



**Courtesy
Translation of**

Supplement to the Original Flight Manual No. E - 614

for the hydraulic 4-Blade-Constant-Speed Propeller

MTV-22-B/174-12

on the airplane

**Robin DR 300/180R
Robin DR 400/180R
Robin DR 400/180S
Robin DR 400/180
Robin DR 253
Robin DR 253B**

possible mufflers:

Gomolzig 74-0301

Hirth FVA 23-V2
(not for Robin DR 253, DR253B)

Robin Modification No.: 89 S.B. 129
(not for Robin DR 300/180R, DR 253, DR253B)



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1. GENERAL

Information concerning the propeller: MTV-22-B/174-12 see Section 2.
Propeller Spinner: MT-Propeller No.: P-274-A

2. LIMITATIONS

Diameter: 174 cm (68.5 in)
no cut-off allowed

Blade angle: at station cm 61 (24,0 in) :
low pitch: 11,5° ±0,2
high pitch: 30,0° ±0,1°

Propeller Speed: MTV-22-B/174-12
max. allowable take-off power 2.700 RPM (5 minutes)
max. allowable continuous power: 2.500 RPM

Markings at the tachometer : green arc 500 to 2.200 and 2.400 to 2.500 RPM
yellow arc 2.200 to 2.400 and 2.500 to 2.700 RPM
red radial line 2.700 RPM

The airplane may be operated without spinner as well. In this case remove filler plates.

For DR 400/180S:

The a. m. operation limitations are valid. The restrictions to 2.600 RPM becomes obsolete.

Placards:

Close to the tachometer, there is a placard with the following contense:

Avoid manifold pressure over 18 inch Hg
between 2.200 RPM and 2.400 RPM

If the offset of the tachometer can not be corrected to a value below 30 rpm, a placard with the rpm offset at 2200 rpm, 2300 rpm and 2400 rpm has to be installed close to the tachometer.

The installation of the manifold pressure gauge is marked as follows:

Manifold Pressure

The installation of Propeller lever is marked as follows:

Propeller control



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3. EMERGENCY PROCEDURES

Malfunction of the propeller pitch control:

In case of oil pressure loss in the propeller control system, or if the pitch control fails, the propeller will return to low pitch position (take-off position).
Push Propeller Control to maximum and hold propeller-speed below 2700 RPM by the power lever.
Select lower air speed, if applicable.
Monitor oil pressure and oil temperature.

4. NORMAL PROCEDURES

Daily Control

Before every flight, check condition of blades and Spinner. Blade tip play up to 3 mm is allowed, blade angel play up to 2mm is allowed.

No unallowable cracks in blades (refer to Installation and Operation Manual E-124)
Erosion sheets may not be loose. PU Tape has to be installed and o.k., in other case replace it in the next 10 operation hours after last check. No oilleakage allowed.

Starting the engine:	Propeller position	low pitch
Before take off:	Throttle	2000 RPM
	Propeller lever	high pitch
	Cycle Prop	to 1500 RPM then low pitch
	if engine is cold	repeat 3 times

Move the Propeller lever slowly, because the propeller MTV-22 is equipped with light natural composite blades and responds faster to pitch changes than propellers with metal blades.

After take off and after reaching the safety height, reduce rpm to a value within the green arc of the tachometer at full throttle, for noise reduction.



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5. PERFORMANCE

The performance data in the original Flight Manual remain valid except the information provided in this Supplement to the Original Flight Manual.

Take off distances:

The table take off distances in this Supplement of the Original Flight Manual is valid.

Take off Distances

Flapposition „Take off“, Propeller MTV-22-B/174-12, no Wind

Aircraft DR 300/180R	refer to original AFM
Aircraft DR 400/180R	refer to original AFM
Aircraft DR 253	refer to original AFM
Aircraft DR 253 B	refer to original AFM

Aircraft DR 400/180 and DR 400/180S

Altitude feet	Temp. °C	Take off distances at 1100 kg				Take off distances at 900 kg			
		Concrete Runway (m)		Grass Runway (m)		Concrete Runway (m)		Grass Runway (m)	
		over 15 m Obstacle	roll	over 15 m Obstacle	roll	over 15 m Obstacle	roll	over 15 m Obstacle	roll
0	-5	419	247	492	331	274	159	309	199
	+15	465	278	553	379	305	177	347	225
	+35	515	309	617	428	335	159	381	254
4000	-13	560	331	668	477	362	212	419	278
	+7	629	371	761	547	404	238	473	318
	+27	701	413	830	627	446	265	526	357
8000	-21	770	450	909	715	484	282	583	397
	-1	889	512	1 147	834	545	322	663	459
	+19	973	574	1 319	971	606	362	747	525

Climb Performance:

For Type DR 300/180R: The climb performance data for the Propeller Sensenich 76EM8S5-0-58 according to the Original Flight Manual remain valid.

For type DR400/180R: The information given in the Original Flight Manual remain valid (Propeller Sensenich 76EM8S5-0-58)

For type DR400/180 bzw. DR 400/180S: The information given in the Original Flight Manual remain valid except:

Propeller speed: 2.500 RPM
Optimum speed: 160 km/h low Altitudes
150 km/h at 15.500 ft



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Cruise Performance		20°C below standard temp.						standard temperature						20°C above standard temp.					
		Alt.(ft)	nP (RPM)	MAP (ft)	%PWR Std-20°C	Cl (lb/ft²) Std-20°C	TAS (km/h) Std-20°C	nP (RPM)	MAP (ft)	%PWR Std	Cl (lb/ft²) Std	TAS (km/h) Std	nP (RPM)	MAP (ft)	%PWR Std+20°C	Cl (lb/ft²) Std+20°C	TAS (km/h) Std+20°C		
Robin DR400/160		10000	2000	20.5	73	43.8	221	70	41.0	215	66	38.5	209						
Robin DR400/180S		10000	2500	19	68	35.1	205	65	33.5	199	63	31.2	194						
Robin DR300/180R		10000	1800	18	64	34.4	196	61	31.9	191	59	29.7	186						
Robin DR 253		10000	2000	20.5	69	34.6	200	56	33.8	197	65	32.6	195						
Robin DR 253 B		10000	2200	19	62	32.2	192	59	31.4	189	57	30.8	187						
Engine Lycoming O-360-A (Siemens) Propeller		6000	2500	22.5	61	44.0	235	78	41.9	229	75	40.0	224						
MTV-22-B/14-12 Suction filter Suction filter		8000	2500	21	74	39.3	219	72	37.3	214	69	35.6	209						
Max. Take off weight flaps clean		8000	2200	22.3	75	37.5	231	72	36.2	223	70	35.2	217						
Fuel capacity		6000	2100	21	69	34.7	210	68	33.7	208	64	32.9	203						
		6000	2100	19	62	33.7	194	60	32.9	193	58	32.2	190						
		6000	2500	24	86	46.4	245	85	44.2	237	80	42.2	230						
		6000	2500	22	77	43.0	232	74	41.1	225	72	39.3	218						
		6000	2500	21	69	34.6	197	65	32.9	191	64	31.3	185						
		6000	2200	23.5	77	38.5	237	75	37.2	230	72	36.1	222						
		6000	2500	22	71	35.7	217	68	34.6	211	65	33.7	203						
		6000	2500	21	67	34.0	194	64	33.1	192	62	32.3	185						
		4000	2500	26	93	52.1	245	85	48.3	239	85	46.8	231						
		4000	2500	24	85	44.1	231	82	41.5	226	78	39.5	217						
		4000	2500	23	75	39.4	214	73	38.1	201	71	34.5	205						
		4000	2200	23	72	36.6	213	72	35.5	206	70	35.6	199						
		4000	2200	22	69	34.9	198	66	33.9	191	59	29.4	175						
		2000	2500	26	92	50.0	244	90	49.0	238	87	48.0	225						
		2000	2500	24.5	85	46.0	228	82	45.0	218	80	44.0	207						
		2000	2500	23	80	43.0	205	78	42.0	195	76	41.0	190						
		2000	2000	24	75	37.5	211	73	36.3	206	73	41.3	201						
		2000	2000	22	69	34.9	197	67	33.9	191	68	37.3	187						
		2000	2000	21	63	32.6	184	61	31.8	179	57	31.1	175						



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6. WEIGHT AND BALANCE; LIST OF EQUIPMENT

Original equipment:

Standard propeller (Sensenich 76EM8S5-0-()) with spinner:	weight = 19,35 kg arm = 1,38 m mass moment = 26,7 kgm
Engine Lycoming O-360-A3A	weight = 131,0 kg arm = 0,957 m mass moment = 125,36 kgm
intended changes:	
Propeller MTV-22 with Spinner	weight = 19,0 kg arm = 1,4 m mass moment = 16,6 kgm
Engine Lycoming O-360-A1P	weight = 132,45 kg arm = 0,957 m mass moment = 126,75 kgm
Hydraulic Propeller Governor	weight = 1,15 kg arm = 1,187m mass moment = 1,365 kgm
Vernier Control Cable 05-10460	weight = 0,7 kg arm = 0,55 m mass moment = 0,350 kgm
Manifold Pressure 7-100-12	weight = 0,13 kg arm = 0,1 m mass moment = 0,013 kgm

The empty mass moment with Lycoming O.360-A1P and the propeller MTV-22... is 3,38 kg higher than with the original Sensenich propeller.

The empty mass with Lycoming O-360-A1P and the propeller MTV-22... is 3,08 kg higher than with the original Sensenich propeller.



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Section 7 Description of System and Function

The propeller is equipped with an infinitely variable hydraulic pitch change mechanism operated by a hydraulic propeller governor.

Once a propeller speed is set, the governor keeps the propeller speed constant, independently of manifold pressure and flight speed.

Propeller pitch is operated by a propeller pitch change knob on the instrument panel.

Pulling the knob results in a decrease of rpm.

The set rpm is kept constant by the governor, independent from air speed and throttle setting. If the engine power is not sufficient to hold the selected Propeller speed, the propeller pitch changes to low pitch.

The propeller governor is flanged to the engine. It is driven directly by the engine.

The propeller governor oil supply is part of the engine oil system.

In case of oil pressure loss due to a failure in the governor oil system, the propeller sets to low pitch.

Section 8 Additional Instructions

Check of tachometer:

During the annual check of the airplane, the accuracy of the tachometer has to be checked. If the offset of the tachometer can not be corrected to a value below 30 rpm, a placard with the rpm offset at 2200 rpm, 2300 rpm and 2400 rpm has to be installed close to the tachometer.

Procedure for towing with hydraulic constant speed propeller:

The Propeller MTV-22.... is approved for towing gliders and banner.

Procedure for towing gliders:

Take off with full throttle and propeller speed set to 2700 rpm, or 2500 rpm if the airfield conditions allow.

After reaching the safety height, propeller speed has to be reduced to 2500 rpm.

Full throttle remains until releasing the glider.

Climbing with reduced propeller speed, reduces the noise emission.

Descend with propeller speed set to 2000 rpm and power setting between 15 and 18 inch manifold pressure.


Select a descend speed in a way, that a decrease of the cylinder head temperature of 28°C/min (50°F/min) will not be exceeded.

All other information remain valid.

**AIRCRAFT FLIGHT MANUAL SUPPLEMENT****ELEVATOR ELECTRIC TRIM**

This supplement includes the information to be provided to the pilot, as required by the certification basis.

This supplement supersedes any existing supplement in section 7 concerning the elevator electric trim.

Revision	Date	Description	DGAC approval
	Dec. 11 th , 2002	Original issue	17 MAR 2003 

1. GENERAL**1.1. Applicability**

Aircraft type	Manufacturer change
DR400/180	n°132
DR400/180R	n°132
DR400/200R	n°132
DR400/500	n°132

1.2. Description

An elevator electric trim tab control can be installed in option. It comprises a servo-actuator connected to the trim control system, an ON/OFF switch located on the instruments panel, a trim UP/DOWN control button located on the stick handle and a circuit breaker.



2. LIMITATIONS

No change.

3. EMERGENCY PROCEDURES

If the elevator electric trim malfunctions:

1. Oppose and correct action by means of elevator control if necessary.
2. Set the elevator trim switch to OFF and disable the elevator trim breaker.
3. Do not attempt to switch it back ON.
4. Manually operate the tab to trim the aircraft.

4. NORMAL PROCEDURES

4.1. Before take-off.

1. Elevator trim breaker IN
2. Elevator trim switch ON
3. Elevator electric trim control DOWN trim / UP trim
Make sure the elevator trim control wheel and the trim indicator move in the proper direction.
4. Trim back to take-off position.
5. Stop using the elevator electric trim during take-off and initial climb.

4.2. Approach

Trim the aircraft for the approach speed.

Stop using elevator electric trim during final approach and landing flare.

5. PERFORMANCE

No change.

6. WEIGHT AND BALANCE

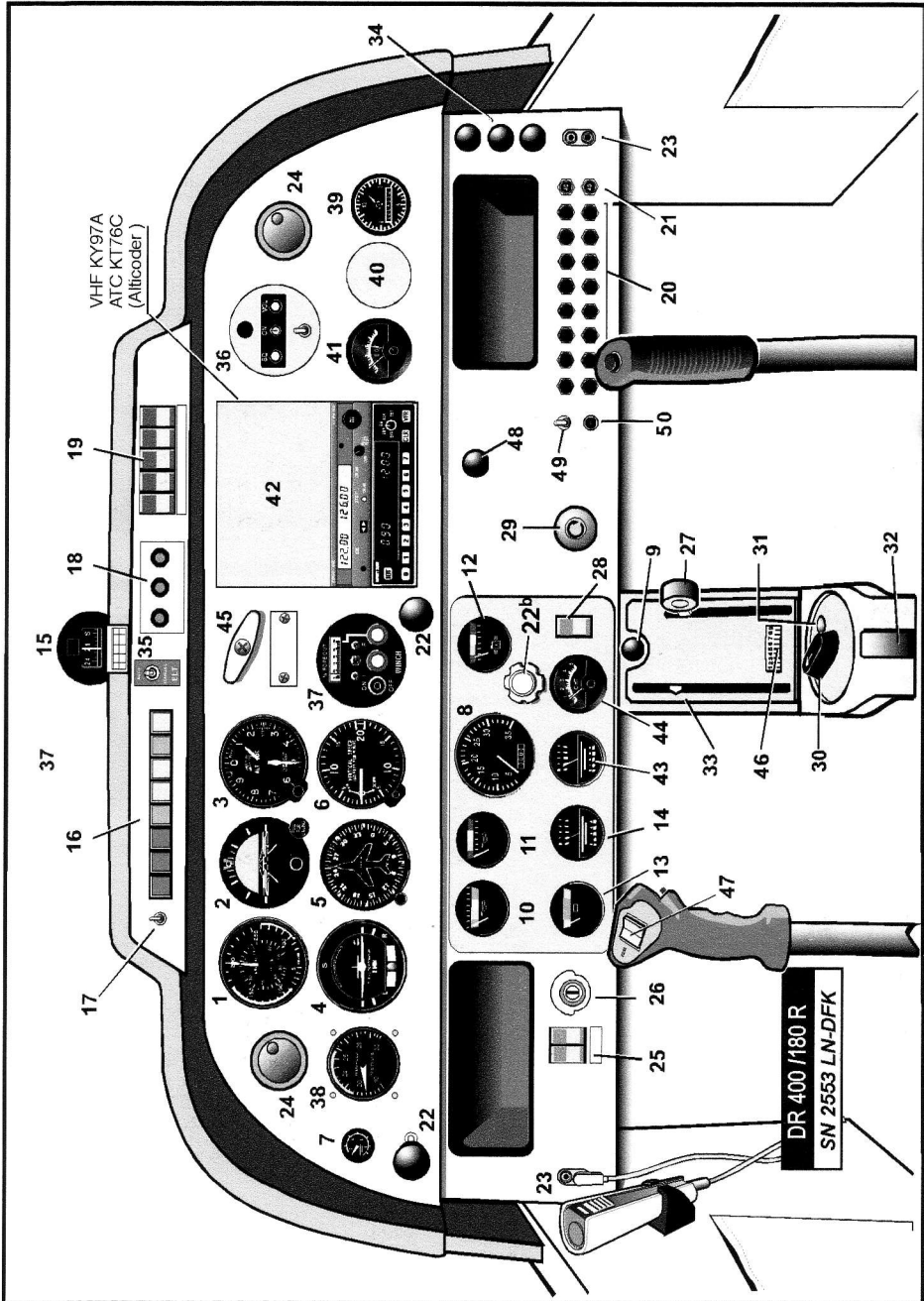
Refer to latest weight and balance record form.

SUPPLEMENT

INSTRUMENT PANEL

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1	Airspeed indicator (km/h -kt)	25	Battery / alternator safety switches
2	Gyro horizon (pneumatic)	26	Magneto switch
3	Altimeter, sensitive (ft - mb)	27	Mixture control
4	Turn coordinator, electric	28	Electric fuel pump control (safety switch)
5	Directional gyro, pneumatic	29	Carburetor heat control
6	Rate of climb indicator, ft/min	30	Fuel shut-off valve
7	Vacuum gauge	31	Starter push-button
8	Tachometer	32	Elevator trim control wheel
9	Parking brake control knob	33	Elevator trim position indicator
10	Oil pressure	34	Cabin heat / windshield defrost controls
11	Oil temperature	35	<i>ELT remote control (standard on french aircraft only)</i>
12	Fuel pressure	36	Intercom control
13	Voltmeter	37	Electric-cable winch control
14	Fuel gauge	38	Manifold pressure indicator
15	Magnetic compass	39	Flight hours recorder
16	Warning lights : Oil press. low, Fuel press. low, Fuel level low, Low Volt, Starter motor engaged, Flaps down, Towing cable hooked (one standby light)	40	2-1/4" (58 mm) instrument cut-out
17	Lights test & day / night dimmer switch	41	EGT (Exhaust Gas Temperature)
18	Instrument panel lighting (from LH to RH): light 1 (under glareshield), light 2 (overhead flood lights), radio (avionics integrated lighting)	42	<i>Instrument cut-out</i>
19	Safety switches (from LH to RH): Landing light, taxi light, strobe light, navigation lights (one standby switch)	43	Auxiliary fuel gauge
20	Fuses (radio)	44	CHT (cylinder head temperature indicator)
21	Breakers	45	Towing cable emergency / cable release grip
22	Throttle control (dual)	46	Direction trim position indicateur
22b	Propeller control	47	Direction trim push button
23	Mike and headset jacks	48	Auxiliary tank valve control
24	Fresh air vent	49	Radio Master switch
		50	12V Auxiliary socket