-A. CERT(FICATED FAR PART 36 STAGE 2 NOISE LEVELS

This aircraft is certified as a Stage 2 helicopter as prescribed in FAR Part 36, Subpart M, for gross weights up to end including the certificated maximum lakeoff and funding weight of 11,800 lbs. There are no operating limitations in marting the takeoff, flyover, or approach noise requirements.

The following noise levels comply with FAR Part 35, Appendix N, Stage 2 noise level requirements. They were obtained by ensiye a operand data from noise tests conducted under the provisions of FAR Part 36, Amendment 35-14.

The cartified noise levels are:

Flight C <u>ondition</u>	EPNL (EPNdB)	
Taksoff	93.2	
Flyover	93.4	
Approach	95.6	

MOTE

No determination has been made by the Federal Aviation Administration that the noise levels of this electeft are or should be acceptable or unacceptable for operation at, into, or out of, any export.

V_n is defined as the airspeed in level flight obtained using the minimum epocliscation engine torque corresponding to maximum continuous power available for see level. 25°C embient conditions at the relevant maximum certificated weight. The value of V_n (hos defined for this aircraft is 122 KTAS.

4-11-B. SUPPLEMENTAL ICAO ANNEX 16, CHAPTER 8 NOISE LEVEL INFORMATION

The test and analysis procedures used to obtain these noise levels are resentially equivalent to those required by the international Civil Aviation Organization (ICAO) in Annex 16, Yolume 1, Chapter 8 (ICAO Ann

Section 5

OPTIONAL EQUIPMENT SUPPLEMENTS

Peragra	TABLE OF CONTENTS	Paga Number
OPTION	IAL EQUIPMENT	5-3
Fabl-	LIST OF TABLES	
Table Number	Tille	Page Number
5-1	Flight Manual Supplements for Ontlocal Equipment	5-3

Section 5

OPTIONAL EQUIPMENT SUPPLEMENTS

OPTIONAL EQUIPMENT

Both Holicopter Textron's policy is one of continuous product improvement and Bell reserves the right to incorporate design changes, make additions to and improve its products without imposing any obligation upon the company to furnish for install such changes, additions, improvements, etc., on its products previously manufactured.

The following items may be installed on the basic helicopter by authorized personnel. Only the optional equipment listed in this section require a Flight Monual supplement.

NOTE

Filight Manual Supplement numbers ending with .1 or -1 grapplicable to Model 412 S/N 33001 — 33107 only. Supplement numbers ending with 2 or -2 are applicable to Model 412 S/N 33108 — 33213 and 35001 — 36019. Supplement numbers ending with a .3 or -3 are applicable to Model 412 S/N 33214 — 33999 and 36020 and SUB. Filight manual supplements not ending with a decimal or dash number are applicable to all 412 helicoptass

Table 5-1. Flight Manual Supplements for Optional Equipment

NAME OF EQUIPMENT	KIT NUMBER	DATE CERTIFIED	CURRENT REVISION
BHT-412-FMS-1.2 Winterization Heater Operations	212-705-008	20 January 1981	Rev. 6 14 MAY 93
BHT-412-FMS-2 Emergency Flobia	412-705-004	20 January 1981	Rev. 1 15 APR 95
BHT-412-FMS-3 Heated Windshield	412-706-010	20 January 1961	Reissued 18 OCT 94
BHT-412-FMS-4.1	Effectivity S/N 33001-33107		
BHT-412-FM5-5,1	Effectivity S/N 33001-33107		
BHT-412-FMS-6 Flight Oriector	412-706-111	13 February 1981	Releaned 8 MAY 69
BHT-412-FMS-7 Internal Hoist	214-705-003	2 October 1981	Released 11 MAY 95

Table 5-1. Flight Manual Supplements for Optional Equipment (Cont)

NAME OF EQUIPMENT	KIT NUMBER	DATE CERTIFIED	ÇURRENT REVISION
BHT-412-FMS-8 LMer Kit Operations	412-706-006	29 September 1981	Released 5 OCT 94
9HT-412-FMS-9.2 Externet Cargo Operation	212-705-103	14 May 1981	Reissued 15 SEP 95
BHT-412-FMS-10 Category A Operations		Data incorporated into Section 5 of basic Flight Manual	
BHT-412-FM9-11,I	Effectivity SAN 33001-33107		
BHT-412-FMS-12 Nighteon Searchlight	212-209-393	4 December 1981	Reissued 8 MAY 69
BHT-412-FMS-13 Cold Weather Operations	412-703-004	Data Incorporated into basic Flight Manual	
BHT-412-FM5-14 Thalland Special Aylonics	412-899-003	11 February 1902	Not Printed
BHT-412-FMS-15 Fixed Step	212-708-057	8 February 1982	Reissued 23 JUN 94
BHT-412-FM9-16 Droop Restraint, Main Restor and Stick Centering Indicator	412-704-114/412-704- 115	Dela insorperated into besic Flight Manual	
BHT-412-FMS-17.2 Auxiliary Fuel Operations	412-705-007	5 January 1984	Reissued 23 JUN 94
BHT-412-FMS-18.2 Loudhailer Operations	412- 989- 143	17 November 1983	Releasued 8 OCT 91
BMT-412-FMS-19 2 Soft Interior	412-705-510	28 March 1985	Rev. 3 XX SEP 98
BHT-412-FM6-20 Weather Redar Kill	412-899-107	15 June 1985	Reseased 5 OCT 64
6HT-412-FMS-21 Global Nav. System GNS- 500A/S1 with NAY switching	412-899-141	16 June 1986	Relaqued B MAY 89
BHT-412-FMS-22.2 Calegory A Operations		8 June 1996	Rev. 1 11 NOV 89
BHT-412-FMS-23 (Reserved)			Orlginā

Table 5-1. Flight Manual Supplements for Optional Equipment (Cont)

KIT NUMBER	DATE CEATIFIED	CURRENT
412-706-019	24 July 1987	Relasiand 8 DEC 95
412-706-009	10 March 1988	Relaeued 23 JUN 94
	19 February 1988	Original
412-899-022	1 July 1987	Rev. 2
412-899-223/214-705- 003	19 September 1988	Relatued 11 MAY 95
205-706-047	14 October 1986	Reissued 20 JUN 94
412-899-225	5 April 19 89	Raissuad 9 OCT 91
412-899-227	23 May 1989	Relasued 8 OCT 91
	9 November 1989	Reisoued 23 JUN 84
	8 February 1990	Ortginal
412-570-001-101	29. June 1990	Not Printed
412-889-231	22 June 1980	Original
412-570-001-103	12 October 1890	Not Printed
	412-706-019 412-706-009 412-899-022 412-899-223/214-706-003 206-706-047 412-899-225 412-899-227	KIT NUMBER 412-706-019 24 July 1987 412-706-009 10 March 1988 19 February 1988 412-899-022 1 July 1987 412-899-223/214-706- 003 206-706-047 14 October 1988 412-899-225 5 April 19 89 412-899-227 23 May 1989 9 November 1989 8 February 1990 412-899-231 22 June 1990

Table 5-1. Flight Manual Supplements for Optional Equipment (Cont)

NAME OF EQUIPMENT	KIT NUMBER	DATE CERTIFIED	ÇURRENT REVISION
BMF-412-FMS-36.2 Colegory B Operations when Configured with Nine or Less Passenger Seats		10 April 1991	Rey, 1 23 APR 48
8HT-412-FMS-36.3 Dual Digital Automatic Flight Control System, Search and Rescue (SAR)	Ellectivity S/N 33214- 32999 and 36020 and SUB		Not Printed
BHT-412-FMS-37.4	Effectivity S/N 36087 and SUB		
BHT-412-FM9-38.4	Effectivity S/N 36087 and SUB		
BHT-412-FMS-39 3 and 39.4	Etieclivity S/N 36024-36086 S/N 36097 and SUB		
BHT-412-FMS-40 Increades Generator Capacity	412-706-025	29 October 1992	Reinsued 5 OCT 94
BHT-412-FM6-41.3	Effectivity 9.7N 36020-36086		
BHT-412-FM9-43.3 and 43.4	Effectivity S/N 36020-36088		
BHT-412-FMS-44.3 and 44.4	Effectivity S/N 36020-36086		
BHT-412-FM6-46.3 and 45.4	Effectivity S/N 36020-36066		
BHT-412-FMS-46.3	Effectivity S/N 36020-36086		
BHT-412-FMS-47 Folding Step	412-8 90 -287	25 October 1993	lanięhO
BMT-412-FMS-48.2 Engine No. 2 Gay Trim Switch	T9 412-93-118	28 July 1994	Önginel
BHT-412-FMS-49.4	Effectivity S/N 36087 And SUB		

Table 5-1. Flight Manual Supplements for Optional Equipment (Cont)

NAME OF EQUIPMENT	KIT NUMBER	DATE CERTIFIED	ÇURRENT REVISION
BHT-#12-FMS-53.4	Effectivity S/N 36119, 36122,36129,36126,361 and 36133 ONLY	27.	
BHT-412-FMS-54	TBD		
BHT-412-FMS-55.4	Effectivity 5/N 35122, 35123, 36126, and SUB		
BMT-412-FMS-66.3 and 56.4	Effectivity 5/H 35020 - 36086 S/M 36067 and SUB		
BHT-412-FMS-CAA-57.3 and 57.4	Effectivity S/N 36087 and SUB		
BHT-412-FMS-58.4	Effectivity S/N 36087 and SUB		
BHT-412-FM5-59.4	Effectivity S/N 36067 and SUB		
BHT-412-FM9-60 4	Effectivity S/M 16067 and SUB		
BHT-412-FMS-61.3 and 51.4	Effectivity SIN 36020 - 36086 S/ N 36087 and SUB		
BHT-412-FMS-63.2, 63.3, and 63.4 Belf Sealing Fuel Cells	Effectivity S/N 33108 - 33213 S/N 36001 - 36019 S/N 36020 - 36086 S/N 36067 - SUB	19 September 1997	Rev. 1 22 OCT 93
BHT-412-FMS-65-2, 65-3, and 66-4 Ten Call — Self Sealing Fuel	Effectivity S/N 33108 - 33213 S/N 36001 - 36019 S/N 36020 - 36085 S/N 36087 - SUB	22 June 1998	Rev. 1 2 JUL 9
BHT-412-FMS-66.4	Effectivity S/N 36067 and SUB		



ROTORCRAFT FLIGHT MANUAL

33006 — 33213 36001 — 36019

SUPPLEMENT FOR WINTERIZATION HEATER OPERATIONS (212-706-008)

CEFTIFIED
JANUARY 20.1981

This supplement shall be stacked to the Wodel 412 Flight Manual (BHT-412-FM-2) when the 212-708-006 Winterzeton Master has been (1444-664)

The information contained herein supplements the information of the basic Fagist Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual.

Hell Hellcopter 1133 RON

FOR DIRECTOR OF MICE WORTH, NOW 2018)

REISSUE - 18 DECEMBER 1998

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Original 6 January 20, 1981	Raylston February 9, 1985
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Revision January 7, 1992	Revision 7 October 6. 1991
Reivaton September 8, 1993	Revision
Revision 4 August 31, 1984	Relatio 0 Degember 18, 1996

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	4-9 - 4-16 Deletes			
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MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 78193-0170

DEC 18 1998

NOTE

Revised text is indicated by a black vertical fine, invert latest revision pages; dispose of superseded pages.

INTRODUCTION

The Winterization Heater is installed to provide increased cabin heating capacity. The heater besically consists of a larger musing value, a larger noise suppressor, extra cutlets, ducts, and hardware necessary for metalletics. Operation of the Winterigation heater is identical to the basic hapter.



LIMITATIONS

WEIGHT C/G LIMITATIONS

Actual weight change that be determined after the heater is inequalled and pallest readjusted if necessary to return empty weight CG within allowable fimits.

HEATER OPERATION

Heater shall not be operated when OAT is above 21°C (69.6°F).

BHT-412₽₩9-1.2

Section 2

NORMAL PROCEDURES

PRESTART CHECK

Enttery switch - ON.

Heater circuit breaker switch - in.

Heater switch — OH.

Check "Heater Air Line" light illuminates.

Hester switch - OFF.

HEATER OPERATION CHECK

Operation check may be accomplished at this time or at any time heater operation is desired.

100% (Ng) rpm and at least 78% N₁ on both engines.

Thermosted — Full colds.

WARNING

DO NOT OPERATE MEATER ABOVE 21°C (69.8°F) OAT.

Heater switch — ON.

increase thermostal setting and observe healed air-flow.

Return thermostal to full cold and observe heater sirflow shutoff. If heater sirflow shutoff is observed, reset thermostal to desired temperature it heater operation is desired.

[CAUTION]

TURN HEATER OFF WHEN:

THE HEATER AIRFLOW DOES NOT SHUT OFF WHEN THERMOSTAT IS TURNED TO FULL COLD.

THE "HEATER AIR LINE" LIGHT ILLUMINATES.

THE HEATER CIRCUIT BREAKER TRIPS.

NOTE

if heater is on for takeoff, reter to appropriate performance chart in Section 4.



EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic Flight Manual.



PERFORMANCE

Performance with Winterization Heater availabled OFF to the some as that shown in bases Flight Manual for heater OFF.

Performance with Winterization Heater switched ON is presented as follows:

Reset to sigure 4-1 for out-of-ground-effect hover performance.

In-ground-effect hover performance is the same as that shown in basic Flight Manual for treater ON.

Refer to Figure 4-2 for takeoff performence.

Refer to figure 4-3 for climb performance.

8HT-412-FMS-1-2

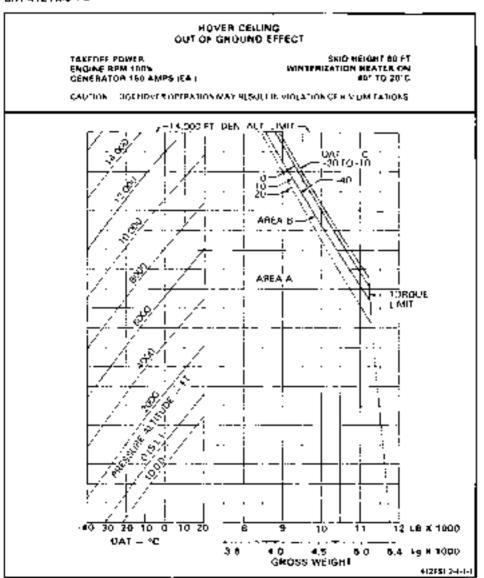


Figure 4-1. IShant 1 of 21

BHT-412FM6-1-2

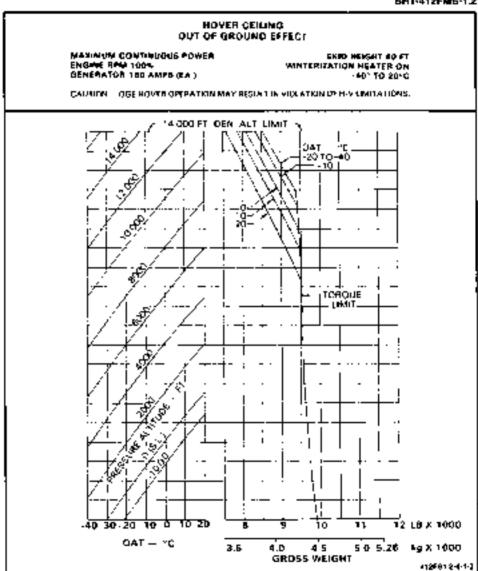


Figure 4-1. (Sheet 2 of 2)

BHT-412FM8-1-2

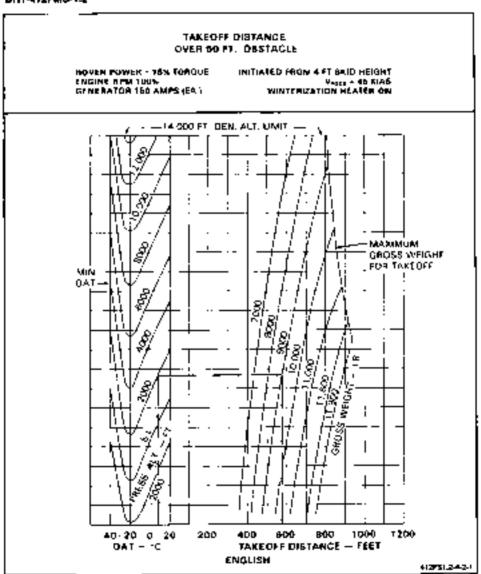


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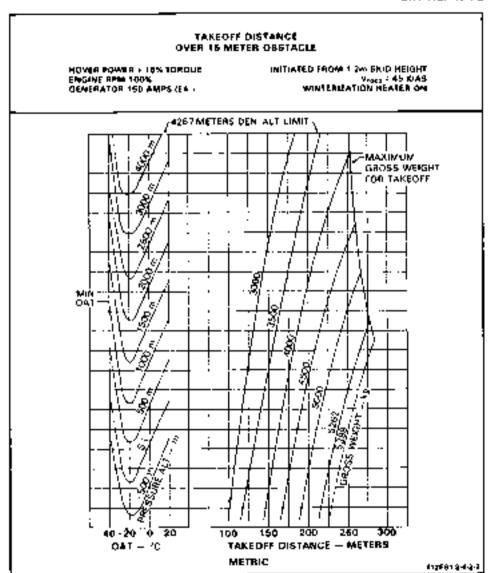


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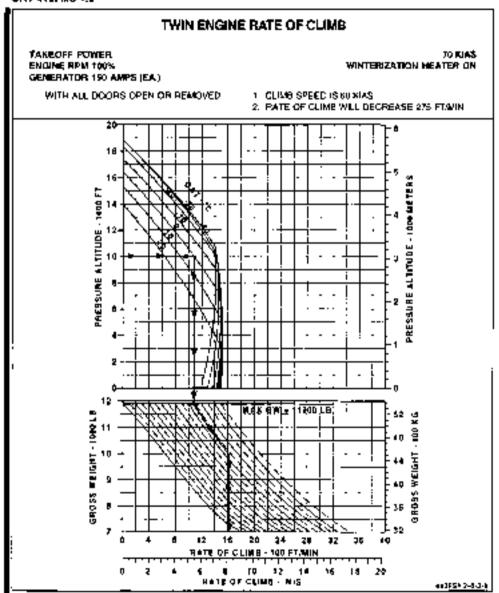


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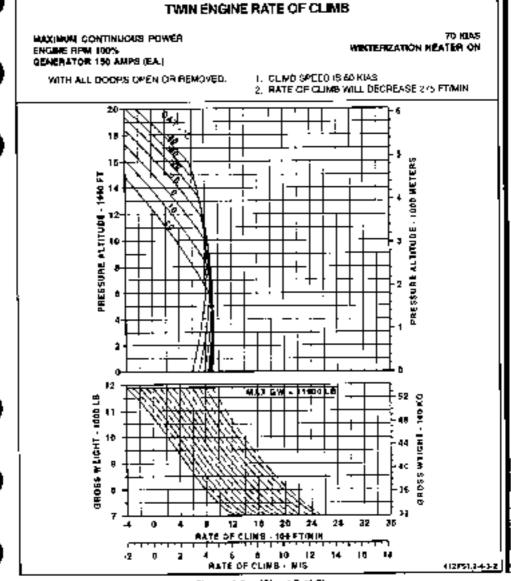


Figure 4-3. (Sheet 2 of 2)

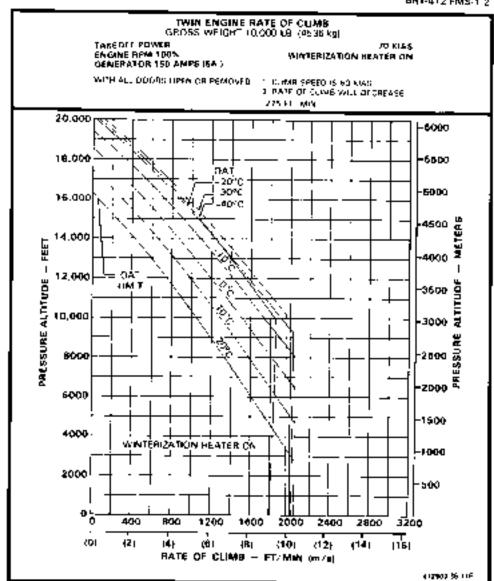


Figure 4-3. (Sheet 4 of 12)

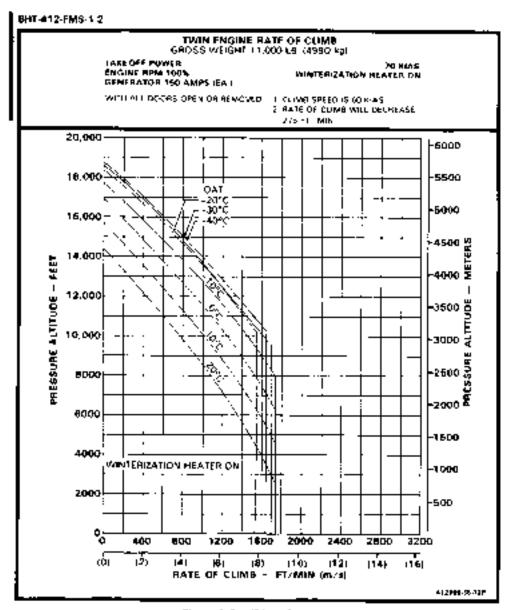


Figure 4-3 (Sheet 6 of 12)

BHT 412 FM6 1.2

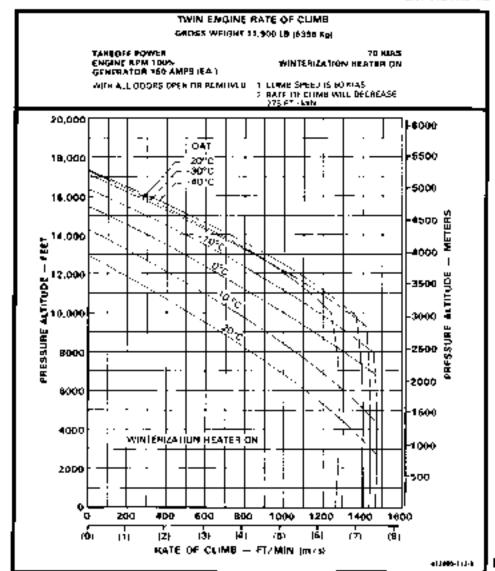


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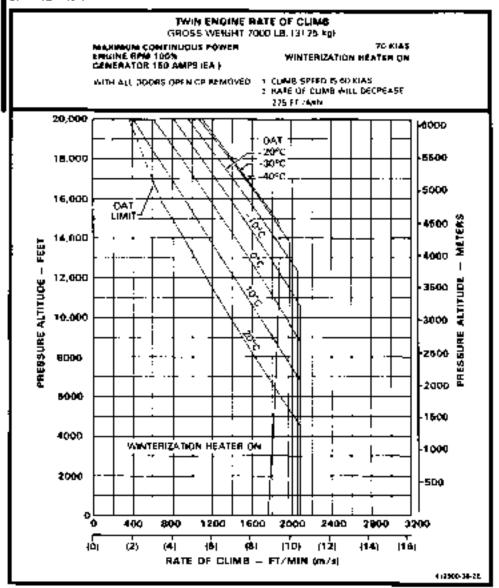


Figure 4-3 (Sheet 7 of 12)

BHT-412-FMS-1.2

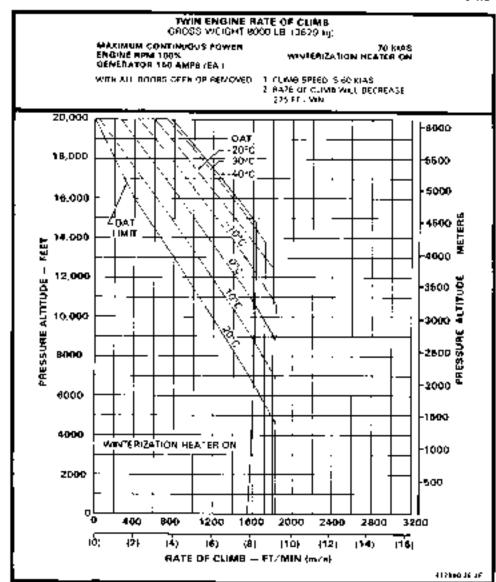
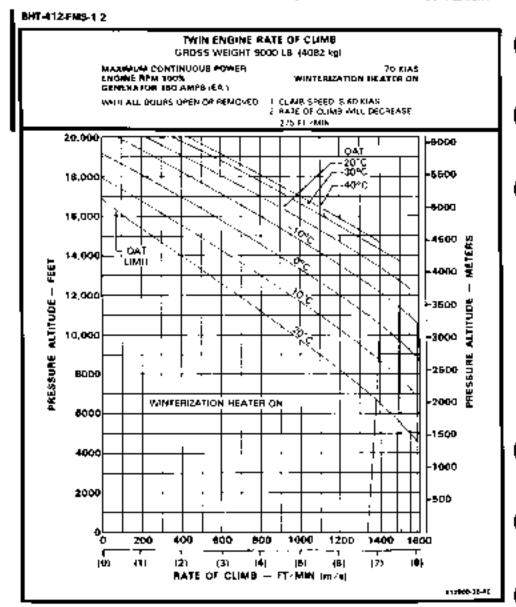


Figure 4-3. (Sheet 8 of 12)



BHT-412-F#46-1-2-1

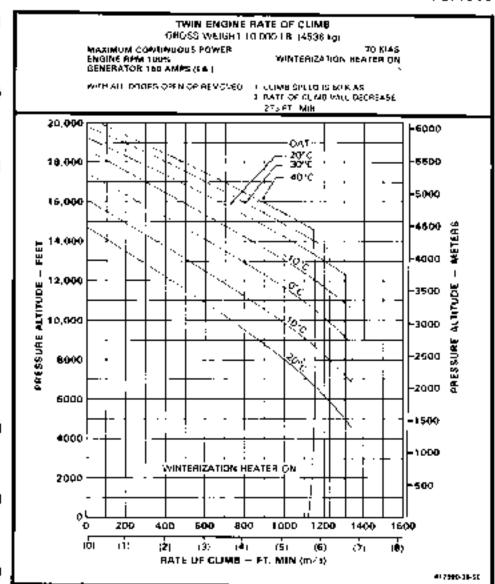
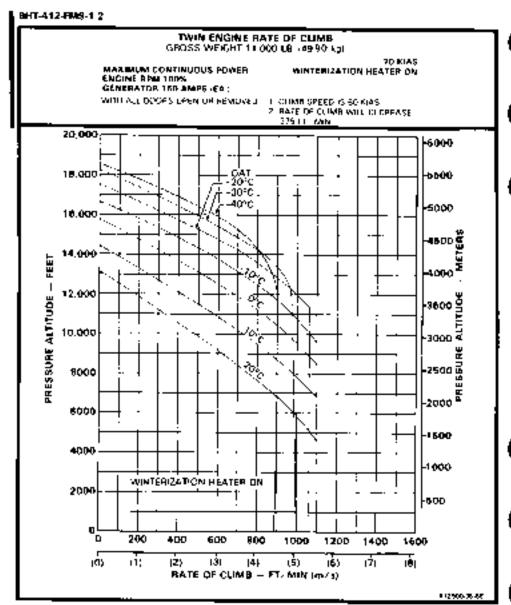


Figure 4-3. (Sheet 10 of 12)



Fegure 4-3. (Sheet 11 of 12)

BHT-412-FMS-1.2

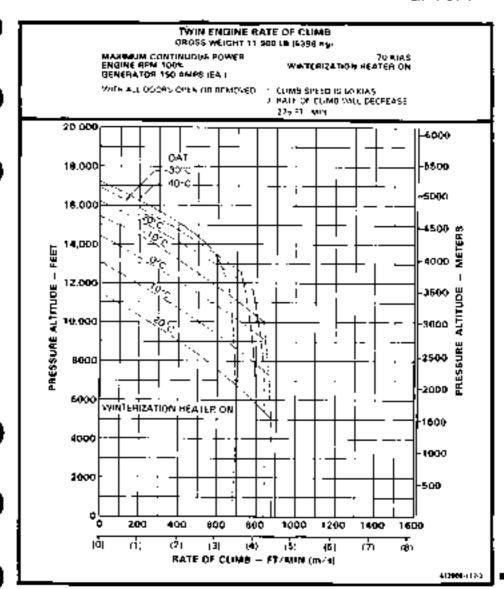


Figure 4-3, [Sheet 12 of 12]

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ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT EMERGENCY FLOATS

(412-706-004)

CERTIFIED 20 JANUARY 1981

This supplement shall be sitached to the Models 412 and 412 EP Flight Manual when the 412-706-004 Emergency Floats have been installed.

Refer to BHT-412-FM\$-55.4 for \$/N 38122, 36123, 36125 and subsequent.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

COPPERSY WORKER
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Bell Helicopter 113311(ON

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23 JUNE 1994 REVISION 1 — 15 APRIL 1996

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BHT-412-FMS-2 FAA APPROVED

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ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76193-0170 FAA APPROVED BHT-412-FMS-2

GENERAL INFORMATION

The emergency fleets will allow the helicopter to land in water during an emergency situation. The kit consists of six skid mounted fleet bega, four water activated (lost switches that are mounted on the underside of the fuscisge, a pneumatic bottle located in the nose compariment, a collective mounted EMERG FLTS switch, a pedestel mounted EMER IMPLATION handle, and the necessary handware to complete the installation. Also, the kit includes provisions for installing life raits and vests.

The floats automatically initiate when the EMERG FLTG switch is in the ARMED position and the water activated float ewitches are submerged. If the system or one of the float bags rupture after inflation, check valvos in each float bag will meintain float integrity. An instrument panel mounted EMER FLOATS causion light illuminates whenever the EMERG FLTG switch is in the ARMED position. System security is protected by an EMERG FLOATS circuit breaker located on the overhead console.

The EMER INFLATION handle provides for manual activation of the emergency flotation system in the event the floats fell to inflate automatically.

Section 1

LIMITATIONS

TYPE OF OPERATION

The emergency floate are installed for assistance during emergency ditching and use is approved for VPA and IFR operation.

FLOATS ewitch shall be OFF and FLOATS coulon light extengulated when operating over land.

Emergency float safety pin shall be removed prior to tight over water.

FLIGHT WITH OPTIONAL EQUIPMENT INSTALLED

Fixed passenger step shall not be installed concurrently with emergency floats.

Retractable passenger step shall be stored prior to flight over water.

When internal hoist is installed, hoist cable anti-challing guard shell be installed on same side of helicopter as holst.

AIRSPEED LIMITATIONS

Inflation of emergency floats during forward flight is prohibited. Flight after landing with floats inflated is prohibited.

WARNING

SEVERE NOSE UP PITCHING WILL OCCUR IF EMERGENCY FLOATS ARE INFLATED IN FORWARD FLIGHT OR DESCENT. REFER TO INADVERTENT FLOAT INFLATION IN FLIGHT (SECTION 3).

Maximum autorotation Airspeed (floate stawed):

105 knots below 10,000 feet pressure affiliate

80 knots shove 10,000 feet pressure attitude

Maximum forward speed for ditching:

33 knots in colm water.

16 knais in rough weign

Auto of descent should be reduced as low as possible upon water contact.

ALTITUDE LIMITATIONS

Meximum pressure attitude for inflation of emergency floats in 10,000 feet. Helicopter operation above 10,000 feet is permitted provided the FLOATS awaich is in the OFF position and FLOATS cautron light to satinguished.

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after floats are installed and ballast resducted. If necessary, to return empty weight og within ellowable limits.

The emergency float kit does not change the CG limits of the helicopter.

FLOAT ARMING Floats shall not be armed:

- Over land.
- Above 60 KIAS.
- 3. Above 600 feet AGL.

PLACARDS

FLOAT INPLATION OR OPERATION IN FORWARD FLIGHT IS PROHIBITED

(Located above pliot strapeed indicator.)

Section 2

NORMAL PROCEDURES

EXTERIOR CHECK

NOTE

Ensure that emergency Hosts have had periodic inflation and inspection.

Emergency Iloats — Stowed.

Emergency float covers and supports — Clean and secured.

INTERIOR CHECK

EMER INFLATION handle — Down and salesfed.

Nitragen bottle — Secured and pressure within allowable limits for pressure attitude and ambient temperature as shown on chart decal, located on nitrogan bottle.

Emergency floats safety pin -- Remove for over-water flight.

PRESTART CHECK

FLOATS switch OFF.

EMFR FLOATS circuit breaker — IN.

BEFORE TAKEOFF OVER WATER

STEP switch - STOW.

FLDATS ewitch — ARMED; check FLOATS caution light Huminated.

IN-FLIGHT OPERATION

FLOATS switch — OFF upon reaching 800 feet above water and airspeed of 60 KIAS or above, or when over land; check FLOATS caution light extinguished.

BEFORE LANDING OVER WATER

FLOATS ewitch — ARMED when below 600 feel above water and airspeed of 60 KIAS or below; chack FLOATS caution light-librated.

AFTER LANDING

FLOATS switch OFF; check FLOATS caution light extinguished.

BEFORE LEAVING HELICOPTER

Emergency floats safety pin — installed.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

INADVERTENT FLOAT

In event of unintended inflation, reduce alrapsed, adjust rate of descent to 200 for or less, and land as again as possible. Avoid landing on terrain which could damage float bags.

ELECTRICAL MALFUNCTIONS

FLOATS CAUTION LIGHT ON WITH FLOATS SWITCH OFF

If FLOATS caution light illuminates with FLOATS switch OFF, pull EMER FLOATS circuit breaker.

NOTE

If EMER FLOATS circuit breaker is pulled floats will not deploy automatically.

If FLOATS caution light remains illuminated after pulling circuit breaker, land as soon as practical.

ELECTRICAL SYSTEM FAILURE

Pull EMER INFLATION handle upon water contact to inflate floate.

EMERGENCY DITCHING

WARNING

CREW AND PASSENGER DOORS SHALL REMAIN GLOSED DURING DITCHING.

FLOATS switch ARMED; check FLOATS caution light illuminated. Establish an autorotative glide speed of 65 to 70 knots for all gross weight.

WARNING

SEVERE NOSE UP PITCHING WILL OCCUR IF EMERGENCY FLOATS ARE INFLATED IN FORWARD FLIGHT OR DESCENT.

Al 100 feet attitude execute a moderate cyclic flare to reduce airspeed. Adjust collective and cyclic pitch sufficiently to louchdown in a negacup attitude with forward apaced and rate of descent as low as possible.

If emergency licats do not initiate immediately upon water confact, pull ENER INFLATION handle.

After water touchdown, complete abutdown, check for damage, and determine it helicopter should be abandoned.

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NOTE

Takeoff after emergency landing with floats inflated is prohibited.

EGRESS AFTER DITCHING

Ensure rotor is stopped prior to egress.

Crew egrees should be accomplished by jettisoning crew doors.

Passenger egrass should be accomplished by pushing out passenger door windows at corners marked EMERGENCY EXIT PUBH HERE.

Section 4

PERFORMANCE

No change from basic manual.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR HEATED WINDSHIELD

(412-706-010)

CERTIFIED 20 JANUARY 1981

The supplement shall be strached to the Models 412 and 412 EP Flight Manual when the 412-706-010 Heated Windshield has been installed.

The Information contained herein supplements the information of the basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual.

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BHT 412-FMS-3

INTRODUCTION

The Heated Windshield Kit ellows the crew to electrically defrois/defog the windshield. The kit consists of two heated windshield panels, ewitches, circuit breakers, caution/advisory lights, and the nacessary hardware and wiring to complete the wisterious.

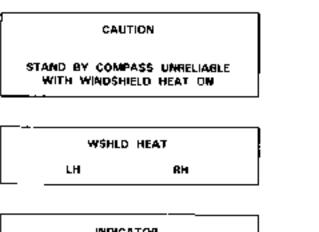
The ON/OFF switches are located on the overhead console and identified as WSHLD HEAT LH and RM. Placing either switch in the ON position activates the conseponding heated windshield panel and illuminates the respective ON advesory light. The caution/advisory lights are located on the instrument panel. The caution pontion of the light illuminates HOT whenever the respective heated windshield panel overheats. Bectrical power is provided by the 28 Vdc NON ESNIT, bus, CONT and PVR circuit breakers, located on the overhead console and identified as WINDSHIELD HEAT LH and RH, provide circuit protection.

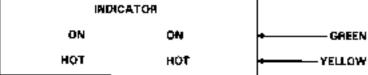
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LIMITATIONS

PLACARDS AND DECALS





BHT-412-FM8-3

Section 2

NORMAL PROCEDURES

PRESTART CHECK

WSHLD HEAT LH project - OFF.

WSHLO HEAT RH switch - OFF.

WINDSHIELD HEAT circuit breakers - In.

BATTERY BUS 1 switch = ON

WINDSHIELD HEAT causion/advisory lights segments — PRESS TO TEST; check ON lights illuminate green, HOT lights Buyminate green, HOT lights Buyminate green,

NOTE

The intensity of the heated windeheatd lights is controlled by the caurion panel BRIGHT/DSA switch when PILOT INSTRICT theosystics on

BEFORE TAKEOFF

WSHLD HEAT LM switch — ON In desired; check ON both (Ruminatas).

WSHLO HEAT RH switch - ON Itil deskedt; check ON told (Numinates.

NOTE

The windshield heat green advisory sights will illuminate and extinguish as the windshield heat cycles on and off during normal operation.

BHT-412-FMS-3

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

DC GENERATOR FAILURE

NON-ESNTL BUS swetch MANUAL

NOTE

DC power for the heared windshield is supplied by the nonessemial bue.

WINDSHIELD HEAT CAUTION LIGHT

II alther WSMLD HEAT caution light Appringing (NOT), turn respective WSMLD HEAT switch OFF

WINDSHIELD HEAT CIRCUIT BREAKER

HILH OF RH WINDSHIELD MEAT CONT OF PWR circuit breaker, pops out, nurs respective WSHLD HEAT events DFF

Section 4

PERFORMANCE DATA

No change from basic Flight Manual.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR FLIGHT DIRECTOR

(412-706-111)

CERTIFIED FEBRUARY 13, 1981

This supplement shall be shaded to the Model 412 Fight Manual when the 412-708-111 Flight Director has been excluded.

The information contained herein supplements the information of the basic Flight Manuel. For Lentetions. Procedures, and Performance Data not consulted in the supplement consult the basic Flight Manual.

Bell Helicopter TEXTRON

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BHT-412-FMS-8

INTRODUCTION

The Flight Cirector assists the flight crew in control and navigation of the halicopter Mine Flight Director modes on addition to standby (SBY) mode, are available for selection by the flight crew: Altitude (ALT), Indicated Arapead (IAS). Vertical Speed (VS), Heading (HOG), Navigation (NAV). Localizer and Glideslope (ILS), Back Course (BC), VOR Approach (VOR APR), and Go-Around (GA). Flight discourage in the instrument game).

The Flight Oirector can be coupled to the Automatic Flight Control System (AFCS) for fully automatic thands off) flight path control

BHT-412 FMS-6



LIMITATIONS

TYPE OF OPERATION

The Flight Director may be used during VFR or IFR renicing confident,

FLIGHT DIRECTOR LIMITATIONS

During VOR approaches, except for VORs collocated at the arport, the Flight Decetor shall not be coupled in VOR APR mode prior to VOR station passage inhound.

Maximum approach gradient is 6 degrees.

Flight Director modes may not be commended. From the copillot position.

NOTE

Flight Director bars are repeated on copies ADI.

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after the Flight Director is installed and bollect readjusted, if necessary, to return empty weight CG within Mowable White.

AIRSPEED LIMITATIONS

Withinton simpleed for coupled operation of Flight Director is 50 KtAS

BHT-412-FMS-8

Section 2

NORMAL PROCEDURES

PRESTART CHECK

PRLOT INSTR LT knob = OFF (day operation).

AUX SYS PITOT and STATIC switches - NORMAL

SYSTEMS CHECKS

FLIGHT DIRECTOR CHECK

FORCE TRIM swetch - ON.

NP1 and HP2 bustons - QN

Flight deactor SBY betton Deprese and hold: check DCPt, light and all made selector and holipine controller lights (fluminate and FO tailing on AOI appears, then referre betton

HSI heading marker Set to aircraft heading.

Fight deactor HDO builton — Depress, check HDG and CPL lights aluminate, SBY light extragorators

ADI roll command bar - Chack contered

HSI heading marker — Move right; check ADI rid command has received right and roll actuator pusition indicates (API) moves right, check cyclic stick moves right to approximately 2 seconds

HSI hearing marker — Reset to secrets treading

Flight director VS hutton - Depress, check VS light Numbrases.

ADI pitch commissed bar . Check centered.

Cyclic ATTO TRAM switch — Move alt: chack ADI pitch command has moves up and pitch API moves up: chack cyclic stick moves off in apparaximately 2 seconds.

Cyclic NAV ST6Y buston — Degrass momentally and release. Check HDG, VS, and CPL lights autingueth. SBY light illuminates, theck all APIs cannot pitch and roll continued bars retreat from years.

HSI heading marker - Set to tokenfi heading.

NOTE

For prokinged ground operation. AFCS shall be operated in SAS mode gray.

TAKEDEE

SAS/ATT finition — ATT or SAS as deginal during leaver and takents ATT pelor to enturing limiting method (IMC)

NOTE

It is recommended that the cycle.
FORCE TRIM release button be
depresent before littoff to trim
eclusions to center positions.

Cyclic FORCE TRIM release burnon Departs and hold until desired climbour entitude is attained, then release.

Figure director — Select modes as desired after anaching 60 KIAS

IN FLIGHT OPERATION

Fight director - Select amules de designi

DESCENT AND APPROACH

Fight director - Select mode for type of approach to be flown.

Collective pitch — Adjust to maintain desired approach speed.

GO-AROUND

Colective GO- AROUND button — Depress at Missed Approach Point

Collective pitch - Adjust to desired climb powersenting

Amspeed - Adjust so degited climb appeal

Flight director 5-fect modes as desired.

LANDING

Cyclic NAV STBY button - Degrees at or above 60 KIAS to decouple tages director.

AFCS - SAS or ATT mode as desired

NOTE

It is recommended that the cyclic FORCE TRIM release button be depressed before touchdown to trim actuators to center positions

For profesiged ground operation, AFCS shall be operated in SAS mode only

Section 3

EMERGENCY AND MALFLINCTION PROCEDURES

Table 3-1 Couton lights

CAUTION LIGHT WORDING	FAULT COMPITION	CORRECTIVE ACTION
DCPL	Faght director not coupled	Ensure that HP1 and HP2 are angaged in AT1 mode. Engage Right director modes as desired. Departs CPI, human it GPI, just not digmented.

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Table 3-2. Weining Rage

FLAG WORDING	FLAG LOCATION	FAULT CONDITION	CORRECTIVE ACTION
ATT	ADI	Vartical gyro not turning at full speed/attitude information unrallable (Flight director may or	If only plot ATT flag is displayed, pilot shall movitor standby antitude indicator and liight director.
		mey not decouple.)	If crify the copilor ATT flag es displayed, the copilor shall recontor the mandby attitude indicator. Flight director is
			lunctional and light director indications repeated on copilots ADI are valid.
			Check PILOT and CPLT ATTD SYS obcuit breakers — in. If Reg does not remeet, coordine flight in ATT or SA5 mode.
FO	ADI	Flight director not coupled due to flight director failure. (Flitch and roll command bare may or may not retract from vary.)	Check FLT DIR (AC and DC) circuit breakers in. Check desired models) engaged. If flag does not retract from view, continue flight in ATT or SAS mode. [ATT mode for IMC conditions.)
GS No Negered)	HSI	(Sideglope signal unreheble. (ADI plich command bar retracts from view. AFCS holds pitch attitude present at time of signal takers.)	Continue light in any mode, which expelse ATTO TRIM switch and collective to mointain airspeed and glidapath. (Monitor raw glidapath, 1800)
NAV No legendi	HSI	VOR or localizer signal unreliable. (ADI roll command her retracts from view. MSI course deviation her and No. 1 bearing pointer enreliable. AFCS holds roll level actitude.)	Check NAV 1 (DC) alreads breaker in. Check VMF NAV 1 runed properly alguet identified. Continue liight in HDG or ATT mode.
OFF	HS1	Directional gyro failure or HSI failure. Heading information unreliable. TAFCS holds roll level attitude)	Chack PLOT and CPLT HSI and GYAO CMPS (ACI circuit breakers in . Consinue light in any mode except. HOS.

FLIGHT DIRECTOR FAILS TO COUPLE

HP1 and HP2 budgons CN

SAS-ATT button - ATT

CPL busion Depress if CPL fight out thumingsed.

MO1E

The Flight Director will not couple if MP1 or MP2 is inappressive.

PITOT-STATIC SYSTEM MALFUNC-TION

in the event of an apparent malfunction of the capitot ellimeter, vertical speed indicator, and/or arispeed indicator, proceed as follows.

AUX SYS PITO1 or STATIC sweich las applicable! DFF

Flight director — Disengage vertical modes

Section 4

PERFORMANCE DATA

No change from base. Flight Manual.

6HT-412-FMS-6

Section 1

MANUFACTURER'S DATA

WEIGHT AND BALANCE

No change from book Flight Menual

Section 2

MANUFACTURER'S DATA

SYSTEMS DESCRIPTION

FLIGHT DIRECTOR (412-706-111)

The Right director is designed for use as a workload reliever to essist the pilot in control and navigation of the heticopte. The flight director has nine modes of operation, any of which may be coupled to the helipilot system for fully be accorate hards off flight path control. When decoupted from the helipilots, the flight director provides automate flight path computation and visual picch and roll command indications to direct the pilot in managering the habitopies to maintain the selected flight path. When the flight director is coupled in the appropriate modes, the automatic flight control system will managerin the helicopter to perform the following functions:

- Maintain a constant pressure abbude (ALT).
- Mainteln a constant indicted airseved IIASI.
- Maintain a constant vertical speed climb or descent (VS).
- Turn to and maintain a selected magnetic handing (HDG)
- Capture and track a selected VOR radial INAV or VOR APRI.

Capture and neck an ILS isositzer and olidestope (ILS)

Capture and track a localizer back course (BC)

Initiate a massed approach (90-enound) climbout (GA)

The flight director computer analyzes vertical and leseral flight and nevigenions) date to penarata pitch and toll steering commands which are displayed visually on the explicate describe endicator (ADF). The ventical channel combines pitch attitude, airspeed, elikude, vertical poaed. and miderione deviation information to produce computed altchcommand signals. The lateral channel combines roll activade, heading, and course deviation information to produce computed ro4 command. signals. Automatic (light path comrobis achieved when the pitch and toll commands from the flight. director computer are coupled to the helipilot computers

Should a flight or navigation date signal become availd—the affect of pitch or roll channel well served to stirlude hold mode and the respective commandible on the ADI will retract from New Highlight holipitot take or is desengaged, the Right director will decouple automasticity.

ting or nirulinaum of data contained on this page is subject to the reactionism on the still page of this document.

BHT-412-FMS-6

FLIGHT DIRECTOR CONTROLS

MODE SELECTOR

The mode selector (figure 2-1) enables the pilot to select the desired flight director mode by depressing the appropriate push-encoush-off button. Selected modes are arranged to illumination of the respective mode select buttons. The MAV, 8C, and VOR APR buttons have two lights each [ARM and CAP) to advise the pilot of the status of the flight director computer. The US button fegerals [ARM and GS] advise when the computer has arrand or depleted the glidestope. Depressing the SBY button disengages all modes and tress the Minimution of all mode selector lights. Turning the PILOT INSTRICT (not plockwise directal mode selector lights for restil operation.

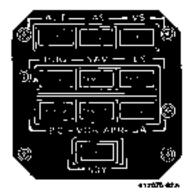


Figure 2-1. Flight director mode selector

COUPLE BUTTON

The CPL button is a push-omposh-off button located on the hallplins control panel on the pederal When holts hallplins (IPT) and IPP2) are engaged in the antique retainion mode (ATT), selecting any valid flight director mode well couple the flight director to the helipilots automatically, as indicated by illumination of the ON legend of the CPL button, The pilot may decouple the flight director by depressing the

CPL burton. When decoupled, the flight director will communit functioning in the selected mode, providing views pitch and religious indicator (ADI). Once depressed, the CPL button must be depressed again to recouple any flight director mode.

FORCE TRIM SWITCHES

The FORCE TRIM switch on the pedestal must be DN anytime the flight deactor is coupled for automatic flight control.

The cyclic mounted FORCE TRIM retease button. can be depressed to allow the prior to regoeition the cyclic control and pedals manually for large scale peich, roll, and year conscious. Upon depressing the busson, the rotary trim actuators are de-energeised, the flight director modes are decoupled momentantly, the helipliot pitch, titl. and you linear actuators return to center positions, and the helipilot computers are placed in a feet follow-up made to track flight control positions. Upon releasing the button, the helipelots and flight director will resulted functioning in the preselected modes. If previously decoupled in the ATT mode, the helicitors will maintain the atthude existing at the time the button or reinspect.

ATTITUDE TREM SWITCH

The cyclic mounted ATTD TRIM switch can be moved fore and att to adjust prich attitude and largely to adjust roll attitude during decoupled operation in attitude retention mode. The switch is also used to make small pitch attitude changes when coupled in any mode except ALT and ILS alter glideslope capture. Boll stitude can also be adjusted by the ATTD TRIM switch, except when a largest mode to engaged. It and attitude changes should be made by depressing the cyclic FORCE TRIM release burnon.

FUGHT DIRECTOR STANDBY BUTTON

The cyclic minumed NAV STBY buston at a remote switch having the same function as the SBY buston on the flight director made selector. Depressing the button disempages All flight

BHT-412-FMS-6

director modes, casts the alternite of all mode selector. Iights satisfies the pitch and coll commend bers on the ADL and places the (light director in a standby status. The pilot must then reselect the modes if continued flight director operation is desired.

GO-ARDUND BUTTON

The GO-AROUND button, located on the collective control head, is a remote switch having the same function so the GA button on the light director Depressing the button places the flight director in go-around needs and divengeges all other modes in GA mode the flight director commands a roll leval efficiency and a patch around which will provide a 750 test-per manuse rate of climb (The pilot must adjust collective pitch to maintain desired climb aropeed.)

AUXILIARY PITOT "STATIC SWITCHES

The AUX SYS PITOT and STATIC switches provide a means for isolating the flight descriptoraged and altitude sensors from the copies pror-static system in the event of leakage or other system matturction. When the PITOT switch is OFF the flight director airspeed denoming disconnected, syndering the tAS mode inoparative. Placing the STATIC switch in the QFF position disconnects both the elispeed and pulsuals sensors of the Regist director and thereby disables the ALT, TAS, and VS modes. The prior should disengege the effected vertical modes to prevent undescrible flight control inputs when either switch is on the OFF position.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT SINGLE-SPEED INTERNAL HOIST

214-706-003

CERTIFIED OCTOBER 2, 1981

This supplement shall be attached to the Model 412 or 412EP Flight Manuel when the 214-706-003 Single Speed Internal Hoist has been lostelled

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

Bell Helicopter TANKON

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REISSUE — MAY 11, 1995

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NOTICE PAGE

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MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76183-0170 FAA APPROVED BHT-412-FMS-7

GENERAL INFORMATION

The Single Speed Internal Hoist enables cargo and amargancy rescue operations in areast where landings cannot be accomplished. The hoist can raise or tower loads up to 600 pounds (272 kilograms). The hoist cable is 250 usable (est (76.2 malers) in length. Each of the four cable mounting locations allows the hoist to be extended 90 degrees outboard. Caution

lights on each side of the holst illuminate when the hook reaches 20 feet (5 meters) below the skide during retraction. An electrically actuated cable cutting device allows pilot or holst operator to sever the cable in an emergency. A manually operated cable cutter, accessible to the holst operator, they be used to sever the cable if the electrical cable cutter fails

Section 1

LIMITATIONS

1-3. TYPES OF OPERATION

Hoist operations shall be conducted under appropriate operating rules for external loads.

Passenger operations with hold installed are approved II houst is slowed and electrical system to deactivated.

Holat operations are prohibited during instrument meteorological conditions.

1-4. FLIGHT CREW

A crawmember wearing an approved safety harness in passenger compartment is required during all phases of hoist operations. Crawmember shall wear protective gloves for guiding cable during operation. The hoist operator shall be familiar with hoist operating procedures and limitations.

1-5. CONFIGURATION

1-5-A. REQUIRED EQUIPMENT

Hoier cable entichating guard shall be installed on standard or high shid landing gear (with or without floors) on same side of helicopter as hoist.

1-5-B. OPTIONAL EQUIPMENT

Fixed passenger step shall not be installed concurrently with internal hoist.

Retrectable passenger steps shall be stowed during hold operations.

Hoist appraisan with flight director in coupled made is prohibited.

Hoisting or lowering an empty litter in open position (except Stokes Otter) is prohibited.

Refer to appropriate Flight Manual Supplement(s) for additional limitations, procedures, and performance data.

1-6. <u>WEIGHT AND CENTER OF</u> GRAVITY

Actual weight change shall be determined after hoist to installed and ballest readlusted. If necessary.

For maximum gross weight, including help to lead, refer to applicable Flight Manual or BHT-412-FM9-19-1 when increased Gross Weight and Takeoff Horsepowerkij is justalied.

Maximum horst load is 500 pounds (272 kilograms). This is a structural limitation only and does not ensure that longitudinal or lateral CG will remain within approved (Imits Maximum sillowable holst load varies with gross weight, center of gravity, and holst location. Refer to appropriate Holst Loading Schedule.

NOTE

The center of gravity of hoist load in forward position is F.5. 92 (2083 mm) and B.L. 50 (1524 mm). The center of gravity of hoist load in pit position is F.S. 131 (3327 mm) and B.L. 64.4 (1536 mm).

For Longitudinal vs. Lateral CG limits with internal holst refer to internal holst CG anvelope figure 1-1.

1-7. AIRSPEED

VNE with asymmetrical door configuration is 20 KIAS.

VNE with hinged panels locked open and cargo doors open is 20 KIAS.

VME with hinged panels removed and cargo doors removed or secured open is 60 KiAS.

1-24. <u>HOIST DUTY CYCLE</u> LIMITATIONS

The holat is approved for continuous operation with loads not to exceed 500 pounds (272 kilograms).

1-25. ALLOWABLE HOIST LOAD

Select hour touching schedules (ligures 1-2 through 1-5) appropriate for position in which houst is installed.

NOTE

Moist loading schedules are based. on most adverse loading combinations of pitol, copilor, and hoist operator, each weighing 170 or 200 pounds (77.1 or 90.7 kilograms), and on a weight empty CG at 0.8 Inches (7.3 mm) to right of centarline prior to adding holds. II Isteral CG is appreciably different or crevimomber weights are out of this range, allowable hoist load shall be computed. For computation, assums hoist operator in forward position to be located at F.S. 87 (2210 mm) and B.L. 40 (1016mm), and in att. position F.S. 125 (3175mm) and B.L. 40 (1018mm).

1-25-A. LEFT HOIST INSTALLATIONS

Enter appropriate schedule, figures 1-2 libraugh 1-5 at gross weight of helicopter prior to hotsting. Proceed vertically to intersect with diagonal line representing number at trewmembers on board, top of schedule, or right outoff line. Proceed horizontelly to tell to read maximum allowable hoist load, intersecting with right cutoff line gives maximum load which does not cause helicopter to exceed gross weight timetations.

Using Weight empty chart, Section 5 and left hoist loading schedules ensures that both longitudinal and lateral limits are not exceeded during first hold operation. However, for subsequent hotsting, additional precautions must be taken to evold exceeding forward longitudinal limits.

1-25-A-1. LEFT FORWARD HOIST LOCATION

To continue using maximum allowable holet capobility: (Rofer to ligure 1-2 through 1-5)

- a. put holated load (people or cargo), along side of island, or
- when holisted load is put immediately forward of island, reduce maximum holet load to 300 pounds.

WARNING

DO NOT PUT HOISTED LOAD IN FORWARD AREA OF PASSENGER COMPARTMENT UNLESS MAXIMUM HOIST LOADS ARE COMPUTED FOR THAT CONFIGURATION.

1-25-A-2. LEFT AFT HOIST LOCATION

To continue using maximum allowable holst capability: (Refer to figure 1-2 through 1-5)

- put hoisted load along island or inmediately forward of laland, or
- b. ensure empty weight CG is within Area A. Refer to Weight empty thank Section 5.

1-25-8. RIGHT HOIST INSTALLATIONS

Right lateral timit for hoist operations varies with longitudinal center of gravity of the helicopter. The loading schedules have been modified to account for this variation

- Starting with appropriate schedule for number of crowmembers on board, enter at gross weight of helicepter prior to hoisting.
- Proceed vertically to intersect with diagonal line representing helicopter center of gravity prior to holsting, top of schedule, or right cutoff line.
- Proceed herizontally to left to read maximum allowable hols! load.

When helicopter center of gravity is believed STA. lines, interpolate to determine CG.

intersecting right culoff line gives maximum lead which does not cause helicopter to exceed gross weight limitations or forward languagement limits.

For multiple hoists during a single flight, after each hoist operation enter appropriate achequie at revised gross weight and proceed to new center of gravity to determine maximum allowable hoist load.

EXAMPLE 1: NORMAL

Determine Hoist Land when holet is in R:M FWO POISTION and arem consist of Pilet, Copilet and Hoist Operator.

GIVEN.

Gross Weight — 9,500 (bs.

CQ - STA, 135.5 before holsting

From appropriate 11,800 lb. GW schedule obtain hoist load as follows:

Enter gross weight at 9,500 lbs.

Proceed up GW line to interpolated STA, 135.6

Proceed left to read hoist load of 210 lbs. Point (s).

EXAMPLE 2: NORMAL

Datermine Motat Load when holet is in R/M FWD POSITION and crew consist of Pilot, Copilot and Holet Operator.

GIVEN:

Gross Weight - 9,500 lbs.

CQ - STA, 138.5 before heleting.

From appropriate 11,500 lb, GW schedule obtain holst load as follows:

Enter gross weight at 9,600 lbs.

Proceed up GW line to STA, 138.5

Proceed left to read hold lead of 550 lbs. Point (a).

1-25-C. RIGHT HOIST INSTALLATION - PENALTY REGION OPERATION

The dashed line on schedules represents tangitudinal center of gravity prior to hoisting which will result in a gross weight center of gravity at Sts. 135,2 and S.L. 4,5 during holal operations with meximum holat loads derived using this line. This center of gravity is the corner of but not in Penalty Region shown in Limitations.

Moist loads derived for Hormal Operations may be increased when GW/CG combinations are forward of these

represented by dashed line. Loads may be increased up to but not greater than those defined by dashed line. However, this procedure will result to operations within Penalty Region. Rater to Section 1. Internal Hoist CG Envelops, for Penalty Region.

EXAMPLE 3: PENALTY REGION

Determine Holst Load when holst is in R/N FWD POSITION and crew consist of Pilot, Copilet and Holst Operator.

GIVEN:

Gross Weight - 9,500 los.

CG - STA. 135,5 before helating

From appropriate 11,500 lb. GW achedule obtain hoist load as previously determined in Example 1 the maximum hoist load for normal operations is 210 lbs. Point (4).

To increase hold load to maximum for condition without exceeding GW/CG limits, proceed up to dashed line and raph left to find 435 lbs. Point (\hat{c}) .

The Penalty Region is any load greater than Point a up to maximum load at Point a.

For GW vs. CO combinations off of the CO represented by the dashed line (see Example 2), there is no Penetty Region.

1-26. <u>WEIGHT EMPTY</u> CHART

The Weight empty chart for internal holy(ing operations is shown in Section 5. Refer to the maintenance manual for additional information.

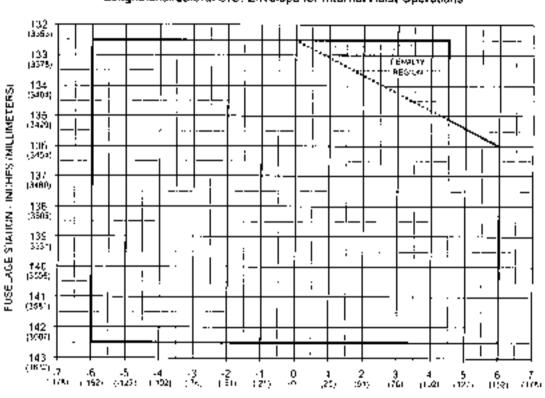
NOTE

Allowable hoist load must be computed when weight empty is not within specified guidelines, shown in Section 5.

NOTE

Allowable holdt loads must be computed when AUX Fuel kits are lostalled.

Longitudinal/Laterat C.S. Envelops for Internal Hoist Operations



LATERAL - INCHES [MILLIMETERS]

4125-5-2-1-1

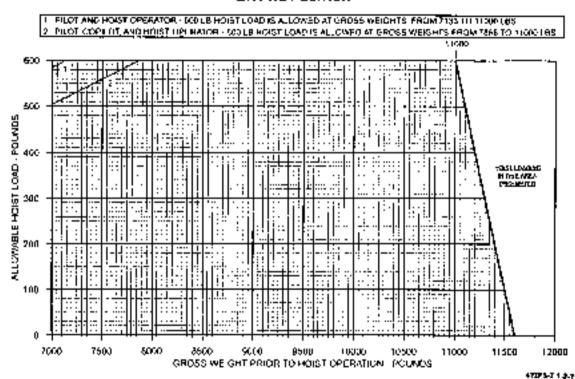
Figure 1-1.

Internal holst CG envelope

LIH FWD POSITION

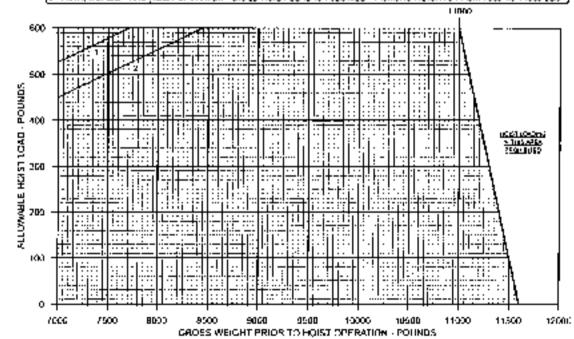
Figure 1-2.

Haist landing schedules 11,600 lb. GW (English) (Sheet 1 of 6)



L/H AFT POSITION

1. PILOT AND HOIST TIPENATION - 600 LB HOIST LOAD IS ALLDWED AT GROSS WEIGHTS, FROM 2130 TO 11000 195.
2. PILOT, COPULOT AND HOIGT OPERATOR - 610 LD HOIST LOAD IS ALLOWED AT GROSS WEIGHTS FROM 2666 TO 21000 LBS.

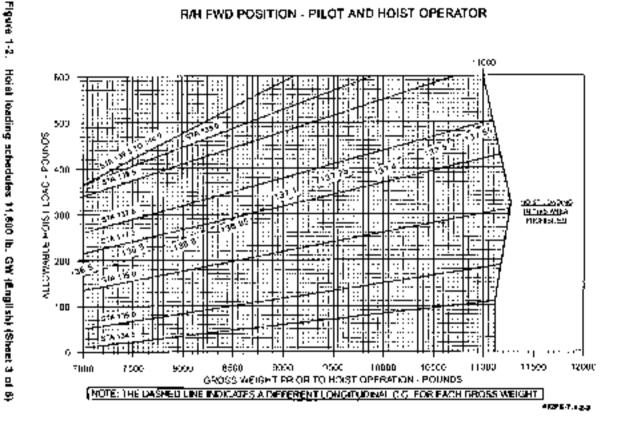


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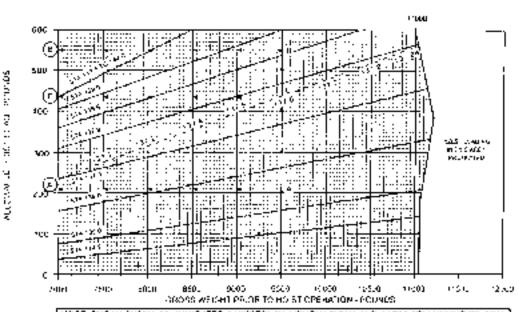
Ä

Holst loading schedules 11,600 ib. GW (English) (Sheel 2 of 8)

RAH FWD POSITION - PILOT AND HOIST OPERATOR



R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR.



NOTE: THE DASHED UNE INDIÇATES A DIFFERENT LONGITUDINAL C.G. FOR EACH GROSS WEIGHT

#129 B.F. 124

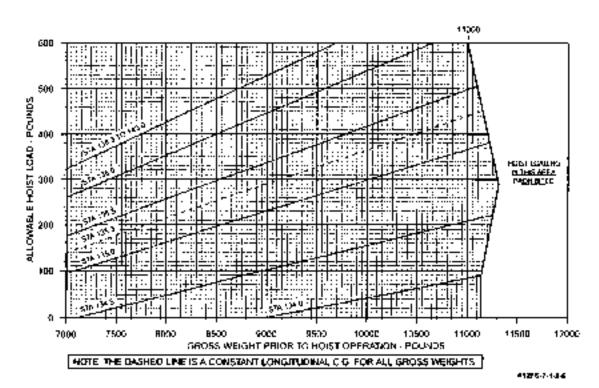
Figure 1-2.

Holst loading schedules 11.500 to GW (English) (Sheet 4 of 6)

Figure 1-2.

Hoist loading schedules 11,600 lb. GW (English) (Sheet 5 of 6)

R/H AFT POSITION - PILOT AND HOIST OPERATOR













R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR

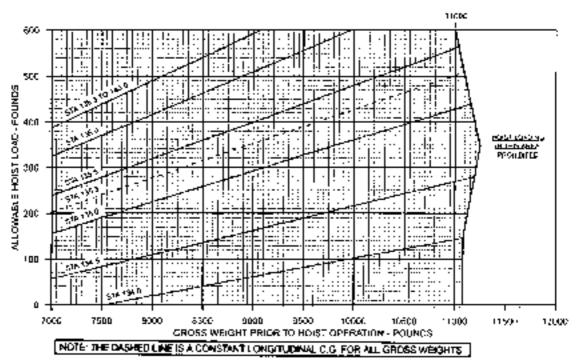


Figure 1-2.

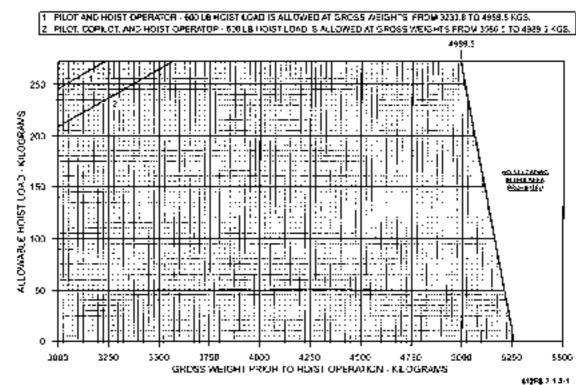
Hoist loading echedules 11,600 lb

GW (English) (Sheat 6 of

Figure 1-3,

Holst loading schedules 5261 kg. GW (Metric) (Sheet 1 of 6)

LH FWD POSITION



L/H AFT POSITION

PROTAND HOIST OPERATOR - ANOUGH HOIST LICAN IS A LICTARD AT GROSS WEIGHTS. FROM DAME A 777 ARREST KICK PIUTI COPLOT, AND HOIST OPERATOR 1600 LB HOIST LOAD IN AUGMED AT GROSS WEIGHTS FROM SIDEN FOR MEN A KIGO

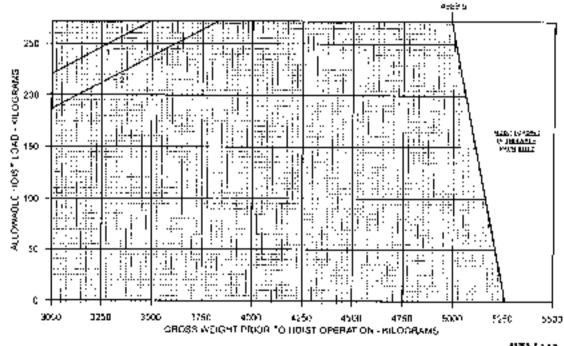
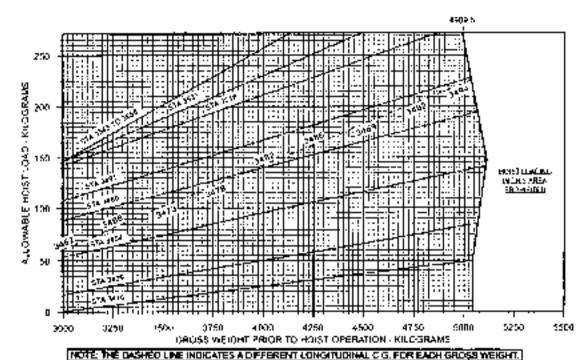


Figure 1-3.

Holds toading schedules 5261 kg. GW (Metric) (Sheet 2 of 6)

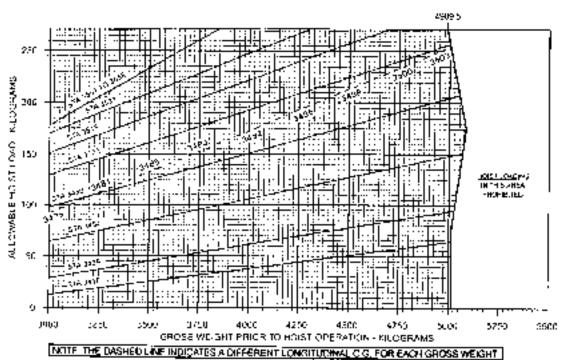
Hoist loading schedules 5261 kg. GW (Metno) (Sheet 3 of 6)

R/H FWD POSITION - PILOT AND HOIST OPERATOR.



41871-7-1-3-2

R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR

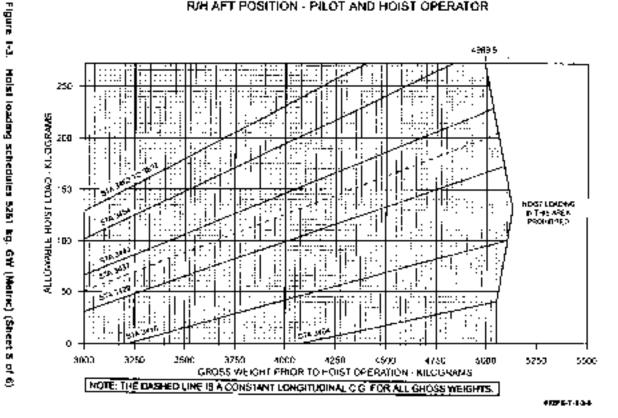


41275-74-3-4

Figure

Hotel loading schedules 5261 kg. GW (Metric) (Sheet # of 6)

RVH AFT POSITION - PILOT AND HOIST OPERATOR



R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR

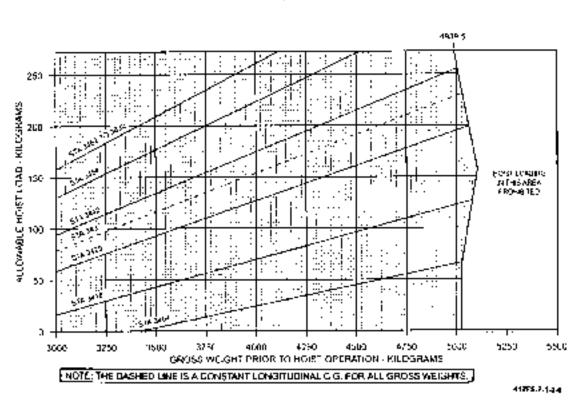


Figure 1-3,

Holal lauding achedules 5261 kg. GW (Metale; (Sheet 6 of 6)

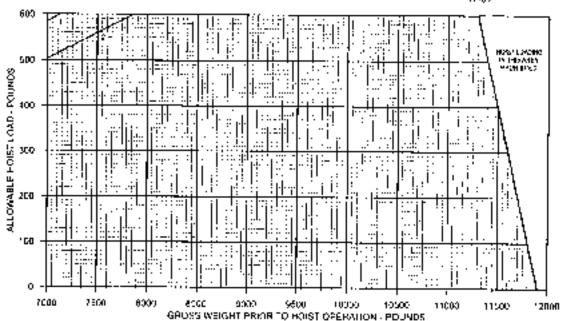
Figure

Hoist loading schedules 11,900 lb. GW (English) (Shoet 1 of 6)

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L/H FWD POSITION





LIH AFT POSITION

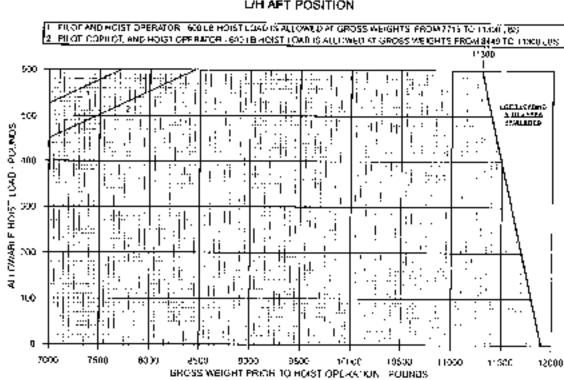
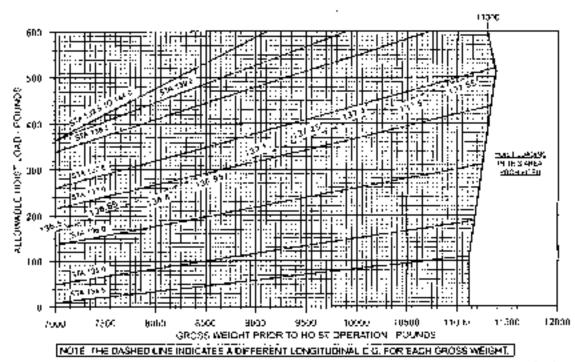


Figure 14

Hole! loading achadules 11,900 ib. GW (English) (Sheet 2 of 5)

Holet landing schedules 11,900 lb. GW (English) (Sheet 3 of 5)

R/H FWD POSITION - PILOT AND HOIST OPERATOR



41275-7-14-2









R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR

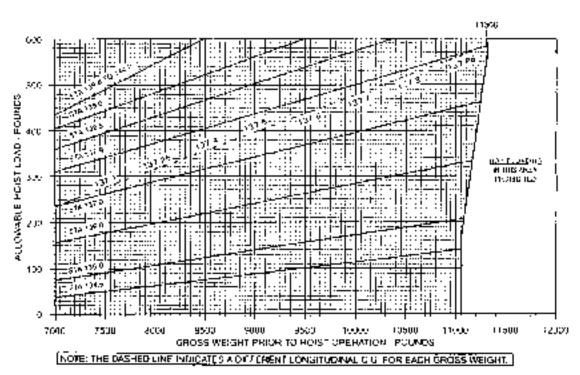
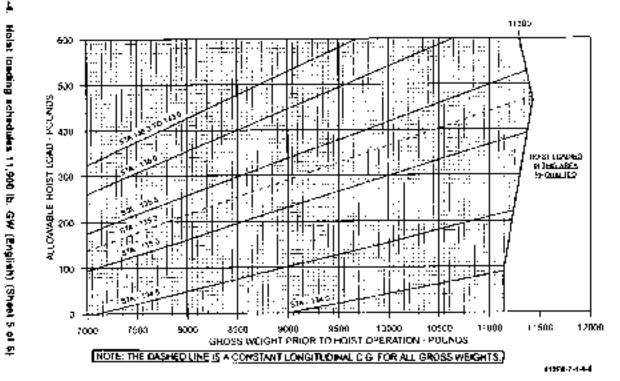


Figure 1-4

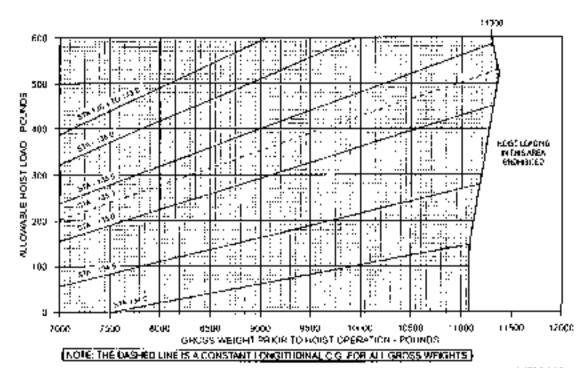
Hoist loading schedules 11,900 lb. GW (English) (Sheet 4 of 6)

Figura 14.

R/H AFT POSITION - PILOT AND HOIST OPERATOR



R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR.



Heist loading achedules 11,800 lb. (W [English] (Sheet 6 of 6)

Figure

L/H FWD POSITION

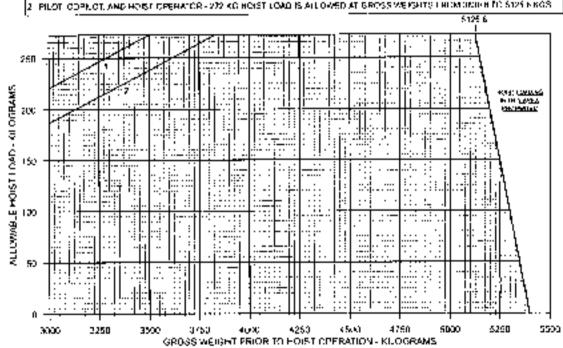
1 MILOT AND HUIST OPERATOR - 272 ACHIVIST JUNCIES ALLOWED AT CADSS WEIGHTS FROM 22:38 TO 5125 6 KGS."
2 PILOT COPILOT, AND HOIST GRERATOR - 272 KG HOIST LOAD IS ALLOWED AT GROSS WEIGHTS FROM 2560 5 TO 5125 6 KGS.



4025-7-14 1

L/H AFT POSITION

THI MICOT AND HOIST OFERSTOR. 272 KG HOIST COAD IS ALLOWED AT GROSS WEIGHT S FROM SASE 2 TO \$125 6 KGS.
2. PILOT COPILOT, AND HOIST GPENATOR - 272 KG HOIST LOAD IS ALLOWED AT GROSS MEKSATE LHIDMORIUM TO \$125 N KGS.

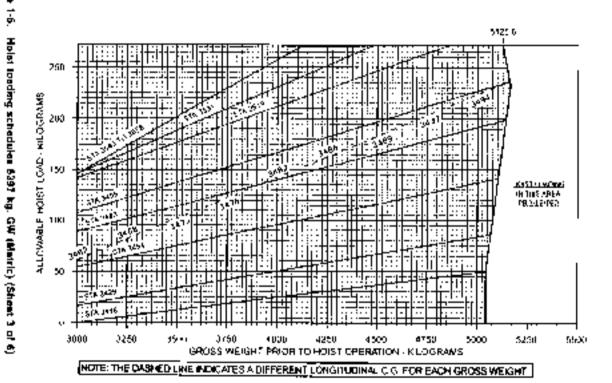


4185-7-14-2

Figura 1.5.

Horst loading schedules 6367 kg. GW (Metric) (Sheet Z of 6)

R/H FWD POSITION - PILOT AND HOIST OPERATOR.



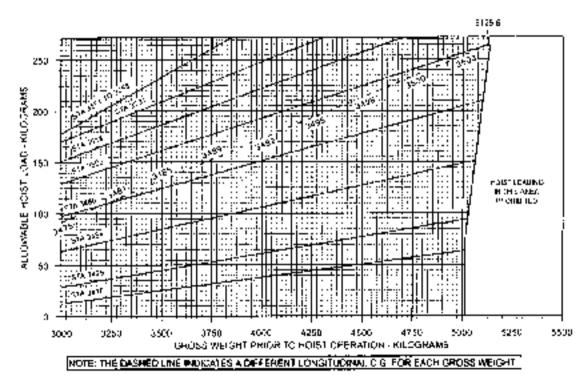
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R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR.

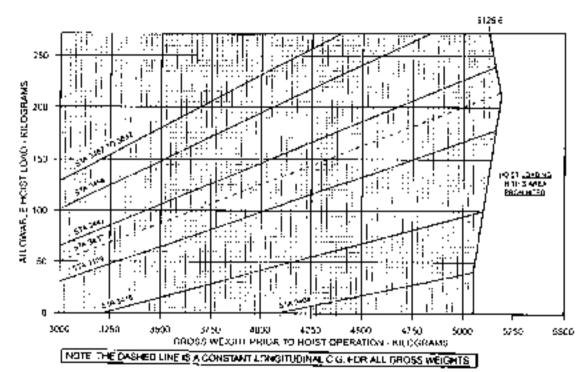


41275.7-144

Holst toading schedules \$397 kg. GW (Metric) (Sheet 4 of 6)

Holst loading schedular 5397 kg. GW (Meiric) (Sheet 5 of 6)

R/M AFT POSITION - PILOT AND HOIST OPERATOR



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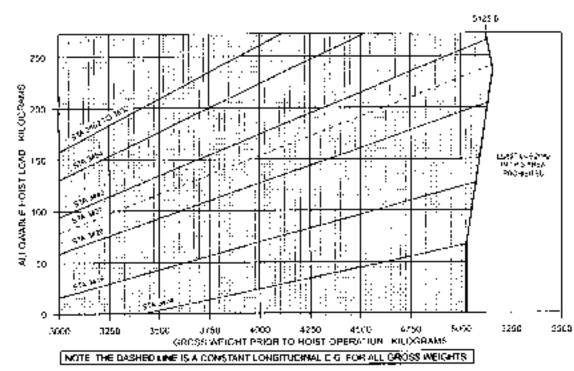








R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR.



44256-7-144

Figure 1-5.

Hoist toading schedules 5387 kg. GW (Metric) (Sheet 6 of 6)

Section 2

NORMAL PROCEDURES

2-2. FLIGHT PLANNING

WARNING

HOIST LOAD CAN CAUSE LONGITUDINAL OR LATERAL CO LMITS TO BE EXCEEDED.GROSS WEIGHT AND CENTER OF GRAVITY SMALL BE COMPUTED TO ASSURE LOADING WITHIN APPROVED LIMITS.

CAUTION

IF ADDITIONAL LOADS ARE CARRIED DURING HOISTING OPERATIONS, LOADS SHOULD BE PLACED ON SIDE OF HELICOPTER OPPOSITE HOIST POSITION.

Gross weight and CG — Compute with and without holes load.

2-4. <u>INTERIOR AND</u> PRESTART CHECK

2-4-A. HOIST INSTALLATION CHECK

NOTE

it plict plane to operate hold with other crewmember in passenger compartment, holet shall be inetalled in forward right position. Hoist — installed in desired position, check roof and floor etud adapters and looking collers properly secured.

Boom actuator — Installed in proper position; all fluings secured.

AIRCRAFT POSITION switch (on heist control box, figure 2-1) — Set in proper contilion.

Hook — Rotales freely on cable.

Cable — Check proper routing through guide rollers, pulleys, and drums.

Gearbox oil levels — Check sight glasses.

Hoist operators pendent — Installed: connectors secured.

Electrical power cables — Condition: connectors secured.

WARNING

ACTUATION OF CABLE CUT SWITCH ON PEDESTAL CAN CUT CABLE REGARDLESS OF HOIST PWR SWITCH POSITION. ACTUATION OF CABLE CUT SWITCH ON HOIST CONTROL BOX CAN CUT CABLE, EVEN IF CABLE CUT CIRCUIT BREAKER IS OUT.

CABLE CUT switches (pedestal and horst)

— Off; covers safetied.

Safety veste, tetter strape, holding slings, and litters — Condition; secured or stored.

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2-4-B. HOIST OPERATION CHECK

Cargo doors and hinged panels — Secured open or removed.

HOIST PWA. CONT and CABLE CUT circuit breakers — in.

BATTERY switches — ON (or connect externel power).

NON ESNTL BUS switch - MANUAL.

ICS — Check intercom between pilot and hoist operator using holst pendant ICS (rigger and HOT MIC switch (right ICS box only).

HOIST PWR switch — ON; check that green (power on) light and amber 20 FOOT CAUTION lights on hoist control box illuminate.

Hoist OVERTEMP warning lights — Press to lest.

CAUTION

MAINTAIN TENSION ON HOIST CABLE WHILE REELING IN AND OUT TO PREVENT SLACK.

HOIST and BOOM switches (pilot and operator) — Actuals to check all hoist functions for proper operation. Check that pilot HOIST switch overrides operator centent HOIST switch.

Holst Gable — Check for corrosion, kinks, liet spots, lieging, or broken strends.

Up limit switch actuator. Relies while hotels is recking in and check holes motor stops; then release and check holes resumes operation.

Reduce hotel speed as cable approaches up limit. Check that holet stops when hook reaches up limit without access tension on cable.

Holet - Stowed for Hight- hook restraint secured.

HOIST PWR switch - OFF.

NON ESNTL BUS switch - NORMAL.

BATTERY switches - OFF.

NOTE

Ground crewmember should be instructed to discharge helicopter static electricity before attaching load to hotal when possible.

2-6. SYSTEMS CHECK

Cargo doors and hinged panels - Secured open or removed.

CABLE CUT awitches (pedestal and holst) - Off; covers safetied.

MOIST PWA, CONT. and CABLE CUT circuit breakers - in.

2-5-A. BEFORE TAKEOFF

Safety years and straps - On and secured to helicopter.

Gloves . On.

STEP switch (if installed) - \$70W.

2-9. IN-FLIGHT OPERATIONS

Maximum hoist load shall be determined prior to each hoist operation.

NOTE

The Hight-Velocity Diagram is not a fimilation for internal hoist operations under an appropriate operating certificate.

HOIST PWR switch - DN.

WARNING

HOIST OPERATOR SHALL BE SECURED TO HELICOPTER WITH AN APPROVED SAFETY HARNESS OUGING HOIST OPERATIONS.

Establish hover over hotel operation area.

Holst hook restraint - Removed.

BOOM switch (or pilots HOIST switch) - Out.

NOTE

Each holst operation performed is defined as realing holes cable out and then in while hovering with any weight on holes, regardless of whether the holes was used for iraining or an actual rescue

The pilot must record each operation in the penalty CG region. For each hoist operation performed within penalty CG region, four (4) additional hours of usage must be logged against the main retor yoke, mast and lower cone sout.

HOIST switch - DOWN.

Discharge static electricity when possible, and connect hook to load, observing allowable hold load.

NOTE

As hook nears the up or down limits, hoist speed automatically slows.

HOIST switch - UP

CAUTION

USE CARE TO PREVENT CABLE, HOOK, AND LOAD FROM

FOULING ON FUSELAGE OR LANDING GEAR.

Maintain zero ground speed until load is clear of obstructions.

BOOM switch - IN to swing hotel boom and lead into cabin, if possible.

Takeoff into wind, if possible, allowing adequate hals food clearance over obstacles it load is not internal.

ÇAUTION

AIRSPEED WITH EXTERNAL LOAD IS LIMITED BY CONTROLLABILITY. CAUTION SHOULD BE EXERCISED WHEN CARRYING AN EXTERNAL LOAD. HANDLING CHARACTERISTICS MAY GE AFFECTED BY THE SIZE. WEIGHT, AND SHAPE OF LOAD.

Airspead - As required for adequate controllability, not to exceed limits for holal operations (20 or 80 KIAS, as applicable).

2-13. LITTER HOISTING

When amergancy transportation of a patient by litter is essential, every affort should be made to land the helicopter for litter loading. Litter holeting can be hezerdous and should be accomplished only when a landing is not feesible and the condition of the patient precludes the use of the personnel holeting along.

In addition to all other procedures contained herein, the lollowing shall apply to iller holsting operations.

F4A APPROVED BHT-412-FMS-7

2-13-A. EMPTY LITTER

WARNING

HOISTING OR LOWERING AN EMPTY LITTER IN DPEN POSITION IS PROHIBITED. AN EMPTY LITTER CAN DSCILLATE UNCONTROLLABLY IN ROTOR WASH AND FLY UPWARD. STRIKING FUSELAGE OR TAIL ROTOR.

Prior to holeting or fowering an empty litter, litter shall be closed and secured with straps. Litter should be suspended in a near-vertical position and sling straps should be drawn tight.

2-13-B. LOADED LITTER

WARNING

LITTER PATIENT SHALL BE SECURED TO LITTER WITH SAFETY STRAPS.

MOIST HOOK CATCH SHALL BE SECURED WITH SAFETY PIN PAIOR TO HOISTING LITTER PATIENT.

Litter aling strape should be adjusted so that litter as 24 to 28 inches (61 to 71 centimeters) below holst hook.

NOTE

lf litter is suspended too lar below hook. Hitter cannot be Joaded in helicopter with horst hook at up limit.

CAUTION

A LOADED LITTER CAN ROTATE A BOUT CABLE OUTING HOISTING, HOIST DPERATOR MAY HAVE TO GRASP LITTER SLING STRAPS TO CONTROL ROTATION AS LITTER APPROACHES LANDING GEAR.

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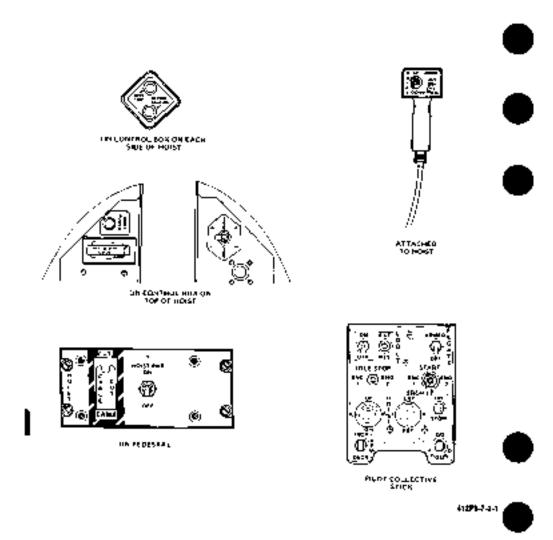


Figure 2-1. Internat hoist controls

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-15. HOIST LOAD JETTISON

To jutilison hole! load in an emergency, actually CABLE CVT switch (located on pedesta) or hole!).

In the event of failure of CABLE CUT switch, sever cable with manual cable cutter (stowed in pouch on heigh).

3-15-A. HOIST OVERTEMP. WARNING LIGHT

In the event that the OVERTEMP warning light (located on holst control box) illuminates, continue present specialion until holst is reside in. Leave HOIST PWR switch ON (for cooling fan operation) and allow holst to cool. When OVERTEMP light extinguishes, holsting may be resumed at cestinguishes, holsting may be resumed at cestinguishes.

Section 4

PERFORMANCE

No change from basic menual.

Section 5

WEIGHT AND BALANCE

5-11. <u>WEIGHT EMPTY</u> CHART

The Weight empty chart for internal holsting operations is shown in figure 5-1 Refer to the maintenance manual for additional information.

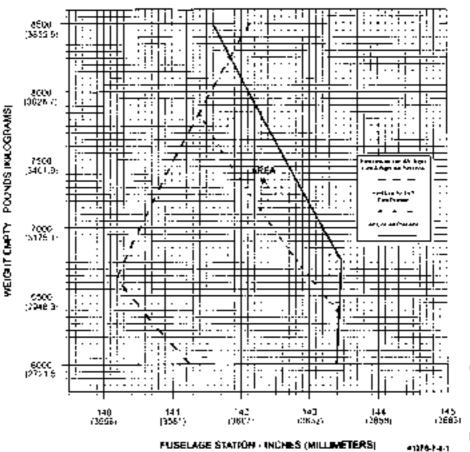
NOTE

Allowable hoist load must be computed when weight empty is not within specified guidelines.

NOTE

Allowable houst loads must be computed when AUX Fuel hits are installed.

412 Weight Empty Chart for Internal Holst Operations



FUSELAGE STATION - INCHES (MILLIMETERS)

Figure 6-1. Weight empty chart



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR LITTER KIT OPERATIONS

(412-706-006)

CERTIFIED SEPTEMBER 29, 1981

This supplement shall be attached to the Models #12 or #12EP Flight Manual when the #12-705-008 Little Kit has been entitled.

The information consulted herein supplements the information of the basic Flight Manual. For Limitations, Procedures, and Participance Data not consulted in the supplement, consult the basic Flight Manual.

Bell Helicopter IIXIRON

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REISSUE - 5 OCTOBER 1994

LOG OF REVISIONS

Original ...0 ...29 8ap 8.1 Rejecte ...0 ...08 May 89 Rejecte ...0 ...06 Oct 94

LOG OF PAGES

LIGHT MANUAL		MANUFACTURER'S DATA		
Page		Revision No.	Paga	Revision No.
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APPROVED:

MANAGER

ROTORCKAPT CENTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TEXAS 76193-0170

Jamy Milly

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FAA APPROVED INTRODUCTION

BMT-412 FMS-B

INTRODUCTION

The Little Kit provides them littles and the provisions for installing up to Ores litters in the helicopter. A cabin attendent seat is also included in the kin

FAA APPRUVED Section 1 and 2

8HT-412-FMB-6

Section 1

LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after the litterial are installed and ballest readjusted if remarkery. In return empty weight CG within allowable limits

MINIMUM FLIGHT CREW

The minimum slight crew too fetter operations shall contist of a prior and a second crew-merchan or cabin attendanc, both of whom shall be tryingd in and capable of assisting in litter patient emergency executation procedures.

Section 2

NORMAL PROCEDURES

LITTER LOADING

Social patients to threes, then head litters about the hellocater in tequence from top to bottom. When only two patients are carried, they should outdury the roy and center litter positions. When only one patient is carried, the center litter should be used.

LITTER UNLOADING

NOTE

Normal unloading procedures apply when either pastenger door can be opened. Refer to Saction 3, Emergency Procedures, for unloading procedures, when cabin door cannot be opened.

Open colon dear and unlead listers and patients. Note the helicopter in sequence from boston to lop.

Litters to be handled by one person inside cabin and one person outside cabin. BHF412-FMS-8

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

UNLÖADING THROUGH EMERGENCY EXITS

NOTE

In the event shar cabin doors cannot be opened. Ifteer perience shall be unloaded through emergency poppout windows Alter all litter patients have been tenioved, ambulatory patients may then exit.

Remove emergency pop-our window by pushing at corners as marked. Unstrap perions on center litter and ramove perions through wesdom opening.

Disconnect top River at and nage open window and lower and to real on center lister. Removepetient retuntion straps and ship papers down lister and our shiptigh window opening

Raise top and center litter ends near open window and engage center litter. Basta bottom top litter. Disconnect bottom litter. Basta bottom litter at and near open window and raist handles on the lower surface of the window opening Unarrap pattern and slide patient up litter and through window opening.

Section 4

PERFORMANCE

No change from basic Flight Manual



MANUFACTURER'S DATA

WEIGHT AND BALANCE

TABLE OF MOMENTS (IN-LB)		TABL	TABLE OF MOMENTS <u>(kg + mm)</u> 100	
	LITTER PATIENT	┰[╎]┰	LITTER PATIENT	
Yfeight Pounde	Londed Laterally F.S. 117	Weight IK.G.1	Landed Lanerally 2972 mm	
100	11700	50	1486.0	
110	12870	55	1634.6	
120	14040	60	1783.2	
130	16210	66	1931.8	
140	15380	70	2080.4	
150	17660	75	2229 0	
160	18720	77.1	2291.4	
170	19990	80	2377 6	
180	21080	85	2826.2	
190	22230	80 '	2674.8	
200	23400	85	2023.4	
210	24570	100	2972.0	
220	25740	105	3120.6 3269.2	



ROTORCRAFT FLIGHT MANUAL

33108 - 33213 36001 - 36019

SUPPLEMENT FOR EXTERNAL CARGO OPERATION

(212 - 706 - 103)

CERTIFIED MAY 14, 1981

This supplement shall be attached to the Model 412 Fight Manual (BMT-412-FM-2) when the 212-705-103 External Cargo Suspension Nook has been installed.

The information contained herein supplements the information of the basic Flight Manual. For Limitations, Procedures, and Performance Data not conssined in this supplement, consult the basic Flight Manual.

Cell Helicopter TEXTRON

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REISSUE — 15 SEPTEMBER 1995

BHT-412-FM6 9.2 FAA APPROVED

NOTICE PAGE

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FAA APPROVED BHT-412-FM8-9.2

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Original	Revision
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LOG OF PAGES

PLIGHT MANUAL

MANUFACTURER'S DATA

Page	Aevision No.	Pegé	Plenvision No.
Tipe 147 4 — 6 Ini 1-1 = 1-2 2-1 = 2-2 2-3/2-4 3-1/3-2 4-1 — 4-4	a	1-1 = 1-2	

NOTE

Revised text is indicated by a black vertical line, insert latest revision pages; dispose of supersected pages.

BHT-412-FM8-9.2 FAA APPROVED

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Original D May 14, 1921 Revision 1 September 6, 1923 Revision 2 January 13, 1934	Revision
Revision 1 Avenue 24 1884	

APPROVED.

MANAGER

ROTORGRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH. 1x 78193-0170 FAA APPROVED BHT-412-FMS-9.2

INTRODUCTION

The External Cargo Suspension Hook, when installed, will permit the operator to white the helicopter for transportation of external cargo, when operated by a qualified pilot.

Section 1

LIMITATIONS

TYPE OF OPERATION

Operation of the belicopter with no load on the external curgo suspension block is authorized under the stendard einworthingse certificate under VFB or IFB conditions without removing the unit from the helicopter.

The installation and use of the reer waw meror contained in the kill is lieft to the operators discretion.

The regrisses meror shall be covered or removed for right flight.

VER OPERATION

With a load attached to the suspension assembly, operation shall be conducted in accordance with appropriate operating tales for external loads under VFR conditions.

IFR OPERATION

External local operations are permitted provided the operator substantiates to the Administrator that the return of the Local combination means FR bandling requirements and insures that the Rytoscault External Load Operator Contlices reflects seems with appropriate sectionists.

WEIGHT - CG LIMITATIONS

Actual weight change whell he determined after cargo hock is installed and ballast readjusted, if necessary, to retain empty weight CG within abovemielimits Maximum gross weight including external cargo tood is 11,900 pounds (5398 Allograms). Maximum external cargo load is 4500 pounds (2041 Mograms).

AIRSPEED LIMITATIONS

VNE as 80 KRAS at or bases 10,000 feet density anitude for all gross weights with external cargo on suspension with Above 10,000 feet decrease VNE 2.5 knots per 1000 feet.

CAUTION

THE AIRSPEED WITH EXTERNAL CARGO IS LIMITED BY CONTROL-LABILITY CAUTION SHOULD BE EXERCISED WHEN CARRYING EXTERNAL CARGO. AS THE HANDLING CHARACTERISTICS MAY BE AFFECTED BY THE SIZE. WEIGHT, AND SHAPE OF THE CARGO LOAD

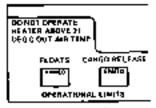
Light, weigh), high drag lizardy ractions a switch connector between the cargo book and the slang to provent unstable oscillations in flight above 20 KIAS

BHT-412 FM6 9.2 FAA APPROVED

PLACARDS AND MARKINGS



relocates en forward right side of averteen consolist



(becames on used) center part of inell-ymeen panel)

EXTERNAL LOAD LIMIT
4500 LBS
BEE FLIGHT MANUAL FOR
LOADING MESTRUCTIONS
AND FLIGHT UMITATIONS

(Luceted un under eide of hercopter next hungarison describig)

462-759.2-1-1

Figure 1-1. Placards and markings

Section 2

NORMAL PROCEDURES

GROUND CREW INSTRUCTIONS

instruct ground crawmember to discharge helicopter elaboratements before enaching cargo by touching the airframe with a ground wire, or it is motel alling its used, the hookup ring can be alruck against the cargo hook it doorstact has been lost after initial grounding, the helicopter should be rectrically regrounded and, if possible, contact maintained until hookup is corregisted.

instruct ground personnel to check primary and secondary tood rings for condition and proper size

(Table 2-1). Check for proper rigging and configuration (Figure 2-1).

WARNING

USE OF MAPPROPRIATELY SIZED LOAD RINGS MAY RESULT IN LOAD MANG-UP YHEN LOAD RING IS TOO BMALL OR MADYERIEM LOAD RELEASE IF LOAD RING IS TOO LARGE.

Check that only one primary ring is captured in food begin and only one excendery ring with correct processaction dimension is captured in primary ring.

Table 2-1. Ring Size — Cargo Hook PM SP1709-52

PRIMARY FING	PRIMARY RING	MAXIMUM CROSS-SECTION
INSIDE DIAMETER	GROSS-SECTION	OF SECONDARY MEMBER
3.0 to 3.1 en.	n.ū in.	0.625 M.
(76,2 to 76,74 enm)	(25.4 men)	(75.8 mm)
3.) to 4,0 m.	e.0 in.	0.750 M.
{79.74 to 101.6 mm)	(25.4 man)	(19.0 mm)

EXTERIOR CHECK

Cargo suspension assembly — Condition and security.

Repr view mirror (if installed) — Secure and clean.

INTERIOR CHECK

CARGO HOOK REL circuit treates - In.

Battery BUS 1 awhich - ONL

CARGO RELEASE ARMED causion light illuminates.

Cyclic CARGO RELEASE Issuen — Depress and hold; pull down on cargo hoots hook should open Release button was cargo hoots, hook should close and lock.

Cargo reliable pedal (between directional control pedat(s) — PUSH and hold; pull down on cargo hook; hook should open. Release pedal and cargo hook; hook should close and look.

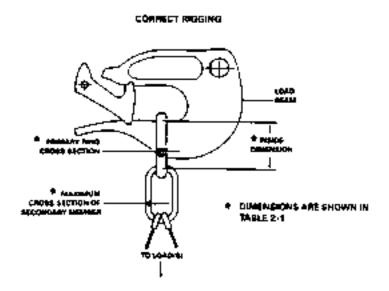
MOTE

The padelisate as with function regardless of CARGO REL switch position.

CARGO REL pwitch - OFF.

Battery 605 (switch — OFF

6417-412-FMS-9.2 FAA APPROVED



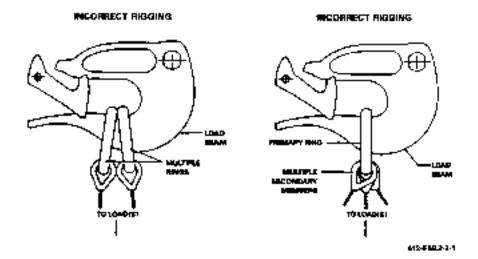


Figure 2-1. Effective toading practices

FAA APPROVED BHT-412-FMS-9.2

BEFORE TAKEOFF

CARGO REL 4w4ch — ARM; check GARGO RELEASE ARMED anabon light lituminates.

TAKEGEE

NOTE

Batter directional control may be realized by evoiding relative whole from the right from quedrant while performing external darge operations.

Hover helicopter at sufficient height to slow crownermor to discharge static electricity and to affach cargo along to cargo trook.

NOTE

Attachment of curgo eling to the hook can be observed by means of the real year minus.

Ascend vertically descrip over cargo, then slowly. It's cargo from surface.

Pedeje — Check for adequate directional control.

Noves power — Check torquerequired to have rwith waternal load.

MOTE

The Height-Valority Diagram is not a finitation for enternal cargo operations under an appropriate operating certificate.

Take off into the wind if possible allowing adequate sling load classance over obstacles

IN-FLIGHT OPERATION

HOTE

Constrain monotonents should be made smoothly and kept to a minimum to prevent ascillation of strog load.

CARGO REL switch (overhead) - At 044/46.

NOTE

Tria padal raioase will function regardless of CARCO REL awhen position.

Asspeed — Within limits for estiquine controllation of references.

Flight pash — As required to award Right with external load over any person, vehicle or structure.

DESCENT AND LANDING

CARGO REL switch (overhead) — ARM prior to tinal approach.

Right path and approach angle — As required for word direction and obstacle diseases.

Execute approach to a hover with cargo-clear of the surface. When stabilized at a trover, descend slowly until cargo contacts surface, stabilish canalon on sting.

Cyclic CARGO RELEASE button — Deprese to misses sting from book.

MOTE

Returned allog load from the hook can be confirmed vesselly through rear view minus. FAA APPROVED BHT-412-FMS 9.2

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

CARGO FAILS TO RELEASE ELECTRICALLY

In the event that cargo book will not release the sting when the CARGO RELEASE button is depressed, proceed as follows: Mointain consider on sang.

Cargo reliess pedal (between directional control pedals) — PUSH.

Section 4

PERFORMANCE

INTRODUCTION

No change from basic Flight Menual performance with no load attached to cargo book.

NOTE

Performance may be affected by the size and phape of the external load.

HOVER CEILING IGE

MOTE

When using any hover celling chart for external cargo operations, refer to ligure 4.1, critical relative wind astronths

in ground affect hover colling charts for external cargo operations are presented in figure 4-2.

HOVER CEILING OGE

Refer to basic Flighs Manual for out of ground effect haver calling charts during external cargo operations.

BHT-412-FMS-9 2 FAA APPROVED

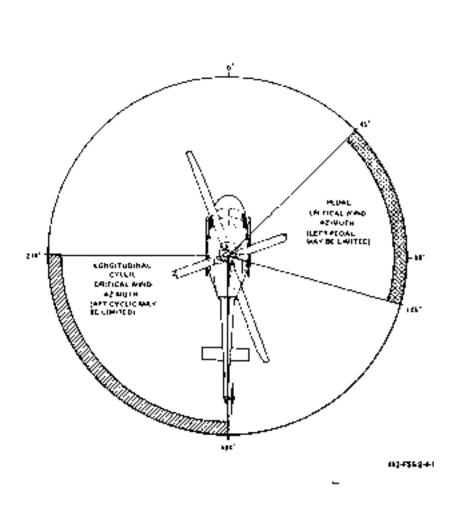


Figure 4-1 - Critical relative wind approachs

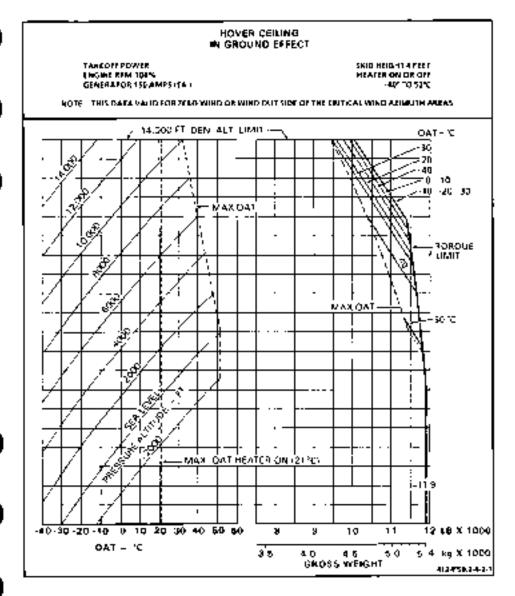


Figure 4-2 Hover ca-ing in ground effect (Sheet 1 of 2)

BHT.412-FMG-9.2 FAA APPROVED

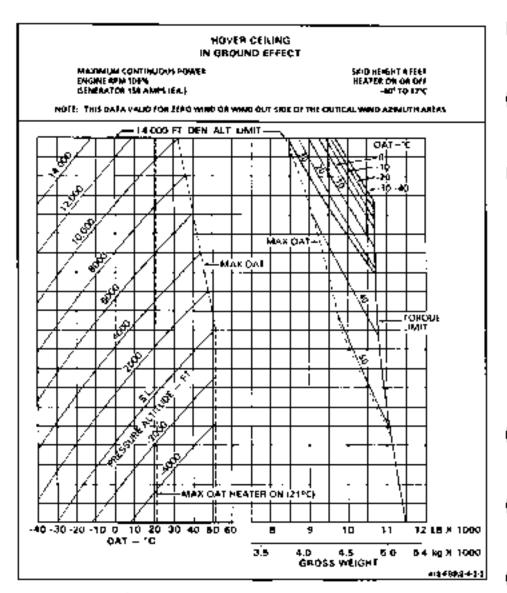


Figure 4.2. Mover ceiling in pround effect (Sheet 2 of 2)

MANUFACTURER'S DATA BHT-412-FMS-9.2

Section 1

MANUFACTURER'S DATA

WEIGHT AND BALANCE

EXTERNAL CARGO LOADING

The External Cargo Loading Tables (tables 1-1 and 1-1M) present moments for external loads suspended from the cargo hook as fusalings station 138.0 (3506 mm).

BHT-412 FMS 9.2 MANAFACTURER'S DATA

Table 1-1. External curpo fooding table (English)

EKTERMAL CARGO LÓAÐING TABLE ENGLESN						
Çargo Weigha (Uei	Morrani F.S 1398.0	Cargo Waight (ES)	##C(FIRM) F 9 1980	Carpo Walght (Ur)	Morrani F S 1398.0	
ВĎ	6900	1400	248600	3880	483300	
100	1,3900	1450	266300	3400	438400	
150	20100	1500	267200	3440	501700	
200	17400	1960	289100	3200	F19400	
280	34400	2000	278000	1750	517500	
300	41400	7040	282900	3800	624400	
380	48300	2100	788800	3950	631300	
400	55200	2150	799700	3990	538200	
450	62100	2200	303400	39M0	549100	
800	49000	226û	210500	4000	552000	
560	76900	2300	317400	4050	550000	
600	\$2800	7360	324300	4100	845200	
8840	89700	2+00	331200	4150	877700	
700	34600	2 ● 60	336,100	4200	\$ 7 3 4000	
7840	103400	2500	346000	4260	1 PT-00	
000	110400	2880	351600	4800	593400	
** -0	117300	2000	388400	4360	600300	
900	124200	2680	386700	4400	607200	
750	491100	2700	372400	448D	614100	
1000	135000	2750	3796-03	4800	9.21000	
1050	144900	2800	386400	4560	827800	
1100	161800	2860	393300	4500	634600	
1150	188700	2500	400200	4650	641700	
1200	100000	2250	407100	4700	646800	
1250	172800	3000	414000	4760	688800	
1300	179400	5050	420900	4200	462400	
1350	198300	3100	427800	4860	668300	
1400	163200	3180	430700	4900	478200	
1450	200100	1200	441800	4990	483100	
1500	267000	3250	448600	****	##00000	
1550	2+3500	2200	405459			
1400	220000	3350	482300	II	1	
1460	331100	3400	*88500	II	1	
1700	234600	M40	475100	lk .	1	
1760	241600	3600	●83000	II .	1	

412900-43

Table 1-1M. External cargo loading table (Metric)

	C≖rgo	Nomena	Cergo	Moreon
100	Meghi			
### ### ### ### ### ### ### ### ### ##	led.		1691	100
120	42	1402	1240	43462
140 6608 1360 47648 200 7010 1400 49070 1400 30477 320 3214 1400 50477 3270 11716 1070 53276 400 14020 1600 56080 440 1642 1640 5448 1520 18728 1720 60786 55080 4500 22432 1840 53884 5500 22432 1840 53884 5600 22432 1840 53884 5600 22432 1840 53884 5600 22432 1840 53884 5600 70100 63080 70100 63080 70100	8 3	7804	1280	44864
200 7010 1800 49070 240 8412 1440 50477 280 2814 1480 51878 320 11716 1570 53276 340 17518 1560 5459 400 18020 1600 5600 440 15422 1640 57482 480 18824 1680 58884 520 18728 1720 60286 550 1878 1780 61698 600 21030 1800 63090 600 21030 1800 63090 600 25324 1840 84492 720 25238 1920 6728 750 76538 1920 6728 860 28040 2000 70100 880 29642 2000 70100 880 30844 2080 72904 920 3246 2120 74308	120	4205	1320	46266
240 8412 1440 50477 280 3814 1480 51878 370 11716 1670 53276 380 17618 1560 54578 400 18020 1600 58680 440 16422 1640 57482 480 18424 1680 58884 520 18728 1720 60286 660 21030 1800 63090 660 21030 1800 63090 660 22432 1840 84492 660 23634 1860 63884 720 25238 1920 67286 750 75638 1980 63698 800 28040 2000 70100 880 30844 2080 7204 920 3246 2120 74308 860 33548 2150 78708 1040 35662 2240 73512 <	160	6608	1360	47669
280	200	7010	1#00	49070
370				
360 17618 1660 54478 400 14020 1600 56080 440 15422 1640 54884 480 18824 1680 54884 570 18728 1770 60786 660 21030 1800 63090 660 22432 1840 44492 660 23834 1680 63884 720 1 25238 1320 67785 750 75838 1980 63884 920 28040 7000 70100 880 29442 2080 71502 880 30844 2080 71502 880 30844 2080 71502 880 33548 2150 78708 860 33548 2150 78708 860 33548 2150 78708 860 35862 2260 77110				
400 18020 1600 56000 440 16422 1640 57482 480 18824 1680 58884 520 18728 1720 60786 680 21030 1800 63090 640 22432 1840 84492 660 23834 1680 63884 720 1 25238 1820 67785 750 75838 1980 83668 900 28040 2000 70100 840 29442 2040 71502 850 30844 2080 71502 850 33548 2150 78708 850 33548 2150 78708 850 33548 2150 78708 850 33548 2150 78708 850 33548 2150 78708 850 33548 2150 78708 850 33548 2150 78708 850 33548 2150 78708				
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### 18824 1680 58884 520 18728 1720 40787 680 18628 1780 61688 660 22432 1840 54492 660 23834 1680 63990 720 25238 1920 67785 750 75838 1980 83698 900 28040 2000 70100 840 29442 2040 71502 880 30844 2080 71502 880 30844 2080 71502 880 33648 2150 78708 1000 35662 2240 78512 1040 35864 2268 79493 1120 37864 2268 79493	400	10020	1600	58090
520 18728 1720 60785 6560 6600 21030 1800 63090 6400 22432 1840 6560 63090 6500 72034 1860 653804 1860 653804 1860 653804 1860 653804 1860 653804 660 75658 1960 67785 6800 76500 70100 6800 28040 2000 70100 6800 30844 2080 71904 920 32246 7120 74308 860 33548 2150 78700 860 33548 2150 78700 77110 1040 35652 2260 78512 1120 378549 1120 378549 1120 378549 1120 378549				
680				
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640 22432 1840 44492 660 93834 1680 65884 720 25238 1820 67785 750 75638 1960 86898 900 28040 2000 70100 840 29442 2040 71502 880 30844 2080 71904 920 32246 7120 74308 980 33648 2160 78708 1000 35060 2710 77110				
660 93094 1680 65804 720 25238 1320 67787 750 75838 1980 6869 800 28040 2000 70100 880 30844 2080 72904 920 32246 7120 74308 850 33548 2150 78708 1000 35050 2730 77110	600	21080	1800	6,0090
720	640	22432	1840	44442
750	680	93834	1880	45 884
800 2900 2000 70100 800 2900 2000 70100 800 2900 2000 71502 800 30844 2080 72904 920 32246 7120 74308 800 33548 2150 78708 1000 35050 2250 77110 1000 35652 2260 73512 1120 39864 2268 79493				67706
800 29002 2000 71502 800 30844 2080 72904 920 32246 2120 74308 850 33548 2150 76708 1000 35050 2730 77110 1000 35652 2240 73512 1000 37864 2268 75493			11	
880 30844 2080 72904 920 32246 7120 74308 880 33648 2160 78708 1000 35050 2730 77110 1040 36662 2260 78512 1080 37864 2268 79493	900	280 ± 0	2000	70100
920 32246 7120 74308 850 33548 2150 76708 1400 35050 2730 77110 1040 35652 2260 73512 1080 37864 2268 75493 1120 39768				
950 33548 2150 76708 1400 35050 2230 77110 1040 35652 2240 78512 1080 37864 2268 75493				
1400 35060 2230 77110 1040 36662 2260 73512 1080 37864 2268 75493			1	
1040 35452 2240 73512 1080 37864 2268 75493	1			
1080 37864 2268 75493	1-000	35060	3330	77110
1120 39766 /	1000			
			2268	79493
	1120	39768 40668	l I	

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ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR NIGHTSUN SEARCHLIGHT

(212-899-333)

CERTIFIED
DECEMBER 4, 1981

This supplement shall be attached to the Model 412 Flight Manual when the 212-899-303 Nightour Searchtight has been installed.

The information contained herein supplements the information of the basic Flight Manual. For Limitations. Procedures, and Performance Data not contained in this supplement, conquit the basic Filiaht Manual.

Bell Helicopter MEXTRON

a Sawasan y Japana

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MANAGER

ROTORCRAFT CERTIFICATION DIRECTORATE AIRCRAFT CERTIFICATION SERVICE DEPARTMENT OF TRANSPORTATION ROLLHWEST REGION FORT WORTH, TEXAS

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INTRODUCTION

The Highson Searchlight is a high intensity light which mounts on the lower nose of the helicopter. The senon are light may be started, almod, and focused from the operator's panel inside the helicopter. The lift consists of the Nightsun Searchlight, recurits, hardware, cable, and operator's panel.



LIMITATIONS

OPERATING LIMITATIONS

IFR operation is prohibited with Mightoun Searchfight installed.

FLIGHT CREW LIMITATIONS

Operation of the Nightsun Sperchlight is restricted to the copilot or operator position.

WEIGHT/CG LIMITATIONS

Actual weight changes shall be determined after searchight is installed and ballest readjusted, if

necessary, to return empty weight CG within allowable limits

PLACARDS AND DECALS

CAUTION

DO NOT USE NIGHTSUN SEARCHUGHT BELOW SO FT AGL OR IN FOG CONDITIONS MONITOR LOADMETER WHEN USING MIGHTSUN SEARCHUGHT.

412099-5

Section 2

NORMAL PROCEDURES

EXTERIOR CHECK

Mighteun Searchlight — Security and wiring. Lens. for cleanlinear.

PRESTART CHECK

SCMLT PWA and SCHLT CONT circuit brookers - IN.

INFLIGHT OPERATION

NIGHTSUN SEARCHLIGHT MASTER swelch ON.

NIGHTSUN SEARCHLIGHT START switch — START, hold in start position approximately 5 seconds, or until ignition has occurred. Aim and focus — As desired.

HORTUAS

HOLDING SWITCH IN START POSITION MAY DAMAGE EQUIPMENT.

CAUTION

DO NOT AIM THE BEAM TOWARD OTHER AIRCRAFT OR VEHICLES BECAUSE OF TEMPORARY BLIND-ING EFFECT.

BEFORE LANDING

NIGHTSUN SEARCHLIGHT MASTER SWIICH - OFF.



EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic Flight Manual

Section 4

PERFORMANCE DATA

No change from the basis Flight Manual



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR FIXED STEP

(212-706-057)

CERTIFIED 6 FEBRUARY 1982

This supplement shall be attached to the Modals 412 and 412 EP Flight Manual when the 412-706-057 fixed step has been installed

The information contained herein supplements the information of the basic Flight Manual for Ulmitations, Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual.

Bell Helicopter IIXIRON

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REISSUE - 23 JUNE 1994

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The hired steps mount to the sides of the fuselage to facilitate passenger entry and exist.



LIMITATIONS

OPERATING LIMITATIONS

The coments of this supplement shall be used in conjunction with the basic flight Manual for helicopters equipped with the fixed step.

The 412-706-004 Emergency Host Kit shall not be installed in conjunction with the fixed step.

The 212-706-105 Passanger Step shall not be installed in conjunction with the fixed step.

The 212,706,057 Fixed Step shall be removed when the 214,706,003 historical Hobri is installed.

WEIGHT - CG LIMITATIONS

Actual weight change shall be determined after hit is installed and before medjusted, if necessary, to return empty weight CG within allowable finits.

BHT-412-FM5-15

Section 2

NORMAL PROCEDURES

No change from basic Flight Manual.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic Flight Manual

Section 4

PERFORMANCE

No change from heald Flight Matual.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT AUXILIARY FUEL SUPPLEMENT

412-706-007

33108 — 33213 36001 — 36019 AND 3602D — 36086 AND 36087 AND SUB

CERTIFIED 5 JANUARY 1984

This supplement shall be attached to Belt Helicopter Model 412 and 412EP Flight Manuals when 412-706-007 Auxiliary Fuel Kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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Bell Helicopter [FXTRO]

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REISSUE — 23 JUNE 1994

NOTICE PAGE

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ROTORCRAFT CERTIFICATION OFFICE PEDERAL AYIATION ADMINISTRATION FT. WORTH, TX 76193-0170

Dary Willely

BHT 412 FMS-17.2, 17.3 AND 17.4

INTRODUCTION

The Ameritiany Fuel Kin provides additional fuel expectly to extend the range of the helicopter. The hit consists of a telt and right auxiliary fuel tank and the hordware and wiring necessary to complete the installation. The left or right entailisty fuel tank may be removed as operational requirements dictate.

One fuel (ank provides an additional 81.7 U.S. gallons (309, Z.liters) of fuel. Both fuel tanks combined, provide an additional 163.4 U.S. gallons (618.5 liters) of fuel

BHT-412-FMS 17.2, 17.3 AND 17.4

Section 1 |

LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight changes shall be determined after installation of auxiliary fuel tanks(s), and ballest shall be readjusted, if necessary, to secure empty weight CG within allowable limits.

WARNING

INDISCRIMINATE LOADING OF THE MELICOPTER MAY RESULT IN VIOLATION OF THE PERMISSIBLE CENTER OF GRAVITY LIMITATIONS WHEN THE HELICOPTER IS EQUIPPED WITH THE 412-706-007 AUXILIARY FUEL KIT.

The gross weight center of gravity Amits as presented in the basic flight Manual do not change when either or both auxiliary fuel tanks are installed.

Refer to Menufacturer's Data, Section 1, for weight and balance data and inading example

BHT 412-FMS-17 2, 17 3 AND 17 4

Section 2

NORMAL PROCEDURES

IN-FLIGHT OPERATION

CAUTION

WHEN DNLY DNE CABIN MOUNTED AUXILIARY FUEL TANK IS 11SED. THE FUEL INTOON SWITCH MUST BE REPLACED TO OPEN WHEN 4 FUEL QUANTITY INDICATION OF 500 LBS. IS ON EITHER SIDE, FAIL-URE TO MANUALLY OPENTHE FUEL INTOON SWITCH WILL BESULT IN FUEL EXHAUSTION TO THE ENGINE OPPOBITE THE SIDE WHICH HAS THE AUXILIARY TANK THE FEA. TURE WHICH AUTOMATICALLY OPENS THE INTERCONNECT VALVE WILL NOT HAVE A CHANCE TO FUNCTION WITH ONLY ONE AUXIL: JARY TANK INSTALLED, WITH TWO EQUALLY LOADED AUXILIARY TANKS INSTALLED, THE AUTOMA-TIC FEATURE WILL FUNCTION

BHT-412-FMS-17.2, 17.3 AND 17.4



EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic Flight Monual

BHT-412-FMS-17 2, 17.3 AND 17-4



PERFORMANCE

No change from having Flight Manual.

BHT 412 FMS-17 2, 17.3 AND 17 a

Section 1

MANUFACTURER'S DATA

WEIGHT AND BALANCE

AUXILIARY FUEL SYSTEM

AUXILIARY FUEL SYSTEM SERVICING

The numbery fuel ranks are interconnected with the basic fuel system to allow gravity flow of auxiliary fuel into main fuel cells as fuel is consumed. The auxiliary fuel system is serviced ampultaneously with the basic fuel system through the single filter port local order the als right eide of the fuscinge.

FUEL SYSTEM CAPACITIES

BASIC SYSTEM WITH LEFT OR RIGHT AUXILIARY TANK

Total capacity. 419 1 U.S. gallons (1586.5 liters)

Usable fuel: 412.1 U.S. gallons (1560.0 liters)

BASIC SYSTEM WITH BOTH AUXILIARY TANKS

Total capacity: 500.8 U.S. gallons (1895.7 Iners)

Usable tual 493.8 U.S. gallona (1869 2 literal

AUXILIARY FUEL LOADING TABLES

Fuel leading tables are presented for weight and helance competations in both English and Metric units. These tables shall be used in Ilau of the tables for the basic fuel system when cities or both auxiliary fuel table are installed. Weights and moments listed horse represent total first on board to include that contained in basic fuel cells. Refer to table 1-1 and 1-2 for English or 1-1M and 1-2M for Metric when both left and right auxiliary tenks are installed. Tables 1-3 and 1-4M for Metric apply to single auxiliary tank installed on lottede, and tables 1-5 and 1-6 for English or 1-5M and 1-5M Metric, apply to single witalliery tank installed on not side.

412 ROTORCHAFT MANUFACTURER'S DATA

BHT-412-FM9-17.2, 17.3 AMD 17.4

Table 1.1 Fuel Loading With Left and Right Ausiliary Tanks — Longitudinal (English)

	_		Longd	 ud=ul			
	8 or JP-4 (8 t	Lh US Gal	lon	Jan J	Al nrups je	H Lb % S G	Mknı
Diseasey JUS Gag	Weigh: (Pounds)	CG (Inghes)	Mameni In-Lb	Cognitor pu 6 ()=)	Weight (Pounds)	CG (Inches)	Momeni (in Lb)
10>	Nb .	1)84	9061	10	18	1)9 4	9479
20	פני	139 6	18148	20	134	119 8	14986
10 60	895 260	139 B 138 9	27261 38374	40 20	204 232	139 N 119 9	34519 13063
50	125	1155	45466	50	340	115 9	\$/56b
9 4 3	179	139 6	53023	·58.1	396	119 9	55400
60	190	191 1	55079	60	448	1611	5766R
70	400	140.5	64203	70	476	147.5	81258
BO	520	148 2 149 A	77064	80	644	142.7	80621
90	585		87693	90	612	149 8	9167A
100	азп	151 0	90150	*00	880	151 П	102460
110	510	153 1	109762	N10	749	163 [111771
1315	70 U	152.9	119268	*20	814	152.0	124766
130	448	153 7	122877	•30	004	153.7	135871
160	ain	154.3	146412	140	1020	154 J 164 B	144434
180	976 1040	120 H 135.3	187512	150 · 160	1083	199 7	167836 188 20 0
170	1146	155.0	172149	173	1154	155 0	180105
187	1170	1201	182637	180	1224	154 1	191086
190	1235	158 4	193154	100	1792	156.4	505049
700	1200	154 R	201840	100	1360	156 0	211248
2029	135 1	157.0	212107	2079	1416	153.0	721988
210	1148	156.6	211623	. 210	1471	156.5	223447
720	14.10	184.6	219648	720	1496	1536	279786
237	1495	15# 0	225745	290	1566	151.0	376164
740	1540	145 6	271816	240	1692	1488	247515
741 a	1567	149.7	237186	MID	1639	1483	7#3064
260	1675	140 0	241800	: 250	#70n	IERA	362960
860	1890	1453	782317	240	*78 #	145]	583385
770	1795	142 0	763899	270	4636	1454	275013
280	1830	(Ex > 2	\$15,00	290	1901	160.3	285901
290 300	1565 1950	15017	284070 284446	290 300	#972 20 4 0	1507	29 (190
.110	2016	151 I 161 6		. 300		1514	306244
320	2013 2080	1579	905273 41 595 2	. 340 . 320	210# 2176	151 9)20514
130	2145	152.2	374469	1 310	2244	152.2	301537
.140	2230	1626	337025	340	2312	1625	382540
950	2275	152.8	347620	350	5,182	152.8	36 3664
380	734C	153 1	758254) ×0	7441	153 1	374789
170	2405	K [4]	168567	320	2616	163 1	JR8701
374.5	24.10	153.4	973178	374.6	2647	1634	0.0710
380	247C	152 9	377663	340	2584	156.7	195714
OAT.	2635	I E T A	305067	390	3667	161.8	402939
400	280G	1510	992400	1 400	2720	1516	a10320
410	7845	150 1	400017	440	2706	150 1	418479
420	2210	109.2	402716	E311	7064	1493	476115
9269	21/2	146 /	412496	4264	1905	1467	4317111
430	2799	145 8	415536	410	2924	1483	495091
440	2860	149 1	42 6 476	; 440 150	2993 2060	149)	446107 467164
450 460	2925 2990	169 a 149 /	#36995 #478U3	44U	3060 3128	1457	9PR597
470	2356	inori	46A250	470	1196	1506	479400
400	31.00	150.2	468674	490)264	140.7	490251
490	2189	1505	475143	490	1135	1505	501480
483#	3210	1606	4R2426	i 493 A	3 168	1504	506795

^{&#}x27;Expert feet process for most forward og condumn-

NOTE: At data above represents total fuel on build (basic and aux4exy), based on numinal dunsity at 15 ℃

412 HOTORCHAPT WANUFACTURER'S DATA

BHT 412-FMS-17.2, 17.3 AND 17 4

Table 1-1M. Fool Loading With Left and Right Auxiliary Tanks — Longitudinal (Metric)

- —			Longo	Fpa/mapl					
	om Block High	U 779 kg · ko	81	Jer A, A1 or JP 5 (0 R15 Ag Tuer)					
Contracty	Weight	CC	Magnesi	Quantity	Weght	CG	Morres		
(irens)	, kgi	(acete)	iką amil	[[knecy]	rkg)	[mmi	Pig-mm		
40	31.2	3642	110500	1 40	12 G	3341	116437		
90	62 1	2547	220578	80	46.7	Va# /	231764		
120	37.6	3561	333019	120	47 A	3551	347786		
160	124.6	24.6.2	442579	166	110 B	1952	461.81		
200	. 99 .	1558	853402	200	1600	3556	5.749 (8		
220 T	171 9	3993	BICZAI	1 1270.7	1/9 5	J553	6.29183		
240	186.5	16.15	672.7A3	240	195 8	3636	71100		
280	215 1	1727	RIJAGO	280	228 2	3127	194501		
340	249.1	1761	941107	320	260 8	276)	186634		
)60	780 4	1825	107766	340	293 1	Just	1121871		
aup	2116	JA53	1200263	440	325.9	9852	1255367		
460	342.7	.1877	1328648	. 440	JAN G	3877	6.7899C4		
480	271.9	3894	145/462	480	391 (3839	P6345136		
520	404 (3915	1941987	520	4217	3915	1666788		
860	416.2	1930	1714266	260	454.7	3910	1/93255		
600	4474	254.3	.047450	500	458 9	3344	1925222		
690	1985	3555	1971566	640	5815	1966	2082433		
650	±29 B	3945	2098864	PAC	554.1	1984	2002533 2197007		
770	300 t	3674	33286-A	780	586 7	2974	2331446		
PAU	9920	3682	2367144	. 280	8193	1982	23313=0 2484C63		
ra z p	8155	1988	}ariges	1 787 0	HIA	1466			
100	623.1	J96h	V410099	1 800	651.0	3482	75576N4		
340	654.2	1887	7542875	BAC	fAa L	1795 J HB 7	2584786 2660367		
180	6RE 4	J817	781€172	REC	7.77	7907 3817			
9173	714-A	1786	2876073	9123	748 8	3788	2224789		
330	716.7	7770	3701969	920	749 \$	J750	7]99648		
960	(61.7	1785	2830045	1 960	787 2	3785	2559746		
1000	(18.9	1797	295 24R1	1000	3144	3797	2364827		
1060	H1C 0	1810	2086110	1040	8474		109779		
1000	B# 2	3023	D-6004			2610	3228534		
1180	B72 3	2022		1080	ano a	9655	1103360		
#16C	903.5	.1844	1343524	1120	9134	4871	3499146		
1700	9347	3652	24/3054	1160	965.7	3844	1633349		
1540	966 K		1002314	1200	A77 A	3134	376R441		
1280	947 0	5 864 5877	3731851	1240	1010 a	3844	J20419h		
1230	10281		3060384	12A0	1116.70	3872	403m49b		
1260	1059 2	3840	3989C76	1820	10000	3860	41.43758		
1400	1099 : 1099 (2487	411749B	1960	11081	1887	# AII 1745		
1887 6	.104.0	1496	424740A	1400	11407	1996	446)077		
1880		1897	aArt)Ak	1417.6	1195	1897	4501427		
1880	1716	1863	4268051	1446	1173 +	TAAJ	4555135		
	1152.7	3866	4684417	1480	1205 9	1000	484 5950		
1520	1183.9	1032	4524705	1520	123R S)03Z	4749933		
1560	1215 (909(4828770	1540	1271 1)0VB	4140748		
1400	1744 0	1)84	4774864	1800	13027	3784	4933201		
1614)	1267.3	3778	4747585	16141	13167	37TB	1964105		
1640	1222.3	J#81	442947)	1640	#336 1	1/57	E052650		
1480	1209.5	3765	4957907	1490	•J60 +	J785	5186762		
1776	13/9 /	3797	SAAGRAA	1220	##Q1 A	3797	4)21494		
1760	1370 8	7805	\$316AG4	1760	10967	3905	2420734		
1850	1892 0	26.1	53466/b	1800	1488.7	3911	5557527		
1840	14331	2690	Adimese	1940	1455 1	2620	5727326		
1865 7	1455 9	AB 76	5568818	1869.2	1623.3	3825	587647.1		

"Control fuel emercing for most licrospic tig condition

NOTE - All data above represents small likelion body disbasic and suxulary), havel on ruminal density at 15 °C.

412 KOTORGRAFT MANUFACTURER'S DATA

BMT-417-FMS-17 2, 17 3 AMD 17.4

Table 1-2 Fuel Loading With Left and Right Auxiliary Tanks — Leseral (English)

Luteral											
J.	8 er JP 4 (6.6	6 Lb+U B. Gall	lo e }	Jet 1	6, 61 (a JP 6)	6.8 le·V.6.0	∎Puni				
Cosemy	Weight	ca	Moment	واختذن	Weight	DG.	Mament				
IV 5 GP:	(Pounds)	Inches	i¶n-LE}	IV 8 Get	(Pounde)	(line*we)	(in 4b)				
10	**	•	۰	10	GB	a	۵				
20	190	2		20	636	0	0				
30	195	· ·	c	30	204	0					
◆ D	780	•	۰	40	>>>	V	c				
GD.	325	· ·		40	740	u	e				
86.3	379	3		10 3	197	a					
60	Cek	0.34	14	ea	408	0.04	- 14				
Žυ	465	0.34	-27	70-	475	-0.06	- 76				
μп	587	0.75	94	8.0	544	-0.06	21				
			*.	50	612	0.04	25				
9D 100	985 460	U (74 0 04	2 L	100	810	a D4	25				
110	716	-0 0A	21	110	744	-0 03	22				
120	780	0.0%	-23	120	816	-0 03	-24				
פרנ	845	u 03	75	120	844	-0.02	27				
140	310	-0 03	27	140	957	0.03	29				
150	175	0.02	20	160	1-026	0.02	20				
160	1040	-0 02	21	180	1034	0 02	22				
120	1106	a u 2	-22	100	1134	-0 02	-23				
180	1120	0 02	-23	180	1724	0.02	24				
190	1206	-0.02	26	190	1792	-0.02	26				
200	1 100	0.03	26	200	1360	0 02	27				
		0.01	-27	207.9	1414	-0 02	-2A				
20/9	1361			310	1638	-0.20	586				
2 4 4	1165	0.20									
220	1430	-0.43	172	550	1494	0.83	494				
710	1495	947	-878	290	1564	0.42	857				
140	1560	0 BD	780	240	1632	0.60	816				
360	1426	-0.60	113	250	1700	9 80	-880				
240	1420	C 48	· I I I	280	1788	0.45	-449				
220	1766	-0.46	·J07	270	1834	-C 46	446				
500	1070	0.46	31B	290	1904	C 46	-467				
290	1486	D-44	#2A	200	1973	C 44	968				
300	1990	0.44	9,19	3011	2040	-C 43	·#77				
3.0	2015	·041	526	910	\$178	-Ç #1	464				
120	2000	041	. 153	320	217t	5 41	292				
330	2746	-O 4D	150	190	7244	.g ≠p	-898				
340	2310	0.40	144	740	2312	C AD	725				
3611	27.76	640	. 51 🛭	350	2350	-C #0	352				
360	2140	-C JB		260	2441	·C 39	155				
370	2*06	0.84	71A	370	2618	6.38	-441				
360	7870	ro 36	E9.6	380	2594	-0.36	9 10				
350	7535	0.75	887	300	2663	0.36	928				
400	28400	-0.44	844	400	2720	934	926				
440	3165	-0.33	-179	410	2788	6.19	120				
440	27.10	031	145	420	2858	-0.31	- 165				
430	2786	-6.70	132	430	2974	0 10	-177				
#4II	2000	630	.850	. 440	2952	-0 10	- 808				
160	2926	0.54	-14н	450	3060	-0.29	167				
45 0	2990	0.29	847	460	3178	0.39	-907				
420	3096	0.28	5 54	470	1186	-6 JA	895				
480	3120	020	882	480	1264	2)7	581				
420	3120	-0.25	798	440	3882	÷ 26	273				
493 B	75.0	-O Zb	- 843	499.6	1466	0.26	- 840				

[&]quot;Creece fuet amount for most forward op condition

NOTE. All data above represents rotal feel on board (basic and auxiliary), based on nominal density at 15°C.

412 ROTORCHAFT MANUFACTURER'S DATA

BHT-412-FMS-17.2, 17 3 AND 17.4

Table 1-2M Fuel Loading With Left and Right Aurabary Tanks - Lateral (Matric)

			1,80	ė i gil			_	
	Jai Bar JP 4 (0 779 kg litert		ال ا	1 A, A 1 = JP (JP 5 (C 846 kg - han)		
Outside (Bland	step-tigene Jihrgen	e G	Mamera (kg-mm)	() a geordery abbligang (Weight INST	CG lister	Money Mg-ma	
40	31.2	D	0	40	47 E		<u> </u>	
50	62 3	2	0	an	85.2	٥	ā	
120	93.5	5	0	. 20	97 8		a	
1 e a	134 6	9	V	.20	1704		a	
700	155 A		V	200	163.0	c	٥	
220 7	171 W	^		2207	1764	c	0	
240	186 9	2	-174	240	1956	-2	241	
240	2 40 1	2	436	ZAD CAS	35F 5	2	456	
120	749.5	١.	749	223	260.6		2 ± 1	
4611	200 4		200	440	2517		29.7	
avv	311.6		313	400	924.9	1	326	
aoy	147 /		146	441	351 5	1	259	
appu	373.9	• !	374	484	35. 1	1	191	
520	406.)	1	ans	520	4237		424	
580	436.7	1	498	840	436.2	1	456	
600	462)	1	487	500	498 P		-486	
640	4947	1	.455	640	621 E	i	527	
ERO .	6296	-1	530	440	5501	i	-664	
720	560.9	i	8-8-5	220	586 F	i	581	
7412	892 0	i	092	200	8193	- i	1115	
7470	813 0	i	61.7	787 0	4412	- 1	641	
800	B2 1. I	- 5	3156	800	155. 5	š	1260	
840	854.7	P	5689	340	4844	ě.	-81BC	
880	845 4	11	75.19	380	7170	11	7827	
920	246.7	12	9317	920	749.9	11	-9747	
240	747.7	.16	9120	260	/42.2	11	10149	
4000	JJH V	12	-9247	*000	814.8	12	-9773	
FO4D	910.2	12	5720	1040	A47a	-12	10169	
LOAD	941 2	17	10094	1085	88×-U	.2	19660	
1120	872.1	1:	9695	1120	912 9	- 7	1.0042	
1167	903.1	- 1G	-9035	1164	945 2	·a	9162	
1200	9347	-10	934)	1849	9178	10	5778	
1240	985 3	- 10	-9668	1200	10164	-10	10.04	
1280	9974	-10	997>	1240	10430	10	10430	
1320	1028	10	10861	1320	1078.6	-10	10/58	
1380	1056.3		10553	1340	1104 1	-10		
1400	1090 a	10	10904	1400	1140 7	10	-14081	
1440	11716	ě	10034	1440	1170 4	_	-11407	
1490	1152.7	.9	10374	1480	1706 6	,	·\AR64 40063	
1520	118 1 9		2421	1520	12.18 4	. 6	9906	
1560	1786 U	ě	9720	1560	12/11	:	60169	
2800	1246.0	ě	936R	1800	1109 4			
164U	12//>	ı.i	10218	1640	13037		10430	
генп	1308 8	ï	10168	1881	1376)	2	106#0	
1720	1335 7	;	417H	1880			10551	
1750	1370	.,			##D1 #	,	9811	
IHUD	14020	.,	9996	1780	1434 1	4	10019	
1843	14020		2814	1800	14667	7	10247	
IRGE 7	1944 1 1946 4	5	-4595	1840	1464.3	.0	9646	
THUE /	- 0444	4	4775	1889.7	1827.7	•	9139	

'Critical fuel amount for most forward op condoing

NOTE: An date above represents total fool on board (basic and equil stat), based on represent demany at 15 °C.

412 ROTORCBAFT MANUFACTURER'S DATA

BHT-412-FM9-17.2, 17.3 AMD 17.4

Table 1-3 Feel Leading With Left Auxiliary Tank — Longitudina (English)

			Longil	udirel			
Je	1900 JP 4.60	; Lp. US G+1	aal	Jan 2	1, #1 or JP-6 -4	68UW/05 G	إسرائي
Outroip V 8 (up)	Weight (Pounds)	CO Universal	Moment (In Ltd	Outrary IU.S Gain	Weight (Pounds)	ec thu re nt	Mame vi Jin-Lbi
10	65	139.4	4061	10	48	139.4	9479
20	120	63B 4	10140	10	136	.36 6	18986
20	IAR	MAR R	77361	20	204	· 40 R	28519
41>	260	#3A W	1837a	43	779	199 *	70051
bG	эгь	•38 🕶	86468	₽ o	J#0	179 5	47564
75-5-1	319	*19 5	5 1022	-58.1	197	139.5	55540
80	390	441 1	55029	t0	448	141 1	57569
70	455	145 F	44339	70	478	745 8	GB#CI
90	630	14B 7	77324	₩	544	148.7	A0#93
90	Ces	P50 7	40160	20	442	150.7	98228
100	660	162 2	gaggb	165	640	163 1	10,3540
110	716	#69. 4	109874	110	74A	1536	114833
150	7 0 0	1647	120866	1341	2 B 6	15 4 F	178235
130	B+P	866 Y	1)#687	190	960	155 T	117819
140	910	1005	142415	140	152	186.5	140510
150	975	1572	153270	150	1020	1572	160344
180	*84 0	157 F	144112	180	1088	167 6	1711446
170	*1D\$	1584	175037	170	1756	1584	183110
133.9	F130	100 €	179219	173.9	1100	158 6	187674
180	#170	166.3	103764	180	1224	166.2	191138
100	1236	1681	189078	190	1442	163.1	197805
200	1300	160 1	1951 30	202	1)80	160 1	204138
7071	1946	1487	199477	2011	1208	. 48.5	770840
210	1365	148.4	202886	870	1428	. 484	211915
220	1430	149 2	5,3392	220	1496	145.2	223203
230 240	1495 1580	150 O 160 7	22425U 235092	230 240	1564 1632	160 O	2346CH 746747
240 280	1826	1614	235092 346025	250	1200	1014	267190
240	1680	1636	146000	750	1766	-630	
270	1766	1624	287013	270	1986	. 43.4	2687)6
220	1920	1631	518645	ino	1904	.511	2975G2
#90	1865	153 6	749939	290	1972	. 536	107859
300	1950	1540	100300	300	7040	1960	314740
308.8	2007	1544	100500	2014	5.00	104 4	37424D
310	2015	154.2	203001	310	2198	154 2	125044
340	2010	1530	318240	210	2178	153.0	1339JR
110	2145	161 4	.125611	310	2244	1612	1406.1R
240	7210	1607	103047	240	3313	169.7	148418
250	2276	1497)40668	250	3300	:497	198789
AND	23402	1484	144484	380	2448	1454	163773
380 7	2 113	1484	14Rep.	3607	2463	1989	1845 18
370	2405	1490	358345	370	2516	149 0	174884
380	7470	149 0	169517	380	2584	149 4	188566
340	2515	150 1	300504	120	2657	180 1	198046
400	2800	150 5	391300	400	2/20	1504	409360
110	2864	150 4	401892	410	2788	160.6	472430
412.1	2879	I NO S	400261	412 1	2AN2	1604	422333

[&]quot;Critical tool enfount for most forward og condition

NOTE - All data above ergemonic total field on bread these and assailance insend on nominal deserts of 15 C

412 AOTURGRAFI MANUFACTURER'S DATA

\$647-412-FMS 47.2, 17.3 4ND 17-4

Table 1-3M. Fuel Loading With Left Aux-liary Tank — Longitudinal (Metric)

	el 6 pr J > - 4 p	C 778 ha. lise	Ir.	Jei	4, 41 or JP-5	i (0 H 15 kg k	mr
_	Weight	ca	Moment	Canrole	Mary ht	CG.	Могра
OMAIA; Innie	·hy;	(perky	(44)-memi	lemal	they a	(mm)	(kg mr
31:		3542	120510	1 40 '	32.4	1541	1164)
86	62.3	3547	24/79 78	AD	65.2	754T	5,7154
120	915	3551	1320.4	179	97	3551	3472
150	124.6	3652	442579	160	1504	3557	44311
200	150 H	4567	5534G2	200	163 C	3652	3789
-220 7	1/19	964)	610761	.550 4	∗ 74 €	3563	6.1911
240	155.0	3635	679382	240	196 +	1636	21104
200	318 4	3 739	815476	280	228 2	1730	#5 321
020	249.1	3800	947346	280	280.6	7800	> ,∎0
760	283.4	3845	1078919	760	2933	1344	11/86
•00	311 4	7999	1211817	A30	125 9	3689	12674
440	1857	3923	1334412	aso	36 8 8	1521	14063
460	379.9	2246	1474187	' ано	24' 1	3944	15440
520	4050	3871	1806255	620	#717	397	16025
140	436.2	4001	1745236	660	454 J	400"	18256
600	4473	4006	1822004	900	469.9	4004	89885 .
640	490 5	8071	3034469	64D	527.5	4071	20963
F30 3	5125	#02T	2063636	G56 1	538 9	4027	21600
640>	129 6	3979	21741111	deb	554 1	9971	22014.
500	560 B	3186	21 (9269	120	6887	1885	22799
780	199 0	1102	2254928	260	619.3	2005	21585
784 C	¥10 €	3267	22960 16	784.0	638.4	3783	24037
800	1291	2272	7350113	200	P 1/1/4	3773	24005
000	894 2	2782	2461381	! eau	684 4	1793	11969
880	485 F	48.16	3614801	800	7170	3016	27363
92N	716 7	1210	3745858	520	709 E	1834	28747
96D	T477	9812	288N14A	960	782.2)863	201.10
1000	778 9	3844	3012726	1000	914.6)666	315#6
LUMO	41C G	3862	1104470	1440	447.4	1687	42246
1080	8412	3894	3277416	1090	1800	1976	94280
1.20	A77.7	1903	3409621	1120	9170	3407	75889
	4035	3919	2540817	1.14/1	645.7	1449	37042
1.60	4(4)	.1923	1469834	1164.9	962 5	1122	37357
7.68 9	9987	1495	2640857	1220	127 A	3195	38085
1200	9058	3862	2730084	1242	1010 4	1141	39034
1240		1697	3521501	1280	164) 0	2613	39979
1780	9970 102 8 1	1802	3P#1R21	1320	10/3 6	ANOS	40974
		1805 1778	4007076	1 1360	1108 /	3728	almini
1140	1059 3 146 2 5		4077076	1,365.4	1112.6	3775	42007
11+5 4		3775 3707	#1/494K	1402	11407	NTB'	48195
18/40	1020 4		4282080	1982	1172.4	3800	20505
1440	1921 6	300D		8487	1305.9	3612	45466
1480	1862 7	1812	4354092	1620	1238.5	3624	47783
1580 1580 0	12:60	3934 3934	452/234 4658310	15600	12710	3634	46733

[·] Carego: furé amount du reusé formété og connomn

NOTE - All date shows represents total field on board basic and qualifierer based on nomeral doctors at 15 C

412 ROTORCRAFT MANUFACTUREA'S DATA

BHT-412-FMS-17 2, 17 3 AND 17 4

Table 1-4 Foel Loading with Left Auxiliary Tank Lateral / English)

			Lai				
	es B on JP a 16	5 Lb U 9 1	Selun	T	Jan A A1 mi	JP-5 (B-8 Lb	·IJ % Galler
Quartity	Winghi	CG	Матна	Charmiela	Weight	CG	Morketii
U.S. Gair	[Pàunās]	-line nego	ı in-Lbi	ju.s Ge;	[Pnunds]	(Inrivat)	In Lb
)u	44	a	v	19	ы	u	u
20	130	ä	Ď	20	134	ű	å
30	196	9	ŏ	99	704	ű	ă
áň	660	ő	ű	40	272	ň	ñ
50	525	š	Ď	90	340	ä	ä
48 <	249	ō	ō	58.1	397	ā	ā
θÚ	340	-0.03	12	1 60	+24	000	- 42
žú	P35	-U 45	205	1 70	476	0.45	-214
80	520	45	-75+	80	644	1.45	789
911	555	2.75	1116	90	617	2.35	1277
100	650	2 97	וכפי	100	G∎C .	297	2020
110	T15	-155	2538	112	744	3 35	-2655
120	78 0	4 04	3+51	180	b14	404	J297
110	845	-4.65	1780	130	R14	4.45	2014
140	510	4 80	-4160	140	AS7	4.40	-4670
150	575	-110	4973	150	1036	6 10	-6202
140	1040	5.24	9554	160	1084	G 14	GB10
170	1105	-5.55	6433	170	1154	5 55	-6416
175.4	1140	2 /2	-6401	178-4	1193	h 79	-6907
180	1170	9.70	6469	180	1734	-6.70	-GR77
190	1735	-5.58	-6431	183	1297	-n sa	-7204
500	1300	-5 40	7070	700	1360	6.40	-7344
742.1	1346	5 27	74G1	7071	1428	f. 17	7491
210	1365	5.38	7344	215	1426	Fr 242	7681
220	1430	-5.55	-79.17	220	1494	-6.55	8331
5 30	1499	5.70	1522	230	1664	6 40	-8815
240	1544	-4 RS	9836	200	1632	5.89	9647
250	1875	-1 BZ	9201	260	(70)	6 47	PA 10s
740	1090	-6.10	10708	260	1766	6.10	#0765
270	1755	4 30	10981	27:1	1886	6.00	11861
240	1620	4.30	11466	360	1811	632	-11844
250	INES	-6 +0	12044	280	1972	646	12621
300	1950	6 47	-12617	.100	2040	6 47	13199
300 h	2007	-6 54	13136	308.8	2100	6 51	13734
סינ	2015	6.60	12/48	310	2108	6.4>	19700
120	2080	4.30	12104	320	2176	6 30	1)209
330	2145	4.10	-15:86	980	2244	6.10	1)688
340	2214	-4 A5	13160	Ján	2012	5 92	1875
350	2275	5.00	13195	.)60	2380	5 80	13804
340	2340	5 60	13104	360	2048	4.60	1)70#
16B 7	2345	5.60	13112	160 7	245;	2 60	1)737
270	2404	5 6R	1 (48))70	7878	6 65	14251
350	24.70	4.76	18203	Jeu	2584	5 15	14858
390	2614	5 85	18470	390	2652	5 85	15514
4611	2600	5 94	15844	avv	2160	5 74	1615)
430	2669	e 03	16070	410	2755	801	.14812
612.1	2619	A U.5	16154	4171	2802	601	- 14796

^{*} Distinct Net amount for most bitward by paragraph

NOTE: All data educe has exercis factal field on board those and sometary; based on numeral damaes at 15 C.

BHT-412-6MS-12-2, 12-3 AND 17-6

Table 1-4M Find Loading with Left Auxiliary Took | Lateral (Metric)

			Lau	P'B.	_			
	Jel B or JP 4	10 779 kg la	iei:		Jet A Al w JP 5 10 815 kg. lite-1			
Charley Hiles:	Weight eq:	EG Inel	Marson Mj. med	Questions (Intern)	Yenghi (kg)	CG Journal	Morran Out man	
40	20.7	,	c	. 40	92 -	n		
80	62.3	5	ò	1 80	65 2	n		
120	916	5	ŏ	120	47.0	ñ		
160>	124.6	5	ŏ	180	# JU #	0		
2092	155.8	ō	ě	200	16.70	0		
2201	Lora	ū	ě	. 2207	1)8 +	0		
200	186.9	-i	187	1 246	195 +	1	.15	
20 ·	218.5	71	-4580	280	256.5	-21	-475	
42.	249.1	.15	-1778	126	260.6	15	-312	
46-1	260.4	-67	18207	180	79) <	47	1265	
400	111 =	44	28474	400	525 4	14	2727	
460)42.7	99	33127	440	39.6.5	40	3549	
aeo	5789	130	41125	480	54' 1	110	43 02	
520	406.0	- 119	-48195	:20	4237	119	5542	
560	416.2	-178	55814	:40	455.3	122	5840	
HUÜ	167.3	135	63046	BCU	464.9	135	-6800	
640	198 B	140	69720	. 840	527.5	140	7301	
004.1	5:70	-147	75919	64# D	5410	147	7952	
680	124.6	145	-76752	840	558 1	145	-0034	
720	540 B	-147	79814	720	586.7	147	-8331	
700	642.0	-124	-61656	780	6#93	-LAR	-8546	
7×4 <1	610 %	-122	47404	784 0	6380	136	N621	
500	E2.3 T	137	15365	800	6519	127	-8401	
540	Ma2	141	-92742	P40	984 8	141	9660	
520	676 .	-145	. 20383	884	2170	-146	-10398	
920	716 7	160	107505	970	7493	-Lau	·))240	
940	747.7	-182	113850	960	762 2	10.3	-11009	
1000	778 A	166	170700	1000	HI44	- #46	12679	
1:181>	810 N	.00	117900	1040	30) .	144	13166	
1000	HE12	-61	135433	M080	#8U ^	161	.14160	
1120	8:2J	'n3	142165	1170	912 *	.163	14480	
1180	903.9	'66	146901	1160	105 2	• 160	15430	
1164.9	41-17	66	151093	1256.5	-4# S	166	15811	
19165	4 (4 7	162	151471	1200	977 B	123	- 15840	
1240	965.0	157	-151631	1740	1910 4	157	15863	
1285	9971>	152	157544	1280	102)::	163	1586.1	
N 96")	11129 1	-147	-151731	1320	1035 6	147	15611	
1960	1069 7	147	-150421	1360	11091	143	15725	
1)65 4	1063 4	142	·#51017	1265 4	11156	147	-15758	
141111	1090 &	144	8570°B	1490	11 MJ 7	144	15434	
1000	1171.6	146	463754	1440	117), a	144	-17121	
1480	11447	142	171752	1460	1205.9	146	17987	
1520	1738 W	151	-170783	1520	1238.5	161	10701	
1560	1715-0	161	165835	1560	12770	16.3	.13448	

Concel fiel amount immost forwarding condition

NOTE I did data shows represente inital fast on board (basic and autolise of based on normalal decays at 15 C

A12 ACTORCRAFT MANUFACTURER'S DATA

8MT-412-FMS-17 2, 17 3 AND 17 4

Table 1-5 Fuel Loading with Right Auxiliary Tank - Longitudinol (English)

			Long	naderal .			
1	et Blow JP # jt	5 to U.S. C	Selluni]	Jel A. A1 u	JP 6 +6 8 2 b	US QUIVE
Шивечну	Weight	66	Morsens	Datemy	Weight	co	Momuni
IUS Gali	[Puunds]	ilecheal	(Rel LB)	ID S Gail	(Pounds)	Herbital	IIr LD:
•0	47	13#4	#461	.,,	88	159 4	3474
20	110	139.6	13148	50	1)6	139.6	14986
70	199	1398	2,7261)u	200	13+8	23510
qu	740	1399	36174	41:	272	13+9	34063
50	325	1399	42798	50	3.00	1399	47566
198.3	379	1357	53022	.50 1	397	1999	44440
av	390	1411	55079	ac	MCH.	141 '	57564
40	455	1458	96179	70	E 15	1453	6#401
au	52 u	1487	(7)24	ac	544	145.7	#.49 3
9U	565	150 /	66.40	9C	612	1907	92228
100	854	152 1	98155	100	880	157 1	111,5564
110	715	153.6	109524	110	748	153.5	118899
120	780	154.7	120665	120	816	154 /	128235
134	645	155.7	131567	110	814	1557	1.579.59
144	910	1585	147415	140	952	1565	146366
150	575	157.2	153270	150	1020	15 7 2	163344
147	1740	1578	184117	180	1784	1573	171+A6
170	1105	1584	175012	170	1156	158 4	185110
1719	1130	1564	1792'0	173.3	1183	156.5	187624
180	1170	156.2	182754	180	1724	158.2	. 91 189
150	1235	1631	189079	190	1792	153 1	197805
200	1300	150 1	195130	700	1380	150.1	204136
7071	1346	1487	199477	2071	1408	1482	/UB686
310	1365	1494	207546	210	1428	1484	211585
220	1436	149 2	210356	220	1498	145.2	273207
230	1499	1500	224350	i 2300	1584	.20.0	2J4600
740	1560	150.7	235392	740	1633	.50 r	245547
150	1635	1514	24G33K	750	1700	1514	25 (384
784	1490	1620	28688G	260	176B	1570	788716
270	1755	P52 4	367813	270	1836	*57.6	280174
280	1090	153 1	378 8 43	280	1904	153.1	291502
290	IUb>	153.4	JARLIE	. 29n	1972	153.6	202899
300	1950	1540	100300	l aon	78 4 0	1500	J1416U
304 8	2007	854 4	JOSES A	' JOR E	2100	154 4	324240
310	2016	656 Z	110713	· 210	210B	154 2	125054
320	20B0	463.0	118246	250	2176	1530	7 1797 1
310	2145	MG I R	126611	280	2744	151 P	34083)
340	2210	#60.2))3047	340	2012	450 T	348414
250	2276	144 2	340548	350	JJAN	149 5	350200
яво	7J 6 0	148 4	347724	360	2049	148 6	365773
3607	2346	1486	149461)60.7	2444	148 6	364516
370	7405	94A ()	398345	37 0	2616	149.5	374EM
280	9470	149 6	Je9412	jen	JAAM	149.6	3466-6-6
390	2636	160 1	100944	ääu	2662	150	108084
400	76110	460 E	381360	400	2720	150.5	409380
410	7665	160 R	401962	ain	37AR	150 8	428430
412.1	2679	#40.9	400265	412.1	2802	150.9	422872

^{*} Enside find amount for most forward op condustr

NOTE - All gagg above represents total line on board theatr and available, hasen on removal decipes at 15 C

412 ROTORCHAFT MANUFACTURER'S DATA

BMT-412-FMS-17.2 17 3 AND 17 4

Table 1-5M Fuel Loading with Right Auxiliary Tank Langetedmai (Metric)

	Jm B nr JP.4	1:0 779 kg-1	ilui i	T	Jei A. Al	ni JP:6 (D-61	l 4 kg/liter;
Quentray	Verang®-1	C.G.	Morrout	Clumminy	Weight	ca	Моте
Ouerai	INGI		164	[Insert]	ıkyl	(mm)	IÞg-ma
40	313	3642	110510	30	17 8	3541	11543
BC	63 1	3642	\$3009.7B	aŭ	45.7	1547	23126
120	93.4	Jh61	932019	120	97.6	1551	3472
180	124.6	3652	442579	180	130 4	1957	4631
200	166.9	3552	453402	200	163.0	1957	6799
23C 7	171.9	944)	610781	1220 7	179.5	1553	6191
240	186.9	3639	679182	240	105 B	1635	7110
75C	218 9	a739	815476	280	228 2	1739	8 532
320	247 3	9000	947140	140	240 P	3000	9910
340	280 a	4643	11174979	140	2933	JM4R	11726
400	211.6	9696	1211917	400	328 9	2009	12674
440	342.2	3923	1344412	440	350 5	1923	1406.3
41C	2219	3488	1416151	480	3911	3946	154400
540	405 u	99 18	1604255	520	437.7	3971	14126
360	435.2	400	1745238	560	455 1	4001	18766
400	4473	4006	1872004	800	480.9	4006	19584
440	E-98 5	4021	7004489	440	521 5	4021	2u9da
850 3	6165	4027	2061838	455 3	5364	4027	21404
400	629 6	3973	2104101	980	554 1	1973	22014
720	540 8	3556	2171259	720	5967	JARG	2279B
760	592.0	3409	7734971	750	6193	JANE	236AA
784 N	6111 4	3167	2294935	7840	6304	.1763	243.10
### I	62) (97/2	2350333	800	0514	3772	2458A
340	634 2	3793	244 (381	■4D	GR44	2793	25959
JAO	689.4	3825	7814801	880	7170	3816	22159
920	716 /	3834	7747878	920	7404	1696	28747
960	7477	3152	2840140	960	782 2	3861	30130
1000	778.9	3148	3012785	1000	9183	38 4 K	414 #6
11340	810 U	3132	3144420	1040	HELD	3082	32996
1000	84. 5	3198	3277315	CARE	880 u	3896	34 284
1120	672 9	3909	3409821	1125	9124	3905	35685
1860	5015	3119	2540917	1160	RAE 7	3914	Linas
1868 *	5007	3127	3560004	l blaka	RE26	3922	17)67
1200	14 7	3125	364065)	1700	8728	3895	38086
1240	386 8	3183	3730 86 5	1 1740	10104	3863	39081
1280	300 D	3433	3821501	1 1780	10430	3845	79081 19978
1120	10781	3305	3611931	833C	1075 8	30°15	40426
1360	1059.3	3770	400ZD35	1260	11/48 r	3723	4186
1366	10675	1775	4014713	1361 4		37.75	
1400	1040 4	3767	4120340	benc .	1112 8	9787	42000
1940	1121 8	3800	43670MC	1410	1140) 1173 4		43198
1400	1152.7	3217	4394023	balks	1205.9	3800 3817	44689
1520	11879	1924	4527234	9626	12556	9817 9874	45968! 47360,
15600	12150	1424	4460310	15600	12210		487901
.9000	12150	1014	4400310	111000	17710	39.00	46,490.

¹ Cultof fail amount for most largeard on randition

NOTE - As Gold Study - Orderends lotal feel on board (basic and example), based on nominal density at 1510.

412 ROTORCHAFT MANUFACTURER 5 DATA

BHT-412-FMS-17.2, 17.3 AND 17.4

Fable 1.6 Fuel Loading with Pight Auxiliary Tank — Lateral (English)

			Let	eral						
١	<u>ul 8 or JP.4 (€</u>	i.5 kb 'U \$. 0	ellor(JVI A. A1 or JP-5 [6 8 L6 10 S. 4						
Duencing U.S. Bet	Weight Pounds	CG -Inches-	Mameni (in-Lb)	Quantity ID S. Cark	Weights (Pounds)	Et) (Inc t a n)	Moment			
2 2 2 2	1. 5-24-32.	-11244	lun-en1	10.5.007	(700-01	/me-au	- Invest			
10	85	a	0	٠, ا	68	0	0			
20	130	ä	ě	20	136	Ď	ň			
סני	195	ä	è	100	204	å				
ap	260	ă	ò	40	272	ű	Ü			
50	375	ō	ŏ	30	340	ũ	ŏ			
50 3	379	ā	ö	70.3	397	_	á			
80	390	C 03	-17	40	400	-0.03	, ii			
70	455	0.34	199	70	478	0.34	162			
80	920	1 30	вте	10	344	1.30	701			
90	583	2 27	1299	90	417	J 22	1355			
100	G50	2 90	babs.	100	480	3 30	1972			
110	716	3 4R	3400	110	748	3.48	2501			
120	780	1 26	3091	130	916	3 96	3223			
130	Res	4 43	3743	130	204	4 43	3914			
140	810	4.77	4286	140	962	4 21	4484			
150	978	5.00	4875	150	1020	5 CR	5100			
160	1040	6 JR	6491	140	IOGR	F JR	6745			
170	1205	\$ 60	4079	120	1166	6 S G	#JBE			
173 6	1830	8.60	4.12B	173.9	1183	5.00	4025			
180	1870	5 16	4036	180	1220	6.16	4304			
180	1286	4.78	5842	130	1292	≜ 73	6111			
200	1300	4 36	586R	2/85	1340	4.16	5930			
207.1	1)46	1.2	5546	207.1	1408	6 12	5801			
310	1,566	1 20	5788	210	1428	≜ 20-	4988			
220	1430	E 46	4164	820	1896	446	4867			
23ŏ	1495	1 4à	4922	230	1564	467	7241			
740	1560	1 31	7604	240	1632	481	2860			
250	1826	1 00	£126	250	1700	6.00	#5 00			
260	1890	3 17	2070	200	1 198	51)	9070			
270	1755	5 28	5/88	210	1816	5 78	9898			
100	1820	540	5428	280	1904	5 W	10292			
290	1885	5 60	10666	250	1972	6 60	11043			
300	1950	3 63	11018	930	2040	2 52	11526			
300 6	2007	5.74	17520	938.6	7120	5 T#	12094			
300	2016	5 /2	11526	310	2198	b 72	17098			
320	2C#0	5 93	11502	370	2176	153	12019			
310	2145	5 14	11457	330	2214	1 36	12028			
340	3310	5 70	11492	340	7312	5 70	12027			
390	2275	8.06	11482	350	2310	0.05	150.0			
360	2340	+ 15	11543	360	2448	4.93	151.8			
340 7	1145	4 92	11537	3607	2453	4.92	12049			
370	1405	604	12049	370	2516	5 D1	17808			
340	2470	6 10	12597	380	7584	B 10	13178			
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Control to all personni for report forward by condition

NOTE - All data above represents total Analism board (basic and auxiliary), based on normal density at 15°C.

BHT-412-FM6 17.2, 17.9 AND 17-4

Table 1-6M. Fuel Loading with Right Auxiliary Tank — Lateral (Metho).

			Lai	<u> </u>	_					
	Jet 8 01 JP 4	10 779 kg (i	ler)	Jet A. All or JP 5 (0 815 kg - Item						
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) 20	936	0	ó	126	97.8	ò	ó			
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200	156.3	0		200	163.0	U	Ú			
2207	1719	0	U	220.7	1759	Ö	Ú			
240	Paal	-1	-187	280	195 8	1	196			
2an	21A 1	16	3926	280	228.2	18	4106			
37N	349 1	*4	10949	920	260.8	44	1147			
JGD	JAN 4	66	18506	960	293.7	8.6	19356			
400	3114	82	26551	400	325.7	87	28724			
440	3027	97	89202	440	358.5	97	14 177			
480	3799	108	40.581	480	391 .	108	4223			
650	405.2	#1 B	47730	520	423.7	118	4979			
560	436 z	#26	54561	580	458.1	178	57+94			
800	467)	199	62151	800	488.0	133	65024			
040	498)	199	69252	840	521 5	135	72480			
698)	5765	147	72775	658.0	5365	145	78183			
680	929 6	191	69378	880	554	131	72887			
720	660 a	120	67238	720	BRB 7	170	70404			
760	582 a	110	65120	780	519.3	110	68163			
784.0	610 .	105	64052	784 0	936 9	105	67053			
800	625.1	107	66832	800	651.9	107	69753			
840	664 2	174	74579	540	884.4	114	78032			
990	685.4	115	81543	880	717.0	119	85353			
630	216.2	174	88871	920	7498	174	22976			
86V	1411	126	95708	980	782.2	120	160122			
.000	7789	192	107675	1000	8148	132	407554			
1040	4124	196	110140	1240	8474	136	115246			
.000	gar ¿	Leb	117748	1780	880 C	1 + D	123700			
1120	HJZ J	142	123847	1170	917.9	142	*29832			
1160	903.5	145	191008	1180	246.2	145	437054			
11689	910 2	148	137443	1184.9	958.5	146	139065			
1200	934 /	142	132727	1200	277.6	142	13014			
1240	985 4	137	1353.0	1240	10104	127	6.784.78			
1280	997 a	133	137401	1280	1043.0	132	1.18758			
1920	.056 .	125	107825	1320	1075 6	129	139752			
1360	1059.1	128	133472	1380	11201	126	139631			
1 165 4	1083.5	125	137738	1345.4	11116	128	1,39075			
1400	1095.4	127	138431	1400	11407	127	144M2			
1040	1121 4	130	145400	1440	1172.4	130	162642			
1480	1152 7	132	187756	1410	1736 Я	132	168179			
1820	11833	135	189827	ISSC	1228.5	126	FG7160			
1680	1215.0	131	187670	1560	127:0	138	978366			

Cotton fool amount for most forward og condition.

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412 ROTORCRAFT MANUFACTURER'S DATA

BHT-412-FMS-17 2, 17 3 AND 17 4

LOADING EXAMPLES

The CG examples shown below apply only to hallcopters with standard sealing which are aquipped with both tanks of the \$12.706 007 Austary Fuel Kd. The loadings are based on standard 170 pound people for both crew and passengers.

At empty weights below 7400 pounds there are no restrictions on passenger or fuel loadings oxcopt as imposed by the gross weight CG limits of the helicopter.

With helicopter weights at or above 7400 polaris the following procedure should be applied:

Ballast the hall-copies to the most sit weight amply line. When flying with 2 crow members and 9 pessengers add weight in the baggage compartment as required to maintain C.G. within the forward florits.

Ekantylleg.

With a ballasted weight empty of 7500 pounds, 20 pounds is required in the baggage comparisons.

Wish a ballatied weight enemy of 7700 pounds, 40 pounds is required in the baggage compariment

WARNING

BAGGAGE COMPARTMENT WEIGHT MUST BE REMOVED FOR SINGLE PILOT OPERATION



ROTORCRAFT FLIGHT MANUAL

33108 - 33213 36001 - 36019 AND 33214 - 33999 36020 AND SUB

SUPPLEMENT FOR LOUDHAILER OPERATIONS

412-899-143

CERTIFIED NOVEMBER 17, 1983

This supplement shall be expected to the Model 412 Flight Monagi (BHT-412-FM-2 or -3) when the 412-899-143 Localitation has been installed.

The information contained herein supplements the information of the basic Flight Manual. For Limitations. Procedures, and Performance Core not consolned in this supplement, consult the basic Flight Manual.

Bell Helicopter 1331(19)

AGST STEAM BOW INTO MARK HORSE STEAM OF

17 NOVEMBER 1983

REISSUED - 8 OCTOBER 1991

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NOTE

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INTRODUCTION

The Loudheiler, when installed, will permit the helicopter craw to direct ground personnal while remaining shiborite. The kin contains a speaker assembly, smplifler, switches, and the necessary hardwares to complete the installation. Use of Loudheiler is controlled through pilot or copilot control panel. Optional configurations allow use of a semote (hand held) microphone and/or a tape recorder.

LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined ofter Loughster is installed and balless reactioned if recessary to return amply weight CG within allowable limits.

OPERATING LIMITATIONS

IFR operation is prohibited with Loudhailer installed.

NORMAL PROCEDURES

BEFORE EXTERIOR CHECK

PA SYSTEM PAIR (which - OFF.

EXTERIOR CHECK

FUSELAGE

Fugalege underside — Check security and wiring connections of Laudholler.

LOUDHAILER OPERATION

WARNING

USE EXTREME CARE DURING GROUND OPERATION OF LOUDHAILER TO PREVENT INJURY TO PERSONNEL GROUND SUPPORT PERSONNEL IN VICALITY OF HELICOPTER SHOULD WEAR PROTECTIVE HEARING DEVICES.

PA circuit breakers — Check et.

SIREMIMOM switch - OFF.

TRILLIMOM switch - OFF

PA SYSTEM GAIN control switch - OFF

NOTE

OFF position is the minimum gain present of the remote emplifier located in the beggage compenies.

PA SYSTEM PWR switch - PWR.

Rotate commol switch on communications control penels to HAIL/AUX.

PA mode select - As desired.

PA SYSTEM PWR switch - OFF, when toudhaller operation is completed.

EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

No change from basic manual.



ROTORCRAFT FLIGHT MANUAL

33108 -- 33213 36001 -- 36019 AND 36020 -- 36086 AND 36087 AND SUB

SUPPLEMENT FOR SOFT INTERIOR

412-705-510

CERTIFIED 28 MARCH 1985

This supplement shall be attached to the Model #12 Flight Manual (BHT-412-FM+2, or -3) or Model #12EP Flight Manual (BHT-412-FM+4) when the #12-706-510 Soft interior has been installed.

The Information contained havin engalements the information of the legal: Flught Mismouth For Limitetions, Procedures, and Performance Owls and contained in this supplement, consult the basic Flught Marquet.

Bell Helicopter TXTRON

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REISSUE - 5 OCTOBER 1994

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INTRODUCTION

The soft interior, when installed, will parmit the halicenter to be flown with doors offrogen with an aircread limitation of 100 KAS.

LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after \$60 interior is installed and ballast readjusted if were usery to return empty weight CG within allowable faults.

DODAS OPEN OR REMÓVED

Remove both sees backs from outboard latting seate on each cide of stansmission pylon.

Flight operation is approved for the following alternative configurations during VFR conditions only

- Body plaw doors removed
- Both aliding doors locked open or removed with lasth hinsted genets installed or removed

In all cases, door configuration shall be symmetrical for both sides of the fuselage.

NOTE

Opening or removing doors whills halcootes center of gravity and reduces Vive Refer to Weight and Batance section in Manufacturer's Data and to Airapeed Linecations

AIRSPEED LIMITATIONS

Vice with decre open or removed is 100 KIAS



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR WEATHER RADAR KIT

412-899-107

CERTIFIED
16 JUNE 1986

This supplement shall be attached to the Model 412 Flight Manual (BHT-412-FM-1, -2 or -3) or Model 4125P Flight Manual (BHT-412-FM-4) when the 412-899-107 Weather Radar kit has been installed.

The Information contained herein supplements the information of the basic Flight Manuel. For Limitations, Protedures, and Performance Data not contained in this supplement consult the basic Flight Manual.

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MANAGER

ROTORCRÁFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76193-0110

INTRODUCTION

The primary purpose of the system is to detect storms along the Rigid path and give a visual indication in colors, of their intensity so a determination to avoid the storm can be made. The sociondary purpose of the system is to interrogate and locate the surface-based transponder beacons. The system can be operated in one of three modes; rater, beacon, or both. In BOTH mode, the system performs both radar (weather or terrain) detection and beacon location simultaneously.

Section 1

LIMITATIONS

Contents of this supplement shall be used in conjunction with basic Flight Manual and Sperry-RCA Primus 500 Cotor Radar Prior Handbook, for holicopters equipped with Weather Radar kit.

OPERATING LIMITATIONS

The minimum stant and horizontel range versus stilltude at which ground largets can be mapped to shown in Figure 1.

Targals more than nineteen degrees (meximum depression) below helicopter centerline cannot be illuminated because of antenna tilt (imitations (Figure 1).

Objects closer than 3/10 mile from radar antenna will not be detected because of system limitations.

The rader beam emitted is approximately seven and one-half degrees wide. The antenna may be raised or depressed lifteen degrees from helicopter contentine.

GROUND OPERATION

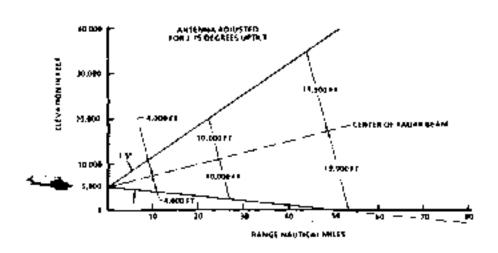
Radar system shall not be operated on ground when personnel are in the DANGER AREA (Figure 2).

Radar system shall not be operated within 100feet of any hieting operation

Radar system shall not be operated on ground anytime a large metallic object is forwerd of belicopter nose, within 60 degrees of centerime, and at a distance of tess than 100 feet.

WEIGHT/CG LIMITATIONS

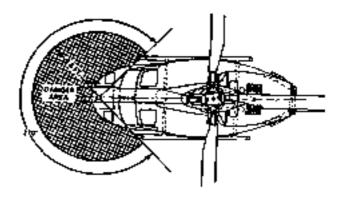
Actual weight change shall be determined after his is installed and ballast added it necessary, to return empty weight CG within allowable limits.



12 4 APR 21 APR

Figure 1. Redar Beam (Mumination)

FAA APPROVED BHT-412-FM5-20



er' left in time ar} all in.

Figure Z. Personnel Danger Area

Section 2

NORMAL PROCEDURES

PREFLIGHT CHECK

1. NOSE AREA

Radome — Condition and cleantiness.

Antenna — Freedom of movement and security.

INTERIOR CHECK

INSTRUMENT PANEL

Radar OFF pushbutton - Depress.

RAD GAIN control - PRESET.

9CN GAIN control - PRESET.

Mode control selector switch — RAD.

RANGE control — TEST.

TILT control — + 15 degrees.

(NT control — Midpoint.

BEFORE TAKEOFF CHECK

WARMING

DO NOT ALLOW PERSONNEL WITHIN 8 FEET AND 135 DEGREES EITHER SADE OF THE HELICOPTER CENTERLINE DURING RADAR OPERATION (WX, CYC OR MAP PUSHBUTTONS DEPRESSED).

DO NOT OPERATE THE RADAR DURING REFUELING OPERATIONS OR WITHIN 100 FEET OF AIRCRAFT, YEHICLES, OR CONTAINERS CONTAINING FLAMMABLES OR EXPLOSIVES (WX, CYC OR MAP PUSHBUTTONS DEPRESSED).



DO NOT OPERATE THE RADAR IN THE DIRECTION OF LARGE METALLIC OBJECTS THAT ARE WITHIN 10D FEET OF THE HELICOPTER (WX, CYC OR MAP PUSHRUTTONS DEPRESSED).

NOTE

120 degrees ecan is automatically selected when system is activated.

Radar poshbutton — Depress WX

NOTE

Rader requires approximately 60 seconds to warm-up.

SEC SCAN pushbutton — Press, check for 60 degrees antenna scan. Press SEC SCAN again, antenna should return to 120 degrees antenna scan.

Redar STBY postsbutton — Depress.

INFLIGHT OPERATION



THE SYSTEM PERFORMS ONLY THE FUNCTIONS OF WEATHER DETECTION, GROUND MAPPING, OR SEACON LOCATION, IT SHOULD NOT BE USED OR RELIED UPON FOR PROXIMITY OR ANTI-COLLISION WARNING.

Radar pushbutton — Depress WX, CYC or MAP. (Verify correct test patient.)

INT control — As desired.

RANGE control — As desired.

TILT control - As desired.

SEC SCAN - As desired.

BEFORE LANDING

Radar RANGE control — TEST (Verify correct test pattern)

TILT control - + 15 degrees.

DFF pushbutton -- Depress.

Section 3

EMERGENCYIMALFUNCTION PROCEDURES

MODE FAILURE

Indication

Test display does not match test pattern.

Procedure:

OFF pushbutton — Depress.

POWER FAILURE

Indication:

No display on Indicator.

Procedura:

 WEATHER ROR AC/DC sincuit breakers — Check in.

- INT control Rotate clockwise.
- WX, CYC or MAP pushbutton Depress.

DISPLAY DOES NOT STABILIZE

Indications:

- Display follows changes in helicopter stritude.
- STAB OFF light illuminated.

Procedures:

- CPLT ATT circuit breaker Check in.
- STAB pushburton Depress.

Section 4

PERFORMANCE DATA

No change from basic manual.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR GLOBAL NAVIGATION SYSTEM GNS-500A/S3. WITH NAV SWITCHING

(412-899-141)

CERTIFIED

This supplement shall be attached to the Model 412 Flight Manual when the 412 899-141 Global Novigotion System GNS-5004/53 has been inclaimed.

The information contained havely expetitivents the information of the basic Flight Manual. For Limitations, Procedures, and Performance Date not contained in this supplement consult the basic Flight Marcon.

Bell Helicopter 13/11/01

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16 JUNE 1986

REISSUED 6 MAY 1989

412 ROTORCRAFT FLIGHT MANUAL

FAA APPROVED SUPPLEMENT

8HT-412-FMS-21

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BHT-412-FMS-21

INTRODUCTION

The GNS 500A/\$3 is a very low frequency VLF-OMEGA radio navigation system that provides great circle point to point navigation on a worldwide basis. It also displays to the flight craw on assessment of its ability to navigate and will automatically revert to dead rackoning during periods of wadequate signal reception.

The GNS-500A/S3 consists of a control display unit (CDL) mounted on the padestal, a computer receiver unit (CRU) and an optional equipment unit (OEU) located in the right switches comparence.

A NAV-1/VLF switch is tocated on the pilot instrument panel next to the HSI. It is a combined on 2 position pushbuston and annunctator. Pressing the pushbuston will couple the HSI to the NAV-1 receiver or GNS-500A/S3. The NAV-1 or VLF ennunctator light will fluminate to identify the coupled mode. BRQ PTR select ewitches are located on both the pilot end copilot instrument panels and allows selection of VLF or ADF bearing to be displayed on the pilot or copilot HSI.

BHT.417.EM5.21

Section 1

LIMITATIONS

OPERATIONAL LIMITATIONS

The following GNS Operators Manual must be immediately available to the fight craw whenever navigation is predicated on the use of the GNS-SOGA/63.

- Operator's manual Report 1080 detect 9-1-80. For the -3A Program and CRT/CDU.
- Operator's Marsual Report 1080 dated 1-19-81 for the -38 Program and CRT/CDU.

Provided the GNS-500A VLF/Omage navigation system is receiving usable signals from all least two Omage ravigation stations, it is approved for

- VLF/IFR RNAV operation within the common boundance of the Unried States and Alaska in accordance with the EN ROUTE critical of AC 90-45A or the critical AC 20-1018
- Operation as a means to update self-contelled newlgation systems, such as MS or Doppler, in accordance with AC 120-31A in the orgas between Latitudes 85°M to 66°S, with the exception of the area above 45°M Latitude bounded by Longitudes 30°E and 120°M extending across the Asion Continent

Operation as sole means of long range navigation in accordance with AC 120 37 in the areas between Latitudes 85°N to 55°S, with the acception of the area above 45°N Latitude bounded by Longitudes 30°E and 120°E extending ecross the Asian Continent.

During RNAV operation of the GNS 500A/S3, additional navigation equipment required for the specific type of operation must be installed and specable.

The GNS 500ArS3 position information must be checked for accuracy freesonableness) prior to use an ameans of nevergation and under the following conditions.

- Prior to each compulsory reporting point during IFR operation when not under radar numeritance or control.
- At or plice to shirel at each enroute waypoint during IFR operation along approved ANAV loubs.
- Prior to requesting off-airway routing, and at hourly inservols thereaster during RNAV operation of all approved RNAV routes.

During period of Dead Rectioning, navigation shall not be predicated on the use of the GNS-500A/S3. for RNAV operation

Following a period of Dead Reckoning, the helicopter position should be verified by visually sighting ground reference points and/or by using other nevigation equipment such as VOR, DME, Tecan, NDB, or rader fly.

The GNS-500A)S3 may not be used for navigation in terminal areas or during department from, or approaches, to, airports.

Use or disclasure of data contained on this page is subject to the restriction on the title page of the day, page;

BHT-412-FMS-21

OPERATIONAL LIMITATIONS (Cont)

Enroute ravigation shall not be predicated on the GNS-500A/S3 during the period that DR is foundated.

Section 2

NORMAL PROCEDURES

PREFLIGHT CHECK

EXTERIOR CHECK

ENGINE AREA, AFT COMPARTMENTS AND TAILBOOM, RIGHT SIDE

Avionic compartment - Check

CAU and QEU - Condition and security.

MOTE

Refer to GNS Operators Manual Inc. systems checks and operation.

BEFORE TAKEOFF

NAV-10/UF swetch — As desired.

NOTE

When the HEI is coupled to the VLF, the course set knot is disabled.

BRG PTR 1 switches — As desired.

NOTE

Selecting NAV 1, or NAV 2 will connect basing pointer 1 to either the NAV 1 or NAV 2 receiver respectively.

BRG PTR 2 switches - As desired.

MOTE

Salecting VLF or ADF will connect hearing pointer 2 to either the VLF or ADF receiver respectively.

BHT-412-FM5-21



EMERGENLY AND MALFUNCTION PROCEDURES

GNS-500A/\$3 MALFUNCTIONS

NOTE

Refer to GMS Operators Manual for system malfunction indications and procedures

Warning flags

FAIL FLAG	FLAG LOCATION	FAULT CONDITION	CORRECTIVE ACTION
Navigation	HŞI	Naniganion information unreliable.	NAV-17VLF switch — Préss to change navigation modes.



PERFORMANCE DATA

No Change

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ROTORCRAFT FLIGHT MANUAL

BHT 33108 — 33213 AND 36001 - 38019

SUPPLEMENT FOR CATEGORY A OPERATIONS FOR HELICOPTERS EQUIPPED WITH PT6T-3B OR PT6T-3BF ENGINES

VERTICAL TAKEOFF

CERTIFIED 6 JUNE 1986

This supplement shall be attached to Model 417 Flight Manual (BMT-412-FM-2) when operating in Category A conditions and PT6T-3B or PT6T-3BF engines are installed.

The information contained herein supplements information of the basic Flight Manual. For limitations, Procedures, and Parformance Data not contained in this supplement, consult the basic Flight Monual or other applicable supplements.

Bell Helicopter HEXTRON

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6 JUNE 1986

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ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION

FT. WORTH, TX 76193-0170

BR-412-FMS-22 Z

INTRODUCTION

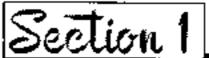
A "Pategory A" takeoff is defined as follows: operation of the helicopter in such a manner that if one engine fails at any time after the start of a takeoff, the helicopter can.

- 1. Return to, and safely stop on, the takenif area; or
- Continue the takeoff, climb out, and attain single engine forward flight.

A "Category A" landing is defined as follows: Operation of the helicopter in such a manner that if one engine fails at any point in the approach, the helicopter can —

- Land, and stop safely on the intended landing area; or
- Climb out from the point of follore and attain single engine forward flight.

This supplement is divided into limitations, procedures, and performance for a given set of conditions.



OPERATING LIMITATIONS

ATTENTION

Manufactory compliance with the operatory havitations in Section 1 of this Manual is required by law.

WEIGHT LIMITATIONS

Maximum Gross Weight 10,500 Pounds (4752 7 Kilograms)

TAKEOFF AND LANDING WEIGHT VS ALTITUDE LIMITATIONS

Maximum Takeoff and Landing Weight - Varies with temperature and altitude - See Gross Weight Limits for Takeoff and Landing Chart.

MOTE.

The minimum heliport watch and length are 72 (set 122 motors) and 150 feet (46 meters) respectively for Category "A" vertical operations from ground level or a levated heliports.

ALTITUDE LIMIT FOR TAKE-OFF AND LANDING

The attitude limit for takeoff and landing is 2500 feet pressure abstude.

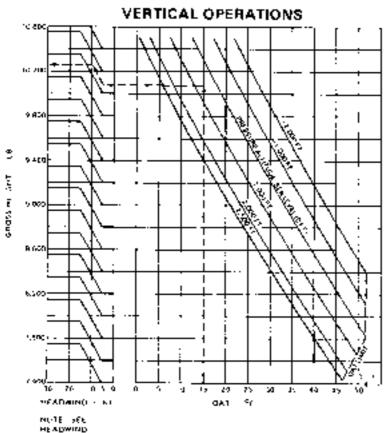
ALTIMÉTER (VERTICAL T. O. ALTIMÉTER)

For vertical takendi procedures the Vertical taxeoff altometer must be set, 10096 N2, RPM-flat pitch, doors and windows closed, hearer and went oill.

NOTE

Imors and windows terroin classed heater off, vent off this is COP is reached. Thus is required to prevent possible chors in the Vertical takeoff altigrates.

BHT-412-FMS 22 2



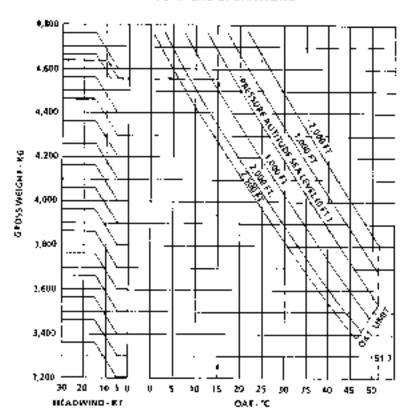
I HABET SECTION &

GROSS WEIGHT LIMITS FOR TAKEOFF AND LANDING (ENGLISH)

Section 1

8mT-412-FMS-22-2

VERDICAL OPERATIONS



NOTE SEE HEADWIND COMPONENT CHART, SECTION 4

GROSS WEIGHT LIMITS FOR TAKEOFF AND LANDING (METRIC)

412099-13

BHT-#12-FMS-22 2



No change to basic envelope. For takeoff and landing purapeed refer to Performance Section

AMBIENT AIR TEMPERATURE — OPERATING LIMITATIONS

See Performance Section in this Supplement.

CROSSWIND LIMITATIONS

The mose worst break is that regularizing of wind a kerty and direction where the creas what component exceeds 15 knots. Refer to "Hearleight Component Charts in Section 4.

TYPE OF OPERATION

Category A operation is approved for day/night VMC, non-iting conditions. Night tukeuff and landing may be accomplished with adequate lighting

FLIGHT CREW

The minimum erew for v_{τ} throat type takents and vertical type landing operations consists at two ρ_{τ} at

CONFIGURATION

Skid landing gear only All doors on

Pratt and Whitney PT6T-3B or PT6T-3BF engine- -half be matalled

CENTER OF GRAVITY LIMITS — FOR VERTICAL OPERATIONS ONLY

Center of gravity limits are from Station 130.0: 130(2.0) to Station 142.0 (3606.8). The center of gravity operational range is variable, depending upon gravit weight and shall be computed from the weight and helence data.

NOTE

Station foldstame is bested 28 melow (\$99.8 mellometers) although most forward point of the rabin nose

Maximum asymmetric center of gravity limits are 9.5 inches (85.5 millimeters) to the left and right from the fuselage center line.

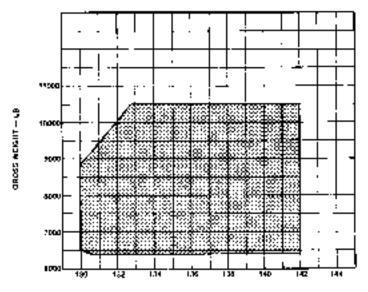
GENERATOR AMMETER

Maximum = 150 Arros per Animetec

BHT-412-FM5-22-7

REQUIRED EQUIPMENT

This supplement requires the installation of an approved capillats instrument his, an approved dual control but, the 212 706 029 attimeter, and one operation SIJAS

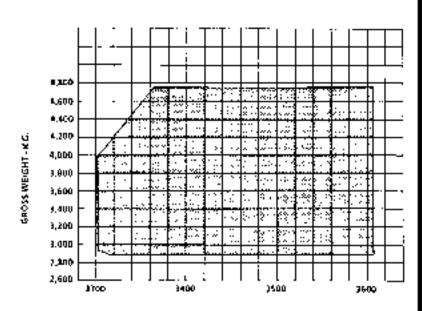


LONGITURINAL C.C. STATION - INCHES

CENTER OF GRAVITY LIMITS (ENGLISH)

Section 1

BHT-412-FMS-22.2



LONGITUDINAL C & STATION-MM

CENTER OF GRAVITY LIMITS (METRIC)

412099-14

CENTER OF GRAVITY LIMITS (METRIC)



NORMAL PROCEDURES

Power Assissance Clicck - Refer to Section 4 of the Supplement

VERTICAL TYPE TAKEOFF

NOTE

Sec Vertical Takeoff Profile, Vertical Takeoff Figure 1, Vertical Takeoff Figure 2 and Vertical Takeoff Figure 3

NOTE

Takenti' will be initiated with the field opter positioned such that the nakeoff index marks are directly appears the crew doors and the historyter centered on the heliport. This will assure that the tail rutor is within the confines of the heliport.

Triple Tactiometer | 100%

Collective - Flat Pitch (full down).

Dixirs and Windows - Closed-

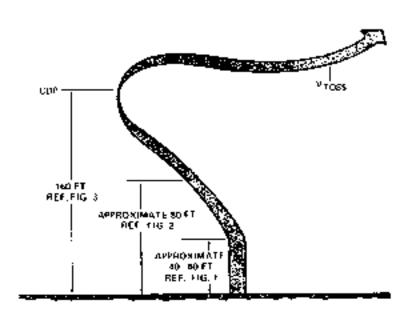
Heater and Vent Blower - Off During Takeoff

Vertical Takeoff Altimoter - Set to zero.

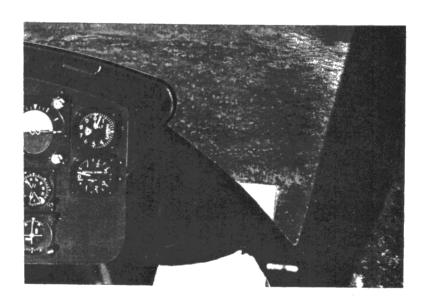
Flight Altimater - Set to correct station pressure or elevation.

In Have all 1 wo to Four Feet - Note Transgrission Torque.

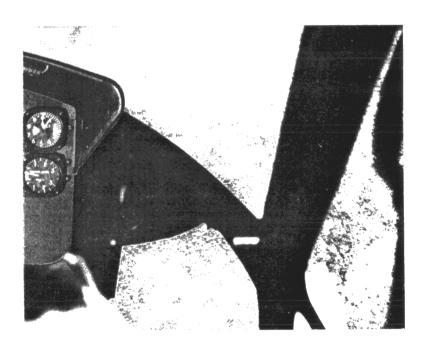
Collective - Apply smoothly to obtain a tready rate of climb along the takeoff flight path using a transmission longue not to exceed an additional 15% torque in excess of the value noted in hover.



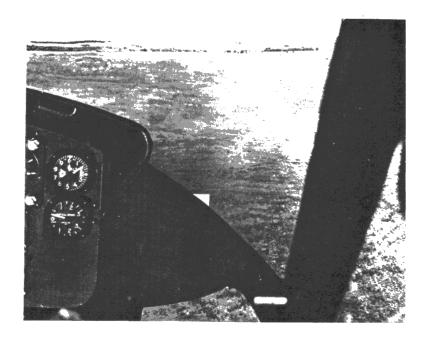
VERTICAL TAKEOFF PROFILE



VERTICAL TAKEOFF FIGURE 1



VERTICAL TAKEOFF FIGURE 2



VERTICAL TAKEOFF FIGURE 3

The pilot will control the flight path by visual reference to the far right corner of the heliport and the takeoff index marks. As altitude above the heliport is increased to approximately 40 to 60 feet, it will be necessary to transation auto rearward flight at a very slow speed in order to maintain visual reference with the far right corner of the heliport (see Vertical Takeoff Figure 1). The takeoff will be continued by visual reference to the far right corner of the heliport (see Vertical Takeoff Figure 2) until the critical decision point (CDP) is reached (see Vertical Takeoff Figure 3).

NOTE

Visual reference with the helipoon is defined as that position where the far right corner of the heliport is aligned approximately halfway between the edge of the instrument panel and the lower corner of the windshield. The amount of heliport area visible to the pilot will vary with height above the ground. At all points in the takeoff maintain visual contact with howard right hand corner of the heliport boundary.

Cupilon will call out the following altitudes from the vertical takeoff altimeter during takeoff:

- Al 60 feet indicated: "60 feet".
- A) 80 feet indicated: "80 feet".
- At 100 feet indicated: "100 feet"
- d. At 120 feer indicated "120 feet"
- e. At 140 feet indicated "140 feet"
- At 160 feet indicated: "CDP, ROTATE".

At the indicated Critical Decision Point (CDP), translate into forward flight to obtain takeoff safety speed (VTOSS) of 30 knots plus wind (65 kpms maximum). Apply power of not less than 73% torque and climb to 200 feet above takeoff point at VTOSS Accelerate to best rate of climb assispeed (65 knots) and climb en route. Copilot should manifely power and systems parameters.

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VERTICAL TYPE LANDING

NOTE

See Vottical Landing Profile, Vottical Landing Figure 1 and Variotal Landing Figure 2

A vertical type landing to a landing that is improved treat the Landing Decision Point (LDP) which is 30 knots indicated airspeed plus reported wind velocity and at an abunda of 200 feet above the level of the helipoit surface.

Flight Controls - Adjust frictions to desired levels.

Governor Switches - Automatic

Twist Grip NI Controls Full Open - Throttle Prictions adjusted to desired level.

Engine RPM 100% No.

Force Trim - As desired

Fight Altoward - Set to hearest reporting station

From an abspeed of 30 knots indicated also would speed and a height of 200 feet. On pilot will introde the approach when the LDP is reached. The LDP is reached when the pilot obtains the topical sight picture of the helipoit (see Vetteal Landing Figure 1). Pilot talk "LDP" and indicates the approach.

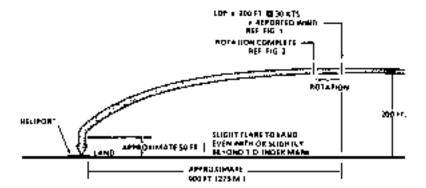
The approach is initiated by ensing the nose of the site of the obtain the cor. of approach logist picture free Vertical Landing Figure 21 and simultaneously lowering the collective to establish the approach angle.

Doing the descent, visual contact is maintained with the through light hand known of the helippit (see Versical Landing Figure 1 and Vertical Landing Figure 2).

NOTE

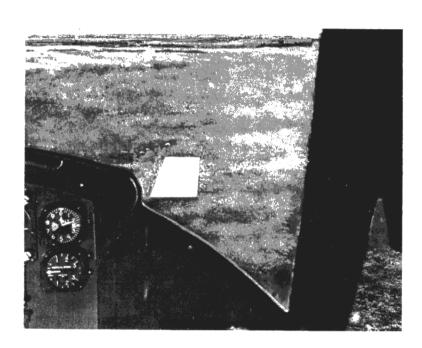
The approach langue is such that the tail retor will clear in 25-feet (7.6-meter) obstacle on the approach end of the heliport

Section 2

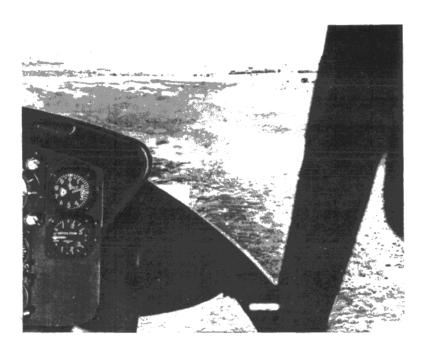


VERTICAL LANDING PROFILE

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VERTICAL LANDING FIGURE 1



VERTICAL LANDING FIGURE 2

BHT-412-FM9-22-2

As the helicopier crosses the approach and of the heliport with the required tool rotor obstacle clearance, a slight face is initiated so that the helicopier is brought to a landing with the pilot's door even with an slightly forward of the takeoff mark on the helipopt.

NOTE

The empilor will call our anspeed and altitude information prior to LOP (i.e., "Ainspeed High" or "Ainspeed Low," and "Altitude High," or "Altitude Low") and roter rpm, tocque, and Inter Turbine Low and interest of an engine failure after LoP, the pilot will adjust the power as soon as possible to Obtain the maximum single engine power available during the descent.



EMERGENCY AND MALFUNCTION PROCEDURES

PRIOR TO COP

SEGMENT WORDING	FAULT CONDITION	CORRECTIVE ACTION
C BOX OIL PRESS	Combaning gearhox ob pressure below normal.	Land
C BOX OIL TEMP	Combining gearbox oil compensaure above limit	Land
XMSN OIL TEMP	Transmission oil temperature is almove him.	Land
XMSN OJL PRESS	Transmission call paessure is law	Land
BACCAGE FIRE	Smoke in baggage compartment.	Land
FIRE I PULL.	Fire indication in No. 1 Engine com- partment.	Land, then pull No. 1 dan- dle, select MAIN bottle, then RESERVE if notes- tary, close No. 1 (wist grip.
PIRE 2 PUI.L	Fare indication in No. 2 engine companiment.	Land, then pull No. 2 handle, select MAIN buttle, then RESERVE if neces- sary, close No. 2 twist grap

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PRIOR TO CDP(Cont)

SEGMENT WORDING	FAULT CONDITION	CORRECTIVE ACTION						
ENG LOUT	No. 1 Engine NI RPM almormally low.	See Engine Out Procedure						
ENG 2 OUT	No. 2 Engine NI RPM abnormally low.	See Engine Out Procedure						

AFTER COP

SEGMENT WORDING	FAULT CONDITION	CORRECTIVE ACTION						
C BOX OIL. PRESS	Combining gentlers oil pressure below normal.	Accelerate to VTOSS and land as soon as practicable.						
C BOX OIL TEMP	Combining gearting oil temperature above limit	Accelerate to VYOSS and land as some as practicable						
XMSN OII. TEMP	Transmission oil Temperature is above limit	Accelerate to VTOSS and land as soon as practicable						
XMSN OIL PRESS	Transmission oil pressure is low.	Accelerate to VTOSS and land as soon as practicable						
BACCACE FIRE	Smoke in baggage compartment	Accelerate to VTOSS and land as soon as practicable						
FIRE (PITL).	Fire indication in No. 1 Fugure conspartment.	Accelerate to VTOSS and then pull No. 1 handle, select MAIN hottle, then RESERVE of necessary, close No. 1 wist grip.						

BHT/412/FMS/22/2

AFTER CDP(Cont)								
SEGMENT WORDING	CONDITION	CORRECTIVE ACTION						
FIRE 2 POLL	Fire indication in No. 2 Engine com- parations	Accelerate to VTOSS and then pull No. 2 handle, select MAIN bottle, then RESERVÉ of necessary, close No. 2 twist grap.						
ENG LOUT	No. I Engine Nt RPM abnormally low.	See Engine Out Procedur						
ENG 2 OUT	No. 2 Engage NI RFM abnormally low	See Engine Out Procedur						
	PRIOR TO L	DP						
SEGMENT WORDING	FAULT CONDITION	CORRECTIVE ACTION						
C BOX OIL PRESS	Combining gearbiex oil pressure helow normal.	Reduce power Land as soon as practicable.						
C BOX OIL TEMP	Combining gearbox oil temperature above limit.	Reduce power Observe reorperature within Limits, if not land us soon as possible						
XMSN OIL TEMP	Transmission oil temperature is above limit	Reduce power. Observe readposature within limits, if not land as soon as possible.						
XMSN OIL PRESS	Transmission will pressure is low.	Reduce power Land as soon as possible						
BACCAGE FIRE	Smake in baggage compartment.	Reduce power to minimum required. Land at soon as possible, and inspect rail boom area for damage.						

PRIOR TO LDP(Cont)

SEGMENT WORDING	FAULT CONDITION	CORRECTIVE ACTION						
FIRE PULL	Pire indication in No. I Engine con- partment	Pull No. 1 handle, select MALN bottle, then MESERVE of necessary, close No. 1 twist grip						
FIRE 2 PULL	Fire andication in No. 2 Engine compartment	Pall No. 2 handle, select MAIN bottle, then RESERVE if necessary, close No. 2 twist pr.p.						
ENG LOUT	No. 1 Engine N1 RPM abnormally low.	See Engine Out Procedure						
ENG 2 OUT	No. 2 Engine NI RPM abnormally low.	See Engine Out Procedure						

AFTER LDP

SEGMENT WORDING	FAULT CONDITION	CORRECTIVE ACTION						
C BOX OIL PRESS	Combining grantson oil pressure hollow normal.	Land						
C BOX OIL TEMP	Combining gearbox oil temperature above limit.	Land.						
XMSP OIL TEMP	Transmission oik ieniperature is above limit	lund						
XMSN OIL PRESS	Transmissien oil pressure is law.	Land.						
BACCAGE FIRE	Smoke to paggage compartment.	Land.						

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AFTER LDP (Cont)

segment Wordnig	FAULT <u>CÓN</u> QTÍCÓN	CORRECTIVE ACTION
FIRE 1 PHILL	Fire indication in No. 1 Engine compartment.	Load, then pull No. I handle, select MAIN bottle, then RESERVE it necessary, close No. I twist grip.
PIRE 2 PULL	Pire indication in No. 2 Engine comparisons:	Land, then pul. No. 2 handle, select MAIN bottle, shen RESERVE if necessary, close No. 2 twist grip.
RNG 1 OUT	No Elegane NLRPM abportably low	See Engine Out Proceduse
BNG 2 OUT	No. 2 Engage N1 RPM abnormally law	See Engine Out Procedure.

ENGINE OUT PROCEDURE

NOTE

After an engine failure, the power on the remaining engine shall be increased to the maximum permissible power himita (2.5 minute power rating for helicopters equipped with PTGT-3B engines or 30 minute power rating for helicopters equipped with PTGT-3BP engines). The rotat speed shall be instarounced within books.

During Takeoff Prior to Critical Decision Point (CDP)

An engine failure prior to reaching CDP (160 feet above the heliport) will necessitate a landing back to the heliport. The landing is accomplished by descending back toward the takeoff surface, white maintaining 97% rutur speed. While maintaining a level attitude, increase collective pitch 22 necessary to sushing the landing. Perform normal shintdown procedure.

During Takeoff After Critical Decision Point (CDP)

In an engine fails during or following CDP, the helicopter shall be accelerated to takeoff safety speed (VTOSS) of 30 kpots plus word. When excelerating to VTOSS, notor speed shall be maintained within limits. Accomplish climbout at an airspeed of 30 kpots plus headwind. Use the 2.5 minute power rating (for helicopters ecoupped with PT6T-JB engines) or the 30 minute power rating (for helicoptern equipped with PT6T-JB engines) or 200 feet above the helipoot. Then aircelerate to the best rate of climb speed (65 knots). The copilot should maintain power Significance affected angular.

Twial timp - Rocate to full closed.

Fuel - OPP

Boost Pump Off

Crossfeed - Override Close

Interconnect Valve - Open

During Landing Pylor to Landing Decision Point (LDP)

An emergency condition during landing prior to the LDP (200 feet above the helipert), the behaupter should be accelerated to best rate-of-thimb speed for climbout, depending on the terrain and obstacles. Shut down infected engine

Twist Grap - Rotate to full closed.

Fuel - Off

Boost Pump - Off

Crusafeed - Overmile Cluse

Interconnect Valve - Open

OB, proceed to the LDP and use the procedure below

During Landing at the Landing Decision Point (LCP)

Maintain: cotor apeed within limits and accomplish a rimbout or accelerate to the best care-of-clamb spread of 65 knots, depending on the terrain and obstacles

OR, proceed to a landing while using the procedure below

During Landing After the Landing Decision Point (LDP)

If an emergency occurs after LDP, the techniques is continued to land. The landing is accomplished using the 2.5 minute power rating flor helicopters equipped with PT&T&B engines) or the 30 minute power rating (for helicopters equipped with PT&T&BP engines). The rotor speed shall be maintained within limits. Visual context with the eight potture of the two sides of the helipart shall be maintained. After landing, perform normal shotdown procedures.

MALFUNCTION PROCEDURES

Section 3 No change

BHT-412-F#8-22 2



PERFORMANCE DATA

The performance data presented in this section are based on the engine memofecturer's infinitesimoperational properties the PTST-3B or PTST-3BF engines with installation loader

An engine power assurance check thant is presented which is also based on a minimum assertion to an exist assaultation losses and proper rigging of engine controls.

If engine performance does not meet that shown in the "ENGINE POWER ASSURANCE CHART" steps should be taken to accertain the causes of engine power loss.

The enumeron belaport size, using the vertical takeoff and landing procedure, is 72 feet a 160 feet 22 meters a 46 meters). A chart is presented showing the MINIMUM HELIPORT SIZE AND AN APPROVED HELIPORT MARKING. The heliport marking shown was used during the type tests.

The grass weight braits for takeoff and landing varies with the component of head wood directly approach to the flight path. The Headwind Component Chart presents a method of chiamong the boundwood component for use on the Gruss Weight Limits for Takeoff and Landing Chart. Section 1. The measurement constraint demonstrated was 15 Knots and is shown as a limit on the Headwind Component Chart.

Interpolation of all data is allowable but extrapolation is not permitted.

HOVER PERFORMANCE

The Hover Performance client is pre-wined to show the percent torque required to bover in ground-effect (IGE) at a four-foot (I 2 meters) skell height, and the percent torque available as shown in the following example:

Tarque Required to Hover

Determine Ambanit Air Thoiperatura (NAT):

gory:

Determine Pressure Altitude (Ha):

TOHID ft.

Determine Grass Weight (G W).

ESHO IN THIS THE NO.

Enter thirt in CAT, printed varietily operate to He proceed portionally to the right to GW, then proceed vertically downward to the TORQUEMETER scale and read persons. torque required to hover. Transmission Torque!

59.5%

Torque Available (Twin Engine)

Enter thank at OAT, proceed vertically appeared to Hu, proceed horizontally to the right to the TAKEOFF POWER AVAILABLE curves, then proceed vertically downward to the TOROLEMETER scale and condinguous torque ovallable.

1000

TAKEOFF PERFORMANCE

Takeoff Salety Speed (Viess)

The takes Γ safety speed varies with wind. Vius: \bullet 30 kt. IAS \bullet winds.

Altimeter Calibration

Takeoff performance is losed on the altraneter calibration shown in the Takeoff Altraister Cabbration Chart

Taknoff Distunce

Vertical Takeoff thetanic

15 o ft 146 m 1

Using the vertical takeoff principlary. The takeoff the Laure consecuted from the off end of the helipart when in takenif position, is the maximum

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distance needed to land after a rejected takenff (one engine failure prior to or at critical decision point for the vertical takenff procedure). This takenff distance applies to all conditions of GROSS WEIGHT, PRESSURE ALTITUDE AND AMBIENT AIR TEMPERATURE When operating within allowable limits.

Takeoff Flight Path, Obstacle Clearance

The takeoff flight path begins at the end of the takeoff distance, at 35 feet above the takeoff surface and Vtoss. Two charts are involved in the determination of the takeoff hight path and are titled as heliow.

Takeoff Flight Path, Climb Index

Takcoff Flight Path, Obstacle Clearance

These charts are used as in the following example

Example

1. Determine Ambient Air Temperature

150

2. Determine Pressure Altitude

Sex Level: (0:fr)

- Determine VTOSS (20 k), TAS + Headwind Companion 40 kts, of 10 Knots)
- 4. Determine Actual Gross Weight

4309 th 73765 kg (

5 Determine height above and distance from the Takeoff Surface of known obstacles along the Flight Path. BHT 412-FMS-22 2

Check Maximum Allowable Gooss Weight.

10,500 lb. (4762,5 kg)

If actual gross weight is less than allowable, proceed.

- Enter Takcoff Flight Path, Climb Index Chart at Ambient Air Temperature
- 8 Move Vertically up to Pressure Alchade.
- Move Housentally Right to Actual Gross Weight for Takeoff.
- Move Vertically Down to VTOSS Correction. Curves.
- Move Diagonally, Parallel to VTOSS Correction Curves to VTOSS
- Move Vertically Privat to Climb Index Scale and Read Climb Index.

46.0

[3] On the TAKEOFF FLIGHT PATH OBSTACLE CLEARANCE CHART locate CLIMB INDEX point, which has just been determined, at a height above taken!! surface of 200 feet. A line from this point through 35 foot height at C Horizontal Distance represents the minimum height flight path from the end of the takenth distance and should be compared with the height of known obstacles along the flight path for obstacle clearance.

CLIMB PERFORMANCE

Single Engine of Minimum Vioss (30 kts IAS)

Single engine rate of climb at minimum VPOSS ISO IAS as shown for 7000, 8000, 9000, 10,000, and 10,500 pounds grees weight. In addition, that is shown for 3200, 3600, 4000, 4400, and 4762.7 killing ama grees weight. These curves are fin general information only, since takenth dight path chart is presented for highs path determination.

Single Engine at Bost Rate of Climb Speed (86 kts Void)

Single engine rate of climb at bost rate of climb speed (65 kts Voal) is unchanged from the basic Romorers(1 Fight Manual Data (Cat. 8).

LANDING PERFORMANCE

Landing Distance, Versical Procedure

Agenal Landing Distance .							 	TLO	A. I.	3 3 5	īП	ŀ
Scheduled Landing Distance				 			 	138	ft. l	12 O	ш	ŀ

Using the vertical procedure, the landing distance is the actual distance needed for the tail rotor to clear a 25 foot (3 meter) height and come to a step on the landing surface with only one engine operating

The actual landing distance is 110 feet (33.5 meters). For scheduled landings the landing distance is 128 feet (42.0 meters). These landing distances apply in all conditions of GROSS WEIGHT, PRESSURE ALTURE, AND AMBIENT TEMPERATURE when operating within allowable bruds.

MODEL 412 POWER ASSURANCE CHECK (HOVER) PT6T-3B ENGINE

HEATER/ECU - OFF

THROTTUES. TEST ENGINE - FULL OPEN PRICTIONED OTHER ENGINE - FUGHT IDLE

NII RPM - 97%

COLLECTIVE PITCH INCREASE UNTIL LIGHT ON SKIDS OF HOVERING DO NOT EXCEED BICK ITT OF 100 8% NLRPM

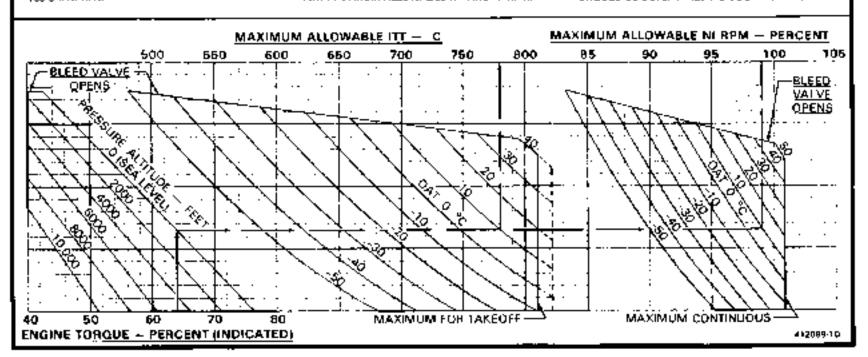
STABILIZE POWER ONE MINUTE. THEN RECORD PRESSURE AUTITUDE DAT, ENGINE TORQUE ITT. AND NI RPM

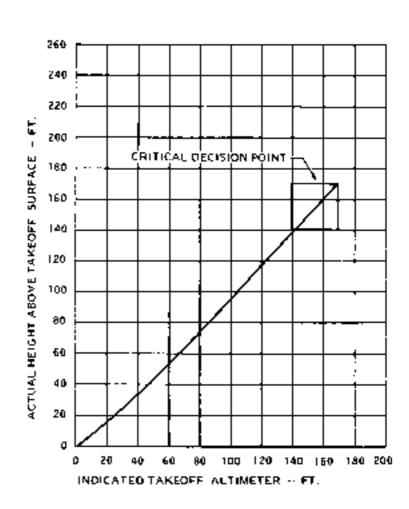
FINER CHART AT INDICATED ENGINE TORQUE MOVE UP TO INTERSECT PRESSURE AUTITUDE, PROCEED TO THE RIGHT TO INTERSECT OUTSIDE AIR TEMPERATURE, THEN MOVE UP TO READ VALUES HOR MAXIMUM ALLOWABLE IT! AND NI RPM.

IF INDICATED ITT OR NI RPM EXCEEDS MAX. ALLDWABLE, REPEAT CHECK, STABILIZING POWER. FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

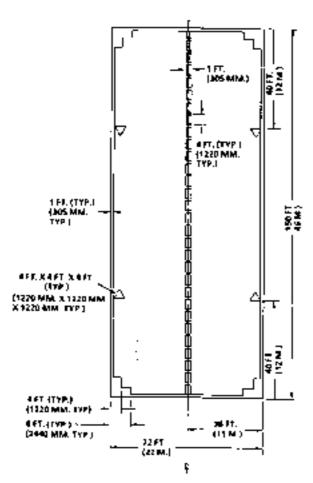
IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OF NI RPM AFTER STABILIZING FOUR MINUTES, PUBLISHED. PERFORMANCE MAY NOT BE ACHIEVABLE CAUSE SHOULD BE DETERMINED AS 500N AS PRACTICAL.





TAKEOFF AUTIMETER CALIBRATION

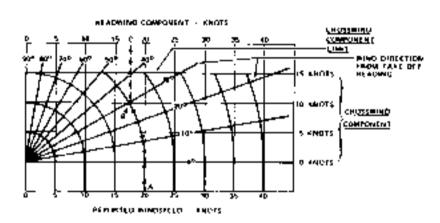
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MINIMUM HELIPORT SIZE AND APPROVED HELIPORT MARKING

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EXAMPLE

h 14	TL OFT HEACHMG	170*
7 64	PORTEG INITIAL CHRECTION	200*
3 40	NO DIRECTION DEGREES FROM FAKE OF FINADING	303
. 44	POHIED MINO SPEED .	20 * MUTS
> 4M	II EH KHAH I AT HEMJETED MIND TPEED, POINT N	
€ PA	OCE FOILPMARD, FOULDAING THE SHAPE OF THE	
CL	INVIOLIMES TO AIMS DIRECTION DEGREES FROM	
14	ARE OFF HEADING POINTS	
7 PA	OCERO GER DO AND A JAMES A CORO DE HISTORIA DE LA CONTROLICA DE LA CONTROL	
co	NPCNENT ECOLE AND READ HEADNING COMPONENT	a7 E RHOTA
6 PA CL 14	NOSTO I, PMARIN, TOWN HAMMED THE SHAPE OF THE INVEDITURES TO AMED CIPICOTION DEGREES FROM DEE (164 HEADING MOMENTS DOCFED VERTIFULLY UPWARD TO THE HEADINGS):	87 E RHÓF

HEADWIND COMPONENT CHART

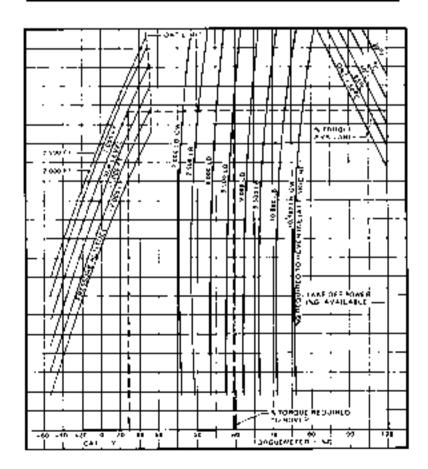
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HOVER PERFORMANCE

(ENGLISH)

(GE 14 FT. SKID HT.) POWER REQUIRED TO HOVER AND TAKE-OFF POWER AVAILABLE

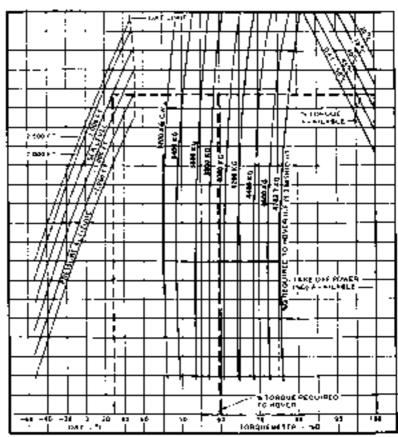
ENGINE RPM 100% GENERATOR 150 AMPS MEATER OFF



HOVER PERFORMANCE

IGE (1.2 M SKID HT) POWER REQUIRED TO HOVER AND TAKE-OFF POWER AVAILABLE

ENGINE RPM 100% GENERATOR 110 ANDS HEATER OFF



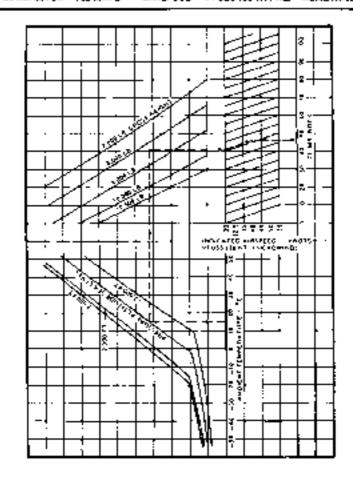
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PT6T-38 ENGINE TAKEOFF FLIGHT PATH (ENGLISH)

CLIMB INDEX

2 SMINUTE POWER BAGINE RPM 43% GENERATOR 100 AMPS HEATER OFF INOPERATIVE ENGINE SECURCO

AIRSPEED - VICKS IDO KT. IAS - MEADWINDS

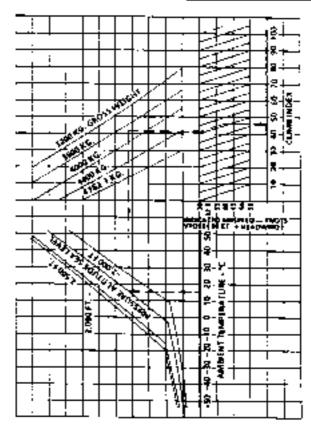


PT67-3B ENGINE TAKEOFF FLIGHT PATH (METRIC) CLIMB INDEX

2.5 MIN. POWER ENGINE RPM 97 % GENERATOR 150 AMPS HEATER DEF

INOPERATIVE ENGINE SECURED

AIRSPEED - VTOSS(30 KT. IAS + HEADWIND)



412099-16

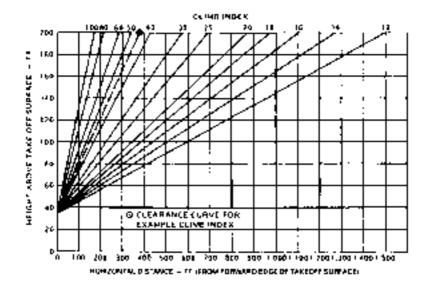
PT6T-3B ENGINE TAKEOFF FLIGHT PATH (ENGLISH)

OBSTACLE CLEARANCE

2 SMINUTE POWER
ENGINE RMA 97%

HEATER OFF

ENGINE RPM 97% INOPERATIVE ENGINE SECURED
GENERATOR 100 AMPS AIRSPEED YTOSE - 30 KT, IAE + HEADWIND



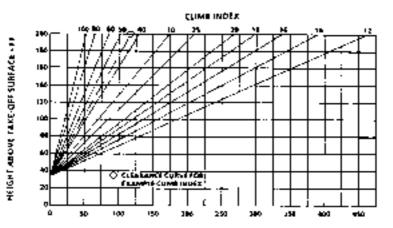
PT6T-3B ENGINE TAKEOFF FLIGHT PATH (METRIC)

2 5 44M. FOWER

ENGINE ROW 97% *GENERATOR 150 AMPS*

OBSTACLE CLEARANCE
HEATER OFF
INOPTRATIVE ENGINE SECURED

AIRSPEED VTOSS - 30 KT. WAS . HEADMIND



HORIZONTAL DISTANCE -- METERS (FROM FORWARD EDGE OF FAREOFF SURFACE) 472995-12

Hey 3

BHT-412-FWS-72-7

PT6T-3B ENGINE SINGLE ENGINE RATE OF CLIMB (ENGLISH) 7,000 LB. GROSS WEIGHT

2 5MIN. POWER

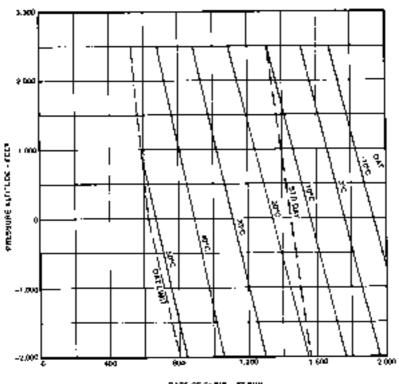
ENGINE RPM 97%

GENERATOR 100 AMPS

AIRSPEED VTOSS - 30 KT. IAS

MEATER OFF

INDPERATIVE ENGINE SECURED



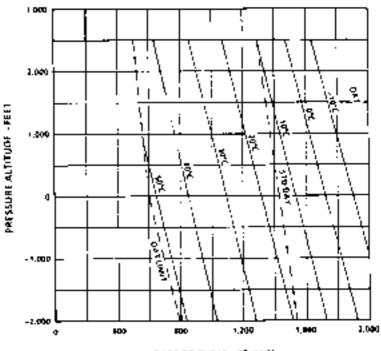
PT6T-3B ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC) 3,200 KG. GROSS WEIGHT

2.5 MIN. POWER ÉNGINE RPM 97%

AIRSPEED VTOSS . 30 KT. IAS

HEATER OFF

GENERATOR ISO AMPS INOPERATIVE ENGINE SECURED



RATE OF CLIMB - FT. MIN

413099-12

PT6T-3B ENGINE SINGLE ENGINE RATE OF CLIMB (ENGLISH)

8,000 LB. GROSS WEIGHT

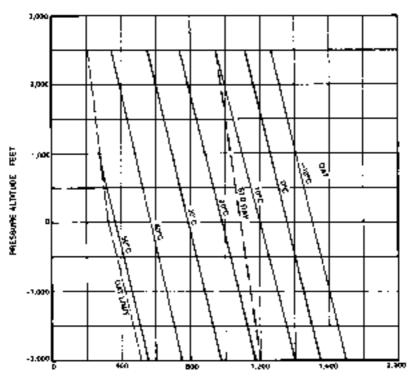
2.5 MIN, POWER

AIRSPEED VTOSS = 30 KT. IAS

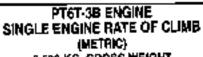
ENGINE RPM 97%

MEATER OFF

GENERATOR 150 AMPS IMOPERATIVE ENGINE SECURED

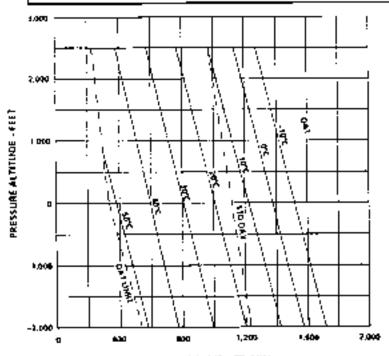


MAIL OF CLASS - FIJMIN



3,600 KG. GROSS WEIGHT

2 SMIN. POWER ENGINE RPM 97 % GENERATOR 150 AMPS ARSPEED VTOSS = 30 KT. (AS HEATER OFF INOPERATIVE ENGINE SECURED



RATE OF CLIMB - FT /MIN.

LF2076-19

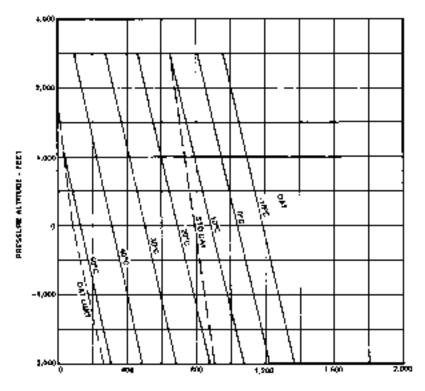
BHT-412:FM8:29.2

PT6T-3B ENGINE SINGLE ENGINE RATE OF CLIMB (ENGLISH)

9.000 LB. GROSS WEIGHT

2 S MIN. POWER
ENGINE MM 87%
GENERATOR 150 AMPS

AIRSPEED VTOSS - 20 KT, IAS MEATER OFF INOPERATIVE ENGINE SECURED

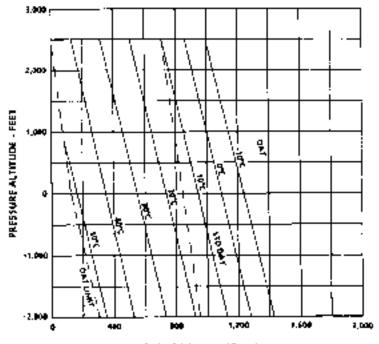


PIATE OF GLAND - PT/WH.

PTST-38 ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC)

4000 KG, GROSS WEIGHT

2.5 MM, POWER ENGINE RPM 97% GENERATOR 150 AMPS AIRSPEED VTOSS = 30 KT, IAS HEATER OFF INOPERATIVE ENGINE SECURED



RATE OF CUMB - FTJMIN.

412009-20

8HT4124FM5-22-2

PT8T-38 ENGINE SINGLE ENGINE RATE OF CLIMB

(ENGLISH)

10,000 LB. GROSS WEIGHT

Z SMIN, POWER

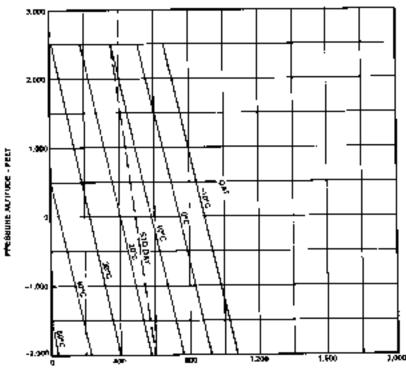
AIRSPEED VTOSS - 30 KIAS

ENGINE RPM 97%

NEATER OFF

GENERATOR 150 AMPS

INDIM ALTIVE ENGINE SECURED



NATE OF CUMB - PLANT

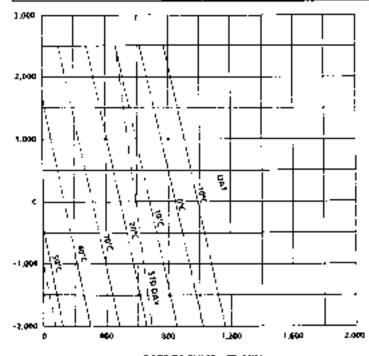
PRESSURE AL LITLUS - FEET

BKT-412-FMS-22.2

PT6T-38 ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC)

4400 KG, GROSS WEIGHT

2.5 MIN POWER ENGINE RPM 97 % GENERATOR 150 AMPS AIRSPEED VTOSS – 30 KIAŠ HEATER OFF INOPERATIVE ENGINE SECURED



RATE OF CLIMB AFT. MIN.

411099-11

PT6T-38 ENGINE SINGLE ENGINE RATE OF CLIMB

10,500 LB. (4782.7 KG.) GROSS WEIGHT

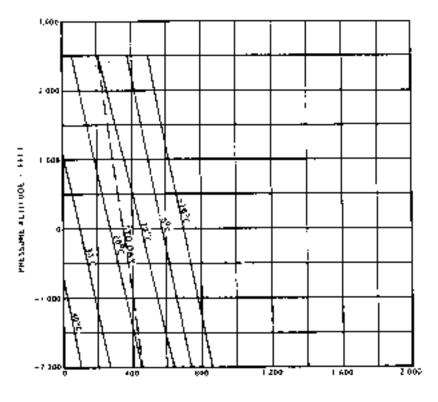
ER AIRSPESO VEOSS - 30 KT IAS

2 5 MIN FOWER SINGING RIPM 97%

HEATER OFF

GENERATOR 150 AMPS

INOPERATIVE ENGINE SECURED



RATEOFCLING - IT MIN

PT6T-3BF ENGINE TAKEOFF FLIGHT PATH

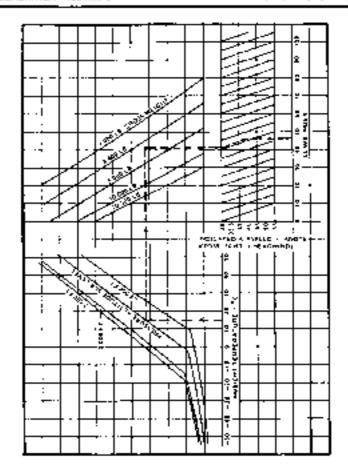
(ENGLISH)

DO MINUTE POWER -

CLIMB INDEX

INOPERATIVE ENGINE SECURED

GENERATOR 150 AMPS AIRSPEED . VTOSS (90 KT, IAS - HEADWIND)

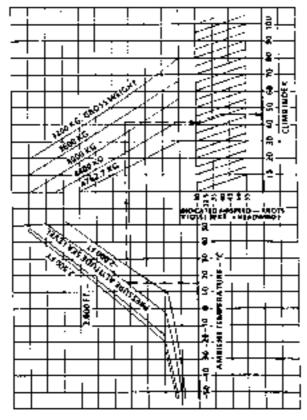


PT6T-3BF ENGINE TAKEOFF FLIGHT PATH (METRIC) CLIMB INDEX

30 MINUTE POWER ENGINE RPM 97% **HEATER OFF**

INOPERATIVE ENGINE SECURED

AIRSPEED - VTOSS (30 KT. 1AS + MEADWIND) GENERATOR 150 AMPS



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BHT-412-FMS-22-2

PT6T-3BF ENGINE TAKEOFF FLIGHT PATH

(ENGLISH)

OBSTACLE CLEARANCE

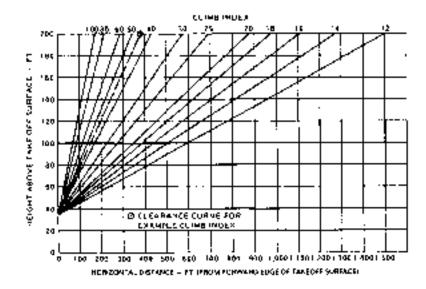
30 MINUTE POWER ENGINE 8PM 97%

GENERATOR 150 AMPS

ИЕФТЕЯ ОРР

INOPERATIVE ENGINE SECURED

AIRSPEED VTOSS - 20 KT, IAS + HEADWIND



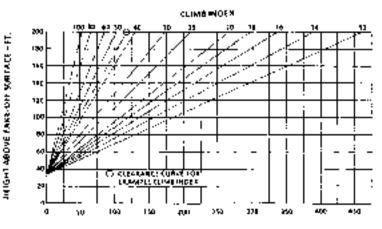
BHT-412-FM5-22.2

PT6T-3BF ENGINE TAKEOFF FLIGHT PATH (METRIC)

OBSTACLE CLEARANCE

30 MINUTE POWER

INDPERATIVE ENGINE SECURED
AIRSPRED VIOSS = 36 KT. IAS = HEADWIND ENGINE RPM 97% GEHERATOR 150 AMPS



HORIZONTAL DISTANCE - METERS FROM FORWARD EDGE OF FAREOFF SURFACEI 813049 [1

BHT-412-FMS-22.2

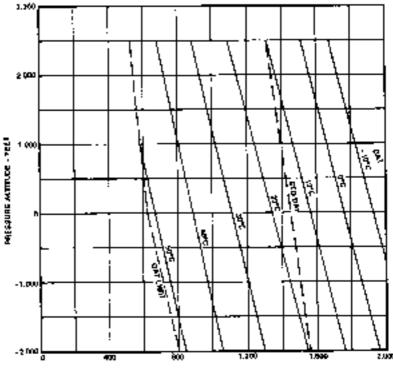
PT6T-38F ENGINE SINGLE ENGINE RATE OF CLIMB (ENGLISH) 7,000 LB. GROSS WEIGHT

30 MINUTE POWER ENGINE APM 97%

AIRSPEED VTOSS # 30 KT. IAS

HEATER OFF

GENERATOR 150 AMPS INOPERATIVE ENGINE SECURED



RATE OF CUMB - FT/MIN

BHT-412-FMS-22.2

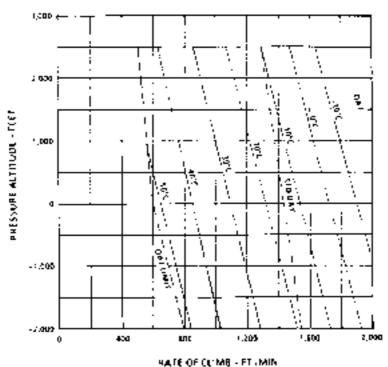
PT6T-3BF ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC) 3,200 KG, GROSS WEIGHT

30 MINUTE POWER

ENGINE RPM 97%

CENERATOR 150 AMPS

AIRSPELO VTOSS - 30 KT. IAS HEATER OFF INTEPPRATIVE ENGINE SECURED



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BHT-412-FM5-22-2

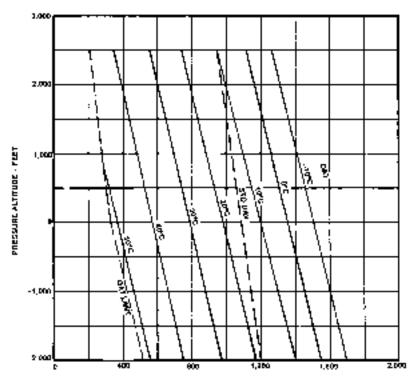
PT6T-3BF ENGINE SINGLE ENGINE RATE OF CLIMB (ENGLISH)

8,000 LB, GROSS WEIGHT

30 MMPUTE POWER EMGINE RPM 97% GENERATOR 150 AMPS AIRSPEED VTOSS - 30 KT. IAS

HEATER OFF

INOPERATIVE ENGINE SECURED



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BHT-412-FMS-22.2

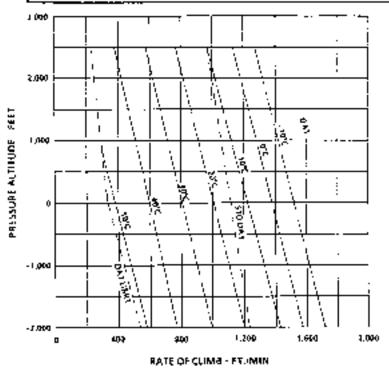
PT6T-3BF ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC)

3.600 KG, GROSS WEIGHT

30 MINUTE POWER
ENGINE RPM 87%

AIRSPEED VTOSS - 30 KT IAS HEATER OFF

GENERATOR 150 AMP'S INOPERATIVE ENGINE SECURED



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BHT-412-FMS-22,2

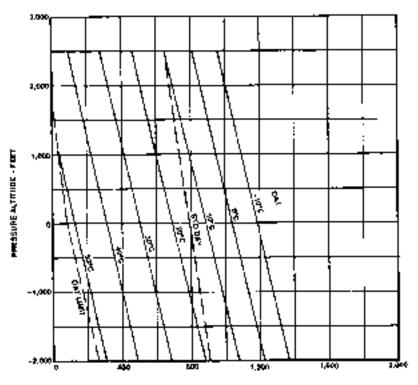
PT6T-38F ENGINE SINGLE ENGINE RATE OF CLIMB (ENGLISH)

9,000 LB, GROSS WEIGHT

30 MINUTE POWER ENGHI APM 97% GENERATOR 150 AMPS AIRSPEED VTOSS - 30 KT 1AS

HEATER OFF

INOPERATIVE ENGINE SECURED



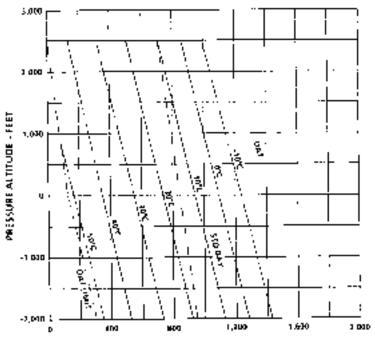
RATE OF CUMB - FLARH.

BHT-412-FMS-22-Z

PT6T-3BF ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC) 4000 KG, GROSS WEIGHT

30 MINUTE POWER
ENGINE RPM 97%
GENERATOR 150 AMPS

AIRSPEED VTOSS = 30 KT. IAS HEATER OFF INOPERATIVE ENGINE SECURED



RATE OF CLIMB - FT/MIN.

412059-20

BHT-412-FM9-22 2

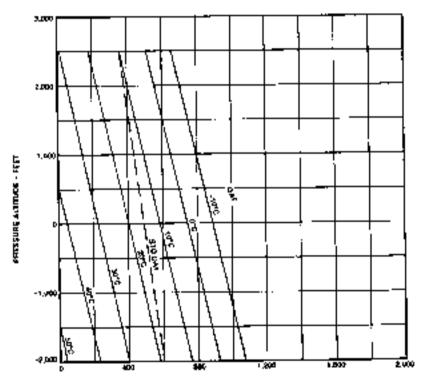
PT6T-38F ENGINE SINGLE ENGINE RATE OF CLIMB

(ENGLISH) 10,000 LB. GROSS WEIGHT

30 MINUTE POWER ENGINE RPM 97% **GENERATOR 150 AMPS** AIRSPEED VTOSS - 30 KIAS

HEATER OFF

INOPERATIVE ENGINE SECURED



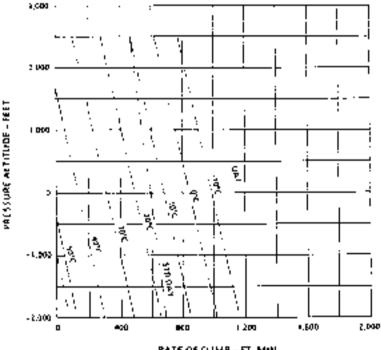
RATE OF CLASS - FT./MIN.

BHT-412-FMS-22-2

PT6T-3BF ENGINE SINGLE ENGINE RATE OF CLIMB (METRIC) 4400 KG, GROSS WEIGHT

30 WHUTE POWER ENGINE RPM 97% GENERATOR 150 AMPS

AIRSPEED VTOSS - 30 KIAS HEATER OFF INOPERATIVE ENGINE SECURED



RATE OF CLIMB - FT, MIN

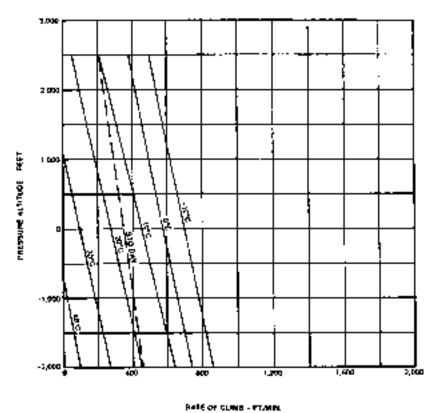
412099-71

BMT-412-FM5-22.2

PT6T-3BF ENGINE SINGLE ENGINE RATE OF CLIMB

10,500 LB. (4762-7 KG.) GROSS WEIGHT

20 MINIOTE POWER ENGINE RPM 27% GENERATOR 150 MAPS ARISPEED VTOSS - 30 KT. IAS HEATER OFF MOPERATIVE ENGINE SECURED



413400-151



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

COLD WEATHER OPERATION WITH KEROSENE FUELS

CERTIFIED **24 JANUARY 2005**

This supplement shall be attached to the Model 412 Flight Manual (BHT-412-FM-2) when conducting Cold Weather Operation with Kerosene Fuels.

Information contained herein supplements information in the basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, refer to the basic Flight Manual.

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A Textron Company

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24 JANUARY 2005

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LOG OF REVISIONS

Original 24 JAN 05

LOG OF PAGES

PAGE	REVISION NO.	PAGE	REVISION NO.		
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1 — 2	0				

NOTE

Revised text is indicated by a black vertical line. Insert latest revision pages; dispose of superseded pages.

LOG OF TC APPROVED REVISIONS

Original 24 JAN 05

APPROVED



DATE 'JAN 2 4 2005

MANAGER

TRANSPORT CANADA QUEBEC REGION

CIVIL AVIATION – AIRCRAFT CERTIFICATION

TC APPROVED BHT-412-FMS-23.2

Section 1

LIMITATIONS

FUEL AND OIL

FUEL

Refer to Manufacturer's Data portion of this supplement for approved fuels list.

JET B OR JP-4

Fuel conforming to ASTM D-1655 Type B, MIL-T-5624 Grade JP-4, or NATO F-40 may be used at all ambient temperatures.

JET A, A-1, JP-5 OR JP-8 (KEROSENE TYPE FUELS)

1. Ambient Temperature Above -30°C (-22°F)

Fuel conforming to ASTM D-1655 Type A or A-1, MIL-T-5624 Grade JP-5, or NATO F-44 and MIL-T-83133 Grade JP-8, or NATO F-34 may be used without restriction.

2. Ambient Temperature Below -30°C (-22°F)

Operation with fuel conforming to ASTM D-1655 Type A is limited to ambient temperatures above -34°C (-29°F).

Operation with fuel conforming to ASTM D-1655 Type A-1, MIL-T-5624 Grade JP-5, or NATO F-44 and MIL-T-83133 Grade JP-8, or NATO F-34 is limited to ambient temperatures above -40°C (-40°F).

3. Engine Starting

Engine starting with fuel conforming to ASTM D-1655 Type A or A-1, MIL-T-5624 Grade JP-5, or NATO F-44 and MIL-T-83133 Grade JP-8, or NATO F-34 is limited to fuel temperatures above -30°C (-22°F).

Fuel temperature shall be measured by draining a quantity of fuel from the helicopter fuel tank and from the engine fuel inlet filter.

NOTE

Refer to Manufacturer's Data portion of this supplement for fuel temperature measurement procedure.

BHT-412-FMS-23.2 TC APPROVED

Section 2

NORMAL PROCEDURES

BEFORE EXTERIOR CHECK

Flight planning — Completed.

Gross weight and CG — Compute (refer to BHT-412-MD-2).

Publications — Checked.

Portable fire extinguishers — Condition and security.

Fuel — Measure fuel temperature as required.

NOTE

When OAT is below -30°C (-22°F), fuel temperature measurement procedure must be carried out for affected fuel types (refer to Limitations Section in this supplement). Fuel temperature measurement procedure is described in the Manufacturer's Data portion of this supplement.

Aft fuel sumps — Drain samples as follows:

FUEL TRANS switches — OFF.

BOOST PUMP switches — OFF.

ENGINE 1 and ENGINE 2 FUEL switches — OFF.

BAT BUS 1 switch — ON.

Aft fuel sump drain buttons (left and right) — Press.

NOTE

If aft sumps fail to drain, the sump valves may be operated manually.

Forward and middle fuel sumps — Drain samples as follows:

Press-to-drain valves — Press.

Fuel filters — Drain before first flight of day as follows:

BOOST PUMP switches — ON.

ENGINE 1 and ENGINE 2 FUEL switches — ON.

Fuel filter (left and right) — Drain samples.

ENGINE 1 and ENGINE 2 FUEL switches — OFF.

BOOST PUMP switches — OFF.

BAT BUS 1 switch — OFF.

Rotor tiedowns — Removed and secured.

Section 1

WEIGHT AND BALANCE

No change from basic manual.

Section 2

SYSTEMS DESCRIPTION

No change from basic manual.

Section 3

OPERATIONAL INFORMATION

No change from basic manual.

Section 4

HANDLING/SERVICING/MAINTENANCE

FUELS

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 this supplement for ambient temperature limits.

The following fuel listing is provided for the convenience of the operator (Table 4-1 through Table 4-3). It shall be the responsibility of the operator and his fuel supplier to ensure that the fuel conforms to one of the approved specifications above.

Consult the engine manufacturer for alternate or emergency fuels.

FUEL SYSTEM SERVICING

Total capacity:

337.5 US gallons (1277.4 L).

333.7 US gallons (1262.8 L) for S/N 34001 — 34024.

Usable fuel:

330.5 US gallons (1251 L).

326.7 US gallons (1236.4 L) for S/N 34001 — 34024.

The fuel system is gravity serviced through a single filler port on the right side of aft fuselage. A grounding jack is provided below the fueling port.

NOTE

If fueling to a total of less than 1000 pounds (453.6 kg), open interconnect valve prior to fueling. Close interconnect valve prior to engine start.

Electrical/mechanical sump drain valves are located in each lower aft tank. Pushbutton switches for electrical operation of each drain valve are located on either side of the aft fuselage. To operate the drain valves, both FUEL switches must be in the OFF position and emergency dc bus 1 and essential dc bus 2 must be energized. Each lower aft tank also has a defueling valve. To drain the fuel, remove the plug and insert a standard fitting to open the spring-loaded poppet valve.

The lower forward and mid tanks have mechanical push-to-drain valves.

FUEL TEMPERATURE MEASUREMENT

Required apparatus:

- Measuring container with graduated scale
- Calibrated temperature meter with thermocouple probe suitable for measuring fuel at cold temperature

Procedure:

Perform the following prior to engine start:

- 1. Collect at least 250 cc fuel sample using the drain valve from either main feed fuel tank (left or right).
- 2. Measure fuel temperature immediately.
- 3. Record fuel temperature once thermocouple reading has stabilized.

If recorded fuel temperature is above -30°C (-22°F), repeat step 1 through step 3, but collecting fuel sample using the drain valve from either engine fuel inlet filter (left or right engine).

NOTE

Ensure container temperature is close to ambient and thermocouple is properly immersed in the fuel.

Table 4-1. Fuels COMMERCIAL TYPE A AND A-1

FUEL VENDOR	ASTM D-1655, TYPE A PRODUCT NAME	ASTM D-1655, TYPE A-1 PRODUCT NAME	
American Oil and Supply	American Jet Fuel Type A	American Jet Fuel Type A-1	
ARCO (Atlantic Richfield)	Arcojet A	Arcojet A-1	
Boron Oil	Jet A Kerosene	Jet A-1 Kerosene	
British-American	B-A Jet Fuel JP-1		
British Petroleum	B.P. Jet A	B.P. A.T.K.	
California-Texas		Caltex Jet A-1	
Chevron	Chevron Jet A-50	Chevron Jet A-1	
Cities Service	Citgo Turbine Type A		
Continental	Conoco Jet-50	Conoco Jet-60	
Exxon Co. U.S.A.	Exxon Turbo Fuel A	Exxon Turbo Fuel A-1	
Exxon International		Esso Turbo Fuel A-1	
Gulf Oil	Gulf Jet A	Gulf Jet A-1	
Mobil Oil	Mobil Jet A	Mobil Jet A-1	
Phillips Petroleum	Philjet A-50		
Pure Oil	Purejet Turbine Fuel Type A	Purejet Turbine Fuel Type A-1	
Shell Oil	AeroShell Turbine Fuel 640	AeroShell Turbine Fuel 650	
Standard Oil of British Columbia	Chevron Jet Fuel A-50	Chevron Jet Fuel A-1	
Standard Oil of California	Chevron Jet Fuel A-50	Chevron Jet Fuel A-1	
Standard Oil of Indiana	American Jet Fuel Type A	American Jet Fuel Type A-1	
Standard Oil of Kentucky	Standard Turbine Fuel A-50	Standard Turbine Fuel A-1	
Standard Oil of New Jersey	Standard Jet A	Standard Jet A-1	
Standard Oil of Ohio	Jet A Kerosene	Jet A-1 Kerosene	
Standard Oil of Texas	Chevron Jet Fuel A-50	Chevron Jet Fuel A-1	
Техасо	Texaco Avjet A	Texaco Avjet A-1	
Union Oil	76 Turbine Fuel		

Table 4-2. Fuels COMMERCIAL TYPE B

FUEL VENDOR	ASTM D-1655, TYPE B PRODUCT NAME
American Oil and Supply	American JP-4
ARCO (Atlantic Richfield)	Arcojet B
British-American	B-A Jet Fuel JP-4
British Petroleum	B.P. A.T.G.
California-Texas	Caltex Jet B
Chevron	Chevron Jet B
Continental	Conoco JP-4
Exxon Co. U.S.A.	Exxon Turbo Fuel 4
Exxon International	Esso Turbo Fuel 4
Gulf Oil	Gulf Jet B
Mobil Oil	Mobil Jet B
Phillips Petroleum	Philjet JP-4
Shell Oil	AeroShell Turbine Fuel JP-4
Standard Oil of California	Chevron Jet Fuel B
Standard Oil of Indiana	American JP-4
Standard Oil of Kentucky	Standard Turbine Fuel B
Standard Oil of New Jersey	Standard Jet B
Standard Oil of Texas	Chevron Jet Fuel B
Техасо	Texaco Avjet B
Union Oil	Union JP-4

Table 4-3. Fuels MILITARY

COUNTRY NATO F-34 (JP-8 TYPE)		NATO F-40 (JP-4 TYPE)	NATO F-44 (JP-5, JP-8 TYPE)			
Belgium	BA-PF-7	BA-PF-2	3-GP-24			
Canada		3-GP-22	3-GP-24			
Denmark	D. Eng. R.D. 2453	MIL-T-5624, Grade JP-4				
France	AIR 3405	AIR 3407	AIR 3404			
Germany		VTL 9130-006	VTL-9130-007			
			VTL-9130-010			
Greece		MIL-T-5624, Grade JP-4				
Italy	AA-M-C.141	AER-M-C.142	AA-M-C.143			
Netherlands	D. Eng. R.D. 2453	MIL-T-5624, Grade JP-4	D. Eng. R.D. 2498			
Norway		MIL-T-5624, Grade JP-4				
Portugal	AIR 3405	MIL-T-5624, Grade JP-4				
Turkey		MIL-T-5624, Grade JP-4				
United Kingdom	D. Eng. R.D. 2453	D. Eng. R.D. 2454	D. Eng. R.D. 2498			
			D. Eng. R.D. 2452			
United States	MIL-T-83133, Grade JP-8	MIL-T-5624, Grade JP-4	MIL-T-5624, Grade JP-5			

Department of Transport

Supplemental Type Certificate

This approval is issued to: Number: SH05-2

Bell Helicopter Textron Canada Limited Issue No.: 1

12860, rue de l'Acemir Approvat Date: January 24, 2005 Mirabel, Quebec, [7] 1R4 Issue Date: January 24, 2005

Canada

Responsible Office: Quebec

Aircraft/Engine Type or Model: BS:1.1, 212, 412, 412 EP.

Canadian Type Certificate or Equivalent: 11-86

Description of Type Design Change: Cold available use of Kerosene finels for Bell 212 & 412 behooplers

Installation/Operating Data, Required Equipment and Limitations:

Use of Kerosene fuels in cold weather will be permitted in accordance with Bell Helicopter Report No. 412-099-875, mittal release, dated 3 January 2005, or later Trapsport Canada approved revision.

The applicable Rotoiciati Flight Manual Supplements are the following Bell Helicopter publications : Model 212 :

BHTT-212-FMS-31, issue 0, dated 24 January 2005;

Model 412 :

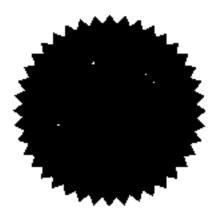
- BHT-412-FMS-23.1, issue 0, dated 24 January 2005;
- BHT-412-FMS-23.2, issue 0, dated 24 January 2005;
- BHT-412-FMS-23.3, issue 0, dated 24 January 2005.

Model 412EP:

BHT-412-FMS-23.4, issue 0, dated 24 January 2005.

or later Transport Canada approved revision.

- End —



Conditions: This approval is only approached to the type/model of aeronautical product specified therein. Prior to increasing this model, when the installer shall establish than the interrolational between this change and any other productions's incorporated will not adversely affect the anyouthings of the modeled product.

> Lanze-Mihaela Avrigeatu. For Minister of Transport

trugeau





ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT SEAT CUSHION KIT

412-706-019

CERTIFIED 24 JULY 1987

This supplement shall be attached to Model 412 or 412EP Flight Manual when the 412-706-019 Seet Cushion Kit has been metalled.

information contained herein supplements information of basic Flight Manual. For Limitations, Proceedures, and Performance Data not contained in this supplement, consult butic Flight Manual.

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REISSUE -- 8 DECEMBER 1995

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APPROVED:

MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AYIATION ADMINISTRATION

FT. WORTH, TX 76193-0179

FAA APPROVEO BHT-41z-FMS-24

GENERAL INFORMATION



The Seat Cushion Kit is installed in conjunction with the Utility Passenger Seat Kit and provides increased comfort level for passengers.

PAA APPROVED BHT-412-FM9-24

Section 1

LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after Sest Cuchion Kit is installed and ballest readjusted if necessary to return empty weight CG within allowable limits.

PLACARDS AND MARKINGS

DOORS MUST BE KEPT CLOSED DURING.
PLIGHT IF SEAT CUSHIONS INSTALLED

Localed on inside of sliding passenger door.

Section 2

NORMAL PROCEDURES

BEFORE TAKEOFF

Passengers doors - Closed.



ROTORCRAFT FLIGHT MANUAL

33108 - 33213 36001 - 36019 AND 36020 - 36086 AND 36087 AND SUB

SUPPLEMENT FOR AUXILIARY FUEL OPERATIONS (412-706-009)

CERTIFIED
10 MARCH 1988

This supplement shall be exteched to the 412 Filight Manual (BHT 412 FM·2. ·3 or ·4) when the 412-706-909 Auxiliary Fuel Kirkes been installed

The Intermation contempt herein supplements the information of the leaste Fitght Manual For Limitations. Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual.

Boll Helicopter TEXTRON

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INTRODUCTION

The Austriary Fuel Kit provides additional hiel capecity to surered the remyslof the helicopter. The kit consists of a left and night ausiliary fuel tests, and the hardware and wising necessary to complete the installation. The left or right auxiliary fuel test, may be removed as operational requirements dictate.

One tuel tenk provides an additional 15.3 U.S. gallons 461.7 Mars] of tuol. Both fuel tanks combined, provide additional 32.6 U.S. gallons [123.4 Bars] of fuel

Section 1

LIMITATIONS

WEIGHT/CG LIMITATIONS

NOTE

The contents of this supplement shall be used in conjunction with the basic Flight Manual for helicopters equipped with the 412-706-009 Auxiliary Fuel Tank Kit installed

FUEL AND OIL LIMITATIONS

FUEL SYSTEM CAPACITIES

Basic system with left to right auxiliary took:

Total usable fuel capacity is 346.7 U.S. gations (1312.3 have).

Books system with both auxiliary conks:

Total utable fuel capacity is 363.0 U.S. gallons 173 74.1 State).

WEIGHT AND BALANCE

Actual weight change shall be determined after kit is installed and ballest medjusted, if hecessary, to retain gross weight CG within allowable limits

Section 2

NORMAL PROCEDURES

IN-FLIGHT OPERATION

CAUTION

WHEN DNE CABIN MOUNTED AUXILIARY FUEL TANK ONLY IS USED. THE TANK INTERCONNECT SWITCH ON THE COCKPIT FUEL PANEL MUST BE PLACED IN THE OPEN POSITION WHEN THE FUEL QUANTITY INDICATION ON THE LOW SIDE WHICH DOES NOT HAVE AN AUXILIARY TANK, REDUCES TO APPROXIMATELY 500 LBS. THIS WILL ALLOW THE AUXILIARY FUEL TO BE SHARED BY BOTH ENGINE FEED AND PRECLUDE THE TANKS POSSIBILITY OF PURL EXHAUSTION TO THE ENGINE BEING SUPPLIED BY THE SIDE WHICH DOES NOT HAVE ΑN AUXILIARY TANK. THE AUTOMATIC PEATURE OF THE TANK INTERCONNECT VALVE MAY NOT FUNCTION WITH ONLY ONE AUXILIANY TANK INSTALLEO.

EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic manual.

PERFORMANCE

No change from basic marrial

MANUFACTURER'S DATA

WEIGHT AND BALANCE

AUXILIARY FUEL SYSTEM

AUXILIARY FUEL SYSTEM SERVICING

The sustincy fivel tanks are interconnected with the basic fivel system to allow gravity flow of auxiliary fivel into main fivel cells as fivel is consumed. The auxiliary fivel system is serviced simultaneously with the besic fivel system through the single filter part located on the aft right side of the fivelage.

AUXILIARY FOEL LOADING TABLES

Total usable fuel capacity with 412-705-009 Auxiliary Fuel Kir (both renkyl installed in 363.0 U.S. pallons (1374.1 liters).

Total usable fuel capacity with one tank (left of sight) installed is 346.7 U.S. gallors (1312.3 figer).

First loading tables are presented for weight and behand computations in both English and Matric units. These tables shall be used in hou of the tables for the basic fuel system when either or both sublikely fuel tanks are installed. Weights and moments listed herein represent total fuel on board to include that contained in basic fuel calls. Refer to table 1-1 and 1-2 for English or 1-1M and 1-2M for Metric when both left and right enaithery tables are installed. Tables 1-3 and 1-4 for English or 1-3M and 1-4M for Metric topic to single sustingly took installed on before right.

Table 1-7. Fuel loading with laft and right suchlary ranks (two 18.3 gel.) — longitudinal (English)

	Longitudinal									
	Vii Bai #P4 [6	SCOTES COL	Born	Jan A, A1 or JP 515 & UsiU S (Gelovi)						
Ouerosy (U.S. Gall)	Weight (Pouros)	og Ingeren	Mamers Ile-Jul	Quartery (U.S. Cal)	Weght Promotel	CG Unchest	Mumar do-Lbi			
10	66	138 4	8061	10	ês:	100.4	247			
20	130	128 6	18146	20	198	139.8	. 838			
20	195	1388	27284	30	234	199.8	2051			
40	380	138 B	30374	40	272	199.9	3805			
50	325	1388	#5468	50	34/0	199.9	4758			
580	379	139 9	53022	<u>- 58.9</u>	997	iás s	5664			
BCI	390	141-0	9499C	80	408	1 4 1 , N	5752			
70	455	145.4	86:57	70	476	145.4	6971			
80	520	148 4	77168	90	544	140.4	MC73			
RCI	585	150.6	8810*	BCI	812	150.6	8216			
190	650	152 😭	98930	100	нно	1822	16349			
110	715	153 5	109753	110	748	163.5	I 'ABI			
120	780	154.7	120666	120	61-6	164.7	17027			
130	846	155 7	13:587	130	RR4	165.7	13763			
140	4.0	156.5	142415	140	852	166.5	14888			
150	675	157 2	153276	150	1070	167 Z	16004			
160	8Ç4Ç	157.9	164218	180	ICER	167.9	17178			
110	1166	158.6	175253	170	1156	168.6	16334			
172-6	**22	158 B	178174	7 177 6	1174	158.8	18643			
180	1170	156.2	182754	180	1774	156.2	19118			
190	1236	1527	1885AS	190	1792	162.7	19726			
200	M200	1498	194740	700	1360	149 B	20372			
205.8	+318	148 2	198292	1 205 0	1999	149.2	20799			
210	1365	146.7	202978	210	1428	I ≜ B.7	21234			
220	1430	149 9	214357	770	1496	149.9	22425			
230	1495	151 I	225895	230	1554	151.1	23632			
240	156C	152.2	297432	740	1637	152.2	24839			
250	1625	153.2	248950	750	LTOO	153.2	26044			
260	1890	154.0	280260	260	1755	154.0	27227			
270	1755	2 54 8	271874	270	1935	154 B	28421			
275 7	1792	155.7	7 (81 8	_ 276 7	1875	155.2	29100			
260	1820	154.7	281554	260	1904	154 T	29454			
290	1885	153 I	7HATM2	290	1977	153.2	30211			
100	1950	1919	285205	300	2040	151 9	90987			
110	2015	1907	303661	310	2108	1507	31787			
120	2300	149.4	310767	320	2176	149.4	92509			
127.7	2130	148 7	316731	4 327.1	2228	149.7	99190			
130	2145	149.0	319805	330	2244	1490	22435			
340	2710	149 7	330937	340	73+2	1497	34814			
350	2275	150.4	342160	350	22 8 3	150.4	11795			
380	2340	151.2	353908	360	2448	151.3	37313			
361 o	2360	151.3	357068	■ 353.0	1460	151 3	37366			

MCTC: All data above represents usable fuel (bears and succitary: David on nominal density at 15°C (68°F).

Custory at which G6 of foot changes direction.

[△] Guardity resulting in maximum forward CG of tell-cuptor rationy weigher.

Quantity resulting in mentions and EG of headopte, progressingly 6520 to or leads.

Quantity resulting it indistribute att CC of helicopher tweethr empty more man 6520 to...

Table 1-1M. Fuel loading with left and right auxiliary tanks I two 51.7 liter) — longitudinal (Metric)

		das'	Lengu			
رو نان د 1	Mar. P.510	Jak 4		0 779 kg.hkg	Jedê brijê.44	
CK IMPI	Venight 1-gt	Campus Bigss	Morean (kg mod	mw. ca	Weight (Ag)	Diseasony Idens
3541 135	12.6	40	110479	3541	31.7	40
3547 231	K5 2	10	22097f.	3547	63.3	80
3551 347	97 D	120	332319	\$651	80.5	125
3557 460	100.4	180	447579	3552	124.6	160
3557 578	163.0	200	553402	1552	156.0	200
3553 eas	179 9	1 2207	610761	3553	171 9	220 7
3632 24	185-6	240	679184	3632	IR7 Č	7afi
3776 854	22 8 2	280	B1764:	3726	218 i	280
3795 389	280 II	520	946084	3795	240 3	720
3048 1729	287 4	380	1070978	3949	280 1	160
3006 1366	225.0	400	210878	3996	5116	400
3917 1404	35H K	110	134/748	3917	342.8	daC
3947 1544	381.2	490	475783	3947	373.ĕ	48Č
3873 1643	427.9	520	'6082AT	3970	405	52C
388H 1820	4664	MO	779566	3999	a)6 2	ééč
4300 1950	4BÃO	600	187333A	4009	a67 a	GOC
4376 2096	521 6	640	2007364	1026	498 G	GaG
4000 7146	502.3	- 653.2	2021990	4033	508.e	693.2
3973 220	564 2	690	21Cad9#	3973	529.7	680
3878 227	586 B	720	2)75731	3879	56C.9	72C
3800 215	519 £	760	7749600	3800	592 C	76C
3766 23M	63 ∓ C	- 7733	2284226	3765	606.7	778.6
3785 2463	6620	600	2398812	3785	623.2	80C
3015 261	002 V 684 G	640	2496536	3815	924.2 G§a.a	eac
3843 225	717 Z	890	2634377	3843		RSC
3874 290	749 8	920		3874	G89.5 7'6.7	92C
3898 305	782 a	900	2776496	3893	747.E	92C 96C
3877 119			2919672		779 C	
3841 3344	8153 8475	1000 1040	1059238	3977 3977		1000
3847 335		: \C43.7	1192998		8,0.5	1040
	850 G		3204846	3045	8,30	1043 1
3907 3431	880 Z	1080	3285859	3907	gal 3	1086
3971 3533	9120	1120	13 <i>)/da</i> y	3871	872.5	1126
3838 352:	846 4	1160	2468617	3839	903.6	HEG
3807 377	978 0	1200	3558784	3807	914.8	120C
7775 BM1	910 7	. 1340.5	3647994	3776	496 '	124C 2
396C 308C	949 2	1280	7784980	3800	997 '	1280
anae +103	976 0	1020	3928°CG	3820	1028.3	1320
3030 4254	108 4	1365	4065877	3838	1059 4	1360
3943 4303	1188	1774 I	4113547	ypa3	10764	1374 (

NOTE. As you apply represent that follows you analysis and numbers as a second province of 15°C 159°F).

Quantity as which CB of feel category direction.

Charming resulting in maximum forward CC of February in later view #11.

[.] Quantity resulting in minimum all CG of helicultur (weight emery 2957 kg of legal

Quantes resulting in mannancial CG of help, preclaying his impry move than 25%? agr.

Table 1-2 Fuel loading with left and right numbery tanks (two 16.3 gal.) — leteral (English)

_				Lai	دار			
_		at 6 n° .12-4 16	Statis No	lanı	Jes A	A Lor JP 6-A	STMD 5 Gale)NI
	Quechty U.S. Gally	Weight (Mounds)	CO Inchesi	Manieni ilo Uhi	Quantas IJ S. Gan	Weight (Pounds)	CG (hones)	Munant -m-Le-
_	10	es	٥	¢	10	HĤ	:1	
	20	120	9	Ċ	20	.78	0	:1
	30	195	9	Ľ	טנ	204	3	7
	40	260	o o	Ľ	40	277	п	2
	50 54 B	325	0	Ľ.	50	:1411	3	2
	80	390	0 0.03	l: -12	1 54 C	371 468	0 00	17
	70	1967	-0 OK	-77	70	476	·n ns	79
	800	520	005	26	• ma	770 544	-0 06	27
	97	305	0.04	-23	80	915	-0 00	2
	100	650	0.04	-20	150	680	0 04	27
	110	715	-0 03	-21	iĭŏ	748	0 03	22
	120	78G	0.03	-23	120	áīĞ	0.03	21
	130	845	2.73	75	130	884	-0.03	27
	160	916	ก่อง	27	140	952	0.03	29
	160	976	0.03	29	150	1020	0.03	91
	160	IOAC	9.02	-21	160	1088	0.02	22
	175	1105	0.02	22	170	1.56	-0.02	-23
•	172.6	1122	9.02	22	172.6	1.74	-0.02	-23
	190	1170	0.03	35	180	1224	-0.03	97
	190	1275	044	50]	190	1292	.0 ca	588
	200	1300	0.55	715	290	1360	-0.55	748
•	205.9	1837	0.60	B02	- 205.8	1299	-0.60	839
	210	1365	0.59	805	■ 210	1428	0.59	ومع
	229	1440	0.56	Bul	220	1496	-0.56	838
	230	1495	0.54	-807	290	1584	-0.54	H45
	240	1560	0.52	-811	240	1632	-0.52	-H49
	250	1625	စုည		! 250.	1.700	-0 Su	-859
	250	1690 1766	045	·811	280	1788	U.48	849
	270 280	1820	044	-BU/	270	1838	-0 411	043
	290	1885	3 43	-8u i -8i i	280 290	1904 1972	-11.44 -11.43	-838
	390	1950	-041	-BUC	330	2040	-11 4.1	-848 838
	310	2015	340	AUE	:1111	21.4H	-0.40	843
	920	2019	0 39	·A11	1 :120	7176	-11 78	-84A
	390	2145	0 39	B1=	::::::	2244	חה.ח	063
	340	2210	036	·79E	740	2717	-0.76	003
	350	2275	0 35	-798	360	2380	-0.36	833
	UAK	2340	0.34	.79E	j 360	2448	-0 34	832
	3650	2380	014	-Año	3630	7469	0 34	839
	-				****		+	***

NOTE: 40 date above represents coable for liberic and auxiliary) beend on normal density at 15°C (58°C).

' Quarrie, st which CC of fuer changes a recision.

Diagramy resulting in maximum largest CG of hedgapter

Table 1-2M. Fuel loading with left and right auxiliary tanks (two 61.7 liter) — leteral (Metric)

			la	ie 31			
	Jinbor Jii 4	10 7 15 Fg 1 Is	r·I	Jel	a Atm Phys	0.819 kg (Apr	
Guarticy distric	Wesque kg)	1.3	Warners Ng mest	Universe Others	Mercelli:	CG.	Muman
₽J.	91.2	_ ;	_ ^	ac	22 C	0	
90	62.)	Ċ	9	l ac	60.2	2	
120	47.4	ė	ā	120	47.7	ó	
15)	124 €	0	a a	160	170.4	á	
255	199.8	ė	- 0	200	163.6	0	
206.6	16: 0	į.	.)	la riaccio	152.4	9	
340	187.0		IBŤ	1 240	195.6	í	. 3
292	21e		219	280	27.0 7	i	, ,
332.7	396.6		236	1 502.7	216.7	i	24
320	249 7		249	320	200.3	i	16
360	28C a	- 1	-290	V.0	293.4	i	14
4)0	71 6	- 1	-512	490	326.0	i	22
245	1478	- 1	-525	440	958.6	-1	35
480	173 9		374	420	391.7	i	25
530	105	- :	405	520	423.5	i	43
563	436.2		406	560	450.4	i	45
633	a67.4	i	-467	820	482 C	i	48
640	438.6	:	499	540	521.6	i	53
650.2	906.8		509	953.2	552.7	i	Ñ
680	676.1	8	4738	550	554.2	-ii	44.
720	660.9	15	6175	720	NEA R	-11	- 545
760	9920	iá	8288	750	FIP 4	14	Nb:
778 6	2 920	16	-9098	775.6	634.5	15	25
800	623.2	15	·9J48	■ 000	652 G	-15	218
840	624 4	13	9162	940	602 G	14	752
	689.5	13			7172	13	-92
AAC			691) 9317	950 920	749 8		97/
920	7167 7478	13	8974		782 4	17	93)
960	7750		9348	950 1000		-12	.27
1000		12			915-0 947-6	11	93
1040	810 Z 841 3	!!	6912 426a	1049		- ;;	4A,
1000		!!			890.2		
1120	672.5	!!	9598	1120	9128	-!!	1004
1160	903.6	19	2076	1160	410.1	!0	241
1200	934.8	10	9348	1200	976-0	-10	971
1240	968.0	19	9660	1240	1010.6	-10	10.10
1280	947 (9	6974	1250	1043.2	-ā	-431
1350	1078.3	9	4255	1320	1075.5	9	HM
1360	1059.4		-6535	1000	. 108'1	,	947
1374.1	1070.4	-9	56.14	13741	1119 9	9	1003

NOTE: All data above represents usance their chastic and availably based on noticoal density at 15°C (50°C)

^{1.} Quantity at which CG at Inclickunges decimen-

 [■] Country resulting in infamous is alread CG of the scopes;

Table 1-3. Fuel loading with left or right auxiliary tanks (one 16.3 gal.) — longitudinal (English)

			ng	uadinsl			
	ler Blor JP 4 ro	i.SCUPL S GA	lent .	Jet A.	At at JP 516	въъ.∨.з. о⊯н	INI
Quantity	Vergiri	20	Yorkel] Оналиц	Merghi	55	Moreor
m 2 Chri	Pounds	[knthes]	र्गत किर्म	10 S. Gat:	Aurican	disches:	·IILUI
10	56	139 4	9051	10	55	139,4	9179
70	197	139 6	18119	20	136	119 €	18986
360	196	138 8	21261	30	204	139.6	28519
40	280	178 B	35314	40	272	1]9 9	38063
50	325	138.3	45469	50	340	139.9	47566
58.7	379	138.8	53022	△ 58.9	397	119.9	\$5540
90	777	140 9	54951	1 90	405	14C 9	67487
70	455	146.8	44334	20	476	145 8	69401
:0	520	14N N	77440	1 80	544	149 G	81056
20	505	151.5	55628	30	012	151.5	92718
100	650	150 Z	99550	100	690	162.2	1041 (5
110	715	154 8	110652	110	748	194.6	115790
170	797	156.0	12169)	120	B16	156 0	127296
110	BEN	157.0	132655	130	894	157.0	138798
146	ŘIO.	160 Z	143952	110	958	158.2	150606
150	975	159.2	155220	150	1020	199.2	162384
1 156 1	1016	159.7	162255	1 1963	1:363	159.7	169761
150	1040	158.0	154320	150	1/288	158.0	171904
170	1105	152.4	110612	110	1156	154.4	138495
186	1170	150.8	115553	180	1224	150.9	184102
199.4	1231	ILBI	182311	1 185 4	1298	146.1	190753
200	1300	149 6	134490	200	1960	149.6	203456
200	1385	150.B	205842	210	1428	150.8	315348
550-	1430	151.9	217217	220	1496	151.9	127347
230	1495	152.9	778586	230	1584	152.9	139136
240	1550	153.9	210084	240	1895	153.9	251165
250	1626	154,6	251713	250	1799	154.9	269930
11 758 4	1696	155.5	252173	259.4	1764	156.6	274302
2/0	1755	154 1	270446	270	1836	12-1.	482928
280	1820	152.6	277732	780	1934	152.0	190550
290	1895	151.2	285012	290	1975	151.2	199165
300	1950	150 0	292500	300	2240	150.0	306000
1 311 4	2024	IABO	300756	. 3114	2111	142.6	31 4 585
326	2020	149.0	310544	920	2176	149 3	324877
936	2145	150.1	321955	330	2244	150.1	339824
űč	2210	150.9	333439	360	2912	150.9	348681
■ 346 7	2254	151.4	3412 56	■ 346.7	2358	151.4	357001
● 300 ·	2200	1916	341290	340.7	7356	151.4	357991

NOTE: All data show represents usable fuel pasts and existent based on normal centity of 1540 (5916).

Oranitry at which CG of fuel changes described

[.] Gut of the resulting in recognism liveward CO of tratecopies for any aways;

Quentity residing in maximum art CB of noticestor (weight empty 6830 in at lets).

Quantity resulting in massion on CB of helicopte, type grip courty maps than 8830 the

Table 1-3M Fuel loading with left or right excillary tanks ione 61.7 liter) — fongitudinal [Metric]

constitutional									
	Jer Blov Jik 4	(d. 278 kg/m	ы	Jer A. Af or JP 6 13.815 kg/mer-					
Countrie	Waget	ca	Mament	Cuponty	Wegni	Çij	Moder		
digest	.edi	Imost	ng-mmi	(kre-s)	IFU	,—III.I	·kg-mn		
40	.11.2	3541	110479	40	32.6	3541	11543		
40	62.3	3547	220978	90	b5 2	3547	23120		
120	90.5	.1551	933019	130	979	3551	34726		
180	174 K	.1552	442579	160	.30 *	3552	46316		
200	155 8	J=52	5534U2	200	163.0	3562	5788		
220.7	171.9	3553	610761	220 7	179.9	3553	53916		
24.7	1871:	IE317	6 8 31 (9	240	195.6	3637	71139		
200	218.1	.1739	815478	299	228.2	3739	85324		
320	249.3	J815	951089	222	260 B	3815	9919		
363	200: 4	36.7	1085428	282	293.4	3871	11357		
◆ □□	311.6	1217	1223537	499	326.3	3917	12749		
443	342.8	1952	1354746	449	358.6	3992	:457.0		
48ÿ	373.9	1867	1489244	480	191.2	3983	15581		
520	405	4011	1825686	523	a23.8	4013	17907		
560	43E 7	4006	780500	560	456.4	4076	19120		
581.5	aec.a	4057	1889486	- 691.6	462.1	4057	19558		
600	407.4	4046	1801100	600	489 0	a0a6	197841		
M40	488.6	1927	1958002	640	521.0	1927	20483		
680	529.7	Jose	2002089	683	550.2	1818	21270		
7171	7231 / 6 KHZ	1010	2101453	- 717.1	584.4	1762	21986		
			2111228	723	586 B	1764	27387		
720	540.9	3.70A		760		3866	23637		
780	592.0	5900	224960C	900	619.4	3833			
IIUL	623.1	3633	2388728		692.0		74AU1		
нац	6544	3007	2526636	840	eea g	3801	75437		
886	6255	3989	266591C	880	237.2	3869	77691		
920	716 1	3917	2807314	929	149.8	39)7	20360		
яні:	747 E	3240	7946332	960	1874	3940	30876		
923.0	765.0	3050	2021750	1 982 0	800.3	7940	31211		
1300	772 0	3934	30 6458 6	1000	815.0	3934	37362		
HÇ4C	210 3	3624	11-4513	1040	847.6	3894	JJ505		
H:HI:	841.3	2255	:244052	1080	880.2	3896	13890		
1120	8775	3K73	1236668	1120	317 E	3423	J4896		
1160	903 b	3700	1454644	1.60	315 a	3790	35830		
1170 €	915.1	3775	3465E26	1.1178.5	560.5	3779	JG268		
1200	254 h	3757	2540022	1200	9780	3787	37036		
1240	966.0	3800	2677562	1240	10106	3807	J84/J		
1240	997 (3830	2819893	1285	0040.7	2830	19954		
13123	1055.3	3045	190E 244	■ \11/2 1	1069.5	3945	41432		

NOTE: All data above represents orgitie likelithetic and evaluary) based on immost density of 15°C (59°F)

Quantity or which DG of feel changes direction.

[.] Gunning trailing in maturious forward CG of not copts (at any weight)

⁻ Quantity resulting in majorational) CG of helicopied weight empty 2007 kg to keep

Quantity regulting in mysams mixth CG or nate opter (weight arrive, word than 3007 kg).

Table 1-4. Fuel loading with left or right auxiliary tanks (one 16.3 gal.) — interal (English) (Sheet 1 of 2)

			Le	and .					
Jet Biox JP-4 (8.5) NO.S. Cation(
				16.2 Left)	Laural I 1	6 3 NyMI			
	artily 5 Ga i	Wanget (Poor da)	CG illocoop	Muneral Holloy	CG Hautest	Mumare -in thi			
	ıu	Eb	ı:	۰	п	J			
	20	130	U		II	i			
	30	195	0	9	0	0			
	40	260	6	9	0	0			
	Sü	125	e	0	п	п			
	94.6	399	0	9	u	Ш			
• •	ea	190	-0.04	15	0.09	20			
	70	455	42.4.1	195	חה ח	173			
	60-	52G	0.64	431	U.HU	416			
	90	:es	1.20	302	1.15	873			
	100	650	-1.58	1077	1.50	975			
	110	719	1.82	1301	1 77	. 288			
	120	780	2.07	1615	2.01	.566			
	110	145	-2.27	1919	2 22	1876			
	140	±10°	241	1211	2.19	21.75			
	150	976	2.52	2451	2.49	2428			
•	152.6	497	2.53	-2510	2 49	2470			
•	156.3	1016	2.44	2520					
	157.8	1026	261	2739					
	160	1046	2 69	2193	211	2215			
	1/0	1105	200	7977	1.6.1	2022			
	180	1176	263	3147	1.57	1832			
	182 3	1188	2.62	3194					
	190	1135	-2.67	32 3 T	1.37	1692			
	200	1300	254	4907	1 29	1877			
	210	1365	2 42	3303	5.23	-679			
	220	1430	230	3289	' 18	1687			
	230	14.25	7 70	3289	2.11	1669			
	240	1560	7 11	3292	1 08	1686			
	260	1625	2 0 3	3299	1 04	1690			
	240	1590	195	3786	1.00	1690			
	270	1756	183	3299	0.96	1685			
	280	1320	181	3294	0.92	1674			
	290	1895	1.76	-3288	0.33	1578			
	300	1950	162	3298	0.68	1622			
	310	2015	164	3905	0.54	1691			
	320	2080	1 56	3286	0.81	1689			
	330	2145	1.54	3000	0.74	1621			
	340	2210	1 49	-3293	0.76	1630			
	346.7	2254	1 15	3291	0.75	1591			

^{1.} Quantity at which CG of the impages exection.

^{***} Quantum as which CG of the inhanges one, not for refl according table only

¹¹¹ Quantity at which CL of the changes direction fronget and entrankingly

Quantity resolving in presonautor lateral CC of he is potential factorismy tank.

Quantities involving in impromote lateral CG of neticology for oges quadrate rank.

Table 1-4. Fuelloading with left or right auxiliary ranks (one 18.3 gal.) — fateral (English) (Shaet 2)

			0184		
		JINA A1 MUP-54	6.8 LLo U.S. Gallano		
		Laterate	€ 31vli:	Latera-11	6 3 Proprie
Шавтогу	Weight	C6	Morrent	66	Moment
Ju. 8. Ga +	(Paucids)	-Inches:]u-[h]	lindresi	IM CDI
16	68	۰	u	υ	0
20	116	U	ů.	0	0
36	264	0	o	V	0
40	272	0	D	II	ů
50	.140	o	e e	0	0
54.6	331	J	G G	0	0
. 50	408	0.04	16	-C C8	-211
70	426	0.43	705	0.38	IAI
MO	544	0.84	457	0 e0	A 39
90	512	1.20	734	1.15	704
100	550	-1.58	-1034	1.50	1020
110	74 H	1 82	.1361	177	1724
120	916	2 0 7	1689	5.0.	1640
190	964	2 77	-27QJ	132	.865
140	852	2 43	-2313	2 39	2275
150	1000	2.52	2570	2.49	7540
► 152.G	1039	2 60	7626	3 4 8	2583
156.3	13163	2 48	-2635		
1578	1973	2.67	2865		
160	1388	7 68	-2 82 T	7.13	2517
173	1158	2 89	.2110	183	2115
180	1224	2.69	1299	151	1977
4 CA'	1243	-7 EH	-0001		
IRT	1797	-2 H7	3 453	1 31	1770
260	1900	2.54	3454	1.29	1754
216	1028	2 42	-3466	1.25	1756
770	LOST	2 30	3441	1 8	1765
230	1584	2.20)aa	1.13	1767
240	1632	2 16	·]a##	Lan	1763
250	1700	-7 CO	1451	1 34	1768
260	1.7HH	· F.05	2448	1 00	1768
270	1836	. 88	3452	3.86	1763
260	1904	-1.61	1440	3 92	1752
79D	1977	-1.75	2451	u 89	1755
100	2046	-1.69	3248	0 RG	1764
310	21 0e	1.64	3457	0.04	1771
120	21.76	1.58	3438	U-Ú-I	1763
210	4244	-1 54	-3456	0.76	1750
346	23:7	1 49	3445	D-76	1757
346.7	7356	146	3443	D 75	1769

Quarticle at weigh GG of fuer changes proming.

^{11.} Quantity of which CE of fael the programment for left questiony cack only

^{***} Quantity at which CG of fact that gas direction to right accessivition only

Quantity resulting in maximum lateral CG of netropier for left socklary rank.

Guantity resulting in maximum limited CG of helicopius for oghi availars, limit.

Table 1-4M. Fuel feeding with left or right smalllery tanks (one 61.7 liter) — laterel [Metric] (Sheat 1 of 2)

		Lan	ural					
Jet B or JP 4 (O 777 hg/l mil								
		L grenal (i	51 Zaelil	Lennalië	1.7 9 ph			
Chamming	(Approximate)	66	Venen	CG	Moment			
[200es]	l∎pl	Imenil	Fg vard		-kg mm3			
40	31.2	0	0	0	II			
86	62.3	6	9	e e	0			
120	90.5	e	9	0	0			
180	124.6	0	0	0	II			
200	199.8	6	a	۰	9			
20€ €	160.9	•	2	ა	0			
140	187.0	4	749	2	1/4			
/80	2.81	15	-3272	14	2053			
320	249.3	26	-6482	25	6231			
290	280.4	35	.9 <u>8</u> 14	34	9534			
400	3116	13	13399	42	10057			
440	347.9	50	-17140	49	16797			
490	2728	55	20938	55	20555			
520	405.1	61	24711	60	2+306			
560	436.2	G#.	27917	63	27491			
+ 4776	460.0	-64	-28800	к3	28350			
ARLA	460 0	63	29040					
597.1	485 1	-88	31627					
800	a67.a	GB	31763	22	25737			
640	498 6	-БВ	23905	47	33434			
KON	579 7	-08	36020	40	5,188			
8918	538.9	GB	35645					
720	560 9	·68	·:IR141	36	10632			
760	692 C	-84	97688	33	19976			
BCC	823.2	61	39015	33	19719			
840	054,4	-56	-37955	30	1#632			
860	NHS 5	56	97703	28	19198			
930	716.7	52	37985	27	19151			
960	747.e	51	-30130	76	1944)			
1000	779 D	49	38171	25	19475			
1040	נטוא	47	38079	24	12445			
1080	841.3	15	37869	23	19350			
1120	672.5	-43	-37510	22	19195			
1150	903.6	47	-07951	21	19978			
1200	234 B	<u> </u>	28 127	Ži	18631			
1240	966.0	39	37674	23	19320			
1280	911 1	-38	-37890	19	18945			
13173	1022.0	97	-37825	19	19674			

Quantity at which EQ of fuel changes describe.

^{**} Directory or which ISG of first changes direction for felt auxiliary tank univ-

Countries resulting in maximum lateral CG of helicopter for IRM booklety lank.

Quantity resulting in transmission largest CG of helicopies for right environment.

Teble 1-4M. Evel looding with left or right auxillary tanks (one 61 7 liter) — lateral (Method) (Sheet 2)

			La	leral		
			Jan A. Allerde	5 (3 D (5 kg/krec)		
	_			S1 7 Lein		8° 7 Neghri
	Quarter	Margin	ills.	Morreud	ca	Vomen
	Бина	-6.01	inmi	thy most	10001;	No cont
	40	12.5	0	D.	a	0
	HE:	65.2	9	e e	ú	Ш
	120	97.5	0	0	0	0
	'60	110.4	υ	D	7	ņ
	200	163.0	0	0	2	Ü
-	208.6	168 4	0	6	9	û
	240	195.6	4	782	7	391
	700	228.2	15	3423	14	31195
	120	Jan I	26	6791	25	6520
	160	293.4	>5	10769	74	8976
	400	3260	43	14018	42	10892
	440	310	50	17920		17571
	480	291 2	56	21907	55	₹151G
	120	423.8	ь.	25862	H2	2547H
	560	4554	M	585.0	63	28753
٠	517.5	470.7	 H	10125	63	38004
	591.5	462 1	63	20172	na	1000
-,	29/1	4866	68	33088		
•	500	489 0	00 46	11257		
	640	989 O	8		99	26895
	880	521.5 554.7		25469	47	74515
			68	37686	40	22168
	69 i B	543 t	h#.	18338		
•	720	986.8	68	29902	35	20530
	780	0.84	- 64	39642	33	20440
	800	852 D	₹1	29772	31	20212
	840	684.6	56	19707	30	20638
	ппп	717 2	55	19448	28	20082
	920	749 A	53	29719	37	20245
	960	782 4	51	.19902	26	20342
	1000	816.0	49	39 8 35	75	20375
	1040	8477	47	3 98 17	34	20342
	1080	880.3	45	19608	27	20246
	1125	912.6	#3	19250	27	70087
	1.80	345.4	42	34707	21	19853
	1200	978 0	41	40088	21	7053B
	1745	1010.6	36	194'3	20	70217
	1283	1043.2	12	29842	19	19821
	1312.3	1049.5	17	19772	19	20321

Duantity at which EG to fael changes disjourn.

^{**} Collectify 41 w/NotifiCS of foet changes direction for letherent any rank only

Disability resulting in maximum, good CG of heteropter for tell purposery such

Eventuly reaching in maximum familia CIS of helicopter for right governing (gre.)



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT TWO-SPEED INTERNAL HOIST

(412-899-223)
OR
(214-706-003)
CERTIFIED
SEPTEMBER 19, 1988

This supplement shall be attached to the Model 412 & 412EP Flight Manual when the 412-899-223 or 214-706-003 internal Hoist has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

Bell Helicepter TEXTRON

POST OFFICE SOLUME - FORE WOMEN INLESS 18-01

REISSUE — MAY 11, 1995

COMMENT HORSE
COMMENT HAS
SELL SINGLE STORM
WE DELL RELICIONES INTERPRETAR
ALL MELICIONES INTERPRETAR

9H7-412-FMG-26 FAA APPROVED

NOTICE PAGE

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LOG OF REVISIONS

Revision 1 May 25, 1990

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		LOG OF	PAGES		
	PAGE	REVISION NO.	PAGE	REVISION NO.	
_	FLIGHT	MANUAL	35/36		
	Tille — NP		MANUFACTURER'S DATA		

G September 19, 1988

NOTE

Revised text is indicated by a black vertical line, insert tatest revision pages; dispose of superseded pages.

9HT-412-FMS-26 FAA APPROYEO

LOG OF APPROYED REVISIONS

Original 0	September 19,	1988
Revision 1	May 25,	1990
Arisaue	May 11,	1995

APPROYED:

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A MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76193-0170 FAA APPROVED BHT-412-FMS-26

GENERAL INFORMATION

The Two Speed Internal Holat enables cargo and emergency rescue operations in areas where fanding cannot be accomplished. The hoist can raise or lower loads up to 600 pounds (272 kilograms). The holat contains 250 usable test (76.2 meters) cable. Each of the four cable mounting locations allows the holat to be extended 90 degrees outboard. The hoist provides two extend/retrieve speeds (HIGH and LOW). With LOW speed selected, a

continuously variable spend range from zero to 125 feat/minute (36.1 meters) minute (18.2 meters) minute (18.2 meters) a continuously veriable speed range from zero to 250 feet/minute (78.2 meters/minute) is available. An electrically actuated cable outling device allows althor the pilot or hotel operator to sever the cable if necessary. A manually actuated cutting device is provided for use in the event of an electrical faiture.

LIMITATIONS

1-3. TYPES OF OPERATION

Moist operations shall be conducted under appropriate operating rules for external loads.

Passanger operations with holst instatted are approved if holst is stowed and electrical system is descripated.

Holst aperations are prohibited during instrument meteorological conditions.

1-4. FLIGHT CREW

A crewmember wearing an approved safety harness in passenger compartment is required during all phases of troist operations. Crewmember shall wear protective gloves for guiding cable during operation. The holst operating procedures and limitations.

1-5. CONFIGURATION

1-5-A. REQUIRED EQUIPMENT

Holst cable antichating guard shall be installed on standard or high skid landing gear (with or without floats) on same side of holicoptor as holst.

1-5-B. OPTIONAL EQUIPMENT

Fixed passenger step shall not be installed concurrently with internal hoist.

Retractable passenger ateps shall be stowed during hold operations. Holst operation with Hight director in coupled mode to prohibited.

Holating or lowering an empty litter in open position (except Stakes litter) is prohibited.

Refer to appropriate Flight Manual Supplement(s) for additional limitations. procedures, and performance data.

1-6. <u>WEIGHT AND CENTER OF</u> GRAVITY

Actual weight change shall be determined after hoist is installed and ballest readjusted, it necessary.

For maximum gross weight, including hoist load, refer to applicable Flight Menuel or SHT-412-FM-19 1 when increased Gross Weight and Takeoff Horsepower kit is installed.

Maximum hoist load is 600 pounds (272 kilograms). This is a structural limitation only and does not ensure that longitudinal or lateral CG will remain within approved limits. Maximum allowable holet load varies with gross weight, center of gravity, and hojet location. Refer to appropriate Hossi Loading Schedule.

NOTE

The center of gravity of holst load in Torward position is F.S. 82 (2080 mm) and B.L. 60 (1524 mm). The center of gravity of holst load in aft position is F.S. 131 (3927 mm) and B.L. 64 4 (1636 mm).

For Longitudinal vs. Lateral CG limits with internal hoist refer to internal hoist CG envelope flaure 1-1.

1-7. AIRSPEED

YNE with asymmetrical door configuration is 20 KIAS.

VNE with hinged panels locked open and cargo doors open is 20 KIA9.

VNE with hinged panets removed and cargo doors removed or secured open in 60 KIAS.

1-23. HOIST SPEED

HIGH speed -- Limited to holet loads of 300 pounds (136 kilograms) or less.

LOW speed — Limits of bosic hoist (500 pounds., 272 kilograms).

1-24. <u>HOIST DUTY CYCLE</u> LIMITATIONS

The hoist is approved for continuous operation with loads not to exceed 600 pounds (272 kilograms).

1-25. <u>ALLOWABLE HOIST</u> <u>LOAD</u>

Select halet loading schedules (ligures 1-2 through 1-5) appropriate for position in which hoist is installed.

NOTE

Holet heading echedules are based on thost adverse toading combinations of pilot, copilot, and holet operator, each weighing 170 or 290 pounds (77.1 or 90.7 kilograms), and on a weight empty CG of 0.3 inches (7.3 mm) to right of centerline prior to adding holes, if lateral CG is appreciably different or crawmamber weights are out of this range, allowable holes (ead shall be computed. For computation, seconds holes operator in forward position to be located at F.S. 67 (2210 mm) and located of F.S. 125 (3175mm) and 8.L. 40 (1016mm).

1-25-A. LEFT HOIST INSTALLATIONS

Enter appropriate schedule. Figures 1-2 through 1-5 of gross weight of helicopter prior to horsting. Proceed vertically to intersect with diagonal line representing number of crewmembers on board, top of schedule, or right cutoff fins. Proceed horizontally to left to read maximum allowable horst load. Intersecting with right outoff line gives maximum load which does not cause helicopter to exceed gross weight limitations.

Using Weight empty chart, Section 5 and left hold loading schedules ensures that both longitudinal and leteral limits are not exceeded during lifet hold operation. However, for subsequent holding, additional precautions must be taken to exceeding lorward longitudinal limits.

1-25-A-1. LEFT FORWARD HOIST LOCATION

To continue using maximum ellowable hoist capability: (Refer to figure 1-2 through 1-5)

- put holated load (people or cargo) along side of island, or
- b. when holated load is put immediately forward of island, reduce maximum holat load to 300 pounds.

WARNING

OO NOT PUT HOISTED LOAD IN FORWARD AREA OF PASSENGER COMPARTMENT UNLESS MAXIMUM HOIST LOADS ARE COMPUTED FOR THAT CONFIGURATION.

1-25-A-2. LEFT AFT HOIST LOCATION

To continue veing maximum allowable hoist capability: (Autor to figure 1-2 through 1-5)

- put holeted load along Island or immediately lorward of Island, or
- b. ensure empty weight CO is within Area A. Refer to Weight empty chart. Seption 5.

1-25-B. RIGHT HOIST INSTALLATIONS — NORMAL OPERATIONS

Right lateral limit for holet operations varies with longitudinal center of gravity of the helicopier. The loading schedules have been modified to account for this variation.

- Starting with appropriate schedule for number of crawmembers on board, enter at gross weight of helicopter prior to holpfing.
- Proceed vertically to intersect with diagonal line representing helicopter center of gravity prior to hoisting, top of schedule, or right cutoff line.
- Proceed horizontally to but to read maximum allowable hotal load.

When helicopter center of gravity is between STA. lines, interpolate to determine CG.

Interaccing right cutoff line gives maximum lood which does not cause helicopter to exceed gross weight limitations or forward longitudinal limits.

For multiple holets during a single liight, after such holes operation enter appropriate schedule at revised gross weight and proceed to new center of gravity to determine maximum allowable holet load.

EXAMPLE 1: NORMAL

Determine Holst Load when holst is in R/H FWD POISTION and arew consist of Pilot, Copilot and Holst Operator.

GIVEN:

Gross Weight - 9,500 Rbs.

CO - STA, 135.5 before holding

From appropriate 11,800 lb. GW schedule obtain holss load as follows:

Erver gross weight at 9,600 lbs.

Proceed up GW line to interpolated 5TA, 135,5

Proceed left to read holet load of 210 lbs. Point (\mathbb{A}) .

EXAMPLE 2: NORMAL

Determine Hafet Land when holes is in RIM FWD POSITION and crew consist of Plint, Copilot and Holes Operator.

GIVEN:

Gross Weight - 0.500 lbs.

CG — STA. 138.5 before holisting.

From appropriate 11,600 (b. GW schedule obtain holet load as tollows:

Enter gross weight at 9,500 lbs.

Proceed up GW line to STA, 138.5

Proceed left to read hold land of 660 lbs. Point (\bullet) .

1-25-C. FIGHT HOIST INSTALLATION - PENALTY REGION OPERATION

The dashed line on schedules represents longitudinal canter of gravity prior to holsting which will result in a gross weight center of gravity at Sta. 135.2 and B.L. 4.5 during holst operations with maximum holst londs derived using this line. This center of gravity is the corner of but not in Pensity Region shown in Limitations.

Hoisi loads derived for Hormal Operations may be increased when GW/CG combinations are forward of those represented by dashed line. Loads may be increased up to but not greater than those increased up to but not greater than those increased up to but not greater than those increased by dashed line. However, this procedure will result in operations within Penalty Region, Refer to Section 1, internal Hoist CG Envelops, for Panalty Region.

EXAMPLE 3: PENALTY REGION

Determine Holst Load when holst is in R/H FWD POSITION and crew consist of Pilot, Capitol and Holst Operator.

GIVEN:

Gross Weight - 9,500 lbs.

CO - STA. 135.5 before holeting

From appropriate 11,650 [b. GW achedule obtain holes load as previously determined in Example 1 the maximum holes load for normal operations is 210 lbs. Point (a).

To increase holes load to maximum for condition without exceeding GW/CG limits, proceed up to deshed line and read left to line 435 lbs. Point ©.

The Penalty Region is any load greater than Point (a) up to maximum load at Point (b).

For QW vs. CQ combinations att of the CQ represented by the dashed line (see Example 2), there is no Panelty Region.

1-28. <u>WEIGHT EMPTY</u> CHART

The Weight smpty chart for internal holding operations is shown in Section 5. Refer to the maintenance manual for additional information.

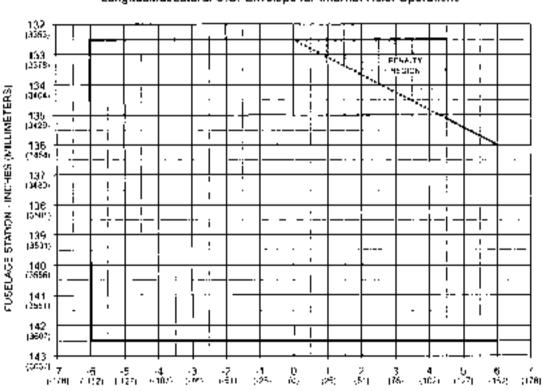
NOTE

Allowable holdt load much be computed when weight empty is not within specified guidelines, shown in Section 5.

NOTE

Allowable holst loads must be computed when AUX Fuel like are installed.

Longitudinal/Leteral C.G. Envelope for Internal Hoist Operations



LATERAL - INCHES (MILLIMETERS)

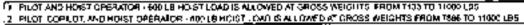
41775-24-1-4

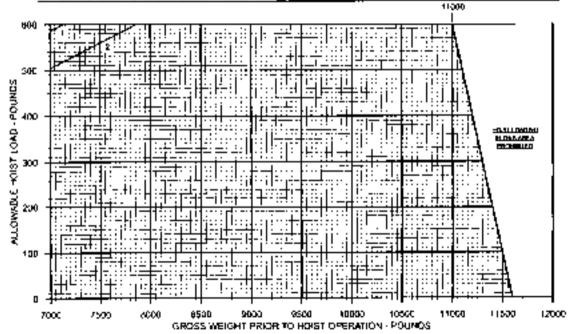
Figure 1-1. Internal hoist C.O. envelope

LH FWB POSITION

Figure 1-2.

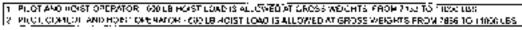
Holet loading schedules 11,600 lb. GW (English) (Sheet 1 of 8)

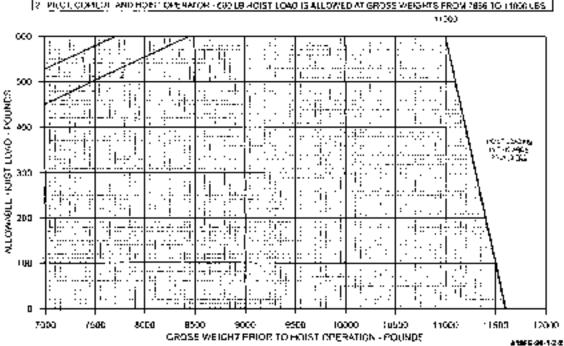




41571-18-14-14

L/H AFT POSITION





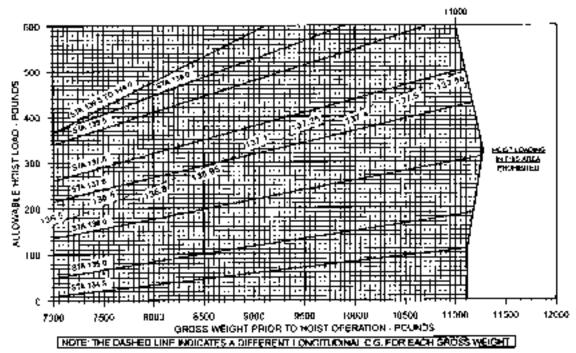
Figure

Hoist loading schedules 11,600 lb. GW (English) (Sheet 2 of 5,

R/H FWD POSITION - PILOT AND HOIST OPERATOR

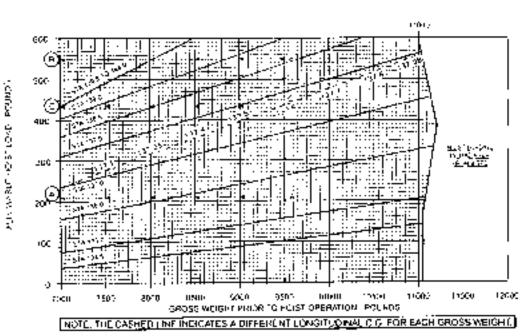
Figura 1-2.

Hotel landing schedules 11,600 lb. GW (English) (Sheet 3 of 8)



attrium (144)

R/H FWD POSITION - PILOT, COPILOT AND HOIST OPENATOR



4131-3-1-2-4

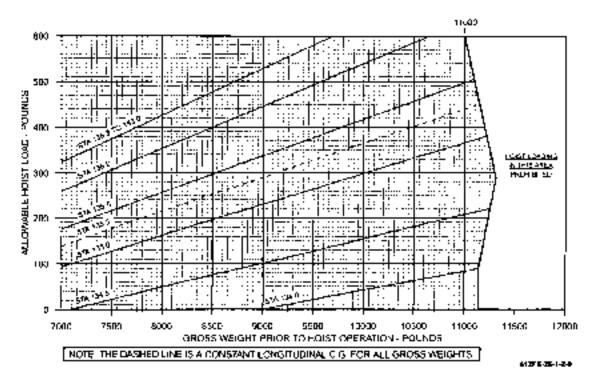
ø

Noist landing schodules 11,600 ib. GW (English) (Sheet 4 of 8)

Figure 1-2.

Holat loading schedules 11.600 lb. GW (English) (Sheet 5

R/H AFT POSITION - PILOT AND HOIST OPERATOR.





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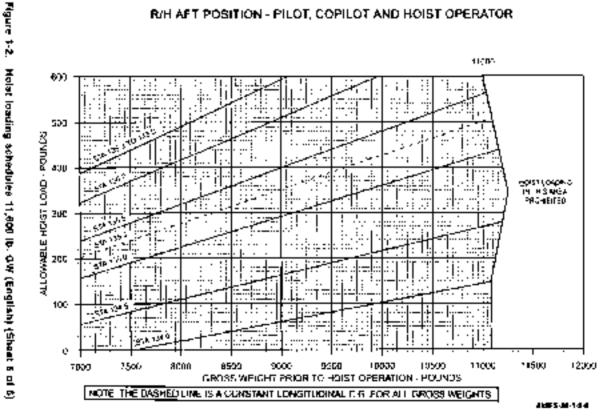




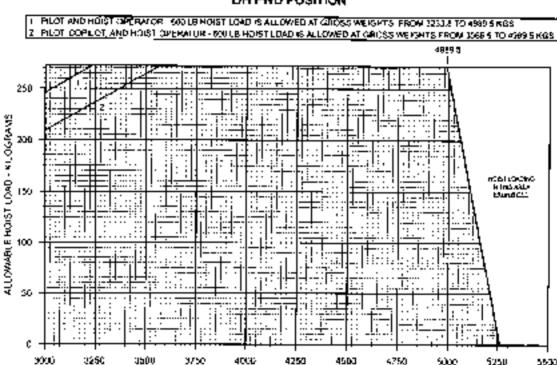




R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR



L/H FWD POSITION



GROSS WEIGHT PRIOR TO HOIST CRERATION - KILOGRAMS



Holet landing schedules 6261 kg. GW (Metrio) (Sheet 1 of 5)





4750

4503



5250

5000



48246-24-14-1

5530

L/H AFT POSITION

T PILIT AND HOIST UPERATOR - 600 LB HOIST COAD IS ALLOWED AT GROSS WEIGHTS. FROM 3499 7 KD 1999 1 KGS.
2. PILOT, COPILOT, AND HOIST OPERATOR - 600 LB HOIST COAD IS ALLOWED AT GROSS WEIGHTS FROM 3430, 5 TO 4998 5 GGS.

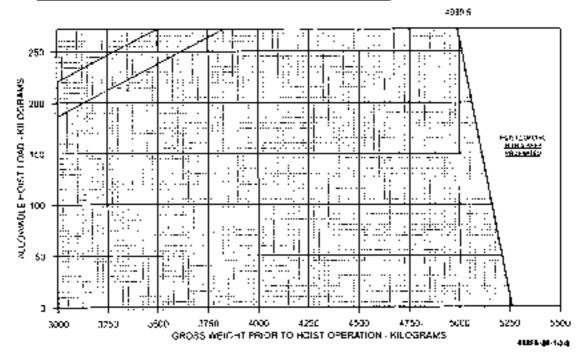
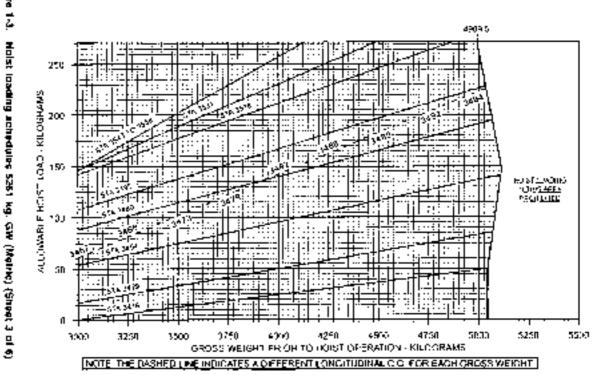


Figure 1-3.

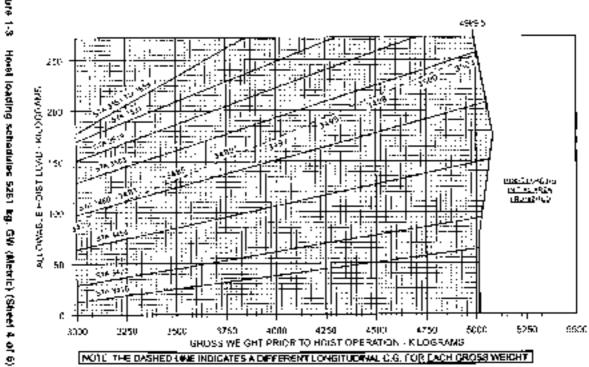
Holst loading schedules 5251 kg. QW (Metric) (Sheat 2 of 6)

R/H FWD POSITION - PILOT AND HOIST OPERATOR



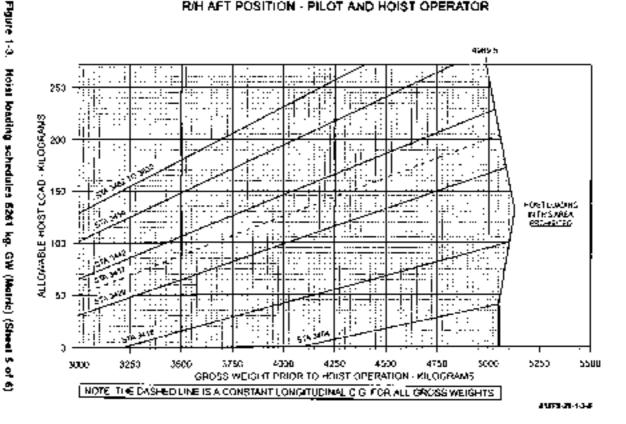
H155 #1 100

R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR

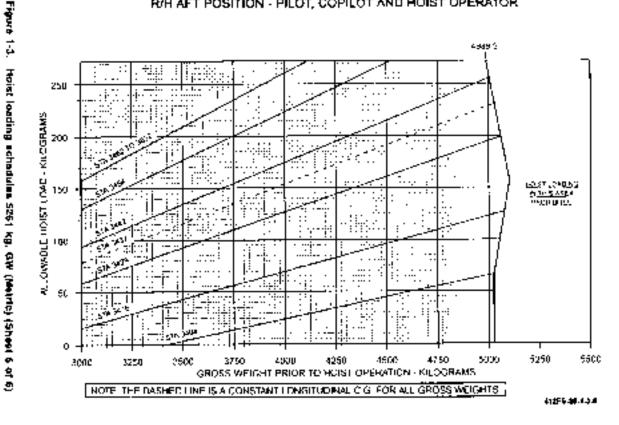


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R/H AFT POSITION - PILOT AND HOIST OPERATOR

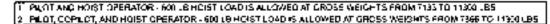


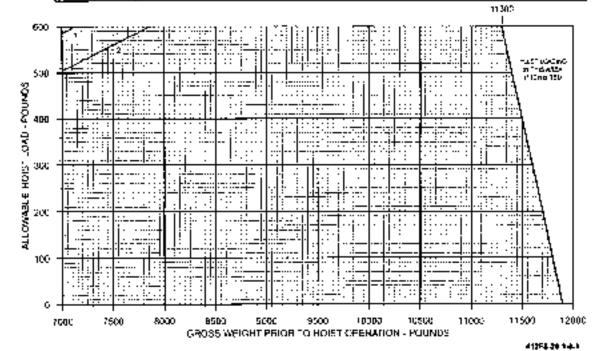
R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR



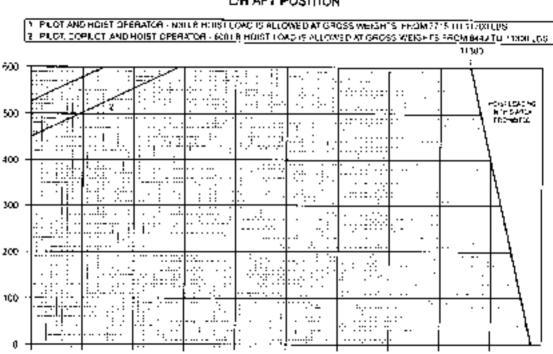
Holse loading schedules 11,800 lb. GW (English) (Sheet 1 of 5)

L/H FWD POSITION





LIH AFT POSITION



9500

GROSS WEIGHT PRIOR TO HUIST OPERATION - POUNDS

10000

10500

. 1300

9000

41**376-38**-14-4

11590

12000

Figure 1-4.

Haist loading schedules 11,900 lb. GW (English) (Sheet 2 of 6)

ALL CAPBLE HOIST LOAD - POLINDS

7000

7500

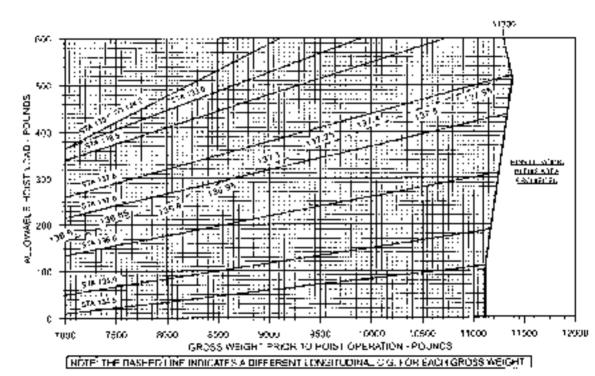
8000

8500

Figure 1-4.

Holst loading schedules 11,900 lb. GW (English) (Sheet J of 5)

R/H FWD POSITION - PILOT AND HOIST OPERATOR



41464-20-1-4-2

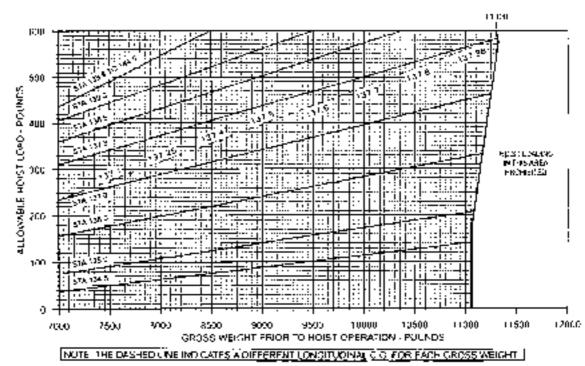








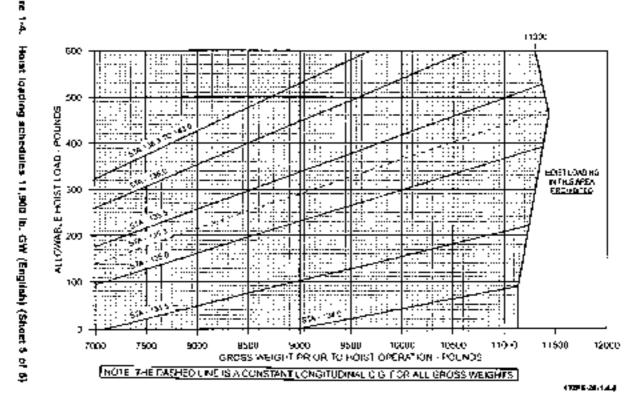
R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR



413FS.\$4.1-4-4

Holst loading schedules 11,000 lb. GW (English) (Sheel 4 of 6)

R/H AFT POSITION - PILOT AND HOIST OPERATOR



R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR

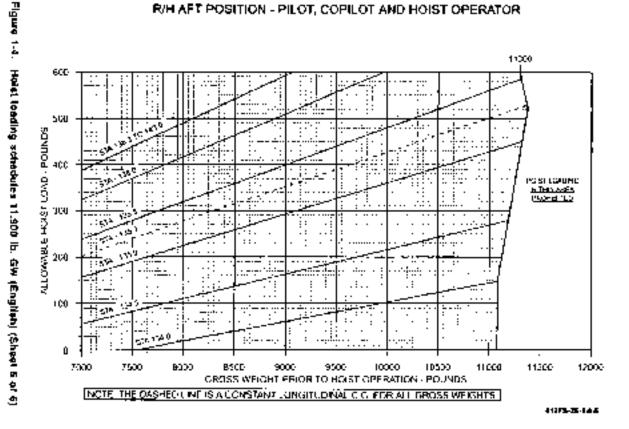
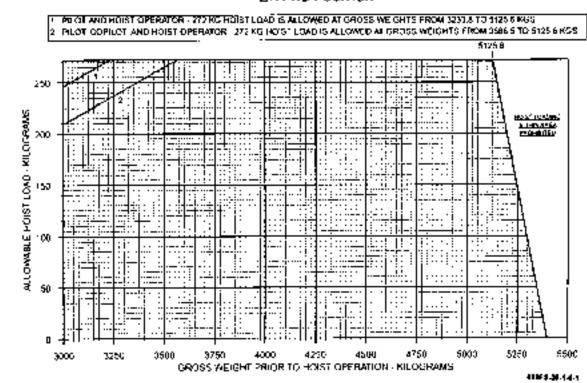


Figure 4

5

Hotel loading schedules 5397 kg. GW (Matric) (Sheet 1 of 5)

UH FWD POSITION



LIH AFT POSITION

FILOF AND HUIST CIPT MACCIR - 2/12 KG HOIST LOAD IS ALLOWED AT GROSS WEIGHTS FAOM SASAS TO \$1256 KGS.

2. PILOT COPILOT, AND HOIST SASRATOR - 272 KG HOIST LOAD IN ALL UWED AT GROSS WEIGHTS FROM 1530 & TO \$125 6 KGS.

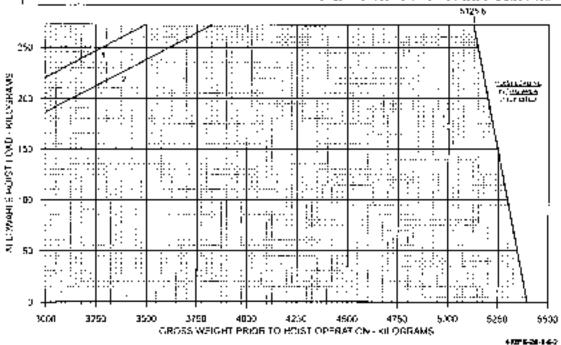
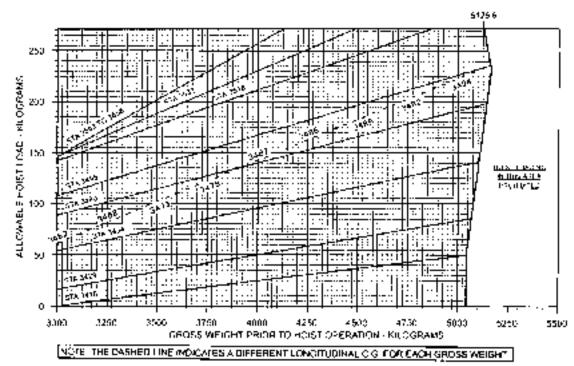


Figure 1-5.

Holst loading achequies \$397 kg. GW (Netric) (Sheet 2 of 6)

R/H FWD POSITION - PILOT AND HOIST OPERATOR



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Hold loading schedules 5397 kg. GW (Metric) (Sheet 3 of 6)











R/H FWD POSITION - PILOT, COPILOT AND HOIST OPERATOR.

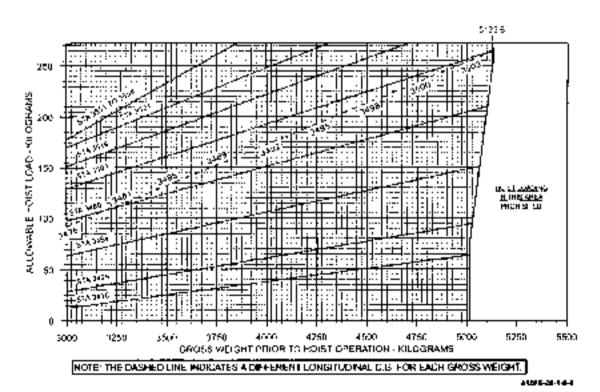
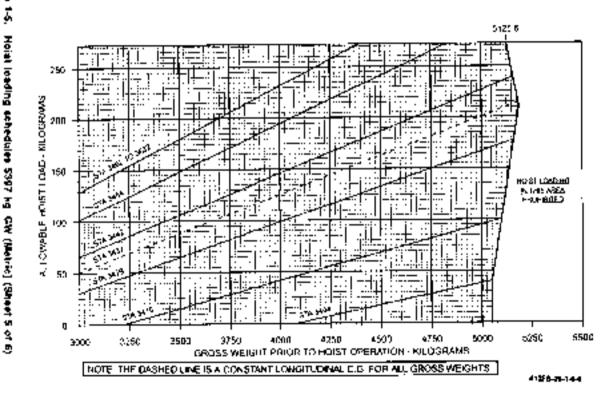


Figure 1-8.

Holes loading schedules 5397 kg. QW (Metric) (Sheet 4 of 6)

R/H AFT POSITION - PILOT AND HOIST OPERATOR



R/H AFT POSITION - PILOT, COPILOT AND HOIST OPERATOR.

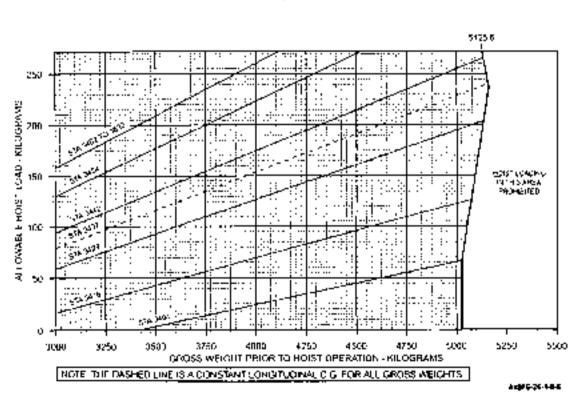


Figure 1-5.

Haist loading schedules 6397 kg. GW (Metric) (Sheet 6 of 6)

Section 2

NORMAL PROCEDURES

2-2. FLIGHT PLANNING

WARNING

HOIST LOAD CAN CAUSE LONGITUDWAL OR LATERAL CO LIMITS TO BE EXCEEDED.GROSS WEIGHT AND CENTER OF GRAVITY SHALL BE COMPUTED TO ABBURE LOADING WITHIN APPROVED LIMITS.

CAUTION

IF ADDITIONAL LOADS ARE CARRIED DURING MOISTING OPERATIONS, LOADS SHOULD BE PLACED ON 810E OF HELICOPTER OPPOSITE HOIST POSITION.

Greek weight and CG — Compute with and without height lend.

2-4. <u>INTERIOR AND</u> PRESTART CHECK

2-4-A. HOIST INSTALLATION. CHECK

NOTE

If pilot plans to operate hofst with other orewmember in passunger compartment, holet shell be installed in forward right position. Hoist — Installed in desired position; chack roof and floor stud adapters and locking collars properly secured.

Soom actuator — Installed in proper position; all littings secured.

AIRCRAFT POSITION switch (on holst control box, Figure 2-1) — Set in proper position.

Hook — Relates freely on cable.

Cable — Check proper routing through quide rollers, pullsys, and drums.

Georbox oil levels — Check sight glasses.

Holet operatore pendant — Installed; connectors secured.

Electrical power cables — Condition; connectors secured.

WARNING

ACTUATION OF CABLE GUT SWITCH ON PEDESTAL CAN CUT CABLE REGARDLESS OF MOIST PWR SWITCH POSITION. ACTUATION OF CABLE CUT SWITCH ON MOIST CAN CUT CABLE, EVEN IF CABLE CUT CIRCUIT BREAKER IS OUT.

CABLE CUT switches (pedestal and holat) — Off: covers seletied.

Safety vests, lether straps, holsting slings, and litters — Condition: secured or stored. FAA APPROVED BHT-412-FMS-26

2-4-B. HOIST OPERATION CHECK

Cargo doors and hinged penels — Secured open or removed.

HOIST PWR. CONT and CABLE OUT elecuit breakers — In.

BATTERY switches — ON (or connect external power).

NON ESNTL BUS switch — MANUAL.

ICS — Check intercoin between pilot and holst operator using hotst pendant ICS trigger and HOT MIC switch (right ICS box ordy)

HOIST PWR switch — ON. Check that blue HOIST POWER light on hoist control box and amber CAUTION light on hoist pendant illuminates.

Holes pendent CAUTION and OVER TEMP Indicators — Pres to test.

HOIST UP/DOWN, BOOM IN/OUT, and SPEED HIGH/LOW switches (pilot and operator) — Actuals to check all holst functions for proper operation. Cleck that pilot HOIST switch overrides pendant HOIST switch.

Hoist OVERTEMP warning lights — Pressto test.

CAUTION

MAINTAIN TENSION ON HOIST CABLE WHILE REELING IN AND OUT TO PREVENT SLACK.

HDIST and BOOM switches (pitot and operator) — Actuate to check all heigh functions for proper operation. Check that pitot MOIST switch overrides operator pendent HOIST switch.

Hoist cable — Chack for correction, kinks, flat spots, traying, or broken strands.

Up limit switch actuator - Raise while holes is reeling in and check horst motor stops; then release and check horst resumes operation. Reduce holet speed as cable approaches up limit. Check that holet alops when hook reaches up limit without excess tension on cable.

Holss - Slowed for flight; hook restrains secured.

HOIST PWR switch - OFF.

NON EBNTL BUG switch - NORMAL.

BATTERY awitches - OFF.

NOTE

Ground crewmember should be instructed to discharge heticopter static electricity before attaching lead to holst when possible.

2-6. SYSTEMS CHECK

Cergo deore and hinged panels - Secured open or removed.

CABLE CUT switches (pedesial and hols!)

Oil; covers salebed.

HOIST PWR. CONT, and CABLE CUT circuit breekers - In.

2-6-A. BEFORE TAKEOFF

Selety vests and straps - On and secured to helicopter.

Gloves · On.

STEP switch (If Installed) - STOW.

2-9. IN-FLIGHT OPERATIONS

Maximum hole) load shall be determined prior to each hole) operation.

NOTE

The Melght-Vetocity Diagram is not a limitation for internal hoist operations under an appropriate operating certificate.

HOIST PWR switch . ON.

WARNING

HOIST OPERATOR SHALL BE SECURED TO HELICOPTER WITH AM APPROVED SAFETY HARNESS DURING HOIST OPERATIONS.

Establish hover over holst operation area.

Haist hook restraint - Removed.

SPEED switch — As desired (refer to limitations).

BOOM switch (or pilots HOIST switch) -OUT.

NOTE

Each hotal operation parformed is defined as reeting holat cable out and then in white hovering with any weight on holat, regardless of whether the holat was used for training or an actual rescue.

The plict must record each operation in the penalty CG region. For each hoist operation performed within penalty CG region, four (4) additional hours of usage must be logged against the muin rator yoke, must and lower core seat.

HOIST pwitch - OOWN.

Discharge static electricity when possible, and connect hook to load, observing allowable hoist load.

NOTE

As hook nears the up or down (imits, hoist speed automatically slows.

HOIST awdicts - UP.

CAUTION

USE CARE TO PREVENT CABLE, HODK, AND LOAD FROM FOULING ON PUSELAGE OR LANDING GEAR.

Maintain zero ground speed until load to clear of obstructions.

BOOM switch - IN to swing heist boom and last into cabin, if possible.

Takeoff into wind, (I possible, ellowing adaquate hoist load clearance over obstacles if load is not interns).

CAUTION

AIRSPEED WITH EXTERNAL LOAD IS LIMITED BY COMTROLLABILITY. CAUTION SHOULD BE EXERCISED WHEN CARRYING AN EXTERNAL LOAD. HANDLING CHARACTERISTICS MAY BE AFFECTED BY THE SIZE, WEIGHT, AND SHAPE OF LOAD.

Airspeed - As required for adequate controllability, not to escend limits for helps operations (20 or 60 KIAS, as applicable)

2-13. LITTER HOISTING

When emergency transportation of a patient by litter is essential, every effort should be made to land the helicopter for litter loading. Litter holeting can be hazardous and should be accomplished only when a landing is not lessible and the condition of the patient precisions the use of the personnel holeting sling.

In addition to all other procedures contained herein, the following shall apply to litter holating operations.

FAA APPROVEO BHT-412-FMS-25

2-13-A. EMPTY LITTER

WARNING

HOISTING OR LOWERING AN EMPTY LITTER IN OPEN POSITION IS PROHIBITED. AN EMPTY LITTER CAN DECILLATE UNCONTROLLABLY IN ROTOR WASH AND FLY UPWARD, STRIKING FUSELAGE OR TAIL ROTOR.

Prior to helisting or lowering an empty litter, fitter shall be closed and secured with straps, Litter should be suspended in a near-vertical position and sling straps should be drawn tight.

2-13-8. LOADED LITTER



LITTER PATIENT SHALL BE SECURED TO LITTER WITH

SAFETY STRAPS.

MOIST HOOK CATCH SHALL BE SECURED WITH BAFETY PIN PRIOR TO HOISTING LITTER PATIENT.

Litter sling straps should be adjusted so that litter is 24 to 26 inches (61 to 71 centimeters) below holst book.

NOTE

If litter is suspended too far bolow hook, litter cannot be loaded in helicopter with hoist hook at up limit.



A LOADED LITTER CAN ROTATE ABOUT CABLE DURING HOISTING, HOIST OPERATOR MAY HAVE TO GRASP LITTER SLING STRAPS TO CONTROL ROTATION AS LITTER APPROACHES LANDING GEAR.

BHT-412-FMS-28 FAA APPROVED

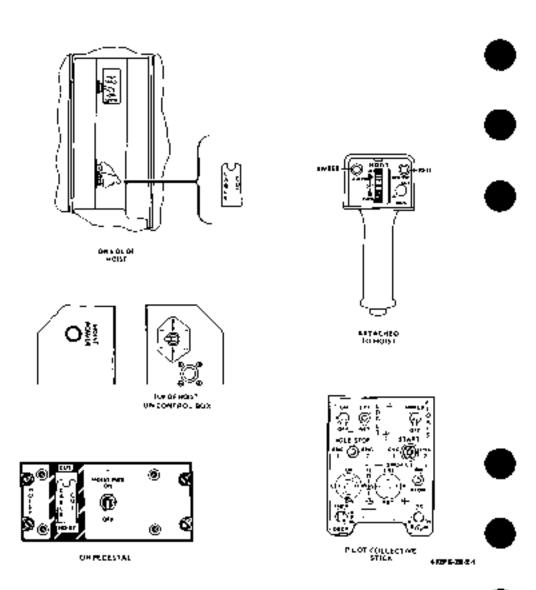


Figure 2-1. Internal hoist controls

PAA APPROVEO BHT-412-FMS-26

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-15. HOIST LOAD JETTISON

To jettison holst load in an emergency, actuate CABLE CUT switch (located on pedeate) or holst).

In the event of failure of CABLE CDT switch, sever cable with manual cable culter (stowed in pouch on holss).

3-15-A. HOIST OVERTEMP WARNING LIGHT

in the event that the OVERTEMP warning light (located on pandant) fluminates. configue present operation until holat cpile is regled in. Leave NOIST PWR switch ON (for cooling fan operation). When OVERTEMP light extinguishes, holating may be resumed as desired.

Section 4

PERFORMANCE

No change Irom basic manual.

Section 5

WEIGHT AND BALANCE

5-11. <u>WEIGHT EMPTY</u> CHART

The Weight empty chart (or internal hoisting operations is shown in figure 5-1. Refer to the maintenance manual for additional information.

NOTE

Allowable hoist load must be computed when weight empty is not within specified guidalines.

NOTE

Allowable hotel load must be computed when AUX Fuel kits are metalled.

MF 1-20-0-1

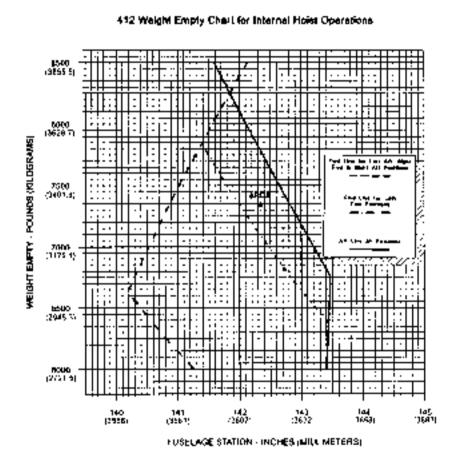


Figure 5-1. Weight empty chart



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR LITTER KIT OPERATION

(205-706-047)

CERTIFIED
14 OCTOBER 1988

This supplement shall be attached to the Models #12 and 412 EP Flight Manual when the Litter Kir 205-706-047 has been installed.

The information contained herein supplements the Information of the basic Flight Manual For Limitations, Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual

Bell Helicopter TEXTRON

POST OFFICE ODER OF A POST WARRY TRANSPORT

REISSUE - 23 JUNE 1994

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412 ROTORCRAFT FLIGHT MANUAL

FAA APPROVED
SUPPLEMENT

BHT-412-FMS-27

LOG OF PAGES

FLIGHT MANUAL

MANUFACTURER'S DATA

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APPROVED:

MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76193-0170

a, MKSly

NOTE: Revised real is indicated by a high vertical fine insert least revision pages; dispute of supercarded pages.

BHT-412-FM5-27



The Liner filt provides these lighers and the provisions for installing up to three lighers in the helicopter. A cabin attendent seet is also included in the hit.

BHT-412-FM5-27



LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after the litter(s) are installed and ballots readjusted if necessary to return empty weight CG within allowable limits

MINIMUM FLIGHT CREW

The minimum Right class for little operations shall consist of a paios and a second presentation of option attacked, both of whom shall be trained in any capable of exclaning in little patient amorgonary evaluation procedures

BHT-412-FMS-27



NORMAL PROCEDURES

LITTER LOADING

Secure partients to litters, then load times about the helicopter in sequence from top to bottom When only two patients are carried, they should occupy the top and center fitter positions. When only the patient is corred, the center litter should be used.

LITTER UNLOADING

NOTE

Normal unloading procedures apply when wither precented door can be

opened. Refer to Section 3. Emergancy Procedures for unloading procedures when cabin doors cannot be opened.

Open coben door and unload limers and pasients from the helicopter in sequence from binting to too.

Letters to be handled by our person inside cabin and one person outside calpin

BHT-412-FMS-27



EMERGENCY AND MALFUNCTION PROCEDURES

UNLOADING THROUGH EMERGENCY EXITS

NOTE

in the evens that cobin doors can not be opened, letter patients shall be unloaded through emergency pop our windows. After all litter patients have been removed, embulsheary papents may then exit.

Ramove emergency pop-our wandow by pushing as comercial marked.

Unsuap parient on center litter and remove patient through window opening.

Disconnect top little at end near open window and lower and to rest on center litter Remove patient ratentian swaps and side papers down litter and out through window opening.

Raise top and certier litter ends near open window and engage center litter in brackess for top litter. Disconnect bottom litter Raise bortom litter at and near open window and rest handles on the lower surface of the window opening. Undoeppatien and slide patient up litter and shrough window opening.

BHT 412 FM6 27



PERFORMANCE

No change from basic Flight Manual.



WEIGHT AND BALANCE

T	ABLE OF MOSHENTS	TAI	TABLE OF MOMENTS					
	(IN LEI		(kg + mem)					
			100					
L	LITTER PATIENT		UTTER PATENT					
	Loeded	7 1 i	ابهاعهما					
W eigh il	Laterally	Wajgha	Loderalių					
Poundsl	£5. 117	UK G.I	2972 nim					
100	11700	50	148 6 .0					
110	12870	66	1634.6					
120	14046	80	1783 2					
130	15210	85	1931.8					
140	16380	1 70	2080-4					
150	17550	75	2229 0					
160	18720	17.1	2291 4					
170	19990	80	2377.6					
180	21060	85	2526 2					
190	22230	90	2674 8					
200	23400	95	2923.4					
210	24670	100	2972.0					
220	26740	105	3120.6					
		110	3263.2					



ROTORCRAFT FLIGHT MANUAL

33108 - 33213 36001 - 36019AND 33214 — 33999 36020 AND SUB

SUPPLEMENT FOR DUAL BATTERY INSTALLATION

(412-899-225)

CERTIFIED APRIL 5, 1989

This suppliement shall be arrached to the Model 412 Filest Manual (BHT-412-FM-2 or -3) when the 412-899-226 Dust Byttery Installation has been inequiled.

The information consumed herein supplements the information of the basic Flight Manual. For Limitations, Procedures, and Performence Data not contained in this supplement, consult the basic Flight Manual.

Ball Helicopteri

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FLIGHT MANUAL

MANUFACTURER'S DATA

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6-1 - 5-4	0		

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MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TEXAS 76193-0170

NOTE

Revised text is indicated by a black vertical time. Intert satisfies pages: dispose of supersocial pages.

INTRODUCTION

The dust battery system consists of two 25.2 volt. 40 ampers how betteries togeted in the nose comparament Both batteries are connected to BAT BUS NO. 1 in parallel BATT 1 HOT and BATT 2 HOT womings are located on the caused segment panel Battery swhiches are located on the instrument panel and ere labeled BATT 1 and BATT 2. There are two calcult breakers, labeled BATT 2 CB1 and BATT 2 CB2, focalised on the right side of the helicopter.

Section 1

LIMITATIONS

WEIGHT/CG LIMITATIONS

Whight change sholl be determined after the dual bottories have been metalled, and bollest shall be readjusted (if necessary) to resum ampty weight CG to within allowable limits.

ELECTRICAL LIMITATIONS

BATTERY LIMITATIONS

Maximum barrary case temperature is 54.5 °C I130 °F), as indicated by Mumination of BATT 1 HOT or SATT 2 HOT sourcest fights.

WARNING

BATTERY SHALL NOT BE USED FOR ENGINE START AFTER ILLUMINATION OF BATT 1 NOT OR BATT 2 NOT SEGMENT LIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R D A N C E YE IT H MANUFACTURER'S INSTRUCTIONS

Section 2

NORMAL PROCEDURES

BEFORE EXTERIOR CHECK

Flight planning — Completed

Grass weight and CS — Compute frafer to Weight and Balance section in Manufacturer's Oata BHT-412-MD;

Publications — Checked.

Portable fire extingulations — installed and excured.

Aft fuel sumps — Drain samples as follows:

FUEL TRANS switches - OFF.

BOOST PUMP awtiches - OFF

FUEL neitribes - OFF.

BATT 1 switch - ON.

BATTERY BUS 1 switch - ON.

Aft final etimp deals furtions (left and right) - Depress.

NOTE

It aft sumps fail to drain, the sump valves may be operated manually. Forward and middle lost eatings — Drein samples as follows:

Proce-to-drain válvás — Proce.

Fuel filters — Drain before first flight of day as follows:

8005T PUMP awitches - ON.

FUEL switches - DN.

Fuel fitter light and right! - Drain semoies.

FUEL switches - OFF

BOOST PUMP swhchee - OFF.

BATT 1 awritch - DFF.

SATTERY BUS 1 swetch - AUTO TRIP OFF

EXTERIOR CHECK

1 FUSELAGE - FRONT

None compartment — Condition, batteries connected door segured.

NOTE

Ballant is not allowed beneath betteries

PRESTART CHECK

NOTE

BATT 1 sweech and BATT 2 purities will be ON during GROUND POWER START

NOTE

Both betterles, or aither single herrory may be used for engine scan when properly charged. This procedure shows a dual bettern start.

BATT 1 switch - ON

BATT 2 awtich - ON.

BATTERY BUS 1 and BUS 2 switches — ON; check BATTERY country light fluminates.

ENGINE STARTING

ENGINE 1 START.

N1 RPM — Check #1% minimum. BATT 2 switch — OFF.

NOTE

After start, in order to avoid exceptive generator drive loads, charge only one bettery at a time.

GEN 1 switch - ONt check ammeter load increases.

BATT 2 switch — ON when ammour load drops below 200 amos.

NOTE

Bafora attempting generator essented stors on second engine, it is recommended that the bettery be charged until attempt lead drops below 150 emps

ABMPS 1 Indicator — Check at or below 150 arms.

ENGINE SHUTDOWN

Ughting and misoelloneous switches - OFF.

BATT 1 and BATT 2 switches - DFF.

MOTE

SATTERY 8US 2 whitch will old Off outomasselly when SATT 1 and SATT 2 awitches are barred OFF.

Collective down lock - Secured as dealed.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

Table 3-1. Warning Eghin

PANEL WORDENG	FAULT CONDITION	CORRECTIVE ACTION		
BATT 1 NOT or BATT 2 HOT	Bassary overhouring	Affected bassary awritch — OFF, Land es soon se practical.		

WARNING

BATTERY SMALL NOT BE USED FOR ENGINE BILLUMINATION OF BATT 1 HOT CA BATT 2 HOT LIGHT BATTERY SMALL BE REMOVED AND SERVICED IN ACCORDANCE WITH MANUFACTURERS MISTRUCTIONS PRIOR TO RETURN TO SERVICE

Table 3-2 Courton lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
BATTERY	BATTERY BUS 1 and BUS 2 switches/relays in the same position.	Turn BATT BUS 1 switch ON end BATT BUS 2 switch OFF. M light remains on reverse switches.



PERFORMANCE

No ohange from basic manual

RETURN TO SERVICE.

Section 6

CATEGORY A OPERATIONS

EMERGENCY PROCEDURES

Table 6-1 Warring fights -- Telepoff prior to CDP

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
BATT 1 HOT or BATT 2 HOT	Recovery overheading.	Land with efficiency bettery switch — OFF.
		WARNING
		GATTERY SHALL NOT BE USED
		FOR ENGINE START AFTER
		ELUMINATION OF BATT 1 HOT
		OR BATT 2 HOT LIGHT
		BATTERY SHALL OF REMOVED
		AND SERVICED IN
		ACCORDANCE WITH
		MANUFACTURER'S
		INSTRUCTIONS PRIOR TO

EMERGENCY PROCEDURES

Table 6-2. Warring lights — Takeoff stree CDP

PANEL WORDING	FAULT CONDITION	COMRECTIVE ACTION
gatt 1 MOT & GATT 2 HOT	Bettery overheating	Accelerate to Vinez Affected between switch — OM, Land on soon as practical.
		WARNING
		BATTERY SHALL NOT BE USED FOR ENGINE BYART AFTER
		LUAMATION OF BATT 1 HOT
		OR BATT 2 HOT LIGHT.
		BATTERY SHALL BE REMOVED
		AND BERVICED IN
		ACCORDANCE WITH
		MANUFACTURER S
		INSTRUCTIONS PRIOR TO
		APTUAN TO SERVICE.

EMERGENCY PROCEDURES

Table 6-3. Warreng lights — Lending prior to LOP

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
BATT 1 HOT or BATT 2	Battery overfeating.	Affected bettery swetch — OFF, Land as soon as presected.
		WARNING
		BAT JERY SHALL NOT BE USED
		FOR ENGME START AFTER
		ILLUMINATION OF BATT I HOT
		OR BATT 2 HOT LIGHT.
		BATTERY BHALL BE REMOVED
		AND SCAVICED IN
		ACCORDANCE , WITH
		MANUFACIURER S
		INSTRUCTIONS PRIOR TO
		METURN TO SERVICE

EMERGENCY PROCEDURES

Table 8-4. Warning Egists — Landing ofter LDP

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
SATT 1 HOT - BATT 2 HOT	Bettery overheating.	Land immediately. Affected battery swetch — OFF.
		WARNING
		RATTERY SHALL NOT BE USED FOR BAGINE START AFTER RELUMINATION OF BATT 1 HOT OR BATT 2 HOT LIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A CCORDANCE WITH MANUFACTORS PRIOR TO RETURN TO SERVICE.

MANUFACTURER'S DATA

WEIGHT AND BALANCE

No change from basic manual

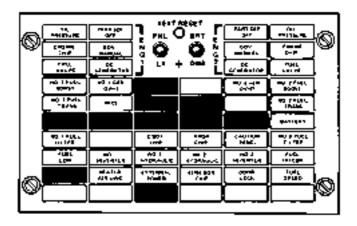


MANUFACTURER'S DATA

SYSTEMS DESCRIPTION

INSTRUMENT PANEL AND CONSOLES

incorporation of Dual Battery Installation will after the instrument penal and do power system as shown in figures 2-1 time 2-3.



#170FLJ54

Figure 2-1. Instrument pend

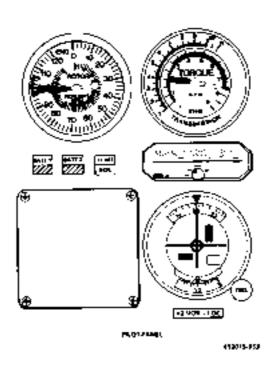


Figure 2-2. Instrument penel

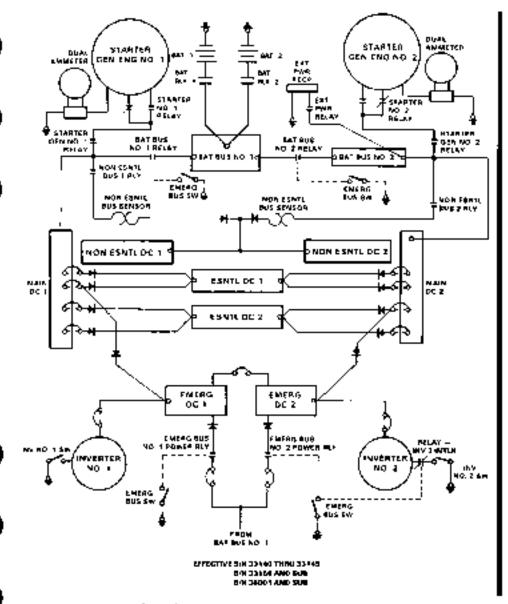


Figure 2-3. DC electrical eyesers (Sheet 1 of 2)

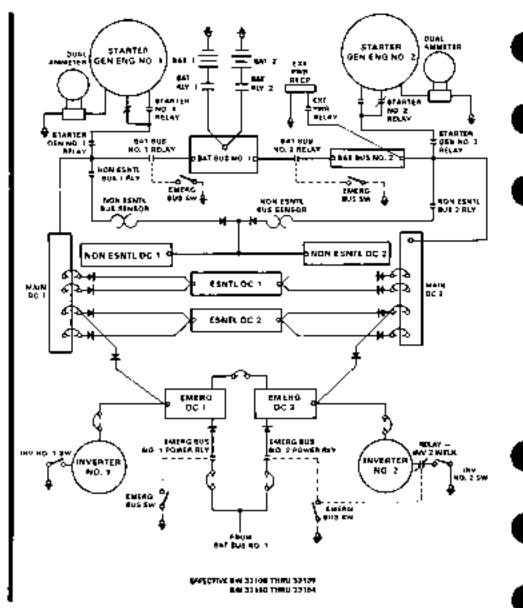


Figure 2:3. DC electrical system (Sheet 2)



ROTORCRAFT FLIGHT MANUAL

33108 - 33213 36001 - 36019 AND 33214 - 33999 36020 AND SUB

SUPPLEMENT FOR REMOVAL OF UPPER AFT CENTER FUEL CELL

(412-899-227)

CERTIFIED 23 MAY 1989

This supplement shall be attached to the Model 412 Flight Manual dSRT 412-FM 2 or -3) when the upper sits center foel cell her begin removed.

The Information considered herein supplements the information of the basic Flight Manual. For Limitations, Procedures, and Performance Date not contained in this supplement, consult the basic Flight Manual.

Be# Helicopter TEXTRON

P (Property No. 10 lasts

ROSE GATTER BOX 442 A PERFE ATRICK TREAS FARSE

23 MAY 1989

ACISSUED - 8 OCTOBER 1991

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FLIGHT MANUAL MANUFACTURER'S DATA

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NOTE

Revised text is endoated by a black vertical line, theort latest revision pages, dispose of superseded pages.

LIMITATIONS

OPTIONAL EQUIPMENT

Auditory tool kits shall not be installed when the aft upper center fuel call is serioused.

WEIGHT CG LIMITATIONS

Actual weight change shall be determined after the upper aft center fuel cell is removed and balance reedjusted, if necessary, to setain empty weight CG within finits

> FUFL SYS CAP 1736 FRS AUX FUEL KITS NOT ALLOWED

> > 41,000041

Figure 1. Piecards and decals

NDRMAL PROCEDURES

No change to besit manual.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

No change to basic manual

Section 4

PERFORMANCE

No change to beels menual.



MANUFACTURER'S DATA

WEIGHT AND BALANCE

WEIGHT EMPTY CENTER OF GRAVITY

With the upper an center fuel cell removed, the total net weight and C G, changes are depicted in Table 1.

Table 1. Weight and comes of gravity changes

WEIGHT CHANGE LBSI		LONGSTUDINAL	LATERAL	VERTICAL
28.9	ARM (RO	190.2	0 1	3G. a
	MOMENT	5600 9	-2.1	-1020.6

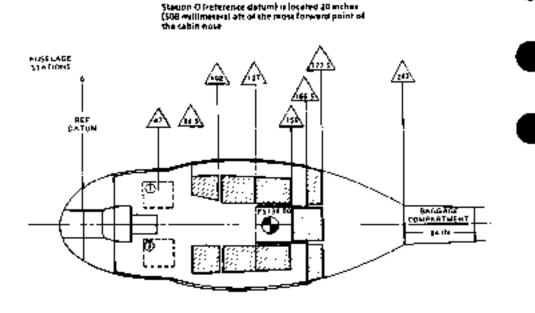
FUEL LOADING

Oue to the fuel flow sequencing between the tanks, the fuel leading CG will very between fueling a very between fueling a very between fueling a very between fueling a very between fueling and the very between fueling and the very between flows and the very betwee

Critical fuel CG's are shown on fuel teless 1, 2, 2M and 3, 3M.

With normal craw and passenger loading, grossweight CG will remain within limits at any fuel quantity.

Figure 2 depicts fuel tank locations by station number.



NOTE

POLOTSEAT

COMLOT OF PASSENGER SEAT

COMLUTIONES

COMMITTININAL LOCATION

EXTERNAL (ARGO

413861-07

Figure 2. Internel fuel senk eration location

Tobio 2 Fuel (reding table (English)

USABLE FUEL LOADING TABLE, UPPER AST CENTER TANK RENACIVED Interioperal (English)								
Jac B, JP-4 (B.5 Cos/Gas)				Jerd	4. A·1. JP·6	16.6 Lbs/G	# I	
U.S. Çel.	Weight Lb	CG	Moment (In-Lb)	U.5 Gal.	(Lb)	CG lini	Moment (hr*kb)	
10	85	139.4	9061	10	68	139 4	8479	
20	130	139.6	18148	20	135	139.6	18986	
30	185	139.6	27261	30	204	139 B	28619	
40	260	139.9	36374	40	272	138.8	38063	
80	326	139 🛊	45468	50	340	139.9	47 58 6	
58.3	379	139.9	53D22	68.3	397	139 0	88840	
60	350	1406	54834	80	406	140.8	67 385	
70	455	144 7	60930	70	476	144.7	88877	
80	520	147.8	78858	840	544	147.B	80403	
90	586	160.1	979 09	90	613	150.1	91881	
100	650	152 0	98800	100	680	162.0	103360	
110	716	150 6	109824	110	748	153.6	144883	
112	72B	153.9	112039	*12	762	169 🛊	117272	
126	780	150.0	117000	120	816	150.0	122400	
130	846	140.6	122949	130	864	146.5	128622	
140	910	141.8	129038	140	952	141 8	134894	
145,2	244	140.1	132254	145.2	90 7	1+0.1	138278	
150	975	141.0	137475	150	1020	141 0	143820	
160	1040	142.8	148512	160	1088	142 8	1553 66	
170	1106	144.3	109462	170	1158	144 3	168811	
180	1170	145.7	170469	18D	1224	145.7	178337	
190	1236	146.9	181##2	190	1292	146.9	189796	
192. I	1249	147.2	183868	*1#Z 1	1306	147.2	192243	
200	1300	145.8	189540	200	1.38C	145.8	198288	
210	1365	144.4	197406	210	1428	144.4	208203	
220	1430	143.0	204490	220	1486	143.0	Z1392 0	
230	1495	141 7	211642	230	1584	141.7	221619	
240	1560	140.6	219038	240	1632	140.6	229458	
•2 40 7	1587	140.1	222339	*244.1	1650	140.4	232000	
260	1826	140.0	278500	2540	1700	140.8	239380	
250	1690	141.9	239811	280	1788	141.B	20087\$	
267	1736	142 6	247554	267	1816	142.6	258952	

Most forward C.G. condition at weight empties under \$250 pounds has no fuel.

Weights given are nominal weights at 10°C

NACTAR!

This table is invalid with musikary foot tare (a) installed.

Mass cytical fuel emount for most forward C.O. condition at weight empties 6260 poends on greener.

^{**}Most critical feel amount for most sit; C.G. condition at weight empties up to 7600 pounds.

^{***} Miget critical fuel emount for most alt C.G. condition at weight empties 7600 pounds or greater.

Table 2M. Fuel loading table [Metric]

USABLE FUEL LOADING TAGLE, UPPER AFT CENTER TANK REMOVED MOREORIAL IMMERICA								
Jes	Jen B. JP-4 10.7 7 P log fl1			Jat A. A-1, JP-8 (0.815 kg/L.)				
l, Hara	Weight (kg)	CG (mm)	Манчен [ар-тыр]	Uters	Weight Ingi	CCI (mm)	Moment Hig-most	
40	31.2	3541	110479	40	32.6	3847	115437	
80	62 3	3547	220976	20	6 6.2	3547	237264	
120	93.6	3567	332019	120	9 7.8	3651	347268	
189	124.8	3552	442579	160	130.4	3052	462101	
200	756.0	3862	663402	200	169.0	36-52	67897B	
220.7	172.0	3553	611118	220.7	179.8	3500	630135	
240	197.0	3617	676379	240	195.B	3817	707 46 8	
280	218.1	370B	808716	280	220.2	3704	848186	
320	249.3	3785	343601	320	280.B	3785	987126	
360	280.4	38.38	1076776	360	293.4	3030	1128089	
400	911.6	38:86	1210878	400	326.0	3886	1206836	
**424.1	330.4	3309	1291634	424.1	345.6	3909	1360950	
440	342.8	3866	1321837	440	358 6	3866	1382763	
400	373.9	3731	1395021	480	391.2	3731	1469667	
6.20	405.1	3525	1455465	820	423 0	3625	1536275	
649.8	420.1	35.50	1623180	549.8	447 9	3554	1593628	
5-6D	436.Z	37-07	165679#	680	458 4	3569	1826892	
600	487.4	3620	1891988	800	489.0	3620	1770100	
640	480.5	3643	1626372	840	521 8	38-83	1810821	
680	529.7	3488	1958831	500	554 2	3686	2049432	
720	560.9	3734	2094401	720	588.B	3734	2191111	
***727.2	588.5	3738	2117677	***727.2	6927	3738	2216613	
280	592.0	3701	2190892	78D	618.4	3701	2272399	
600	623.Z	3063	2282782	800	652.0	3683	2388276	
840	654.4	3825	2372200	84D	684.5	3626	2401675	
880	488 6	3592	2482318	880	717.2	3592	2576182	
920	718.7	3561	2552168	920	749.0	1561	2670036	
923.7	/19.0	3569	2581058	923.7	762.8	3559	2679213	
980	747.8	3586	2661611	960	702.4	3588	2905-886	
1000	776.0	3614	2815306	1000	815.0	3614	2945410	
1010.7	707.3	3622	2861601	1010 7	823.7	3822	2983441	

Noss (presed C.G. condition at weight employs under 2839 folloysme has no huel.

Weights given are nominal weights at 18°C

NOTE

This totale to trouble with suchary fuel tankint installed.

^{*}Récus erident fuel emount for most forward C.G. condition at weight emption 2839 billograms of Granis.

^{**}Most princed final amount for most aft C.O. condition at weight emption up to 3447 histograms.

^{****}Most critical fuel amount for most aft C G, condition at weight empties 3447 killograms or greater.

Table 3. Fuel loading table - lateral (English)

				_			
Jei	B. JP-4 (6.	S k berGell		Jan 4	4. A-1. JP-5	re.B Leave	
U.9 Ġ≢	Welghi (Lb)	ÇQ Ønl	Moment IIn-Lbf	U.S. Gud	Weight ILbl	DG IMI	Moment Ur-Us
10	45	٥	4	10	6.R	0	ō
20	130	•	G.	20	170	0	•
30	195	٥	₽	30	204	•	Ð
40	260	0	٠	40	272	ø	•
5 0	326	٥	D	50	340	a	D
18.7	378	٥	ø.	5 8 3	397	•	0
60	390	ø	D	80	408	0	- 0
30	466	Q	G	70	41#	•	0
60	52D	0	0	80	544	ø	0
90	586	0	6	940	612	-O	D
100	680	0	0	100	580	ø	0
11D	715	a	0	110	7≜8	Ð	0
112	720	•	٥	112	782	•	0
120	780	-0.48	- 369	120	B1B	-0 40	-370
130	845	-0.63	- 532	130	8≅84	0.63	567
140	940	-0.17	-701	140	802	-0.77	-733
*145.2	944	-0.63	-7B4	*145.2	9:87	0.83	-819
160	976	-0.00	-780	160	1020	0 80	-\$16
180	1040	-0.76	- 780	160	104B	-0.75	-616
170	1106	-0 71	-765	170	1154	-0 71	-83
180	1170	-0.67	- 7B +	160	1224	-0.87	-820
180	1736	-0 6 3	- 772	190	1292	-0.83	-614
200	1300	-0.60	- 780	200	1360	-0.00	- ⊕ 14
210	1365	-0.57	- 778	210	1478	0.57	-814
220	1430	-0.54	-772	220	14 9 \$	-0.54	-804
230	1495	0.52	777	23D	1564	-0.52	-81
Z40	1060	-0 b 0	-780	240	1632	-0 50	-814
260	1625	-D 48	-780	260	1700	-0.48	-# 11
260	1690	-0 46	-773	280	1788	-0.46	-812
267	1736	-D.45	-791	267	1816	-0.45	- ₿1°

[&]quot;Moss critical fuel amount for mass termal C.G. pondition.

NOTE
This table is invalid with auditory fuel tank(s) installed

Weights given are nominal weights at 16°C.

Table 3M. Fuel loading table — leteral (Matric)

USABLE FUEL LÓADING TABLE, UPPER AFT CENTER TANK REMOVED Labral (Marine)							
J u l	B. JP-4 (0.	779 k p.L .)		Jet A. A.1, JP-5 (0.815 kg/L.)			AL.
Lise.	Weigha (kg)	CG (mm)	Monwel Ikgemmi	Lete	Weight Ikgl	CG (mm)	Молина Фартина
40	31.2	0		40	32.6	o	٥
80	6Z. 3	o	0	80	€5. Z	0	0
120	93.5	0	٥	120	97 6	٥	•
160	124.0	o	•	160	130.4	0	o
200	156.8	o	a	200	163.0	۵	0
240	1870	۰	٥	240	1966	ø	•
280	213.1	o	a	280	228.2	a	٥
320	249 3	ō	۵	330	260.6	O.	٥
380	200 4	o	٠	360	293 4	ø	o
400	311.8	Ð	٥	400	328.0	Q	Q
424 1	330 a	•	۰	424.1	348 6	ó	0
444	342.8	-1D	-3428	440	358.6	- 10	-3588
440	373 9	-16	-6600	480	3912	-16	-6866
520	405.)	-1B	-7897	520	423.8	- 19	8052
+549.8	426.1	-21	-0990	-649-0	44/8	-21	-\$406
550	438.2	-21	-9160	560	4 58 4	·21	-9584
600	467.4	19	8861	800	489 0	-19	-9291
4-9 0	498.0	-15	-8876	640	621.6	-18	-93 9 9
880	628.7	17	9006	-8B≠0-	554.2	. 17	9421
720	560.9	-18	-8974	120	6868	-16	-#3#8
760	892.0	-15	-8880	760	619.4	-15	-9291
BOO	623.2	-14	-6725	800	662 0	-14	-9120
6= 0	584.4	-14	-8162	840	684 0	-14	-9584
B 20 0	585.5	-13	-8912	880	717 2	-13	-9324
920	7167	-12	-0000	920	74B 8	-12	-6848
B=6·0	747.B	-12	-2974	960	782.4	-12	-9389
1000	779.0	-11	-6544	1000	816.0	-11	-#9-66
1010.7	767.3	-11	-8840	1010.7	629.7	-11	-9081

[&]quot;Most critical heel amount for most lateral C.G. condition.

Weighte given are naminal weights at 15°C.

NOTE

This settle is invalid with auxiliary fuel control frameled.



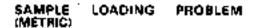
The helicopter is characted to transport nine pathengers and 180 pounds of begongs on a trip that will require approximately 220 U.S. gallene of fusione way. The helicopter will be refused and the 180-pound pilot will return alone. Desermine excreme GG conditions for both lights.

DUTBOUND FLIGHT

	LONGITUDINAL			LATERAL		
	WEIGHT Maj. I	CG (kp.)	MOMENT (the vist)	CQ li n.l	MOMENT ((b) 100)	
		_		_		
Weight Empty	7265	142.3	1034116	-02	1831	
104	25		4146	٥	0	
+ Ptot	190		8930	+22 0	+4180	
+Passangers, 15 man seasi	860		88450	O	۰	
(Peppengury, 4 mass max)	880		59160	0	۰	
+ Rappage	180		46990	ø	0	
Basic Operating Weight + Payload	9190	186.3	1252762	+0.3	~2549	
+Takeoff Fuel (267 U.S. Callone)	1816	142.6	268982	-0.45	-817	
Takeoff Condition	11000	137.4	1511744	+0.2	- 1732	
Basic Operating Weight + Payload	9190	136.3	1262782	F O 3	+2549	
+Cehical Forward Fuel						
(244.1 U.B. Gallana)	1860	140.1	232566	0.49	-813	
Most Forward Comption	‡D960	136.9	1#85348	+0.2	+1736	
Basic Operating Weight + Psyload	9190	136.3	1282782	+0•3	+2849	
+Centing Fuel (#7 U \$, Ge#ons)	320	139.9	44768	0	0	
Lending Condition	9510	136.4	1297550	+03	12549	

RETURN FLIGHT

	COMMITTUDINAL			LATERAL		
	WEIGHT Rba.)	CB Un I	MOMENT (Bartin)	CG (In.)	MOMENT (Marin)	
Weight Emply	7265	142.3	1034116	-0.2	1631	
1 Oil + Peot	25 190		4146 8 9 30	₽ +2₽¢	-4180	
Basic Operating Wrongful	1480	140 0	1047192	-0.3	+2649	
I TakeoN Fuel (257 U.S. Galfona)	1816	142.8	268982	0.45	817	
Telepat Condition	9296	140 5	1308154	10.2	+1732	
Basic Operating Weight	7450	140.0	1047192	+0.3	+2549	
+Cildcal Forward Fuel (244.1 U.S. Gallens)	1880	140.1	232668	-0.49	819	
Mest Farward Condition	9140	14D.B	1279758	±0.2	+1736	
Basic Operating Wolgho	7480	140.D	1047192	+0.3	+2549	
+Cripcel Aft Fuel (112 U.S. Bellonsi	762	163.9	117272	a	D	
Moss Aft Condeion	8242	141.3	1154464	+0 3	+2549	
Basic Operating Weight	7400	140.0	1047192	-0 J	+2549	
-Landing Fuel (47 U.S. Gallone)	320	139.9	44768	•		
Leading Condition	7880	140.0	1091980	-0.3	-2549	



The fusicopter is chartered to transport nine passengers and 80 kg of beggage for a trip that will require approximately 930 liters of fuel one way. The holicopter will be refused and the 90 kg pilot will return sions. Determine extreme CG conditions for both flights.

OUTBOUND PLIGHT

	CONGREDINAL			LATERAL	
	WEIGHT Ikgi	DG Veneni	MOMENT (<u>hg*nen</u>)	CG 4mml	MOMENT (*9*±±**) 100
Wangiri faripiy	3295.3	3014	119092.1	-0	-198
+CHI +P454	11.3 90.0		486 3 1074 6	0	0 +503
+Patriengers, (5 man epan)	375.D		11745.0	+7039 O	0
+Persengers, (4 mae soat) +Baggage	300.B 40.0		6630.0 5296 0	0	
Batic Operating Warght + Payload	41518	3462	143723.0	.7	+305
→ Talke-off Fuel (10 40 7 Closes)	<u> 823.7</u>	3822	28934.4	11	-97
Takeoff Condision	4975.3	3468	173657.4	+4	+214
Basic Operating Weight + Payland	4151.6	3407	143723.0	+7	+ 305
+Forward Funt (\$23.7 Litters)	767 B	3559	26792 Z	12	-40
Most Forward Condition	4804.4	3477	170515.2	+4	+216
Batic Operating Weight + Psyload	4151.6	3462	143723.0	-7	+308
- Landing Fuel (180-7 (Ages)	_147_3	3552	5232 1	D	0
Landing Contriden	4298.6	3485	146956 /	+7	+306

RETURN FLIGHT

	LONGITUDINAL			LATERAL	
	₩ЕІДЫТ (Ig)	DB Immi	MOMENT (hg*mm)	ca (mm)	MOMENT (kgrmm)
Weight Emply	3295.3	3814	119092.1	-6	-198
+ C+ + P4q1	11.3 90.0		400 3 1074.6	0 993+	+503
Busic Operating Weight	3396.6	3552	120652 0	19	+305
-Takeoff Fuel (1010. 7 Chers)	823.7	3622	29034.4	-11	-91
Takeoff Condition	4220.3	3586	150498.4	+5	+214
Saule Operating Weight	3296.B	3552	120652 0	+9	+ 305
+Forward Fuel (923. / Leters)	75Z.B	3558	2 67 \$ 2.2	12	-90
Most Forward Condition	4149. 4	3553	147441.2	- Б	+216
Basic Operating Weight	3398.6	3662	120682.0	19	+305
-Clinical Aft Fool 4424.1 Uhmaj	345.8	3809	13608 5	۵	0
Most Aft Condition	374Z.Ż	3585	134181.5	+8	+905
Basic Operating Weight	3396 6	3552	120652.D	+8	+306
+Landing Fuel (180.7 Uteral	147.2	355Z	<u>6232.1</u>	٥	D
Landing Condexon	3843 9	3652	125884.1	+9	+306

MANUFACTURER'S DATA

SYSTEMS DESCRIPTION

INSTRUMENT PANEL AND CONSOLES

When the upper sit center hist celt is removed, a 1738 lb fuel capecity placerd is mounted on the center section of the instrument panel. See figure 3.

FUEL SYSTEM

DESCRIPTION - MECHANICAL

The fivel system filipure 41 is comprised of 9 crash resistant fuel cells. Six of the cells are located below the cells liber and three me located sit of the cells and obove the level of the underfloor.

calls. Refer to figure 5 for fund (sum pequance, Pertial cell dividers in two of the sit colle and the system interconnect valve provide 52.5 gallons (198,7 kiteral isolated fuel supply for each angine.

FUEL TRANSFER AND FILLING

Each towns fuel cell is joined with its opposite (left and right), and with the upper cell interconnect system.

FUEL QUANTITY SYSTEM

The DIGITS TEST burion is functionally inoperative.

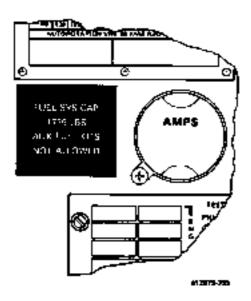


Figure 3. Instrument panel

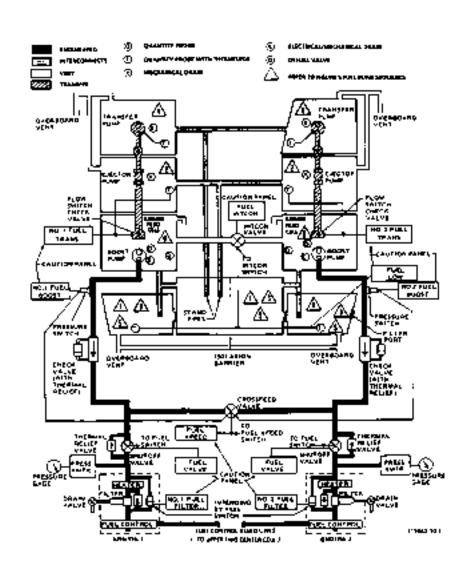


Figure 4. Fuel eyetem schematic (Sheet 1 of 2)

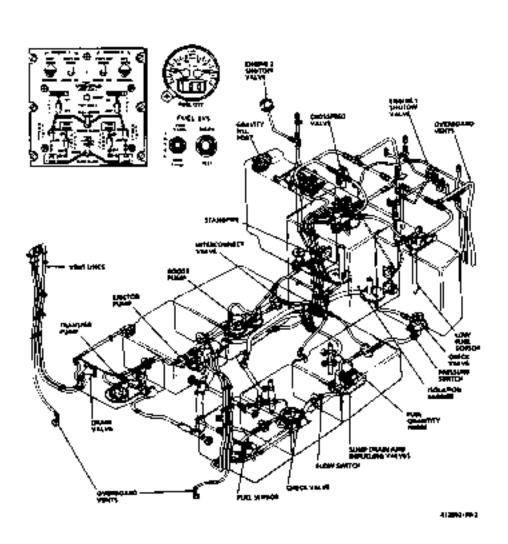


Figure 4. Fuel system achematic (Sheet 2)

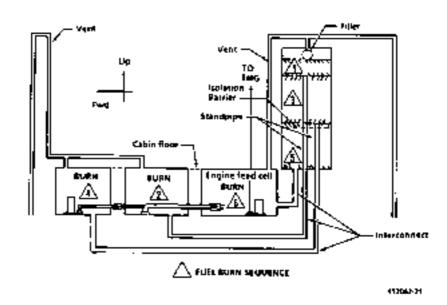


Figure 5. First burn anyways



MANUFACTURER'S DATA

HANDLING/SERVICING/MAINTENANCE

SERVICING

FUEL SYSTEM SERVICING

Total capacity: 274.7 U.S gallona (1037 O Instal).

Usoble fuel: 267.7 U.S. gallons (1010.7 liters)

BELL MODEL 412

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR CATEGORY B OPERATIONS WITH APPROVED CONFIGURATION OF NINE OR LESS PASSENGER SEATS

SUPPLEMENTAL TYPE CERTIFICATE NO. SH7727SW

CERTIFIED FEBRUARY 8, 1990

This supplement shall be interched to the \$4odel 412 Flight Manual when helicopter is equipped with an approved wine or less passenges sees configuration.

The information contained herein supplements the information of the basic Flight Manuel. For Limitetions, Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual.



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INTRÓDUCTION:

This supplement removes the Height-velocity diagram as a firmitation when helicopter is equipped with an approved configuration of nine or less passanger easie.

Use or disclosure of data conseived on this page is subject ? to the resundance on the offe page of the document.

LIMITATIONS

TYPE OF OPERATION

Flight shall be conducted in accordance with Category B operations and an appearance configuration of nine or less passenges assets

ALTITUDE LIMITATIONS

Maximum aftirude for takeoff and landing is 9000 teat density skiltude

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after approved easing is installed, and balloss shall be readjusted lift receipably) to return empty weight CG to within allowable limits.

Section 2

NORMAL PROCEDURES

TAKEOFF AND LANDING

MOTE

The Height-velocity diagram does not represent a finitestion.

Refer to Performance Once, Section 4

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

No change from besic Flight Manual.

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PERFORMANCE

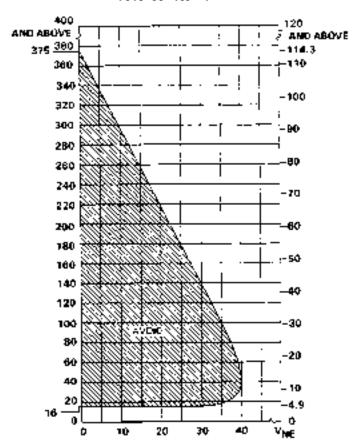
HEIGHT-VELOCITY ENVELOPE

Operation in height-velocity envelope is critical in the event of a single engine failure during takeoid, lending, or other operation note the surface (figure 4-1). The AVOID area of the Height-velocity diagram defines the combinations of sitspeed and height above ground from which a talk single engine landing on a smooth, level, firm exiface demot be assessed.

The Height-velocity diagram is valid only when the Weight-Attitude Temperature Historical are not exceeded (refer to bests Flight Manual). The diagram does not define the conditions which assure continued flight tollowing an engine tailure not the conditions from which a safe power-off landing can be made. SKID MEIGHT ABOVE SURFACE – FEET

HEIGHT - VELOCITY DIAGRAM

FOR SMOOTH, LEVEL, FIRM SURFACES



INDICATED AIRSPEED - KNOTS

Figure 4-1. Height-velocity diagram (OEI)

Use or depthouse of data compared on this page is subject in the sectorist on the this page of this document.

• BELL MODEL 412

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR LORAN C NAVIGATION SYSTEM (KING KLN-88) 412-899-231

> CERTIFIED 22 JUNE 1990

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This supplement shall be exacted to the Model 412 Flight Manual when the Loren C Namigation System (King KLN-88) has been installed

The information contained herem supplements the information of the bests Flight Manuel. For Limitations, Procedures, and Performance Date not contained in this supplement, consult the basic Flight Manuel.

Bell Helicopter TEXTRON

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FLIGHT MANUAL

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INTRODUCTION

The Loren C Novigation System is a nevigation old for use in the North American geographic area as defined in King KLM-8S Plot Guide.

Visual navigation date, when selected, is presented on the pilot HSI in the form of L/R steering, bearing to waypoint, and "TO" indications are also duplicated on the copilot HSI.

The system consists of a combined Loran C receiver and navigational computer, an antenna, a four-way enqueciator, switching already and associated wiring.

LIMITATIONS

TYPE OF OPERATIONS

The Loren C system, 66 installed in this hallcopter, a certified for operation in day or night VFR non-cting conditions.

OPERATIONAL LIMITATIONS

A KLN-68 Priot Quide (King Priv 006-08458-0000, Operation Revision Status ORS 011 dated August 1989 or later revision, shall be accessible by the Right crew at all times during Right.

The Loren C havigation shall be operated in secondance with the menufacturers manuacions with the following exceptions:

- This Loven C cannot be coupled to the Right director or helipfol
- There is no tuol meragement data available to this installation.
- It is the responsibility of the pilot to verify that any nevigation or communications date used is correct.

PLACARD AND DECALS

FOR VARIABLE

Hoceted on instrument penell-

LATERAL MODES EXCIPT HDS A GA ABL MODESHIN EBA IS NEUCOSEE

Hocated on matrument panel)

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after the Loren C is installed and ballost readjusted asrequired to return empty weight CG to within allowable limits.

NORMAL PROCEDURES

EXTERIOR CHECK

7. CABIN TOP

Loren Clanterine — Condition and security.

PRESTART CHECK

LORAN PYVR and FAN circuit breakers ~ In.

Loren Clunt - Venty off.

BEFORE TAKEOFF

Loren C unit — Turn on. Verify operational revision status on initial display page is identical to that of swalable KLM-88 Pilos Guide.

Pilot MSI CAS pointer Align to desired course shown on Loren display.

NAV/LAN switch concentrator — Press; uselfy LRM segment Muminated and NAV segment actinguished.

Pilot and copilot HSI deviation bers — Verify centered and "TO" indication discinned.

Plan HSI beening pointer — Venity basing to waypoint displayed.

NOTE

For additional normal procedures, except fuel management, safet to KLN-88 PBM Guide.



EMERGENCY AND MALFUNCTION PROCEDURES

NO CHANGE

Section 4

PERFORMANCE

NO CHANGE

BELL MODEL 412 ROTORCRAFT FLIGHT MANUAL

33108 THROUGH 33213 AND 36001 THROUGH 36019

SUPPLEMENT FOR IMPROVED HOVER PERFORMANCE WITH PT6T-3BE ENGINES AND 5-MINUTE TAKEOFF POWER RATING (412-570-001-103)

> CERTIFIED OCTOBER 12, 1990

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This supplement shall be excepted to the Model 412 Flight Menual when the Improved Hover Performance Modelication 1412 570-001-1031 has been installed

The information contained haveln supplements the information of the basic Flight Manual. For Limitations. Procedures, and Performance Data not contained in this supplement, consult the basic Flight Manual.

Bell Helicopter TEXTRON

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LIMITATIONS

WEIGHT/CG LIMITATIONS

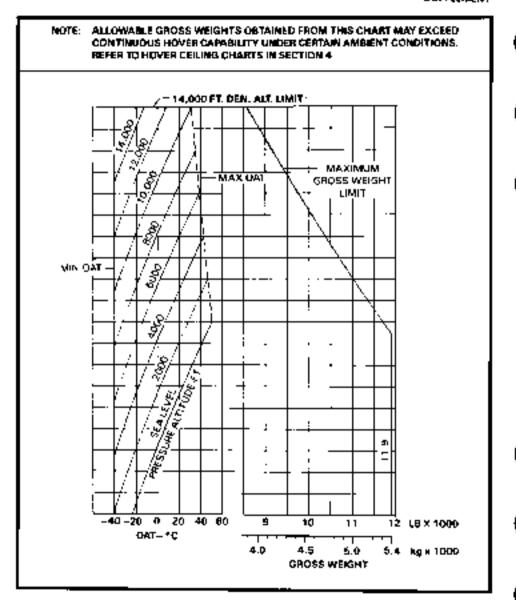
Actual weight change shall be determined after components are installed and ballest readjusted, if necessary, to return empty weight CG to within plowable limits.

Refer to Weight Altitude-Temperature Limitations chart for maximum allowable weight for takeoff, lending, and IGE hover operation

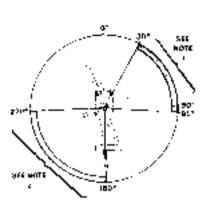
AIRSPEED LIMITATIONS

Altepeed shall not exceed 105 KIAS for placehed Vist, if letal when operating above 81% mast respue.

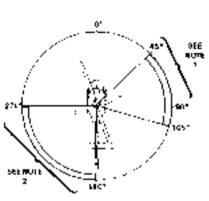
Refer to Maximum Speed-Sideward and Rearward Faghs. Crosswind and Tailwind At A Hover chart.



Weight-altitude-semperature limitations for takeoff, landing, and in-ground-effort measurers

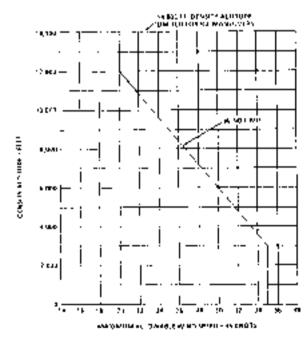


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OGA CRITICAL ASLATIVE AYAO AZIMUTH

IGN CAPTICAL RELATIVE WIND ASSAULTH



Manipulm appeal — stripping and received High) . Crosswill and splight at hover

POWER PLANT LIMITATIONS

Prait and Whitney Aircraft of Canada, Ltd. PTGT 38E.

POWER TURBINE RPM (N., LIMITS)

Minimum in cruise	97%
Minimum for hover. cakeoff, and climb	100%
Maximum continuous	100%

MAST TORQUE LIMITS

TWIN ENGINE OPERATION

Maximum continuous	817
Tekeott range (5 minutes meetman)	61 to 1005

WALLEN

TAKEOFF POWER SHALL NOT BE USED ABOVE 105 KIAS.

Maximum

100%

CAVION

WHEN OPERATING NEAR THE MAXIMUM MAST TORQUE LIMIT, INADVERTANT OVERTORQUE MAY OCCUR DURING MANEUVERING FLIGHT CONDITIONS INVOLVING TURNS AND/OR NOSE DOWN

ATTITUDE CHANGES DECREASE POWER TO 90% MAST TORQUE PRIOR TO MANEUVERING HELICOPTER.

intentional use of mast torque over 100% is prohibited

TRANSMISSION TORQUE LIMITS

Daletad, See MAST TORQUE LIMITS.

ROTOR LIMITATIONS

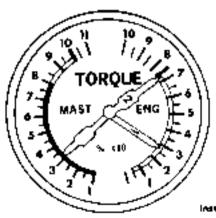
ROTOR RPM IN ILLMITS - POWER ON

Minimum	97%
Combinuous operation	87 to 100%
Макітыт соложир ие	100%
Uperation with mast torque at or below 32%	100 to 104.5%
Maximum with most corque at or below 32%	104.5%

FUEL AND OIL LIMITATIONS

TRANSMISSION, INTERMEDIATE AND TAIL BOTOR GEAGBOX OIL

Turbine (ii) 555 is the only approved oil for use at the transmission and gearboxes.



TRULE TORDUE WORCATOR

MAST TOMBUÉ

>€LLOW	81 re 100%	Simulate (aké) fi ranga
ACD	100%	Masimum
	ENGINE	
GREEN	5 to 58.9%	Corements OEI operation
YELLOW	58 5 to 13 2%	30 minute OEI range
RED	73.2%	Mgamum OEI

International members



NORMAL PROCEDURES

EXTERIOR CHECK

FUSELAGE - AFT LEFT SIDE

Check OVER TRO working Reg lobi's eyel for indication of eventurates.

PRESTART CHECK

OVER TORO couton light — Press. Check light Mummoton and MAST TORQUE indicator reads 105±1%

CAUROM

IF MAST TORDUE INDICATOR INDICATES AN ERROR GREATER THAN ± 1% FROM THE 105% POBITION THE MAST TORQUE SYSTEM IS UNRELIABLE. MAINTENANCE ACTION IS REQUIRED.

BEFORE TAKEOFF

Throttles - Full open. Adjust frictions

RPM switch Minimum beap (DECR for 4-5 seconds).

RPM switch - Minimum trim (-2 for 4-5 seconds).

No - Check 95% or greater.

RPM swetch — Adjust to obtain matching torque at 100% No.

Flight instruments - Check operation and ses.

TAKEOFF

Arab - Class

NOTE

As collective is increased, it may be necessary to remarch engine torques prior to reaching hove:

RPM ewitch — Adjust to obtain matching forgot or ITT, as required, and 100% No.

Hover power — Check torque required to hover as four feet skid height.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

EMERGENCY PROCEDURES

Causion lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
OVER TORU	Макстотория висеедя 100.5%	Reduce power or severity of moneuver Land as soon as practical.

PERFORMANCE

INTRODUCTION

The partermance data presented herein are derived from the engine manufacturer's specification power for the engine less installetion losses when used with the 417-570-001-103 improved Hover Performance modification. These data are applicable to the basic helicopier without any optional equipment which would appreciably effect lift, dreg. or books enallable.

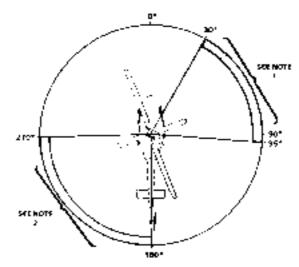
HOVER CEILING OGE.

AREA A (unphaded great as shown on the hover colling charts preparts hover performance for which serietactory cyclic and directional control have been demonstrated in relative winds of 35 knots from any direction at or below 3000 feet MD. Improved control mergins will be reaked by avoiding winds in the critical relative wind assignt beess.

AREA 8 ishaded areal or shown on hover calling charse presents additional hover performance which can be realized in color winds or winds outside the critical relative wind extracts process.

NOTE

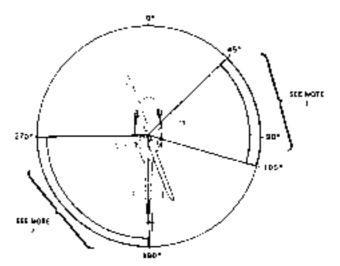
Tall rotor or cyclic control margin may preclude operation in AREA 8 of the hover coffing charts when the relative wind is in the respective critical wind azimush area.



MOTES:

- The Paral citized which as much howevery with parallel and a company to the action and the company of the compa
- a Instally to make a harding the to large felt cadel requirements for corner wed selection
- b Peruraian of available left padal control with A diseasional AFCE taggings.
- 2 unighted and court religion which and court may be to-miss with tempted and AFCS hardware.

OGE CRITICAL RELATIVE WIND AZIMUTH



IGE CRITICAL RELATIVE WIND AZIMUTH

Critical retains word attraction

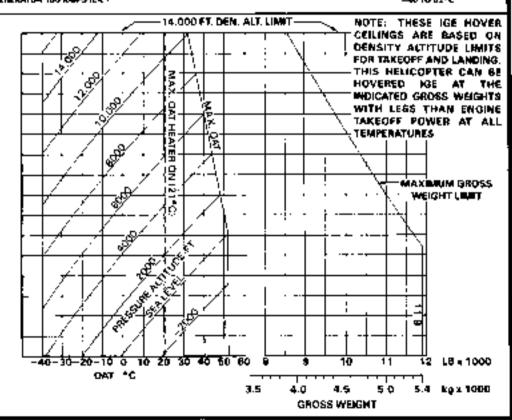


POWER SEE NOTE BELOW ENGINE RPM 100% GENERATOR 150 ARMS IEA

Carrier Sheet 7 or

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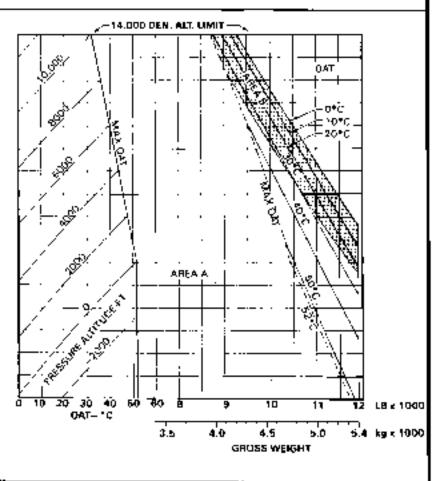
BRID HEIGHT 4 FEET HEATER ON DRIGHT -NO TO 82°C



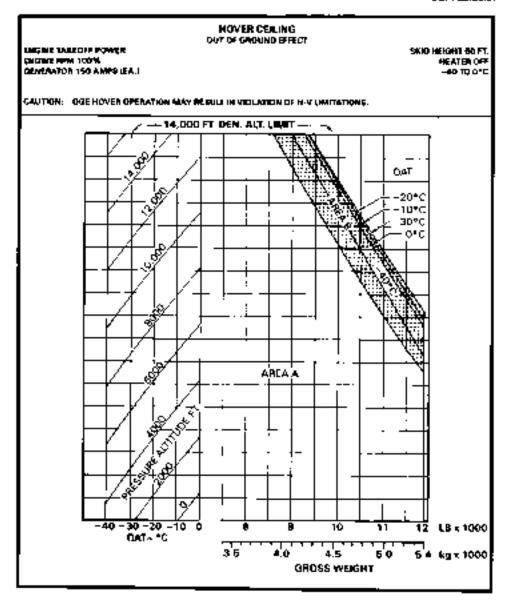


ENGINE TAKEUPT PUWER ENGINE PPM 100% GENERATUR 150 AMPS 164 ; SAID HEIGHT BOFT HEATER OFF 0 10 5210

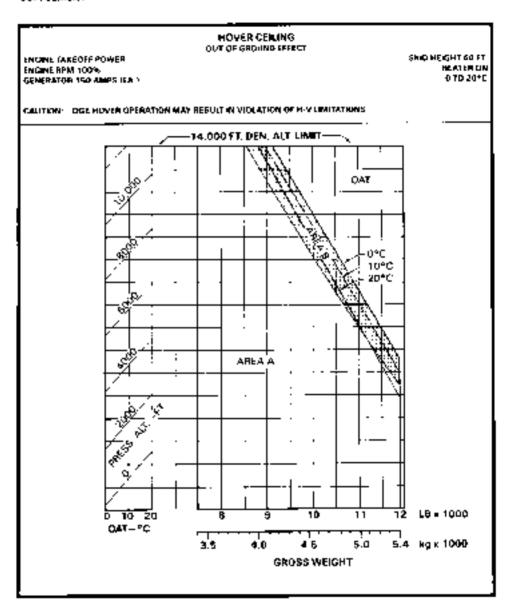
CAUTION - DGE HOVER OPERATION MAY RESILCT IN VADILATION OF HIM LIMITATIONS.



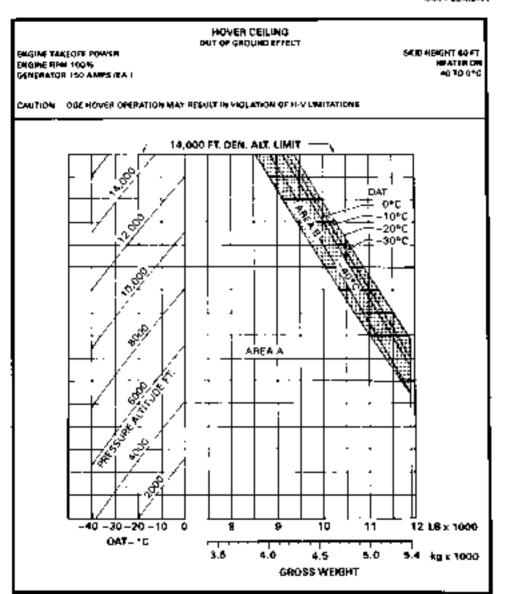
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Hover celling (Sheet 3 of 10)



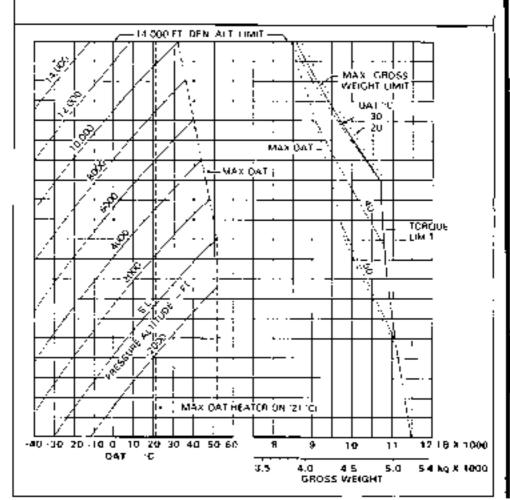
Mover calling ISheet 4 of 101



Hover calling (Shaut 5 of 10)

HOVER CEILING IN GROUNG EFFECT

MAXIMUM CONTINUOUS FOWEN ENGINE RPM 100% GENERATOR USO AMPS (FA.) SKID HAIGHT & FEET HEATER ON OR OFF 40° *0 \$7°C

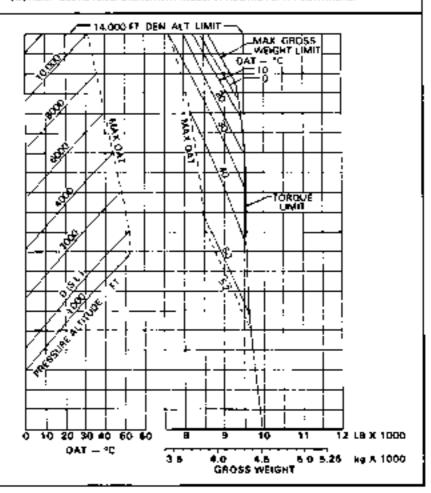


Hover chiling (Sheet 6 of 10)

MOVER CEIUNG OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER ENGINE RPM 100% CENERATOR 150 AMPS (EA) 9KIO HEIGHT 40 67. HEATER OFF A TO 52°C

CAUTION: DOE HOVER OPERATION WAY RESULT INVIOLATION OF HIS CHARTATIONS.



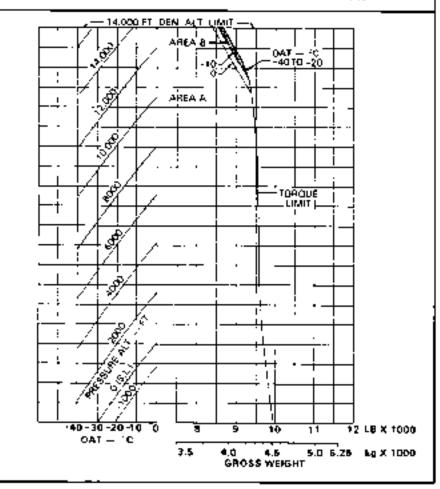
Hower calling (\$heet 7 of 10)

HOVER CEILING OUT OF GROUND EFFECT

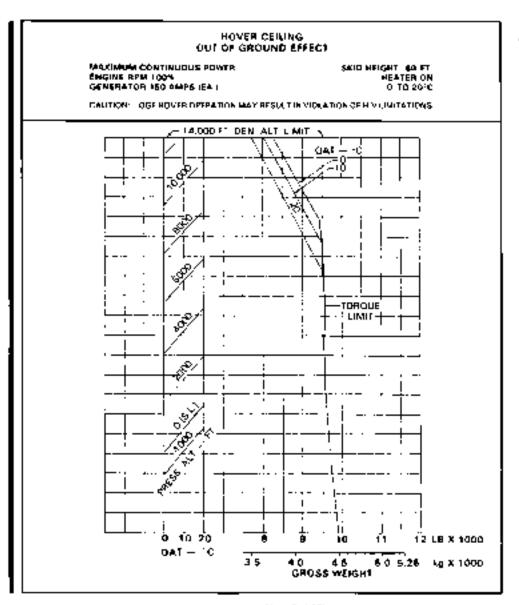
MAXIMUM CONTINUOUS POWER ENGINE RPM 100% GENERATOR 150 AMPS (EA.)

SKEN HEAGHT 60 FT MEATER OFF 40 10 0°C

CANTION: OF CHOVER OPERATION WAS RESULT IN VIOLATION OF HIS LIMITATIONS.



Have believe (Sheet 8 of 10)

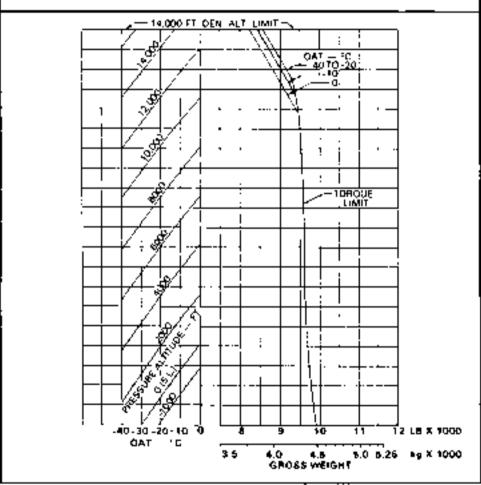


Hover calling (Sheet 9 of 10)

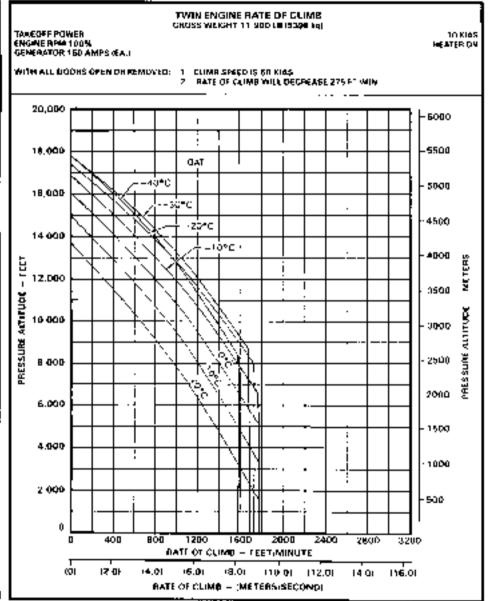
HOVER CEILING OUT OF GROUND EFFECT

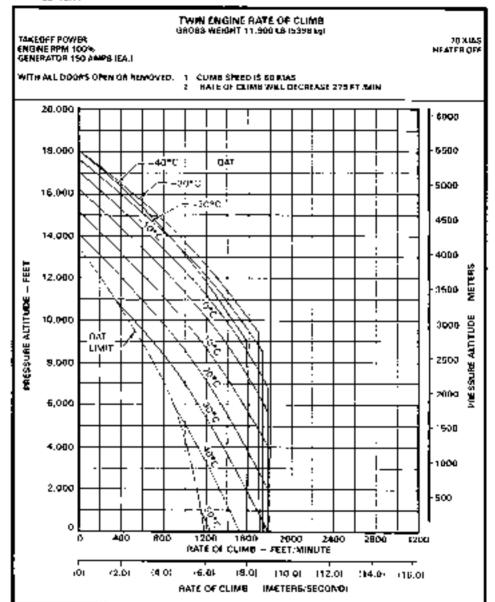
MBITIMUM CONTINUOUS POWER EMGINE 9PM 100% GENERATOR 150 AMPS (6A.) SNIO HEIGHT 60 FT MEATER ON 40 TO 07C

LADISON DOE HOVER OPERATION MAY RESULT IN VIOLATION OF HIS LIMITATIONS

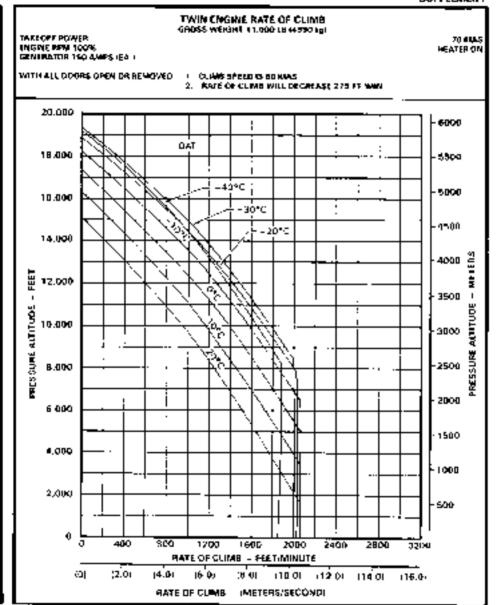


Hove calling (Sheet 10 of 10)

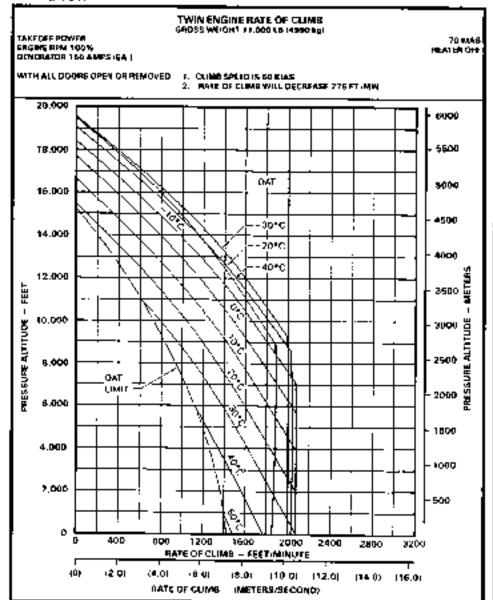




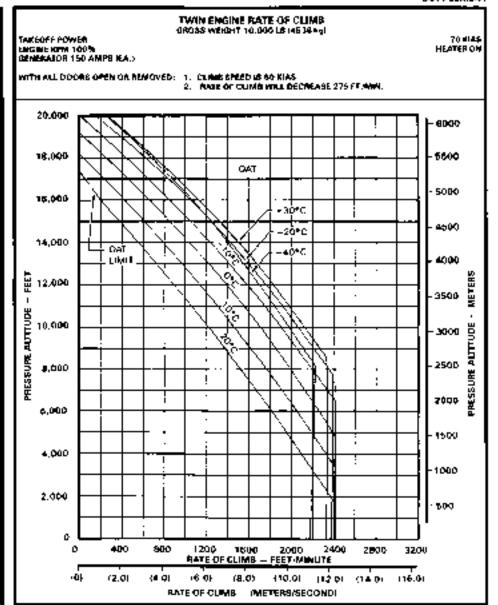
Town angine rate of camb (Sheet 2 of 24)



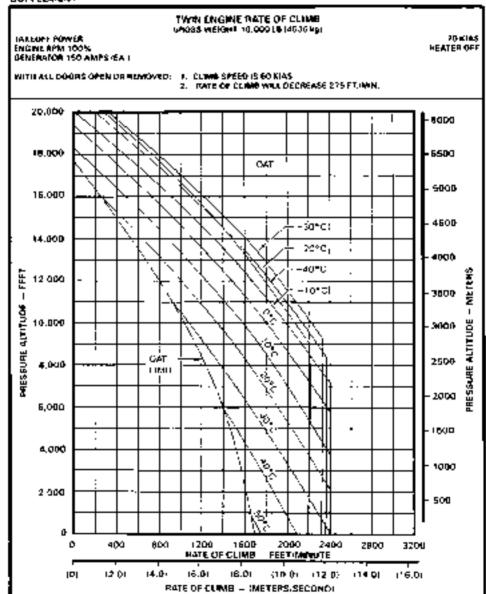
Twin engine rate of climb (Sheet 3 of 24).



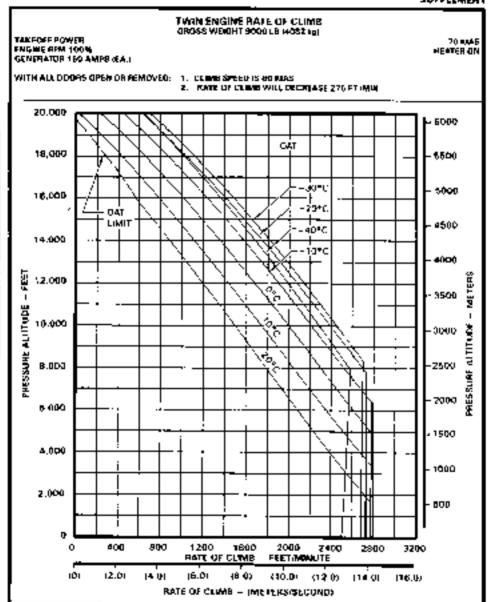
Texts engine rate of camb (\$heat 4 of 24)



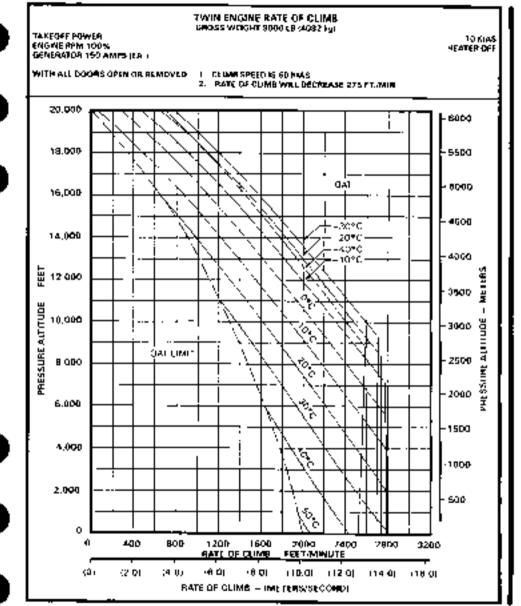
Twin angine rase of climb (Sheet 5 of 24)



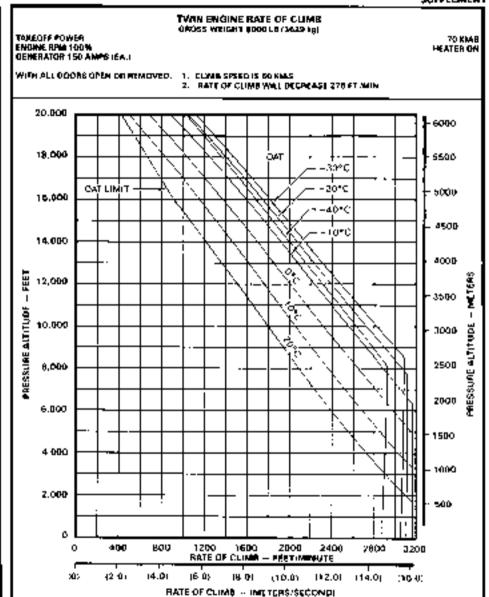
Twin engine case of climb (Sheet 6 of 24)



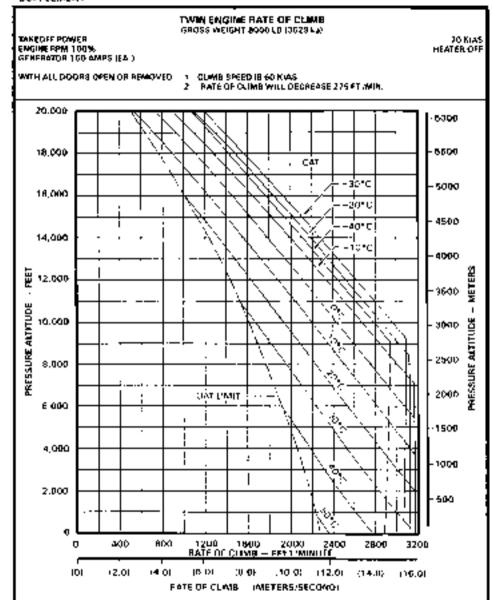
Twin engine rate of climb (Sheet 7 of 24)



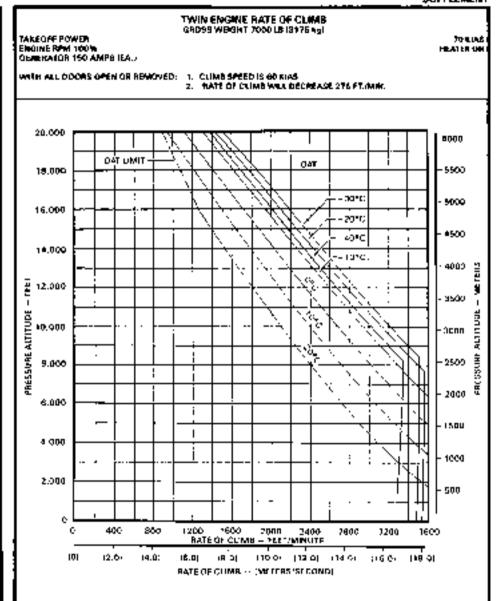
Two engine rate of climb (Sheet 6 of 24)



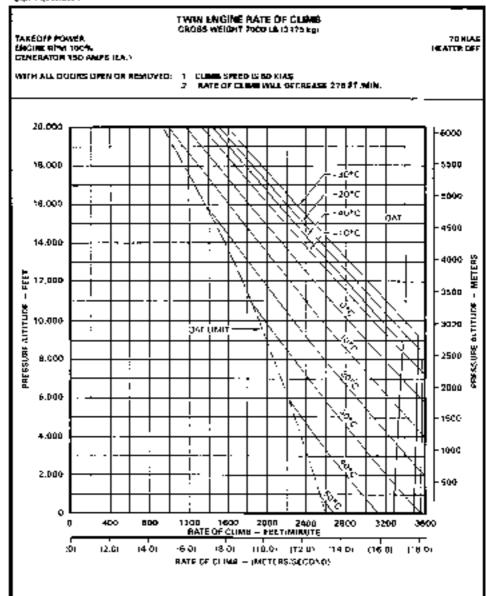
Twin angine rate of climb (Sheet 9 of 24)



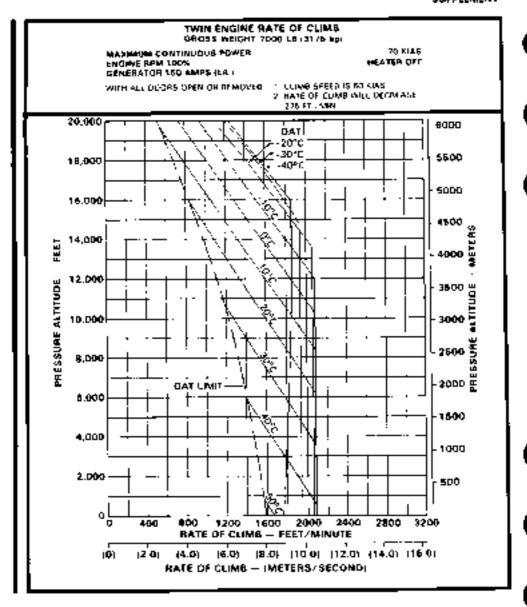
Twin engine rate of climb (Sheet 10 of 24)



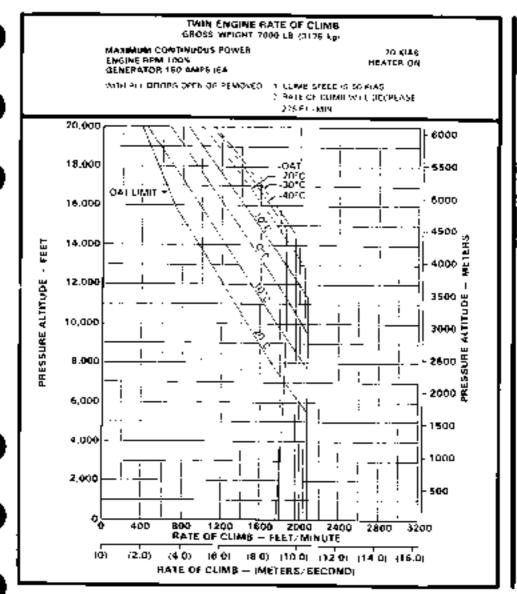
Twin engine rate of climb (Sheet 11 of 24)



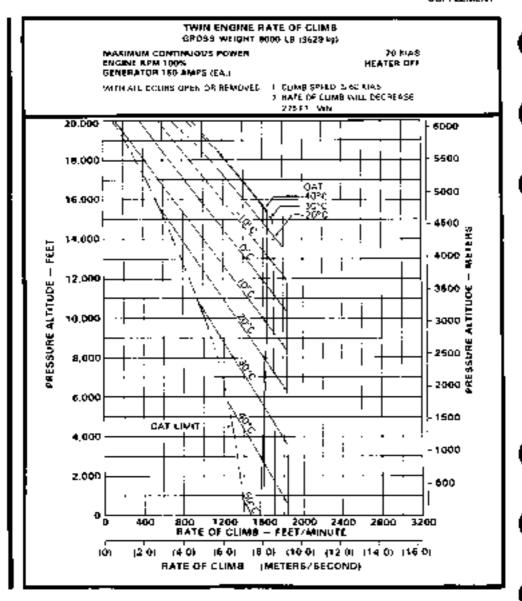
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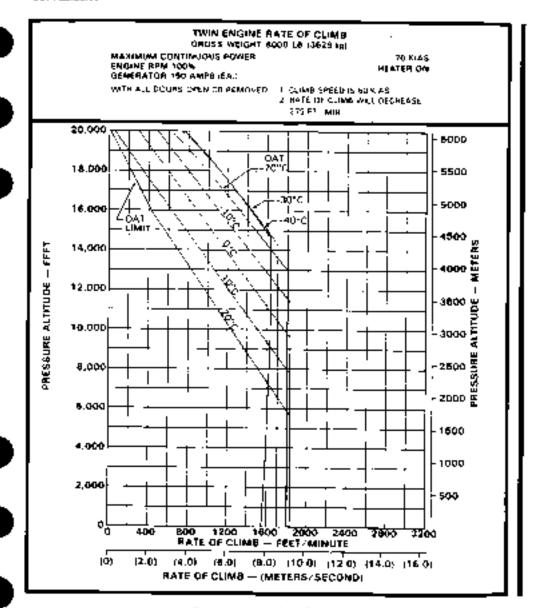
Twin singing mate of climb (54)444 13 of 24)



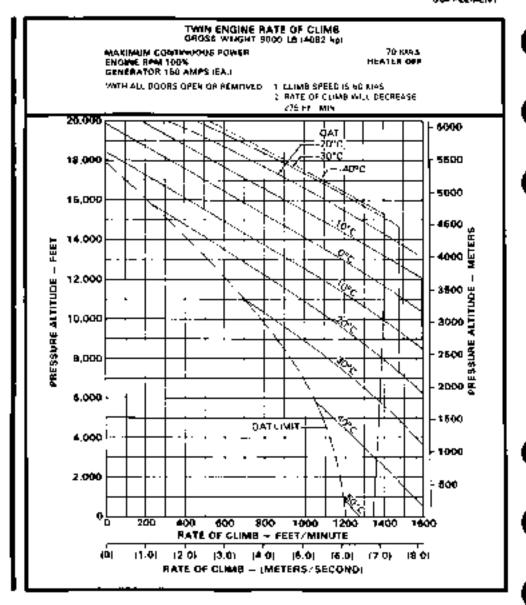
Two engine rate of climb (Sheet 14-of 24)



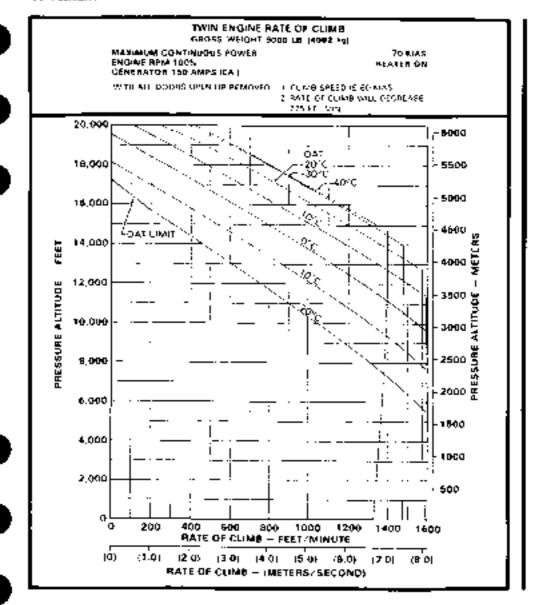
Twin angine case of climb (Sheet 16 of 24)



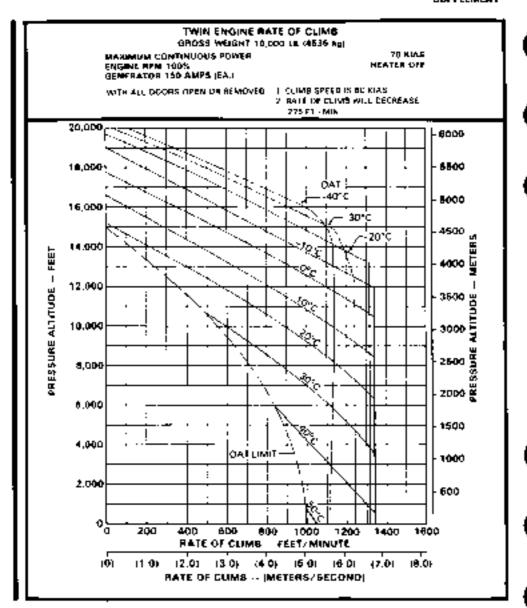
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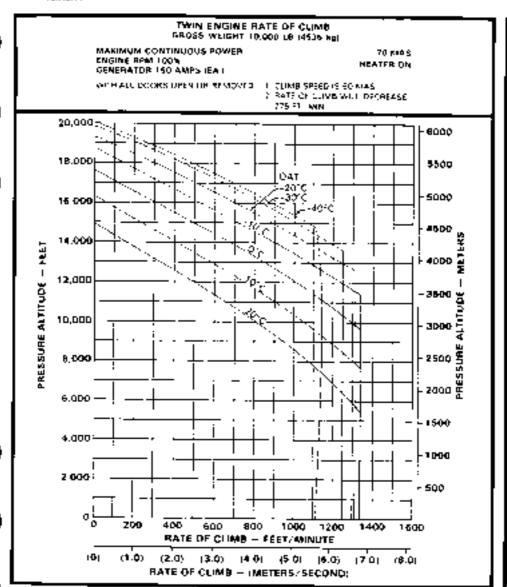
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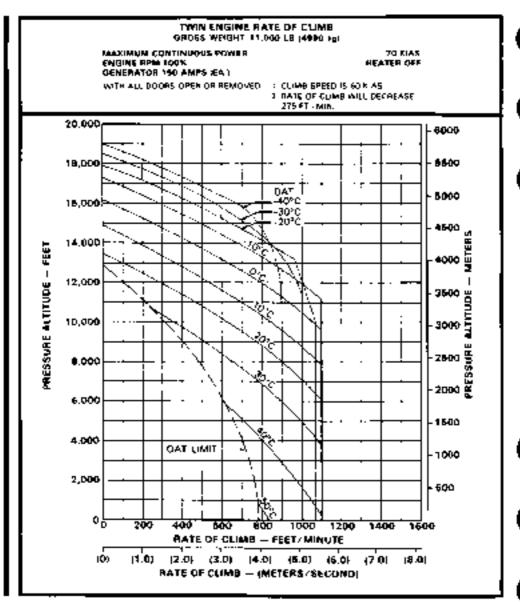
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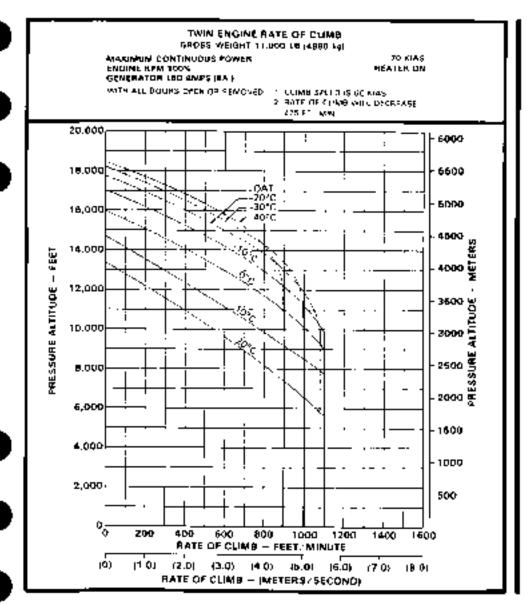
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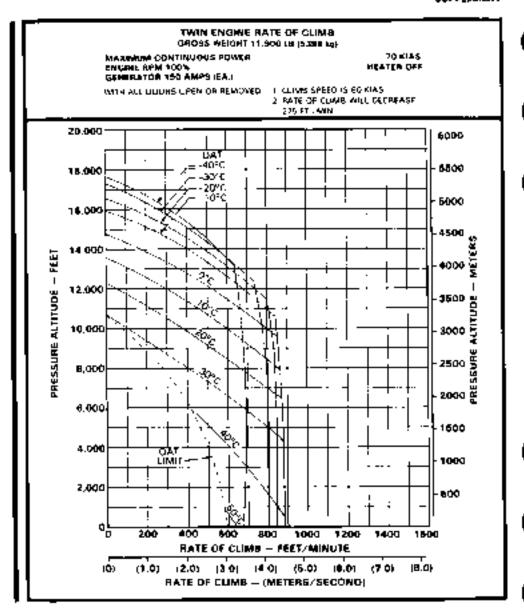
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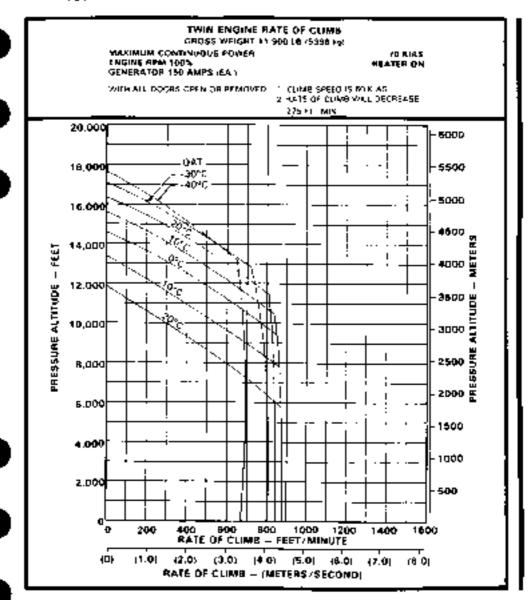
Twin engine rate of climb (\$heat 21 of 24)



Two angine rate of climb (Sheet 22 of 24)



Two angine rate of climb (Sheet 2.3 of 24)



Twin engine race of climb (Sheet 24 of 24)

MANUFACTURER'S DATA

WEIGHT AND BALANCE

No change from basic Floht Manual

Section 2

MANUFACTURER'S DATA

SYSTEMS DESCRIPTION

INSTRUMENT CONSOLES

PANEL

AND

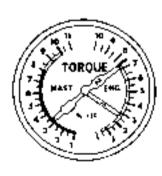
OVERTORQUE WARNING SYSTEM

AMBER



An OVER TRO warning fleg (car's eyel is located in the lower left off eviories competement. If mast torque exceeds 108%, the warning fleg will be tripped showing atternating black and while sections.

(located on instrument panel)



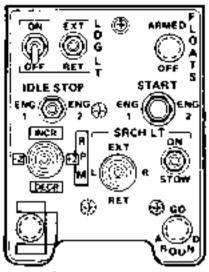
Replaces TRANSMISSION TORQUE page!

POWERPLANT

The prior RPM switch is mounted on the collective switchbox. The pillot switch is a five position momentary-on type switch. The INCR position increases engine RPM, and the DECR position decreases engine RPM. The INCR/DECR positions control the governors on both engines simultaneously. Regulated engine RPM may be adjusted in flight through the operating range of \$7 to 101.5 (±0.5) % by moultain the switch.

The RPM +2:-2 switch increases or decreases angine No. 2 RPM to provide torque or ITT matching. Engine 2 trim range is 2.0 - 2.5% No Engine 2 governor should be at least 95% minimum tem - minimum base.

The copilot does not have trim capability. For location of APM switch, refer to collective control panel.



Сойвскіме солигої рамаі.

Section 3

MANUFACTURER'S DATA

OPERATIONAL INFORMATION

No change from basic Flight Manual

Section 4

MANUFACTURER'S DATA

HANDLING/SERVICING/MAINTENANCE

No change Nom basic Flight Manual



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT CATEGORY B OPERATIONS WHEN CONFIGURED WITH NINE OR LESS PASSENGER SEATS

33108 — 33213 34001 — 34024 36001 — 36019 AND 33001 — 33107 WHEN 412-075-008-111 TORQUEMETER IS INSTALLED (BHT-412-FMS-19.1) CERTIFIED 10 APRIL 1991

This supplement shall be attached to the Model 412 Flight Manual when helicopter is configured with nine or less passengers seat configuration.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, or other applicable supplements, consult hasis Flight Manual.

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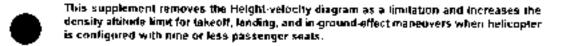
APPROVED:

MANAGER

ROTORCRÁFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION

FT. WORTH, TX 76193-0170

GENERAL INFORMATION



LIMITATIONS

1-3. TYPES OF OPERATION

Flights may be conducted in accordance with this supplement only when the helicopter is configured with nine or less passenger seats.

1-6. <u>WEIGHT AND CENTER OF</u> GRAVITY

Maximum gross weight for takeoff, landing, and in-ground-effect meneuvers is 11,900 pounds (5,396 hitograms) or as shown in Hover centing in pround effect (takeoff power) chart, refer to SECTION 4, whichever is less

Actual weight change shall be determined after seating is installed, and ballast shall be adjusted (if necessary) to return empty weight CG to within allowable limits.

1-8. <u>ALTITU</u>DE

Maximum density attitude for takeoff, landing, and in-ground-offect maneuvers is 18,000 feet. Refer to Weight-Attitude-Temperature Limitations chart (Figure 1-1). MOTE: ALLOWABLE GROSS WEIGHTS OBTAINED FROM THIS CHART MAY EXCEED HOVER CAPABILITY UNDER CERTAIN AMBIENT CONDITIONS, REFER TO HOVER CEILING CHARTS IN SECTION 4.

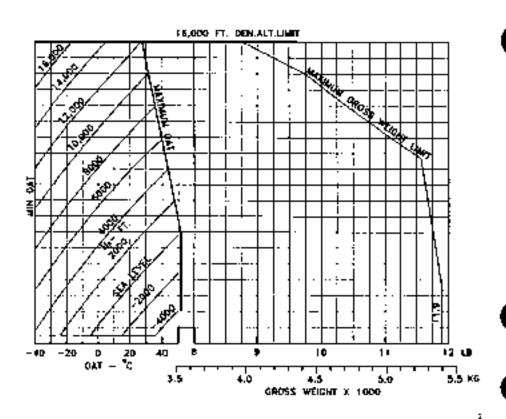


Figure 1.1. Weight-altitude-temperature himitations for takeoff, landing, and in-ground-effect maneuvers

NORMAL PROCEDURES

2-2. FLIGHT PLANNING

Refer to Performance Data, Section 4.

NOTE

The Height-velocity diagram does not represent a limitation.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual,

PERFORMANCE

4-4. <u>HEIGHT - VELOCITY</u> ENVELOPE

Operation in height-velocity envelope is critical in the event of a single engine failure during takeoff, landing, or other operation near the surface (Figure 4-1). The AVOID area of the Height-velocity diagram defines the combinations of airspeed and height above ground from which a safe single engine landing on a smooth, level, firm surface cannot be assured.

The Height-velocity diagram is valid only when the Hover Celling Out of Ground Effect performance envelope is not exceeded (refer to Figure 4-2). The Hover Ceiling in Ground Effect performance charter to Figure 4-3) does not define the conditions which assure continued flight following an engine failure nor the conditions from which a safe power-off landing can be made.

4-5. HOVER CEILING

The Hover Celling in Ground Effect charts (Figures 4-3 and 4-4) provide the maximum allowable gross weights for takeoff, landing, and IGE manuvers at all pressure attitude and outside air temperature conditions with heater on or off. Genversely, the hover celling allitude can be determined for any given gross weight.

Adequate cyclic and directional control are available at the gross weights allowed by the Hover Ceiling IGE charts in winds up to 35 knots from any direction at or below 3,000 feel HÖ (refer to Basic Filght Manual). Above 3,000 feel HD, improved control margins will be realized by avoiding winds in the critical wind azimuth area (Figure 4-5).

4-6. TAKEOFF DISTANCE

The Takeoff Distance charts (Figure 4-6) provide takeoff distances required to clear a 50-foot or 15-meter obstacle in a zero wind condition. Takeoff is initiated from a hover at 4 feet (1.2 meters) shid height with climbout of 45 knots.

NOTE

Downward takeoffs are not recommended because the published takeoff distance performance cannot be achieved.

HEIGHT VELOCITY DIAGRAM HUR SMOOTH LEVEL, FIRM SURFACES

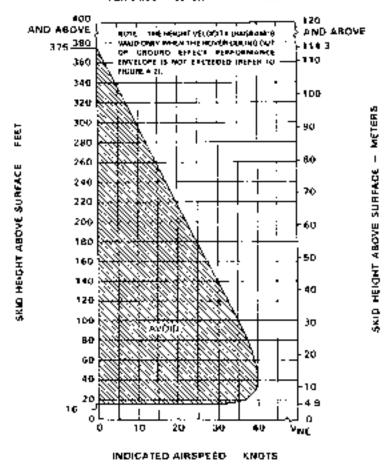


Figure 4-1. Height-volocity diagram (OEI)

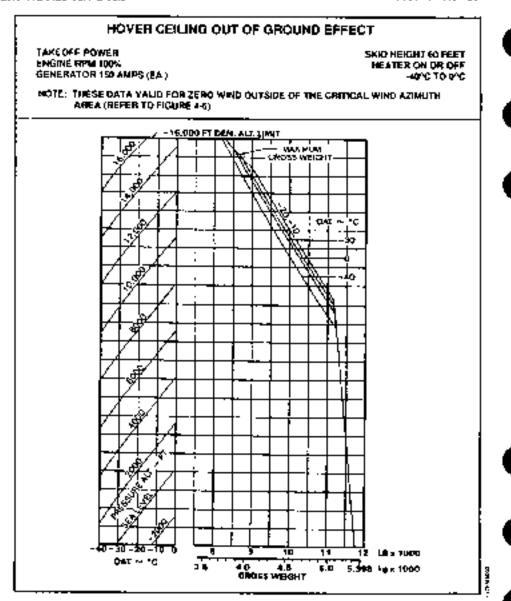


Figure 4-2. Haver ceiling out of ground effect (Sheet 1 of 2)

HOVER CEILING OUT OF GROUND EFFECT.

TAKEOFF POWER ENGAGE RPM 100%, GENERATOR 150 AMPS [EA.]

SKID HEIGHT 60 FEET HEATER ON OR OFF O'C TO 52°C

NOTE. THESE DATA YAUD FOR ZERO WIND OUTSIDE OF THE CRITICAL WIND AZIMUTH AREA (REFER TO FIGURE 4-5)

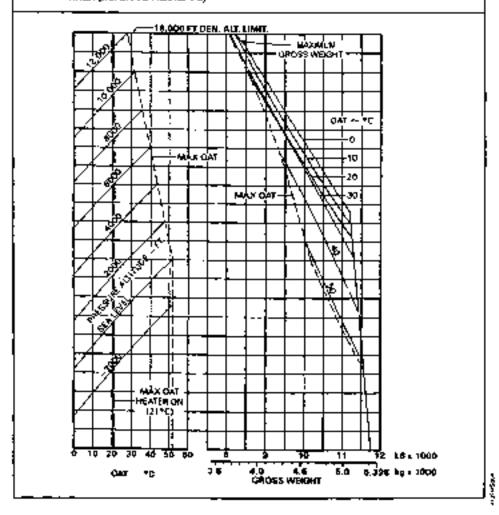


Figure 4-2. Hover coiling out of ground effect (Sheet 2 at 2)

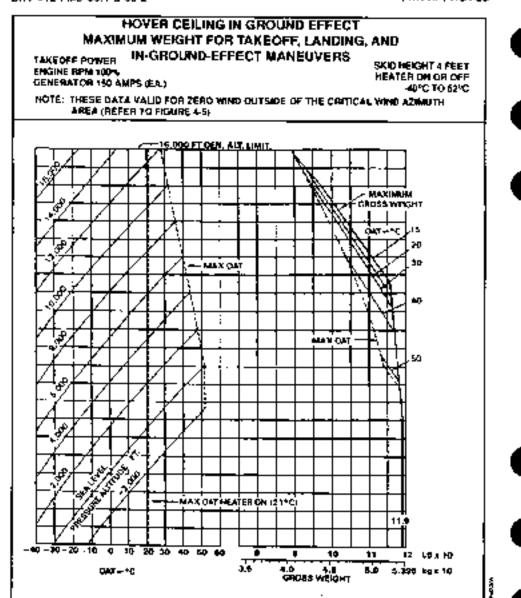


Figure 4-3. Hover ceiling in ground effect (takeoff power)

HOVER CEILING IN GROUND EFFECT MAXIMUM WEIGHT FOR TAKEOFF, LANDING, AND IN-GROUND-EFFECT MANEUVERS

MAXIMUM CONTINUOUS POWER ENGINE RPM 100% GENERATOR 150 AMPS (EA.)

SKIID HEIGHT 4 FEET HEATER ON OR OFF 40°C TO 52°C

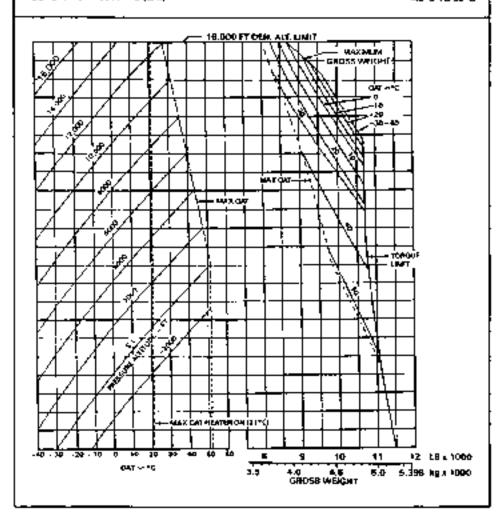
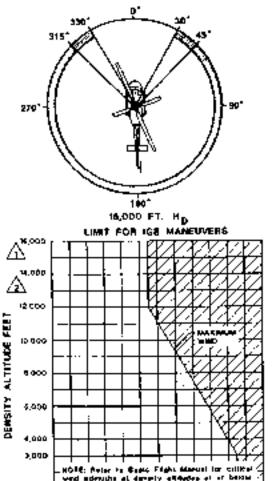


Figure 4-4. Hover ceiting in ground effect (maximum continuous power)

CRITICAL RELATIVE WIND AZIMUTH



Critical wind asympth — howeving with the relative wind asimuth angles in shaded was 200 can result in the following:

- Installing to metablish heading that to large left pedal inquitements for contain wind velocities.
- Beduction of evaluate left pedal control with a directional AFCS hardover.
- All cyclic may be twided with tonginational AFCS hardows.
- d. Nover performance is validles all headings in salm wind.

A for M₀ from 14,000 to 16,000 M winds up to 190° off nose for Mover performance to be valid

For the below 14,000 th winds up to +45° old nose for hower performance to be valid.



MAXIMUM ALLOWABLE WIND SPEED-KNDTS

3 CCG 1441

TAKEOFF DISTANCE OVER 50 FOOT OBSTACLE

HOVER POWER → (5% TORQUÉ jivot la exceed limits) INITIATED FROM AFT, SKID HEIGHT ENGINE RPM 100%: Y₇₀₀₅ × 45 KIAS GENERATOR 150 AMPS (EA.) HEATER ON OR OFF

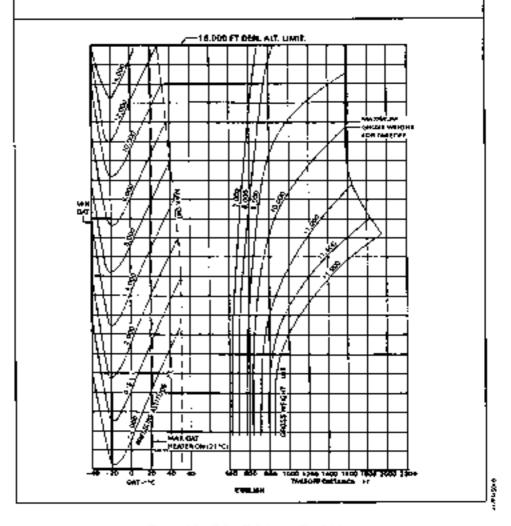


Figure 4-6. Tekeoff distance (English)

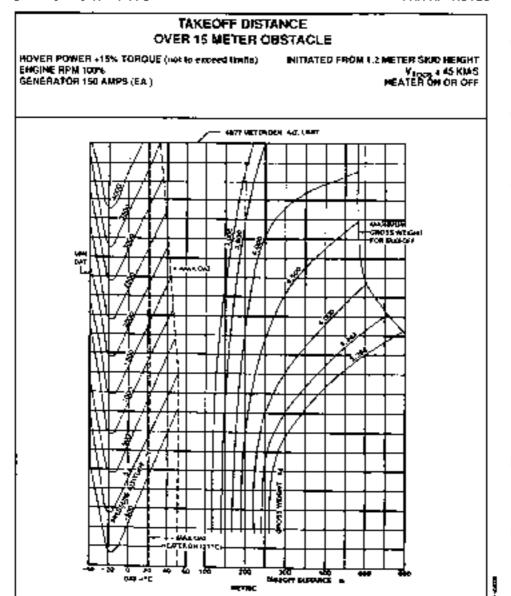


Figure 4-7. Takooff distance (Motine)



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT FOR INCREASED GENERATOR CAPACITY KIT (412-706-026)

CERTIFIED 29 OCTOBER 1992

This supplement shall be attached to the Modele 412 end 412EP Flight Manuals when the Industrial Generator Copacity Kit is intraffed.

The information contained herein supplements the information of the basic Flight Manual. For Ulmitetions, Procedures, and Performance Opto not contained in this supplement, consult the basic Flight Manual.

Bell Helicopter IIXIRON

PORT SPREE BOX 410 - PUMP ROWIN MARKS (HIS)

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9HT-412-FMS-40 FAA APPROVED

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Sarry M. Delly

MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76180-0170 FAA APPROVED BHT-112-FMS-40

INTRODUCTION

The increased Generator Capacity Kit increases the emperage limit from 150 to 200 emps on each generator. The incremental partnermence losses for the additional 50 emps each is presented in Section 4.

LIMITATIONS

WEIGHT/CG LIMITATIONS

Actual weight change shall be determined after kit is installed and ballast adjusted (if necessary) to return empty weight CG within allowable limits.

GENERATOR LIMITATIONS

Continuous operation
Maximum for operation above
15,000 feet density altitude
Maximum

0 to 200 amps

150 amps 200 amps CAUTION

DURING SINGLE GENERATOR OPERATION, ELECTRICAL LOADS SHALL BE REDUCED BEFORE RESTORING POWER TO NONESSENTIAL BUS TO ENSURE GENERATOR LOAD LIMIT IS NOT EXCEEDED.



0 to 200 AMPS 150 AMPS

AMMETER

Continuous operation

Maximum for operation above 15,000 ft H_D

200 AMPS

Maximum

INSTRUMENT MARKINGS

Section 2

NORMAL PROCEDURES

No change from basic Flight Manual.

BHT-412-FMS-40 FAA APPROVED

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

ELECTRICAL POWER FAILURES

OC POWER FAILURE

INDICATIONS.

DC GEMERATOR caution 6ght lituralnates.

A8 lighting and extentes on nonessential buses inoperative.

PROCEDURE:

GEN FIELD and GEN RESET circuit breakers — Check in.

GEN switch (effected generator) — RESET, then ON

If generator removes enoperative, proceed as follows:

GEN switch (affected generator) - OFF

If No. 2 Generator failed:

BATTERY BUS 2 switch - OFF:

BATTERY BUS 1 switch - ON

lé nomensoritei bus power la required, proceed ge follows:

Sweet off all unnecessary equipment

CAUTION

DO NOT SET NON EGNTL BUS SWITCH TO MANUAL BEFORE TURNING OFF UNNECESSARY EQUIPMENT TO ENSURE GENERATOR LOAD LIMIT IS NOT EXCEDED.

NON-ESNTL BUS switch - MANUAL.

OC AMPS - Monitor.

Equipment switches — As desired/off as necessary to maintain generator load below maximum limits.

NOTE

During single engine operation, avoid generator load above 150 amps to attend climb performance presented in basic Flight Menual.

PERFORMANCE

PERFORMANCE VARIATIONS

Performance variation charts are provided to determine hover and climb performance decrements due to the additional power requirements for the generators when operating at 200 amps each The charts are organized into three performance sections according to helicopter configuration and respective flight menual and supplements to which the charts apply.

PERFORMANCE SECTION APPLICATION

PERFORMANCE SECTION	HELICOPTER SERIAL NUMBERS	EQUIPMENT REQUIRED	FLIGHT MANUAL/ SUPPLEMENT
Section 4A	33001-33107	None	*BHT-412-FM-1
Section 48	33108-33213 35001-36019	None	*BHT-412-FM-Z
	00001-83107	Increased Gross Weight and Taken# Horsepower (412-075-008-111)	6HT-412-FME 19,1
Section 4C	38020 - 36086 AMD 36087 AND SUB	None	*BHT-412-FM-3
	33108-33213 38001-38019	Improved Howe Performance Musification (412-570-001-100)	BHT-412-FMS-34.3
		Provinced Maximum Continuous Power Ka (412-706-029)	BHT-412-FM5-41
	33001-33107	Incascurd Mealmon Contractus Power Kit (412-706-029)	BHT-412-FM6-41

Basic Fight Manual or appropriate optional equipment supplement

BHT-412-FMS-40 FAA APPROVED



DMT.412.FM.1

PERFORMANCE

TWIN ENGINE HOVER AND RATE OF CLIMB DECREASE DUE TO 200 AMP GENERATOR LOADS.

Enter appropriate chart with pressure ablieds and OAT to determine whether or not performance reduction is required, it applicable, decrease performance data in basic liight manual or appropriete optional equipment supplement as indicated on their lists of climb reduction of 30 feet per minute or hover gross-weight reduction of 50 pounds out of ground effect or 60 pounds in ground effect.

HOVER PERFORMANCE VARIATION FOR BHT-412-FM 1

TAKÉÓFF PÓWER GENERATOR 200 AMPS JEACHJ

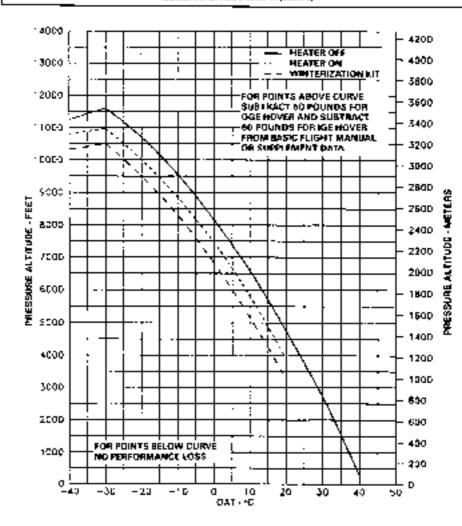


Figure 4A-1. Hover performance variation — rakeoff power

HOVER PERFORMANCE VARIATION FOR 8HT-412-FM-1

MAXIMUM CONTINUOUS POWER GENERATOR 200 AMPS (EACH)

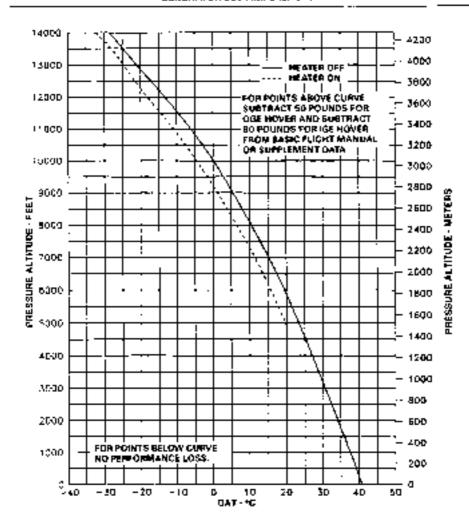


Figure 4A-2. Hower performence variation — maximum continuous power

CLIMB PERFORMANCE VARIATION FOR BHT-412-FM-1

TAKEOFF POWER GENERATOR 200 AMPS (EACH)

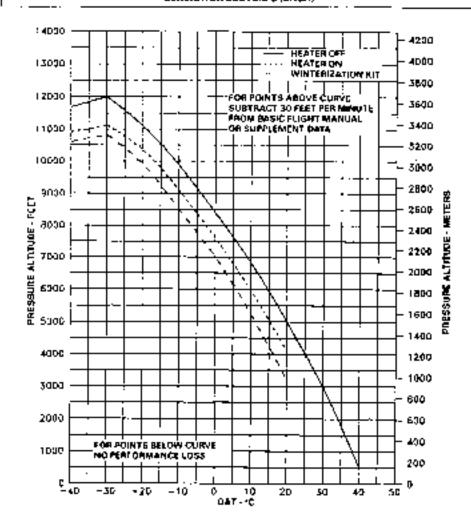


Figure 4A-3. Climb performance variation — takeoff power

CLIMB PERFORMANCE VARIATION FOR BHT-412-FM-1

MÁXIMUM CONTINUOUS POWER GÉNERATOR 200 AMPS (EACH)

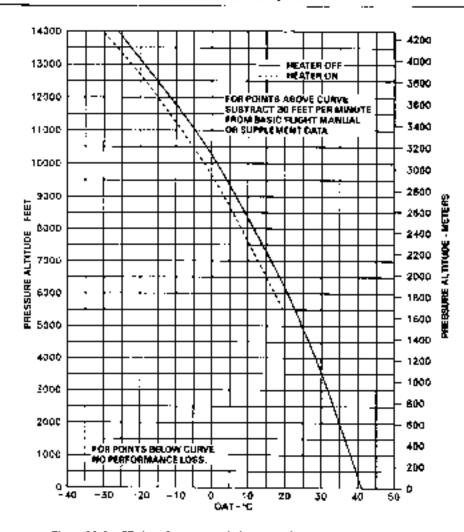


Figure 4A-4. Climb performance variation — maximum continuous power



ВНТ-412-FM-2 ВНТ-412 FMS-19.1

PERFORMANCE

TWIN ENGINE HOVER AND RATE OF CLIMB DECREASE DUE TO 200 AMP GENERATOR LOADS.

Enter appropriate chara with pressure allitude and OAT to determine whether or not performance reduction it required it applicable, decrease performance data in basic flight manual or appropriate optional equipment supplement as willcated on chart trace of climated oncome trace of climated and the control of the control

HOVER PERFORMANCE VARIATION FOR BHT-412-FM-2 AND BHT-412-FM-6 19.1

TAKEOFF POWER GENERATOR 200 AMPS IFACHI

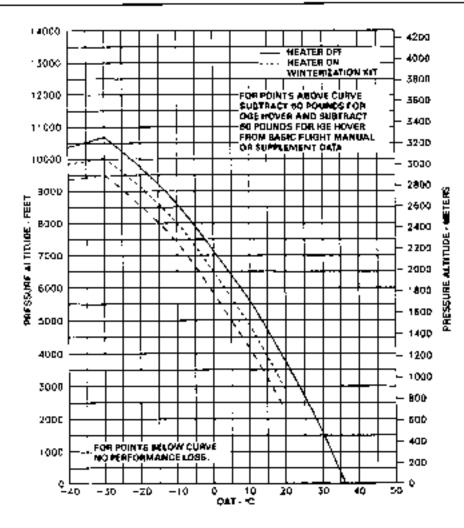


Figure 48-1. Hover performance variation — takenti power

FAA APPROVED BHT-412-FMS-40

HÖVER PERFORMANCE VARIATION FOR BHT-412-FM-2 AND BHT-412-FMS 19.1

MAXIMUM CONTINUOUS POWER GENERATOR 200 AMPS (EACH)

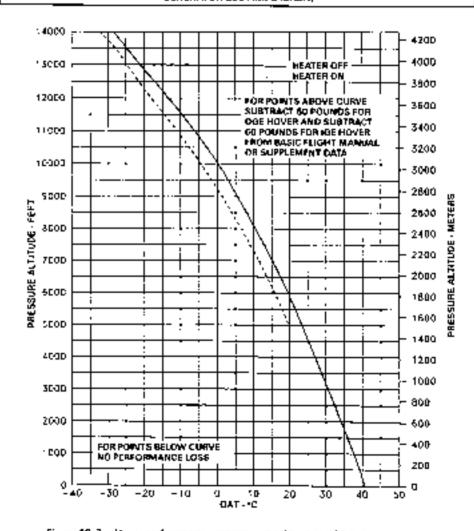


Figure 46-2. Hover performence variation — maximum continuous power

RHY-412 FMS-40 FAA APPROVED

CLIMB PERFORMANCE VARIATION FOR BHT-412-FM-2 AND BHT-412-FMS-19.1

TAKEOFF POWER GENERATOR 200 AMPS (EACH)

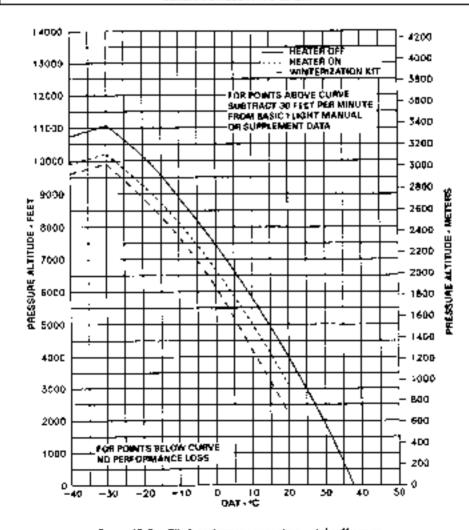


Figure 48-3 Climb partonnence vereition — takeoff power

FAA APPROVED BHT-412-FMS-40

CUMB PERFORMANCE VARIATION FOR BHT-412-FM-2 AND BHT-412-FM6-19.1

MAXIMUM CONTINUOUS POWER GENERATOR 200 AMPS (EACH)

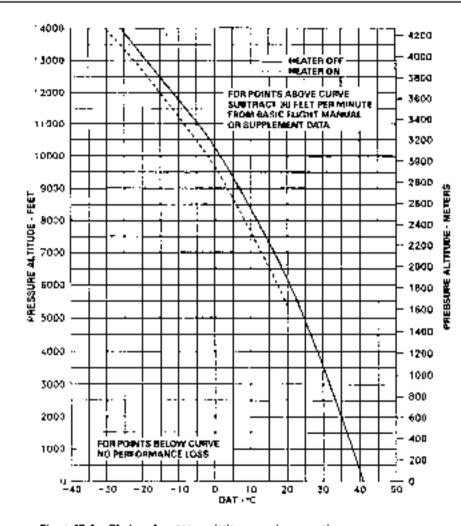


Figure 48-4 Climb performance varietion – maximum continuous power

BNT-412-FMS-40 FAA APPROVED

Section 4C

BHT-412-FM-3 BHT-412-FM-4 BHT-412-FMS-94.2 BHT-412-FMS-41

PERFORMANCE

TWM ENGINE HOVER AND RATE OF CLIMB DECREASE DUE TO 200 AMP GENERATOR LOADS

Enter appropriate chart with pressure abitude and OAT to determine whether or not performance reduction is required. If applicable, decrease performance data in boald flight manual or appropriate optional equipment supplement as indicated on chart trate of climbinduction of 30 feet per himself of hover gross weight reduction of 50 pounds out of ground effect or 60 pounds in ground effect).

FAA APPROVED BHT 412 FMS 40

HOVER PERFORMANCE VARIATION FOR BHT-412-FM-3, 8HT-412-FM-4, 8HT-412-FMS-34.2, AND 8HT-412-FMS-41

TAKEOFF POWER GENERATOR 200 AMPS (EACH)

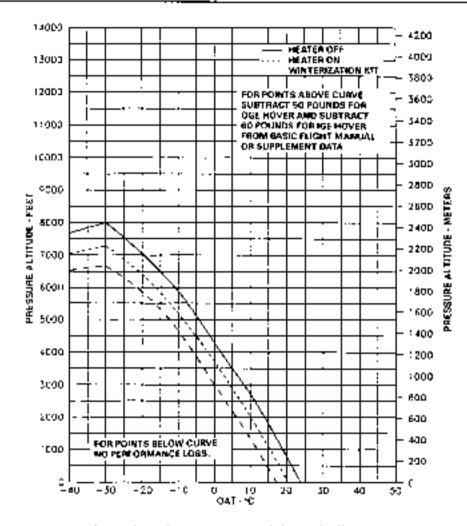


Figure 4C-1 Hoves performance variation — takeoff power

BHT-412-FMS-40 FAA APPROVED

HOVER PERFORMANCE VARIATION FOR BHT-412-FM-3, BHT-412-FM-4, BHT-412-FMS-34-2, AND BHT-412-FMS-41

MAXIMUM CONTINUOUS POWER GENERATOR 200 AMPS (EACH)

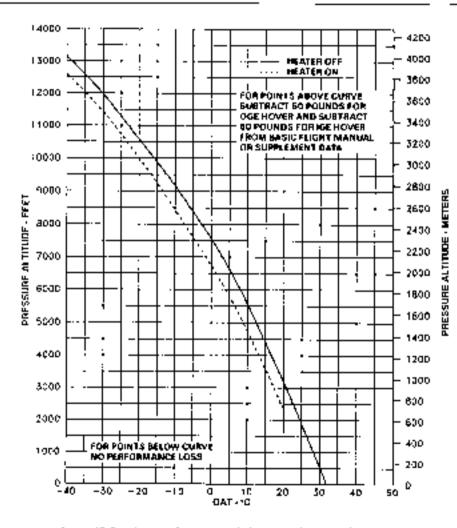
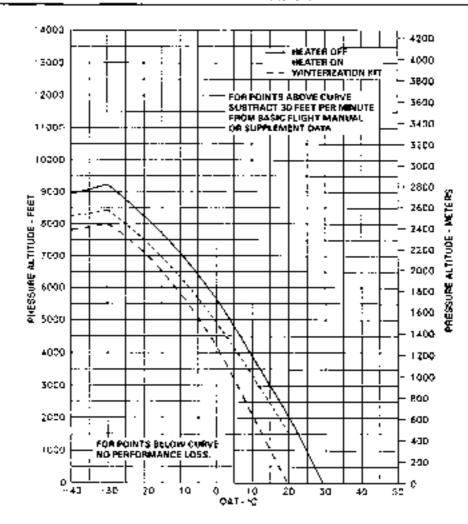


Figure 4C-2 Hover performance variation — maximum continuous power

CUMB PERFORMANCE VARIATION FOR BHT-412-FM-3, BHT-412-FM-4, BHT-412-FMS-34, 2, AND BHT-412-FMS-41

TAKEOFF POWER GENERATOR 200 AMPS JEACHE



F-gura 4C-3. CRmb performance variation - sakeoff power

BHT-412 FM6 40 FAA APPROVED

CLYMS PERFORMANCE VARIATION FOR BNT-412-FM-3, BNT-412-FM-4, BHT-412-FMS-34,2, AND BHT-412-FMS-41

MAXIMUM CONTINUOUS POWER GENERATOR 200 AMPS (EACH)

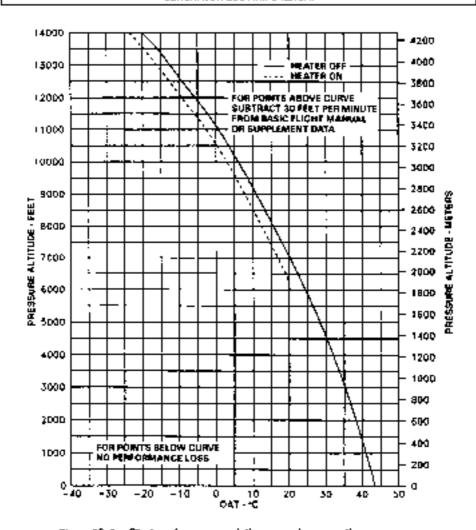


Figure 4C-4. Climb performance variation — maximum continuous power



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

FOLDING STEP

412-899-287

CERTIFIED 25 OCTOBER 1993

This supplement shall be attached to the Model 412 Fight Manual when the 412-899-267 folding step has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

Boll Mulicopter 13/11(0)

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25 OCTOBER 1993

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ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76193-0170

LIMITATIONS

OPERATING LIMITATIONS

The 412-706-004 Emergency float kit shall not be installed to conjunction with the lolding step.

If necessary, to return empty weight CG within ellowable limits.

WEIGHT - CG LIMITATIONS

Actual weight change shall be determined offer kill is installed and bullest readjusted,

Section 2

NORMAL PROCEDURES

NOTE

After passenger loading/ unloading, slow step (up).

EXTERIOR CHECK

2. FUSELAGE — CABIN LEFT SIDE

Folding step — Stowed (up).

6. FUSELAGE — CABIN RIGHT SIDE

Folding step — Stowed (up).

EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic Flight Manual.

Section 4

PERFORMANCE

No change from basic Flight Manual.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT ENGINE NO. 2 GOVERNOR TRIM SWITCH

TB 412-93-118

33001 — 33213 36001 — 36019

CERTIFIED 28 JULY 1994

This supplement shall be attached to the Bell Helicopter Model 412 Flight Manual (BHT-412-FM-1 and BHT-412-FM-2) when engine #2 governor trim switch has been installed per TB 412-93-118.

Information contained herein supplements information of basic Filight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

Boll Holicopter TEXTRON

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28 JULY 1994

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day mi Eelly

LIMITATIONS

No change from basic manual.

Section 2

NORMAL PROCEDURES

BEFORE TAKEOFF

Throf(les — Ful) open. Adjust friotlogs.

RPM INCR/DECR system — Mistimum beep (DECR for 4-5 seconds).

RPM INCR/DECR switch — Minimum trlm (-2 for 4-5 seconds).

N_e — Check 95% or greater.

RPM INCR/DECR switch — Adjust to abtain matching torque at 100% N_a.

Flight instruments — Check operation and set.

TAKEOFF

Area — Clear.

NOTE

As collective is increased, it may be necessary to rematch engine torque prior to reaching hover,

RPM INCR/DECR switch — Adjust to obtain matching lorgue or ITT, as required, and 100% N_n.

Hover power — Check torque required to hover at four feel skid height.

EMERGENCY PROCEDURES

No change from basic manual.

Section 4

MALFUNCTION PROCEDURES

No change from basic manual.

Section 5

OPTIONAL EQUIPMENT SUPPLEMENTS

No change from besit menual.

Section 6

CATEGORY A OPERATIONS

No change from basic manual.

MANUFACTURER'S DATA

Weight and Balance

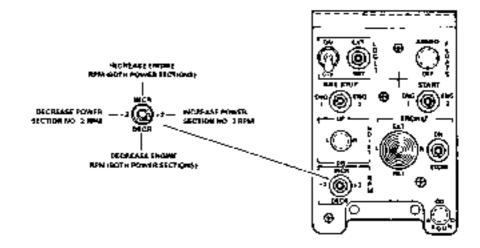
No change from basis manual.

Section 2

MANUFACTURER'S DATA

SYSTEM DESCRIPTION

The +2/-2 switch allows the pilot to match engine performance and improve total engine power available.



412-FMS-48.5 46.2-9-1

Figure 2-1. Engine RPM INCR/DECR switch.



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT SELF SEALING FUEL CELLS

412-899-175

S/N 33108 33213

AND

S/N 36001 - 36019

S/N 38020 — 36086

S/N 36087 AND SUB

CERTIFIED
19 SEPTEMBER 1997

This supplement shall be etteched to Model 412 or 412EP Filight Manual when SELF SEALING FUEL CELLS are installed.

Information contained herein supplements information of basic Flight Manual. For Limitations. Procedures, and Performance Data not contained in this supplement, consult basic Filcht Manual.

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GENERAL INFORMATION



Due to the increased wall thickness of the cell, the total and useable (uel capacities are less than those of the basic halicopter.

Section 1

LIMITATIONS

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after installation and ballast readjusted, if

necessary, to retain gross weight CG. within allowable limits.

Section 2

NORMAL PROCEDURES

No change from basic Flight Manual.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic Flight Manual.

Section 4

PERFORMANCE

Mo change from basic Flight Manual.

Section 5

WEIGHT AND BALANCE

5-7. FUEL LOADING

Fuel loading tables lists usable (uel quantities in 10 gallon (40 liter) increments, with weights and moments in both anglish and metric units for belance computation. Critical fuel loading for computing most forward and all DGs are denoted.

5-7-A. BASIC SYSTEM — SELF SEALING FUEL CELL.

Total capacity: J28.3 U.S. gallons (1242.2 liters).

Umble fuol: 321.3 U.S. gallons (1215.7 Riers).

- Tables S-1 and 5-2 Provides longitudinal CG data for approved fuels
- Tables 5-3 and 5-4 Provides lateral CG data for approved fuels.

5-7-B. BASIC SYSTEM WITH ONE LONG RANGE AUXILIARY FUEL TANK (LEFT OR RIGHT).

Refer to BHT-412-FM9-17.2/17.3/17.4.

Total especity, 410,0 U.S. gallons (1551.7 liters).

Usable (uel: 403.0 U.S. gallons (1525.7 Riers).

- Table 5-5 Provides longitundinal CO
 data for approved finds
- data for approved fuels.

 Table 5-6 Provides lateral CG data for left side installation.

 Table 5-7 - Provides lateral CG data for right side installation.

5-7-C. BASIC SYSTEM WITH BOTH LONG RANGE AUXILIARY FUEL TANKS.

Refer to BHT-412-FMS-17.2/17.3/17.4.

Total capacity: 491.5 U.S. gallons (1860.9 liters).

Usable fuel: 484 6 U.S. gallone (1834.4 liters).

- Table 5-8 Provides longitundinal CQ data for approved fuels.
- data for approved fuels.

 * Table 5-9 Provides lateral CG data
 for approved fuels.

6-7-0. BASIC SYSTEM WITH ONE SEAT TYPE AUXILIARY FUEL TANK (LEFT OF RIGHT).

Refer to BMT-412-FMS-26-2/25-3/25-4.

Total capacity: 344.5 U.S. gallons (1204.2) literal.

Usable fuel: 337.5 U.S. gallons (1277.7 liters).

- Table 5-10 Provides longitundinal
- CG data for approved fuels.

 * Table 5-11 Provides lateral CG data
 for left aide installation.
- for left elde installation.

 Table 8-12 Provides lateral CG data
 for right side installation.

5-7-E. BASIC SYSTEM WITH BOTH SEAT TYPE AUXILIARY TANKS.

Refer to BHT-412-FMS-25.2/25.3/25.4.

Total capacity: 350.9 U.S. gallone (1365.9 Illera).

Unable 1491, 353.9 U.S. gallone (1339.4 liters).

- Table 5-13 Provides longitundinal
- CG date for approved fuels. Table 5-14 Provides Interel CQ date for approved fuels.





Table 5-1. Useble (us) loading table self-sealing tanks (English). Jet A, A-1, JP-5, JP-8 (6.6 Lbs/Gal)

U.S.	WEIGHT	LONG CO.	MOMENT
GALLONS	(lb)	(in.)	(m-lb)
	68	139.6	9486
20	135	139.7	18999
30	204	139.6	28519
40	272	139.9	38053
60	340	139 9	47566
\$4,6	371	139.9	61903
80	408	143.6	58589
70	476	149.0	70448
80	544	131.4	62362
90	612	1541	94309
100	840	156.4	106352
110	748	158 2	118334
120	B16	159.6	130234
130	884	180 0	142147
136.3	927	1615	1497 11
140	802	139 5	151939
150	1020	155.0	158100
160	1088	151.0	154288
187.3	1/38	148 \$	169334
170	1858	149 Z	172475
180	1224	150 7	184457
190	1222	152.0	198384
206	1360	153.2	208352
210	1428	154.4	220443
220	1496	155.3	202929
230	1584	156.0	243984
237.3	1614	156.7	252914
246	1632	196.2	254918
250	1700	154.8	203160
260	1758	(50.0	270504
279	1606	151 5	278338
260	1904	150.2	265981
265.9	1944	149.5	290628
290	1972	149.8	235406
300	2040	190.7	307428
310	2 106	191.5	319382
320	2178	152 3	331405
321.3	2105	152.4	332994

^{*} Most critical amount for most forward C.G. condition at weight empty is 8580 pounds or greater.

This table is invalid with exciliary fuel tank(s) installed.

4174FMS-6348-1-8

Most ericles had amount for most aft C.G. condition at empty to up to 5450 pounds.

^{***} Most critical fuel amount for most aft C.G. condition at weight empty is \$450 pounds or greater. Weights given are nominal weights at 15 C.

Table 5-1M Usable fuel loading table self-sealing tanks (Metric)

Jet A, JP-5, JP-6 (0.015 kg/l)

	WEIGHT	LONGES	MOMENT
LITERS	(kg)	(mm)	(kg-mm/100)
40	32.6	3551	1158
80	55.2	3551	2315
120	97.0	3551	3473
160	190,4	\$553	4633
200	†B3.0	3553	5791
206.7	168.5	2553	5807
240	195.6	3691	7220
280	228.2	3795	8660
320	250.8	3876	10109
360	283.4	3945	11575
400	328.0	3998	13033
440	358.8	4041	14491
480	391.2	4074	15937
F15.7	420.3	4102	17241
520	423.8	4087	17321
540	456,4	2002	18083
600	489.0	3851	10431
F33.2	51 6 .1	3780	19509
54 0	621. 6	3767	19753
689	554.2	3825	27196
720	506.0	3403	22164
760	819.4	3894	24119
800	852.0	3922	25571
840	684.6	3950	27942
- may	717 Z	3973	2 649 4
· 444.2	792.0	3960	29134
920	749.8	3965	29455
960	782.4	3942	20607
1000	815.0	387 €	21549
1040	847.6	3835	32505
1040	800.7	3787	334ZI
1022.1	B\$1.9	2727	22466
1120	912.8	3820	34869
1460	945.4	3840	36303
1200	978.0	386)	37761
*** 12157	990 6	3871	38354

About critical Amount for most forward C.G. condition at weight empty is 2464 billiograms or greater

This table is invalid with swillery fuel tankie) installed.

#12:FMS-60:0-1-2

[&]quot; Most critical fuel amount for most aft C.Q. condition weight simply to up to 2925 bitograms.

^{***} Most critical fuel execute for recorded C C condition at weight empty is 2005 billing-term or greater.
Weights given are nominal weighte at 15 C.

Table 5-2. Usable fuel loading table self-sealing tanks (English) Jet 8, JP-4 (6.5 Lbs/Gal)

	V.S.	WEIGHT	LONG CG	MOMENT	
	GALLONS	(Mb)	(in.)	(In-Ib)	
\equiv	10	65	139.6	2644	
l	20	130	139.7	18161	
l	30	195	139.8	27261	
l	40	260	139.9	36374	
l	50	325	139.9	45468	
	54.6	345	13B.B	43665	
	60	350	143.5	96004	
	70	455	148.0	67340	
	80	520	1514		
	90	585	154.1	78725 90149	
	190	650	158.4		
	116	715	158.2	101680	
	120	160	158.5	(13113	
	130	845	160.6	124488	
	136.3	886		135876	
	140	91 D	161.5	143088	
	150	976	150.8	145236	
	160	70 = 0	155.0	151125	
	167.3	1087	151.0	157040	
	170	1105	148.8	157746	
	180	11 (F3	149,2 150,7	154866	
	190			175\$10	
	200	1235	152.0	107720	
	200	1300 1365	153.2	199180	
	220		154.4	210756	
		1430	155.3	222079	
.,	230	1495	155.0	233220	
••	237.3	1542	156.7	241631	
	240	1960	156.2	249872	
	250	1925	154.0	251550	
	260	1490	183.0	258570	
	270	1755	151.5	266058	
	280	1#20	150 2	271364	
	285.9	1868	149.5	277771	
	290	1688	149.6	282375	
	300	1950	160.7	213865	
	316	2015	167.6	305278	
	320	2060	152.3	316784	
	321.3	2068	152.4	316211	

Woel arrival amount for most forward C.O. condition at weight empty is 6560 pounds or greater.

This table is invalid with auxiliary fuel tank(s) installed

412-PWS-63-5-2-I

Most ortifost fool amount for most aft C.G. condition at weight empty is up to 6450 pounds.

Most orbical fuel amount for most art C.G. condition as weight empty is 6450 pounds or greater.
Weights given are nomined weights at 15 C.

Table 5-2M. Usoble fuel loading table self-sealing tenk≤ (Metric): Jot 9, JP-4 (0.779 kg/l)

Sui B, ar-4 (a.rrs Kgri)									
	₩€IÇHT	L¢≪G CG	MOMENT						
LITERS	(kg)	(mm)	[kg-mm/100]						
- +0	31.2	3551	1104						
	62.3	3551	2212						
120	90.5	3551	2320						
160	124.6	3553	4427						
200	₹55. 8	3553	5536						
206.7	101.0	3563	5720						
240	187.0	3681	59 07						
280	216.1	J7 96	6777						
320	249.3	3876	9663						
380	280.4	3945	11062						
400	311.6	3994	12458						
440	342.6	4041	13853						
480	373.9	4074	15233						
515.7	401.7	4192	16478						
520	405.1	4087	18558						
350	436.2	7947	17282						
600	457.4	3851	18000						
633.2	493.3	3780	18547						
640	400.6	3767	#68 6 2						
540	529.7	3825	20281						
720	560.9	3863	2 868						
760	692.0	3894	23052						
800	623.2	9922	24442						
840	654.4	3950	25849						
800	685.5	J8 7 3	27235						
** BBB.*	699 .7	3000	27848						
920	715.7	3965	28345						
960	747.8	3912	29294						
1000	779.0	3871	\$0155						
1049	B10.2	3635	31071						
1000	€413	2797	31944						
1082.1	643.0	⊅7 ₽7	32009						
£120	etz \$	3820	33330						
1160	\$\$ 2.8	3840	36608						
1200	934 8	3551	\$6093						
*** 1215,7	947.0	3971	366 58						

Most chilesi amount for most forward C.G. condition of weight empty is 2984 kingrams or grasser.

Thus table is invalid with excillary fuel tentus) installed.

112495-12464

Most entitled fuel amount for most aff C.G. condition at weight amply is up to 2925 follograms.

^{•••} Most calcul fuel emount for most aft C.G. condition at veright empty is 2525 Magnatus or greater. Weights given are nominal weights at 15 C.

Table 6-3. Lateral usable luci louding table self-sealing tanks (English) Jet A, A-1, JP-6, JP-6 (6.8 Lba/Gal)

U.S	WEIGHT	LAT CO	MOMENT
DALLOH	(lbe.)	(In.)	(4n- E b)
	1000.	43	[m. =1
10	88	D	0
20	138	0	O O
>0	204	0	0
40	272	Q	٥
50	3#0	0	0
54.6	⊅ ₹1	ø	0
60	408	-0.06	-24
70	418	-0.06	-24
₩0	544	-0.06	•27
90	612	-0.04	-24
100	680	-0.04	-27
110	746	-0 01	-30
120	€ I #	-0.03	-24
130	484	-0.03	47
136.3	927	-0.03	-28
140	952	-0.31	-295
190	1020	-0.30	-\$10
160	1066	-043	-885
T 167.3	1136	-0.70	-796
170	1156	-0.69	-798
180	1224	-0.65	-795
190	1292	-0.61	-768
200	1360	-0 ta	-7 0 0
210	1426	-0. 55	478 5
220	1496	-0.53	-793
230	1564	-0.51	-788
240	1532	-0.49	-800
250	1700	-0.47	-133
260	1704	-0.45	-798
270	1608	-0.43	·78 9
250	1904	-0.41	-787
290	1972	-0.40	-769
300	2040	-0.39	-196
310	2106	-0.17	-760
320	2178	-0.1€	-763
321.3	2165	-0.56	-787

Most critical lesi empuration left side most fatural C.O. condition.
 Weights given are nominea weights at 45 C.

This table is invalid with succitory fuel (anit(s) installed.

619**FMS-83**-5-3-1

Table 5-3M. Lateral unable funt loading table self-sealing tanks (Metric). Jet A, A-1, JP-5, JP-8 (0.815 kg/l)

fluessa.	WEIGHT (Ma)	LAT CO (mm)	MADMENT (kg-dwn)
	(-48)	11411117	(
40	対象	0	0
60	65.2	0	Û
120	97.€	ø	0
160	130.4	9	Ð
200	163.0	٥	0
200.6	158.4	•	9
240	195.0	-2	-391
280	224.2	-1	-228
320	260.6	-1	-261
360	293.4	-1	-293
400	326.D	-1	-326
440	358.6	-1	-359
480	387.2	-1	-391
515.6	420.2	-1	425
520	423.0	-8	-2543
560	458.4	-12	-5477
600	489.0	-15	-7335
633.0	515 9	-18	-9240
640	521.6	-18	-5389
660	554.2	-17	-9421
720	586.0	-15	-5502
760	619.4	-15	-0291
800	652 O	-1#	-9128
840	624 6	-13	8900
880	717.2	-13	-8324
920	749.B	-12	-8998
960	752.4	-12	-0.369
1000	675.0	-11	-8445
1040	847.6	-11	-9324
1080	880.2	-10	-8002
1120	912.8	-10	-9129
1380	845.4	-10	-9454
1200	0.610	-9	-9402
1215.7	B00.3	-8	4917

Most critical fuel envount for left side most (atera) C.G. condition.
 Weights given are nominal weights at 15 C.

This table is invalid with auxiliary fuel tanks) installed.

412FMS-846-3-3

Table 5-4. Lateral usable fuel loading table sett-sealing tanks (English) Jet 9, JP-4 (6.5 Lba/Gal)

Ų.\$.	WEIGHT	LAT CG	MOMENT
DALLON	(lbs)	(in.)	(in-to)
10	85	9	
20	130	š	ŏ
30	195	ä	ŏ
40	260	ä	ŏ
50	325	š	
14.6	385	ő	a
		_	
50 70	380	-0.06	-23
100	407	-0.0s	-23
	520	-0.01	-26
90	585	-014	-23
100	850	-0.04	-26
110	715	40.04	-29
120	780	-0.03	-23
130	845	-003	-25
136.3	886	-000	-27
140	910	-031	-262
190	975	-0.50	-166
160	1040	68.0	-655
167.5	1087	-070	-761
170	1105	-0 63	-752
160	1170	-065	-761
190	1235	-0.61	-750
200	1300	-Q 58	-754
210	1265	∙0 55	·75 1
220	1430	-0 53	-758
230	1465	-0.51	-762
240	1560	-0.49	-784
260	1625	-0.47	-784
260	1690	-0.45	-761
270	1755	-0.43	1755
280	1820	-0.41	-746
290	1205	-0.40	-764
300	1950	-0.32	-761
310	2015	-0.37	-748
320	2090	-0.36	-749
321.3	2066	-0.36	-752

Most critical luck encount for telt side most taleral C.G. condition.
 Weights given are number weights at 15 C.

This table is invalid with auxiliary fuel (apage) [petaled

412-FMG-41/5-4-1

Table S-4M. Letteral usable first leading table self-scaling tanks (Methic)

Jet B, JP-4 (0.779 kg/l)

	24, 21, 11,	(Billion Maril	
	WEIGHT	LAT CG	MOMENT
LMERS	(kg)	(mm)	(Mgr.mm)
40	31.2		0
B0	52.3	0 0	ŏ
			_
120	97.5 124.6	Q D	0
160			•
200	155.8	6	0
208.8	160.9	D.	0
240	187.D	-2	-374
290	218.1	- 1	-218
320	249.3	-1	-249
360	280.€	-1	-200
400	311.6	-1	-312
440	342.8	-1	-343
480	373.9	.1	-374
6,648	401.7	-1	-#02
520	406.1	-7	-2430
\$60	436.2	-12	-\$2\$5
900	467.4	-15	-7011
833.0	493.1	-16	•₹876 *
640	498.6	-18	-8974
680	629.7	-17	-9003
T20	\$8Q.B	-15	-8413
780	592.0	-15	-8881
800	623.2	-14	-8725
840	654.4	-12	-8507
880	685.5	-13	-0017
920	718.7	-12	-86QC)
960	747.8	-12	-8974
1000	779.0	-10	4569
1040	810.2	-11	-8912
1090	841.3	-10	-8413
1120	\$72.5	-10	-8725
1160	3.600	-10	-9036
1200	934.8	49	-8413
1215.7	947.0	.9	-8923

^{*} Wost entresi fuel amount for loft side most lateral C.G. condition. Weights given are nominal weights at 45 C.

This table is invalid with auxillary fuel tenh(s) installed.

412/700-62:5-4-2

Table 66: USABLE FUEL COADMS FABLE WITH BELF-BEALING FAMILS AND \$1.7 GAL ALTERUPT.

Jel A. A.T. JPAS JPAS IS BUILDAGED

JAIR JP 4165 LOHOAN

u.s.	ele Cercina C	LÜHCI CO			-		INTERES
QVITTOW O'S'		IM	(In-Eb)	GALLO		(juri ricente crè	94-491 mûmên
							:
10	16	1375	9466	10			99
20	135	139.7	18590	21			INI
30	254	133.5	25519	30			272
40	272	133 5	39067	40			361
50	.140	1,34.5	47966	56			454
54.6	271.3	-33.9	9:3=2	. 54 6			400
50	468	1414	58569	43			900
70	476	147.4	FC187	77			670
10	544	149.3	0.491	ax.			779
90	6.5	151.8	92502	90			500
100	680	153.3	100240	190			26.5
110	14:	154 5	115585	110			1100
120	a.c	1556	179970	120			1213
130	ан	155.4	124750	100	(6 4)		1321
-40	952	197.7	149654	140			1430
:50	1055	157.9	16,428	150			1939
lat)	1033	154 3	1/2448	150			- ALE
170	1150	159.0	100304	177			1756
1702	11574	159.0	18 -4 320	175.2		150.0	:750
1.50	1274	:55 4	180210	100			1318
190	1292	.05.0	196384	190			1577
200	1360	149.2	202912	700			1939
201.7	1368.2	148 9	203719	201.2			1947
7:0	1478	149.6	210628	210			2048
270	1446	150.4	224968	230			2150
200	1664	161.1	236)20	230		151.1	2256
240	16)2	151 8	247738	340			216N
250	17100	152.5	259250	350			2478
260	1796	155 N	278904	250			2586
270	1836	150.6	2820-0	270			24956
290	1904	154.0	298215	280			7809
297	1572	154.5	304874	290			2912
900	2040	154.9	215996	100			3023
2013 C	3US3 4	155.0	119361	7 703.0			3052
MC	2168		17484)	310			9°C5
320	2176	.43.9	133719	320			3140
39C	2244	151.7	M(M. 2	230	2145		3453
340	2312	150 8	346187	Hi.			3025
350	3360	149.5	355610	250		145 5	3#011
35. 6	2390 9	-464	357197	251 8		1414	3474
360	2848	145.6	366710	350			3843
310	2518	150.3	378159	170		150.0	3614
380	2584	150.6	389667	1 100			3124
380	5445	1512	490962	190		1512	3802
400	2720	1516	412382	400		151.4	3841
403 D	27404	1917	415) (9	'''' 400 B	2619.5	15: 7	3971

Most orderal amount for most forward G.O. condition at a weight empty below \$750 people has so high

492-748-63-65-1

^{*} Most critical amount for most francist C.G. condition and weight empty of 6750 paulets or greater.

Most original four presents for enter art 0.0 consistion at a veright amply below \$400 pounds.

^{**} Most (*Red) fuel amount for most aft C.D. condition at a weight amply of \$100 younds or greates Meighte ghan are exemul exights at 15 C.

Table area usable fuel loading table with Self Gealing Table and 309 liters all fuel passes

Jana, Art, JPA, JPA, 61ShgT-

Joi B. JP-4 (779 455)

,_		_			_ _		_	
				MONEH!			LONG CA	мармент і
	UTERE	(hg)		(little-com)	€ LLEGAL?	Fig.	4****	(kg-ress)
			:		. ——			
1	40	32 6	3543	115507	40	35.2	3543	110400
	NO.	65.2	7540	231 130	l šč	62.3	3548	227111
	#20	97.0	3551	347289	12:	914	33:1	131947
;	140	190 4	3953	463311	163	174.6	35:3	447846
	200	185 U	30:3	5/9139	200	155.6	3552	558552
-	2067	158 5	35:3	390340	236.7	16· Q	9553	572°C2
	740	1R5 F	3691	721940)#J	187.0	9831	650005
	710	229.2	3772	850770	260	714 1	3772	46274P
	825	280.0	3833	998464	320	249.3	3030	254747
	950	293 4	3876	113/216	360	280.4	3875	1086985
	400	176 0	3812	1275312	400	31 6	9912	1218975
	443	358 F	3842	1417601	, iii	342 0	3942	1351190
	443	394.2	3867	1551690	450	377.9	33967	1403341
	623	*29.6	3958	1850174	520	405 I	334	1515486
	980	156 4	4008	1829251	550	135.7	4008	1748450
	600	48M D	4023	1967747	M0	457 a	= 023	1880090
	540	521 K	40.36	2108178		498.8	4038	2012164
"	544.3	525 D	4038	2120041	- 8442	501 8	4735	2025327
	660	554.2	3950	2149090	180	5000 0	3290	7062394
	720	586 B	3861	2265835	770	980 0	3961	7165551
	760	8194	3785	2344-720	289	997 F	2785	2740971
	7017	450 B	3742	7347881	76¥ 7	580 a	3762	2244104
	800	653 D	3800	24777400	600	623.2	3600	2958160
	D-MT	6M B	387.1	2617226	: (44)	684.4	5820	250161 3
	860	717 2	3841	2756200	. 880	485.5	3847	7634457
1	920	749 8	3861	2094974	970	7157	3661	2767 (01
1	960	782.4	3879	30,14930	960	747 M	3879	29000971
1	1000	815.0	3875	3155125	1000	7780	3675	30r#G25
:	1340	847.6	2000	22.0.54	1940	810.2	3906	3184485
	1060	6807	1919	3440074	1580	841.5	3919	3897193
	1120	412	760 h	2000217	1120	477.5	3931	3429719
	1487	934 6	3906	3000291	1745 (490.3	3936	3517734
1	L160	545.4	1809	3711840	1160	903.4	1926	1547491
1	1200	yrsa	38/9	3793662	1200	914 5	1879	1626689
i	1240	1010 8	3477 3430	3013043	1240	966.0	3872	pa]197 .
•	1780 1320	1043.7 1075.8	3 8 01	36954M 4089118	(280	917.1	1630	36/8870 :
			3794		1320	1028.3	3601	1903492
	130 B 1350	1084 4 1188 4	3506	4114382 4217482	1330 6	1034.5	3794	3932623
:	1400	11470	3315	435033	1360	10594 1090-6	3809	4001189
1	1440	11736	2430	44948M	1440	1/218	3810	#169911 #208341 +
1	1440	12067	38a0	443:100	1450		3830 3840	
1	1529	1236 6	3851	4770519	1950	1152 5	3840 3851	4427213 . 4559897
	1525.2	1243 0	3852	4788162	177 1525 2	11841	3852	4576680
1					1.12.12	1104	9976	-1/0040

Most chical should foreign foreign C.G. condition of a weight empty below \$502 billograms has no f

412 FM9-645-6-2

[&]quot; Most critical emount for most forward C () gostletos se a weight straty of \$000 \$ ingrares of greater.

[&]quot; Mass critical fuel amount for most aft C.O. consider at a weight every below 2767 integrave.

Was (relet fue) amount for work kill.C.O. condition at a weight empty of 2747 killogoune or greater. VEHIGHER great are normal weights at 15 G.

Name S4. Uşarılız Publi Loading Table with Self-Scaling Tanks and 31.7 Gal Aux Publichia involves.

John A.1, JP 5, JP F& Extendal)

MrR, PASS SCOORS

	MEIGHT	LATES	MOMENT		WEIGHT	LATES	MOMENT
THI LAN	Liberto	an j	∔n-b	- CON LOW	jika (- An h	In#b
		_	_			_	
10	55 136	п В	D	10 20	65 1)0	n	
ũ	200	ŏ	ő	20	125	ö	
Ã,	272	ŭ	ŭ	40	260	Ď	
50	340		Ď	55	77:		
41	371.1	ñ	Ď	WI	354.5	ñ	
į.	405	0.13	67	60	390	0.13	
'n	474	-572	-343	73	475	4,72	.).
6	544	-1.78	-266	80	520	-176	-9
10	MIZ	-2 83	-1610	90	501	-7.63	-14
ю	FAC	-170	7744	165	650	-7.10	21
0	743	3 64	2872	115	715	2 84	27
25	616	4 29	9501	125	hec	4 29	.93
ľ	1884	450	41.59	125	845	45"	-394
140	862	-5 DF	-476D '	140	RIC	-5.00	-4:
50	1020	-5.77	5176	150	975	-F 2₹	- 11
(GC)	1088	5.60	0954	160	1000	6.50	- 57
2	1156	-571	4601	170	1105	-5.71	-63
ĕ	1157.4	-571	-8 9 09	170 8	1106.3	-6.71	-83
	1724	-5.72	-root	180	1170	-5.77	-66
٠.	1292	5.55	T'H ·	190	1735	-5.56	-54
	1360	-5.41	7158	700	1300	-5-41	- 70
	1868.2	-5.28	7374	201.2	1007.8	-5 39	10
٠	1428	-5.54	-7911	210	1.365	.5.54	-75
•	1496	-5.59	8:12	220	1440	-5.59	-81
К	1554	-5 84	3,71	230	1435	-5.64	-87
40	1872	.5 pt	-9742	740	1560	.5 pr	-91
57	1700	45.50	-10316	750	1655	4.08	98
60	1768	-519	.10944	760	1690	-6 19	.104
70	1836	-6 29	-11548	275	1765	-b 29	-11¢
280	1904	-8.29	-12167	280	1620	-6 39	-116
80	1972	-548	·1277B	790	Ina:	-646	-172
92	2040	+ 56	-10382	300	1950	4.16	-177
ļģ.	2060 4	A 58	.17551	1 2533	1965.5	-6.50	-149
13	2109	649	.19554	912	2015	-6 43	-12 9
320 330	2176	-023	-13558	320	STREET	-623	-129
40	2347	4.34 4.66	- 13554 - 13548	330 340	2145 2710	-8 36 -5 95	-179 -179
	2380	570	19566	350	2275	-570	-129
/52 14	2390 1	- 5.70	13968 -13556	751.5	2275 2285.4	-570	-129
_	2390 0	-575	-15556	351.5	2340	-575	-127
380 371		: 14	-14697	370	2401		-134: -180:
39C	258a	5 52	.19797	342	2407	-5 92	-145
990 990	2562	400	-15912	990	2535	-0.50 -0.00	-192
HUG	2720	807	- 18910	i 400	5800	400	-157

Most entical test second for left site most fateral G.O. condition.
 Weights gives are some at weights at 15 C

a:2:FWSe3-58-1

TABLE FORE USABILE FUEL COADING TABLE WITH SELF-SEAUNC TANKS AND 32H LITERS ALIE PRIFT (LA). Natro

J# 4 6.1, (P.5)P 81 8154pt

Jan B JP-4 ; 775 kg/lj

~					_				
	LITERS	MEIGHT (Mg)	IUMI Fri ĈĈ	ING-MENT	i	Liferes	MEKDHI (kg)	(mm)	марекрит Перименј
_		_			_				
1				_	-				—
•	40	32.6	0	-1		40	31.7	۰	a
	80	55.2	e	a		60	67.5	- 0	ā
	120	ع او		a		120	999	0	9
	120	12D 4		4		160	1246	c	a
	300	-62 D	п	2		200	155.6	G	0
1	206 ₹	148.5	a	u	ı	206 T	15 I D	п	0
•	240	135.6	- 6	-11/4		240	ሳይ፣ ው	5	-935
	280	228 %	-26	4280		260	218 1	- 25	5453
	320	260 E	- 56	-14605		320	249.3	-66	-! 37 IN
	Ήn	293.4	76	22299		380	2604	.75	4, 130
	•60	956.0	-92	23502		400	311.6	·Ai	26156
	4 0)58.4	-105	-37863		440	342.6	-105	35330
	487	391.2	-118	-45279	- 1	450	173.5	-116	491/5
1	420	422 1	-126	53788	ļ	520	456.1	-128	-81040
1	960	458.4	-132	60245	ı	560	438.1	-133	-Magan
1	A70	499.0	139	47571		800	467.4	-140	65436
1	642	921.6	.145	-79632		640	498.4	-147	.19258
1	844.2	525 C	-145	-19126		Gast 2	3G1 S	.145	-12766
	980	554.2	-145	-80159		680	929 ?	.145	.16acu
	729	200 /	-161	-87719	- 1	225	960.3	-741	·19314
	463	M94	477	94458	- 1	760	592 C	-137	411'09
	701.7	Mce	127	-69346	ı	7817	593.4	-137	-R1791
	607	662.0	-141	-91 132		MC	623.2	-142	. gigargag
	(A)	68# 4	-145	-99267		640	654.4	. 46	-5 55 37
	PRO	717.2	-148	-105813		890	665.5	-150	-100A028
	970	749 8	40	-113970		920	Tra 7	-153	100203
	960	792.4	156	-122054		600	F47 8	155	-115915
	1000	M5.0	158	129772		1000	428.0	156	-123062
	1(40)	547.0	-161	·138 454		1041	MIG 7	161	13(04)6
	1160	880.2	-184	-144343		1290	(4°)	194	-127976
	סכוי	612 B	-166	-151525		1120	672.5	-166	-144632
	11467	934 K	167	-156072		1148 「	6913	-167	-'4PITE
	1 160	SANA	165	156991	!	1160	BCD 6	IGS	4840.
	1200	978.0	-160	-156 48 6	i	1200	63e 0	158	187688
	1240	14106	-155	-196643		1240	966.0	196	150680
	1280	1043.7	- 150	-156499		1280	997 (-150	-149555
	1376	1075 6	-145	-155 99 1		1,120	1028.3	-146	-149101
	1330.6	Ingu a	.140	4 56 159		1330 5	1035.5	- 144	149261
	1060	11064	.146	-161525	- 1	1.760	ICSA 4	146	184618
	1-60	11410	.148	-165622	i	1420	1690.6	.149	197480
	I-4D	11/26	-150	-174040		1440	1121.6	-151	- 18438E
	1480	1706 1	-157	163342		1460	1150.9	-153	-176397
	1525.2	1239 g 1243 0	.15 4 .156	.190775 -192571	_	1525.2	11841	-15e 156	-162749 184150

[&]quot; Moss crebcal fast amount for left size west talend G.C. condition. Weignes given are not make weignes at 15 G.

#17##\$#\$**5**62

Table 5-3. USABLE FUEL LÉAGRES TABLE WITH BELF-BEALING TABLES AND 31.1 GAL ALIC FUEL (RIQ (Englis)

JALA ARI JPROJEMBIS NUMBER

Jel B. JP-4 (F.S. (resFap)

				. 					
u.5		LAT ¢6	INCOMENT.		u.a.	YTÉKÜPLT	LA1 00	tecete mT	
DATFOR	(text)	[ln.l	-{m-1b+	:	CATT CIT	(t=.)	#n #	- In-Bel	
			_						
10	61	a	п.		10	65	п		
20	134	- 4	D İ		25.	130	0	Ó	
30	204	- 9	6 1		15	195	Ó	Ó	
40	2/2	ú	6 1		40	260			
50	340	a			50	375	0		
54.6	371.7	0	0		SH 5	790 9	0	-	
50	408	90.	4		60	930	0.01		
70	4/6	0.62	296		70	455	0.62	283	
ED	544	1 68	614		40	520	1 65	174	
40	6.5	255	1581		90	585	2.56	149,	
100	690	120	2136		105	650	3.29	210	
110	740	977	2820		112	7.5	578	2656	
120	816	471	3457		125	750	4.73	729	
130	044	461	4075		130	045	4 61	388	
140	862	4.65	4712		145	9.0	4.89	450	
150	1020	922	5224		150	975	5 22	509	
150	1098	5 = 4	2240		180	1040	5 48	9671	
170	1150	3 56	6543		170	1105	5.05	675	
170.2	1157.4	5.00	6551		1757	1106.1	N 66	626	
190	1274	50)	0157		180	1170	6.00	548	
190	1292	46)	Y962		190	1236	469	57 (
2.0	1360	4 42	6011		200	1900	442	5/4	
2017	1368.2	421	5787		201 1	1307 E	4.23	3:3	
710	1478	442	6112		710	1765	4 47	603	
220	1446	46)	6906		226	1410	4.6)	642	
230	1964	40)	7554		230	1495	4.8)	722	
290	1612	4 99	4144		240	1560	4.99	7784	
250	1700	3 14	4/38		750	1825	514	825	
250	1754	± 30	9370		750	IMBO	5 30	465	
770	1870	5 41	998B		770	1755	640	451	
280	1804	5 00	10586		280	1822	6.56	1011	
296	1972	5.69	11221 :		210	1885	560	1976	
300	2140	5 173	11412		300	1950	5.79	1129	
105 D	20504	567	11997		303.0	1949.5	5.67	1146	
J10	2104	5 69	11995		316	2015	5.69	11.664	
32P	2176	5.6	1:990 ;		920	2000	6.51	1145	
220	2244	5 84	1:985		930	2145	5 54	1145	
ИD	2312	ניו פ	11989		340	12'0	5 19	1147	
730	1380	5 04	11995		350	2775	5 04	1148	
151 £	2390-9	501	11978		351.5	23854	5.01	11450	
360	2449	š1,	17529		960	2340	511	1156	
170	2518	521	19708		370	2405	571	1253	
380	2584	531	12721		360	2470	5 31	וורנו	
390	2662	5 40	14321		390	2571	540	1344	
40 0	2720	549	1=935		400	2600	5 49	1424	

[&]quot; Most offices that should for right side most should C.C. condition.
Weights given are nominal swights at 15 C.

412-095-60-52-4

Tybin 578. UŞABLE FUEL LOADING TABLE MITH SELF-ŞEALING TANKS AND 309 LITERS AUX FUEL [RN]

ALA ALL JP 5. (P 5: 819494)

A:8 JP4 (779 kg/l)

	-			
и	TEAB	MEIGHT IMI	LATIOS IPPO	ікі іми) помінц
		_=		
	46	30.6	0	0
	50	86.7	_	b
	'70	27.6	0	D
	-90	130 4	0	ī.
	200	1630	Ō	Ď.
	206.7	168.5	0	9
	240	195.6	3	491
	750	2263	25	5705
	170	260 N	50	17877
)AF-	299.4	14	21712
	• K	226.0	90	29)40
	43	196 b	11/9	36136
	450	391.7	114	4453.
	420	423 N	123	57137
	460	4564	131	4878
	600	439 0	128	67482
	640	5215	143	74555
	444 2	5250	144	15603
	KAC	554 2	128	707318
	720	566 B	117	MASS
	760	GIP4	168	66095
	751.7	620 B	1[:T	66424
	900	6520	113	13676
	846	834 6	עוי	61467
	60 0	T17 2	124	68933
	920	TARE	136	95974
	960	702.4	112	100,777
	1000	8150	136	110845
	10=0	8476	:40	118664
	1080	890 2	143	125869
	1120	P123	145	133266
	1145 7	B)4 C	146	135015
	1160	945.4	146	178028
	1200	978.0	139	135942
	1040	10106	141	1424)5
	1200	10412	137	142914
	1370	1075.8	120	137 (07
	1330.6	1084.4	127	517724
	1360	1054	129	42984
	1400	11410	132	158612
	1440	פרוי	175	158436
		1306.2	137	165049
	14691			
	1480 1520	236 6	145	173402

Nosi entresi fuel amount for right wide most laferal C.G. condition.
 Weights gives are somiral weights at 15 C.

412/FMS-63/7-2

Table 6:8 USABLE FUEL LOADING TABLE WITH SELF-STALING TANKS AND 1934 GAL AUX FUEL (CNG(SH)

MINISTER PROBLEMS NO.

JerB JP44654C4S4C

_			. —:					
	va	WE CHT	L CH 3 00	el-Cap €#T		WE/OHT	LONG 60	MOMENT I
- 1	GVITCHG 0.9	(per)		kn-ks	: Vå	NE KINI	Out-	4348) #0#644
	dwfr.com	I MARIE	(In.)	In-mod	1 00000	licari	-jen j	1,740)
		-		_	· -			
1			139 5	5485	l ig	• • • • • • • • • • • • • • • • • • • •	136.5	5069 .
-	1D	68 198	139.2	1889	: 70	190	1347	- \$161
-	10	7D4	129.0	18518	i ä	198	129 8	27361
	40	272	139.9	28000	1 🗂	250	139.9	Je314
	50	340	1399	**966	i ਔ	125	130 0	15168
	5e fi	3TI 3	158 9	: 'BIZ	· 96	MA B	139 9	49551
1	80	406	149.6	58589	- F60	250	143.5	96004
•	10	476	147)	7(119	70	455	147 2	47522
	In.	544	149.7	1 165	, aŭ	:50	149 3	7756A
	90	812	150 1	921/76	~~	585	1501	SE160
	160	680	151.8	-53224	166	450	16: E	38670
	ă11	748	152.0	11294	! iïi	715	150 8	135252
	120	816	1518	125338	120	760	153.6	115800
	170	I Ba	154.)	- 17401	išň	MS	154.3	1303fe
	140	962	154 8	147370	in	910	154 b	143868
	150	1020	195 4	58409	190	£15	1504	151515
	iin	1064	155.8	-88610	ião	1040	156 B	182037
	סיו	1156	199.2	180567	im	1109	156.0	172601
	160	1224	156.6	195078	l ieo	1170	156.6	183222
	190	1392	157 0	200844	199	1238	157.0	183895
	200	1360	157.2	213/92	200	1200	151.2	234360
	20€ Î	1347.9	157.3	718314	234 Î	1396 T	-513	238662
	210	1428	155.5	222054	210	1355	1995	212296
	220	1496	152.7	228439	210	1670	159.7	218361
	330	1564	150 1	234758	730	1455	:50 1	224400
	299.2	1999 #	1499	238145	215.2	1529.9	148 9	227638
	240	1832	149.7	743494	740	1580	149.2	111757
	250	1100	141.7	254490	290	1525	140) 1	243269
	260	1769	150.3	769(6)4	Xe.	1690	150.2	353636
	370	1836	150.6	278802	270	1755	150 B	254300
	280	1904	151.1	28,1694	200	1820	161.1	275002
	290	1972	151.5	100754	290	1885	151.5	385576
	300	20 - 50	154.9	305676	900	1560	151 9	25647/5
	310	2109	152.7	32 IO48	910	2015	162.5	126865
	320	3116	152 6	123058	220	2060	157 6	217406
	330	2544	1929)#3108	930	2745	197.9	327981
	340	7312	151.7	154164	340	77 10	150.2	118577 '
	380	2380	153.5	368390	390	2275	157.5	MIST
	260	2449	150.7	276258	360	2140	16) 1	159600
	368.6	3506.5	153.9	325747	354 d	:395.9	155.9	386729
	טינ	2516	1534	386961	9/0	2406	15) 8	349699
	360	2084	152.3	151672	380	2470	157 N	377416
	290	1852	1574	400574	390	2535	151 6	354613
	400	2720	150 8	#1(4 h)	400	2500	150 8	192080
	410	גפינ	149 9	417921	410	2665	149 P	136484
	417.2	8637 G	149.3	422564	417.2	17 B	1473	454872 ,
	420	2050	149 .	420660	420	27.90	149 4	#57662
	430	3804	149 6	437420	430	2796	149 6	4 (8132
	40	2992	178.8	448501	وبه	2860	149.9	428-14
	450	3060	190.2	459612	450	2649	160.2	*38235
	460	3176	150 Ş	470754	470	2960	150 5	445695
	470	1125	150.8	45:551	470	3066	150.6	450694
_	460	3264	1500	#9266#	490	7120	151.0	e71120
	- 484 N	1295.)	151.7	464346	" 484.6	31438	151.2	478585

Most critical amount for most forement C.G. condition of a weight among below \$220 pounds have no final

412-PMS-63-5-6-1

⁻ Must collect amount for most forward C.C. condition in a weight arrapty of 6520 pounds or greater.

⁻ Most critical fuel amount for most aft G.G. condaton.

Weights given are nowing weights at 15 C.

Table 5-8M, USABLE FUEL LOADING TABLE WITH SELF-SEALING TANKS AND 618 LITERS AUX FUEL (Marce)

AND AND AND UNBORRED

Jet 0, JP-4 (T79 kg/b)

. ITT De	WEIGHT	LONG-05	MOMENT	HTFF&	MEIGHT.	1049 00	NOMENT
ITERS	in gr	(ener)	_;p=-um:	11111111	1141	luw)	(and and
—· 4	374	7941	115002		 2'2	3847	1104
60	66.2	3548	211330	60	92.3	1648	2211
130	PT B	355)	347268	120	915	2557	3219
160	1304	5553	4633119	160	124 6	3881	4428
200	163-3	3811	579139	200	155.0	185)	5635
306.7	186.5	3553	526540	7 706 7	16, 0	1551	5171
240	1964	3691	721960	240	197.0	3691	6900
780	229.7	3764	858B4 5	3M1	2181	3774	1210
JZD	260 5	250,0	393848	360	243 3	3810	M97
16.7	793	5943	1127636	360	79a e	384)	16777
400	1360	3866	1260316	400	21 - 6	3866	12046
440	358-6	1094	1355366	440	342.6	3894	133 4 ft
480	171 2	7417	1502300	460	37) 9	1917	18646
420	423.5	3934	1665110	510	105 1	3929	15915
968	456.4	9945	1836498	560	436.2		17209
600	4894	3947	193497.1	800	467 4		1 ≥ R5
640	5214	9967	2059167	840	195 6		19175
ARO	554.2	3978	3304608	680	629.7		3107)
720	546.5	3988	2340156	720	560.9		26367
760	4194	399)	2473254	760	5920		23640
772.7	419 8	28/90	2516463	7777	60. 9		34053
800	662.0	7952	2578/704	800	6212		24628
340	GU 6	3866	26a M66a	640	654 4		25297
880	717.2	2097	2722706	100	6055		26029
860 2	726.5	9792	27#3890	690.2	69) 9		25228
430	7494	3792	ZM32+Z	900	7167		37 176
960	752.4	5807	29/889/	960	ta? e	3607	zga ho
-600	81F0	3920	3112300	1000	779.0	3820	79787
1040	54° 6	3810	3229366	1040	8192	3810	30661
1086	Ing 2	3840	3)\$2249	1060	641.3	1646	12867
1120	912.6	3856	3519757	1130	672.5		23842
1150	345.0	3864	3653028	ישווי	90) 6	3664	34916
1200	978 G	3574	3788777	1200	934 B		38514
1240	10108	5842	3922149	1340	984 0	1882	37499
1783	-3417	7890	4057048	1280	997 (3890	18197
1320	1075.8	3897	4193393	4320	1078.3		40077
1960	1136.0	390a	4)27194	1360	1099.4	3904	41560
165 2	14371	3910	4446014	1395.2	1005 9	3910	43496
1400	1747.0	3500	4435745	1400	1090 8	1906	42550
144}	1173.0	3679	4352384	1440	114: 0)679	#1613
1453	1236.2	3842	4545362	1480	1157.9	1887	444 10
1561	.576.9	3827	4740888	1520	ן ששרך	3827	#5314
1550	12714	3400	4615174	1550	12152	J800	46515
19792	1297 0	3192	4590486	15/9/2	1230.7	1792	49649
1600	1334.0	3795	4945560	1500	1246 a)795	47300
1640	1336.6	3807	5081753	1440	12TT N		48377
1660	13682	5819	9225760	1580	1306 T	3819	A 840 L
1729	1431 (2870	5354876	1720	1739.0	3820	51183
ITO	1434.4	3875	5-490580	1750	13T1 D		52442
1600	:467 (3899	5623011	1800	1402 8	3835	53746
334.4	1425.0	78-40	5740936	" 1604.4	1429 0		M173

Most critical amount for most forward C.G. condition at a weight empty below 3139 killagrame has n

412 http://de.2

^{*} Most critical amount for most forward C.G. condition at a weight empty of 3642 kilograms or greater

[&]quot; Most critical fuel amount for most aft C.G. condition

Weights given are nominal weights at 15 C.

BHT-412-FMS-63.2 & 63.3 & 63.4

TARAGO USABLE FUEL COADING TABLE WITH BEUF-BEALING TARKS AND 1834 GAL AUX PURL (Crean)

NAME OF STREET

Janu LP4 (GSTNuGar)

			. —					
vs	#EIGH!	LAT CO	MOWEH1	i	U.S.	WEIGHT	LATEG	момент
GALLONS	1001	اعار	(An Ab)	! 9	ALL DAS	Hitch -	∤m.j	(m-lb)
<u> </u>				'				-
19	63	0	v		10	—- 88		—· ,
70	136	ŭ	Ď		20	130		
90	204	ō	Ď		30	195	3	
ã	277	ŏ	ő		40	280	5)
50	540	Ď	Ď		90	125		7
54.0	277.9	ő	Ď		94 B	354.0	3	
- că		ΛDě	18		w	190	400	.3
70	ATE	.000	-iĝ	i	70	122	400	- 5
	944	U DA	-22	- 1	80	120	36	- 2
iii	612	δão	-24	- 1	90	325	404	-2:
100	bbu.	-ČA	-17	- 1	100	950	-0.04	-26
110	149	0.55	-22	- :	110	715	-5.61	.71
170	NIÓ	40.55	24	!	120	750	20	-7:
130	867	40.00	-87		120	345	300	
140	952	0.55	24		140	212	201	.;
150	1000	-0.52	-16-		150	975	401	
160	1669	40.32	-22		180	1040	30	ř
170	1156	40.22	21		170	1105	< az	.2
180	1224	40:5	-24		180	1177	402	
190	1292	032			120	1235	307	3.
900	1380	40 22	-27		200	1300	302	- 3
204.1	1387.9	-522	23		204 1	1326.7	307	- 3
240	1876	.575)57		210	1385	C 25	-34
220	1496	-0.15	-524		775	1411	6)5	50
270	- 544	615	-014		230	1-95	245	-67
238 Ž	1589.4	35	400	-	225 2	- 528 3	4 90	.16.
240	1632	0.00	(81		240	1990	441	.T4
250	1700	-548	782		250	1825	41-81	-74
250	1758	044	-178		260	1690	37	72
370	1876	2 42	789		272	1193	440	-75
250	1904	< 41	-A00		730	1970	0.07	. 76
290	1972	6.60	-199		790	1015	440	7%
330	2045	e 19	796		300	1990	477	-78
סינ	2136	437	•т т	i	574	2015	0.57	74
335	3176	4)?	805	- 1	320	7061	-431	-77
130	2244	4 34	-008	- 1	500	(14)	47%	0.6
300	27.2	49.50	-155	- 1	340	2210	434	-25
155	7100	4.51	-165	ı	59U	8672	-0.33	-75
360	2445	41.52	.183		300	23-0	032	.74
370	2515	0.72	-605		370	3406	-0.37	
390	7554	áái	·NOI		390	24H)	-0.51	-784
990	2652	0.90	.195		391	2424	0.30	76
#1 0	2721	0.00	616		490	:800	-030	-781
aig	2788	å 29	-809	:	410	2665	029	7.5
490	2050	0.29	-800	i	+20	3730	-0.26	76
400	2924	4 27	.769	:	490	2198	-021	-750
440	1992	-0.76	-226	- 1		2660	426	./4
#50	3060	0.26	-796	- 1	450	2000	-0.26	-76
₩	3124	033	382	į	480	2990	-0.25	-741
4.00	3198	-0.75	-799	:	470	127/	-0.25	.76
480	3264	024	783		480	1120	4024	-746
464.5	17957	0.24	784		484.8	314) y	-0.24	-756
						21-79	-0.64	·ra

Most entired first propert for left side most lateral G.G. condition.
 Weights given are nominal weights at 15 C.

413-FMS-63-5-9-1

Table 6.9M USAGUE FUEL LEADING TABLE WITH BELF-SEAUNG TANKS AND 618 LITERS AUX FUEL MANGE.

Mark Properties

LATERS	(PS) (PS))mml	ikg-mm)
40		2	-1
54		1	2 1
- 50		1	1
.40	130 4	,	- :
200		1	:
2067			5
240			-196
787		-1	-225
320			-261
160		-1	-261
400		- 1	-125 :
440		i	37(
480		-i	-351
570			424
560		- 1	456
FIN		- 1	412
840		- 1	522
600		-i	-354
720		-;	567
160		i	619
		-	430
T72 ;		-!	456
800			
Aut			4181
100		-12	-8506
990 3		-15	4437
9270		-12	-5798
96.		12	-5184
1000		-11	4365
1040		- 11	517# T
1093		10	-8402
1122		10	.5120
1190		-12	-6454
1200		- 4	-8802
1240		.9	-9095
1780		4	. 63.44
1020	1 10754	-3	-8606
1060	10.00	4	-8867
1795	11271	- 4	-9091
1400	1141-1	a	94,78
144	11726	- 4	-9349
1483	1206.2	- 4	-98-90
1923		- ā	-8672
1963		- 7	-8900
15797			-9009
1633			·P175
164		.,	-9956
1688		,	PAM
1735		ė	4411
1760		ã	6906
			-0003
1804 1834 d			-8370

Weights given are nominal weights at 15 C.
 Weights given are sominal weights at 16 C.

41244643592

Table 5-10, USABLE FUEL COADING TABLE WITH SELF-SEALING TANKS AND 16.3 GAL AUX FUEL (Separ)

Jel A. A. 1, JP-5, JP-8 (5.8 Lbs/Gaf).

Jet B. JP 4 (5.5 Los/Ge):

-		-	
IJ.Š.		LÓNGES	
TO	y (Ma.)	00.1	(pr-1p)
1П	πн	179.5	PH RE
20	138	1997	18999
Ю	204	139.6	28519
40		1999	38053
SD		179 B	41666
. 5		139 P	51942
50		143.2	58426
0		147 4	70162
٥ú		150.5	81872
XO		192 7	93452
DΩ		154.5	110640693
10		195.9	116613
ZΠ		157 1	128194
30		158.2	139845
60		159.1	151453
Š		1550	163096
6		100.2	106230
ă		157 1	170925
5		153.3	177215
ú		150 U	183830
5		148.8	185699
ĸi		149.6	190542
Ö		151 1	205498
ŭ		152.3	7124M
20		1533	228337
ij		154 3	74 (325
40		195.2	253258
Ñ		150.0	265290
6		156.3	289538
w		155.2	274394
70		151 7	263 173
80		162.3	289979
ÿä		1510	297772
00		149 B	305692
7		149.5	307217
ō		150.8	915822
ž		152.9	328358
Ö		151 7	340415
5		162.2	349402

Most critical amount for most forward C.O. condition as a weight swipty below 6580 pounds has no final.

417-FMS43-910-1

Most critical amount for most forward C.O. condition as a weight swepty of 6886 pour or or greater.

Word stitled businessed for most off C.O. condition at a weight empty before \$500 pounds.

^{***} Most efficie law amount for most aff C G condition at a weight empty of 4540 pounds or green;

Whights given are somired weights at 18 G.

Faun 4-10M, NISABLE PUBLICADING TABLE WITH BELF-STALING FAINS AND 62 LITERS AUX FUILL [Vehic]

3e(A, A-1 314; JP-8 (91545/)

JetB JP at 778 kg/)

_		WEIGHT L	ONS CE	MOMENT	, _i -		WEIGHT			
L	TERS.	[kg]	(mm)	ika-runi	Ĺ	LI1ER8	_ IKOI	(mm)	(kg-mm)	ı
`					_				_	
_	- 40	378	2548	115502		40	11 Z	2545	110400	
i	90 80	652	154H	231330	l	70	273	3548	221111	ı
•	120	STH	3651	347288	l	120	53.5	3551	331947	
	120	130 4	3517	451311		150	17 8 K	3659	442546	
	200	103.0	3553	575130		200	156.6	3657	55355T	ı
1.	2067	168 5	3553	58454U		206.7	161.0	3457	5/2102	•
1	240	195.6	78/10	719612	l	240	157.0	3679	687825	
	ZNC	2:82	3777	451811		280	718 1	3777	:23839	
	220	25G 8	3450	1004080		320	249.2	3850	989728	ı
	350	7214	3304	1145434		360	290.4	3904	1094838	ı
	400	326.0	3946	12000108		400	3116	3946	1229574	
	4-6	354.6	3981	1427597	ı I	440	342.5	3981	1384528	
- 1	480	291 2	4010	1566713	1 1	440	173.8	4013	1499419	
	520	427.8	4334	1709609	l '	520	405.1	4034	1534091	
	560	456 4	4057	1851615		560	436.2	4157	1769826	ı
i-	577 4	473.6	4069	1914794	ı I	577.4	449.8	4069	1830214	•
!	900	489.0	4005	1858445	Ι .	600	497.4	4005	187 (997	
	640	521.6	2400	2035805	•	640	498 8	3903	1945863	ı
	550	554.2	3813	211.1165		650	529.7	2611	2019523	ı
- 1	694.9	566.0	37.62	2141811	I I	694.9	5413	3782	2047299	
į.	770	528.8	3836	2223381	'	720	560 9	3636	2134709	
•	760	619 d	3540	2378498	ļ	740	592 D	3840	2273434	
	000	652 C	9871	2523092		800	623.2	3471	7412407	ı
	840	684 6	3900	2681940		640		3500	2562004	•
	RM1	717.2	9925	28450 IC		680		3925	2520658	
	920	749 5	7946	2 98 0210		920		3948	2529457	
	959.4	782.2	1970	1105461		252.8		3970	2965308	
- 1	960	782.4	3868	.1106346	i	960		3983	2969177	
- 1	IONO	a150	3927	3200505	- 1	1000		3927	3048133	
	1040	847.6	3067	1294621		1040		3867	3149092	
	1050	880 2	J850	3089770		.cmc		3850	17100162	1
	1120	512B	3816	3459345		'120		3818	3329384	ı
- 1	114] 6	972.7	1797	3530562	- 1	1143 8		3797	3383264	
- 1	1183	945 a	3606	3526192	- 1	1160		3906	3450254	
ı	1200	8760	3872	3743784		1200		3928	3570414	1
	1243	10106	3846	3656768		1240		3848	3/15082	ı
_	1277 7	1041.3	3857	4028806		'277 7	996.3	3967	3848305	-

Mass cettical pergent for most forward C.G. condition at a weight empty below 2064 khograme has no fuel.

Wraights given are nominal marginit at 15 C.

412 FMS 63 5:10-7

Most critical amount for what forward C.G. condition at a switch tempty of 3944 kinggrams or globler.

[•] No pi critical find measure for most aR.C. G. aposition at a resight empty callow 3844 bilograms.

^{***} Most critical final amount for most aft C.G. condition at a weight empty of 3005 billograms of greater

Table 6-11. CIBABLE FUEL LOADING FABLE WITH SELF-SEALING TANKS MID 14,3 GAL AUX FUEL (LIN) (Expert

Jet A. A.4. LP-S. JP-B /6 8 Los/Sa/)

Jet 8, JP 4 (8.5 (be/\$4))

ONTTON O 2	lipr) Milèni	(m.i	WOMENT (m-fb)	U.S. GALLICAN	WEIGHT IIbs	lin)	MÇMENI (M-16)
<u> </u>	_						
10	56	п	c	10	86	- 0	
20	196	0		70	130	0	
30	204	D	G	30	195	- 4	,
40	377	II	г.	40	260	- 0	(
50	34)	D	c	j sc	335	a	,
54.5	3713	. n	¢	506	354 9	٥	1
60	408	-0.12	-69	100	JPC	-0.17	-
70	475	0.00	328	יי ו	455	-0.69	-01-
80	544	·1 n2	-555	66	520	-1.05	534
90	612	1 42	-B68	90	585	-142	-83
100	880	-1.75	-1190	100	650	.1 75	-113
110	743	-2.05	.1056	110	T 15	-2.00	-14V
1211	816	-7.72	-101Z	120	750	-2 22	-113
130	684	-245	-2122	130	M45	-2.40	-202
145	657	·25°	-2428	140	910	-2.55	633
150	1020	-258	-2832	190	875	-2.56	291
152.6	1037 7	2.54	-2636	1526	991.9	-754	-251
160	1688	-274	-2981	IAN	1040	.2 T#	-285
173	11.50	-2.74 -2.72	3167	170	1105	-5.74	-2521
183 8 581	1224		-0347	140	1170	-2,73	-319
	1248.5	-2 72	1396	189.6	1934	-1 /2	-1744
190 200	1292 1360	-3 51 2.48	-7398 3366	190	1235	2 6 3	-324
213	1948	-137	-0384	200 210	1300 1368	-1 49	-3233 -323
220	1496	2 27	-3396	210	1430	-2 37	
730	1564	2 20	-3336	230	1035	-2.27 -2.20	-024 -028
240	1632	2.58	-3395	740	1560	-2:00	J241
250	1700	2.00	-3400	250	1525	-2:00	-0.240
2536	17245	-197	-9397	253.5	1648.4	-197	3243
250	1768	41.90	-3385	280	1990	-1.92	-3249
270	1836	-185	-9397	270	1755	1.85	324
200	1904	178	-9389	260	1520	-178	-314
293	1972	-172	-3187	790	1585	1.72	-324
300	2040	167	3407	. 300	1960	-167	-315
902.2	2055 U	-165	-3381	302.2	1964 3	165	-3241
110	2108	161	.3394	2.0	2015	-161	-374
370	2175	-157	-3416	325	2080	. 57	-9286
330	2244	-452	-3411	300	2145		-0280
J37 6	7285 7	1 48	3188	297 6	2104.4	-148	-3747

[&]quot;Most critical time) amount for left side most lateral C.G. condition. Whights given are nothing weights at as C

412-FMS-63-5-11-1

Table 5-11M, USANIE FUEL LOADING TABLE WITH SELF-SEALING TANKS AND 62 LIVERS AUX FUEL (LH) OHERS.

Jel A. A. 1, JP 5 JP 8 (915k) To

Jer 8, JP-4 (775 kg/l-

JTE#\$	WESHT Onl	LAT CG (mm)	indesident (kg-mm)	LITEAB	WEIGHT (kg)	(mm)	(kg-mm)
	_			۱			-
40	J2 6	0	С	40		0	
50	85.2	0	0	80		Û	
20	97.6	0	0	120	90.5	0	
16û	133 4	0	0	160		Û	
30 T	1G3 O	0	0	200	105 &	0	
	188 5	Ш	U	206 /	1510	Ш	
ı	1956	В	+1569	240	157.0	-8	-14
	77 ft 2	-22	-6000	280		-12	-47
Ú	260 8	-21	-8365	220	240.3	.31	.77
ęσ	293.4	-41	-12009	360	ZMI 4	41	-114
ЮÚ	329.0	-48	-15642	400	3116	-48	-149
4ŋ	358 5	54	-19364	440	347.8	- 94	185
æά	301.2	-60	-234 12	490	272.9	-50	284
20	420 €	64	-27123	520	435.1	-54	-256
œij	458.4	-68	-30172	-80		-68	-26
ä	470 6	- 60	.30117	j 577.4	445.8	64	26
a	4d W Ü	-70	-34430	500		-70	31
ú	521.6	-70	-30512	- GeO	498 G	-70	Jan
εŪ	554.2	-68	-28240	880		-69	-96
ومؤ	966.3	-69	-39078	694.9	5413	- 69	77
770	546 R	et.	-19116	720		- 61	3/5
760	519.4	- 63	-38082	760	592.0	- 63	17.
600	557.0	-60	-19120	500		40	-870
840	3846	-57	-30002	640		.57	37.2
040	717 2	-54	-16729	650		-54	370
920	749.8	-52	38900	420		-52	37.
588	762.2	-20	-18117	858.8		-50	-373
960	782.4	-50	-39120	960		-50	-31
1000	015.0	40	-18120	1000			37.
1040	947.8	-48	-38490	1040		-48	-372
1080	960.2	-44	-38729	: 1680		-44	370
1120	¥12 A	-40	-19750	1170		-43	-079
1498	302.2	42	39162	11418			374
1160	245.4	٠.	-18761	1100		41	-070
1200	978.0	-40	-38120	1200		40	27.7
1240	17'06	.18	-38413	1740		-18	-778
1777	1041 3	-3 ě	-29570	1277 7	99€ 3	-38	376

Non-oritical fuel empure for left side most leteral C.O. condition.
 Weights gives are nominal swights at 15 C.

412-FMS-69-5-11-2

Tabm \$-12 USABLE FUEL LOAGING TARIF WITH SELF-SEALUNG FANKS AND 14-3 GAL AUX FUEL-(AH) (E-)-A)

Jet A. A-1, JPG, JPP (BRADEGE)

лет б. иР-4 (8 6 цыс/Са);

US '	WEIGHT	LATICS	MOMENT			LATEG	100
LITON	(be)	liu.)	(Im-lb)	GALLON	(B)(0)	lin.i	Qfm-l
19			-	10	66	9	_
20	136	Ó	0	20	130	D	
30	204	0	0	30.	198		
40	272	Ó	٥	1 40	260	0	
50	340	Ū	0.1	i 50	325	ō	
54.6	3713	ñ	اة	54 6	354.9	ò	
80	408	0.08	انج	60	390	0.06	
70	476	0.60	286	07	455	UMI	
HEI	544	0.99	306	eŏ	520	0.93	
99	812	1 30	820	90	595	1,11	
100	550	167	1136	ιώ	850	161	
110	748	1.53	1444	10	715	190	
120	815	Z 16	1763	'ŽŮ	790	2 16	
170	884	2 36	2077	·30	845	2 35	
14D	852	\$ 50	7160	'40	910	240	
150	1020	2 53	25 8 1	50	975	2.53	
152.6	10377	2 49	2584	152.5	8919	248	
IAI	1024	206	2790	·6û	1040	206	
170	1156	1 27	2046	1 '70	1:05	177	
180	1724	153	1503	- aŭ	11/70	169	
183.6	1248 5	1 45	· enp i	183 6	1'934	145	
190	1297	140	'NNU	190	1276	140	
200	1360	1 33	-809	200	1300	133	
Z10	1428	127	1814	210	1385	111	
220	1458	121	·810	220	1430	12.	
230	1551	1 16	1814	730	1485	116	
240	1832	111	912	240	1560	11.	
250	1730	1 37	919	330	1625	107	
255.6	17245	125	· B11 ·	253 8	1848 4	106	
260	1758	1 52	1900	760	1690	107	
770	1835	0.00	1818	270	1755	010	
280	1904	0.95	909	250	1820	995	
290	1904	0.80	1814	230	1885	982	
270 300	2640	0.94	916	300	1950	082	
				307.2	1954 3	050	
362.7	2055.0	0.00	1808				
310	2138	0.86	1813	110	2015	086	
320	2175	0.83	1905	J20	2000	080	
חנה	>244	O Ac	1796	190	2145	980	
9176	22997	0.75	1814	J37 G	2194 4	0.79	

^{*} Most critical fuel emount for right either most lateral C, C, condition. Marghin given are normal weights at 16 C.

417-FMS-63-5-17-1

Table 6-12M. USABLE PUEL COADMO TABLE WITH SELF-SEALING TANKS AND 62 LITERS AUX FUEL (RH)

Jene, A-1, JP-5, JP-8 (8154g1)

Jel B. JP 4 (779 agh)

•		:		-	, . _	· - -	—	
		ти€кінТ	LATCO	ACMEN1		WEIGHT	LAFCE	MEMENT
1	LITERS	(Pg)	(enmi	ikg-nm	LITERS	Maj	(mm)	ika-mmj
١.,		-						
_				· —	_			_
	40	32.6	Û		40	317		
	80	65.2	0	9	6D	623	Û	9
	130	97 B	II	0	173	935	0)
	160	1)) a	D	9	160	124 8	Û	9
	200	163.0	п	0	200	1550	Ū	- 0
	206.7	168.5	9	9	2067	181 U	Ш	9
	240	195-6	5	978	240	107 D	5	935
	280	728.7	19	4396	290	2184	19	4144
•	720	200.0	29	7563	320	249.3	29	7229
	360	393.4	38	10582	290	2HC 4	36	10095
ı	420	3260	45	14996	400	3115	48	14334
ı	440	356.5	#3	18004	j 440	W2.8	58	18166
ı	æ00	301.2	68	22693	480	373.9	58	21687
ı	520	423.6	62	25275	520	405 (62	25115
١.	960	496 c	65	29666	- 5eo	436.2	66	78:56
ı	577.4	470.6	F 3	79647	577 4	449 8	53	20337
•	900	489⊘	69	29917	600	487 4	50	24772
	543	216	45	23984	(40	1955	45	22904
	58 0	564 2	29	21614	680	500.7	39	70659
	684.3	200.3	37	70655	694.9	5013	37	20029
	720	586-8	38	21125 :	720	550 2	38	20192
	760	6194	.34	21050	700	592-0	34	20129
	900	662 0	92	23864 -	605	6217	22	18947
	640	604.5	J1	21223 :	840	634 4	31	20295
	980	717.2	20	23/W ;	880	685.5	58	19490
•	927	7498	25	20994	920	716.7	28	20087
ı	660.9	782 5	27	21170	955 8	747.7	27	7,7187
ı	960	7924	27	21:25	960	747.8	27	20192
•	1000	8150	26	21120	1000	7790	26	70254
	1000	647.6	25	21:90	1040	8102	25	23254
	.0 0 0	AND)	24	21125	IDMO	641.3	24	23192
	120	9128	23	20094	1120	812.5	29	20067
	1141.6	974.2	22	20008	1147.6	4810	22	19602
	1160	946.4	22	20790	1190	9036	22	19880
	1700	RIMO	71	22638	1200	934 S	21	19631
	1240	1010-6	21	21223	1240	9625-0	21	23285
	1277.7	1041.3	20	20927	1277 7	9953	20	19907

Most critical Axis amount for right side most lateral C.G. condition.
 Weights groun are nominal weights at 15 C.

412-FMS-83-6-12-2

Table 6-11. 48ABLE FUEL LOACHING TABLE WITH BELF-SEALING TANKS AND 32.6 GAL AUX FUEL (FIGURE)

Jet A. A. 1 JP-5 JP-5 (B.S. S. Lba/Call)

Jef B. JP-4 (6.51 he/Gat)

İ	U.S.	WEICHT	ONC CO.	MOMENT	i	u.s	WEKNIT	LONG CO	МОмЕнт
	GALLON		(An)	101464		DALLON	(1856.)	lin	արժնի -
ı			_		•				
	-						_		
	10	48	139.5	94.86		10	65	1395	9068
	20	136	138.7	10399		20	130	109.7	18161
	20	204	139.5	28519		20	195	139 B	27261
	40	2.2	139 9	38050		40	750	139.8	36374
_	.50	340	129 9	47566		30	.125	1328	45466
•	54.6	3713	139.9	51942		54.6	354.9	1368	49651
	60	400	143.1	*0305		60	790	183.1	55009
	70	4)11	147.5	60972		70	455	147 0	60005
	40	544	149.5	31451		AU	520	149 (77896
	90	A12	1515	J2902		90	585 666	151 A	MBIS
	100	860	150.3	104244		100 110	715	153.3	19645 19486
	1 1Û 120	748 816	154.5 156.6	115568 126970		120	780	154 5 155 6	21968
	130	9E4	156 4	138258		130	845	155.4	32158
	140	952	157.2	149654		140	910	157.2	-41052
	150	1020	157.9	16,0358		150	975	1579	'51953
	160	1024	158.5	172448		100	1040	157.5	'64940
	158.8	11485	158 2	112544		169.8	1097.9	1597	174778
	1/11	1158	158 /	13:146.0		1711	1105	156.7	7.7.764
	180	1204	155.1	159542		180	1110	155 (61417
	190	1292	1519	1#6255		190	1235	151 9	167597
	199.9	1359.3	1490	202529		1000	1299 4	1400	93803
	200	1350	1490	202540		200	1300	1#D 0	· D1700
	210	1428	150.2	214426		210	1365	150 2	205023
	220	1495	158.4	225450		220	1430	151 4	216502
	2.10	1554	1*2 5	2185.0		220	1485	152.6	227938
	240	1632	150.4	250348		240	1550	153.4	239304
	250	1700	154.3	252310		250	1625	154.3	250738
	780	1 (68	158.1	274717		260	IERO	155 (262 (19
	269 H	1505.0	155.0	288128	-	28>9	1754.4	155.9	271503
	470	1838	155.9	248732		270	1755	155.9	271895
	230	1904	154.4	298978		280	1820	154 4	281006
	290	1972	150.0	931718		290	1865	153 0	283405
	300	2040	15#7	339468		300	1960	151 7	295819
	310	2108	150.5	317254		310	2015	150 5	301258
	118.5	2165 8	149.5	323787		318.5	2070 3	149.5	309508
	320	2176	149.6	325530		320	2080	148.6	211168
	310	2244	150 4	337468		330	2145	150 4	322608
	340	2012	151.2	24957#	I	340	2210	161.2	334152
	330	2380	131.8	361264		350	2275	151 8	345345
•	753.9	24055	152.1	366012	1 45	753.9	2300.4	152 (149833

Most prifical amount for most foregard C.G. condition at a weight empty below 6580 pounds has no fuel

412-PMS-63-5-10-3

Most critical amount for most forward C G-condition at a weight empty of \$350 pounds or greater.

Most critical feel amount for most aft C G condition at a weight amply below \$450 pounds.

[™] Most critical fuel amount for most aft C G condition at a wellight empty of 4550 pounds or greater.
Weights given are nominal weights at 15 C.

TABLE 3-13M LUŞARI FIRIRI LITADƏNG TABLE MITH SELF.SEALING TANKS AAD 123 LITERS ABU FUEL. IMADIÇ

Jet A. A.1, JP-5 JP B (815kgf)

J&CB JP-4 (779 kg/l)

LITER9		LONG CO			LITERS		FORCE DR	
LIIERS	(24)	(mm)	(hà-mm)	_	LITERS	(84)	<u></u>	kŋ-m⊌
40		3643	115502		40	31.7	3543	113
80	55.2	3548	231330		60	52.3	3548	771
120	97 B	3551	347288 -		120	W S	3951	יותנ
160	130.4	2651	463311 (150	446	3553	447
200	1520	2517	579139		200	155.5	9550	563
2057	168.5	3553	958540		206.7	1510	9550	572
240	195.5	3675	716830		240	157.0	3675	687
240	224.2	3752	830488		280	2181	1762	820
320	249: N	3811	PHR125		720	249.3	1831	954
360	290 4	3877	1107512		360	Z!0 (3877	1087.
400	33E G	JUTS	1375608		400	311.6	3910	1219
440	958 6	3942	1493601		440	342.6	3947	1351
490	991.2	3987	1551890		410	373.9	3967	1403
520	423.8	2938	1590114 (530	e 05 1	Энав	1015
560	456,4	4006	1629238		560	438.2	4006	1747
500	4810	4023	1967247		800	467.4	4020	1480
639 1	520.9	4043	2105863		639 (4379	4040	ZU 121
640	5216	4041	2107786		640	458.6	4041	2014
683	554.3	J943	2185211		680	5297	3943	2083
723	556.4	785	7352414		720	960.9	3866	5.65
7566	6186	3784	2233124		756.6	588.4	3784	2230
760	8194	3787	2345888 ·		ሚባ	59Z O	2797	22*2
860	6520	7870	2497 495		mor)	673.7	34,70	2786
3#0	584 6	3851	2636395		540	834.4	3851	25 (5)
890	717.2	1879	2782015		630	6855	35/8	2850
920	748 8	3904	2927219		920	7187	3904	2707
960	787.4	3927	3972485		960	747.8	9927	2936
1000	615 D	J948	321 M35	_	1000	779 0	3949	3076
1040	6125 847 H	395H 3940	3285857		1021 5	795 7	3959	3150
1080	8802	3002	3139644 3434540		1040	5'02	3 94 0	31921
1120	8.58	3866	3434340 3528888		1260	MID	3902	J2521
1:50	9454	3533	3623718		1120	8725	2656	33734
1200	9780	3802	3718356		1160 1200	ena s	MJS	34653
1200	9825	3797	373 0436 (934 (3807	3554
1740	10106	3816	3858450		1205 5 1 24 0	900 n	3797 3816	3888°
1280	10432	3836	4001716		1280	9071	3836	3824
1326	1075 0	3863	4157807		1320	1028.3	3885	3974
13384	1091 5	3664	4217965		13394	1043.4	3884	40314

Most critical amount for most forward C.G. pond-tion at a weight empty below 2884 kitograms has no full Most critical amount for most forward C.G. pond-tion at a weight empty of 2964 fillograms or greater.

#12-FMS-53-5-13-2

[&]quot; Most critical fuel amount for most aff C.G. condition at a weight emply before 2071 billograms.

Most critical funt amount for most att C.G. condition at a weight empty of 2371 kilograms or greater.
 Weights given are nominal weights at 15 C.

Table 6.14. USABLE FUEL LOADING TABLE WITH SELF-SEARING TARKS AND 33 & CAL AUX FLIEL (50) 4/2

JAPA ART JPS JPS (ASTENDA)

JEG PARSUBSEN

_										
	U.S. GALLON	WEISHT (Ma.)	LAT GG Jin i	MOMENT (M-45)	GALLON	William (Ibe)	LAT CG (m)	(In-th)		
ı										
ı	10 20	- 58 136	0	D i	13		0	0		
l	10	234	a	, o	23	110	0	0		
ı	4D	272	ă	0	20	195	0	0		
ı	90 90	340	ä	٥	40	250	Ü	Ų		
	54 B	371]	ő	0	50 54 6	395 254 9	!!	0		
!	40	-03	-0.06	-24			:1	0		
	7D	476	-0.50 -0.64	-19	80 70	290 455	40 BK	-2:) -1H		
	80	544	0.05	27		900 520		-1n 26		
	30	512	-0 Çe	24	80 90	986	4005 4004			
l	100	560	-0.04	27				-29		
l	110	747	-0.02	22	100 110	650	204	-28		
l	120	818	-0 63	14		715	203	-71		
l	130	854	.DC3	-27	129	780	0.03	23		
l	140	952	-0.03	-19	102	845	0.03	25		
	150	1020	-0.03		149	910	903	27		
		1088		- 21	150	P75	903	28		
	163.9	1145.5	-0 C3	-29 -23	160 168 9	IMU	0.03	- 11		
	170	1145.9	.D 1B	-20 6		1097 A	-0.07 -0.16	-42		
	180	1224	0.36	-208 481	170 i 180	1106		-144		
	190	1792	-0.46	-520		1170	-0.96	421		
١.	158.9	11593	-0 40	-788	190 1994	1235 1296 4	-048 -058	.593 .754		
	200	137.0	-0.56	-7A0		1300	058			
	210	1428	-U 55	-745	200 210	1365		.754		
	220	1458	-0.53	-783	720	1433	0.55 0.53	-751 -758		
	230	1564	-0 55 -0 51	-748	220	1495				
	240	1532	048	-7aa	240	1560	051 -041	762		
	250	1700	047	-799	290	-	-047	-749		
	256	1768	24	-778	260	1625 1680	-5 44	-764 -744		
	208.5	1835.3	0.43	-710	280 9	1754.4				
	270	1838	0.43	789	270	1755	4.43	-754		
	750	1904	0.41	781	250	1820	C41	-755 -746		
	290	1972	0.40	789	290	1885	-C.40	754		
	330	2940	-0.79	785	300	1950	-0.36	754 -781		
	310	2106	-0.37	780	310		40.37			
	3865	2100 2169 K	40.30	790		2015 2070.3		-746		
	240	2176	-		3185		-0.36	745 140		
	930	2244	-0.36	-703	:)20	2090	-0.36	7#9		
	340		-0.35	-785	730	2145	-0.35	791		
	340 350	2013 2080	-6.34	-786	340	2210	0.34	751		
	350	2408.5	-0.30	-785	020	2275	0.33	791		
	303.9	2400 5	-C XI	-794	343.9	23004	-0.31	759		

Most critical fact amount for left pide most lateral C G, condition.
 Weights given are normall weights at 15 C

412-FMS-60-5-14-1

Table 5-18M - USABLE PUEL LÓAQUES TABLE WITH SELF-BEALING SANG AND 120 LITEAS ADX FUEL PARKS

Jet A. A. 1, JP 5, JP 6 (8154640)

.et 8, JP-4 (779 kg/l)

				1				
UTEAS	WELGHT Ikgi	LAT CG (omn)	MOWENT .	LITERS	MEIÇHT MEIÇHT	(mm)	MOMEN (Ng-mri	
				1	"		<u> </u>	
40	126	0	— ·	40	31.2			
80	86.2	ō	ā	60	62 1	Ď		
120	97.8	Ō	ā	120	93.5	Ď		
160	130.4	0	0	160	124 G	0		
200	1030	0	0	200	155.6	0		
206.7	168.5	0	0	206 7	161.0	Ü		
240	195.6	- 1	4196	743	1810	-1	-1	
280	228.2	-1	-226	263	218 1	-1	-2	
320	200 A	-1	-26	320	249.1	-1	-2	
360	290.4	-1	-2≅1	380	250.4	-1	-2	
400	32E O	.1	- DZH	400	311.6		-9	
44U	358 6		-35v	440	342.3	.1	٠.	
440	391 2		·9D:	48 û	373.9	.1]	
520	423 B		-424	520	4051	.1	.4	
560	458,4		456	560	#30 Z	-1		
800	489.0		-489	600	4674	-1	-	
639 (520 9		-521	: 6391	497.0	-1	-	
640	521 6		-574	640	420.6	-1	4	
680	554.2	-9	-4964	1 480	579 /	-9	-47	
130	548.5	-12	-7042	720	550.F	-12	- 67	
7568	818 6	-15	-9249	1 758.8	589.4	-15	-88	
Teù:	819.4	-1≛	-9201	™ 60	592.0	15	*8	
600	852.0	-14	-9128	600	623.2	-14	-67	
840	884.6	-13	-8900	<u>64</u> 0	654,4	-17	***	
BBC	717.2	-13	-9324	M0	685 \$	-13	-49	
820	748.8	-12	-8988	620	716.7	-12	-65	
960	782.4	-12	-2309	R7()	747 6	-12	-89	
1000	815-0	-11	-8965	1000	779.3	-11	. 65	
1921.5	642.5	-11	-8155	1921 \$		-11	-87	
1040	8474	-11	-9324	1040		-11	-99	
1040	8 4C 2	-16	-6801	1 080		-10	-84	
1120	912.8	-16	9128	120		-10	-97	
1160	945.4	-10	-9464	1160		-10	- 92	
1200	978.0	-4	-8802	. 1200		9	-84	
1205 5	882.5	-4	-8842	1205 \$	939.1	9	-84	
1240	101C.6	9	9095	124)		-9	-00	
1250	1043.2	9	8389	1280		-9	-65	
1320		8	-8606 .	1320		4	-Aa	
1339.4	1091.6	4	-8733	13384	1043 4	-3	-63	

^{*} Most critical five amount for left gide most teteral C.G. condition. Watging given are nominal entities at 13 C

#12-FMS-633-5-14-2



ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT TEN CELL — SELF SEALING FUEL

412-899-377

S/N 33108 — 33213

AND

SAN 36001 -36019

\$/N 36020 - 36086

S/N 36087 AND SUB

CERTIFIED 22 JUNE 1998

This supplement shall be attached to Model 412 of 412EP Flight Manuel (BHT-412-FM-2, BHT-412-FM-3 and BHT-412-FM-4), when SELF SEALING FUEL CELLS are installed

Information continued herein supplements information of basic Flight Manual. For Limitations, Procedures, and Parformance Date not contented in this supplement, or other applicable supplements, consult basic Flight Manual.

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22 JUNE 1998 REVISION 1 — 02 JULY 1898

NOTICE PAGE

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LOG OF REVISIONS

LOG OF PAGES

	REVISION		REVISION
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FLIGHT MAN	UAL	Δ — B	
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NOTE

Revised lext is indicated by a black vertical line. Insert latest revision pages: dispose of superseded pages

LOG OF FAA APPROVED REVISIONS

Original	0	 22	JUN 94
Revision	1	 02	JUL 98

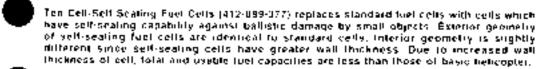
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MANAGER

ROTORCRAFT CERTIFICATION OFFICE FEDERAL AVIATION ADMINISTRATION FT. WORTH, TX 75193-0170

GENERAL INFORMATION



All (their components including fuel quantity gauging system are identical to standard system.

Section 1

LIMITATIONS

1-6. <u>WEIGHT AND CENTER OF</u> GRAVITY

Actual weight change shall be determined after installation and ballest readjusted, if necessary, to retain gross weight CG within allowable limits.

1-20. <u>INSTRUMENT</u> MARKINGS AND PLACARDS

Refer to ligure 1-1.

BASIC FUEL CAP 2121 LBS

WITH AUX FUEL KIT 412-706-007 3236 LBS

> 412-706-009 2343 LBS

Location: instrument panel

Figure 1-1. Instrument Markings and Placards

Section 2

NORMAL PROCEDURES

No change from basic menual.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

No change from basic manual.

Section 5

WEIGHT AND BALANCE

5-7. FUEL LOADING

Fuel loading tables tists usable fuel quantities in 10 gallon (40 liter) increments, with weights and moments in both engines and metric units for belonce computation. Critical fuel loading for computing most forward and at CGs are denoted.

6-7-A. BASIC SYSTEM — SELF SEALING FUEL CELL.

Total capacity: 326.5 U.S. galtons (1285.9 liters).

Useble fuel: 317.3 U.S. gallons (1201.1 literal)

- Tables 5-1 Provides longitudinal CG data for approved fuels.
- Tables 5-2 Provides lateral CG data for approved fuels.

5-7-B. BASIC SYSTEM WITH BOTH SEAT TYPE AUXILIARY TANKS (16.3 GAL /61.7 LITRE EACH).

Refer to BHT-412-FMS-25,2/25 3/25 4

Total capacity: 359,1 U.S. gallene (1359.3) literal.

Usablo fuel: 349.9 U.S. gellone (1924 5. litera).

- Table 5-3 Provides longitudinal CG data for approved tuels.
- Table 5-4 Provides lateral CG data for approved fuels.

5-7-C. BASIC SYSTEM WITH ONE SEAT TYPE AUXILIARY FUEL TANK ILEFT OR RIGHT).

Refer to BHT-412-FMS-25.2/25.3/26.4.

Total capacity: 342.8 U.S. gallons (1297.6 liters).

Usable fuel. 339.6 U.S. gallons (1262.8 liters).

- Table 5-5 Provides longitudinal CG data for left side installation.
- Table 5-6 Provides (steral CG data for left side installation.
- Table 5-7 Provides longitudinat CG data for right elde installation.
- Table 5-8 Provides Interal CG data for right side installation.

5-7-D. BASIC SYSTEM WITH BOTH LONG RANGE AUXILIARY FUEL TANKS (81.7 GAL /309.8 LITRE EACH).

Refer to BHT-412-FMS-17, 2/17, 3/17, 4.

Total capacity: 489.9 U.S. gallone (1854.4 liters).

Usoble fuel: 480.7 U.S. gallons (1819.6) litera),

- Yable 5-9 Provides longitundinal CO data for approved fuels.
- Table 6-10 Provides lateral CG data for approved fuels

5-7-E. BASIC SYSTEM WITH ONE LONG RANGE AUXILIARY FUEL TANK (LEFT OR RIGHT).

Refer to BMT-412-FMS-17 2/17.3/17.4.

Total capacity: 408.2 U.S. gallons (1545.2 litera).

Usable fuel; 399.0 U.S. gallons (1510.4 Riters).

- Table 5-11 Provides longitudinal CQ data for left side installation.
- Table 5-12 Provides Isteral CG data for left side installation.
- Table 5-13 Provides longitudinal CG data for right side installation.
- Table 5-14 Provides lateral CG data for right side installation.

Table 5-1. Usable fuel loading - longitudinal - basic helicopter (English)

	USABL	EFUEL LO	ωί να Τ λέμε	Lovei tub	NAL CG IEN	ALISHI .	
			910' Tyden	3170 09 6:			_
	<u>4 4</u> 41 -145.					<u> 18 5 M / Cali</u> j	
Used by	Attender	ca	Normark	Comin	200	66	Memani
.05 Gara	Αn	INCTES	probit	1.5040	^	P	at E.
10	64	139 K	4424	1:	ы	138 6	4003
20	138	1351	16421	20	130	139.1	16796
30	214	1894	2Fad2	340	1 26	179 6	271 m 2
40	272	125 P	37953	40	200	139 0	36250
:0	340	133.7	4+443	5:	329	1397	46,999
50	200	1797	=7005	60	390	129.7	54890
1.65.0	426	1397	59455	152 e	407	139 7	Seekz
70	414	143.5	56 134	72	458	1436	05315
50	940	147,7	90322	R:	NZO	1477	76778
90	G12	150 8	22259	9:	SES	.50.0	58117
ICD	560	15	104(45	100	650		39666
110	749	155.3	1,1185	10	715	.550	111073
170	51C	1570	128153	. 20	780	157.0	12,92.00
130	464	1955	14010¢	- 30	845	.000	110926
71089	منه	159.6	150/08	1138.9	WEG	159.6	144657
147	952	1521	191425	10)	910	159 (114740
150	7020	154 7	197776	167	475	1547	150815
-00	Iala	ISD B	164128	163	1040	150.9	156869
179	1156	147.5	170481	17)	1175	1470	145540
1 177 4	1 · FA	1474	170748	7 17N 4	1127	347.4	184177
180	1234	148.9	140227	192	1170	148.9	174197
190	1292	150.3	194191	100	1215	150.3	155524
390	1360	151 6	705144	2000	1300	151 8	127050
210	1418	169.7	216097	213	1888	1527	200475
220	1496	173 B	2.15044	770	1420	150.8	217593
730	1564	144 F	241939	230	1035	1547	23()22
" 227 B	5617	1853	291054	" 237 J	1546	155 3	737665
240	1632	154 P	252760	240	1550	15# V	241500
25/1	1700	159.9	260627	26>	1626	.1.1.1	249233
260	1768	151.6	284395	760	1690	151 d	256458
273	1836	1504	2760et	270	1756	150 a	299587
287	1964	139 1	22.8924	287	1820	144 '	271302
1 286 4	-444	146.0	755806	77564	1946	148.3	258804
297	1972	1488	233089	290	1825	148 6	280.04
200	2040	119.5	305632	105	1950	1495	221575
111	2108	1504	218981	310	2015	150 a	0:2-9-
779779	2154	151.0	a2570 a	2007.3	2052	(51.0	.111234

Care a sur quantities for most review out condition (action) and rem-

magnis gean are communicated with the existing

Concentration concentration and projection Victime with the PCSA shows are convention in Model and Model a

NOTE This table is enable with donkery foot tank (\$1,000).

012 FMS-45/5-9-1

[&]quot; Cared up uppelled to real all CO to differ

Table 6-1. Usable fuet loading - longitudinal - basic helicopter (Metric)

	1,8461	LE PUEL LO	ADINA TABU Basa System			TRIC;	
701	6 AP JPS	.Paula sis	kali	122		16 730 <u>644</u> 1	_
Dans	Weight	(a	Monwell	Custes	West	E.5.	Moment
Pirk	20		þe mbyr	311-34	P3-	7071	p=7-62.
40	42 5	3525	114758	40	72 7	3520	110505
P0	65.2	3634	poquagar	• · · ·	E3 :	2534	970407
120	97 B	1fe1 l	246720	120	95.4	3541	339540
170	ه زيور ا	2545	463247	150	127.0	والاوان	4551)2
240	153.0	3847	5781 5 8	236	1198	2547	950A35
1 1237 C	163.1	3544	685.450	12370	189.9	3548	67 (866
. 240	125 U	2560	898367	540	171.0	3640	642667
240	226.2	3660	540000	290	273 /	2090	825567
370	260 h	.1784	201946	3%	265.7	2758	P68570
36%	2394	3564	1132564	360	247.6	39-4	1111314
400	926 O	8504	12 19105	490	3. h R	3974	125,3997
4-00	75.6	3773	1424617	400	351 6	1973	1296664
497	991 2	4314	ISTOLAL	4.50	343.6	49.4	1999349
5X2	482 6	a:49	1716795	£30	4.22	4046	1482010
515 /	425.4	8353	1736383	"8297	423.0	4069	1707236
960	455.4	3450	1607864	500	4474	1950	1767294
500	4090	3345	1879,77	elvi	4794	3845	1840072
544	521.5	3753	1457751	GEA	511.0	3793	1916965
. 041.0	525.5	9742	1966776	. R44 B	515.3	3742	1425-60
699	554.7	3774	2094999	e50	5433	37.79	3050470
720	505.5	3818	2740136	770	775.3	3815	2136156
760	6144	3852	z355688	760	507.2	3156	2019823
àvu	582 0	3162	2671170	970	599.2	3462	7447478
340	-00.5	3910	2515689	840	271.3	04.40	2634121
880	717.7	7936	202215E	05V	709.7	3135	7768752
* 930.2	731.7	3343	2892574	** 915.2	719.2	3943	2835796
470	749.8	3970	1919254	920	7755.5	2420	2831634
960	782.4	5076	.1012@6a	9+0	767.0	33,4	2974303
.0:00	4150	3629	3128420	1000	799 N	9939	1067013
.040	4476	3 8 G2	2222967	1040	431.0	3607	3155094
1045	880 Z	1769	33' 7a61	·:A:	862 O	3760	3152323
. 1089 5	96J B	3766	2327421	. 1057.3	are a	2506	3262 m7
120	वार्न	3785	345/527	1120	854 B	3/88	3389859
1161	945.4	1617	3803034	1160	426.8	3911	9532270
,300	970 0	3633	3748461	1206	9:00	3633	3674877
11201.1	9/6 9		3762528	11 1201 1	959.7	3833	3678539

 $^{^{\}prime\prime}$. Wheat and gave the state search become (0%) and the energy gap appropriate

Month devices community as a 10 0 (30 %)

MOTE This table is involve with appropriate built technique stated

412-785-45-5-1-7

[&]quot; Efficien auseber brings en Okkonstee

For which the program that $\hat{\theta}$ and demand others, (CC) from the approximation magnitude $\hat{\theta}$

Table 5-2. Usable fuel loading - lateral - basic helicopter (English)

			Parit Skillen	onsausa	ıl		
10"	A, 411, 34 E,					[6.5 to Gar]	
Districts	Veergh:	<u> </u>	M near	0.446	West.	20	Vomen
-D5 C24	16	in deal	La Bro	1.704	601	1907801	b1
10	7:	0.1	— :	10	65	0.0	.1
20	97	0.9	()	20	130	U U	- >
90	704	44	:	39	106	0.0	- 2
40	272	9.0	:	40	280	0.0	a
50	340	20		90	325	UU	D
:0	404	34		60	350	0.0	
6) 4	429	0.0		82 6	427	0.0	6
70	476	0.0	-1)	79	455	υU	-12
40	54-	υu	-17	m:	520	2.0	.13
4P	61 <u>0</u>	0.0	1)	A2	515	2.5	13
100	GBO	0.0	-1)	100	650	2.0	-12
111-	748	60	-13	! IN	715	20	.3
120	A16	20	1)	120	Yap	22	- 25
190	41+	9.0	15	170	6:5	0.0	. "1
1789	944	20	13	135.5	240%	65	-13
140	472	-0.2	171	140	915	-5.4	-154
150	1020	-54	-407	ISN	975	4.4	989
160	128*	-55	.640	150	1040	C S	-516
1/4	1155	-0 G	4672	170	1105	0.5	-84%
1704	1153	-0.8	-577	1,170,4	1307	.0.4	-647
IMO	1724	2.6	497	180	1170	ae	-547
190	1292	-0.5	-577	199	12 36	-0.8	627
390	(39)	-2.5	-577	200	1000	-0.5	-647
210	1425	-25	277	210	1966	-05	.847
220	1496	E.5	-577	220	:430	-0.5	-647
236	1564	-) 4	-77	2730	:435	-44	-647
447.5	1517	-04	-577	237 A	:546	0.4	647
240	1692	-1.4	477	240	7550	-04	-FAL7
250	1700	4	477	26-	1029	.u a	.647
250	1784	-0.4	477	360	1630	-n a	-647
220	1436	0.4	677	274	1755	-0 4	-547
250	1904	-4	677	201	1820	0.4	547
266.4	1949	-4.2	477	285.4	657	.00	447
220	1972	-0.3	677	290	1845	·03	447
900	2040	.0.1	-678	101	1950	na -	-40
3·D	2100	0.0	086	210	2015	·D 3	esa
217.1	- I to	-0.3	-096	317.3	2262	.03	685

Distriction governs to work lake a CS congruen.

which governs some expensions of a first term.

For nativation (programs, one Mig and and Alamend values). One of own are discuss from the prosection of the values. And to which the second control of the set

NOTE This lab discreta is with auditory for family installed

412-98-5-5-2-7

Table 5-2. Usable (us) loading - Interel - basic helicopter (Metric)

	115	4RIF FFI	LOTATING TA			(K.)	
			Bere: System	· 1231 14(m)			
	3, & 1, J ² , 3,				Let B. JP-4		
Омпазу	eVery#1	CH	Moment	Coursey	We gra	DC.	Moment
/MANUEL	72 G	YPTI	итенц	40	PEI	0	.em.uga 0
an-		V	0	-)2.6		
MD.	45.7	4	r.	M	61.0		U
. 20	218	0	D	120	95 9	U	-
161	100,4	0	v	160	127.8	0	0
Sva	IKT D	٩	r.	200	158.1	0	0
73 / D	192 6	a	D.	237.5	188.4	U	U
24-1	195 6	V	24	240	101.3	0	24
7/10	55# 5		-150	200	223.7	-1	-147
226	780.8		-152	חזנו	255.7	-1	-144
940	293 A		152	950	267.€	.1	.14}
403	270.0	٥	-154	400	3185	D	-142
440	356.6	u	-152	44U	351.6	U	-144
403	9912	0	152	450	363 5	0	10}
590	433 B	a	-452	530	415.5	0	-142
525 /	428.4	a	-152	528	490.0	υ	.743
563	456.4	10	-4359	560	447,6	In	-4364
ENS	146 D	-17	-5484	600	479.4	-12	-5877
540	521.6	15	.7593	840	511.4	15	.7444
* (da 9	625.6	- 15	-T786	1.544.0	915.1	-15	-7 ₩ 3
883	554.2	-14	-3726	880	2437	-14	-7643
725	586.6	19	7796	720	575.3	13	7649
760	6194	-10	-T72G	760	607.2	-13	-7643
•uo	652.0	-12	-7796	830	639.2	-12	.7643
₹a>	684 6	11	.7796	940	671.2	11	-7640
105	717.2	-11	-7796	880	700 1	11	-7643
900.2	628.0	-11	-3796	905.2	719.2	11	7649
920	749 6	-10	-7796	920	735.1	-IP	-7647
240	783.4	-10	-7796	960	767 a	-1 D	7640
1000	615.0	10	.7798	1000	799.0	16	7640
1040	647.6	-4	-7796	1040	451 Q		·T643
1060	880.2	-4	-3796	1090	462.4	.9	-7643
1684.2	687.6	ñ	7706	1064 2	366 3	-9	-7643
1120	DIS B	4	-7803	1120	494.9	.p	·T649
1760	M45.4	-4	-7866	1160	425.à	-8	-7750
1200	878 P	i	-M01a	12110	464.1	·A	-7867
18011	978.0	-4	-8414	1201 1	959.7		- 1980

Сласитие филал полоси менес съсъемно.

The significant for the street weights of $10^{\circ}~\mathrm{C}_{\odot}(30^{\circ}~\mathrm{F})$

For capazione purposes, see resegre sommentees seases is the anomal somewhat som seeinger and showers taken and reviewed to whole homeons.

NQTE The table is resold with almostly bull codes; inscalled

£12##54573%

Table 5-3. Usable fuel loading - longitudinal - w/32.6 gal aux fuel in LH and RH position (English)

	J5A9.	E FUSICION	ŒNO TAUL	LONSIDU	INAL COVER	nus-	
				S Ball Aug Tar	4 - 242 P.Do	Gai	
#*		nga ka n	l ial:		.016, JF.a		
Owaé	(Alwayle)	cs.	Moment	<u> </u>	Weight	20	Mgonen;
1.04	•	peptin	10.6	192 Ce1	191	1.1r4	F-01
10	58	128.6	SALTE	1:1	ė:	198 c	9004
20	135	129.1	18901	79	130	174 :	.4036
20	204	1794	28442	30	195	104.4	27157
40	212	1396	37963	40	569	139.6	35256
70	300	1297	47482	±0	325	109.7	a=J#6
- 60	409	1127	57706	-60	290	129 7	548RN
'6/5	438	115.	59486	1624	457	199.7	55062
70	4.76	1432	58782	70	455	140.8	65135
8 D	544	146.3	79511	80	520	. 4E 3	75000
90	512	145.9	91740	40	585	1489	9711V
105	-60	1507	1024/52	100	650	ISDT	97975
11:	748	166.2	11/3831	1111	715	152.2	106509
120	d'e	153.4	175151	120	780	153.4	119594
1775	364	152 8	196497	190	845	154.4	170477
140	952	155 1	147035	140	910	155.9	141212
16%	1026	156.1	159170	150	875	156.1	152140
160	1096	164.7	170527	160	1140	1567	147004
170	1146	157.5	162 173	170	1105	157.5	174058
17 121 5	1150	197.7	183674	**1/13	2111	157.7	175762
164	1224	154.7	F35A)	180.0	1179	154.7	180947
190	1200	151.4	186547	ian	1206	151.1	187011
20.1	1060	148 5	261 997	200	1300	108.5	192015
1205.6	1980	477	704874	201:	1212	147.7	1:148:22
210	1425	148 7	212296	210	1384	1417	202970
220	441	149.9	224251	220	1430	144.4	3142EB
130	· 5-64	1510	236204	2.10	1496	151.0	805784
240	1642	1551	246157	240	1950	152.1	2277/10
250	1745	153.5	250 (24	250	1655	15 373	244635
250	1768	159.9	272059	260	1690	151 3	761057
2/7	1876	154.6	049950	279	1786	1546	271044
11.27 14	1591	154.0	784237	7704	1736	154 -	27:692
290	1904	189.2	291675	280	1820	187.2	274802
240	1972	151.6	299440	297	1835	151.0	284532
300	2040	150.6	30/211	20:	1R7D	.50.6	243657
310	2108	1494	314974	214	2015	149 +	1D1078
10102	2169	141.4	321875	219.0	2074	1484	207771
320	2:76	145.5	322144	270	2040	146.6	.15e#e#
500	2244	147.1	207093	330	2145	1493	720216
3a	1312	150.1	34/046	343	2217	1501	351/31
- 1414	2379	197.3	358671	349.9	22/4	150 8	343035
	67.9	197.3	2040-1	2477	- 33.4	11/2	.H.K.Q

[🤚] тек тандынык отторуунын басынын улсын элект

medica (APP 48) have always of 1511, 1531 for

412/FMS-85-5-3-1

[&]quot; Call all of pur despressors in Congressors

Constitution papers and Meet and the entrated in the disease are seeing free engaged and Meeter assets are expenses and seeing and s

Tebje 5-3. Usebje fuel loading - longitudinal - w/123.4 (Area aux fue) in LH and RH poethon (Metric)

	USABL	Æ FUEL LÓ	ADINU TABLE	- DOMOTED	ina, co ilii	ET=iCi	
1	E	ase with DH	and RH 51 7	Luc And Tool	1523 5 416	5	
رومال ""	A A-I, JP-S,	JP-n (a Bis)	kgel)		Jai B J NA	0.799 kpt	
Charlety	Wangir	60	Numar:	Qua-114	Wajgid	ca	Noney
N-mi	Aug	1007	ren.bgf	Mir.	144	pres)	reading.
40	12.6	1520	114758	40	170	3570	112505
30	55.2	36'34	22(49)	501	59.9	9894	825907
12-	47.0	3521	306339	120	45.9	3541	3,165,45
16:	170 4	1545	4G724/	ien	127 B	3545	453178
auc.	143.0	3547	57615e	200	IS2.6	3507	566805
1237.0	1931	3516	685,75.1	12970	1873	35ap	671698
240	135.6	355D	ផយទេ	· 24D	4 (8)	3:6:	MCG45
280	228.2	3877	R2 (494	. 540	\$23.1	9572	6214ái
224	255.0	2729	977659	170	99° 7	1746	955467
360	245.4	1027	1116931	360	207 G	3807	1004806
400	326.0	2836	1254959	400	319.6	3550	1230322
40%	39E.6	3884	1302759	440	361.6	3*84	1165412
485	791.7	3913	1500031	450	243.5	2513	1500775
520	423.8	3936	1565858	520	415.5	2508	1596729
560	496,4	3999	1406874	640	4474	9.16	1771402
MID	AMP N	387K	1945665	MCD	4794	3976	1204580
642	521.8	3946	2065479	646	517.4	390g	2144597
71 (49,1	0.453	4026	21:8450	" (e# 1	518.6	+505	2070865
680	554.7	2920	21/5741	EdD	543.3	3336	2135474
796	586.0	3984	2295930	720	575 9	9504	2211251
750	GIP 4	376G	9332900	74D	607.2	3768	2587'0'
1764.2	826.1	3731	2345909	1064.3	613.9	1751	2.902^{19}
900	652.0	3/30	5464346	60.0	639.2	3786	2415967
MD	684.6	3812	2809683	MD	671.2	3517	7558846
Bet	71.5.2	3842	2795407	640	705.1	9542	270:31)
986	704 8	1969	2900920	A20	7.15 (.18GB	2841670
960	F82 4	3894	3048401	960	ray p	3894	2266614
1000	815.0	3916	8191959	190:	799-0	9916	J129249
" 1923 6	0313	1475	7274709	' " Iass G	BITE	3925	3510470
1040	847.8	3909	3313958	1040	831.0	1905	4244336
1303	630,2	3972	3407950	1707	662.9	1872	3341146
1175	R! > M	3817	7502516	1120	P94 9	3837	34XI)22
1160	945.4	3405	3617050	1166	25 P.R	9605	350544)
1200	978.0	3776	J68 (544	1200	95 # 8	3775	.HE LOCATE
12016	914.7	3768	3,799585	12:16	PG4 P	2)89	3836734
1240	1019.6	3757	3527290	1242	990.6	9181	975215)
1285	15412	70:0	J97275A	1,500	1322.7	3808	3394765
1320	1675 8	2010	4115721 i	: 320	1354.7	3828	4597371
11929 5	1673.5	3830	4134642	" 1724.5	(158.3)	959U-	a)59471

Списытыя выпійня голова комых СВ отключування двогав?

117-705-65-5-6

 $^{^{12}}$. Calculated appropriate for small of 12% whether

World Special research and KM 1511 (551).

Turning action purposes and magnetize scores makes. Cold above are democratic on the general defense and member to whole personal.

Table 5-4. Useble funt leading – Interest – w/32.6 ga), aux (uel in CH and RH position (English)

lor	なんし 早ら.	حا 6 €) کا ⊏د	-Garj-		Jet 3, JP 4	16 A 15,450 j	
Luceir	Weigh:	62	Manuel	Owners	Weight	55	Magrac
-03 (4)	ıb.		.17k	R/G (AH)	ь.	Licerna	·F & :
<u> </u>	6.	- 90		·	55	— oö	- 6
20	136	20	a	20	139	0.0	D
50	فنزع	0.4	9	ĸ	195	00	
40	372	0.3	9	65	265	0.0	
:0	J40	41	a	50	325	PD	0
ы	#iji)	0.9	U	, ec	910	0.0	
65.0	425	0.0	9	. 426	407	0.0	:-
10	478	ua	-11	, 70	455	on.	-10
60	743	0.0	.19	8c	520	5.0	- 113
PO	417	0.3	-10	93	rea	2.0	.1
120	ceu	0.0	-13	106	644	20	-13
116	743	0.0	.13	110	715	50	.13
170	414	9.9	-10	120	TAD	2.0	- 1
126	684	v a	-13	1 130	845	20	-12
140	,4 0	0.0	1,	142.2	912	20	13
150	1070	an		. '50	975	o n	-1.7
1+0	1058	0.0	.9	190	1946	50	1.2
170	1156	0.0	4.0	j -70	11.03	2.0	-12
10.5	1166	uu	- 2	171	11.15	20	-11
130	1024	-09	.374	1827	1170	-59	257
120	1262	0.4	-504	:90	1736	24	482
296	1960	-05	4647	200	13141	05	-639
1,300 m	1390	-01.6	677	12034	1,119	0.5	647
2°D	1476	-05	-677	210	1165	-05	647
226	14,16	0.5	677	220	1430	-05	647
236	15/54	-0.4	-677	210	1495	0.4	647
246	1632	-0.4	4677	240.0	1560	04	-647
276	1700	-n a	677	750	1629	0.4	647
260	1768	-04	-877	: 700	IGRA	64	647
276	1636	Ųā	.677	276	1756	0.4	941
270.4	1619	-n a	-677	270	1758	0.6	647
240	1904	.p.e	-877	280	1820	~ 4	-647
295	1072	0.0	627	290.0	1966	23	(m?
300	2040	-0.7	-877	340	1850	-63	-647
310	2106	-0.9	.517	3.0	2015	40.3	-847
319.0	2169	-0.3	F77	9.0	2074	0.3	647
320	2176	-D 3	-577	320	E080	-63	-647
300	2294	0.3	6:8	326	∡145	u.3	-646
340	3512	-0.3	485	340	2210	03	-675
349.9	2379	-D 3	896	350	2774	41	-665

KARKA high public, fatories begins a tyconglisis.

Assigned given the expressionally edges as $(S^{1/2}, (S^{1/2}), S^{1/2})$

41214546644

Plant and Albert (1909 and 1909) to put Million and Addition (1906 and an applicated) than brought and washing to the Addition of the Addition

Table 5-4. Dasble feel teading - lateral - wf123.4 (itre aux fuel in LH and RH position (Metric)

Jan				لمن المربك وردا	JW H, . P 4		
Quantity	West	cc	Numeri	Courtes	Wwgni	00	Murran
₹m.		1000	January.	(=9)		1563	F79-07
40	T. 70' &	3	- 0	40	<i>3</i> 9:		
40	65.2	2	۰	B0	R1 6	c	a
:25	97.8	-	Ū.	140	95.5	ě.	Ū
160	135.4	5	Ö	110	127.6	č	ò
£UD	158 0		۰	200	1588		ň
277.0	. 49 1			297.7	1209	Ğ	Ü
740	196.6	- 3	-24	240	171.6	ě	24
180	228.2	-1	-147	280	263 (1	-104
327	240 B	1	-152	240	255.7	-1	.140
565	790 4	1	-152	JFO	847.6	1	149
400	326.0		-152	400	פ ערני	a	-149
445	aE9.6	-	-152	040	981 6	ů.	-142
460	391.2	3	-152	480	392.5	ā	-14-7
520	-238	-	-1:2	520	415.5	a	-146
167	4764	- 5	-152	560	47.4	ō	-14.5
8000	488.0	3	-152	600	179.1	ā	-149
640	5218	-	-152	640	511 A	a	-140
GHR :	529.0	- 3	-172	443.1	416.6	Ū	16#
680	554.7		4755	500	543.3	-1	-4172
120	546.8	.10	-5640	720	575.9	-10	-5717
160	6194	-12	-74SB	750	607.2	-12	7010
1758.3	626 I	-12	-7796	1764.2	613.9	-12	1643
PU ·	6520	-12	7796	⊕;U	629.8	-12	-1643
Ed:	694.6	-15	-7796	Bellin	671.2	-11	7643
EA:	217.9	-11	-7798	810	703.1	-11	-7043
6 20	7406	-10	-7796	920	735 (-10	-1043
860	/57 A	-10	-7795	960	767 D	-10	-7647
1060	815.0	-10	-7796	1000	749.0	.10	- 1643
1023.6	DH 3	Ġ.	-7796	1020.6	6.79	9	7648
[040]	847.8	-	-7796	1040	831.0	á	-7643
1080	830.2	9	-7796	1300	662.9	.9	.1843
1170	017.8	•	-7746	1170	F44 2	ā	-7643
1160	945.4	a	-7796	1100	925.8		·T643
1200	978 11	ā	-7795	:200	952.6	-ē	.7649
1207.6	984.5	-3	-7796	1207 6	BG4 2	- 4	-7649
1240	1010.5	ā	.7500	1240	SMC.E	.6	-7647
1270	1041 8	ā	-7975	1260	1982.7	ē	.7720
1350	10.6.5	-7	-8003	1120	1054 7	·Ť	-7846
1324.5	1779.5	-2	-8015	1924.5	1058.3		-/880

Оперативности по таки верхи СС сочинот.

41249945-54-3

May be good and to remain engages at 1910 of 190. To

For catastating purposes, cate things and stream values (Colombia) and stream out things and blooming rather and companies whole surbang.

Table 5-5. Usable fuel loading - longkudine) - w/16.3 gel avx fuel in LH position (English)

	_	/S#B.	E FUEL LOI	i ONG TJĖJE	i o ustro i	MAL GG JEN	<u>is is-</u>	
!					d Aug Sank 12			
L		4 A 1. # 5		إشن		JATB 15-4	ibala Óur	
Г	Convers	Weight	CO	Mornan	Charleton (Wegengin;	3G	Mongra
П	_11* rs-4		ede(## I	180 Jun		ra keu	in to j
П		es	135.5	9474	16	es	134 e	9604
П	20	1+-	105.1	16921	26	133	139 1	· 9086
П	20	2.34	1394	28447	.11.	195	109.4	27187
П	40	5.45	100 5	17/452	41.	260	194 €	1952/56
П	50	æ.	134,1	27440	50	125	190.7	45368
П	60	431	1.49.7	51005	40	14:	139 /	54490
П	.er B	426	139.7	5945R	1 52.5	407	199.7	S5867
П	70	47-	147.4	66277	70	155	14) 1	F=227
П	74	:41	148.9	799 (0	-31.	570	146 6	75095
П	90	512	143.7	W1557	40	3 8 3	149.7	87547
П	170	597	151 T	107177	107	ery:	151.7	9*625
ı	110	745	152.4	114749	11:	715	157.4	109646
:	120	516	154.5	125941	120	763	154 6	100163
i	120	984	195.5	107919	137	447	456 C	101934
i	140	95.6	157.0	149538	140	219	157 C	142910
•	150	1920	165.2	10:115	152	+75	159 -:	164007
	194.5	1056	150 6	167240	7716 2	1004	155 €	154909
	150	1G8-d	158.6	170361	180	1444	15a é	162545
	170	1156	142 9	175798	173	1114	1524	168712
	130	1224	149.5	183041	180	1170	149 €	174285
i	1967	1269	147.5	187092	11867	1213	14.1 é	179023
	190	1392	149 1	-91289	-42	1276	148 1	19286:
	2:0	1.184	1494	703744	200	1000	149.4	198277
	210	1029	16: 7	21519#	210	1066	150.7	20570*
:	250	la Bri	15) 8	527151	27:	1420	151.8	217129
•	230	1564	154.9	293105	290	1416	152.9	208554
	240	1436	167.4	26-054	763	IGEO	1574	234974
	2:0	1700	154.7	253004	250	1625	154.7	251401
	" (5A.)	1729	154.5	267645	" 254."	1692	-54.9	25550)
	7CN	1254	164.5	277212	250	1660	15+0	200201
•	270	1836	152.5	270495	270	1755	150.5	267533
:	240	1964	161,1	287793	200	1820	171.1	875268
i	790	1977	149.9	205511	290	1885	1499	282481
	300	2040	148.7	201279	340	19711	146.7	269199
i	1,002,7	2059	143 4	105092	10027	1000	148.4	991319
!	סוע	3106	144.0	214085	310	2015	1450	360535
÷	a20	2176	149.5	326097	620	2050	149.0	311553
	710	2244	150.6	377245	.170	2145	150.6	373374
	** 913.5	1255	150.2	342287	·· 339 6	2158	1509	32,7186

 $[\]tilde{\gamma}$), we determine parameters are the set of Coronation probabilities, they

Mylykly glaps pro research applies printing (ACI).

4124WS-65-5-5-1

[&]quot; Challed supplier to your Consider

For calculating provided, this MONES and Minimal radius of the officers are defect to a Weight

ava stansars vasues and rounded to one became place;

Table 5-5. Usable fuel (cading – longitudina) – w/61.7 li(re aux luel in LH position (Metric)

		Paul: AT	азівкі тавце <u>в ЦН 61 7 ага</u>		eas Billines		
	ሊዲኒም <u>ዓ</u> .				.WIR JP 4		
Channy	Wante	C3	Morrant	Gaa-th	Meralik	cu	Worwel
(80%)	#E1.	700	FEMANIE.	(HIBH	פיי	HT =1	. washing
a?	226	3920	114753	40	32 C	7720	1256
95	65.2	3534	720430	EQ.	638	3:34	21520)
122	978	3541	346339	120	95.9	ð54 í	13954)
161	1924	3545	462247	160	127 6	3545	457172
503	167.0	3547	574165	70N	1596	354.7	186906
1 727 0	192.1	3546	465363	1257.4	1823	9545	471893
202	198.5	9560	696321	2411	1916	35.00	463651
282	224.2	3679	A7.64R9	28D	323 F	38/9	853014
222	760 E	9768	452717	320	755.7	2766	962597
340	293.4	8929	1129061	3÷0	297.6	JF29	Holga
400	251.0	2010	1/54112	a:D	3.84	3878	123949
440	358.5	3919	1405267	440	361.6	2919	137771
487	901.2	9749	1516342	a¶0	3435	.1953	15 (548)
520	427.1	3982	1697364	520	4155	2988	165423
560	455.4	4007	1828614	550	447.4	4007	173272
11587.4	475 T	4026	1927780	" 5A7 &	469.3	aren	IMBR655
640	4290	3891	1951424	600	4794	2991	171950
640	521.6	3490	2029103	640	511 4	2690	138920
(69)	554.2	3401	2106436	GND	543.3	3601	705508
1705.6	575 P	3747	111742	1/06 5	5e4 6	2147	211547
720	596.6	3761	22-6-90	720	575.A	3761	214337
πò	6194	0700	7357242	700	8072	2746	230568
600	125.0	3691	242//12	HCU	P39 S	2631	2048/3
643	634.6	956.	2613241	910	6712	3861	2551,190
142	7172	3864	2758795	480	7031	2848	2/34649
925	(49.8	35.7	2934290	920	736 (2813	2976584
9E0	7324	3906	3079173	arn	ם דאד	3935	7318675
	784 D	3693	3013642	ני ופעריי	768.6	2933	9049104
1000	815.0	0294	3170624	100:	**************************************	3694	30131311
1040		2054		100:	MI D	2846	3234029
1346	md T fi		3286190 336275c	1040	662.9	3820	32546736
	840.2	3530				3620 3786	
1125	0.5 K	3769	14;7256	1135	R94.4	atet	2188183
. 1145.3	832.6	3767	3518498	11745.9	915.6		344942
1160	945.4	2776	3559678	1161	926 8	3776	3439696
1205	47E.N	.1799	3716147	1200	SSN N	7798	3647212
1940	16136	3570	3850013	1240	P90 9	2620	9754422
·· 1262.4	1023.2	3892	J94957S	111262.8	10090	3632	396615

[🖰] Çilir şilingi geçelliği i menge amaşılır Çermiline jerindek gerellişdi.

resignar gavaniars control antiques in (\$10, 50) Cu

418-FN545-5-6-Z

^{**} Concurred year new companies of concurren

For each platter purposes, true in popular, with respect to taking $\mathcal F$ (i.e. the surface continued to the effect of

an illinormal ration and a smaller in a finderical disco-

Table 5-5. Usable fuel - lateral - w/16.3 gall aux (uel in LM position (English)

	1157	VECE SLEVI	OKOINOTAR	DE LATERA	LCR ENVI	ßн.	
İ	-			I Amerikania			- 1
	<u> </u>			<u> </u>	261 B 18-4	IBSE Not	- 1
Oce-15	Van gea	Ĉo i	Memograf	Dames .	Wayle.	C6 .	As, and
Alto Care	18.1	cackes."	F 4.	g to their	P-1		
	- ae	- Gu	c'		85	0.0	
20	195	0.0	0	21-	130	(5	_ ^
10	704	oa	e	.15	195	6.0	
40	272	οu	a	40	260	: >	0
50	340	0.0	0	50)25	0.5	0
40	404	DII	a	66	390	: >	
52.5	408	VV	a	82.6	ap/	2.5	:
70	3.6	-0)	121	70	ath	:.3	.55
. 10	544	-0.8	-457	A:	570	-C P	-404
20	512	.1.	-841	98	SeS	7,1	457
j mo	460	41.9	1319	1199	640	.15	974
170	748	-18	1344	110	715	-1 6	-1756
129	: 'e	20	1670	120	780	2.0	15/15 j
1.30	864	-5.0	1997	100	845	-2.5	1997
140	252	-24	-2316	114)	8-0	-54	-53.3
150	1020	-2.6	2614	150	975	.e 6	2502
155.8	1925	25	-2615	155.3	.035	3.5	7507
7.157.5	10/9	-27	-2306		1025	-2.7	27/5
140	IA*A	->7	1501	-60	· nan	7.7	2603
170	1,58	-76	3054	.12	1105	-C.B	2974
180	1224	26	/194	-80	1176	4.5	3563
1867	1750	-56	-32M	1467	1215	-2.5	-3132
j 196	12.25	-25	-1761	190	1915	4.5	- 9179
Sco	1.170	.2.4	3261	200	. 300	2.4	3137
710	1426	-22	-358.	213	1345	-2.3	-2137
220	1436	-22	356.	220	1410	2.2	2197
230	1224	21	3:6'	700	1485	: 1	3127
240	16.50	-20	-,159.	24)	1540	-2 :	2197
250	1700	-19	- 3261	250	625	7.9 7.5	2102
254 1	1778	-	-3551	754.1	1862		- 1137
2e>	1756	: 9	026:	260	1600		2107
200	1416	-! 6	IE#!	270	1,757	2.3	-3137
245	1904	-1.7	-3261	260	1520		-2107
240	1972	6	9261	200	1595		2197
3027	384D 2059	.16	-3261	300 308,7	1960	_	-3137
3/27		-16	-2261	302.1	2015	7.5	-0197
320	2176	-16	-1291				3137 -2143
325	2175	_	-32EG	120	7060		
	2214	15	9247	230	2145	1.5	3191
227.6	725E	-1.5	-3101	הוידו	216*	- 1	-7166

المحاورين في ورواي الرحم على إلا مهري بهر الرحاض

maging gags are non-security to \$4.10 in 1971.

For introduction programs, we thing place the material states of the order on a material text in the agest accomplishment content and the content of the con

612 FMS-65/54-1

Table 5-8. Vacable fuel - lateral - w/61.7 litre num fuel in LH position (Matric)

	1054		LOADING TA			u=:	
.101	4 24 1954			4.0 (<u>Jnk.)</u>	Jet Bil Pia	6 790 kp/f-	
Uparida	(her pla)	CG	Majorier/	Contract	Weight	CU	Monare
#Irest	24)=4	permega	MIRC	198	-TAT	170.03.
40	200	· a	D .	40	22.0	4	:
50	65.2	v	0	PO .	E2-2	=	:
120	97.8	9	D	120	25 W		2 3
140	120.4	a	υ	150	127.0	- 5	
200	159 0	9	0	200	159 B	=	5
287 **	190.1	9	0	637.0	149.3	=	
240	195.6	a	-93	249	191.0	:-	- >>2
750	20/8/2	.59	-2927	350	227.7	-1.1	-2669
)20	260.2	-2.1	-6.195	320	755 7	22	.6775
350	FB3 4	-34	-9903	160	247.6	-34	-970#
400	sve c	-47	13871	200	319.6	-41	-13599
840	15.4 #	-FO	-17013	440	351.6	-50	.17493
460	391.5	-54	-21758	380	2435	-56	-21061
5W	422.5	-61	25718	920	416.5	-61	-75713
560	455.4	-66	-384EM	560	447.4	-65	25890
537.4	475.7	-62	30152	587.4	469.0	63	-ganac
1597.2	494.7	-69	Jacob	15972	477.7	-69	-32823
£Na	485.0	-69	-33510	500	479.4	-69	92921
840	521.6	-67	35136	440	S11 a	-67	34417
601	154.2	-64	36744	SMJ	5433	-еь	38023
746.6	575 P	-se	-27406	706.6	564 c	66	37053
125	58£ b	64	27876	729	525.1	-64	-21063
163	6174	-61	37506	760	607.2	e1	37043
EO:	854.0	-55	37800	303	639.2	96	37053
840	684 6	95	37806	101	671 7	55	27063
PA3	717.2	-43	37506	2000	7001	99	370+3
9425	149 b	.50	57806	983	736	40	-37083
960	792.4	41	37105	960	787 C	-48	37053
961.9	784.D	-48	37506	9519	769.±	∎R.	17063
1000	615.0	4b	37406	1000	799.0	-45	-37055
1740	B4T G	-45	-37106	1040	\$31.0	45	37063
1080	64D 7	-43	-3750e	14160	867 9	49	-17065
1120	912.0		37806	1120	194 :	41	37059
1145.9	813.9	-40	-37806	11459	315.6	40	37069
1150	945.4	-40	-37806	1160	524 ·	-#D	-3TG#3
1200	976.0	.19	-27828	1200	655.0	29	-37095
1260	10104	-36	-37963	1240	99G.E	38	17216
1267 A	1029.2	-17	-38005	1262.0	1909.0	-17	-31281

Consume quarter forward meets CIS to offer.

Weight glass are needed registed to 12 (45) (1).

No causes the purposes has very subdivine (1994) (1), (2) there are implicate Weight and before a season to the condition of the condition.

412-5145-653-5-6-2

Table 5-7. Usable fuel - tongitudinal - w/16.3 get aux fuel in RN position (English)

	LSA	NC FIEL LO					
	լում, գ.դ. JP.I	Basac with v 5 JP-8 (e.e.) b	<u>44 (6.1.18 6</u> . (6.1.	n Wila Caribi		-6 3 Ib d anh	
Juanety		CB.	Morreet	George	Woods	C4	Мотил
1000	180	janii	1.141.1	dN man		de-lager	100
.0	eß.	138.6	1424	f 7v —		138 5	9009
20	176	114 (19921	70	197	1991	1908e
26	204	129.4	38442	30	132	139.4	27187
46	676	179.6	37 36 2	40	200	1396	36284
50	143	1197	47463	50	329	195.7	45,388
90	403	129 7	1,7095	NO.	191	139 7	54490
100.6	126	179.7	59 48e	7625	407	132.7	:68B2
75	478	145.4	46297	70	299	143.4	56227
85	24	14t 9	/291C	50	570	146.9	26399
45	512	139.7	#1597	26	aPi	146.7	37547
100	200	1517	103:77	100	450	151,7	##625
112	744	153.4	114749	11:	715	151.4	109686
124	916	154.8	126937	120	760	154.5	120,463
130	IM	156.0	1.77919	115	324	1560	101694
16)	162	157.0	149806	140	910	157.6	142913
150	1020	154.0	161115	153	976	158.0	1541417
1156.2		156.6	167790	11,455.2	1009	154 =	169409
160	1050	195.6	170981	163	1040	158.6	162845
170	1156	162 B	1767CA	171	1105	152 >	168912
180	1224	149.6	183061	180	1170	.48 C	174965
7.086.7	12-9	147,6	197292	*****	1013	1476	179629
.80	1262	148.1	181989	191	12.15	188 1	163962
200	1950	144.4	203944	200	1300	1494	194377
710	1478	150.7	215198	210	1365	150.7	205704
220	1496	151.8	277151	220	1470	151.6	717177
200	1144	162,4	289109	230	1495	1524	228554
240	1627	153 8	255054	₹#0	1560	153.6	2 99978
250	1760	154.7	282004	250	1525	154 7	251401
1254.1	173 8	164 9	267648	1,044.1	1562	1549	25554)
280	1768	154.0	272317	260	1540	154.0	260204
270	1606	152.5	279985	270	1750	1525	25/533
280	1934	151 1	287761	280	1926	151	275)58
290	1972	149.0	206518	290	1185	1498	287461
300	2000	148 7	30327#	300	1856	1267	259899
1 302.7	2069	1484	305397	1,302.7	1964	1484	291919
910	2108	149.0	314085	סוני	2315	1420	300737
370	2176	1144	3561.93	929	2:190	1488	911 6 59
130	2214	150 e	337985	333	7145	150.6	757074
" XII 6	2268	150.9		1, 352P	7' 68	150.9	327158

^{*} Crecia Natiquae des forrecentarians C.C. conceson provides sero seus

William Street and Control of the Art Control of

Поставляющей выроченным мунум это окольнувания, условным эне эксплуатичным менута

min Minney vigure and recoderate and departs places

#I3#WS-43-5-7-1

[&]quot; Citival Noticean Ber Universal Claimetter-

Table 6-7. Beable fuel - longitudinal - w/81.7 life eux luel (n RM position (Metric)

All	A AT JPS	Base ed JAN (S.R.) S	ALA ALI JPS JPS JPS (Straigs)								
Quartify	Weight		Moment	Conne	Wergel	<u>(0 789 kg))</u> C()	Мотил				
-92941	34.		PT TDI	MINI.		E77.	ENT+2				
#Q	32 G	37.50	114758	40	. 37 a	3620	112515				
AD	56.2	35.34	730430	90	63.9	3536	225907				
120	77 A	35.21	341/399	120	26.9	3541	399640				
160	130.4	3545	442247	140	127.6	3545	453172				
500	163.0	2547	578156	20-	199.9	3547	566815				
. 531.0	191 (3505	685858	1237.0	189.3	3646	5/1898				
240	195.5	SASE	696321	240	191 1	1640	F82601				
280	208.2	3872	639498	260	40'3.7	3679	173011				
350	260.4	à7ec	M82117	220	266.7	3766	282837				
360	290.4	7929	1128361	260	7276	.10.24	1101290				
a 70	ଅଥିବା ଓ	3374	1254317	100	319.6	3879	1739021				
40	.150 G	9919	1405307	440	35 : 6	4115	1377/16				
430	391.2	3953	1946,362	450	3835	3463	1515089				
520	4298	3982	1687364	920	2155	3282	1854236				
560	456 4	40:17	1828674	560	497.4	# 207	1/92 725				
** 507.4	4/87	4026	1927090	·· 581.4	469.3	4026	1889952				
MID	4590	3991	1951/124	670	a79 a	3991	191,7500				
840	561.6	3650	2023103	540	E. I f	3930	1004648				
600	5 1 4 2	3801	310Ka36	686	5473	3801	2065097				
77:66	575.4	3847	215/647	1706.6	564,6	3747	7115476				
780	588.6	3761	2205639	720	575.3	3741	2160371				
760	6.84	3 178 2	7357949	764	607.2	2 796	2,106063				
400	663.5	2621	2497772	500	699.2	3621	3448736				
340	684.5	3761	2443290	840	B71.5	3561	2591307				
APO.	717,2	7688	27 M 798	*67	702.1	2575	2734043				
YET	749 B	3517	2)34(9)	970	736.1	3917	2979es=				
040	762.4	3635	2079671	#60	767.0	3935	3015625				
PS B	784.4	3733	3050542	** 951.9	768,6	8933	2012/21/24				
1006	915 G	3464	3119604	1000	799.4	3884	3111919				
1046	347.5	3956	3260190	1081-	451.0	3856	3204024				
1691	arn z	3820	3362756	1080	862.9	9820	2896739				
1126	W12 8	3788	3497256	1120	324.9	3284	3399483				
1146.4	939.9	9787	351MM	11:46.9	915.8	9767	3441473				
1160	945 e	3776	3649476	1.160	AEFLO	3776	3494649				
1200	976 0	3799	3715187	1200	956.6	3790	J602212				
1240	1010.6	3826	388:813	1240	995.6	3820	3784877				
1262.8	1079.7	3832	9143575	** 1267 ft	1009.0	3872	3386155				

 $^{^{\}rm A}$ Crecewise quantities to an interest TC condition probabilities (see Fig.

412-FNS-63-5-7-2

¹¹ ОФ, моне фил в вызонных это быссемых.

Words are no normal regulations, party

For electricity projection, you replies and Moreov values, all the receives the derived been received and Moreov values and the deviation of the strong

Table 5-8. Usable fuel - Interel - w/16 3 galleux fuel in RH position (English)

	1.50	GREFHEL:	,DADING DAG	S.E LATERA	U CO JENGU	15-1	
				Al Austrian (
	4, 4.1, 34.5				Let Blue A		
Caramir.	Weight	ĆB	Nomens	Outsours	Morghi	76	Marsara
Fig. 444	·E	JA-Provi	60.84	p.s: man	IE;	(b).FeV	<u></u>
141	50	7.0	u	10	45	oa.	0
~	1.10	3:	0	20	13%	v0	V
×	204	1:	a	70	195	D O	0
6:	272	4.5	V	4:	260	VO	0
50	:4:	40	0	6:	725	0.0	v
60	40:	a:	a	60	.190	NΠ	0
E2.6	424	44.5	0	52.6	au7	1111	0
70	472	4.7	10.1	75	159	0.2	J+
₩	584	a.:	401	8:	57 a	p.r	261
9.	514	• • • •	ليوارا	90	565	1.1	53 5 5
100	MIC		641	· fm	650	15	749
110	74.5		1319	'10	715	10	1256
120	₹1 -	2.4	1-40	100	760	20	1971
130	EM4	2.7	1974	130	845	22	1880
140	A2	24	7289	.43	210	2.4	218h
1,195.0	1050	2.5	2572	1190.0)15	6.5	2477
155.2	1053	25	2592	155.2	1029	2.5	2077
150	1068	2 .	2277	180	1040	3.1	2177
170	11.20	. 4	2151	.70	11/15	19	2056
180	1214	. e	2016	'ea	1170	16	1477
194.7	1269	. 9	1,728	195,7	.5.3	1.5	1645
.50	1292	1.5	1928	190	2.15	1.5	1813
200	1250	1.4	1.55.8	200	. 300	14	1643
210	1428		1920	210	· }- 5	1,4	1835
220	1436		1356	770	·430	1.3	IAG C
3.40	1954	1.2	1928	2.50	. 4/35	1.2	1843
740	1632	1.2	IASB	240	· 540	12	1841
250	1700	1.5	1936	717	1825	11	1843
26d i	1724	- 11	1928	254.1	1692	1.1	1635
250	1788	1.1	1976	(49)	'M9D	11	1647
270	1836	1.1	1926	. 27v	1755	11	1843
280	1404	1.0	IAZR	240	- 625	1,>	1885
230	1977	10	1928	36D	reas	1:	1013
J:0	2040	0.9	1926	900	1 36 0	4.2	1843
107 /	3059	PΦ	1478	300.7	1965	03	1803
210	5.66	0.4	1725	319	2015	0.2	1642
250	2:76	0.9	192 <	925	2000	4.1	1615
336	2244	0.9	1672	210	<105	0.7	1829
331.6	22es	υB	1942	333.6	2165	4.4	1875

^{*} Calculation control to 1000 at a section condition

Analis com arrage changles (1) 1 (5) Ar

417-7445-88-5-8-1

For consistent composition was designed for the most extent of the constraint, and descent their designed and defended and not seen to see section of a section.

Table 5-8. Usable lust - Interet - w/61.7 litre aux (ust in RH position (Metric).

.61	A Art JP S.		<u>ь</u> Ана <u>т / по</u> ь.м		Jai 8 JP #1	- 7994 mode	
Quently.	Weight	CG	Мотили	Diam'r 19	Weight	EG	Homen
PR1	-78	prog	500 Hgt	нып	wi	mm ₂	JOHN S
40	32.6	0	0	10	22.0	Ŀ	
10	16.2	a	п	40	E0.4	P	9
120	37.6	a a	a	120	25.9	D	e
160	1,025 at	0	V	160	127.8	Ŀ	9
700	1620	q	η .	200	159.8	P	9
2370	195.1	u	α,	237 0	139.3	D	a
260	195.6	0	10 I	240	1,71,8	Ŀ	-16
760	228.7	12	2 6 00	2m3	2217	12	2579
320	260 B	21	5591	320	75.5 T	z.	5461
360	293.4	39	9592	367	:91 B	31	WIG
460	2263	42	13667	405	319.6	42	19000
440	395.5	49	17589	440	3516	49	17185
400	371.2	55	21064	480	39 3.5	55	21063
\$70	1221	En	25414	5,80	4155	60	24016
500	458.4	64	29184	:4:	447.4	54	28492
76670	de c.P	45	29864	9570	463.7	θà	29276
557.4	478.7	17	29818	597.4	4693	62	29272
500	449.7		28434	N/C	479.4	54	25400
GA-D	F.21 6	46	24914	640	511,4	43	24420
580	554 E	47	23276	283	541.3	47	22A 14
726.6	578.4	39	22274	738 8	564.B	34	21778
770	1 1 N 2	1B	22210	724	F75 3	39	21776
760	613.4	26	29214	763	607.2	36	21778
EnG.	692 >	34	28210	601	693.2	34	21778
:40	644 E	17	22214	843	6712	30	31776
440	7-72	21	25214	580	/23.1	31	21778
2 20	747 E	10	22214	+2-1	795.1	30	21776
240	782.4	28	26714	860	767-0	54	21779
9619	764.2	28	28214	9619	764.5	24	21778
1400	P17:	27	92514	1070	293 A	27	21776
1040	647.5	25	26214	1040	8310	2G	21778
1070	600.2	25	2,214	1050	862.B	25	21778
1.50	915.8	24	72714	1150	1949	24	21778
7145.9	993.8	24	26714	1145 P	915.6	74	21778
1:50	daş d	29	22214	1150	200.0	20	21778
1200	9/5.1	23	26197	1200	GS# #	20	21756
1240	1010 8	22	2206B	1240	990 5	77	71603
1262 4	1029.0	21	21958	1760 5	1009.0	21	215ep

^{*} A rice testing the to more blood CG continue

412-790-65-5-62

Meges geet steromeste agreement in the Fil

For carrier on a section of the Melgan is obtained a cause of Carlatonia in a carrier contribution. And Melland with a contribution by the adoption of page 1.

Table 5-9 Useolé fuel – longitudinal – w/81,7 g8) aux fuel in LH and RH position (English)

				Triskoitus Signikas ta			
Jan 1	4 4 1 18%				Jan P. J. F. A		
Dann	Venezh		Honen	Charleton	Wange	CC	Library -
65.04	A .	FTD.	-+1	1157 119		PKPM-	1 - 1
10	141	LHL	V# 38	10	0%	138.6	\$E09
40	135	1201	19921	2.	.30	1.41	-0086
90	224	1,79.4	28442	36	185	139.4	27:47
40	272	1.95	27682	-00	260	179.6	\$6399
90	343	179.5	47483	1 70	.125	189.7	45034
60	475	יפיו	57225	ا دة ا	345	139.7	44810
	425	129.7	79436	.00	1927	1/97	-6892
iù	475	147.3	447.19	- 5ú	411	14.8 3	65.903
ŧÜ	544	146.4	79555	60	630	146.4	76157
Ôù	9.5	IAB I	90553	80	595	146.1	PHANT?
1:17	441	149 -	131671	.at	662	140 6	171A
115	(85	100.7	112590	1	7.5	1507	1077.0
170	814	751.5	123114	120	Tag	151 #	113254
IN	ына	752.4	134136	130	BAS	152.4	124754
143	953	-5.1	105167	147	PIG	153.1	13912
160	2424	1647	134 86	187	975	453.7	14 9475
140	**187	154.2	14/411	187	.04D	154.2	160401
101		94.7	179936	125	1125	-54.7	170941
141	1/24	199	182110	102	פייו	155 -	18 143
1901	1232	155 5	209313	190	1735	155.5	192341
200	1155	155.9	211260	200	1.130	1754	262903
1.7260	1814	155	220685	1727.9	1050	1951	21003
210	1425	152.5	222370	210	:345	155.6	
210	1-95	152 7	222376	220			272522
230	1564	152 :	224 MB		14,17	192.7	216074
2124	166 5	1479	200498	24:	1495	150.1	554,960
2104	1612	1479	20142	12)+ a	1494	117.9	230043
550	1700	149.5	240 816		INAC.	117.0	23011
#: 0 #60	1763	149.0	>60050	540	167.9	146.5	241074
370	1035	149.0	. —	Sini	16,91	149.0	29169
500	1904		2:4416	2'0	11775	170.2	21239
		160 0	2666691	260	1820	150.0	2/2960
380 300	1877	100.4	2 96-/ 01	290	:895	150.4	253516
	2040	ISTE	11-7-424	UNI	1964	140.6	724070
2'0	2104	191.2	3 (8494	יורי	50.00	181.5	774636
720	2176	151.5	350743	1711	2040	151.5	7.9100
WU	2944 2917	151.9	240790	110	2145	IF I 🕶	375 155
160		152.3	25 1836	Hu	22-u	164.2	334214
1611	(300m	152.5	282663	35D	22°	1F2 5	Agent 14
1111	1476	192.7	213932	360	2240	1F2 7	A-747
19/17	2516	157.0	284975	176	2466	160.0	:н/чт
	2505	153.6	History	1.771.0	7410	169.0	369205
380	7964	152 1	363468	346	2410	142.1	9/5534
790	2867	151.1	460536	.196	54.76	161.1	301356
400	2/20	150.7	409700	4X	75140	140.2	A30451
410	7766	1447	116267	311	2-+-	140,2	997700
1200	2856	146 6	47 WAY	14200	7/30	146,9	405284
435	7524	147 7	4 include:	4):	2/55	748.5	415333
445	2442	140-	246195	40:	2560	149.1	426453
455	C-60	144.4	451100	450	7935	149.4	407010
4	717.6	145 '	455374	450	5460	1497	447947
470	7796	1.00	479967	470	7055	1553	458.71
447	7254	150.2	420310	-60	31.70	1502	416474
400	1269	150.2	431093	11,460 /	21.75	-555	466010

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Table 5-9. Deable fuel – longetudinal – w/309.3 litre aux fuel in LH and RH position (Motris)

		or electrical terms		·			
1			прику та <u>ви</u> Гагеј БИ 200 (
<u> </u>	Nation of the			STITE ALL PROPERTY		799aga	
Gueras	MHT:	- <u></u>	Normani	O.AFFRY	Mary 12 a	CG CG	1
- man	160	****	bearing.	Ben			(Marriage)
40	32.0	7227	119756	411		3840	112565
10	663	3674	234876	au .	83.9	2504	225307
124	97.4	3501	94-7:0	1.26	25.9	3841	335540
160	·3= •	8545	492241	1 .52	127 3	2545	451172
200	167.0	9547	5741.58	133	157 8	164T	464866
12370	1911	75-48	885352	7227.0	109.3	1540	H7: EUR.
740	1250	35-83	694327	745	191 8	15mi	662457
200	225 2	3674	1354/6	345	207	M-74	827015
720	253.6	3743	PT5174	325	255.7	3740	984210
360	293.4	37.95	1124200	OA:	207 0	1707	118 (424
400	326.0	3314	1247330	617	3126	2514	1218921
++0	258.6	331	1.1774.84	40:	351.6	3541	1356490
480	341.2	January .	1511149	495	387.5	3884	1487065
R20	4910	989 x	INTERNA	529	415.5	3314	1613641
66e:	con a	9909	1747166	560	4474	3900	1745220
6001	4830	3915	1914264	600	479.4	3915	1476600
640	521.6	3928	2045501	6-0	5114	2974	\$ NEWSON
660	95- L	3937	2142825	660	247.7	3919	2" asi- U
120	588 B	3947	22077255	730	E 75	79.67	2271861
180	6194	396.5	245,861	760	6677	3954	W02117
11.751.3	ETI 4	3964	2547574	77.787.0	674 6	20-a	2402656
600	657.0	2909	35G274B	600	E16.5	94,44	2511339
gar,	con c	28G4	2045038	8+0	6712	5943	2503701
884	1172	1/96	2:35 Je2	460	7091	909	1768831
905.2	730 5	1754	277,7026	1906.2	724.0	3755	17/19556
#2D	749 8	3760	2819867	620	7,95,1	4949	2.7541.3
260	7274	3774	206,0042	660	7** :	3178	2695375
1003	B12.5	1700	X 22044	1193	/94 :	3773	3021927
1043	847.6	2005	1224470	1-)133	821.2	3602	3159067
1063	140 <)#14	2551049	1097	Ø€2.∎	3814	328,259
1151	615.	3426	3491957	1127	894.5	3876	3423412
Hea	145. 0)# %	Assembly	1163	925 5	287%	3556768
1200	*** :	.1946.	1760900	1301	958.5	28-4G	3007121
1204	iniar	Shice	259(44)	1587	991.5	2855	3618968
120-1	High 5	3863	105,0073	1289	1032 5	3864	1650A-4
1329	1079.6	3811	BARTAN	1320	1054 F	3871	40849460
1860	11084	30/6	4236900	1360	1286.6	387A	8714505
*** 426 7	113.0	7856	4433360	1400	11106	3486	CLAUCIAS .
1440	1146 B 11716	3354	441035	11.468.1	1127 (3864	4/6/972
		3551	45211.12	1440	11501	181.1	2442177
1450	1506.9 1536.6	2515 2512	4535696 4735265	1620	11826	3874	25,94887
1550	1571.4	.7787	4814772	1620	. 544 q)#10- 17#1	#65.405
11550	1996.6	2772	4414112	1549.7	-		4725249
1600	1206.0	3771	44. 4444	1660	.5,65	2770	4758991
1640	17.00.0	9741	90,4044	1600	1218.4	1773	4500988
1680	1869 2	9749	9094542 9148811	1680	1310.4	3/51	4954673
1726	1401 6	31/1,	5130011 5327967	1550	1345.2	3789 3787	508/1/// 5018467
264	1434.4	3805	5457415	1780	1400.2	2325	
1970	1457	3012	5691501	-100	1431.3	78.5	ANACOM ANACOM
- 10120	1423.0	3615	5657896	118136	1461 4	2815	
10.70		2012	20.10	18-10	740		APER I

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Table 5-10. Usable feel - lateral - w/163.4 gg/ aux fuel in LH and RH position (English)

JSAGUS PUBL [ÁRDINA TARI É FOATE HÁDICO É MÓDISHÁ چَ<u>در آناء عيمار</u> Ja: R. . P. 1 - 6 5 lb. Gau Ó ₩ ;mqiJ Owtran MAGTI n/omare GLAIMY Wash. QUE BY --ed: IDIK w.I 100 68 19 6 • 0 a a E --11 136 a a 30 150 95 ı X E 364 a۵ E. м 195 эt b 15 779 42 260 ąτ ō 40 a۵ ø 5: 52 ШΠ 44 ø 335 3 (ņ G2 390 ٥ 50 406 211 ŀ O E 68.6 407 00 ø 42.6 41.0 0.0 u ž ars ΩE ... 70 415 20 12 544 20 -11 æ. 520 0.0 13 85 642 20 13 γc 444 46 ٠, 100 860 5.0 13 100 ь£О 11.1-٠, 746 : a -, 1 110 115 Uι 119 ٠, '1 : 0 100 180 159 116 ш 6 54 -'1 845 00 -12 16a :30 1)0 910 .12 445 20 • 1 149 70 133 :50 975 20 150 1420 60 11 ·ces 160 1040 >0 . 2 150 .. 13 170 175 1746 6.3 11 1125 36 - ,3 11 180 1.176 . 2 . 30 .554 r.: 30 0.0 140 - 735 30 - 12 . 30 1250 17 m 110 20 230 1260 t.: 14 - 12 . 411 2574 - 15 i 10 - 12 207.9 г: 13 :67 · 16F -245 240 1406 -7.2 \$1:1 42 1430 03 400 1496 100 220 -7.2 417 1496 ů٠ -229 230 564 -2.4 552 234 1239 4 1806 -0.4 877 2544 :546 0.4 -667 740 1837 -0.4 .677 OP1 1560 0.4 ·647 1694 0.4 He? 256 1700 .04 .E. 7-1 642 200 1766 -0.4 677 761 SHM: 11.4 2/1 1768 04 1687 (836 677 270 -0.4 1904 -677 287 1816 1114 me? 280 -0.4 1972 677 1665 11 4 ma? 290 -02 723 100 7040 -01 -677 201 1550 uэ 987 **64**7 710 7109 01 -677 3.1 2015 dУ 7080 au? 120 2155 .53 -677 723 a y447 .93 627 333 2145 97 3.200 **(244**) -677 2210 647 -93 343 07 MID: 2414 0.2 -677 K) 2275 **a**.) 687 940 2 541 363 2449 0 8 622 2340 4.7 647 360 627 370 2406 43 -947 310 2514 0.5 677 37 · A 2415 43 447 777 3 35/6 33 3534 43 422 140 7470 41 -64" 280 250 :002 03 a:> .145 7626 47 842 -34" 400 2720 00 877 340 crus -32 -547 ¿Fffer 42 410 3799 30 471 411 2500 4.1 4370 42 443 470.3 2658 -12 677 2109 647 2974 430 8) 420 -22 2427 22 677 440 ZNeki : 2 41 400 92 400 2000 22 G#3 450 2005 45: 32 GBS 466 2990 3.2 256 496 0.78 44) à1# 10 1/2 2066 -12 583 -140 546 466 2000 32 483 2120 -3.2 -525 417ع 1125 <2 -823 4807 YMY 10 m#f.

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end women years and removed to one recommendation.

Table 5-10. Usable fuel - lateral - w/616.5 litre aux fuel in LH and RH position (Metric)

	VŞA	ALE F.IF.	LEADING TH	C= (ATEA	N COMPTH	=	
	- 30	144 	ana Firi 102 2	11-1 20- 10	<u>1916-2684</u> 2-1916-27-47		
	6 AT #5 1	P. 6 (1 815)	harr.		<u> </u>	CG CG	Momen
Gumay.	Weight	CO.	Monan	Chamber	Milely:		Man-A
-	<u>*4'</u>	-674	man <u>ba</u>	1874-			
40	37.6	0		40	52 C	ŭ	Ď.
80	66 /			ilio Litu	95.2	ŏ	ا ہ
16D	P1 B	٩	0	124	137.5	ŏ	ا ہ
180	1 30 4	٩	0		150 8	ŏ	- i
200	18370	٥	٥	590	1893	å	ŭΙ
211 :	463.1	9	a	1970		ä	.24
800	195 5	2	-74	24D	191 6		-144
250	336.5		147	280	597		-142
929	260 B		***	320	295 1	1	-142
361	290.4	-1	.54	360	267.6		144
400	926.0		- 54	160	3196	1	
44:	968.6	C.	-152	440	3516	8	
480	37° C	0	-152	460	.wis	2	143
220	423.6	0	-157	570	a.65	D	.145
660	455.4	V	+152	560	3871	0	.144
610	452.0	V	- 152	600	874 B		.140
640	5216	U	- 152	60	511 .	۰	.145
680	954.2		-152	69:	5457	٩	.149
700	1865	0	187	720	5153	9	- 115
ren	6104	3	152	760	8012	0	- 149
181.5	Sec. 4	3	192	7070	666.6	"	. 120
601	669 :	-5	356-4	B20	639.2	9	-35 14
845	MA.C	-7	-5113	840	671.5	,	-50 10
45:	7172		-6,684	4411	7031	•	-2617
19067	798 S	-11	.: 195	, 8025	724 0	"	-143
920	74U A	··a	. 17796	620	735 (10	-7643
360	1924	··a	.7736	: uen	767 G	10	7643 '
1005	8170		-7786	1006	78 i a	.16	PHAL)
1040	64/6	9	-7736	1541-	Maria.	.9	77442
ICEE	887.2	9	-7796	. 6614	M2.8	.9	766)
11.30	910.8	9	-7795	1120	bio a	.9	744.1
1946	945.4	a	-7796	1160	326 B	-8	(94)
1756	378.3		-2796	1200	P2 4 E	-4	-7523
1246	10,14	,	-77.96	1540	NV I	4	.7642
1240	1043.2	.5	-7795	1200	1-122 7	-7	.7847
1820	1075.5	- 4	-7796	1323	1994 7	-7	-7642
1360	114114	-7	-1796	1363	1086.6	-7	-7843
14(6)	11414		7796	1+33	1116.4	-,7	-7843
1405.7	1745	.т	. 7704	18057	1123,1	.,	-7843
1440	11726	-7	. r.ge	1445	1150 6	.τ	-7840
1403	12662	-6	7736	1005	1162 5	0	T(40
1521	1238	-6	-5/36	1500	1214.5	ь	76+3
1581	1271 4	6	-7796	1960	1346 +	-8	-7643
1549.7	1295 6	ň	-7796	1535.7	1970.2	-8	7560
1405	1304.0	н	-7796	1600	12784	-6	784)
1646	1336 6		-7796	1640	19:04	-6	7940
1000	13683	å	-7410	1897	iguagió	6	
1/20	140. 9	ě	.2856	1723	1974.)	•	.2772
1760	1434 4		.7919	1704	1495.2	-	-7754
1800	1007.0	-5	7995	1800	1438.2	,	-7828
1878.5	18814		-2019	17196	1452.3	ı.	-7880
1419.5	10413		-60-7	<u> </u>			

^{*} Open spropping or well-back the conflict

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ALTERNATION NATIONS and sections against the special features and the section of

Table 5-11. Usable fuel - longitudinal - w/81.7 gal sux fuel in LH position (English)

	125891		AZING TABLE			GUSF:	
		<u>Bascett.</u> JF.6;6 èin:	<u>.ны</u> 2 п <u>ы с</u> . .е. (n ern Lous		(6.5 E. Visit	
Charrity	Weath)e.e (e e	Mamen:	Display	Wo 30	CG CG	Nomen
n. Siden	15:	1.046	M E	of Day and	100 July	hariphat 20	# B
10	- 66	125.6	9424	10	. 151	- M &	9000
20	13¢	139 1	18921	20	.90		18384
30	404	132.4	28447	30	186	179.4	2/18/
40	272	139.6	37962	40	260	.38 6	162 M
50	940	177	47483	3°	326	129.7	45188
RO	203	133.7	67006	دة ا	390	1797	54440
.876	100	137.7	63056	1 62.6	427	129.7	55367
75	476	141.4	59272	70	455	149 a	65250
AS.	540	145.5	/2645	an	5:0	146.0	76024
90	617	5.001	91159	90	5:5	1490	87137
100	660	150 /	102448	100	650		
110	748	154.4		110	T'5	1507	07962
150	816	1514	112821		_	157.7	108799
130	464	154.4	125 (57	120:) teu	153.4	119632
140	469		136485	130	MS	184.4	130466
	_	-59.3	147512	144	B.D	155.7	141297
150	1020	15G C	169165	-10	975	156.0	152103
100	1046	154.7	1/0502	.80	1040	150 7	162981
170	1156	157.7	161957	. 201	1105	151 9	173874
11794	11/2	157.5	185595	17170 a	1127	167.5	177502
180	1220	156 1	165227	180	1176	155.1	181521
130	795	.21 a	196246	190	1236	151.0	127568
200	1,940	149.0	207600	7:0	1.190	149.5	139562
1204.9	. 287	.477	2:5599	1204.5	1332	147.7	196623
210	1425	.461	711514	210	1366	143.1	212167
25N	-145	.400	222472	270	1430	146 C	212740
2720	1564	1490	214226	270	1445	143,5	223732
240	1982	150,5	2456./V	240	55FG	150.5	274746
250	1700	1711	296932	250	-625	751 1	745597
260	1764	1517	268285	240	1670	7517	258440
272	1806	152.9	279637	275	1755	157.3	2673CB
540	1904	157 N	290988	240	1820	1528	2781 1 1
297	1372	143.3	309340	790	IRBG	155.5	289001
360	8040	157.6	31.5951	300	. 220	1234	199650
11.304.5	2011	152 P	311655	11,704 =	. 990	159.9	3145Vb
N/S	2*(+)	15.00	322864	310	2015	153.2	304625
320	2176	161 9	300671	325	2040	151.9	216045
782	1244	150.5	338399	134	2145	150.0	32 34H x
340	2012	10%	346 tes	رمر	7610	1497	130191
36C	2380	148.7	16,1836	160	2275	146.7	234311
1358.0	2402	1414	386399	13532	2596	laga	340677
250	2008	149.7	364183	260	2340	148 7	348:69
370	è516	149 6	375461	17:1	2405	145.0	258217
.191	2574	14/7	264635	763	2470 2470	1497	309766
190	2652	150.1	199.91	190	2535	150.1	309:00
" 3 3 90	50.3	150.5	406791	1999.0	394	190.5	
739 0	61.3	iau a	0140741	. 344.0	1794	155	390378

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Table 5-11. Deable fuel - longitudinal - w/309.3 litre aux fuel in LH position (Metric)

	580.	LIDELLO	ADING TABLE	- LONGITUE	NAL CO INF	TRCI	
l		Bate: APT	· C# 3:9 3 (pa	Aug Tana - 1			
(4)	6 J. i PS.	<u> १२ ४ क</u> अपदा	Fg()		Jai B JP4	(3./93 kg/)	
CHUNA	Weight	CG	Vomen!	Sumah	e/leight	66	Mornacu
411	PSI	1557	ram.bgr	بھ∞ب	red	_ ***	1907-168
40	92.5	3525	144758	40	22.0	3620	112505 1
D0	G5.3	2534	2720430	40	£90	72.74	223907
.sa	97.8	3841	846389	120	46.9	3541	239540
160	-30 d	3645	462517	160	1278	3545	452172
200	167.0	2547	57H15e	200	1598	3947	565805
72370	192.1	3549	636363	1237.0	IABO	3546	64789
240	185 -	3560	696127	240	191 8	35.50	be2667
78/1	22 8 P	2653	839543	(80	2237	3650	P23055
220	260.5	5784	979307	325	256.7	26754	20,2767
36G	297.4	3607	111M53	340	28 7 8	3607	1094927
400	326.0	3449	1954410	401	3.96	3949	1200174
440	358.5	2952	1302777	440	351.6	3684	1265434
40.	1912	7913	1570743	480	3:35	3713	1500692
570	473.6	3937	1868711	526	4155	9937	1805961
540	4554	395)	1976554	94P	847 d	3959	1771515
600	499 D	3977	104+827	800	4/9/4	3977	1908648
640	521 B	3994	2053459	640	Bild	39 9 a	20A2165
-165e 3	534.9	4900	PARREIS	" FRE 3	554.4	4000	2097447
(40)	554.2	2347	2135216	680	5497	9943	2142216
f20	546.8	3856	2262497	720	675.3	3456	2014063
765	6.91	3274	2008857	760	6072	37.4	2293921
1275.5	617 I	3750	3969900	1,779.5	619.6	3750	9361074
800	0520	9769	gecaeli3	ACO .	634 2	3765	2408273
940	644.6	3287	3592884	840	6.12	3797	2541.85
850	77.62	3804	2730909	850	701 1	TAIN	3677793
920	749.8	9827	2868193	420	735.1	3627	2612796
950	782.4	3844	2007337	950	767.5	Jěca	3948297
1000	8150	3:60	3144545	1000	789.0	7860	3043742
1645	8476	3874	3283747	1040	1910	3874	7019081
1060	8602	3585	3421545	1080	362.9	J#07	1254766
1122	9128	9900	3500 ta2	1150	194 9	3960	3420249
'- InF1 :	4797	7907	3671304	15 MISSO	#27 P	3907	3539215
1:60	946.4	3991	966740*	1160	725 K	3901	2515527
1200	9700	3868	3767498	1700	965.6	3645	5798240
1240	INTO 6	3636	3477064	1240	39 0 ₿	3836	UBCM45D
1280	1049.2	9607	9971622	1200	1029.7	3847	3863655
1320	1076.0	CNTL	8086111	1350	1054.7	2780	2056256
7 (1777)	1089 8	2768	4106161	11387.0	1068.2	3744	4025549
1960	11004	3776	4186772	1360	ICMS F	3778	4103586
1640	110110	.1790	4372953	1430	1116.6	2790	4229164
1440	11/5/8	3602	442:15	1440	1150.6	3992	ETTES 14
1450	1206.2	3814	4500277	latifi	ITRE !	39.4	4509984
71 16164	1831.0	7 4 22	4705707	** 15*04	1206.8	2821	4612330

Create full quasies are most lowers CS specifies problems are found.

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^{**} Copin by gradien in a soft of CC condition

alonging paper any normal accepts of the Eurisia to

It is placed as a property of the

Table 5-12 Usable fuel - Island - w/81.7 gal aux fuel in LH position (English)

	USA		eximiting FB 7.356				
lai	4 A 1 JP 5			1.0014 1.4 .		1550,5at	
Cardle	Waspe	EG .	Vienere	Gruentile	Versit	014	Mamera
-LS Cer	-	4CT4L	Prb.	P.St Land	10.	#363e34	300
10	61	0.0	0	10		111	- C
8)	· 3 d	0.0	ä	25	136	20	č
33	334	0.0	ō	35	196	5.0	Ď
40	222	0.6	ň	45	266	. 1	Õ
69	240	0.0	ä	55	225	11	ň
50	a.#	UC	Ü	E5	250		Ü
66.5	426	0 C	ň	52.6	417	17	ő
79	478	72	38	75	455	::	-117
• 5	Sia	10	565	80	-20	-7.5	244
90	612	-21	-1262	90	586	2.1	1276
100	850	-28	-1914	.00	650	2.5	-1040
11.5	748	-36	2957	-10	715	-2.5	-2475
1/2	816	40	-0245	120	780	4.2	-3178
122	Atc	.4.1	-5450	190	445	44	-1710
143	452	4.6	4559	:40	910	3.5	4356
150	11.20	-5.1	-5213	150	975	-5.1	-1947
165	109E	.5.4	-5856	160	1040	-14	-5546
175	1150	-5.6	-6491	120	1707	5-	5295
1794	7179	-5.7	48706	1/2.4	1127	57	-5410
IAC	1224	.6 6	7042	160	1172	34	-5721
190	1296	4.5	-7170	190	1275	11	5853
200	1997	5.4	-7955	2:0	1302	-54	-5943
204.9	1341	-5.3	-7369	211 8 W	-332	5)	7044
g 1s2	1425	.6 A	-1525	210	1265	-6.4	-7350
52C	1464	5.6	*3*1	220	1497	6 a	7943
290	1564	-5.1	-8456	22u	1445	-57	8577
243	1692	5.9	-24000	240	1583	5.4	-41/5
250	1700	-E C	-10237	250	1625	5.0	1795
201	1,062	-5.7	-14672	250	1890	-61	-10397
279	18.36	4.3	11507	270	1755	-63	-10399
2190	1904	-5.4	-12142	28D	1920	-6 a	11476
290	1972	5.5	.12777	230	1884	-65	-17213
2193	2040	47	-1,0111		1950	66	12820
9.406	2071	-ē.b	-13861	7,774,5	1580	-6.6	-10056
114	2108	7.5	19581	910	2015	-65	19058
220	2176	-5 3	-1300	229	20,000	-63	19058
330	2248	9.1	·13661	310	7145	· 5 I	-130°F
144	2713		19661	340	2210	5.9	.13050
250	7380	-5.7	+13561	360	2275	-5.7	+13050
365.2	2400	-5.7	13681	353.2	7296	-5.7	-13058
JM	2440	-54	14093	367	27 4 00	-5.6	.13271
270	2616	56	14729	270	2405	-5 P	40ED
.160	2564	5)	15370	280	2470	-5.9	-14490
200	7577	-6 C	16014	390	2936	-6.6	118906
3950	2717	.6 .	16594	399.0	2598	-6.1	·!1852

^{*} CHaid and Aphally to and Library (1) judgings

#12.PM6.96.6.12-1

mayor german and a region engineers of the Co.

For a MANAPANA, purposes, and "We yill and Manapal aglocal (CS) more a service of the Wagne and Manapal address from the other hands of the description of

Table 5-12. Usable fuel - lateral - w/309.3 litre aux fuel in LM position (Metric)

$\overline{}$	Us			BLE - LA EII		a:.·	
<u></u>		Both with JP # ID 0 is		å.orT⊒na 1			
					JHF JP a		
9.5019	April 14	C2	Montel	பேசும்ற	eV angési	26	Moment
,94m) 40	15/4			<u> </u>	12.0	וזייו	MT.TH-Q-
	27 6 55 C	3	_ a '	4:		0	
20 120	37 B	9	9	4:	e3 V	a	
160		9	ä	100	95.9	u n	2
20 -	170 4 168,5	9	a	200	127 8	a	
20.7	197.1	0	0		199.5	u	
240	195 6	ä	74	23.0	167.	ŭ	2
20.	129.2	.9	-286a	280	272	-12	.,\a
325	263 F	-39	110.0				CE-20
360	793 4	-63	16472	720 180	255.7	39 63	-10002
40.	325	-n.i an			7N7 E		18101
44:	355.0	-96	26520 345-6	400	313.5 351 k	41 96	25,096 -3,6554
48:	201.5	-102	-47 5 47	40	363.5	-107	41707
923	403.5	112	·47517 ·57641	4111	.163 S	-10+	49549
560	454 4	128	56527	360	347 8	124	57278
500	483.0	-136	-68357	6:6	4544	-135	0654
Fa:	531.4	142	.74170	MIII	511.4	-142	-77647
6563	534.6	144	77.750	(54.7	524 4	142	75747
50;	554.2	146	-81053	4:D	544.1	-)-65	79491
720	194.4	140	02633	720	575.)	· 4·	-51411
780	£19.4	- 136	-M471D	750	607.7	. 45	12629
775.6	692.1	134	.84914	78a	6194	. 34	-53237
3140	154 C	+197	-87679	H20	639 1	7.37	47879
161	1146	-142	-92327	MD	621 Z	1.0	95406
901	717.2	147	105117	820	709	747	103042
200	749.5	-151	-112846	950	735	. 5.	110621
360	762.4	. 54	-120574	260	isra	754	111212
inen	114 0	-67	129709	- 500	759.0	. 67	125790
1040	247.6	-151	-10G047	1340	4310	-: 61	133371
10.0	960.2	-152	.149771	1096	862.9	- 5	140949
11:0	912 A	-156	-151493	1120	851.4	- 66	149524
-1153.0	229 /	-157	-15/28/	111130	9213	-187	154287
1110	946.0	156	157287	1160	V266	· . PR	154697
12:0	976.0	-161	-157187	1200	9687	161	154297
1240	1010 6	.156	-157287	1240	P90 6	-126	154727
1280	1042 5	-171	-157087	1260	13027	.15*	154297
1920	10/5 8	-146	-15T.187	1.120	1054.7	-146	154297
1137.4	1094.6	-14-	-157257	1531.0	1066.2	.144	154597
1380	1108.4	-146	-141340	1360	1:86 -	146	58682
1400	1141.0	-149	-168685	1400	1118 5	-149	- 66264
1430	1173.6	-151	-177257	1440	1750.4	-141	- 171902
1+10	1200.2	-154	125026	1410	1162.5	154	161581
15104	1291.0	-155	181.1.	12124	1206.5	-15"	187827
12104	1221 7	-122	4141		1204. 1	-19-	141142

[&]quot; Odk dård grænk, he mod byrge (15 nørger).

Weight green are not would exage to as 10 of 120 for

For each distance, growing use Wingra and Dioperal agrees. The amount are desperations (sequel that Wellerik elders and a conjunkt, where exertings,

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Table 5-13. Usable fuet - longitudinal - w/81.7 gal aux fuet in RH position (English)

10 65 126 649 740	
Quarter Verify C3	
	innara
10	
20	3009
100	:2096 .
40	221 8 7
10	960 de
5d 405 139 7 57005 60 340 129 7 182 6 475 129 7 5,6496 160 6 617 119 7 70 477 143 4 64272 70 675 145 6 5d 5-4 148 6 78446 8d 520 145 6 5d 5-4 148 6 78446 8d 520 145 6 5d 5-4 148 7 160 7 102484 150 670 160 7 130 746 150 7 102484 150 670 160 7 130 746 155 7 10221 170 76 76 7 130 746 155 7 10221 170 76 76 7 130 575 156 4 125 7 10221 170 76 76 7 130 544 164 170405 170 645 164 4 140 567 155 0 147212 140 970 165 0 130 162 156 0 15915 170 645 164 4 140 567 155 0 147212 140 970 165 0 130 162 156 0 15915 170 170 170 130 162 156 0 15915 170 170 170 170 130 162 156 0 15915 170 170 170 170 130 164 157 1575 158595 170 170 170 170 130 1294 155 1 128393 180 1710 149 0 130 130 149 149 159 150 170 149 0 130 149 149 149 170 170 149 0 130 160 160 160 160 170 149 0 130 160 160 160 160 170 149 0 130 170 149 149 252372 250 149 0 149 0 130 170 160 150 5 345173 240 150 0 160 0 130 170 160 0 7 266265 260 160 0 130 150 150 5 345173 240 150 0 130 150 150 5 345173 240 150 0 130 150 150 5 345173 240 150 0 130 150 150 5 345173 240 150 0 130 150 150 5 345173 240 150 0 130 150 150 5 345173 240 150 0 130 150 150 5 345173 250 150 0 130 150 150 5 345173 250 150 0 150 150 150 5 345173 250 150 0 150 150 150 5 345173 250 150 0 150 150 150 5 345173 250 150 0 150 150 150 5 345173 250 150 0 150 150 150 5 345173 250 150 0 150 150 150 5 150 5 150 0 150 150 150 5 150 5 150 0 150 150 150 5 150 5 150 0 150 150 150 5 150 5 150 0 150 150 150 5 150 5 150 150 150 5 150 5 150 0	47395
192 495	54490
70 477 143 4 6427 70 475 145 4 5 5 5 6 5 6 5 6 5 6 6 5 6 6 6 6 6 6	Seesi
5d 5-4 148.8 78848 80 520 145.8 30 612 149.0 91.99 90 535 132.0 100 767 160.7 123488 150 670 70.7 110 742 155.7 11222 110 70 75.2 120 515 153.4 125762 120 70 75.4 130 844 164.2 13605 170 845 764.4 140 867 155.0 147212 140 91.0 755.0 140 162 165.0 150,00 74 756.7 155.0 140 162 165.0 150,00 74 766.7 166.0 170 1756 165.0 150,00 74 766.7 176.7 170 1756 165.0 150,00 77 170.7 110.0 767.7 170 1756 155.0 155.0 155.0	67265
100	76324
100	8/14/
110	97467
120 515 1534 125152 120 780 1534 140	28794
130	19532
140 367 1550 147512 140 910 1500 150 150 150 150 150 150 175 150 175 150 175 150 175 150 175 150 175 150 175	30466
190	41297
180	50190
170	15410
14754	73434
180	77803
190 1292 161 9 1962ac 150 1295 151 0 200 1309 1400 802001 200 1700 1400 1 200 1309 1997 141 7 206944 7714 2 1200 1400 1 200 1400 1997 141 7 206944 7714 2 1200 1400 1 200 1400 1400 1400 202072 200 1400 1400 1 200 1664 1400 202072 200 1400 1400 1400 1 200 1704 160 150 5 24017 240 1500 1600 1400 1 200 1704 161 1 256202 250 1600 1600 1600 1 200 1704 161 2 266265 260 1600 1600 1600 1 200 1404 162 8 200844 200 1600 1500 3 1 200 1404 162 8 200844 200 1600 1500 3 1 200 2044 153 8 21369 200 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 153 8 1 200 2044 153 8 21369 200 1500 1500 1500 1500 1500 1500 1500	11521
200 1360 1460 802760 200 1700 1460	:7568
704 9 1971 141 7 205944 704 4 1302 141 7 205944 704 4 1302 141 7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	979762
210	26673
720 1496 148.0 252972 000 1480 149.0 252972 230 1664 1696 2592,5 2.0 1496 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 149.6 150.5 150.5 150.5 150.5 150.5 150.7 240 150.6 150.7 260.66 260 1690 169.7 260.7 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 175.6 157.8 279.60 17	00167
230 1864 1498 234225 220 1408 1458 14586 240 1408 14586 240 1408 1605 245178 240 1505 1605 250 2505 2505 2505 2505 2505 2505 25	13040
740 1400 1505 045774 240 1560 1505 250 750 750 750 750 750 750 750 750 750 7	23992
250 1704 151 254202 250 1525 151.1 2 240 1708 1617 269265 270 1695 1617 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	36746
240 1763 1617 269265 260 1695 1517 3 270 1836 1523 279637 270 1755 1573 3 260 1344 1528 230364 260 1606 152.6 3 260 2640 153.6 11369 350 1666 153.6 3 300 2640 153.6 31369 350 1606 153.6 3 304 6 2071 163.9 219655 304.5 1592 153.0 3	45597
270 1936 153 279607 270 1756 157 3 3 3 3 3 3 3 3 3	56049
080	57300
290 1972 163.0 162.0 090 1983 1973 2 300 2040 153.6 01089* 000 1650 153.6 0 "304.6 2071 163.0 218.55 "304.5 1580 153.0	78151
300 2040 153.6 31389* 300 1650 153.6 3 **304.6 2071 163.0 218655 **304.5 1580 153.0 3	Tenti
11 304 6 2011 193 9 218:55 11 304 5 1580 1580	19852
	04996
	MMG20
320 21 ⁷ 6 151.7 130531 320 2060 151.9 1	18045
	28409
	LIPHOR
950 2260 148.7 0508/6 950 2276 148.7 S	36311
1997 2 2402 1464 35639) 1997 2204 1464 1	10675 -
	MB050
970 2516 1493 2 ¹ 5483 970 2405 14937 3	66917
040 9584 la97 396993 280 2470 ra97	69755
390 2652 (50.1 390°63 390 7536 150.1 3	193613
	иилъ

^{*} Tradition (gradement or more) the more fit in contract of a chartes from that

magnitiques del remain en gradia (1916, 1941).

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Открытельными стемент СО-может.

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and the end of the analysis of the state of

Table 5-13. Usable first - longitudinal - w/309.3 litra aux luet in RH position (Matric)

	Heiri		ADING TABU			ETAKI	
		Bases Act	<u>. 11:1 306 2 1</u> 96	- Aus Talik 🕕			
	4, 4 a J ² -5 <u>.</u>			. =		(P. CRE NOT)	
Cambby	e/eaghs	1.0%	Martion:	Quantity.	Verangeri	CO	More
(minut	Pg1	.e.q.	211 841	_ #***.			promiting .
45	95.6	1920	114756	40	32 0	2470	1,550,
50	61.7	1574	2)1-4-11	42	51.7	35.34	22590.5
100	97.6	2541	34632R	120	25.5	3641	9996#3
163	. 4) 4	7515	461247	160	1270	35-45	457172
264	. 63 :	1547	F74176	200	159 a	3541	545845
227.0	. 91'.	3548	645753	12370	129.7	3546	671895
241	1994	75e0	548/27	24C	191 A	1566	682667
260	7757	1685	F)=0#4	260	2297	3040	872385
350	280 8	3754	978007	J20	265 7	2794	967787
707	20) 7	1837	3110552	260	257 G	IFO ⁻	1494927
400	326 C	.18a2	1254910	3(4)	212 K	9546	1730176
440	358€	3644	1392777	440	381,6)604	1765434
460	341.2	7913	1530743	480	363.5	IPLI	1000092
270	423.8	.1932	1659711	520	415.5	159)	1638951
560	E,K B	3984	1806684	REO	407.4	9661	1771216
500	489.0	9.477	1944412	6:0	479.4	3977	1900646
640	5616	3944	20#3959	840	3174	1594	2042156
" 656.3	534.9	4090	7129449	150 0.0	724 4	6700	2057447
SEO	654.2	3943	7185218	450	542.3	364.1	21427116
72.0	5368	3556	2262497	720	575.3	365e	2215080
760	6194	97.74	2539657	æ	507.7	37.5A	2291921
17755	612 1	3750	2369930	1779.5	41V.5	3750	7772774
acu -	ESS U	3785	2454454	ROD	690.7	9766	2405275
910	634 6	9767	2501884	840	671 :	2787	2Fa179F
550	7172	3434	27014415	880	704.7	3806	26//220
920	745.6	3827	7869173	970	735.1	3927	2612705
4th	TA2 4	3944	3407937	yeo .	787.4	3844	78a4247
1600	811.0	Saco	JIAEGAE	1400	7+9.0	3850	2042/92
1967	647.6	3874	3282747	1040	031.9	7074	3219291
1080	PAT 2	78*8	3421946	1980	862 V	385E	3254706
1120	912.6	2900	3560142	1120	854.9	3990	3490244
17 (357)0	094.7	2917	35 (1304)	- 1153 a	9517	1417	3569220
1100	B45 4	3431	348793*	1160	928.4	3901	3815537
.200	MYS.C	28:0	3767498	1290	9503	3066	3703240
1240	1910.6	2016	9477064	1240	P4D4	181F-	3800640
*2E0	1043.2	3637	3971602	1240	1022.7	260)	3593862
1320	1075.4	2780	4064111	1320	1254 T	7.07	3166466
1 (0.07.5)	10.4 6	2165	4106181	113070	1268 7	1768	6025749
1260	1108.4	3776	4195772	1950	1286.6	1775	4,00050
1160	11410	1790	4323857	1400	1113.6	379	4290064
1440	1:236	7504	4452119	140	1150.5	Jeus	4174519
IAEU	12057	3814	4650277	1440	1162.5	3514	4609954

^{1.} APA Silvetina differ to may be and CC conclion, includes services

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¹¹ Свез униравниту вусци по людю.

magnitigate preportable agregation (\$10 (#)14).

For debaston distribute sale weight and terribute sources in the steam angle over two straight

and Market adjust and to relative your paymes packet

Table 5-14. Usable fuel - Interet - w/87.7 gal aux (uel in RH position (English)

	<u> </u>	sa e sugu	LONDING "As	CE - 216116	L 1 G IE NGL	·Hı	
			84 an 7 US (c)				
Isl	3.60, E.P. 4				-e II .12 I		
Q1-4-959	(August	62	Munigor,	U. arilly	Warde	en a a a a a a a a a a a a a a a a a a a	Vomen
delar	.8.1	.ertes	**E		pro c		·# b1
10	et.	0.0	-12	1.25 <u>341</u> 0	65	5.00 5.00	'''''
et.	10:	0.9	ä	25	120	: 5	D.
16	704	0.9	ő	7.0	199	0.0	, D
41.	1/2	νa	ä	45	280	4.5	
40 50	340	0.0	U				6
2D		0.0	ů	57	16.5	< :	D
	401			6.4)=0	4.2	r.
62.c	426	Va	ш	87.6	A27	6.5	5
70	476	0:	-64	75	486	C1	Б'
50	344	1.9	3.17	AL.	720	1.3	915
At-	512	20	123a	9:	255	<i>)</i> :	191
'01	460	29	1912	.00	650	2.1	. P
1113	74.1	7.4	2561	· 10	715	2.1	2445
121	310	99	32 19	.20	reb	34	3077
100	¶ _{by} a	44	æ-6	1.50	345	4.4	2705
143	127	4.4	4550	. 40	41D	4.7	±90 v
151	1020	51	2,54	150	775	5.1	4958
163	IOBA	5.4	FA29	.00	1,040	5.4	95/1
101	11:6	56	6485	וייו	1105	5.6	4179
179.4	1179	5.7	64-40	177.4	1127	57	67/45
784	1724	5.5	6343	170	1970	9.2	6143
19)	1090	46	6216	130	1236	48	5942
7740	1760	4.5	CO*O	200	1300	45	5512
204.9	1993	4.7	60.00	204.9	1,100	a.1	4261
319	1426	4.4	6342	210	1.364	4.4	4002
224	1465	4.7	NR20	220	1400	47	6670
2.90	1544	4.9	ניאי	/30	1475	14	7777
240	1632	5 i	F248	240	1560	61	7864
250	1/60	5.2	6883	750	1635	52	M42
260	1775	1.4	3518	250	legu	51	9099
270	1676	5.5	10174	270	1755	5.5	9776
260	1904	1.7	10.42	250	1400	57	12312
200	1972	3.6	11425	290	1825	58	12919
200	2040	10	17068	3CP	1970	50	11526
1204.6	2:71	5.5	12307	1.204.5	1980	59	11754
310	2168	7.8	12307	Ano	2015	56	11764
220	2176	2.7	12307	320	2019	50	11764
370	224				_	-	
340	2315	5 5 3 3	12307	3/0	7145	55	11764
			12227	345	2210	-	11764
)90	2360	2.5	12397	360	77/5	1.3	11764
15.1 2	8402	9.1	12307	25)2	2256	5.1	11764
160	7445	4.7	17740	260	274N	- 7	12174
370	251e	5.2	19374	372	1405	5.3	12784
750	2584	5.6	14005	387	2470	≣.4	12395
926	2562	9.5	14635	790	2615	7.5	11945
149.0	271)) t	15202	334.0	2534	2.5	14531

^{*} Charles we descrip a ties-ordered (A) treatment

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Margins parameters a surprise of the Eq.

For and and subject to the sea Weight and Butterforeigns. (17) years any growing to a Weight

And better related by the hard to one deciral control

Table 5-14. Usable fuel - lateral - w/309.3 (Are aux luni in RM position (Metric)

	05		LOADING FA			iiC)	
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ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT PT6T-3BF ENGINE (30 MINUTE OEI RATING)

412-706-054 \$/N 33001 — 33107 33108 — 33213 AND 36001 — 36019 CERTIFIED 18 DECEMBER 1998

This supplement shall be sitached to Model 412 Flight Manual (8NT-412-FM-1 , BHT-412-FM-2, or BHT-412-FM9-19.1) when PT6T-3BF Engine, 30 minute OEI reting kit is installed.

Information contained herein supplements information of basis Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, or other applicable supplements; consult basis Flight Manual.

с Ойт Расаніі музінта

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18 DECEMBER 1998

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DATE DEG 1 8 1998

MANAGER

AOTORCRÁFT CÉRTIFICATION OFFICE FÉDERAL AVIATION ADMINISTRATION FT. WORTH, TX 76193-0170

GENERAL INFORMATION

The PT5T-3B angine, in accordance with 412-706-054, may be radesignaled as PT6T-3BF1o offer an increased 30 menute OEI tailing. This 30 minute DEI rating represents (improved OEI) capabilities while maximum continuous OEI performance is reduced from that prescrited in the basic Flight Manual or applicable supplement.

Section 1

LIMITATIONS

INTRODUCTION

PTST-3BF engine affers an increased 30 minute OEI reting.

WEIGHT

Actual weight changes shall be determined after hit is installed and ballast readjusted, if necessary, to require empty weight CG to within allowable limits

PÓWER PLANT

Pratt and Whitney Aircraft of Canada, Ltd. PT67-386.

NOTE

Operation on an OEI range is intended for emergency use only when one engine becomes inoperative due to an actual mattunction.

Anytime an engine is operated in an OEI sange, an entry shall be made in the heticopter togbook dotailing the extent of operation in excess of twin engine takenti power limits. This does not apply to approved ITT limits for starting or for power assurance checks.

GAS PRODUCER RPM (N_i)

NOTE

Gas producer indicates 212-075-037-113 (or equivalent) must be installed prior to or concurrent with kit.

TWIN ENGINE OPERATION

No change from basic manual.

ONE ENGINE INOPERATIVE (OEI)

Continuous OEI	101.8%
30 minute QEI range	101.8 to 103.4%
Maximum OEI (30 minute)	103.4%

INTERTURBINE TEMPERATURE

TWIN ENGINE OPERATION

Maximum confinuous	765·C
5 minule ranga	765 (6-81010
Maximum	810°C
Maximum stari (2 seconds maximum above 960°C)	1090°C

ONE ENGINE INOPERATIVE (OEI)

Maximum continuous QE	810/C
30 minute OFI range	810 to 850°C
Mozimum OEI	660°C

ENGINE OIL PRESSURE

No change from basic manual.

ENGINE OIL TEMPERATURE

Minimum	0°C
Continuous operation	0 to 115°C
Maximum for MIL-L-7600 oil	11 5°C
Maximum for MIL-L-23889 oil	120°C
Maximum for DOD-L-85784 oil	120°C

COMBINING GEARBOX OIL PRESSURE

No change from basic manual.

COMBINING GEARBOX OIL TEMPERATURE

Minimum	0°C
Continuous operation	0 to 115°C
Maximum for MIL-L-7608 oil	175°C
Maximum (or MIL-L-23699 oil	120°C
Maximum for DOD-L-85734 oil	120°C

INSTRUMENT MARKINGS AND PLACARDS

Rater to figure 1-1 for instrument range markings and figure 1-2 for placerds and decals.



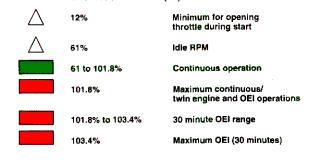
INTERTURBINE TEMPERATURE (ITT)



Maximum for starting (2 seconds maximum above 960°C)



GAS PRODUCER RPM (N1)



412FS67.1-1-1-1

Figure 1-1. Instrument markings (Sheet 1 of 2)

BHT-412-FMS-67.1 & 67.2 FAA APPROVED

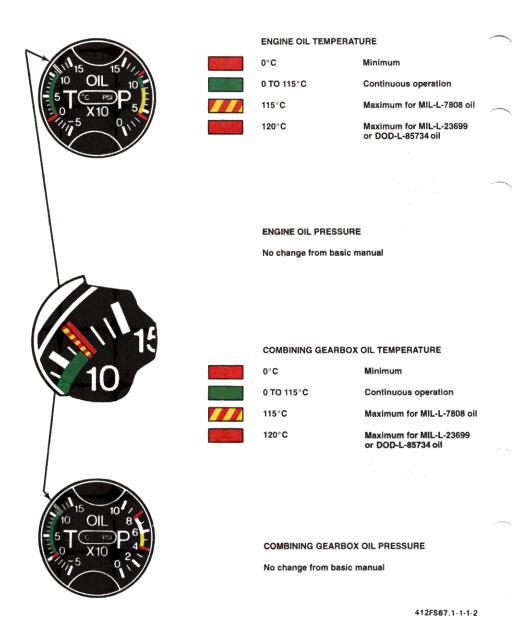


Figure 1-1 Instrument markings (Sheet 2 of 2)

TWIN & OEI 101.8% 30 MIN OEI 103.4%

LOCATION: INSTRUMENT PANEL

a136561 | 6-2

Figure 1-2 Placards and decals

Section 2

NORMAL PROCEDURES

No change from basic manual.

Section 3

EMERGEMCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

INTRODUCTION

Performance data presented herein are derived from engine manufacturer's appointable power for PT67-38F engine less installation losses.

CLIMB AND DESCENT

Reter to figure 4-1 for increased single engine rate of climb - 30 minute power for helicopters with maximum gross weight of 11,600 pounds (refer to BHT-412-FM-1).

Rafer to figure 4-2 for single engine rate of climb - 30 minute power for helicopters with maximum gross weight of 17,900 pounds (refer to 6HT-412-FMS-18.1).

PROBLEM:

What is maximum rate of climb for following conditions?

Helicopter grass weight — 10,500 pounds

Pressure allitude — 5,500 feet.

 $OAT - O^{\circ}C$

FYAMPLE:

- Enter rate of climb chart at 5,500 feet between attitude.
- Move right, horizontally, to intersect 0° OAT line.
- Descend vertically to intersect MAX.
 QW line in lower portion of chart.
- Follow curvature of bend lines to IMe-sect actual helicopter gross weight line of 10,500 pounds.
- Descend vertically to bottom of chart and read 500 feet per minute rate of climb.

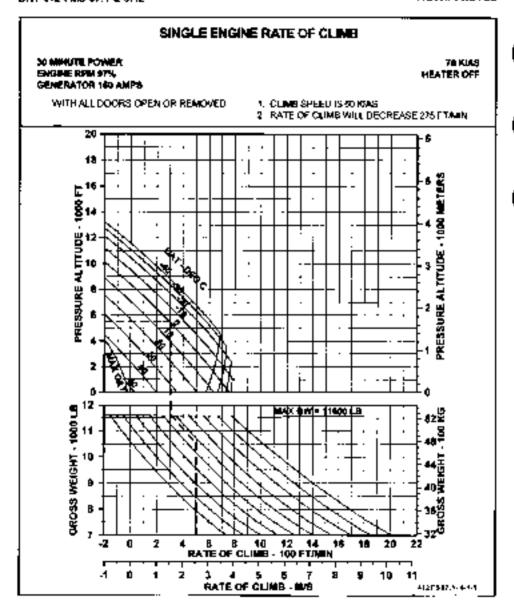


Figure 4-1. Single engine rate of climb - 30 minute power (11,600 pounds) (Sheet 1 of 2)

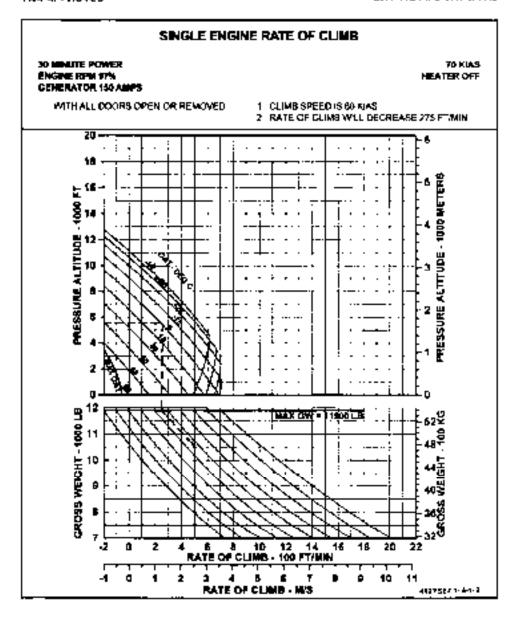


Figure 4-1. Single angine rate of climb - 30 minute power (11,900 pounds) (Short 2 of 2)

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Section 6

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Landing space regulard chart

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Section 6

CATEGORY A OPERATIONS

GENERAL INFORMATION

ORGANIZATION

The information contained in this section is for estagory "A" operations. For limitations, normal procedures, emergency

and malfunction procedures, and performance data not contained in this section, consult the appropriate sections of this filest manual.

DEFINITIONS:

CATEGORY -A" TAKEOFF

- Operation of the helicopter in such a manner that if one engine fails at any time after the start of the takeoft, the helicopter can:
 - 1, At or prior is CDP, return to and safely stop on the takeoff area: or
 - At or after CDP, climb out from point of failure and aftein single engine forward flight.

CATEGORY "A" LANDING

Operation of the helicopter in such a manner that if one engine tails at any time after the Start of 8 (anding approach the helicopter can:

- At or after LDP, continue the approach and safely land and stop on the clear heliport; or
- At or prior to LDP, climb out from point of fellure and attain single engine forward hight.

CRITICAL DECISION POINT

 The last point in the takeoff path at which a rejected takeoff can be assured, and the first point at which a completed takeoff can be assured.

LANDING DECISION POINT

 That point on the landing profile after which the heticopter is committed to landing.

COMPLETED TAKEOFF DISTANCE REQUIRED

 The horizontal distance from the start of the prescribed takeoff procedure to a point at least 35 feet above the takeoff surface where V_{TORR} and a positive rate of climb are prisined following an engine failure occurring at or after CDP.

REJECTED TAKEDEE DISTANCE REQUIRED

 The horizontal distance from the start of the prescribed takeoff procedure to the point where the helicapter is brought to a sale stop on the déalghated surface following an angine faiture. accurring of or prior to CDP.

TAKEOFF FLIGHT PATH

 The distance traveled from where the aircraft. reaches V_{rosp} at or above 35 Met AGL to 1000 feet AGL.

TAKEOFF SAFETY SPEED

The airopeed that will assure the required alimb performance with one engine inoperative,

LANDING DISTANCE REGURRED

The horizontal distance necessary to achieve a takeoff flight path at V_{TORA} and an altitude of 35 feet or higher, with one engine inoperative at or prior to LDP; or the horizontal distance necessary to land the helicopter without further incident, with one engine inoperative of or after LDP.

BALKED LANDING

The discontinuation of a lending approach and the Initiation of a climbout. Category "A" balked landing capability following an engine tellure is assured at or prior to LOP.

ABBREVIATIONS:

V_{uru} IFR — Minimum Atrapesed for IFR

 (Y_{x})

- Takeoff Gafety Speed Y_{TOSS}

Above Ground Level

ν. Best Rate of Climb Speed

CD1 Critical Decision Time

Critical Decision Point

WAT Weight-Attitude-Temperature

GACC Gross Rate of Climb

LDP Landing Decision Point

AGL

CDP

FAA APPROVED BHT-412-FM-2

LIMITATIONS

TAKEOFF AND LANDING WEIGHT VS ALTITUDE LIMITATIONS

Refer to Gross Weight-Altitude-Ambient Air Temperature Limits Charls (ligure 5-1). Charls designated part A may be used for gross weights to 10,000 pounds (4636 kg). Part B charts may be used for gross weights to 10,800 pounds (4899 kg). Part C charts may be used for gross 1 weights to 11,900 pounds (6398 kg).

Interpolation of data between charts for different parts is not permitted. Testing has not been conducted in areas between Parts A. B. and C.

ALTITUDE LIMIT FÖR TAKEOFF. AND LANDING

4000 leet pressure altitude.

CROSSWIND LIMITATIONS

The crosswind hmill for takeon and landing is 20 knots. Refer to the uniscioned Headwind Component Chart in PERFORMANCE subjection.

Takopti or landing downwind or with quartering tallwinds is prohibited.

CONFIGURATION

Standard landing genr or high skid gear with or without emergency floats (floats slowed).

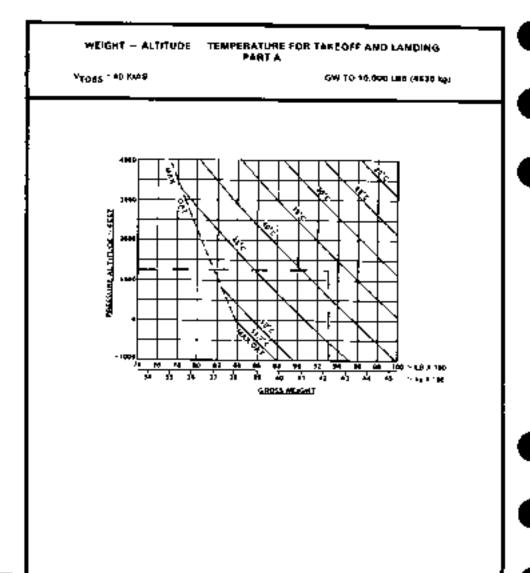


Figure 5-1. Gross weight-shiftedo-ambient air temperature (limits charts — takeoff and in dispersion of 3)

FAA APPROVED BHT-412-FM-2

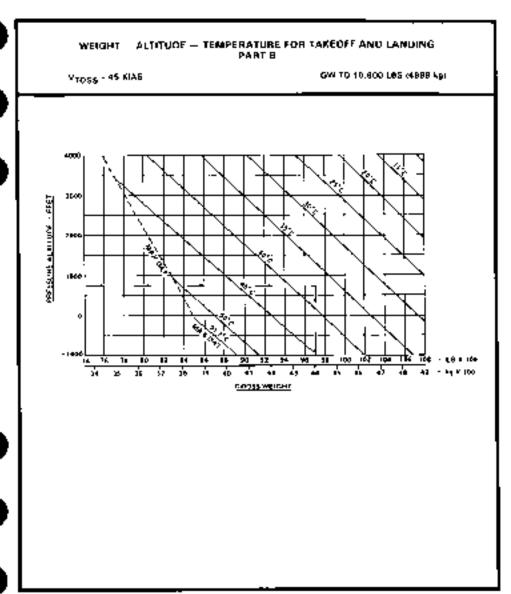


Figure 6-1. Gross weight-eititude-ambient ein température limits charts - lakéoff and landing (Sheet 2 of 3)

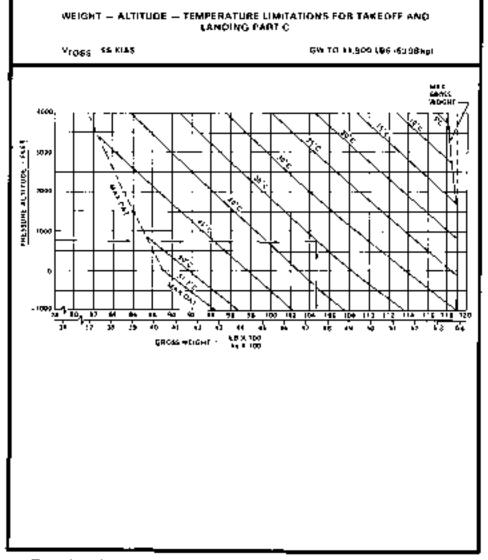


Figure 5-1. Gross weight-attitude-ambient air temperature limits objets — telepoff and landing (Sheet 3 of 3)

NORMAL PROCEDURES

PRIOR TO TAKEOFF

POWER ASSURANCE CHECK (refer to category "A" PERFORMANCE data).

STANDARD TYPE TAKEOFF

Obtain CDP information -- Refer to tigure 6-1 and 5-2.

Gollective — Flat petch.

ENG -- 100% APM (N2).

Altimater — Set, note Indication with collective fully down.

Instruments Normal operating range

SEAT BELT and NO BMOKE switches — As desired.

Azea Clear.

Hove: at approximately 4 feet (1.2 meters) skid height and note largue.

Adjust ADI pitch bar to indicate level.

initiate a lakeoff from hover using a TRANSMISSION TORQUE of 10% above that required to haver and ten degrees note down shiftude.

NOTE

Do not exceed TRANSMISSION TORQUE, ITT, or GAS PROD RPM (N1) limits.

Maintain pitch attitude as the helicopter moves larward to achieve the correct Critical Decision Point (CDP) shown on the takeoff Hight path profile diagram (figure 6-2).

NOTE

CDP height is determined by reference to the pilots barometria attitude. Indicated attitude with collective tall down on the lakeoff surface is used as a ground level reference.

After attaining CDP, accelerate the helicopter to 65 KIAS and continuo the climb.

STANDARD TYPE LANDING

NOTE

A standard type landing leinitiated from a Landing Decision Point (LOP) of 40 KIAS and an attitude of 100 foot (30.5 meters) above the runway, either in level flight or with a rate of descent of not more than 500 feet per minute (froure 6-3).

Flight controls ... Adjust friction to desired level.

GOY switches - AUTO.

Throfiles — Fully open

ENG - 100% RPM (N2).

FORCE TRIM switch — As desired.

STEP switch — As desired.

Attimeter — Set to nearest reporting station.

SEAT BELT and NO SMOKE sign As desired.

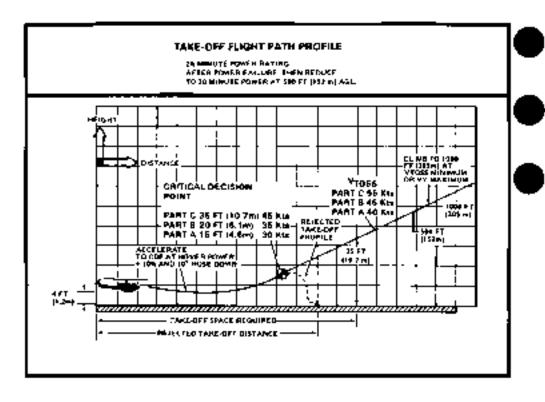


Figure 6-2. Takeoff flight path profile

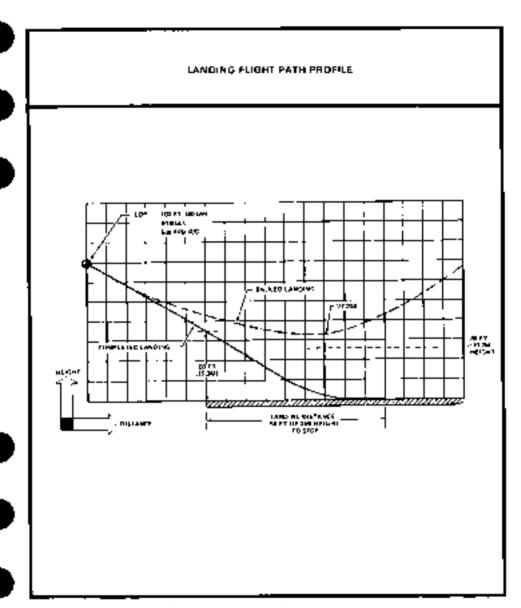


Figure 8-3. Landing flight path profile

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EMERGENCY AND MALFUNCTION PROCEDURES

INTRODUCTION

occur during takeoff prior to COP, during takeoff after COP, during landing prior to LOP, and during landing after LOP.

Tables 6-1 through 6-4 list panel wording, fault conditions, and corrective actions for emergencies and maillunctions that might

Table 6-1. Warning lights - Takeoff prior to CDP

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
MASTER CAUTION	Warning or caution light(s)	Land immediately
FIRE PULL (1 or 2)	Fire indication in No. 1 or No. 2 engine compartment.	Land immediately. Pull affected FIRE PULL handle. Select MAIN fire extinguisher; if necessary, select RESERVE fire extinguisher.
BAGGAGE FIRE	Smoke in baggage compariment.	Land immediately Inspect tellboom area for damage.
ENG OUT (1 or 2)	GAS PROD abnormally low. below 53 - 2% RPM (N1), on No. 1 or No. 2 engine.	
X M S N O I L Pressure	Transmission oil pressure below limit.	Land immediately
XMSH OIL TEMP	Transmission o): temperature above limit.	Land Immediately.
C BOX OIL PRESSURE	Combining gearbox oil pressure below normal.	Land immediately.
C BÓX TEMP	Combining gearbox temperature above limit.	Land Immediately

Table 6-1. Warning lights Takeoff prior to CDP (Cont)

PANEL		 ·
WORDING	FAULT CONDITION	CORRECTIVE ACTION
BATTERY TEMP	Battery case temperature above limite.	Land immediately. BATTERY BUS 1 and BUS 2 switches — OFF.
		WARNING
		BATTERY SHALL NOT BE USED FOR ENGINE START AFTER LIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R D A N C E WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO RETURN TO SERVICE.
ŘOTÓR BRAKE	Rotor brake linings not releacled.	Land immediately.

Table 6-2. Warning lights — Takeoff after COP

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
MASTER CAUTION	Werning or Caution light(s) illuminated.	Accelerate to V _{russ} Reset MASTER CAUTION (tight); take appropriate corrective action as required by illuminated segment(s).
FIRE PULL (1 or 2)	Fire indication in No. 1 or No. 2 engine compariment.	Accelerate to V _{TD33} . Pull affected FIRE PULL handle. Select MAIN line battinguisher. Close throttle of affected angine. Select RESERVE line estinguisher if necessary. Landles soon as possible.
BAGGAGE FIRE	Smoke in baggage compartment.	Land immediately. Inspect fellboom area for damage.
ENG OUT {1 or 2)	GAS PROD abnormally low, below 53 = 2% RPM (N1), on No. 1 or No. 2 engine.	Accelerate to Y ₁₀₈₈ . Secure appropriate engine. Refer to ENGINE OUT procedure. Land as eoon as possible.

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Table 6-2. Warning lights - Takeoff eiter CDP (Cont)

PANEL WORDING		FAULT CONDITION	CORRECTIVE ACTION
X M S N PRESSURE	011	Transmission of pressure bylow limit.	Accelerate to V ₁₀₈₈ . Reduce power; vertify fault on XMSN OIL pressure gage, Land immediately,
XMSM OIL TER	A P	Transmission all temperature above limit.	Accelerate to Y _{TOSE} . Reduce power; verify 1801t on XMSN QIL temperature gage. Land as soon as possible.
G BÓX Paessure	0 I L	Combining georbax oil pressure below normal.	Accelerate to V _{TOSS} . Reduce power; verify fault on GEAR BOX pressure gage. Land immediately.
C 80X TEMP		Combining genitox oil temperature above limit.	Accelerate to Y _{TOSS} , Reduce power; variety fault on GEAR BOX temperature gage, Land as soon as possible.
BATTERY TEX	1P	Battery case temperature above limits	Accelerate to V _{TOSS} , BATTERY BUS 1 and BUS 2 switches — OFF, Land 65 soon 68 practical.
			WARNING
			BATTERY SHALL NOT BE USED FOR ENGINE START AFTER ILLUMINATION OF PATTERY TEMPLIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R D A N C E WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO RETURN TO SERVICE.
ЯОТОЯ ВВАК	E	Rotor brake linings not retracted.	Accelerate to V _{FQ85} , Check refor brake handle fully up in detent. If light remains on, land as soon as possible.

Table 6-3. Warning lights — Landing prior to LOP

PANEL WORDING	FAULT COMMITTION	CORRECTIVE ACTION	
MASTER CAUTION	Warning or caution light(s) illuminated.	Reset MASTER CAUTION light; take appropriate corrective action as required by Ruminated segment.	
FIRE PULL (1 or 2)	Fire Indication in No. 1 or No. 2 engine compartment.	Pull affected FIRE PULL handle. Select MAIN lire extinguisher. Close throule of affected engine. Select RESERVE fire extinguisher, if necessary. Land as each as possible.	
BAGGAGE FIRE	Smoke in beggage compartment	Land immediately, inspect tellboom area for damage.	
ENG OUT (1 or 2)	GAS PROD abnormally low, below 53 ± 2% RPM (N1), on No. 1 or No. 2 engine.	Maintain V _{TOSS} . Secure appropriate origine. Land as about as possible. Refer to ENGINE OUT procedure.	
XMSN GIL PRESBURE	Transmission oil pressore below limit.	Reduce power, Verify fault on XMSN OIL préssure gage, Lend Immediately.	
XMSN OIL TEMP	Transmission oit temperature above fimili.	Reduce power. Yerlfy fault on XMSN Oil temperature gage, Land as soon as possible.	
C BOX OIL Pressure	Combining geerbox oil pressure below normal.	Reduce power. Yerify fault on GEAR BOX pressure gage. Land as acon as possible	
C BOX OIL TEMP	Combining gearbox oil temperature above limit	Reduce power. Verify fault on GEAR BOX temperature gage. Land as soon as possible.	

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Table 6-3. Warning lights -- Landing prior to LDP (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
BATTERY TEMP	Battery case temperature above limits.	SATTERY SUS 1 and BUS 2 switches — OFF. Land as soon as practical.
		WARNING
		BATTERY SHALL NOT BE USED FOR ENGINE START AFTER ILLUMINATION OF BATTERY TEMPLIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R D A N C E WITH MANUPACTURER'S INSTRUCTIONS PRIOR TO RETURN TO SERVICE.
AOTOR BRAKE	Rolor brake Unings not retracted.	Check rotor brake handle fully up in delent. If light remains on, land as soon as possible.

Table 6-4. Warning lights Landing after LDP

	PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
)	WASTER CAUTION	Warning or caution light(s) lituminated.	Land (mmediately.
1	FIRE PULL (1 or 2)	Fire indication in No. 1 or No. 2 angina compariment.	Land Immediately. Pull affected FIRE PULL handle. Close throttle of affected engine. Select MAIN fire extinguisher: If necessary, select RESERVE fire extinguisher.
'	BAGGAGE FIRE	Smake in baggage compartment	Land immediately, inepect tailboom area for demage.
•	ENG OUT (1 or 2)	GAS PACO abnormally low, below 53 ± 2% RPM (N1), on No. 1 or No. 2 angine.	
	X M B N O) PRESSURE	 Transmission oit pressure below timit. 	Land smmzdiałety.

Table 6-4. Werning lights — Landing after LDP (Conf)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
XMSN OIL TEMP	Transmission out temperature above limit.	Land immediately.
C BOX OIL PRESSURE	Combining gearbox oil pressure below normal.	Land immediately.
C BOX TEMP	Combining georbox temperature above limit.	Lend immediately.
BATTERY TEMP	Battery case temperature shave timbs.	Land immediately. BATTERY BUS 1 and BUS 2 ewitches — OFF.
		WARNING
		BATTERY SHALL NOT BE USED FOR ENGINE START AFTER ILLUMINATION OF BATTERY TEMPLIGHT. BATTERY SHALL BE REMOVED AND SERVICED IN A C C O R O A N C E WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO RETURN TO SERVICE.
ROTOR BRAKE	Roter brake linings not	Land immediately.

ENGINE OUT

DURING TAKEOFF PRIOR TO CRITICAL DECISION POINT (CDP)

retracted.

An angine failure prior to reaching CDP with necessitate a landing back to the takeoff surface. If height permits, a positive decaleration to reduce forward airspead is required. As the helicopter descends, it should be taked and the collective should be used as required to cushion the landing. Some forward ground speed is normally required at touchdown.

Maintain control of the helicopter.

Collective — Adjust to maintain ROTOR RPM and OEI power limits.

Flare to reduce ground speed.

Assume landing stiltude before touchdown.

Throttle (affected engine) -- Closed.

Complète shuldown of effected engine.

DURING TAKEOFF AFTER CRITICAL DECISION POINT (CDP)

in the event of an angine failure following CDP, airapsed should be increased to the FAA 4PPROVED BHT-412-FM-2

inkeati safety speed (V_{TOES}) or maintained, whichover is higher. Elimb out to 500 feet (152 meters) above the takeoff surface and accelerate to 55 KIAS. Reduce power to 30 minute limit.

CAUTION

DURING COLD WEATHER DPERATIONS, CAREFULLY MONITOR TOROUG OF THE NORMAL ENGINE WHEN ONE ENGINE FAILS OR IS SHUT DOWN IN FLIGHT.

NOTE

During takeoff, after CDP, it is permeable to droop ACTOR RPM to 91% during the transition from twin engine to single engine flight following an engine failure. ROTOR APM should be regained to normal operating range at or before situating appropriate best rate of climb speed.

Maintain control of the helicopter.

Collective — Adjust to maintain HOTOR. RPM and OE) power timits.

Airepeed — If below V_{ross} , amountly increase to V_{ross} and initiate a climb.

Throitie (affected engine) — Close

Complete shutdown of affected engine.

ENG (unaffected engine) Set to 100% RPM (N2).

DURING LANDING PRIOR TO LANDING DECISION POINT (LDP)

Execute the same procedures as for single engine talture on takeoff after CDP or proceed to LDP and use the procedure below.

DURING LANDING AFTER THE LANDING DECISION POINT (LDP)

The helicopter, with an emergency, is committed to land after LOP. The landing is accomplished using up to the maximum power of the remaining engine while maintaining rotor speed within limits.

Maintain control of the helicopter.

Collective — Adjust to maintain ROTOR RPM and OEI cower limits.

Flare to reduce appead.

Assume landing attitude before louchdown.

Throttle (effected angine) — Closed.

Complete shutdown of alleated engine.

PERFORMANCE

CATEGORY PERFORMANCE

" A "

The power performance data presented in this section is based on engine manufacturers minimum specification power for the PTST-35 engine with installation lesses.

The takeoff and landing data presented in this section is based on tests performed on a level apphalt running 75 fact wide. The minimum runway length for standard takeoff and landing procedures varies with wind, gross weight, pressure shiftede, and temperature.

POWER ASSURANCE CHECKS

Refer to Section 4 for power assurance charts to determine if the engine (power sections) can produce installed specification power.

The hover check is perormed prior to takeoff. The in-flight check is provided for in-flight monitoring of engine performance if either engine (power section) does not meet the requirements of the horse or in-flight power assurance check, cotegory "A" performance will not be achievable. The cause of engine power loss, or excessive interturbine temperature (ITT) or GAS PROD RPM (N1) shall be determined as soon as practical. Refer to appropriate engine maintenance manual.

HEADWIND COMPONENT

The Unfactored Headwind Component chart (figure 5-4) is provided with an example to determine critical crosswind and corrected headwind for category "A" takeoff and landings. The headwind component, as estemiated from the

headwind component chart, is applied to parts A, B, and C of the Takeoff Space Required charts.

REJECTED TAKEOFF DISTANCE REQUIRED

The rejected takeoff distance required is the space necessary to takeoff, climb to CDP, encounter an engine failure at CDP, return to takeoff eurisce, and stop sefely. The rejected takeoff distance required is obtained from either part A, B, or C of the Rejected Takeoff Distance Required charts (floure 6-5).

TAKEOFF SPACE REQUIRED

The lakeoff space required is the horizontal distance required to tokeoff, climb to COP, encounter an engine (allure, accelerate to V_{TOBS}, and climb to 35 feet (10.7 maters) AGL above the takeoff space. Takeoff space required is obtained from entire part A, B, or C of the Takeoff Space they could be component from the Unfectored Meadwind Component from the Unfectored Meadwind Component object (figure 6-4).

TAKEOFF FLIGHT PATH

The takeoff leght path begins at the end of Takeoff Space Required, at 35 feet (10.7 meters) AGL or higher, above the takeoff space and et V₁₀₈₆. Parts A, B, and C of the Takeoff Flight Path charts (figure 6-7) provide data for 35 to 500 feet (10.7 to 152 meters) and 600 to 1,000 feet (152 to 305 meters) AGL. These charts provide attitude gain for much 100 feet (30.5 meters) horizontal distance travaled.

LANDING SPACE REQUIRED

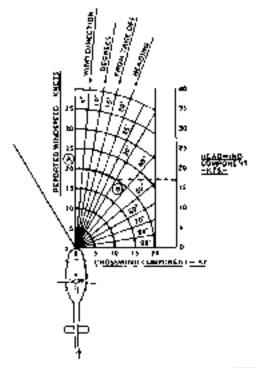
Landing space regulated is the distance necessary to come to a stop from LDP with one engine inoperative

Lending space required (4 obtained from the Landing Space Required chart (figure 5-8).

CORRECTED LANDING DISTANCE

Corrected tending distance from LDP is landing distance corrected for wind factor. The headwind component is obtained from calculation of the Unfactored Headwind Component chart (figure 6-4), and applied to the Landing Space Required chart (figure 6-8) to obtain corrected landing distance.





1. 2 3. 4. 6. 8	EXAMPLE TAKE OFF MEADING REPORTED WIND DIRECTION WIND DIRECTION. DEGREES FROM TAKE OFF MEADING HEMORTED WIND SPEED ENTER CHART AT REPORTED WIND SPEED. POINT A FOLIOW THE SHAME OF THE CURVED LINES TO WIND DIRECTION. DEGREES FROM TAKE OFF MEADING.	k76° 200° 30° 20 KN075
7	POINT 8 PROCEED HORIZON FALLY TO THE HEADWIND COMPONENT SCALE AND READ HEADWIND COMPONENT TAILWINDS HAVE NOT BEEN OF MONSTRATED	17 KNQ PS

Figure 5-4. Unlectored headwind component chart

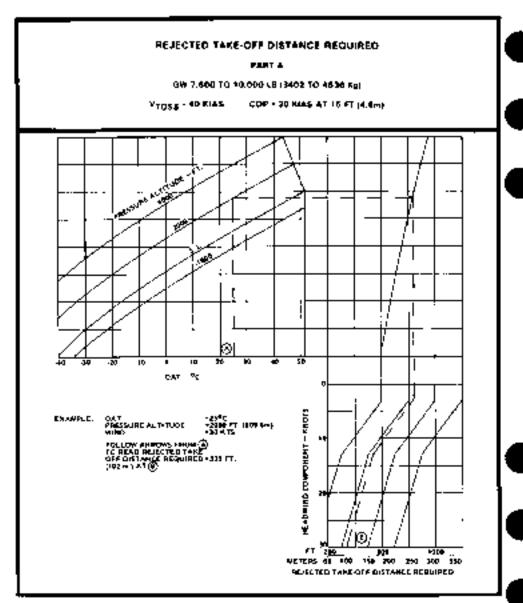


Figure 8-5. Rejected takeoff distance required (Sheet 1 of 3)

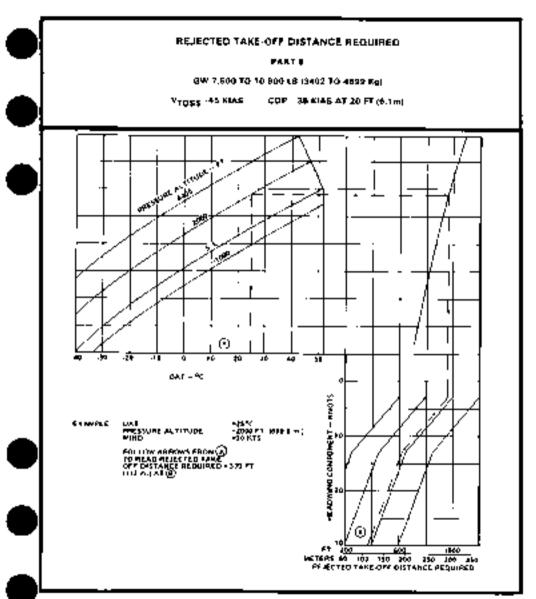


Figure 6-5. Rejected takeoff distance required (Sheet 2 of 3)

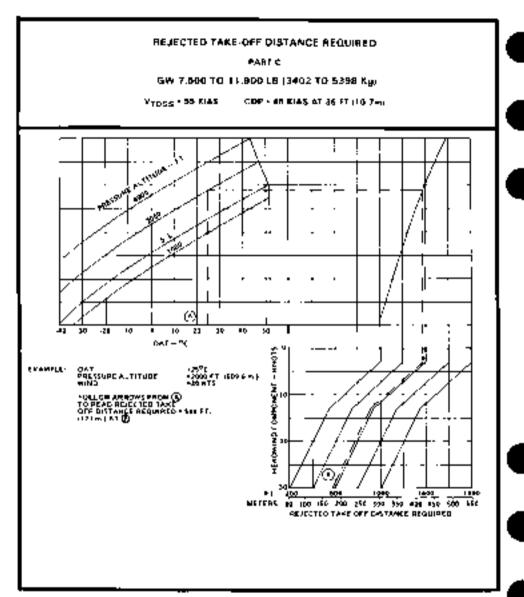


Figure 5-5. Rejected takeoff distance required (Shect 3 of 3)

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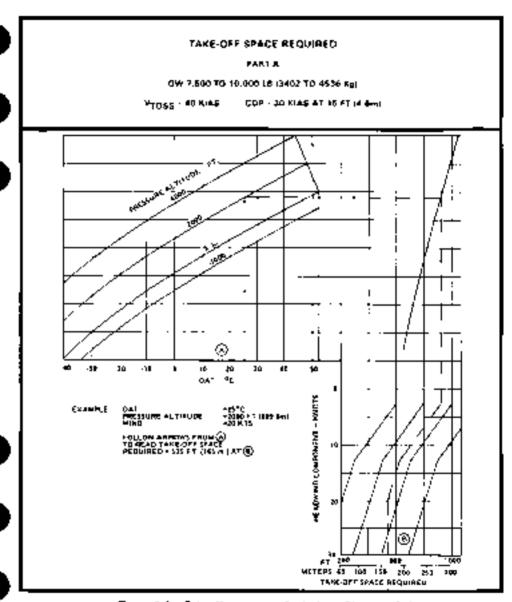


Figure 5-6. Takeoff space required chart (Sheet 1 of 3)

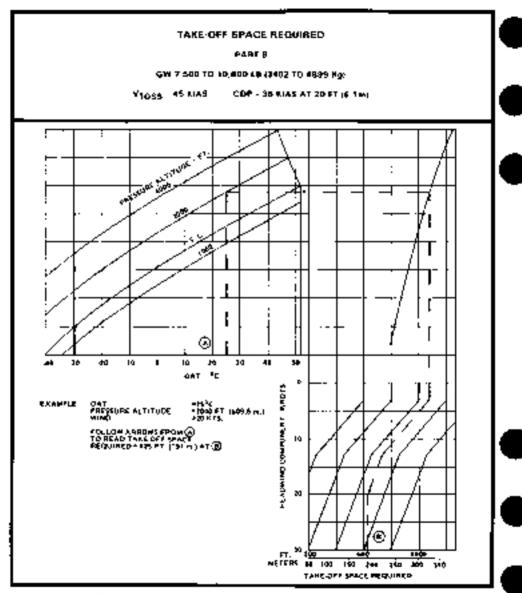


Figure 6-6. Takeoff space required chart (\$heat 2 of 3)

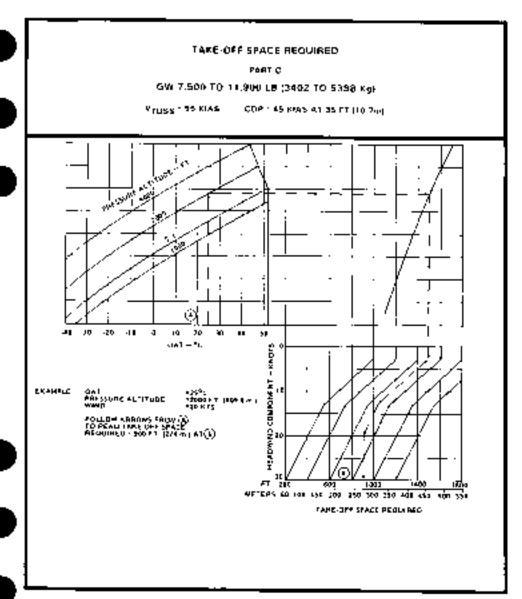


Figure 6-6. Takeoff space required chart (Sheel 3 of 3)

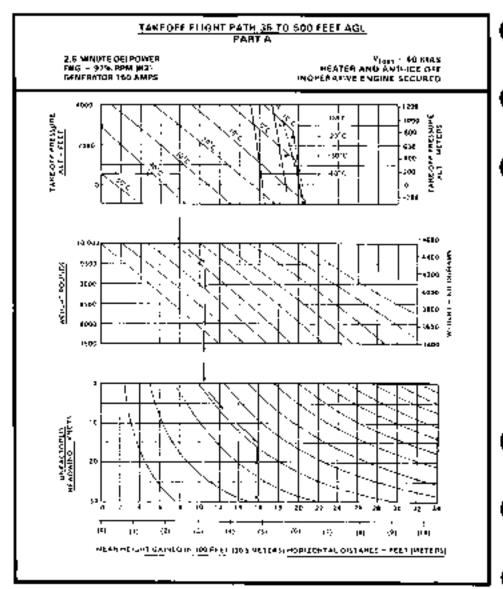


Figure 5-7. Telepoff flight path (Sheet 1 of 6)

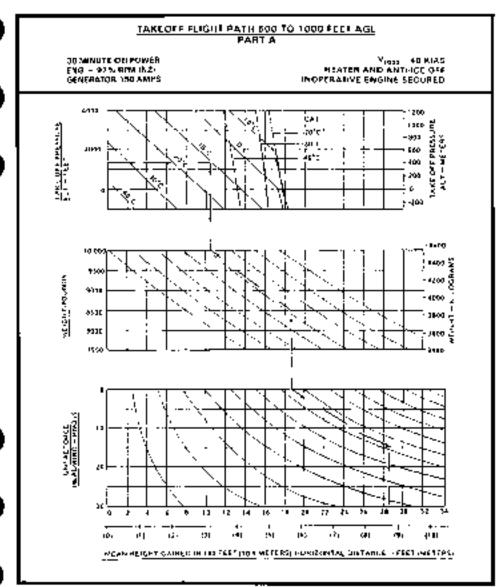


Figure 6-7. Takeoff (light path (Sheet 2 of 6)

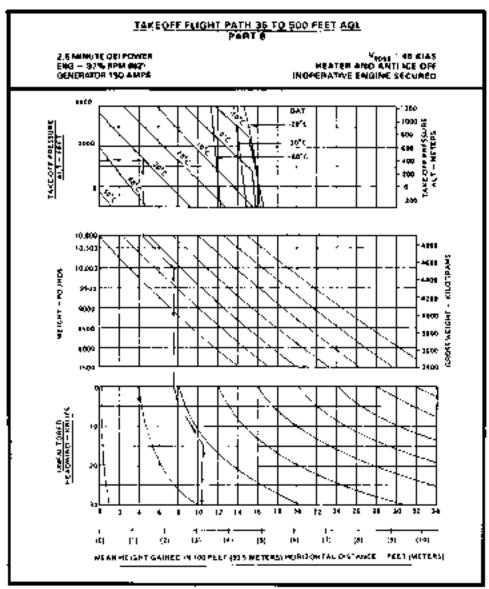


Figure 8-7. Takeoff (light palk (Eheel 3 of 6)

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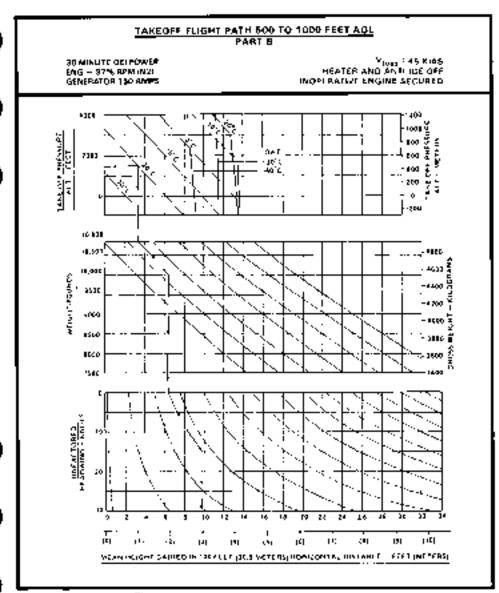


Figure 5-7. Takeoff (light path (Sheet 4 of 5)

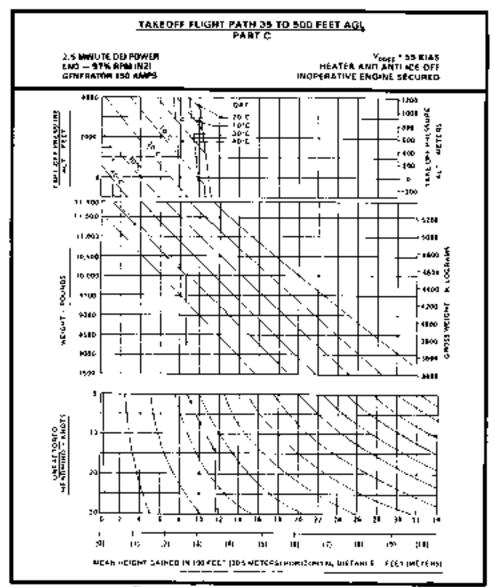


Figure 5-7. Takeoff flight path (Sheet 5 of 5)

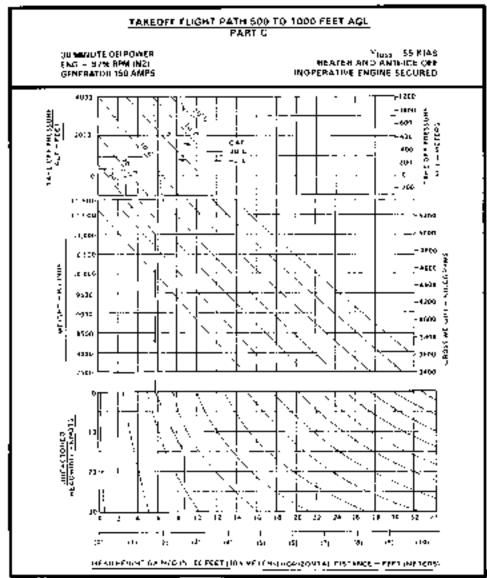


Figure 6-7. Takeoff Highs path (Sheet 6 of 6)

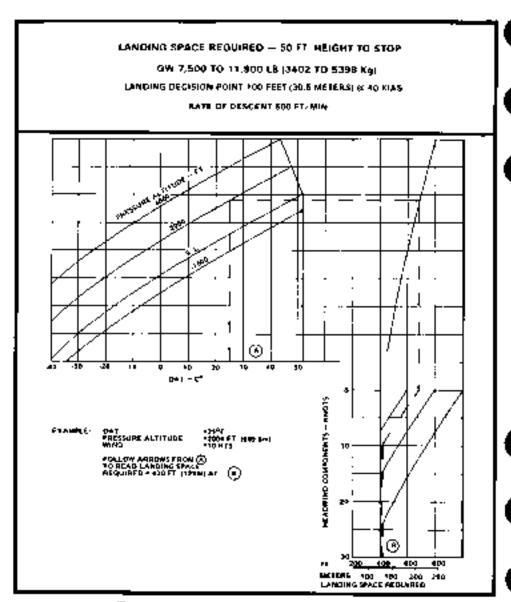


Figure 6-8. Lending space required chart