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MTOsport 2017

Aircraft Maintenance Manual

MTOsport 2017 | Rotax 915 iS | Rotax 916 iS

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Aircraft Maintenance Manual
for Gyroplane MTOsport 2017 915 iS / 916 iS

Content

0 – PREFACE

This document contains proprietary information of AutoGyro GmbH, Germany which is provided in confidence and solely for the purpose of supporting aircraft certification and providing applicable information regarding the proper use, maintenance, inspection, repair, servicing and parts application of AutoGyro GmbH products and services, as directed therein. Neither this manual nor any information in it may be disclosed to others, or used for any other purpose, including but not limited to, design, create, develop, reproduce, manufacture or derive any design, part, product, material, process, modification, configuration change or repair, or to obtain airworthiness authorisation's approval to do so. With the possession and use of this manual the user accepts and agrees to bound by the foregoing terms.

If a Government agency or Department intends to disclose any information, written notice should be given to:

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1 – INTRODUCTION

This manual provides accepted and recommended maintenance procedures applicable for the MTOsport 2017 gyroplane fitted with the Rotax 915 iS / 916 iS engine, designed and manufactured by AutoGyro GmbH, Hildesheim, Germany. The generic term “maintenance” comprises checks, inspections, replacement, repair and other tasks, which are defined in “01-11-00 Definitions and Standard Procedures”. The manual also provides a full description of the aircraft and its systems and troubleshooting (fault isolation) procedures. Where applicable, the manual refers to related manuals, such as the engine manufacturer’s documentation or Component Maintenance Manuals, for example battery, avionics, or optional equipment.

All task descriptions follow aerospace, industry and safety standards or special AutoGyro procedures. The procedures, methods, instructions and parameters specified in this manual must be adhered to by all means. It is not permitted to change procedures or to alter parameters provided herein. Proposed deviations from the procedures, methods and instructions contained in this manual should be directed to:

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The manual has been prepared in accordance with ATA Specification No. 100 being a common standard in aviation and for your convenience. The ATA100 numbering system is described under “Organization and Handling of the Manual”.

This manual will be revised as necessary to incorporate changes in design, parts, approved procedures, or parameters. Note that the manual is only valid if available in current version. The use of an out dated manual may render the aircraft in unsafe or even not airworthy condition. The revision service is described below.

Service Information Letters (SIL), Service Bulletins (SB) or Airworthiness Directives (AD) will also be covered by the revision service and incorporated in the maintenance manual.

Revision Service

This manual must always be maintained in current, up-to-date status. The latest version status is available at www.auto-gyro.com. Note that the manual is subdivided into 5 parts which will be revised individually. As an example, the revision index for the aircraft maintenance manual (AMM), MTOsport 2017 915 iS / 916 iS (M7_915iS / 916 iS), Part B could be ‘AMM-M7-915 iS/916 iS-B-2023-12’. Note that the date code is ‘yyyy-mm’ so files will sort chronologically.

For the purpose of current status this manual will not be published in paper format. A current personalized copy will be provided by AutoGyro GmbH for all certified and registered service partners on the basis of a subscription service. Registered users will be informed about new revisions. We recommend **not** to keep printouts or paper copies for reference.

Record of Revisions

The manufacturer will keep this manual current as an entire document. After each revision of a part the latest revision index (i.e. list of revision indices for each part) will be published on the AutoGyro website and/or by E-Mail to each subscription customer. The document part's revision index can be found in the footer on the left hand side of each page.

Section	Revision	Comment
Part A – Introduction and Declarations	2024-05	updated
Part B – Master Servicing Manual (Chapter 00 – 20)	2024-05	updated
Part C – System Description Section (Chapter 21 – 90)	2024-05	updated
Part D – Diagrams and Charts	2024-05	updated
Part E – Task descriptions	2024-05	updated

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Maintenance Concept and Eligibility

The maintenance concept of the MTOsport 2017 gyroplane is structured into two qualification levels:

- Basic Operator Maintenance / Pilot Checks and Servicing
- Professional Maintenance – Inspection and general maintenance tasks, inspection of Critical Parts (CP)

The respective maintenance level for each maintenance task is shown under
'GENERAL, REFERENCES AND REQUIREMENTS'.

Maintenance tasks may be carried out solely by persons or organizations fulfilling the requirements for personal qualification, infrastructure and required equipment.

Warnings, Caution and Notes

This manual uses **WARNING**s, **CAUTION**s and **NOTE**s in bold italic letters to indicate especially critical and important instructions. The call-outs appear at the top of the Maintenance Job Card if of general nature or applicable for the complete task, or will directly precede the individual Work Step.

The meaning of each call-out is defined below:

WARNING: A warning means that the neglect of the appropriate procedure or condition could result in personal injury or fatal accidents.

CAUTION: A caution means that the neglect of the appropriate procedure or condition could result in damage to or destruction of equipment.

NOTE: A note stresses the attention for a special circumstance, which is essential to emphasize.

Organization and Handling of the Manual

This manual is structured according to ATA100 numbering system. The numbering system will be explained later in more detail.

On document level, the manual is subdivided into five parts, named A to E. The designation and content of each part is listed below:

- **Part A: Introduction and Declarations**
  This section. Explains the basic concept, handling of this manual, its structure according to the ATA100 numbering system, abbreviations and acronyms.

- **Part B:Master Servicing Manual (ATA Chapters 00 to 20)**
  General description of the aircraft, basic definitions and standard procedures, tools, spares, airworthiness limitations, time limits, inspections and checks.
  Briefly, part B describes 'what is to be done, and when'.

- **Part C: System Description Section (ATA Chapters 21 to 90)**
  Part C describes all aircraft systems, following the ATA100 numbering system.

- **Part D: Diagrams and Charts**
  Part D contains diagrams and charts, if necessary in special sizes or as fold-outs.

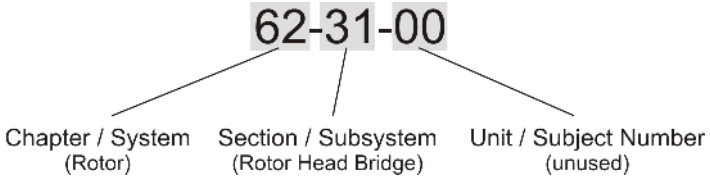
- **Part E: Maintenance Job Cards**
  Job Cards are collected in Part E. Note that the footer of Part E does not spell out to the part's designation, but just shows part and the job index of the referred maintenance task according to the ATA100 numbering system.
  Briefly, Part E describes 'how something has to be done'.

ATA100 Numbering System

ATA100 – Chapter Code

The Air Transport Association (ATA) Standard 100 numbering system is a widely accepted standard that provides a 6 digit numbering system to identify aircraft systems, subsystems and individual components in a structured, hierarchical approach.

The first or leftmost pair of digits defines the Chapter, respectively system. The next pair of digits refers to the subsystem. The third pair of digits specifies a unit. Only complex systems use unit numbers. In case of simple systems, all information is contained in the main chapter and there is no subsystem or unit breakdown.



The ATA100 numbering system and the corresponding system designations were adopted where ever possible and rational. In some cases the wording and nomenclature was adapted to match the design specifics of a gyroplane in best possible way. Due to its high degree of system integration, some systems cannot clearly be assigned to a single function. In this case the system or component was categorized by its main function. Example: the pneumatic trim cylinder also acts as brake in its secondary function.

Chapter 02 has been modified to contain "TOOLS, SPARES AND CONSUMABLE MATERIALS".

Nomenclature and Structure of Maintenance Tasks (Job Cards)

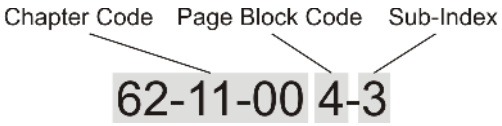
Part E of this manual describes maintenance tasks to be performed by a qualified person in order to check, inspect, replenish, adjust, replace, repair, clean, or to identify malfunctions. Each **Task** is outlined in detail in a **Job Card**.

Each **Job Card** (sometimes referred to as Task Card) consists of

- **Task Description** (header, descriptive text)
- a section referring to GENERAL, REFERENCES AND REQUIREMENTS
- a section listing SPECIAL TOOLS AND CONSUMABLE MATERIALS
- a section pointing out PRECAUTIONS AND SAFETY MEASURES
- a section called PROCEDURES, which lists all **Work Steps** to be performed subsequently
- a PARTS LIST listing part numbers and associated information, and
- explanatory ILLUSTRATIONS, such as explosion drawings or photographs

For ease of navigation each page in Part E shows a unique job index in the page footer consisting of 3 elements:

- **Chapter Code**
  (acc. to ATA100, see explanation below)
- **Page Block Code**
  (distinct index/number per type of maintenance action, see explanation below)
- **Sub-Index**



Page Block Code

The pages within a chapter are structured and numbered according to the page block numbering system as specified below:

Subject	Code
Introduction / Description and Operation	0
Fault Isolation / Trouble Shooting	1
Maintenance Procedures	2
Servicing	3
Removal / Installation / Disassembly / Assembly	4
Adjustment / Test	5
Inspection	6
Cleaning / Painting	7
Repair / Replacement / Retrofit / Modification	8
Storage	9

Effectivities

A job card may contain information relating to different versions of the referred aircraft. This may be stipulated by optional equipment installed, by different design states (Serial Number driven), or modification (MI, AD).

The keyword **EFFECTIVITY**, followed by a term describing its applicability, marks the start of instructions that apply exclusively to a specified version. Examples:

EFFECTIVITY: Variable Pitch Propeller

The following instructions must be performed and are applicable only if a Variable Pitch Propeller is installed

EFFECTIVITY: up to S/N 0123

The following instructions apply to serial numbers 0123 and before

EFFECTIVITY: S/N 0124 to S/N 0248

The following instructions refer only to serial numbers 0124 up to, and including, 0248

EFFECTIVITY: S/N 0124 and subsequent

The following instructions must be performed for serial numbers starting 0124 and subsequent

EFFECTIVITY: before MI 2011-99

Instructions refer to modification state before/without the referenced MI implemented

EFFECTIVITY: MI 2011-99 accomplished

Instructions apply only to those versions where the referenced MI has been accomplished

The end of the range of validity is marked by the term **EFFECTIVITY – END**

In case the effectivity solely comprises of the subsequent work step, or another effectivity statement is introduced, the term **EFFECTIVITY – END** will be omitted.

Instructions outside of **EFFECTIVITY** statements apply to the standard model, respectively to all versions.

Abbreviations and Acronyms

In this manual, a minimum number of abbreviations are used. Where possible the abbreviations and acronyms used correspond with regulations and common standards.

ACL	Anti-Collision Light
AD	Airworthiness Directive
AGL	Above Ground Level
AMM	Aircraft Maintenance Manual
ATA	Air Transport Association
ATC	Air Traffic Control
BCAR	British Civil Airworthiness Requirements
BUT	Bauvorschriften für Ultraleichte Tragschrauber – German design specification for microlight gyroplanes
CAS	Calibrated Airspeed – indicated speed corrected for installation errors
CHT	Cylinder Head Temperature
Ccw	Counter Clock Wise
CG	Centre of Gravity
CP	Critical Part
CRP	Carbon Reinforced Plastic
CSP	Constant Speed Propeller
CT	Coolant Temperature
DA	Density Altitude
DOM	Date of Manufacture
DULV	Deutscher UltraLeichtflugVerband e.V.
ELT	Emergency Locator Transmitter
Empty Wt	Empty Weight of the gyroplane including oil, cooling liquid and unusable fuel
FOD	Foreign Object Damage (Debris)
FPS	Feet Per Second
Ft	Foot
G / g	G-loading as a factor of gravity
Gal	Gallon
Gal/hr	Gallons Per Hour
GEN	Generator
GPS	Global Positioning System
GRP	Glass Reinforced Plastic
HP	Horsepower
Hrs	Hours
H/V	High-Velocity
IAS	Indicated Air Speed – airspeed values in this manual refer to indicated airspeed
ICAO	International Civil Aviation Organization
i.f.d.	in flight direction
In Hg	(Manifold) Pressure, corresponding to inch mercury
ISA	International Standard Atmosphere
JNP	Jahresnachprüfung (german: annual inspection, annual airworthiness review)
KIAS	Knots Indicated Airspeed
Kg	Kilogram
Km/h	Kilometer per Hour
Kt	Knot
kW	Kilowatt

LED	Light Emitting Diode
LH	left hand
LR	Limited reusability (Parts or components that can be used only once or a limited number of times, such as self-locking nuts, split pins..)
LOEP	List of Affected Pages
LTA	Lufttüchtigkeitsanweisung (AD, issued by the Airworthiness Authority)
Ltr	Litre
Ltr/hr	Litre per Hour
M	Meter
MAP	Manifold Absolute Pressure
Max	Maximum
MCP	Maximum Continuous Power
MPD	Mandatory Permit Directive (issued by UK CAA)
Min	Minimum
MLL	Manufacturer Life Limit
m/s	Meter per Second
mph	Miles per Hour
MTOM	Maximum Take-Off Mass
MTOW	Maximum Take-Off Weight
N/A	not applicable
NPI	non procurable item
OAT	Outside Air Temperature
PA	Pressure Altitude
PC	Procurement Code
PFD	Primary Flight Display
PIO	Pilot Induced Oscillation
PIT	procure item through
POH	Pilot's Operating Handbook
Qty.	Quantity
Rcv	receive
rec.	recommended
RH	right hand
RFM	Rotorcraft Flight Manual
RON	Research Octane Number
RPM	Revolutions Per Minute
SAC	Statement of Aircraft Conformity
SB	Service Bulletin
Sec	Second
SIL	Service Information Letter
SoC	Statement of Compliance
sqm	square metre
STP	Stückprüfung (C of A, i.e. conformity of airworthiness)
TADS	Type Approval Data Sheet (german: Geräte-Kennblatt)
TAS	True AirSpeed - calibrated airspeed corrected for air density
TBO	Time Between Overhaul
TCDS	Type Certificate Data Sheet
TCU	Turbo Control Unit
TOC	Table of Contents
TOP	Take-Off Power

V_A	Design manoeuvring speed
V_B	Design speed for maximum gust intensity
VFR	Visual Flight Rules
V_H	Maximum level-flight speed at maximum continuous power
V_{Hmin}	Minimum level-flight speed
V_{NE}	Never Exceed Speed – maximum speed that must never be exceeded
VOX	Voice Operated eXchange, means: voice activation (level)
VPP	Variable Pitch Propeller
VSI	Vertical Speed Indicator
V_X	Speed for best angle of climb
V_Y	Speed for best rate of climb and maximum endurance
W&B	Weight and Balance
Xmt	transmit
Yrs	year(s)

Service Bulletin (SB) and Airworthiness Directives (AD)

Where appropriate, Service Bulletins (SB), Service Information Letters (SIL) or Airworthiness Directives (AD) will be incorporated into the Maintenance Manual with the next revision.

Depending on the market, SB's may be issued by AutoGyro or by AutoGyro Certification Ltd (formally RotorSport UK Ltd)

AutoGyro Certification Ltd (formally RotorSport UK Ltd) is a sister company to AutoGyro GmbH, and responsible for the global approval of AutoGyro products.

In the UK and US Primary Category markets (and some others) the AutoGyro documentation is released via AutoGyro Certification Ltd (formally RotorSport UK Ltd).

Ensure that the correct documentation is used!

See AutoGyro website for details (auto-gyro.com)

Contents

CHAPTER 00 - INTRODUCTION / AIRCRAFT GENERAL

General

The MTOsport Model 2017 915 iS / 916 iS is a ‘new generation’ gyroplane with either a 4-bladed push propeller (915 iS only) or constant speed hydraulic propeller and a 2-blade aluminium main rotor system with swivelling rotor head. It features an open-cockpit fuselage with two seats in tandem configuration. The load carrying frame consists of inert-gas welded stainless steel square tubing. Fuselage and stabilizer with rudder are made from carbon fibre reinforced (CRP) plastic.

The tricycle gear with GRP (glass fibre reinforced plastic) suspension bow features a steerable nose gear.

Rotor flight control consists of conventional linkage using push-rods while the rudder is controlled by cables to allow adjustment of both pairs of pedals and push-pull-cables, routed inside the aft frame keel tube.

CHAPTER 01 - GENERAL

01-11-00 Definitions, Terms and Standard Procedures

The following definitions, procedures and words with special meanings are used in this manual:

Adjust	To put in specified position or condition, usually using tools or devices Example: Adjust the clearance to 1 mm
Check (noun)	A set of check items to be performed. Example: pre-flight check
check (verb)	To make sure that the item is present and/or a given requirement is fulfilled. No tools are required. Example: Warning Lights - Check NONE
Critical Part (CP)	“Critical Parts” are those parts whose failure during ground or flight operation could have a disastrous effect on the gyroplane
Dent	Depression in a surface having area and depth with no sharp edges (see also ‘nick’)
Discard	Put away in order to exclude inadvertent or intentional re-use of the item. Comply with FOD procedures
dispose of	Discard item or substance while employing strict procedures, such as environmental or legal requirements
hand-tighten	Use the bare hand without any tools, gloves or extra efforts
inspect / examine	To look carefully at an item and compare with its standard or specification. Tools or devices may be needed. The condition may be explicitly specified (example: no corrosion). Generally, or if not otherwise stated, inspect/examine means: Make sure that the item • is complete • is correctly attached • has no loose parts • shows no signs of leaks • the surface protection is not damaged • is not cracked or damaged • is not worn Make sure that • all locking devices are installed correctly Make sure that items such as pipes, hoses and cables • look serviceable • do not rub against other items For log books and other technical records: • find pending faults • make sure they are up-to-date and correctly maintained
Inspection	Maintenance procedure to be performed as described in this manual. Example: 100 hrs / Annual Inspection

Maintenance	Any one or combination of overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft or component, with the exception of pre-flight inspection
Measure	To find out dimensions, capacity or quantity of something. Except for counting of smaller numbers, calibrated measurement devices are needed.
Monitor	To watch a parameter or item over a certain period of time in order to read an exact value, derive a trend or identify a change caused by an event. Example: monitor rotor speed indication, monitor RPM drop
Nick	A dent with sharp edges (see also 'dent)
re-torque	Refer to procedure 'torque-tighten'. In contrary to procedure 'torque check' attachment hardware may rotate during re-torqueing
Record (noun)	Technical name for a documentation that shows the accomplishment of maintenance tasks or other activities, usually stating the responsible person's name and date of compliance
record (verb)	To make an (official) entry in a maintenance record
remove securing Hardware	Cut open and remove split pins, lock wire, and such. Wear eye protection. Hold securing hardware with other hand to prevent particles from darting around. Collect all splinters and particles of securing hardware and discard.
Replace	To remove an unserviceable item and install a serviceable in the same location
Servicing	Simple tasks such as lubrication and cleaning, checking and adjusting of air tire pressure, replenishing of fluids
Set	To change (or verify) status of equipment to a given parameter, condition or mode. Example: set altimeter sub-scale to 1013 hPa
torque-check	Refer to procedure 'torque-tighten'. Check with the (minimum) torque value supplied. Attachment hardware must NOT turn! If rotation of attachment hardware was noticeable the torque check FAILED. Refer to procedure described in Job Card
torque-tighten	Use a calibrated tool with the correct range and handle properly and carefully. Set tool to minimum torque (if min. and max. torque values are provided). Use stretched fingers at the long end of the tool and counterhold directly at the pivot point. Click-Type: Stop upon the first clicking. If multiple clicking is heard or further rotation is suspected, open/unscrew and repeat. Replace attachment hardware if appropriate. In order to align attachment hardware (for example in case of a split pin) adjust tool to the maximum allowed torque and tighten carefully until hardware aligns. NO clicking must be heard! If clicking was heard, redo the complete procedure while trying different attachment hardware and/or in different installation position.
Verify	Check that a certain dimension or condition, or set of these, is in-line with given specifications. In order to do so, a special (measurement) procedure will be required and the reference to comply with will be specified.

If not otherwise stated the following standards are based on aeronautical regulations and recommendations (AC43.13-1B), industry and safety standards, and general practices, and shall be applicable throughout this manual. Examples are:

- Torqueing
- Securing (handling of locking wire and other securing hardware)
- Removal of securing hardware
- FOD (foreign object damage) protection
- Discard and disposal procedures
- Handling of hazardous material
- Workplace safety

Notes on “nyloc” (and metal locking such as BinX) nuts:

Ideally a nyloc nut should be used once only. It may be re-used if the thread is undamaged and when fitted to its mating fastener it must only turn with a torque greater than the “Prevailing Torque” listed (values factored from AC43.13-1B):

M6 0.8Nm, M8, 0.8Nm, M10 1.0Nm, 12 1.2N

01-12-00 Standard Bolt Torques

Standard torques are

- M4: 2-3 Nm
- M5: 5-6 Nm
- M6: 11 +/-1 Nm
- M8: 25 +/-3Nm
- M10: 35 +/-4Nm.

Always assess the joint to be tightened and use engineering judgement – do not overtighten plastic or unsupported tube joints!

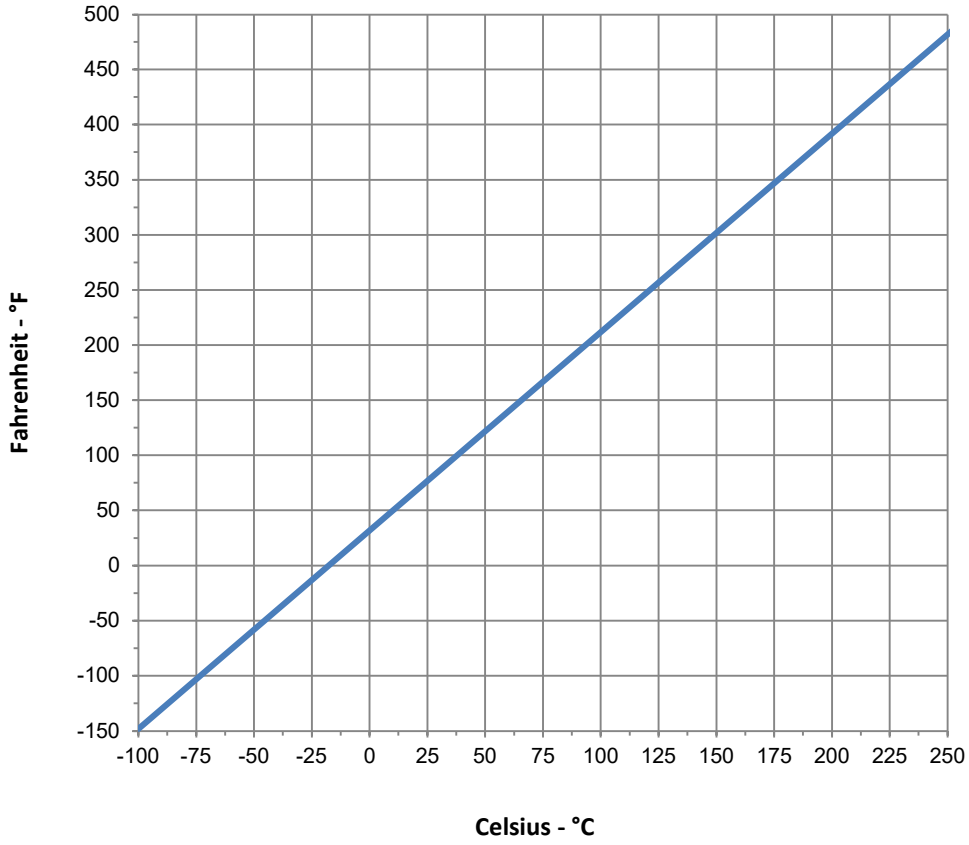
01-21-00 Standard Commercial Tools

Most maintenance tasks on the Calidus can be conducted using standard, commercially available metric tools. In addition, the following standard commercial tools are required:

- Inclinometer (digital) / Digital spirit level with angle gauge
- Spring balance / Dynamometer
- Tensiometer (to measure cable tension)
- 1m aluminium ruler
- Fuel hose clamp
- Torque wrench (in required torque ranges)
- Multimeter
- 3 m-tape measure
- Torch light
- Tyre pressure gauge / tyre filling device

01-91-00 Conversion Tables

LENGTH / DISTANCE				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
m (metre)	3.28	ft (feet)	0.305	m
mm (millimetre)	0.039	in (inch)	25.4	mm
km (kilometre)	0.54	nm (nautical mile)	1.852	km
SPEED				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
m/s (metre per second)	196.85	ft/min (feet per minute)	0.0051	m/s
km/h (kilometre per hour)	0.54	kts (knots)	1.852	km/h
km/h (kilometre per hour)	0.62	mph (miles per hour)	1.61	km/h
PRESSURE				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
hPa (hectopascal)	1.0	mbar (millibar)	0.0001	bar
bar (Bar)	14.50	psi (lb per square inch)	0.0689	bar
bar (Bar)	0.0295	inHg (inch mercury)	33.864	bar
FORCE / WEIGHT				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
N (Newton)	2.205	lbf (pound force)	0.4536	N
N (Newton)	0.1019	(respective force of 1 kg)	9.81	N
MASS (WEIGHT)				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
kg (kilogram)	2.2046	lb (pound)	0.4536	kg
VOLUME				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
l [or ltr] (Litre)	0.2642	US gal (US gallons)	3.7854	l/ltr
l [or ltr] (Litre)	1.057	US qts (US quarts)	0.946	l/ltr
l [or ltr] (Litre)	0.0164	in^3 (cubic inch)	0.946	l/ltr
TORQUE				
Multiply	**by**	**to obtain / Multiply**	**by**	**to obtain**
Nm (Newton metre)	0.738	lbf.ft. (pound-foot)	1.3558	Nm
Nm (Newton metre)	0.113	lbf.in. (pound-inch)	8.851	Nm
kgmm	0.0098	Nm	101.94	kgmm



Celsius-Fahrenheit Conversion Chart

CHAPTER 02 - TOOLS, SPARES AND CONSUMABLE MATERIALS

02-51-00 Consumable Materials

Consumable Material (CM) referenced throughout this Maintenance Manual is coded AG-XXX-NN where NN is a consecutive number and XXX represents the material code according to the classification listed below:

Class	Description	Class	Description
BAS	BONDING, ADHESIVES AND SEALANTS	LUB	LUBRICANTS
CCM	CHEMICAL CONVERSION MAT.	MSC	MISCELLANEOUS
CLA	CLEANING AGENTS	OIL	OILS
CPA	CORROSION PREVENTIVE AGENTS	PNT	PAINT AND LACQUERS
FUE	FUELS	PRM	PRIMER, PREPARATION FOR PAINTING
GRS	GREASES	PRS	(STORAGE) PRESERVATION
HYF	HYDRAULIC FLUIDS		

The following consumable materials are referenced in the Maintenance Manual:

CM-Item	Material / Description	AutoGyro Part Numbers
AG-BAS-01	Loctite 221 red	PN 30487
AG-BAS-02	Loctite 243 blue	PN 30483
AG-BAS-03	Loctite 542 red	PN 30488
AG-BAS-04	Loctite 638 green	PN 30485
AG-CPS-01	'Hohlraumspray'	PN 34197
AG-GRS-01	Silicon grease Lagermeister 2002	PN 30477
AG-LUB-01	Ballistol Oil Universal	PN 31816 (5L can) PN 31846 (2ml injection syringe) PN 31847 (5ml injection syringe)
AG-LUB-02	Anti-Seize Spray	PN 31590
AG-LUB-03	HHS 2000	PN 30476
AG-LUB-04	Liqui Moly LM 47 MOS2	PN 45506
AG-OIL-01	Aeroshell Sport Plus 4	PN 43082

CHAPTER 03 - MINIMUM EQUIPMENT REQUIREMENT

In accordance with the Pilot's Operating Handbook (POH) Section 2.11 the following equipment must be operative for flight

- Air speed indicator
- Altimeter
- Compass
- Side Slip Indicator
- Rotor RPM indicator
- OAT indicator
- Engine instruments (oil pressure, oil temperature, RPM, CHT)
- Pre-rotator

Depending on the equipment state or relevant condition a limited or restricted operation may be granted to facilitate maintenance efforts and operability.

Equipment / System	Condition	Limitation/Restriction
Compass	Defective	Local flights within the traffic pattern and with ground reference.
Rotor RPM indicator	Defective	Flight to a maintenance facility.
Pre-rotator	Defective / No function R-RPM indicator working	Flight to a maintenance facility under the following conditions: • Experienced pilot as sole occupant • Concrete/asphalt runway with a minimum of 5 times the normal required take-off roll distance available • Second briefed person 'handpropping' the rotor while engine/propeller is off • Steady, laminar headwind
Pre-rotator	Malfunction, R-RPM > 120 R-RPM indicator working	Flight to a maintenance facility under the following conditions: • Experienced pilot • Concrete/asphalt runway with a minimum of 3 times the normal required take-off roll distance available • Steady, laminar headwind

CHAPTER 04 – MANUFACTURER LIFE LIMITATIONS (MLL)

For the safe operation over the specified lifecycle of the aircraft and liability reasons the following manufacturer limitations shall apply. In case the component has an operating hours and calendric time limit the first limit shall apply.

Note that at expiration of the specified manufacturer life limit (MLL) the component shall be replaced for your own safety, independent of its condition.

ATA	Equipment / System	MLL
62-00-00	Rotor System II (RSII) Standard	2500 hrs
	Rotor System II (RSII) TOPP 8.4m	2500 hrs
	Rotor System II (RSII) TOPP 8.6m	2500 hrs
62-31-00	Rotor main bearing	1500 hrs

Note that the Rotor main bearing is only supplied pre-assembled into the teeter tower. Trained partners with the correct tooling are permitted to change the bearing.

Status and lifetimes of components, liquids and fluids is listed in the Event and Configuration Log form. The initial Event and Configuration Log is delivered with the gyroplane by AutoGyro. An empty form is provided for download on the AutoGyro website.

Primary and Secondary structure determination:

A primary structural part is one for which the failure would be catastrophic and would prevent continued safe flight and landing.

All other structure can be considered as Secondary, thus failure of a Secondary structural part would not be immediately catastrophic and with due care continued safe flight and/or a safe precautionary landing could still be made.

Because of the simplicity of the aircraft structure some parts have a dual role – such as the airframe. As an example, the airframe of the aircraft is primary structure, yet it carries attachment point for items non flight critical components.
The primary structural elements are considered to be:

- Airframe
- Connection assemblies joining the rotor head to the mast.
- The rotor assembly and rotor head
- The tail and rudder assembly
- The rudder and rotor control system
- The main undercarriage and nosegear
- Whilst other items may have an effect on flight safety, they are considered secondary to the above. The undercarriage is included, as whilst it does not contribute to safe flight, it is difficult to make a safe landing without it – inevitably an aircraft rollover would result, probably destroying the aircraft.

Critical parts

The following parts and assemblies have been denoted critical during the design review process, and special care must be taken with them during storage, handling and installation.

Item & Part Number	Reason/comment
Assemblies	
Rotor Head Upper Assembly	Correct assembly of pitch, roll, main bearing and teeter bolts/nuts and splits pins is essential for safe operation
Airframe	Must be inspected carefully for damage or cracks
Rotor Assy RSII TOPP 8.4 and 8.6m	Correct assembly of the rotor system is essential for safe operation. Life limited and serialised assembly
Rotor Head assembly	Correct assembly of Rotor Head upper and lower assemblies
Parts	
Teeter bolt	Must be correctly fitted, with no cracks or damage for safe operation
Teeter tower (assembly)	No cracks or damage permitted for safe operation, and free spinning bearing without any poor feel. Life limited and serialised assembly because it carries the bearing.
Main bearing nut	Must be properly tightened and correctly fitted with a split pin.
Rotor blade assembly	Damage or fracture of the rotor blade is not permitted
Mast box section	Must be inspected carefully for cracks or other fractures
Gimbal block	Must be free of cracks or fractures for safe operation
Main bearing bolt	Must be properly tightened and correctly fitted with a split pin.
Pitch and roll bolts	Must be correctly fitted, with no cracks or damage for safe operation

CHAPTER 05 - TIME LIMITS, INSPECTIONS & CHECKS

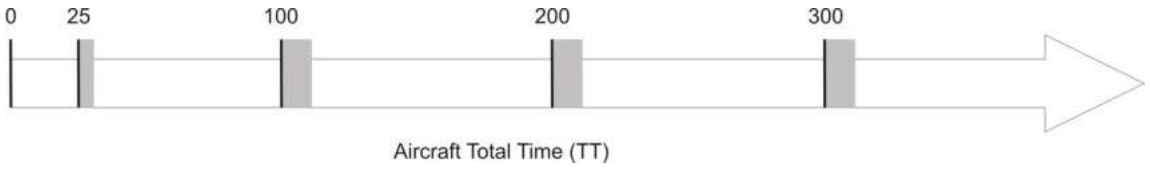
For safe operation and continued airworthiness over the specified lifecycle of the aircraft the following inspection schedule shall apply. Note that specified tolerances must NOT be accumulated!

Task	Interval	Recurrence	Tolerance
Daily / Pre-Flight Check	Before flight / daily	Each	N/A
Complementary / Servicing Tasks	5 hrs (rec.)	Each	N/A
25 hrs Inspection	25 hrs	Once	+/- 5 hrs
100 hrs / Annual Inspection	100 hrs / 1 yr	Each	+/- 10 hrs
Supplemental Inspection	1500 hrs / 5 yrs	Each	-

The 25 hrs inspection has to be performed once, within the specified tolerance.

The 100 hrs inspection has to be performed every 100 hours, within the specified tolerance, at latest within 12 months, counted from issue of the aircraft's Statement of Compliance (Stückprüfung) or Annual Inspection (JNP).

Note that tolerances do not accumulate! However, a preponed (earlier) inspection outside the tolerance will reduce the next inspection due cycle accordingly.



(Total time in hours, counted from engine start to engine shut-down, i.e. HOBBS meter)

05-10-00 Time Limits

In addition to time limits for inspection items and checks the following time limits for inspection or overhaul of respective components or replacement of liquids and fluids apply. Please refer also to the engine manufacturer's manual and time limits specified herein, as well as CHAPTER 04 - Airworthiness Limitations!

Components

ATA	Equipment / System	Time Limit
53-00-00	Airframe	on condition

Liquids and Fluids

ATA	Equipment / System	Time Limit
75-00-00	Engine coolant (acc. to coolant manufacturer)	Recommended at latest 5 years
79-00-00	Engine oil (acc. to engine manufacturer)	As per Rotax service schedule

Refer to CHAPTER 12 concerning replenishing/replacement procedures and types of liquids and fluids.

Status and lifetimes of components, liquids and fluids is listed in the Event and Configuration Log form. It is the obligation of the maintenance facility to keep this form current. An empty form is provided for download on the AutoGyro web site.

05-20-00 Scheduled Inspections & Checks

Daily / Pre-Flight Check

All daily or pre-flight check list items consist of visual checks and do not replace professional mechanical inspection and maintenance. The **Daily / Pre-Flight Checklist** for the standard MTOsport 2017 915 iS / 916 iS gyroplane is provided in the current Pilot's Operating Handbook.

Note that there is no 'post-flight' inspection mentioned. It is reasonable, however, to perform parts of the pre-flight inspection after the last flight of the day in order to take maintenance action in advance, if necessary.

Complementary / Servicing Tasks

The following tasks have to be performed in-between 100hrs inspections and may be performed on an operational level by the pilot or a trained person.

Task	Interval	Tolerance
Lubrication: Teeter hinge (see Chapter 12 – Servicing)	5 hrs (rec.)	N/A
Lubrication: Pre-rotator drive coupling sleeve	as req.	N/A
Cleaning/replacement: Engine air filter	as req.	N/A

25 hrs Inspection (one-time / non-recurrent)

The inspection items of the 25 hrs inspection are covered within the 100 hrs inspection protocol, which is available for download.

100 hrs / Annual Inspection

The maintenance protocol of the 100 hrs / Annual Inspection is available for download.

05-21-00 Temporary Scheduled Inspections & Checks

Temporary Scheduled Inspections and Checks may be introduced by SBs or AD's (if any). Notice of, and compliance with ADs is mandatory. If necessary, AutoGyro GmbH will point out the existence of such information and will provide detailed procedures to registered service partners and owners.

Important Note: Temporary scheduled inspections introduced by the engine/powerplant manufacturer will not be covered by process. As a contribution to fleet safety, AutoGyro may point out the existence of such information, if possible.

05-30-00 Unscheduled Inspections

In case of the following events or occurrences, unscheduled inspections have to be performed.

Event / Occurrence / Unusual Condition	Action / Reference
Rotor vibration	see CHAPTER 18
Propeller vibration	see CHAPTER 18

If in doubt contact AutoGyro Technical support.

05-50-00 Conditional Inspections

Depending on the conditions the gyroplane is operated in or special operational incident the following conditional inspection may apply:

05-51-00 Inspections - Special Operational Conditions

Condition	Action / Reference
Operation in sand or dust	see below
AVGAS	engine manufacturer documentation
Winter operation	see below

Operation in sand or dust

- Refer to engine manufacturer documentation
- Inspect/change air filter regularly
- Reduce 100 hrs inspection interval to 50 hrs
- Apply propeller leading edge protection strip
- Operation with keel tube fin (recommended)

Winter operation

The cooling system for the cylinder heads of the engine is filled with a mixture of Ethylene Glycol anti-freeze and distilled water, which gives freezing protection down to -20°C. Using a hydrometer, check protection temperature of the coolant and add anti-freeze, if necessary. If temperatures are expected to fall below protection temperature, drain the coolant, and if required for service, refill with pure antifreeze (see 12-30-40 Servicing: Engine Coolant).

CAUTION

Pure antifreeze is not as good an engine coolant as a 50/50 mix with water. Take care that engine coolant limits are not exceeded. As soon as ambient temperatures permit, drain and refill with the normal coolant mix.

Because the oil and coolant system contain a thermostat, operation in winter does not require part-blocking of the radiators to maintain temperatures

05-55-00 Inspections - Special Operational Incident

Event / Occurrence / Unusual Condition	Action / Reference
Suspected hard landing	see below
Rotor contact with obstacle	see below
Propeller contact with obstacle or external impact	see below
Birdstrike	see below
Lightning strike	see below

Suspected hard landing

In case of a suspected hard landing perform the following checks:

- Inspect nose gear, attachment, fork, linkage and wheel bearing
- Inspect main gear axles and attachment
- Examine possible rotor / propeller strike → see 'Rotor / propeller contact with obstacle'
- CRITICAL: Inspect main gear suspension bow (airframe attachment and both axle attachments ok, no cracks)
- CRITICAL: Inspect airframe and attachment points for possible deformation or cracks, esp engine mountings.
  Perform levelling procedure (see Job Card 08-20-00 2-1 in Part E of this manual)
- CRITICAL: Inspect engine mounting and propeller to frame clearance approx. 5 cm
- CRITICAL: Perform a rotor alignment check

Defective components must be replaced. In case one or more of the items marked 'CRITICAL' are found defective or out of tolerance, contact AutoGyro customer support.

Rotor contact with obstacle

Rotor contact with obstacle include any rotor strike of the standing or turning rotor with an obstacle, including propeller and fuselage structures. In case of rotor contact with obstacle:

- Perform a rotor alignment check and adjust, if necessary
- Examine damage of aluminium rotor profile:
  → allowed damage: dent with max. depth of 1 mm
  → CRITICAL damage: nick(s)
- In case the turning rotor hit the stabilizer/rudder, a detailed inspection of the affected components must be performed.

In case CRITICAL damage is found, the rotor system must be replaced. Contact AutoGyro Technical Support.

Propeller contact with obstacle or external impact

Refer to engine manufacturer documentation. If there is no visible damage, then perform tap test on propeller blades to assess for invisible damage. Replace damaged parts.

Birdstrike

- Perform detailed inspection of all affected component
- If rotor blades are affected, proceed according to 'Rotor contact with obstacle'
- If propeller is affected, proceed according to 'Propeller contact with obstacle or external impact'

Lightning strike

A lightning is likely to have caused invisible damage to many components, especially the main rotor bearing. The aircraft must not be flown until satisfactory inspection has been undertaken and any rectification has been completed.

05-60-00 Ground Test Run

The maintenance protocol of the Ground Test Run is available for download.

05-70-00 Functional Test Flight

The maintenance protocol of the Functional Test Flight is available for download.

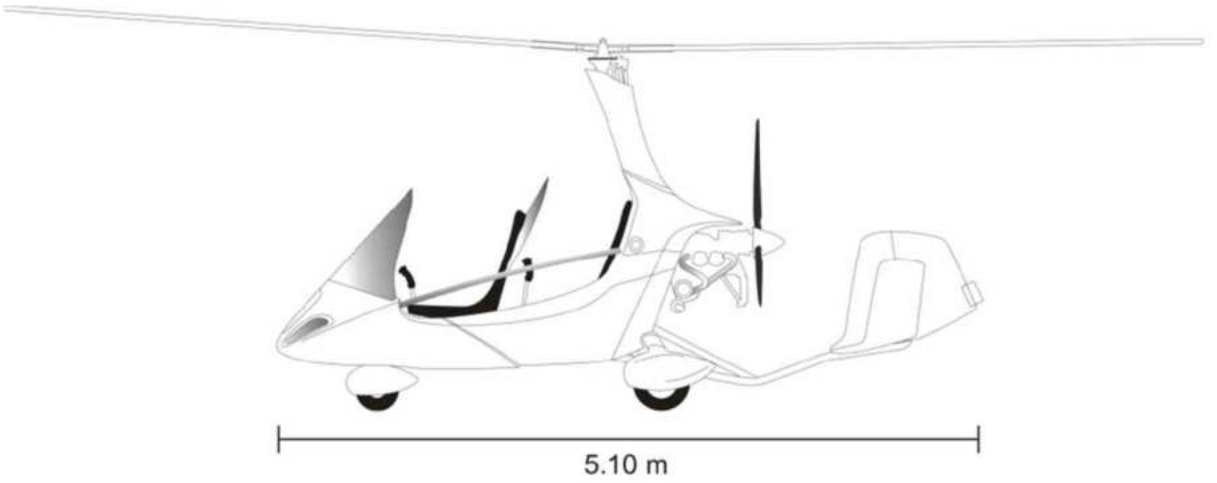
05-90-00 Maintenance Records & Aircraft Logs

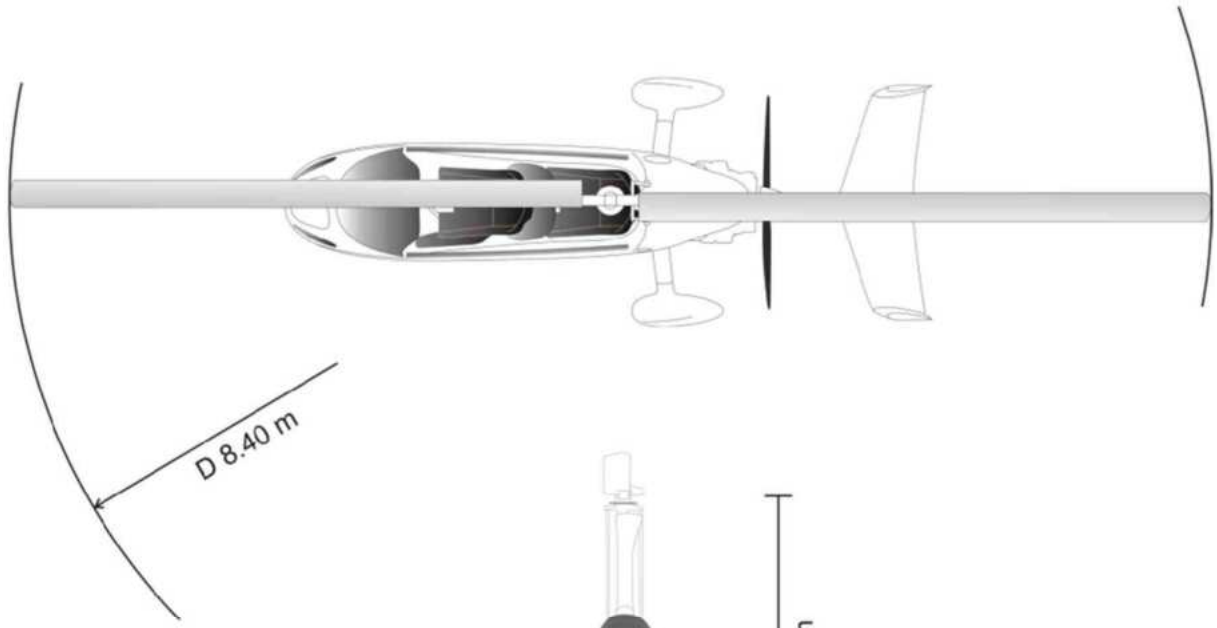
An illustrated 'Parts List' (AutoGyro Parts List) will be compiled individually and delivered with each gyroplane.

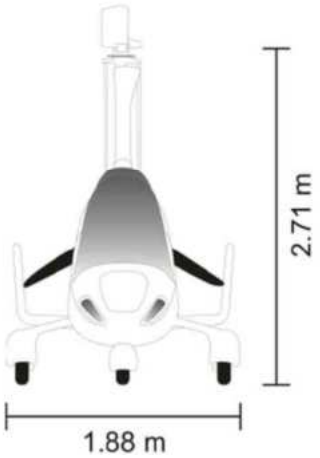
Forms are available for download.

A 'Life Limited Items Log' (LLI) is delivered with the aircraft by AutoGyro and shall be kept current by the maintenance facility. An empty form is available for download.

CHAPTER 06 - DIMENSIONS & AREAS







Length	5,25 m
Width	1,88 m
Height	2,76 m
Rotor diameter	8,4 m (915 iS installation only) or 8,6m
Rotor disc area	55,44 sqm
Propeller diameter	1,72 m

CHAPTER 07 - LIFTING / JACKING / SHORING

See Job Card 07-00-00 2-1 in Part E of this manual.

CHAPTER 08 - LEVELING & WEIGHING

Weighing shall be performed in a draft-free hangar on level ground, with the aircraft defueled to minimum useable fuel.

Make sure each wheel of the gyroplane is located centred on the scales.

The weighing report is available for download.

CHAPTER 09 - TOWING & TAXIING

Experience shows that aircraft may be exposed to much higher loads when operated on ground, than when in flight. Such loads caused by rumbling on rough terrain, or bouncing the aircraft over the hangar threshold may easily exceed the design load in peak.

Use caution when handling the gyroplane on ground. Care must be taken when pushing at the rudder or at the outer stabilizers. Avoid excessive swing of the rotor blades as repeated bending ultimately leads to fatigue or damage.

CHAPTER 10 - PARKING, STORAGE & RETURN TO SERVICE

Parking up to 6 months

No special measures need to be taken.

NOTE Don´t let E10 remain in the fuel system for unnecessary long time or for long-term storage!

Parking more than 6 months

- Refer to engine manufacturer documentation
- Maintain battery charged
- Unload wheel gear
- Cover aircraft with a light plastic tarpaulin or cloth

Long-term Storage

Contact AutoGyro Technical Support

Return to Service

Perform a 100 hrs Inspection.

CHAPTER 11 - PLACARDS & MARKINGS

To avoid duplication and error, placards are shown in the pilot operating handbook (POH or Rotorcraft Flight Manual).

Placards may be market specific by language and or units of measure. Check in the respective handbook.

CHAPTER 12 - SERVICING

12-10-00 Cleaning

Care and regular cleaning of engine, propeller, rotor system and fuselage is the basic foundation for airworthiness and reliability. Therefore, the gyroplane should be cleaned after every last flight of the day or more often, if environmental conditions dictate.

In order to protect the gyroplane against dirt, dust, bird soil, and sunlight, the aircraft should be covered with a light plastic tarpaulin or cloth. Openings to the engine, service access ports and airspeed indicator should be closed after the flight (insects, birds etc.).

Contamination can be cleaned with clean water, possibly with mild cleaning additives. To clean the rotor it is best to soak contamination with a cloth or towel, wipe with soft or micro-fibre cloth, and rinse thoroughly with water.

12-20-00 Lubrication

Component	Application	Reference
Lubrication: Teeter hinge	5 hrs (recomm.)	see below
Lubrication: Pre-rotator drive coupling sleeve	as required	see below

See CHAPTER 05 for respective time limits.

Lubrication: Teeter hinge
The teeter hinge consists of a steel bolt running in special Teflon coated bushings. In order to provide proper bearing action and to avoid wear and bearing play, which will cause rotor vibration in consequence, regular lubrication is essential. In order to do so, the best practise is to perform work steps 5 to 7 from Job Card 62-11-00 6-1 INSPECTION: ROTOR – TEETERING PARTS in Part E of this manual. Make sure to apply grease also on the outer (secondary) bearings inside the teeter tower.

Lubrication: Pre-rotator drive coupling sleeve
Apply a thin layer of lubricant AG-LUB-03 on coupling sleeve when in extended position in regular intervals, at latest when the sliding surface feels dry or after flight through rain. Mast cover must be removed!

12-30-10 Servicing: Engine Air Filter

The air intake filters need to be replaced or cleaned according to the manufacturer‘s recommendation. Depending on environmental conditions, such as dust, sand, or pollution the recommended rate of maintenance should be increased as required. Engine cowling must be removed!

12-30-20 Servicing: Tire Pressure

Main wheels	1.8 – 2.3 bar
Nose wheel	2.0 – 2.4 bar

NOTE: Green valve caps are used when the tire is filled with nitrogen.

12-30-30 Servicing: Battery

The aircraft is fitted with a maintenance-free gel electrolyte battery. Maintenance is therefore limited to outside soundness, correct attachment, and cleaning. Check integrity of the battery as leaking fluid contains corrosive sulphuric acid which would lead to extensive damage when contacting the framework and attachments.

Charge the battery only with a charging device which is suitable for gel electrolyte batteries.

CAUTION: The battery must never be deep discharged, as it will be damaged. If so, it might need to be replaced.

12-30-31 Servicing: ETX 900 Lithium LiFePO5 Earth X Battery

The Lithium battery is a maintenance free battery. EarthX lithium battery has over discharge protection via an internal Battery Management System (BMS) to disconnect the battery from the active load (your vehicle) to protect the cells from damage when it is 95-98% drained.
Inspection or testing is not needed for 24 months after purchase, and thereafter the following is recommended annually:

- Follow any inspection requirements for the battery type as documented by the battery manufacturer, found on the manufacturers website.
- Visually inspect the battery for signs of damage; plastic case is warped or swollen.
- Check the fault indicator mounted on the upper side of the battery, and/or located in the instrument panel LEDs, a solid or flashing warning indicates a variety of defects as below.
- Ensure the terminal screws are tight (properly torqued)

Charge the battery only with a charging device which is suitable for Lithium batteries.

12-30-40 Servicing: Engine Coolant

The cooling system for the cylinder heads of the engine is filled with a mixture of anti-freeze and water, which gives freezing protection down to -20°C. Check protection temperature of the coolant and add anti-freeze, if necessary.

Verify coolant level in the expansion tank, replenish as required. Minimum fluid level is stated (engraved) on the fuel dipstick.If no fluid is visible on the dipstick, a technical defect is most probable. Have engine inspected before next flight.

If temperatures are expected to fall below protection temperature, refer to 05-51-00 Winter operation.

Note! The coolant system contains a complex pathway of hoses to each cylinder head. Take care to ensure the system is properly vented during refilling.
With the Rotax header tank cap removed (and only with a cold engine), adequate venting may be ensured by sharply squeezing the radiator hoses until no air bubbles exit through the tank.
Refit the cap after venting.

12-40-00 Replenishing / Replacement of Fluids

Liquid / Fluid	Max. Filling Qty.	Type / Code
Engine coolant (50/50 distilled water and EthyleneGlycol antifreeze suitable for aluminium engines)	3.8 ltr	as documented
Engine Oil	3.4 ltr	as documented

See CHAPTER 05 for respective time limits.

CHAPTER 13-17 – UNASSIGNED / N/A

CHAPTER 18 - VIBRATION & NOISE ANALYSIS

Vibration may be induced by the rotor system, the propeller or even the engine. Finding out the cause for vibration and its proper cure requires experience and special equipment. This is why vibration analysis and related maintenance can only be performed by specialized service partners, or AutoGyro GmbH, Germany directly.

The following tests or fault isolation procedures should be performed in order to exclude systematic errors in case of rotor vibration:

- rotor system cleanliness
- check/verify correct installation position of the shim washers relative to teeter block and teeter tower (one or two dot markings on block, shim washer and teeter tower must align)
- check for possible play in teeter bearing in axial or radial direction
- check rotor system alignment (see Job Card 62-11-00 5-1 in Part E of this manual)
- check for possible play in rotor bearing
- adjust (increase) rotor control friction (see Job Card 62-32-00 5-1 in Part E of this manual)

In case of unusual vibration, contact AutoGyro or an AutoGyro specialized service partner. If possible, try to describe the type of vibration as precise as possible as this will help to save time to reproduce and troubleshoot, or even allow a first remote assessment. The following table provides a basic classification.

Vibration appearance / sensation / parameter

- Lateral (left-right / back-forth) vibration with approximately 6 per second amplitude
- Vertical (up-down) vibration with approximately 12 per second amplitude
- Free-stick movement – carefully release control stick (if possible/safe) and describe path and displacement of control stick head
- Flight condition (weight, speed) with highest vibration level
- Rotor RPM
- Higher frequency vibration (around 50 Hz, like an electric razor), changing with RPM
- Higher frequency vibration, frequency and amplitude significantly changing with power setting, possibly irregular or erratic
- RPM or power setting with highest vibration levels

Noise is mainly created by the propeller. Engine and muffler play a secondary role in noise emission, as long as intact. Any deficiencies could be easily identified by a visual inspection or tap test. Repair or replace as necessary.

Propeller noise is emitted by the fast turning blade tips and usually increases exponentially with RPM and speed due to interaction of air disturbances with the blade tips.

As noise is a subjective perception, only measurement will provide reliable data. However, the following table provides elements and countermeasure to troubleshoot and cure in case of unusual noise emission.

Possible causes for noise / countermeasures

- Check propeller condition (cleanliness, erosion, damaged or splintered blade tips). Clean or repair propeller.
- Check propeller RPM during take-off (full throttle) or cruise. Adjust/reduce if required.
- Check/adjust propeller pitch. Check pitch setting of individual blades and adjust so that they are the same.
- Check leading edge of propeller and leading edge protection strip (if installed). A damaged leading edge protection strip (loose or sticking out end) may change noise signature significantly. Replace as necessary.
- Check air filter condition and installation condition.
- Check exhaust system for soundness

CHAPTER 19–20 – UNASSIGNED / N/A

Contents

CHAPTER 21-22 - UNASSIGNED / N/A

CHAPTER 23 – COMMUNICATIONS

23-10-00 Speech Communication / Radio

The communication system consists of an integrated VHF radio system installed in the instrument panel. Different versions may be possible. Please refer to the manufacturer's specifications and manuals for reference. Wiring diagrams are provided in Part D - Diagrams and Charts of this manual. Different possible cockpit layouts are described in CHAPTER 31-10-00 INSTRUMENTS & CONTROL PANELS.

23-40-00 Interphone / Intercom

The standard intercom system features standard headset sockets (TRS / Tip Ring Sleeve). Sockets are provided at the side of each crew seat. The intercom amplifier and VOX control is integrated in the respective radio. See manufacturer's manual for additional information.

As the intercom function is an integral part of the radio system, please refer to CHAPTER 23-10-00 SPEECH COMMUNICATION / RADIO.

CHAPTER 24 - ELECTRICAL POWER

The 12V DC electrical system consists of two engine driven electrical generators, a battery, master switch, indicators, switches, electrical consumers, and cabling. With the ROTAX 915 iS / 916 iS engine an electrical power supply is vital for continued engine operation as this engine variant solely relies on electrically driven fuel pumps and engine ECU. GEN1 is used by the engine only, GEN2 is used to supply the aircraft ancillary systems.

An additional, externally mounted 40A generator (GEN3) is optionally fitted equipped for high electrical load operations.

Turning the master switch to the ON position closes the battery contact and energizes the gyroplane's electrical system. The orange LOW VOLT warning light will illuminate briefly as a functional check. A steady indication warns the pilot that the voltage of the system has dropped below a safe value. In this case a safety circuit (load shedding relay) will automatically disable the unnecessary systems (seat heating, 12V power receptacle, heating fan). It is not unusual for this led to be lit when first turning on the key switch, which will depend on the level of battery charge. The GEN3 (where fitted) amber warning light is installed to indicate that the battery is not being charged by that generator.

BRP-Rotax
INSTALLATION MANUAL

VALIDATION OF INSTALLATION

External Power Supply

Is an engine installed in a specific aircraft type for the first time, it is required to measure the voltage on three positions:

- Battery Voltage (separate Voltmeter)
- Voltage on Electric Starter (separate Voltmeter)
- ECU Bus Voltage (displayed in BUDS Aircraft diagnostic tool)

Depending on the location where the engine should be used, this measurement must be done at the lowest reachable temperature. In case the measured voltages drop below 9 V the installation is insufficient. In this case specification of the battery and execution of the wiring needs to be checked.

Separation of EMS and Airframe circuit

Proof the continuity between Fusebox Regulator A and Fusebox Regulator B in static condition (Fusebox will not be supplied with power by an external power source).

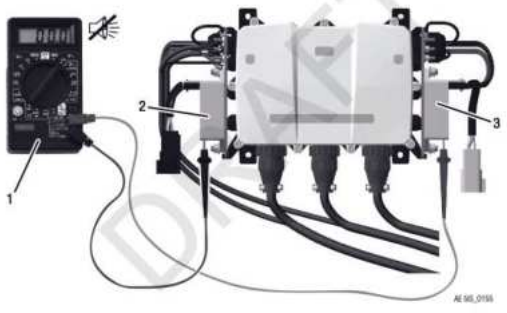


Figure 3.2: Validation of EMS and Airframe Circuit separation

1 Multimeter *2 Rectifier regulator A (black connector)*
3 Rectifier regulator B (grey connector)

If continuity of the installation is not sufficient, then the concept of the wiring needs to be revised.

24-30-00 DC Generation and Battery

Direct current is provided by an engine-integrated AC generator with external rectifier-regulator (12V 20A DC). The battery is mounted in a bracket at the rear of the lower mast frame.

24-60-00 DC Electrical Load Distribution

The DC electrical load distribution system includes cockpit switches, control electronics (relays and logic components), fuses, electrical harnesses and cabling, and electrical consumers. Electrical schematics are provided in Part D - Diagrams and Charts of this manual.

The power demand for various consumers is provided in the following table:

ATA Reference	Equipment / System	Power load
24-3	*Generator (Gen2)*	*(-) 420 W*
24-3	*External Generator (Gen3)*	*(-) 600 W*
23-1	Radio ATR833 (if inst.)	7 W (receive) / 39 W (transmit)
25-1	Seat heating (if inst.)	100 W
28-2	Electrical fuel pump (ea.)	41 W
33-4	NAV/Pos lights (LED)	8 W
33-4	Strobe lights	46 W
33-4	Landing light (LED)	36 W
34-7	ATC Transp.TRT800H (if inst.)	max. 10 W
36-1	Pneumatic compressor	103 W / (280 W peak)
85-23	Heated gloves (if conn.)	30 W
85-23	Heated pants (if conn.)	50 W
85-23	Heated jacket (if conn.)	88 W
85-23	Heated soles (if conn.)	17 W
85-34	Aspen (if inst.)	70 W
85-	Pitot heat	19W
85-34	Garmin 695 / 795 (if inst.)	40 W
85-34	Garmin area 500 (if inst.)	5 W (charging)
85-34	Garmin G3X (if inst.)	30 W

Fuses together with their values and application are listed below:

Fuse / Name	Value	Application
F2 Gen. 3	5 A	Generator 3 (if installed)
F3 Compressor	15 A	Electric Compressor
F5 ECU	2 A	Engine Turbo Control Unit (if inst.)
F6 Cockpit	5 A	
F7 Avionic	10 A	
F8 ACL	10 A	Strobes
F9 Start	5 A	Engine Starter Relay
Line fuse/Taxi light	10 A	
Line fuse/Landing light	10 A	
F12 Prop.	15 A	Propeller Adjustment (if inst.)
F13 Trim.	3 A	Trim and Rotor Brake Control
F14 Sensor	3 A	
F15 Heater pilot	15 A	Seat Heating Front Seat (if inst.)
F16 Heater co-pilot	15 A	Seat Heating Rear Seat (if inst.)
F17 12 V plug	5 A	12 V Power Outlet
F18 Rear cockpit	10 A	
At the battery		
Regulator	30 A	
Cockpit	50 A	
Aux. generator	50 A	
Starter	125 A	

Note that the electric fuel pumps are supplied and fused via the engine management system. The engine fuse box is located to the rear of the mast, in the engine area. See the Rotax manual for the fuse types and values.

CHAPTER 25 - EQUIPMENT / FURNISHINGS

25-10-00 Flight Compartment

Forward and aft seat are adjustable to suit different pilots and consist of a GRP bowl which is fastened to the frame structure. Basic upholstering consists of an easily cleanable, water-repellent 'sports design' seat and backrest cushions with foam core. Alternatively a leather cover is offered.

The cushions are attached with hook-and-loop tape with the shoulder harness passing through the back cushion.

For each seat an adjustable four point harness is available.

CHAPTER 26 – N/A

CHAPTER 27 - FLIGHT CONTROLS

27-00-00 Flight Controls

See CHAPTER 67 – ROTOR FLIGHT CONTROL.

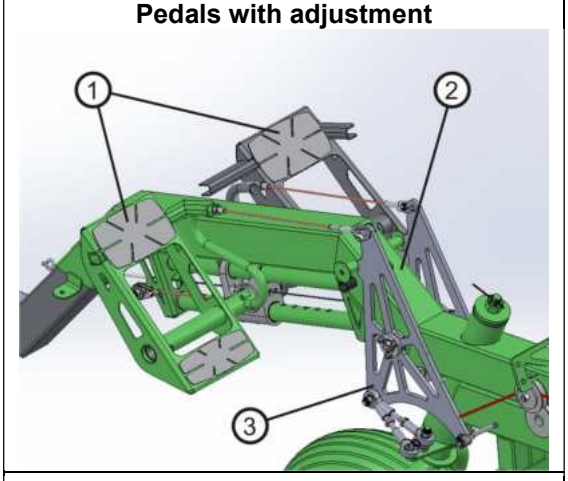
Note: Stabilizers are described in CHAPTER 55 - STABILIZERS.

27-20-00 Flight Controls – Rudder

The rudder is connected to the adjustable foot pedals with two push-pull control cables with are routed through the horizontal frame, steel cables and two bell crank levers. Nose wheel steering is directly linked to pedal/rudder control input by the two bell crank levers and control rods. The pair of aft pedals is interconnected in parallel with the nose wheel control path.

Both pairs of pedals are individually adjustable to suit pilot's comfort. A shorter adjustment is achieved by pulling the adjustment handle which releases the detent catch. Pulling it further pulls the pedals closer. Pulling the handle to release the detent, and then pushing with both feet gently against the pedals allows longer adjustment.

Pedals with adjustment



1 – Pedals
2 – Adjustment handle
3 – Nose wheel and rudder control

The rudder fin is described in CHAPTER 55-40-00 RUDDER.

CHAPTER 28 – FUEL

28-10-00 Storage

Two fuel tanks are located under the rear seat and have a total capacity of 94 litres. Tanks are made from PE plastic and feature a ventilation line that is routed under the aircraft body. A drain valve is available in the bottom aft area of each tank that accepts a standard drain tool with pin to open the valve.

A large crossover port connects both tanks to ensure quick equalization.

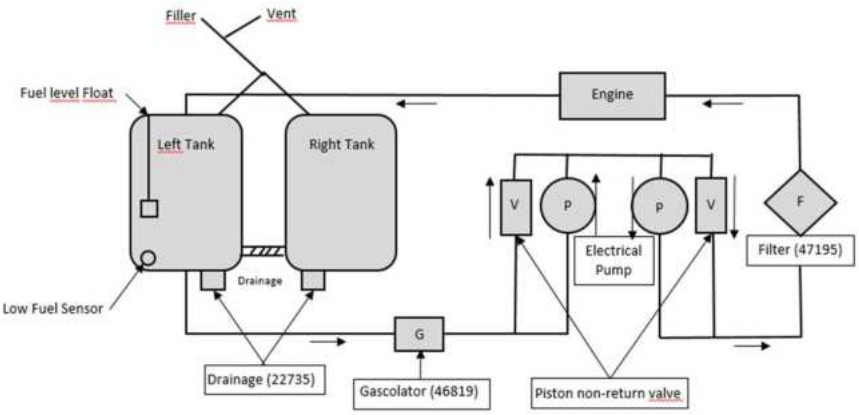
The gascolator drains through on the right side, near the suspension bow, allowing easy access for drainage. Always close properly after inspection!

Drain Valve(s)

28-20-00 Distribution

The fuel distribution system comprises fuel hoses, made of fabric-reinforced rubber, PTFE hose with stainless steel braid, a shut-off valve, a filter and two pumps.

Fuel system ROTAX 915 iS / 916 iS:



Location of gascolator drain point

28-40-00 Indicating

An electronic fuel level gauge with integrated and independent low fuel sensor is provided in the cockpit. The LOW FUEL warning light is triggered as soon as 7.5 litres or less of usable fuel remain in the tanks. On ground, fuel quantity can be determined by a transparent line positioned at the rear end of the tanks.

Additionally, and optionally, a low/high fuel pressure warning LED (FUEL P.) may be fitted to the panel. This lamp indicates solid when the fuel pressure downstream of the fuel pumps is less than 0.15bar. The pressure sensor is located in the fuel supply hose between the pump filters and the fuel pressure regulators on 914UL engines.

CHAPTER 29-30 - UNASSIGNED / N/A

CHAPTER 31 – INDICATING SYSTEM

Note: The hour meter / HOBBS meter is described in CHAPTER 77 – ENGINE INDICATING.

Where a Garmin G3x is fitted, this feature is incorporated within that device.

31-10-00 Instruments & Control Panels

Different instrument panel layouts are available. The basic instrumentation arrangements include:

- GPS Layout
- EFIS Layout
- Night VFR

The panel layout “GPS” includes all relevant instruments arranged in a way to accept most off-the-shelf moving map navigation devices in the respective format. Alternatively, the area in the centre of the panel may be used to install a map holder or attach checklists and/or maps.

Some hand held GPS units and antennas emit magnetic fields that vary with respect to time and/or levels of battery charge. These may change the compass deviations, so always cross check between the compass headings with the GPS installed and placard accordingly if required.

All EFIS layouts are tailored to the integrated flight and navigation suite of the respective manufacturer. In addition to navigational and moving map functions, the system provides primary flight data and engine/vehicle monitoring. It is of utmost importance to read and understand the operators’ manual and to become familiar with the system before operation. In case of a system failure, altimeter and air speed indicator are provided as back-up.

Depending on the chosen instrumentation and optional equipment, the depicted panels on the following pages may vary.

NOTE

The cockpit panel detail layouts may vary from those shown.

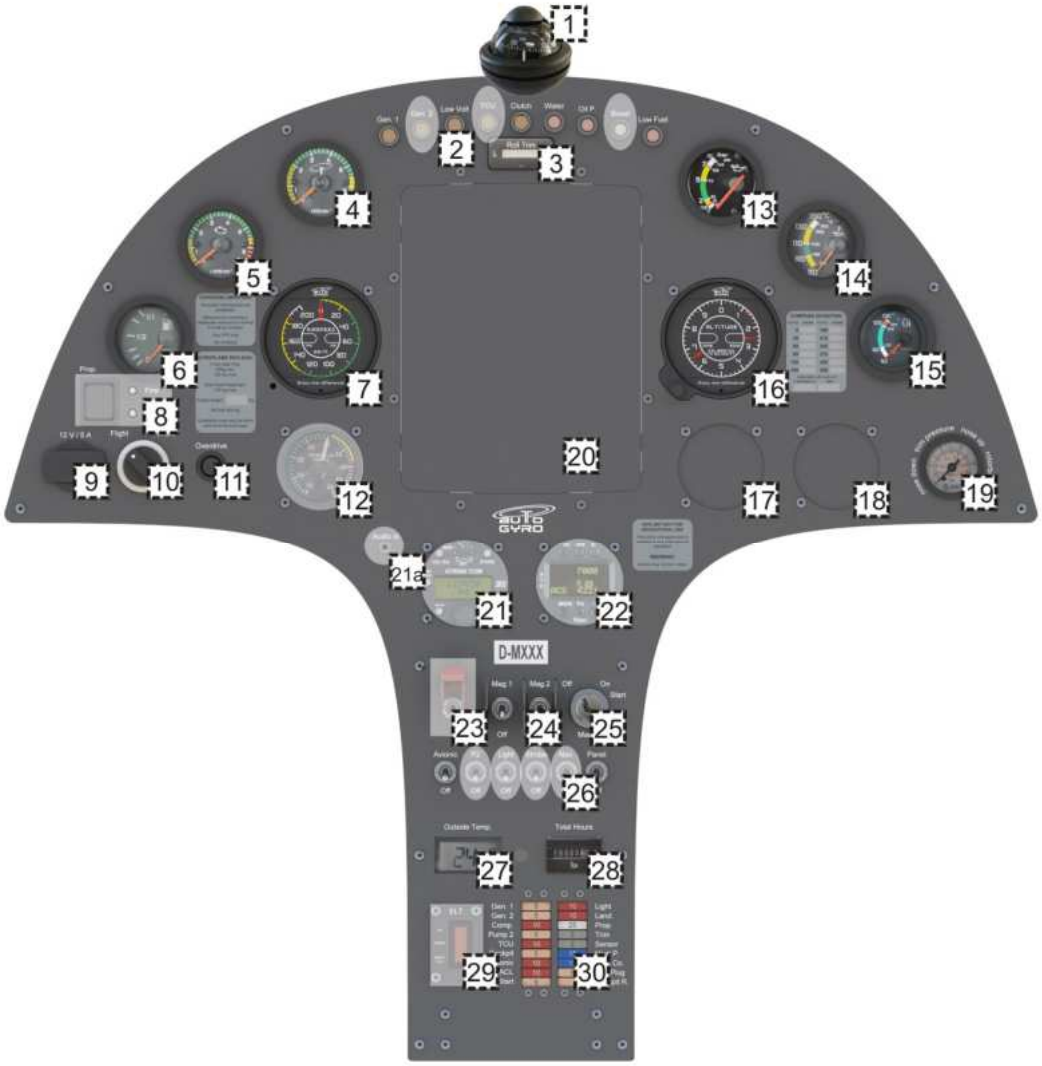
Each panel has an additional ‘Battery Backup’ switch, covered by a red flip-up cover. This is mounted adjacent to the lower switches. For emergency use in the event of a full alternator failure.

Where fitted, a blue push-pull knob is provided for the propeller control.

Example of panel from MTOSport 2017 915iS/916iS with blue propeller control fitted (ringed). Where a 'single lever control' system is fitted, with a Woodcomp KW30 propeller, there is no blue knob.

Note that the panels shown within this section are representative only.

Panel Layout – GPS Panel



1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼" for optional inst.
18 – Cut-out 57mm / 2 ¼" for optional inst.
19 – Trim/brake pressure gauge
20 – Installation provisions
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Rack for Garmin 695

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼" for optional inst.
18 – Cut-out 57mm / 2 ¼" for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Rack for Garmin 695
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Rack for Garmin 795

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼" for optional inst.
18 – Cut-out 57mm / 2 ¼" for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Rack for Garmin 795
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Rack for I Pad mini 1,2,3

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼" for optional inst.
18 – Cut-out 57mm / 2 ¼" for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Rack for I Pad mini 1,2,3
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Rack for I Pad mini 4

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼” for optional inst.
18 – Cut-out 57mm / 2 ¼” for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Rack for I Pad mini 4
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Insert for Aspen

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼” for optional inst.
18 – Cut-out 57mm / 2 ¼” for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Insert for Aspen
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Insert for Area 500

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼" for optional inst.
18 – Cut-out 57mm / 2 ¼" for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Insert for Area 500
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Insert for Flymap 7"

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼" for optional inst.
18 – Cut-out 57mm / 2 ¼" for optional inst.
19 – Trim/brake pressure gauge
20 – Option GPS Insert for Flymap 7"
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – GPS Insert basic T

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Engine RPM
6 – Fuel level indicator
7 – Air speed indicator
8 – Deleted
9 – 12V power receptacle (if installed)
10 – Pneumatic mode selector
11 – Pre-rotator overdrive
12 – Fuel Flow gauge
13 – Oil pressure
14 – Oil temperature
15 – Cylinder head temperature
16 – Altimeter
17 – Cut-out 57mm / 2 ¼” for optional inst.
18 – Cut-out 57mm / 2 ¼” for optional inst.
19 – Trim/brake pressure gauge
20 – 2 x Cut-out 80mm for opt. installation
21 – Radio (if installed)
22 – ATC Transponder (if inst.)
23 – Deleted
24 – LANE switches
25 – Master/starter switch
26 – Switches (Avionics, P2, Lights, Opt.)
27 – Outside air temperature / OAT
28 – Hour meter
29 – ELT control (if inst.)
30 – Fuses

Panel Layout – EFIS Insert Garmin G3X 10"

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Deleted
6 – Air speed indicator
7 – 12V power receptacle (if installed)
8 – Pneumatic mode selector
9 – Pre-rotator overdrive
10 – Option EFIS Insert Garmin G3X 10"
11 – Fuel Flow gauge
12 – Altimeter
13 – Trim/brake pressure gauge
14 – Radio (if installed)
15 – ATC Transponder (if inst.)
16 – Deleted
17 – LANE switches
18 – Master/starter switch
19 – Switches (Avionics, P2, Lights, Opt.)
20 – Outside air temperature / OAT
21 – Hour meter
22 – ELT control (if inst.)
23 – Fuses

Panel Layout – EFIS Insert Skyview 10"

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Deleted
6 – Air speed indicator
7 – 12V power receptacle (if installed)
8 – Pneumatic mode selector
9 – Pre-rotator overdrive
10 – Option EFIS Insert Skyview 10"
11 – Fuel Flow gauge
12 – Altimeter
13 – Trim/brake pressure gauge
14 – Radio (if installed)
15 – ATC Transponder (if inst.)
16 – Deleted
17 – LANE switches
18 – Master/starter switch
19 – Switches (Avionics, P2, Lights, Opt.)
20 – Outside air temperature / OAT
21 – Hour meter
22 – ELT control (if inst.)
23 – Fuses

Panel Layout – EFIS Insert Flymap 10"

1 – Magnetic compass
2 – Warning lights
3 – Lateral/roll trim indicator
4 – Rotor RPM
5 – Deleted
6 – Air speed indicator
7 – 12V power receptacle (if installed)
8 – Pneumatic mode selector
9 – Pre-rotator overdrive
10 – Option EFIS Insert Flymap 10"
11 – Fuel Flow gauge
12 – Altimeter
13 – Trim/brake pressure gauge
14 – Radio (if installed)
15 – ATC Transponder (if inst.)
16 – Deleted
17 – LANE switches
18 – Master/starter switch
19 – Switches (Avionics, P2, Lights, Opt.)
20 – Outside air temperature / OAT
21 – Hour meter
22 – ELT control (if inst.)
23 – Fuses

31-60-00 Integrated Display Systems

The Glass Cockpit layout is tailored to the integrated flight and navigation suite GARMIN G3X or FLYMAP. In addition to navigational and moving map functions, the system provides primary flight data and engine/vehicle monitoring. It is of utmost importance to read and understand the Operators Manual and to become familiar with the system before operation. In case of a system failure, an altimeter, air speed indicator and rotor speed indicator are provided as backup instrumentation.

CHAPTER 32 - LANDING GEAR

The MTOsport Model 2017 has a conventional tricycle gear with GRP (glass fibre reinforced plastic) suspension bow and a steerable nose gear.

32-10-00 Main Gear

The main gear consists of a GRP suspension bow which is bolted to a support frame at the bottom of the mast and main frame. The spar is designed to absorb even higher than normal landing loads in case of a hard landing or crash.

32-10-00 Nose Gear

The nose gear consists of a steerable nose wheel in a fork made of stainless steel tubing. Nose wheel steering is realized by cables and a linkage to pedal/rudder control input.

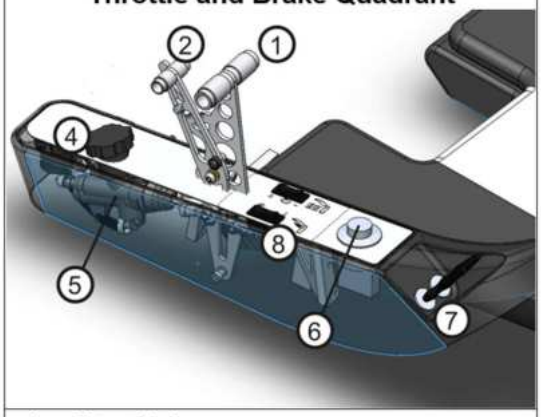
32-40-00 Wheels and Brakes

Both main wheels feature hydraulic disc brakes. The hydraulic wheel brake is actuated by pulling the brake lever (2). A locking pawl mechanism allows setting for use as parking brake. In order to release the parking brake pull the brake lever a little further to let the spring-loaded locking pawl disengage, and then release wheel brake.

Do not try to disengage the locking pawl by pressing the small release lever without pulling the brake lever at the same time. Releasing the pawl using the small release lever only will lead to premature deterioration of the teeth. If the teeth are worn the function of the parking brake will be compromised!

The throttle and brake quadrant also supports the brake fluid reservoir (4) with screw cap and fluid level minimum and maximum markings, as well as the primary brake cylinder (5).

Throttle and Brake Quadrant



1 – Throttle lever
2 – Brake lever with locking pawl
4 – Brake fluid reservoir
5 – Primary brake cylinder
6 – Seat adjustment control push button
7 – Headset / helmet connectors
8 – Seat heating control (if installed)

For correct tire pressure see CHAPTER 12-30-20 SERVICING: TIRE PRESSURE.

CHAPTER 33 – LIGHTS

33-40-00 Exterior

The basic aircraft is approved for day VFR operation only. As an option the following lights can be configured on the MTOsport Model 2017:

- Landing Light
- Position Lights with integrated Strobe Lights on both outer vertical stabilizers (Either AutoGyro or Aveo Ultra Galactica (certified) devices)
- Belly landing light
- Dimmable instrument panel lighting for front and rear seats

Electrical schematics / wiring diagrams are provided in Part D - Diagrams and Charts of this manual.

Power consumption figures are listed in CHAPTER 24-60-00 DC ELECTRICAL LOAD DISTRIBUTION.

CHAPTER 34 – NAVIGATION

34-10-00 Flight Environment Data

The MTOsport 2017 features a Pitot-Static System to measure accurate air data. Total pressure is picked up by a pitot type tube located in the nose section of the fuselage. The tube is connected to the integrated cockpit instruments by a plastic pneumatic hose. The static pressure is measured across two ports, one on either side of the fuselage. OAT data is measured by a probe located at the bottom of the fuselage behind the nose gear and displayed in the cockpit as digital value.

Where required, a heated pitot tube may be installed.

34-20-00 Attitude and Direction

As part of minimum equipment, a magnetic compass is installed on top of the instrument panel, under the windshield.

34-70-00 ATC Transponder

An ATC Transponder may be installed as an option. Possible installation positions in the instrument panel are described in CHAPTER 31 – INDICATING SYSTEM. Please refer to the manufacturer's documentation for reference.

CHAPTER 35 - UNASSIGNED / N/A

CHAPTER 36 – PNEUMATIC

Aircraft trim, rotor brake and activation of the pre-rotator is controlled by a pneumatic system, consisting of an electrically driven air compressor with filter/dryer, a pressure gauge in the cockpit, a pressure compensation vessel, solenoid valves, air lines, pneumatic actuators, and the respective cockpit controls.

The pneumatic system controls the following function:

- rotor brake ON, effects i.e. rotor disc flat / flight control stick forward position (brake mode)
- adjustable longitudinal trim, effects i.e. rotor disc/stick pulled aft (flight mode)
- adjustable roll trim
- engagement of the pre-rotator, i.e. activation of the clutch and upper engagement (only in flight mode or in brake mode with overdrive/override button)

The aforementioned functions are described in more detail in the dedicated chapters.

A schematic drawing of the pneumatic system is provided in Part D - Diagrams and Charts of this manual.

36-11-00 Generation / Compressor

The electrically driven compressor and filter/dryer is located behind the instrument panel. The wiring diagram is provided in Part D - Diagrams and Charts of this manual.

36-21-00 Distribution

Air distribution comprises of hoses, valves (solenoids), (cockpit) controls and switches, (pressure) sensors and a pressure compensation vessel. The main pneumatic switching logic is combined in the pneumatic control which is installed behind the instrument panel. See Part D - Diagrams and Charts for schematics.

Note that the pneumatics actuators (cylinders) are not described in this ATA Chapter, but assigned to their mechanical main function.

Example: the brake/trim cylinder is described in CHAPTER 67-05-00 PITCH TRIM SYSTEM / ROTOR BRAKE.

CHAPTER 37-50 - UNASSIGNED / N/A

CHAPTER 51 - STANDARD PRACTICES – STRUCTURES

51-00-00 Standard Practices – Structures

Structural repair of composite structures or the welded steel frame is limited to AutoGyro GmbH or its specialized service partners.

CHAPTER 52 - DOORS, COVERS AND COWLINGS

52-10-00 Passenger / Crew

This gyroplane is designed as an open cockpit aircraft and features no doors. Two windshields from break-proof polycarbonate protect the crew against the air stream, insects, and direct rain. Access and exit is provided over the sill board on the right hand side.

Note that windshields are described in CHAPTER 56-10-00 FLIGHT COMPARTMENT / WINDSHIELDS.

52-40-00 Service Covers and Cowlings

The pneumatic control box is installed behind the cover of the centre panel. Note that some of the pneumatic pump and air dryer can be accessed through the cover of the storage compartment in the nose section.

Access for maintenance and inspection is described in a dedicated job card 52-40-00 2-1 in Part E of this manual.

CHAPTER 53 – FUSELAGE / MAIN FRAME

The load carrying structure of the gyroplane consists of an inert-gas welded stainless steel square tube framework and includes mast, forward extension, and aft extension. The main frame carries all loads induced by the crew stations, engine, rotor, undercarriage, stabilizer, and serves as installation platform for additional equipment. Attachment points for the engine installation are provided by a steel tube ring mount at the rear of the mast, which also supports the rotor at its top end.

The fuselage enclosure including its two crew stations is made of glass fibre reinforced plastic. It is mounted to the forward extension of the main frame and is not designed as a load carrying structure.

CHAPTER 54 - UNASSIGNED / N/A

CHAPTER 55 – STABILIZERS

The stabilizer structure with rudder is made of carbon reinforced plastic (CRP) and is bolted to the keel tube (aft extension) of the main frame. Presence and function of the stabilizer plays a vital part in flight stability and safety. Inspect carefully all attachment points and the integrity of the composite component.

In order to assess the integrity of the stabilizer, carefully pull the fin tips in lateral direction (left/right) with a maximum of 150 N. A 'linear' resistance must be felt. In case mechanical noises are heard/felt, contact AutoGyro.

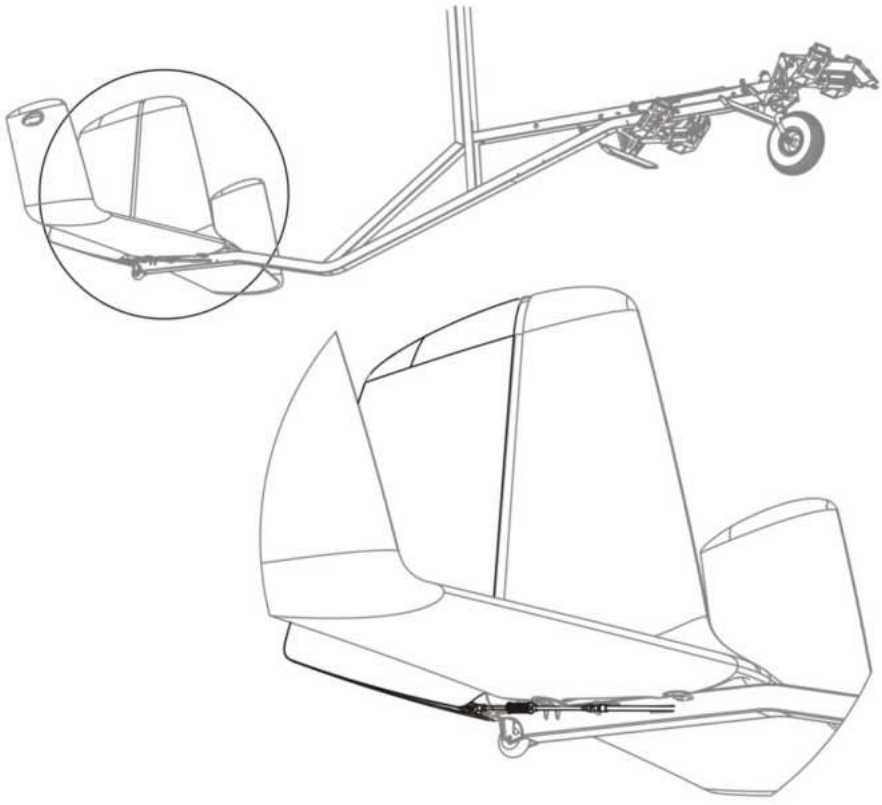
55-40-00 Rudder

The rudder is made of CRP and is hinged to the central fin of stabilizer. An aluminium trim tab is provided to eliminate constant pedal input during cruise flight and to provide a pre-defined rudder setting in case of a control failure. The trim tab should be adjusted to allow pedal-off cruise flight. Adjust according to the following table:

Pedal input (for straight and level flight, slip indic./ball centred)	**Corrective action** (seen from behind, i.e. in flight direction)
Constant right pedal required	Bend trim tab to the left
Constant left pedal required	Bend trim tab to the right

Avoid unnecessary bending as the tab may break at its perforation. A misadjusted or broken tab may change flight characteristics significantly and in case of a rudder control failure, the gyroplane may render difficult to control. Replace trim tab if it feels soft or if fissures at the perforated part are visible.

The rudder is additionally centred by return springs mounted under the tail. These align the rudder in the straight ahead position, such that should a cable fail – or the occupants be unable to control the rudder – then the aircraft will continue to fly reasonably straight



CHAPTER 56 – WINDOWS

56-10-00 Flight Compartment / Windshields

Environmental protection for pilot and occupant against the air stream, insects, and direct rain is provided by large windshields in each station. The windshields are made of durable polycarbonate (Makrolon) and bolted to the gyroplane enclosure.

CHAPTER 57-60 - UNASSIGNED / N/A

CHAPTER 61 – PROPELLER

In standard 915 iS configuration a 4-bladed, fixed pitch 'HTC' propeller with GRP propeller blades is installed. Depending on customer configuration a spinner may be installed. As an option, the Woodcomp KW30 (standard fit for the 916iS engine) hydraulic constant speed variable pitch propeller may be fitted. The Woodcomp KW30 is an EASA certified propeller and should ('MUST' in the case of a certified version of the aircraft) be maintained in accordance with the Woodcomp issued Maintenance Manual.

NOTE. The KW30 propellers for the 915 iS and 916 iS are different, 915 iS have M8 bolts, 916 iS have M10 bolts on a larger PCD.

Adjustment of the fixed pitch propeller is described in a dedicated Job Card in Part E of this manual. The mechanical end stops of the variable pitch propeller are pre-adjusted. In case, re-adjustment should be necessary on the variable pitch propeller, please refer to the manufacturer's documentation or contact AutoGyro. It is essential that the propeller pitch adjustment does not prevent the aircraft from achieving a minimum climb rate in full coarse of 250fpm at MaxTOW, or allow over-revving in the climb at full fine. Nominal engine rpm fitted with a HTC propeller at full fine in the climb is 5500, max 5800 in level flight.

HTC propeller. There are 6 (Rotax manufactured) flanged nuts fitted to the gearbox flange, into which the propeller bolts are tightened. These carry the gearbox torque to the propeller hub.

An optional spinner assembly may be fitted for the HTC propeller. This comprises a composite spinner, an aluminium CNC machined mounting plate, and 9 M4 screws to hold the spinner to the plate (with plastic washers under the heads).

The Woodcomp propeller is mounted using fastenings provided by Woodcomp. The bolts are captive in the propeller, and pass through top hat spacers that carry the torque between the propeller flange and the propeller, into M8 (915 iS) or M10 (916 iS) nuts.

In certain cases, damaged propeller blades can be repaired. Concerning repair limits and allowable damage contact AutoGyro Technical Support. Provide a precise description of the damage, dimensions and preferably photos of the affected area.

61-10-00 Propeller assembly

The propeller assembly comprises propeller blades, hub and related attachment hardware.

61-20-00 Controlling

In case of a variable pitch propeller (VPP) refer to the manufacturer's (Woodcomp KW30) documentation.

For setting the KW30 propeller;

The basic propeller is set to achieve a nominal 5950rpm in full fine pitch.

The governor is then set to give a max engine rpm of 5800 in full fine pitch by way of the limit stop.

The governor is also set to give a minimum engine rpm in full coarse of 4600 by way of the coarse limit stop.

Where a ‘single lever control’ unit is fitted, follow the device instructions.

CHAPTER 62 – ROTOR

The two-bladed, semi-rigid, teetering rotor system comprises high-strength aluminium extruded rotor blades, a hub bar, and a common teeter hinge assembly.

Due to their working principle, every two-bladed teetering rotor system induces a certain amount of vibration, depending on flight condition (speed) and disc loading. AutoGyro optimizes each rotor system at a medium disc loading and speed before delivery. However, if the rotor system shall be tuned to a different flight condition or reveals undue vibration, contact AutoGyro or a specialized Maintenance Partner.

IMPORTANT NOTE: Rotor Systems are Manufacturer Life Limited (MLL)!

Some guidelines to Vibration and Noise Analysis and classification schemes are provided in Part B CHAPTER 18 of this manual.

62-11-00 Rotor – Teetering Parts

The teetering parts of the rotor system consist of teeter bolt, teeter block, rotor hub (bar), and rotor blades.

IMPORTANT NOTE: Only rotor system 8.4m TOPP, or 8.6m TOPP is released for use with the Sport 2017 915iS / 916iS.

The rotor blades feature an aerodynamic profile especially suitable for rotorcraft which, in combination with its relative centre of gravity, provides aerodynamic stability by eliminating negative blade pitching moments and flutter tendency. The hollow blade profile is sealed at both ends by plastic blade caps.

The aluminium rotor hub bar is pre-coned to the natural coning angle of the blades and connects the blades firmly to each side with fitting bolts and a clamping profile. In order to compensate for asymmetric air flow in forward flight the blades are free to teeter. The hinge assembly consists of teeter tower, teeter bolt and teeter block.

The teeter bolt runs in a long Teflon coated bushing in the teeter block (main bearing action), as well as two shorter bushings in the teeter tower (emergency bearing action). The main bearing action is supported by special grease which is applied through a grease nipple on top of the teeter block. Servicing is described in Part B CHAPTER 05 of this manual.

62-31-00 Rotor Head Bridge, Bearing and Teeter Tower

The rotor head bridge is made of precision machined aluminium. The rotor bearing (Manufacturer Life Limited!) and teeter tower represent one integrated component.

62-32-00 Rotor Gimbal Head

Tilting action in pitch and roll of the rotor is facilitated by the rotor gimbal head. The gimbal head is a cardan hinge.

62-41-00 Rotor RPM Monitoring

Rotor RPM monitoring is realized by an inductive pick-up which is installed with a nominal gap of 2mm at the sprocket wheel. The sensor counts the (10) holes in the sprocket disc. Rotor RPM is indicated in the cockpit in an analogue-type instrument which also houses the control electronic. The system requires power supply.

CHAPTER 63 - ROTOR DRIVE

63-11-00 Pre-rotator

The pre-rotator is used to quickly bring the rotor up to safe RPM for take-off run by the press of a button. Pre-rotation is activated by a push-button on the flight control stick. Because of a safety circuit, activation of the pre-rotator is only possible with the pneumatic mode selector in FLIGHT position and the control stick in forward position. This prevents inadvertent activation of the pre-rotator during flight or in BRAKE mode.

The pre-rotator is activated as long as the respective push-button on the control stick head is depressed, provided the following pre-conditions are met:

- pneumatic mode selector set to FLIGHT
- control stick in forward position (controlled by a micro switch)
- trim pressure less than 3 bar

In this case, the pneumatic clutch is pressurized. Engine torque is then transmitted through the pre-rotator drive, a 90° gearbox and upper drive to the pinion which is engaged by another small pneumatic actuator into the geared ring of the rotor head. The drive pinion is sliding on a helical gear to provide automatic lock-out in case of rotor RPM overrun. In order to allow necessary changes in length both pre-rotator drive shafts feature a sliding sleeve coupling.

The pre-rotator can be activated in BRAKE position to park the rotor blades fore-aft for taxi. To do so, the pre-rotator push-button and the overdrive/override switch in the cockpit panel have to be pressed simultaneously. Prolonged activation of the pre-rotator with rotor brake engaged should be avoided.

63-11-10 Pre-rotator Lower Engagement

Pre-rotator lower engagement consists of the pneumatically activated coupling.

For pneumatic control of the coupling refer to CHAPTER 36 - PNEUMATIC.

63-11-20 Pre-rotator Drive

Power flow is realized through a 90-degree gearbox and drive shafts. The 90-degree gearbox is mounted directly to the disc coupling. The pre-rotator drive shaft features a cardan joint right after the 90-degree gearbox and a sliding shaft coupling in the upper area to allow changes in length due to the tilt of the rotor head.

The cardan joints must be set at the correct relative angles in order to prevent over-stressing and failure.

63-11-30 Pre-rotator Upper Engagement

The pre-rotator upper engagement comprises a drive pinion with bearing, which is engaged by a small pneumatic actuator into the geared ring / sprocket wheel of the rotor head. The drive pinion is sliding on a helical gear to provide automatic lock-out in case of rotor RPM overrun.

63-51-00 Rotor Brake System

The rotor brake system consists of a brake pad mounted to a bracket which is hinged to the rotor head bridge. A second brake pad is mounted in forward position which will contact the sprocket wheel only when in full flat / level (stick fully forward) position. With the pneumatic mode selector in BRAKE position the operation of the pneumatic trim actuator is reversed so that increased pressure causes the actuator to push the rotor head up (or level) and presses the brake pads against the rotor head disc. In order to increase brake pressure, move the 4-way trim switch to aft. Note that this action will also push the control stick forward which will push the sprocket wheel against the forward brake pad. At full brake pressure the control stick will be maintained in its full forward position while aft and forward brake pads provide braking action.

Due to its main function the pneumatic brake/trim actuator/cylinder itself is allocated to CHAPTER 67-05-00 PITCH TRIM.

CHAPTER 64-66 - UNASSIGNED / N/A

CHAPTER 67 - ROTOR FLIGHT CONTROL

Rotor flight control comprises of control stick, a base control unit / tube, flight control base link and control rods (push rods) which are connected to the rotor head bridge.

Pitch and roll of the gyroplane is controlled by tilting the complete rotor head by means of the control stick. Control input is transferred via a base control unit / tube running horizontally along the forward extension of the main frame (below the seats) to the base link and from there to the rotor head via control rods (push rods). The control rods with ball joints at both ends are supported by a bell crank about half way up the mast (Figure 1).

The control stick head is ergonomically shaped to fit the pilot's right hand and features control buttons for radio transmission (1), a four-way trim function (2), and activation of the pre-rotator (3).

67-05-00 Pitch Trim System / Rotor Brake

The Pitch Trim System comprises of a 4-way beep trim switch (2) / “Coolie Hat” at the flight control stick and the pitch trim / brake pneumatic actuator. Pneumatic control is allocated to and described in CHAPTER 36 - PNEUMATIC. Components related to the rotor brake are shown in CHAPTER 63-51-00 ROTOR BRAKE SYSTEM.

Trimming is effected by varying trim pressure in the pneumatic trim actuator which is installed in parallel with the rotor head tilt for pitch control. Aft or nose-up trimming activates the electrical compressor and increases trim pressure, causing the actuator to contract, and tilting the rotor disc aft. Forward trimming opens the pressure relief valve to reduce trim pressure and allows the rotor disc to flatten, due to the spindle head offset and the gyroplane’s weight. The actual trim condition is indicated on the trim/brake pressure gauge in the centre panel of the cockpit.

67-06-00 Roll Trim System

Lateral/roll trim works accordingly, using a lateral pneumatic trim cylinder. Lateral trim condition is indicated by a self-dimming LED bar on the instrument panel.

CHAPTER 68-70 - UNASSIGNED / N/A

CHAPTER 71 - POWER PLANT

Power plant comprises aircraft provisions, installations and systems related to the core engine. The engine itself is allocated to CHAPTER 72 – 74 – ENGINE RELATED.

71-10-00 Engine Cowling

Concerning engine cowlings see CHAPTER 52 – DOORS, COVERS, COWLINGS

71-20-00 Engine Mounts

Attachment points for the engine installation are provided by a steel tube ring mount at the rear of the mast. To provide vibration isolation, the engine is connected to the ring frame by 4 rubber mounting bushings. The engine mounting bushings have to be inspected regularly and have to be replaced, if torn or porous. Defective rubber bushing can also cause undue engine/propeller vibration.

IMPORTANT NOTE: Engine mounting bushings are recommended to be changed at a minimum of every 5years, or when there is notable sag.

71-50-00 Engine Electrical Harness

The engine electrical harness includes wiring, cables and cockpit switches for starting, energizing and grounding of the dual breakerless capacitor discharge ignition circuits (including instructor mag switches, if installed), and engine indication. A wiring diagram is provided in Part D - Diagrams and Charts of this manual. Also refer to the engine manufacturer’s documentation.

71-60-00 Engine Air Intakes

The engine aspirates through a single air filter mounted on the left side of the engine.

71-70-00 Engine Drains

Oil tank breathing is provided by a rubber hose which is routed down to under the body by the oil cooler. This hose has a cut in to upper section to allow the engine to breath should the lower part be frozen in flight.

CHAPTER 72 TO 74 - ENGINE RELATED

For the (core) engine refer to the engine manufacturer's documentation in its latest revision. Concerning fuel system (Filter, Pumps, Shut-off valve) see CHAPTER 28 - FUEL. Engine cowlings are described in CHAPTER 52 – DOORS, COVERS, COWLINGS. For removal and installation see the dedicated Job Card in Part E of this manual.

CHAPTER 75 - AIR / ENGINE COOLING

Engine cooling is provided by air cooled cylinders and liquid cooled cylinder heads. The sensors are mounted in the cylinder heads, into the coolant. Therefore, coolant temperature (CT) indication in the cockpit corresponds to actual coolant temperature. The water cooling system comprises of engine driven pump, one radiator, an aluminium expansion tank with radiator cap and sight glass, thermostat and hoses.

The radiator is mounted on rubber isolators and brackets just in front of the propeller. Hoses from/to the radiator go to the engine water pump and return.

For the relevant checking and replenishing procedures, refer to engine manufacturer's manual.

Oil cooling is described in CHAPTER 79 – OIL SYSTEM.

CHAPTER 76 - ENGINE CONTROLS

Engine control consists of engine power lever / throttle with choke and related cockpit switches for engine shut-down and test.

76-10-00 Power Control

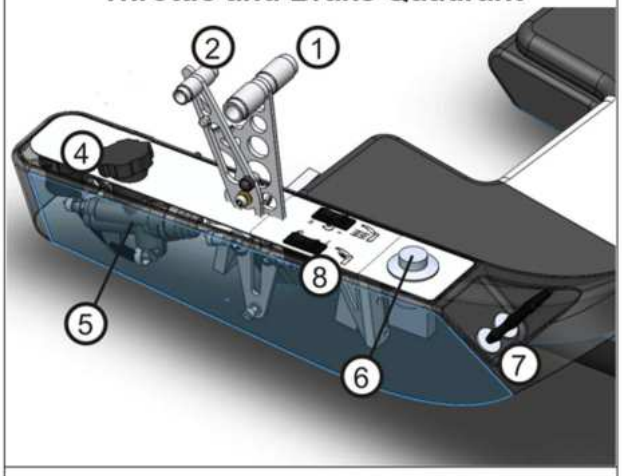
Engine power / throttle is controlled by a control column located on the left side of the pilot station. The unit also provides a lever for activation of the wheel brake.

Throttle control (1) is conventional with IDLE in aft (or pulled) and full throttle in most forward position. The throttle lever is linked with cable controls to the intake butterfly valve. A mechanical spring applies tension to the control cable and brings the engine to full throttle in case of a cable break. The throttle lever has a pre-set friction brake which holds the throttle in the selected position.

76-20-00 Engine Shutdown / Emergency

For normal and emergency shutdown, a pair of LANE switches (LANE 1 + LANE 2) is installed in the cockpit centre panel. These switches are also used for testing the individual ignition circuits.

Throttle and Brake Quadrant



1 – Throttle lever
2 – Brake lever with locking pawl
4 – Brake fluid reservoir
5 – Primary brake cylinder
6 – Seat adjustment control push button
7 – Headset / helmet connectors
8 – Seat heating control (if installed)

CHAPTER 77 - ENGINE INDICATING

All relevant engine parameters are displayed in the cockpit, using analogue-type instruments in standard version. In case of integrated cockpit systems (option), engine data may be displayed in the integrated instrumentation system (glass cockpit). An hour meter (Hobbs Meter) is installed in the cockpit to count engine operating time with an accuracy of two decimals (1/100 hrs). Although the 'engine operating time' is also used for total aircraft hours counting, the hour meter is allocated to this chapter as the main function.

CAN-Bus note

The engine parameters (Coolant temp, coolant led, oil temp, oil pressure and engine rpm) are provided via the Rotax CAN-Bus system to the gauges, via a digital to analogue Converter. On start up the gauges initially go to full scale deflection, the normal Road gauge manufacturer's process.

The AutoGyro Converter then self-checks by displaying the red line indication, dropping to the green line indication.

The Converter compares the information provided by the two CAN-Bus inputs.

If one input fails the unit will display the information from the other CAN-Bus.

If both fail the indication is zero, but the gauge internal warning light illuminates.

If the information provided shows a significant discrepancy the gauge will go to FSD and the internal warning lamp will illuminate.

In the event of both, CAN-Bus input failure, or Converter failure, no information will be displayed on the gauges.

In this situation provided the Lane A or B lamps are unlit, the engine will run normally.

77-10-00 Power

With a piston engine with fixed pitch propeller, engine power indication normally solely consists of an engine RPM indicator. In this case, regardless of whether a fixed pitch or a variable pitch propeller is installed, a fuel flow rate indicator is provided. This provides the pilot with clear information regarding fuel burn versus engine rpm.

See CHAPTER 31 – INDICATING SYSTEM for different cockpit layouts.

77-20-00 Temperature

For temperature indication, an engine coolant temperature (CT) gauge is provided. Due to the engine cooling principle (air cooled cylinders with water cooled cylinder heads) the CT represents cylinder head coolant temperature.

Oil temperature indication is described in CHAPTER 79 – OIL SYSTEM.

77-40-00 Integrated Engine Instrument Systems

Integrated display systems (glass cockpit) are described in CHAPTER 31-60-00 INTEGRATED DISPLAY SYSTEMS.

CHAPTER 78 – EXHAUST

78-00-00 Exhaust

The basic exhaust system including manifold and turbo charger with waste gate is part of the core engine. Refer to the engine manufacturer's documentation. The configuration meets the noise test requirements of Germany. An aftermuffler is fitted to the 916 iS engine. This is standard Rotax fitment.

CHAPTER 79 - OIL SYSTEM

The dry sump forced lubrication comprises oil pump, separate oil tank with dip stick, oil cooler, hoses, as well as oil temperature and oil pressure indication.

79-11-00 Storage / Oil tank

The oil reservoir with dipstick is behind the aft seat and can be easily reached through an access door on the right hand side of the fuselage. The oil tank is made of stainless steel with oil filler cap. The cap can be unscrewed / tightened by a quarter rotation in order to check the oil level using a dip stick or for replenishing of engine oil.

The type of lubrication system requires a special procedure for accurate oil level checking and to prevent overfilling. Refer to the engine manufacturer documentation for detail and procedures.

79-20-00 Distribution and Cooling

Oil distribution and cooling is provided by a separate oil cooler, which is connected to the oil circuit by oil hoses and a thermostat assembly.

79-21-00 Oil Hoses and Lines

Oil hoses are made of PTFE hoses, protected by braided stainless steel.

79-22-00 Oil Cooler

An oil cooler is fitted to the lower aft end of the fuselage / enclosure, below the central section of the main gear suspension bow. Oil flow through the cooler is regulated by a thermostat assembly which opens the cooler circuit at approximately 90 °C.

Do not attempt to block the oil cooler to increase the oil temperature, as this could cause overheating on a hot day. The oil reaches at least 90 °C before the oil can transit through the cooler.

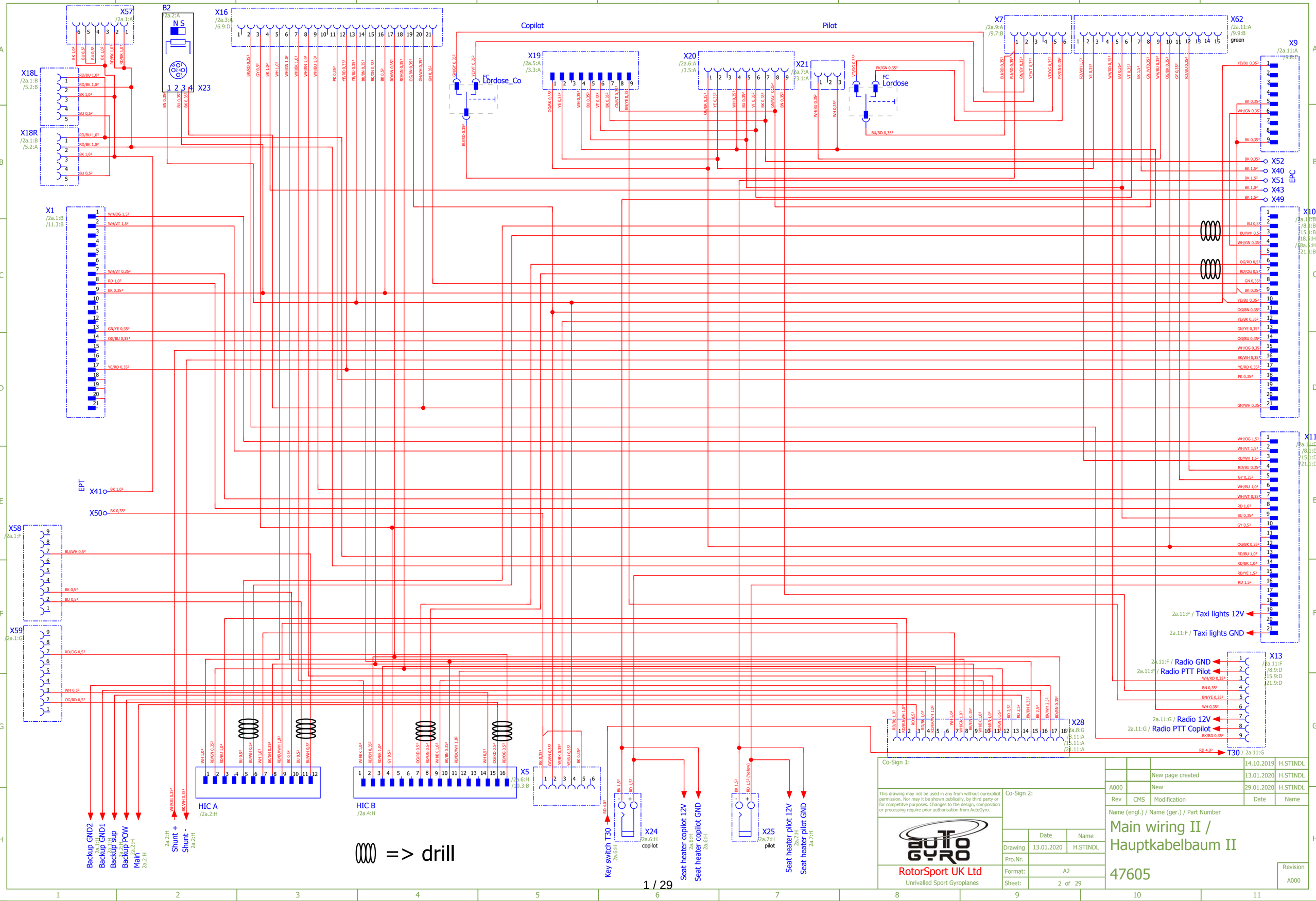
79-30-00 Indicating

Oil temperature is measured in the oil feed line at the thermostat, between the oil cooler and the engine. The oil in this pipe is drawn from the oil sump, where the hot oil from the engine is delivered and mixes. When the gauge indicates 50 °C then the engine oil leaving the engine will exceed that value.

When the oil temperature reaches 90 °C the thermostat will open, allowing the oil to pass through the oil cooler matrix. Having been cooled, the oil then passes the same sensor, which will now indicate a lower temperature than 90 °C – subject to the incoming oil temp and OAT.

Indicators of Oil Pressure (Oil-P) and Oil Temperature (Oil-T) are provided in the cockpit as analogue-type instruments in standard version. See CHAPTER 31 – INDICATING SYSTEM for different cockpit layouts.

Contents



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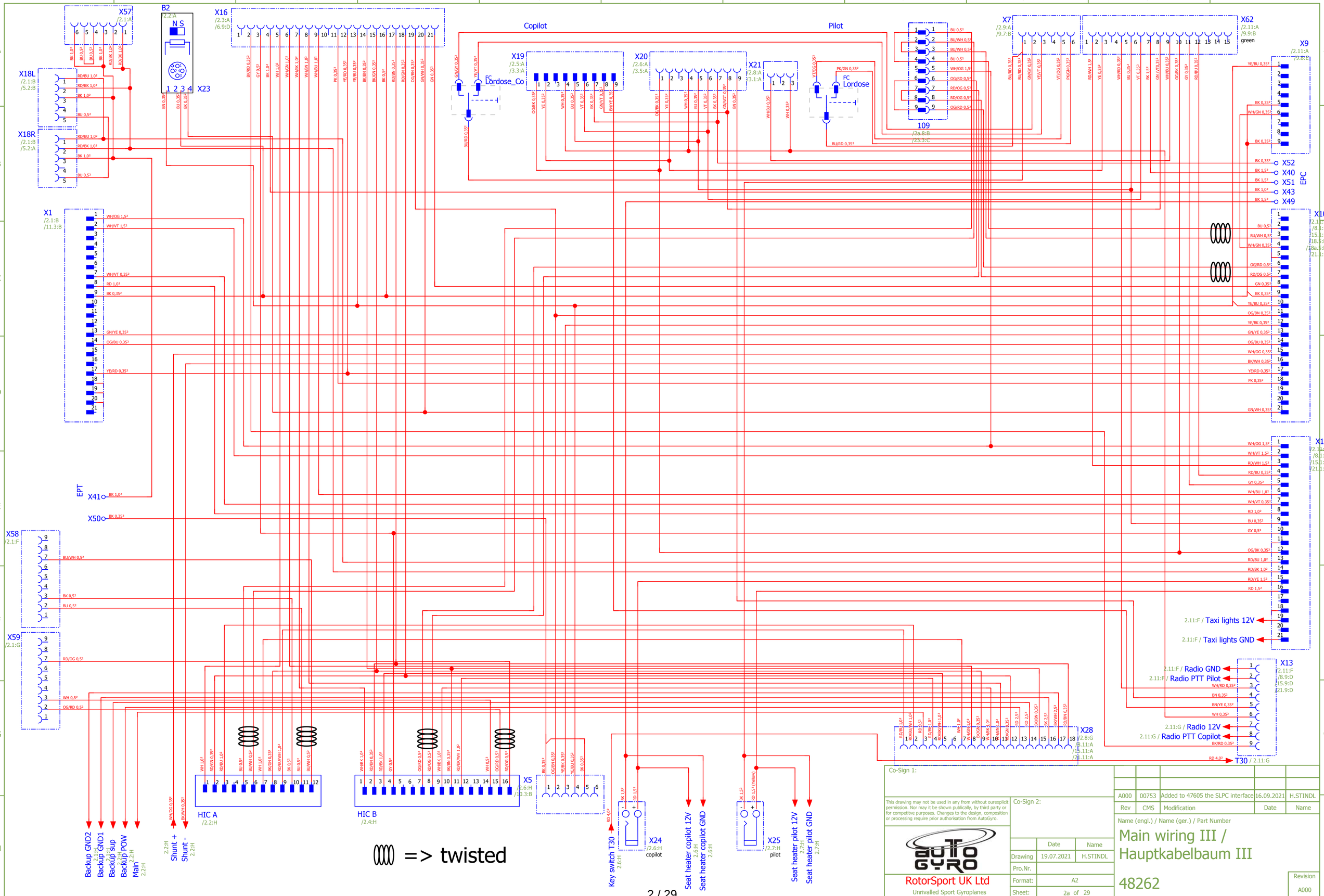
Rev	CMS	Modification	Date	Name
			14.10.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A000		New	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

Main wiring II / Hauptkabelbaum II

47605

Revision A000



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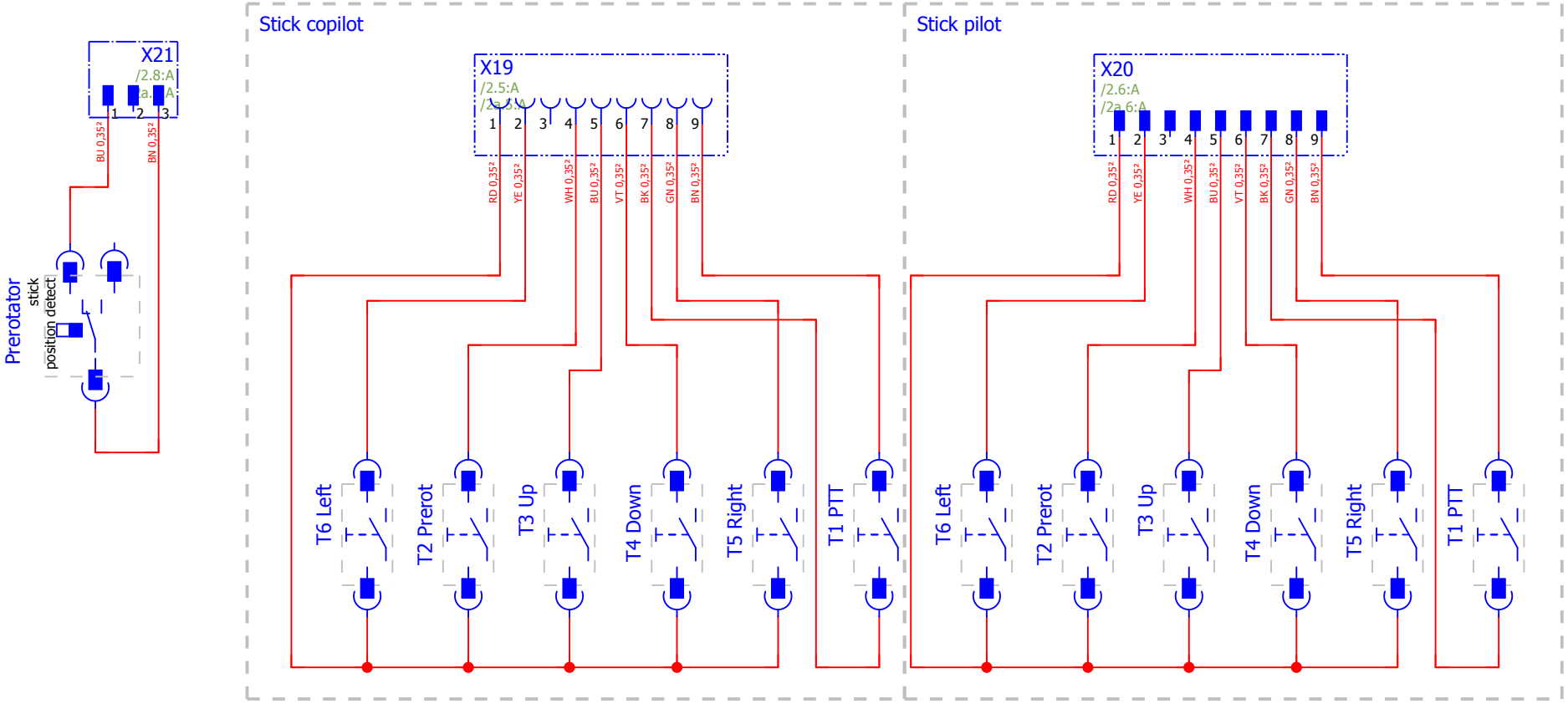
Rev	CMS	Modification	Date	Name
A000	00753	Added to 47605 the SLPC interface	16.09.2021	H.STINDL

Name (engl.) / Name (ger.) / Part Number

Main wiring III / Hauptkabelbaum III

48262

Revision A000



			22.02.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A000		New	29.01.2020	H.STINDL
Rev	CMS	Modification	Date	Name

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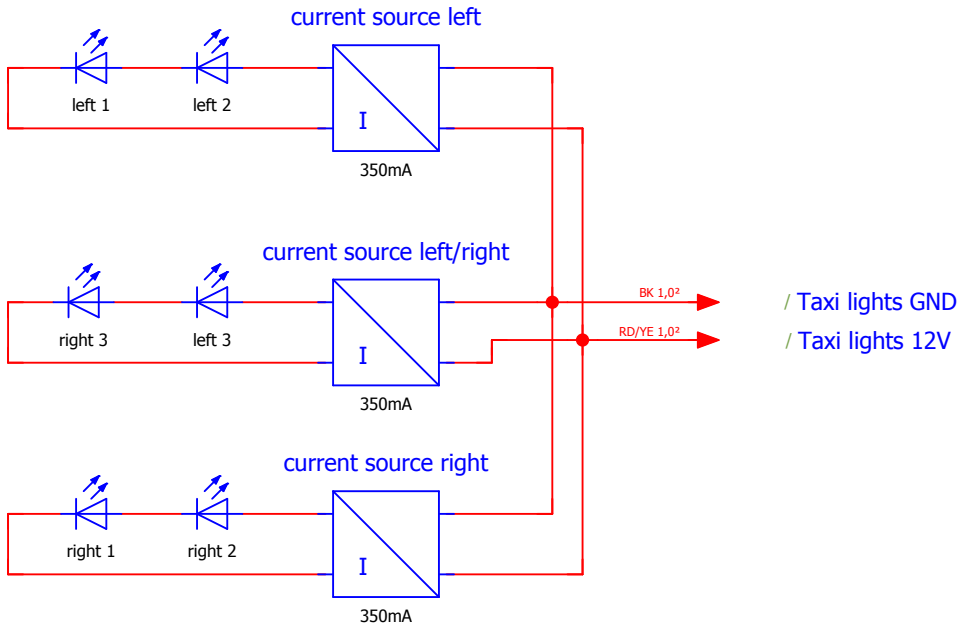
Name (engl.) / Name (ger.) / Part Number

Sticks, Reed switch / Sticks, Magnetschalter

44457/44460/45024

Revision A000



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		New page created	13.01.2020	H.STINDL
A000		New	29.01.2020	H.STINDL
Rev	CMS	Modification	Date	Name

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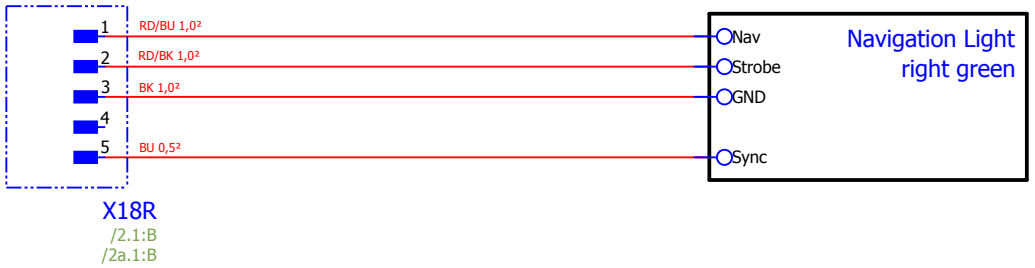
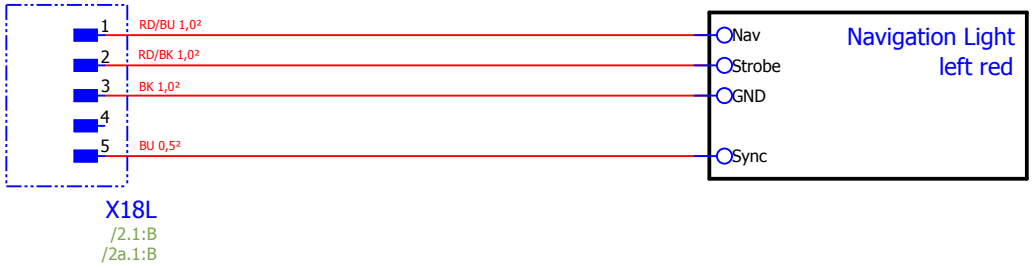
Landing light / Landelicht

44716

Revision A000





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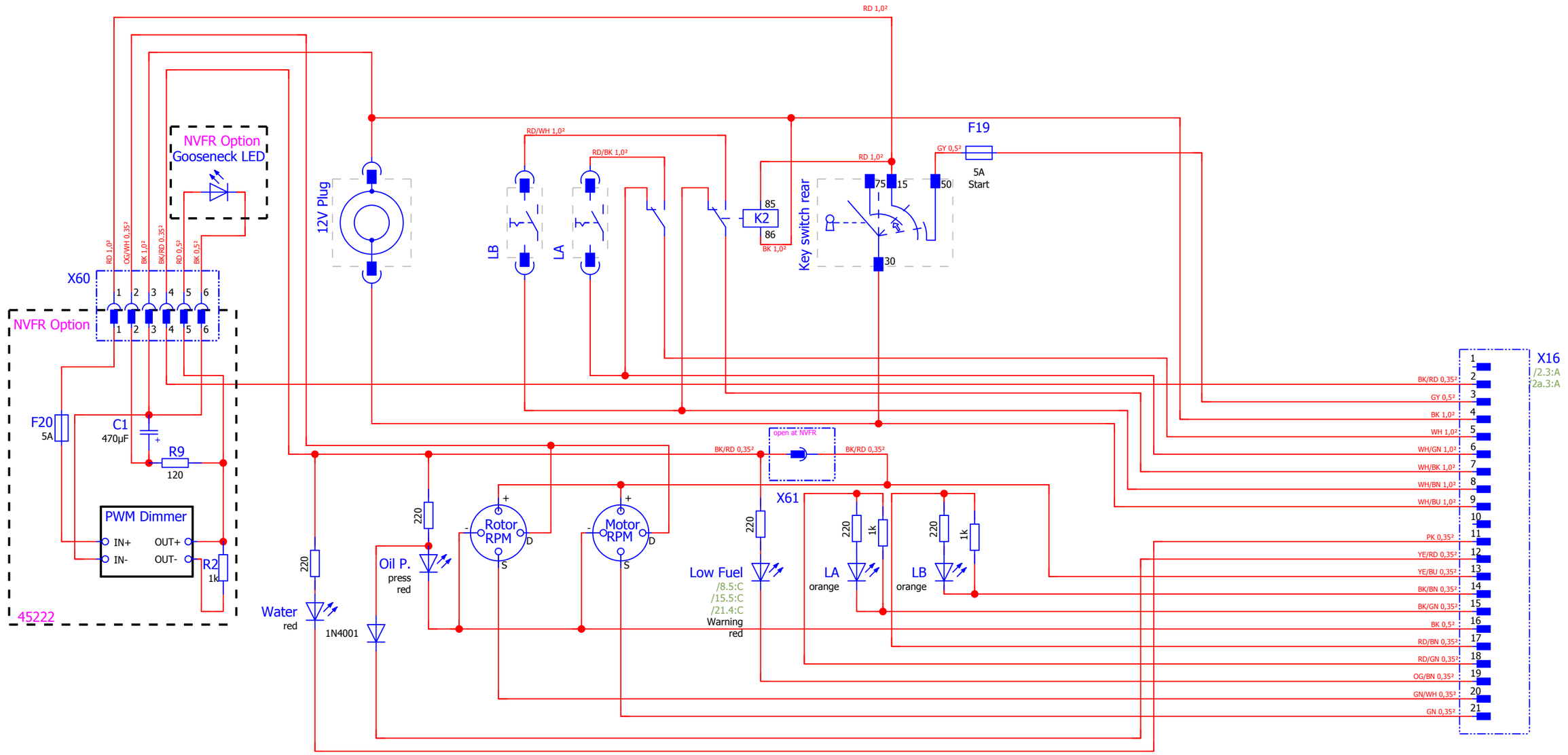
			23.05.2017	H.STINDL
		New page created	13.01.2020	H.STINDL
A000		New	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

NAV / Strobe

44652

Revision A000



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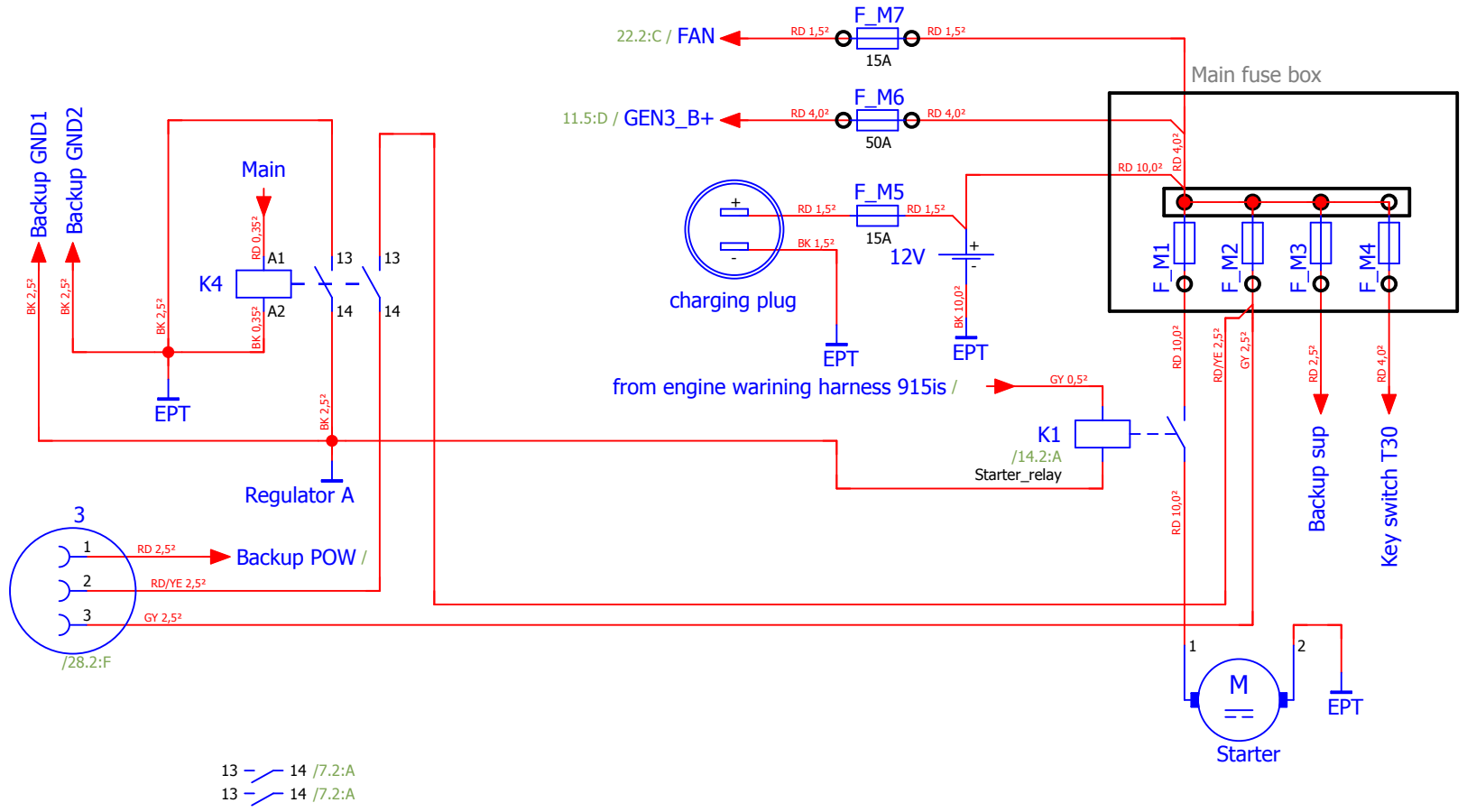
Rev	CMS	Modification	Date	Name
A006	00659	Changed Dimmer to PWM Dimmer	13.01.2020	H.STINDL
A007		Added LED_dim_power	29.01.2020	H.STINDL
A008		Relay wiring correction	26.03.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

Cockpit rear seat 915iS
Cockpit hinterer Sitz 915iS

46776 45222

Revision A008



F_M1	125A	Starter
F_M2	30A	Rotax Generator
F_M3	30A	Rotax Backup
F_M4	50A	Key switch T30
F_M5	15A	Charging plug
F_M6	50A	Generator 2 B+

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A000		New	24.05.2024	HARRY

Name (engl.) / Name (ger.) / Part Number

Main fuse attachment kit / Hauptsicherungshaltesatz

44417

Revision A000

Oil temp. S
Water temp. S
Oil pressure S
Motor RPM S
Fuel flow S
Fuel level S
Rotor RPM S
Option Roll Trim + - S
Option Altimeter AutoGyro + -
Option ASI AutoGyro + -
EPC
CAN_Converter
D-SUB 9: 1 2 3 4 5 6 7 8 9
D-SUB 25: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Dimmer1 14.4:A
Dimmer2 14.4:A
X10 /2.11:B /2a.11:B /15.1:B /18.5:H /18a.5:H /21.1:B violet
1 BU 0,5²
2 BU/WH 0,5²
3 WH/GN 0,35²
4
5
6 OG/RD 0,5²
7 RD/OG 0,5²
8 GN/RD 0,35²
9 BK 0,35²
10 RD 0,35²
11 OG/BN 0,35²
12 YE/BK 0,35²
13 GN/YE 0,35²
14 OG/BU 0,35²
15
16
17 YE/RD 0,35²
18
19
20
21 GN/WH 0,35²
NVFR LED Dimmer VCC 8.10:D
Option GEN 3 orange
Clutch orange
Fuel pressure orange
Water red
Oil P. press red
Low Fuel Warning red
Low Volt orange
not for NVFR
NVFR LED Dimmer GND 14.3:C
not for NVFR
1N4001
220
1k
T2 T1 + - Outside Temp
X53
EPC
X28 /2.8:G /2a.8:G /15.11:A /21.11:A
RD/BU 1,0² RD 0,5² RD/BK 1,0² RD/BK 1,0² WH 1,0² WH 1,0² BK/GN 0,35² WH/BK 1,0² WH/BK 1,0² RD/GN 0,35² RD 2,5² RD 2,5² BK/BN 0,35² BK 2,5² BK 2,5² RD/BN 0,35²
S2 P2 Lane A Lane B Backup
LA orange
LB orange
Prerot Overdrive
X13 /2.11:F /2a.11:F /15.9:D /21.9:D
BK 1,0² BN 0,35² WH/RD 0,35² BN 0,35² BN/YE 0,35² WH 0,35² RD 1,0² BN/YE 0,35² BN/YE 0,35²
LED Dimmer VCC / 8.2:C
BK 0,35²
X11 /2.11:D /2a.11:D /15.1:D /21.1:D brown
1 WH/OG 1,5²
2 WH/VT 1,5²
3 RD/WH 1,0²
4 RD/BU 0,35²
5 GY 0,35²
6 WH/BU 1,5²
7 WH/VT 0,35²
8 RD 1,0²
9 BU 0,35²
10 GY 0,5²
11
12 OG/BK 0,35²
13 RD/BU 1,0²
14 RD/BK 1,0²
15 RD/YE 1,5²
16 RD 1,5²
17
18
19 RD 1,0²
20
21 BK 1,0²
EPC
NVFR 14.2:C / Cockpit VCC
h
F10 10A Land. Light
F11 10A Underb. Light
Option
X14 black RD 1,0² BK 1,0²
S1 Avionic
S3 /15.9:F /21.9:F Light
S5 Strobe
S6 Nav
Option IVO Endlag. IVO IVO - +
Flight/Brake NC = Flight mode
EPC
F13 3A Trim
F7 10A Avionic
F18 10A Rear Cockpit
F2 5A GEN. 3
F3 15A Comp.
F5 2A ECU
F6 5A Cockpit
F8 10A ACL
F9 5A Start
F12 5A Prop.
F14 3A Sensor
F15 15A Heat pilot
F16 15A Heat copilot
F17 5A 12 Plug
B11 0,25A
RD 2,5² GY 2,5²
RD 4,0² GY 2,5³
Key switch 75 15 50 30
15.2:H / T30
K3 /15.7:H /21.7:H low voltage relay
12V Plug
EPC

Co-Sign 1:

Co-Sign 2:

Rev	CMS	Modification	Date	Name
A007	00753	Change prop fuse from 15A to 5A (SLPC)	16.09.2021	H.STINDL
A008		Connect CAN-Converter to Sensor earth	15.06.2022	HARRY
A009		designe updated	24.05.2024	HARRY

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Name (engl.) / Name (ger.) / Part Number
Cockpit GPS 915iS II
47610
Revision A009

Komfort

X7
/2.9:A
/2a.9:A

OG/BK 0,35²
GN/GY 0,35²
YE/VT 0,35²
VT/OG 0,35²
PK/GN 0,35²

X62
/2.11:A
/2a.11:A
green

RD/WH 1,5²
YE 0,35²
WH/RD 0,35²
BU 0,35²
VT 0,35²
BK 1,5²
GN/VT 0,35²
WH/BU 0,35²
OG/BK 0,35²
GY 0,35²
RD/BU 0,35²

L
M
J
K
BK 0,35²

RD 1,5²
BK 1,5²
BK 0,5²
BK 0,5²
BK 1,5²
RD/WH 1,5²

Pressure
switch
8 Bar

Compressor
M
D8

D2
A
C
B
D
Trim

WH/BU 0,35²
WH/RD 0,35²
Gy 0,35²
E
D10
Prerotation

YE 0,35²
GN/VT 0,35²
F
H
G
I
Rolltrim

X9
/2.11:A
/2a.11:A
RollTrim Sensor

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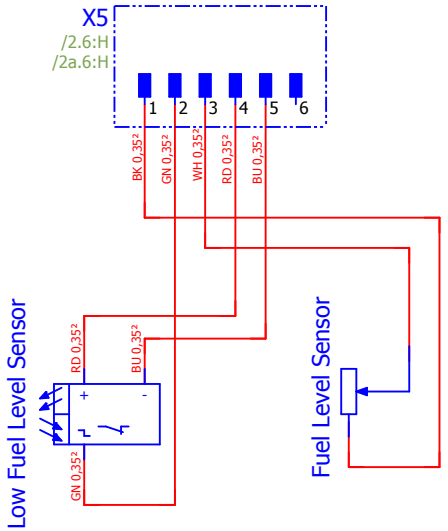
A001		Redrawing nothing change	29.01.2020	H.STINDL
A002		Added lables	24.05.2024	HARRY
Rev	CMS	Modification	Date	Name

Name (engl.) / Name (ger.) / Part Number

Pneumatic system standard / comfort

47429 / 47504

Revision A002



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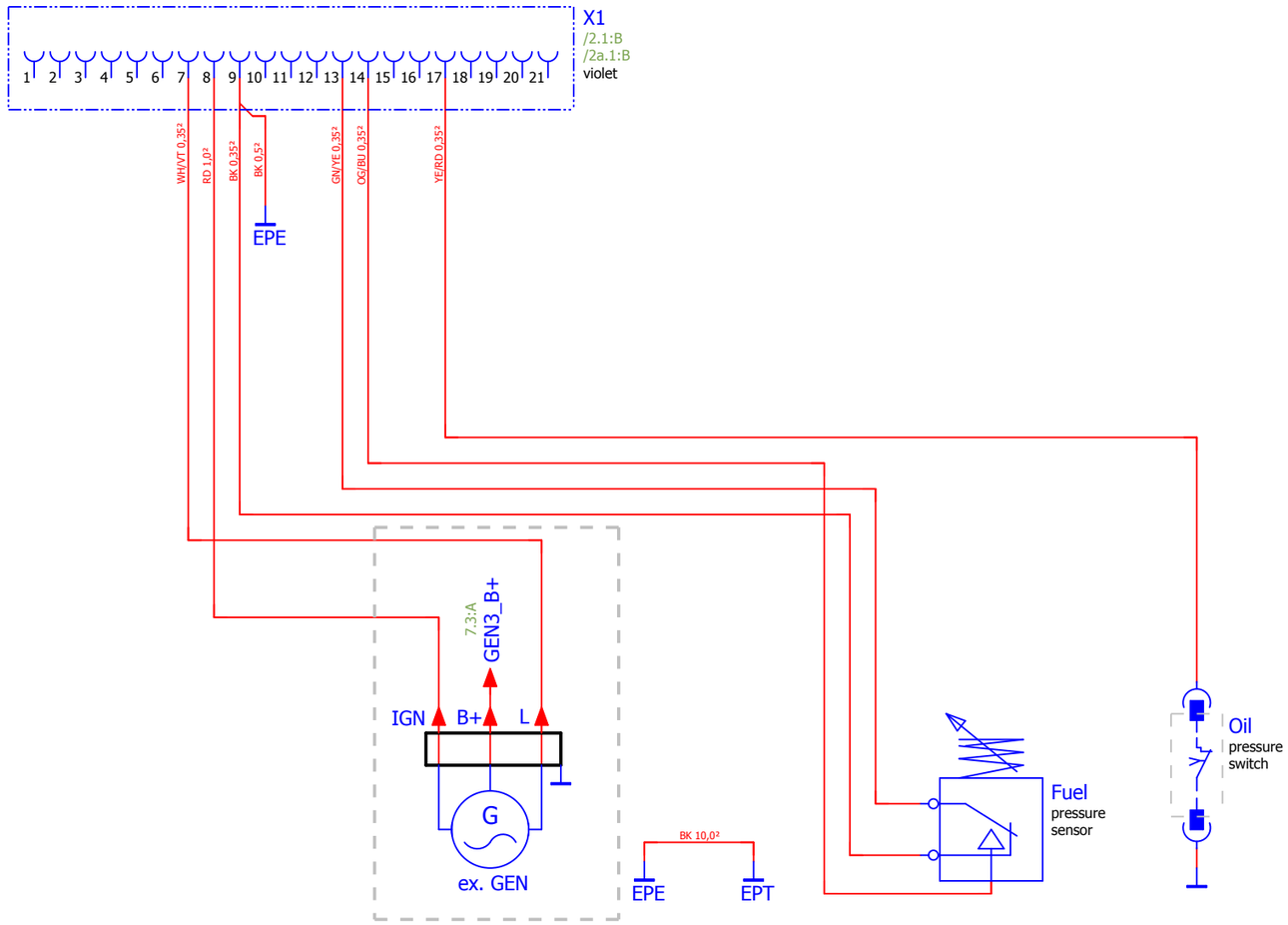
A000		New	22.02.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A001		Redrawing nothing change	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

Fuel tank sensor / Tanksensor

44543

Revision A001



EPT - Earth Point Traverse
EPE - Earth Point Engine

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A3	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

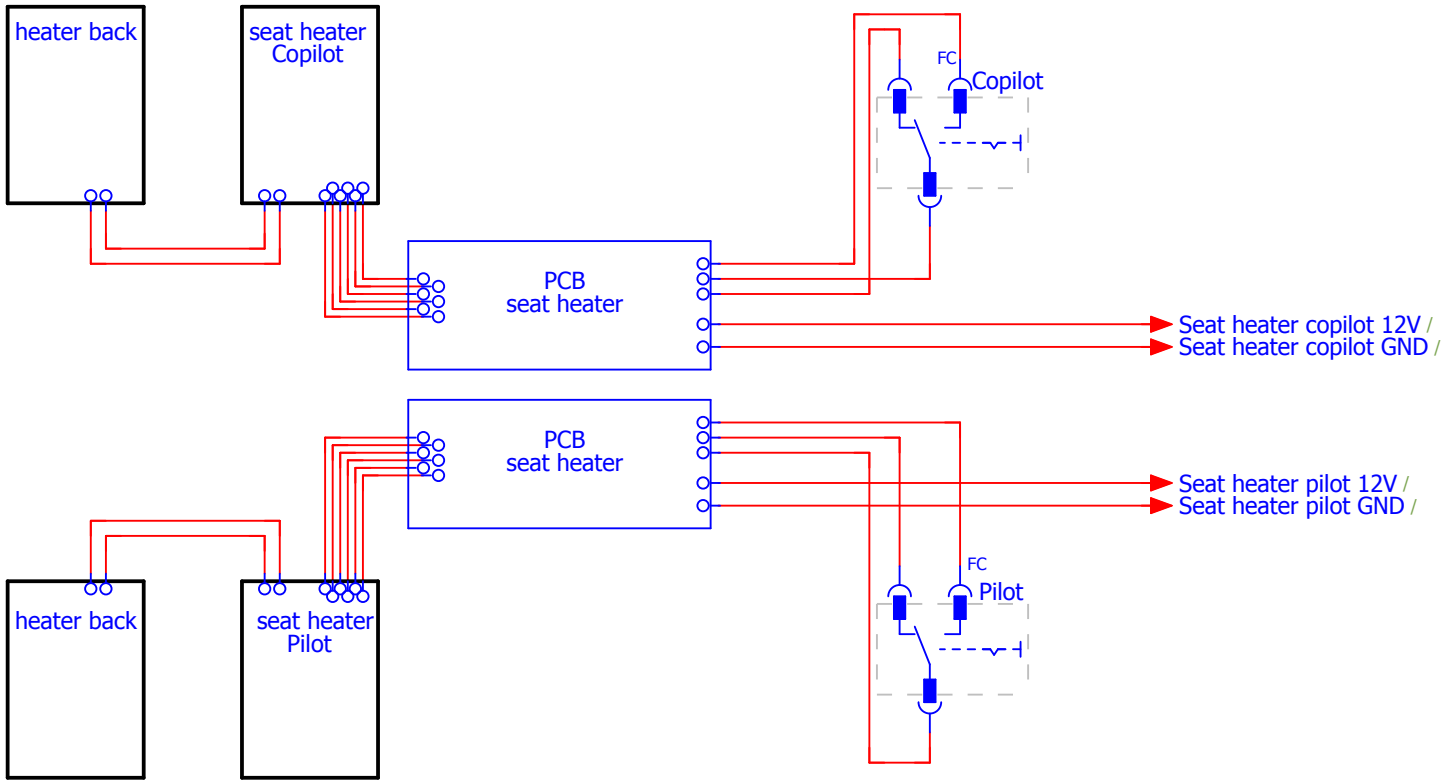
Rev	CMS	Modification	Date	Name
		New page created	13.01.2020	H.STINDL
A002		Redrawing nothing change	29.01.2020	H.STINDL
A003		Removed IVO	24.05.2024	HARRY

Name (engl.) / Name (ger.) / Part Number

Engine bay wiring
Motorraumkabelbaum

46803

Revision A003



FC - Front contact

Co-Sign 1:

Co-Sign 2:

RotorSport UK Ltd

Unrivalled Sport Gyroplanes

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A4	
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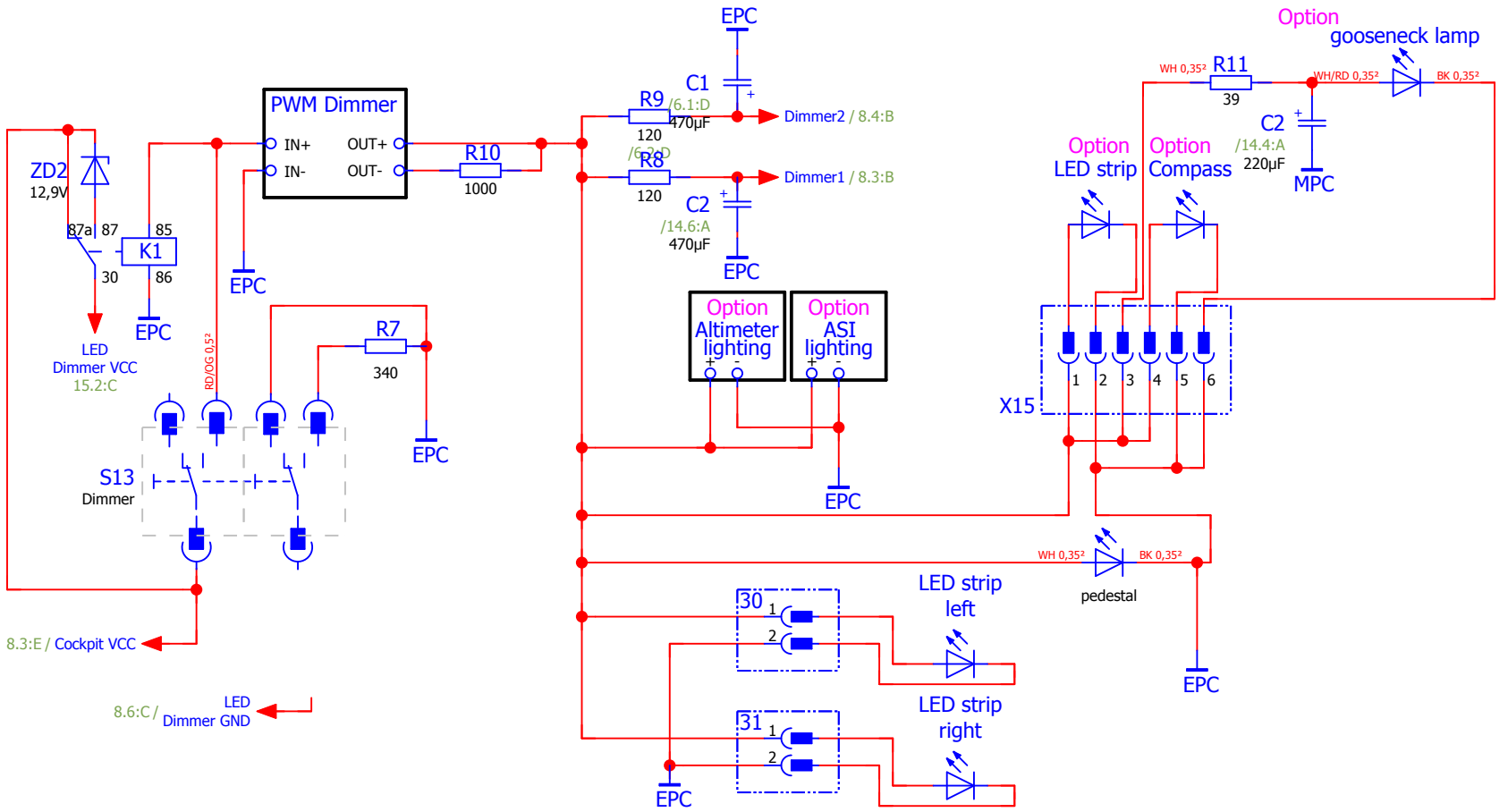
Rev	CMS	Modification	Date	Name
A000		New	22.02.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A000		Redrawing nothing change	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

Seat heater / Sitzheizung

44598

Revision A000



			13.01.2020	H.STINDL
A001		Redrawing nothing change	29.01.2020	H.STINDL
A002		Added capacity	24.05.2024	HARRY
Rev	CMS	Modification	Date	Name

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A4	
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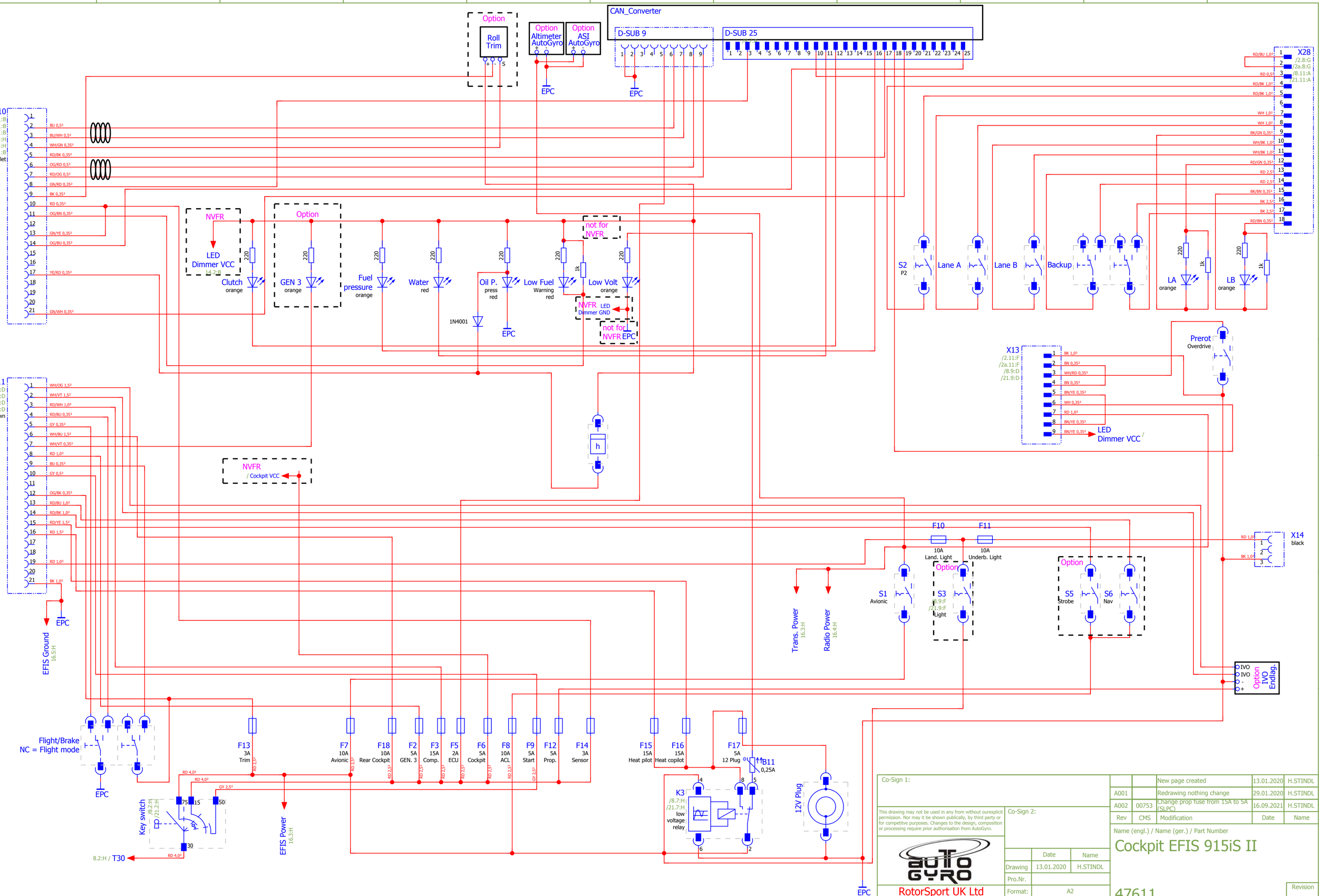
RotorSport UK Ltd
Unrivalled Sport Gyroplanes

Name (engl.) / Name (ger.) / Part Number

Cockpit light
Cockpitbeleuchtung

45635

Revision
A002



Co-Sign 1:

Co-Sign 2:

Rev	CMS	Modification	Date	Name
		New page created	13.01.2020	H.STINDL
A001		Redrawing nothing change	29.01.2020	H.STINDL
A002	00753	Change prop fuse from 15A to 5A (SLPC)	16.09.2021	H.STINDL

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A2	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

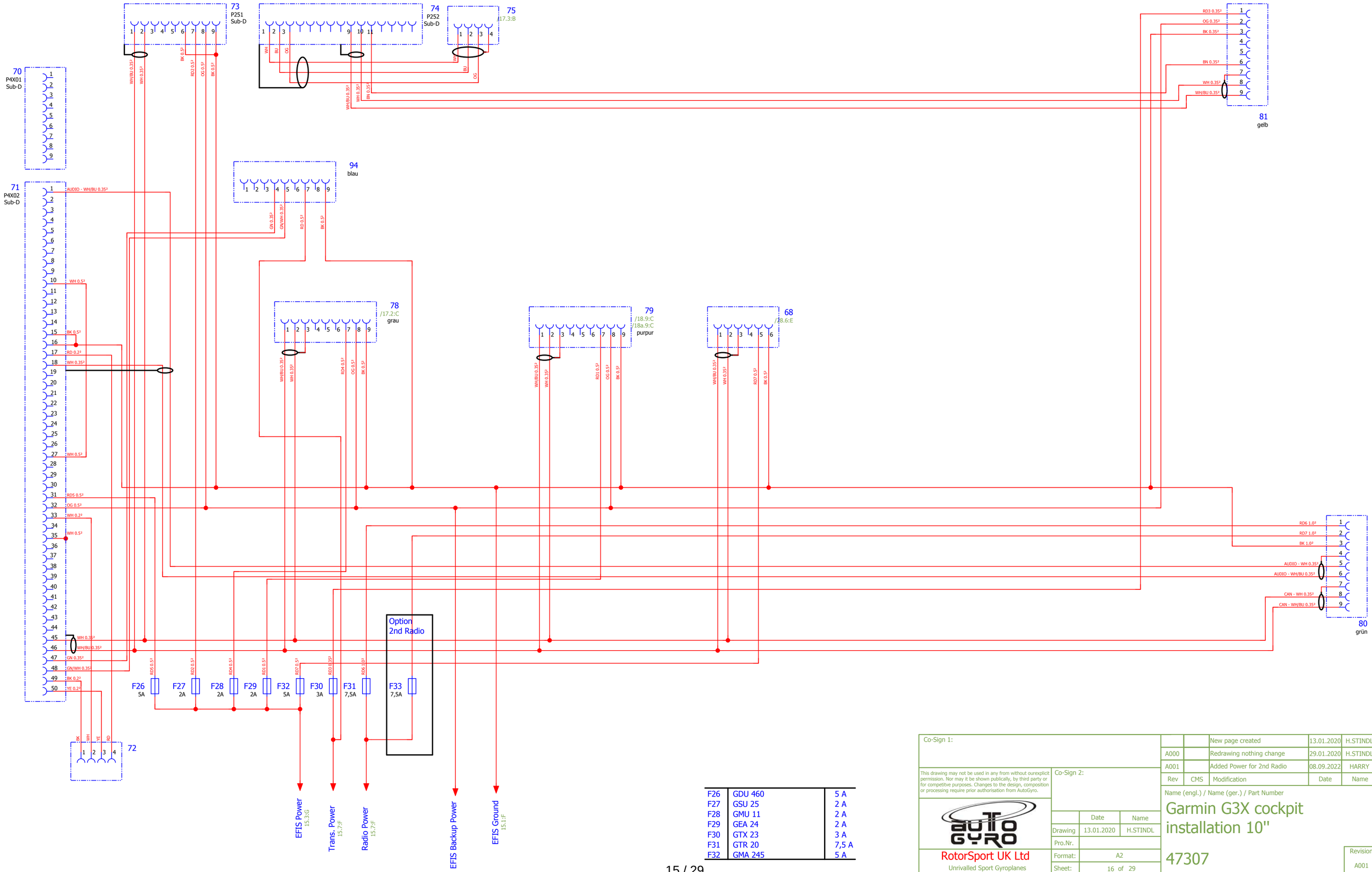
Name (engl.) / Name (ger.) / Part Number

Cockpit EFIS 915iS II

47611

Revision A002

GDU 460 GSU 25 GTP 59



F26	GDU 460	5 A
F27	GSU 25	2 A
F28	GMU 11	2 A
F29	GEA 24	2 A
F30	GTX 23	3 A
F31	GTR 20	7,5 A
F32	GMA 245	5 A

Co-Sign 1:

Co-Sign 2:

RotorSport UK Ltd
Unrivalled Sport Gyroplanes

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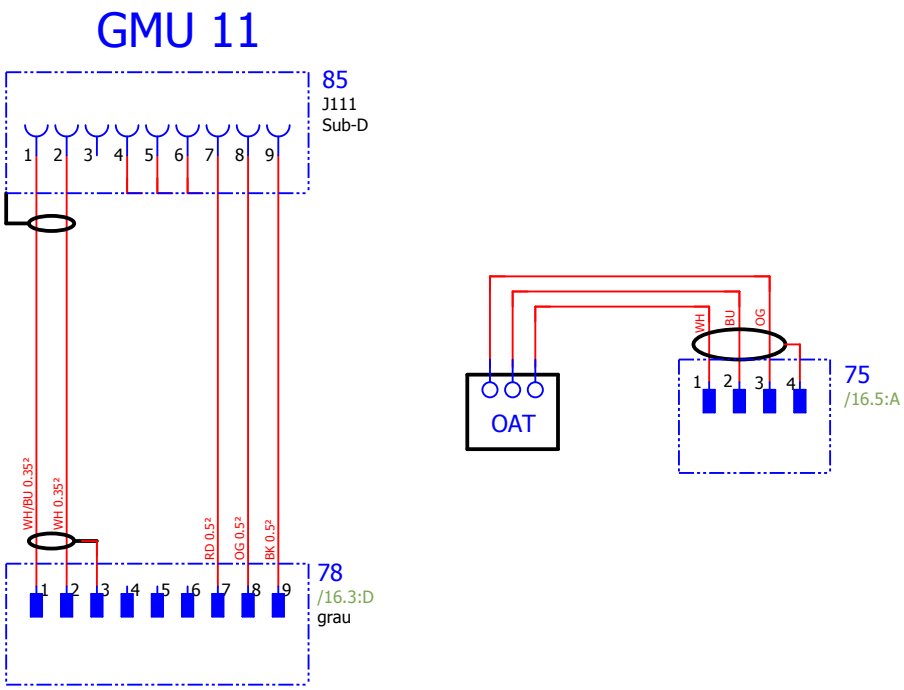
Rev	CMS	Modification	Date	Name
		New page created	13.01.2020	H.STINDL
A000		Redrawing nothing change	29.01.2020	H.STINDL
A001		Added Power for 2nd Radio	08.09.2022	HARRY

Name (engl.) / Name (ger.) / Part Number

Garmin G3X cockpit installation 10"

47307

Revision A001



Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A4	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

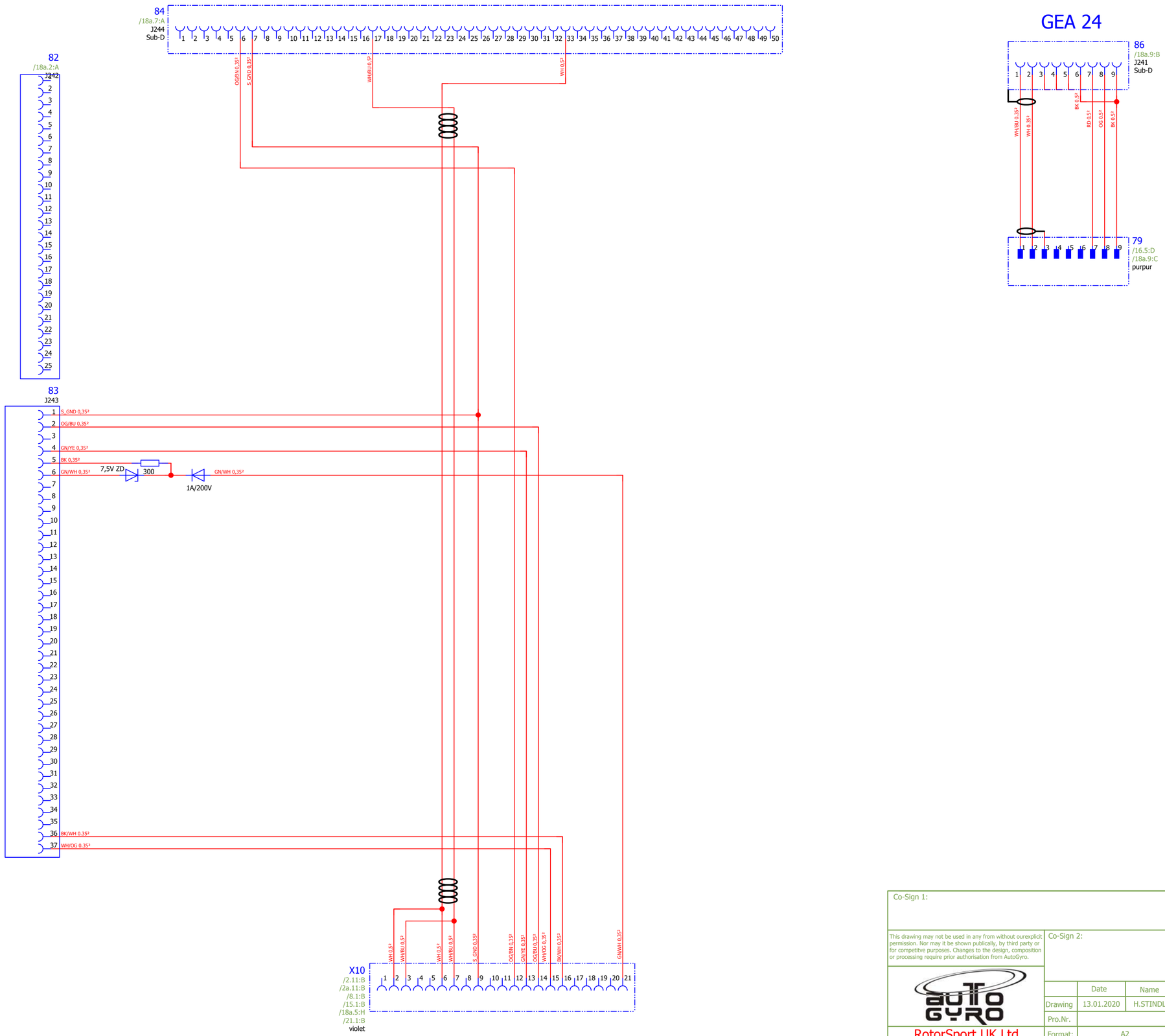
Rev	CMS	Modification	Date	Name
A000		new	18.06.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A000		Redrawing nothing change	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

G3X installation kit 915iS
G3X Einbausatz 915iS

46699

Revision A000



Co-Sign 1:

Co-Sign 2:

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A000		new	18.06.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A000		Redrawing nothing change	29.01.2020	H.STINDL

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A2	
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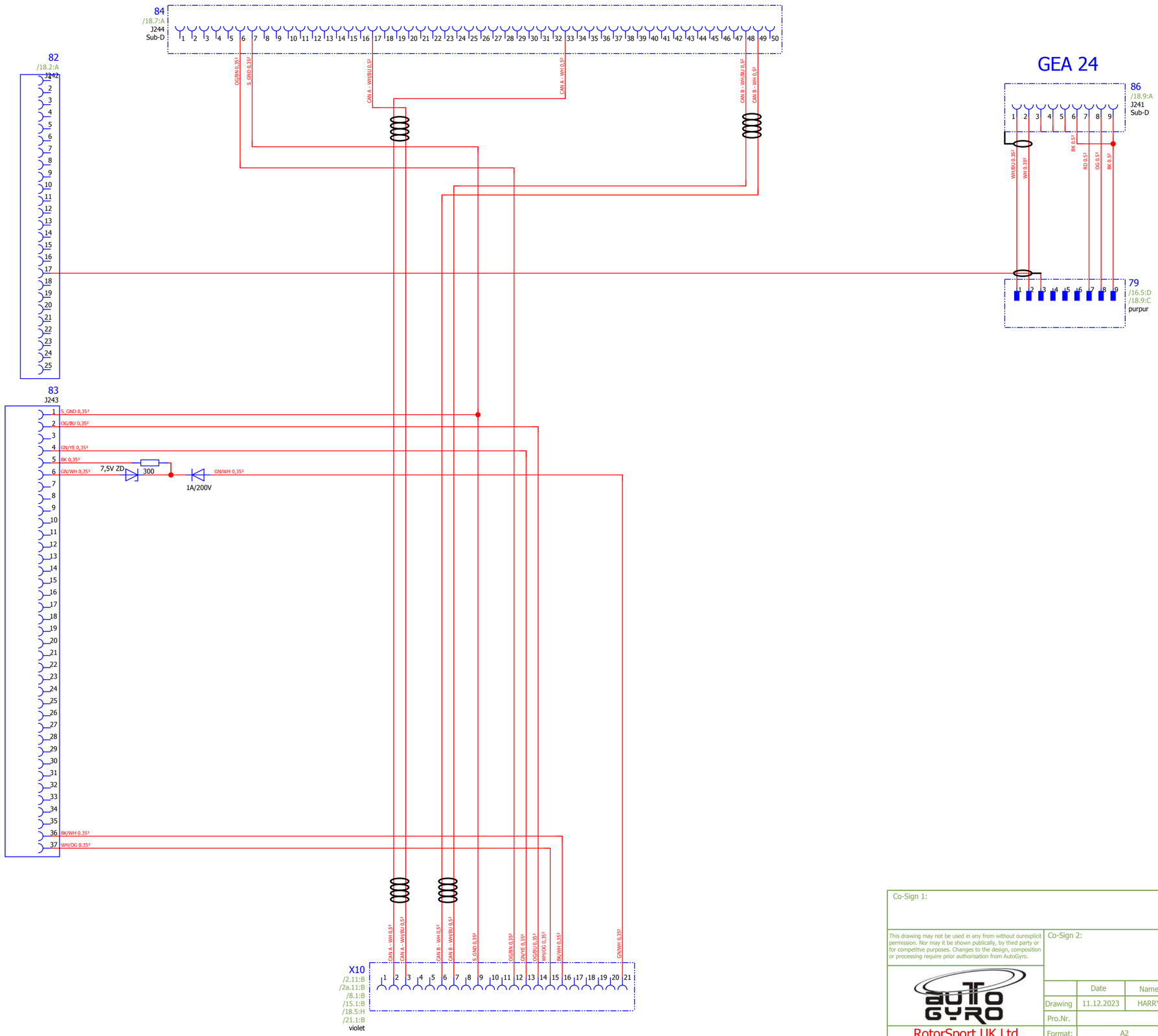
Name (engl.) / Name (ger.) / Part Number

Cockpit installation - Sensoren GEA 24

47307

Revision A000

RotorSport UK Ltd
Unrivalled Sport Gyroplanes



Co-Sign 1:

Co-Sign 2:

Rev	CMS	Modification	Date	Name
A000	00806	New	11.12.2023	HARRY

	Date	Name
Drawing	11.12.2023	HARRY
Pro.Nr.		
Format:	A2	
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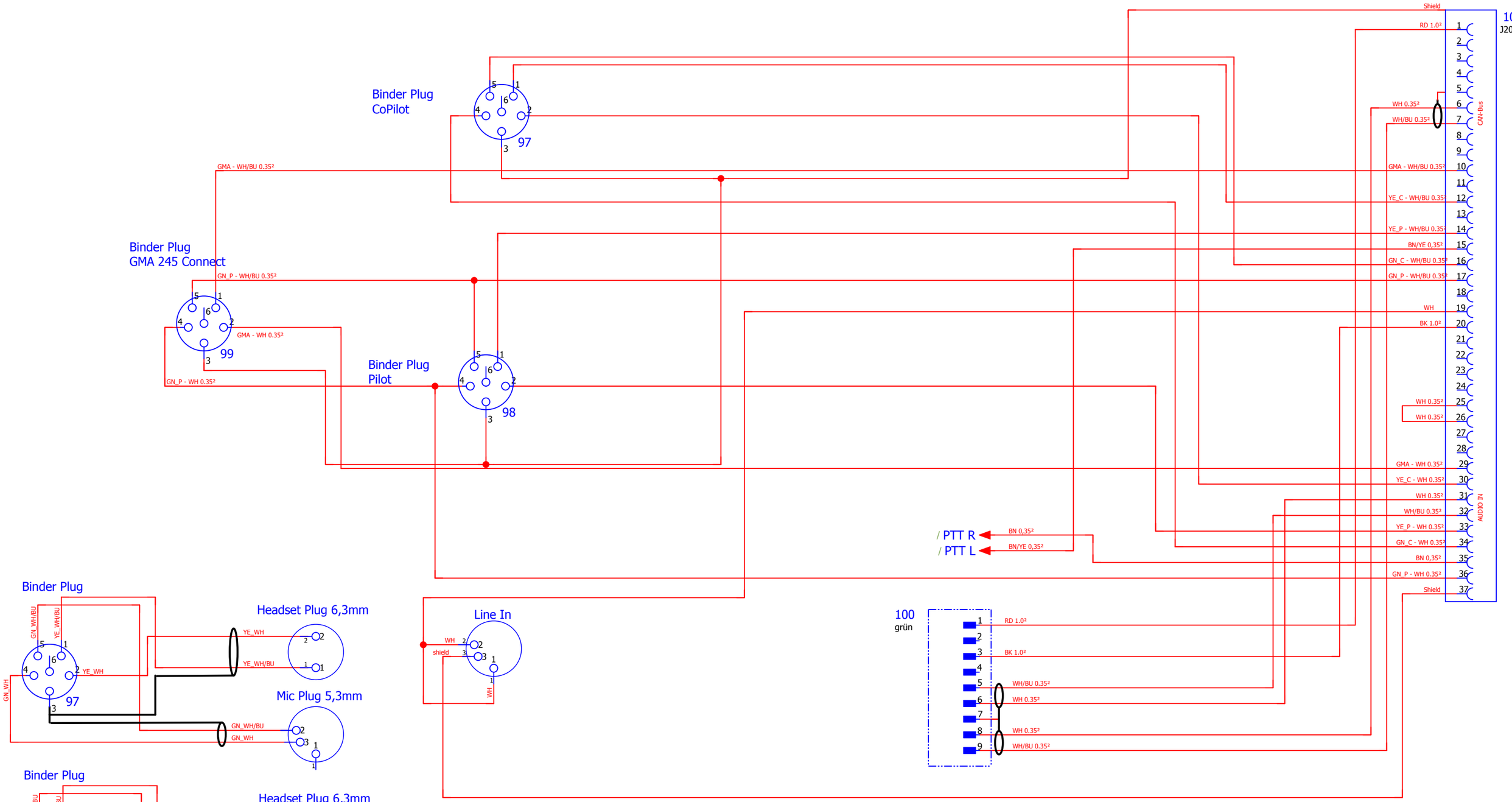
RotorSport UK Ltd
Unrivalled Sport Gyroplanes

Name (engl.) / Name (ger.) / Part Number

Cockpit installation - Sensoren GEA 24B

49259

Revision A000



Binder

1 Headset positiv (YE_x - WH/BU)
2 Headset negativ (YE_x - WH)
3 Shield
4 Mic 2 negativ (GN_x - WH)
5 Mic 2 positiv (GN_x - WH/BU)
6

Line In (Mono)

1 Line In + (WH)
2 Line In + (WH)
3 GND (BK)

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A3	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

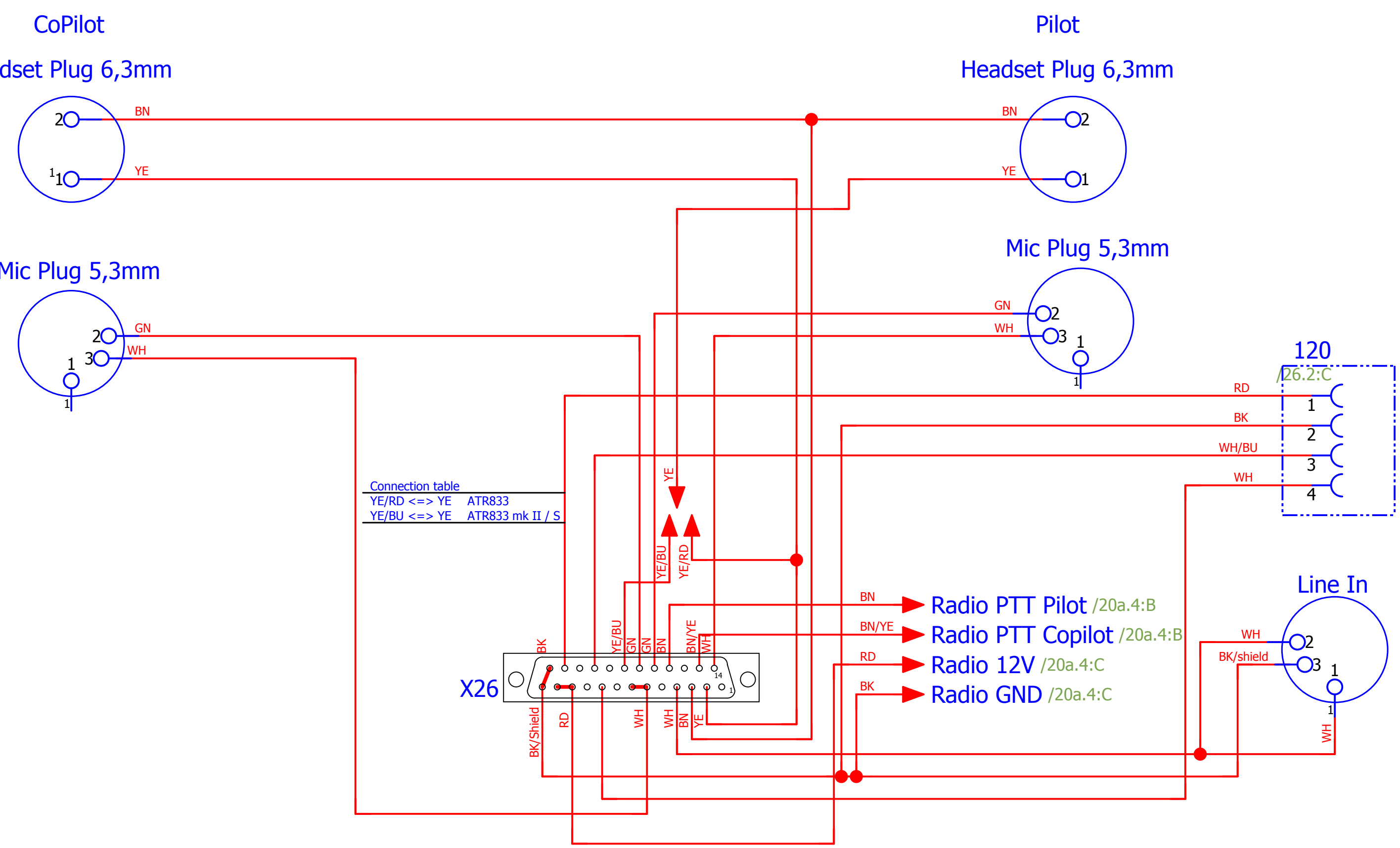
Rev	CMS	Modification	Date	Name
A002		Changed CAN-Bus wires on Pin 6 and 7	09.10.2019	H.STINDL
		New page created	13.01.2020	H.STINDL
A002		Redrawing nothing change	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

GTR 20 installation kit
GTR 20 Einbausatz

46648

Revision A002



Sub.-D 25 pol.

1 Free
2 Headset positiv (YE, YE/RD)
3 Headset negativ (2 x BN)
4 Line In (WH)
5 Free
6 Mic 2 negativ (WH)
7 GND bridge to 6
8 Free
9 Free
10 Free
11 Power 12V (RD)
12 Power 12V (RD)
13 Power GND (BK)
14 Mic 1 negativ (WH)
15 PTT 2 (BN/YE)
16 Free
17 PTT 1 (BN)
18 Mic 1 positiv (GN)
19 Mic 2 positiv (GN)
20 Headset positiv (YE/BU)
21 Free
22 Free
23 Free
24 Free
25 Power GND (BK)

Line In (Mono)

1 Line In + (WH)
2 Line In + (WH)
3 GND (BK)

Mic Plug 5,3mm

1 Free
2 Mic positiv (GN)
3 Mic negativ (WH)

Headset Plug 6,3mm

1 Headspeaker positiv (YE)
2 Headspeaker negativ (BN)

Co-Sign 1:

Co-Sign 2:

RotorSport UK Ltd
Unrivalled Sport Gyroplanes

Rev	CMS	Modification	Date	Name
			13.01.2020	H.STINDL
A002		Redrawing nothing change	29.01.2020	H.STINDL
A003		Added plug for remote control	08.07.2022	HARRY

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
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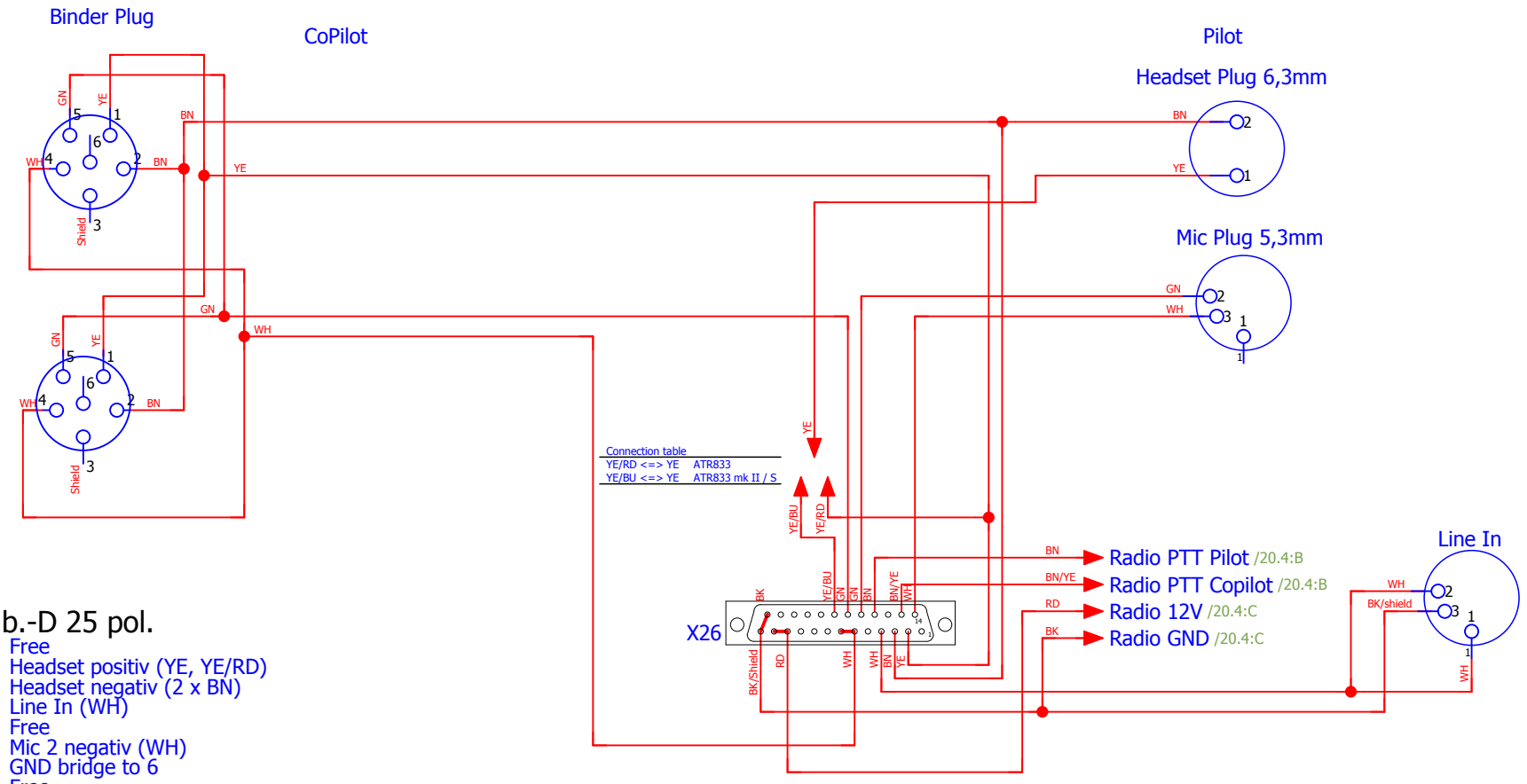
Name (engl.) / Name (ger.) / Part Number

Wiring harness intercom ATR833

44497

Revision
A003



Sub.-D 25 pol.

1 Free
2 Headset positiv (YE, YE/RD)
3 Headset negativ (2 x BN)
4 Line In (WH)
5 Free
6 Mic 2 negativ (WH)
7 GND bridge to 6
8 Free
9 Free
10 Free
11 Power 12V (RD)
12 Power 12V (RD)
13 Power GND (BK)
14 Mic 1 negativ (WH)
15 PTT 2 (BN/YE)
16 Free
17 PTT 1 (BN)
18 Mic 1 positiv (GN)
19 Mic 2 positiv (GN)
20 Headset positiv (YE/BU)
21 Free
22 Free
23 Free
24 Free
25 Power GND (BK)

Line In (Mono)

1 Line In + (WH)
2 Line In + (WH)
3 GND (BK)

Mic Plug 5,3mm

1 Free
2 Mic positiv (GN)
3 Mic negativ (WH)

Headset Plug 6,3mm

1 Headspeaker positiv (YE)
2 Headspeaker negativ (BN)

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A4	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

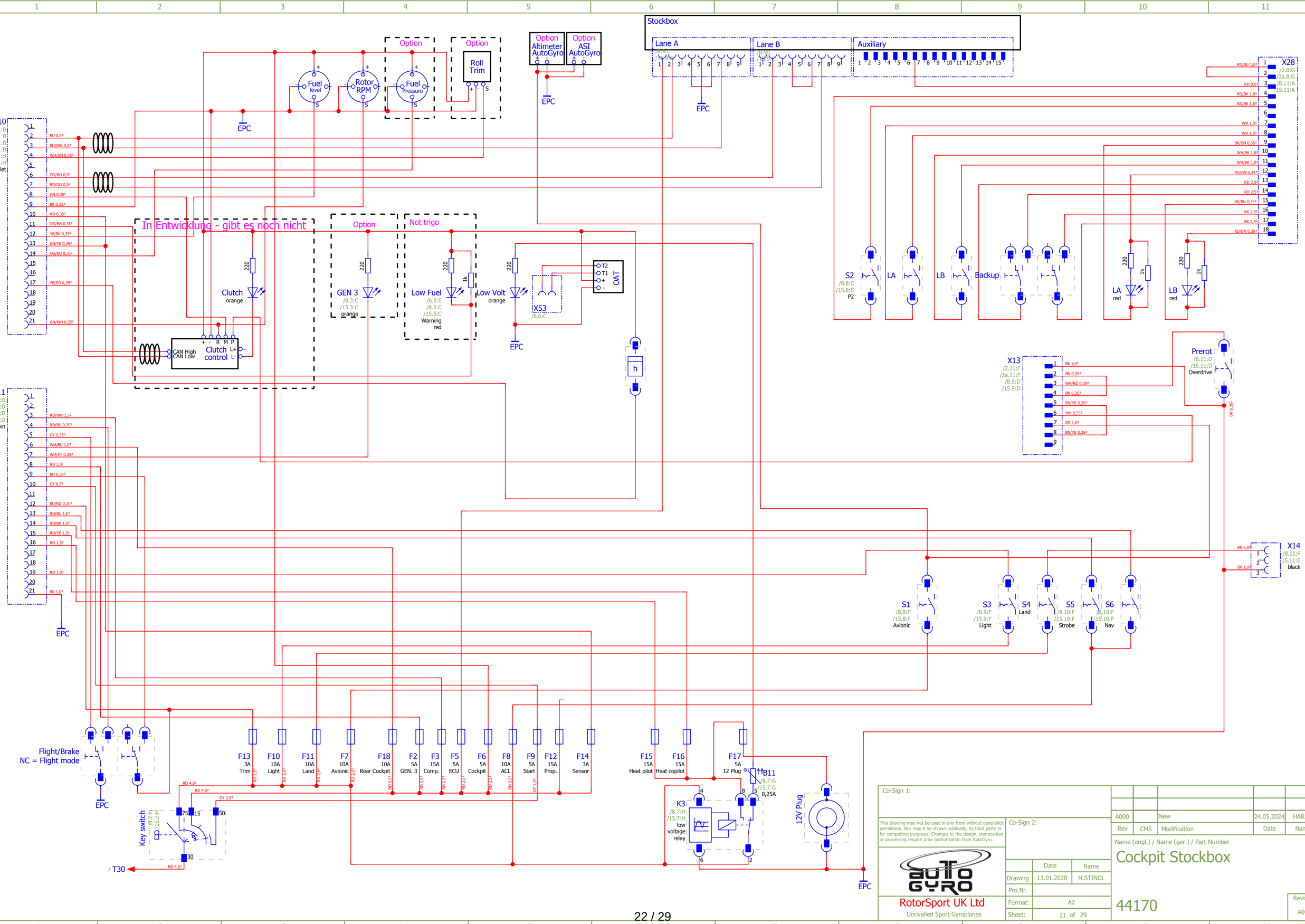
Rev	CMS	Modification	Date	Name
			19.11.2019	H.STINDL
			13.01.2020	H.STINDL
A000		Redrawing nothing change	29.01.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

Wiring harness intercom ATR833 Trigo

46210

Revision A000



Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	13.01.2020	H.STINDL
Pro.Nr.		
Format:	A2	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

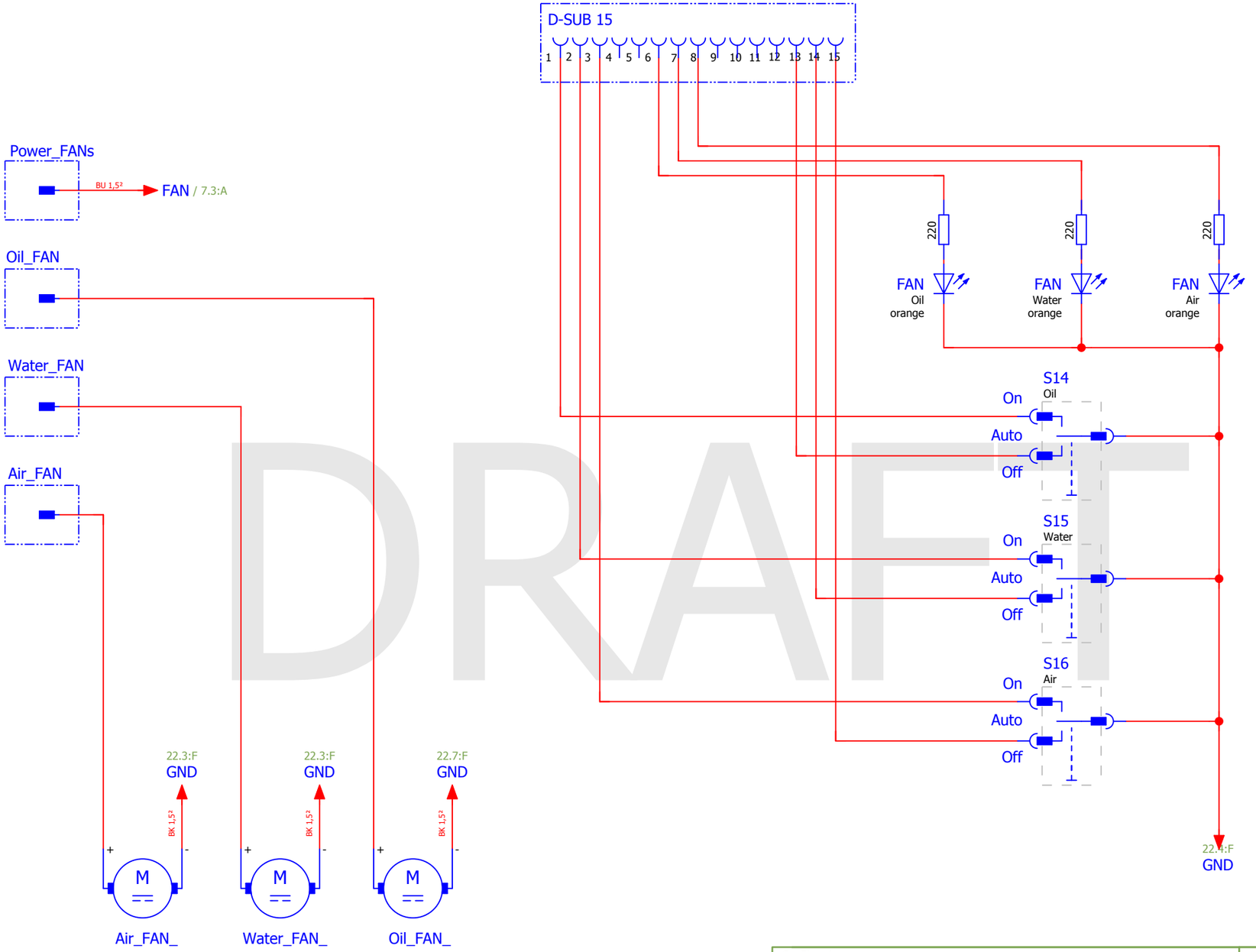
Rev	CMS	Modification	Date	Name
A000		New	24.05.2024	HARRY

Name (engl.) / Name (ger.) / Part Number

Cockpit Stockbox

44170

Revision A000



Co-Sign 1:

Co-Sign 2:

Rev	CMS	Modification	Date	Name
	New page created		22.07.2020	H.STINDL

Name (engl.) / Name (ger.) / Part Number

CAN Relay-Addon PCB

	Date	Name
Drawing	22.07.2020	H.STINDL
Pro.Nr.		
Format:	A3	
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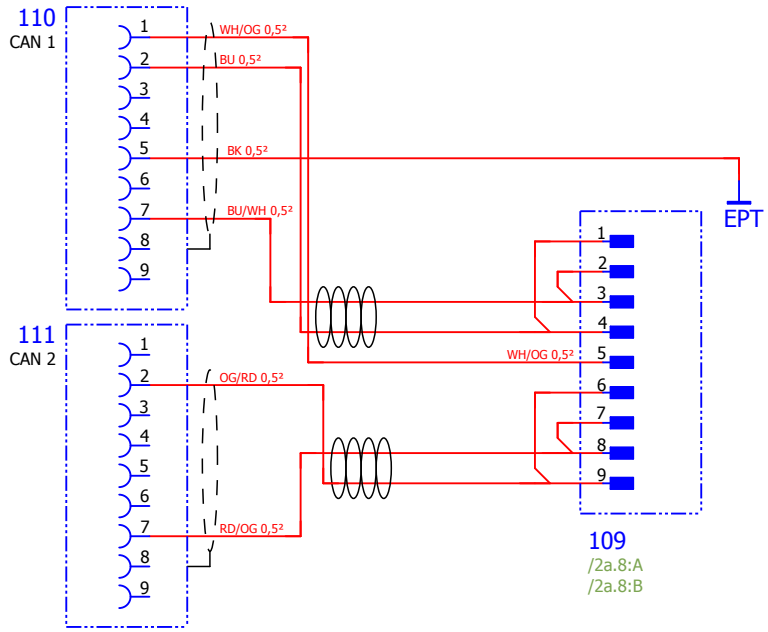
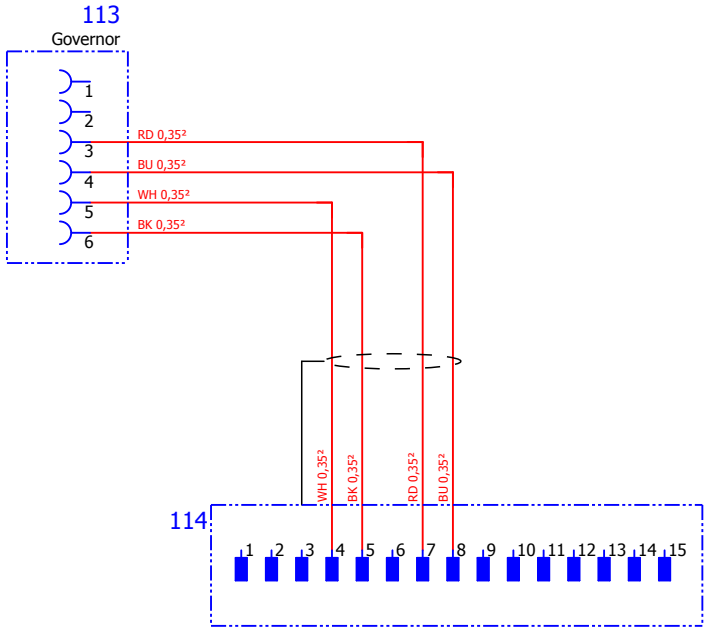
Revision

RotorSport UK Ltd

Unrivalled Sport Gyroplanes





Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	19.07.2021	H.STINDL
Pro.Nr.		
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RotorSport UK Ltd

Unrivalled Sport Gyroplanes

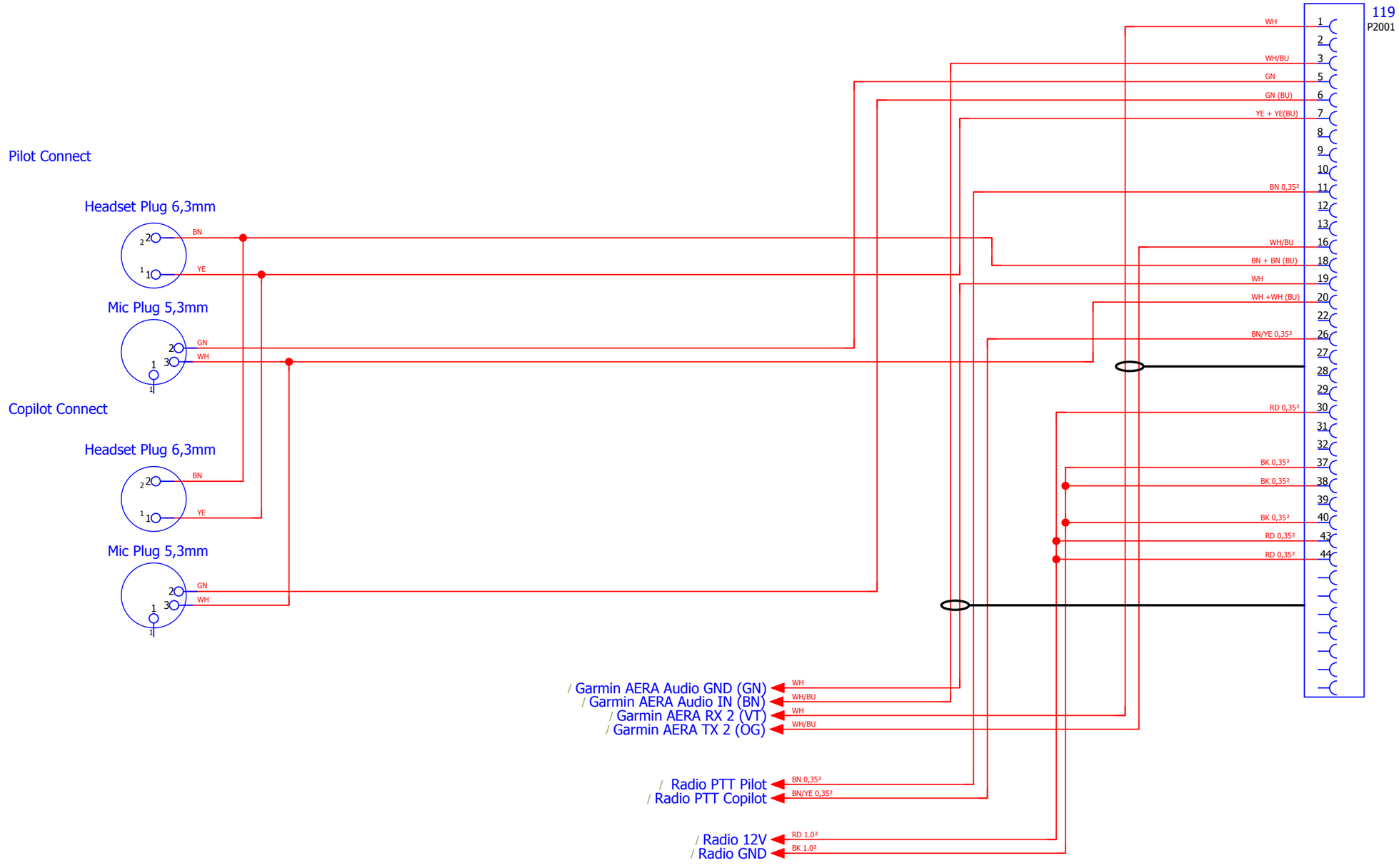
Rev	CMS	Modification	Date	Name
A000	00753	New	16.09.2021	H.STINDL

Name (engl.) / Name (ger.) / Part Number

SCU installation kit (2017)
SCU Einbausatz (2017)

48266

Revision A000



Garmin GTX 345 RS232 NMEA
Garmin AERA 760 Serial Port 2 Aviation In/NMEA & VHF Out

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	27.10.2021	H.STINDL
Pro.Nr.		
Format:	A3	
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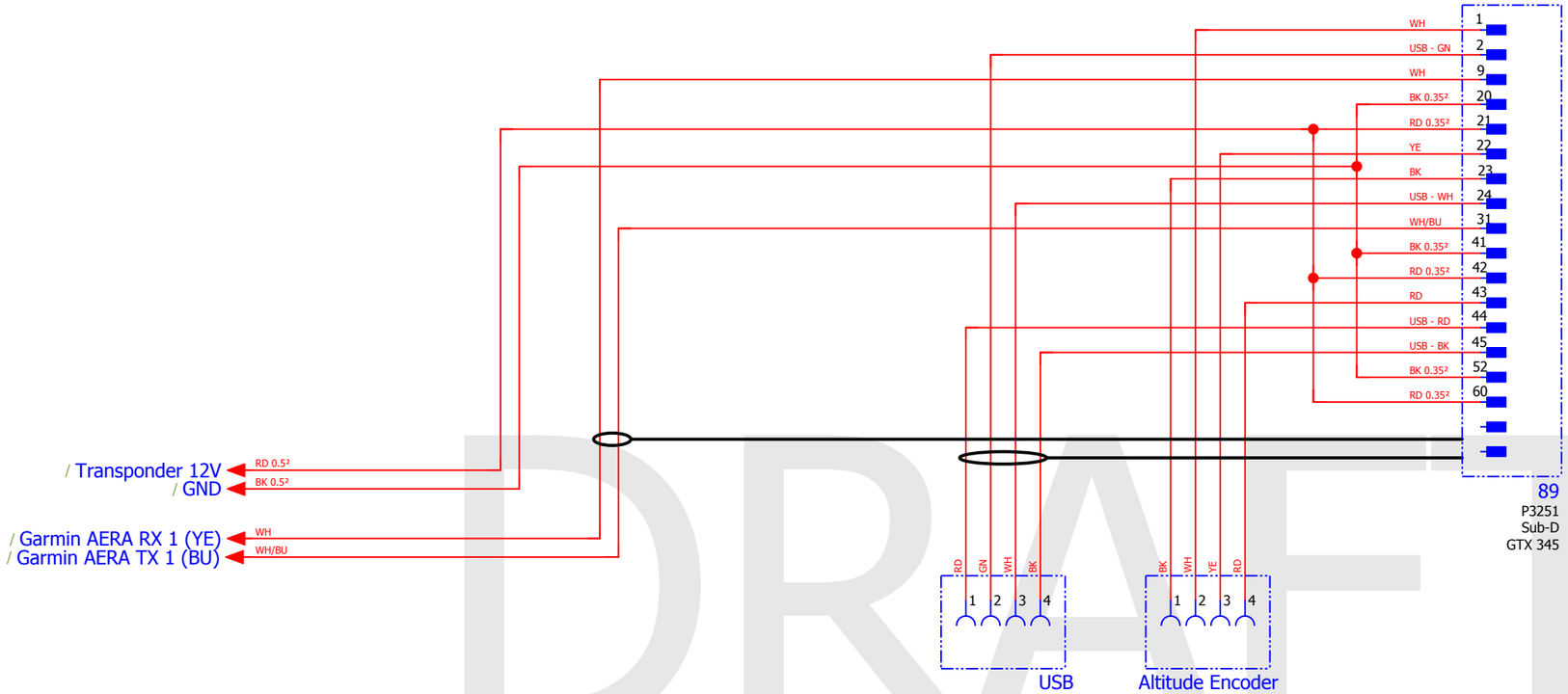
RotorSport UK Ltd
Unrivalled Sport Gyroplanes

Rev	CMS	Modification	Date	Name
A000		New	24.05.2024	HARRY

Name (engl.) / Name (ger.) / Part Number

GTR 225 installation kit
MTO 2017 with Aera 760

Revision A000



Garmin GTX 345	RS232_1	Connext FMT 1
Garmin AERA 760	Serial Port 1	Connext 57600 Baud

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	27.10.2021	H.STINDL
Pro.Nr.		
Format:	A3	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

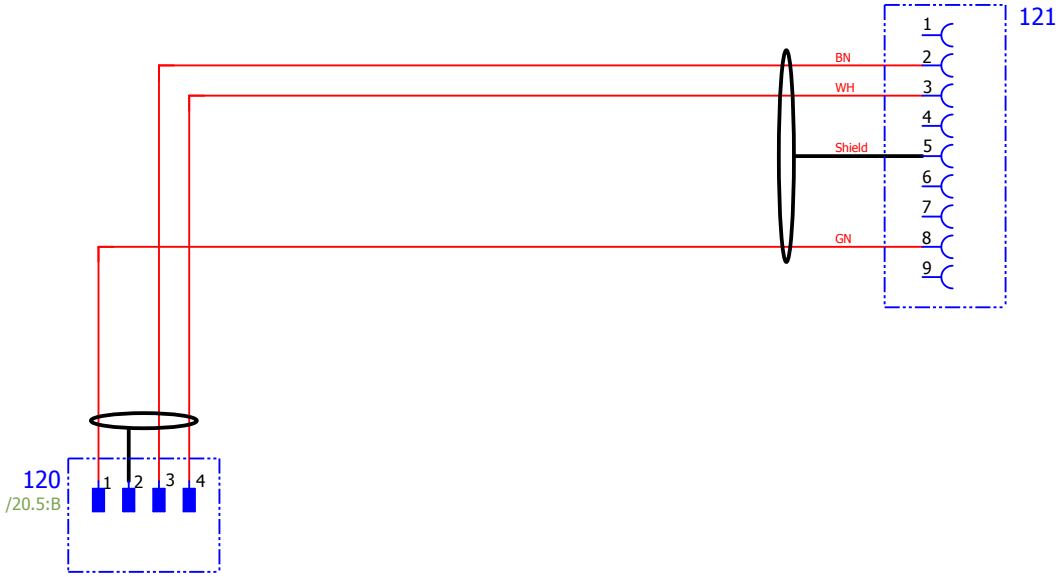
Rev	CMS	Modification	Date	Name
A000		New	07.08.2019	H.STINDL
A001		Added labeling	06.01.2020	H.STINDL
			27.10.2021	H.STINDL

Name (engl.) / Name (ger.) / Part Number

GTX 345 installation kit MTO 2017 with Aera 760

47412

Revision



Co-Sign 1:

Co-Sign 2:

A000		New	08.07.2022	HARRY
Rev	CMS	Modification	Date	Name

	Date	Name
Drawing	08.07.2022	HARRY
Pro.Nr.		
Format:	A4	
Sheet:	26 of 29	

RotorSport UK Ltd

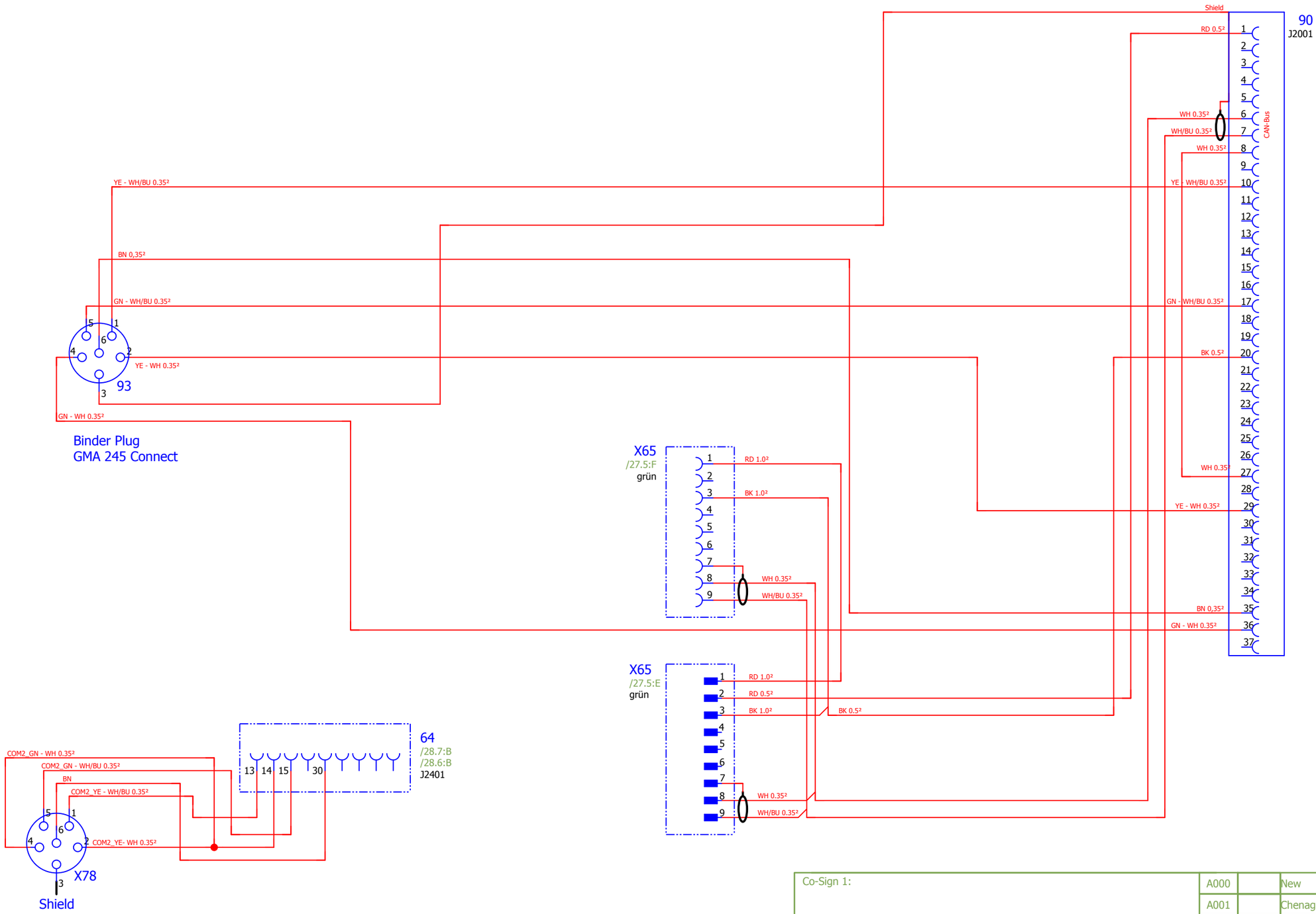
Unrivalled Sport Compliance

Name (engl.) / Name (ger.) / Part Number

Wiring harness ATR833 remote

48550

Revision A000



Binder
1 Headset positiv (YE_x - WH/BU)
2 Headset negativ (YE_x - WH)
3 Shield
4 Mic negativ (GN_x - WH)
5 Mic positiv (GN_x - WH/BU)
6 PTT

Co-Sign 1:

Co-Sign 2:

RotorSport UK Ltd
Unrivalled Sport Gyroplanes

	Date	Name
Drawing	01.09.2022	HARRY
Pro.Nr.		
Format:	A3	
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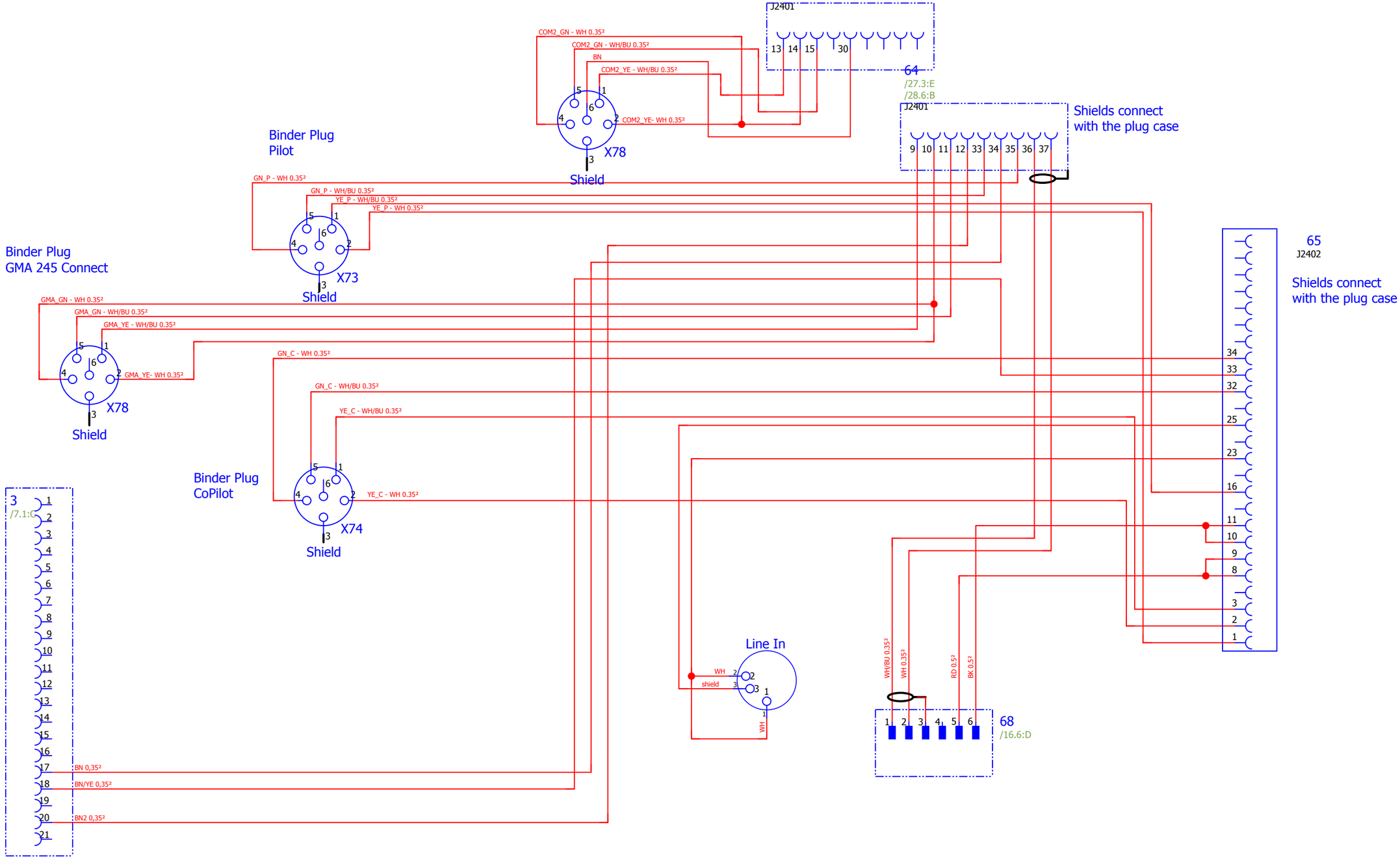
A000		New	01.09.2022	HARRY
A001		Chenaged power of 2nd Radio	08.09.2022	HARRY
A002		Removed wrong power wirings	09.09.2022	HARRY
Rev	CMS	Modification	Date	Name

Name (engl.) / Name (ger.) / Part Number

GTR 20 installation kit for second radio

48682

Revision A002



Binder

1	Headset positiv (YE/GMA_WH/BU)
2	Headset negativ (YE/GMA_WH)
3	Shield
4	Mic negativ (GN_WH)
5	Mic positiv (GN_WH/BU)
6	

Line In (Mono)

1	Line In + (WH)
2	Line In + (WH)
3	GND (BK)

Co-Sign 1:

Co-Sign 2:

	Date	Name
Drawing	01.09.2022	HARRY
Pro.Nr.		
Format:	A3	
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RotorSport UK Ltd
Unrivalled Sport Gyroplanes

Rev	CMS	Modification	Date	Name
A000		New	24.05.2024	HARRY

Name (engl.) / Name (ger.) / Part Number

GMA 245r installation kit
GMA 245r Einbausatz

47914

Revision A000

Contents

07-00-00 2-1 LIFTING OF GYROPLANE

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Rotor system must be removed, see Job Card 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

WARNING: Object is heavy! Inadequate handling could cause injury. Use proper lifting techniques or assistance!

WARNING: When working with cranes or other lifting equipment the general safety regulations have to be respected at all times!

CAUTION: Never attempt to lift gyroplane with rotor system attached!

PROCEDURES/ DESCRIPTION

1. Re-install teeter bolt, hand-tighten castellated nut and secure castellated nut adequately.
2. Loop a lifting belt around the teeter bolt and carefully lift the gyroplane.

CAUTION: Do not use a chain or any lifting gear that could damage the surface of the teeter bolt.

ILLUSTRATIONS

Figure 1 - Lifting belt looped around teeter bolt

07-00-00 2-2 JACKING OF GYROPLANE

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

Unload and lift nose gear

1. In order to unload the nose gear, load or lash-down keel tube in most aft position until gyroplane rests safely on both main wheels and keel tube

Lift main gear

2. In order to unload one of the main wheels carefully jack the gyroplane under the keel tube, taking care not to damage the keel tube fin (where fitted)
3. Let the gyroplane tip to the desired side and continue to jack slowly until the gyroplane rests stable on nose wheel, one main wheel and jack.

   NOTE: Sand bags or load may be used to add additional weight on the desired side
4. Secure gyroplane adequately before commencing work and do not leave unattended in jacked position. Do not work under the aircraft unless the aircraft is properly and safely supported.

07-00-00 2-3 SHORING OF THE GYROPLANE

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

CAUTION: Never use tie-down equipment or lashing straps in a way that would exert unsupported stress or high momentum on the structure of the gyroplane!

CAUTION: The suspension bow is not designed to take up high longitudinal forces!

PROCEDURES/ DESCRIPTION

Shoring, road transport or container transport

WARNING: The rotor system must be removed, disassembled and carefully packed for road transport.

CAUTION: When wrapping the gyroplane make sure that foil or stretch does not cover the painted surface directly. Put a soft layer in between for damage protection and let plastic components breathe. Do not expose wrapped gyroplane or parts to sun radiation or heat in order to avoid paint damage.

1. Restrain main wheels (blocks/chocks). For container transport replace main wheels with wooden blocks to provide safe stand.
2. Put a wooden block below the lowest point of the keel tube and lash keel tube against wooden block. The block should be dimensioned so that the main wheels (if installed) are half way unloaded.
3. Lash-down both main wheels through the lashing lugs (use rims/axles alternatively) and/or the mast tie-down kit (option).
4. Lash-down nose wheel through its axle.
5. For container transport or shipping, use the mast tie-down kit (option) and consider folding the mast.

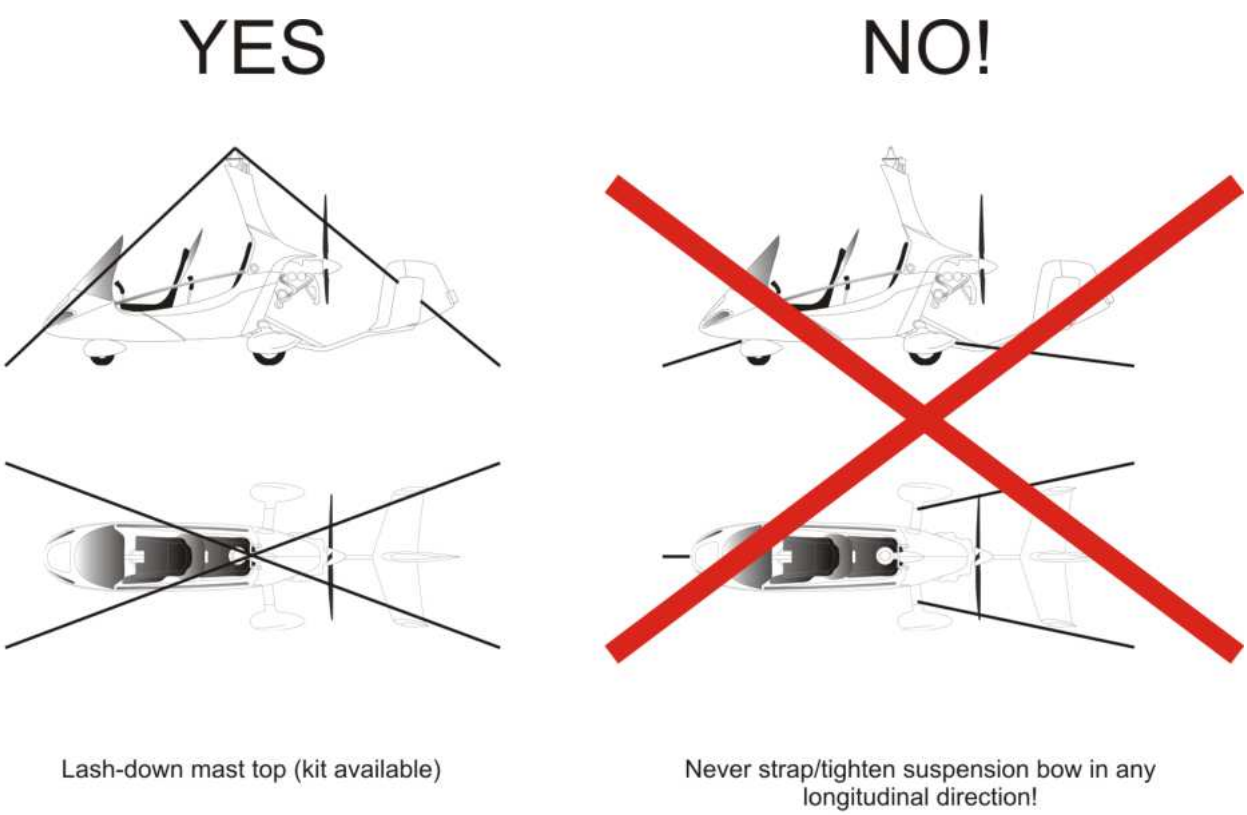


Figure 1 - Lash-down methods of gyroplane

08-10-00 2-1 WEIGHING OF GYROPLANE

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PROCEDURES/ DESCRIPTION

NOTE: Weighing is performed by measuring the weight below each wheel with level datum (keel tube between front and rear seat) 5° down. Horizontal datum is main wheel axis vertical plane.

The actual AutoGyro weighing form should be used and is available for download on the AutoGyro website.

08-20-00 2-1 LEVELING OF GYROPLANE

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

Mast fairing must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PROCEDURES/ DESCRIPTION

Measurement of Dimension D1

1. Use a tape measure and measure distance between mast reference point and fuselage reference point. See Figure 1 for reference.

NOTE: Where no visible reference mark provided, mast reference point is defined as the inner edge of the upper mast end. Fuselage reference point is defined as the outer top edge of the ball joint.

2. Contact AutoGyro Technical Support for reference values.

Measurement of Stabilizer Alignment

NOTE: The stabilizer is mounted with a slight left (or CCW) rotation relative to longitudinal axis to compensate for propeller swirl. The correct alignment is measured as described below.

3. Mark two reference points with 600mm offset from the inner edge of the central fin (see Figure 2).
4. Measure left and right distance (DL and DR) from offset reference points to the central reference point at belly seam at the underside of the fuselage (see Figure 2).
5. Verify that DL is 10 +/- 2mm longer than DR.

Measurement of relative angles

NOTE: The datum plane for the aircraft is the keel tube between the front and rear seat (see Figure 3)

6. Use an inclinometer / digital spirit level and measure thrust line angle (see Figure 4) relative to datum plane (Figure 3).
7. Use an inclinometer / digital spirit level and measure stabilizer incident angle (see Figure 5) relative to datum plane (Figure 3). Perform measurement in the straight area about 30 cm above the upper surface

of the horizontal stabilizer.

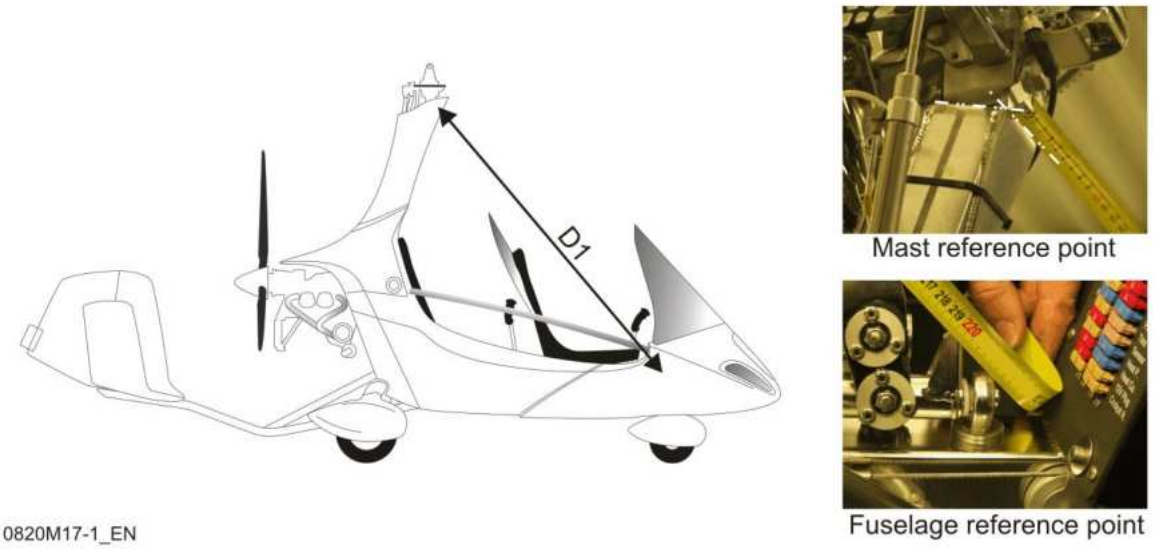


Figure 1 - Measurement of Dimension D1

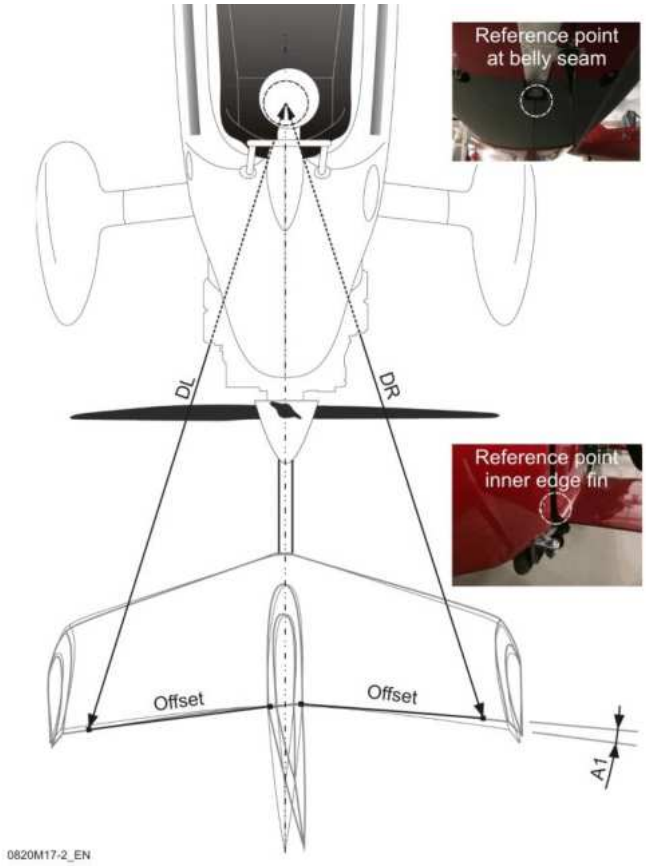


Figure 2 - Measurement of Stabilizer Alignment

Figure 3 - Measurement of reference zero

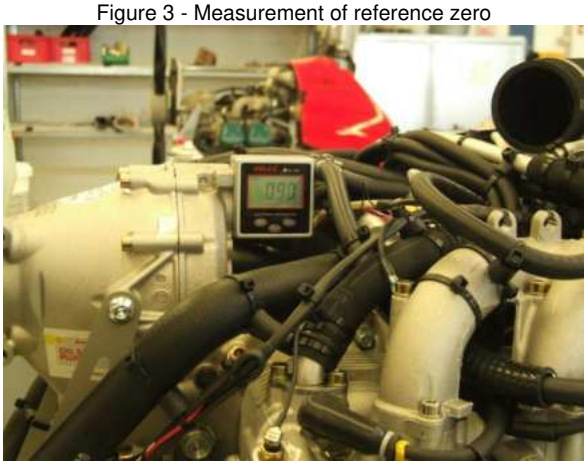


Figure 4 - Measurement of thrust line angle

Figure 5 - Measurement of stabilizer incident

24-30-00 4-1 REMOVAL-INSTALLATION: BATTERY

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

WARNING: Electrical shorting of the battery will produce high current with the risk of personal injury and damage to equipment

PROCEDURES/ DESCRIPTION

WARNING: Be careful to avoid electrical short cuts at all means.

Removal

1. Remove ground (L-) connection at the frame and isolate metallic cable shoe.
2. Remove hot (L+) cable at the battery and protect battery poles.
3. Untighten battery retainer and remove battery.

Installation

4. Install battery in reverse order (work steps 3 to 1).

ILLUSTRATIONS

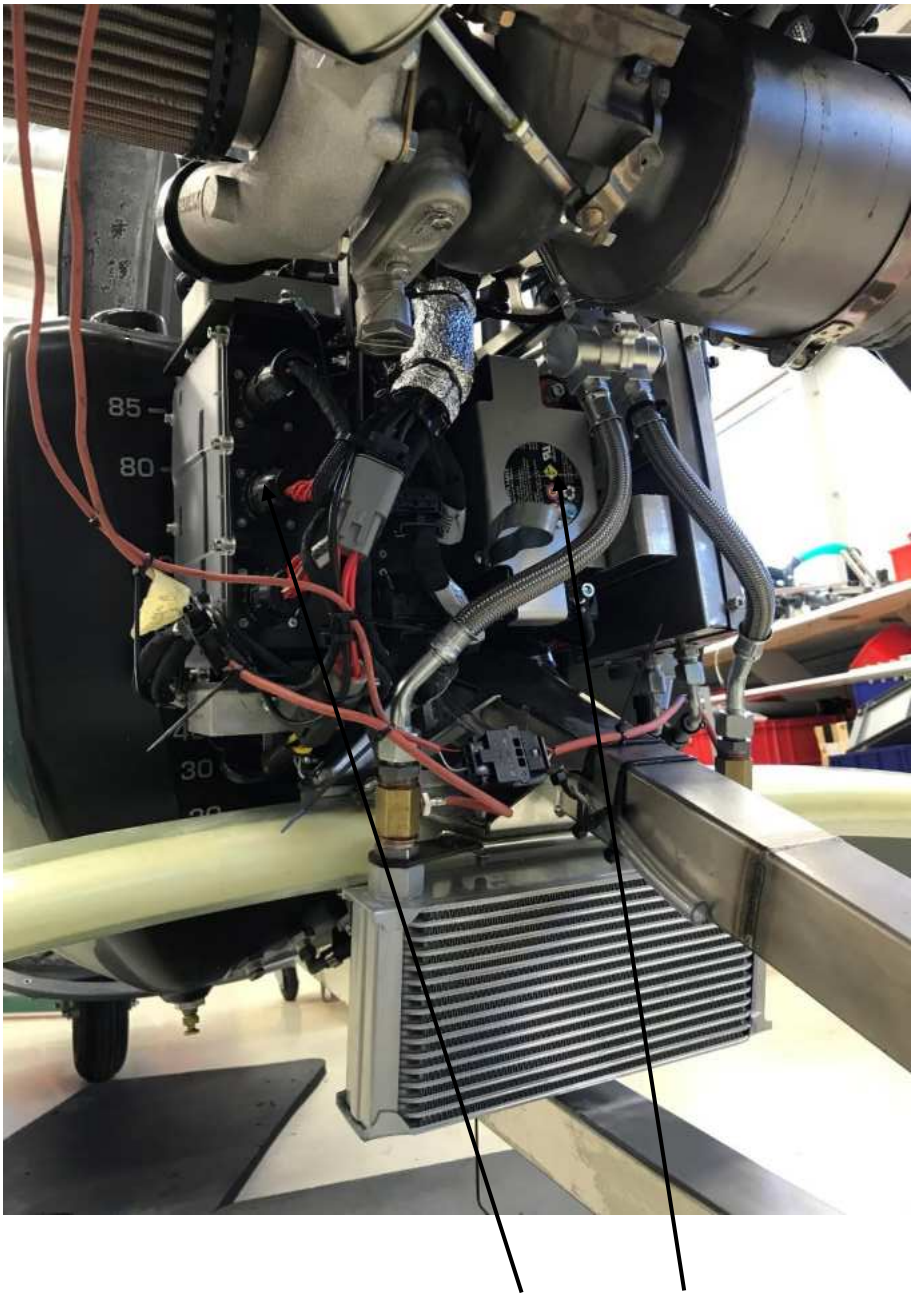


Figure 1 - Installation Position of the fuse box and Battery

27-20-00 5-1 CHECK-ADJUSTMENT: RUDDER CONTROL ANGLES

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Digital Spirit Level (PN 31438)

PRECAUTIONS AND SAFETY MEASURES

None

PROCEDURES/ DESCRIPTION

Check/adjust neutral setting

1. Adjust forward pair of pedals neutral/parallel with nose wheel unloaded. In order to simplify measurement and to avoid errors, unload nose wheel until reference plane becomes horizontal.
2. Verify angle A1 is 35 +/-3° when measured against a plane perpendicular to the reference plane (see Fig. 1).
3. Verify angle A2 is 53 +/-3° when measured against a plane perpendicular to the reference plane (see Fig. 1).
4. Verify left and right distance DL and DR of the control links are 80 +/- 2mm (see Fig. 1).

   NOTE: Do NOT measure rudder deflection against the stabilizer or the central fin as both are slightly twisted by design. Refer to 08-20-00 2-1 for further information and levelling procedure.

5. With pedals neutral, verify rudder deflection AN is 7.5° to the right when measured against aircraft longitudinal axis.

Check left and right control stop and corresponding rudder deflection

6. Press RH control pedal until control stop is reached (see Fig. 1). With cantilever in the mechanical end stop make sure that no other mechanical stop within the complete control path is reached.
7. Verify full RH rudder deflection AR is 32 +4/-2°. Repeat step 6 with pedal in the LH control stop. Verify full LH rudder deflection AL is 27 +4/-2°.

ADJUSTMENT POSSIBILITIES

IMPORTANT NOTE: All components of the rudder control system are manufactured with minimum possible tolerances and pre-adjusted to suit the aircraft configuration. In case of misalignment or out-of-tolerance values, contact AutoGyro Technical Support.

ILLUSTRATIONS

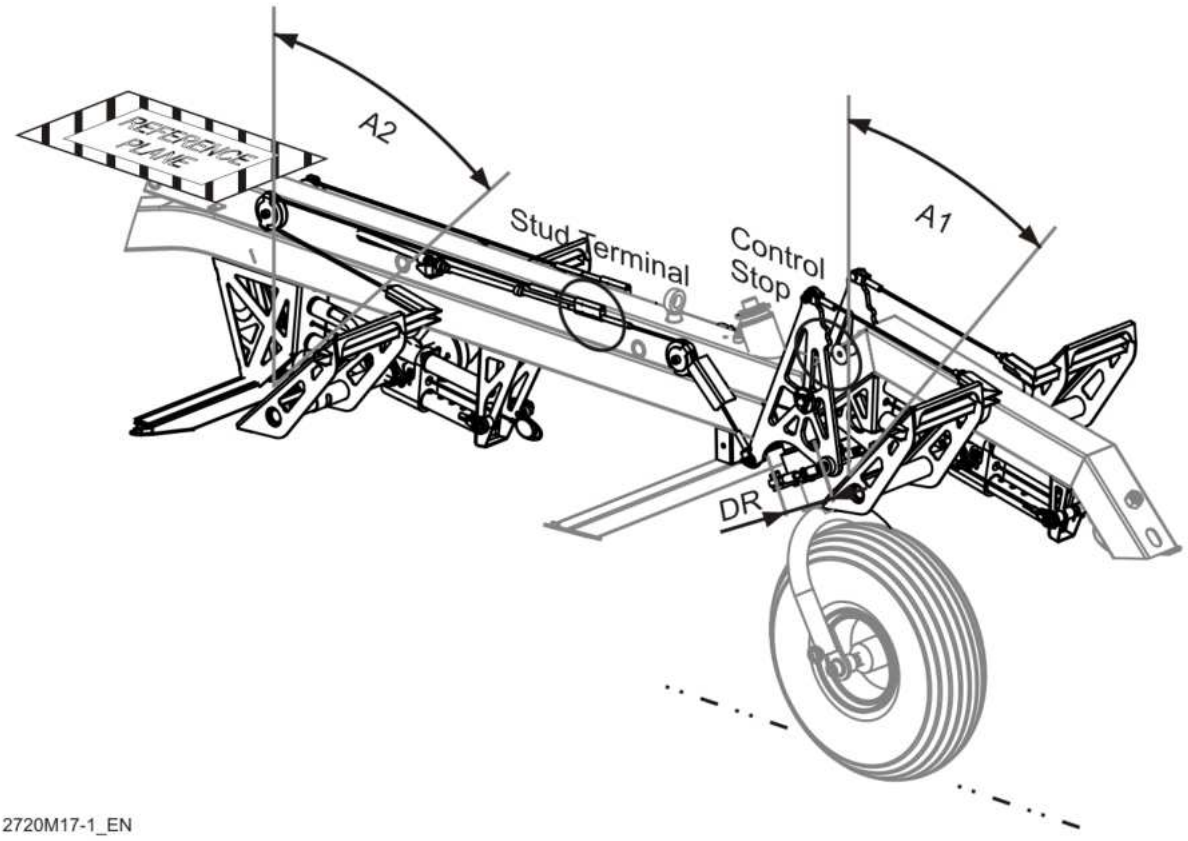
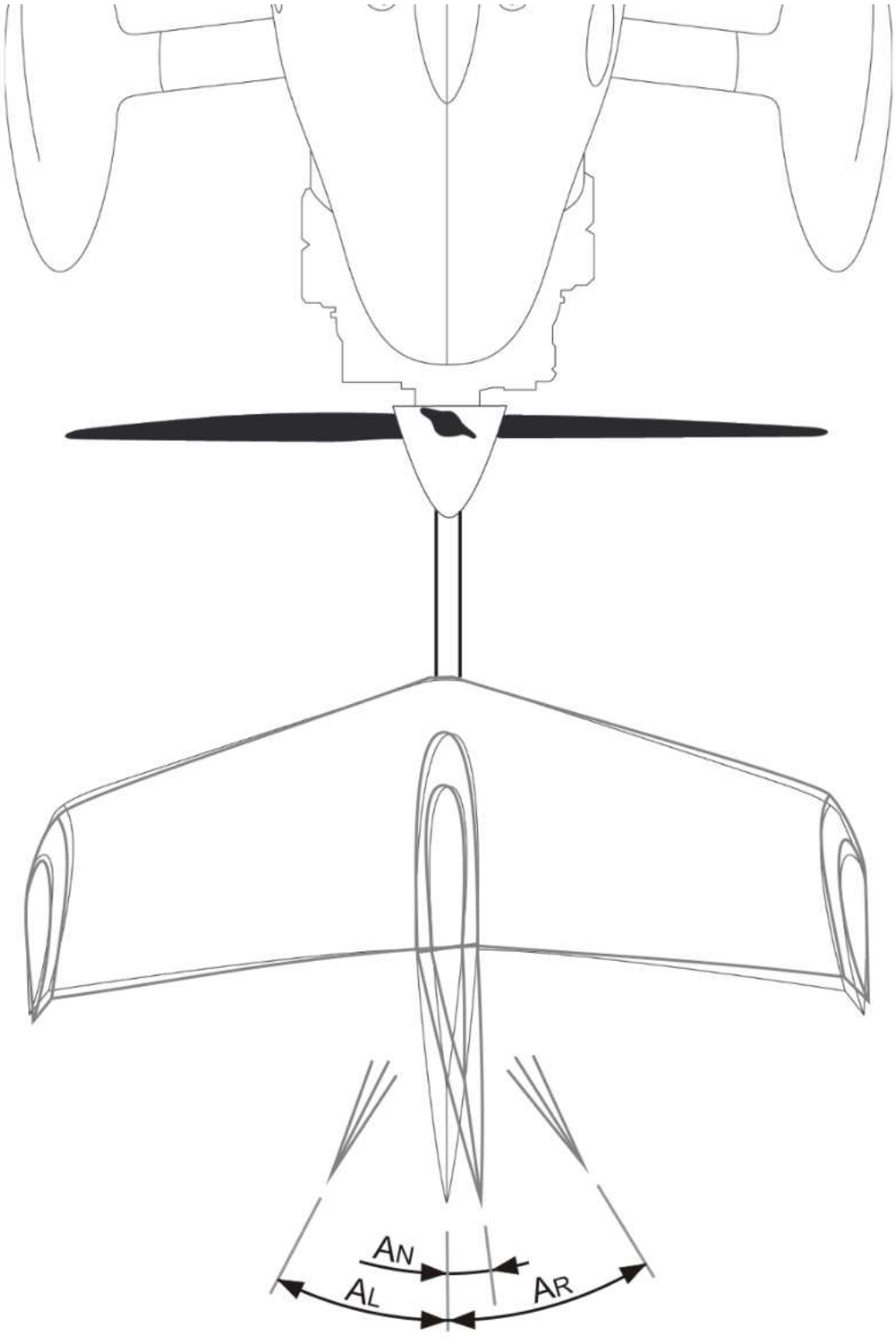


Figure 1



2720M17-2

Figure 2

28-20-00 6-1 INSPECTION: FUEL FILTER (GASCOLATOR)

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

IMPORTANT NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

WARNING: Fuel and fuel vapours are HAZARDOUS MATERIAL, must be treated and handled accordingly, and constitute a danger to health and hardware!

IMPORTANT NOTE: Depending on engine variant and optional equipment, number and type of installed fuel filters may differ!

PROCEDURES/ DESCRIPTION

1. Remove and inspect gascolator filter.
2. In order to do so, clamp the fuel line to prevent fuel from spilling.
3. If contamination is found, clean the filter gauze. Use brake cleaner and compressed air applied
4. In case of residual contamination or damage, strainer has to be replaced.

PARTS LIST

Figure	Position	Description	PN	Remarks
1		Gascolator	46819	915 engine
2		Gascolator	46819	916 engine
1		Strainer	NPI	
2		Strainer	NPI	

ILLUSTRATIONS

Figure 1 - Location of gascolator drain point.

Figure 2 – Gascolator for 916 engine

28-20-00 8-1 REPLACEMENT: FUEL FILTER

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

IMPORTANT NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

WARNING: Fuel and fuel vapours are HAZARDOUS MATERIAL, must be treated and handled accordingly, and constitute a danger to health and hardware!

PROCEDURES/ DESCRIPTION

NOTE: Depending on engine variant and optional equipment, number/type of installed fuel filters may differ.

1. CAUTION: Before disconnecting any fuel lines, clamp respective hoses to prevent fuel spillage.
2. Disconnect filter and replace with new filter.
3. Re-connect hoses to filter and make sure tight fit (no leaks, dry).
4. Remove clamps from fuel hoses.

PARTS LIST

Figure	Position	Description	PN	Remarks
1		Fuel Filter	Rotax Part	915 engine
2		Fuel Filter	Rotax Part	916 engine

ILLUSTRATIONS

Figure 1 - Location of fuel pumps (within this box) and quick-change fuel filter (915 engine)

Figure 2 - Location of fuel pumps (within this box) and quick-change fuel filter (916 engine)

28-20-00 8-2 REPLACEMENT: ELECTRICAL FUEL PUMPS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Battery must be removed, see 24-30-00 4-1

Important Note: Refer to Engine Manufacturers documentation for change of fuel pumps.

SPECIAL TOOLS AND CONSUMABLE MATERIALS

IMPORTANT NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

WARNING: Fuel and fuel vapours are HAZARDOUS MATERIAL, must be treated and handled accordingly, and constitute a danger to health and hardware!

PROCEDURES/ DESCRIPTION

WARNING: Make sure the electrical system is switched off and protected against unintended activation.

1. Clamp respective hoses to prevent fuel spillage.
2. Unscrew both terminal nuts and disconnect both ring-eye cable connectors. Isolate blank connectors to prevent electrical short-cut.
3. Disconnect fuel lines from pump.
4. Untighten clamp and replace fuel pump.
5. Install new fuel pump and tighten clamp

IMPORTANT NOTE: The electrical terminals of the pump and the ring-eye cable connectors have different diameters to ensure correct polarization

6. Re-connect electrical cable connectors and tighten terminal nuts. Secure terminal nuts with securing paint.
7. Re-connect hoses to pump and make sure tight fit. Use securing paint on nuts and threads.
8. Remove clamps from fuel hoses.
9. Activate respective fuel pump and check function and proper fuel line connection (no leaks, dry).

PARTS LIST

Figure	Position	Description	PN	Remarks
1		Fuel Pump	Rotax Part	Rotax Fuel Pump 915 engine
2		Fuel Pump	Rotax Part	Rotax Fuel Pump 916 engine

ILLUSTRATIONS

Figure 1 - Location of pumps inside the Rotax pump box (915 engine)

Figure 2 – Electrical fuel pump (916 engine)

32-40-00 4-1 REMOVAL-INSTALLATION: WHEELS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Gyroplane must be jacked, see 07-00-00 2-2

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PROCEDURES/ DESCRIPTION

Nose wheel – Removal

1. Unscrew and remove nut (Figure 1; 4) and washer (Figure 1; 3). Discard nut.
2. Pull out and remove bolt (Figure 1; 2) with washer (Figure 1; 3) and remove wheel.

Nose wheel – Installation

1. Install wheel with 2 items (Figure 2; 1) in place, bolt (Figure 1; 2) with washer (Figure 1; 3) and washer (Figure 1; 3) in reverse order.
2. Install new self-locking nut (Figure 1; 4) and torque-tighten with 40 Nm.

Main wheel – Removal

1. Remove wheel spat (if installed).
2. Remove split pin, unscrew and remove nut (Figure 3; 4, 5). Discard pin.
3. Unscrew and remove 4 x bolt (Figure 4; 1) with serrated washer. Mind limited reusability of serrated washer!
4. Remove wheel from axle assembly (Figure 5) Make sure that the spacer remains on the axle

Main wheel – Installation

1. Insert main wheel on axle assembly (Figure 1).
2. Insert 4 x bolt (Figure 4; 1) with new serrated washer and attach brake disc to main wheel.
3. Torque-tighten bolts (Figure 4; 1) with 10 Nm in crosswise sequence.
4. Install castle nut (Figure 3; 5) and torque-tighten nut with 35 Nm.
5. Install split pin (Figure 3; 4). Ensure that the split pin head is uppermost.
6. Check free rotation of wheel, radial run-out and braking action.
7. Install wheel spat, if required (using Loctite)

PARTS LIST

Figure	Position	Description	PN	Remarks
1	2	Nose Wheel Axle M10x155 DIN 912	NPI	
1	3	U10	NPI	
1	4	M10_Si	20183	
1	5	Nose Wheel Fork	NPI	
1	9	U6-18	NPI	
1	15	M6x12, round head	NPI	
2	1	Spacer Nose Wheel Axle	NPI	
2	3	Spacer 26-5/20,2	NPI	
3	4	Split pin 3,2x40	20391	
3	5	Castle Nut M18x1	NPI	
4	1	Serrated Washer	20009	
4	2	M6x12 round head	21140	

ILLUSTRATIONS

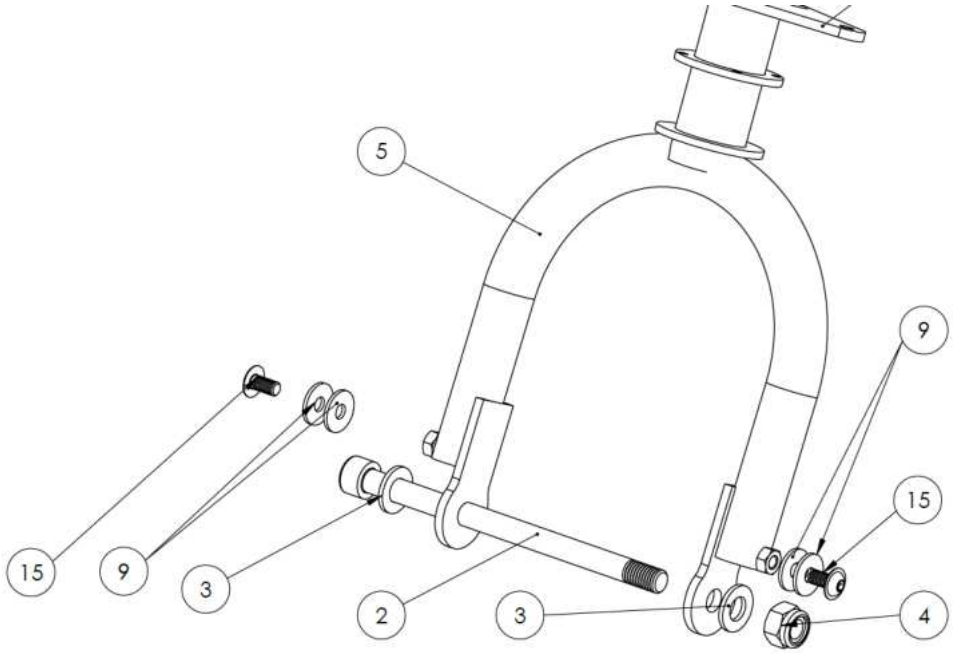


Figure 1 – Nose Gear with Wheel

Figure 2 – Spacer Nose Wheel Axis

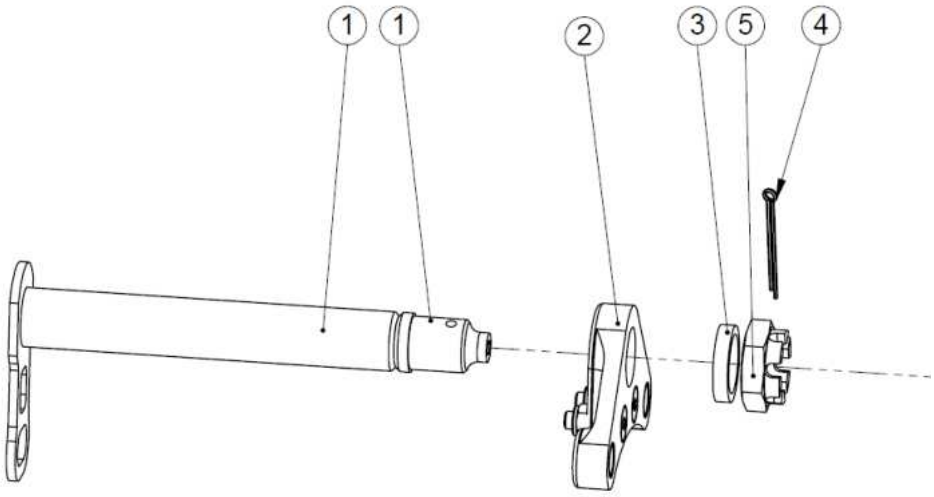


Figure 3 – Rear Wheel Axis

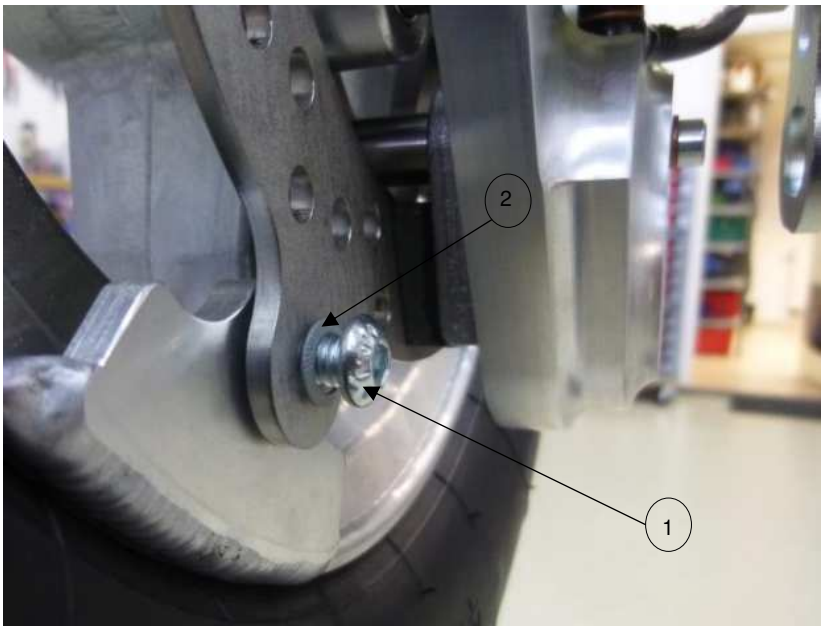


Figure 4 – M6 x 12 Screw and serrated wash

Figure 5 – Rear Axis

Figure 6 – Wheel installed

Figure 7 – Split pin

32-40-00 8-2 REPLACEMENT: MAIN WHEEL BRAKE PADS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Gyroplane must be jacked, see 07-00-00 2-2

Affected wheel must be removed, see 32-40-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Silicone Spray (PN 30490)

NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

IMPORTANT NOTE: Procedure involves handling and disposal of special materials. For your health and environmental aspects respect all applicable regulations

PROCEDURES/ DESCRIPTION

1. Pull out brake disc between brake pads.
2. Remove 4 x shaft bolt (11) with serrated washer (12). Mind limited reusability of serrated washer!
3. Remove brake pad (9) and (10). Dispose properly.
4. Clean 4 x guide sleeves of axle assembly (1) and inspect for damage, scores or run-in grooves.
5. Apply a thin layer of silicone spray on guide sleeves of axle assembly.
6. Fit new brake pad (10) onto lower guide sleeves.
7. Fit new brake pad (9) onto upper guide sleeves.
8. Insert 4 x shaft bolt (11) with serrated washers (12) and torque-tighten with 10 Nm. Make sure that brake calliper and pad moves easily about the guide sleeve.
9. Insert brake disc between brake pads.
10. In order to re-install wheel continue with 32-40-00 4-1

PARTS LIST

Figure	Position	Description	PN	Remarks
1	9, 10	Brake pad Set	30044	
1	3	Serrated Washer	20009	

ILLUSTRATIONS

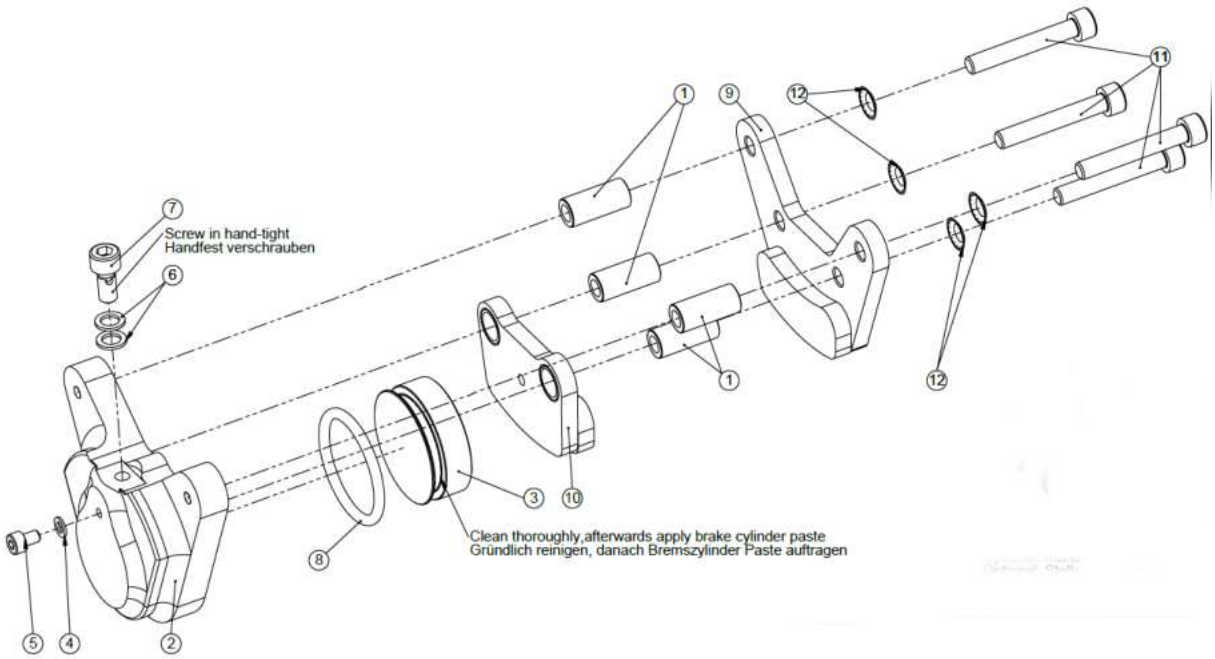


Figure 1 – Brake Calliper

32-40-00 8-3 REPLACEMENT: MAIN WHEEL BEARING

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Gyroplane must be jacked, see 07-00-00 2-2

Affected wheel must be removed, see 32-40-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 638 green (PN 30485)

For special tools or assistance contact AutoGyro Technical Support.

PROCEDURES/DESCRIPTION

1. Remove old bearings.
2. Degrease new bearing and dry-off with paper towel.
3. Apply Loctite 638 green on outer surface of first bearing and press in bearing.
4. Install spacer. Use of a tool may be appropriate.
5. Apply Loctite 638 green on outer surface of second bearing and press in bearing.
6. Spacer must be held by both inner bearing rings. Re-position and press as necessary.
7. Check easy run of bearings.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	2	Ball bearing 6204 ZRS	20078	
1	3	Spacer Wheel	20079	

ILLUSTRATIONS

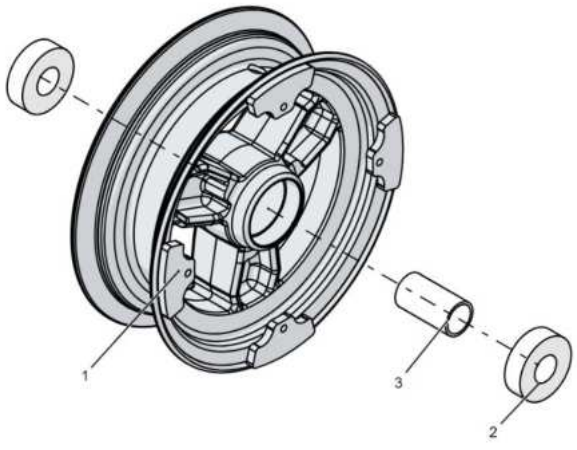


Figure 1 – Rim with bearings

32-40-00 8-4 REPLACEMENT: O-RING BRAKE PISTON

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Gyroplane must be jacked, see 07-00-00 2-2

Affected Wheels must be removed, see 32-40-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Würth Brake Cylinder paste (Würth PN: 0893980) or equivalent

NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

IMPORTANT NOTE: Procedure involves handling and disposal of special materials. For your health and environmental aspects respect all applicable regulations

PROCEDURES/DESCRIPTION

1. Remove the wheel where the O-Ring needs to be replaced according to 32-40-00 4-1.
2. Remove 4 x shaft bolt (11) with serrated washer (12). Mind limited reusability of serrated washer!
3. Remove brake calliper (Figure1; 2).
4. Remove the brake piston (Figure1; 3) from the caliper, either by using the brake lever or using compressed air pushed through the vent screw hole. Be careful to avoid brake fluid contamination of the brake pads and aircraft, and especially of painted parts.
5. Remove the O-ring (Figure1; 8) from the brake calliper and clean the part.
6. Spread some cylinder paste into the groove than insert the O-ring and spread some paste on the surface of the brake piston and the O-ring.
7. Press the brake piston back to its position in the brake calliper.

IMPORTANT NOTE: Mind the direction of installation from the brake piston!

8. Insert 4 x shaft bolt (11) with serrated washers (12) and torque-tighten with 10 Nm. Make sure that brake calliper and pad moves easily about the guide sleeve.
9. Insert brake disc between brake pads.
10. In order to re-install wheel continue with 32-40-00 4-1.
11. After reassembly bleed the brake system to ensure that it is free of air entrapment in accordance with normal brake bleeding processes. Tighten the vent screw after bleeding.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	Cylinder bushing 22x10x6	NPI	
1	2	Brake Calliper	NPI	
1	3	Brake Piston	NPI	
1	4	Copper Washer 6mm	21399	
1	5	M4x6	NPI	
1	6	Washer 6mm	21403	
1	7	Hollow Screw	NPI	
1	8	O-Ring	48751	
1	9	Inner Brake Pad	30044	9+10 as set
1	10	Outer Brake Pad	30044	9+10 as set
1	11	M6x40	20024	
1	12	safety washer M6	20009	

ILLUSTRATTIONS

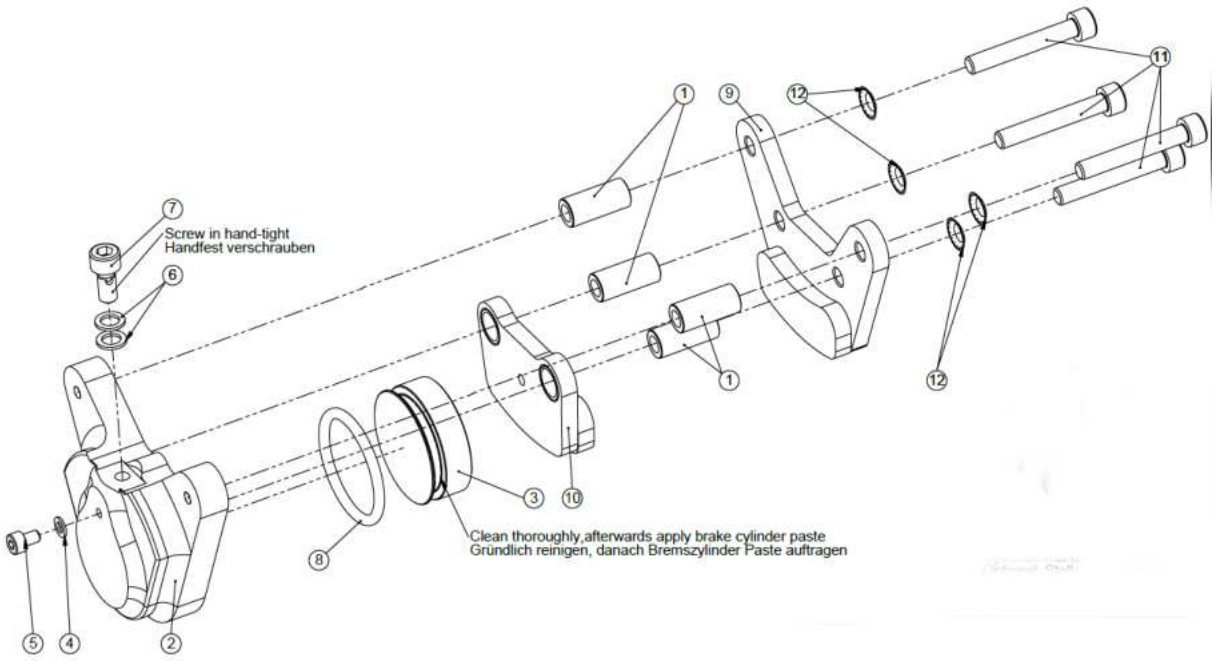


Figure 1 – Brake Calliper

32-40-00 4-1 TEST: PITOT STATIC SYSTEM INTEGRITY

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

For special tools or assistance contact AutoGyro Technical Support

PRECAUTIPONS AND SAFETY MEASURES

CAUTION: Instruments can easily be damaged if test is performed improperly. Manipulate test equipment slowly and carefully. Monitor indicators and make sure that indication is always within normal indication range!

PROCEDURES/ DESCRIPTION

Pitot System Test

1. Pull-out plunger of test equipment for the pitot nozzle (long silicone tube) to read 2 ml.
2. Attach test equipment to pitot nozzle.
3. Slowly depress plunger to read 1 ml. Airspeed indication must increase significantly.

   NOTE: The actual value will depend on the length and cross-section of the pipework installed.
4. Leave set-up unchanged and check decay over 10 seconds. Decay should be less than 10% per 10 seconds.
5. Gently ease tube off the pitot nozzle. Airspeed indicator(s) must return to zero.
6. If any of the preceding tests has failed, have system inspected and repaired.

Static System Test (if installed)

1. Block one static port with a strip of tape.

   NOTE: Do not use transparent tape as this may be overlooked and forgotten. It is recommended to use red insulating tape with a relatively large extending end.
2. Press in plunger of test equipment for static port (short silicone adapter) completely.
3. Press and hold test equipment to the open static port tight to the hole.
4. Pill plunger slowly about 3ml.
5. Indicated altitude and airspeed must increase.
6. If installed, VSI indication must increase momentarily and will slowly fade to zero.
7. Leave set-up unchanged and check decay over 10 seconds. There shall be no noticeable decay (except VSI).
8. Remove silicone adapter from static port. Altitude must return to initial indication.
9. If any of the preceding tests has failed, have system inspected and repaired.

Figure 1 – Pitot Static Integrity Test Equipment

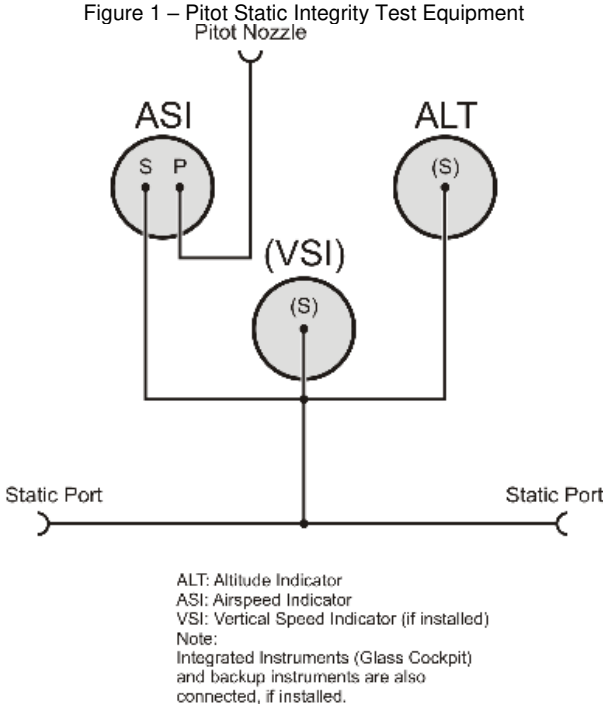


Figure 2 – Pitot Static Instruments Connecting Diagram

34-10-00 7-1 CLEANING: PITOT STATIC SYSTEM

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLES

None

PRECAUTIONS AND SAFETY MEASURES

CAUTION: Make sure all pitot and static lines are disconnected from any instruments before blowing through the lines!

CAUTION: Do not blow with the mouth directly into pitot or static ports. This will introduce moisture and might damage instruments!

PROCEDURES/ DESCRIPTION

1. Disconnect all instruments from pitot line. These are airspeed, and optionally integrated display systems, if installed. The static line is vented via a filter behind the instrument panel and should never need cleaning.

NOTE: In most cases it is not necessary to remove the instrument panel.

2. With the help of compressed air clean all pitot lines by blowing from the inside (cockpit panel side) to the outside
3. Make sure to clean/check each branch of a line by closing the other open ends.

ILLUSTRATIONS

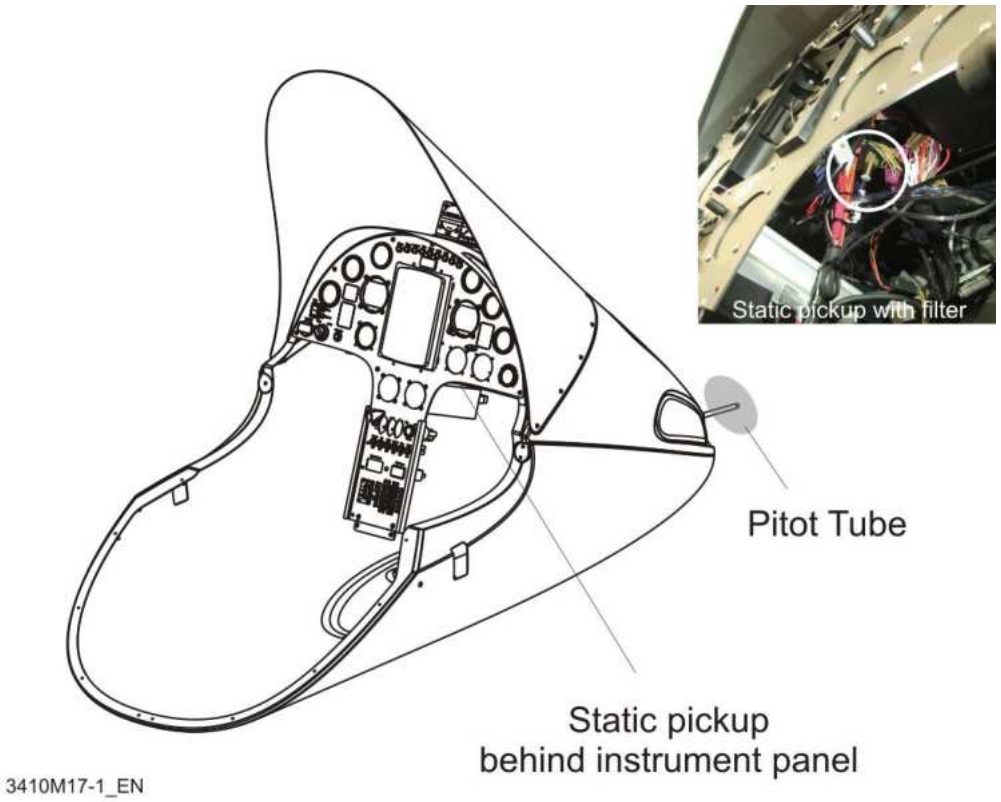
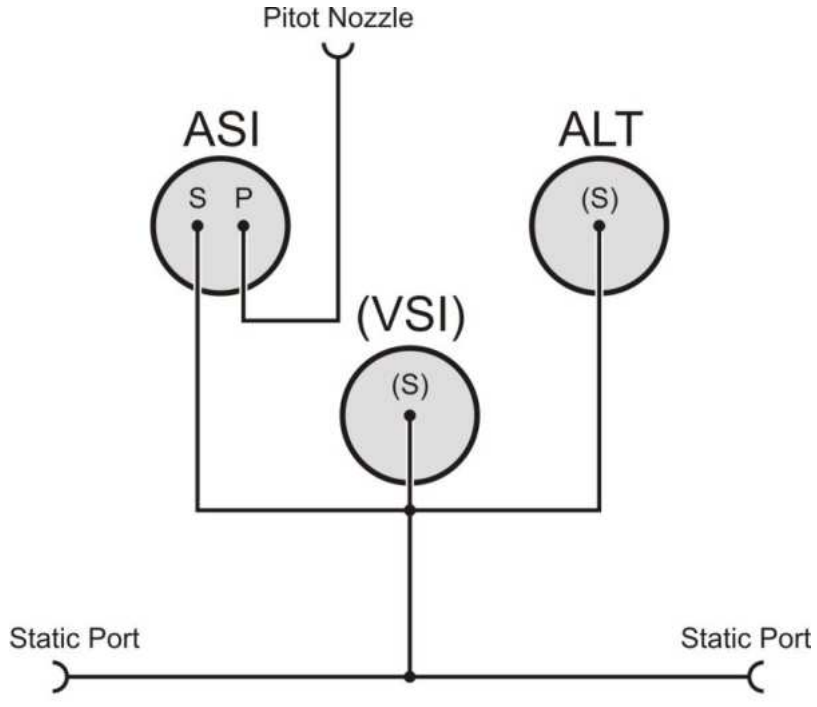


Figure 1 – Static Pickup and Pitot Tube



ALT: Altitude Indicator
ASI: Airspeed Indicator
VSI: Vertical Speed Indicator (if installed)
Note:
Integrated Instruments (Glass Cockpit) and backup instruments are also connected, if installed.

Figure 2 - Pitot Static Instruments Connecting Diagram

36-21-00 8-1 REPLACEMENT: FILTER/DRYER

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Preparation work: Service covers / maintenance access accomplished, see 52-40-00 2-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

1. Open the baggage compartment and disconnect filter/dryer with quick locks.
2. Replace filter/dryer with new one and make sure cartridge is tightened safely to airframe.
3. Re-connect inlet and outlet connection with moderate torque.
4. Close baggage compartment.

PARTS LIST

Figure	Position	Description	PN	Remarks
2	1	Dryer II	48519	

ILLUSTRATIONS

Figure 1 – Baggage Compartment

Figure 2 - Location of Filter / Dryer

52-00-00 4-1 REMOVAL - INSTALLATION: COWLINGS AND FAIRINGS

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

Mast fairing, oil cooler duct and side bar (1/2) – Removal

1. Remove and retain pan head bolts with poly washers of forward mast fairing (Figure 1, marked with a circle) and remove forward mast fairing.
2. Remove and retain pan head bolts with poly washers of aft mast fairing (Figure 1, marked with a triangle) and remove forward aft fairing.
3. Remove and retain pan head bolts with poly washers of oil cooler duct and remove duct.
4. Remove the fastenings at either end of the left and right side bar and remove side bars.

Fuselage fairing (3) – Removal

1. Mast fairing, oil cooler duct and side bars must be removed (see previous procedure and Figure 3).
2. Remove the bolt from the rear of the right side bar and strengthening strut, if fitted (Figure 4).
3. Remove the bolts from the front and rear of the left side bar, if fitted (Figure 4 & 5).
4. Loosen the upper clamp of the tank connecting hose and disconnect the hose (Figure 6).
5. Remove the lower bolts of the left and right upper push/pull rods and disconnect from the bell-cranks (Figure 7).
6. Loosen the 2 bolts attaching the upper fairings to the forward mast - do not remove (Figure 8).
7. Remove the 2 screws securing the upper fairings to the rear of the mast (Figure 9).
8. Remove the 3 screws securing the cowlings to each other along the upper rear joint over the engine (Figure 10).
9. Remove the 4 fastening bolts securing the lower fairings to the mast root (Figure 11 & 12).
10. Remove all bolts from the lower centre joint of the left and right fairings, and left and right fairings to forward fairing attachments (Figure 13, 14 & 15).
11. Remove the 2 previously loosened bolts from the upper fairings to the forward mast attachment one at a time and remove the appropriate fairing, ensuring that it does not foul on the tank drain (Figure 8 & 16).

Fuselage fairing (3) – Installation

1. The fairings are assembled in the reverse order of disassembly described above.

Mast fairing (1/2) – Installation

1. Install mast fairing in reverse order (work steps 2 - 1).
2. Fasten all bolts with 3 Nm.

ILLUSTRATIONS

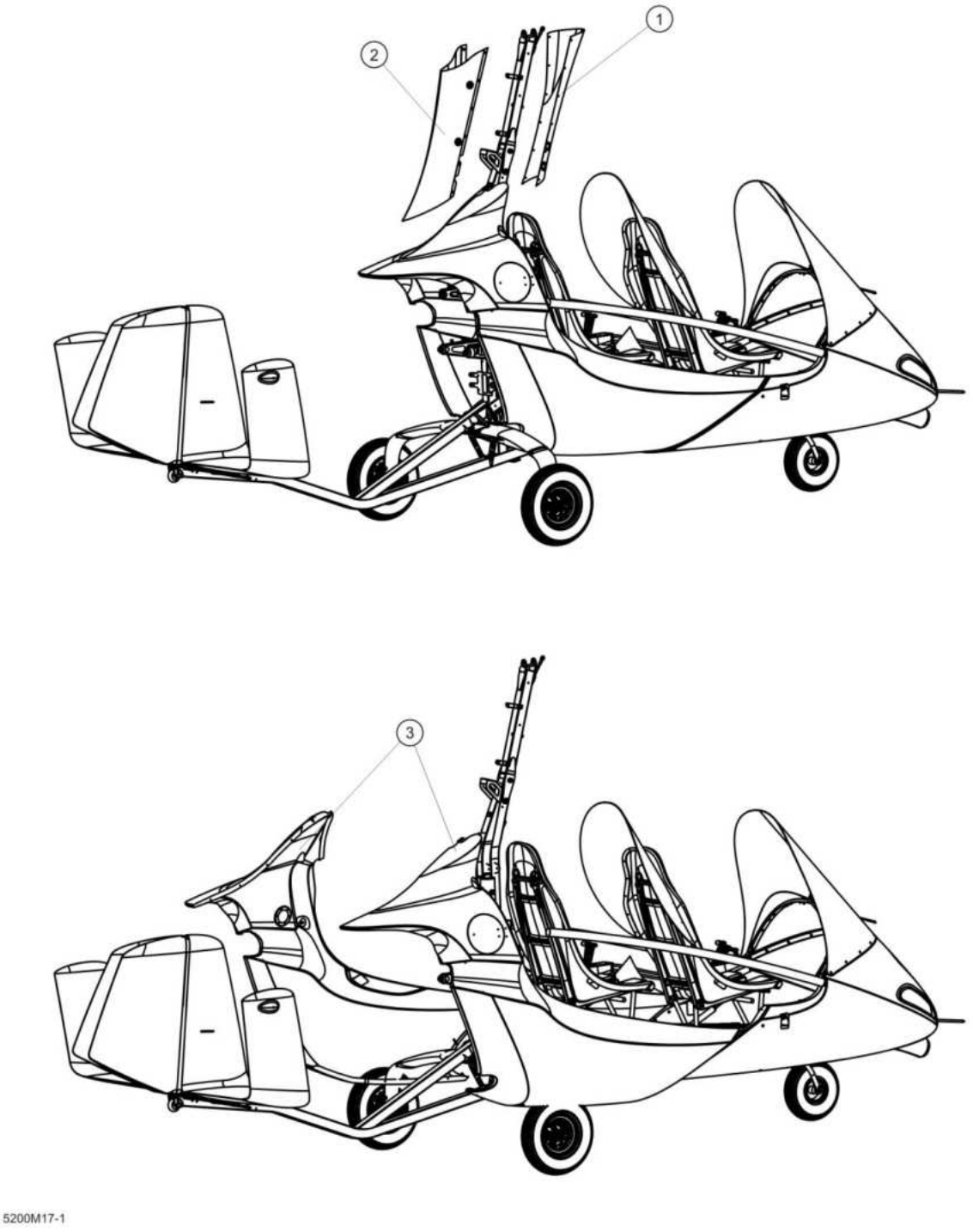


Figure 1 - Mast fairing and fuselage fairing

Figure 2 – Mast Fairings

Figure 3 Mast Fairings

Figure 4- Mast Fairing

Figure 5 – Side Bar

Figure 6 – Side Bar

Figure 7 – Push Rods

Figure 8 – Upper Fairings

Figure 9 – Rear Mast Fairings

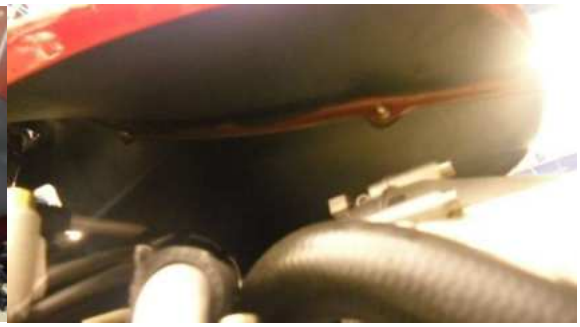


Figure 10 – Screws over Engine

Figure 11 – Mast Root

Figure 12 – Mast Root

Figure 13

Figure 14

Figure 15

Figure 16

52-40-00 2-1 PREPARATION WORK: SERVICE COVERS / MAINTENANCE ACCESS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PROCEDURES/DESCRIPTION

Access to fuses and cabling (Figure 1 / 2)

Panel fuses are accessible without removing any covers; they are mounted onto the instrument panel and labelled accordingly.

Instrument panel - Removal (Figure 3)

1. Remove rotor system or secure.
2. Release brake pressure and bring stick in most aft position.
3. Unscrew and remove panel bolts (13 x).

IMPORTANT NOTE: Protect panel and instruments using a soft layer of cloth
Remove panel and lean against flight control stick. Use caution and do not damage tubing, cables and connectors. Disconnect as required.

Instrument panel - Installation

1. Bring panel into position so that bores and threaded inserts align. If needed let a second person support the nose.
2. Reconnect any disconnected cables

NOTE: In order to do so, support nose / lower belly using a jack with a soft cover.

3. Tighten bolts. Use engineering judgement and do not over torque.

If any system has been disconnected, then test that system for proper function (e.g. pitot disconnection means apply suitable pressure to the Pitot tube to prove it is connected properly by noting the airspeed indication on the ASI).

ILLUSTRATIONS

Figure 1 - Instrument Panel with attachment bolts

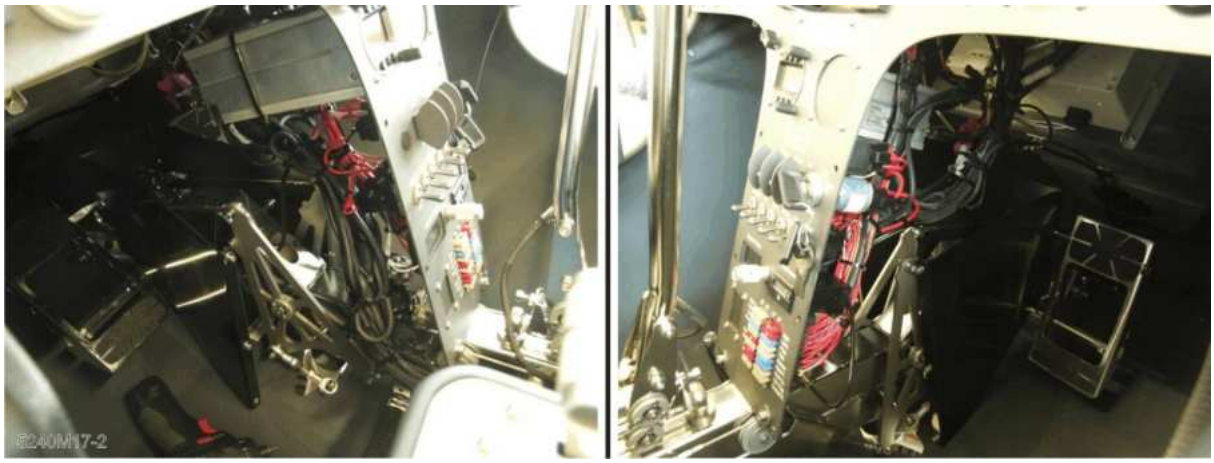


Figure 2 – Access to fuses and cabling

61-10-00 4-1 REMOVAL-INSTALLATION: PROPELLER - HTC

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

PRECAUTIONS AND SAFETY MEASURES

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

PROCEDURES/ DESCRIPTION

Removal

1. Before removing the spinner (optional equipment) check marking (filed notch) is available on spinner and spinner base plate. If not, the installation position has to be marked accordingly (paint or tape mark).
2. Unscrew and remove bolts with poly washers (Figure1; 8, 9) and remove spinner (Figure1; 1).
3. Mark installation position of propeller hub, engine flange and spinner base plate (if installed) relative to each other.
4. Release torque on each bolt (Figure 1; 4) by turning bolt half a revolution in counter-clockwise direction. Do not untighten or unscrew bolts!
5. Unscrew and remove bolts (Figure 1; 2) and washers (Figure 1; 3).

Installation

1. Install propeller hub, bolts (Figure 1; 2) with washers (Figure 1; 3) in its original installation position.
2. Torque-tighten bolts (Figure 1; 2) with 15 Nm in crosswise sequence.
3. Torque-tighten bolts (Figure 1; 4) with 10 Nm in crosswise sequence.
4. Install spinner (Figure 1, 1), spinner bolts with poly washers. Make sure spinner is in correct installation position relative to spinner base plate. Check marking.
5. Secure spinner bolts (Figure 1; 8) with Loctite 243 and torque-tighten with 3 Nm in crosswise sequence.

Note: Paint marks between the propeller attachment bolt protruding threads and the captive flange nut are recommended.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	spinner HTC4B, painted	46905	
1	2	M8x130	NPI	
1	3	U8/24	NPI	
1	4	M6x40	NPI	
1	5	Hub 4B-LK101, 6-47 front	NPI	
1	6	Propeller Blade CCW-172, cutted	35393	
1	7	Hub 4B-LK101, 6-47 rear	NPI	
1	8	M4 x 12	NPI	
1	9	U4, Poly	NPI	
1	10	Base Plate	46906	
1	11	Torque bush spacer	NPI	
1	12	Spacer	NPI	

Note that the propeller blades may be purchased separately, or as a complete propeller with preset blade pitch to suit the engine variant required. The blades and hub (front and rear as a pair) carry serial identification (same number on both parts).

ILLUSTRATIONS

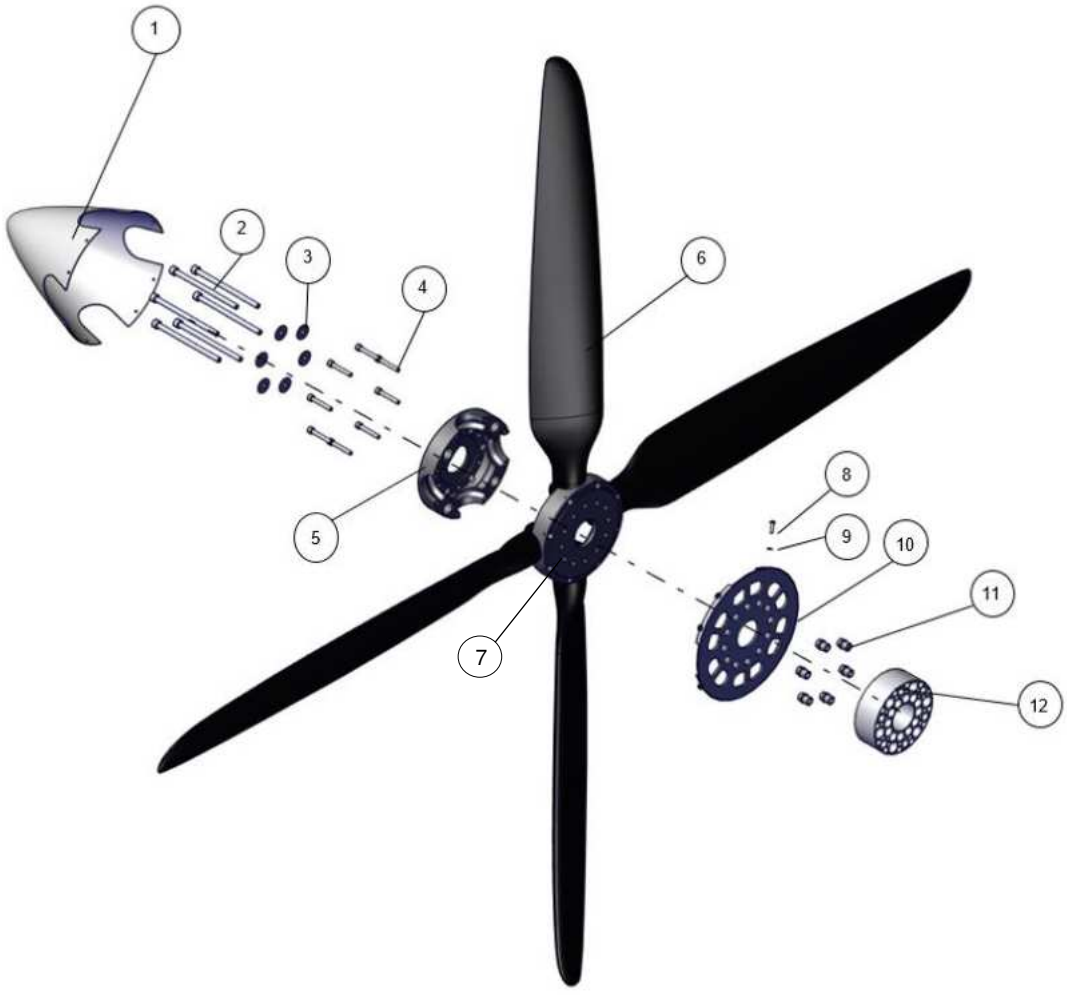


Figure 1 – HTC 4 Blade Propeller with Spinner and Base plate

61-10-00 4-2 DISASSEMBLY - ASSEMBLY: PROPELLER - HTC

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Propeller must be removed, see 61-10-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

Disassembly

1. Mark inner and outer propeller hub to indicate relative installation position.
2. Place propeller assembly on a horizontal and clean surface and support propeller hub so that assembly does not lie on propeller blades.
3. Unscrew and remove bolts (Figure 1; 1).
4. Remove outer propeller hub and remove individual blades.

Assembly

1. Place inner propeller hub on horizontal and clean surface and support propeller hub.
2. Insert individual blades in correct position.
3. Attach outer propeller hub, insert bolts (Figure 1; 1) and hand-tighten.
4. Torque-tighten bolts with 10 Nm in crosswise sequence.

PARTS LIST

See chapter 61-10-00 4-1

ILLUSTRATIONS

Figure 1 – Propeller and Hub

61-10-00 5-1 ADJUSTMENT: PROPELLER PITCH - HTC

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Spinner (if installed) must be removed, see 61-10-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Propeller Pitch Adjustment Tool (PN 30492)

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

1. Untighten bolts (Figure 1; 1) so that bolt heads do not contact outer propeller hub.
2. Unscrew bolts (Figure 1; 2) about 2 revolutions.
3. Position propeller pitch adjustment tool with the inner side on outer propeller hub and profiled section on the propeller blade. (over the surface of the tool where it has contact with the hub to avoid paint damages)
4. Carefully adjust blade pitch by tapping with a 200 g rubber hammer in the area of the blade's nose section so that blade pitch increases or decreases. Never use hammer on trailing edge as the blade may be damaged that way.
5. In order to read the correct setting it is advisable to let the blade's trailing edge rest in (touch) the tool while allowing a small light gap between blade's back and the tool's profiled section.
6. Repeat work steps 3 to 5 for the remaining blades.
7. Hand-tighten bolts (Figure 1; 1) and (Figure 1; 2) and check blade pitch setting for all blades. If necessary, untighten bolts and re-do from step 1. Ensure the all blades have the same pitch within 0.3deg.
8. Torque-tighten M8 bolts (Figure 1; 2) with 15 Nm in crosswise sequence.
9. Torque-tighten M6 bolts (Figure 1; 1) with 10 Nm in crosswise sequence.
10. Perform torque-check after first flight or ground run.
    Flight test should indicate 5400 engine rpm in 60mph (100km/h) climb.

    Note: In the absence of a gauge, the propeller is set with an inclinometer measuring the angle of the blade chord to the thrust line at ¾ blade radius, with the blade set horizontally. The angle required is 20 deg.

ILLUSTRATIONS

Figure 1 – Propeller and Hub

Figure 2 - Propeller pitch adjustment and tool

Figure 3 – Hub detail

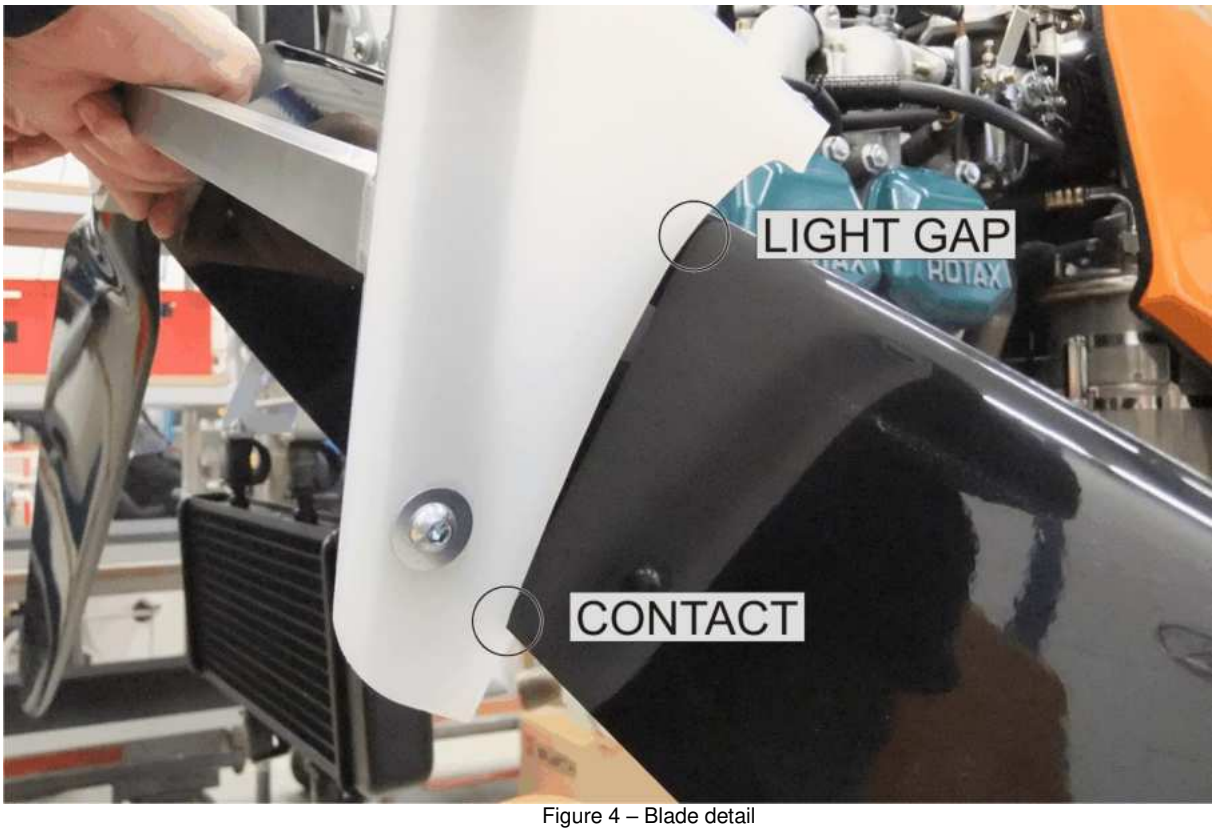


Figure 4 – Blade detail

61-10-10 4-1 REMOVAL - INSTALLATION: PROPELLER - WOODCOMP

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Screw locking varnish yellow (PN 33587)
Aeroshell Grease 5

PRECAUTIONS AND SAFETY MEASURES

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

PROCEDURES/ DESCRIPTION

Removal

1. Before removing the spinner check marking (red dot) is available on spinner and spinner base plate. If not, the installation position has to be marked accordingly (paint or tape mark).
2. Unscrew and remove 9 bolts with poly washers (Figure 3; 2,3) and remove spinner (Figure 3; 1).
3. Release torque on each bolt (Figure 4) by turning bolt half a revolution in counter-clockwise direction. Do not untighten or unscrew bolts!
4. Unscrew and remove bolts (Figure 4).

Note: For detailed instructions and Consumables please refer to the Manufacturers Maintenance Manual!

Installation

1. Install propeller hub, bolts (Figure 4) in its original installation position.
2. Torque-tighten M8 bolts (Figure 4) with 22 Nm in crosswise sequence (915 engine only!) Lock the nuts with locking varnish.
3. Torque-tighten M10 bolts (Figure 4) with 43 Nm in crosswise sequence (916 engine only!) Lock the nuts with locking varnish.
4. Install spinner (Figure 3; 1), spinner bolts with poly washers (Figure 3; 2,3). Make sure spinner is in correct installation position relative to spinner base plate. Check marking.

Note: Paint marks between the propeller attachment bolt protruding threads and the captive flange nut are recommended.

Note: For detailed instructions and Consumables please refer to the Manufacturers Maintenance Manual!

PARTS LIST

Figure	Position	Qty.	Description	PN	Remarks
1	1		Propeller KW30 hydraulic 915 white	48705	Rotax 915 engine
1	1		Propeller KW30 hydraulic 915 carbon	48231	Rotax 915 engine
3		6	Binx Nut M8	28824	Rotax 915 engine
2	1		Propeller KW31 hydraulic 916 white	49032	Rotax 916 engine
2	1		Propeller KW31 hydraulic 916 carbon	49033	Rotax 916 engine
4		6	M10, Si Nut	20183	Rotax 916 engine
5			Sealing Propeller Hub	45738	Rotax 915/916 engine

ILLUSTRATIONS

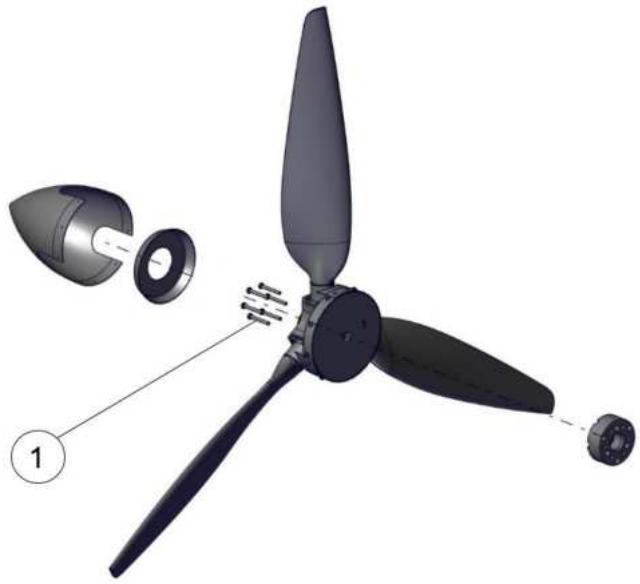


Figure 1 – Woodcomp KW30 Propeller

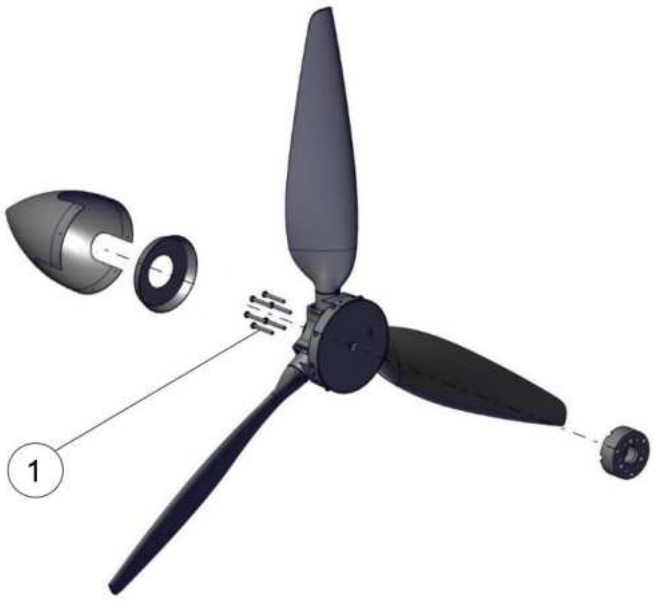


Figure 2 - Woodcomp KW31 Propeller

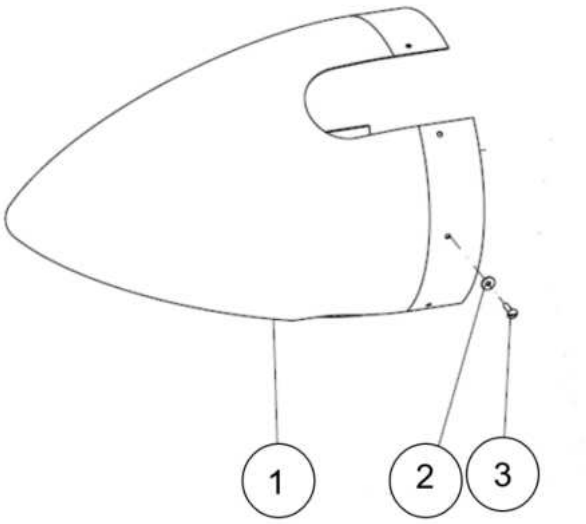


Figure 3 – Woodcomp Spinner

Figure 4 – Propeller Hub Bolts

62-11-00 4-1 REMOVAL: ROTOR - TEETERING PARTS

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 221 red (PN 30487)

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

PRECAUTIONS AND SAFETY MEASURES

WARNING: Wear eye protection and mind FOD when removing attachment hardware!

WARNING: Object is heavy! Inadequate handling could cause injury. Use proper lifting techniques or assistance!

WARNING: Never place the rotor system on a dirty or grainy surface and avoid bending moments at the blade attachments!

WARNING: When handled incorrectly the rotor system can be damaged irreparably. If undetected this may have catastrophic consequences!

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

IMPORTANT NOTE: Some rotor blades have loose washers in them which are required as balance weights. Do not remove or restrain if present!

PROCEDURES/ DESCRIPTION

1. Secure the gyroplane on level ground by engaging the parking brake, adjust the rotor system lengthwise and pump up the rotor brake to its maximum.
2. Remove and discard split pin and unscrew the castellated nut (Fig.1; 4). The rotor system has to be tilted onto the black rotor teeter stop.
3. The teeter bolt (Fig.1; 1) has to be extracted by using only the hand, not a hammer. If needed tilt the rotor blades carefully onto the teeter stop, in order to prevent the bolt from jamming. Make sure that the rotor stays level in the teeter axis, if not the teeter bolt will damage the Teflon coated bushes, while being pushed out.
4. A supervised second person has to hold the rotor system in flying direction.
5. Lift the rotor system carefully out of the teeter tower and be aware of the position of the shim washers (Fig.1; 2). Their thicknesses may differ and it is essential that they are reinstalled on the correct side! They are marked with dots to identify the correct side.
6. Remove the rotor system to one side by letting it rest on your shoulder and take care not to collide with stabilizer or propeller.
7. The shim washers and the teeter block in the hub are marked on each side with one or two engraved dots. Directly after the disassembly the shim washers need to be fixed on their respective side with cable ties.
8. If possible, handle with two persons while holding approximately in the middle of each blade. When supporting the system use two stands each positioned in about 2 metres distance from the hub.
9. The rotor system must not be placed on a dirty or grainy surface, as the blades can scratch and damage easily. The best way is to place the rotor blades centrally onto two stands, supporting the rotor at approximately 2 m distance from the hub.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	Teeter bolt	20718	
1	2	Shim Washer 3, 5	21959	
1	3	U13	20085	
1	4	M12 castle nut	20726	
1	5	Split Pin 3,2x40	20391	
1	6	Teetertower, mounted	43567	
		Teeterbolt Kit (With TefMet bushings)	30256	

ILLUSTRATIONS

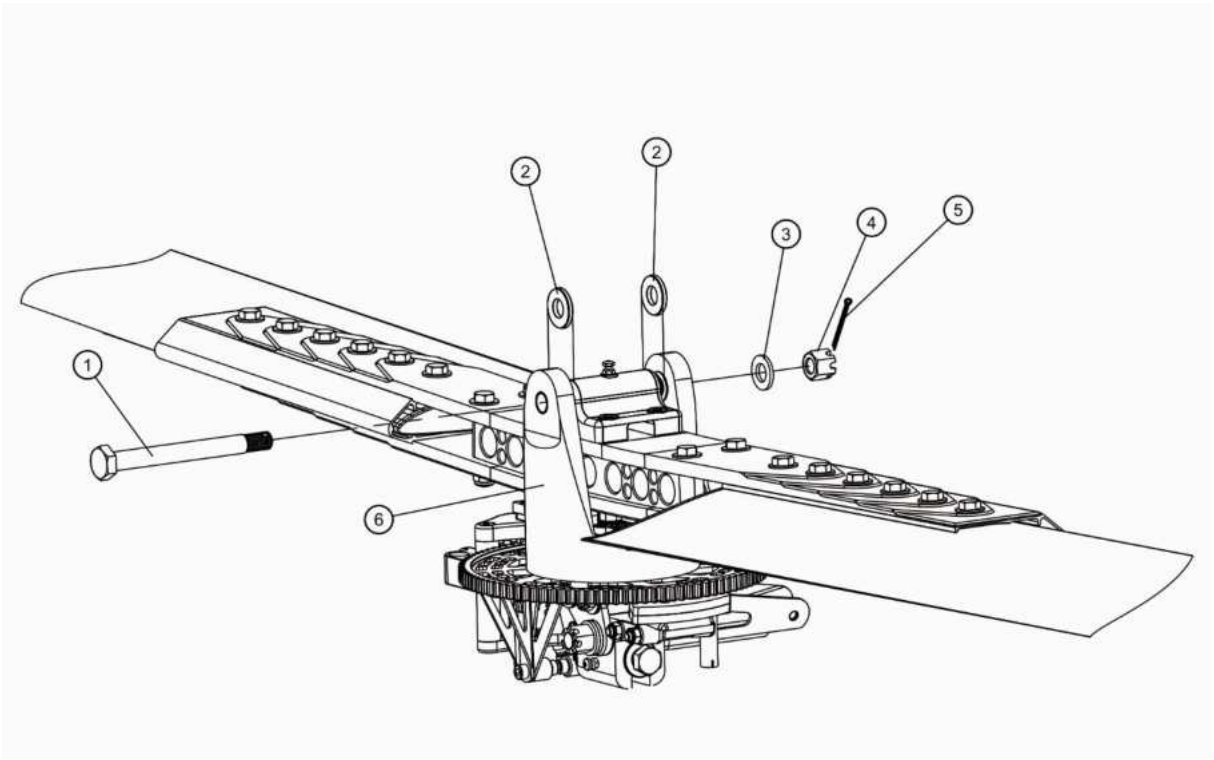


Figure 1 - Removal Rotor - Teetering Parts

62-11-00 4-2 DISASSEMBLY: ROTOR - TEETERING PARTS

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

Rotor system must be removed, see 62-11-00 4-1!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

PRECAUTIONS AND SAFETY MEASURES

WARNING: When handled incorrectly the rotor system can be damaged irreparably. If undetected this may have catastrophic consequences!

CAUTION: The rotor hub must never be disassembled!

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

PROCEDURES/ DESCRIPTION

1. To disassemble the rotor system, place it upside down onto a clean surface or stands to support the rotor at approximately 2 m from the hub.
2. Untighten and discard self-locking nuts (Fig.1; 9) on the first blade by counter-holding the corresponding bolt head to prevent it from turning.
3. Push out all shoulder bolts (Fig.1; 1 - 5) without any force, but use no more than a gentle tapping if necessary. Tilt the rotor blade up and down to support easy removal of the bolt.
4. Carefully pull the rotor blade out of the hub (Fig.1; 7) in radial direction and take off the clamping profile (Fig.1; 10).
5. Repeat step 2 to 4 on second rotor blade.

IMPORTANT NOTE: Do not disassemble the rotor hub!

6. Place rotor blades, clamping profile and rotor hub in a suitable way to prevent bending or surface damage.
   IMPORTANT NOTE: Do not lift or support the rotor system at its blade tips as the bending moment due to the weight of the hub assembly may overstress the blade roots. If possible, handle with two persons while holding approximately in the middle of each blade. When supporting the system use two stands each positioned in about 2 metres distance from the hub.

PARTS LIST

Figure	Position	Description	PN	Remarks
1				
1	1	Shoulder Bolt M8 37/12	NPI	
1	2	Shoulder Bolt M8 40/12	NPI	
1	3	Shoulder Bolt M8 43/12	NPI	
1	4	Shoulder Bolt M8 46/12	NPI	
1	5	Shoulder Bolt M8 49/12	NPI	
1	6	U8	20393	
1	7	Rotor Hub II	NPI	
1	8	U9/20	NPI	
1	9	M8, Si	20121	
1	10	Clamping profile blade	NPI	
1	11	Rotor blade	NPI	
		Replacement Set Bolts Rotorsystem II	33324	

ILLUSTRATIONS

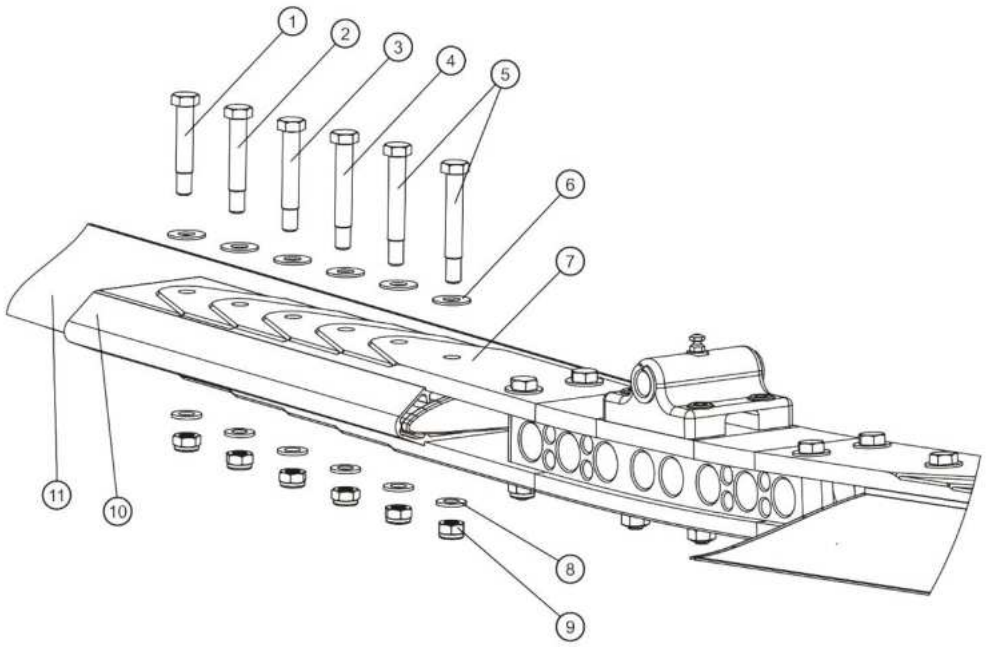


Figure 1 – Rotor Teetering Parts

62-11-00 4-3 ASSEMBLY: ROTOR - TEETERING PARTS

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Adhesive Lubricant HHS 2000 (PN 30476)

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

PRECAUTIONS AND SAFETY MEASURES

WARNING: When handled incorrectly the rotor system can be damaged irreparably. If undetected this may have catastrophic consequences!

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

PROCEDURES/ DESCRIPTION

1. The rotor blades (Figure 1; 11), clamping profile (Figure 1; 10) and rotor hub (Figure 1; 7) are each labelled with an engraved serial number.
2. Insert the first rotor blade carefully into the clamping profile. Make sure that all serial numbers match.

IMPORTANT NOTE: Grease shaft with HHS 2000, but do not allow HHS 2000 to come into contact with threads at any time!

3. Fit the rotor hub side with the according serial number to clamping profile (Figure 1; 10) and blade (Figure 1; 11). Insert 6 x shoulder bolts (Figure 1; 1-5) and corresponding washers (Figure 1; 6) without using force so that the bolt end is on top when the rotor system is installed. For re-identification and correct installation position the shaft length is provided in the figure above. Example: 40/12 means shaft length 40mm.
4. Position the washers (Figure 1; 8) and the self-locking nuts (Figure 1; 9) and hand-tighten.
5. Torque-tighten nuts (Figure 1; 9) with 20 +/- 5 Nm from the inside to the outside. When doing so, counter-hold bolts (Figure 1; 5) to prevent any damage to the hub and blade holes.
6. Repeat work steps 2 to 5 for the second rotor blade.
7. Check rotor system alignment according to 62-11-00 5-1 and adjust, if necessary.

PARTS LIST

Figure	Position	Description	PN	Remarks
1				
1	1	Shoulder Bolt M8 37/12	NPI	
1	2	Shoulder Bolt M8 40/12	NPI	
1	3	Shoulder Bolt M8 43/12	NPI	
1	4	Shoulder Bolt M8 46/12	NPI	
1	5	Shoulder Bolt M8 49/12	NPI	
1	6	U8	20393	
1	7	Rotor Hub II	NPI	
1	8	U9/20	NPI	
1	9	M8, Si	20121	
1	10	Clamping profile blade	NPI	
1	11	Rotor blade	NPI	
		Replacement Set Bolts Rotorsystem II	33324	

ILLUSTRATIONS

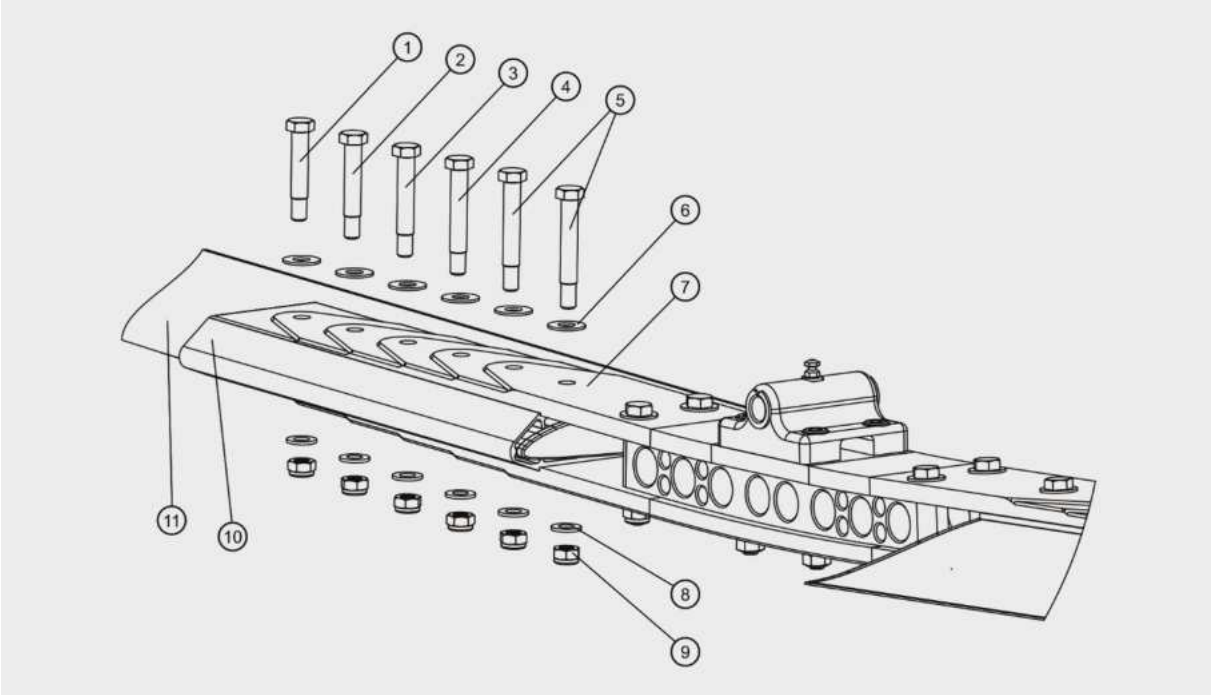


Figure 1 – Rotor Teetering Parts

62-11-00 4-4 INSTALLATION: ROTOR - TEETERING PARTS

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

Secure gyroplane against unauthorized or unintended operation!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Silicone Grease Lagermeister WHS 2002 (30477)

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

PRECAUTIONS AND SAFETY MEASURES

WARNING: Object is heavy! Inadequate handling could cause injury. Use proper lifting techniques or assistance!

WARNING: When handled incorrectly the rotor system can be damaged irreparably. If undetected this may have catastrophic consequences!

PROCEDURES/ DESCRIPTION

1. Secure the gyroplane on level ground by engaging parking brake, adjust the rotor head or teeter tower corresponding to fore-aft and pressurize the rotor brake up to maximum.
2. Check correct matching of parts: The rotor hub and the teeter tower are marked with two dots according to the orientation for installation.
3. Lift the rotor blade with a second briefed person (one person standing aft, one person standing directly in front of the hub).
4. Approach with the rotor system from the side to the gyroplane and make sure not to collide with propeller or stabilizer. Insert the rotor system into the hub from above while standing on a ladder or the rear seat.
5. The second person can let go, as soon as it is resting centrally in the teeter tower on the teeter stops.
6. Apply a thin layer of Silicone Grease Lagermeister WHS 2002 on teeter bolt (using a lint-free cloth).
7. Insert teeter bolt (Figure 1; 1) by hand in the same orientation as it was before (bolt head should be at that side of the teeter block which is marked with one dot) while matching the shim washers (Figure 1; 2) with the corresponding installation positions.
8. Check direction of assembly and shim washers: rotor hub, teeter tower and shim washers are marked on each side either with one or two engraved dots (Figure 2).
9. If the teeter bolt cannot be inserted, tilt the rotor blade along the teeter axis with the free hand.
10. Install washer and castellated nut (Figure 1; 3, 4). Check lateral play of the teeter block in the teeter tower (Figure 2, 2). If it is greater than 0.2mm contact AutoGyro for further support. Tighten the castellated nut of the teeter bolt by hand until there is no lateral play discernible between teeter block and teeter tower, but at least one shim is able to be rotated (Figure 3). Check whether the split-pin hole aligns. If it does not, remove the nut and assemble a 0.2mm shim and re-fit the nut. Tighten to the same position. The split-pin hole should now align. Nut torque should be approximately 1-2Nm. Teeter the rotor and ensure that the teeter block rotates on the teeter bolt and not the teeter bolt in the teeter tower (Figure 4). Fit a new split-pin. Use split-pins only once.
11. Grease nipple in teeter block.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	Teeter bolt	20718	
1	2	Shim Washer 3, 5	21959	
1	3	U13	20085	
1	4	M12 castle nut	20726	
1	5	Split Pin 3,2x40	20391	
1	6	Teetertower, mounted	43567	
		0.2 Shimm washer for castle nut	42945	not shown
		Teeterbolt Kit (With TefMet bushings)	30256	not shown

ILLUSTRATIONS

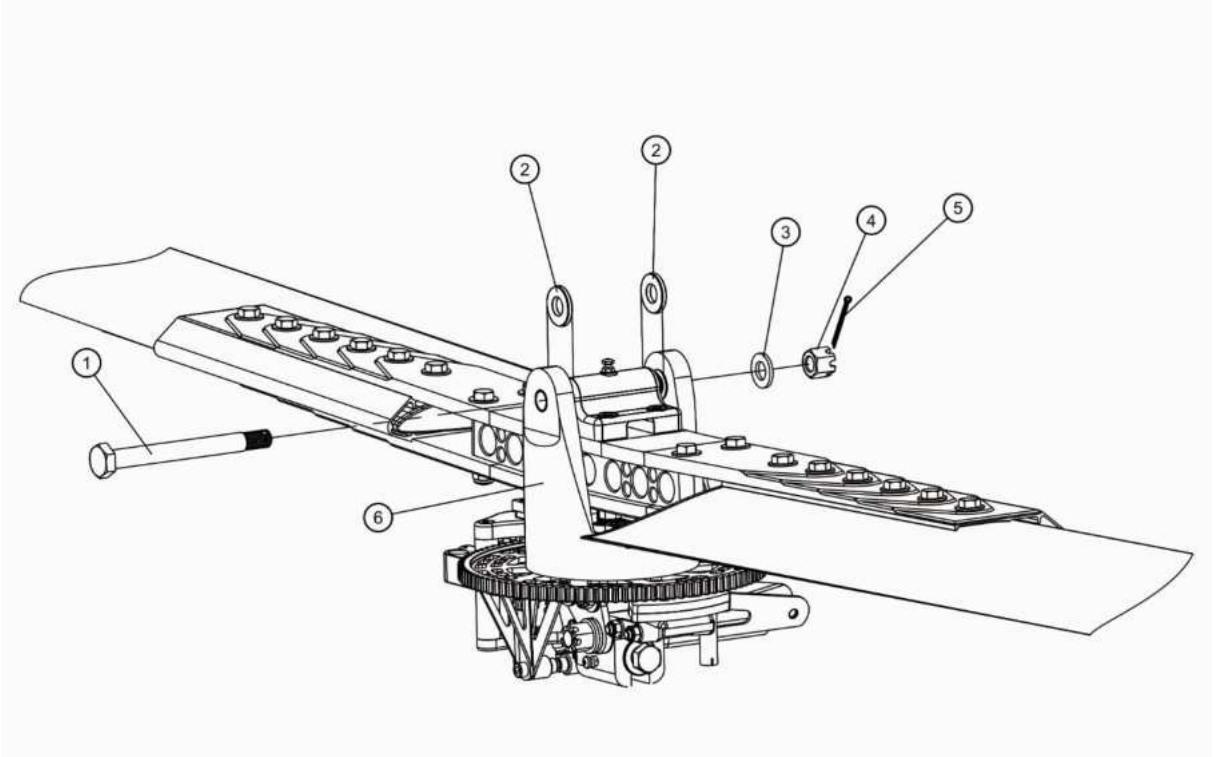


Figure 1 - Installation Rotor - Teetering Parts

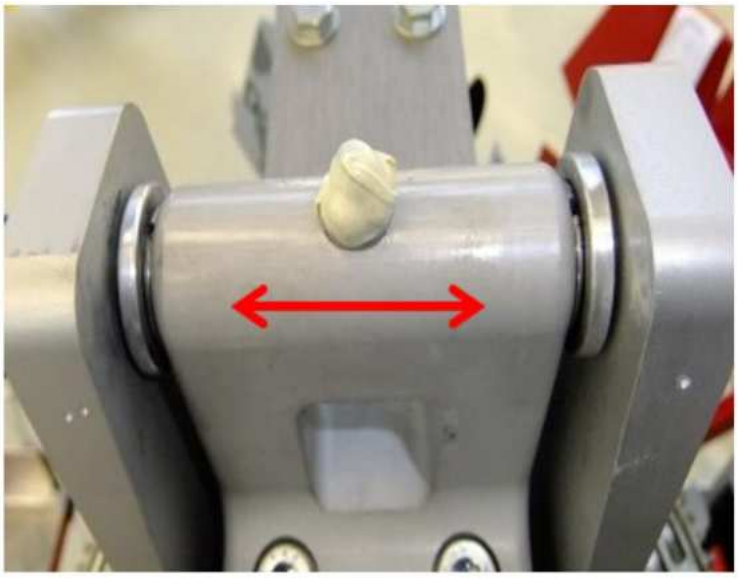


Figure 2

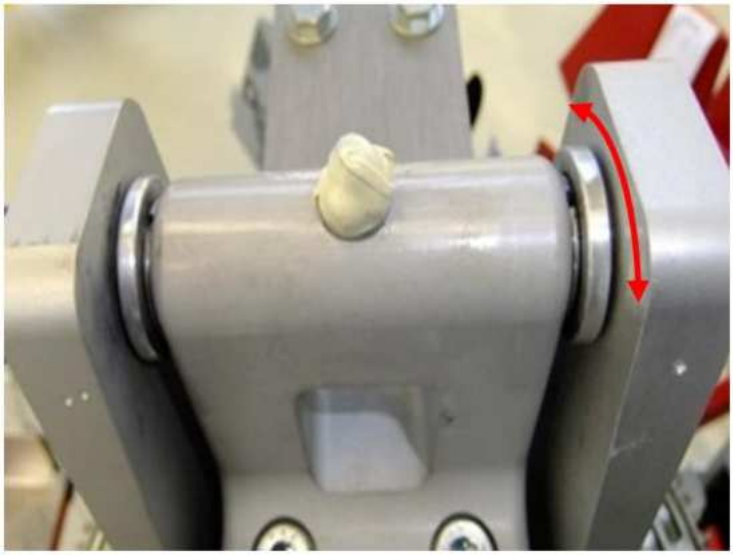


Figure 3

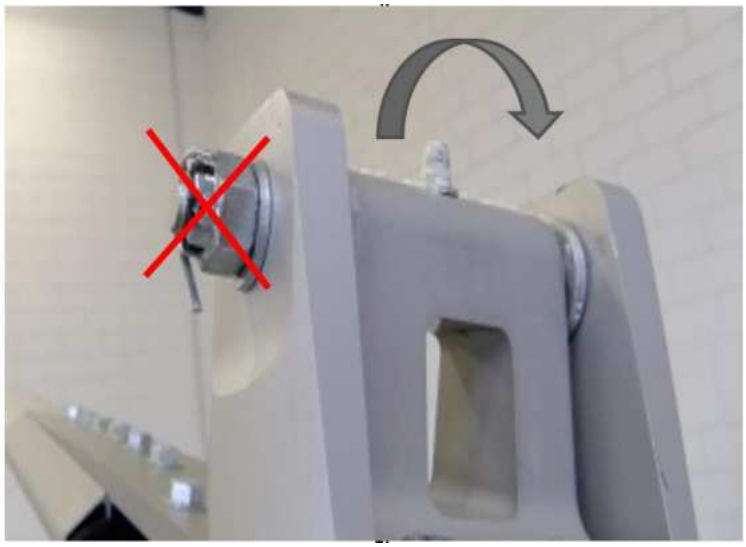


Figure 4

62-11-00 5-1 CHECK – ADJUSTMENT: ROTOR SYSTEM ALIGNMENT

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Line Maintenance'!

Rotor system must be removed, see 62-11-00 4-1

Rotor system must be placed on suitable supports to avoid scratching of the blades or bending moments at the blade attachment

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

WARNING: Object is heavy! Inadequate handling could cause injury. Use proper lifting techniques or assistance!

WARNING: Do not lift or support the rotor system at its blade tips as the bending moment due to the weight of the hub assembly may overstress the blade roots!

WARNING: Never place the rotor system on a dirty or grainy surface and avoid bending moments at the blade attachments!

WARNING: When handled incorrectly the rotor system can be damaged irreparably. If undetected this may have catastrophic consequences!

PROCEDURES/ DESCRIPTION

1. Place rotor system on suitable stands on level ground. Make sure stand surface is level and stand is oriented exactly 90 degrees to rotor blade (see Figure 1).
2. String measuring cord between both outer blade tips. Position at rivet as depicted in Figure 2 'Positioning of measuring cord'.
3. Adjust distance of stand carefully so that measuring cord is strung slightly above the central grease nipple. Verify centre position of grease nipple (Figure 3).
4. In case the measuring cord deviates by more than 2 mm from centre position (i.e. grease nipple inner bore), adjust rotor system linearity. To do so perform the following work steps:
5. Untighten the self-locking nuts of the blade attachment bolts, except for the most inner bolt(s). Counter-hold bolt head to prevent it from turning.
6. Adjust linearity/alignment of rotor system and tighten nuts. Perform alignment check. If necessary, repeat procedure from step 5 on.
7. Torque-tighten nuts with 20 +/- 5 Nm from the inside to the outside. When doing so, counter-hold bolts to prevent any damage to the hub and blade holes.
8. Perform final linearity/alignment check. If necessary, repeat procedure from step 5 on.

IMPORTANT NOTE: In case of any adjustment, a functional test flight must be performed!

ILLUSTRATIONS

Figure 1 - Rotor system placed on stands

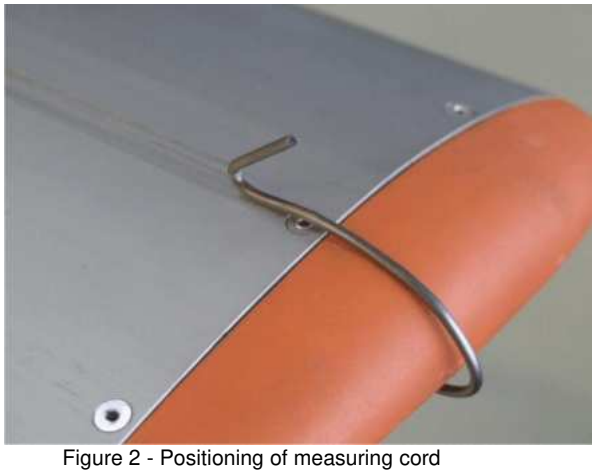


Figure 2 - Positioning of measuring cord

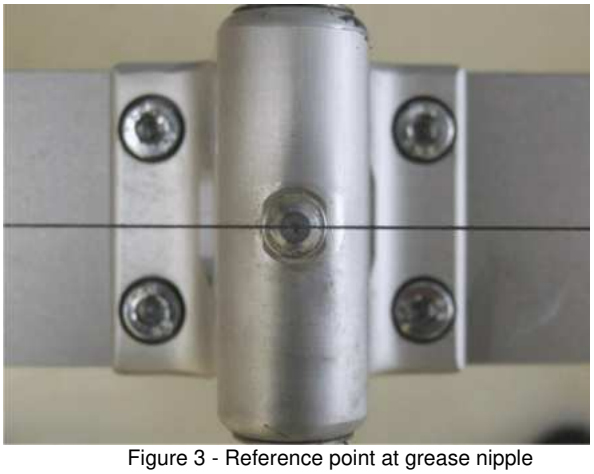


Figure 3 - Reference point at grease nipple

62-11-00 6-1 INSPECTION: ROTOR - TEETERING PARTS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Silicone Grease Lagermeister WHS 2002 (PN 30477)
Loctite 243 blue (PN 30483)

PRECAUTIONS AND SAFETY MEASURES

WARNING: Never place the rotor system on a dirty or grainy surface and avoid bending moments at the blade attachments!

WARNING: When handled incorrectly the rotor system can be damaged irreparably. If undetected this may have catastrophic consequences!

PROCEDURES/ DESCRIPTION

1. Check inner and outer blade caps for tight fit and general condition. Visible insets or score marks may indicate contact with obstacles with possible damage to the rotor system.
2. Perform visual inspection of clamping profile.
3. Perform visual inspection of rotor hub.
4. Perform visual inspection of grease nipple and check tight fit.
5. Check rotor system alignment 62-11-00 5-1, i.e. work steps 1 to 3 for trend monitoring purposes.
6. Inspect teeter bolt. In order to do so, clean with lint-free cloth and inspect for wear marks and corrosion. If corrosion or wear marks are evident (fingernail test), the teeter bolt must be discarded and replaced.
7. Apply a thin layer of Silicone Grease Lagermeister WHS 2002 on teeter bolt (using a lint-free cloth).
8. Inspect bushings in teeter block and teeter tower for correct seating (see Figure 2 - 4 for positions of slits) and secure installation (must not be possible to turn by hand). Otherwise, bushings must be replaced, see 62-11-00 8-1.
9. Insert teeter bolt in teeter block and inspect for play. If any bearing play is evident, try with new teeter bolt. If play is still evident, replace teeter block bushing, see 62-11-00 8-1.
10. Insert teeter bolt in teeter tower and inspect for play. If any bearing play is evident, try with new teeter bolt. If play is still evident, replace teeter tower bushings, see 62-11-00 8-1.

ILLUSTRATIONS

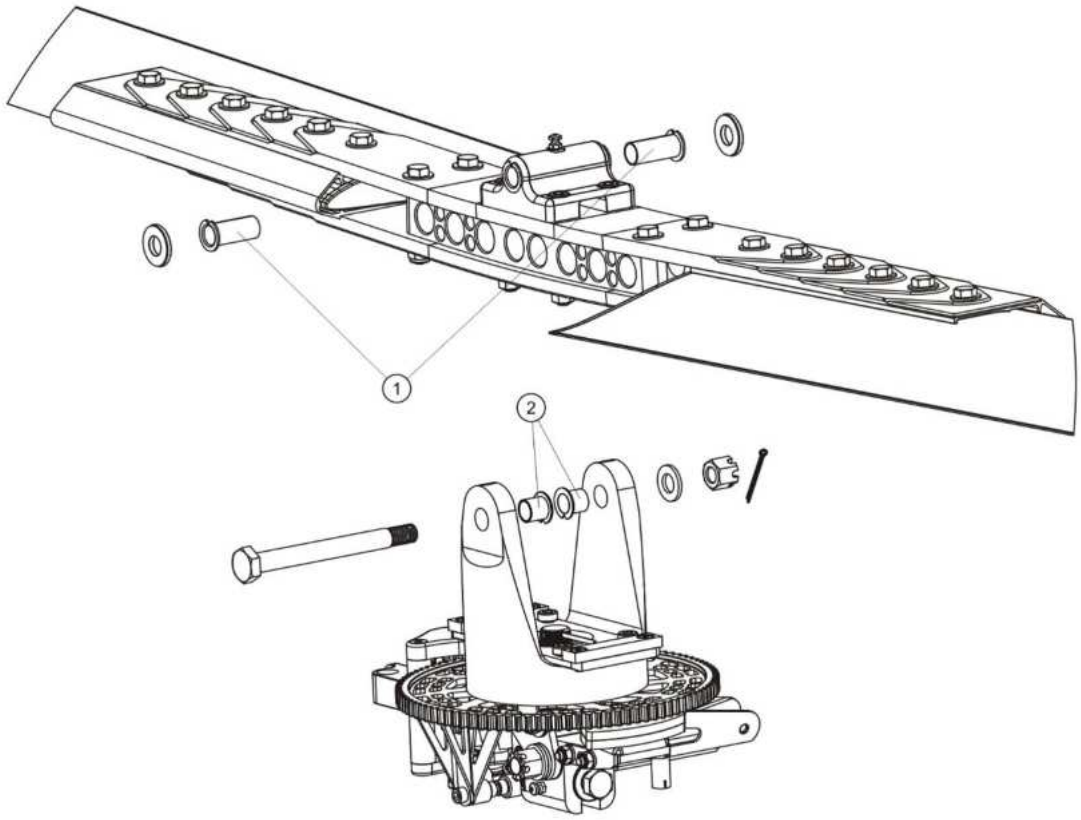


Figure 1 – Teeter Block and Rotor Hub

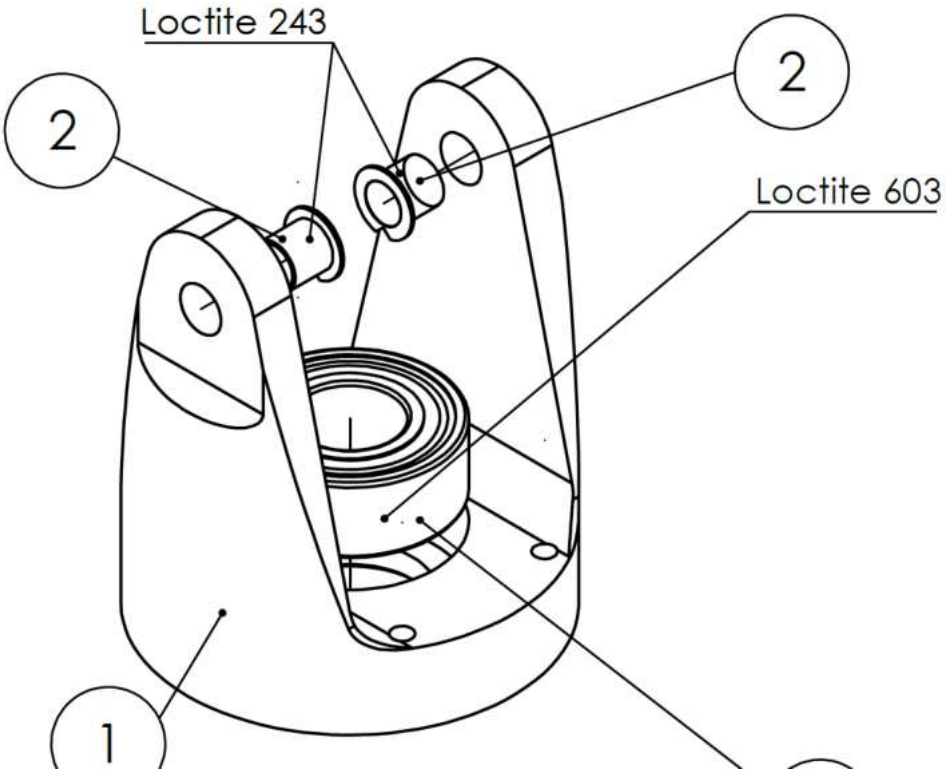


Figure 2 – Teeter Tower

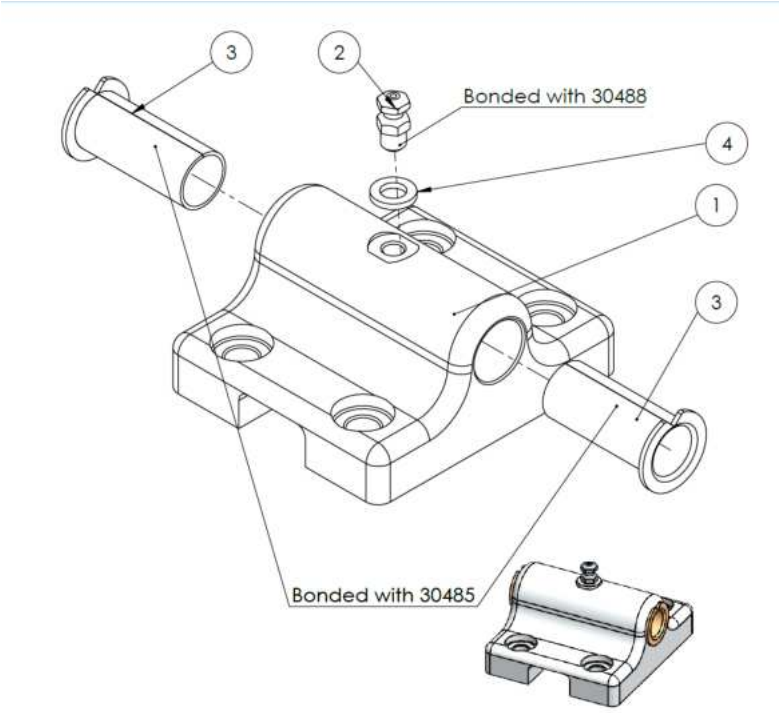
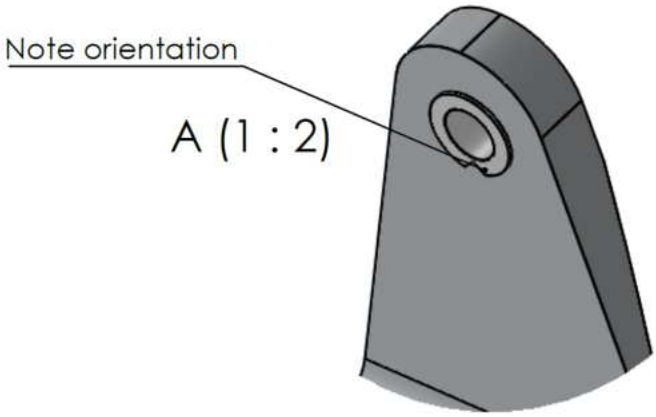


Figure 3 – Teeter Block



Secure bushes with loctite 243 (2 places).
Ensure bushes are fitted as shown, with the notch towards the bearing position.

Figure 4 – Teeter Tower

62-11-00 6-2 INSPECTION: ROTOR BLADES

GENERAL, REFERENCES AND REQUIREMENTS

Basic operational task, which can be performed by a licensed pilot or instructed personnel!

Rotor system must be disassembled, see 62-11-00 4-2

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Aluminium Ruler 1000mm (PN 35077)

PRECAUTIONS AND SAFETY MEASURES

WARNING: Do not use permanent marker on anodized (eloxated) parts!

CAUTION: Do not use sticky labels on aluminium or composite parts as they may be difficult to remove!

PROCEDURES/ DESCRIPTION

1. Inspect for cracks in the blade root area, especially in the area of the inner attachment bore (see Figure 1 "Critical Area", Figure 2 – crack in root area and Figure 3). In case of any cracks the complete rotor system must be replaced.
2. Check trailing and leading edge for damage.

   Trailing edge damage. The photo (Figure 4) shows an example of trailing edge damage. A ding in the trailing edge may be flatted out and the rotors continued in service provided that the ding does not cause a fracture into the inner part of the extrusion, and is not within 1m of the hub bar connection.

   Small damage resulting in a light bend (1-2mm, typically at the rotor tip) may be straightened carefully to the same profile as the rest of the blade section. More damage must be discussed with AutoGyro technicians. Remember, damage that changes the aerodynamic profile will affect the flight characteristic of the blade in that area. The further outboard the damage is, the faster the blade is turning, and thus the aerodynamic effect is greater.

   Leading edge damage. Occasionally a stone or other foreign object enters the rotor disc whilst spinning, resulting in a dent in the leading edge, or in the blade surface. The leading edge is solid aluminium of significant thickness. Small dings can be dressed out only to the basic blade profile. Filling is not permitted. Significant dings within 2m of the hub bar are potential stress raisers and damage left in service must be carefully considered by the inspector for the level of risk. If in doubt, contact AutoGyro Technical Support.
3. Check for dents in the upper and lower surface. Dents in the upper or lower surfaces (Figure 5) more than 1m from the hub bar up to 10mm in diameter are unlikely to cause a stress raiser and may be left in service and monitored by the user
4. Check each rotor blade in its root section for linearity. In order to do place each rotor blade with the nose section facing down on the support stands and measure gap with an aluminium ruler in 1 m distance from the inner end (see Figure 6). Maximum allowed gap (dimension A) is 0.5 mm (LTA DULV-2010-004).

Important Note: More substantial damage.
In all instances where the suffered damage such that the blade is bent in any plane, then the rotorsystem as a whole must be replaced. Rotor blades are carefully weighed and measured, and paired through the process for optimum performance. Random pairing is not likely to result in a satisfactory rotorsystem.

Whenever a rotorsystem is replaced due to damage, then the rotor bearing MUST be replaced. Due to the long lever arm of the rotor, impact damage at the tip can lead to high forces in the bearing and possible internal bearing brinelling. This will reduce service life and possibly create premature failure.
Every inspection must be thorough.

Cracks in the root area, either at the bolt holes or longitudinal at the blade root, are not permissible.
Bending of the blade in any plane is not permissible.
Limited damage may be dressed out or corrected

If in doubt, always ask.
IMPORTANT NOTE: In order to avoid measuring errors draw a straight and parallel line 200 mm from the trailing edge. Use a lead pencil. Do not use permanent marker on anodized (eloxated) parts!

ILLUSTRATTIONS

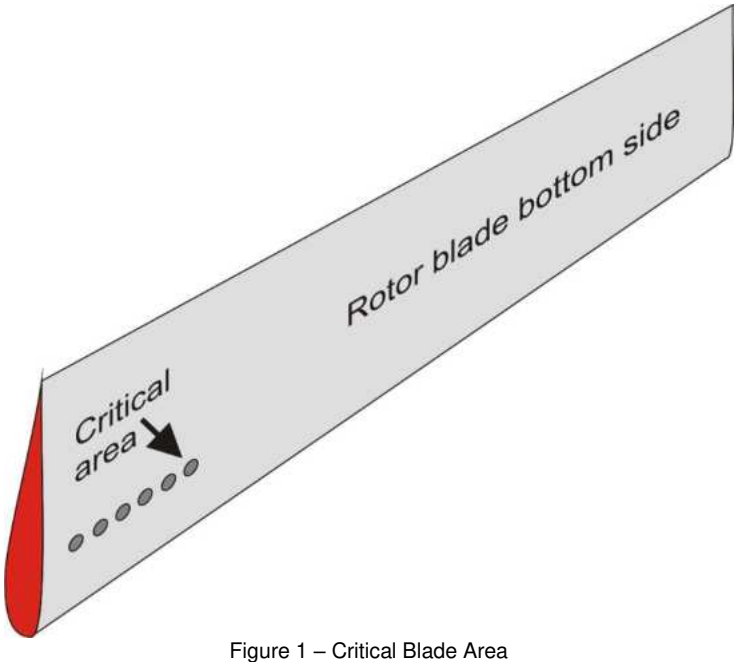


Figure 1 – Critical Blade Area

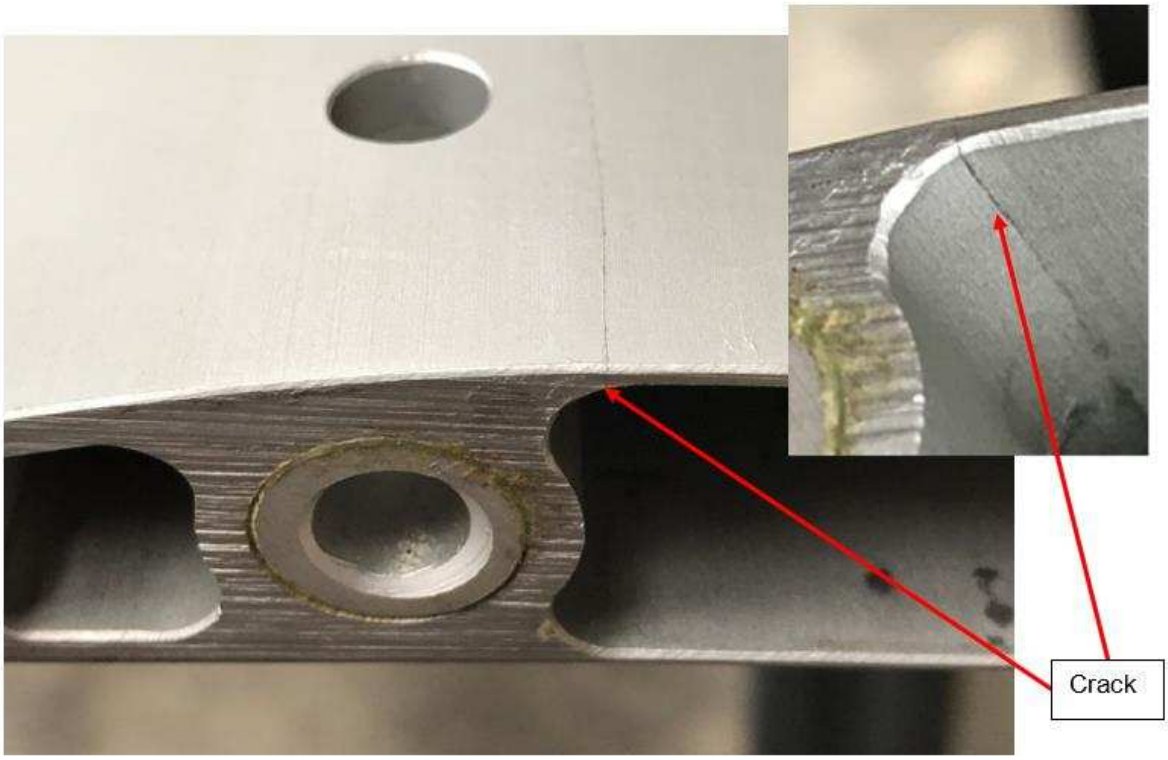


Figure 2 – crack in root area, inner cap removed

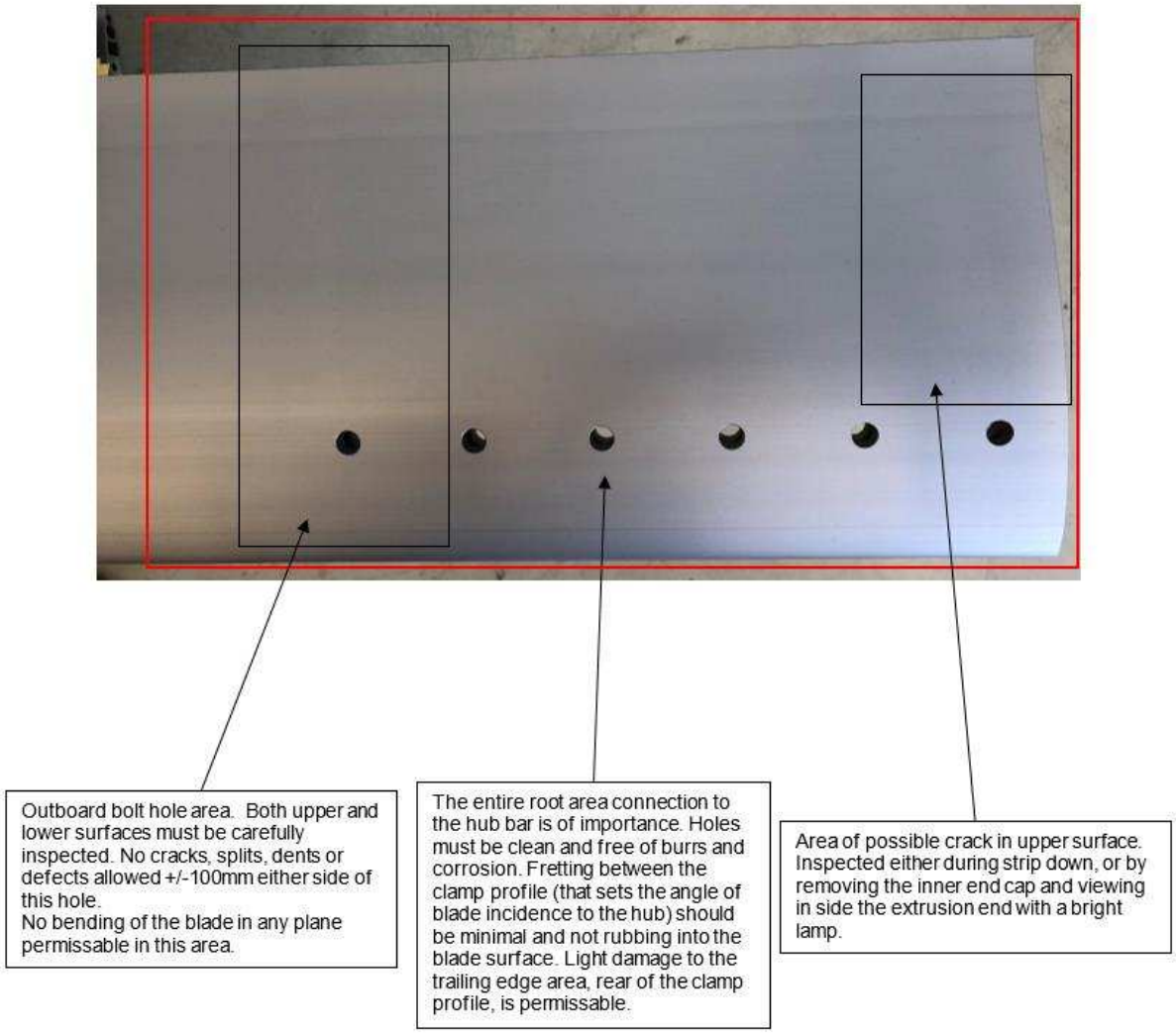


Figure 3 – View of the tope side of the rotor root (RSII, 6-hole attachment)

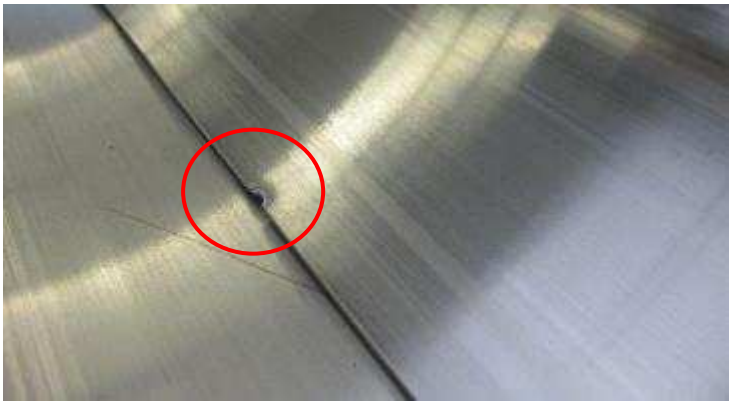


Figure 4 – damage on trailing edge

Figure 5 – dent in surface

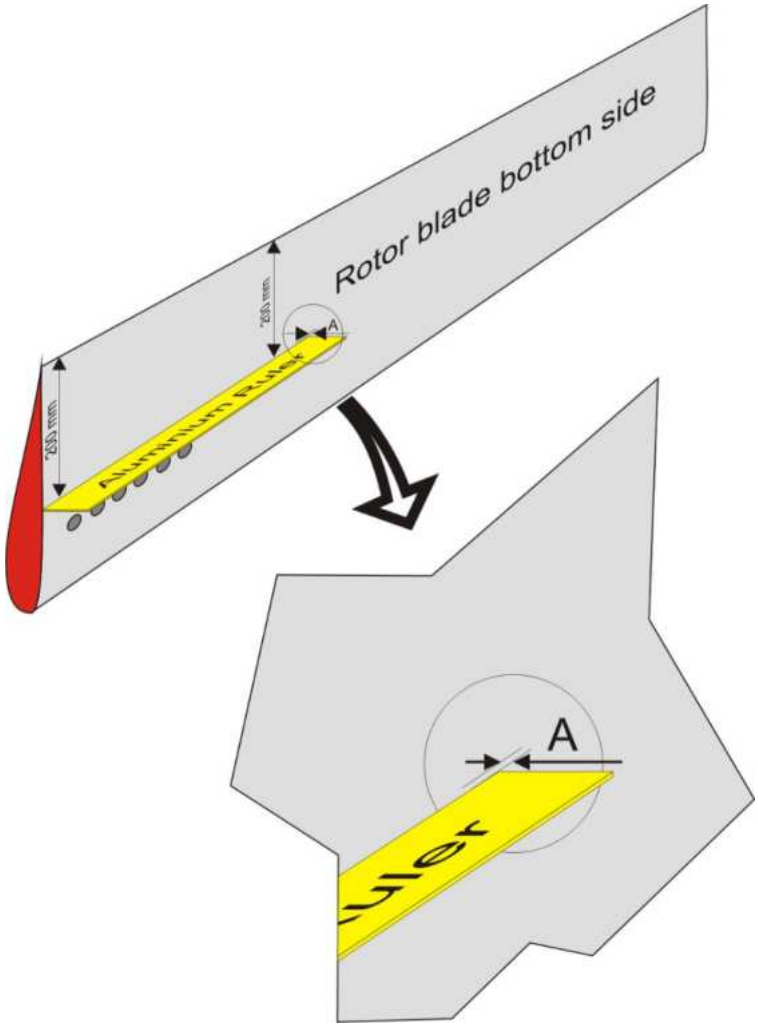


Figure 2 – Rotor Blade Inspection

62-11-00 6-3 INSPECTION: ROTOR HUB BOLTS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Rotor system must be removed, see 62-11-00 4-1

Rotor system must be placed on suitable supports to avoid scratching of the blades or bending moments at the blade attachment

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Silicone Grease Lagermeister WHS 2002 (PN 30477)

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

PRECAUTIONS AND SAFETY MEASURES

CAUTION: Remove and re-install only one bolt at a time. Never remove more than one bolt of the installation!

PROCEDURES/ DESCRIPTION

1. Remove first Rotor Hub Bolt and discard self-locking nut. If necessary use a mandrel and a hammer and tap carefully. Use caution not to damage the threads or the surface of the bore.
2. Inspect Rotor Hub Bolt for corrosion. In case of any signs of corrosion the bolt must be replaced.
3. Apply a thin layer of Silicone Grease Lagermeister WHS 2002 on shaft, but NOT on the thread.
4. Re-install bolt with moderate pressure.
5. Install new self-locking nut and pre-torque to approximately 10 Nm.
6. Repeat work steps 1 to 5 for the remaining bolts.
7. Torque-tighten all Rotor Hub Bolts to the final torque of 25 Nm in opposing/crosswise sequence.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	Rotor Hub II Top	NPI	
1	2	Pin Rotor Hub II	NPI	
1	3	Rotor Hub II Bottom	NPI	
1	4	U8	20393	
1	5	M8, Si	20121	
1	6	Pin	20663	
1	7	Shoulder bolt M8 49/12	NPI	
1	8	U9/20	NPI	
1	9	Teeter Tower III, mounted	43567	
1	10	M8x70, flat	NPI	
1	11	Binx nut M8	28824	
		Replacement Kit Rotor Hub II Bolts	33355	

ILLUSTRATIONS

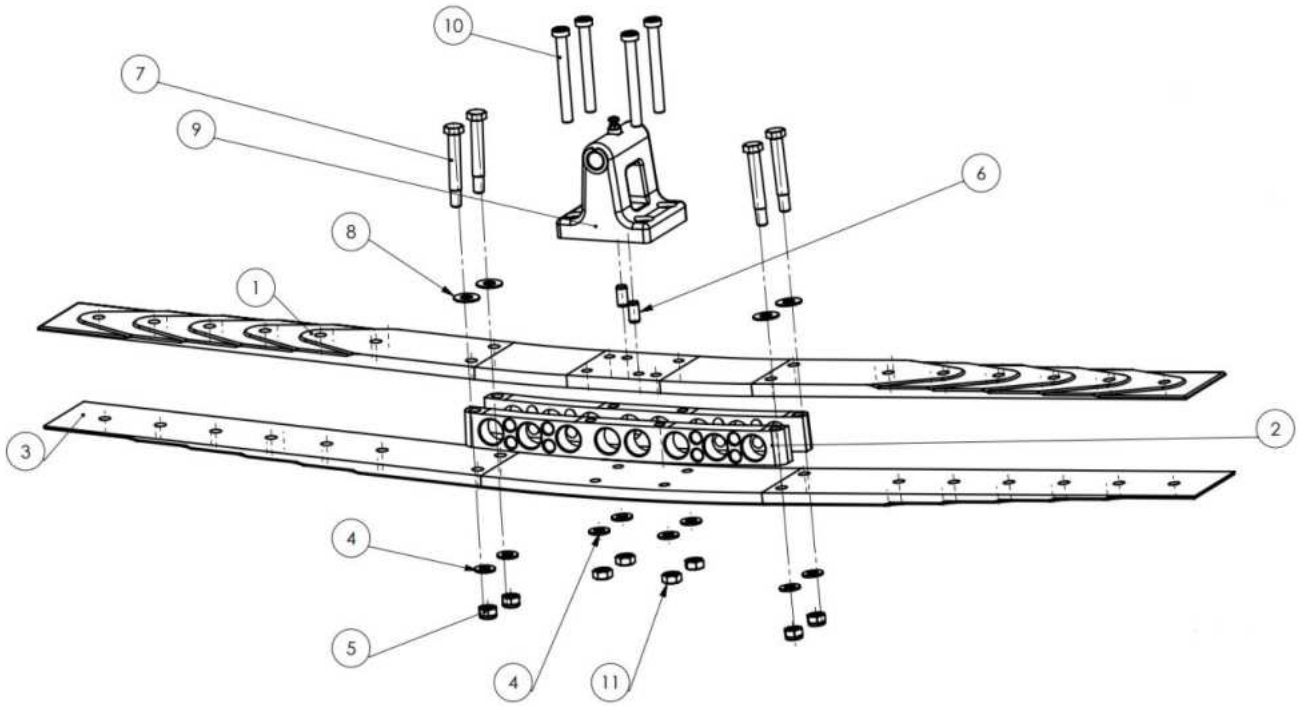


Figure 1 – Rotor Hub Bolts

62-11-00 6-4 CHECK: TEETER ANGLE

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Digital Level (PN31438)

PRECAUTIONS AND SAFETY MEASURES

CAUTION: Be careful not to damage the blades while using the digital level. Any scratches or other damages on the blade or the hub may cause a failure!

PROCEDURES/ DESCRIPTION

1. Engage the rotor brake.

   Caution: Do not remove the rotor bag until rotor brake is engaged to avoid blade flapping.

2. Remove the rotor bag.
3. Move the rotor system until it touches the teeter stop. Hold the digital level and check angle.
4. Move rotor system to the other side of teeter stop and check angle again. Angle has to be 14° +/- 1°
5. If you use the tool which is mentioned above you have to sum up both angles for the blade which points to the flight direction because while moving from one teeter stop to the other one the horizontal line will be crossed. For this case it is 5.60°+8.90° = 14,5°

6. Do it again for the blade which points to the end of the aircraft. This blade is above the horizontal line and the angle is the difference between both measurements.
7. If you use a tool which can be put to zero than it will only show the angle movement abd there is no need to sum up or check the angle difference. Allowed angle is 14° +/- 1°.

8. You can see that the hub is in contact with the forward teeter stop on the left picture. Zero the level and you can check the angle by putting the rotor to the rear teeter stop.

9. Is the angle smaller than the tolerance given this could have one reason:
10. External force applied to one or both ends of the teeter stop assembly from the underside which has deformed the plate. It must be determined how this has occurred. This cannot happen in an in-flight or taxiing phase or normal aircraft operation.

62-11-00 8-1 REPLACEMENT: TEETER BUSHINGS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Rotor system must be removed, see 62-11-00 4-1!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 638 green (PN 30485)

Bushing Removal Tool Teeter Block (PN 36039, Figure 4)

Bushing Removal Tool Teeter Tower (PN 33763, Figure 5)

PRECAUTIONS AND SAFETY MEASURES

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

PROCEDURES/ DESCRIPTION

Removal

CAUTION: It is advisable to heat up the teeter block in an oven. When removing the teeter block marks all parts or use cable ties so that each and every part of the component is re-assembled and installed in exactly the same location and orientation! This is especially important for the shim plates between teeter block and hub bar.

WARNING: Affected aluminium parts must not become warmer than 160 °C.

1. Remove bushings from teeter block. In order to do so warm up teeter block to 120 °C, preferably in an oven.
2. Use appropriate tools to drive out bushings. Be careful not to damage the surface of bore.
3. Remove bushings from pre-heated teeter tower.
4. Use appropriate tools to drive out bushings. Be careful not to damage the surface of bore.

Installation

1. Clean bushing seatings / bores from bonding residues and de-grease.
2. Teeter block: Apply a thin layer of Loctite 638 green to bore.
3. Press in first bushing (1) with joint/slit facing up. Use a bench vice and press carefully until bushing flange is flush.
4. Clean off excessive Loctite, if necessary.
5. Repeat step 6 to 8 for second bushing.
6. Teeter tower: Apply a thin layer of Loctite 638 green to bore.
7. Press in first bushing (2) with joint/slit facing down. Pull in bushing until flange is flush. Use thick washers on both sides to protect teeter tower and bushing flange from damage.
8. Clean off excessive Loctite, if necessary.
9. Repeat step 10 to 12 for second bushing.
10. If necessary rework inner diameter of bushings in teeter tower with a reamer 13H7.

Figure	Position	Description	PN	Remarks
1	1	Bushing TEF-MET 13/16/21x30	20662	
1	2	Bushing TEF-MET 13/15/21x15	20677	

ILLUSTRATIONS

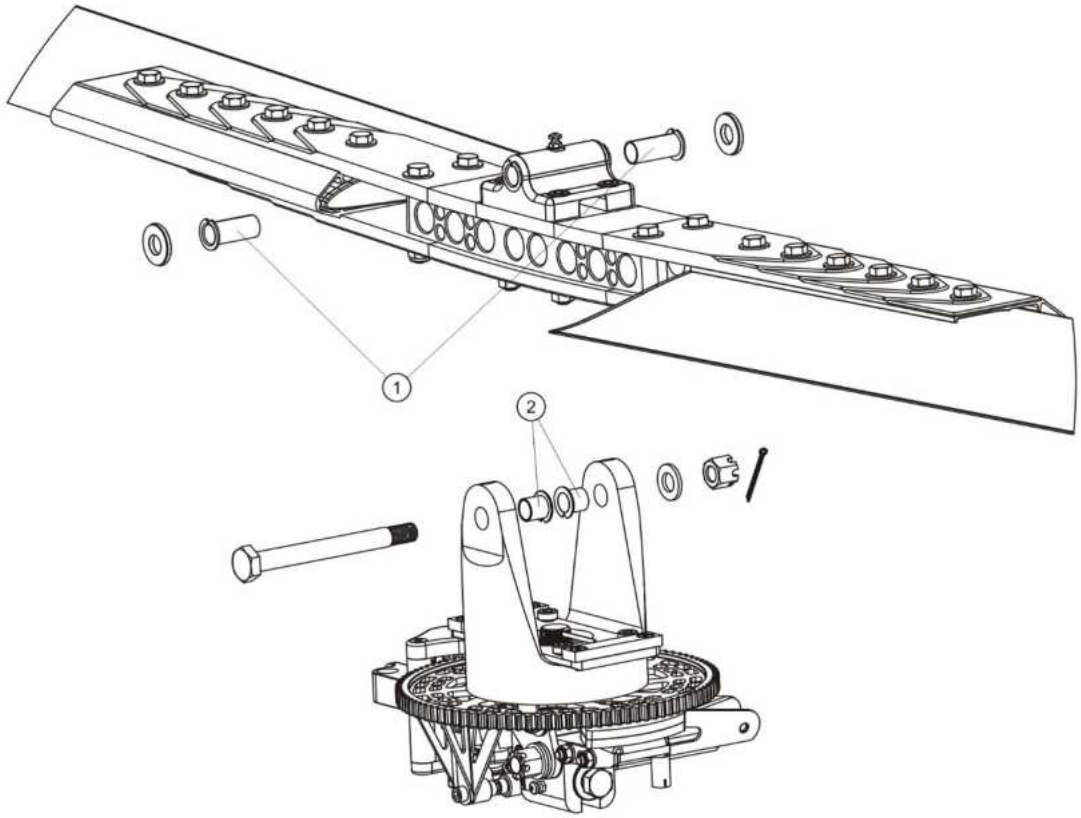


Figure 1 – Teeter Block and Tower with bushings

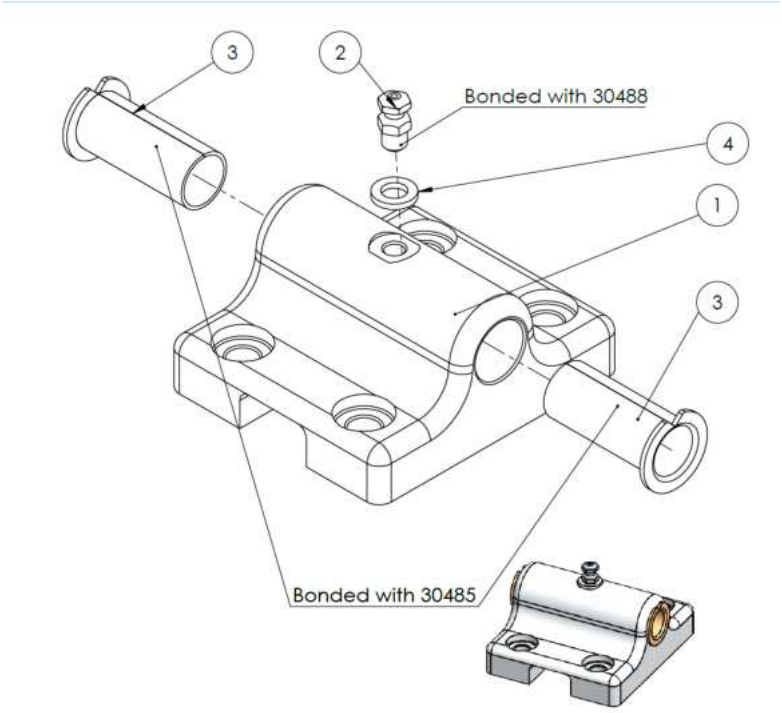
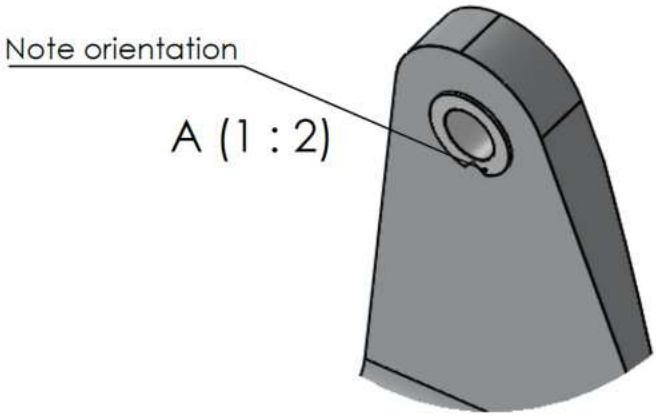


Figure 2 – Teeter Block



Secure bushes with loctite 243 (2 places).
Ensure bushes are fitted as shown, with the notch towards the bearing position.

Figure 3 – Teeter Tower

Figure 4: Bushing removal tool Teeter Block

Figure 5: Bushing removal tool for Teeter Tower

62-20-00 8-1 REPLACEMENT: ROTOR SPROCKET

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check Parts List below before starting job!

PRECAUTIONS AND SAFETY MEASURES

CAUTION: When removing or disassembling make sure to mark all parts so that each and every part of the component is re-assembled and installed in exactly the same location and orientation!

PROCEDURES/ DESCRIPTION

1. Switch pneumatic mode selector to BRAKE.
2. Remove and dispose the split pin (Figure 1; 1).

WARNING: Wear eye protection when removing attachment hardware!

3. Untighten the castle nut (Figure 1; 2).
4. Switch pneumatic mode selector to FLIGHT.
5. Remove the castle nut (Figure 1; 2).
6. Remove the teeter tower with the Rotor Sprocket. Fix the teeter tower in a bench vise carefully.
7. Remove and dispose the 10 (Figure 2; 12) screws of the Rotor Sprocket. Remove the Rotor Sprocket.
8. Put new Rotor Sprocket on teeter tower.
9. Apply Loctite 243 to the 10 screws (figure 2; 12) of the Rotor Sprocket. Tighten the ten screws crosswise with a torque of 10 Nm.
10. Rotate rotor head so that rotor blades (removed!) would point exactly in flight direction.
11. Attach teeter tower with new Rotor Sprocket to the rotor head.
12. Align the hole or magnet to the 7 o´clock position in flight direction (Figure 4).
13. Tighten castle nut (Figure 1; 2) with a torque value enough to fix the adjustment of the main bolt.
14. Inspect backlash of pre-rotator upper engagement. Backlash should be as tight as possible, but also wide enough to allow easy engagement of the pinion into the sprocket wheel in any position.
15. Torque-tighten castle nut (Figure 1; 2) with final torque of 120 Nm and re-check position. Apply further torque until the split pin can be inserted.
16. Insert and secure new split pin (Figure 1; 1). Make sure that ends of the split pin do not contact rotating parts (Figure 5).
17. Inspect backlash of pre-rotator upper engagement again. Backlash should be as tight as possible, but also wide enough to allow easy engagement of the pinion into the sprocket wheel in any position.
18. Install the rotor system according to 62-11-00 4-4.
19. Perform job card 63-11-30 6-1.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	Split Pin 3,2x50	23941	
1	2	M20 Castle Nut	23796	
1	3	Teeter Tower		
2	12	M6 x 16 counter sunk Torx	44935	
2	13	Rotor Sprocket	45128	

ILLUSTRATIONS

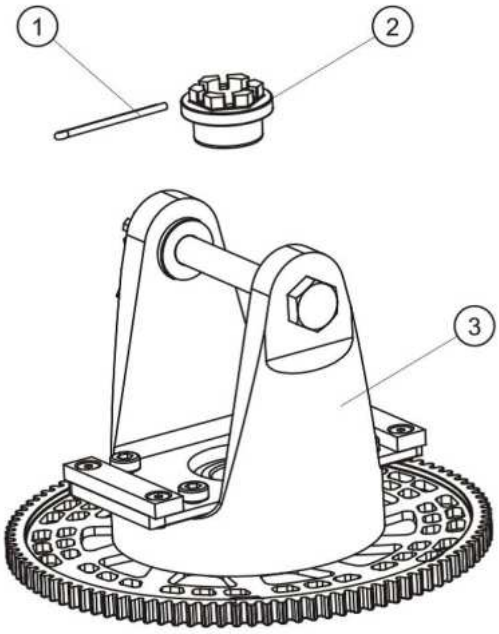


Figure 1 – Teeter Tower

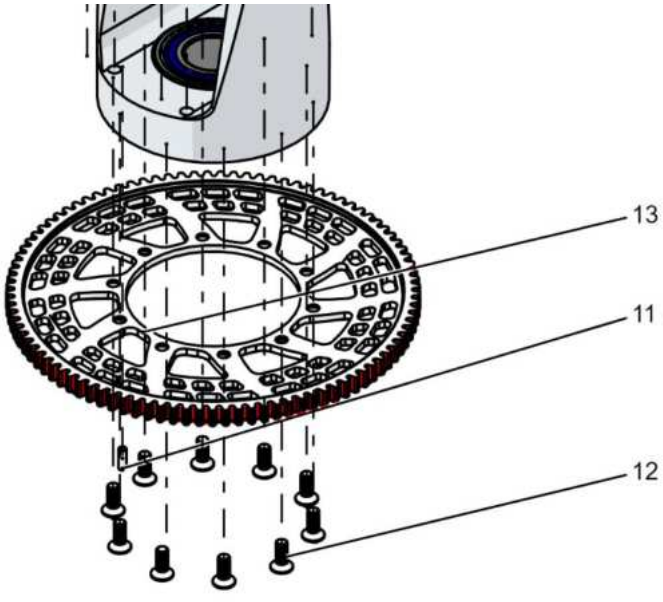


Figure 2 – Rotor Sprocket

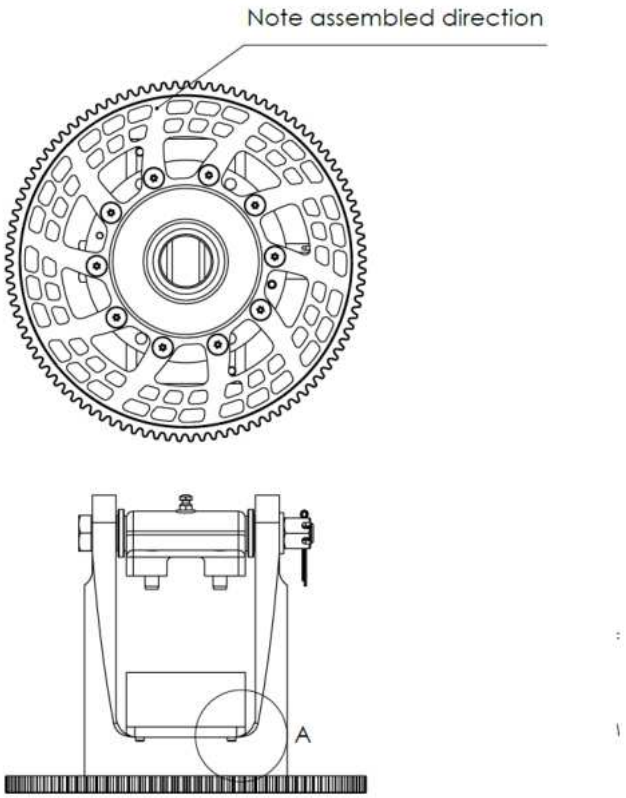


Figure 3 – Rotor Sprocket

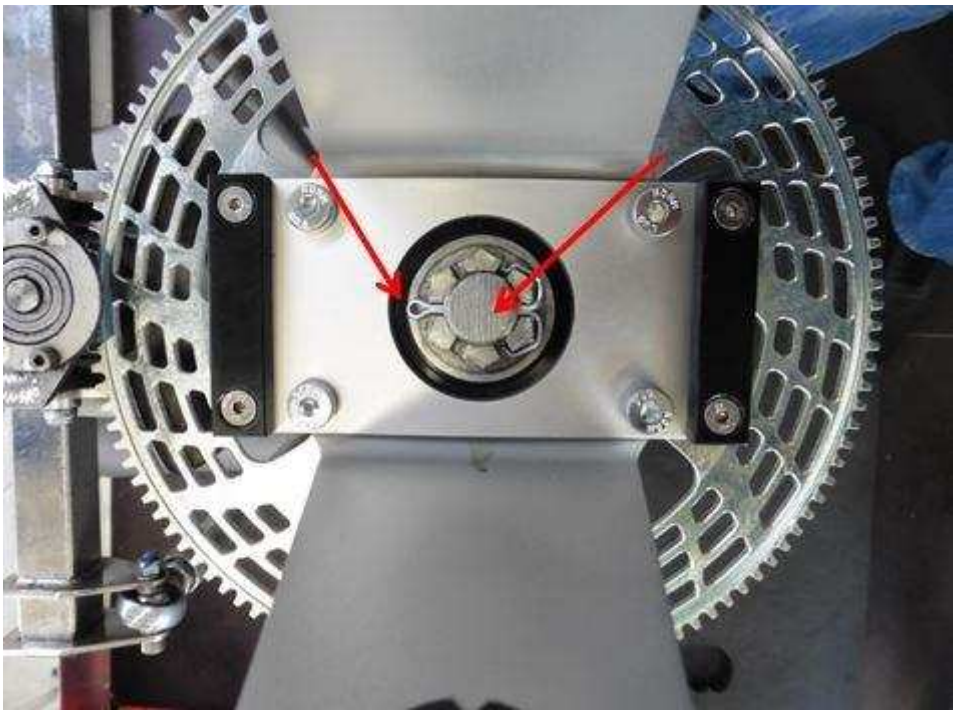


Figure 4 – Rotor Sprocket with Split Pin installed

62-31-00 6-1 INSPECTION: ROTOR HEAD BRIDGE, BEARING AND TEETER TOWER

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check parts list below before starting job!

PRECAUTIONS AND SAFETY MEASURES

WARNING: Wear eye protection and mind FOD when removing attachment hardware!

PROCEDURES/ DESCRIPTION

1. Inspect rotor head bridge (Figure 1; 4) function and condition, i.e. no misalignment, dents, nicks, corrosion, or cracks. In case of any of the aforementioned is evident or suspected contact AutoGyro Technical Support.
2. Inspect, whether the upper bearing shield Bendix shaft is welded on inner bottom side to the rotor head side plates; if not contact AutoGyro Technical Support.
3. Inspect teeter stops for correct attachment and condition.
4. Inspect teeter tower (Figure 1; 3) for correct attachment and condition, i.e. no cracks. In case of cracks or unusual condition or appearance contact AutoGyro Technical Support.
5. Remove and dispose the split pin (Figure 1; 1).
6. Perform torque-check on main bolt nut (Figure 1; 2). Torque-check castle nut with 120 Nm.
7. If torque-check fails mark gyroplane unserviceable and contact AutoGyro Technical Support.
8. Insert new split pin (Figure 1; 1) and secure. Make sure that ends do not contact rotating parts.

WARNING: Do not fly gyroplane in case torque-check failed. Clearly mark as unserviceable and prevent from use until resolved.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	Split Pin 3,2x50	23941	
1	2	M20 Castle Nut	23796	
1	5	M20x1,5 Rotor Bolt	45132	RH III
		M20x1_5x73 Rotor Bolt	25957	RH II

ILLUSTRATIONS

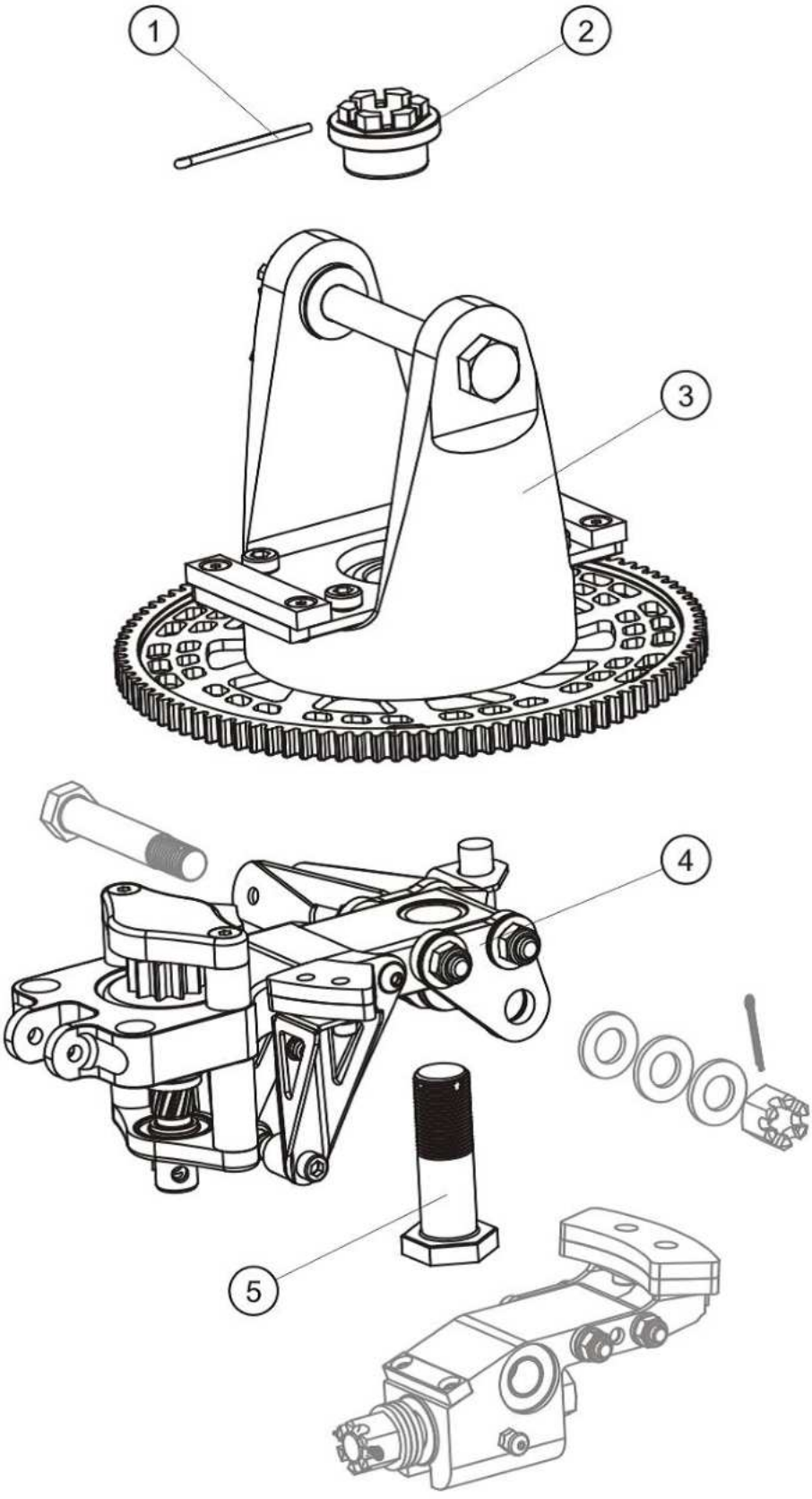


Figure 1 – Rotorhead Bridge, Bearing and Teeter Tower

62-32-00 5-1 CHECK - ADJUSTMENT: ROTOR CONTROL FRICTION

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Rotor head bridge / gimbal head configuration state must conform to version II

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Scale (PN 36114)

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

1. Switch pneumatic mode selector to FLIGHT and release trim pressure completely. If necessary, switch repeatedly!
2. Attach spring balance / dynamometer as shown in Figure 1 and pull carefully until control stick starts to move. Note maximum value (breakout force).

WARNING: Job includes work at critical flight controls. Duplicate inspection must be performed after completion!

3. Breakout force can be adjusted by tightening the gimbal head pitch bolt. If the bore pin drill of the gimbal head pitch bolt is covered by the castle nut, place shim washers between the washers (Pos. 3 & 6). Note: 0.1 mm shim washer equates approximately 20° nut rotating angle.
4. Rotor vibration levels will decrease with higher control friction, but handling qualities will suffer, if control friction is too high. Friction should not exceed 10 N, with an absolute maximum of 15 N!
5. After completion, switch pneumatic mode selector to BRAKE, apply brake pressure and secure rotor system.

ILLUSTRATIONS

Figure 1 – Measurement of Rotor Control Friction

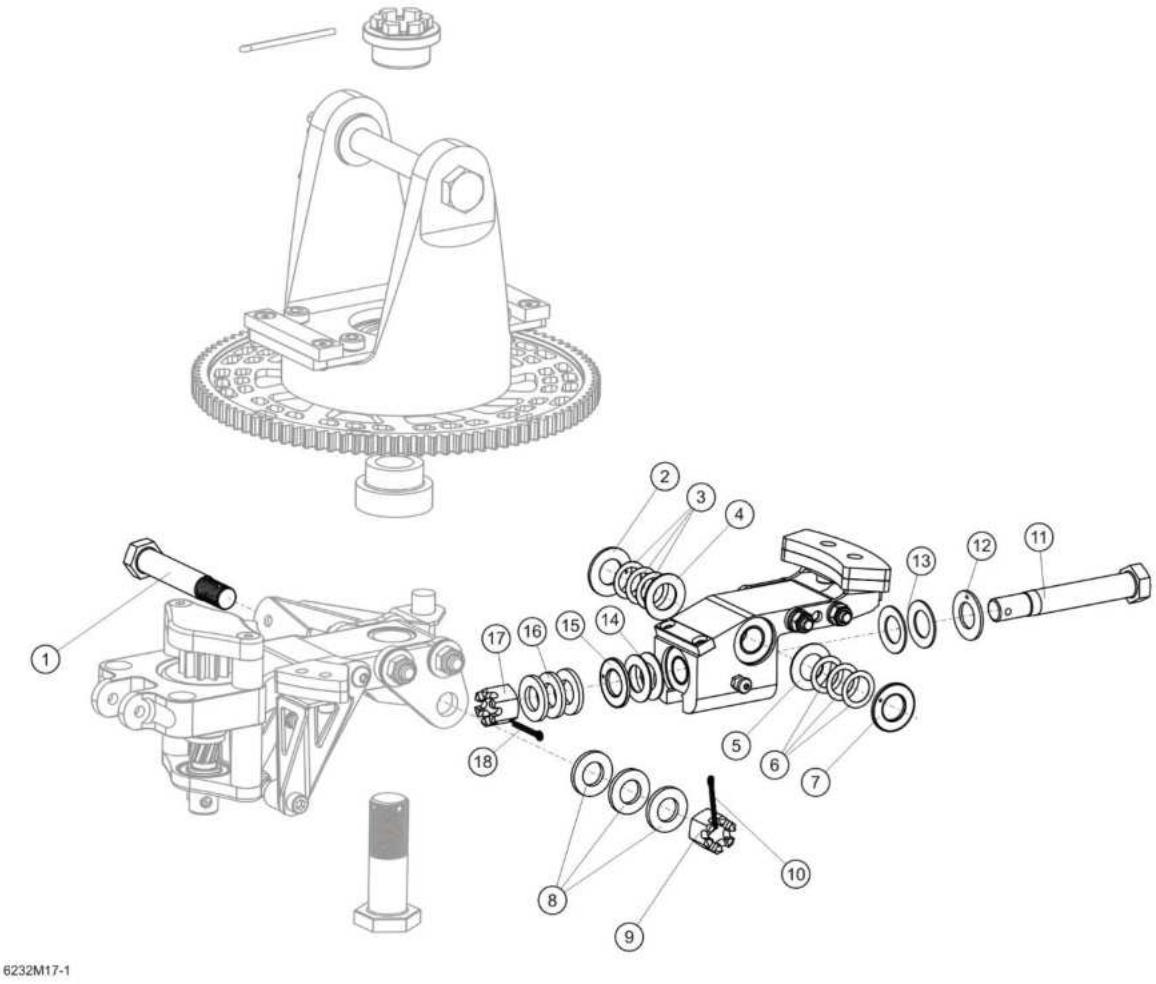


Figure 2 – Gimbal Assembly Rotor System III (with spring washers)

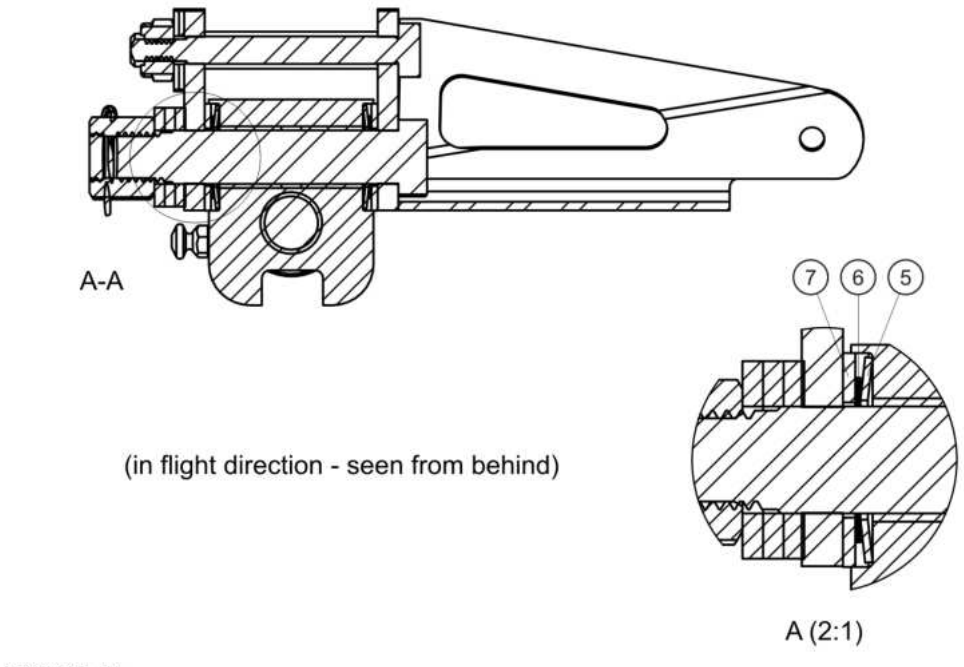


Figure 3 – Arrangement of spring and shim washers on gimbal head – Version III

62-32-00 6-1 INSPECTION: ROTOR GIMBAL HEAD

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Silicone Grease Lagermeister WHS 2002 (PN 30477)

Digital Spirit Level (PN 31438)

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

1. Inspect gimbal head for correct function and condition, i.e. check split pins (Figure 1; 1) are installed and no play at the hinge points is evident.
2. Verify angles of gimbal head mechanical end stops. In order to do so perform the following work steps:
3. Place gyroplane on level ground with zero roll attitude and lower mast section vertical.
4. Rotate rotor head so that rotor blades (removed!) would point exactly fore-aft. Place inclinometer on top of teeter tower and measure RH and LH end stop angle. Make sure that mechanical stops are reached. Record values.
5. Rotate rotor head so that rotor blades (removed!) would point exactly left-right. Place inclinometer on top of teeter tower and measure FORE and AFT end stop angle. Make sure that mechanical stops are reached. Record values.
6. Verify measured angles comply with the values specified in the corresponding type certificate data sheet. If any of the values differs by more than 1° from the specified value mark component unserviceable and contact AutoGyro Technical Support.

ILLUSTRATIONS

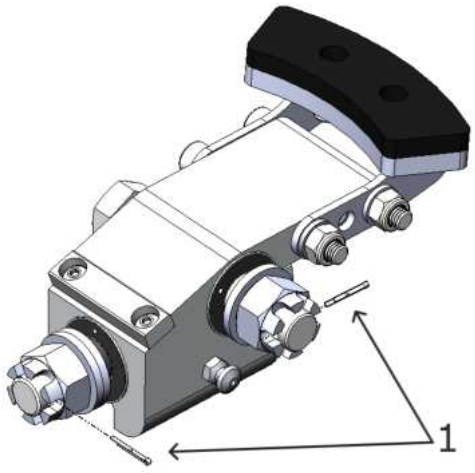


Figure 1

63-11-00 4-1 REMOVAL-INSTALLATION: PRE-ROTATOR COUPLING

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Only Pre Rotator gearbox II and later are used with the Rotax 915 iS / 916 iS engines!

Engine cowlings must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

IMPORTANT NOTE: Procedure involves parts with limited reusability. Check Parts List below before starting job!

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

Removal (Assumes aircraft side panels are already removed)

1. Remove hoses from oil reservoir and seal open ends against contamination.
2. Remove oil reservoir.
3. Loop a lifting belt around the propeller/gearbox shaft and take the load off the engine mounts using appropriate lifting equipment.

   NOTE: Both engine mounts in the LH side remain in place.

4. Unscrew and remove 2 x attachment hardware of engine mounts on RH side. Discard self-locking nuts.
5. With the engine weight unloaded, tilt engine around remaining LH engine mounts as far as necessary (do not overstretch rubber bushings) in order to get access to the pneumatic clutch.
6. Disconnect pneumatic hose at quick connect coupling.
7. Cut open and discard affected cable ties.
8. Unscrew and remove M6 screw and M6 nut on top of the coupling (Figure 2, Figure 3; 1, 4) and disconnect Drive Shaft. Discard M6 nut.
9. Unscrew and remove 4 x M6x20 bolts and remove pneumatic clutch with attach ring (Figure 4).

   NOTE: Do not separate attach ring from clutch and let adapter frame remain on engine.

10. Remove pneumatic clutch by pulling apart sliding shaft coupling.

Installation

1. Insert sliding shaft coupling and position pneumatic clutch with attach ring on adapter frame.
2. Apply Loctite 243 blue on threads and torque-tighten 4 x M6x20 bolts with 10 Nm.
3. Insert M6 screw and new nut and tighten it (Figure 3; 1, 4).
4. Check that vertical pre-rotator drive can be easily turned by hand.
5. Re-connect pneumatic hose at quick connect coupling. Make sure flow control valve is in place and installed in correct flow direction (blue line to coupling, white line to pneumatic box).
6. Perform functional check (engine off) and monitor clutch actuation.
7. Re-install engine mounts. Use new self-locking nuts and torque-tighten.
8. Remove lifting belt.
9. Install oil reservoir.
10. Remove seals and re-connect oil hoses to reservoir.

ILLUSTRATIONS

Figure 1 – Pneumatic Coupling

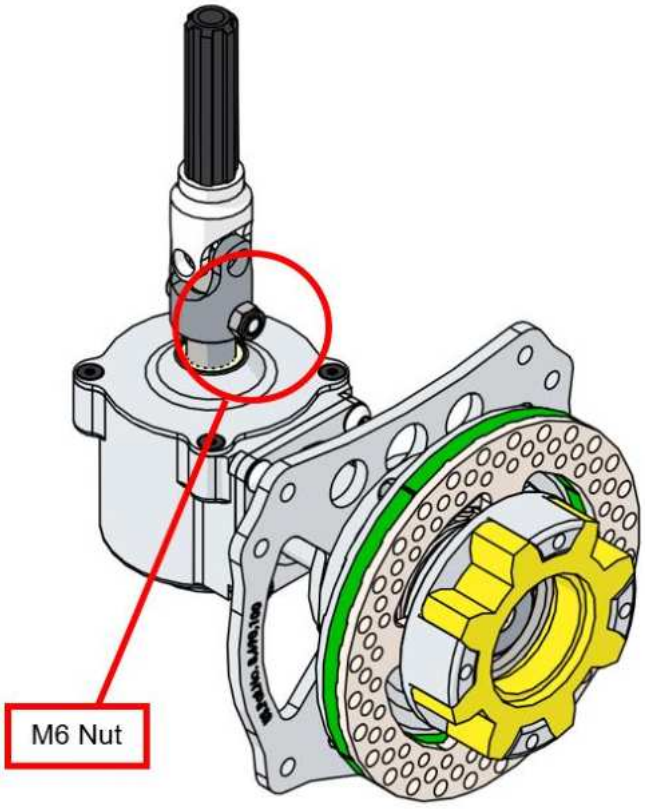


Figure 2 – Location of M6 Si Nut (PN 20027)

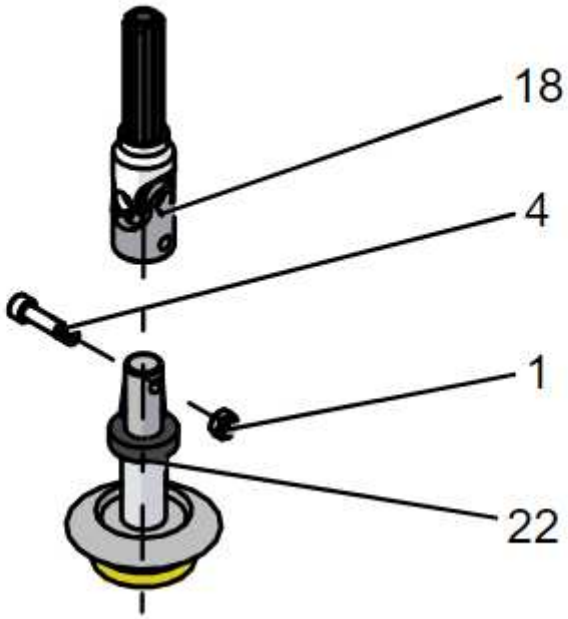


Figure 3 – M6 Screw and M6 Si Nut

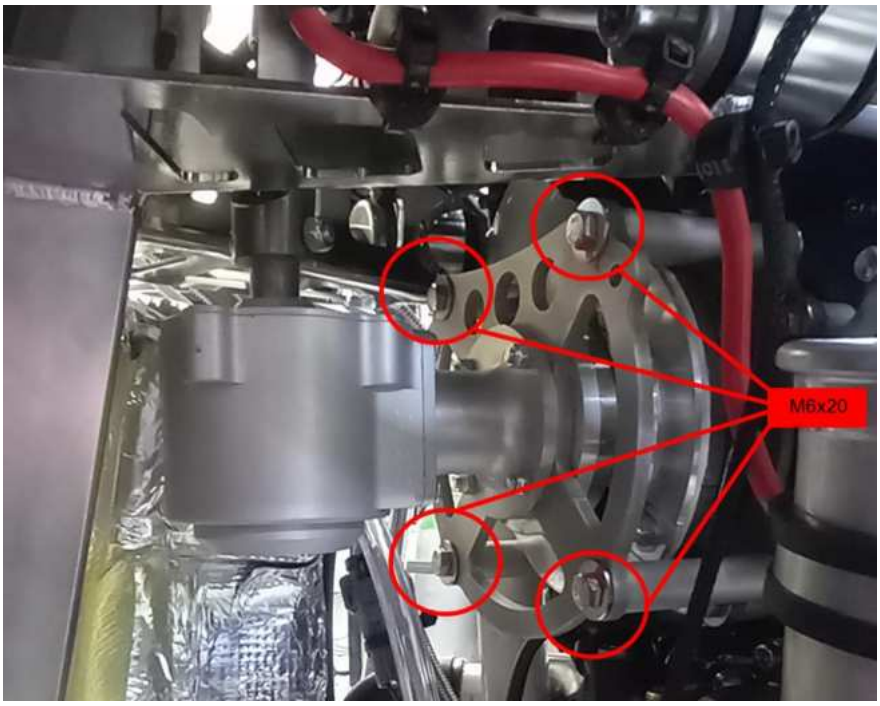


Figure 3 – Location of M6x20 Screws (PN 45753)

63-11-10 6-1 INSPECTION: PRE-ROTATOR CLUTCH

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Engine cowlings must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/.DESCRIPTION

1. Check wear state of clutch lining. Wear mark (groove in the lining) must be recognizable. See Figure 1, dimension A. Replace clutch if necessary.
2. Measure clearance between clutch lining and clutch plate. See Figure 1, dimension B. Clearance must be between 0,5 – 1,0 mm. In case clearance is less than 0,5 mm or more than 1,0 mm contact AutoGyro Technical Support.
3. Measure clearance between inner (engine side) drive star disc and outer (clutch side) drive star claws. See Figure 1, dimension C. Clearance must be between 0,5 – 1,0 mm. In case clearance is less than 0, 5 mm or more than 1,0 mm contact AutoGyro Technical Support.

ILLUSTRATIONS

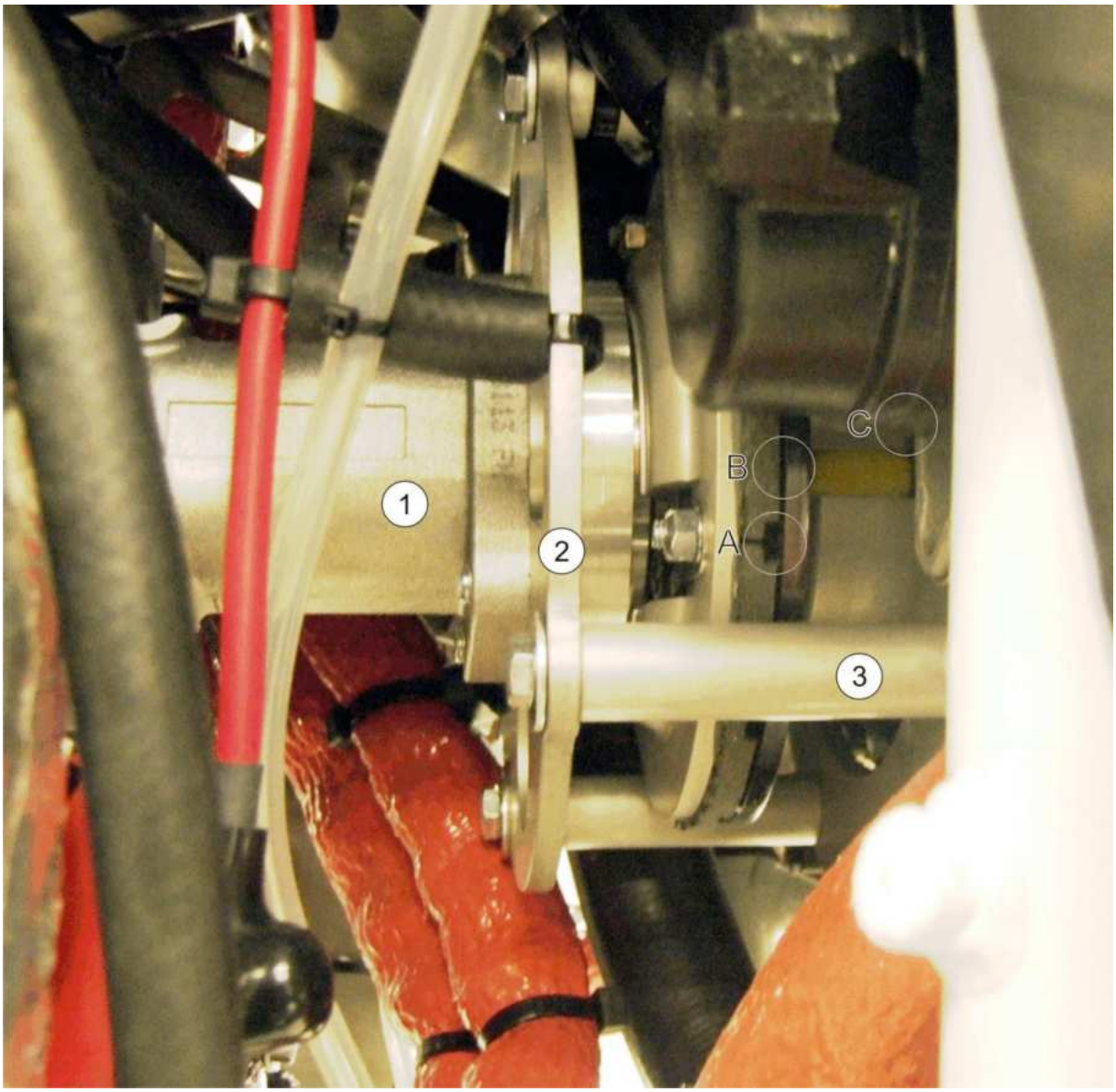


Figure 1 - Pre-Rotator coupling

63-11-00 8-1 REPLACEMENT: PRE-ROTATOR COUPLING LINING

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Engine cowlings must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 7063 Super Clean (PN 35915)

Loctite 648 (PN 31023)

Installation Aid Dog Gear (PN 35790)

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks).

PROCEDURES/ DESCRIPTION

1. Disconnect battery according to 24-30-00 4-1, work steps 1 - 2.
2. Remove M8x20 screw plug (Figure 2) with seal ring from the crankcase. Turn the crankshaft by propeller into top dead center (TDC) position of cylinder 1 and 2. TDC can be checked with the aid of a lamp through the opening of the removed screw. When the crankshaft is in correct position screw thread pin M8x50 (Figure 3) so that the crankshaft is blocked.
3. Remove Pre-Rotator Coupling according to 63-11-10 4-1, work steps 1 – 9.
4. Replace coupling liner. In order to do so, untighten central screw. Should it not be possible untighten central screw bore out bolt head and remove remaining screw thread with pliers. Pull friction plate off the drive shaft axially. Place spare part and fix it with new central screw.
5. Remove coupling dog gear with ‘Installation Aid Dog Gear’.
6. Thoroughly clean the crankshaft and the driver stud with Loctite 7063.

CAUTION: For the following work step, use Loctite 648 only! The use of other brands or alternative products will prevent correct functioning.

7. Apply Loctite 648 on inner and outer thread in sufficient quantity (Figure 4).

CAUTION: For the following work step, the clutch dog gear must be easily screwable (floating) up to the stop!

8. Screw coupling clutch gear onto the thread and remove excess Loctite.
9. Tighten coupling dog gear using ‘Installation Aid Dog Gear’ with a torque of 140 Nm (Figure 5). Clean driver free of Loctite residues.
10. Check with feeler gauge 0.05 mm whether dog clutch gear is contacted with the flywheel. Feeler gauge 0.05 mm must not be able to stick in between dog gear and flywheel (Figure 6).
11. Remove thread pin M8x50. Mount M8x20 screw plug with new copper seal ring and tighten with a torque of 15 Nm. For checking, turn carefully the propeller by hand.
12. Re-connect battery according to 24-30-00 4-1, work steps 2 - 1.
13. Re-install Pre-Rotator coupling according to 63-11-10 4-1, work steps 10 – 19.

PARTS LIST

Figure	Position	Description	PIT	Remarks
1		Replacement Kit Friction Plate	46137	Coupling III / IV

ILLUSTRATIONS

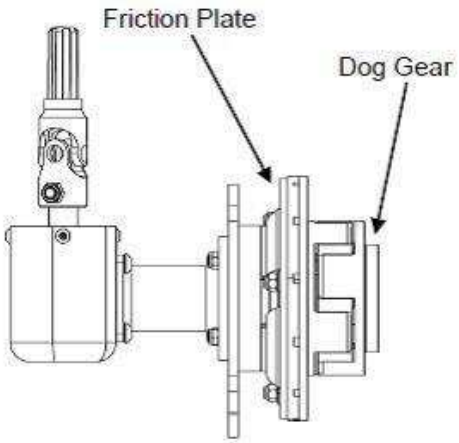


Figure 1 – Pneumatic Coupling


Figure 2 – M8 x 20 Screw Plug


Figure 3 – Thread Pin M8 x 50

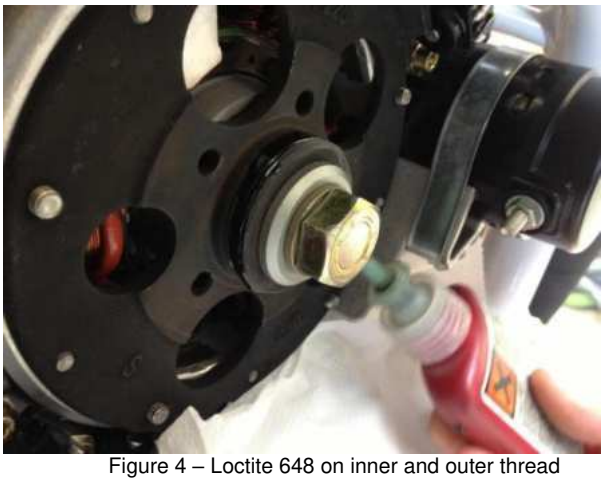


Figure 4 – Loctite 648 on inner and outer thread


Figure 5 – Torque Dog Gear with 140 Nm

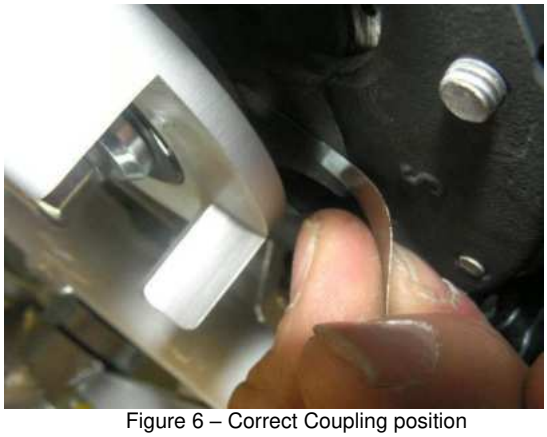


Figure 6 – Correct Coupling position

63-11-00 8-2 REPLACEMENT: PRE-ROTATOR COUPLING DOG GEAR

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Engine cowlings must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 7063 Super Clean (PN 35915)

Loctite 648 (PN 31023)

Installation Aid Dog Gear (PN 35790)

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks).

PROCEDURES/ DESCRIPTION

1. Disconnect battery according to 24-30-00 4-1, work steps 1 - 2.
2. Remove M8x20 screw plug (Figure 1) with seal ring from the crankcase. Turn the crankshaft by propeller into top dead center (TDC) position of cylinder 1 and 2. TDC can be checked with the aid of a lamp through the opening of the removed screw. When the crankshaft is in correct position screw in thread pin M8x50 (Figure 2) so that the crankshaft is blocked (for further information see Rotax Maintenance Manual 12-20-00).
3. Remove Pre-Rotator coupling according to 63-11-10 4-1, work steps 1 – 9.
4. Remove coupling dog gear with ‘Installation Aid Dog Gear’.
5. Thoroughly clean the crankshaft and the driver stud with Loctite 7063.

   CAUTION: For the following work step, use Loctite 648 only! The use of other brands or alternative products will prevent correct functioning.
6. Apply Loctite 648 on inner and outer thread in sufficient quantity (Figure 4).

   CAUTION: For the following work step, the clutch dog gear must be easily screwable (floating) up to the stop!
7. Screw coupling dog gear onto the thread and remove excess Loctite.
8. Tighten coupling dog gear using ‘Installation Aid Dog Gear’ with a torque of 140 Nm (Figure 5). Clean driver free of Loctite residues.
9. Check with feeler gauge 0.05 mm whether dog gear is contacted with the flywheel. Feeler gauge 0.05 mm must not be able to stick in between dog gear and flywheel (Figure 6).
10. Remove thread pin M8x50. Install M8x20 screw plug with new copper seal ring and tighten with a torque of 15 Nm. For checking, carefully turn propeller by hand.
11. Re-connect battery according to 24-30-00 4-1, work steps 2 – 1.
12. Re-install Pre-Rotator clutch according to 63-11-10 4-1, work steps 10 - 19.

PARTS LIST

Figure	Position	Description	PIT	Remarks
1		Pressure Plate mounted	31713	Coupling III / IV

ILLUSTRATIONS

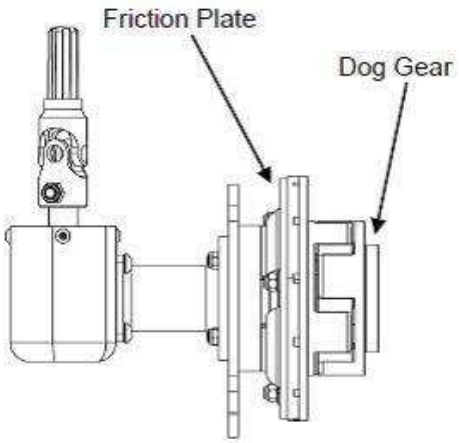


Figure 1 – Pneumatic Coupling

Figure 2 – M8 x 20 Screw Plug

Figure 3 – Thread Pin M8 x 50

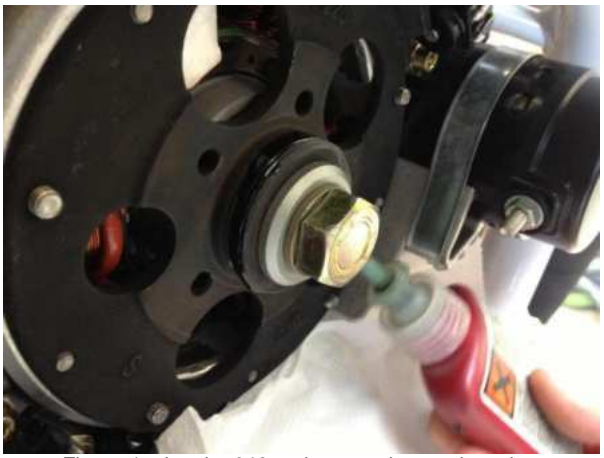


Figure 4 – Loctite 648 on inner and outer thread

Figure 5 – Torque Dog Gear with 140 Nm

Figure 6 – Correct Coupling position

63-11-30 6-1 INSPECTION: PRE-ROTATOR UPPER ENGAGEMENT

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

Mast cover must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Silicone Grease Lagermeister WHS 2002 (PN 30477)

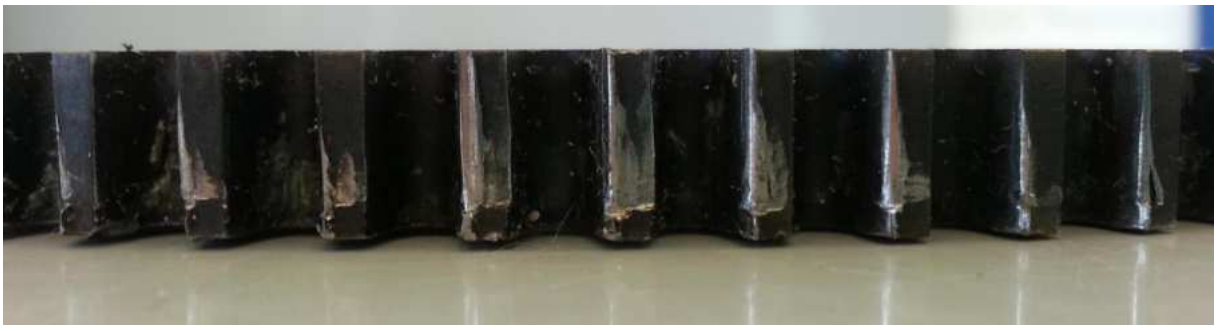
PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

1. Inspect wear pattern and gear mesh of Pre-Rotator upper engagement. If in doubt, contact AutoGyro Technical Support.
2. If the wear pattern is uneven (Figure 1), e.g. due to dynamic skew, the Pre-Rotator upper engagement / Bendix shaft must be repaired according to 63-11-30 8-2.
3. Inspect backlash of Pre-Rotator upper engagement. Backlash should be as tight as possible, but also wide enough to allow easy engagement of the pinion into the sprocket in any position.
4. If necessary, have backlash adjusted 62-31-00 5-1.
5. Grease with Silicone Grease Lagermeister WHS 2002.

ILLUSTRATIONS



63-11-30 8-1 REPLACEMENT: PRE-ROTATOR UPPER BEARINGS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

Loctite 2701 green (PN 30482

PRECAUTIONS AND SAFETY MEASURES

None

PROCEDURES

1. Remove bolts (1/9) and washers (2/8).
2. Remove bracket (3/7) and replace bearing as required.
3. Apply a thin layer of Loctite 243 blue on threads of bolts (1/9), install bolts with serrated washers (2/8) and torque-tighten bolts.
4. Perform 63-11-30 6-1 "INSPECTION: PRE-ROTATOR UPPER ENGAGEMENT”

PARTS LIST

Figure	Position	Description	PN	Remarks
1				
1	1	Rivet 4x12 A2	NPI	
1	2	Bearing 6200 ZZNR	20719	
1	3	Bracket pre-rotator top	NPI	
1	4	Bendix	20700	
1	5	M8x71 DIN 912 8x90	NPI	
1	6	U8	NPI	
1	7	M8 Si	NPI	
1	8	Bendix shaft long	31801	
1	9	Bearing 6202 ZZNR	20720	
1	10	Bracket pre-rotator bottom	NPI	
1	11	Safety washer M4	NPI	
1	12	Rivet 4x12 A2	NPI	

ILLUSTRATIONS

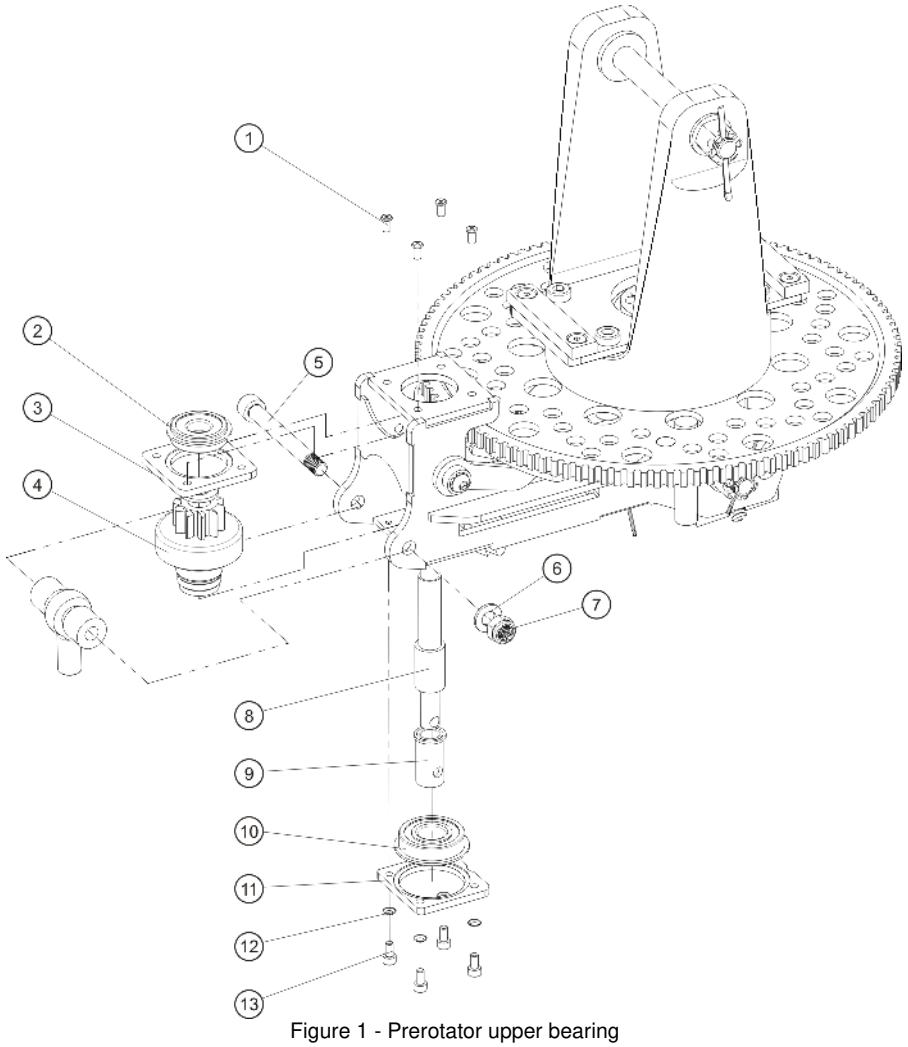


Figure 1 - Prerotator upper bearing

63-11-30 8-1 REPAIR: PRE-ROTATOR UPPER ENGAGEMENT

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 638 green (PN 30485)

PRECAUTIONS AND SAFETY MEASURES

None

PROCEDURES

NOTE: For removal, replacement or re-installation of bearings, refer to 63-11-30 8-1

1. Remove lower bearing and ensure that the shaft is, in free load condition, centrally positioned in the bearing seating. If free play in the upper bearing is present, the following must be carried out:
2. **Free play due to bearing abrasion:** Replace upper bearing and glue Bendix shaft with Loctite 638 green into the upper bearing. Re-assemble lower bearing.
3. **Free play due to abrasion of the Bendix shaft from ball bearing inner ring:** Glue Bendix shaft with Loctite 638 green into upper bearing. Re-assemble lower bearing. If free play is greater than 1/10 mm, then replace Bendix shaft with new part and glue new part with Loctite 638 green into upper bearing. Re-assemble lower bearing.
4. If in doubt or different cause of error suspected, contact AutoGyro Technical Support.

PARTS LIST

Figure	Position	Description	PN	Remarks
		Bearing 6200 ZZNR	20719	
		Bendix shaft long	31801	

63-51-00 8-1 REPLACEMENT: ROTOR BRAKE PADS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

IMPORTANT NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

IMPORTANT NOTE: Procedure involves handling and disposal of special materials. For your health and environmental aspects respect all applicable regulations!

PROCEDURES/DESCRIPTION

1. Unscrew and remove hexagon socket screws (Figure 1; 1) with washers (Figure 1; 2) of affected brake pad.
2. Replace integrated rotor brake pad assembly (3; 4) with new component.
3. Apply Loctite 243 (blue) on screws, re-install hexagon socket screws with washers and torque-tighten
4. After replacing the front pad, check that the head stops onto the pad before the stick reaches the forward limit stop. Adjust limit stop as required.

PARTS LIST

Figure	Position	Description	PN	Remarks
1	1	M5x8	NPI	
1	2	U5	NPI	
1	3	exchangeable brake pads short	43683	
1	4	Brake pad assembly III	36139	

ILLUSTRATIONS

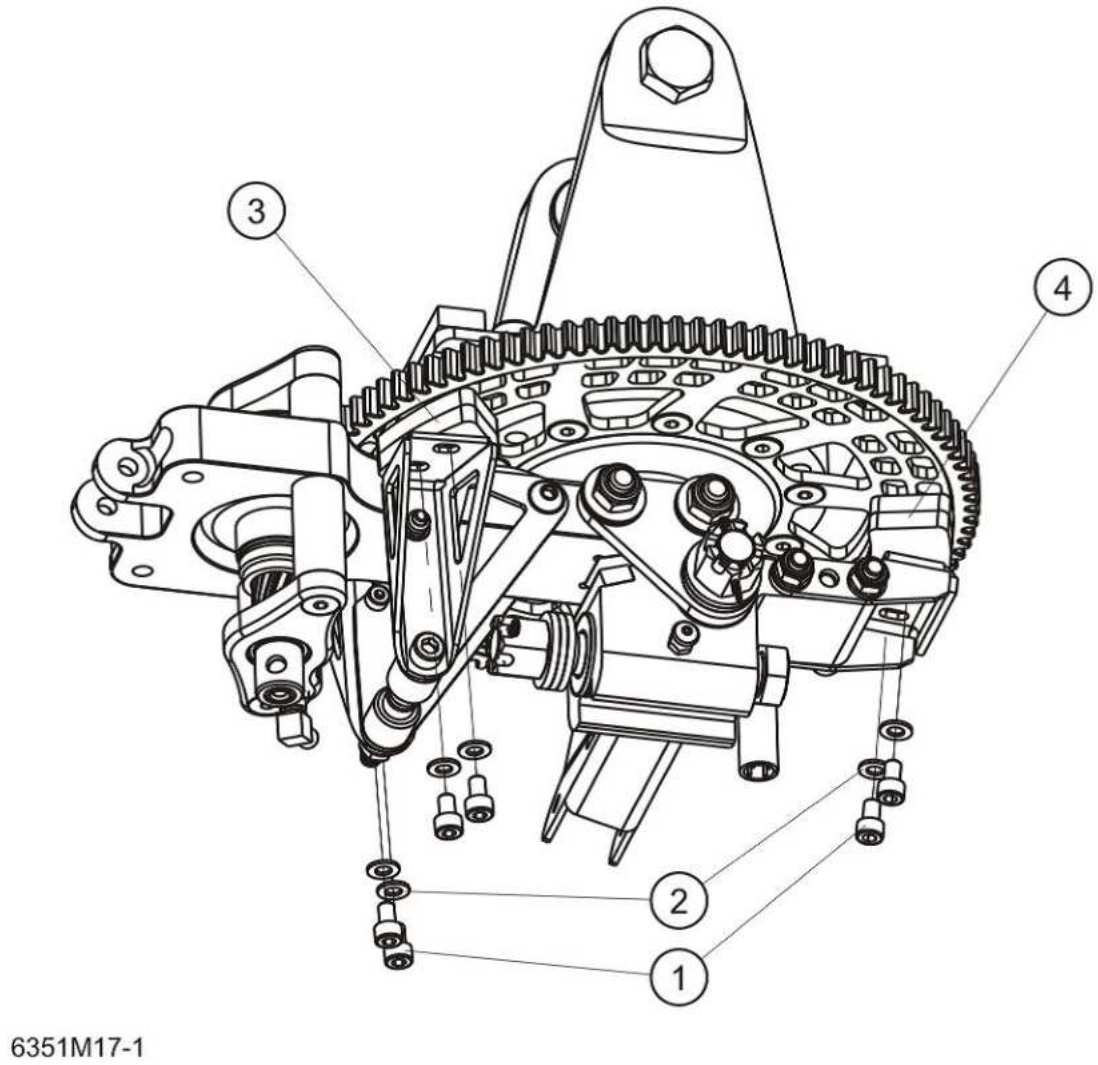


Figure 1 – Rotor Bridge with Brake Pad

67-00-00 6-1 INSPECTION: ROTOR FLIGHT CONTROL

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Work should be performed with the aid of a second briefed person!

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/DESCRIPTION

1. Pump up the rotor brake to its maximum.
2. Carefully move forward flight control stick forward and aft to determine free play. Touch each joint and assess relative motion of joint elements using tactile sense, if necessary with help of a second person.
3. A 5 mm free play, measured at the top end of the control stick, is considered within limits as long as the free play is only a result of equal play in the ball joints.

CAUTION: Control base link and ball bearing must be free of play!

4. If a ball joint exhibits above average play the respective ball joint must be replaced.
5. If control base link or ball bearings exhibit play, or the total play from the ball joints results in play more than 10 mm, measured at the control stick, affected components must be replaced.
6. Move forward and aft flight control stick relative to each other (push one forward while pulling the other one back, and vice versa). No play must be evident. If play is evident, investigate and replace component(s).

67-00-00 6-2 INSPECTION: FLIGHT CONTROL BASE LINK

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Rotor system must be removed, see 62-11-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

WARNING: Job includes work at critical flight controls. Duplicate inspection must be performed after completion!

PROCEDURES/ DESCRIPTION

NOTE: The procedure ensures necessary clearance of the flight control base link when flight control stick is in full aft position.

1. Switch pneumatic mode selector to FLIGHT and allow control stick to move to most aft position.
2. Make sure that gimbal head rests in its aft mechanical stops.
3. Disconnect upper ball joint of lower RH flight control rod from bell crank (see picture). Let gimbal head rest in aft mechanical stops while flight control stick is in full aft position, laterally centred.

   NOTE: The bar of the flight control base link now contacts the ball joint of base control unit.
4. The resulting offset must be between 6,5 mm (outer diameter of spacer aligns with bore centre of bell crank) and 9,5 mm (spacer barely visible through bore in bell crank). Adjust and secure control rod, if necessary. Torque-tighten with 25 Nm.
5. Re-connect ball joint to bell crank and secure.
6. Perform duplicate inspection and functional check.
7. After completion, switch pneumatic mode selector to BRAKE and apply brake pressure.

ILLUSTRATIONS

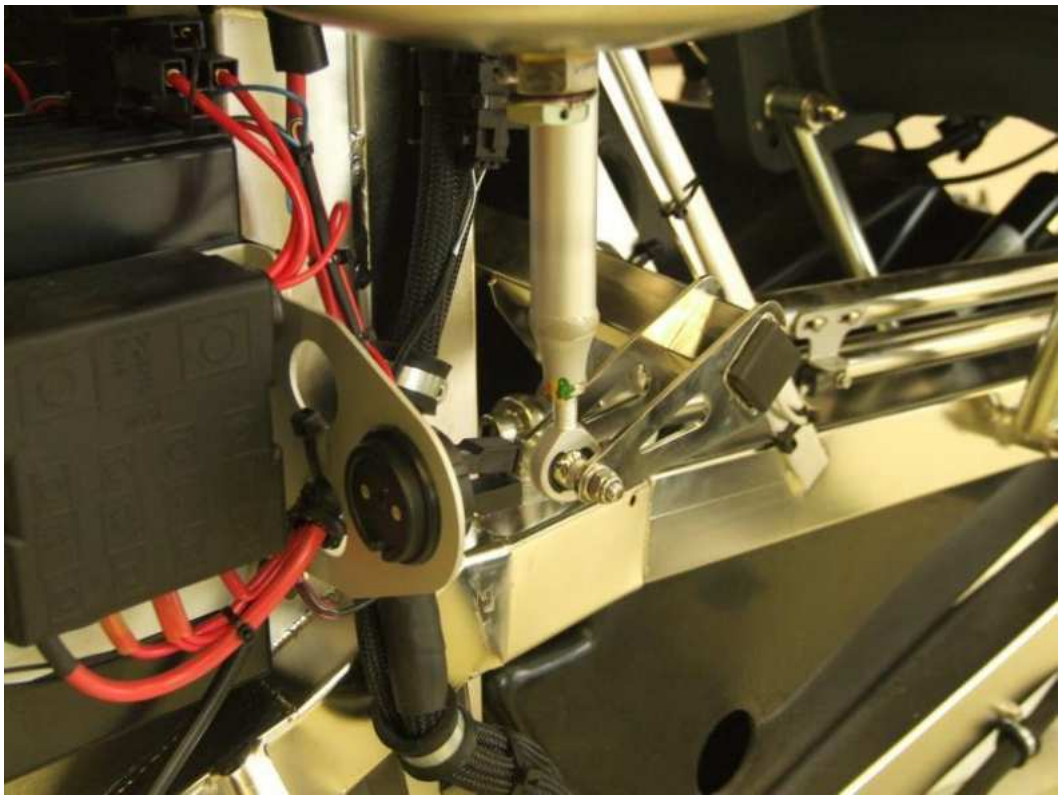


Figure 1 – Clearance in Flight Control Base Link

Figure 2 - Connection of upper ball joint of lower RH flight control rod with bell crank(step3/5)

Figure 3 – Offset Measurement

67-05-00 8-1 REPLACEMENT: PITCH TRIM/BRAKE PNEUMATIC SEAL

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Gyroplane must be placed on level ground and restrained (blocks, chocks)

Mast cover must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

Loctite 243 blue (PN 30483)

IMPORTANT NOTE: Procedure involves spare parts. Check parts list below for ordering details of affected components!

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES

1. Install rotor lash bag to support rotor system.
2. Switch pneumatic mode selector to FLIGHT and release trim pressure completely. If necessary, switch repeatedly!
3. Disconnect ball joint from rotor brake link plate.
4. Disconnect rod end from ball joint (Figure 1).
5. Remove circlip / snap ring with appropriate tool (Figure 2).
6. Tilt pneumatic cylinder to the side and move out piston completely. In order to do so, switch pneumatic mode selector to BRAKE and apply brake pressure.

NOTE: The servo-valve requires a certain system pressure to switch-over to BRAKE mode. If brake pressure is not built-up during compressor activation, switch to FLIGHT, run the compressor (trim AFT) for some seconds and switch-over to BRAKE mode with the compressor engaged.

7. Remove old seal ring and discard. Install new seal ring using the special grease provided in the package (Figure 3).
8. Retract piston and re-assemble pneumatic cylinder. Re-install circlip / snap ring.
9. Apply Loctite 243 blue on threads, install ball head and tighten.
10. Re-connect ball joint with rotor brake link plate (Figure 4).

PARTS LIST

Figure	Position	Description	PN	Remarks
		Pneumatic cylinder brake/trim repair kit	32926	

ILLUSTRATIONS

Figure 1 - Disconnect rod end from ball joint

Figure 2 - Remove circlip / snap rind

Figure 3 - New seal rind installed with special grease

Figure 4 - Re-connect ball joint and upper cardan hinge

71-20-00 8-1 REPLACEMENT: ENGINE MOUNT BUSHINGS

GENERAL, REFERENCES AND REQUIREMENTS

Task may only be performed by an organization or individual trained and entitled to carry out 'Professional Maintenance'!

Secure gyroplane against unauthorized or unintended operation!

Battery must be removed, see 24-30-00 4-1

Fuselage fairing must be removed, see 52-00-00 4-1

SPECIAL TOOLS AND CONSUMABLE MATERIALS

None

PRECAUTIONS AND SAFETY MEASURES

Gyroplane must be placed on level ground and restrained (blocks, chocks)

PROCEDURES/ DESCRIPTION

1. Use a crane to lift the engine. Mount the screw shekels and chains to the lifting points as shown.
2. Start with lower mounting bushings and replace engine mounting bushings one by one.
3. Check correct alignment of bushing prior torqueing.
4. After the engine is mounted check the engine for correct alignment to the body.

NOTE: For the 915iS/916iS. There are different engine mounts build by Rotax. Rotax has factory fitted a nut to the turbocharger plate. AutoGyro now use Nord-Lock washer in combination with this nut. This washer is only required for Rotax 915 iS / 916 iS engines with a fixed nut. Otherwise, the all-metal nut is used as before. Observe modified tightening torque 56 Nm. (Figure 3)

PARTS LIST

Figure	Position	Description	PN	Remarks
2		Engine Mount Set 65 Shore HNBR	48114	
4	1	Nord Lock Washer	48272	

ILLUSTRATIONS

Figure 1 – Lifting points Rotax 915 / 916 engines

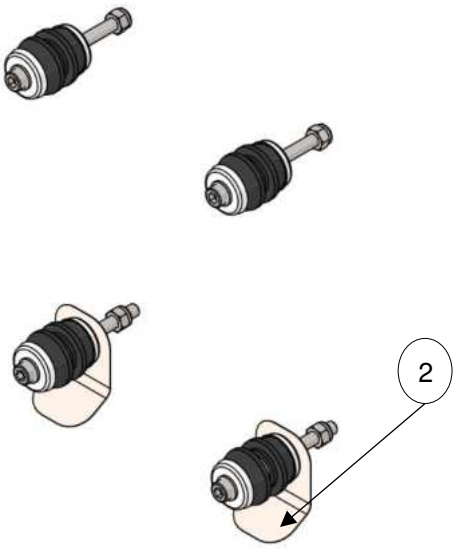


Figure 2 – Engine Mounting Set 48114

Figure 3 – 915 / 916 version with fixed nut

Figure 4 – Nord Lock washer

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