

Diamond DA 40 Tdi D-ESCR D-ESCS

CHECK-LIST & Emergency procedures



Based on MTOW 1150 Kg

**Alain
Navez**

WARNING

PROPELLER

✓ Never move the propeller while the ENGINE MASTER switch is ON.
Also do not move the propeller while the ENGINE MASTER is OFF immediately after operation (remaining pressure in the rail).

FUEL (D-ESCR)

✓ Long Rang Tank installed and the fuel quantity max indicator reads 15 US gal.

STARTING ENGINE

✓ Do not operate the starter motor for more than 10 s. After operating the starter, let it cool off for 20s before attempts to start.

✓ If the Oil Pressure has not moved to the GREEN rang within 3 s after starting.
SET THE ENGINE MASTER SW OFF.

✓ **WARM UP at IDLE for 2 minute AFTER STARTING.**

RUN UP

✓ **(D-ESCR)** If the caution light and the ECU BACKUP UNSAFE light do not illuminate during the run up **TERMINATE FLIGHT PREPARATION.**

✓ **(D-ESCR)** If the ECU BACKUP UNSAFE light does not extinguish after the test,
TERMINATE FLIGHT PREPARATION.

✓ The Run-Up test procedure must passed without any error.
In case of an error, **TERMINATE FLIGHT PREPARATION.**

ENGINE INDICATION IN FLIGHT

✓ In case of OIL – COOLANT – GEARBOX temperature reaches the yellow range,
INCREASE THE SPEED and REDUCE PWR by 10%.

ENGINE SHUT-DOWN

✓ **BEFORE shut-down , the engine MUST RUN FOR AT LEAST 2 MINUTES in IDLE to avoid heat damage of the turbo charger.**

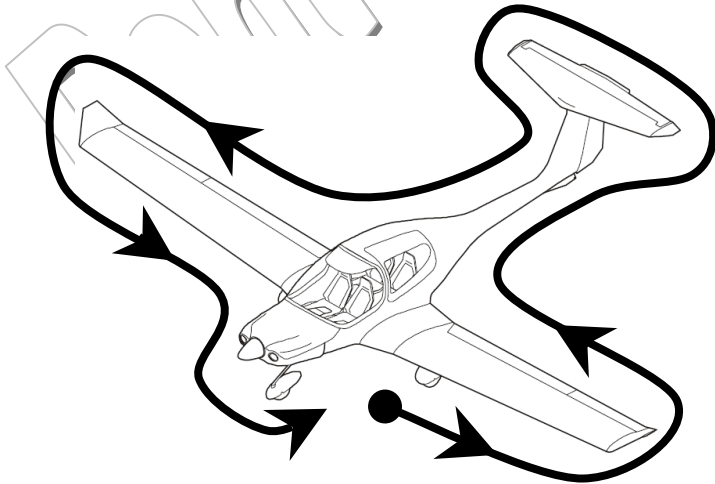
PRE-FLIGHT INSPECTION

cabin checks

Flight controls.....	FREE & CORRECT
Airplane documents	complete & up-to-date
Engine Master.....	OFF
ECU SWAP.....	AUTOMATIC
Emergency fuel valve	Normal & Seals
Emergency Electrical switch.....	OFF & Seals (D-ESCR)
All electrical SW	OFF
Circuits breakers.....	IN (If pulled, check reason)
Power lever.....	IDLE
Electric Master.....	ON (Key)
Fuel quantity.....	CHECK
Electric Master.....	OFF

External inspection

walk-around



External inspection check

Left Wing

Landing gear.....	Strut-tire-brake
Tank drain.....	Drain water & sediment
Stall warning.....	Check (suck on opening)
Pitot probe.....	Clean
Lights.....	No damage
Position & strobe light.....	No damage
Aileron & linkage.....	No damage
Flap & linkage.....	No damage

Fuselage

Rear cabin door & window.....	No damage
Antennas.....	No damage
Empennages & linkage.....	No damage

Right wing

Flap & linkage.....	No damage
Aileron & linkage.....	No damage
Position & strobe light.....	No damage
Landing gear.....	Strut-tire-brake
Tank drain.....	Drain water & sediment

Front fuselage

TOW BAR.....	REMOVED
Nose gear.....	Visual inspection
Propeller & spinner.....	Visual inspection
Air intakes (5°).....	Clear
Gear box oil level.....	Check
Engine oil level.....	Check
Exhaust.....	Visual inspection
Gascolator.....	Drain water & sediment

BOARDING

The PIC must instruct and help the passengers for boarding.
NEVER LEAVE THE REAR PASSENGER CLOSE THE REAR DOOR ITSELF
THE PIC MUST CLOSE AND LOCK THE REAR DOOR.

BEFORE STARTING ENGINE

Rudder pedals.....	Adjust & locked
Safety harnesses.....	Fastened
Doors.....	Closed & locked
Parking brake.....	Set
Flight controls.....	Free
Power lever.....	IDLE
Friction device.....	Adjusted
Alternate Engine Air.....	CLOSED
Alternate Static.....	CLOSED
AVIONIC MASTER.....	OFF
ELECTRIC MASTER.....	ON
Annunciator panel.....	Check & acknowledge
WATER LEVEL caution LIGHT	CHECK OFF
(on fuel gauge indicator)	

STARTING ENGINE

PRPOPELLER.....	CLEAR
Strobe light.....	ON
POWER.....	IDLE
ENGINE MASTER.....	ON
Wait until GLOW indicator extinguishes	
ELECTRIC MASTER.....	START

WARNING

If the START light remain ON after the engine has started.

➤ ENGINE & MASTER switches → OFF

AFTER STARTING

OIL PRESSURE.....	GREEN range within 3s (at very cold t° the OP can be as 6.5 bar for max. 20 seconds.)
Warm up.....	IDLE for 2 minutes
Warm up.....	1400 RPM
Until OIL & COOLANT t° are in the green	
Annunciator panel.....	Acknowledge
AVIONIC MASTER.....	ON
Electrical equipment.....	As required
Flaps.....	CHECK & UP
Flight instruments & Avionics.....	Test & Set
IDLE RPM.....	Check 890 +/-20
Altimeters.....	SET & X-CHECK
Before Taxiing.....	Brakes release

◦ *items to be performed during taxi*

◦ Brakes (pilot & co-pilot).....	CHECK
◦ T&B, Compass , DG, ADF, Horizon,.....	CHECK

RUN UP

Position airplane into wind if possible

Parking Brakes..... Set
POWER..... IDLE
Engine instruments..... GREEN range
Fuel Temperature..... GREEN range
(Oil pressure may be in yellow range in idle & warm engine)

POWER..... MAX for 10s
CHECK { Oil Pressure..... GREEN range
RPM..... Check 2240 to 2300 RPM
LOAD indication..... 90 to 100 %
POWER..... IDLE

ECU TEST..... PRESS & HOLD

Automatic sequence, observe :

- 1- ECU A / ECU B / CAUTION..... Blinking
- (D-ESCR)** 2- ECU BACKUP UNSAFE..... Blinking
if ECU bkp unsafe do not illuminate : NO GO !!!!!
- 3- ECU B / CAUTION..... Blinking
- 4- RPM..... Cycling
- 5- ECU A / CAUTION..... Blinking
- 6- RPM..... Cycling
- 7- ALL annunciator light..... OFF
- (D-ESCR)** 8- ECU BACKUP UNSAFE..... OFF
if ECU bkp unsafe do not extinguish : NO GO !!!!!

ECU TEST..... RELEASE

ECU SWAP..... ECU B
Engine running without a change, but a slight shake of the engine may occur.
ECU SWAP..... AUTOMATIC

BEFORE TAKE-OFF

DOORS..... Closed
Annunciator panel..... Check
Fuel qty. MAIN TANK..... Check
Flaps..... T/O position
Trim..... T/O position
Parking brakes..... Release

On the Runway

- ✓ Heading
- ✓ Pitot
- ✓ Transponder
- ✓ Landing light

TAKE-OFF

POWER..... MAX
Vr..... 60 KIAS
Initial climb (with flaps T/O)..... 70 KIAS

At Safe altitude (300 ft AGL) proceed for the cruise climb:

Flaps..... UP
Speed..... 80 KIAS
POWER..... 90 %
Cruise climb..... 75 KIAS
Touch & go..... 100 %

CAUTION

If OT - CT - GT reaches the yellow range
Increase the speed by 5 to 10 KIAS and reduce PWR by 10 %

After Take-off check list

- ✓ **F** Flaps..... Checked UP
- ✓ **Tro** Throttle..... SET 90%
- ✓ **Tran** XPDR..... Working
- ✓ **La** Landing & taxi lights..... OFF
- ✓ **Mot** Engine instruments..... Green Arc

APPROACH

DOWN WIND

Fuel qty. MAIN TANK..... CHECK
Speed..... Reduce below 108 KIAS
Flaps..... T/O
Maintain speed..... 90 KIAS

BASE LEG

Speed..... Reduce below 91 KIAS
Flaps..... LDG
Maintain..... 80 KIAS

FINAL

Approach speed..... 70 KIAS

AFTER LANDING

PWR..... IDLE
Flaps..... UP
TPX..... STBY
Pitot heating..... OFF
Lights..... as required

ENGINE SHUT-DOWN

Parking brake..... Set
PWR..... IDLE FOR 2 MIN
AVIONIC MASTER..... OFF
ALL Electric..... OFF
ENGINE MASTER..... OFF
ELECTRIC MASTER..... OFF

Rent A Flight

DIAMOND DA 40 D

EMERGENCY PROCEDURES

Airspeeds for safe operations

V _A	108 KIAS
V _{NE}	178 KIAS
V _S	52 KIAS
V _{SO}	49 KIAS
Gliding speed	73 KIAS

EMERGENCY LANDING WITH ENGINE OFF

1 - Airspeed for best glide 73 KIAS

2 - Select a suitable landing area

Consider Wind
..... Surface
..... Leng
..... Obstacle

3 - Check

Fuel..... Qty. On MAIN
ENGINE MASTER..... ON

If the problem will be solved..... RESTART ENGINE

If not possible

4 - PREPAR EMERGENCY LANDING

MADAY CALL

EMERGENCY FUEL VALVE..... OFF

ENGINE MASTER..... OFF

SEAT BELT..... Fastened

5 - ON SHORT

When flaps is set..... ELECTRIC Master OFF

ENGINE running roughly or loss of power

SPEED..... 73 KIAS
PWR..... MAX
If in incing conditions..... Alternate Air ON
Fuel qty. MAIN TANK..... CHECK
Fuel transfer pump..... ON
EMERGENCY FUEL VALVE..... NORMAL
ECU SWAP..... CHECK ECU B
If selecting ECU B does not solve the problem, switch back to AUTOMATIC.
➤ LAND ON THE NEAREST AIRFIELD.
➤ PERAR FOR AN EMERGENCY LANDING

RESTARTING THE ENGINE IN FLIGHT

NOTE

- As long as 60 KIAS is maintained, the propeller will continue to windmill.
- After a complete stop the propeller starts to windmill at speed above 105 KIAS
- Maximum altitude for restarting the engine : 6500 ft
- If the ENGINE MASTER is switched OFF and ON again, glowing will be initiated.

SPEED for best glide..... 73 KIAS
PWR..... MAX
Alternate Air..... ON
Fuel qty. MAIN TANK..... CHECK
Fuel transfer pump..... ON
AVIONIC MASTER..... OFF
ELECTRIC MASTER..... ON
EMERGENCY FUEL VALVE..... NORMAL
If the propeller is stationary
ELECTRIC MASTER..... START

DEFECTIVE RPM regulating system

CAUTION

- Every effort should be made do not exceed 2500 RPM.
- The PWR should be moved slowly. The wooden propeller blades produce more rapid RPM changes than metal blades.

Oscillating RPM

PWR..... Change setting
if the problem does not clear :
ECU SWAP..... ECU B
if the problem does not clear itself, switch back to AUTOMATIC
LAND ON THE NEAREST AIRFIELD

RPM overspeed

PWR..... Reduce to maintain 2300 RPM
ECU SWAP..... ECU B
if the problem does not clear itself, switch back to AUTOMATIC
CONTROL RPM..... With the PWR lever
➤ LAND ON THE NEAREST AIRFIELD

RPM Underspeed

PWR..... As required
ECU SWAP..... ECU B
if the problem does not clear itself, switch back to AUTOMATIC
➤ LAND ON THE NEAREST AIRFIELD

COOLANT TEMPERATURE (CT)

High temperature

- Reduce power by 10%
- Increase airspeed by 10 KIAS
- If the temperature not reach the green range within 60 seconds, reduce power as far as possible and LAND ON THE NEAREST AIRFIELD.

LOW temperature

- Check WATER LEVEL LIGHT (on the fuel gauges)
- If ON..... Reduce at min PWR
Expect loss of coolant and engine failure
Prepear for EMERGENCY LANDING

NOTE

During an extended descent at low PWR setting coolant t° may decrease

OIL TEMPERATURE (OT)

High temperature

- Check oil pressure
- If is within the green..... Reduce POWER
Increase airspeed
- If is very low..... Reduce at min PWR
Expect loss of oil and engine failure
Prepear for EMERGENCY LANDING

LOW temperature

- Increase POWER
- Reduce airspeed

OIL PRESSURE (OP)

Not in the green

- Check oil and coolant temperature
- If is within the green..... Expect wrong OP indication
Keep monitoring temperatures
- If are not in the green..... Reduce at min PWR
Expect engine failure
Prepear for EMERGENCY LANDING

GEARBOX TEMPERATURE (GT)

High temperature

- Reduce POWER
- Increase airspeed

FUEL TEMPERATURE (FUEL TEMP)

High temperature

- Reduce POWER
- Increase airspeed

LOW temperature

- Increase POWER
- Reduce airspeed

ECU FAILURE

In case of failure in ECU A, the system automatically swiches to ECUB

- LAND ON THE NEAREST AIRFIELD
- Prepear for EMERGENCY LANDING

ELECTRICAL FAILURES

Alternator Failure (Alternator &/or Low voltage Caution)

Circuit Breakers Check

ESSENTIAL BUS..... ON

Reduce Electric load to the essential for the flight

➤ LAND ON THE NEAREST AIRFIELD

The batteries are the last remaining source for a minimum of 30 minutes

Complete Failure (When the main battery is dead) (D-ESCR)

IN IMC Condition..... EMERGENCY SW ON

As futher source for artificial horizon and flood light for 1 h

➤ LAND ON THE NEAREST AIRFIELD

Starter malfonction (Warning START)

The starter does not disengage after the engine has started

POWER..... IDLE

ENGINE MASTER..... OFF

ELECTRIC MASTER..... OFF

SUSPICION of CO Contamination

Cabin heat..... OFF

Ventilation..... OPEN MAX

Windows..... OPEN

SPEED..... Reduce below 120 KIAS

Front canopy..... Gap position

CAUTION

Maximum demonstrated airspeed for opening the front canopy is 120 KIAS

Fuel Transfer pump failure

WARNING

➤ The emergency fuel valve transfers fuel using the engine driven fuel pump from the auxiliary tank to the main tank at a rate of 21 US gal/h

➤ AUX tank quantity must not be less than 1 US gal

➤ If the fuel pump takes in air (if the emergency fuel valve is not switched back to normal prior the aux tank is empty).
AN INSPECTION OF THE PUMP IS NECESSARY prior to next flight

1 - Use the Emergency fuel valve on EMERG. TRANSFER to use the AUX. tank.

2 - MONITOR FUEL QUANTITY

3 - RETURN THE EMERGENCY fuel valve on NORMAL to use the MAIN tank

SMOKE AND FIRE

ENGINE fire when starting ON THE GROUND

EMERGENCY FUEL VALVE..... OFF
FUEL TRANSFER PUMP..... OFF
ENGINE MASTER..... OFF
ELECTRIC MASTER..... OFF
EVACUATE IMMEDIATELY

ELECTRICAL fire ON THE GROUND

ELECTRIC MASTER..... OFF
If the ENGINE running
POWER..... IDLE
ENGINE MASTER..... OFF
➤ EVACUATE IMMEDIATELY

ENGINE fire in FLIGHT

Cabin heat..... OFF
EMERGENCY FUEL VALVE..... OFF
POWER..... MAX
FUEL TRANSFER PUMP..... OFF
ELECTRIC MASTER..... OFF
Windows..... open if required
The front canopy may be partially open in gap position (below 120 KIAS)
➤ Proceed for an EMERGENCY LANDING

ELECTRICAL fire in FLIGHT

AVIONIC MASTER..... OFF
ELECTRIC MASTER..... OFF
EMERGENCY ELECTRIC..... ON (artificial horizon)
Cabin heat..... OFF
Windows..... open if required
The front canopy may be partially open in gap position (below 120 KIAS)
➤ LAND ON THE NEAREST AIRFIELD

Unintentional flight into icing conditions

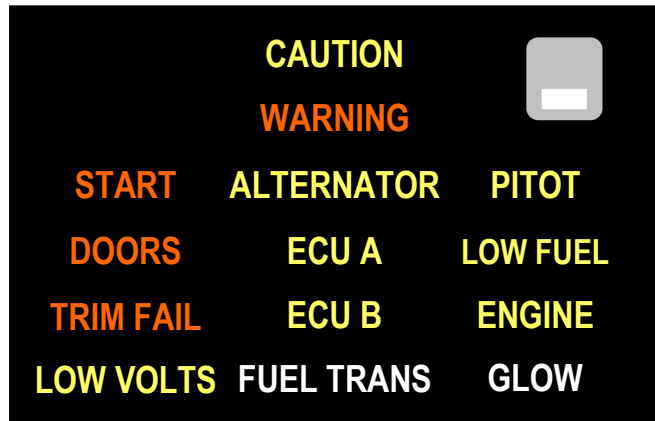
Try to reach zones with a higher t°

Pitot heating..... ON
Cabin heat..... ON
DEFROST..... ON
PWR..... Increase to prevent ice
build-up on the propeller
Alternate Engine Air..... ON
ATC..... ADVICE

If the PITOT heating fail:

Alternate Static..... OPEN
Windows..... CLOSED

ANNUNCIATOR PANEL



Testing

Holding the acknowledge for 2 seconds. All lights will begin to blink, and alert will sound continuously.

WARNING message

Is indicated by a CONTINUOUS aural alert and red WARNING light blinking. Pressing the acknowledge terminate the aural alert, extinguish the WARNING light, and the associated affected system will change from blinking to solid.

START

Illuminated continuously as long as the Starter motor remain engaged. But Warning light and the aural alert wil not be activated.

If the START light remains illuminated after the engine has started, IMMEDIATELY switch OFF ENGINE and MASTER switch.

DOORS

Doors is not lathed.

TRIM FAIL

Indicates a failure of the automatic trim system of the auto pilot

CAUTION message

Is indicated by a MOMENTARY aural alert and amber CAUTION light blinking. Pressing the acknowledge terminate the aural alert, extinguish the CAUTION light, and the associated affected system will change from blinking to solid.

LOW VOLTAGE

Voltage drop below 12.6V or exceeds 12.9V.

Follow ALTERNATOR FAILURE procedure.

ALTERNATOR

Alternator Failure. The only remaining electrical sourceis the battery.

Follow ALTERNATOR FAILURE procedure.

ECU A – ECU B

Malfuction of the related engine control unit ECU A or ECU B

PITOT

Pitot heating switch is off.

LOW FUEL

Fuel in the MAIN TANK is less then 3 US gal (→2/-1 US gal).

Indication calibrated in straight and level flight.

ENGINE

A parameter on the Engine or Fuel instruments is outside of green range.

FUEL TRANS

Fuel transfer pump is active.

GLOW

Glow plugs are active.

Diamond DA - 40 Tdi D-ESCS & (D-ESCR)

			Ref	
Oil Specification	Shell Helix Ultra 5W30 Synthetic		2-6	
Max restart altitude	6500 ft		2-6	
Max Operating Altitude	16400ft		2-15	
Fuel Total / Usable	2 x 15 USgal (2 x 20,5 USgal)	2 x 14 USgal (2 x 19,5 USgal)	2-21	
VNE	178 KIAS	Red Line	2-3	
VNO	129 KIAS	Green Arc	2-3	
VA	94 KIAS	< 980 Kg	2-3	
	108 KIAS	> 980Kg < 1150 Kg		
VFE	91 KIAS	LDG (White arc)	2-3	
	108 KIAS	T/O		
Vy	66 KIAS	Flaps T/O	4A-2	
Max. Demo Cross Wind	20 Kts		5-8	
Cruise Climb	73 KIAS	Flaps UP	4A-2	
Best Gliding speed	73 KIAS	Flaps UP	3-4	
Approach Speed	71 KIAS	Flaps LDG	4A2	
Precautionary Landing	67 KIAS	Flaps LDG	4B-3	
Landing flaps less	73 KIAS		4B-18	
Empty Weight / Moment	793 Kg (824 Kg)	1915,7 Kgm (2003,4 Kgm)	C.N.	
MTOW	1150 Kg		2-10	
MLW	1092 Kg		2-10	
Finesse	Prop Windmill 8,8	Prop stationary 10,3	3-23	
	For 1000 ft plane 1,45NM	For 1000 ft plane 1,7 NM		
T/O Performances 2000 ft - no wind - T° std	GR : 360 m	Over 50 Ft : 670 m	5-11	
Landing Performances 2000 ft - no wind - T° std	GR : 310 m	Over 50 Ft : 780 m	5-20	
Stalling Speeds (MTOW)	Bank 0°	Bank 30°	Bank 45°	Bank 60°
Flaps UP (Vs)	52	57	66	79
Flaps T/O	51	55	64	78
Flaps LDG (Vso)	49	55	62	76

	850 Kg	1000 Kg	1150 Kg
VR (Flaps T/O)	49	55	59
Vy (Flaps T/O)	54	60	66
Cruise Climb	60	68	73
Approach (Flaps Land)	58	63	71
Prec Landing Short final	58	63	58
Best glide	60	68	73

Speed to be remember (safety)

- ✓ VR 60 KIAS
- ✓ Vy (FL T/O) for initial 66 KIAS
- ✓ Precaution landing 66 KIAS
- ✓ Vref (FL Land) 70 KIAS
- ✓ Cruise climb 75 KIAS
- ✓ Best glide 75 KIAS
- ✓ Vref (no FL) 75 KIAS