

EMERGENCY PROCEDURE TABS

ENGINE FAILURE
EMERG. RESTART 1

QMP00167

AP(RAN)19, CL

ROYAL AUSTRALIAN NAVY

IROQUOIS

HELICOPTER

PILOT'S CHECKLIST

Queensland Air Museum



026026

FIRE 2

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LIFT TAB

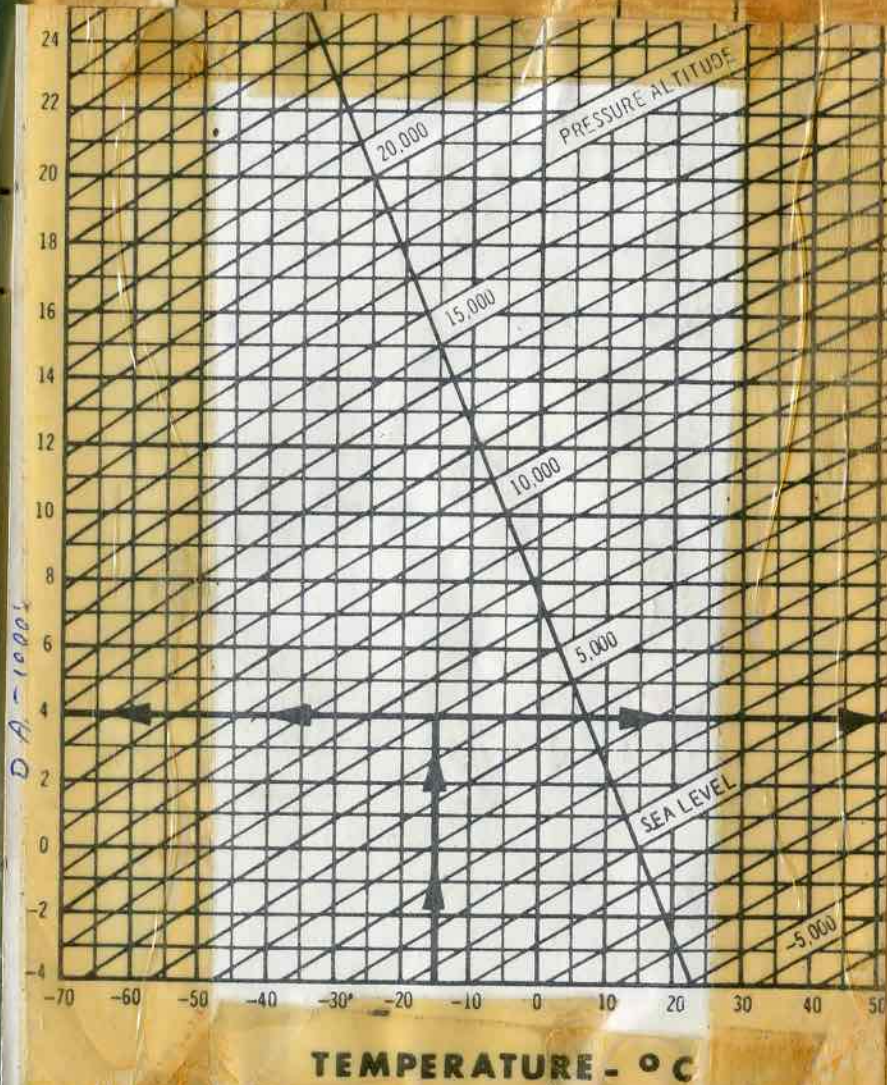
1. HEIGHT/VELOCITY
DIAGRAM
2. HOVER OGE
3. TAKE OFF GROSS
WEIGHT LIMITATION
- 4.5. RANGE CHART
- 6.7.
- 8-10. MAX. ENDURANCE

NORMAL PROCEDURES - SECTION 11

AMENDMENT RECORD CERTIFICATE

To record the incorporation of an Amendment List in this publication sign against the appropriate A.I. No. and insert the date of incorporation.

A.I. No.	AMENDED	DATE



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AMENDMENT RECORD CERTIFICATE

To record the incorporation of an Amendment List in this publication sign against the appropriate A.L. No. and insert the date of incorporation.

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ENGINE FAILURE

1. a. In Flight

Indications: (a) Rotor Rev. Decay
(b) Audio Warning

Actions: 1. Enter auto – 60 kts
2. May Day
3. Check: a. Harness
b. Warn crew
c. Fuel off
d. Electrics Off
e. Carry out E.O.L.

b. In Hover

Indications: (a) Yaw left
(b) Sink
(c) Drop in RRPM

Actions: 1. Freeze collective – stop yaw
2. Cushion impact with remaining lever

c. Low Level

Indications: (a) Rotor RRPM Decay
(b) Audio Warning

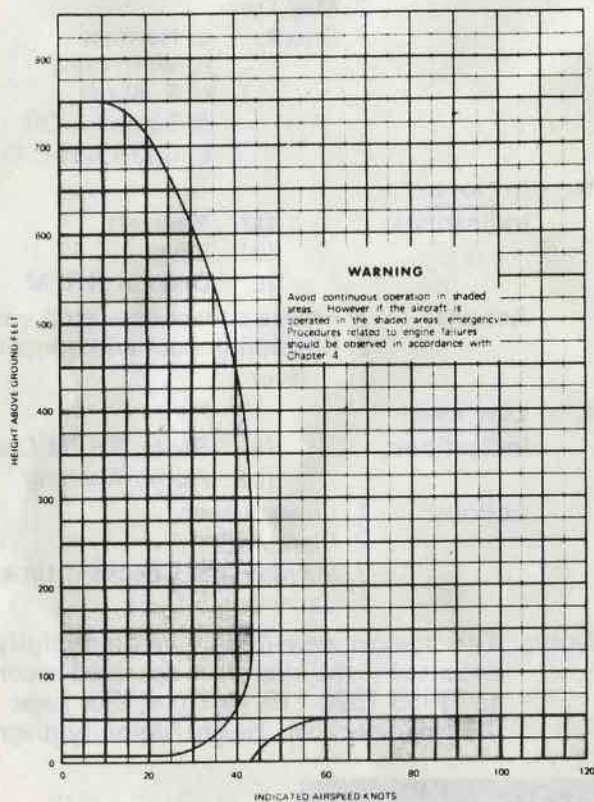
Actions: 1. Lower Lever
2. Flare A/C
3. Mayday and Checks if time
4. Carry out E.O.L.

Note: This manoeuvre will only be successfully executed if the aircraft is operated according to TM55-1520-219-10, Ch.4, (See page 1-2 this Checklist) Height/Velocity diagram.

EMERGENCY RESTART

It is stressed that this is purely an emergency procedure, and will need considerable altitude to be carried out successfully (3,000 ft). It is not to be attempted if the cause of flameout was mechanical.

- a. Enter auto
- b. Select landing area
- c. Governor to emergency
- d. Attempt manual start – closely monitoring E.G.T.



Height velocity diagram

ENGINE FIRE ON START

2. Indications: 1. Ground crew warning
 2. Fire warning light
- Actions: 1. Close throttle
 2. Motor engine on starter
 3. Main and start fuel – off
 Igniter circuit breaker – out
 4. Ground crew extinguish fire

ENGINE FIRE IN FLIGHT

- Indications: Fire warning light – on
- Action: 1. Establish autorotation, 60 Knots
 2. Close throttle and shut down engine
 3. Main and start fuel – off
 4. Mayday transmission
 5. Harness tight and warn crew
 6. Electrical power – off
 7. Make forced landing

ELECTRICAL FIRE

- Isolate defective circuit (circuit breakers)
 Land immediately
 Extinguish fire (Hand exting's)
 Switch off generators and inverters (circumstances permitting)

AIRFRAME FIRE

- Reduce airspeed
 Sideslip to keep fire clear of cockpit
 Land immediately
 Fight fire

TAIL ROTORS FAILURE

3. a. Forward Flight

- Indications:
1. Loss of response from rudder pedals
 2. Possible uncontrollable yaw to starboard (large collective application)

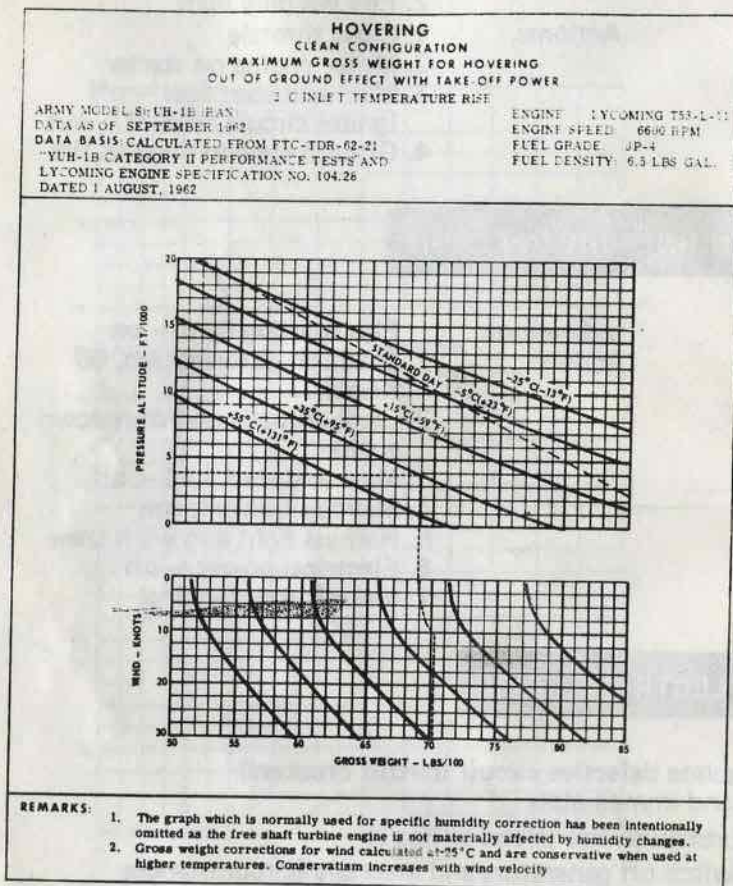
- Action:
1. Enter Autorotation
 2. Mayday transmission
 3. Hold 50-60 kts
 4. Switch off Fuel
 5. Make engine-off landing with forward speed sufficient to maintain directional control

If time permits attempt to find combination of I.A.S., skid and power sufficient to allow powered flight until a secure area can be reached.

b. In Hover

- Indications:
1. Rapid yaw to right
- Action:
1. Close throttle immediately
 2. Carry out hover E.O.L.

Note: Tail rotor emergencies are probably the most complex that the aircraft can suffer: To enable the pilot to cope with any situation he must have a thorough knowledge of Ch.4, AP(RAN)19, Vol.1, Bk.1. (TM55-1520-219-10, Jan. 1969).



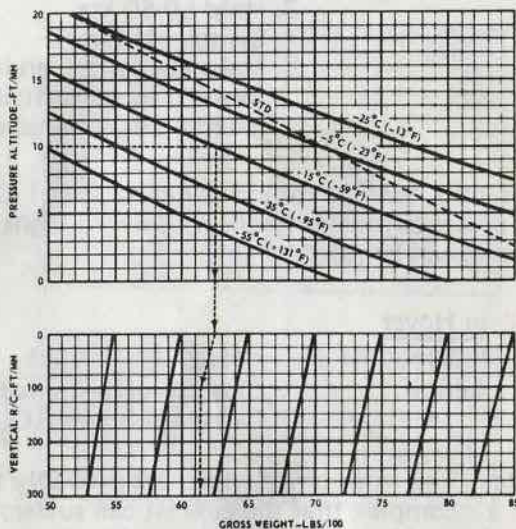
TAKE-OFF GROSS WEIGHT LIMITATION

CLEAN CONFIGURATION
 MAXIMUM GROSS WEIGHT FOR HOVERING
 OUT OF GROUND EFFECT WITH TAKE-OFF POWER
 2°C INLET TEMPERATURE RISE

ARMY MODEL(S): UH-1B (RAN)
 DATA AS OF: SEPTEMBER 1962

DATA BASIS: CALCULATED FROM FTC-TDR-62-21 "YUH-1B
 CATEGORY II PERFORMANCE TESTS" AND LYCOMING ENGINE
 SPECIFICATION NO. 104.28 DATED 1 AUGUST 1962

ENGINE: LYCOMING T53-L-11
 ENGINE SPEED: 6600 RPM
 FUEL GRADE: JP-4
 FUEL DENSITY: 6.5 LBS/GAL.



- REMARKS: 1. The graph which is normally used for specific humidity correction has been intentionally omitted as the free shaft turbine engine is not materially affected by humidity changes.
 2. Gross weight corrections for vertical rate of climb calculated at -35°C and are slightly conservative when used at lower temperatures.

Take-Off Gross Weight Limitation (RAN)

HYDRAULIC FAILURE

4. **Indications:**
1. Stiffness in controls
 2. Master caution panel light
- Action:**
1. Check hydraulic controls
 - a. Circuit breaker
 - b. Control switch
 2. Adjust I.A.S. below 70 knots to give satisfactory control
 3. Re-set master caution
 4. Pan call
 5. Make running landing as soon as practicable - 10-15 K.I.A.S.

HYDRAULIC LOCKING

- Indications:**
1. Locking of hydraulically operated controls
- Action:**
1. Turn Hydraulic Switch off, then on
 2. Repeat until successfully unlocked or carry out hydraulic out procedure as above

RANGE CHART STANDARD DAY

CLEAN CONFIGURATION - LONG RANGE

ARMY MODEL(S): UH-1B (RAN)
DATA AS OF: SEPTEMBER, 1962

DATA BASIS: FLIGHT TESTS (FTC-TDR-82-21, "YUH-1B
CATEGORY II PERFORMANCE TESTS") AND LYCOMING
ENGINE SPECIFICATION NO. 104.28

ENGINE: LYCOMING T53-L-11
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB./GAL

GROSS WEIGHT	PRESS. ALT.	POWER SETTINGS					RANGE - Nautical Air Miles												
		ENGINE SPEED	APPROX.		SPEED/KM/TS		1073	1000	900	800	700	600	500	400	300	200	100		
			TORQUE PERCENT	FUEL FLOW	TAS	CAS	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	
POUNDS	FEET	RPM	PSG	LB/HR	TAS	CAS	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL			
6000	SL	6600	29.3	558	113	113	218	203	182	160	140	120	102	80	60	40	20		
			28.5	526	112	109	229	213	192	168	147	126	107	84	63	42	21		
		2000	27.7	505	113	106	240	224	202	176	154	132	112	88	66	44	22		
		4000	26.8	480	112	102	252	234	211	184	161	138	117	92	69	46	23		
		6000	25.9	455	112	99	264	246	222	200	175	150	123	100	75	50	25		
		10000	22.9	408	106	91	280	260	234	208	182	156	130	104	78	52	26		
		12000	20.7	374	101	84	290	270	243	216	189	162	135	108	81	54	27		
		14000	19.0	346	95	78	295	275	248	224	196	168	137	112	84	56	28		
		16000	18.2	322	87	68	290	270	243	216	189	162	135	108	81	54	27		
		18000	18.0	314	80	60	274	255	230	206	182	156	128	104	78	52	26		
		20000	6600	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6500	SL	6600	30.5	565	113	113	215	200	180	160	140	120	100	80	60	40	20		
		2000	29.5	540	112	109	224	208	188	168	147	126	104	84	63	42	21		
		4000	28.9	520	113	106	233	217	196	176	154	132	108	88	66	44	22		
		6000	27.6	491	112	102	245	228	205	184	161	138	114	92	69	46	23		
		8000	26.4	462	110	97	256	238	214	192	168	144	119	96	72	48	24		
		10000	24.7	428	106	91	266	248	224	200	175	150	124	100	75	50	25		
		12000	22.3	394	101	84	273	254	229	204	176	152	127	102	76	51	25		
		14000	21.5	376	95	78	272	253	228	204	176	152	127	102	76	51	25		
		16000	21.2	363	87	68	258	240	216	192	168	144	120	96	72	48	24		
		18000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		20000	6600	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

REMARKS:

1. Engine Specification fuel flow increased 5% per MIL-M-7700A.
2. Range = Fuel Available x TAS
Fuel Flow
3. Cargo mirror installation will reduce range 6%.
4. Test data show that a continuous use of anti-ice bleed will reduce range 4 1/2% up to 10,000 feet and 14% at 15,000 feet.

Range Chart (Sheet 2 of 3)

Low Fuel Warning Light
Indication of the C.W.P. indicates that sufficient fuel remains for 20 mins. However, if either fuel boost pump has failed, this time is reduced to 5 mins.

OIL PRESSURE/TEMPERATURE

7. a. Low Transmission Oil Press or High Temperature

- Action:
1. Land as soon as possible
 2. Shut down, when position passed and acknowledged

b. Low Oil Pressure and/or High Temp. (eng.)

- Action:
1. Check oil valve open
 2. Land as soon as practicable

RANGE CHART STANDARD DAY

CLEAN CONFIGURATION - LONG RANGE

ARMY MODEL(S): UH-1B (RAN)
DATA AS OF: SEPTEMBER, 1962DATA BASIS: FLIGHT TESTS (FTC-TDR-62-21, "YUH-1B
CATEGORY II PERFORMANCE TESTS") AND LYCOMING
ENGINE SPECIFICATION NO. 104.28ENGINE: LYCOMING T53-L-11
FUEL GRADE: JP-4
FUEL DENSITY: 6.5 LB./GAL

GROSS WEIGHT	PRESS. ALT.	POWER SETTINGS					RANGE - Nautical Air miles													
		ENGINE SPEED	APPROX. TORQUE	FUEL FLOW	SPEED/KM/HR		1075	1000	900	800	700	600	500	400	300	200	100			
POUNDS	FEET	RPM	PSG	LB/HR	TAS	CAS	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL	LBS FUEL			
8000	SL	6600	29.0	545	102	102	201	187	168	152	133	114	94	76	57	38	19			
	2000		27.0	515	101	98	211	196	176	156	137	117	98	78	59	39	20			
	4000		27.1	503	100	94	214	199	179	160	140	120	100	80	60	40	20			
	6000		26.4	475	98	88	217	202	182	162	141	121	101	81	61	40	20			
	8000		26.2	460	91	81	213	198	178	158	139	119	99	79	59	40	20			
	10000		26.4	456	88	73	200	186	167	152	133	114	93	76	57	38	19			
	12000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	14000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	16000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	18000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	20000	6600		-	-	-	-	-	-	-	-	-	-	-	-	-	-			
8500	SL	6600	27.2	528	95	95	193	180	162	144	126	108	90	72	54	36	18			
	2000		27.0	514	95	92	199	185	167	148	129	111	92	74	55	37	18			
	4000		26.9	497	93	88	201	187	168	152	133	114	94	76	57	38	19			
	6000		26.8	479	88	81	198	184	166	144	126	108	92	72	54	36	18			
	8000		26.0	466	84	75	186	173	156	138	119	102	86	68	51	34	17			
	10000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	12000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	14000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	16000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	18000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	20000	6600		-	-	-	-	-	-	-	-	-	-	-	-	-	-			

REMARKS:

1. Engine Specification fuel flow increased 5% per MIL-M-7700A.
2. Range - Fuel Available x TAS
Fuel Flow
3. Cargo mirror installation will reduce range 8%.
4. Test data show that a continuous use of anti-ice bleed will reduce range 4 1/2% up to 10,000 feet and 14% at 15,000 feet.

Range Chart (Sheet 4 of 8)

BAIL OUT

8. Due to helicopter flight operations it is unlikely that bail out procedure would be required. However, the following procedure should be followed.

- Alert crew
- May day call
- Jettison doors
- Trim to cruise flight
- When ready bailout as required

MAXIMUM ENDURANCE

STANDARD DAY

CLEAN CONFIGURATION 2

8600 RPM

ARMY MODEL(S): UH-1B (RAN)

DATA AS OF: SEPTEMBER 1962

DATA BASIS: FLIGHT TESTS (FTC-TDR-62-21, "YUH-1B

CATEGORY II PERFORMANCE TESTS") AND LYCOMING

ENGINE SPECIFICATION NO. 104.28

ENGINE: LYCOMING T53-L-11

FUEL GRADE: JP-4

FUEL DENSITY: 6.5 LB/GAL.

GROSS WEIGHT POUNDS	PRESS. ALT. FEET	POWER SETTINGS					ENDURANCE - Hours											
		ENGINE SPEED RPM	APPROX.		SPEED/KNOTS TAS CAS	1073 LBS FUEL	1000 LBS FUEL	900 LBS FUEL	800 LBS FUEL	700 LBS FUEL	600 LBS FUEL	500 LBS FUEL	400 LBS FUEL	300 LBS FUEL	200 LBS FUEL	100 LBS FUEL		
			TORQUE PERS.	FUEL FLOW LB/HR														
5000	SL	8600	12.7	376.5	53.4	53.4	2.8	2.7	2.4	2.1	1.9	1.6	1.3	1.1	0.8	0.5	0.3	
	2,000		12.7	350.3	54.0	52.5	3.0	2.8	2.5	2.2	1.9	1.7	1.4	1.1	0.8	0.6	0.3	
	4,000		12.6	342.3	54.7	51.6	3.1	2.9	2.6	2.3	2.0	1.8	1.5	1.2	0.9	0.6	0.3	
	6,000		12.6	325.5	55.4	50.7	3.3	3.1	2.8	2.5	2.2	1.9	1.6	1.3	0.9	0.6	0.3	
	8,000		12.6	310.0	56.2	49.8	3.5	3.2	2.9	2.6	2.3	1.9	1.6	1.3	1.0	0.6	0.3	
	10,000		12.6	296.3	57.0	49.0	3.6	3.4	3.0	2.7	2.4	2.0	1.7	1.3	1.0	0.7	0.3	
	12,000		12.6	284.7	57.9	48.2	3.8	3.5	3.2	2.8	2.5	2.1	1.8	1.4	1.1	0.7	0.4	
	14,000		12.7	273.0	58.9	47.5	3.9	3.7	3.3	2.9	2.6	2.2	1.8	1.5	1.1	0.7	0.4	
	16,000		12.7	261.9	59.9	46.7	4.1	3.8	3.4	3.1	2.7	2.3	1.9	1.5	1.1	0.8	0.4	
	18,000		12.8	254.0	60.8	45.9	4.2	3.9	3.5	3.1	2.8	2.4	2.0	1.6	1.2	0.8	0.4	
	20,000	6600	13.0	248.4	61.5	44.9	4.3	4.0	3.6	3.2	2.8	2.4	2.0	1.6	1.2	0.8	0.4	
5500	SL	8600	13.9	388.1	54.4	54.4	2.8	2.6	2.3	2.1	1.8	1.5	1.3	1.0	0.8	0.5	0.3	
	2,000		13.9	370.0	55.1	53.5	2.9	2.7	2.4	2.2	1.9	1.6	1.4	1.1	0.8	0.5	0.3	
	4,000		13.9	354.0	55.8	52.6	3.0	2.8	2.5	2.3	2.0	1.7	1.4	1.1	0.8	0.6	0.3	
	6,000		13.9	338.3	56.6	51.8	3.2	3.0	2.7	2.4	2.1	1.8	1.5	1.2	0.9	0.6	0.3	
	8,000		13.9	323.3	57.5	51.0	3.3	3.1	2.8	2.5	2.2	1.9	1.5	1.2	0.9	0.6	0.3	
	10,000		13.9	309.7	58.4	50.2	3.5	3.2	2.9	2.6	2.3	1.9	1.6	1.3	1.0	0.6	0.3	
	12,000		13.9	297.9	59.4	49.4	3.6	3.4	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.7	0.3	
	14,000		14.0	286.3	60.3	48.6	3.7	3.5	3.1	2.8	2.4	2.1	1.7	1.4	1.0	0.7	0.3	
	16,000		14.1	277.5	61.1	47.7	3.8	3.6	3.2	2.9	2.5	2.2	1.8	1.4	1.1	0.7	0.4	
	18,000		14.5	274.3	61.6	46.5	3.9	3.6	3.3	2.9	2.6	2.2	1.8	1.5	1.1	0.7	0.4	
	20,000	6600	15.4	275.0	61.7	45.0	3.9	3.6	3.3	2.9	2.5	2.2	1.8	1.4	1.1	0.7	0.4	

REMARKS: 1. Engine Specification Fuel Flow increased 5% per MIL-C-5011A
 2. Cargo mirror installation will reduce endurance 3%.
 3. Endurance data not shown where power required exceeds normal rated power available

Maximum Endurance Chart (Sheet 1 of 4)

SECTION II

NORMAL PROCEDURESTABLE OF CONTENTS

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EXTERNAL CHECK

1. Before Manning
 - a. Obtain briefing
 - b. Check and initial authorisation
 - c. Check and initial TA100
2. Approaching Aircraft
 - a. Ensure that a/c is into wind
 - b. Check fire guard is posted
 - c. Check fuel or oil spillage
 - d. Check a/c attitude appears normal
3. External Check
 - Pitot – Remove cover, no cracks or blockages
 - Main Rotor – Condition of under surfaces
 - Windscreen – Condition, cleanliness, wipers
 - Nose – Skinning
 - Radio Bay – Open, security radios and leads, no water or dust
Close
 - Underside – Search and landing lights stowed
Condition of skin
 - Nose Bubble – Free from dirt, no loose articles, condition of tail rotor push/pull rods
 - Pilots Door – Condition
Jettison pins showing
 - Static Vent – Clear
 - Winch – Condition and stowed
 - Nav. Lights – Upper and lower condition
 - Skid – Condition – no two bolts adjacent pulled
 - Rear Cabin – Check security, loose articles, door – shut
 - Starboard
 - Ext. tank – Security
undo cap – check contents, refasten cap. Check jettison pin safe. Check rear bolt attachment.
 - Main
 - Fuel Tank – undo cap, contents, refasten

- Fire Access (Both) – open – check oil level and filler caps of Tx oil, hydraulics, and engine oil. Cleanliness – no spillage.
- Engine Cowls – Secure
- Heater Compartment – Open – empty – close
- Baggage Compartment – Open – check flight idle stop, push rod to tail rotor, tail rotor servo for leaks, baggage for security
- Tail Pipe – No cracks
- Anti-Collision light – Intact
- U.H.F. Aerials – Upper and lower – check
- T/R Drive Hatch – Check drive coupling, check security of compressor fuel drain.
- T/R Cable Hatch – Check cable
- Fuselage Right – Check skin
No wrinkles
All under panels – secure
- Elevator Right – Condition and play
- Pylon Right – Condition tailskid
– 42° gearbox oil level
T/R cable – condition
T/R gearbox oil level and filler cap
– Tail Light
- Tail Rotor – Baldes – leading and trailing edges – security of leakages, no oil leaks from gearbox
- Pylon Left – Skin condition – fasteners

- Elevator Left – Condition and play
- Fuselage Left – Skin – no wrinkles all panels secure. Fasteners.
- Left Engine Cowls – Check secure
- Jet Pipe – Check cracks
- T/R Cable Hatch – Check cable
- T/R Drive Hatch – Check drive. Security of compressor fuel drain.
- Fire Panels – Check for fuel leaks
- Invertor Compartment – Open – check – security – 2 circuit breakers in, close.
- Drains – Check master drain, investigate spillage
- Battery Compartment – Security battery and leads. Security all electrics. 4 circuit breakers in. No acid spillage – close
- Ground Supply – Check cover locked
- Port Ext. Tank – As for Starboard Tank
- Skid – Condition
- Cabin doors – Condition
- Nav. lights – Check
- Static vent – Clear
- Door Jettison Pins – Showing
- Nose Bubble – Clear, check T/R rods
- Rotor Head – Check – oil levels in pillar block and grips (4), upper surface blades. All push rod connections. Damper times. (4-6 secs), servo jacks – connections and leaks. Check connections to synch. elevator. Check short shaft. Check debris guard. Condition of upper cabin surface.

INTERNAL COCKPIT CHECK

General

Adjust tail rotor pedals
 Adjust seat for height and position
 Secure port seat harness
 Ensure all a.c. circuit breakers in
 Fasten safety harness — check rel.
 Controls — full and free movement

Roof Panel

Rotor brake	Off
D.C. circuit breakers	As required
Dome light	Off
Pitot heat	Off
Nav. lights	As required
Anti-coll. light	Off
Windscreen wipers	Off
Cargo switch	Off
Cabin heat	Off
Defrost	Off
Lighting switches	As required
Inverters	Off
Main generator switch	On
Standby/Start gen.	Start
Non-ess. busbar	Normal
Battery	On
O.A.T. gauge	Note reading

Instrument Panel

Fire warning light	Test
Rotor brake warning light	Test
Temp. & Press. gauges	Condition
Compass slaving	In
N1, N2, and E.G.T. gauges	Condition
Flight Instruments	Condition
	Set altimeters
	Reset clock
	E2B compass and correction card
Door jettison (both)	Wire locked

Pedestal panels

Force trim	On
Hydraulics	On
Cable Cutter	Guarded Wire locked
Master Caution Panel	Test. Reset
De-ice	Off
Oil valve	Open
Main fuel	On
Start fuel	On
Audio	Off
Transfer pump	Off
Governor	Auto
U.H.F. control box	Select chan. Off
S.M.A.D.F.	Off
V.H.F. control box	Off
<u>Pedestal panels</u>	
Hot mic.	On
Cabin I/C	As required
A.D.F. tels.	Off
V.H.F./U.H.F.	As required
Meter sens.	Min.
Aerial	Lower
Squelch	On
Tone	Off
Ext. fuel jett. sw.	Off, guarded
Fuel transfer pump	Off
Ext. tank jettison	Wire locked
<u>Collective lever</u>	
Collective lever	Fully down
Search light	Off
Landing light	Off
Governor Incr/Decr	Decr. 11 secs
Throttle	Fully open, fully close, Fully Open, Close to Flt. idle Set 10° below stop
Map Pack - stowed	

5.

Rear Cabin

To be carried out by the aircrewman if carried. If not the pilot should check the appropriate items before strapping in.

Doors	Shut securely
Seat belts	Fastened
First aid packs	Both stowed
Role equipment	Checked and correctly stowed

6.

STARTING/RUN-UP

Starting

Fireguard posted

All clear

Collective

Cyclic

Starter trigger

Clock

Fully down

Centralise

Depress, hold.

Start

At 25% N1 or 400° E.G.T. whichever occurs first, switch off start fuel.

At 40% N1 or after 40 secs., whichever occurs first, release starter trigger.

Oil pressure warning Lt. - Out

If after 40 secs. N1 has not reached 40% the engine may still accelerate away but the closest attention must be paid to the E.G.T.

If the E.G.T. exceeds:-

(i) 650° for 5 secs. total

(ii) 760° once

during starting and acceleration to flight idle, the start must be aborted by:-

Closing the throttle

Switching off main and start fuel

Re-energising starter and motor engine for 20 seconds.

The overtemp condition must be recorded in the Form TA100.

A cooling period of 3 mins. must be left before attempting a restart, and only 3 starts are to be attempted in a one hour period.

After start up:

Slowly open the throttle to accelerate the engine to flight idle (on the flight idle stop), carefully monitoring the E.G.T.

Inverter switch

Stand by/Start gen.

Start fuel

Temps. and Pressures

U.H.F.

S.M.A.D.F.

V.H.F.

Transmission Oil Pressure

Spare

Stand by

On

Check

T/R

On

On

40 psi minimum with main rotor speed above 230 rpm

7.

Run up

Engine oil pressure

25 psi min.

Fuel

Left fuel boost

Out

Pressure

Master Caution

Right fuel boost

Out

Pressure

Master Caution

Leave both pumps off for

10 secs.

Fuel gauge

Test

Left fuel boost

In

Pressure

Master Caution

Right fuel boost

In

Pressure

Master Caution

Electrical

Spare inverter

Check phases (115 volts)

Inverter switch

Main

Main inverter

Check phases (115 volts)

Phase selector

AC

Main generator

Off. Loadmeter

Non-ess. busbar

Manual

VM selector to Batt., Main Gen., Standby.

ESS. Bus. Non ess bus, check voltage in each case (27 volts)

Non-ess. busbar

Normal, check voltage zero

Main generator

On. Voltage up, loadmeter

VM Selector to Ess. bus. Standby gen., Main gen..

Note voltage in each case and leave on Main gen. (28 volts)

Loadmeters

Main indicates

Standby zero

Hydraulics

Switch off. Check cyclic and collect. can be moved. Switch on. Check control response.

Force Trim

Switch off. Check cyclic and pedals. Switch on. Trim release button. Check operations.

Master Caution Panel

Test. Check lights on warning panel and master caution. Reset.

GovernorThrottle

Gov. Incr./Decr.
Auto/Emerg. switch

Open. set 70%
Full increase
Emerg. for 5 secs. Check
N1 drops. Reselect Auto
Check N1 70%. Monitor
EGT.

Throttle

Close to flt. idle.
Check N1 56 - 58%

Throttle Opening

Gov. Incr./Decr.
Throttle

Full decrease
Fully open
Check E.G.T.
N2 6000 ± 50 R.P.M.
Check R.P.M. low wng. lt.

Audio

Gov. Incr./Decr.

On. Check
Full increase
Audio out
Wng. Lt. out
Max. N2 at 6700 ± 50
Set 6600

Throttle friction

De-Ice/Hot Air "On"
"Off"

Set
Note E.G.T. increase
Note E.G.T. drop

WARNING

If EGT does not increase assume ANTI-ICE
Valve stuck open - a power reduction must
be expected.

8. PRE-TAKE OFF VITAL ACTIONS

Throttle	Fully open N2 6600
Friction - throttle collective	Adjusted Adjusted
Fuel	Switches on Contents Pressure
Temps. and Pressures	Read. Check limits
Flight Instruments	Check. erect. and set as necessary. Compass heading, QNH. As required
Pitot Heat	On
Anti-coll. light	Secure
Harness	Secure
Hatches	Crew, Pax., cargo secure
Rear cabin	Call for instructions
Radio	
<u>After Take Off Check</u>	
Power to hover	Note Torque N1 and E.G.T.
Temps. and Pressures	Check
R.P.M.	Check 6600 N2
Control response	Normal
Lookout	

9. PRE-JOINING CHECK (FREDA)

Fuel	Note contents
Radio	R/T calls
Engine	Temps. Pressures
Direction	Joining and approach plan W/V
Altimeter	Local Q.N.H. set.

PRE-LANDING CHECK

Throttle	Fully open
Throttle friction	Adjusted
R.P.M.	6600 N2
Fuel	Contents Pressure
Temps. and Pressures	Check
Harness	Secure
Rear Cabin	Crew, Pax., Cargo Secure

AUTOROTATION CHECK (HASEL)

Height	Sufficient
Area	Authorised Suitable for E.O.L.
Security	Harness Loose articles
Engine Ts. and Ps.	Check
Lookout	

10.

SHUT DOWN PROCEDURE

Collective	Fully down
Cyclic	Check disc level
Throttle	Close to Flt. Idle
Audio	Off
Circuit Breakers	Anti-ice. Out Ignition. Out
Pitot heat	Off
Anti-coll light	Off
Inverter	Off
Start/Standby gen.	Start
U.H.F.	Off
S.M.A.D.F.	Off
V.H.F.	Off
Transfer Pump	Off
Throttle	Fully closed after two minutes

The E.G.T. limit may be exceeded during shut down if the Throttle is not completely closed, or is not kept fully closed during the rundown including the period after selecting main and start fuel off.

Main fuel switch	Off at 20% N ₁
Start fuel switch	Off at 20% N ₁
Rotor Brake	On at 100 N _r
When the rotor blades have stopped completely:—	
Starter circuit breaker	Out
Rotor brake	Off
Gov. Incr./Decr.	Full decrease
Battery Master	Off

AIRFRAME LIMITATIONS1. GENERAL

The aircraft has been cleared for those manoeuvres appropriate to helicopter operations in all ambient sea level temperatures.

2. ROLES

Training
S.A.R.
Medical Evacuations
Freighting
Communications

3. WEIGHT

The weight of 8500 lbs. for all forms of flying must not be exceeded.

4. C.G.

4500 lbs. to 6000 lbs. — 125" — 138"
6000 lbs. to 8500 lbs. — 125" — 136"

5. AIRFRAME

The aft limits of C of G will be approached with only one pilot and full fuel. In this condition extreme care must be taken in using the baggage compartment. Harsh tail down movements are to be avoided. For training flights a 200 lb. ballast weight will be carried at Station 78.4.

6. ROTOR GOVERNOR

- (i) Governor should be set at 6600 engine R.P.M. for all flights.
- (ii) Governor does not control rotor revs. in autorotation.

SPEEDS

Refer to TM 55-1520-219-10 (Jan. 1969) Chapter Sect. II Figure 7-5 Height Velocity Diag., Chap. 7, Sec. II, Fig. 7-1 Operating Limits and Instrument Panel Charts.

8. HEIGHT

The aircraft should not be flown above 10000 ft. without safety equipment.

9. MANOEUVRES

No aerobatic manoeuvres are allowed.
Max. speed sideways and backwards - 30 kts.

10. EXTERNAL FREIGHT

Loads up to 4000 lbs. may be carried, provided 8500 AUW is not exceeded and speed is governed by the load handling qualities.

11. INSTRUMENT COLOURED MARKINGS

The coloured markings on instruments are not a complete statement of the appropriate limitations, but are given as a practical aid to the pilot.

The indications are as follows:-

Red radial lines	Max. or min. limits
Yellow arc	Precautionary or transient ranges
Green arc	Normal operating range
Red arc	Ranges in which operation is prohibited

12. INSTRUMENT AND NIGHT FLYING

- (i) Flight below 50 knots is not permitted in actual instrument conditions.
- (ii) The angle of bank should be restricted to 30 degrees.

LIMITATIONS

Max. airspeed	120 kts	
Max. airspeed	70 kts	
Hyd. Out		
Max. Glide Distance	294 R.R.P.M.	
in Auto	73 kts	
Min. R of D	45 kts	
in Auto	294 R.R.P.M.	
Range Airspeed	95-115 kts	According to
Endurance Airspeed	60 kts	aircraft weight
		and density
		altitude

Note: Apart from 1 and 2 above, all other figures are approximates, and the TM 55-1520-219-10 must be checked for accurate speeds.

LIMITATIONS

13. WINCHING

- (a) The winch is cleared for a maximum load of 600 lbs.
- (b) When reeling in under no-load condition a tension of 15 lbs. min. should be maintained on the cable at all times to ensure a uniform wrapping of the cable on the drum.
- (c) An excess of lateral C.G. limits may occur on personnel hoist mission made with single pilot and hoist operator with less than 250 lbs. fuel load.
- (d) Usable cable 90 ft.
- (e) A maximum of 10 lifts may be carried out at 30 second intervals during a period of 30 minutes. A cooling time of 5 minutes is to be observed after 30 minutes operating period, except in an emergency.

14. Rotors The aircraft is not to be started in winds in excess of 40 knots except in an emergency.

15. LIMITED POWER

- a. On take-off's from confined areas the GO/NO GO card on the instrument panels are to be used.
- b. The following figures apply to a 60 kt. power check to be carried out before commencing an approach and landing.

<u>Power Difference Between</u> <u>60 kt. Cruise and Full Power</u>	<u>Landing</u>
1. 10 lbs. torque	Hover O.G.E.
2. 6-10 lbs. torque	Hover I.G.E.
3. 4-5 lbs. torque	Zero/Zero
4. Less than 4 lbs.	Running

- c. Full power is that figure when any engine limit is reached, and for R.P.M. droop 200 N2.

ENGINE LIMITATIONS

1. Engine Oil Limits

Min.	—	25 psi
NORM	—	60-80 psi
Max.	—	80 psi
Max. temp	—	93°

2. Tx. Oil Limits

Min.	—	30 psi
Norm.	—	40-60 psi
Max.	—	70 psi
Max. temp	—	110°

3. Rotor Limits

294 – 324 continuous
339 R.R.P.M. Max. in Auto

4. Fuel Pressure

Max. Range	5-20 psi.
Normal	12-15 psi *

5. Max. Torque

50 psi

6. Tachometer Limits

6000 – 6600 R.R.P.M.	0-70 kts
6400 – 6600	Above 70 kts
6600	Max.

7. Max. Gas Producer

101.5% maximum

8. E.G.T. Limits

- a. Start – 650° for 5 secs
760° once
- b. 30 min limit – 620° – 640°
- c. 5 min. limit – 640°
- d. Continuous – 390° – 620°

MISCELLANEOUS

1. a. Engine Oil Tank Capacity - 3.25 galls
b. Airspace .8 galls
c. Type OX 27
2. a. Tx. Oil Tank - 2.25 galls
b. Type OX 27
3. a. Hydraulic Tank - 4 pints
b. System Total 8 pints
c. Oil Type OM 15
4. Fuel - Internal 1072 lbs.
Fuel - External 393 per tank
Type AVCAT F44 Spec. DEF(AUST)207A;
MIL-J-5624G; AM.1JP5
Alternative Fuel: AVTUR FSII F-34;
AVTUR F-35.
5. Generators - Main 28 volt/300 Amps
S/By 27.5 volt/200 Amps
6. Battery - Nickel Cadium
34 amp 24 volt
7. Invertors 115 volts, 3 phase a/c. 400
Two each of cycles per sec.
8. Airframe
 - a. Length 52 ft. 11¼"
 - b. Max. width 9ft. 4"
(Synch. Elevator)
 - c. Rotor Diameter 44 ft.
 - d. Ground Clearance 12-15"
9. For operational reasons when nominated fuels in (4) above are not available, automobile gasoline can be used for up to 50 hours before a hot end inspection is required. Low grade fuel (80 OCT) should be used, and all fuels with additives avoided (i.e. I.C.I.).

Note: Reference to AP(RAN)19, Vol.1, Bk.1, TM 55-1520-219-10, Prior to operation with alternative fuels to determine if additional limitations apply.

