

Yak-18T

Normal Checklists

v2.4
August 2010

NORMAL CHECKLISTS

PRE-FLIGHT (Cockpit)

| | |
|---------------------------------|--|
| Brakes | On |
| Landing Gear Handle | Down & latched |
| Magneto Switch | Off (zero) |
| Battery (master) Switch | On (up) |
| Engine Instrument Switch | On |
| Fuel Quantity | Sufficient |
| Engine Instrument Switch | Off |
| Battery Switch | Off (mid position) |
| Emergency Air Valve | Closed (clockwise) |
| | <i>Do not open the Emergency Air Valve</i> |
| Main Air Valve | Open (anticlock) 9/10 th |
| Main Air Supply | 30 – 45 kg/cm ² |
| Cowl Shutters & Oil Cooler door | Both open (forward) |
| Boost (throttle) | Closed (back) |
| Flap Handle | Up |

PRE-FLIGHT (External)

Carry out normal external checks including:

| | |
|----------------------|---------------------------|
| Engine Oil Level | Sufficient (9 lit min) |
| Fuel | Sufficient |
| Fuel Drain | Check for Water |
| Main Air Purge Valve | Drain, clockwise to close |

HYDRAULIC LOCK PREVENTION

By now throttle is closed, brakes on, mags off & master switch off!

| | |
|-----------------------|--|
| Chocks | Securely set |
| Inlet manifold drains | Check open (up & twist) |
| Propeller | Pull through 7 blades |
| | <i>Repeat if significant oil emerges</i> |
| Inlet manifold drains | Close (twist & drop) |

ENGINE PRIME

Prime engine one stroke for every 10 °C below 100 °C, preferably simultaneously pulling propeller through.

Do not pull engine through if cylinder temp above 80 °C

| | |
|-------------------------|------------------------------|
| Magneto switch | Off (zero) |
| Battery switch (master) | Off (mid position) |
| Operate primer | Right to Prime |
| Propeller | Pull through 4 blades |
| Inlet manifold drains | Depress to drain excess fuel |
| Chocks | Remove |

BEFORE START

| | |
|-----------------------------|---|
| Battery switch (master) | On (up) |
| Generator | On |
| Ignition Switch | On |
| Landing Gear Lights Switch | On |
| Engine Instruments Switch | On |
| Beacon | On |
| Boost (throttle) | Open, close (back), 1" open |
| Prop | Fully fine (forward) |
| Carburettor Heat | Off (up) |
| Oil Cooler Door | Closed (back) |
| Cowl Shutters | Open (forward) |
| Main Air Valve | Open (9/10 th anticlockwise) |
| Main Air Pressure | 20 prefer 30 – 45 kg/cm ² |
| Emergency Fuel Shut-off | Open (fully forward) |
| Emergency Air | Closed (clockwise) |
| Primer | Left – 2 or 3 strokes |
| Fuel pressure | Check rise |
| Primer | Turn right to assist start |
| Engine / Flight Instruments | Check |

ENGINE START

| | |
|----------------|------------------------|
| Brakes | On |
| Starter Button | Press & hold |
| Primer | Pump if required |
| Magneto Switch | 1+2 after engine fires |

Do not turn mags on until engine fires or engine might run backwards; hold starter in for a few secs until engine is stable; if engine rotates backwards at all (prop blades rotate left to right) cease pressing starter immediately and retry. And check main air pressure rises after start.

If engine fails to start after any significant priming do not continue. Ensure mags & switches are off. Return to hydraulic lock prevention.

AFTER START

| | |
|----------------------------|---------------------------------------|
| Boost (throttle) | 40% RPM |
| Oil pressure | Green |
| Primer | Locked (vertical) |
| Starter ring | Turn right to lock (red dot) |
| Cowl shutters & oil cooler | Close both (back) |
| Carb heat | On (down) to warm up |
| Remaining switches | On as required |
| Flaps | Deploy; Check; Retract (up) |
| Radio | On; frequency set |
| Intercom | On |
| Transponder | Standby |
| U/c retract warning light | Check |
| Warning Lights | Check |
| Stall Horn | Check |
| Volts & Amps | Check / Gen Light Out |
| Main Air Valve | Check 9/10 th open (anti~) |
| Main Air Pressure | Rising to 30 – 45 kg/cm ² |
| Taxi Light | As required |

WARM UP & TAXI

Before using greater than 50% RPM for taxi:

| | |
|--------------------------|---------|
| Boost (throttle) | 50% RPM |
| Oil temperature (min) | 40 °C |
| Cylinder Head Temp (min) | 120 °C |

Once CHT reaches 120 °C, set 60% RPM with boost (throttle) and select coarse prop pitch to quicken oil warm up.

ENGINE RUN-UP

| | |
|-------------------------|---|
| Engine Ts & Ps | Check |
| Cowl Shutters | Open (forward) |
| Oil Cooler | Open (forward) |
| Propeller | Fully fine (forward) |
| Carb heat | Off (up) |
| Brakes | On |
| Boost (throttle) | 70% RPM |
| Engine Instruments | Check |
| Carb heat | On (down), wait, off <i>check RPM drop; air inlet temp rise.</i> |
| Prop | Fully coarse & fully fine x2 <i>check RPM decreases 54%, returns 70%</i> |
| Magnetos | Both, 1, both, 2, both <i>max allowable drop 3%</i> |
| Prop | Set 64% RPM |
| Boost (throttle) | Open & close 10 units <i>ensure CSU holds RPM; repeat</i> |
| Prop | Fully fine (forward) |
| Boost (throttle) | 58% RPM |
| Amp/Volt meter button | Press: Check 28 V |
| Boost (throttle) | Idle |
| Amp/Volt meter button | Press: Check 23 V |
| Generator Warning light | Check turns on |
| Boost (throttle) | Open smoothly to 80% |
| Boost (throttle) | 50% RPM |

BEFORE TAKEOFF

| | |
|-------------------------|---------------------------------------|
| Pilot Door | Closed & latched |
| Elevator Trim | Neutral (green light) |
| Landing Gear Handle | Down & latched |
| Magneto Switch | 1+2 |
| Warning Lights | Check |
| Starter ring | Turn right to lock (red dot) |
| Primer | Locked (vertical) |
| DI/Compass | Synchronise |
| Flight Instruments | Check |
| Altimeter | Set |
| Transponder | Set 7000 |
| Taxi light | As required |
| Propeller | Fully fine (forward) |
| Cowl Shutters | Open (forward) |
| Oil Cooler Door | As required |
| Flaps | Up |
| Main Air Valve | Check 9/10 th open (anti~) |
| Main Air Pressure | 30 kg/cm ² min |
| Fuel Quantity | Sufficient |
| Emergency Fuel Shut-off | Open (i.e. not pulled) |
| Passenger Door | Closed & latched |
| Harnesses | Waist & shoulders |
| Flight Controls | Full & Free |
| Engine Ts & Ps | Check |

TAKE OFF

Rotate at 90 kph; Unstick at 135 kph; Climb at 170 kph

| | |
|------------------------------|--------------------------|
| Carb Heat | Off (up) |
| Brakes | Off |
| Boost (throttle) & propeller | Both fully forward |
| Engine Ts & Ps | Check |
| RPM & boost | 100% & as expected |
| No more runway, climbing? | U/c retract |
| Propeller | 82% RPM (at safe height) |

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 – 28.5 |
| Electrics - Amps | 54 max |

BEFORE LANDING

| | |
|---------------------------|--|
| Carb heat | On (down) |
| Main Air Supply | 30 – 55 kg/cm ² |
| Speed | < 200 kph |
| Landing Gear | Down, 3 greens, 3 poles |
| Gear Retract Safety Latch | Latched |
| Landing/taxi Lights | As required |
| | <i>Maximum duration of taxi/landing lights 5 mins.</i> |
| Propeller | Fine (high) |
| Fuel | Sufficient |
| Speed | < 170 kph |
| Flaps | Down |
| Cowl Shutters | As required |
| Oil Cooler | As required |
| Doors | Closed & latched |
| Harnesses | Secure |

SHORT FINALS

| | |
|--------------------|-------------------------|
| Speed (with flaps) | 150 kph |
| Speed (flapless) | 155 kph |
| Landing Gear | Down, 3 greens, 3 poles |
| Propeller | Fully fine (forward) |
| Carb Heat | Off (up) |
| Cowl Shutters | Open (forward) |

AFTER LANDING

| | |
|---------------------------|-----------------------|
| Gear Retract Safety Latch | Latched |
| Flaps | Up |
| Oil Cooler Door | Open (forward) |
| Cowl Shutters | Open (forward) |
| Elevator Trim | Neutral (green light) |
| Landing Light | Off (centre position) |

ENGINE SHUTDOWN

| | |
|--------------------------|---|
| Brakes | On |
| Cowl shutters | Open (forward) |
| Oil Cooler Door | Open (forward) |
| Non essential electrics | Off (down) |
| | <i>(all but first five from left + beacon)</i> |
| Prop | Fine (forward) |
| Boost (throttle) | 28-34% RPM |
| CHT | 150 °C max |
| | (OAT ≥ 25 °C) 165 °C max |
| Boost | 60% RPM for 15 secs |
| Boost | Closed (back) |
| Magneto Switch | Off (zero) |
| | <i>Flying within 1 hr? Open throttle as engine stops & reclose.</i> |
| Main Air Valve | Closed (clockwise) |
| Electrical Switches | All Off (down except...) |
| Battery switch (master) | Off (...central position &...) |
| Map / cabin light switch | Off (central position) |
| Oil Cooler Door | Closed (back) |
| Cowl Shutters | Closed (back) |
| Chocks | Set |
| Main Air Purge Valve | Drain, close (clockwise) |
| Manifold drains | Open (push up & twist) |
| Brakes | Off |

OPERATING LIMITATIONS SUMMARY

SPEEDS

| | | |
|--------------------------|---------------------|-----------|
| Climb out | 170 kph (92 kt) | V_Y ??? |
| Cruise I | 225 kph (121 kt) | |
| Max Cruise (Nom I) | 262 kph (141 kt) | |
| Turbulence max | 300 kph (161 kt) | V_{NO} |
| Never exceed | <i>cannot find!</i> | V_{NE} |
| Gear extend | 200 kph (108 kt) | V_{LE} |
| Flap extend | 170 kph (92 kt) | V_{FE} |
| Approach with Flap | 150 kph (81 kt) | |
| Approach without Flap | 155 kph (83 kt) | |
| Touchdown | 130 kph (70 kt) | |
| Stall Clean | 123 kph (66 kt) | V_S |
| Stall - Flap & Gear down | 114 kph (61 kt) | V_{SO} |
| Best Glide speed | <i>cannot find!</i> | |

MAX G LIMITS

| | |
|------------|---------------|
| At 1500 kg | +6.4 and -3.2 |
| At 1650 kg | +5 and -2.5 |

POWER SETTINGS

*99.4% RPM = 2900 crankshaft RPM = 1908 propeller RPM
Take off, Nom I & Nom II boost unlimited*

| | <u>RPM</u> | <u>Boost</u> | <u>Power</u> |
|-------------------|------------|--------------|--------------|
| Take off (5 mins) | 100% | $P_0+1.3$ | 360 hp* |
| Nom I (max) | 82% | $P_0+1.0$ | 290 hp* |
| Nom II (climb) | 70% | $P_0+0.8$ | 240 hp* |
| Cruise I | 64% | 7.4 max | 180 hp |
| Cruise II | 59% | 6.7 max | 145 hp |
| Idle | 26% | — | — |

* P_0 (at ISA sea level) = 1013 hPa = 76 cmHg = 7.6 boost

OIL QUANTITY

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

OIL PRESSURE

| | |
|-----------------|--------------------------|
| Normal | 4 – 6 kg/cm ² |
| Minimum at Idle | 1 kg/cm ² |

OIL TEMPERATURE

| | |
|----------------------|------------|
| Minimum | 40 °C |
| Normal (recommended) | 50 – 65 °C |
| Maximum (continuous) | 75 °C |
| Maximum (15 Minutes) | 85 °C |

FUEL PRESSURE

| | |
|-----------------|------------------------------|
| Normal | 0.2 – 0.5 kg/cm ² |
| Minimum at Idle | 0.15 kg/cm ² |

CYLINDER HEAD TEMPERATURE

| | |
|----------------------|--|
| Normal (recommended) | 140 – 190 °C |
| Minimum | 120 °C |
| Maximum | 220 °C |
| Max at Shutdown | (OAT < 25 °C) 150 °C (OAT ≥ 25 °C) 165 °C |

GENERATOR

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

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 |

WEIGHT & BALANCE

| | <u>Normal</u> | <u>Aerobatic</u> |
|--|---------------|------------------|
| Empty | 1217 kg | 1217 kg |
| Full load | 443 kg | 303 kg |
| Take off | 1660 kg | 1520 kg |
| <i>Sample full loads</i> | | |
| Fuel | 100 kg | 100 kg |
| Oil | 18 kg | 18 kg |
| Pilot | 80 kg | 80 kg |
| Trainees | 240 kg (3 pp) | 80 kg |
| Equipment | 5 kg | 25 kg |
| Take off (LG up) | 24.5 %MAC | 19.5 %MAC |
| Landing (LG down) (10kg fuel 9kg oil) | 23.4 %MAC | 17.8 %MAC |
| Empty (LG down) | 18.5 %MAC | 18.5 %MAC |
| Permissible CoG | 13.0 – 26.0 | 13.0 – 20.5 |

TAKEOFF CHARACTERISTICS

Firm Grass

| <u>Mass</u> | <u>Speed</u> | <u>Take off Run</u> | <u>10 m height</u> |
|-------------|--------------|---------------------|--------------------|
| 1650 kg | 135 kph | 370 m | 670 m |
| 1510 kg | 125 kph | 265 m | 540 m |

Soft Grass

| <u>Mass</u> | <u>Speed</u> | <u>Take off Run</u> | <u>10 m height</u> |
|-------------|--------------|---------------------|--------------------|
| 1650 kg | 125 kph | 500 m | 920 m |
| 1510 kg | 120 kph | 455 m | 830 m |

LANDING CHARACTERISTICS

Firm Grass

| <u>Mass</u> | <u>Speed</u> | <u>Landing Run</u> | <u>From 15 m</u> |
|-------------|--------------|--------------------|------------------|
| 1650 kg | 130 kph | 470 m | 790 m |
| 1510 kg | 120 kph | 390 m | 690 m |

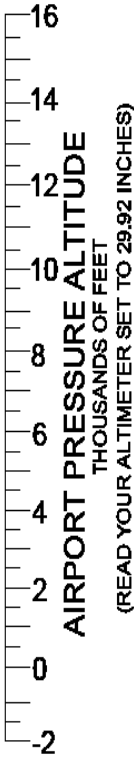
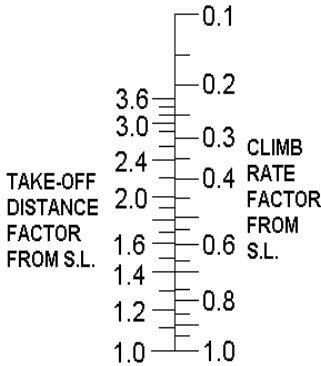
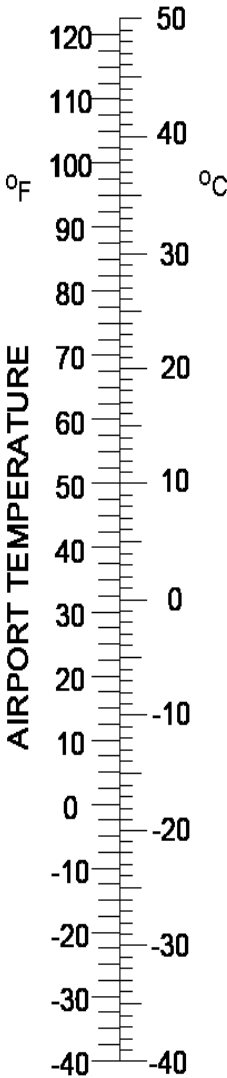
Soft Grass

| <u>Mass</u> | <u>Speed</u> | <u>Landing Run</u> | <u>From 15 m</u> |
|-------------|--------------|--------------------|------------------|
| 1650 kg | 125 kph | 350 m | 650 m |
| 1510 kg | 124 kph | 350 m | 610 m |

CROSSWIND LIMITS

| | |
|----------|-------|
| Take off | 23 kt |
| Landing | 19 kt |

KOCH CHART



DRAW A LINE FROM AIRPORT PRESSURE ALTITUDE TO AIRPORT TEMPERATURE TO FIND T.O. DISTANCE AND CLIMB FACTORS FROM SEA LEVEL.