

Procedures Diamond Star DA42



Procedures

Take-off briefing:

“Standard single pilot take-off from runway

$V_{MC(A)}$	68 kts
V_R	72 kts
Blue line speed	82 kts
Climb	90 kts

Routing will be Initial altitude

In case of any failure before V_R , close both throttles and abort take-off.

In case of an engine failure or fire after V_R with the gear down, close both throttles and land straight ahead.

In case of an engine failure or fire after V_R with the gear up or in transit, perform a one engine out visual circuit (or IMC follow the SID).

Inform ATC.”

Normal take off

Concrete runway: flaps up

Grass runway: flaps approach

T/O:

Brakes - apply
Throttle - 50 % load
Engine instruments - check
Brakes - release
Throttle - full power
Speed - check
V_r - 72 kts
V_{climb} - 90 kts
Positive rate, no more runway available - apply brakes, gear up
200 ft and clear of obstacles - flaps up

After T/O checks: Gear - check up
Flaps - check up
Landing light - off / as required
Climb speed - 90 kts

Short field take off.

Flaps - APP
Brakes - set
Throttles - Full power (100%)
V_R - 72 kts
Positive rate, no more runway available - apply brakes, gear up
V_{CLIMB} - 79 kts

Maintain airspeed of 79 kts until obstacle clearance altitude. Then slowly decrease pitch attitude to increase airspeed. At 200' AAL flaps up.
Continue climb with 90 kias and power settings and checks as normal take off.

Cruise

Throttle..... - 70 % load (11 USG / h)
Speed..... - +/- 135 kts

Holding

Speed..... - 120 kts
Throttle..... - +/- 50 % load (7,5 USG / h)

Steep turns

Speed:..... - 120 kts (50 % load)
Landing light..... - On

IFR: check heading

VFR: Lookout and point in distance

Roll in:

When passing 30° of bank . - add 2 – 5% load
Bank angle - 45°

After the steep turns:

Power..... - as required
Landing light..... - Off.

Stalls

Crew briefing preceding the stall

Type of stall
Altitude to maintain and regain
Direction or heading to maintain
Recovery of the stall is started at:

Full stall:

Nose and/or wing dip or excessive rate of descent with full back pressure

Approach to stall landing configuration:

Speed outside the white arc, buffet or stall warning, whichever comes first

Approach to stall flaps approach configuration:

Speed outside the green arc, buffet or stall warning, whichever comes first

Approach to stall clean configuration:

Speed outside the green arc, buffet or stall warning, whichever comes first

Inside checks

- Landing light On
- Annunciator panel Check
- Engine instruments..... Check
- Fuel Check
- seatbelts, loose items Check

Outside checks

A: Altitude

Recovered before 2000ft

P: Position

No stall exercises above build up areas, populated areas, open water, airfields or other traffic

O: Orientation

Keep track of your position

S: Sky clear

1x 180° turn or 2x 90° turn.

Full stall (VMC only)

- Take a Horizon reference point (HRP)
- Throttles idle
- Gear and flaps as applicable
- Maintain altitude, do not trim!
- Wait for the signs of the (approaching) stall

Recovery:

- Call Recover!
- Pitch down for glide attitude
- Full throttle
- Speed above 80kts, pitch for climb attitude
- Flaps approach, gear up, flaps up (if applicable)
- Climb back to desired altitude (90kts)

Approach to stall

- Take a Horizon reference point (HRP)
- Throttles idle
- Gear and flaps as applicable
- Maintain altitude, do not trim!
- Wait for the signs of the (approaching) stall

Recovery:

- Call Recover!
- Pitch down for level flight attitude
- Full throttle
- Speed above 80kts, pitch for climb attitude
- Flaps approach, gear up, flaps up (if applicable)
- Climb back to desired altitude (90kts)

Normal circuit

- See normal take off for take off.
- Climb to circuit altitude. A climbing turn to crosswind is permitted above 500ft to stay in the circuit area.
- Level off, speed 105 kts (35% load).
- look out and turn to crosswind
- look out and turn to downwind.
- check altitude, speed and distance to runway.

Downwind checks:

Landing light..... - On
Annunciator panel - Check
Engine instruments - Check
Fuel - Check
Parking brake - released
Gear warning horn - checked
Flaps - Approach
Speed..... - 100 kts,
Brakes..... - checked
Seatbelts - fastened
Loose items..... - stowed

End of downwind (point Delta)

- Gear down (check 3 greens)
- About 20% load
- Turn to baseleg

Base leg:

Slow descent to 500 ft,
Speed..... - 95 kts.

Final checks:

Flaps - LDG,
Gear - Down, 3 greens
Speed..... - 85 kts

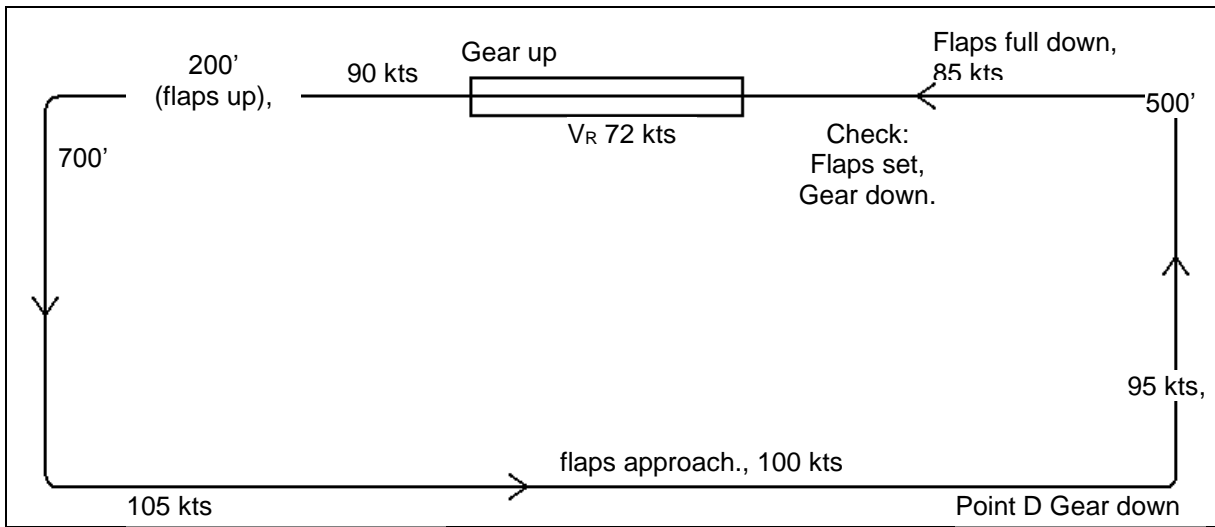


Fig. 1. Normal circuit.

Go-around or wave off

- Full throttle
- Flaps approach
- Increasing speed -> pitch for climb attitude
- Apply brakes, gear up
- 200 ft. flaps up and after take off checks.

Touch and go landing

- Maintain (or regain) centerline
- Flaps up (flaps APP on gras runway)
- Full throttle
- Continue as normal take off

Flapless circuit and landing

- Downwind as in a normale circuit, speed remains 105 kts due to no flaps\
- Point delta, gear down, 3 greens.
- select about 18% load and turn to base leg
- Baseleg speed 95 kts. Pitch attitude about 3° then with normal circuit.
- Final speed 90 kts. Higher pitch attitude
- Make a positive landing

Precautionary landing.

- Downwind and baseleg as a normal circuit
- Final speed 75 kts after final checks. Higher pitch attitude.
- Close the throttles in the movement of the flare.
- Anticipate on a shorter flare then normal.

Instrument approaches.

- Crewbriefing should be completed well before commencing the approach
- Holding speed (120 kts, 50%) until locator. Initial checks completed.
- Reduce speed to 105 kts (gear up, flaps up, 35%)
- Glideslope alive or 0,5nm before descent point select flaps APP. Speed 100kts
- on the glide slope or point of descent select gear down. Check 3 greens.
- Final checks
- Runway in sight and cleared to land (not before 500ft), flaps LDG
- With sufficient runway and a late runway in sight a landing with flaps APP is an option.

Engine failure

V_{MC}, Minimum Control Speed.

V_{MC} is the calibrated airspeed at which, when the critical engine is suddenly made inoperative, it is possible to maintain control of the airplane with that engine still inoperative and then maintain straight flight at the same speed with an angle of bank of not more than 5 degrees.

Summary of conditions:

- Critical engine inoperative and wind milling,
- Maximum available take-off power or thrust on the life engine,
- The most unfavorable center of gravity, (meest achterliggend)
- The airplane trimmed for takeoff,
- Max sea level takeoff weight,
- Flaps and Gear retracted,
- The airplane airborne but not in ground effect.
- ISA conditions

Explanation of conditions:

- a. Critical engine, see next page.
- b. Maximum power on life engine:
With the life engine at max power and the inoperative engine wind milling there is the largest power difference between the two engines thus the largest yaw-moment which has to be countered with rudder input.
- c. The most unfavorable C.G.:
The most unfavorable center of gravity is the most aft C.G. An aft C.G. results in a smaller distance between C.G. and rudder. Thus resulting in a smaller moment with the same rudder deflection.
- d. The airplane trimmed for take off:
- e. Max take off weight:
- f. Flaps and gear retracted:
Extended flaps and gear stabilize the airplane which lowers the V_{MC}
- g. The airplane airborne but not in ground effect:

Critical engine

Omdat beide motoren dezelfde kant op draaien (rechtsom) kent de Diamond DA42 een “kritische motor”. Bij een positieve invalshoek zal het neergaande propellerblad een langere weg afleggen dan het opgaande blad. Aangezien dit in dezelfde tijd gebeurt, beiden een halve omwenteling, zal de snelheid van de luchtstroom langs het neergaande blad groter zijn dan de snelheid van de luchtstroom langs het opgaande blad.

Het effect van attitude op de thrust.

Dat verschil in snelheid leidt tot een verschil in “thrust”. Het aangrijpingspunt van de trekkracht van de propeller ligt door dit effect bij een positieve invalshoek niet in het draaipunt maar rechts daarvan. De trekkracht van de rechter motor heeft een grotere arm (**X**) t.o.v. het zwaartepunt dan de trekkracht van de linker motor (**Y**). Uitval van de linkermotor zal een groter moment om de top as geven dan uitval van de rechter motor.

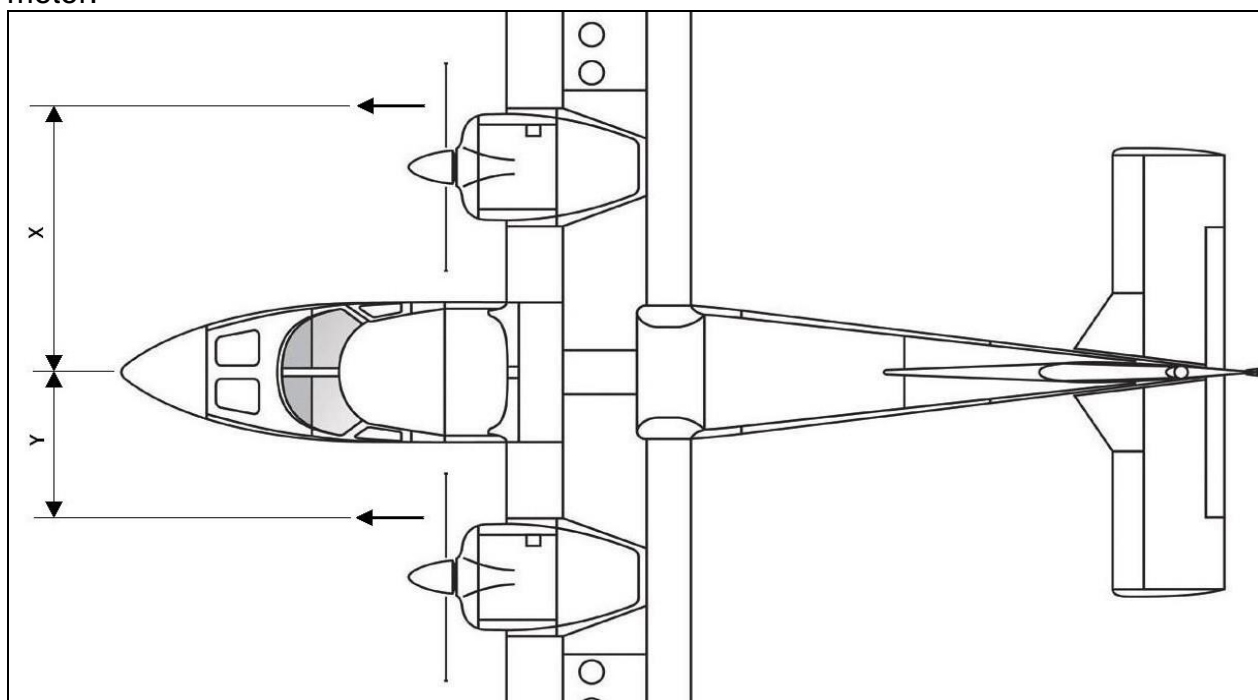


Fig.2.

Dit moment moet opgeheven worden met het rudder. De zijwaartse kracht uitgeoefend door het rudder is afhankelijk van de luchtsnelheid en rudder uitslag. Uitgaande van maximale rudder deflection zal bij een storing in de linker motor een hogere luchtsnelheid nodig zijn dan bij een storing in de rechter motor om een voldoende groot moment op te wekken om het moment van de levende motor op te heffen.

Engine failure:

KEEP THE AIRCRAFT FLYING

Checks: Throttles - Full forward
 Gear - Up
 Flaps - Up
 Speed..... - At least 82 kts
 Attitude..... - Adjust

Feather checks:

IDENTIFY DEAD ENGINE => DOOIE POOT, DOOIE MOTOR

Option to lift your “dead feet”.

Throttle..... - Close (to verify dead engine)
Engine master - Off (prop will feather)

If time permits:

Emergency checklist - Engine Fire failure during flight

Alternator - Off
Fuel selector - Off / crossfeed

Inform ATC and land as soon as practicable

If surcomstances permit:

Save the life engine, select 85% load.

Engine fire in flight

An Engine with an engine fire still produces thrust but needs to be turned off. The loss of thrust comes more gradually.

KEEP THE AIRCRAFT FLYING

Checks: Throttles - Full forward
 Gear - Up
 Flaps - Up
 Speed / heading / altitude .. - Check

IDENTIFY ENGINE ON FIRE

Throttle - Close (engine on fire)
Engine master - Off (prop will feather)
Alternator - Off
Fuel selector - Off
Cabin air / defrost..... - Off

Inform ATC and land as soon as practicable.

If surcomstances permit:

Save the life engine, select 85% load.

Single engine visual circuit.

Take off leg

- Engine failure or fire during take-off. Take action.
- After the Engine is feathered climb out with blue line speed (82 kts).
- Inform ATC with PAN PAN call as soon as practical.
- Level off. speed 105 kts, Load 85%,.

Crosswind

- Do not turn to crosswind before circuit altitude is reached.
- Speed 105 kts, load 85% (or whichever is needed).

Downwind

- Downwind checks, flaps remain up
- Maintain speed 105 kts, load whichever is needed.
- Point Delta, gear down. Check 3 greens.

Baseleg

Flaps up, speed 95 kts. Between 35% and 85% load.

Final

- Turn to final. Speed 90 kts
- If landing assured, flaps APP. Speed 85 kts.

One engine out instrument approaches.

- Engine failure or fire. Take action. Engine is feathered and secured.
- Crewbriefing should be completed well before commencing the approach.
- Brief the new speeds and new configurations.
- After the locator or equivalent maintain speed 100 kts. Flaps remain up.
- On the glide slope or point of descent select gear down. Check 3 greens.
- Final checks, no flaps.
- Runway in sight and cleared to land and landing assured, flaps APP
- With sufficient runway and a late runway in sight a landing with flaps up is an option.

Attachments.

Precision approach normal operation.

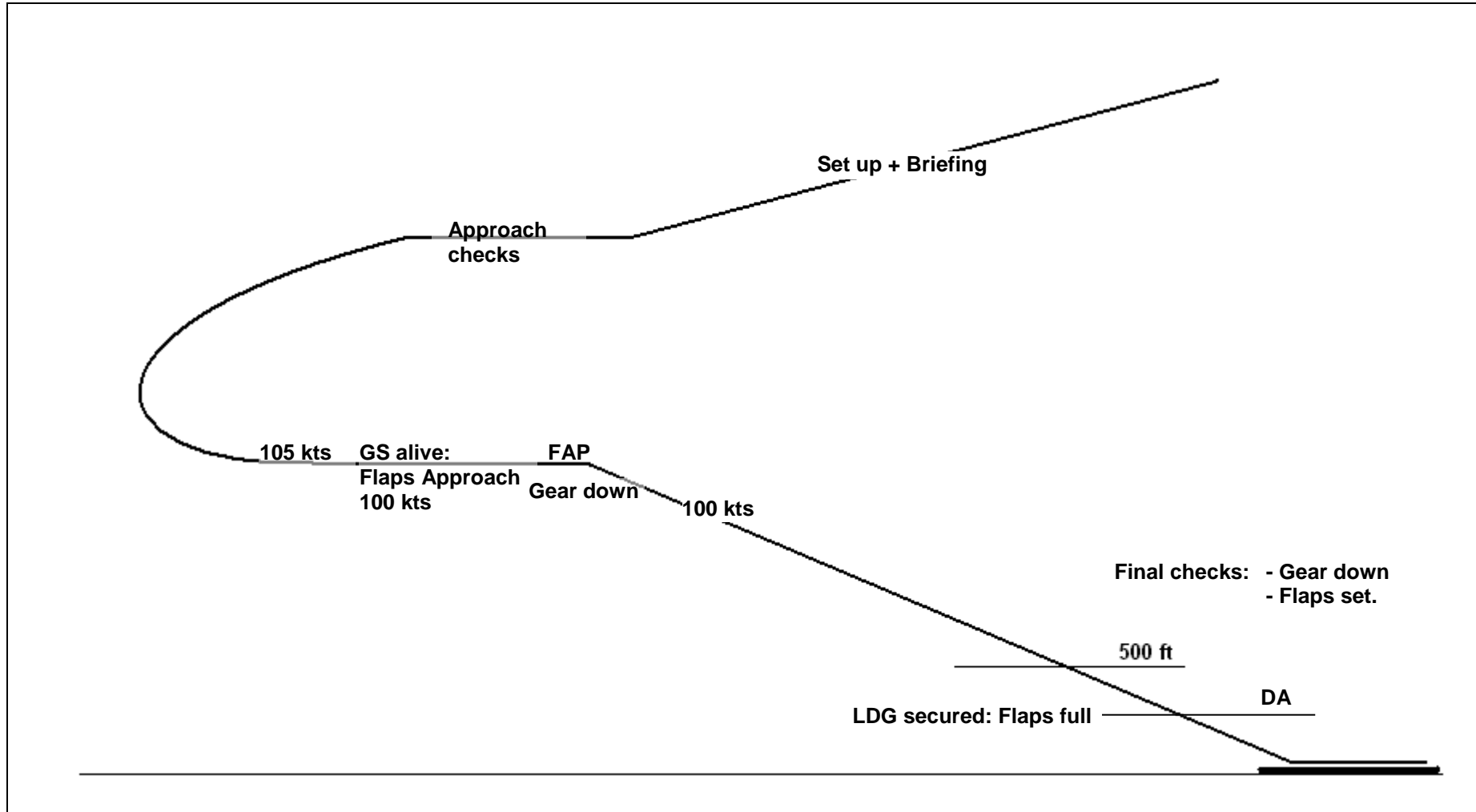


Fig. 3 Precision approach normal operation.

One engine out precision approach.

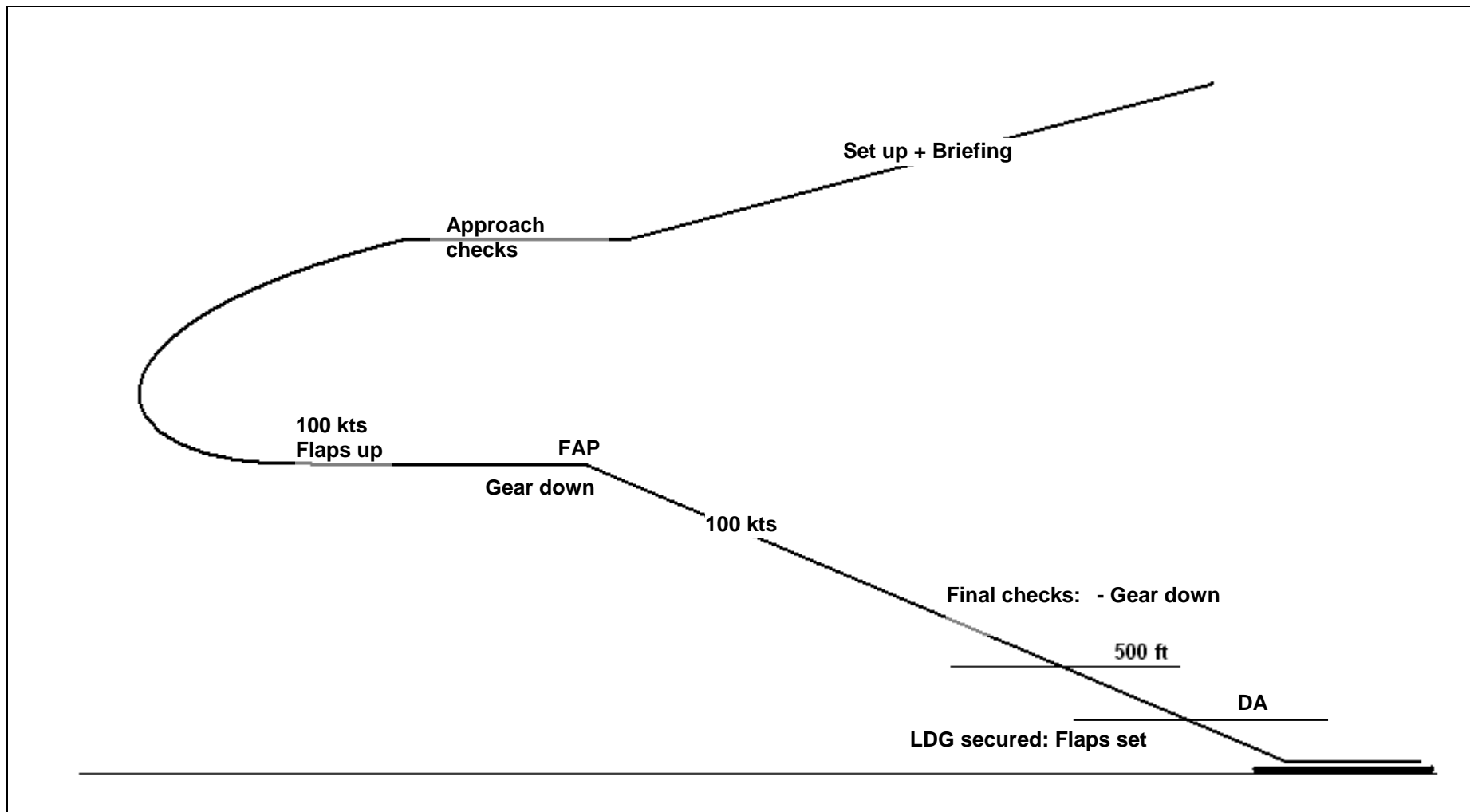


Fig. 4. One engine out precision approach.

Non-precision approach normal operation.

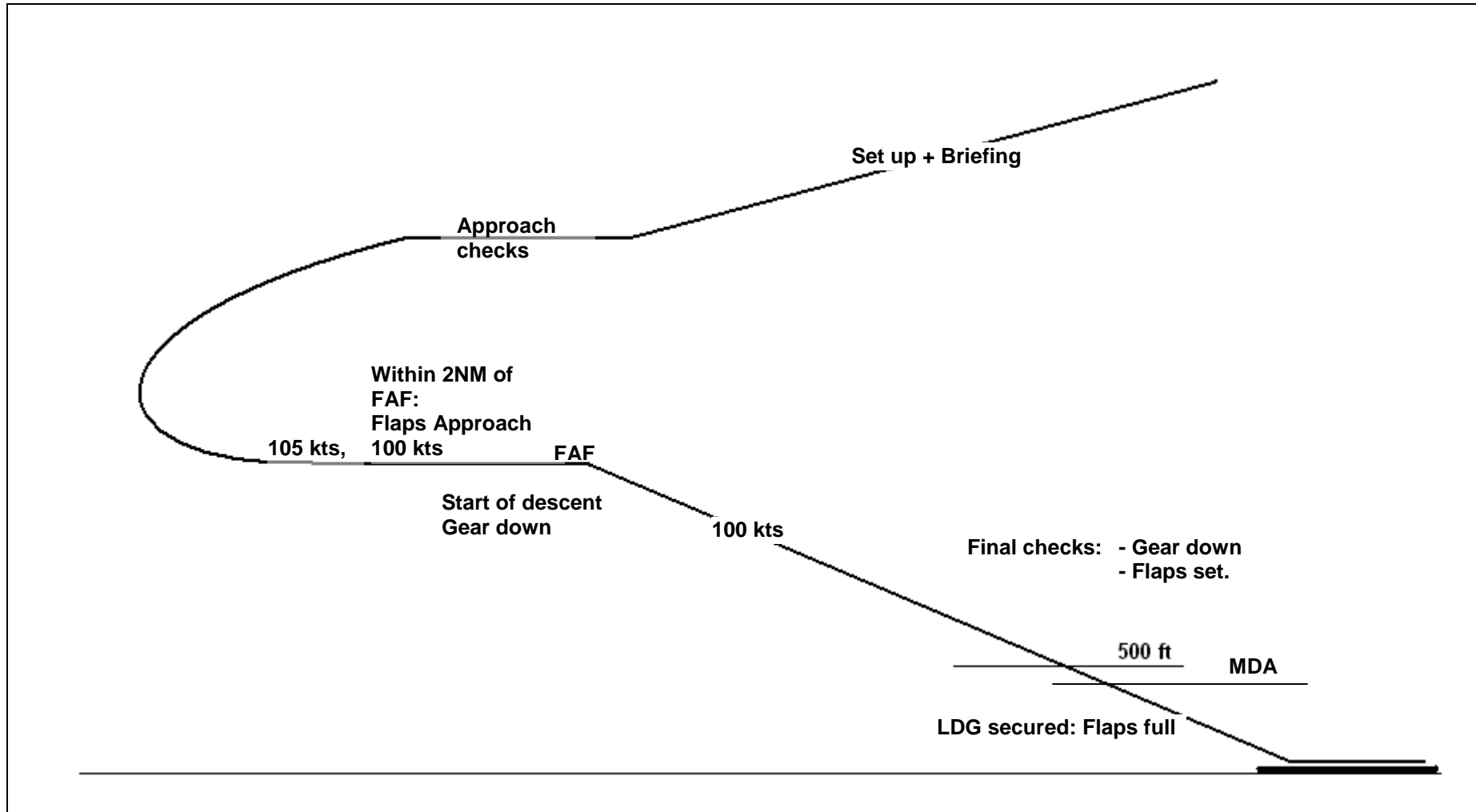


Fig. 5. Non-precision approach normal operation.

One engine out non-precision approach.

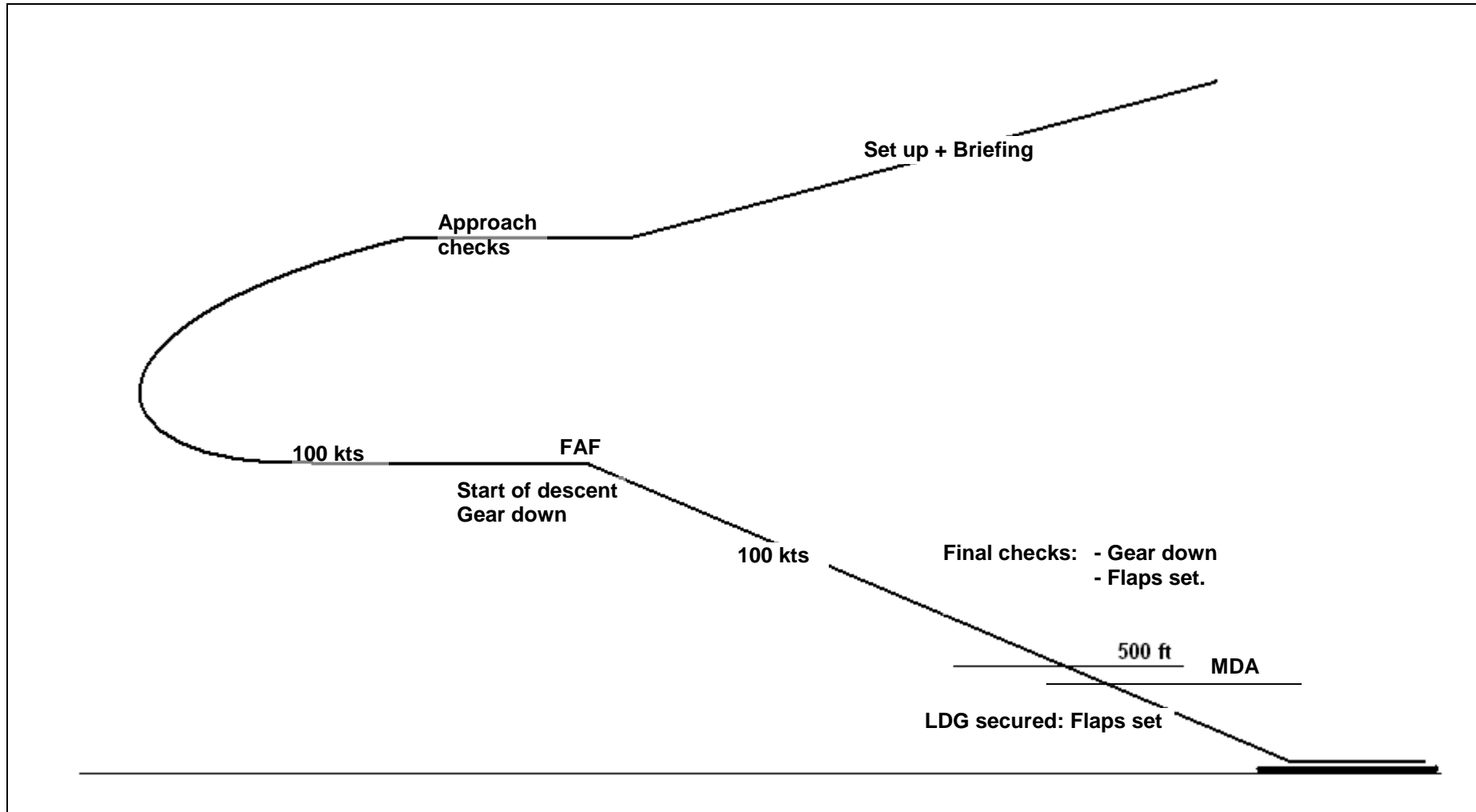


Fig. 6. One engine out non-precision approach.