

Project **YAK-18T**

by **PWDT**

NORMAL PROCEDURES



PRE-FLIGHT

Cockpit

Landing Gear Handle	Down and Latched
Magneto Switch	Off
Brake	On
Battery Switch	On (up)
Engine Instrument Switch	On
Fuel Quantity	Sufficient
Engine Instrument Switch	Off
Battery Switch	Off (mid position)
Main Air Valve	Open 9/10ths
Main Air Supply	30-45Kg/cm ²
Cowl Shutters	Open
Flap Handle	Up
Oil Cooler Door	Closed
Emergency Air Valve	Closed

Do not open the Emergency Air Valve

External

Carry out normal external walk-around check including:

Engine Oil Level	Sufficient (9 L min)
Fuel	Sufficient
Fuel Drain	Check for Water
Propeller	Pull 8 blades minimum
Main Air Purge Valve	Drain, Secure

IF FINAL FLIGHT OF DAY:

Air Line Purge Valve

Drain, Secure

OPERATING LIMITATIONS SUMMARY

Speeds

Rotate	135 kph (59 kts)
Climb out	170 kph (91 kts)
Cruise	225 kph (121 kts)
Max Cruise	262 kph (141 kts)
Gear extend	200 kph (108 kts)
Flap extend	170 kph (91 kts)
App with Flap	150 kph (81 kts)
App without Flap	155 kph (83 kts)
Touchdown	130 kph (70kts)
Stall Clean	125 kph (67 kts)
Stall with Flap	114 kph (61 kts)
Never Exceed (Vne)	300 kph (161 kts)
Glide	165 kph (89 kts)

MAX G LIMITS

+6.5 / -3.2

CROSSWIND LIMITS

T/O	23 KTS
LANDING	19 KTS

Power Settings

Max RPM	99.9% (5 min max)
Max Cont RPM	82%
Idle RPM	26%

ENGINE PRIME (If Required)

Prime engine with one stroke for every 10°C below 100°C. Pull engine through 8 blades. Do not pull engine through if cylinder temp above 80.

Magneto Switch	Off
Battery Switch	Off
Operate primer	Right to Prime
Pull engine through	

BEFORE START

Battery Switch	On
Generator	On
Ignition Switch	On
Landing Gear Lights Switch	On
Engine Instruments Switch	On
Beacon	On
Boost / Throttle	Full, Free, Set 1" Open
Prop	Fully Fine
Carburettor Heat	Off
Oil Cooler Door	Closed
Cowl Shutters	Open
Main Air Valve	Open
Main Air Pressure	30-45 Kg/cm ²
Emergency Fuel Shutoff	Open
Emergency Air	Closed
Primer	Left - 2/3 strokes
Fuel pressure	Check rise
Primer	Turn right to assist start
Engine / Flight Instruments	Check

Oil Quantity

Minimum	8 L
Aerobatics	Less than 14 L
Normal	13-14 L
Long Cruise	15-16 L
Maximum	20 L
Total tank capacity	30 L

Oil Pressure

Normal	4 - 7 kg/cm ²
Minimum at Idle	1 kg/cm ²

Oil Temperature

Min Oil Cooler Inlet	40°C
Norm Oil Cooler Inlet	50 - 65°C
Max Inlet (Continuous)	75°C
Max Inlet (15 Minutes)	85°C

Fuel Pressure

Normal	0.2 - 0.5 kg/cm ²
Minimum at Idle	0.1 kg/cm ²

Cylinder Head Temperature

Normal	140-210°C
Minimum	120°C
Max (Continuous)	230°C
Max at Shutdown	OAT <25°C: 150°C OAT >25°C: 165°C

ENGINE START

Brakes	On
Starter Button	Press
Magneto Switch	1+2 after engine starts to fire

Do not turn mags on until engine fires or it might run backwards; hold starter in for 15 secs after engine starts to clear excess fuel in primer; if prop blades rotate left to right cease pressing starter immediately and retry. If engine runs backwards at all, check main air pressure rises afterwards.

AFTER START

Engine RPM	50%
Temps & Pressures	Green
Gills	Close to warm-up
Oil Cooler	Close to warm-up
Carb Heat	On to warm-up
Remaining switches	On as required
Flaps	Deploy; Check; Retract
Primer	Locked
Radio	On; Frequency set
Intercom	On
Transponder (if equipped)	Standby
Gear retract warning light	Check
Warning Lights	Check
Stall Horn	Check
Volts and Amps	Check / Generator Light Out
Main Air Valve	Confirm Open
Main Air Pressure	Check active
Taxi Light	As required

Generator

Normal Volts	26.5V - 28.5V
Minimum Volts	24V
Max Current	54A

Main Air System

Minimum for start	20 kg/cm ²
Minimum for take-off	30 kg/cm ²
Normal	30 - 45 kg/cm ²
Maximum	55 kg/cm ²

TAKEOFF CHARACTERISTICS

Firm Grass

Mass	Speed	Take-off Run	10m Height
1650 kg	135 kph	370 m	670 m
1510 kg	125 kph	265 m	540 m

Soft Grass

Mass	Speed	Take-off Run	10m Height
1650 kg	125 kph	500 m	920 m
1510 kg	120 kph	455 m	830 m

Before using greater than 60% RPM for taxi: Min Oil temperature 40°C; Min CHT 150°C. Once CHT reaches 150°C, set 60% RPM with boost / throttle and select coarse pitch to quicken warm up.

ENGINE RUN-UP

Cowl Shutters	Open
Oil Cooler	Open
Propeller	Fully Fine
Carb Heat	Cold
Boost / Throttle	70%
Engine Instruments	Check
Prop	Pull Coarse 3 times
	Check RPM decrease
	54%
Magnetos	Check; Max allowable drop 3%
Carb Heat	Check RPM drop;
	Check Inlet Temp rise;
	set off
Prop	Set 64%
Boost / Throttle	Open 10 units; ensure
	Constant Speed Unit
	holds rpm; repeat
Prop	Fully fine
Boost / Throttle	58%
Amp/Volt meter button	Press: 28V
Boost / Throttle	Idle
Amp/Volt meter button	Press: 23V
Generator Warning Light	Check: On
Boost / Throttle	Open smoothly to 80%
	Set 50%

LANDING CHARACTERISTICS

Firm Grass

Mass	Speed	Landing Run	From 15m
1650 kg	130 kph	470 m	790 m
1510 kg	120 kph	390 m	690 m

Soft Grass

Mass	Speed	Landing Run	From 15m
1650 kg	125 kph	350 m	650 m
1510 kg	124 kph	350 m	610 m

BEFORE TAKE OFF

Pilot Door	Closed; locked
Elevator Trim	Neutral: Green Light
Magneto Switch	1+2
Warning Lights	Check
Starter Ring	Turned to lock
Primer	Locked
Heading Indicator / Compass	Synchronize
Engine / Flight Instruments	Check
Transponder (if equipped)	Set
Taxi Light	As required
Propeller	Fully fine
Flaps	Up
Cowl Shutters	Open
Oil Cooler Door	As Required
Carb Heat	Off
Main Air Valve	Open
Main Air Pressure	30 Kg/cm ² minimum
Fuel Quantity	Sufficient
Emergency Fuel Shutoff	Open
Passenger Door	Closed; Locked
Flight Controls	Full and Free

TAKE OFF

Rotate at 110 Kph; Unstick at 130 Kph; Climb at 170 Kph

At safe height:

MAP	9.5
RPM	82%

Weight

	Advanced Training	Primary Training
Empty plus	1217 kg	1217 kg
Full load gives	443 kg	303 kg
Take off mass	1660 kg	1520 kg

Full load consisting of

Fuel	100 kg	100 kg
Oil	18 kg	18 kg
Pilot	80 kg	160 kg (2 Persons)
Trainees	240 kg (3 persons)	-
Equipment (seat cushions/ parachutes etc)	5 kg	25 kg
Permissible CG Position range, % MAC	13.0 - 26.0	13.0 - 20.5

CRUISE

Fuel Pressure	0.2 - 0.5 kg/cm ²
Oil Temperature	40 - 75 °C
Oil Pressure	4 - 6 kg/cm ²
Main Air Pressure	30 - 55 kg/cm ²
Engine CHT	220 °C max
Electrics - Volts	26.5 - 28.5V
Electrics - Amps	54A Max

BEFORE LANDING

Main Air Supply	30 - 55 Kg/cm ²
Speed	<200 Kph
Landing Gear	Down, 3 Greens / Poles
Gear Retract Safety Latch	Locked
Landing / Taxi Lights	As required
Propeller	High
Fuel	Sufficient
Speed	<170 Kph
Flaps	Down
Cowl Shutters	As required
Oil Cooler	As required
Doors	Closed; Locked
Harness	Secure

Maximum duration of Taxi / Landing Lights On not more than 5 mins.

AFTER LANDING

Gear Retract Safety Latch	Locked
Flaps	Up
Elevator Trim	Neutral: Green Light
Landing Light	Off
Oil Cooler Door	Open
Cowl Shutters	Open

ENGINE SHUTDOWN

Cowl Shutters	Open
Oil Cooler Door	Open
Non-essential electrics (all but first five from left + beacon)	Off
Boost	28 - 34%
Prop	Fine
CHT	OAT <25°C: 150°C max OAT >25°C: 165°C max
Magneto Switch	Off

If the aircraft is expected to fly again within 1 hour, open the throttle as engine stops to re-prime cylinders.

AFTER ENGINE STOPS:

Boost	Closed
Main Air Valve	Closed
Electrical Switches	All Off
Oil Cooler Door	Closed
Cowl Shutters	Closed
Main Air Purge Valve	Drain, Secure

AEROBATIC MANOEUVRES

The Yak 18T with M-14P can perform the following aerobatic and elementary flight manoeuvres. The crew determine the flight plan and altitude for aerobatics in each specific case.

Aircraft weight for aerobatics should not exceed 1,500kg, the number of crewmembers must not be more than 2 persons.

While piloting, manoeuvre recovery must be terminated at a level not lower than 1000m. While performing aerobatics the g-load should not purposely exceed +3.5g to +4g.

Prior to performing any elementary and advanced flying, trim the aircraft to an IAS of 180 km/h and SET the engine crankshaft speed of 70%, i.e. Normal II engine regime.

Perform full check of the engine instruments

To prevent against the engine intorelable spin-up while performing elementary and advanced flying, do not exceed the speed over 300 km/h (see aircraft flying limitations)

It is prohibited to perform any aerobatic manoeuvre without the appropriate type-training.

The aircraft is cleared to perform the following manoeuvres:

- Steep turns 45° and 60° of bank
- Figure Eight
- Combat turn
- Diving
- Steep Climb/Zoom
- Spiral
- Slipping
- Barrel/Slow roll
- Flick/Snap roll
- Normal 360° loop
- Half-loop
- Half-roll
- Spins

AEROBATIC MANOEUVRES - ENTRY SPEEDS

Steep turn 45°	180 km/h
Steep turn 60°	200 km/h
Figure Eight	200 km/h
Combat Turn	280 km/h
Diving	150 km/h
Steep Climb/Zoom	280 km/h
Spiral	180 km/h
Slipping	170 km/h
Slow/Barrel Roll	230 km/h
Flick/Snap Roll	190 km/h
Half-Roll	160 km/h
Normal loop	280 km/h
Half-Loop and Half-Roll	300 km/h

NOTES

99.4% Crankshaft RPM corresponds to 2900 rpm.

Maximum duration of Takeoff power not more than 5 mins.

	BOOST	RPM
Take Off	9.5	99.4%
Max Cont	9.5	82%
Cruise Climb	7.5	70%
Cruise I	7.3	64%
Cruise II	6.7	59%
Idle	+/- 1.5	26%