SUPPLEMENT : TOWING PROCEDURES

Your DR 400/180 R is equipped with :

- A structural reinforcement installed on the aircraft at the production stage.
- A tube support bearing a 12 A type Aérazur tow-hook.
- A hook-release handle near the pilot's seat.
- An instruction placard near the hook-release handle.

Propellers approved for towing :

- Gliders : 76-58, 76-54 (76-64 would enter the critical RPM - zone under normal utilisation)
  Banners : 76-54 (76-58 would enter the critical RPM - zone under normal utilisation)
- Propeller HO-27-HM-180/138 (gliders and banners)

GLIDER TOWING PROCEDURES

In addition to the usual procedures, check the correct working of the hooks on the aircraft and on the glider.

Towing configuration :

First stage of flaps up to Vi 140 km/H then flaps up position.
Full throttle whilst climbing.

Descent : Do not close throttle below 2500 RPM in order to avoid the engine cooling being too quick.
Recommended speed Vi = 250 km/h.

TOWING SPEED :

Gliders : Any speed is possible between the minimum aircraft towing speed Vr and the maximum authorised speed of the glider on tow.

The optimum climbing speed depends on characteristics of the glider = for gliders with a low wing loading and a medium glide ratio, the optimum speed is Vr where as it many exceed 130 Km/H for gliders with a high wing loading and glide ratio.

A climbing speed higher than the optimum may be necessary in case of critical engine cooling.

BANNER TOWING PROCEDURES :

In addition to the usual procedures :

- Check the correct working of the hook on the aircraft.
- Then attach the cable to the aircraft and to the banner.
- Lay the folded banner on the ground in front of the aircraft at such a distance that it has reached a sufficient speed when lifting the banner. For a pick up hooking in flight, the approach speed of the aircraft should be 105 Km/H.

A speed very close to Vb should be maintained for the whole flight.

For banner towing at a slow speed and under hot weather conditions, it is advised if need be to install the cooling flap (see sketch 58 - 319) on the inferior engine cowling to obtain a better engine cooling.This flap belongs to the optional equipment of the aircraft.

Following instruction placard is mandatory on this aircraft when equipped with a tow - hook :

See approved flight manual for towing instructions.

	1)	2)	3)
Weight of the towing aircraft in Kg	750	840	1000
Minimum glider towing speed Vr kph	110	115	125
Minimum banner towing speed Vb kph	95	100	120
Minimum authorized speed for the glider on tow kph	135	140	150
Maximum glider weight Vz at Vr = 0,7 m/s	970	765	420
Maximum glider weight Vz at Vr = 1,7 m/s	750	595	330
1000 x.S maximum of the banner	230	155	65

Remark :

1) Normal utilisation = 1 pilot, 110 L Fuel
2) Case of towing pilot's schooling
3) Exceptional case : Passengers transport with a light on tow or leaflets dropping with a reduced banner.

BREAKING RESISTANCE OF THE TOWING CABLE /

- Maximum : 1000 da N
- Minimum : 0,8 time the weight of the glider.

TOWING PERFORMANCE

Weight of the towing aircraft	750 kg	840 kg	1000 kg
Stalling speed (Vo) with first stage of flaps (km/h)	83	88	96
Climbing speed at Vr at ground level with a glider under extreme conditions (conditions FAR 23 65 b)-m/s	2.65	2.8	3.05
At Vr without glider (m/s)	7.25	6.25	4.9
At Vb with extreme banner	2.65	2.8	3.05
At Vb without banner	6.35	5.45	4.5

TAKE OFF PERFORMANCE ON GRASS RUNWAY WITH A GLIDER EQUIPPED WITH A WHEEL.

WEIGHT OF TOWING AIRCRAFT = 750 KG

Weight of glider / Altitude température		300 KG	600 KG
Z = 0	St = 15°	375 (205) m	535 (300) m
	St = + 20°	415 (230)	595 (335)
Z = 4000 ft	St = 7 °	510 (285)	745 (430)
	St = + 20°	565 (325)	835 (495)

WEIGHT OF TOWING AIRCRAFT = 840 KG

Weight of glider / Altitude température		300 KG	600 KG
Z = 0	St 15 °	465 (260)m	655(375)
	St + 20°	515 (290)	730(425)
Z = 4000 ft	St = 7°	635 (365)	925(555)
	St + 20°	710 (415)	1040(635)

WEIGHT OF TOWING AIRCRAFT = 1000 KG

Z = 0	St = 15°	660 (380) m
	St + 20°	735 (435)
Z = 4000 ft	St = 7°	925 (555)
	St + 20°	1040 (635)

The figures shown represent the total distance in meters from the beginning of the motion of the aircraft untill it reaches a 50 ft height at V =1,3 Vs1
(The figures beetween brackets show the rolling distance necessary to reach 1,1 Vs 1).

2 SUPPLEMENTARY TANK (Optional)

Capacity : 50 liters (11 I.G.)
Lever arm : 1,61 m (63,4 inches)
Localization : under luggage compartment

To use the fuel of the supplementary tank consume first enough fuel from the rear tank and then empty the supplementary tank fuel in the rear tank by means of the knob located on the central console.

The fuel quantity which is in the supplementary tank is indicated by a gauge located in the right upper side of the instrument panel.