StingSport

AIRCRAFT MAINTENANCE MANUAL

31 DEC 05

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Dear StingSport Owner:

Congratulations on the purchase of your StingSport! You will find your new TL Ultralight aircraft very enjoyable, extremely economical, and easy to maintain. The StingSport is the ideal Light Sport Airplane. It is fast, economical, pleasing to the eye, and user friendly. We at TL Ultralight Sport Aircraft are certain that your StingSport will give you hours and hours of leisure flying and enjoyment. With this Aircraft Maintenance Manual (AMM), we hope to help inform you about the support and operation of your aircraft. Should there be any questions or errors found in your reading this manual please contact us immediately and we will issue a clarification.

Thank you again for your business. We look forward to a continuing satisfied customer relationship. Feel free to contact us if you have any questions or comments regarding your StingSport.

Fly safe! Fly fun!

(sig)
Jiri Tlusty

TL Ultralight, sro
Letiště, Budova 84
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Czech Republic

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SECTION INDEX

NOTES, CAUTIONS, AND WARNINGS

Throughout this manual, small boxes are inserted reading **Note, Caution**, or **Warning.** These are items which require particularly close attention for special conditions or procedures.

NOTE

This text box emphasizes specific operating conditions, steps in a procedure, helpful hints or useful advice.

CAUTION

This text box represents danger to equipment or operation. By not observing the cautions, the result could be the destruction of equipment and possibly personal danger and injury.

WARNING

This text box represents a hazardous situation. Warnings are used to call attention to operating procedures or conditions which, if not strictly observed, may result in personal injury or death.

Every owner, pilot, operator, or maintainer of the StingSport should become familiar with the entire text of this Aircraft Maintenance Manual (AMM) It also incorporates *only* some references from Rotax®, the engine manufacturer, Woodcomp®, the propeller supplier, and Galaxy®, the installed aircraft parachute system. Please refer to the latest edition of those manufacturer manuals for specific and complete detailed maintenance procedures of each aircraft system.

CAUTION

The StingSport is intended for sport and recreational purposes only. This aircraft meets the standard specification Design and Performance (D&P) established by the American Society for Testing and Materials (ASTM) Document F 2245-04, and it is therefore restricted by that guideline. The aircraft does not comply with any FAA Part 22, or 23 certification processes. Compliance with regulations placed upon the airplane category should be strictly adhered to by the owner and any operator

NOTE

This AMM is valid only if the user complies with any changes that may be issued at a later date. Any pages affected by a change should be removed and replaced with the effective pages immediately.

If this manual is found not to be current, revisions missing or pages removed contact our USA Customer Service location for replacements.

TL Ultralight, sro
Customer Service
10401 West Markham Street
Little Rock, AR 72205

Phone: 501.228.7777
Fax: 501.227.8888

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List of changes

Nr.	Date	Revised Pages	Type of Revision	Posted By
0	1 May 2005	None	Original Issue	
1	31 Dec-05	All	Re-issue - All Pages	

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SECTION 1
GENERAL INFORMATION

INTRODUCTION
Section 1 contains general information regarding manual organization, descriptive data, abbreviations, the Master Equipment List, 'feed-back' forms for the aircraft and this manual as well as current warranty information.

This manual is written to conform to the ASTM F2483-05, Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft. Maintenance and operation of major components, engine, emergency parachute system, propeller, avionics or other installed equipment is provided in the appropriate manufacturer manuals which are included with the aircraft. Any conflicts in this manual should be superseded by the appropriate manufacturer's manual.

Scope
This document defines the content and structure of the maintenance manual for the TL Ultralight, sro StingSport aircraft and its components while operated as light sport aircraft. It also establishes guidelines for the qualifications to accomplish the various levels of maintenance on U.S. certificated StingSport Special (SLSA) Light Sport Aircraft.

Safety
TL Ultralight, sro can not address all of the safety concerns associated with the use of this document. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of any regulatory limitations prior to use.

Referenced Documents
ASTM Standards:
F 2245 Specification for Design and Performance of a Light Sport Airplane
F 2295 Practice for Continued Operational Safety Monitoring of a Light Sport Airplane
Federal Standards:
14 CFR Part 21.190 Issue of a Special Airworthiness Certificate for a Light-Sport Category Aircraft
14 CFR Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration
14 CFR Part 65 Certification: Airmen Other Than Flight Crewmembers

Definitions:

14 CFR—Code of Federal Regulations Title 14 Aeronautics and Space also know as the “FARs” or Federal Aviation Regulations.

100-hour inspection—same as an *annual condition inspection*, except the interval of inspection is 100 hours of operation instead of 12 calendar months. This inspection is utilized when an LSA aircraft is being used for commercial operations such as flight instruction or rental, or both.

Alteration—any change to the airframe or aircraft component part after the initial design and production acceptance testing by TL Ultralight, sro to the applicable ASTM standards that is not described in the TL Ultralight, sro maintenance manual.

Annual condition inspection—detailed inspection accomplished once a year on an LSA aircraft in accordance with instructions provided in the maintenance manual. The purpose of the inspection is to look for any wear, corrosion, damage or conditions of use that would cause an aircraft to not be in a condition for safe operation.

A&P—airframe and power plant mechanic as defined by 14 CFR Part 65.

FAA—United States Federal Aviation Administration.

Heavy maintenance—any maintenance, inspection, or repair, that TL Ultralight, sro has designated that requires specialized training, equipment, or facilities.

Line maintenance—any repair, maintenance, scheduled checks, servicing, inspections not considered heavy maintenance that is approved by TL Ultralight, sro and is specified in the TL Ultralight, sro maintenance manual.

LSA (light sport aircraft)—aircraft designed in accordance with ASTM standards under the jurisdiction of Committee F37 Light Sport Aircraft.

LSA repairman inspection—U.S. FAA-certificated repairman (light sport aircraft) with an inspection rating as defined by 14 CFR Part 65, authorized to perform the annual condition inspection on experimental light sport aircraft, or an equivalent rating issued by other civil aviation authorities. Experimental LSA aircraft do not require the individual performing maintenance to hold any FAA airman certificate in the U.S.

LSA repairman maintenance—U.S. FAA-certificated repairman (light sport aircraft) with a maintenance rating as defined by 14 CFR Part 65, authorized to perform line maintenance on aircraft certificated as special LSA aircraft. Authorized to perform the annual condition/100-h inspection on an LSA, or an equivalent rating issued by other civil aviation authorities.

Maintenance manual—manual provided by an TL Ultralight, sro that specifies all maintenance or repairs authorized by TL Ultralight, sro.

Major repair or maintenance—any repair or maintenance for which instructions to complete the task are excluded from the maintenance manual supplied to the consumer are considered major.

Manufacturer—any entity engaged in the production of an LSA or component used on an LSA.

Minor repair or maintenance—any repair or maintenance for which instructions are provided in the TL Ultralight, sro maintenance manual is considered minor.

Modification—any change to the airframe or aircraft component part after the initial design and production acceptance testing by TL Ultralight, sro to the applicable ASTM standards that is not described in the TL Ultralight, sro maintenance manual.

Overhaul—maintenance, inspection, or repair that is only to be accomplished by the TL Ultralight, sro or a facility approved by the original manufacturer of the product.

Overhaul facility—facility specifically authorized by the FAA or TL Ultralight, sro or component manufacturer to overhaul the product originally produced by that manufacturer.

Repair facility—facility specifically authorized by the FAA or TL Ultralight, sro or component manufacturer to repair the product originally produced by that manufacturer.

Aircraft Maintenance Manual

Format—This maintenance manual has the following sections:

0 Introduction— TL Ultralight introduction, section index, revision listing.
1 General—Listings of general specifications, capacities, abbreviations, task directives, Master Equipment Lists, feedback and warranty forms.
2 *Inspections*—General daily service, weight & balance, Instructions on and checklists for the completion of the 25 hour periodic and annual condition/100-hour inspections, as appropriate and parts lists.
3 Structures—A description of aircraft structures, subsystems and instructions for assembly, detailed parts and assembly drawings.

4 ***Engine***—A description of and instruction for the maintenance of the aircraft's engine.
5 ***Fuel System***—A description of the system, schematic diagram, and instructions for the maintenance and repair of the aircraft fuel system.
6 ***Propeller***—A description of and instructions for the maintenance of the propeller.
7 ***Systems***—A description of the systems and instructions for the maintenance and repair of various subsystems.
8 ***Instruments and Avionics***—A description of and instructions for the maintenance, testing, replacement of instruments and avionics.
9 ***Electrical System***—A description of the system, schematic diagram, and instructions on locations circuits and repair.
0 ***Painting and Coatings***—A description for the repair of small damages, aircraft graphics and paint materials.

Maintenance and Repair

Inspection or Repair, —Each of the inspections or repairs outlined in the maintenance manual specifically list:
(1) Recommended special tools to accomplish the task, if any
(2) The parts needed to perform the task, if any
(3) Type of maintenance, line (**L**), heavy (**H**), or overhaul (**OV**)
(4) The level of certification needed to accomplish the task, owner (**O**), (light sport aircraft) inspection (**RI**), (light sport aircraft) repairman (**RM**), FAA approved A&P (**A&P**), FAA or TL Ultralight repair station,
(5) Detailed instructions and diagrams if needed to perform the task, and
(6) Confirmation by signature to verify the task was accomplished properly.

Repairs and Alterations—TL Ultralight, sro may refer to other repair and alteration manuals such as the FAA's AC for the detailed instructions to accomplish tasks outlined in the maintenance manual.

Level of Certification—When listing the level of certification needed to perform a task, TL Ultralight, sro shall use one of the following descriptors.

*Owner (**O**)*—Items that can be expected to be completed by a responsible owner who holds a pilot certificate but who has not received any specific authorized training. FAA regulations authorize SLSA aircraft owners who hold at least a sport pilot certificate to perform maintenance as outlined in 14 CFR Part 43.

*LSA Repairman Inspection (**RI**)*—Items that can be expected to be completed on an ELSA by a responsible owner, which holds an FAA repairman certificate (light sport aircraft), with an inspection rating or equivalent.

*LSA Repairman Maintenance (**RM**)*—Items that can be expected to be completed on a SLSA by a responsible individual, which holds a FAA repairman certificate (light sport aircraft), with a maintenance rating or equivalent.

*A&P (**A&P**)*—Items that can be expected to be completed by a responsible individual who holds an FAA mechanic certificate with airframe or power plant ratings, or both, or equivalent.

Task Specified—Items that can be expected to be completed by a responsible individual who holds either a mechanic certificate or a repairman certificate and has received task specific training to perform the task.

Therefore the symbol (**O**) indicates a maintenance function that can be performed by an owner or higher skilled level. The symbol (**A&P**) indicates maintenance to be performed by an A&P or a repair station. Indicated at each task by the designation(s) that remain in the following; (**L**,**H**,**OV/O**-**RI**-**RM**-**A&P**)

Task Not Specified—The aircraft is to be maintained, serviced and repaired in accordance with this manual and the equivalent maintenance manual provided by the manufacturer of all other components not manufactured by TL Ultralight, sro. In the absence of specific instructions for a repair in one of the above mentioned maintenance manuals, and where such repairs are not restricted by these manuals or listed as **Overhaul, Alteration, Modification or Major Repair,** such repairs may be completed by an FAA qualified A&P mechanic. Such repairs must be coordinated with the TL Ultralight U. S, Field Technical Director, in accordance with standard maintenance practice described by FAA Advisory Circular 43.13 and use all available resources including exploded parts views for guidance.

Line Maintenance and Repairs

Authorization to Perform—The holder of an LSA repairman certificate with either an inspection or maintenance rating is generally considered the minimum level of certification to perform line maintenance of TL Ultralight LSA aircraft. The examples listed below are not considered as restrictions against the performance of such tasks by an owner who is authorized to perform said task by the FAA.

Typical Tasks Considered as Line Maintenance Include:

1. 100-hour inspection,
2. Annual condition inspection,
3. Servicing of fluids,
4. Removal and replacement of components for which instructions are provided in the maintenance manual.
5. Repair of components and structure for which instructions are provided in the maintenance manual and which do not require additional specialized training.

6. Compliance with a TL Ultralight, sro service directive when the repairman is listed as an authorized person to accomplish the work described.

Heavy Maintenance and Repairs
Authorization to Perform—The holder of an FAA mechanic certificate with airframe or power plant rating(s), or both, or an LSA Repairman maintenance that has received additional task specific training for the function to be performed is generally considered the minimum level of certification to perform heavy maintenance of TL Ultralight, sro LSA aircraft.

Typical Tasks Considered as Heavy Maintenance include:
Removal and replacement of components for which instructions are provided in the maintenance manual or service directive instructions, such as:

1. Complete engine removal and reinstallation in support of an engine overhaul or to install a new engine,
2. Remove and replacement of engine cylinders, pistons, or valve assemblies, or a combination thereof,
3. Primary flight control cables/components,
4. Landing gear assemblies.
5. Repair of components for which instructions are provided in the maintenance manual or service directive instructions,
6. Structural repairs of components or aircraft structure, or both, for which instructions are provided in the maintenance manual or service directive instructions.

Overhaul
Authorization to Perform—Only TL Ultralight, sro or the component to be overhauled on an LSA may perform or authorize to be performed the overhaul of an LSA component. In the U.S., no FAA certification is required to be an LSA approved overhaul facility.

Overhaul Manual—A separate overhaul manual in addition to the TL Ultralight, sro maintenance manual is required to perform the overhaul of an LSA aircraft or LSA aircraft component.
Typical components that are overhauled include:

1. Engines,
2. Carburetors/fuel systems,
3. Starters/alternators/generators,
4. Instruments,
5. Propellers
6. Ballistic parachute systems.

Alteration, Modification or Major Repair
Any alteration, modification or major repair made to TL Ultralight, sro aircraft after the initial design and production acceptance testing to applicable ASTM standards, initial airworthiness inspection and sale to a consumer must be evaluated by TL Ultralight relative to the requirements of the applicable ASTM design and production acceptance specification(s) as well as the aerodynamic, structural, electrical, or flight safety conditions.

No changes may be made to any TL Ultralight, sro aircraft without prior written approval of TL Ultralight, sro. Any changes made without TL Ultralight, sro written approval will void the aircraft airworthiness certificate.

TL Ultralight, sro may authorize another TL Ultralight, sro approved entity to perform the evaluation of an alteration, modification or major repair who shall provide a written affidavit that the aircraft being altered will still meet the requirements of the applicable ASTM design and performance specification after the alteration.

TL Ultralight, sro or another TL Ultralight approved entity that performs the evaluation shall provide written instructions and diagrams on how, who, and the level of certification needed to perform the alteration, modification or major repair.

The instructions must be approved by TL Ultralight, sro and must include ground and flight testing that complies with the original ASTM production acceptance testing standard, as appropriate, to verify the alteration, modification or major repair was performed correctly and the aircraft is in a condition for safe operation.

TL Ultralight, sro or another TL Ultralight approved entity that performs the evaluation shall provide information to the owner of the aircraft for the documentation of the alteration, modification or major repair in the aircraft's records.

Task-Specific Training
TL Ultralight, sro may require type-specific training in order to accomplish a task in either the maintenance manual or in an authorization for a major repair, maintenance, or alteration. The FAA does not give approval to these task-specific training programs for SLSA. TL Ultralight, sro may specify any task-specific training it determines is appropriate to accomplish a task.
Examples of task-specific training include:

1. Engine manufacturer heavy maintenance or overhaul school, or both,
2. Instrument installation or repair course
3. Parachute manufacturer repair course
4. Aircraft manufacturer course.

Safety Directives
An SLSA aircraft may have a Safety Directive issued against an aircraft or component part by the manufacturer. TL Ultralight, sro will issue any directive as outlined in the applicable ASTM continued airworthiness specification.

SLSA and components installed on SLSA's do not have Airworthiness Directives issued against them. If an AD is issued against a type-certificated product that may be incorporated into special light sport aircraft, TL Ultralight, sro will issue a safety directive in accordance with Document F 2295 41 to provide instruction on how to address the safety defect outlined in the AD on the specific SLSA.

TL Ultralight, sro will provide applicable instructions to comply with any safety directive, which will include:

1. A list of the tools needed to accomplish the task,
2. A list of the parts needed to perform the task,
3. Type of maintenance, line, heavy, overhaul,
4. Certification level needed to accomplish the task, RI, RM, A&P.
5. Detailed instructions and diagrams as needed to perform the task,
6. Method to test/inspect to verify the task was accomplished properly.
7. Service directives are considered mandatory tasks in order to maintain a condition of safe operation and compliance with the applicable original ASTM design specification. Service directives are not considered mandatory for experimental LSA's in the United States.

Three View Drawings

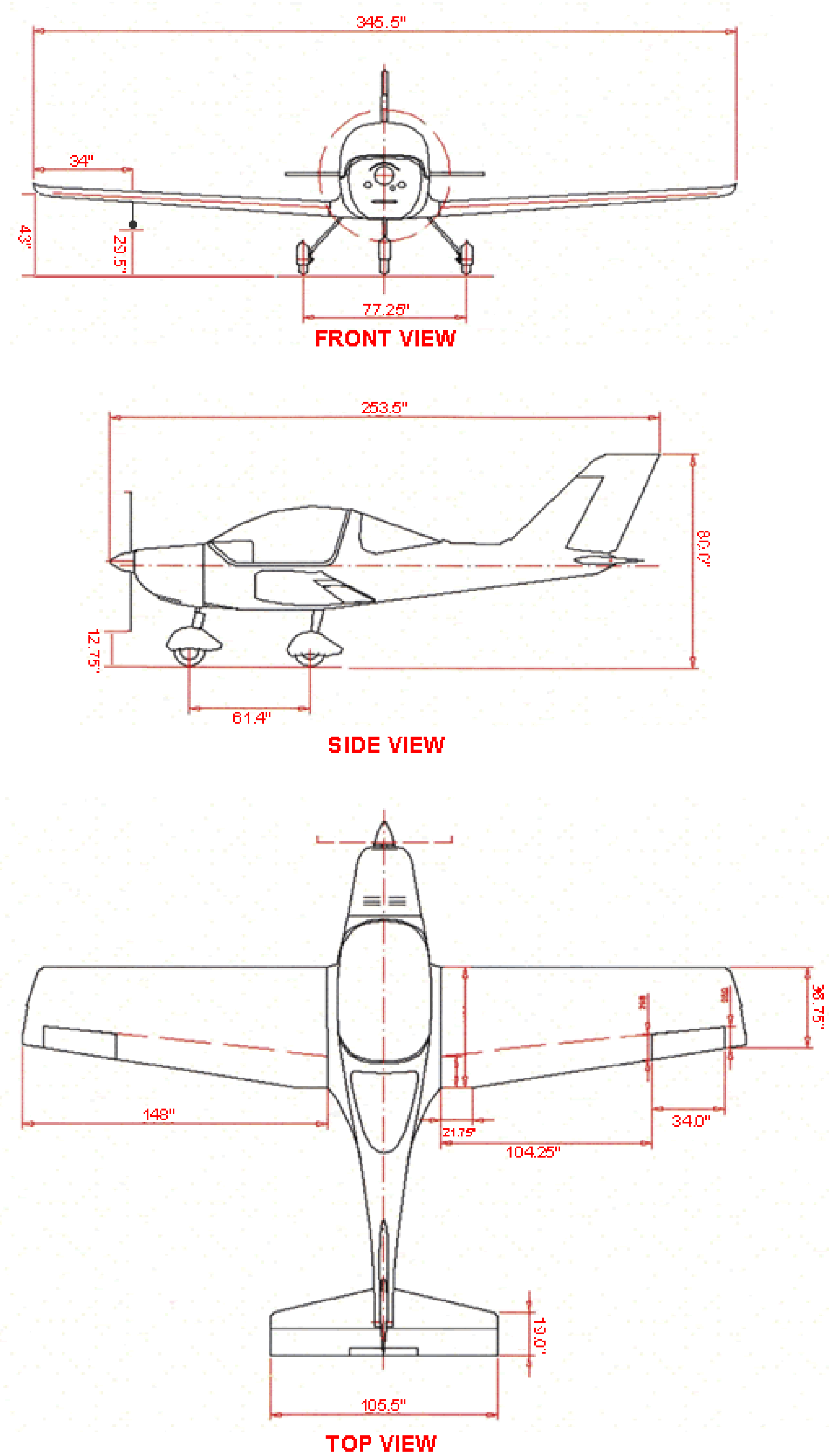

Figure 1.1 Aircraft Multi-Views

DESCRIPTIVE DATA

AIRCRAFT

The StingSport is a full three axis, low wing; two place side-by-side seating, tricycle landing gear aircraft with a steerable nose wheel. The primary aircraft structure is carbon fiber and fiberglass UV resistant reinforced laminate with an inner foam core creating a 'sandwich' layered construction between each ply.

Various options are available such as the Rotax 912ULS, tinted canopies, wing fuel tanks and other avionics or interior selections. Therefore your aircraft may vary from the descriptions in this manual. Please check with your local dealer if you have any specific questions not addressed here.

ENGINE

Number of Engines: 1
Engine Manufacturer: Rotax® G.m.b.H. Aircraft Engines
Standard Engine Model Number: 912 UL
Optional Engine Model Number: 912 ULS
Engine Type: Normally-aspirated, liquid/air-cooled, dry sump, gear-reduced drive, dual carburetor-equipped, four-cylinder, four-stroke, electronic dual ignition, horizontally-opposed engine with 73.91 cu.in. displacement
Horsepower Rating and Engine Speed: 912UL: 80 BHP at 5800 RPM
Horsepower Rating and Engine Speed: 912ULS: 100 BHP at 5800 RPM

PROPELLER

Propeller Manufacturer: Woodcomp® Propellers, SRO
Propeller Model Number: SR 200
Number of Blades: 3
Propeller Diameter: 63 In
Propeller Type: Fixed-pitch, ground-adjustable
Blade Pitch:
Lowest Possible Angle Setting: 16°
Best Climb Angle Setting: 17°
Maximum Cruise Setting: 21.5°
Highest possible Angle Setting: 26°

GALAXY ROCKET PARACHUTE SYSTEM

The rocket deployed emergency parachute system is standard equipment. It is activated inside the cockpit by pulling a red "T" handle located on the overhead roll bar above and between the crew positions. The system is secured by an embroidered red tag attached to a brass safety pin. Refer to the Galaxy operational manual included with the aircraft for detailed maintenance information.

BASIC DIMENSIONS

Length...20 ft. 4 in.
Cabin width ....44 in.
Wing Span ....28 ft. 3 in.
Height ....6 ft. 4 in.

Areas

Wing...121.4 ft^2
Flap..18.6 ft^2
Aspect ratio...7.26
Glide ratio 12:1

FUEL

Approved Fuel Grade: 92 Unleaded Automobile Fuel, “Auto gas” (Yellow)
Approved *Alternate* Fuel Grade: 100LL Aviation Fuel, “Avgas” (Blue)

CAUTION

100LL Avgas is only to be used as an **alternate fuel type** if 92 octane unleaded auto fuel is not available. Due to the high lead content, the use of 100LL Avgas is restricted to less than 30% of engine time. See the latest Rotax engine operational supplement for more detailed fuel specifications and information.

Total Fuel Capacity: 20.5 US Gallons

WARNING

During refueling, the main fuel tank can be filled with approximately 22.2 gallons of fuel. This will eliminate all fuel expansion area and will cause a fire hazard as the fuel expands, is forced out of the fuel vent line and spills on to the parking area.

Total Unusable Fuel: Main tank: 1.7 Gallons
Wing tank (if installed): .3 Gallons

NOTE

Total unusable fuel is the minimum amount of fuel an aircraft may have in its gas tank before engine fuel starvation. Unusable fuel, as its name implies, can not be consumed by the engine for power and thus cannot be relied upon for flight, but is included in the aircraft empty weight.

OIL

Oil Capacity: 3.7 Quarts
Oil Grades: Vary depending on the engine operation and may vary from one aircraft to another depending on the operator. Refer to the Rotax Service Bulletins for the correct oil for your conditions of use.
Oil Filter: Rotax part number 825 701, **no substitutions allowed.**

AIRPLANE WEIGHTS

Maximum Ramp Weight: 1320 Lbs
Standard Empty Weight: 780 Lbs
Maximum Useful Load: 540 Lbs
Maximum Takeoff or Landing Weight: 1320 Lbs
Baggage Weight: Total of 60 Lbs.

NOTE

Each baggage compartment can hold a maximum of 20 Lbs. An additional 20 Lbs may be loaded on the surface of deck aft of the seats if properly secured against an abrupt movement. A total of 40 lbs of baggage weight is used as a basis for most CG calculations.

WARNING

Do not allow baggage to block the exit area of the aircraft parachute system nor hinder free deployment of the four parachute riser cables. After securing baggage, assure that each shoulder harness is attached and operational.

MAXIMUM DEMONSTRATED CROSSWIND VELOCITY

Maximum Demonstrated Crosswind Velocity: 17 Knots

ABBREVIATIONS, AND TERMINOLOGY

ABBREVIATIONS

100LL – 100 Octane Low Lead Aviation Fuel (Avgas) (Rotax = 30% max AvGas)
A – Amps, Electrical Amperage
ADI – Solid state gyro **A**ttitude and **D**irectional **I**ndicator
AGL – Above ground level
AMP – Amps, Electrical Amperage
AOI – Aircraft Operating Instructions (In LSA terms AOI = POH)
AOA – Angle of Attack, relative angle of the wind to an airfoil
ASAP – As Soon As Possible
ASTM – ASTM International (Old -American Society of Testing and Materials)
ATC – Air Traffic Control (Center)
AUX – Auxiliary
Auto Gas – Automobile fuel, 92 Octane is min auto gas rating for Rotax engines
Avgas – 100 Octane Low Lead Aviation Fuel (100LL) (Max 30% use in Rotax)

Big Angle – Large AOA of the Propeller blade in relation to the air stream
BHP – Brake Horse Power

CAS—Calibrated airspeed
CB – Circuit Breaker
CBS – Circuit Breaker Switch
CFIT – Controlled Flight Into Terrain
CK - Check, Checked
Code – Transponder Squawk
Com, Com1 – VHF radio
CSP – Constant speed propeller, (not used in LSA)
CG – Center of Gravity
Cu-In, (Cu.In.), CI – Cubic Inch(s)

D&P – Design and Performance (ASTM) Standards
Datum – Location base for measurement(s)
DC – Direct Current
DOT – (US) Department of Transportation

EIS – Engine Information System
EFIS – Electronic Flight Information System
ETA – Estimated time of arrival
EWGG - Empty weight center of gravity

FAA – Federal Aviation Agency
FG - Fuel Gauge

FSDO – Flight Standards Service District Office (FAA)
FPM – Feet Per Minute
Ft – Foot (Feet)
Full – (Landing flap setting) Second (full) extended Flap Setting (30 degrees)

G, g, Gs – Acceleration due to gravity
GAL, Gal. – Gallon(s)
GPH – Gallons per hour
GPS – Global Positioning System
GRS – Galaxy Rescue System (rocket parachute system)

Half – (Takeoff flap setting) First extended Flap Setting (15 degrees)
HOBBS - Engine hour meter
HP, Hp – Horse Power

IFR – Instrument Flight Rules
IMC – Instrument Meteorological Conditions
In – Inch(s)

K – Kilogram
Kt – Knot, nautical mile

LB(S) Lb(s) – Pound(s)
LL – Low Lead, as in 100LL
LSA – Light Sport Aircraft
LSP – Light Sport Plane

MAC – Mean Aerodynamic Chord
Max – Maximum
MC – Magnetic course
MIDO – Manufacturing Inspection District Office (FAA)
Min – Minimum
MoGas – Low octane (83) ‘motor gas’, ***not*** approved for Rotax engine operation
MPH – Miles per hour
MPG – Miles per gallon

NE – Never Exceed
NM – Nautical Mile(s)
MODE C – Altitude data transmitted to ATC by the XPDR

POH – Pilot Operating Handbook (Not used in LSA)
PIM – Pilot Information Manual (No longer used in LSA)
PSI – Pounds per Square Inch

RPM – Revolutions per Minute

Small Angle – Small AOA of a Propeller blade in relation to the air stream
Stage1 – (Takeoff flap setting - Half) First extended Flap Setting (15 degrees)
Stage2 – (Landing flap setting - Full) Second (full) extended Flap Setting (30 degrees)

T&B – Turn and bank indicator
Tach – Tachometer
TC – Turn Coordinator

V – Volt(s)
VDC – Volts Direct Current
VFR – Visual Flight Rules
VHF – Very High Frequency
VMC – Visual Meteorological Conditions
VSI – Vertical Speed Indicator
VVI – Vertical Velocity Indicator

WgWg – Wig Wag light flashing system

XPDR – Transponder

END ABV

AIRCRAFT AND ENGINE APPROVED EQUIPMENT

Changes and additions to this master equipment list will be issued as structural, dynamic, electrical, loading, weight/balance, and system component performance testing and analysis is completed.

Manufacturers are encouraged to submit requests to the U. S. Field Technical Director for additions to the equipment list. Such requests must explain proposed benefits to our customers, documentation of all aspects of the item under consideration, samples and anticipated effect on existing components/systems, as well as with a written program describing the methods of both ground and flight testing necessary for approval.

TL Ultralight must remain and retain the approval authority of any items installed in the TL2000 series aircraft. Therefore the following master list of equipment must be enforced as the only approved items for installation on the aircraft without further authority. No substitutions are allowed without a proper testing program previously approved under the written authority of TL Ultralight, sro or the U. S. Field Technical Director.

TL 2000 *StingSport* Master Equipment List

Airframe and Engine

Item Description	**Manufacturer**	**Model**	**S/O**
Engine	Rotax	912UL	S
Engine	Rotax	912	O
Engine	Rotax	912ULS	O
Engine	Rotax	912S	O
Engine Oil Filter	Rotax (*No Substitutes!)*	825-701	S
Engine Oil Drain Valve	TL Ultralight	12MM-1.75T	O
Engine Air Filter	K&N	SP2704	O
Engine Air Filter	K&N	SP2706	O
Engine Air Filter	K&N	RU2760	O
Engine Hour Meter	Hobbs	85000	O
Engine Hour Meter Sensor	TL Ultralight	N/A	O
Radiator	TL Ultralight	N/A	S
Oil cooler	TL Ultralight	N/A	S
Oil thermostat	TL Ultralight	N/A	O
Carburetor Drip pans	TL Ultralight	N/A	O
Carburetor Brackets	TL Ultralight	N/A	O
Carburetor Heating System	TL Ultralight	N/A	O
Auxiliary Fuel Pump	Facet	40105	O
Auxiliary Electrical System	TL Ultralight	N/A	O
Propeller	Woodcomp	SR200	O
Propeller	Woodcomp	SR117	S
Parachute System	Galaxy	LSA	S
Cabin Heating	TL Ultralight	N/A	O
Wheel Rims/Tires/Tubes	TL Ultralight	N/A	S
Wheel Pants	TL Ultralight	N/A	O
Landing/Taxi Light	TL Ultralight	Incandescent	O
Landing/Taxi Light	TL Ultralight	Halogen	O
Strobe Lights	TL Ultralight	Dual	O
Strobe Lights	Kuntzleman	Dual	O
Strobe Lights	Kuntzleman	Triple	O
Navigation Lights	TL Ultralight	Incandescent	O
Navigation Lights	TL Ultralight	LED	O
Navigation Lights	Kuntzleman	LED	O
Cabin Light	TL Ultralight	LED	O
Cabin Lock	TL Ultralight	N/A	S
Towing Bar	TL Ultralight	N/A	S
Co-Pilot Toe Brake System	TL Ultralight	N/A	O
Brake Shoes	TL Ultralight	N/A	S
Parking Brake	TL Ultralight	N/A	O
Fatigue Meter	TL Elektronic	TL-4324	O
Aerial Towing System	TL Ultralight	N/A	O

TL 2000 *StingSport* Master Equipment List

Communication and Instrumentation

Item Description	**Manufacturer**	**Model**	**S/O**
VHF Radio	Icom	200A	O
VHF Radio	Garmin	SL40	O
VHF Radio	MicroAir	2.25”	O
VHF Radio	Becker	AR4201	O
VHF Antenna	TL Ultralight	Black	O
VHF Antenna	TL Ultralight	White	O
VHF Antenna	TL Ultralight	SS	O
Transponder	Garmin	GTX320	O
Transponder	Garmin	GTX327	O
Transponder	MicroAir	2.25”	O
Altitude Encoder	Ameri-King	350	O
Transponder Antenna	TL Ultralight	N/A	O
Transponder Antenna	Comant	C101	O
Transponder Antenna	Comant	C105	O
Emergency Locator Transmitter	Ameri-King	450	O
ANC Headsets (2)	LightSpeed	QFRXCc	O
Intercom	Sigronics	SP200	O
Intercom	PS Engineering	PS501	O
Intercom	PS Engineering	PS1000	O
Airspeed Indicator	TL Ultralight	3.125””	S
Airspeed indicator	UMA	2.25”	O
Artificial Horizon	TruTrak	3.125”	O
Artificial Horizon	RC Allen	3.125”	O
Altimeter, Hg	TL Ultralight	3.125”	S
Altimeter, Hg	UMA	2.25”	O
Turn & Bank	TruTrak	3.125”	O
Turn & Bank	TruTrak	2.25”	O
Tachometer	Rotax	2.25”	O
Tachometer	UMA	2.25”	O
Vertical Velocity	TL Ultralight	3.125”	O
Magnetic Compass	TL Ultralight	Pedestal	O
Magnetic Compass	VCC	PA1700	O
Fuel Gauge	TL Ultralight	2.25”	S
Oil Temperature Gauge	TL Ultralight	2.25”	S
Oil Pressure Gauge	TL Ultralight	2.25”	S
Cylinder Temperature Gauge	TL Ultralight	2.25”	S
Exhaust Temperature Gauge	TL Ultralight	2.25”	O

TL 2000 *StingSport* Master Equipment List

Autopilots and Electronic Display Systems

Item Description	Manufacturer	Model	S/O
Autopilot System, SAVs	TL Ultralight	N/A	O
Autopilot System, Steering	TruTrak	PP1	O
Autopilot System, Steering	TruTrak	ADI P1	O
Autopilot System, Altitude	TruTrak	Altrak	O
Autopilot System, Altitude	TruTrak	ADI P2	O
GPS Navigation System	Garmin	295	O
GPS Navigation System	Garmin	296	O
GPS Navigation System	Garmin	396	O
GPS Navigation System	Garmin	496	O
GPS Navigation System	AvMap	EKPIV	O
EIS-Engine Information System	Grand Rapids Technologies	2/4000	O
EIS-Engine Information System	IK Technology	AIM Sport	O
XM Entertainment Receiver	TL Ultralight	N/A	O
EFIS/XMWX-Electronic Flight Information System	True Flight	FL210 Series	O
EFIS/EMS-Electronic Flight Information System	Dynon Avionics	D10/A Series	O
EFIS/EMS-Electronic Flight Information System	Dynon Avionics	D100/120/180 Series	O
EFIS/EMS/XMWX-Electronic Flight Information System	Blue Mountain Avionics	Lite G3/G4 Sport Series	O
EFIS/EIS/XMWX-Electronic Flight Information System	Grand Rapids Technologies	Sport Series	O

REPORT ‘Feed Back’ FORMS

The following pages contain ‘feedback’ reports that are intended to assist the owner in reporting questions, safety issues, service or maintenance issues, parts and assembly performance, incidences, maintenance manual errata/suggestions and warranty claims which may assist in the safe operation of our aircraft and the use of this manual. Electronic versions are also available by request.

Please copy the form, mail or fax it to the address below. You will receive a confirmation of the receipt and status of your comments.

Send the completed form to:

TL Ultralight, sro
Customer Service
10401 West Markham Street
Little Rock, AR 72205
Phone: 501.228.7777
Fax: 501.227.8888

Aircraft / Part / Assembly/ Incident Safety Feedback Form:

Report Date: Aircraft N Number: Aircraft S/N:

Flight hours: Report Airport: Aircraft Airport:

Conditions: (circle) Notes

1. Periodic Inspection
2. Pre-flight Inspection
3. Engine Start
4. Taxi
5. Take off
6. Climb
7. Level Off
8. Cruise
9. Decent
10. Pattern
11. Approach
12. Landing
13. Other

Detailed Description: (Continue on back if required)

Affected parts/assembly:

Part Name	Part Number	Time in Service	Total Time

Dealer Name: Contact:

Warranty Claim Filed: YES - NO Claim Number:

CONTACT INFORMATION

Owner:

Address:

City, State, Zip

Phone / Fax:

Email:

Signature: Date:

Figure 1.2 Aircraft Feedback Form

Aircraft Maintenance & Maintenance Manual Feedback Form:	
Report Date:	
Manual Section: (circle)	0. Introduction 1. General 2. Inspections 3. Structures 4. Engine 5. Fuel System 6. Propeller 7. Utility Systems 8. Instruments and Avionics 9. Electrical System 10. Painting and Coatings
Page Number:	
Subject Heading:	
Description: (errata; information conflict; details; photos, etc)	
CONTACT INFORMATION	
Owner:	
Address:	
City, State, Zip	
Phone / Fax:	
Email:	
Signature:	Date:

Figure 1.3 Maintenance manual Feedback Form

Example of warranty claim form below.
See following page, Figure 1.5, for Warranty Claim Report form.

ULTRALIGHT
CZECH REPUBLIC

2006-0XX

TL Valid Claim Number
(Claim # will be added by TL)

Warranty Claim Report

Date:	Date: Month: Year:
Aircraft Type	TL 2000 StingSport
SN / FAA Numbers	TLUSA_ _ _ _ / N_ _ _ _ _ _
Aircraft time in service	Hours:
Dealer/Owner	/
Location /Phone	/

Problem Description, system affected, include photos
Here add a description of the problem.
Please use a separate claim form for each problem.
Do not use one form for multiple claims except that you may refer to the other claims
as they relate to each other.
You may increase or decrease each of the report areas as necessary.

Solution to problem, parts list, cost/time estimate, include photos
Here describe the solution.
Include the list of parts necessary.
Submit the faulty parts to the distributor for return to the TL factory.

Related reports, documents, recommendations
Here add email notification notification of problem to distributor and date
Add also photos of problem before and after solution.
Please state how this problem can be prevented in the future.

Warranty claim report made by:	
Address:	
Email address:	
Phone:	
Accepted by TL Ultalight as valid claim:	

Figure 1.4 Warranty claim example form

2006-0XX

TL Valid Claim Number

ULTRALIGHT CZECH REPUBLIC

Warranty Claim Report

Date:	Date: Month: Year:
Aircraft Type	TL 2000 StingSport
SN / FAA Numbers	TLUSA_ _ _ _ / N_ _ _ _ _ _
Aircraft time in service	Hours:
Dealer/Owner	/
Location /Phone	/

Problem Description, system affected, include photos

Solution to problem, parts list, cost/time estimate, include photos

Related reports, documents, recommendations

Warranty claim report made by:	
Address:	
Email address:	
Phone:	
Accepted by TL Ultalight as valid claim:	

Figure 1.4 Warranty claim report form

ULTRALIGHT
CZECH REPUBLIC

Sting carbon

TL-ULTRALIGHT s.r.o.
Letiště, budova č. 84
503 41 Hradec Králové
Czech Republic

www.tl-ultralight.cz
barbora.hubena@tl-ultralight.cz
tel/fax: +420 495 213 378
mobil: +420 724 281 383

Hradec Králové, 31.12.2005

Subject: **Limited Warranty**

TL Sport Aircraft are warranted to be free from defects in materials or workmanship for one year or 100 flight hours, whichever comes first, from the initial retail customer purchase date. Initial retail customer purchase date is defined as the date of sale to the first retail purchaser of the aircraft from the TL Sport Aircraft authorized dealer. For aircraft purchased initially by Dealers for demonstration purposes, the full warranty may be extended at time of resale to the retail purchaser provided the aircraft has not exceeded 4 months or 40 hours, which ever comes first. In the event the Dealer demonstration period has been exceeded, the excess time will be deducted from the retail purchase warranty.

Warranty is limited to the airframe and components and excludes instrumentation, avionics, engine, propeller, ballistic recovery parachute system, or any other components covered under separate warranty if any. Within this period, TL Sport Aircraft will, at its sole option, repair or replace the airframe or its components that fail in normal use. Such repairs or replacements will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation costs.

Aircraft must be maintained in accordance with the StingSport Maintenance Manual and Section 9 of the Pilot Information Manual for warranty to remain valid. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs or damage due to normal wear. Furthermore, warranty is void if aircraft is used for commercial student pilot training use.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OR MERCHANDIBILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE.

IN NO EVENT SHALL TL SPORT AIRCRAFT BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT.

TL Sport Aircraft retains the exclusive right to repair or replace the airframe or its components at their discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local TL Sport Aircraft authorized dealer for instructions.

Jiří Tlustý
TL-Sportaircraft

Figure 1.5 Aircraft Limited Warranty statement

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SECTION 2
INSPECTIONS

INTRODUCTION

Section 2 contains information pertaining to light maintenance, the weight and balance calculations and periodic inspection lists for the airplane. Included is a illustrated parts list grouped by category and at the end of this section are detailed checklists of the periodic inspections which are meant to be copied and the copy used as a checklist for the inspection. Return the original to this manual.

AIRPLANE FILES

Certain items must be with the airplane at all times. The following is a list of these items and when they are required:

1. To be carried in the airplane at all times:
    1. Aircraft Operating Instructions (AOI)
    2. Weight and Balance Data
    3. Operating Limitations issued by FAA at airworthiness inspection.
    4. Aircraft Airworthiness Certificate (FAA Form 8130-7)
    5. Aircraft Registration Certificate (AC Form 8050-3)

2. To be with the pilot during flight
    1. Airman Certificate
    2. Medical Certificate
    3. Aviation Charts

3. To be made available upon request:
    1. Airplane Log Book
    2. Engine Log Book
    3. Propeller Log Book
    4. Pilot Log Book

Washing and Cleaning the Airplane (L/O,RI,RM,A&P)

After each flight day, clean the airplane in the following manner:
- Wash and rinse sedentary dirt from the blades of the propeller.
- Wash, rinse and polish glass parts of the cabin. Use chamois leather that is rinsed often in clean water.

- Wash and rinse the leading edges of the wings and tail areas.
- Clean the bottom part of the body behind the front undercarriage leg.
- Remove any grass that may have collected on the undercarriage.
- Clean the interior of the cabin, removing trash from all storage areas.
- Clean other parts of the airplane, as needed, especially the upper sides of the wings and openings of the engine.

Use lukewarm water that is changed often to wash the airplane. First, wash the parts and then dry them off. For cleaning insects off of airplane parts, use the same cleaning agents as used for automobiles.

About once a month, safeguard the airplane with cleansing agents used for cleaning and protecting automobiles, including the propeller and any composite parts. Use a vacuum cleaner to clean the cabin, making sure there are no undesirable objects in the back storage areas.
Before waxing a new airplane, let it dry for approximately one month to allow the finish maximum drying time.

Remark: Cover the Pitot tube while washing the airplane to protect it from water.

ENGINE VISUAL INSPECTION (L/O,RI,RM,A&P)

- Check for possible contaminants in the fuel filter, and change it if necessary. If you spot pollution in the engine space, carry out a complete inspection or change the fuel filters of the auxiliary tanks in the interior of the cabin.
- Assembly of the engine cover: Check the locking of the tap, the oil and the cooling liquid level. Look for possible worn places on the hoses especially at places, or where they are connected to or near metallic parts of the engine.

Carefully check the link of the carburetor with the carburetor bowl stirrup. Looseness or slack in the rubber connector at the neck of the carburetor, is cause for replacement even though it has been tightened, take it off and exchange it according to the carburetor manual.

Filling the Fuel Tank (L/O,RI,RM,A&P)

Due to the composite construction of the airplane, static electricity may occur.
Therefore, while fueling the airplane, follow this procedure:

- Make sure there is no open fire near the airplane, and that no one is smoking near the cabin.
- Have a fire extinguisher close at hand (one suitable for flammable fuels).
- Make sure the grounding cable placed on the right undercarriage leg is reaching the ground.
- Ground the aircraft to the fuel container by a strap to the exhaust pipe.

- Fill the fuel tank only from an approved storage container using a funnel approved for petrol only. The tank should be fastened to the ground with a grounding pin (do not use plastic fuel cans or funnels that are not certified for petrol).
- While fueling, do not wear clothing that may cause static electricity (synthetic fibers, etc.)
- Turn off all electrical appliances, cell phones, ignition circuits and the main switch.
- Close the fuel selector switch.
- Fill the main tank first and then the wing aux tanks if installed
- Unlock and release the fuel cap(s).
- Carefully place the approved funnel in the fuel opening. Use a water separator to prevent contamination of the fuel tank

CAUTION

Do not use a paper fiber filter with the filter refill.

- Pour the fuel slowly. Pay particular attention to keep fuel off of the airplane when you remove the funnel. While filling, do not support your hands or the fuel container on the wing, as the laminate surface is not proportioned for high area force.
- After fueling, remove the funnel, replace the tank cap and lock it. Wipe off any spilled fuel.

Service Life of Airplane and Periodic Maintenance (L/O,RI,RM,A&P)

Regular and careful maintenance is very important to the reliability and safe operation of the airplane. The interim inspections, annual condition and inspections should be noted in the aircraft log book.

Service Life of the Plane and Its Parts (L/O,RI,RM,A&P)

Aircraft service life is a function of the service of the airframe, engine and the propeller. Wear of the airplane depends on its stress and that is why you should avoid placing high stress (point) loads on the laminate construction, especially by multiple repetitions. Do not disassemble the plane needlessly, and anchor the plane according to instructions only. Also, avoid landing in high grass, which can definitely cause excessive propeller wear.

Regular applications of high quality car wax help to prevent aging of the finish. Park the airplane in a covered hangar, if possible, to protect the airplane against the wear and tear at least use a cover over it during exterior storage or parking.

Initial life service of the airframe is 6000 hours. Thereafter, it will be changed by an the amount based on past fleet operating experience.

There is no service life of the engine. It is subject to revision in a certified service center after every 1500 hours or 10 years. The service life of the propeller is not specified, as it undergoes regular revisions at the manufacturer. The service life will be specified according to its factual state.

DAILY SERVICING-

Daily Maintenance (L/O,RI,RM,A&P)

When inspecting even a new airplane, carefully inspect the tightening of the engine pipes and the state of the fuel gascolator and any filter(s). Check all places carefully where the pipes are attached to metal parts of the engine (e.g. oil, coolant and fuel piping).

CAUTION

For preventive maintenance, clean the fuel gascolator and any fuel filters after the first ten flight hours.

The possibility that dust or other debris may be left in the tank or the fuel system during the manufacturing process cannot be overlooked. Rinsing of the tank and the fuel system prior to cleaning the filter can cause major contamination. If your airplane is equipped with tanks in the wings, each tank may be equipped with an independent fuel filter. These filters are accessible after taking off the seats. Check these filters and change them periodically after 150 liters of fuel overdraft (from each tank).

Filters with clear housing are preferred. Daily maintenance consists of before flight inspection and testing of the engine.

LUBRICATING (L/O,RI,RM,A&P)

Lubricants and Lubricant Preparations

Use only the oil prescribed by the engine manufacturer when lubricating the engine. You'll find the name of the oil in the current maintenance section of the engine handbook or in the current Rotax oil recommendation SB. This manual also includes the oil recommendations for the current Rotax SB in Section 4, Figures 4.1 & 4.2. But the current Rotax SB must be consulted in case of changes that are issued by Rotax after the date of this manual.

Information for the initial oil filling can be found in the Rotax SB. This initial oil filling is very important to prevent air from being trapped in the oil system. The Rotax SB is referenced as well as on the label located on the aircraft firewall above the oil reservoir. The oil and filter should be changed every 25 hours as a part of the 25 hour periodic check.

You can reach some lubricating places by removing the seats in the cabin. Others are approachable by removing the covers to the opening on the upper left and right sides at the base of the vertical fin and on side of the body in front of the horizontal stabilizer. For hard to reach places (hang ups), fill the syringe with oil and use a needle that's larger in diameter. You need to apply only one to two drops of oil. In many areas, the oil serves as a conservation agent.

Figure 2.1 LUBRICATION PROGRAM

Unit	Area of lubrication	Periodic 25 hours	Annual (100 hour)	Lubricant
Engine	Throttle control cable into the engine compartment.	X	X	Light Oil
	Choke control cable into the engine compartment.	X	X	Light Oil
Nose gear	Nose gear leg insertion of the upper strut into the lower yoke. Include the links to the rudder pedals.	X	X	Lubrication Grease
Main gear	Axle Bearings.	X	X	Lubrication Grease
Ailerons	Hinges.	X	X	Lubrication Grease
	Rod end bearings	X	X	Lubrication Grease
	Turning actuator to aileron.	X	X	Lubrication Grease
	Push-pull actuator to aileron.	X	X	Lubrication Grease
Flaps	Hinges	X	X	Lubrication Grease
	Torque tube connectors to actuators	X	X	Lubrication Grease
TAIL	Rod end bearing of the elevator control tube.	X	X	Lubrication Grease
	Rudder hinges and bearing.	X	X	Lubrication Grease
	Rudder horn cable shackles	X	X	Lubrication Grease
	Horiz stabilizer fittings and sockets.	X	X	Lubrication Grease
Trim tab	All movable parts on the tail.	X	X	Lubrication Grease
Foot Pedals	All moving parts in the cockpit area	X	X	Lubrication Grease
	Ends of the wing spars and bearing rings.		200X	Lubrication Grease
Structure	Torque ball, wing attach supports (4)		200X	Lubrication Grease
	Ends of the wing spars and bearing rings.		200X	Lubrication Grease

WEIGHT & BALANCE (L/RM,A&P)

All aircraft are structurally and aerodynamically engineered for certain load conditions which result from specific weights and forces anticipated to occur in normal operations within the specified flight envelope. An Aircraft's handling qualities and structural integrity may be seriously compromised if the weight and balance limits are exceeded in normal operations.

It is the pilot's responsibility to make sure the weight and balance limits are not exceeded as to weight, its location, distribution and security prior to any flight.

DEFINITIONS

Arm: The horizontal distance expressed in inches from the reference datum plane to the center of gravity (CG) of an item or location along the fuselage.

NOTE

Units of measurements and weights must be consistent for each set of calculations and in the same system of units, i.e., pounds and inches, or kilograms and centimeters.

Ballast: A specific amount of weight attached in a specific location, which can be temporarily or permanently installed in an aircraft, to help bring its Center of Gravity within the required limits. If temporary ballast must be used for certain operations, the exact amount and its location must be placarded on the instrument panel within clear view of the pilot. The use of Ballast increases Empty Weight and reduces Useful Load.

Basic Empty Weight: The standard empty weight plus the weight of any additionally installed or optional equipment.

Basic Empty Weight Center of Gravity. The c.g. of an aircraft in its basic empty weight condition, and is an essential part of the weight and balance record.

Center of Gravity (CG): A point along an aircraft's longitudinal axis at which all the loads and forces are perfectly concentrated and balanced. It is computed by dividing the total moment by the total weight of the airplane. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

(Total Moment / Total Weight = Center of Gravity)

Center of Gravity Arm is the arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.

Center of Gravity Limits are the extreme forward and aft center of gravity locations (limits) within which the airplane must be operated at any given weight.

Center of Gravity Range: The horizontal distance, along an aircraft's longitudinal axis, within which an aircraft has been found to be fully maneuverable at all specified design speeds, weights and loading configurations.

Datum: A convenient vertical reference plane along the longitudinal axis of an aircraft from which all horizontal measurements are taken.

Installed Equipment: All optional accessories and equipment permanently installed on an airframe or engine at the time of weighing. These items must be included in the "Installed Equipment List" resulting in the Basic aircraft weight. Additions and deletions must be noted in the list each time they are made and new Weight and Balance calculations performed to determine the magnitude and effect of weight change. Ballast, if permanently installed, must also be listed.

Maximum and Minimum Weights: Due to balance, structural and aerodynamic considerations, maximum, or minimum, weights for certain locations on the aircraft are specified. For example, the pilot's minimum (100Lbs) and maximum (240Lbs) weight is be specified for some operations. The same is true for baggage, cargo, fuel, and any other disposable or variable loads.

Maximum Forward and Maximum Aft C.G. Locations: A specified forward most and rear most Center of Gravity location, along the aircraft longitudinal axis. These Center of Gravity location limits are expressed in inches from a convenient reference (forward tip of the propeller spinner) on the aircraft.

Reference or Datum Plane: An imaginary vertical plane located on the forward tip of the propeller spinner from which all horizontal distances are measured for balance purposes.

Standard Empty Weight: The weight of a standard airplane, including unusable fuel, full engine operating fluids, and full engine oil reservoir.

Station: A vertical location along the airplane fuselage horizontal axis given in terms of the distance from the reference datum plane.

Tare: The weight of chocks, blocks, stands, etc. used when weighing an airplane, and is included in the scale readings. Tare is deducted from the scale reading to obtain the actual (net) airplane weight.

Useful Load: The total amount of weight available for pilot, passengers, baggage, cargo and in-flight usable fuel. The difference between the maximum ramp weight and the basic empty weight. (Maximum Ramp Weight – Basic Empty Weight = Useful Load) The useful load will be reduced by the installation of additional equipment.

Weight: Actual individual weight of each item such as airframe, crew, fuel, baggage, cargo, etc. in pounds or kilograms

Empty Weight: The actual weight of the individual aircraft, including the structure, power plant, fixed equipment, any fixed ballast, unusable (in-flight) fuel, and coolant. Original Empty Weight is determined by actually weighing each new aircraft before it is flown.

Any time a Major Alteration, Modification or Repair (WHICH MUST BE APPROVED IN WRITING BY THE MANUFACTURER.) is performed on the aircraft; a new Empty Weight must be determined by either weighing the aircraft again, or by accurate calculation of the weight changes and their effect on Empty Weight Center of Gravity (EWCG) location.

Major Alteration or Modification results from the addition, deletion, or redistribution of existing equipment and accessories, or from a repair which results in a significant increase of weight of the airframe or engine. For example, addition or removal of floats, skis, battery, radios, installation of a additional fuel tank(s) or engine change, painting the airframe, installation of heavier wheels and tires, etc.

Maximum Gross Weight: The maximum total weight for which an aircraft's structure and performance have been approved for normal operations by its manufacturer. It is the maximum weight (Empty Weight plus useful load) at which an aircraft can be safely operated. Maximum Takeoff Weight must never exceed the published Gross Weight.

Useful Load: The difference between the maximum ramp weight and the basic empty weight. Maximum Ramp Weight – Basic Empty Weight = Useful Load The total amount of weight available for pilot, passengers, baggage, cargo and in-flight usable fuel.

Maximum and Minimum Weights: Due to certain balance, structural and aerodynamic considerations, sometimes a manufacturer may specify maximum, or minimum, weights for certain locations on the aircraft. For example, the pilot's minimum and maximum weight may be specified for all, or only for some operations. The same is true for baggage, cargo, fuel, and any other disposable or variable load.

Center of Gravity (CG): A point along an aircraft's longitudinal axis at which all the loads and forces are perfectly concentrated and balanced. It is computed by dividing the total moment by the total weight of the airplane. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

(Total Moment / Total Weight = Center of Gravity)

Center of Gravity Range: The horizontal distance, along an aircraft's longitudinal axis, within which an aircraft has been found to be fully maneuverable at all specified design speeds, weights and loading configurations. All aircraft are designed operate within a specific Center of Gravity Range.

Maximum Forward and Maximum Aft C.G. Locations: Every aircraft has specified a forward most and rear most Center of Gravity location, along its longitudinal axis. These Center of Gravity location limits are given from a convenient reference (Datum Plane) on the aircraft.

Datum: A convenient vertical reference plane along the longitudinal axis of an aircraft from which all horizontal measurements are taken.

Weight: Actual individual weight of each item such as airframe, persons, fuel, baggage, cargo, etc. in pounds or kilograms.

Arm: The horizontal distance expressed in inches from the reference datum plane to the center of gravity (CG) of an item or location along the fuselage.

NOTE

Units of measurements and weights must be consistent for each set of calculations and in the same system of units, i.e., pounds and inches, or kilograms and centimeters.

Moment: The product of the weight of an item multiplied by its arm.
(Weight x Arm = Moment)

Installed Equipment: All optional accessories and equipment permanently installed on an airframe or engine at the time of weighing. These items must be included in the "Master Equipment List." Additions and deletions must be noted in the list each time they are made and new Weight and Balance calculations performed to determine the magnitude and effect of weight change. Ballast, if permanently installed, must also be listed.

Ballast: A specific amount of weight attached in a specific location, which can be temporarily or permanently installed in an aircraft, to help bring its Center of Gravity within the required limits. If temporary ballast must be used for certain operations, the exact amount and its location must be placarded on the instrument panel within clear view of the pilot. The use of Ballast increases Empty Weight and reduces Useful Load.

Loading Chart: Used to calculate the actual Center of Gravity location of a ready to fly aircraft. Care must be taken not to exceed the Maximum/Minimum Weight and Balance Limits stipulated for the aircraft. These limits are determined by structural, stability and control considerations throughout the aircraft speed range.

PROCEDURE

All permanent equipment, options and accessories should be installed on the aircraft prior to weighing. All equipment options and accessories installed in the aircraft must be listed on the “Master Equipment List”. That list becomes part of Weight and Balance Documents by reference.

Be sure to remove any loose equipment, tools, etc. from the aircraft prior to weighing.

Sometimes it is necessary to adjust or reduce fuel, cargo, or passenger weights to remain at or below Maximum Allowable Gross Weight. Temporary or permanent ballast is sometimes necessary to bring the C.G. within specified limits. However, the Maximum Allowable Gross Weight should not be exceeded under any circumstances

The fuel tank should be empty except for unusable fuel. If the fuel tank is not empty, then the exact amount of usable fuel in the tank must be determined. Usable fuel weight and its moment must be deducted from the Empty Weight calculations before EWCG. can be accurately determined.

Oil and coolant tanks and reservoirs must be properly filled before weighing. These and any other liquids necessary for normal operations are considered part of an aircraft’s empty weight.

If weighing is done outdoors, make sure there is no wind to affect the weight measurements. For best results, weigh indoors.

The scales must be calibrated correctly and must be set on level ground.

Any equipment placed on the scales when weighing the aircraft, such as chocks or blocks, should be weighed separately and the weight deducted from the scale reading. These weights become Tare and should be noted for reference, if necessary.

Measurements for the exact horizontal distance from Datum plane to center of spindles of all wheel axles are included. These are recorded as measurements on “Weight and Balance Data Worksheet” Figure 2.5.

The aircraft must be weighed in a level flight attitude, both longitudinally (front to back) and laterally (side to side), as shown in the Moment Arm Data Sheet. Figure 2.3

Place a scale under each wheel of aircraft for all weighings. If only one scale is used, be sure to level the wheels not being weighed before taking the scale readings. Remember, the aircraft must be in proper level flight attitude to ensure accuracy. Figure 2.3

EMPTY WEIGHT CENTER OF GRAVITY CALCULATIONS

Complete each horizontal line of calculations by multiplying Weight from the scale by the Arm to find the Moment.

Total the Weight and Moment columns.

Divide the Total Empty Moment by the Total Empty Weight to determine the Empty Weight Center of Gravity location, from the Datum plane

In the example of Figures 2.2 & 2.4, the Empty Weight Center of Gravity (EWCG) is 83.4 inches aft of Datum. This distance is also known as the Empty Weight Arm.

Typical empty weight calculations for the StingSport aircraft

ITEM	WEIGHT	ARM	MOMENT
NOSE WHEEL	152	32.8”	4986
LEFT GEAR	327	95.2”	31130
RIGHT GEAR	326	95.2”	31035
TOTALS	**805**	**83.4**	**67151**

Therefore the aircraft Empty Weight Center of Gravity (EWCG) Location = 67151 (Total Moment) / 805 (Empty Weight) = 83.4 inches aft of Datum Plane

Figure 2.2, Example of Empty Weights from Initial Weight & Balance

LOADED WEIGHT AND BALANCE CALCULATIONS

Complete the Loaded Center of Gravity calculations as was done in the Sample Weight & Balance Data Sheet. Figure 2.4.

The Empty Weight, the Empty Weight Arm and the Empty Moment are entered into the Weight & Balance Data Worksheet. Figure 2.5.

Write in the actual Fuel weight for each tank location for your aircraft load condition. Fuel weight is calculated at 6 pounds per U.S. gallon. The maximum weight for the Main fuel tank at 20.5 gallons is 123 pounds. If installed, the maximum weight for the Wing aux tanks at 6 gallons each side, 12 gallons total, is 72 pounds. Multiply the fuel weight times the Arm shown in each row to obtain the moment for each tank.

Write in the actual weight of the Crew (Pilot1 and Pilot2), In the case of two occupants, be sure not to exceed the individual maximum recommended weights for the seat load. Multiply the Crew (occupant) weight times the Arm shown in each row to obtain the moment for the Crew seating location.

Write in the actual weight of the baggage in all three locations, pilot side storage, copilot side storage and aft deck area. Multiply the total baggage weight times the Arm shown in the row to obtain the moment for the baggage area.

Total the weights, including the empty aircraft weight which should not exceed 1320 pounds.

Total all the moments, including the empty aircraft moment.

Divide the total moment by the total weight. This is the current CG which should be between 80.2 and 86.7 inches from the Datum plane for the aircraft to be within its weight and balance for this flight loading.

Complete this chart for each of critical test loading conditions to be sure that your final Loaded C.G. position falls within the allowable C.G. limits, at all times, for all operations.

CRITICAL LOADING CONDITIONS

Each of the following eight critical loading conditions should be investigated for each individual aircraft, along with any other possible loading condition which may affect the Weight and Balance envelope of the aircraft. This is particularly important for aircraft operation close to the C.G. limits.

Be sure the maximum individual weights and the Gross Weight are not exceeded at any time.

Be sure all loaded items are placed in approved locations aboard the aircraft.

1. Maximum Crew (Pilot/Co-Pilot) Weight (480lbs), with:
   a) Full Usable Fuel, Maximum Baggage
   b) Full Usable Fuel, Zero Baggage
   c) Zero Usable Fuel, Maximum Baggage
   d) Zero Usable Fuel, Zero Baggage

2. Minimum Crew Weight, (100lbs), with:
   a) Full Usable Fuel, Maximum Baggage
   b) Full Usable Fuel, Zero Baggage
   c) Zero Usable Fuel, Maximum Baggage
   d) Zero Usable Fuel, Zero Baggage

The Loaded Center of Gravity must fall within the specified Maximum Forward Limit of 80.2” and Maximum Aft Limit of 86.7” for all aircraft.

An aircraft log book entry should be made whenever a Weight Balance calculation is performed, indicating date, and nature of change, results and name of person performing the calculation. (If any changes are made to the instrument panel, an entry moment arm is included in the sample.) This document, in its entirety, becomes a part of the Aircraft Legal Documents. It must be kept aboard the aircraft and made available for inspection upon request.

WEIGHT & BALANCE DATA WORKSHEET NOTES

1. **Datum Plane:** Forward tip of nose cone at propeller.
2. **Maximum Forward CG Limit:** 80.2 inches aft of Datum
3. **Maximum Aft CG Limit:** 86.7 inches aft of Datum
4. **Maximum Gross Weight:** 1320 pounds
5. **Maximum Seat Load:** 240 pounds
6. **Minimum Pilot Weight:** 100 pounds
7. **Maximum Main Fuel:** 120 pounds
8. **Maximum Wing Fuel:** 72 pounds
9. **Maximum Baggage Weight:** 60 pounds (40 pounds used for example)

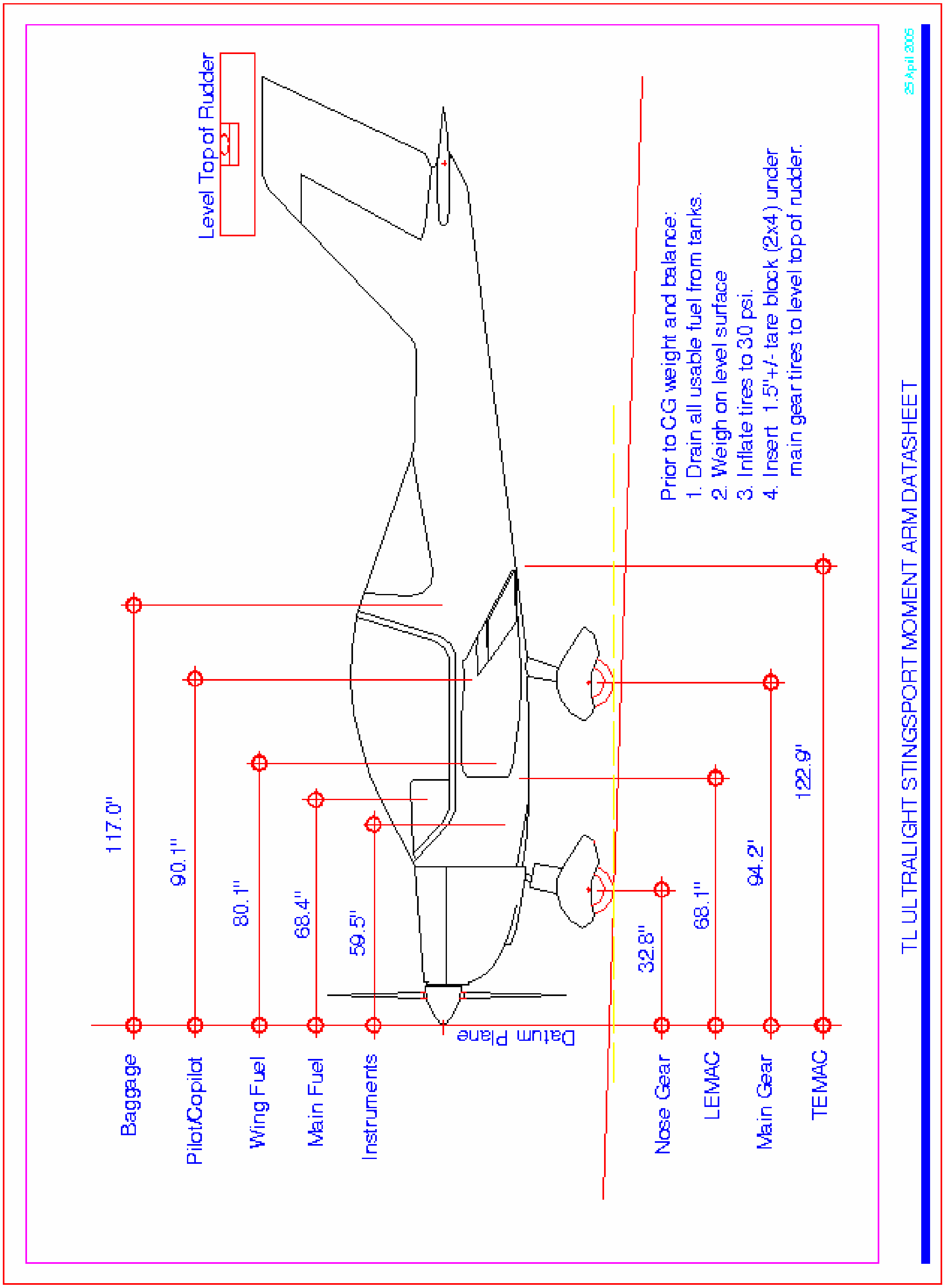


Figure 2.3 STINGSPORT MOMENT ARM DATA SHEET

StingSport N2992N

SAMPLE WEIGHT & BALANCE DATA

Date: *31 Dec 05* By: *MPM*

Item	Weight	Arm	Moment
Nose Wheel	152	32.8	4986
Left Gear	327	95.2	31130
Right Gear	326	95.2	31035
Empty A/C	805	83.4	67151
Instruments		59.5	
Crew	367	90.1	33067
Main Fuel	123	68.4	7387
Wing Fuel	0	80.1	0
Baggage	25	117.0	4680
Totals	1320	**85.1**	112285
		CG	

LEMAC	22%	34%	TEMAC
68.1	80.2	86.7	122.9

Test 1: Minimum Crew Weight, with:

a) Full Usable Fuel, Max Baggage =	84.8
b) Zero Usable Fuel, Max Baggage =	85.1
c) Full Usable Fuel, Zero Baggage =	82.7
d) Zero Usable Fuel, Zero Baggage =	84.1

Test 2: Maximum Crew Weight, with:

a) Full Usable Fuel, Max Baggage =	85.3
b) Zero Usable Fuel, Max Baggage = ***Over Limit!***	86.9
c) Full Usable Fuel, Zero Baggage =	83.9
d) Zero Usable Fuel, Zero Baggage =	85.5

Figure 2.4 SAMPLE WEIGHT & BALANCE DATA EXAMPLE

StingSport N

WEIGHT & BALANCE DATA SHEET

Date: By:

Item	Weight	Arm	Moment
Nose Wheel		32.8	
Left Gear		95.2	
Right Gear		95.2	
Empty A/C		83.4	
Instrument		59.5	
Crew		90.1	
Main Fuel		68.4	
Wing Fuel		80.1	
Baggage		117.0	
Totals			
		CG	

LEMAC	**22%**	**34%**	**TEMAC**
68.1	**80.2**	**86.7**	**122.9**

Test 1: Minimum Crew Weight, with:

a) Full Usable Fuel, Max Baggage =
b) Zero Usable Fuel, Max Baggage =
c) Full Usable Fuel, Zero Baggage =
d) Zero Usable Fuel, Zero Baggage =

Test 2: Maximum Crew Weight, with:

a) Full Usable Fuel, Max Baggage =
b) Zero Usable Fuel, Max Baggage =
c) Full Usable Fuel, Zero Baggage =
d) Zero Usable Fuel, Zero Baggage =

Figure 2.5 WEIGHT & BALANCE DATA WORKSHEET

AIRPLANE INSPECTION PERIODS

FAA REQUIRED INSPECTIONS

As required by Federal Aviation Regulations, all LSA aircraft of U.S. registry must undergo a complete condition inspection ("annual") every twelve calendar months, in addition, every 100 hours of operation when operated in commercial use. It is the responsibility of the owner/operator to assure compliance with all applicable aircraft manufacturer directives.

25-HOUR INSPECTION

Periodic Inspection After Every 25 Hours (L/O,RI-RM-A&P)

The inspection after every 25 flight hours is performed in conjunction with the engine oil and filter change by the airplane owner if he is trained for the airplane's maintenance or by an FAA qualified inspector following the periodic 25 hour inspection checklist. If the aircraft is used for commercial operation the inspection is performed by an FAA approved A&P. Otherwise, it is made in the manufacturer's service center.

Periodic 25 Hour Inspection Checklist

StingSport PERIODIC 25 FLIGHT HOUR INSPECTION

Aircraft S/N:____________ Registration:___________ Date:__________ Aircraft Hours:_______

Inspection Item	Pass Fail	Comments
1. Wash, clean and vacuum the aircraft		Cover pitot tube, close, turn down vents
2. Examine the entire aircraft exterior surface for damage, deformation or abrasion.		Include attachment of all exterior fittings.
3. Examine all aircraft control surfaces, tabs		Check free movement and connections
4. Inspect nose gear, main gear, gear sockets		Include detailed exam of nose assembly.
5. Check the wheels, tires, wheel pants, brakes, lines, cylinders and pads		TP 30 psi
6. Remove and check engine cowlings for signs of heat damage, leaks or cracks.		Store screws in glare shield area
7. Check all engine compartment components and engine mount for chafing, loose connections, wear, fluid or exhaust leaks.		Include oil cooler fittings; check all hoses near exhaust system for heat damage.
8. Check brake fluid level, brake operation		Use DOT4 auto fluid

9. Check air filters, re-service as necessary		Use K&N recharge kit
10. Check oil cooler and radiator for damage, debris and cowling fit.		
11. Inspect the fuel system installation, hoses, connections, pumps & tank. Inspect and clean the fuel filter.		Include fuel lines under throttle quadrant and wing tank lines (if installed). Small filter debris normal for +/-50 hours
12. Oil and oil filter change, examine oil filter insert, send oil sample for analysis.		See Rotax SB for oil specs, pre-fill oil filter half full before installing.
13. Check coolant expansion tank and overflow bottle.		Use silica free, 50/50 coolant mixture with distilled water.
14. Check the exhaust system for leaks, cracks		Examine curved portion of exhaust pipes
15. Check required items detailed in the parachute system technical documents		Confirm safety labels, chute area clear of debris, chute window secure.
16. Check required items detailed in the propeller technical documents		Confirm each blade same pitch/angle; Re-install spinner with alignment notch
17. Check required items as shown in Rotax Line Maintenance for installed engine		This manual available from CD furnished with aircraft as a pdf file.
18. Check all aircraft documentation is on board aircraft		Airworthiness certificate, Ops Limits, Weight & Balance, Registration, AOI.
19. Complete post-inspection engine run and acceptance test flight.		

NOTE:
A form for the 25 hour periodic inspection is provided at the end of this section. This form is to be copied for use and the original replaced at the end of this section.

ANNUAL CONDITION INSPECTION (100-HOUR INSPECTION)

Periodic Maintenance at every 100 Hours (L/A&P,RS)
If used for commercial operations, the Annual Condition Inspection and the 100 hour Inspection and maintenance after every 100 hours is performed by an FAA approved A&P. Otherwise, it is made in the manufacturer's service center.

Periodic Maintenance at every Annual Condition Inspection (L/RI,RM,A&P)
If not used for commercial operations, the Annual Condition Inspection is performed by the airplane owner if he is trained for the airplane's maintenance, by an FAA qualified inspector or by an FAA approved A&P. Otherwise, it is made in the manufacturer's service center.

The maintenance procedure is as follows:

- Maintenance inspections after 100 flight hours checklist.
- Careful inspection of the airframe and repair of small damages.
- Inspection of the glazing of the cabin and its interior.
- Inspection of the steering, for any deformations and incidental setting.
- Inspection and service on the engine according to the engine manufacturer.
- Inspection and service on the propeller according to the propeller manufacturer.
- Oil and oil filter change.
- Flight test by the test pilot.

Annual Condition Inspection Checklist

StingSport ANNUAL CONDITION INSPECTION (100 hour) CHECK LIST

Aircraft S/N:_____________ Registration:____________ Date:___________ Aircraft Hours:________

Inspection Item	Pass Fail	Comments
1.Wash. clean and vacuum the aircraft.		Cover pitot tube, close, turn down vents
2.Unassigned		
3.Engine		
4.Remove and check engine cowlings for signs of heat damage, leaks or cracks.		Store screws in glare shield area
5.Check all components in the engine compartment for chafing, loose connections, wear, fluid or exhaust leaks.		Include oil cooler fittings; check all hoses near exhaust system for heat damage.
6.Check brake fluid level.		Use DOT4 auto
7.Check and clean air filters.		Use K&N recharge kit
8.Check oil cooler and radiator for damage or debris.		
9.Check cowling ducts for blockage		Check for rubbing, clearance and alignment duct air supply to each cooler/radiator
10. Inspect the fuel installation, hoses, pumps, connections, and supports. Inspect and clean the fuel filter(s)		Check all hoses near exhaust system for heat damage
11. Check function of the fuel vent system		
12. Oil and oil filter change, examine oil filter insert, send oil sample for analysis.		See Rotax SB for oil specs, pre-fill filter half full before installing.
13. Inspect and replace the spark plugs.		Replace at 200 Hr or Alternate Annual
14. Check & record the engine cylinder compression values.		
15. Check coolant in expansion tank and overflow bottle.		Use silica free 50/50 coolant mixture with distilled water.
16. Inspect the engine supports and engine compartment components		

17. Inspect and check engine mount bolts		
18. Check the engine mount for cracks, corrosion, weld condition and paint chips.		Repaint any chips
19. Check the exhaust springs, the pipe system and its attachment for leaks, cracks on the exhaust pipe and welds.		Examine curved portion of exhaust pipes
20. Check required items as shown in Rotax engine technical documents		Documents available from CD furnished with aircraft
21. Reinstall cowlings and check for proper installation.		
22. Unassigned		
23. Propeller		
24. Check propeller for scratches or chips.		Inspect blade tips
25. Check hub for corrosion.		
26. Check bolts for corrosion and proper torque.		
27. Check for security and alignment of prop nose spinner.		Re-install spinner with alignment notch
28. Check required inspection items detailed in the technical and operational documents of the propeller manufacturer.		Confirm each blade same pitch/angle;
29. Unassigned		
30. Cabin		
31. Remove seats bases, Check all connections, wing bolt, aileron bolts, control stick bolts, pitot/static lines, electrical lines and connections, fuel lines and connections.		Secure any loose lines, Check drain holes clear
32. Check general condition and attachment of the instrument panel.		
33. Check condition, function and attachment of instruments.		
34. Check function and condition of switches and circuit breakers.		
35. Check function and condition of throttle, starting carb, fuel pumps, heating and ventilation.		
36. Check attachment of the upper instrument panel to the lower throttle quadrant.		
37. Check condition of labels.		
38. Check cleanness and condition of upholstering and fabric covered surfaces.		
39. Check condition of seat backs and bases.		
40. Ensure clearance for limits of all control movement.		
41. Check condition of seat belt and belt attach points.		
42. Refer to manufactures inspection schedule for airbags, if installed.		
43. Check condition of the cabin lock and latches.		Lube latches
44. Check condition of the canopy, canopy frame and forward hinges.		Check for bent hinges, alignment.

45. Check function of canopy struts.		
46. Check canopy operation and fit.		
47. Unassigned		
48. **Fuselage**		
49. Remove the wings		200hr interval or Alternate Annual
50. Check condition of wing torque balls (4). Lube.		200hr interval or Alternate Annual
51. Check condition of the wing spar extension balls and opposite ball sockets (2). Lube		200hr interval or Alternate Annual
52. Remove the wing tip covers and lighting panel to visually check the outer wing spar, upper and lower surfaces of the wings.		
53. Check the attachment and hinges of the wing to aileron controls.		
54. Check the attachment and the hinges of the wing to flap controls		
55. Remove aft baggage boxes		
56. Check security and condition of the sock aft of the storage area and under seats at each wing root.		
57. Check security, wiring, hoses and seal of the fuel sender under the throttle quadrant.		
58. Inspect the back (interior surface) side of the fuselage body		Check for composite delaminating, rudder and trim cables clear, chute container secure
59. Check external and internal antennas		
60. Check all horizontal surfaces on the wings and tail for damage.		
61. Unassigned		
62. Aircraft Parachute system		
63. Check the condition of the chute handle and safety pin for proper fit.		Emergency response personnel pin in place next to rocket
64. Check for proper clearance and freedom from binding of the chute pull (activation) cable.		
65. Check condition of all lines and attachments to the aircraft frame.		
66. Check the parachute system in accordance with the manufacturer inspection schedule.		Confirm safety labels, chute area clear of debris, chute window secure
67. Unassigned		
68. Flaps		
69. Check for free travel.		
70. Check hinges.		
71. Check equal deployment and correct limits.		
72. Visually check surface condition, loosened rivets, deformation, or cracks adjacent to the hinges.		Cracks indicate flap speed limits exceeded
73. Check condition of the torque tubes		Check clearance from rudder/trim cables
74. Check flap operation and lever detents.		Lube inside lever linkage and lock button
75. Unassigned		

76. Horizontal Stabilizer and Elevator		
77. Remove aft tail cone and upper stab access ports		Check drain holes clear
78. Disconnect all controls to the tail.		
79. Remove horizontal stabilizer.		200hr interval or Alternate Annual
80. Check for surface corrosion inside the horizontal stab pin & ball connections, Lube		Check drain holes clear
81. Visually check surface condition – delaminating, deformation, or cracks		
82. Reinstall horizontal stabilizer check attachments and security.		Install in liberal bed of GE II silicone, clean excess immediately. (24 hour cure time)
83. Check suspension and free travel of the elevator and assist trim tab.		
84. . Safety wire horizontal stab bolt to aft fuselage.		
85. Check trim tab operation, condition and hinge.		
86. Check condition and security of the elevator control rod, from the control sticks to the elevator and the trim tab control rods.		
87. Check for continuity, full and free travel		
88. Re-install tail cone and silicone sealant		Apply GE II silicone to perimeter of tail area
89. Unassigned		
90. Vertical Fin and Rudder		
91. Visually check surface condition delaminating, deformation, or cracks		
92. Check suspension and security of the rudder upper/lower hinges.		
93. Check attachment and security of rudder cables.		
94. Check rudder travel limits.		
95. Check attachment of rudder bell crank to rudder torque tube		
96. Check condition of tail light and light wiring in rudder (if installed).		
97. Check for continuity, full and free travel		
98. Unassigned		
99. Flight Stick Controls		
100. Check play and breakout		
101. Check security of links and connections in each wing bellcrank.		Remove four under wing access panels.
102. Check aileron travel limits.		
103. Check condition of the stops.		
104. Check for chaffing of any wires in the control stick operation.		
105. Check for autopilot interference of controls if installed.		
106. Check for free travel of control movement		

107. Unassigned		
108. Foot Pedal Controls		
109. Check rudder pedals for freedom of movement and attachments.		
110. Check condition and attachment of pedal to brake cylinders and pedal adjustment pins.		
111. Check the brakes lines, pedal mounted master cylinders and linkage		
112. Check security of rudder cable links and safety wire.		
113. Check condition of the Nicropress connectors on the control cables.		
114. Check condition and tension of cables.		
115. Check condition and lube rudder cables at aft bulkhead.		
116. Check for continuity, full and free travel		
117. Unassigned		
118. Flap Controls		
119. Check for full travel of flaps		
120. Check for free travel of the flap lever and position lock.		
121. Check security of torque tube bracket and linkage.		Lube as required
122. Check baggage box rubbing on flap or rudder or trim controls.		
123. Unassigned		
124. Elevator trim tab		
125. Check the action of the assist tab servo.		
126. Check play and limits		
127. Check security of links and bell crank		
128. Check trim tab neutral position adjustment.		
129. Unassigned		
130. Main Landing gear		
131. Check condition of landing gear legs and attachment points for cracks or damage.		Inspect aft portion of leg near gear socket in fuselage.
132. Remove silicone closing at gear leg pocket in lower fuselage to inspect condition and security of gear shim(s). Replace silicone		Drive shims to seat as required. Replace GE II silicone around main gear socket when rudder silicone installed.
133. Remove wheel from axle to check bearings and lube.		Do not disconnect brake lines
134. Check condition, wear and inflation of tires.		TP 30 psi
135. Check condition of the brake disk for cracks or heat damage..		
136. Check condition of the wheel, axle and brake attach brackets for cracks or heat damage.		
137. Check wheel for free rotation.		
138. Check function of brakes		

139. Check condition and attachment of brake hoses as they enter fuselage.		
140. Check brake fluid leakage – brake fluid hoses, brake pumps, brake cylinders. Replenish brake fluid as needed.		Use DOT4 auto fluid. Flush and replace at alternate annual inspecton
141. Check condition and attachment of wheel pants.		Install Locktite on all pant bolts and srews
142. Unassigned		
143. Nose Wheel Assembly		
144. Check condition and attachment points of nose strut leg at firewall.		Include detailed exam of nose assembly
145. Check condition of nose wheel steering linkage from foot petal to upper nose strut.		
146. Check condition and fit of upper nose strut and nose wheel fork		
147. Check condition and inflation of tire.		TP 30 psi
148. Check condition of wheel rim for cracks.		
149. Check security of bolts.		
150. Check for free travel of wheel rotation.		
151. Check balance and track of nose wheel.		
152. Check condition of nose wheel strut in accord with TL Service Bulletin TL070706		Available by email request if not on file.
153. Check for nose steering continuity and free travel		
154. Reinstall nose strut firewall cover		Replace fire proofing material at edges
155. Unassigned		
156. Fuel System		
157. Drain fuel tanks		Check for clear flow and debris free O ring
158. Remove and clean fuel filter		
159. Check operation, condition and integrity of fuel pumps and hoses from tank to the engine		Check for heat and interior swelling from non-approved fuel
160. Check connections operation and condition of engine and aux fuel pumps		
161. Check condition of all heat shields, hose protection, and carburetor attachments		
162. Unassigned		
163. Electrical System		
164. Check for electrical conductive connection to right wheel ground wire from fuel tanks and engine ground.		
165. Check that extended length of ground cable will reach pavement surface.		Additional cable available in fuselage
166. Check level of main battery charge.		
167. Check attachment and condition of main battery.		
168. Check condition of the battery cables, starter cable and starter solenoid.		

169. Check condition of the aux battery wire used as a jump start connection.		
170. Check condition and integrity of wiring.		
171. Check condition of plug/socket outlets.		
172. Check for chaffing of wire at firewall		
173. Check for chaffing of wire at exit/entry of plastic wire housing from firewall to instrument panel.		
174. Check function of all lighting.		
175. Check equipment on-board batteries		
176. Unassigned		
177. Pitot Static System		
178. Check condition and pitot tube attachment.		
179. Check cleanness of air inlet holes of pitot tube.		
180. Check attachment and security of hoses to the instruments		
181. Check for pitot-static system tightness		
182. Unassigned		
183. Heating/Ventilation		
184. Check cleanness and lubrication of air inlets and Boden cable.		
185. Check alignment and integrity of the heating and ventilation system hose.		
186. Check condition and attachment of the heater shroud on the radiator.		
187. Unassigned		
188. Avionics and Instruments		
189. Check altimeter and Mode C altimeter function		
190. Check ELT functions and batteries		
191. Check/swing magnetic compass		
192. Update software to all avionics and instrumentation.		
193. Check function of avionics and instrumentation		
194. Unassigned		
195. Completion		
196. Reassemble all components, install Locktite, marker paint, cotter pins, silicone sealant and safety wire as required.		
197. Enter inspection in aircraft logs		
198. Check all documentation is on board aircraft		Airworthiness certificate, Ops Limits, Weight & Balance, Registration, AOI.
199. Complete before flight inspection		
200. Complete post-inspection engine run and acceptance test flight.		

NOTES:

Date:________________ **Signature:**______________________________

NOTE:
A form for the 100 hour periodic inspection is provided at the end of this section. This form is to be copied for use and the original replaced at the end of this section.

200-HOUR INSPECTION (L/RM,A&P)
(Alternating Annual Condition Inspections)

This inspection is made every other annual condition inspection or at each 200 hour periods if under commercial operations. With the exception of changing the spark plugs, changing the coolant, wing removal/inspection and torque ball inspections, the inspection and maintenance are the same as the 100-hour inspection.

300-HOUR INSPECTION (H/A&P,RS)

This inspection is made after every 300 flight hours, or after five years of operation. The inspection of all stressed parts of the construction is made along with the prescribed repair according to the manufacturer's guide book.

The inspection and maintenance include:

- Inspection after 100 hours
- Removing the propeller
- Inspection of the construction.
- Inspection of the interior of the body and the cabin.
- Outer inspection of the entire airframe.
- Inspection of the steering components.
- Replacement of parts.
- A flight test by the pilot.

CAUTION

This inspection is typically made by the manufacturer's service center or a repair station.

ALTERATIONS OR MAJOR REPAIRS

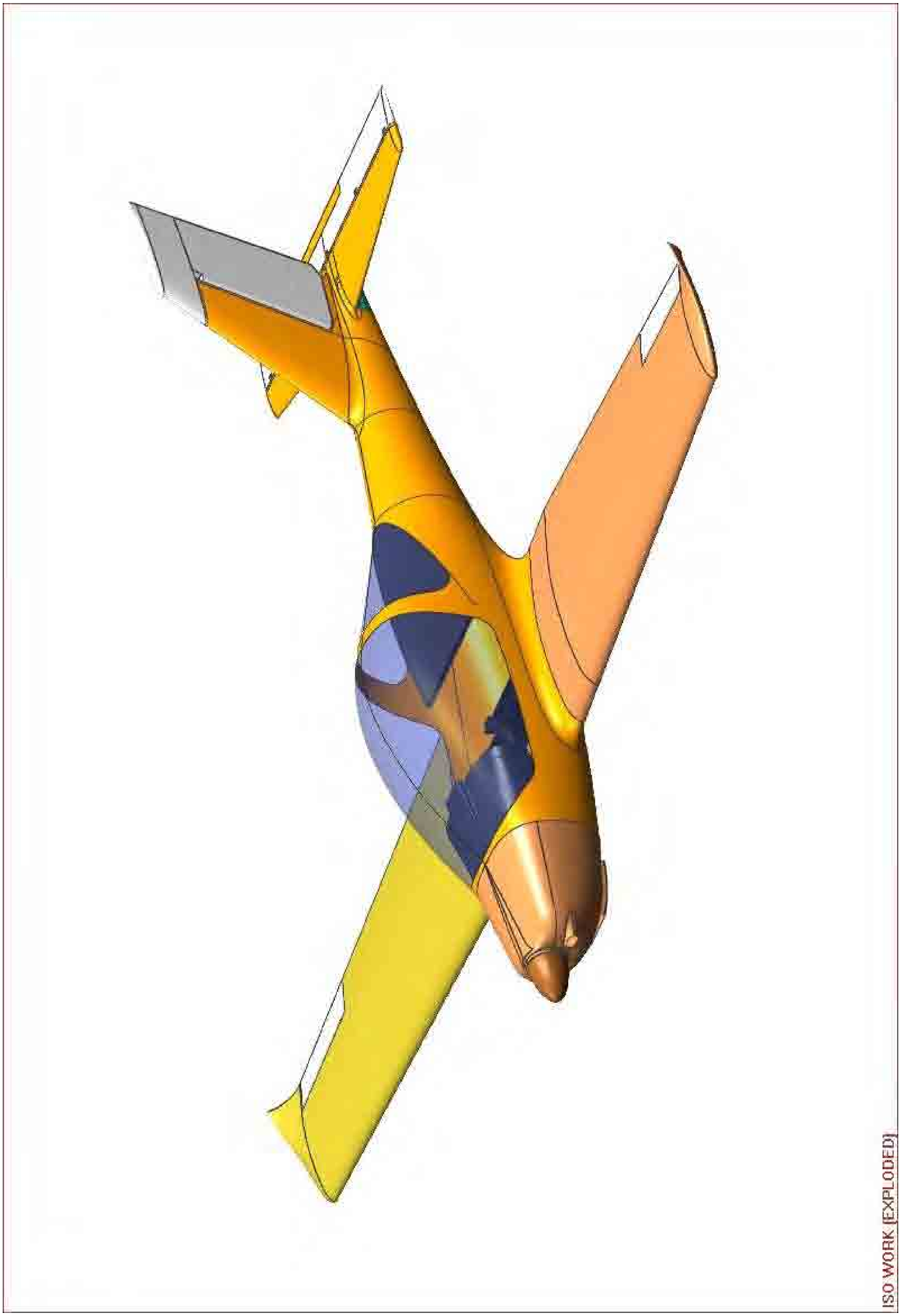
WARNING

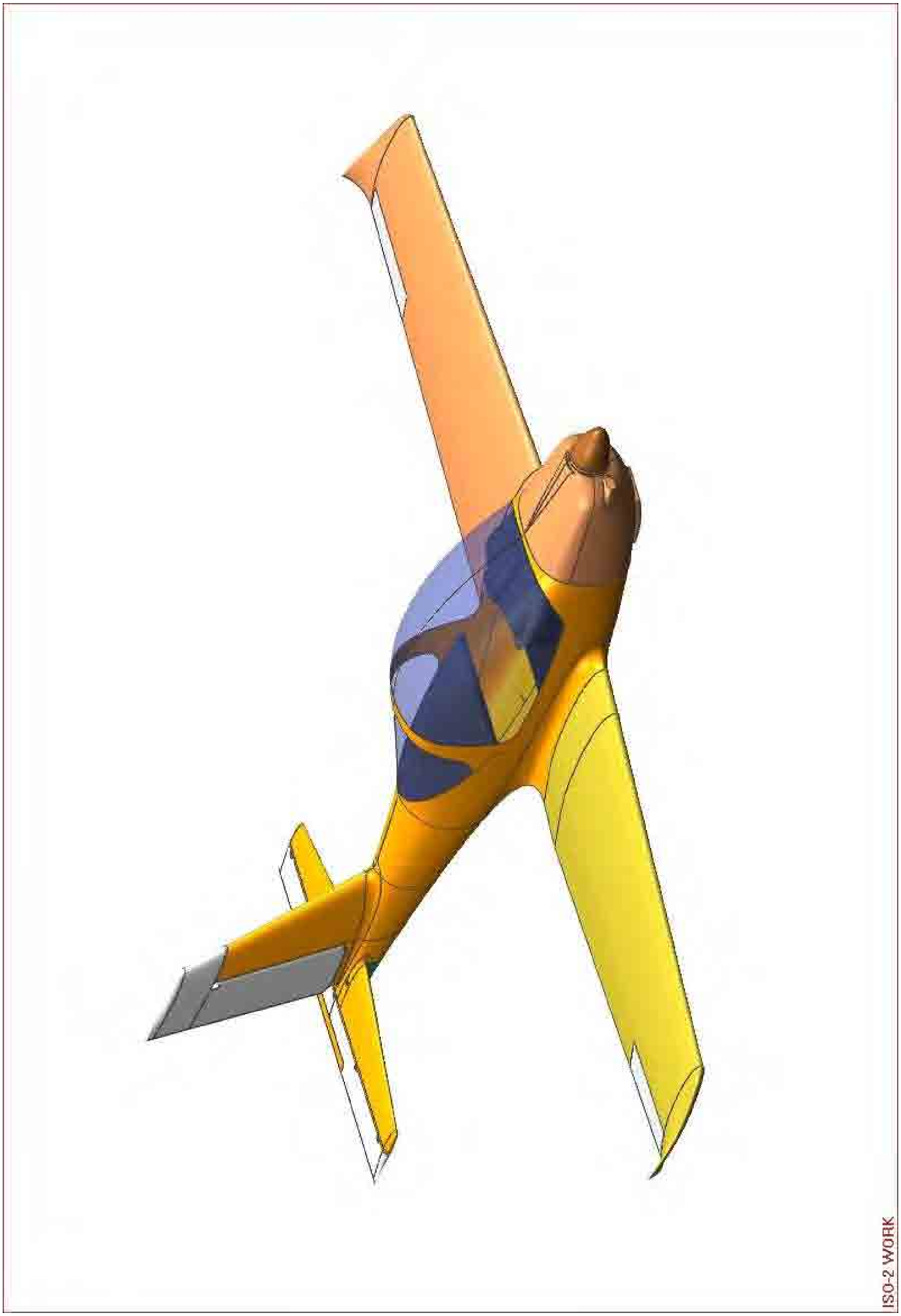
Any alterations or major repairs to the airplane must be approved in writing by the aircraft manufacturer. See Chapter 1, General Information, for more details.

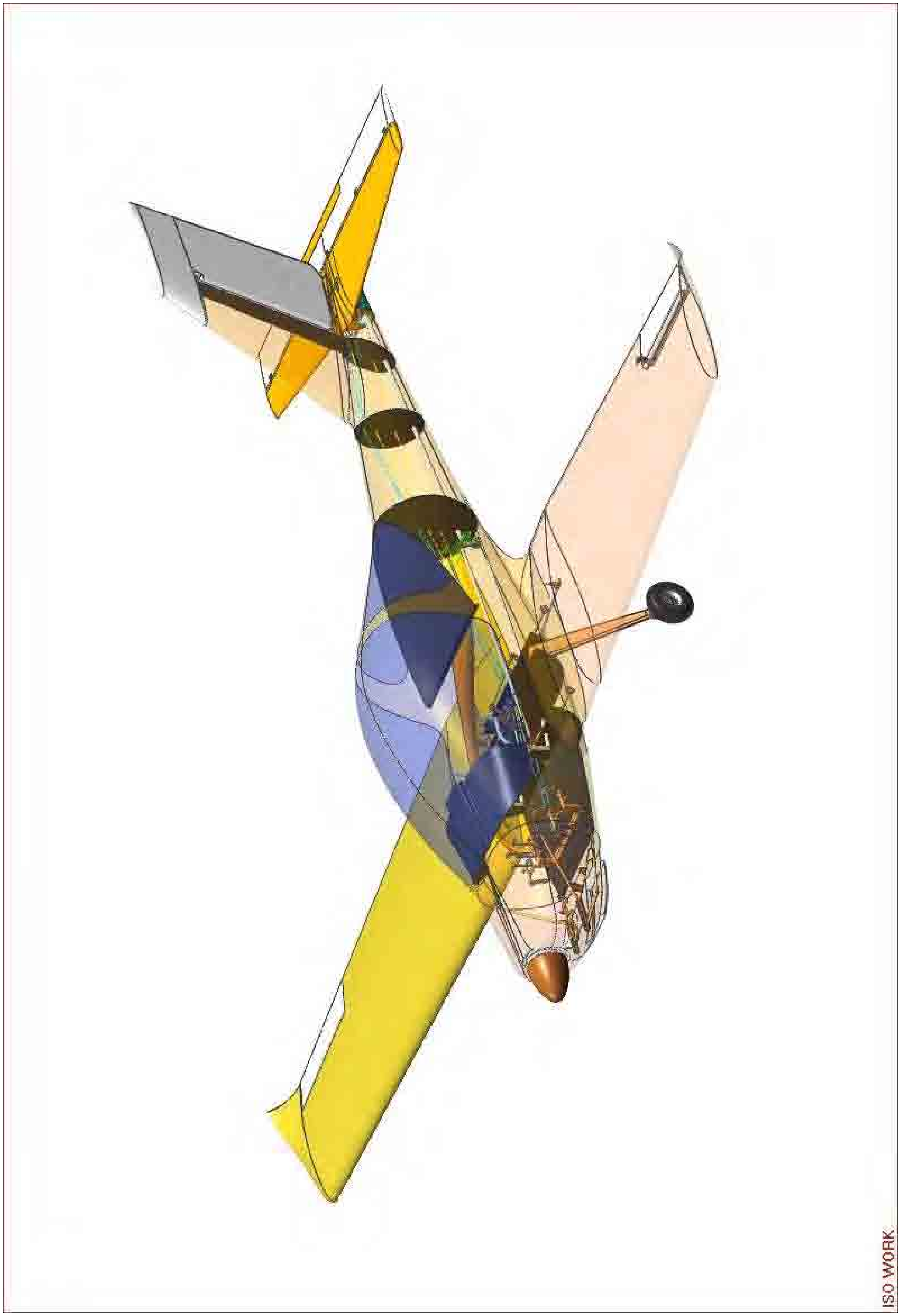
ILLUSTRATED PARTS LIST

TL–2000

StingSport


ISO WORK [EXPLODED]


ISO-2 WORK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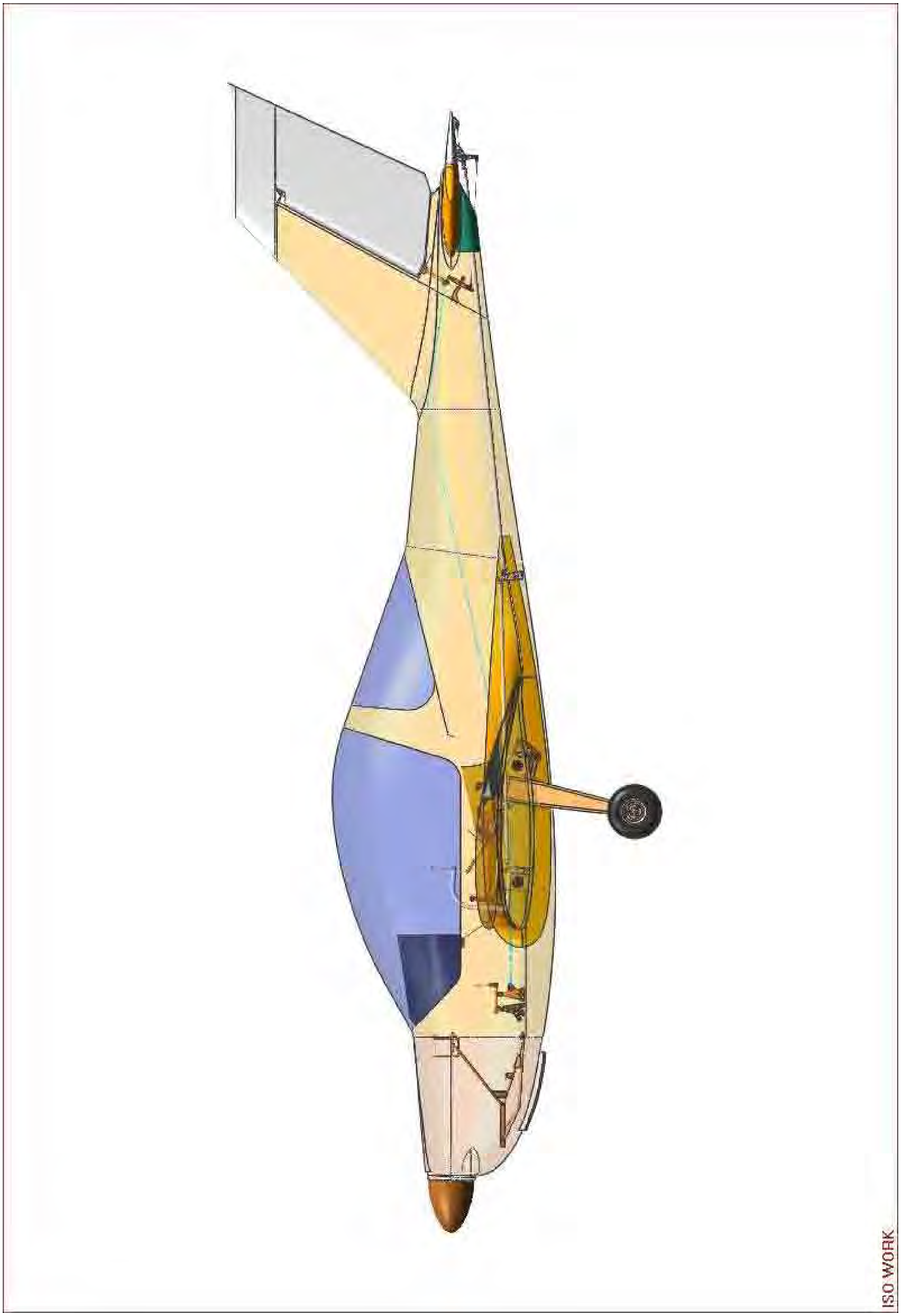

ISO WORK

CHAPTER

01

FUSELAGE

TL – 2000 *Sting Sport*
Illustrated parts catalog

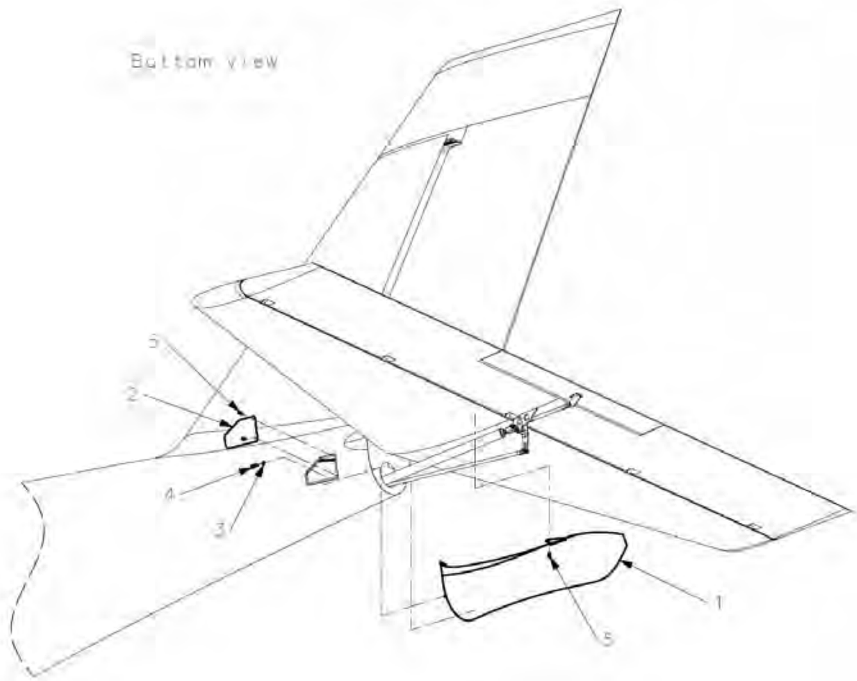


FIG	ITEM	PART NUMBER	NOMENCLATURE		
	1		Kryt		1
	2		Kryt-montážního otvoru		1
	3	ČSN 02 1702.14	Podložka 4		2
	4	ČSN 02	Šroub M4		2
	5	ČSN 02 1146	Šroub M4x16		3

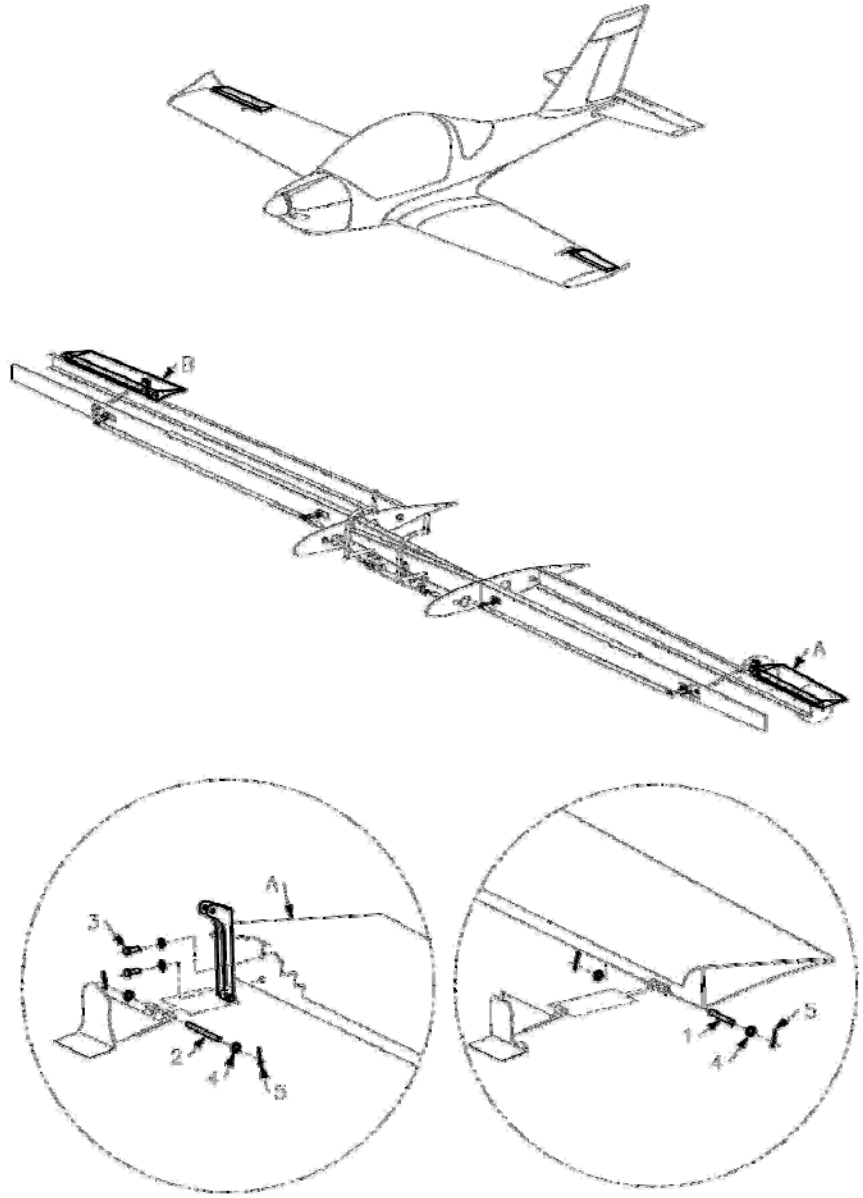
01 – FUSELAGE - 2 -

CHAPTER

02

WING

TL – 2000 *Sting Sport*
Illustrated parts catalog



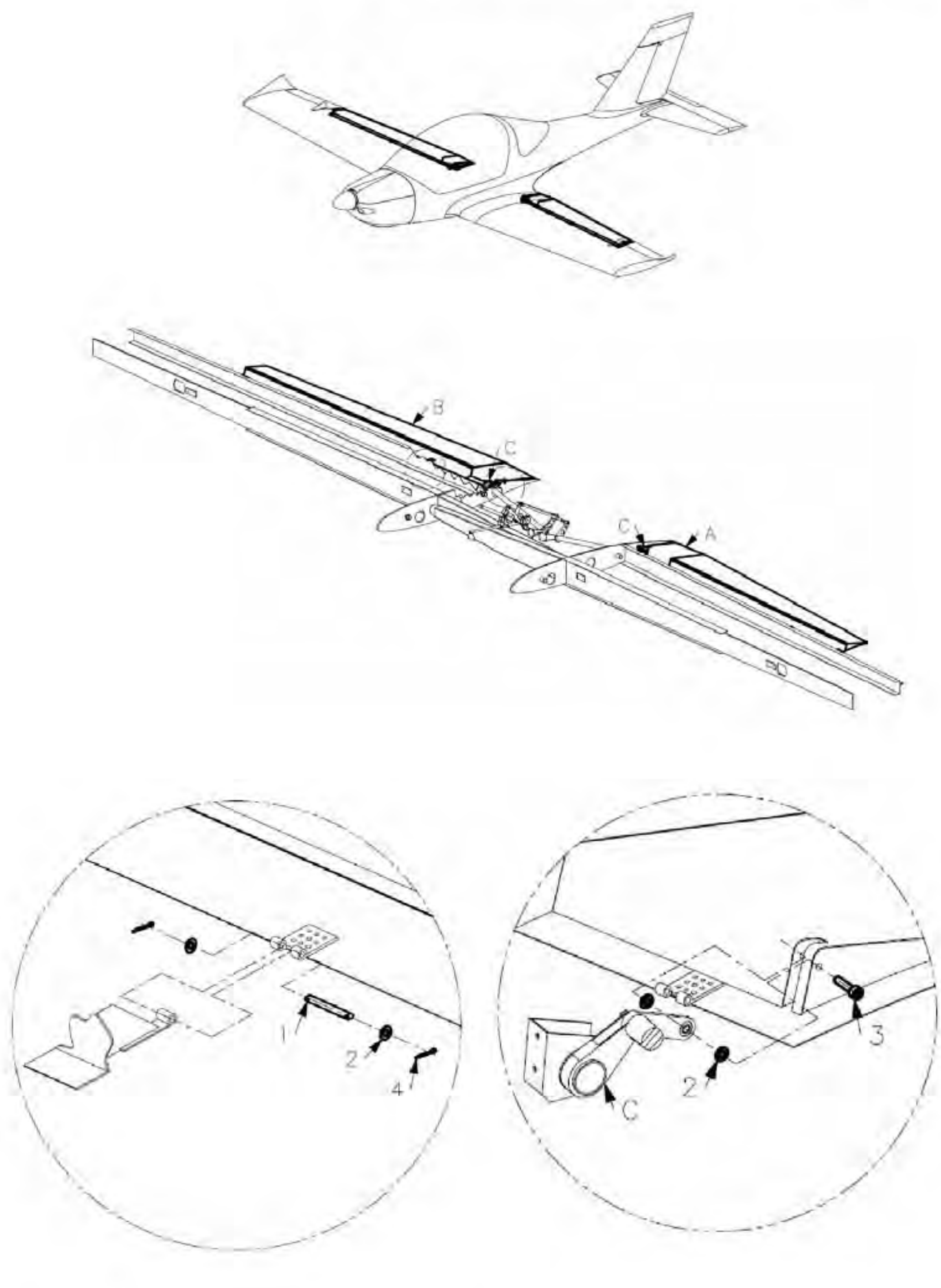
02 – WING -2-

TL - 2000 *Sting Sport*
Illustrated parts catalog

FIG	ITEM	PART NUMBER	NOMENCLATURE		
A			Křidélko-levé		1
B			Křidélko-pravé		1
	1	STING 2-14	Čep-krátký		2
	2	STING 2-14a	Čep-dlouhý		2
	3	ČSN 02 1103	Šroub M6x15		4
	4	ČSN 02 1702	Podložka 6		12
	5	ČSN 02 1781	Závlačka		8

02 - WING - 3 -

TL – 2000 *Sting Sport*
Illustrated parts catalog



02 – WING -4-

TL – 2000 *Sting Sport*
Illustrated parts catalog

FIG	ITEM	PART NUMBER	NOMENCLATURE		
A			Klapka levá		1
B			Klapka pravá		1
C		STING 2-P1	Unášeč klapek		2
	1	STING 2-14	Čep klapek		10
	2	ČSN 02 1702	Podložka 6		24
	3	ČSN 02 1143	Šroub M6x35		2
	4	ČSN 02 1781	Závlačka		10

Part -C-

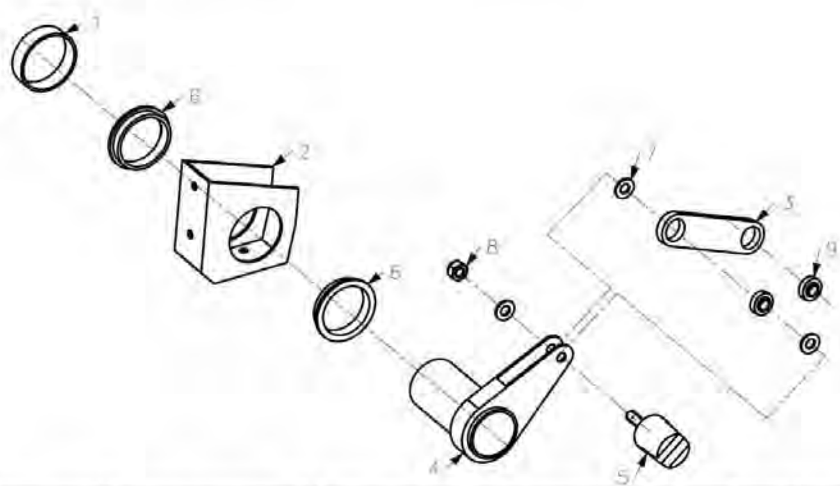


FIG	ITEM	PART NUMBER	NOMENCLATURE		
C	1	KR-TR 38x1,5			1
	2	STING – 2 – 6	Domeček		1
	3	STING – 2 – 7	Táhlo klapek		1
	4	STING – 2 – 10	Páka		1
	5	STING – 2 – 9	Vidlička		1
	6	STING – 2 – 11	Pouzdro		2
	7	ČSN 02 1702	Podložka 6		3
	8	ČSN 02 1492	Matice M6		1
	9	ČSN 02 3515	Ložisko 6		2

02 – WING - 5 -

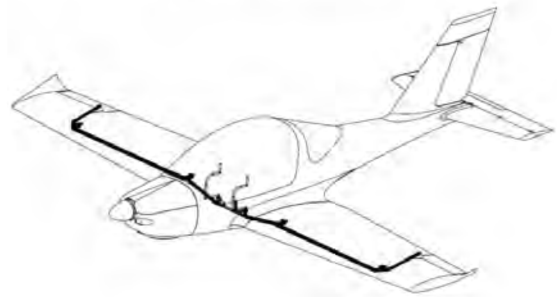
CHAPTER

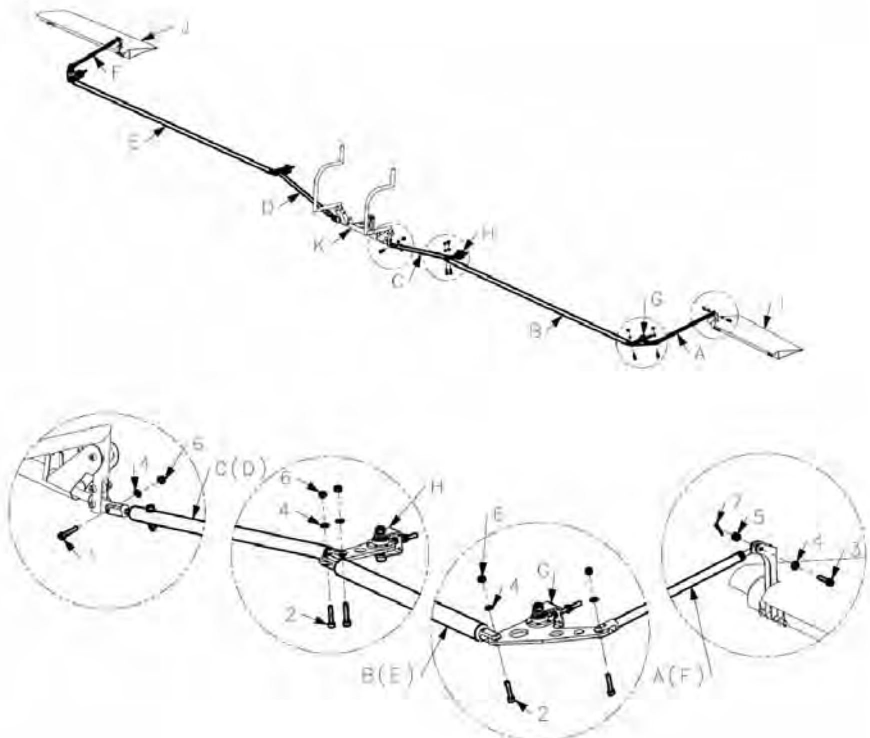
03

FLIGHT CONTROLS INSTALLATION

AILERON SYSTEM

TL – 2000 *Sting Sport*
Illustrated parts catalog





03 – FLIGHT CONTROLS INSTALLATION
AILERON SYSTEM

- 2 -

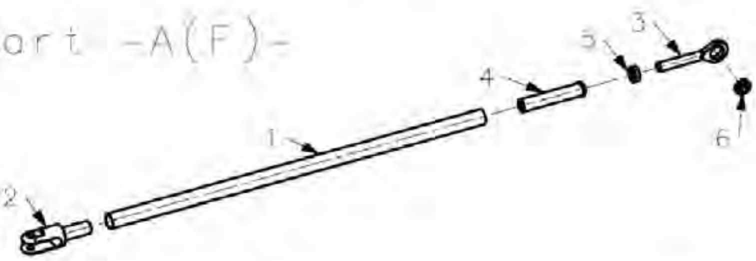
TL – 2000 *Sting Sport*
Illustrated parts catalog

ITEM	PART NUMBER	NOMENCLATURE		
A	STING 3-8 L	Táhlo č.1 v levém křídle		1
B	STING 3-7 L	Táhlo č.2 v levém křídle		1
C	STING 3-6 L	Táhlo č.3 v levém křídle		1
D	STING 3-6 R	Táhlo č.3 v pravém křídle		1
E	STING 3-7 R	Táhlo č.2 v pravém křídle		1
F	STING 3-8 R	Táhlo č.1 v pravém křídle		1
G		Páka č.1		2
H		Páka č.2		2
I		Křidélko levé		1
J		Křidélko pravé		1
1	ČSN 02 1143	Šroub M6x35		2
2	ČSN 02 1143	Šroub M6x30		8
3	ČSN pro závlačku	Šroub M6x35		2
4	ČSN 02 1702	Podložka 6		46
5	ČSN 02 1411	Matice M6		2
6	ČSN 02 1492	Matice M6		10
7	ČSN 02 1781	Závlačka		2

03 – FLIGHT CONTROLS INSTALLATION
AILERON SYSTEM
- 3 -

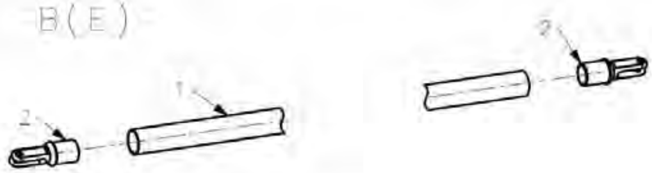
TL – 2000 *Sting Sport*
Illustrated parts catalog

part -A(F)-



ITEM	PART NUMBER	NOMENCLATURE		
A 1	KR-TR 14x1	Táhlo		1
2	STING – 25 – 2	Závitová vložka		1
3	STING – 25 – 7	Oko stavitelné		1
4	STING – 25 – 4	Vidlice pevné		1
5	ČSN 02 1403	Matice M8		1
6	ČSN 02 3515	Ložisko 6		1

part B(E)



ITEM	PART NUMBER	NOMENCLATURE		
B 1	KR-TR 14x1	Táhlo		1
2	STING – 25 – 2	Závitová vložka		2

03 – FLIGHT CONTROLS INSTALLATION
AILERON SYSTEM

- 4 -

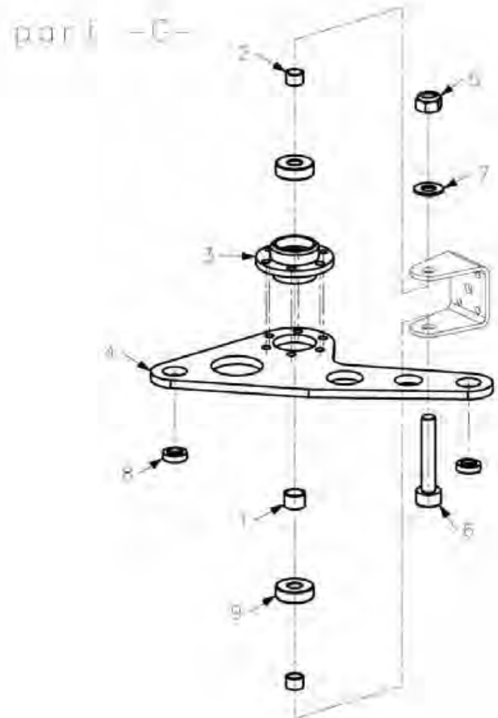
TL – 2000 *Sting Sport*
Illustrated parts catalog

ITEM		PART NUMBER	NOMENCLATURE		
C	1	KR-TR 22x1.5	Táhlo		1
	2	STING 27-7	Vidlice		1
	3	STING 27-6	Vidlice		1
	4	STING 25-2	Vložka		1
	5	ČSN 02 1492	Matice M8		1
	6	ČSN 02 1143	Šroub M6x35		1
	7	ČSN 02 1701	Podložka 6		1
	8	ČSN 02 1492	Matice M6		1

03 – FLIGHT CONTROLS INSTALLATION
AILERON SYSTEM

- 5 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

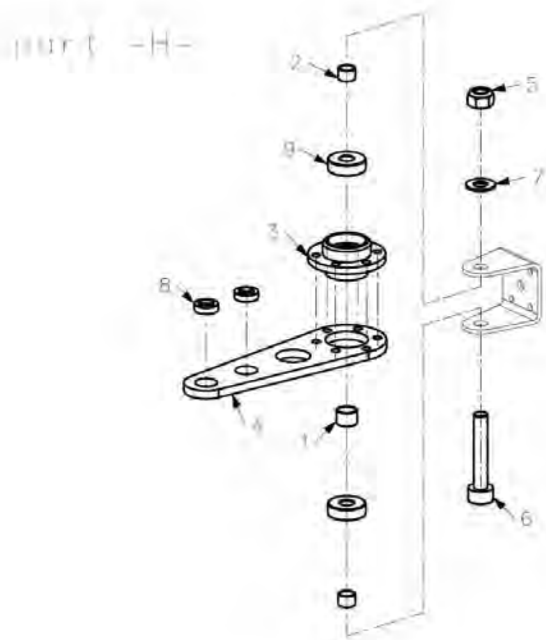


ITEM		PART NUMBER	NOMENCLATURE		
H	1	KR-TR 12x1			1
	2	KR-TR 10x1			2
	3	STING 3-2	Domeček ložisek		1
	4	STING 3-4	Páka		1
	5	ČSN 02 1492	Matice M8		1
	6	ČSN 02 1146	Šroub M8x45		1
	7	ČSN 02 1702	Podložka 8		1
	8	ČSN 02 3515	Ložisko 6		2
	9	ČSN 02 4630	Ložisko 608ZR		2

03 – FLIGHT CONTROLS INSTALLATION
AILERON SYSTEM

- 6 -

TL – 2000 ***Sting Sport***
Illustrated parts catalog



ITEM	PART NUMBER	NOMENCLATURE		
H 1	KR-TR 12x1			1
2	KR-TR 10x1			2
3	STING 3-2	Domeček ložisek		1
4	STING 3-5	Páka		1
5	ČSN 02 1492	Matice M8		1
6	ČSN 02 1146	Šroub M8x45		1
7	ČSN 02 1702	Podložka 8		1
8	ČSN 02 3515	Ložisko 6		2
9	ČSN 02 4630	Ložisko 608ZR		2

03 – FLIGHT CONTROLS INSTALLATION
AILERON SYSTEM

- 7 -

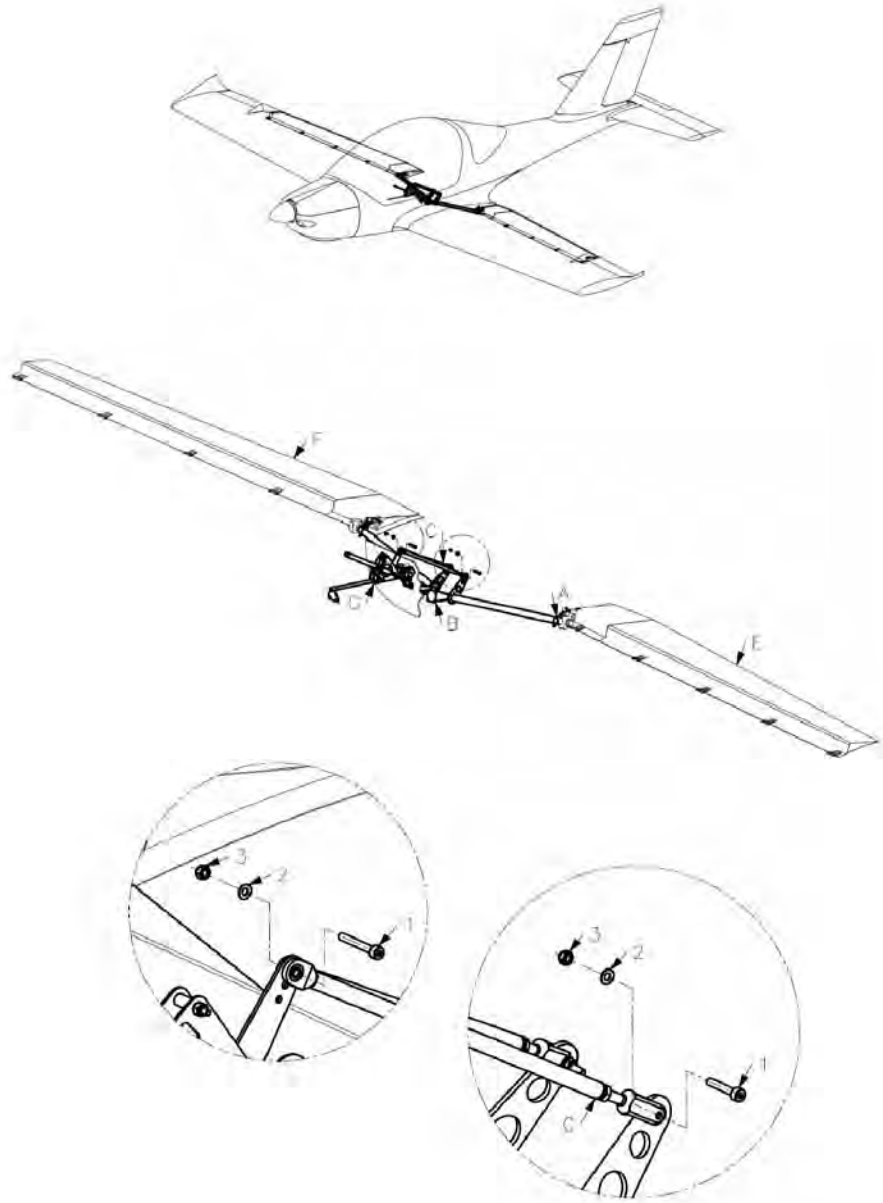
CHAPTER

04

FLIGHT CONTROLS INSTALLATION

FLAP SYSTEM

TL – 2000 *Sting Sport*
Illustrated parts catalog



04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

- 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

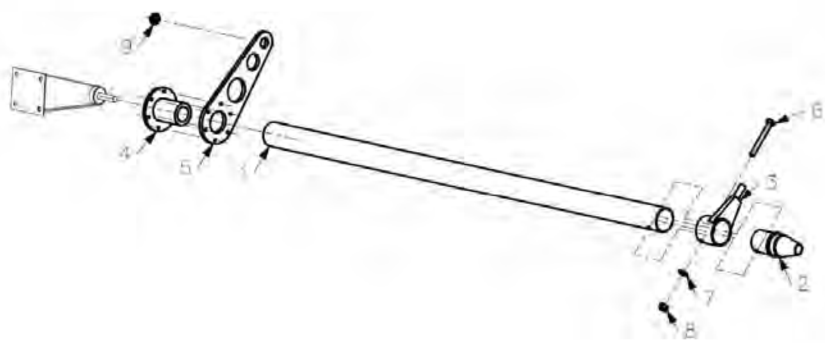
ITEM	PART NUMBER	NOMENCLATURE		
A	STING – 4P2	Torzní tyč		2
B	STING – 4 – 6	Držák torzní tyče		2
C	STING – 4 – 14	Táhlo		2
E	STING – 2	Klapka levá		1
F	STING – 2	Klapka pravá		1
G		Ovládání klapek		1
1	ČSN 02 1145	Šroub M6x35		3
2	ČSN 02 1702	Podložka 6		3
3	ČSN 02 1492	Matice M6		3

04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

– 3 –

TL – 2000 ***Sting Sport***
Illustrated parts catalog

Part -A-



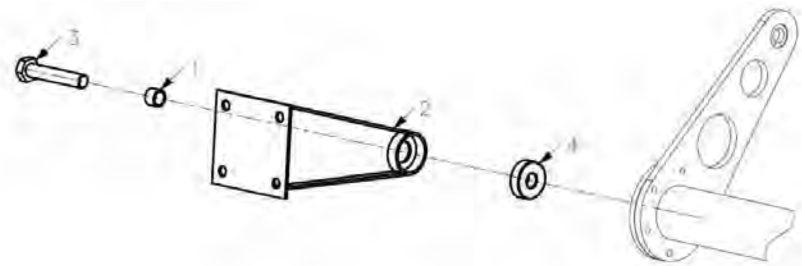
ITEM		PART NUMBER	NOMENCLATURE		
A	1	KR-TR 32x1,5	Torzní tyč		2
	2	STING – 4 – 4	Trn náhonu klapek		2
	3	STING – 4 – 5	Unašeč		2
	4	STING – 4 – 7	Příruba		2
	5	STING – 4 – 8	Páka		2
	6	ČSN 02 1143	Šroub M6x50		2
	7	ČSN 02 1702	Podložka 6		2
	8	ČSN 02 1492	Matice M6		2
	9	ČSN 02 3515	Ložisko 6		2

04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

- 4 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

Part -B-

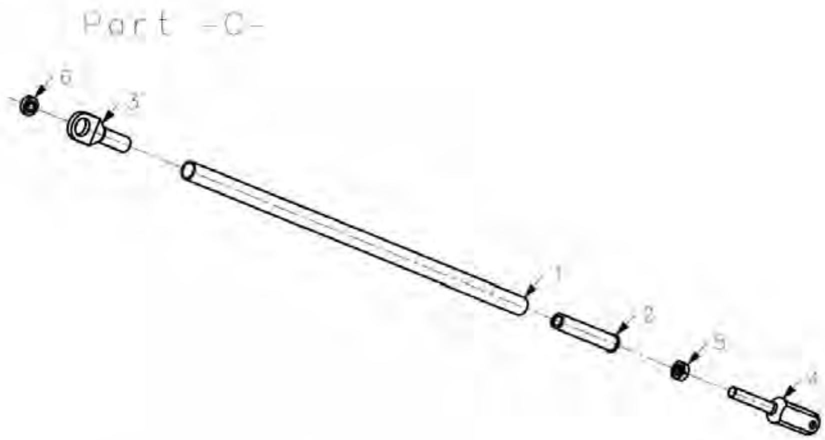


ITEM		PART NUMBER	NOMENCLATURE		
B	1	KR-TR 10x1	Vložka		2
	2	STING – 4 – 6	Držák	R, L	1, 1
	3	ČSN 02 1101	Šroub M8x30		2
	4	ČSN 4630	Ložisko 608ZR		2

04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

- 5 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

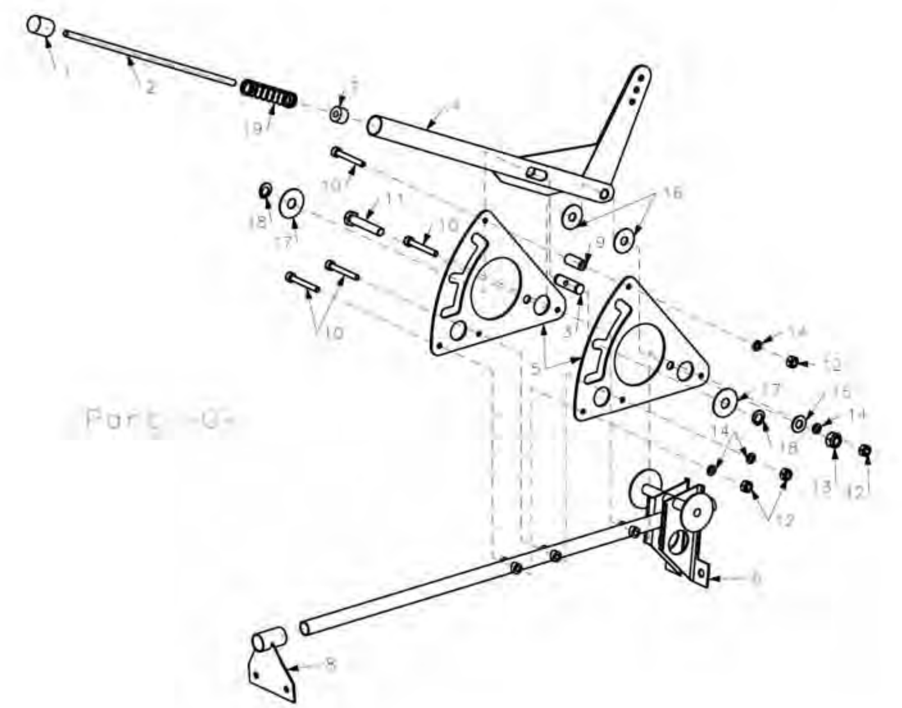


ITEM		PART NUMBER	NOMENCLATURE		
C	1	KR-TR 14x1	Táhlo		2
	2	STING – 25 – 1	Závitová vložka		2
	3	STING – 25 – 5	Oko pevné		2
	4	STING – 25 – 6	Vidlička stavitelná		2
	5	ČSN 02 1401	Matice M8		2
	6	ČSN 02 3515	Ložisko 6		2

04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

- 6 -

TL – 2000 *Sting Sport*
Illustrated parts catalog



04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

- 7 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

ITEM	PART NUMBER	NOMENCLATURE		
G 1	STING – 4 – 1	Tlačítko aretace klapek		1
2	STING – 4 – 2	Táhlo ovládání klapek		1
3	STING – 4 – 3	Zarážka páka klapek		1
4	STING – 4 – 9	Páka ovládání klapek		1
5	STING – 4 – 10	Kulisa		2
6	STING – 4 – 11	Držák páky klapek		1
7	STING – 4 – 12	Podložka pod pružinu		1
8	STING – 4 – 13	Přední závěs páky klapek		1
9	STING – 4 – 20	Distanční trubka		1
10	ČSN 02 1143.55	Šroub M5x40		4
11	ČSN 02 1101.55	Šroub M8x45		1
12	ČSN 02 1492.25	Matice M5		4
13	ČSN 02 1492.55	Matice M8		1
14	ČSN 02 1702.15	Podložka 5		4
15	ČSN 02 1702.15	Podložka 8		1
16		Podložka ∅8,4,x∅25 - Penefol		2
17		Podložka ∅10,2x∅30 - Penefol		2
18	ČSN 02 2930	Pojistný kroužek 10		2
19	ČSN 02 6003	Pružina 16x1-60		1

04 – FLIGHT CONTROLS INSTALLATION
FLAP SYSTEM

– 8 –

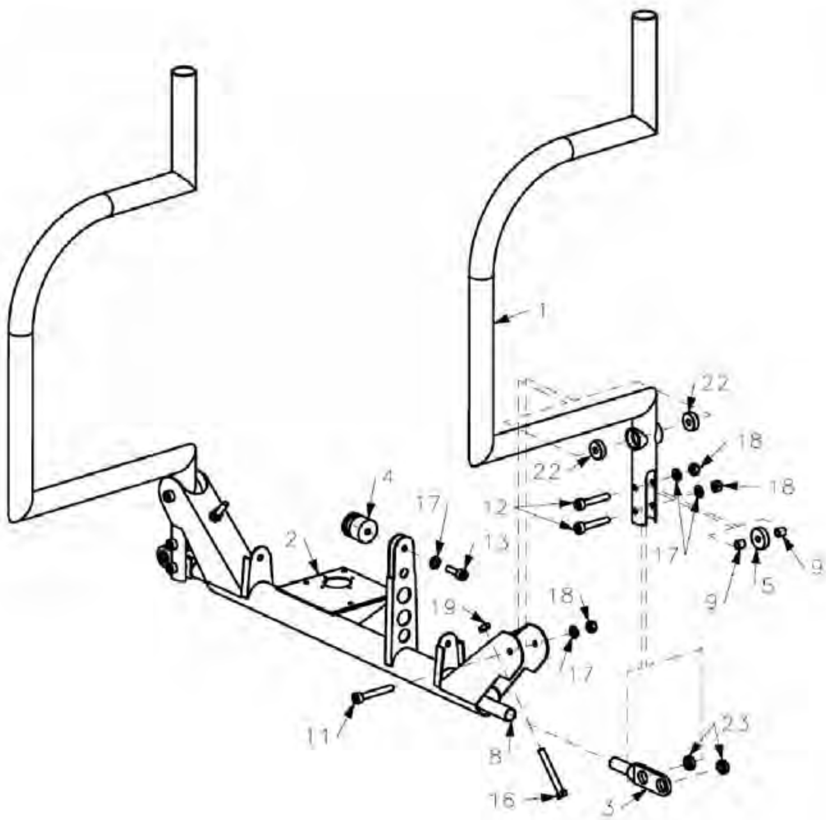
CHAPTER

05

FLIGHT CONTROLS INSTALLATION

CONTROL STICK

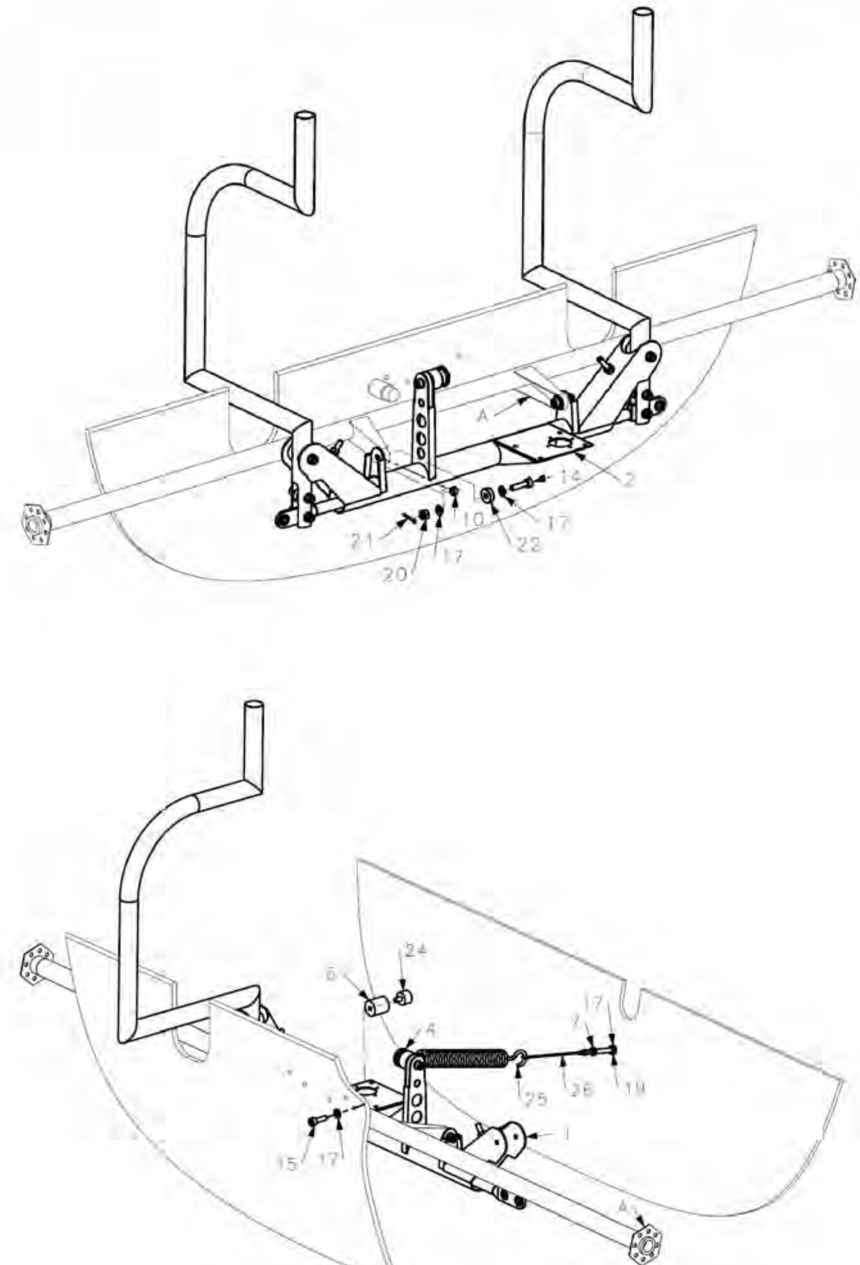
TL – 2000 *Sting Sport*
Illustrated parts catalog



05 – FLIGHT CONTROLS INSTALLATION
CONTROL STICK

– 2 –

TL – 2000 *Sting Sport*
Illustrated parts catalog



05 – FLIGHT CONTROLS INSTALLATION
CONTROL STICK

- 3 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

ITEM	PART NUMBER	NOMENCLATURE		
1	STING – 5 – 2	Řídící páka		2
2	STING – 5 – 3	Držák páky řízení		1
3	STING – 25 – 10	Dvojoko pevné		2
4	STING – 5 – 5	Držák pružiny		1
5	STING – 5 – 6	Doraz řídící páky		2
6	STING – 5 – 4	Doraz přední		1
7	STING – 9 – 8	Šroub s okem		1
8	KR-TR 22x1	Táhlo		1
9	KR-TR 8x1	Distanční trubka		4
10	KR-TR 10x2	Distanční trubka		2
11	ČSN 02 1143.55	Šroub M6x45		
12	ČSN 02 1143.55	Šroub M6x35		6
13	ČSN 02 1143.55	Šroub M6x20		
14	ČSN 02 1101.55	Šroub M6x22		
15	ČSN 02 1101.55	Šroub M6x 25		
16	ČSN 02 1101.55	Šroub M6x60		2
17	ČSN 02 1702.15	Podložka 6		
18	ČSN 02 1492.55	Matice M6		
19	ČSN 02 1403.55	Matice M6		
20	ČSN 02 1411	Matice M6		
21	ČSN 02 1781	Závlačka 2		2
22		Ložisko 626 ZR		6
23	ČSN 02 3515	Ložisko 6		4
24		Silent blok M6-malý		1
25		Pružina		1
26		Lanko		1

05 – FLIGHT CONTROLS INSTALLATION
CONTROL STICK
- 4 -

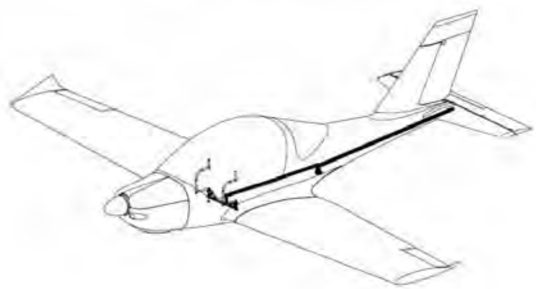
CHAPTER

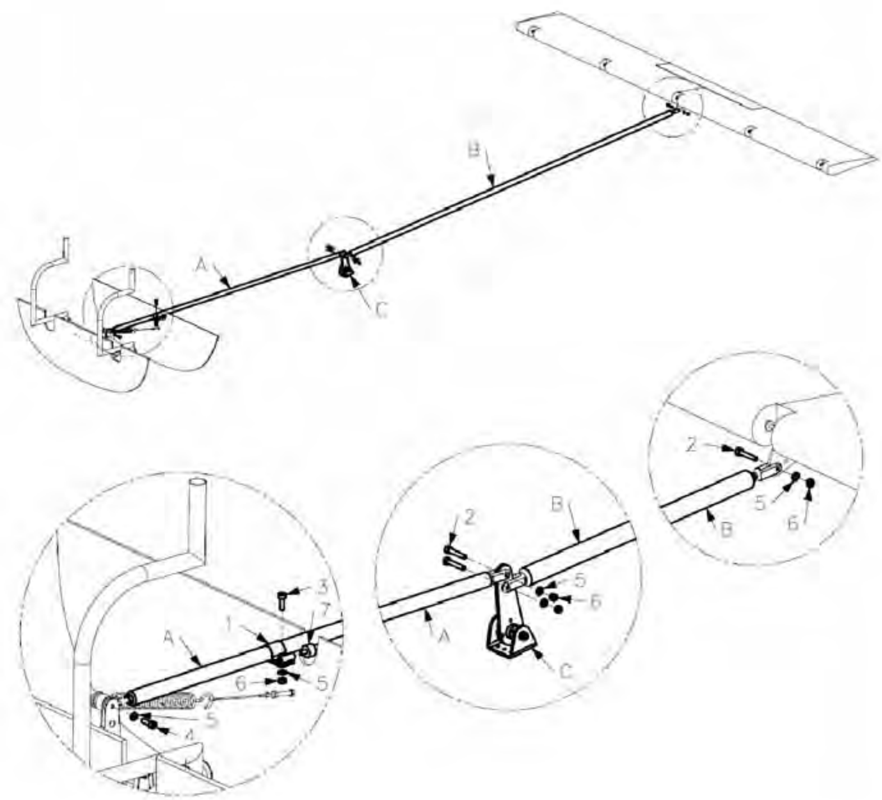
06

FLIGHT CONTROLS INSTALLATION

ELEVATOR SYSTEM

TL – 2000 *Sting Sport*
Illustrated parts catalog





06 – FLIGHT CONTROLS INSTALLATION
ELEVATOR SYSTEM

- 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

FIG	ITEM	PART NUMBER	NOMENCLATURE		
	A	STING – 6 – P2	Táhlo-přední		
	B	STING – 6 – P3	Táhlo-zadní		
	C	STING – 6 – P1	Páka střední		
	1	STING – 5 – 1	Doraz zadní		
	2	ČSN 02 1143.55	Šroub M6x30		
	3	ČSN 02 1143.55	Šroub M6x15		
	4	ČSN 02 1143.55	Šroub M6x20		
	5	ČSN 02 1702.14	Podložka 6		
	6	ČSN 02 1492	Matice M6		
	7		Silent blok M6-malý		

06 – FLIGHT CONTROLS INSTALLATION
ELEVATOR SYSTEM

– 3 –

TL – 2000 ***Sting Sport***
Illustrated parts catalog

part –A–

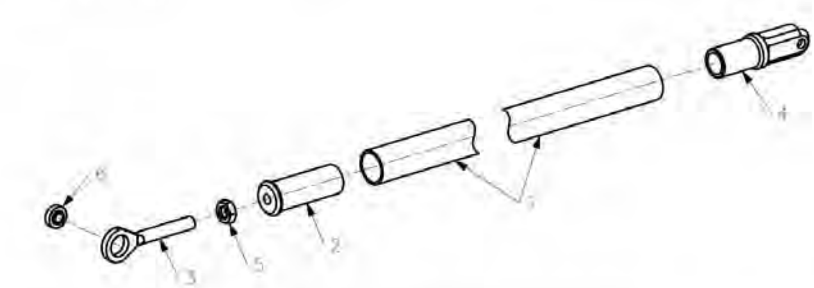


FIG	ITEM	PART NUMBER	NOMENCLATURE		
A	1	KR-TR 22x1,5	Táhlo		1
	2	STING – 25 – 2	Závitová vložka		1
	3	STING – 25 – 7	Oko stavitelné		1
	4	STING – 25 – 4	Vidlice pevné		1
	5	ČSN 02 1403.44	Matice M8		1
	6	ČSN 02 3515	Ložisko 6		1

part –B–

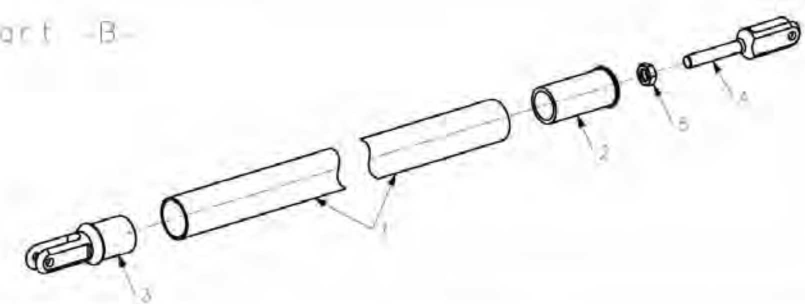


FIG	ITEM	PART NUMBER	NOMENCLATURE		
B	1	KR-TR 28x1,5	Táhlo		1
	2	STING – 25 – 3	Závitová vložka		1
	3	STING – 25 – 6	Vidlice pevná		1
	4	STING – 25 – 8	Vidlice stavitelná		1
	5	ČSN 02 1403.44	Matice M8		1

06 – FLIGHT CONTROLS INSTALLATION
ELEVATOR SYSTEM

- 4 -

TL - 2000 *Sting Sport*
Illustrated parts catalog

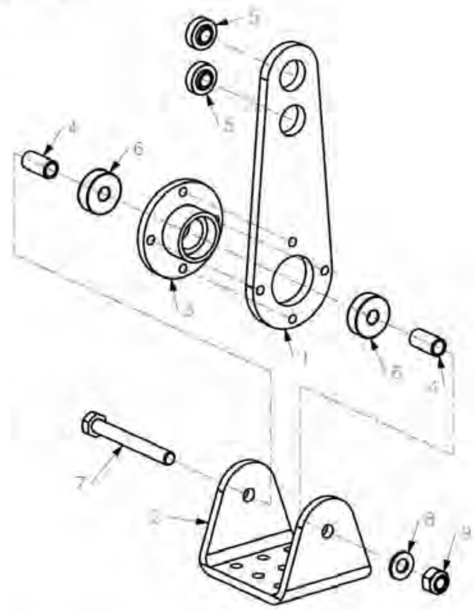


FIG	ITEM	PART NUMBER	NOMENCLATURE		
C	1	STING - 6 - 4	Páka		1
	2	STING - 6 - 1	U-Konzole		1
	3	STING - 6 - 3	Náboj páky		1
	4	TR-KR 8x1 - 15	Distanční trubka		2
	5	ČSN 02 3515	Ložisko 6		2
	6		Ložisko 626 ZR		2
	7	ČSN 02 1101.44	Šroub M6x70		1
	8	ČSN 02 1702.14	Podložka 6		1
	9	ČSN 02 1492	Matice M6		1

06 - FLIGHT CONTROLS INSTALLATION
ELEVATOR SYSTEM

- 5 -

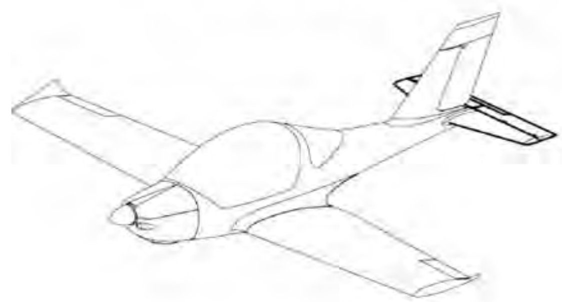
CHAPTER

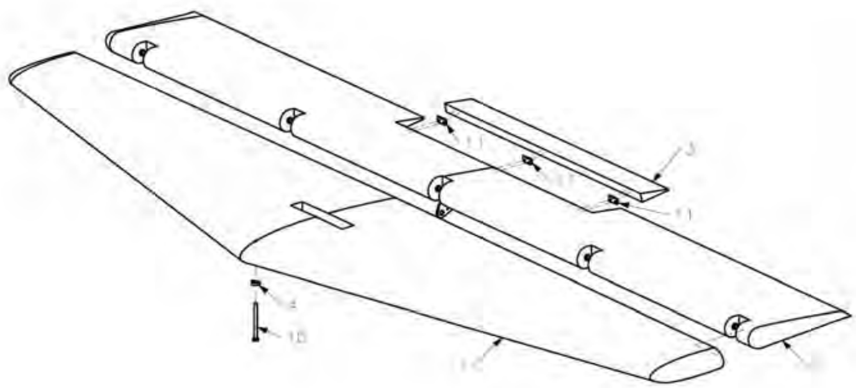
07

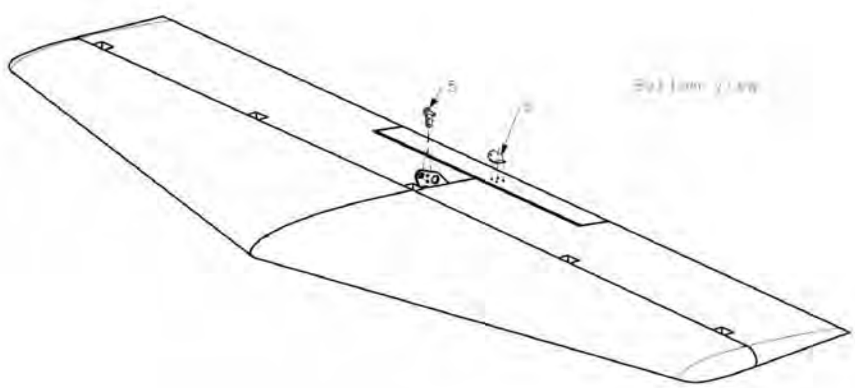
FLIGHT CONTROLS INSTALLATION

ELEVATOR

TL – 2000 *Sting Sport*
Illustrated parts catalog







07 – FLIGHT CONTROLS INSTALLATION
ELEVATOR

- 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

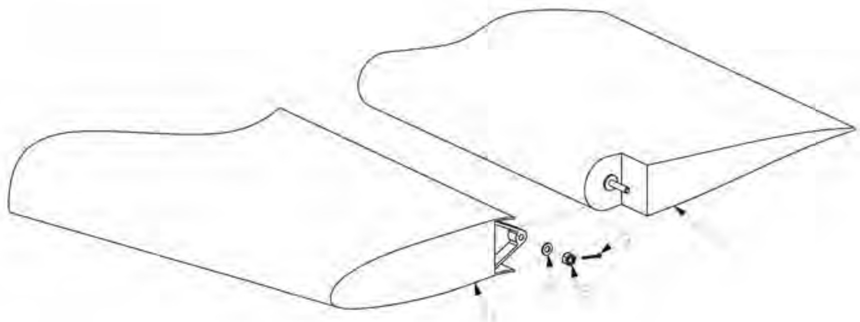


FIG	ITEM	PART NUMBER	NOMENCLATURE		
	1		Stabilizátor		1
	2		Výškové kormidlo		1
	3		Trim ploška		1
	4	STING – 7 – 6	Podložka		1
	5	STING – 8 – 7	Držák páky č.2		1
	6	STING – 8 – 6	Páka č.3		1
	7	ČSN 02 1702.14	Podložka 6		5
	8	ČSN 02 1411	Matice M6		5
	9	ČSN 02 1781	Závlačka		5
	10	ČSN 02 1101.55	Šroub M8x80		1
	11		Pianový pant		3

07 – FLIGHT CONTROLS INSTALLATION
ELEVATOR

- 3 -

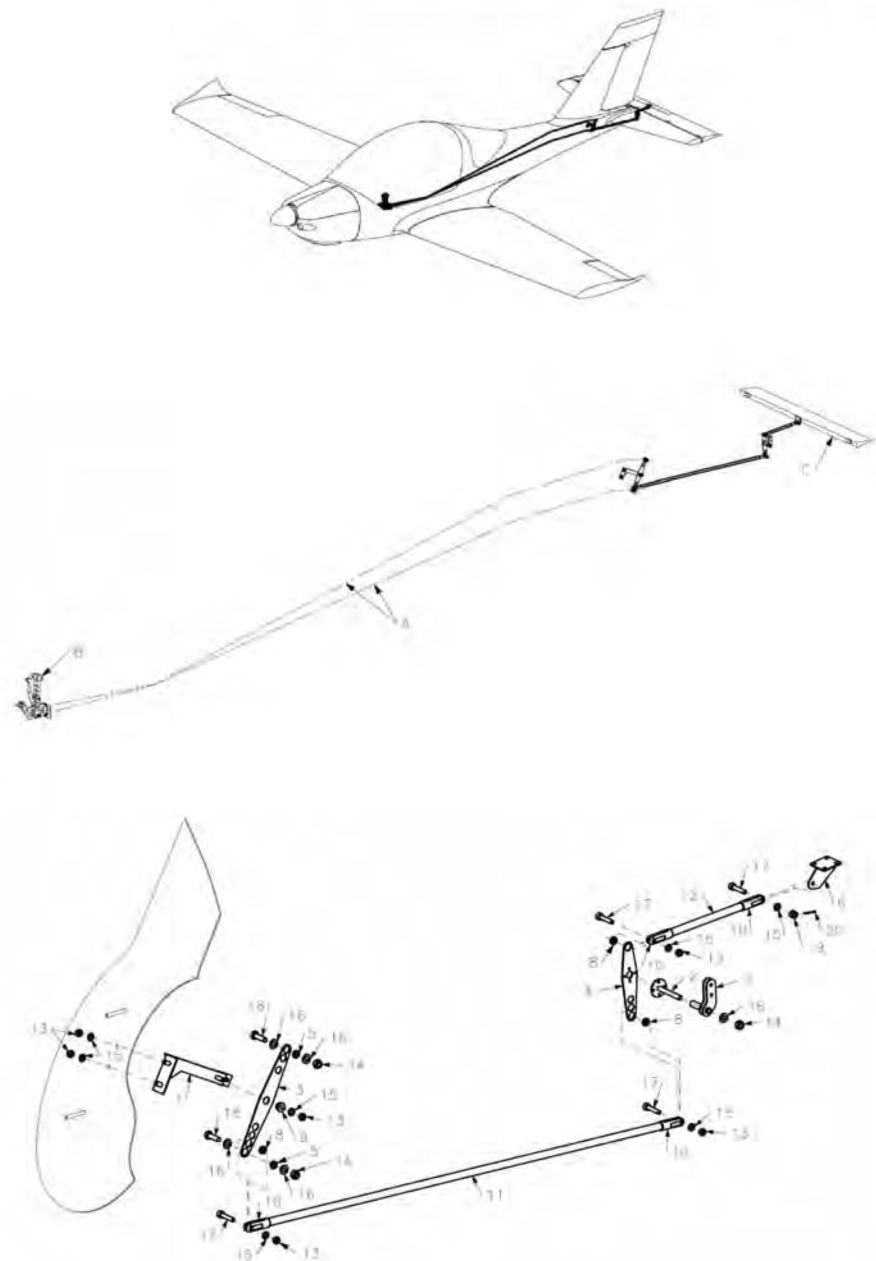
CHAPTER

08

FLIGHT CONTROLS INSTALLATION

TRIM SYSTEM

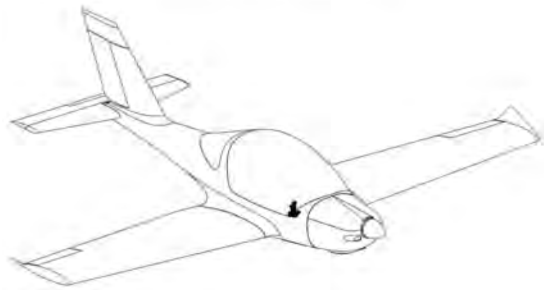
TL – 2000 ***Sting Sport***
Illustrated parts catalog



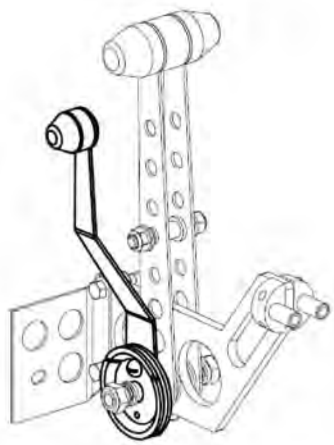
08 – FLIGHT CONTROLS INSTALLATION
TRIM SYSTEM

- 2 -

TL – 2000 ***Sting Sport***
Illustrated parts catalog



Part -B-



08 – FLIGHT CONTROLS INSTALLATION
TRIM SYSTEM

- 3 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

FIG	ITEM	PART NUMBER	NOMENCLATURE		
A		ČSN 02 4324	Ocelové lanko 1,15x7500		1
B		STING – 16	Ovládací páka		1
C		STING – 7	Trim ploška		1
	1	STING – 8 – 1	Držák páky č.1		1
	2	STING – 8 – 2	Unášeč páky č.2		1
	3	STING – 8 – 3	Páka č.1		1
	4	STING – 8 – 4	Páka č.2		1
	5	STING – 8 – 5	Pouzdro ∅6		2
	6	STING – 8 – 6	Páka č.3		1
	7	STING – 8 – 7	Držák páky č.2		1
	8	STING – 8 – 8	Pouzdro ∅5		3
	9	STING – 8 – 9	Pouzdro ∅5 s osazením		1
	10	STING – 25 – 9	Vidlička pevná		4
	11	KR-TR 10x1	Táhlo		1
	12	KR-TR 10x1	Táhlo		1
	13	ČSN 02 1492.25	Matice M5		7
	14	ČSN 02 1492.25	Matice M6		3
	15	ČSN 02 1702.15	Podložka 5		7
	16	ČSN 02 1702.15	Podložka 6		5
	17	ČSN 02 1143.55	Šroub M5x25		4
	18	ČSN 02 1101.55	Šroub M6x20		2
	19	ČSN 02 1411	Matice M5		1
	20	ČSN 02 1781	závlačka		1

08 – FLIGHT CONTROLS INSTALLATION
TRIM SYSTEM

- 4 -

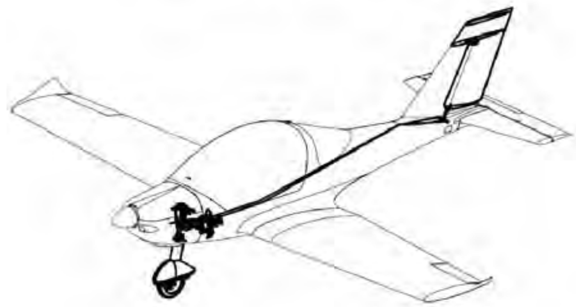
CHAPTER

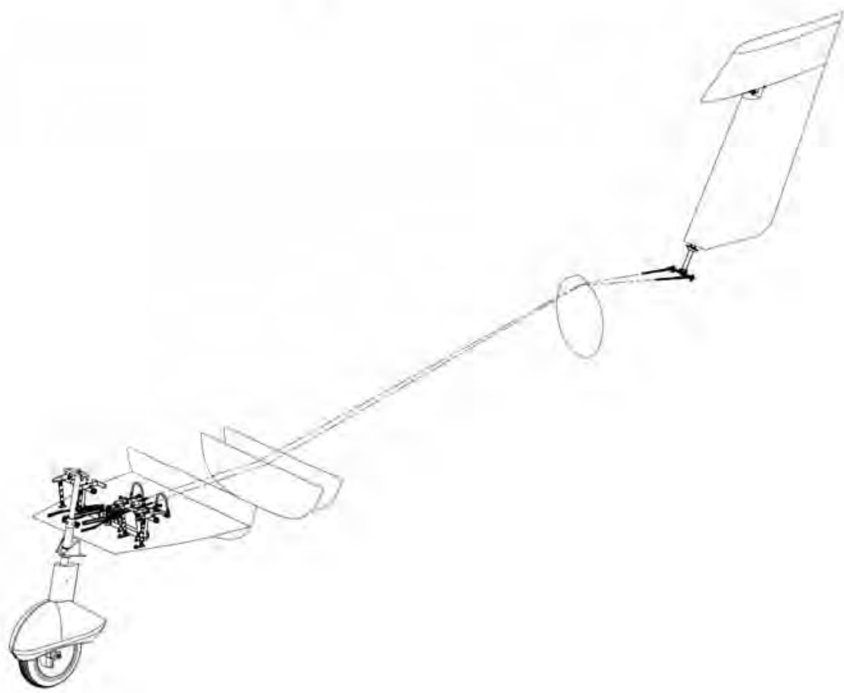
09

FLIGHT CONTROLS INSTALLATION

RUDDER SYSTEM

TL – 2000 *Sting Sport*
Illustrated parts catalog

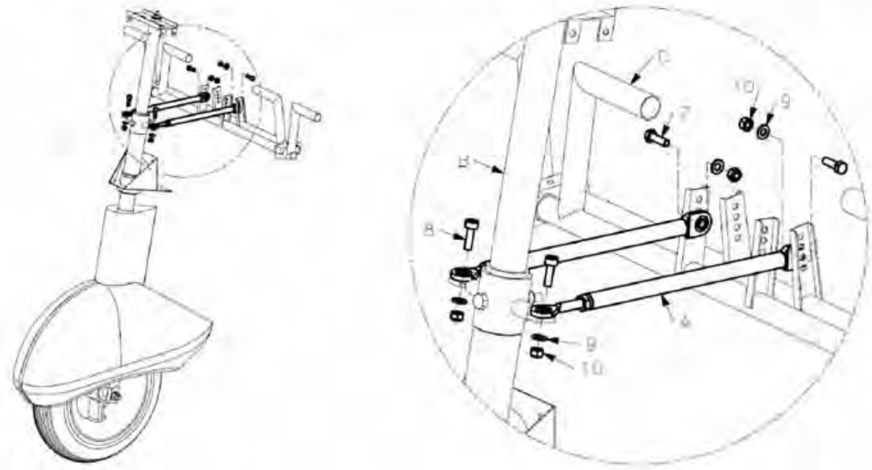




09 – FLIGHT CONTROLS INSTALLATION
RUDDER SYSTEM

- 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog



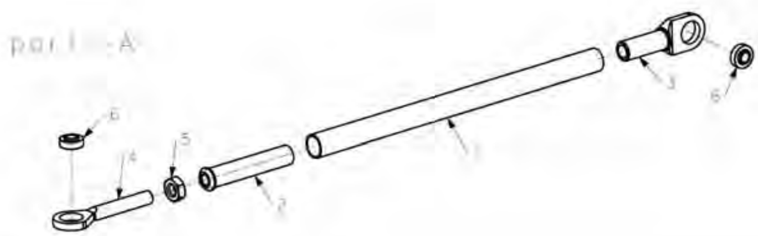
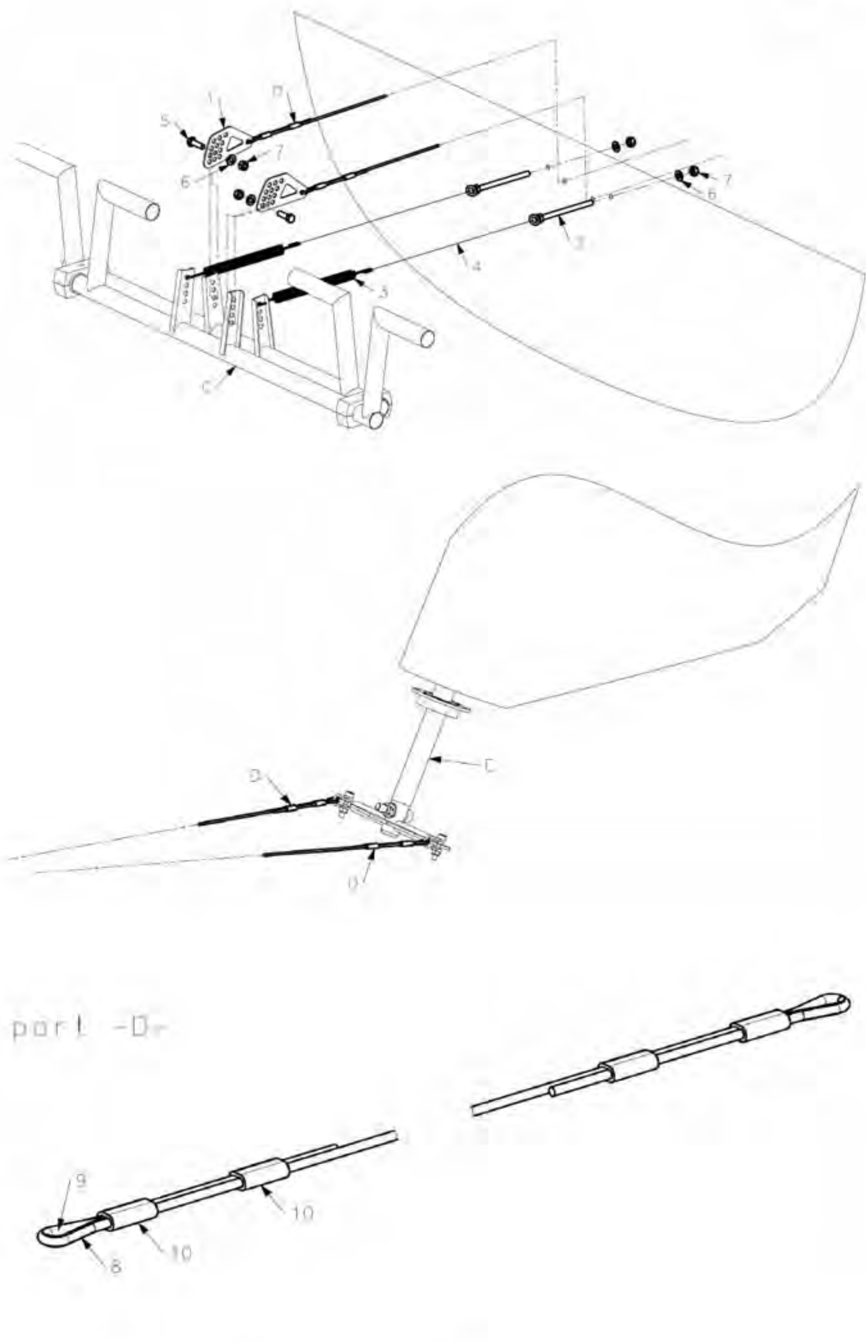


FIG	ITEM	PART NUMBER	NOMENCLATURE		
A	1	KR-TR 14x1	Trubka		2
A	2	STING – 25 – 1	Závitová vložka		2
A	3	STING – 25 – 5	Oko pevné		2
A	4	STING – 25 – 4	Oko stavitelné M8		2
A	5		Matice M8		2
A	6		Ložisko 6		4
B		STING – 12	Přední podvozková noha		1
C			Pedály		1
	7		Šroub M6x20		2
	8		Šroub M6x20		2
	9		Podložka 6		4
	10		Matice M6		4

09 – FLIGHT CONTROLS INSTALLATION - 3 -
RUDDER SYSTEM

TL – 2000 *Sting Sport*
Illustrated parts catalog



09 – FLIGHT CONTROLS INSTALLATION
RUDDER SYSTEM

- 4 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

FIG	ITEM	PART NUMBER	NOMENCLATURE		
C			Pedály		1
D	8	ČSN 02 4323	Ocelové lano ∅ 2.5		2
D	9	ČSN 02 4490	Očnice 4		4
D	10	ČSN 02 4481	Objímka-nalisovaná		8
E		STING – 14	SOP		1
	1	STING – 9 – 4	Napínák lana		2
	2	STING – 9 – 8	Šroub s okem		2
	3		Pružina		2
	4		Lanko ∅1,15		2
	5	ČSN 02 1101.55	Šroub M6x20		2
	6	ČSN 02 1702.15	Podložka 6		4
	7	ČSN 02 1492	Matice M6		7

TL – 2000 *Sting Sport*
Illustrated parts catalog

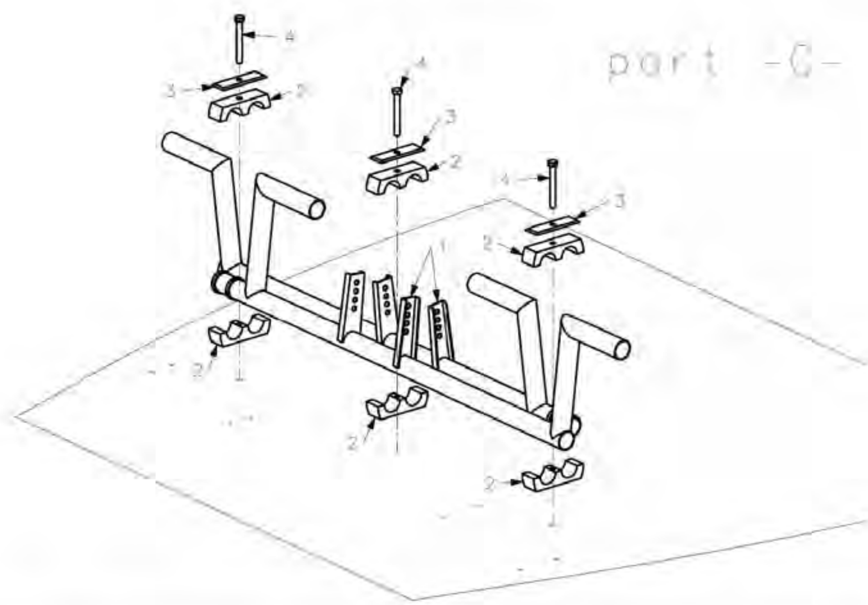


FIG	ITEM	PART NUMBER	NOMENCLATURE		
	1	STING – 9 – 1	Pedál nožního řízení	2	
	2	STING – 9 – 2	Silon. lože pedálů	3	
	3	STING – 9 – 3	Plech na lože pedálů	3	
	4	ČSN 02 1101.55	Šroub M6x44	3	

09 – FLIGHT CONTROLS INSTALLATION
RUDDER SYSTEM

- 6 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

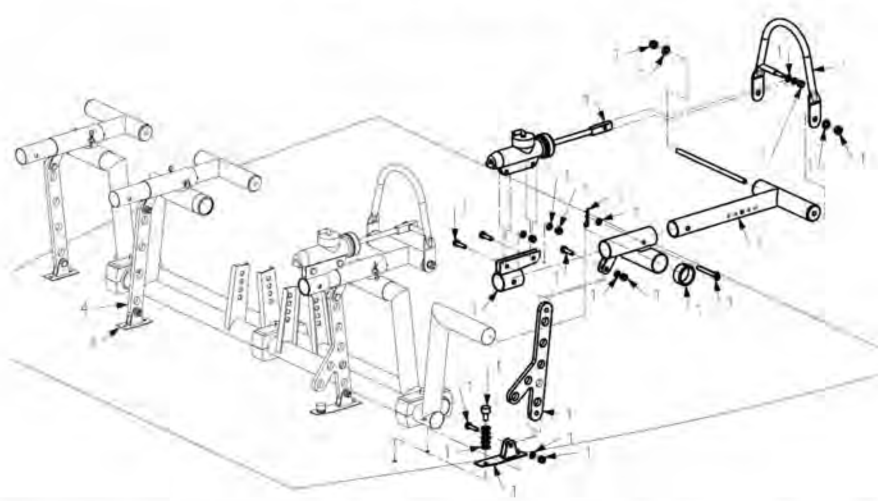


FIG	ITEM	PART NUMBER	NOMENCLATURE		
	1		Konzole pedálu		
	2		Nástavec pedálu		
	3		Držák brzdového válce		
	4		Pedál brzdy		
	5		Osa pedálu brzdy		
	6		Vahadlo-L		
	7		Vahadlo-P		
	8		Držák vahadla-L		
	9		Držák vahadla-P		
	10		Doraz		
	11		Pojišťovací čep		
	12		Podložka 5		
	13		Podložka 6		
	14		Matice M5		
	15		Šroub M5x		
	16		Závlačka		
	17		Silent blok M6		
	18				
	19				

09 – FLIGHT CONTROLS INSTALLATION
RUDDER SYSTEM

- 7 -

CHAPTER

10

FUEL SYSTEM INSTALLATION

TL – 2000 *Sting Sport*
Illustrated parts catalog

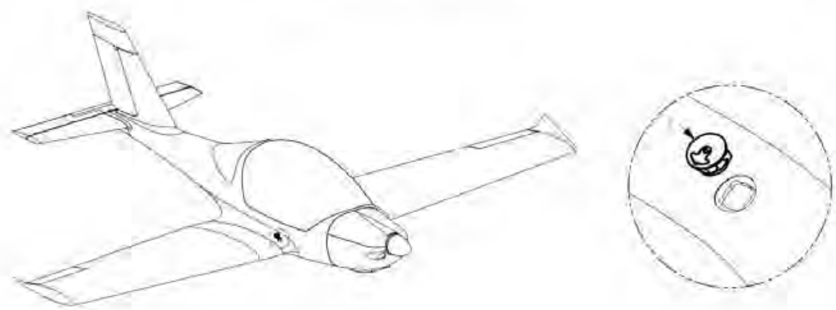


FIG ITEM	PART NUMBER	NOMENCLATURE		

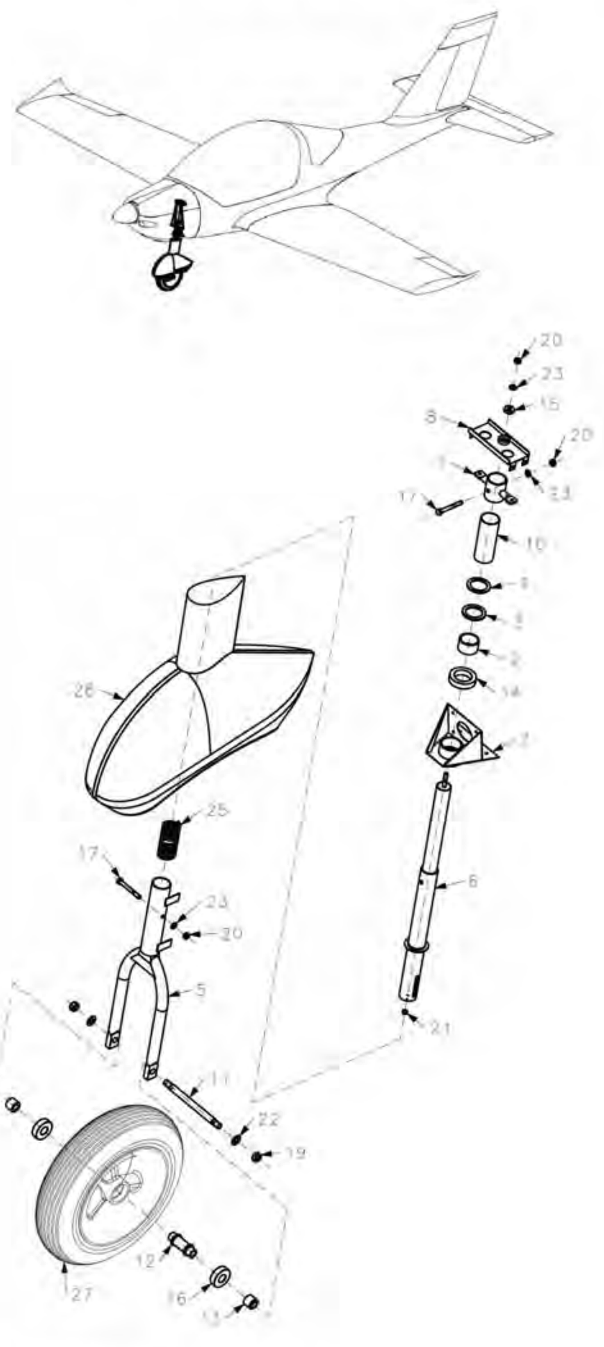
10 – FUEL SYSTEM INSTALLATION - 2 -

CHAPTER

11

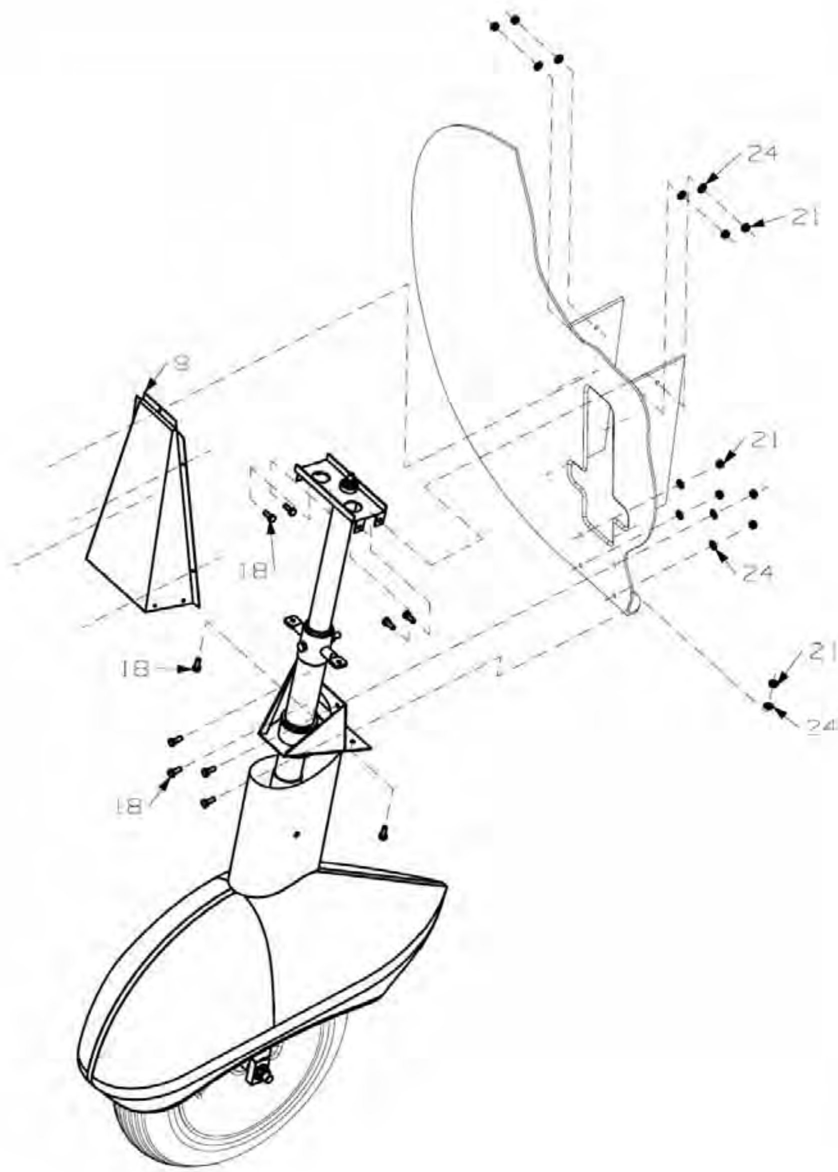
NOSE LANDING GEAR

TL – 2000 *Sting Sport*
Illustrated parts catalog



11 – NOSE LANDING GEAR - 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog



11 – NOSE LANDING GEAR

TL - 2000 *Sting Sport*
Illustrated parts catalog

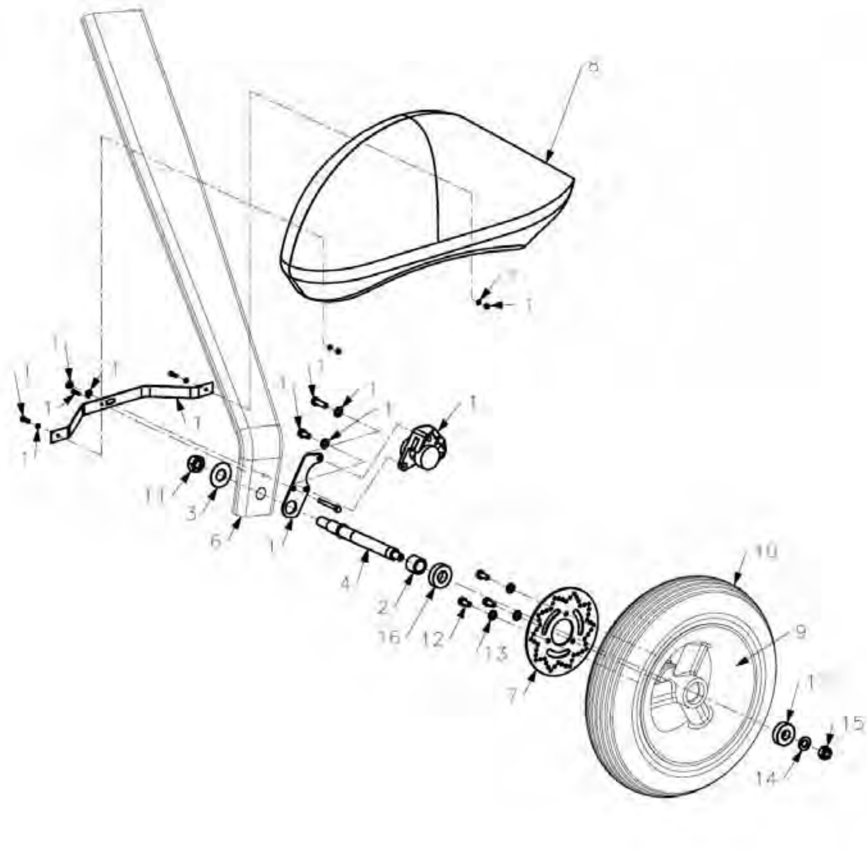
PART ITEM	PART NUMBER	NOMENCLATURE		
1	STING – 11 – 1	Vahadlo přední nohy		
2	STING – 11 – 2	Pouzdro přední nohy		
3	STING – 11 – 3	Silon. kroužek		
4	STING – 11 – 4	Kovový kroužek		
5	STING – 11 – 5	Vidlice		
6	STING – 11 – 6	Noha přední		
7	STING – 11 – 7	Zav. spodn. před. nohy		
8	STING – 11 – 8	Záves vrch. před. noh.		
9	STING – 11 – 9	Krycí plech př. nohy		
10	STING – 11 – 10	Vym. tr. před. noh.		
11	STING – 11 – 11	Osa příd. kola		
12	STING – 11 – 12	Vložka příd. kola		
13	STING – 11 – 13	Vymez. tr. příd. kola		
14	ČSN 02 4730	Ložisko 51108A		
15	ČSN 02 4630	Ložisko 608ZR		
16	ČSN 02 4630	Ložisko 6204		
17	ČSN 02 1101	Šroub M8x65		
18	ČSN 02 1101	Šroub M6x25		
19	ČSN 02 1492	Matice M12		
20	ČSN 02 1492	Matice M8		
21	ČSN 02 1492	Matice M6		
22	ČSN 02 1702	Podložka 13		
23	ČSN 02 1702	Podložka 8		
24	ČSN 02 1702	Podložka 6		
25		Pružina		
26		Aerodyn. kryt		
27		Kolo		

CHAPTER

12

MAIN LANDING GEAR

TL – 2000 *Sting Sport*
Illustrated parts catalog



12 – MAIN LANDING GEAR -2-

TL - 2000 *Sting Sport*
Illustrated parts catalog

FIG ITEM	PART NUMBER	NOMENCLATURE		
1	STING – 12 – 1	Aretace brzdy		
2	STING – 12 – 3	Distanční trubka		
3	STING – 12 – 4	Podložka		
4	STING – 12– 8	Osa kola		
5		Držák aerodynamického krytu		
6		Podvozková noha		
7		Brzdový kotouč		
8		Aerodynamický kryt		
9		Disk kola		
10		Pneu 400x100		
11	ČSN 02 1492.25	Matice M16		
12	ČSN 02 1103.55	Šroub M8x16		
13	ČSN 02 1702.15	Podložka 8		
14	ČSN 02 1702.15	Podložka 12		
15	ČSN 02 1492.25	Matice M12		
16	ČSN 02 4633	Ložisko 6004		
17	ČSN 02 4636	Ložisko 6203		
18				
19				
20				

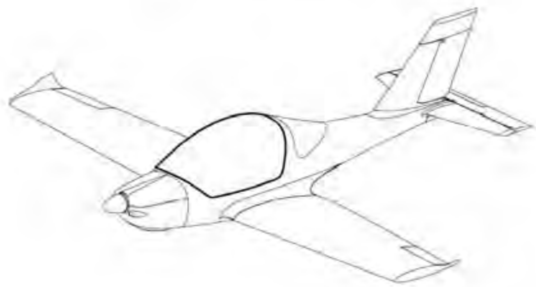
12 – MAIN LANDING GEAR - 3 -

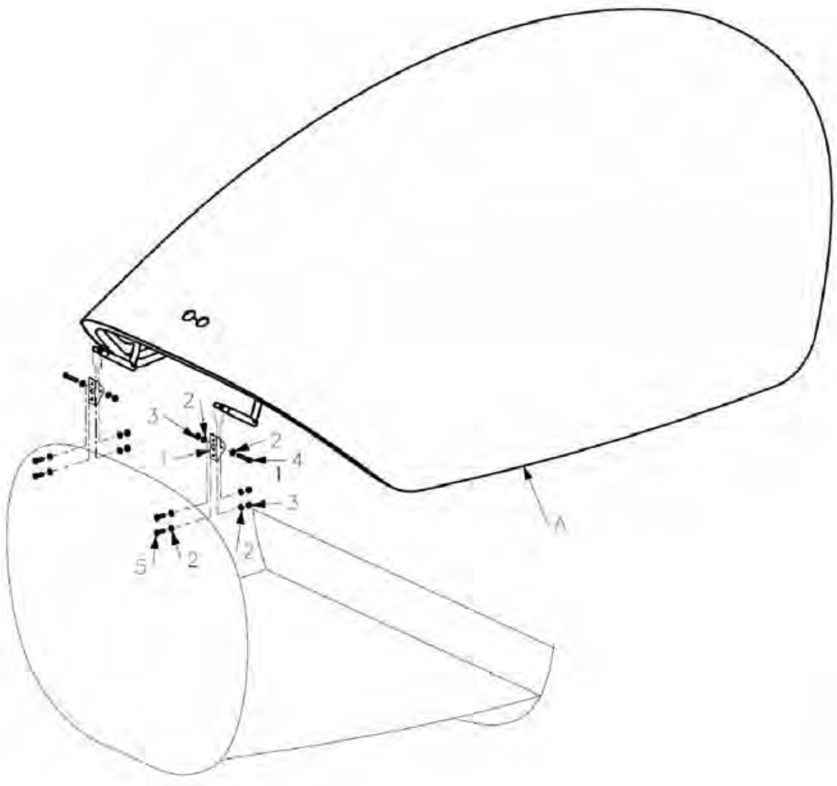
CHAPTER

13

COCKPIT COVER

TL – 2000 *Sting Sport*
Illustrated parts catalog





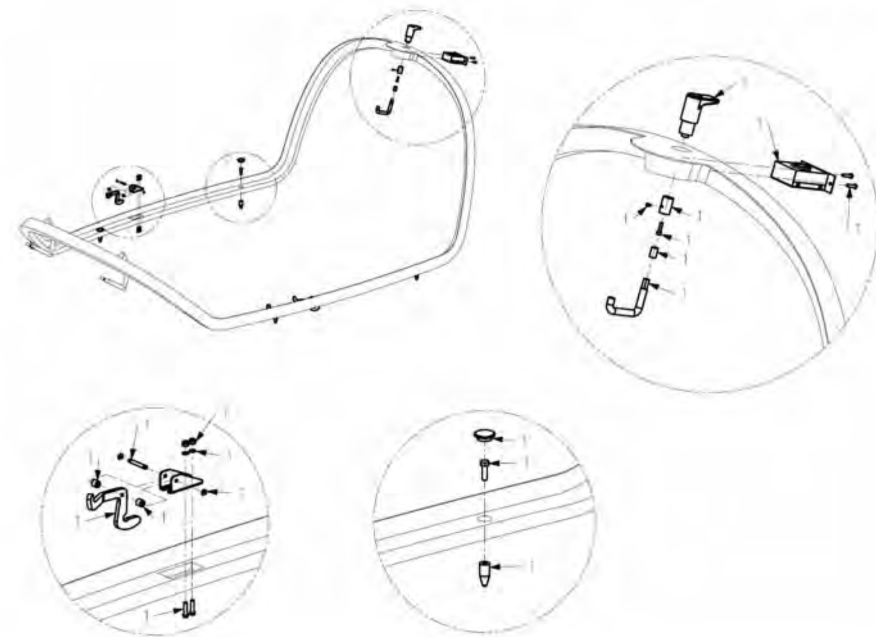
13 – COCKPIT COVER - 2 -

TL - 2000 *Sting Sport*
Illustrated parts catalog

FIG ITEM	PART NUMBER	NOMENCLATURE		

13 COCKPIT COVER - 3 -

TL – 2000 *Sting Sport*
Illustrated parts catalog



13 – COCKPIT COVER - 4 -

TL - 2000 *Sting Sport*
Illustrated parts catalog

FIG ITEM	PART NUMBER	NOMENCLATURE		
A				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

13 COCKPIT COVER - 5 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

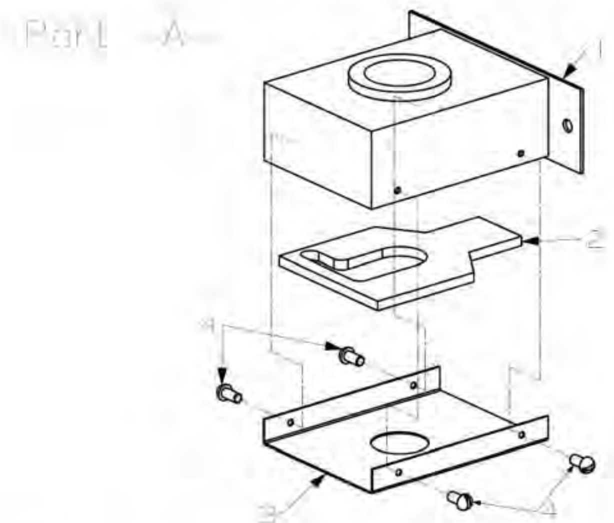


FIG	ITEM	PART NUMBER	NOMENCLATURE		
A	1	STING – 13 – 16	Krabička zámku		
	2	STING – 13 – 9	Jazýček zámku		
	3	STING – 13 – 17	Krabička zámk- víčko		
	4		Šroub M3x10		

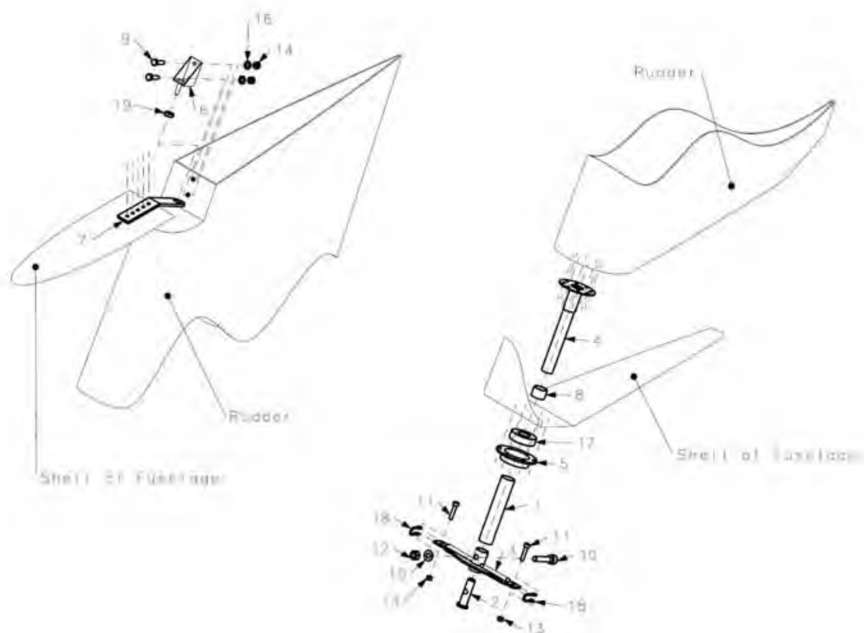
13 – COCKPIT COVER - 6 -

CHAPTER

14

RUDDER INSTALLATION

TL – 2000 *Sting Sport*
Illustrated parts catalog



14 – RUDDER INSTALLATION - 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

FIG ITEM	PART NUMBER	NOMENCLATURE		
1	STING – 14 – 1	Rozpěrná trubka SOP		
2	STING – 14 – 2	Vložka osy SOP		
3	STING – 14 – 3	Páka SOP		
4	STING – 14 – 4	Osa SOP		
5	STING – 14 – 5	Domeček ložiska SOP		
6	STING – 14 – 6	Vrchní závěs SOP- vlam.		
7	STING – 14 – 7	Závěs SOP vrchní		
8	KR-TR 22x1 – 15	Distanční trubka		
9	ČSN 02 1101.55	Šroub M6x16		
10	ČSN 02 1143.55	Šroub M8x40		
11	ČSN 02 1143.55	Šroub M5x16		
12	ČSN 02 1492.45	Matice M8		
13	ČSN 02 1492.45	Matice M5		
14	ČSN 02 1401	Matice M6		
15	ČSN 021702.15	Podložka 8		
16	ČSN 02 1726	Podložka 6		
17	ČSN 02 4630	Ložisko 6004 ZR		
18		Úchyt lana		
19	ČSN 02 3515	Ložisko 6		

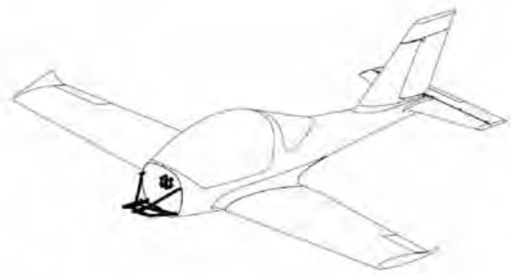
14 – RUDDER INSTALLATION - 3 -

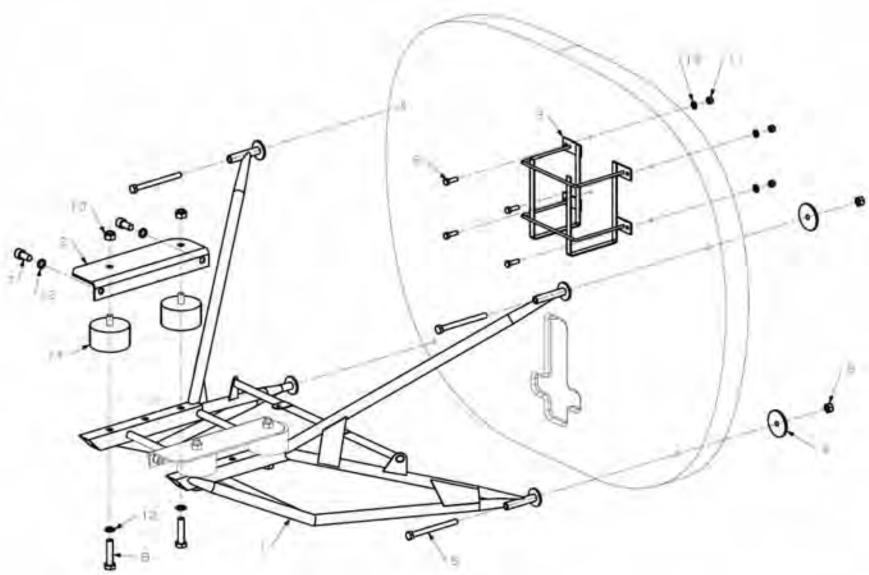
CHAPTER

15

ENGINE MOUNT

TL – 2000 *Sting Sport*
Illustrated parts catalog





15 – ENGINE MOUNT - 2 -

TL – 2000 *Sting Sport*
Illustrated parts catalog

FIG ITEM	PART NUMBER	NOMENCLATURE		
1	STING – 15 – 1	Motorové lože		1
2	STING – 15 – 2	Plech pod motor		2
3	STING – 15 – 3	Držá baterky		1
4	STING – 11 – 4	Podložka		4
5	ČSN 02 1101.55	Šroub M8x95		4
6	ČSN 02 1101.55	Šroub M5x20		4
7	ČSN 02 1143	Šroub M10x20		4
8	ČSN 02 1101.55	Šroub M10x30		4
9	ČSN 02 1492.45	Matice M8		4
10	ČSN 02 1492.45	Matice M10		4
11	ČSN 02 1492.45	Matice M5		4
12	ČSN 02 1740	Podložka 10		8
13	ČSN 02 1702.15	Podložka 5		4
14		Silent blok M10		4

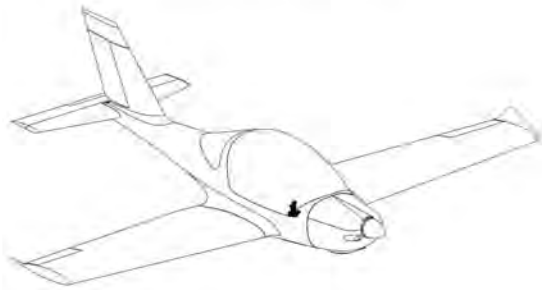
15 – ENGINE MOUNT - 3 -

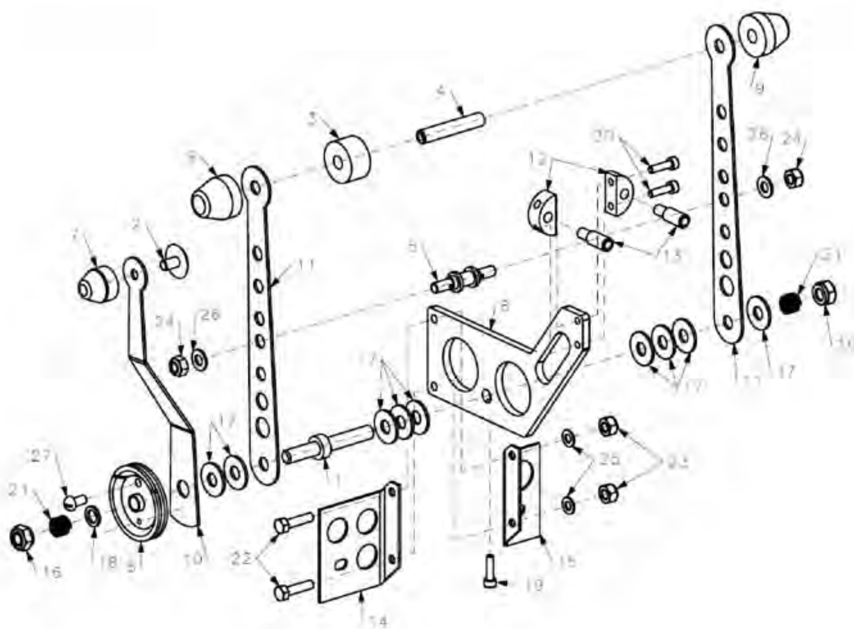
CHAPTER

16

ENGINE CONTROL

TL – 2000 *Sting Sport*
Illustrated parts catalog





16 – ENGINE CONTROL

- 2 -

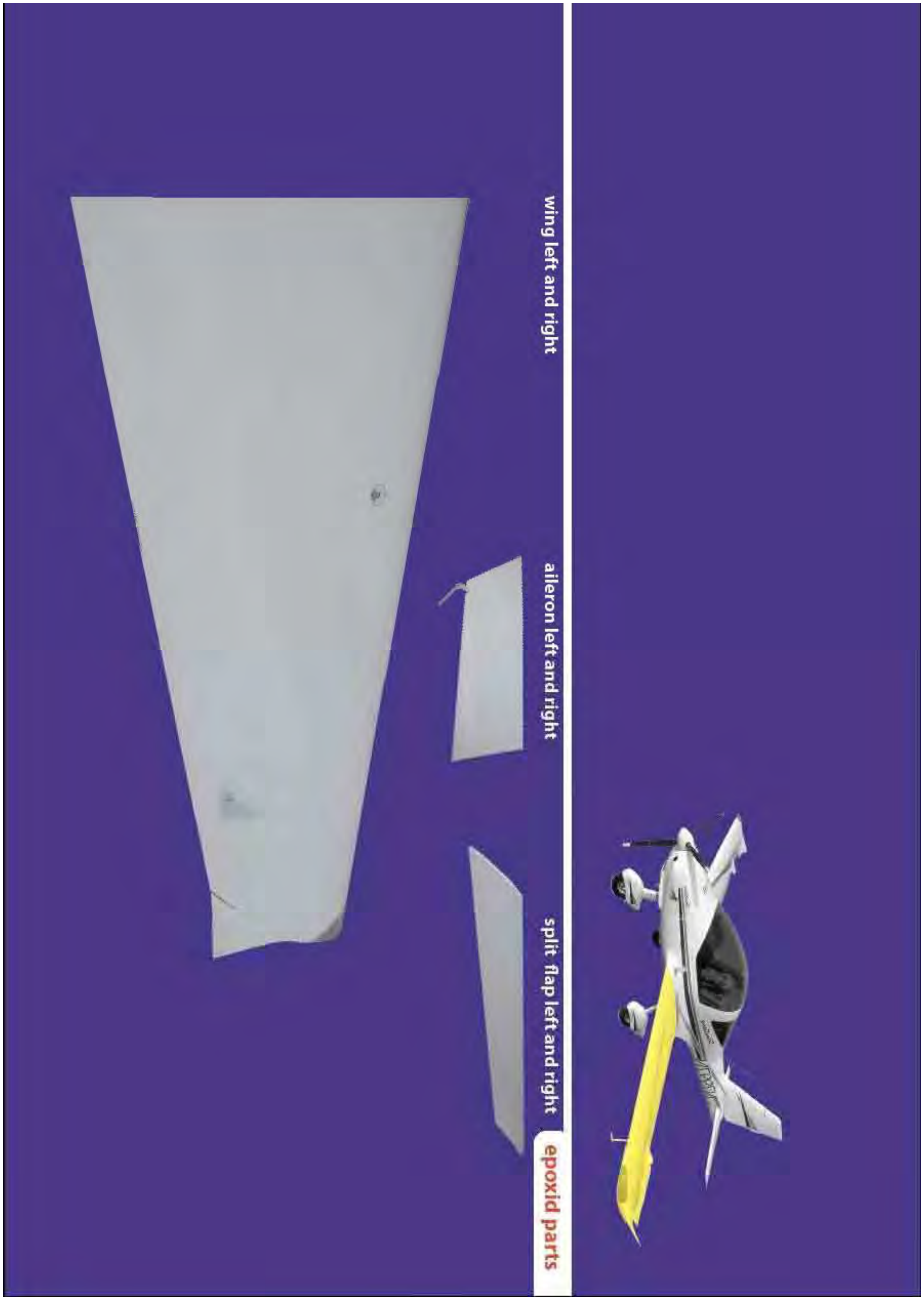
TL - 2000 *Sting Sport*
Illustrated parts catalog

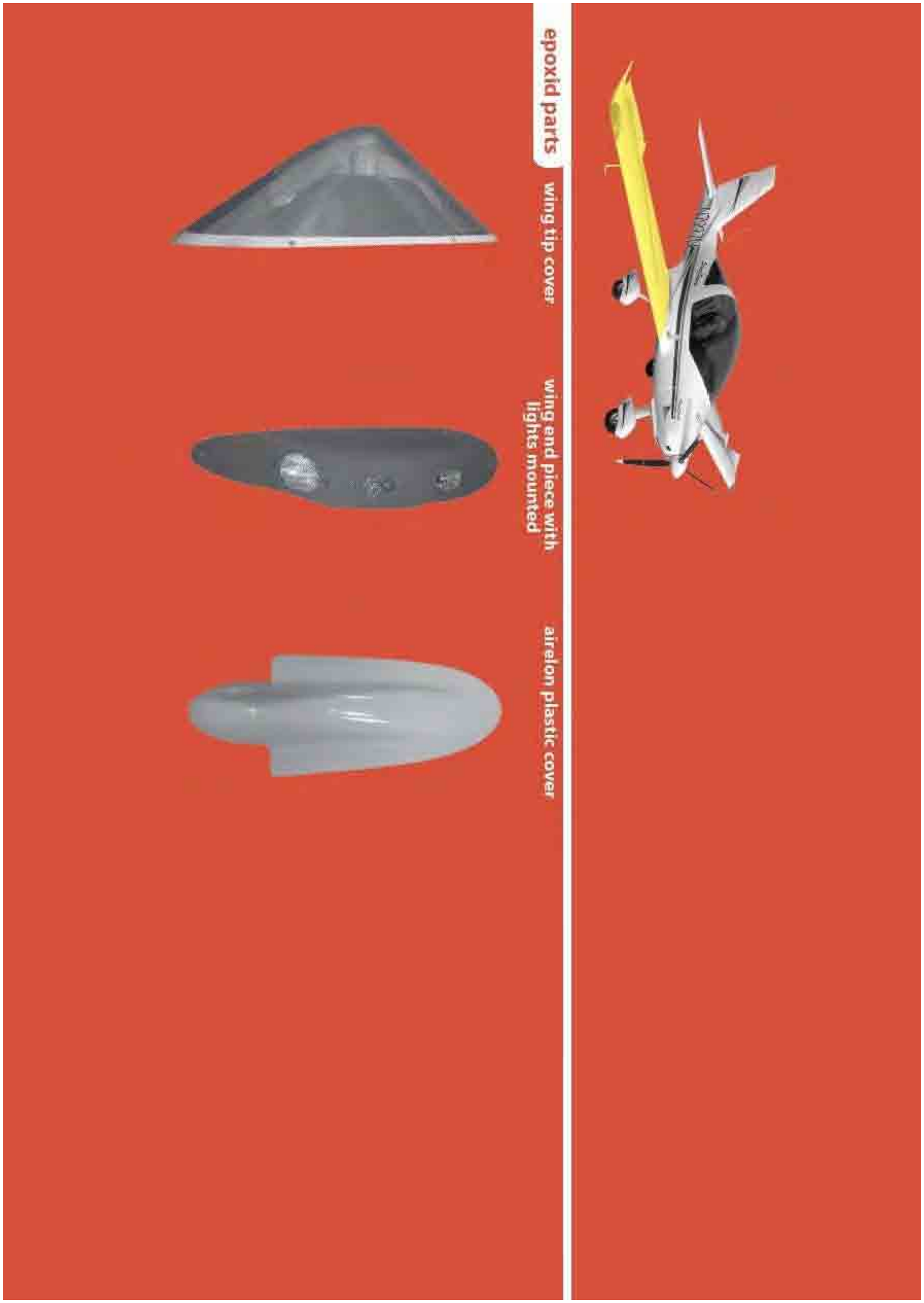
FIG ITEM	PART NUMBER	NOMENCLATURE		
1	STING - 4 - 1	Tlačítko aretace klapek		1
2	STING - 4 - 2	Táhlo ovládání klapek		1
3	STING - 4 - 3	Zarážka páka klapek		1
4	STING - 4 - 9	Páka ovládání klapek		1
5	STING - 4 - 10	Kulisa		2
6	STING - 4 - 11	Držák páky klapek		1
7	STING - 4 - 12	Podložka pod pružinu		1
8	STING - 4 - 13	Přední závěs páky klapek		1
9	STING - 4 - 20	Distanční trubka		1
10	ČSN 02 1143.55	Šroub M5x40		4
11	ČSN 02 1101.55	Šroub M8x45		1
12	ČSN 02 1492.25	Matice M5		4
13	ČSN 02 1492.55	Matice M8		1
14	ČSN 02 1702.15	Podložka 5		4
15	ČSN 02 1702.15	Podložka 8		1
16		Podložka ∅8,4,x∅25 - Penefol		2
17		Podložka ∅10,2x∅30 - Penefol		2
18	ČSN 02 2930	Pojistný kroužek 10		2
19	ČSN 02 6003	Pružina 16x1-60		1


TL
ULTRALIGHT
spare part catalog
TL-2000 Sting - TL Sting Sport

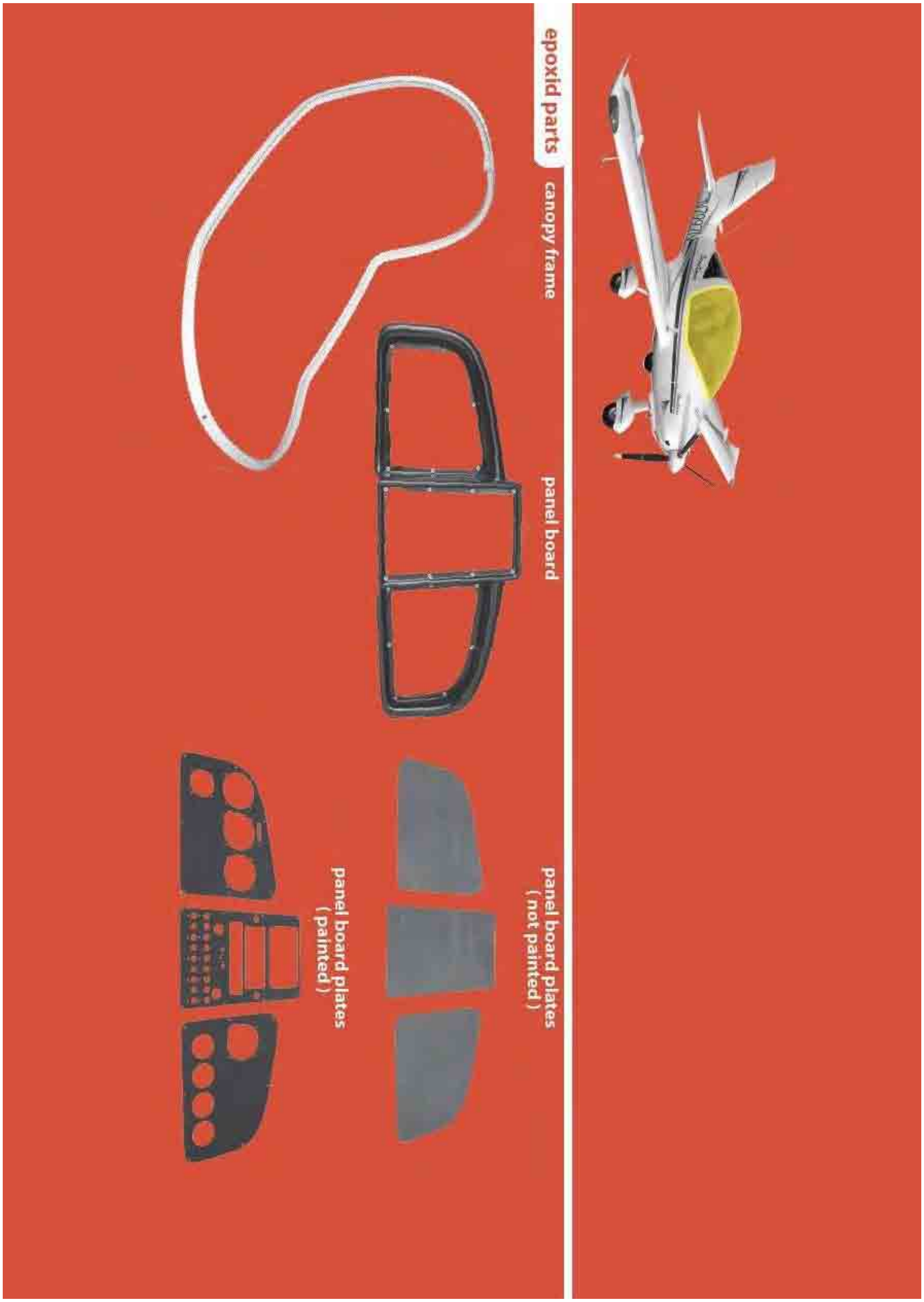

TL - Sting 2000
N797TL


epoxid parts
fuselange


wing left and right
aileron left and right
split flap left and right
epoxid parts


epoxid parts
wing tip cover
wing end piece with
lights mounted
airelon plastic cover


cowling top
cowling bottom
propeller spinner
epoxid parts


epoxid parts
canopy frame
panel board
panel board plates
(not painted)
panel board plates
(painted)

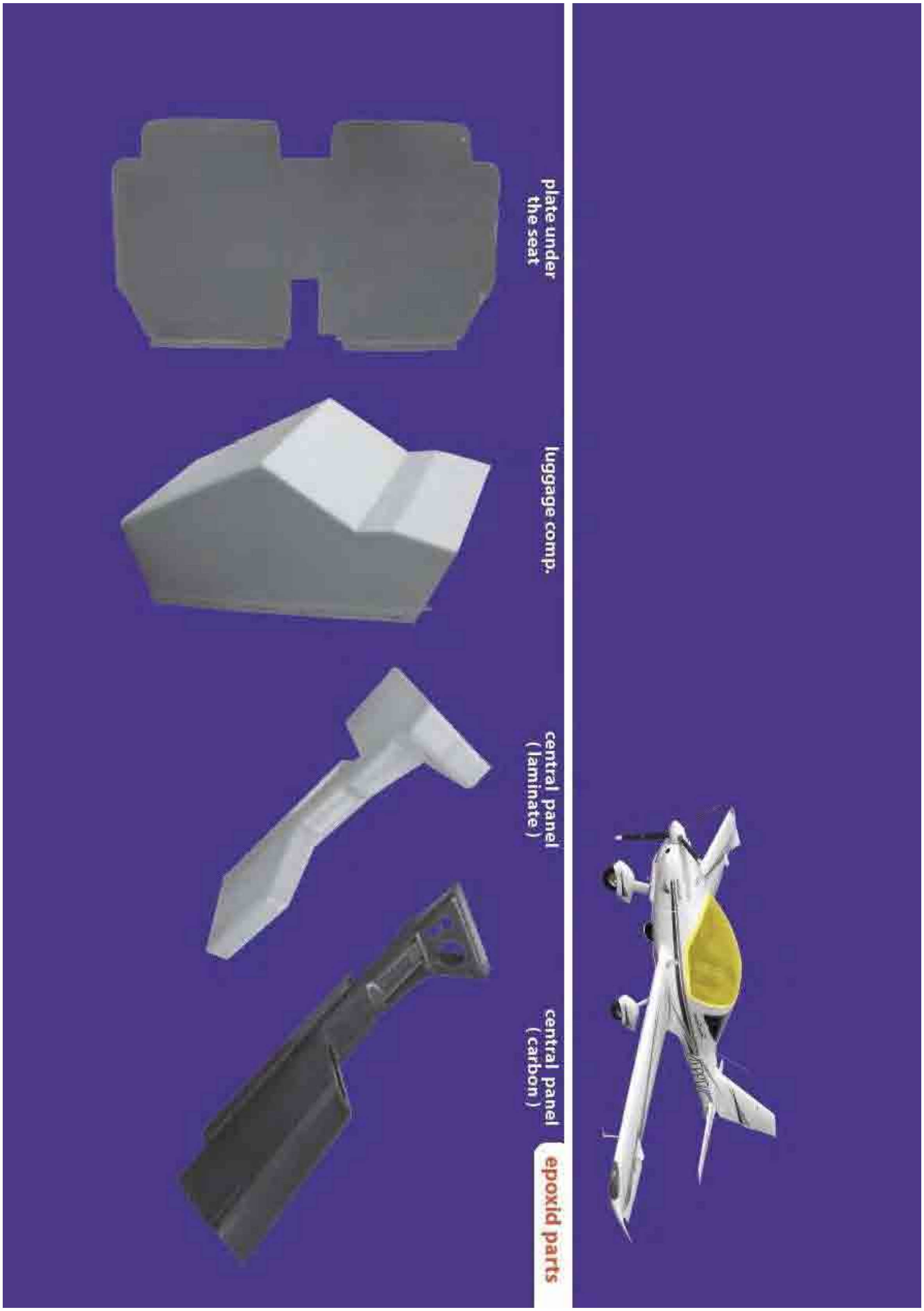
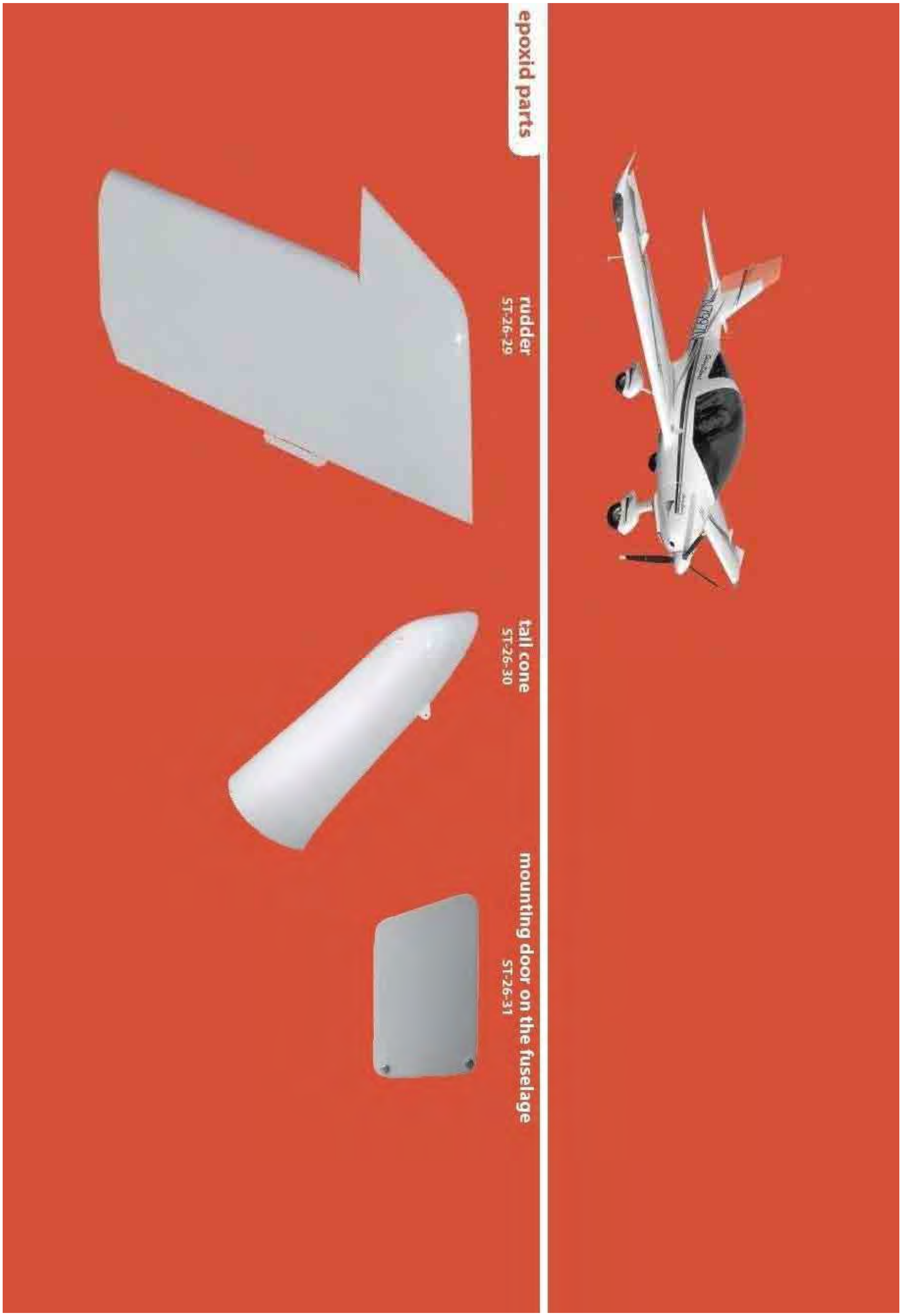
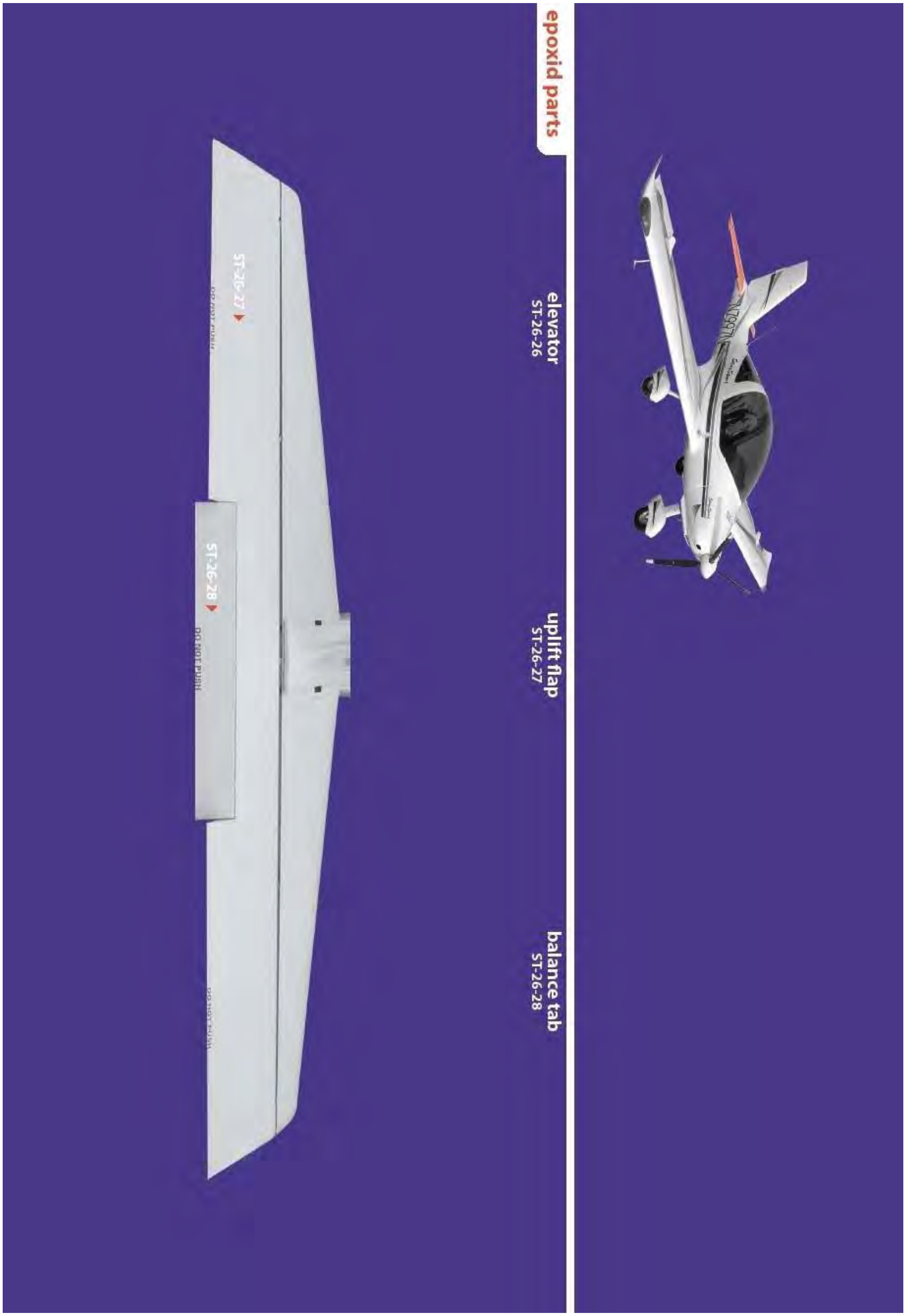
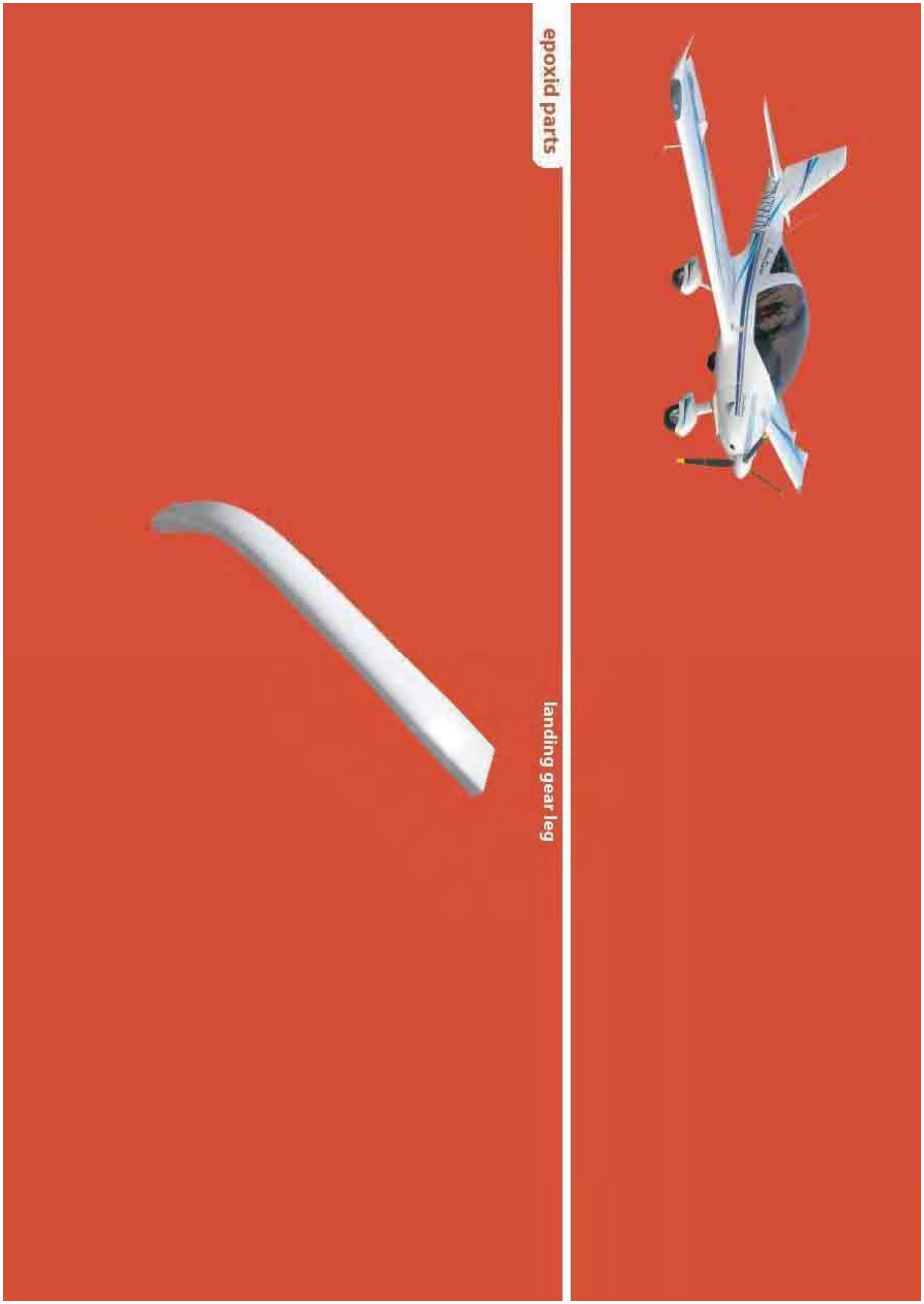
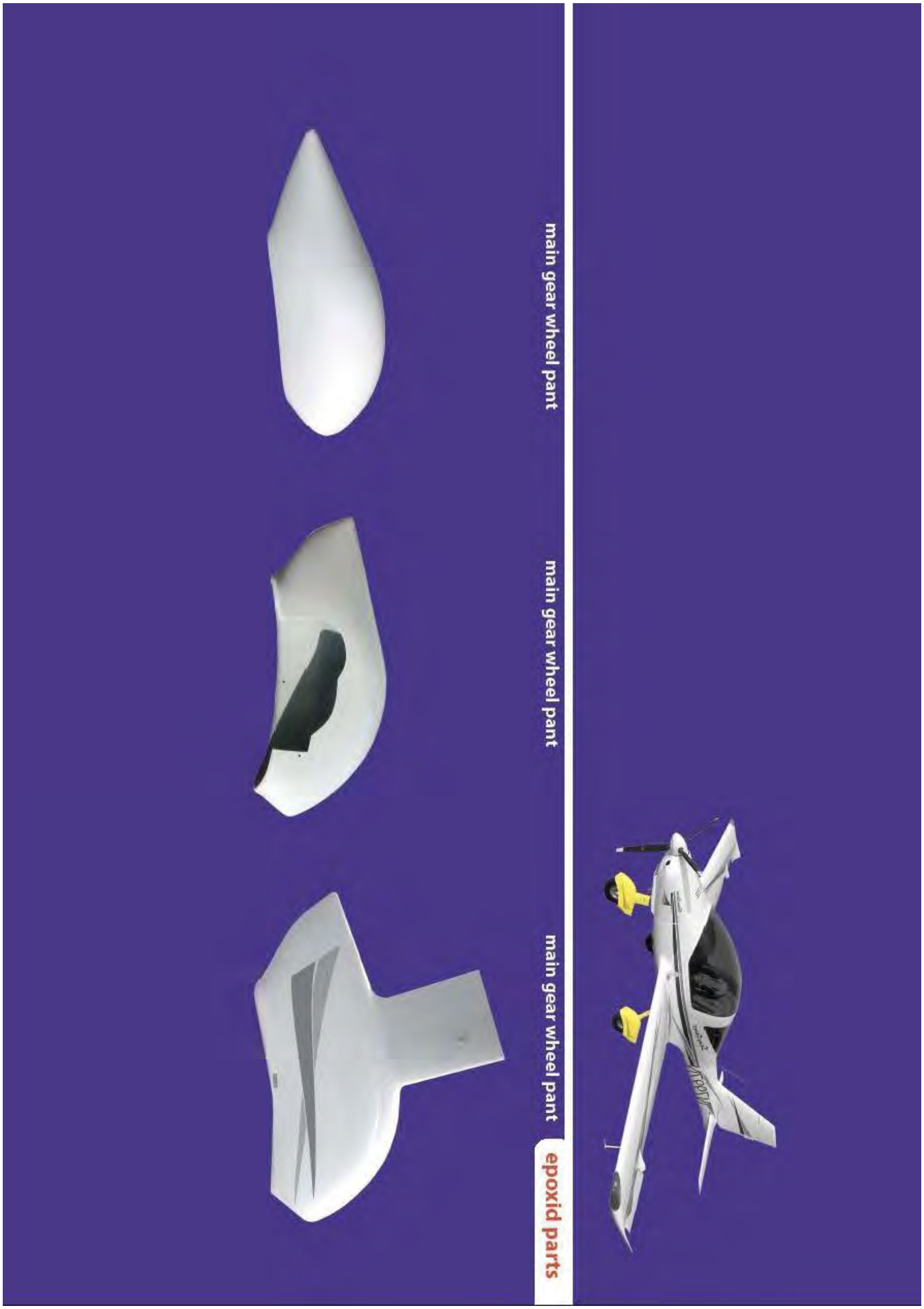


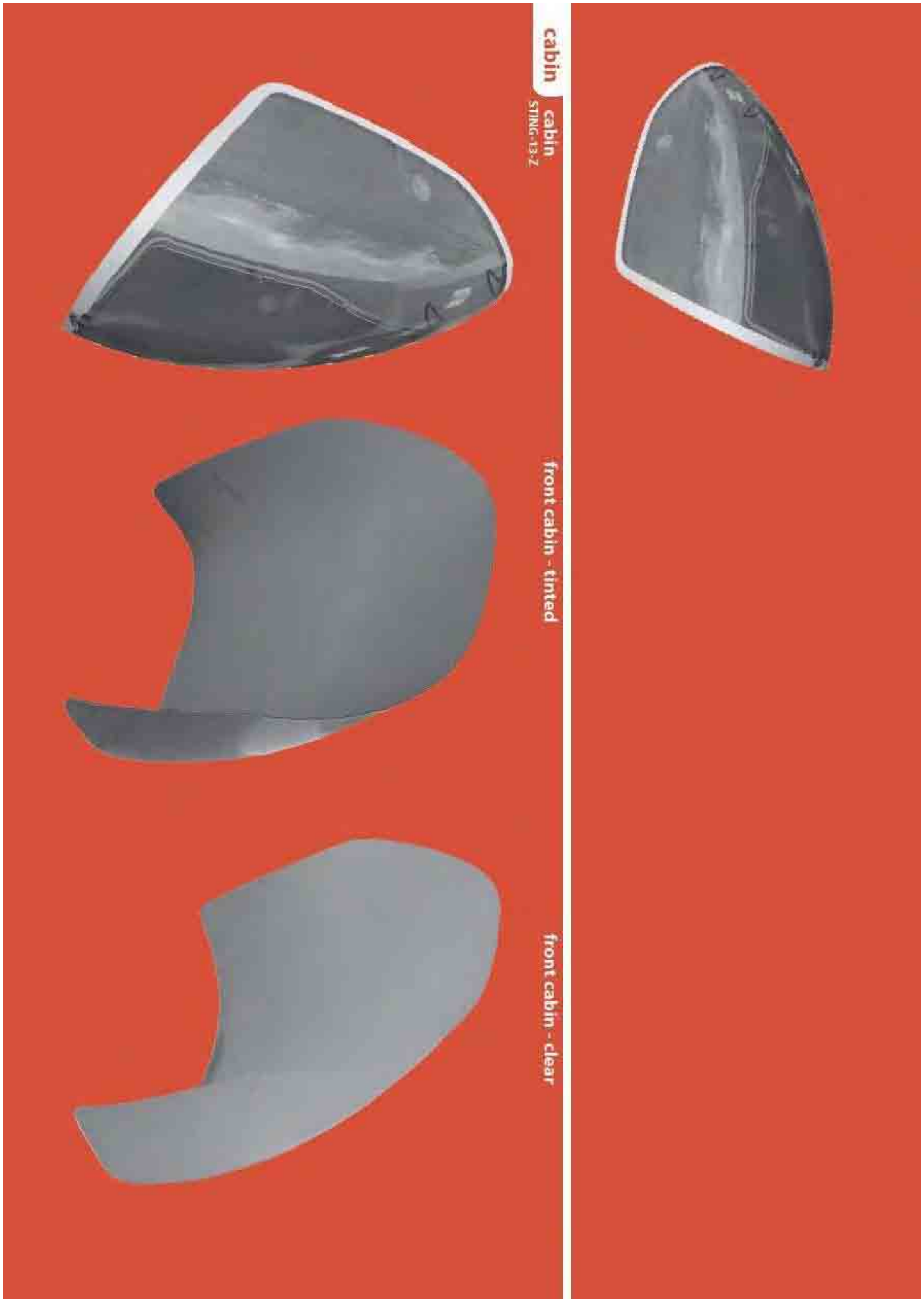
plate under the seat
luggage comp.
central panel (laminate)
central panel (carbon)
epoxid parts

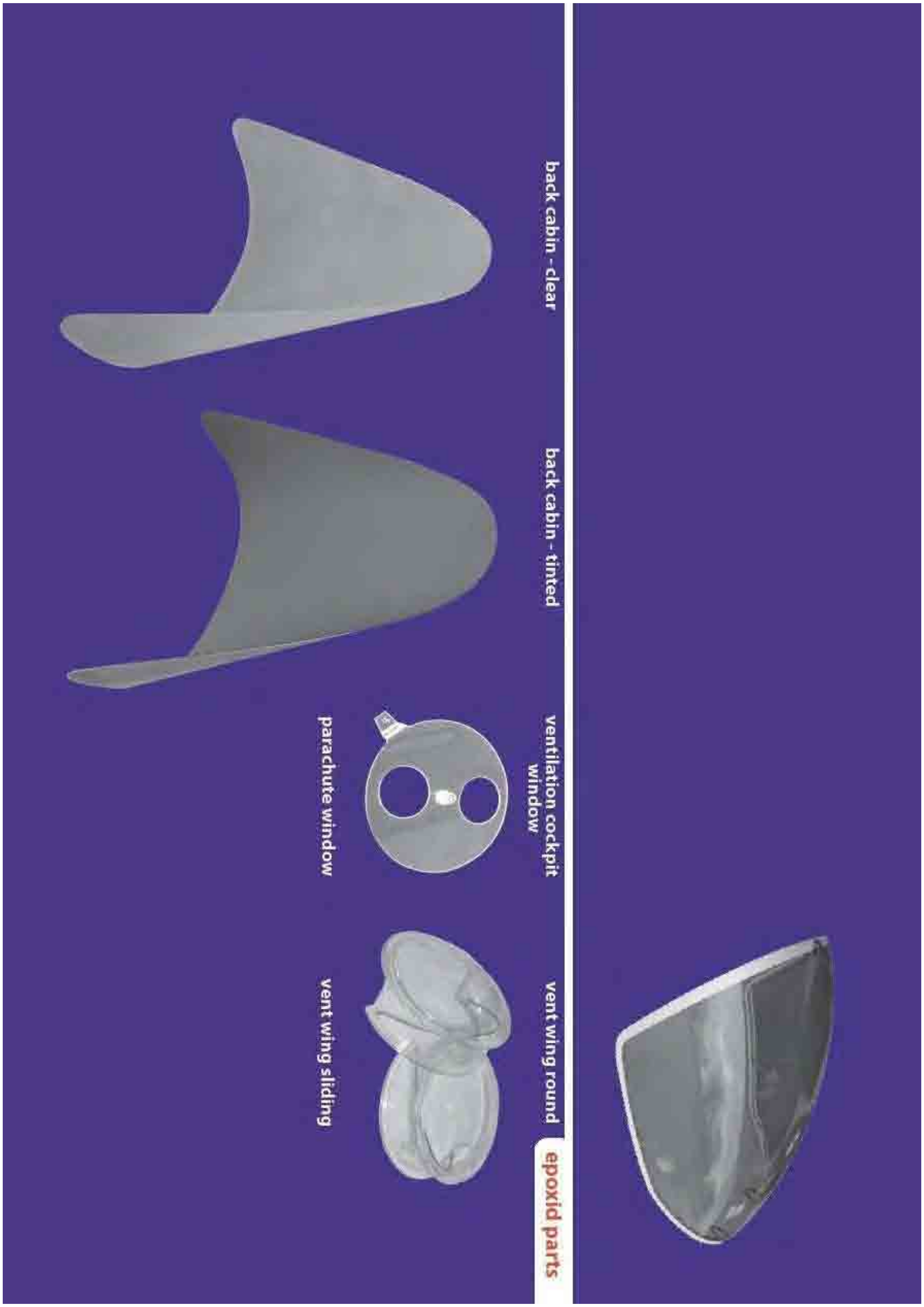

epoxid parts
rudder
ST-26-29
tail cone
ST-26-30
mounting door on the fuselage
ST-26-31

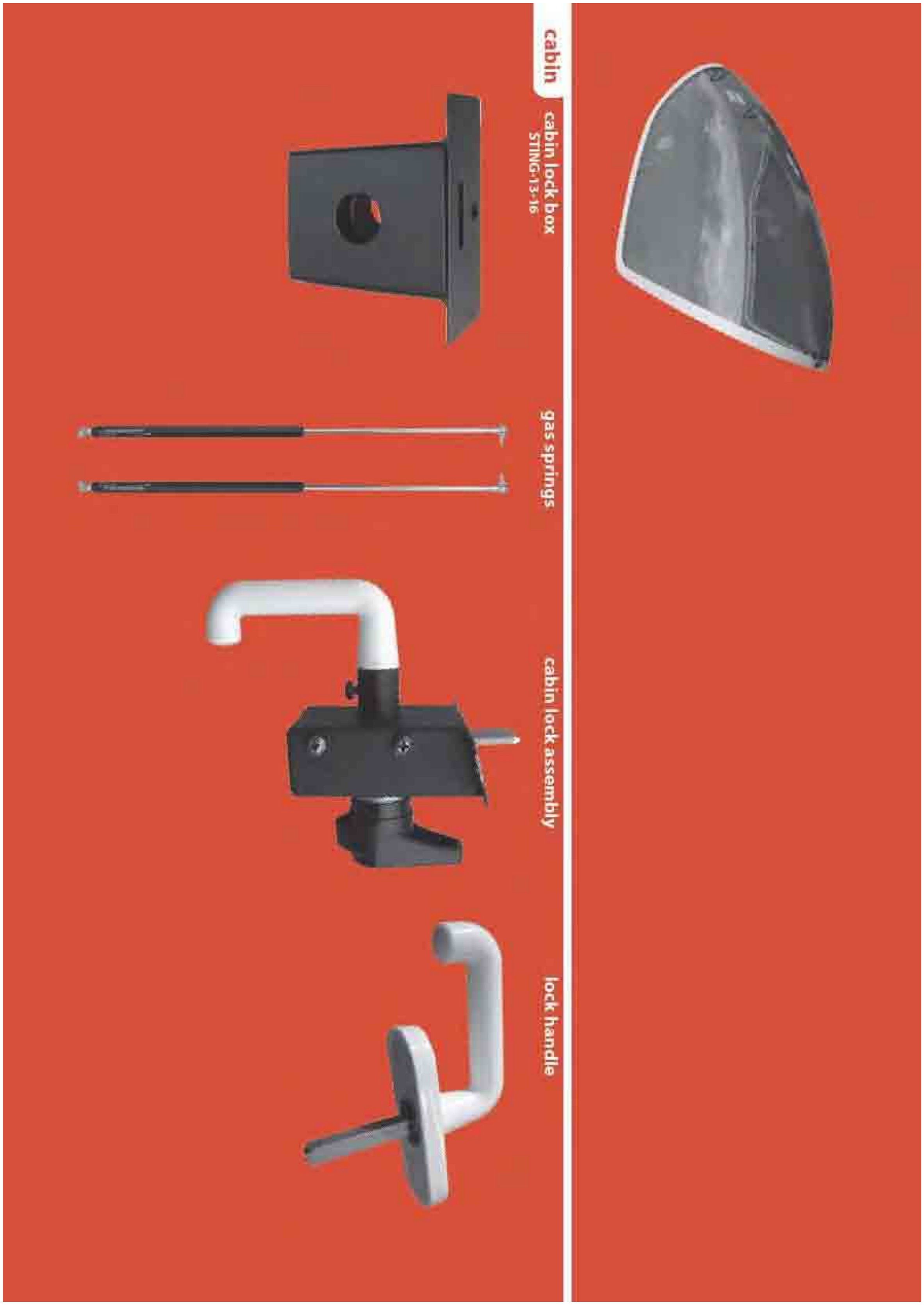

epoxid parts
elevator
ST-26-26
uplift flap
ST-26-27
balance tab
ST-26-28
ST-26-27
ST-26-28
DO NOT PUSH

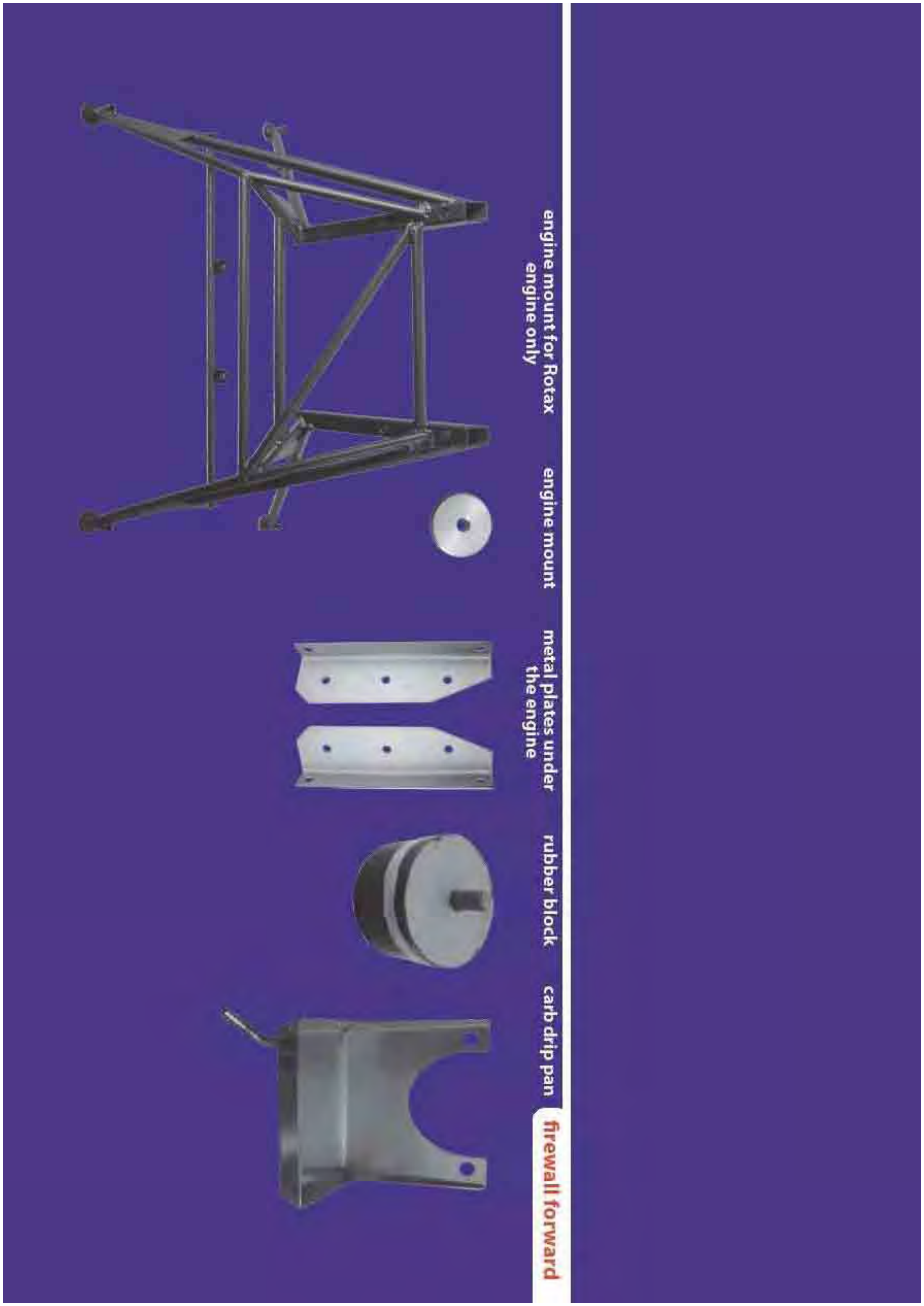

epoxid parts
landing gear leg


main gear wheel pant
main gear wheel pant
main gear wheel pant
epoxid parts


cabin
cabin
STING-13-Z
front cabin - tinted
front cabin - clear

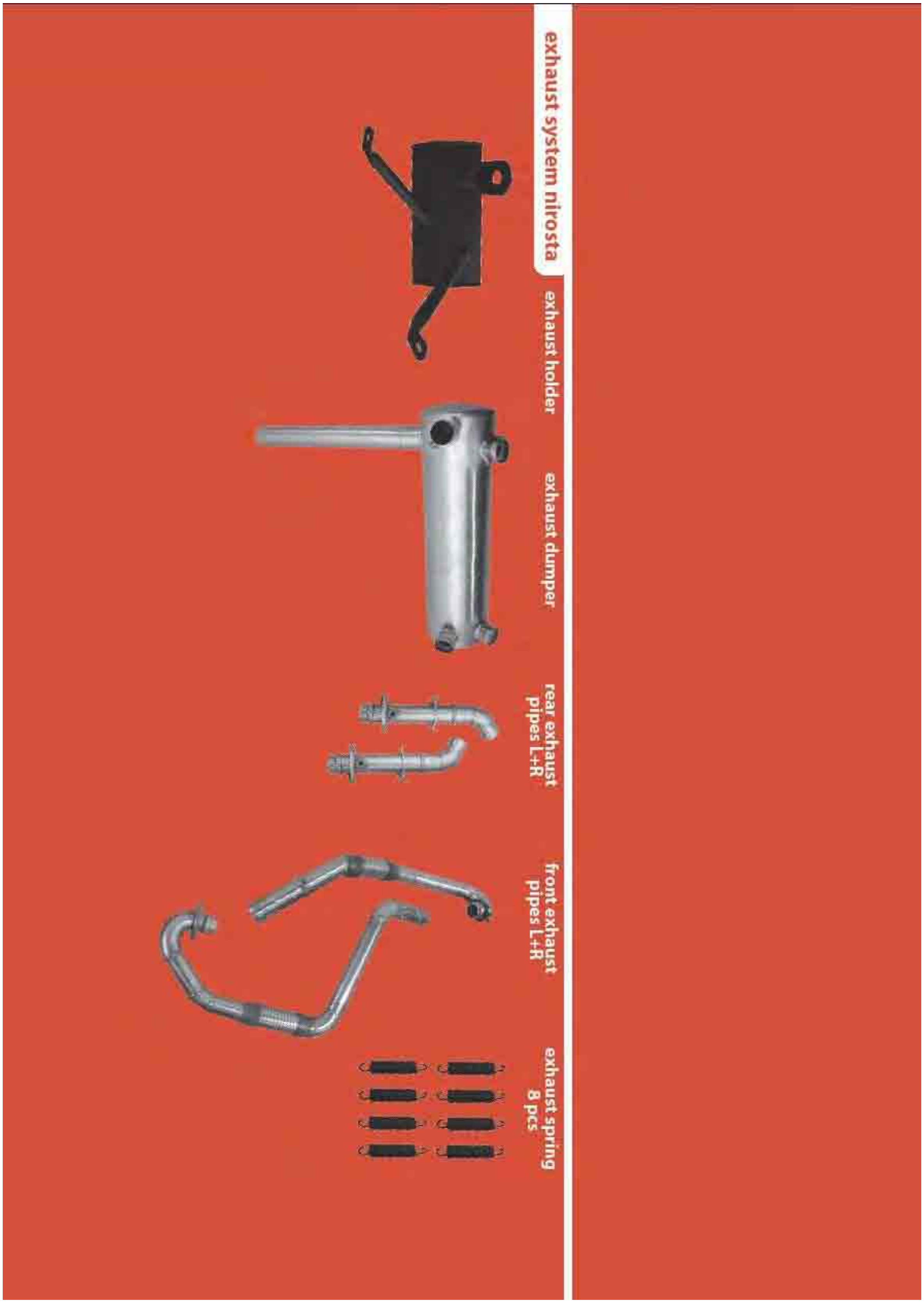

back cabin - clear
back cabin - tinted
ventilation cockpit window
parachute window
vent wing round
vent wing sliding
epoxid parts

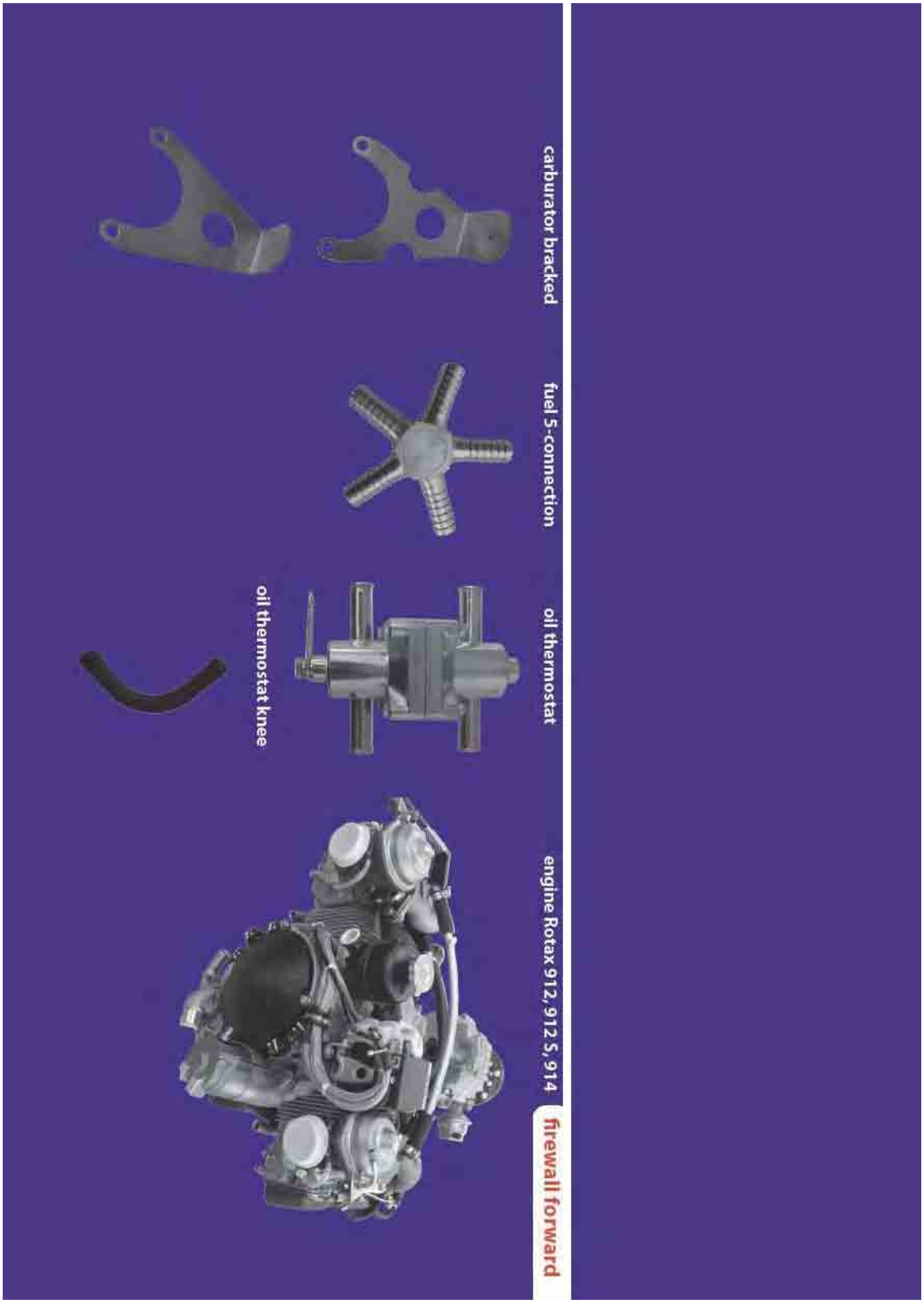

cabin
cabin lock box
STING-13-16
gas springs
cabin lock assembly
lock handle

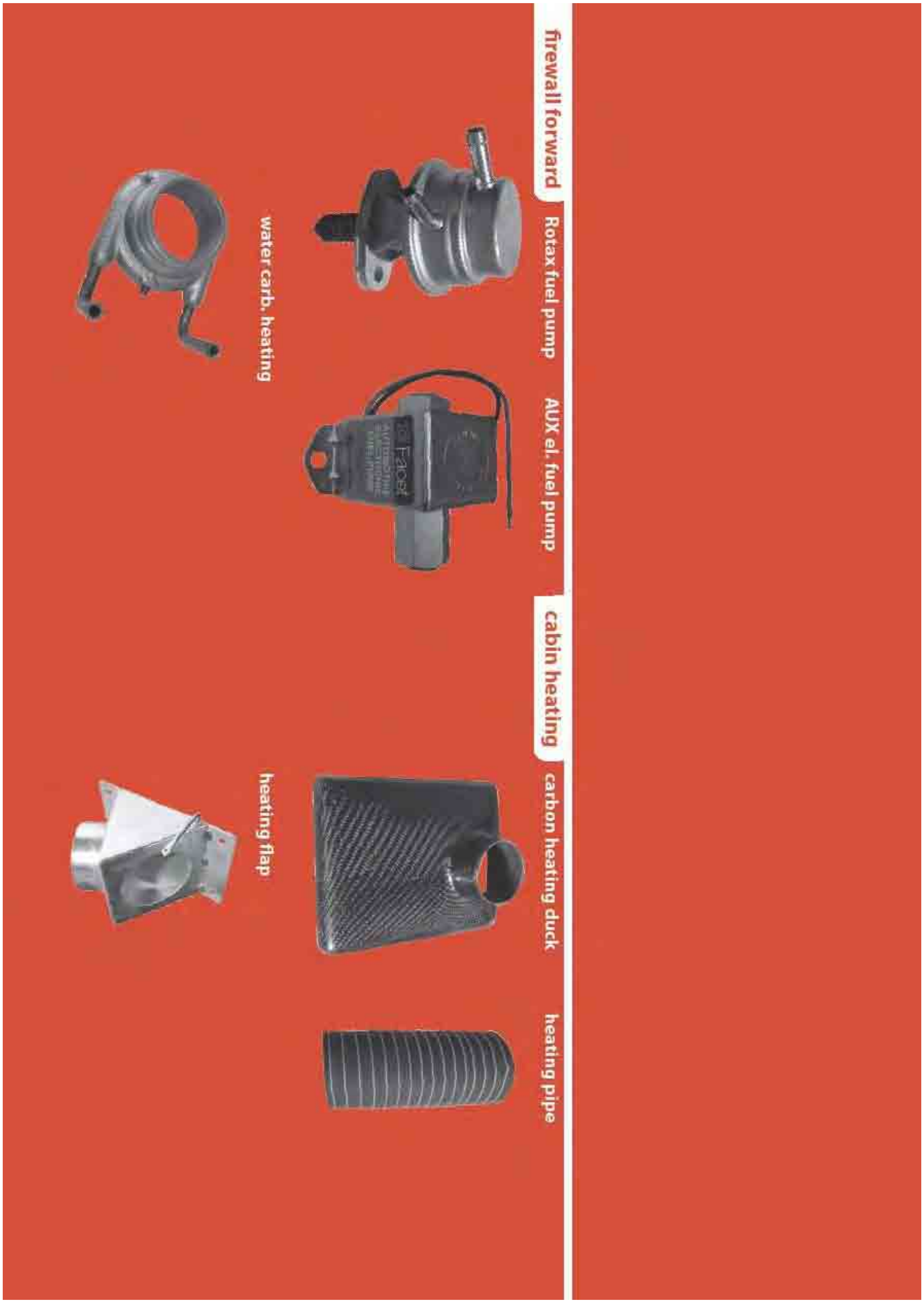

engine mount for Rotax engine only
engine mount
metal plates under the engine
rubber block
carb drip pan
firewall forward

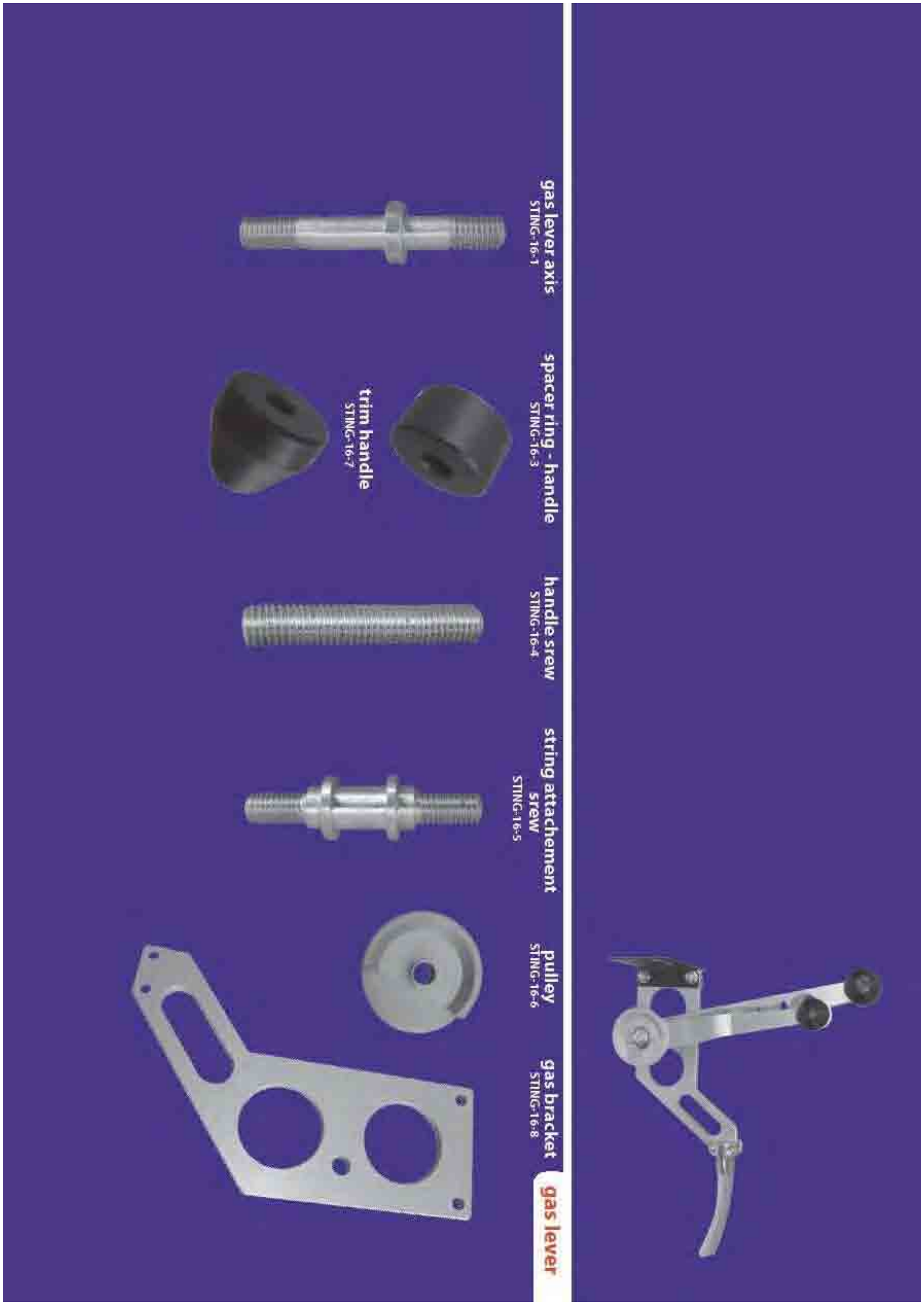

firewall forward
oil filter
ROTAX
oil cooler
water cooler
air filter
required oil type:
Castrol
R4 Superbike
10W-50
water cooler holder
air filter flat


overflow bottle
brake fluid bottle
oil tank
oil tank holder
Warta battery
battery holder
firewall forward

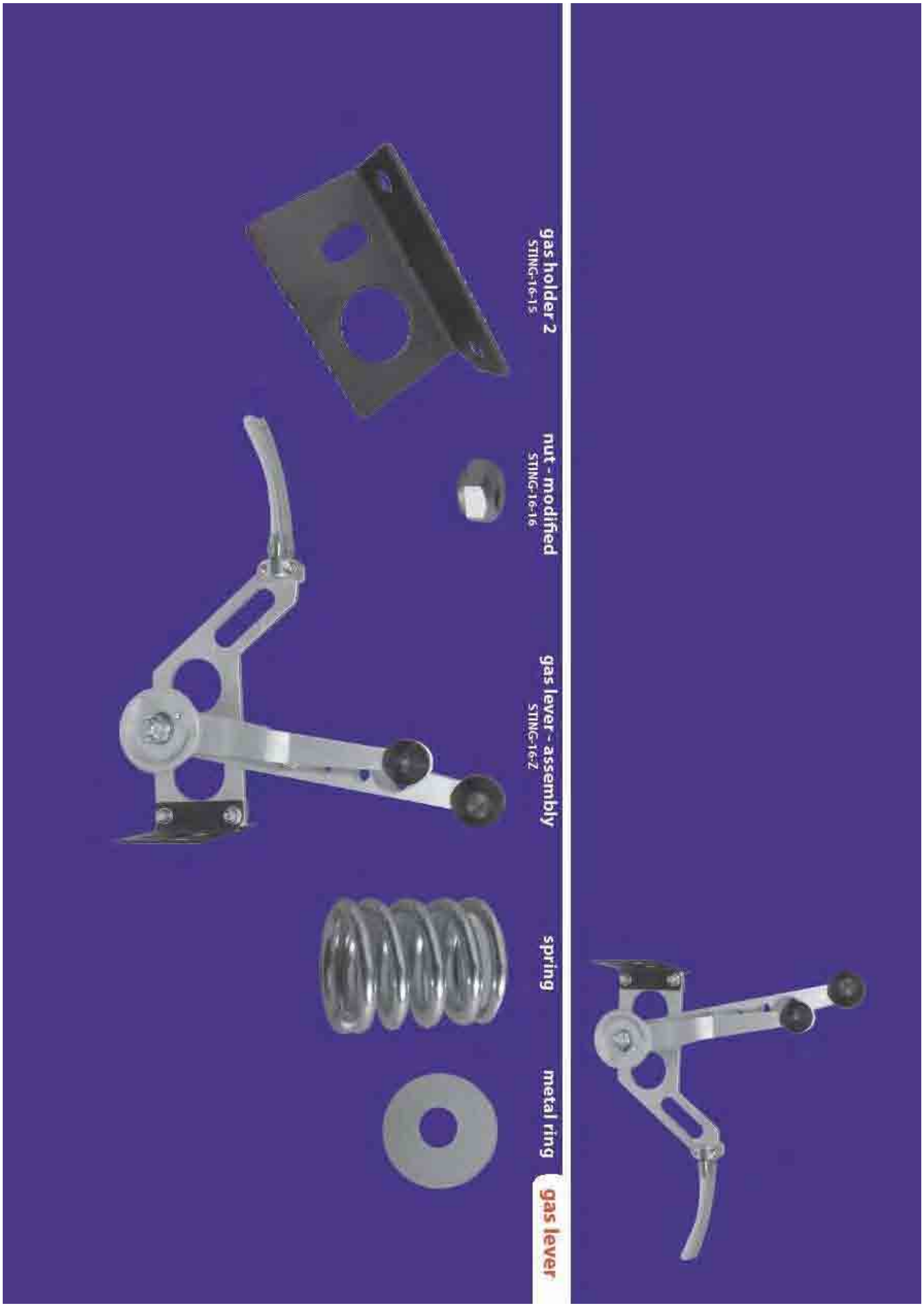

exhaust system nirosta
exhaust holder
exhaust dumper
rear exhaust pipes L+R
front exhaust pipes L+R
exhaust spring 8 pcs


carburator bracked
fuel 5-connection
oil thermostat
oil thermostat knee
engine Rotax 912, 912 S, 914
firewall forward


firewall forward
Rotax fuel pump
AUX el. fuel pump
water carb. heating
cabin heating
carbon heating duck
heating flap
heating pipe


gas lever axis
STING-16-1
spacer ring - handle
STING-16-3
trim handle
STING-16-7
handle srew
STING-16-4
string attachement
srew
STING-16-5
pulley
STING-16-6
gas bracket
STING-16-8
gas lever


gas lever
gas handle
STING-16-9
trim control lever
STING-16-10
gas control lever
STING-16-11
bowden holder
STING-16-12
strainer of wheel bowden
STING-16-13
gas holder 1
STING-16-14

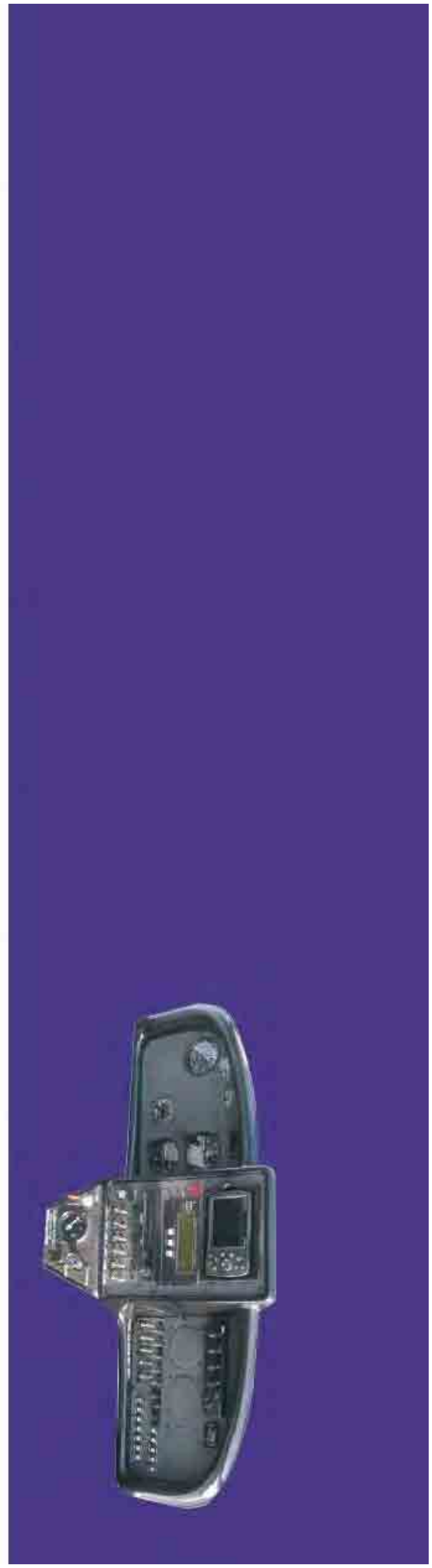

gas holder 2
STING-16-15
nut - modified
STING-16-16
gas lever - assembly
STING-16-Z
spring
metal ring
gas lever


engine instruments
flydat (combined engine inst.)
RPM Rotax
RPM+hourmeter 80mm
fuel pressure
oil pressure


engine instruments
oil pressure - VDO
oil temperature - VDO
EGT - exhaust gas temperature
hourmeter JAEGER
manifold pressure
oil temperature
water temperature
hourmeter - VDO
manifold pressure


engine instruments
voltmeter
star company
fuel gage
constant speed
angels propeller
signalling
pressure transducer
fuelling
hoursmeter contact
maker
hoursmeter hobbs


altimeter Feet BK-3
(1000-20000ft)
altimeter - metre
airspeed Indicator-
- knots (0-160kt)
vertical Speed Indicator -
-BC-2A (0-200ft/in)
apparatus flight
altimeter Feet BG-3E
(1000-20000ft)
airspeed Indicator-
-mile (0-180mph)
airspeed indikator -
-km/h (0-300KPH)
vertical Speed Indicator -
-BC10-1B (0-10m/s)

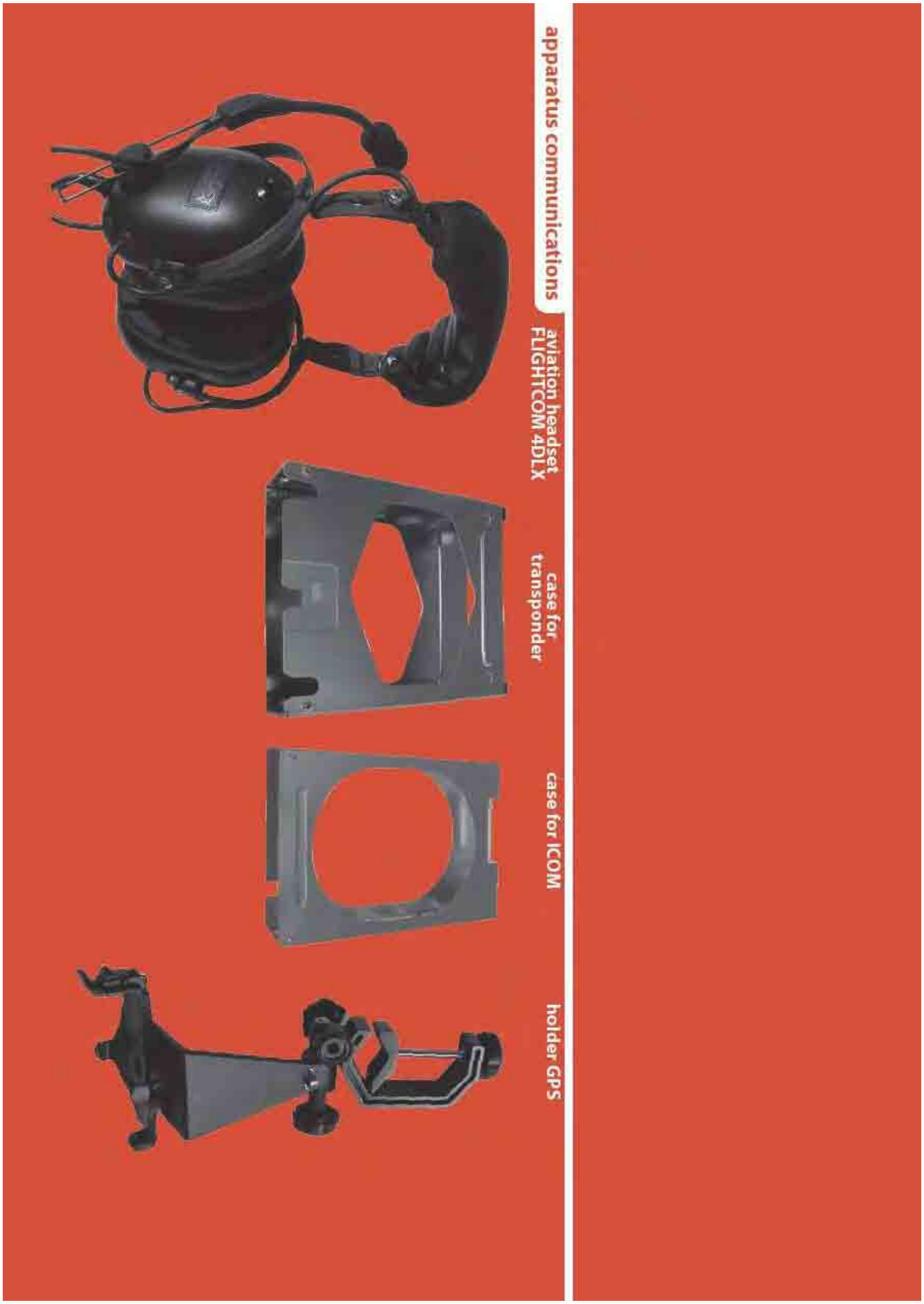


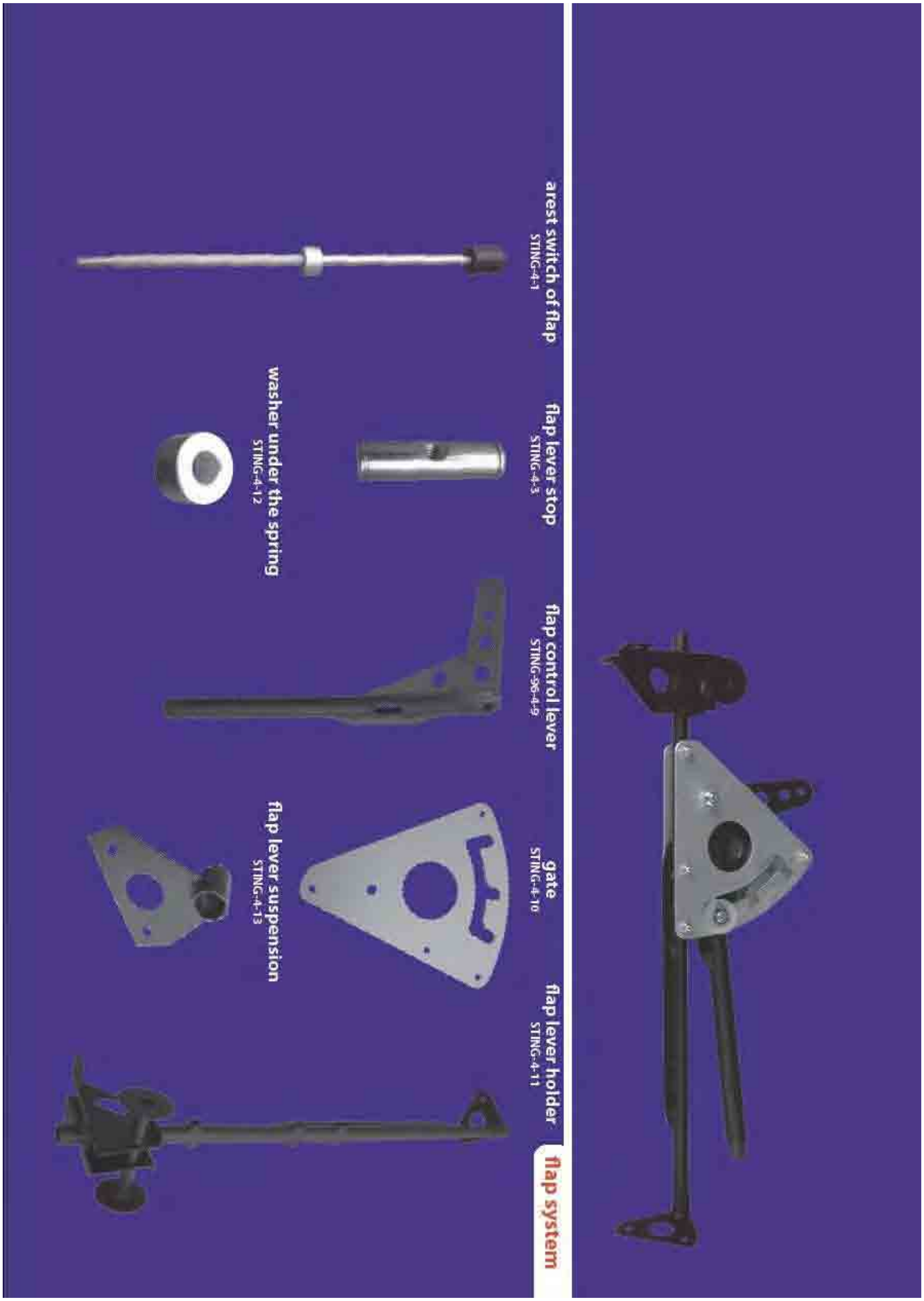

apparatus flight
horizon Gyro-
-vacual GHO 30
horizon Gyro-
-eletric GHO 25
directional Gyro-
-electric GDO 23
magnetic compass
CM-13
magnetic compass
SILVA 70UN-southern
directional Gyro-
-vacual GDO 31
zatáčkoměr elektrický
BZW-4B
magnetic compass
SILVA 70UN-northern
magnetic compass CM-24L
+light-northern

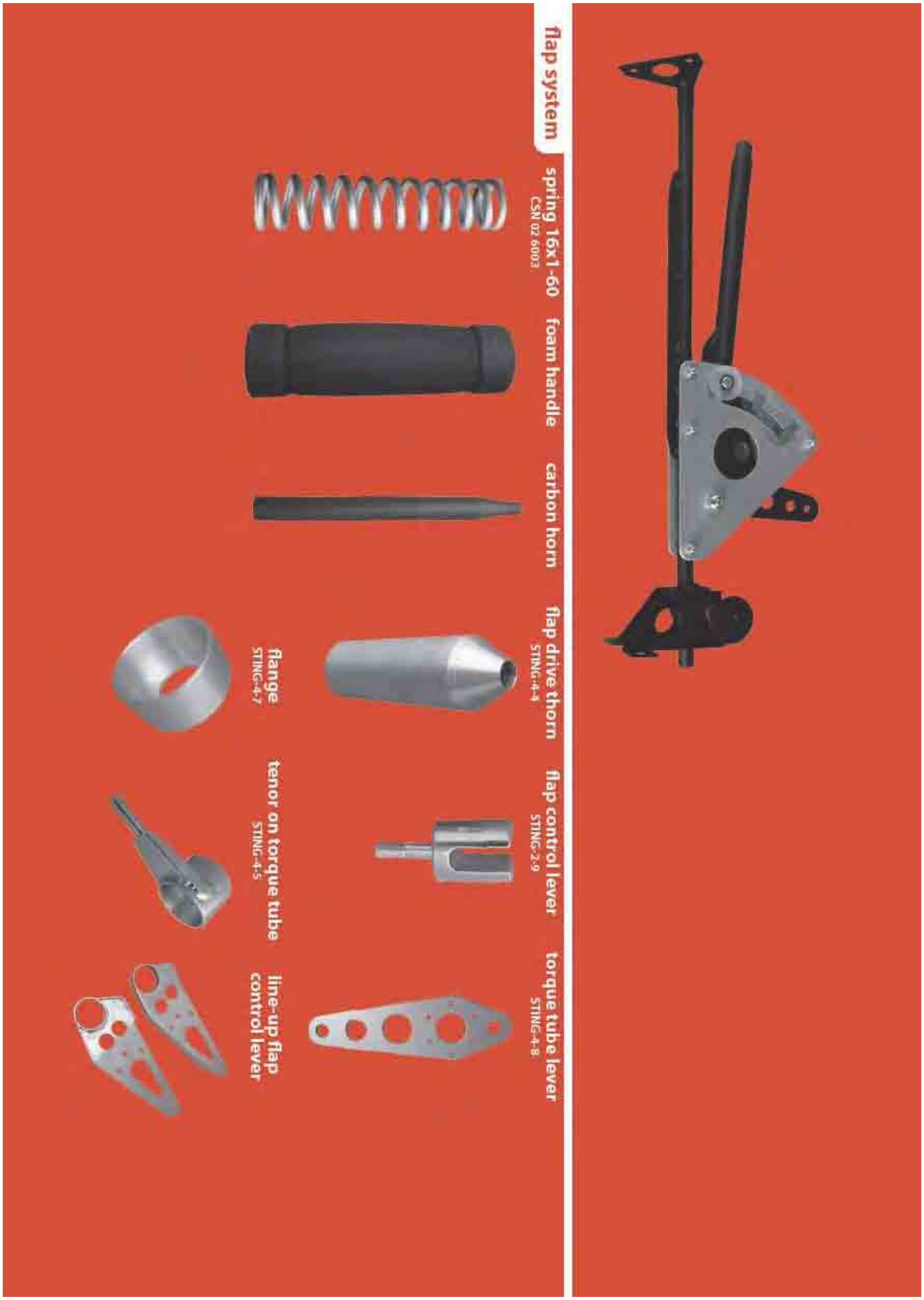

apparatus communications
intercom PM 501
ICOM IC A-200
transponder 327
Garmin
intercom Flightcom 403mc
transponder GTX 320 A
altitude Encoder AK-350

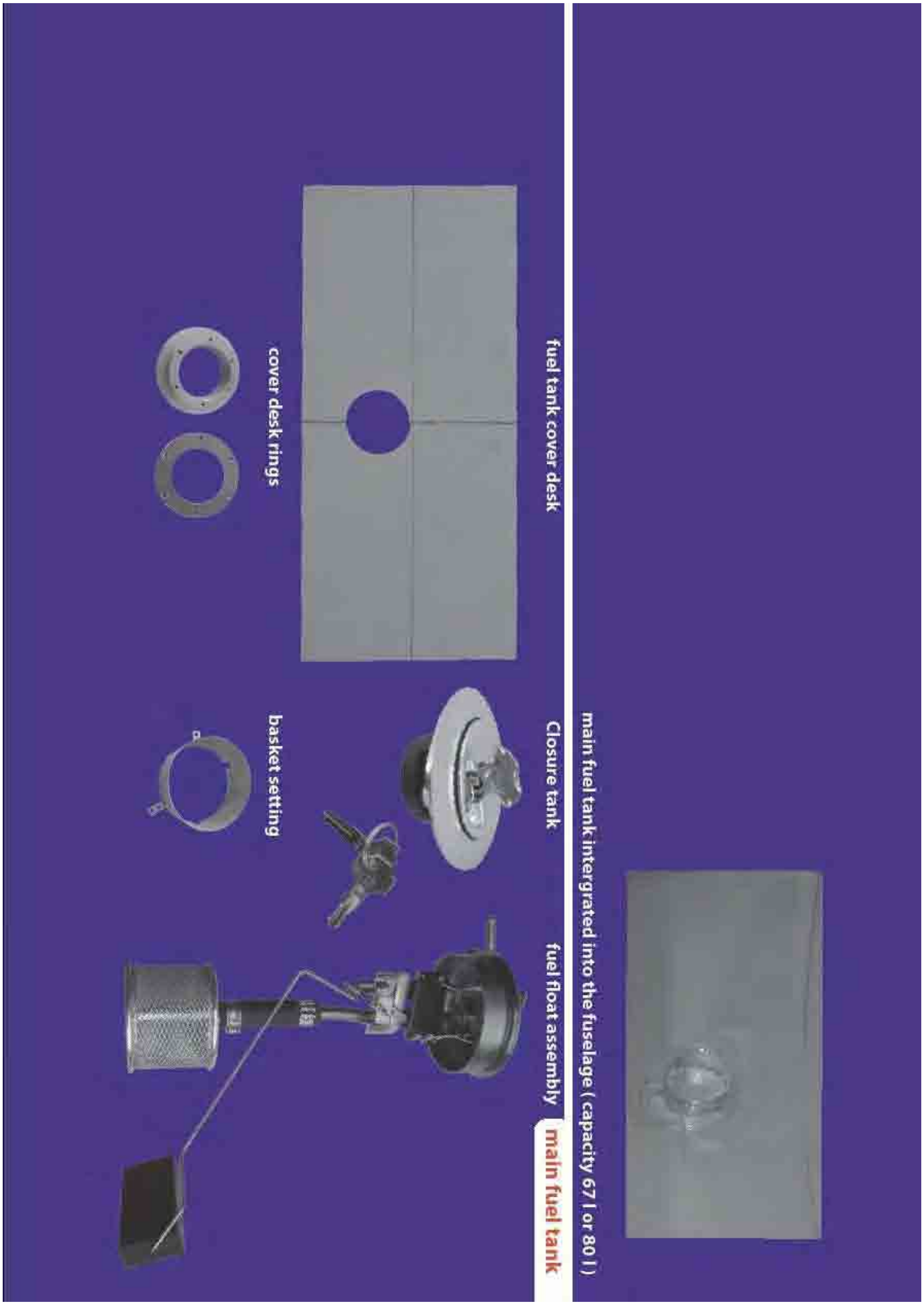

apparatus communications
ELT-emergency
locator transmiter
GPSmap 296
GPSmap 396
air gizmos
antenna GPS
with sucker
antenna GPS
GXM 30

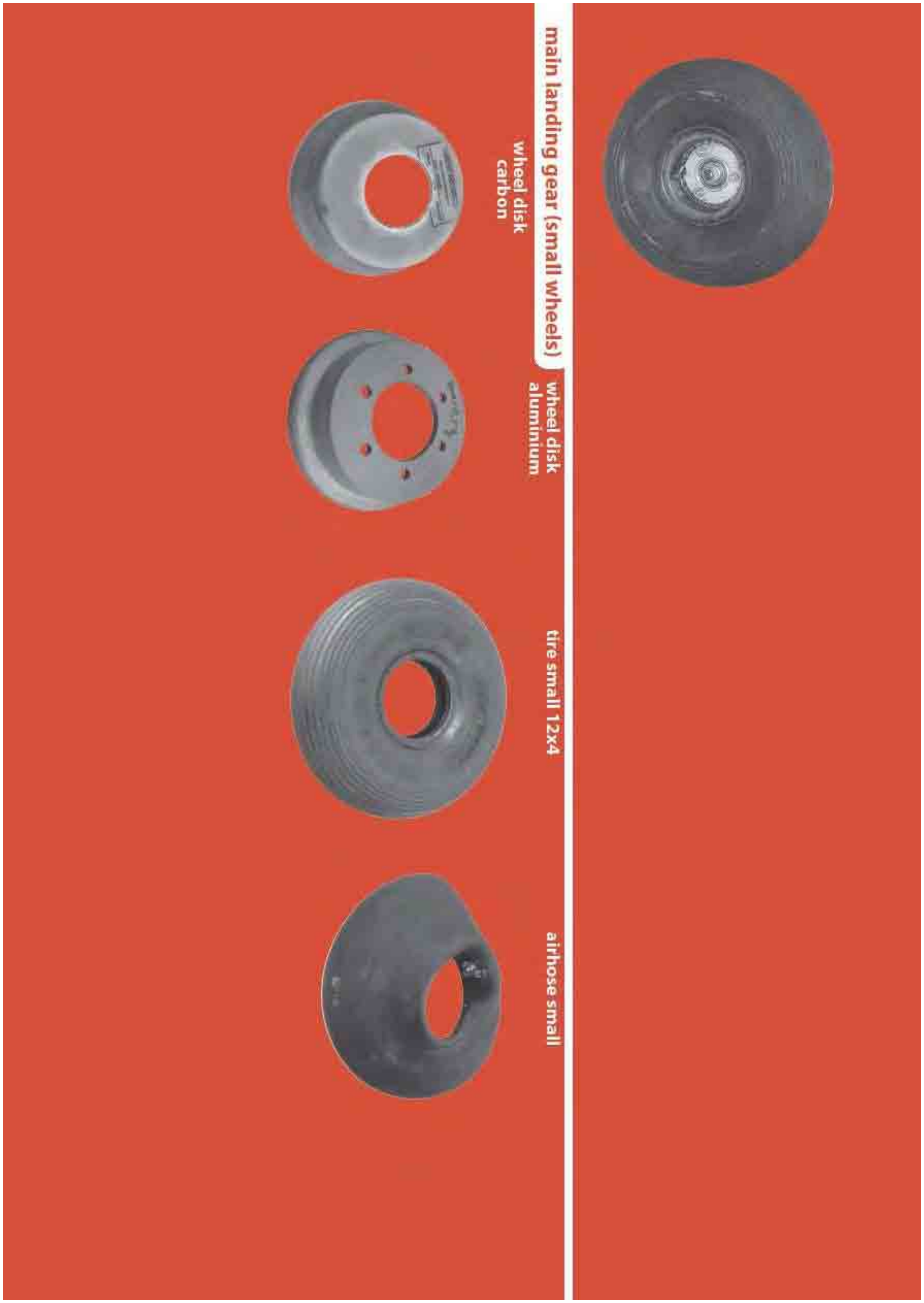

antenna VHF-
-CONS
antenna for
ELT - C-91A
antenna for
ELT - telescope
antenna for
transponder AV-22
antenna for t
ransponder CI-105
apparatus communications


apparatus communications
aviation headset
FLIGHTCOM 4DLX
case for
transponder
case for ICOM
holder GPS

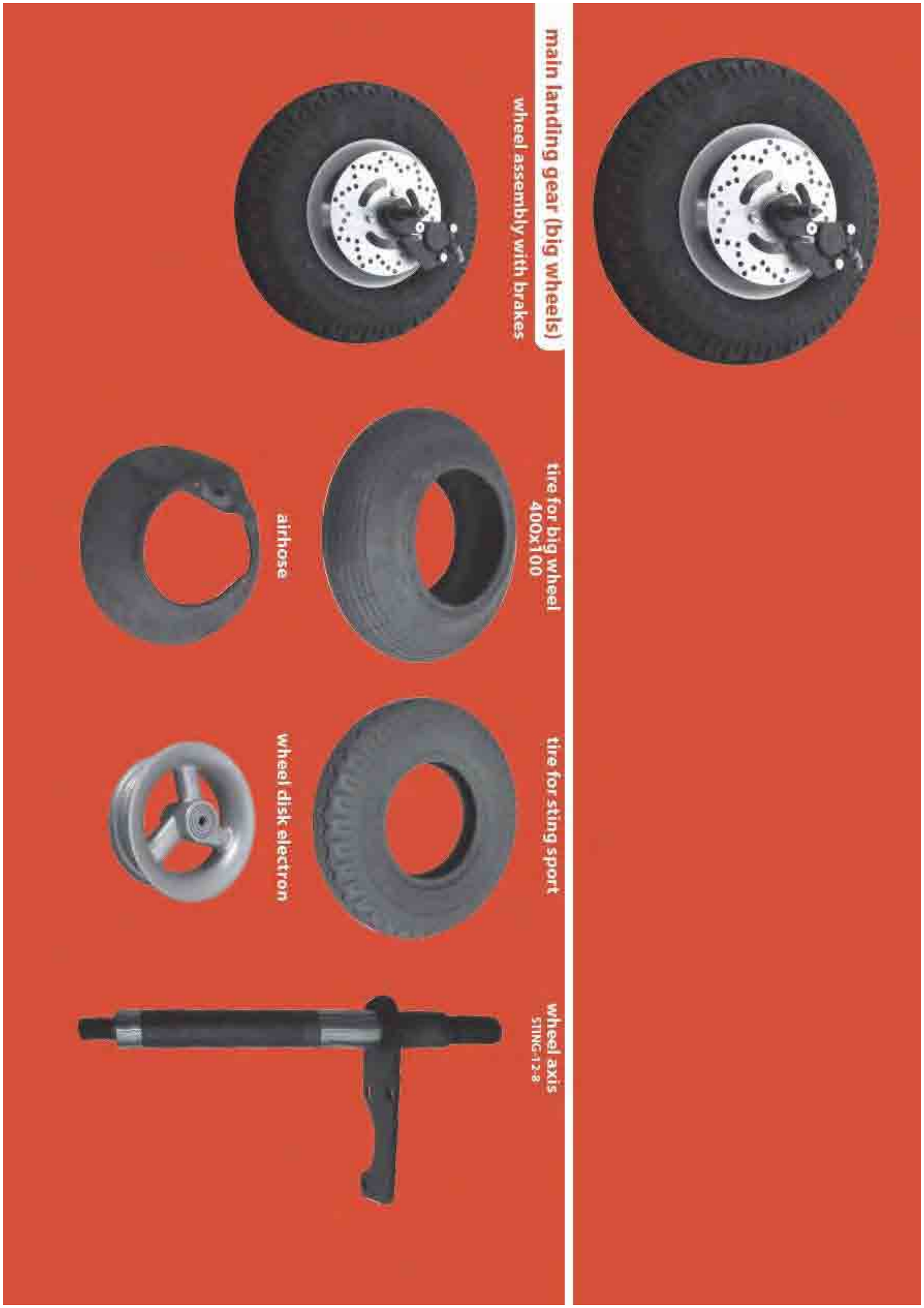

flap system
arest switch of flap
STING-4-1
flap lever stop
STING-4-3
washer under the spring
STING-4-12
flap control lever
STING-96-4-9
gate
STING-4-10
flap lever suspension
STING-4-13
flap lever holder
STING-4-11


flap system
spring 16x1-60
CSN 02 6003
foam handle
carbon horn
flap drive thorn
STING-4-4
flange
STING-4-7
flap control lever
STING-2-9
tenor on torque tube
STING-4-5
torque tube lever
STING-4-8
line-up flap
control lever

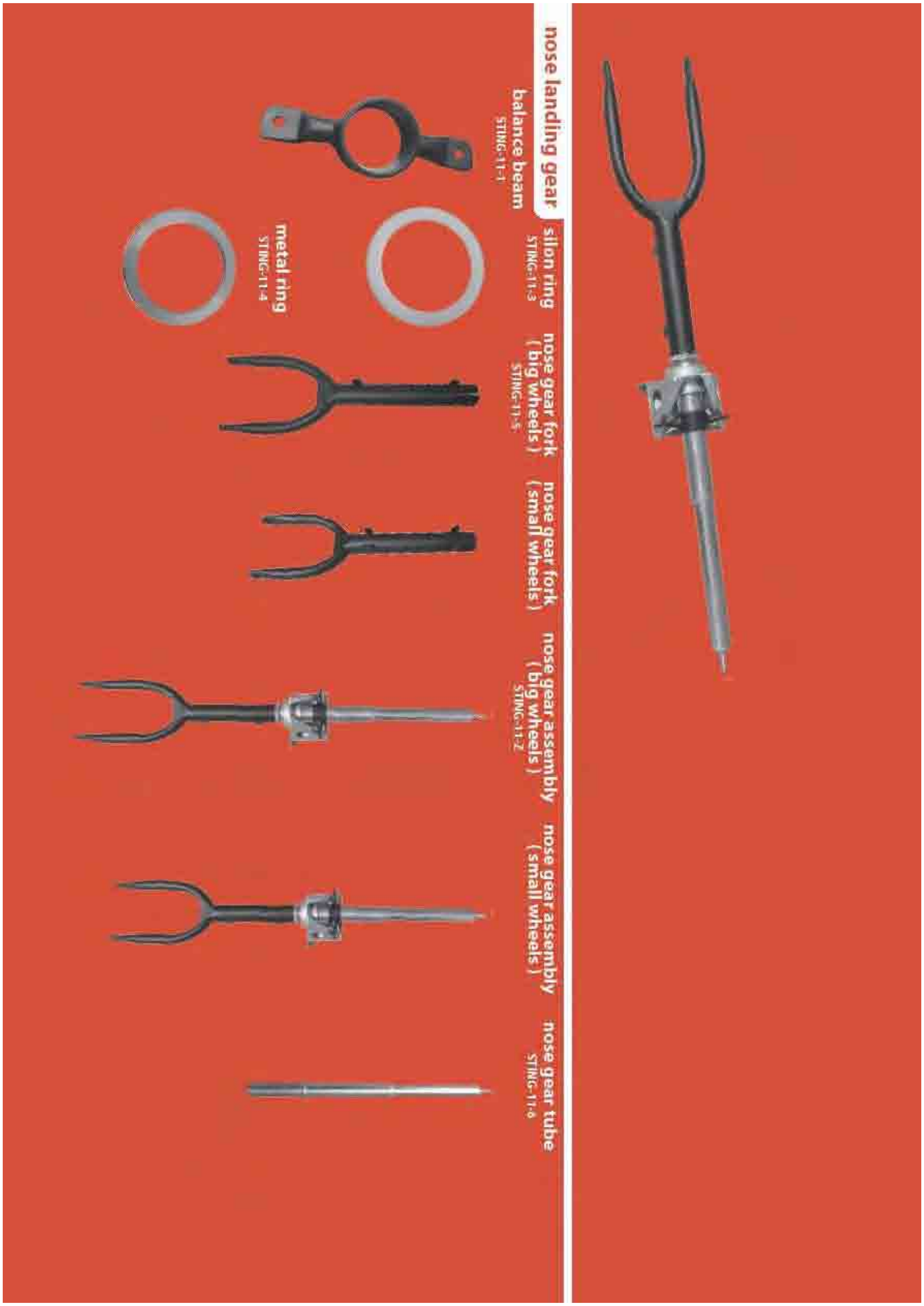

main fuel tank
fuel tank cover desk
cover desk rings
Closure tank
basket setting
fuel float assembly
main fuel tank intergrated into the fuselage (capacity 67 l or 80 l)

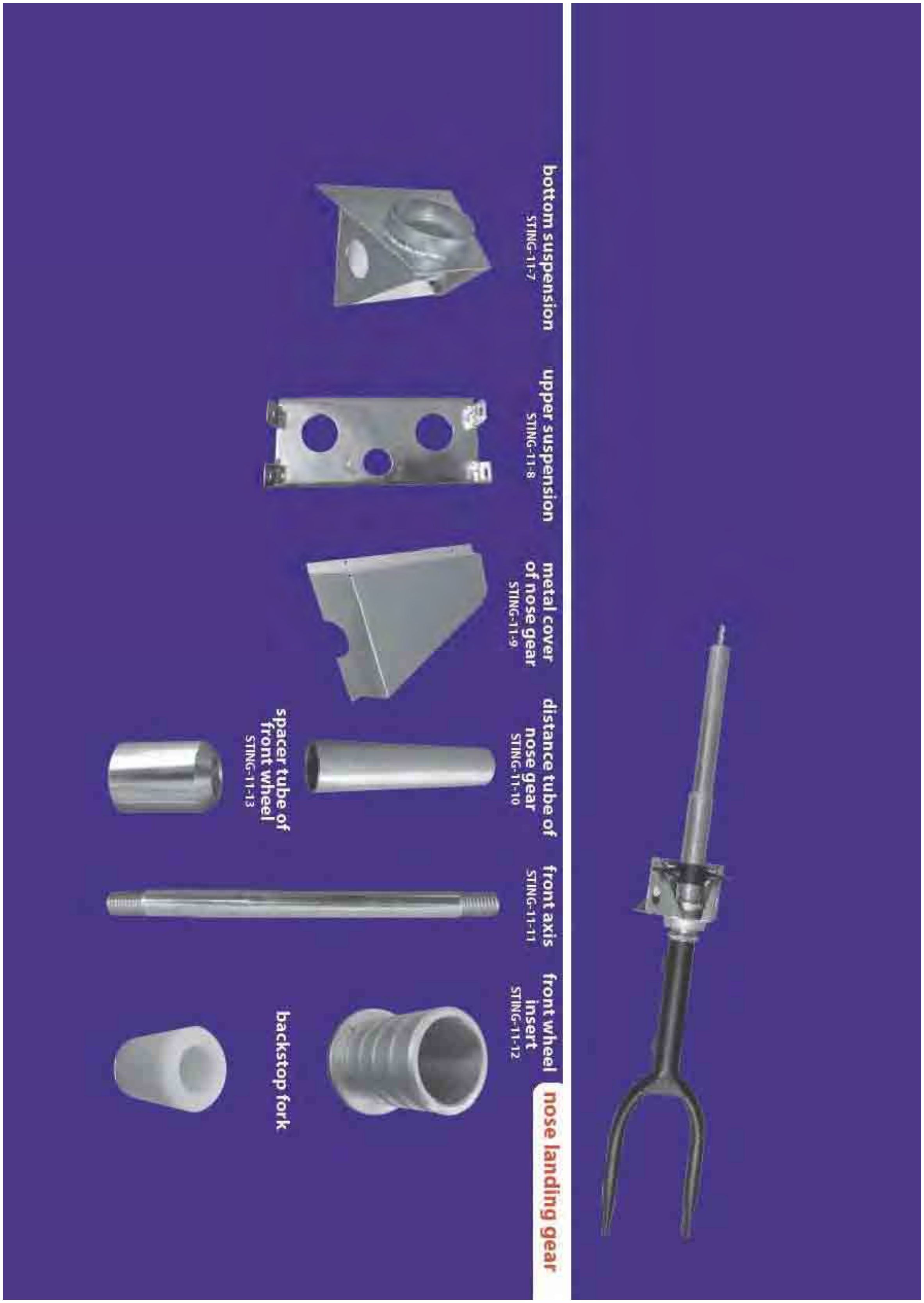

main landing gear (small wheels)
wheel disk
carbon
wheel disk
aluminium
tire small 12x4
airhose small

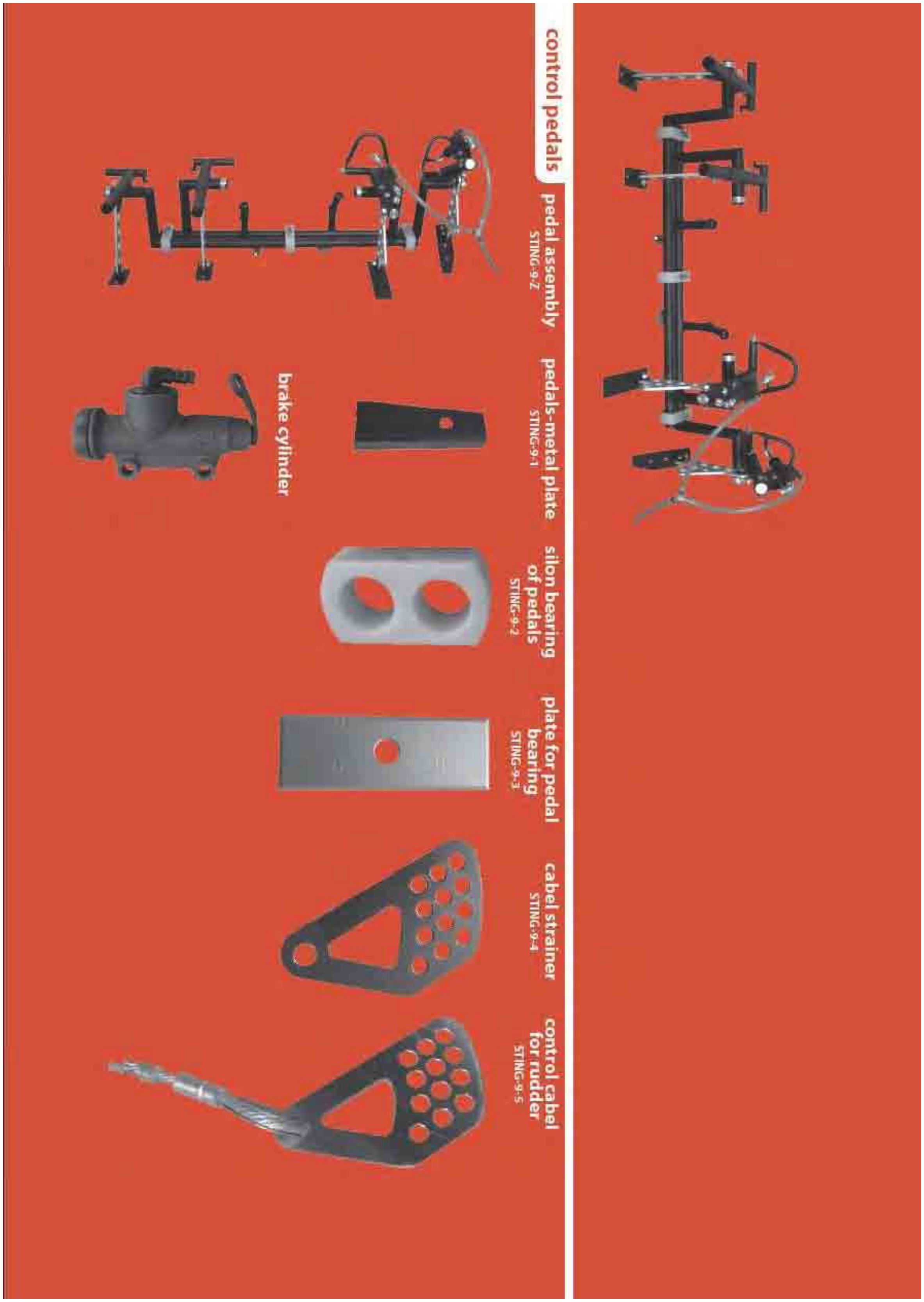

small wheels
main wheel axis
STING-12-6
spacer ring of
wheel cover
STING-12-5
hub of laminate wheel
STING-12-7
main gear case
STING-12-2
distance ring
STING-12-3

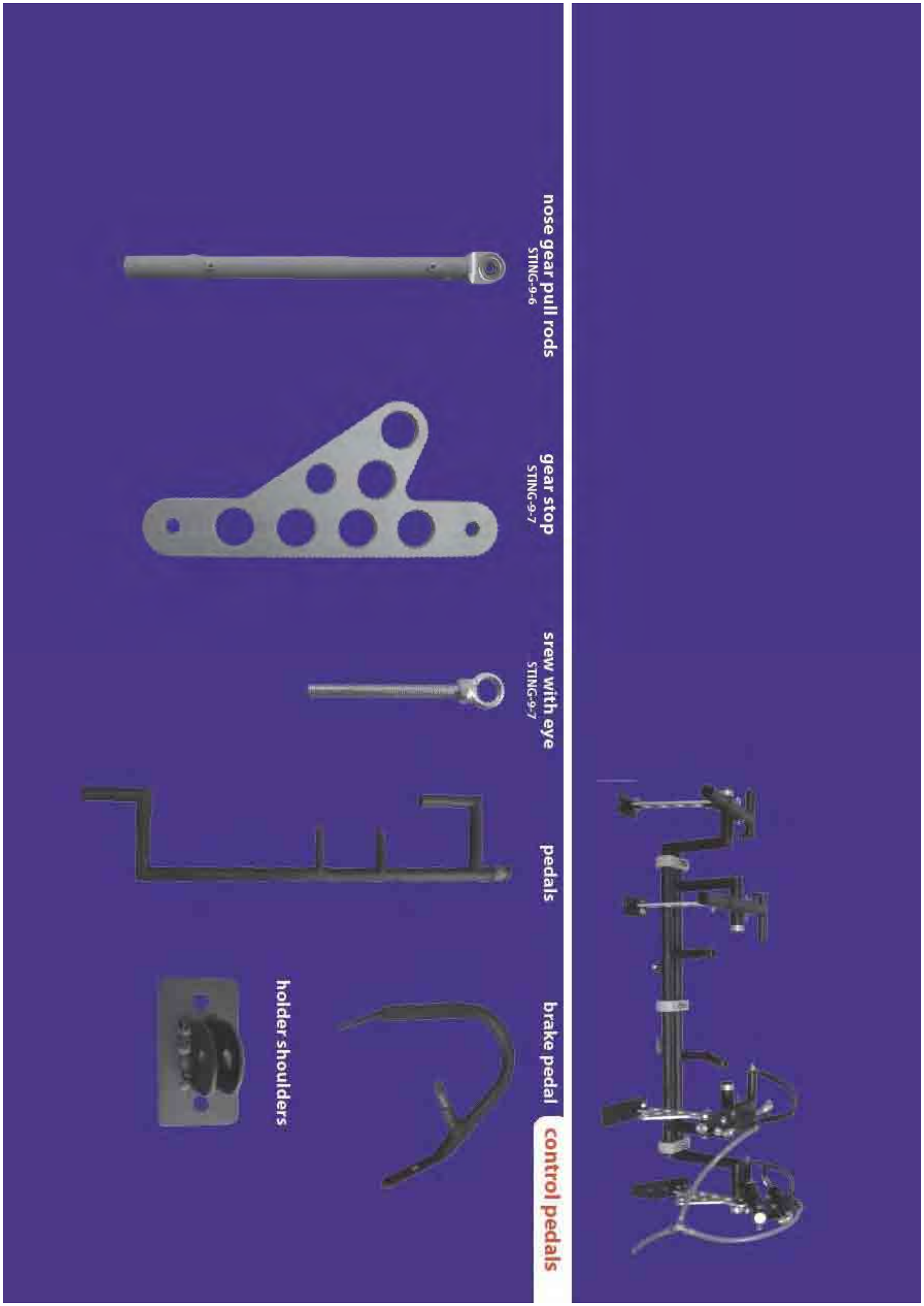

main landing gear (big wheels)
wheel assembly with brakes
tire for big wheel
400x100
airhose
tire for sting sport
wheel disk electron
wheel axis
STING-12-8

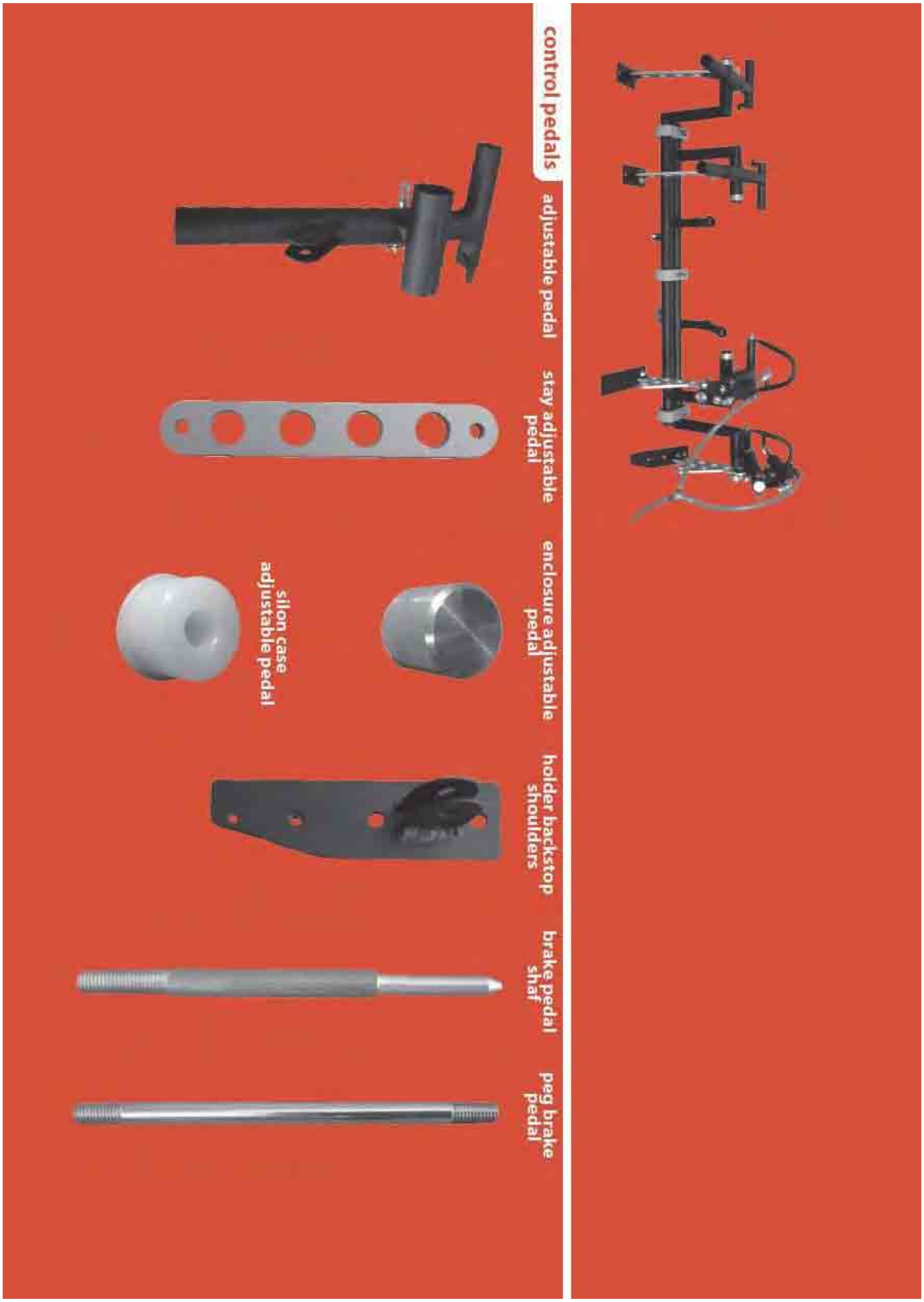

hydraulic brakes
brake pads
brake caliper
brake lines
brake fluid
DOT-3
brake node
hydrulic brakes are suitable for both types of wheel


nose landing gear
balance beam
STING-11-1
silon ring
STING-11-3
metal ring
STING-11-4
nose gear fork
(big wheels)
STING-11-5
nose gear fork
(small wheels)
nose gear assembly
(big wheels)
STING-11-2
nose gear assembly
(small wheels)
nose gear tube
STING-11-6


nose landing gear
bottom suspension
STING-11-7
upper suspension
STING-11-8
metal cover
of nose gear
STING-11-9
distance tube of
nose gear
STING-11-10
spacer tube of
front wheel
STING-11-13
front axis
STING-11-11
front wheel
insert
STING-11-12
backstop fork


control pedals
pedal assembly
STING-9-Z
pedals-metal plate
STING-9-1
silon bearing
of pedals
STING-9-2
plate for pedal
bearing
STING-9-3
cabel strainer
STING-9-4
control cabel
for rudder
STING-9-5
brake cylinder


control pedals
nose gear pull rods
STING-9-6
gear stop
STING-9-7
srew with eye
STING-9-7
pedals
brake pedal
holder shoulders


control pedals
adjustable pedal
stay adjustable pedal
enclosure adjustable pedal
silon case adjustable pedal
holder backstop shoulders
brake pedal shaf
peg brake pedal


rudder
spacer tube of rudder
STING-14-1
axis insert of rudder
STING-14-2
rudder lever
STING-14-3
rudder axis
STING-14-4
bearing shell
STING-14-5
upper hinge laminated in
STING-14-6
upper hinge
STING-14-7

CHECKLIST FOR INSPECTONS

The following cardstock insert pages are intended to be copied but should then be replaced to remain in this manual. The copy is to be used as a checklist and record during the intended inspection. Upon completion of the inspection the checklist copy may be discarded.

SECTION 3
STRUCTURES

INTRODUCTION

Section 3 describes the structure, subsystems and work to be completed in the removal and installation of subsystems and parts drawings specific to the StingSport. Some equipment described in this section may not apply to all StingSport serial numbers.

AIRFRAME

The StingSport is a carbon-composite, low-wing, single-engine, two-seat LSA aircraft. The fuselage is laminated and, in some areas, is sandwiched foam that allows for good structural integrity at a nominal weight. The largest sections of this material are the fuselage section, each wing, the rudder, and the horizontal stabilizer with the elevator. The canopy is constructed of Plexiglas supported by a fiberglass frame that pivots forward on two hinges, and it is fastened by three manually operated latches. The engine is fastened to a six point vibration absorbing cradle mount that is secured to the firewall at four attach points by steel bolts.

The wings are attached to the fuselage by two, interlocking, box-type spars that cross beneath the cockpit and interlock with the opposite wing. These spars in turn are connected by a large over-center locking bolt. An optional six-gallon auxiliary fuel tank may be contained in each wing. Hinged ailerons and split-type flaps are affixed to the aft spar of each wing. The split-type flaps are attached by five hinges that allow the flap to rotate out of the lower surface of the wing when extended and for flush positioning with the lower wing surface when retracted. The cabin compartment is arranged as a side-by-side two-seat configuration with flight controls for both crew positions.

The empennage section is made up of the vertical stabilizer with the rudder and the horizontal stabilizer with the elevator. The vertical stabilizer is molded as a part of the fuselage section. The rudder is attached to the vertical stabilizer by a slide-on pin and a rod that runs down the leading edge of the rudder, through ball bearing races, which connects to the rudder control cables. The horizontal stabilizer is attached to the fuselage section by two horizontal guide pins and a single vertical steel bolt. The elevator is affixed to the horizontal stabilizer by five bolted pivot points.

Baggage compartment

The baggage compartments are located behind the seats. Each compartment consists of two pieces, joined horizontally at the mid point of the vertical walls of each compartment. The upper part is attached to the aft rear deck by six screws and inserts. The lower part is attached to the upper half by seven scews and insets. The lower part extends forward over the flap torque tube and attaches with two small self tapping screw aft of the seatback. This forms a complete enclosure for storage items and prevents contents from entering the aft control section of the fuselage. Maximum baggage weight transported in each baggage compartment is 20 lbs.

FLIGHT CONTROLS

The aircraft's primary flight control system consists of two ailerons, a rudder, and a large elevator. The aileron and elevator control surfaces are mechanically linked to two manually-operated flight sticks by a series of ball bearing push rods. The rudder is manually operated by a pair of control cables linked to foot pedals. The elevator control push rod and an adjustable trim tab control rod are attached beneath the horizontal stabilizer.

TRIM SYSTEM

The rudder and right aileron are equipped with fixed, ground-adjustable trim tab. The elevator has an in-flight, adjustable trim tab that is connected to a control lever in the cockpit by a series of cables and push rods. By moving the trim lever forward, the aircraft nose will trim down, and by moving the lever aft, the nose will trim up.

GROUND HANDLING

TOWING

Powered towing is not recommended. The best way for maneuvering the aircraft on the ground is by use of the included hand tow bar connected to the nose gear on the aircraft. The tow bar should be used to guide the aircraft and actual force of pushing or pulling should be done by the operator holding onto a propeller blade where it passes in to the spinner. The airplane can be handled by propeller, with a tow bar inserted over the axles bolt mounted on the nose wheel fork, by main gear legs, or by wingtips. Switch off the ignition before handling the airplane on the ground! When going through narrow areas, you may need the assistance of someone familiar with the area and the towing process.

CAUTION

Avoid exerting excessive pressure and point loading on the airframe structure, especially on the wing tip ends, clear lenses of the wing tip light system, and the trailing edge of the wings or horizontal stabilizer

The two-piece tow bar is not intended to be used with mechanical towing equipment or tugs. If a tow bar is not available, the aircraft may be turned by pressing down on the lower leading edge of the vertical stabilizer. This will raise the nose wheel off the ground allowing the operator to rotate the aircraft around the main gear axis.

CAUTION

Do NOT push or pull on any part of the rudder or the horizontal stabilizer to move the aircraft.

CAUTION

Do not use the nose wheel faring (pant) to move the nose wheel left and right. The wheel faring is not designed to have large torsional loads placed on the front and aft ends in an attempt to point the nose wheel in either direction.

CAUTION

Only one person at a time should board the airplane. Having more than one person on the designated wing area or step will cause the plane to tip aft, which might damage the tail section of the airplane. If this occurs, the aircraft should be grounded until an inspection of the aft control system can be completed.

PARKING

The airplane should be preferably placed in a hangar, with stable temperature, good ventilation, low humidity and dust free environment. In case of parking outside the hangar it is necessary to anchor the airplane and to cover the canopy or the whole airplane for long-term parking.

The aircraft will roll with very little effort. When parking the aircraft, it is recommended to chock the tires in order to ensure that the aircraft will not move. The aircraft is not equipped with a parking brake. Tie down rings are installed underneath each wing if a greater need for security is considered necessary by the operator.

TIE-DOWN

When parking, the airplane outside the hangar, the airplane should be anchored to the ground. It is necessary to anchor the airplane in order to protect it from possible damage caused by wind and gusts. For this reason the airplane is equipped with anchoring eyes on the lower side of wings, and through the nose wheel rim. Also recommended is a padded strap over the aft fuselage attached to an aft ground tie down.

Secure the airplane with a sufficiently strong anchor (a screw anchor may not be recommended for some soils) with cables and straps. For anchorage of the back part of the airplane, use a strap which is wide enough and underlay it by a soft pad so the strap would not slide on the body of the airplane and damage the paint.

Tie-Down Procedure:

- Secure the parachute system.
- check the FUEL valve is OFF, switch OFF all switches, ignition and main switch
- block the control stick, e.g. by using safety harnesses
- close the vents, including the forward circle vent.
- close and lock the canopy
- insert the airplane wheel chocks
- If the plane will remain for a length of time, place covers on the blades of the propeller, and cover the Pitot tube.
- If the plane will be in the sun, place a suitable cover over the cabin.
- anchor the airplane to the ground by means of cables pulled through the anchoring points noted above.

In the event that gusty or strong wind conditions exist, tying down the airplane is the best precaution to prevent damage. Metal screw rings are located underneath each wing tip for fastening tie-down straps or ropes. The nose gear can be tied down by attaching a rope or strap around and through the wheel rim. To tie-down the rear of the airplane, sling a strap over the top of the empennage and fasten down. Be sure to place padded material in between the strap and the empennage to ensure that the painted surface of the airplane is not damaged.

JACKING

If the aircraft needs to be raised off the ground for any purpose, the specific jack locations are on the end of each main gear strut and on the engine mount. These are to be used to raise or support the airplane in order to prevent damage to its composite surface. For jacking the main gear, jack points are at the base of the gear strut below the axle assembly. The jack pad should contact the airplane on the bottom end of the strut.

NOTE

To prevent damage to the landing gear strut, place a pad in between the jack and the composite material of the strut.

Two jack points attached to both sides of the engine mount are used for holding the nose elevated. These points appear as short rods that are concealing within the cowling. To reach these points, both the upper and lower cowlings must be removed. Secure the aircraft from movement with when the nose wheel is elevated.

Do not place shear loads on the engine mount bolts. To prevent damage to the engine mount do not support the load of the aircraft by blocking under parts of the engine mount. Use the supports specified or block and pad the area under the firewall.

OPERATIONAL WEIGHT LIMITS

Standard Empty Weight: 780 Lbs
Maximum Ramp Weight: 1320 Lbs
Maximum Takeoff Weight: 1320 Lbs
Maximum Landing Weight: 1320 Lbs
Maximum Pilot or Copilot seat load: 240 Lbs.
Minimum Single Pilot or Copilot operation load: 100 Lbs.
Maximum Weight in Baggage Compartments: 20 Lbs each
Maximum Weight on aft Baggage Shelf: 20 Lbs. total
Maximum Weight at Baggage Station location: 60 Lbs total.

CENTER OF GRAVITY LIMITS

Center of Gravity Range:
FORWARD: 22 % MAC; or 80.2” Aft of Data Plane (Forward tip of prop spinner)
AFT: 34 % MAC; or 86.7” Aft of Data Plane (Forward tip of prop spinner)

MANEUVER LIMITS

This airplane is certified as a Light Sport Aircraft and is not approved for aerobatic flight, including spins. **All aerobatic maneuvers, including spins, are prohibited.** An aerobatic maneuver, as defined by 14 CFR 91.303, is an intentional maneuver involving an abrupt change in an aircraft’s attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.

FLIGHT LOAD FACTOR LIMITS

Flight Load Factors:

Flaps Up:	+4.0g, - 2.0g
Flaps Down	+4.0g, - 2.0g

FLIGHT LIMITATIONS:

The StingSport is intended for VFR/VMC flight conditions only. **Do not operate this aircraft in IMC conditions!** Operation under IMC conditions is considered an emergency and is strictly prohibited.

CAUTION

Additional flight attitude limitations are specified by the engine manufacturer to assure appropriate flow of fuel, coolant, and lubrication. See the Rotax manuals included as a CD with the aircraft documents.

WING FLAP SYSTEM

The aircraft utilizes split-type flaps that are controlled by a three-position lever positioned next to the arm rest in between the crew seats. The lever has a locking button that prevents the flaps from being operated inadvertently. When the lever is locked down in the first position, the flaps are totally retracted. In order to extend the flaps to Half (15°), press the button in and move the lever up to the second locked position. From this position, the flaps may either be extended to Full (30°) or retracted. To fully extend the flaps (Full) the button again must be depressed and the lever moved up to the third, locked position.

LANDING GEAR

The landing gear is a fixed, tricycle type with a steerable nose gear and two main landing gears. Shock absorption for the nose wheel is provided by a spring strut cylinder in the lower wheel fork. The main landing gear strut is made from a multi-layer composite that provides spring action and support. Hydraulically-actuated brakes are attached on each main landing gear wheel. The brakes are operated by toe pedals attached to the tips of the pilot rudder pedals. The left toe pedal will actuate the left main landing gear brake, and the right toe pedal will actuate the right main landing gear brake. See Section 7 for more information on landing gear repair.

SAFETY HARNESSES

Each seat in the aircraft is equipped with a four-point safety harness. Each of the shoulder harnesses is latched to a strap that extends aft over the rear baggage deck into which it is secured. The outboard lap belt is secured to the rear bulkhead, and the inboard lap belt is secured to the middle console. The right shoulder harness is attached to the right lap belt, and the left shoulder harness is attached to the left lap belt. One main latch attaches the entire harness, as it fastens the two lap belts together. The shoulder harness strap that is secured to the rear deck can be unfastened if need be by a latch that is located just above the junction where the two shoulder harnesses meet.

To use the safety harnesses, fasten the main latch and then adjust the lap belt to fit tightly as low as possible on the hips. After the lap belts have been properly fitted, adjust the shoulder harnesses. To release the main latch, simply press down on the release button and the harness will unlatch.

Removal of safety harnesses (**L/O**,**RI**,**RM**,**A&P**)

1. To remove shoulder harnesses from the aft luggage deck, the connecting buckles will allow easy removal. To completely remove the shoulder harness portion of the seat belts, remove the two retention bolts at the ends of the harness in the aft deck forward of the aircraft parachute tray.
2. To remove the side harnesses from the side attachment points, remove the nut, washer and the bolt outboard of each side. The remove the shared nut, washer and bolt in the aft portion of the throttle quadrant.

Installation of safety harnesses (**L/O**,**RI**,**RM**,**A&P**)

1. To install the shoulder harnesses – put on the bolt through the washer and the harness eye followed by another washer and insert the bolt into the bracket in aft luggage deck and secure the nut.
2. To install the side harnesses on the side attachment points, intall the harness eye over the shared bolt, insert the bolt in the tube aft of the throttle quadrant, insert the other harness eye over the bolt. Then install the washer and the bolt.

Checking of safety harnesses (**L/O**,**RI**,**RM**,**A&P**)
Check harnesses surface for any damages. Check the lock system function. Check the attachment points of shoulder and side harnesses for any damage or corrosion.

CANOPY

The canopy is designed to allow for a maximum outside view. It is a one-piece construction that is hinged in the front and opens upward assisted by two gas struts. The canopy has a teardrop shape and enables access to the cockpit. The canopy consists of carbon frame on which the windscreen is attached. The canopy is suspended on two swivel-arm hinges on front sides of the composite fixed frame.

The canopy is secured by three separate latches. Two are operated from the inside only and are located next to each crew position. The third latch is located in the rear of the canopy above and between the crew seats. It is accessible from both inside or outside of the aircraft, and it includes an exterior lock to secure the cockpit when unoccupied. The rear fixed aft fixed canopy consists of a one piece plastic with an opening for the exit of the aircraft parachute.

Canopy removal (L/O,RI,RM,A&P)

- Open the canopy
- Remove retaining clips from the two gas strut rod ends (4)
- Support the weight of the canopy on each side then disconnect gas struts on both sides of canopy and from the floor attach pins.
- Disconnect hinge bolt nuts at the interior of the firewall
- Remove the hinge bolts.
- Remove the canopy by rotating it forward and up to withdraw the canopy hinge supports from the forward portion of the instrument panel glare shield. Store the canopy in a safe place so that wind damage cannot occur.

Canopy installation (L/O,RI,RM,A&P)

- Set the canopy on the airplane by first inserting the forward hinge supports into the openings in the forward part of the glare shield..
- Insert the bolts and the nuts into the hinges of the canopy at the interior of the firewall. DO NOT over-tighten these nuts. They should be lubricated and free to turn by hand.
- Snap the gas struts into the rod ends in the frame of the canopy; insert the other end of gas struts in to the pin on the forward floor of the cockpit.
- Snap the four retaining clips back into the ends of each strut to lock the strut in place.

WARNING

It is imperative that the GRS safety pin be reinserted into its respective locking position before the crew and passenger disembark the airplane in order to prevent an accidental firing of the rocket system.

CAUTION

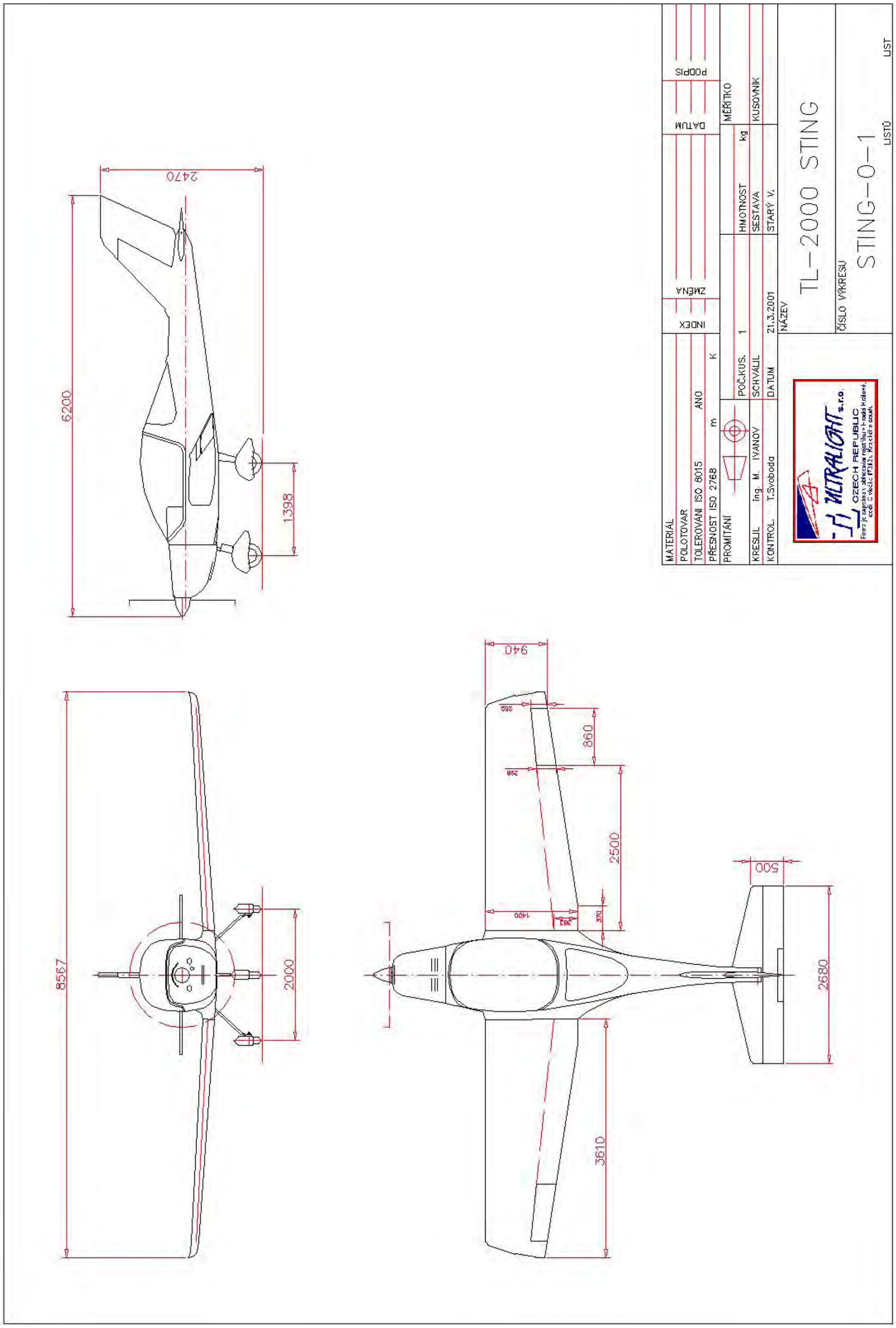
If the canopy is left open for an extended period in bright sunlight, the excellent canopy optics are capable of focusing the sunlight off of the interior curved surface and causing burns in the cabin upholstery.

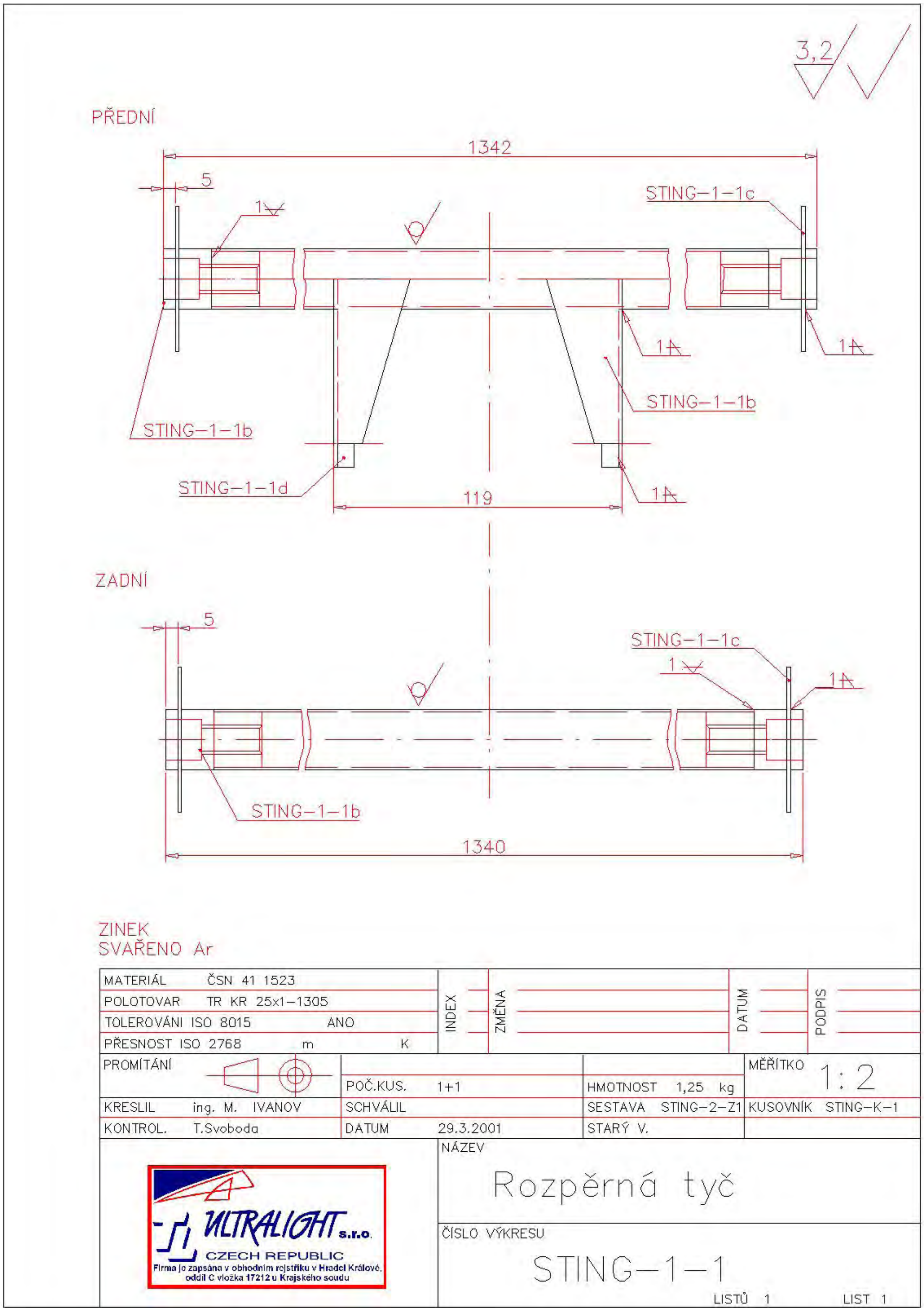
CAUTION

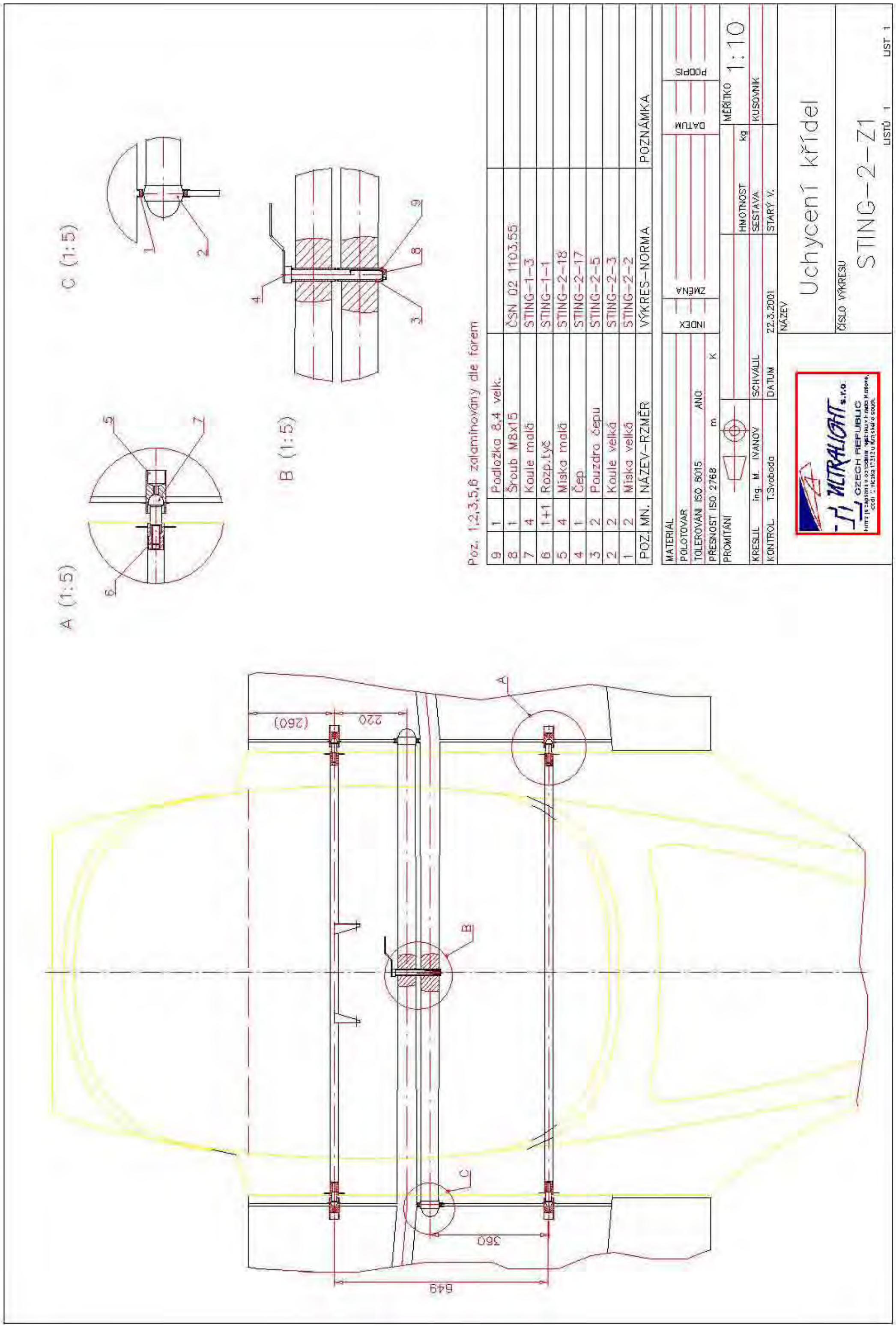
The canopy mechanism may be damaged by over extension if the canopy remains unattended, unlocked, open in the wind or during taxi operations.

DETAILED PARTS AND PARTS ASSEMBLY DRAWINGS-

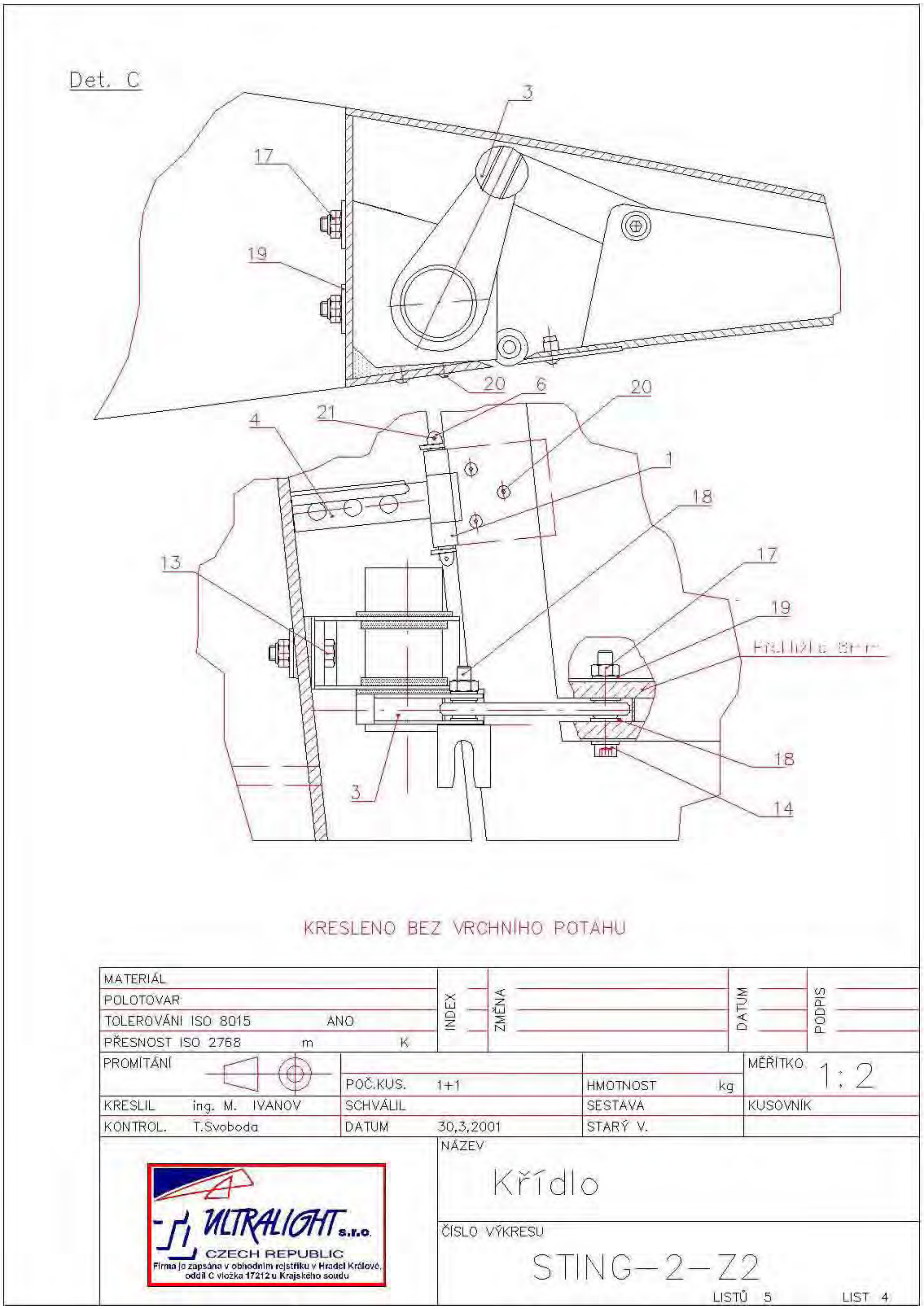
The following pages are provided to accurately describe the manufactured parts and the parts assemblies. They may also be helpful in reassembly of aircraft components that have been removed for repair or inspection.


2470
6200
1398
8567
2000
940
860
2500
500
2680
3610
TL-2000 STING
STING-0-1
ULTRALIGHT s.r.o.
CZECH REPUBLIC

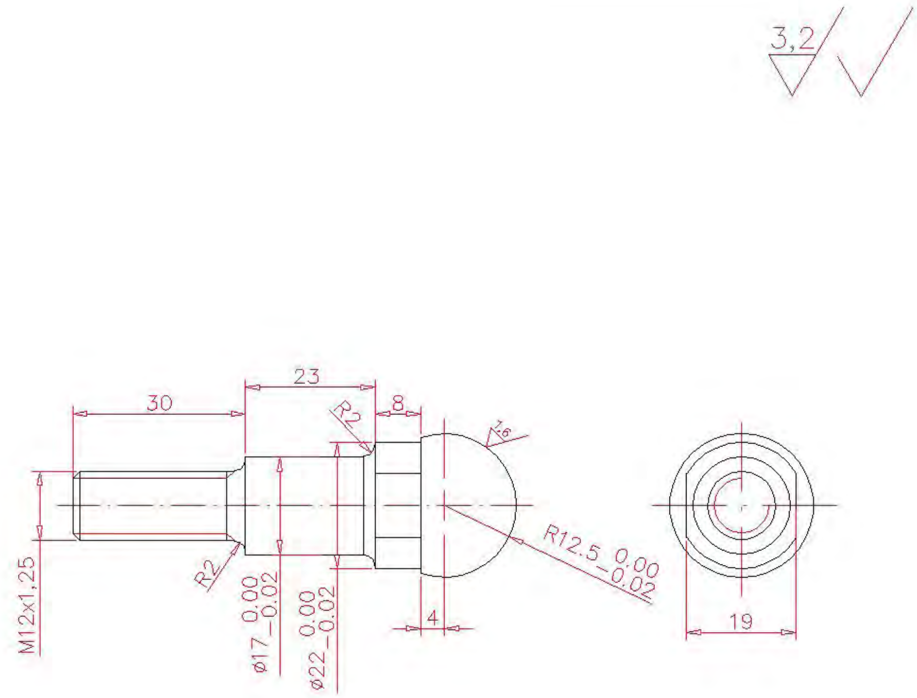

3,2
PŘEDNÍ
1342
5
STING–1–1c
1
STING–1–1b
STING–1–1b
STING–1–1d
119
1
ZADNÍ
5
STING–1–1c
1
1
STING–1–1b
1340
ZINEK
SVAŘENO Ar
MATERIÁL ČSN 41 1523
POLOTOVAR TR KR 25x1–1305
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1+1
HMOTNOST 1,25 kg
MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–2–Z1
KUSOVNÍK STING–K–1
KONTROL. T.Svoboda
DATUM 29.3.2001
STARÝ V.
NÁZEV
Rozpěrná tyč
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–1–1
LISTŮ 1
LIST 1


A (1:5)
B (1:5)
C (1:5)
Poz. 1,2,3,5,6 zalaminovány dle forem
Podložka 8,4 velk.
Šroub M8x15
Koule malá
Rozp.tyč
Miska malá
Čep
Pouzdro čepu
Koule velká
Miska velká
POZ. MN. NÁZEV-RZMĚR
VÝKRES-NORMA
POZNÁMKA
1:10
Uchycení křídel
STING-2-Z1
CZECH REPUBLIC
649
360
220
(260)

.


Det. C
3
17
19
20
6
20
4
21
1
18
13
17
19
18
3
14
KRESLENO BEZ VRCHNÍHO POTAHU
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1+1
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA
KUSOVNÍK
KONTROL. T.Svoboda
DATUM 30,3,2001
STARÝ V.
NÁZEV
Křídlo
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING-2-Z2
LISTŮ 5
LIST 4

.



KALIT
BROUSIT R 12,5

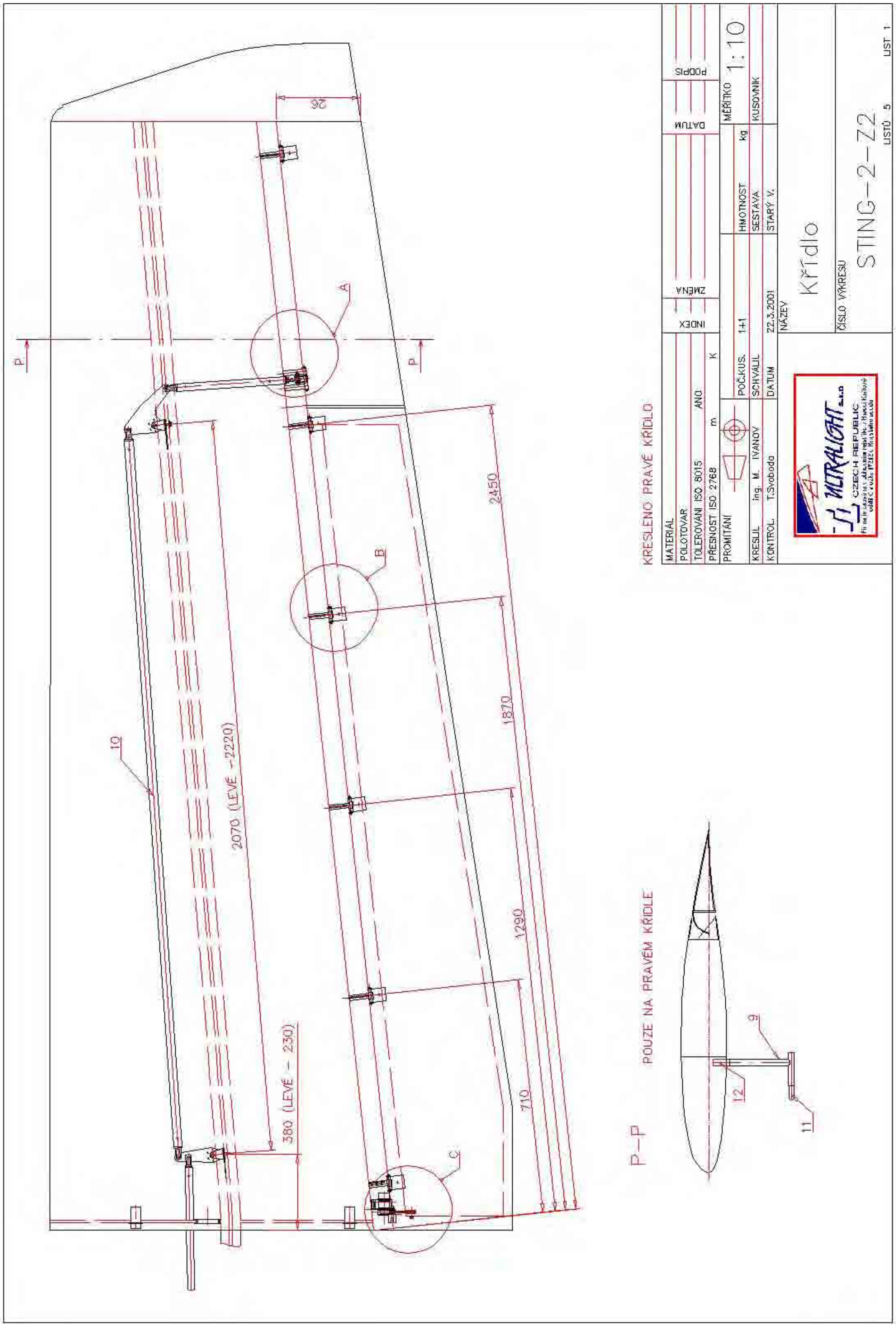
MATERIÁL ČSN 41 5230.4	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR KR 30–80 ČSN 42 6510			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 4	HMOTNOST 0,12 kg	MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–2–Z1	KUSOVNÍK STING–K–1
KONTROL. T.Svoboda	DATUM 12.2.2002	STARÝ V. 30.3.2001	

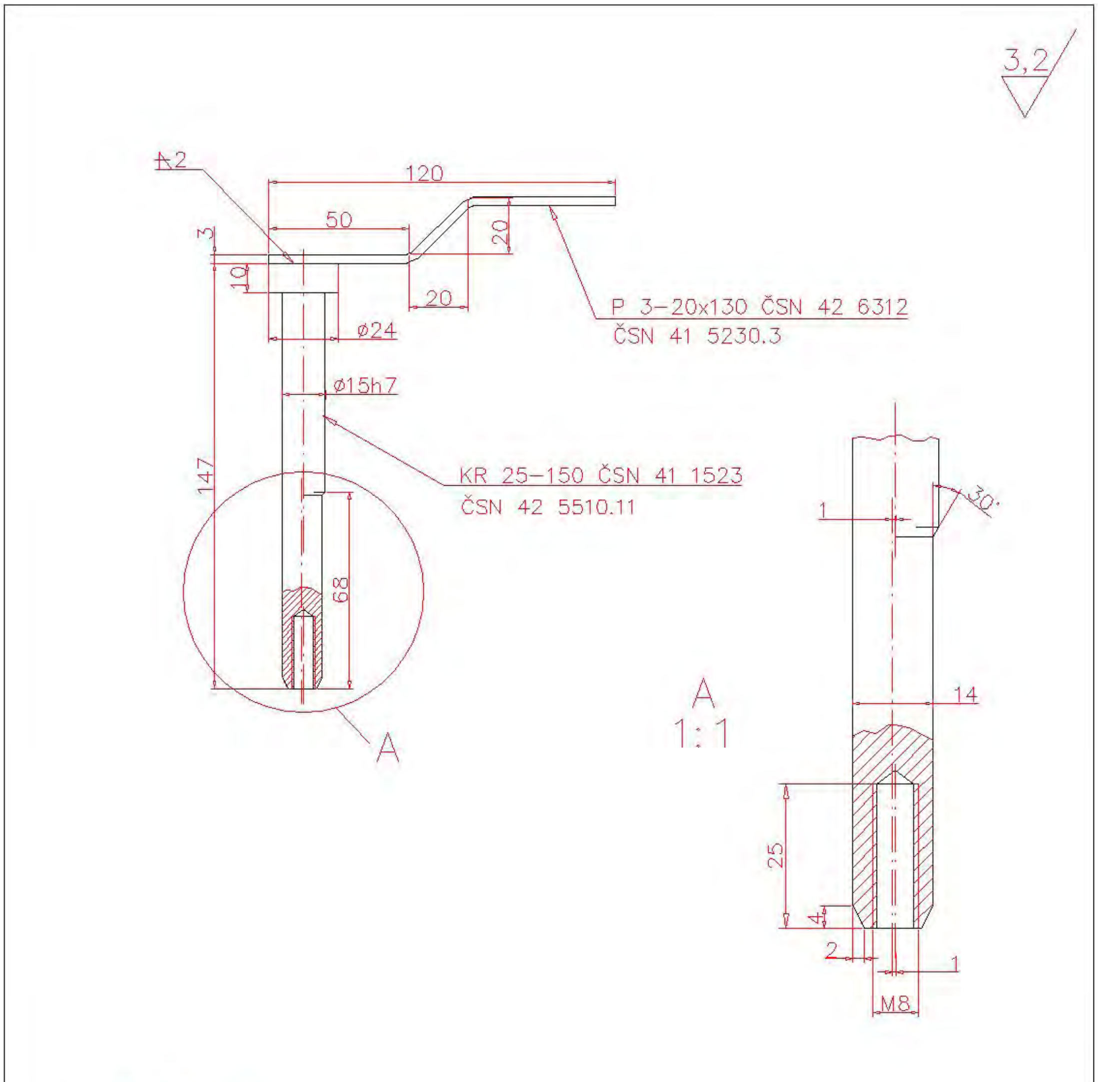
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Koule malá

ČÍSLO VÝKRESU
STING–1–2

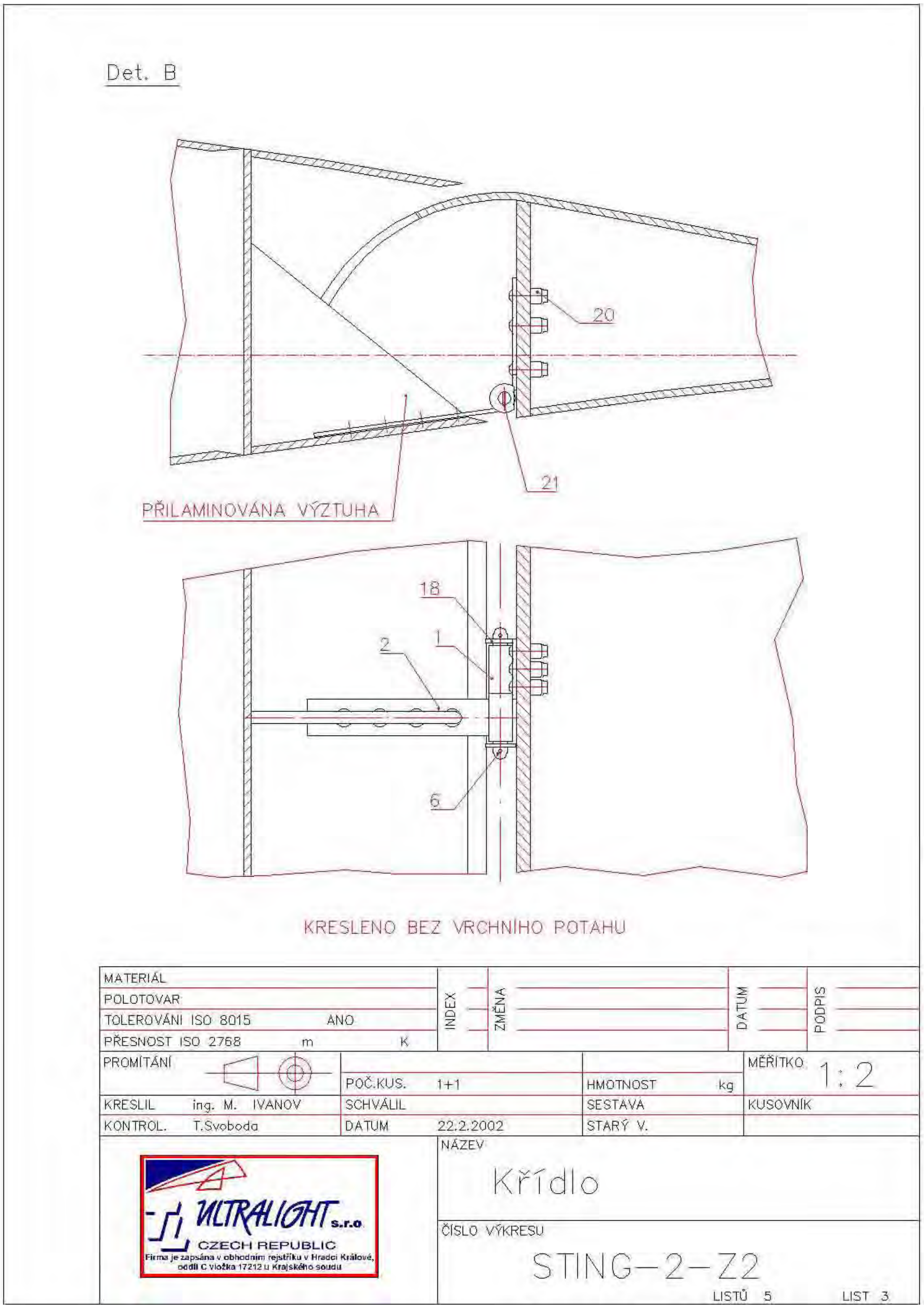
LISTŮ 1 LIST 1


KRESLENO PRAVÉ KŘÍDLO
POUZE NA PRAVÉM KŘÍDLE
P–P
2070 (LEVÉ - 2220)
380 (LEVÉ - 230)
2450
1870
1290
710
96
Křídlo
STING-2-Z2
1:10
22.3.2001
Ing. M. IVANOV
T.Svoboda
STARÝ V.
CZECH REPUBLIC



SVAŘENO Ar
ZINEK

MATERIÁL		INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR				
TOLEROVÁNI ISO 8015 ANO				
PŘESNOST ISO 2768 m K				
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST 0,287 kg	MĚŘÍTKO 1 : 2	
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–2–Z1	KUSOVNÍK STING–K–2	
KONTROL. T.Svoboda	DATUM 12.2.2001	STARÝ V. 30.3.2001		
ULTRALIGHT s.r.o. CZECH REPUBLIC Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu	NÁZEV Čep			
	ČÍSLO VÝKRESU STING–2–17	LISTŮ 1	LIST 1	


Det. B
20
21
PŘILAMINOVÁNA VÝZTUHA
18
2
1
6
KRESLENO BEZ VRCHNÍHO POTAHU
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1+1
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA
KUSOVNÍK
KONTROL. T.Svoboda
DATUM 22.2.2002
STARÝ V.
NÁZEV
Křídlo
ČÍSLO VÝKRESU
STING-2-Z2
LISTŮ 5
LIST 3
ULTRALIGHT s.r.o
CZECH REPUBLIC

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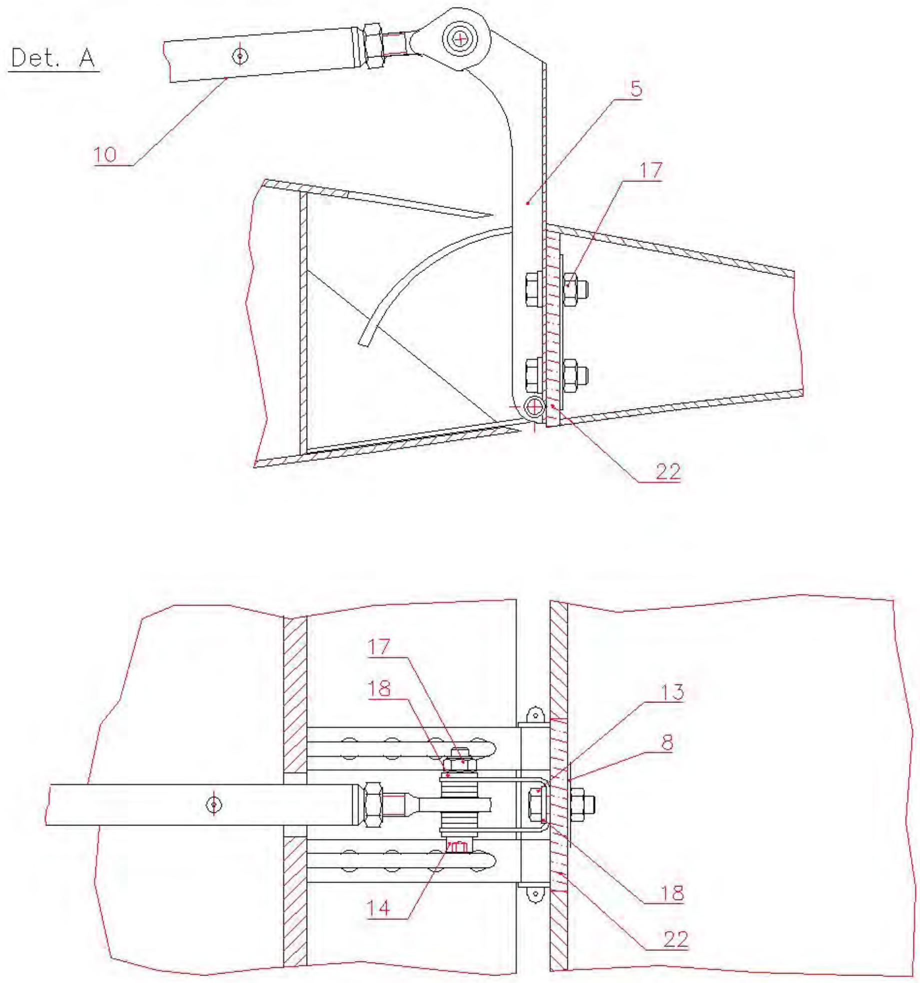
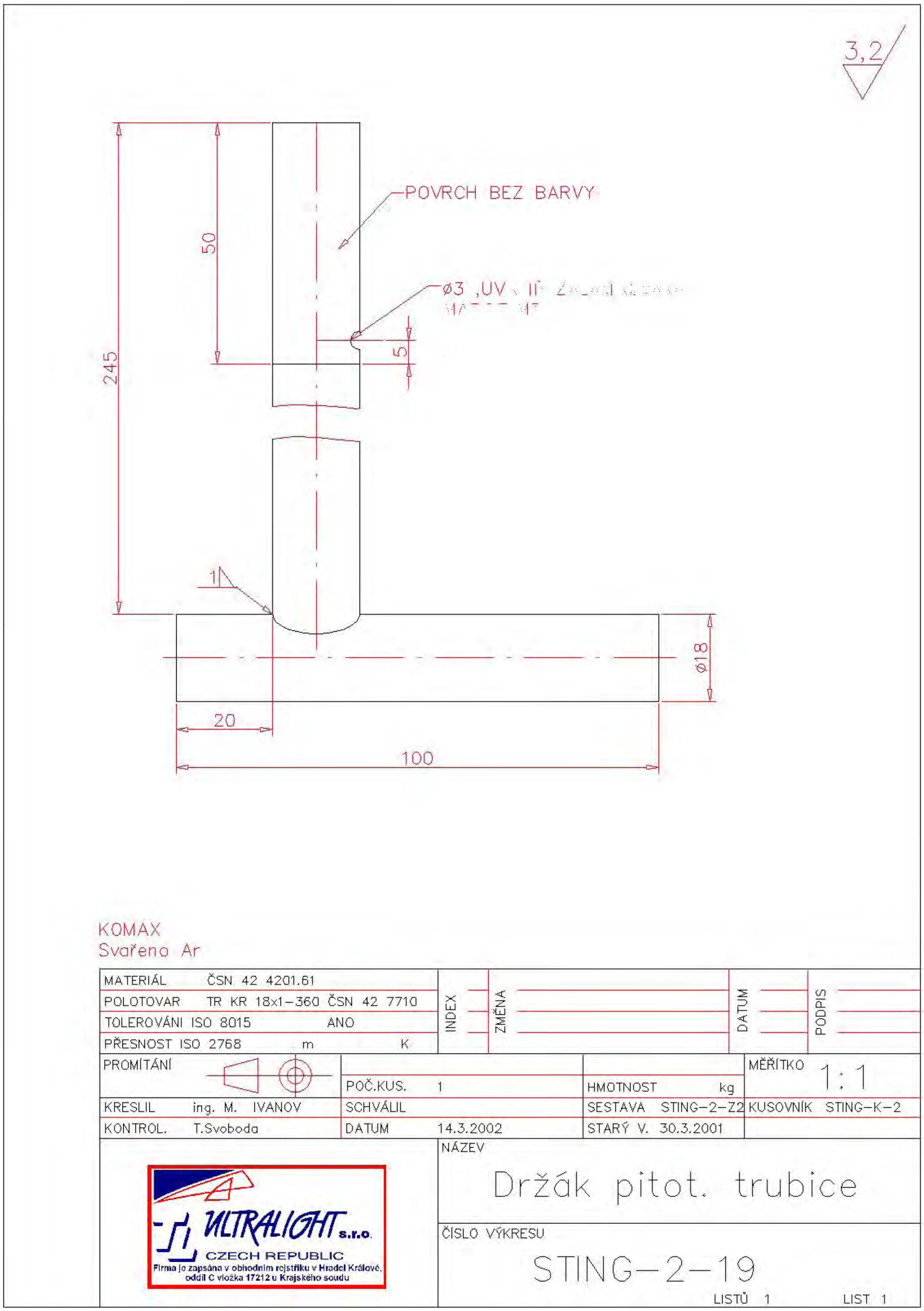
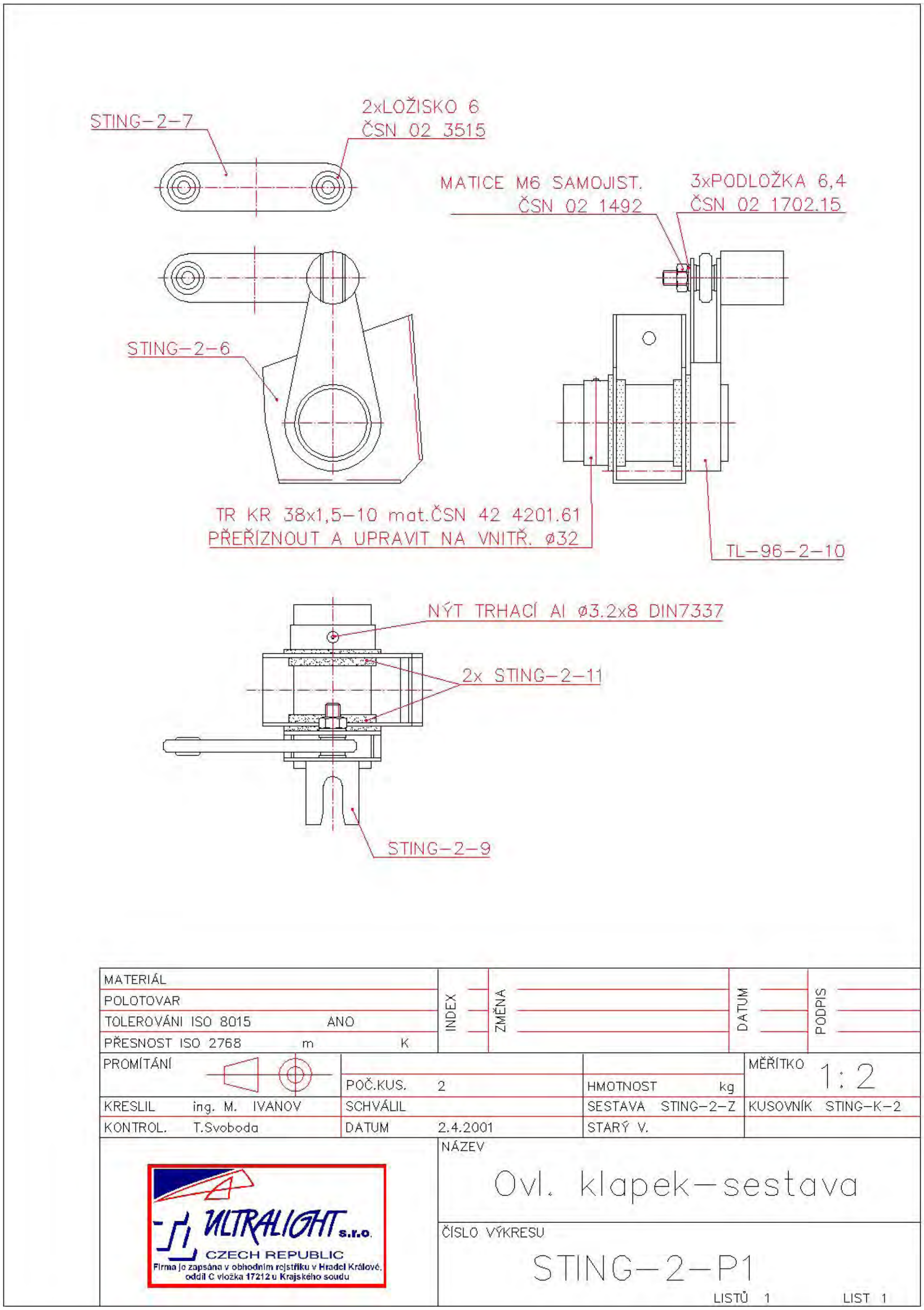


KRESLENO BEZ VRCHNÍHO POTAHU

MATERIÁL	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 1+1	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA	KUSOVNÍK
KONTROL. T.Svoboda	DATUM 27.2.2002	STARÝ V. 22.3.2001	
ULTRALIGHT s.r.o. CZECH REPUBLIC Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu	NÁZEV Křídlo		
	ČÍSLO VÝKRESU STING–2–Z2	LISTŮ 5	LIST 2

.


3,2
POVRCH BEZ BARVY
ø3 ,UV
50
5
245
1
ø18
20
100
KOMAX
Svařeno Ar
MATERIÁL ČSN 42 4201.61
POLOTOVAR TR KR 18x1–360 ČSN 42 7710
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–2–Z2
KUSOVNÍK STING–K–2
KONTROL. T.Svoboda
DATUM 14.3.2002
STARÝ V. 30.3.2001
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
NÁZEV
Držák pitot. trubice
ČÍSLO VÝKRESU
STING–2–19
LISTŮ 1
LIST 1


STING–2–7
2xLOŽISKO 6
ČSN 02 3515
MATICE M6 SAMOJIST.
ČSN 02 1492
3xPODLOŽKA 6,4
ČSN 02 1702.15
STING–2–6
TR KR 38x1,5–10 mat.ČSN 42 4201.61
PŘEŘÍZNOUT A UPRAVIT NA VNITŘ. ø32
TL–96–2–10
NÝT TRHACÍ Al ø3.2x8 DIN7337
2x STING–2–11
STING–2–9
MATERIÁL
POLOTOVAR
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–2–Z
KUSOVNÍK STING–K–2
KONTROL. T.Svoboda
DATUM 2.4.2001
STARÝ V.
NÁZEV
Ovl. klapek–sestava
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–2–P1
LISTŮ 1
LIST 1

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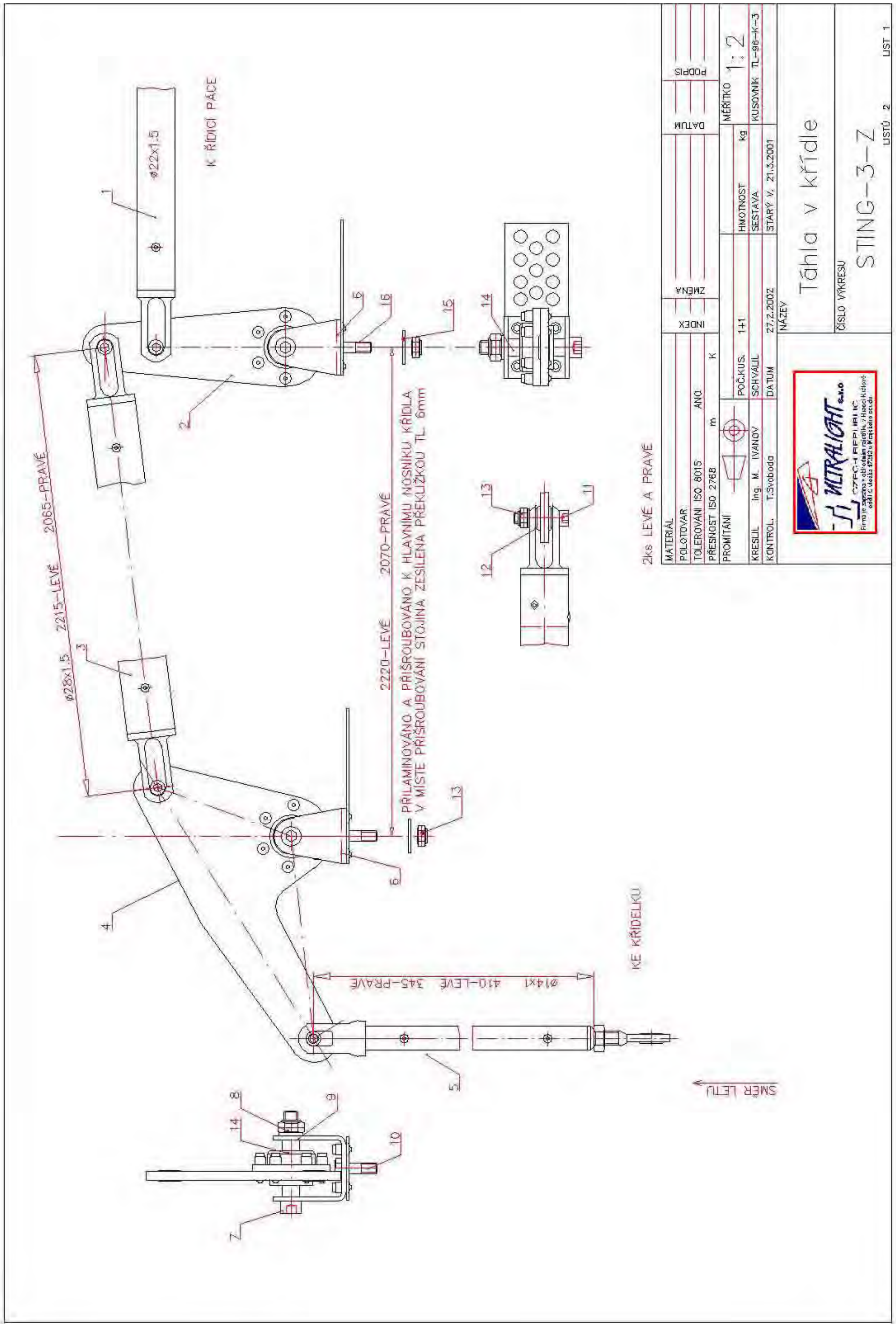
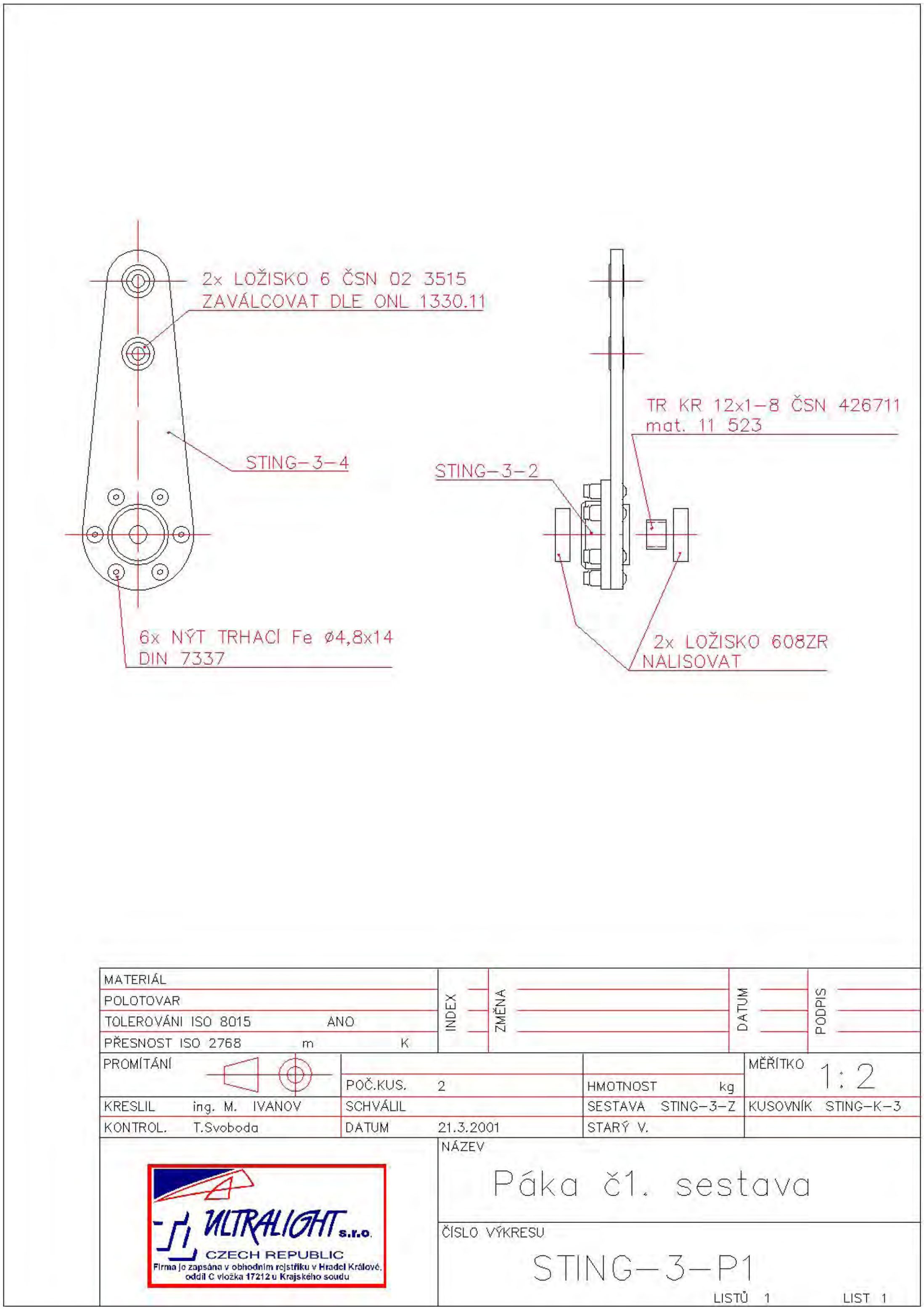
.

.


K ŘÍDICÍ PÁCE
ø22x1,5
ø28x1,5
2065–PRAVÉ
2215–LEVÉ
2070–PRAVÉ
2220–LEVÉ
PŘILAMINOVÁNO A PŘIŠROUBOVÁNO K HLAVNÍMU NOSNÍKU KŘÍDLA
V MÍSTĚ PŘIŠROUBOVÁNÍ STOJINA ZESÍLENA PŘEKLIŽKOU TL. 6mm
2ks LEVÉ A PRAVÉ
KE KŘIDÉLKU
ø14x1 410–LEVÉ 345–PRAVÉ
SMĚR LETU
MĚŘÍTKO 1:2
KUSOVNÍK TL-96-K-3
Táhla v křídle
ČÍSLO VÝKRESU
STING-3-Z

.


2x LOŽISKO 6 ČSN 02 3515
ZAVÁLCOVAT DLE ONL 1330.11
STING-3-4
6x NÝT TRHACÍ Fe Ø4,8x14
DIN 7337
TR KR 12x1-8 ČSN 426711
mat. 11 523
STING-3-2
2x LOŽISKO 608ZR
NALISOVAT
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING-3-Z
KUSOVNÍK STING-K-3
KONTROL. T.Svoboda
DATUM 21.3.2001
STARÝ V.
NÁZEV
Páka č1. sestava
ČÍSLO VÝKRESU
STING-3-P1
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

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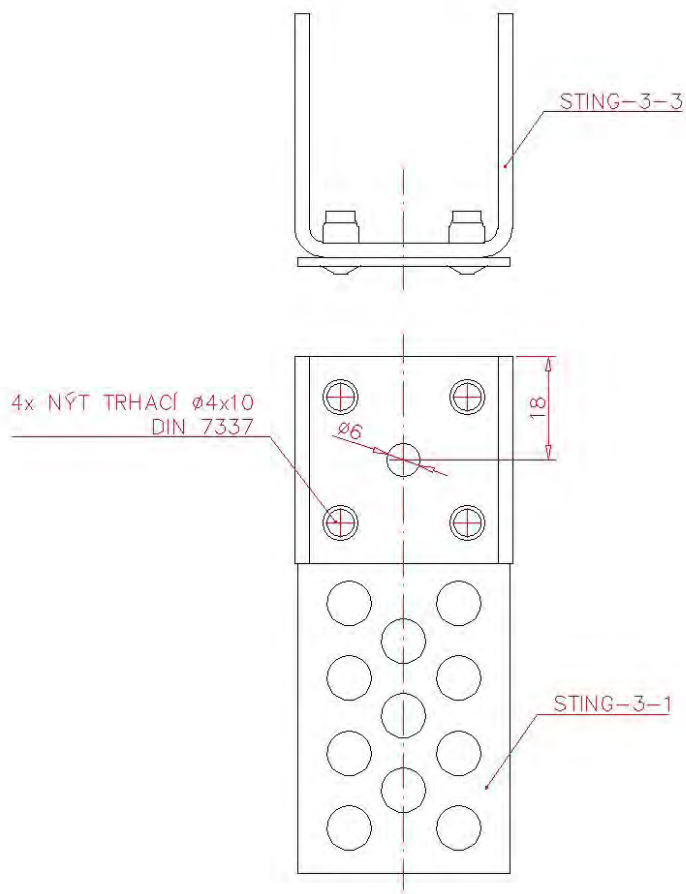

MATERIÁL		INDEX	ZMĚNA
POLOTOVAR		DATUM	PODPIS
TOLEROVÁNI ISO 8015	ANO		
PŘESNOST ISO 2768	m K		
PROMÍTÁNÍ	POČ.KUS. 4	HMOTNOST kg	MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA TL96-3-Z	KUSOVNÍK TL-96-K-3
KONTROL. T.Svoboda	DATUM 24.7.1999	STARÝ V.	

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CZECH REPUBLIC
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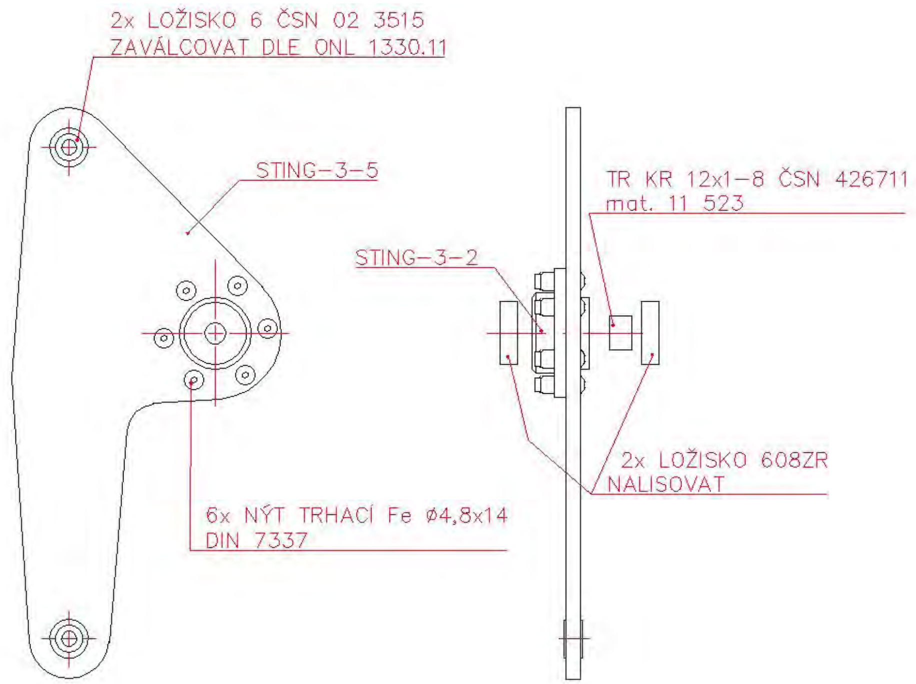
NÁZEV
U-táhla v kř.- sest.

ČÍSLO VÝKRESU
TL-96-3-P3

LISTŮ 1 LIST 1

.



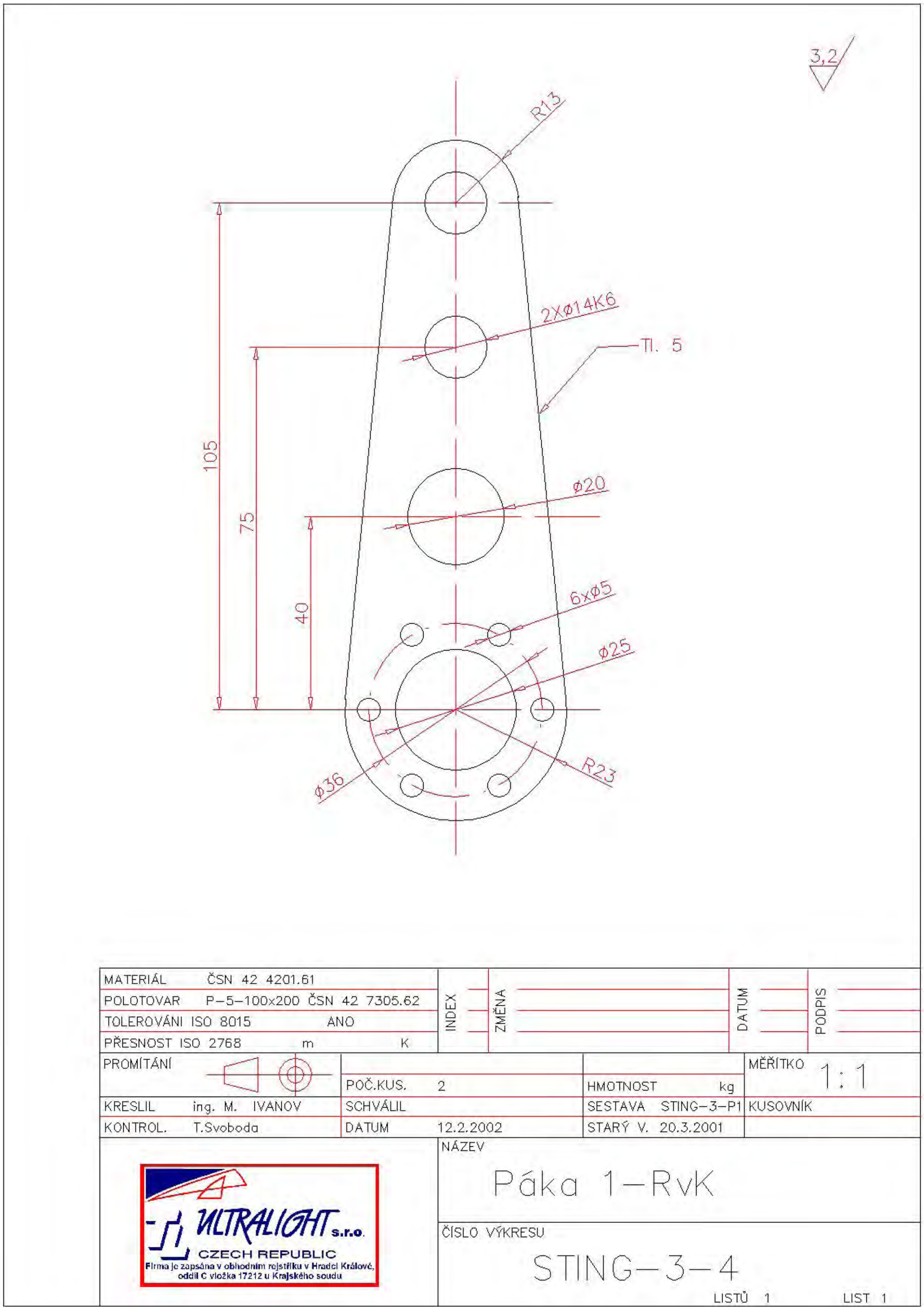
MATERIÁL		INDEX	ZMĚNA / DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNÍ ISO 8015	ANO		
PŘESNOST ISO 2768	m K		
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–3–Z	KUSOVNÍK STING–K–3
KONTROL. T.Svoboda	DATUM 21,3.2001	STARÝ V.	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

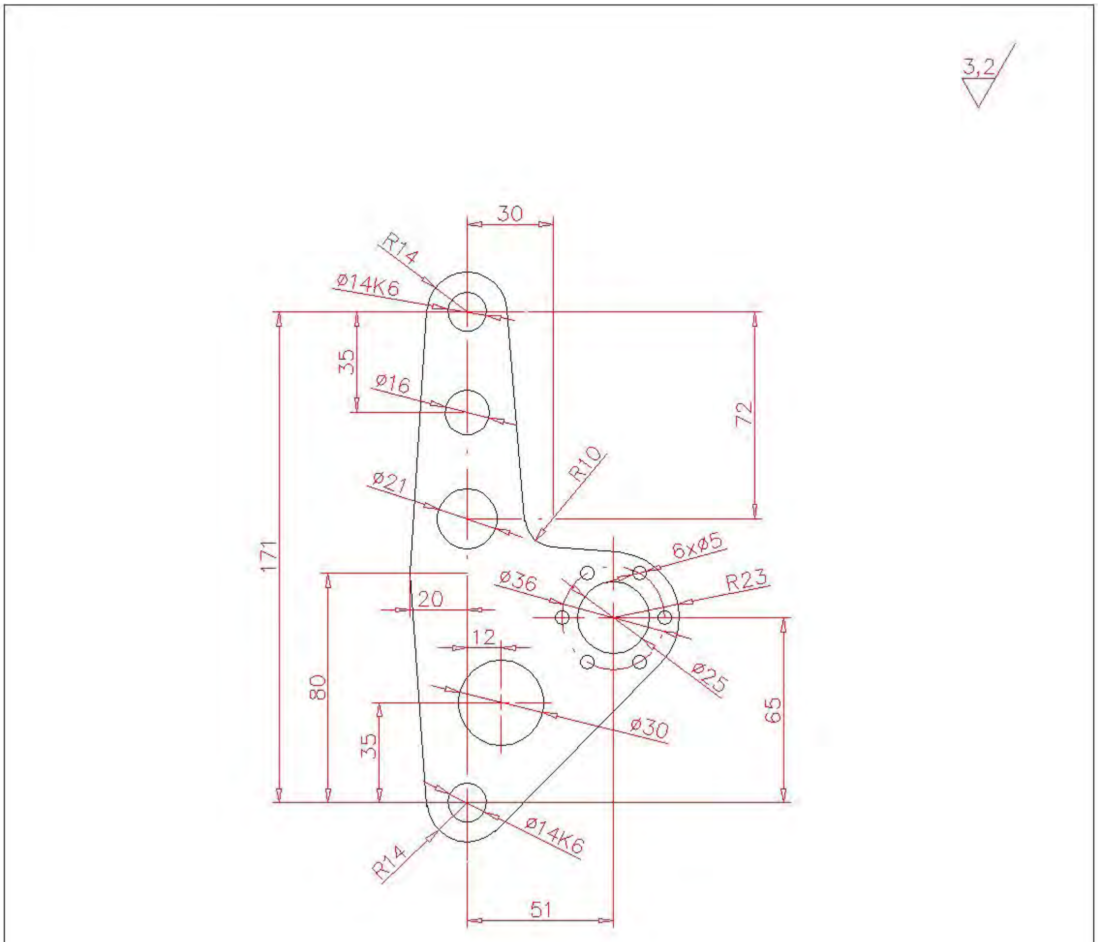
NÁZEV
Páka č2. sestava

ČÍSLO VÝKRESU
STING–3–P2

LISTŮ 1 LIST 1


3,2
R13
2XØ14K6
Tl. 5
105
75
40
Ø20
6xØ5
Ø25
R23
Ø36
MATERIÁL ČSN 42 4201.61
POLOTOVAR P–5–100x200 ČSN 42 7305.62
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–3–P1
KUSOVNÍK
KONTROL. T.Svoboda
DATUM 12.2.2002
STARÝ V. 20.3.2001
NÁZEV
Páka 1–RvK
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–3–4
LISTŮ 1
LIST 1

.



MATERIÁL ČSN 42 4201,61	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR P–5–100x200 ČSN 427305.62			
TOLEROVÁNÍ ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–3–P2	KUSOVNÍK
KONTROL. T.Svoboda	DATUM 30.3.2001	STARÝ V.	

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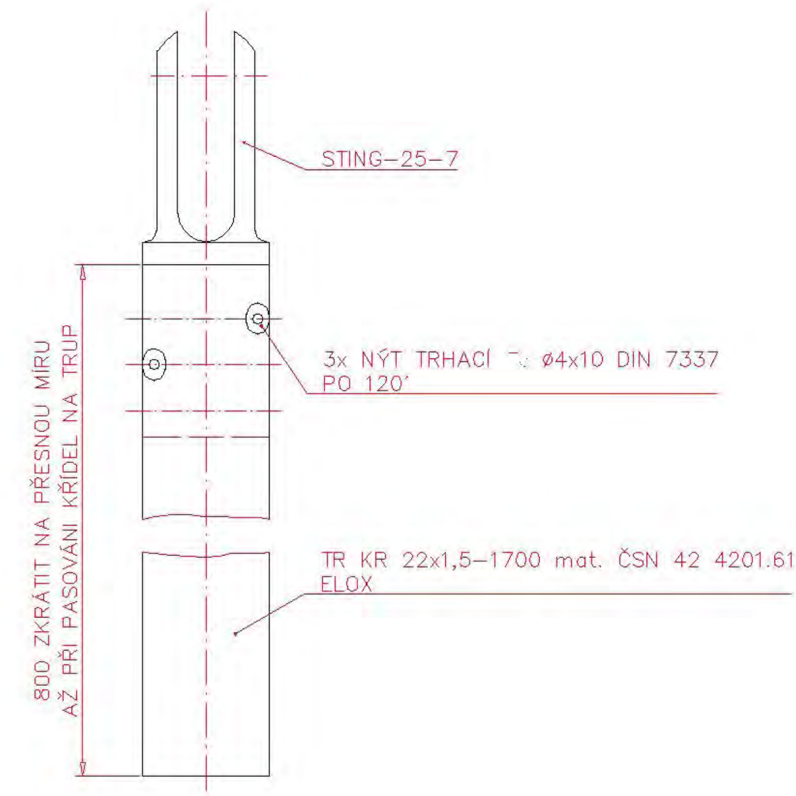
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Páka 2–RvK

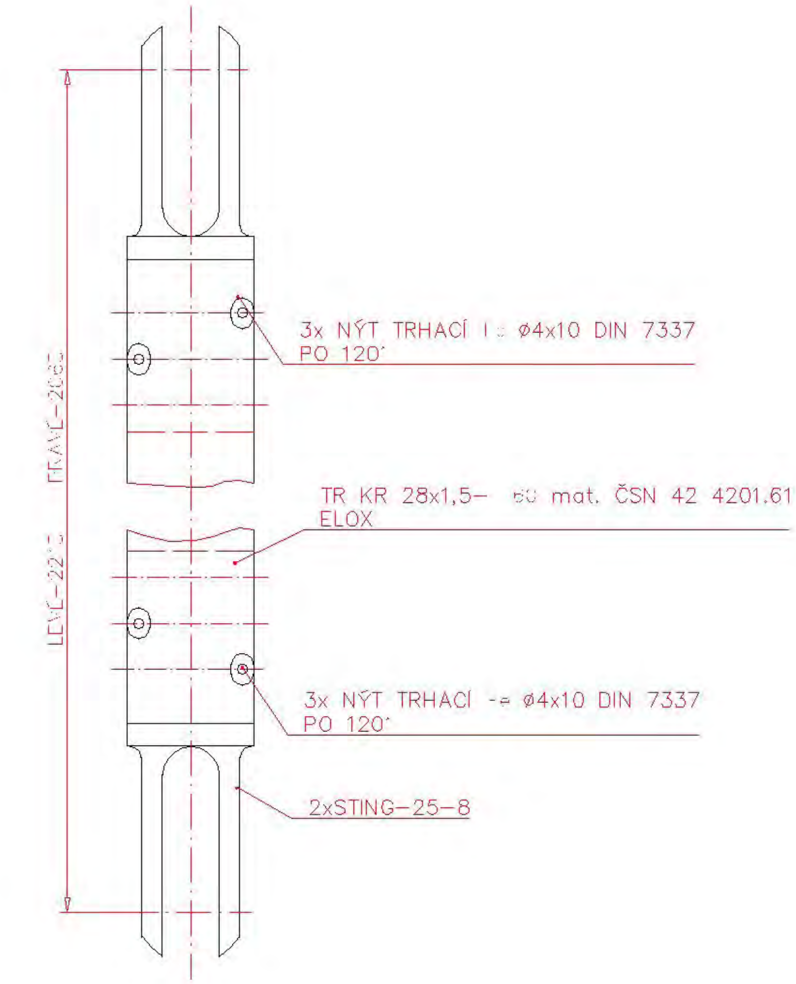
ČÍSLO VÝKRESU
STING–3–5

LISTŮ 1 LIST 1



MATERIÁL		INDEX	ZMĚNA
POLOTOVAR		DATUM	PODPIS
TOLEROVÁNÍ ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–3–Z	KUSOVNÍK STING–K–3
KONTROL. T.Svoboda	DATUM 30.3.2001	STARÝ V.	
ULTRALIGHT s.r.o. CZECH REPUBLIC Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu	NÁZEV Táhlo v křídle č.1		
	ČÍSLO VÝKRESU STING–3–6	LISTŮ 1	LIST 1

.



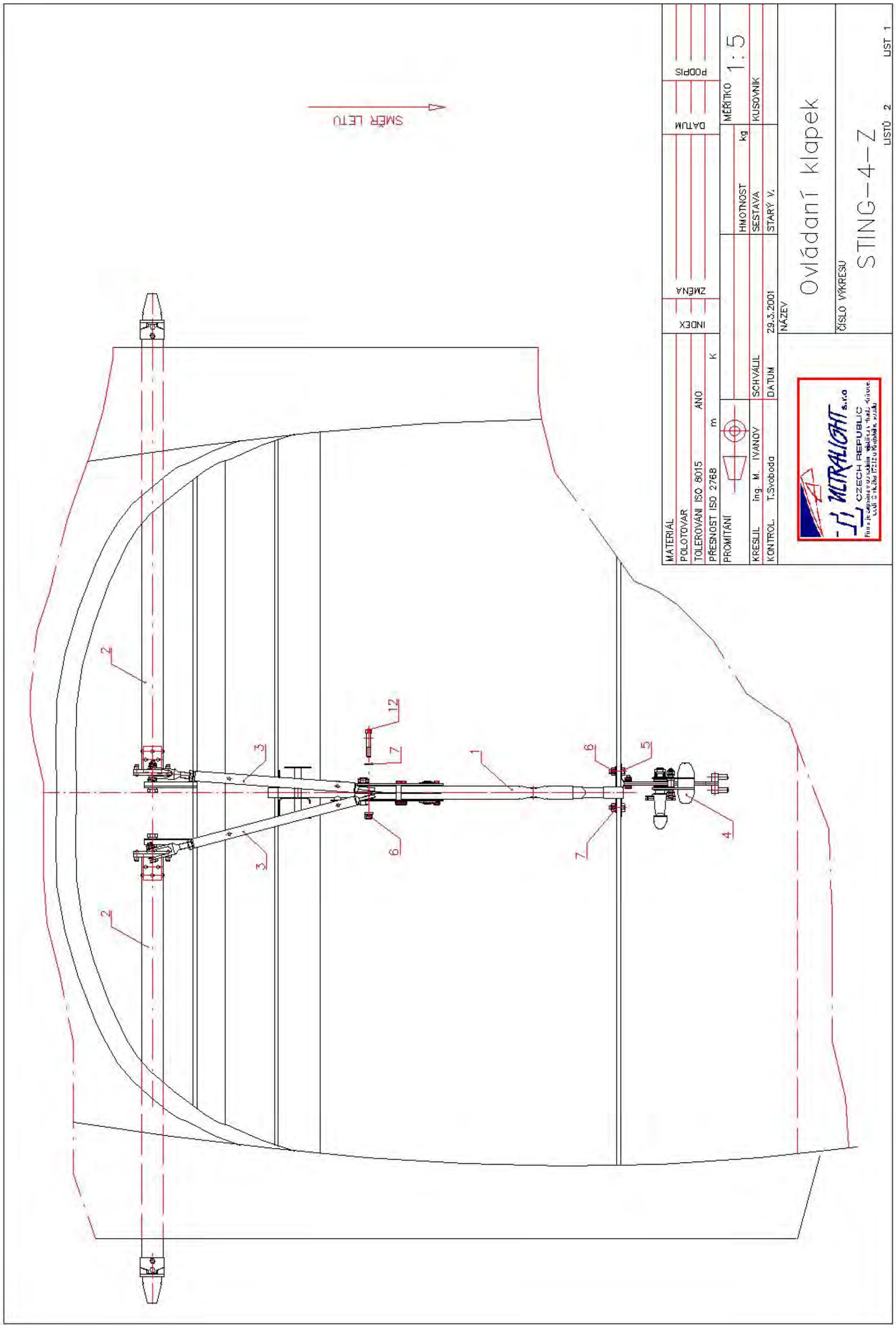
MATERIÁL	INDEX	ZMĚNA	DATUM	PODPIS
POLOTOVAR				
TOLEROVÁNÍ ISO 8015 ANO				
PŘESNOST ISO 2768 m K				
PROMÍTÁNÍ	POČ.KUS. 1+1	HMOTNOST kg	MĚŘÍTKO 1:1	
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–3–Z	KUSOVNÍK STING–K–3	
KONTROL. T.Svoboda	DATUM 12.2.2002	STARÝ V. 30.3.2001		

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Táhlo v křídle č.2

ČÍSLO VÝKRESU
STING–3–7

LISTŮ 1 LIST 1



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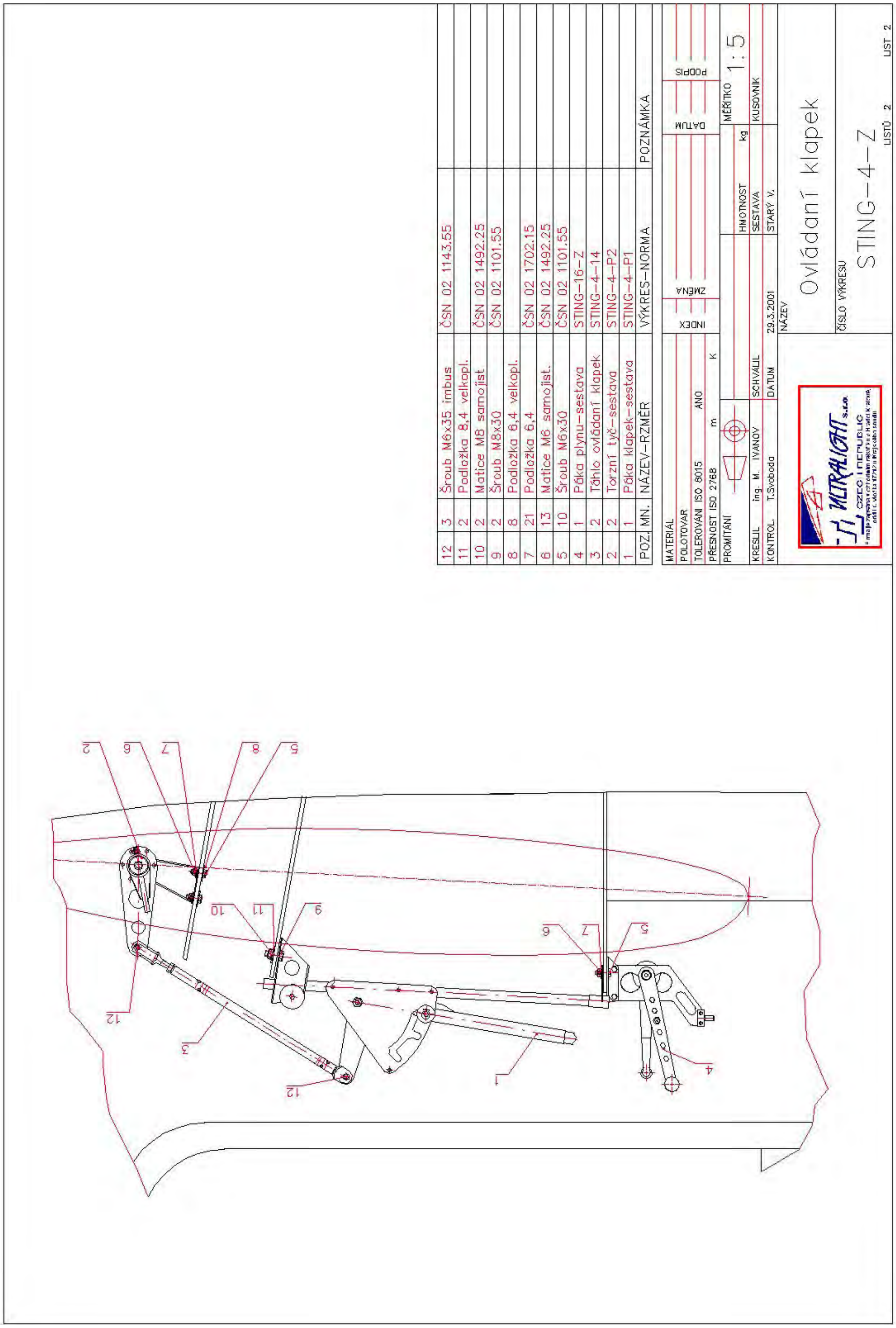
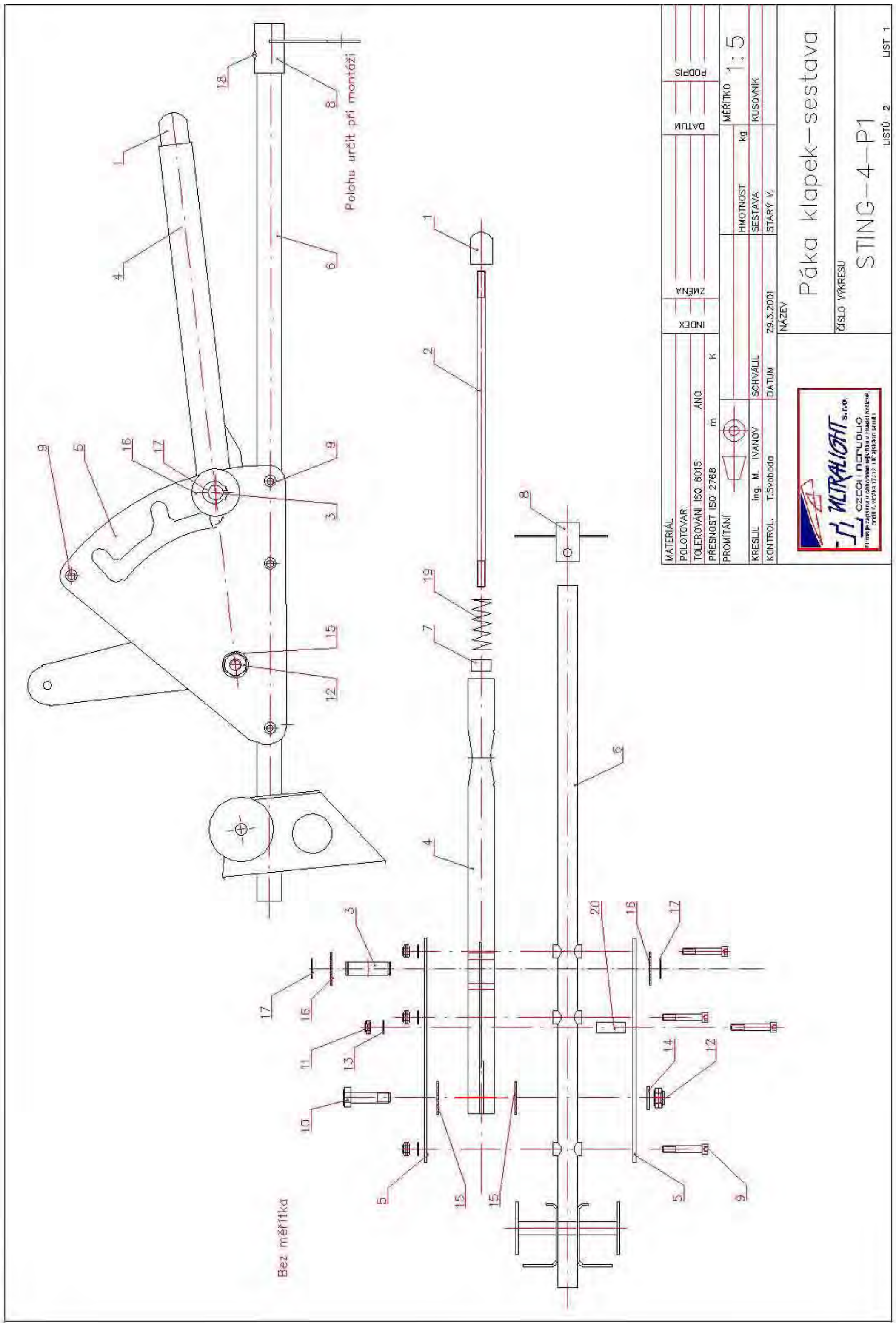
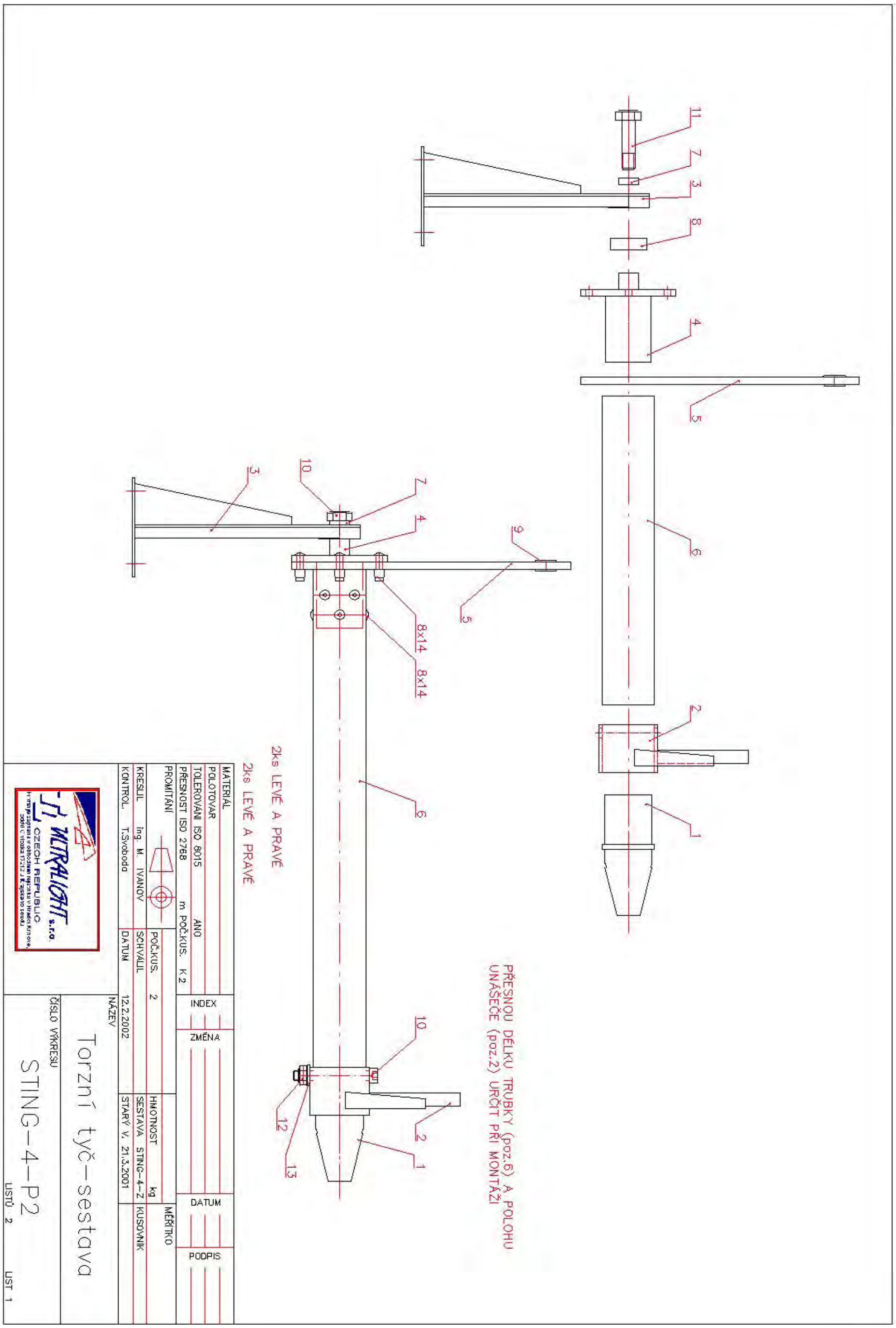

12 3 Šroub M6x35 imbus ČSN 02 1143.55
11 2 Podložka 8,4 velkopl.
10 2 Matice M8 samojist ČSN 02 1492.25
9 2 Šroub M8x30 ČSN 02 1101.55
8 8 Podložka 6,4 velkopl.
7 21 Podložka 6,4 ČSN 02 1702.15
6 13 Matice M6 samojist. ČSN 02 1492.25
5 10 Šroub M6x30 ČSN 02 1101.55
4 1 Páka plynu-sestava STING-16-Z
3 2 Táhlo ovládaní klapek STING-4-14
2 2 Torzní tyč-sestava STING-4-P2
1 1 Páka klapek-sestava STING-4-P1
POZ. MN. NÁZEV-RZMĚR VÝKRES-NORMA POZNÁMKA
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
PROMÍTÁNÍ
INDEX ZMĚNA DATUM PODPIS
MĚŘÍTKO 1 : 5
HMOTNOST kg
SESTAVA KUSOVNÍK
STARÝ V.
KRESLIL ing. M. IVANOV
SCHVÁLIL
KONTROL. T.Svoboda
DATUM 29.3.2001
NÁZEV
Ovládaní klapek
ČÍSLO VÝKRESU
STING-4-Z
LISTŮ 2
LIST 2
TL ULTRALIGHT s.r.o.
CZECH REPUBLIC
12
2
9
7
8
5
10
11
6
9
7
5
12
3
12
1
4


Polohu určit při montáži
Bez měřítka
1 : 5
Páka klapek−sestava
STING−4−P1

.


2ks LEVÉ A PRAVÉ
PŘESNOU DÉLKU TRUBKY (poz.6) A POLOHU UNÁŠEČE (poz.2) URČIT PŘI MONTÁŽI
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015
PŘESNOST ISO 2768 m
PROMÍTÁNÍ
KRESLIL Ing. M. IVANOV
KONTROL. T.Svoboda
SCHVÁLIL
DATUM 12.2.2002
POČ.KUS. 2
HMOTNOST kg
SESTAVA STING-4-Z
STARÝ V. 21.3.2001
MĚŘÍTKO
KUSOVNÍK
INDEX
ZMĚNA
DATUM
PODPIS
NÁZEV
Torzní tyč-sestava
ČÍSLO VÝKRESU
STING-4-P2
LISTŮ 2
LIST 1
TL ULTRALIGHT s.r.o
CZECH REPUBLIC

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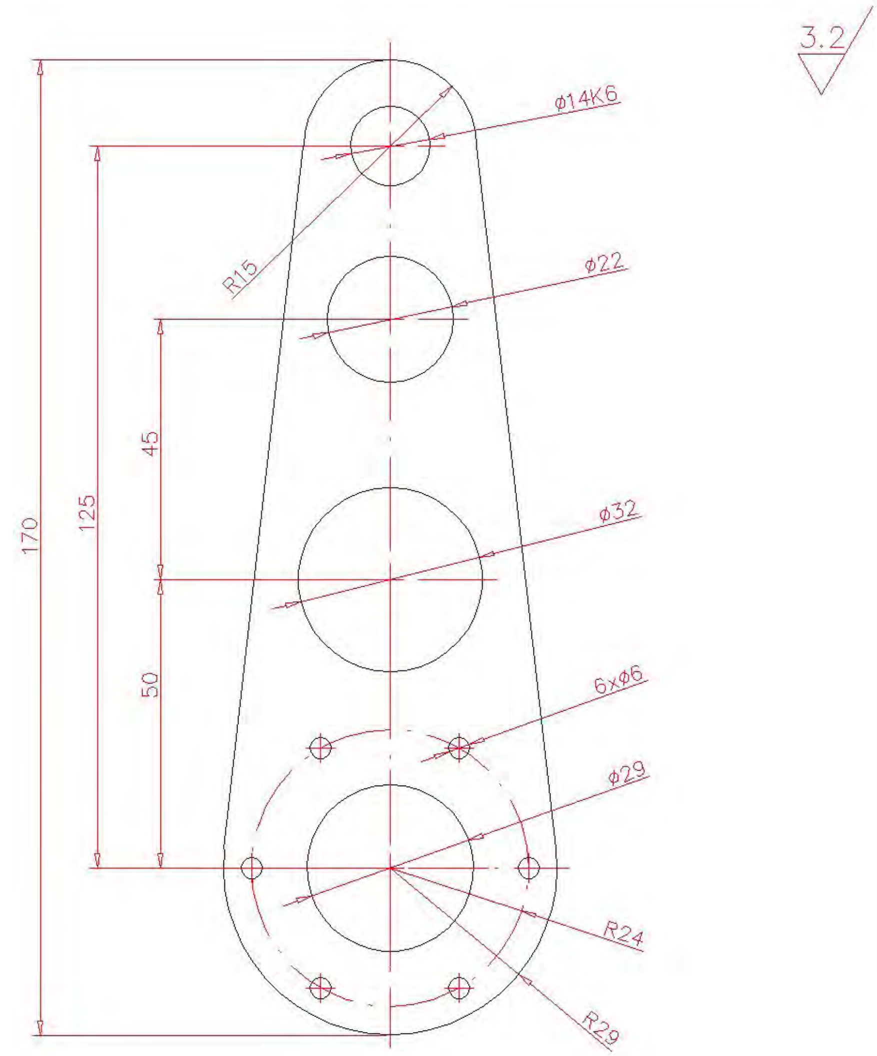

ELOX

MATERIÁL ČSN 42 4201.61	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR P 5–58x170 ČSN 42 7305.02			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–4–P2	KUSOVNÍK STING–K–4
KONTROL. T.Svoboda	DATUM 13.2.2002	STARÝ V. 12.3.2001	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Páka vztl. klapek

ČÍSLO VÝKRESU
STING–4–8

LISTŮ 1 LIST 1

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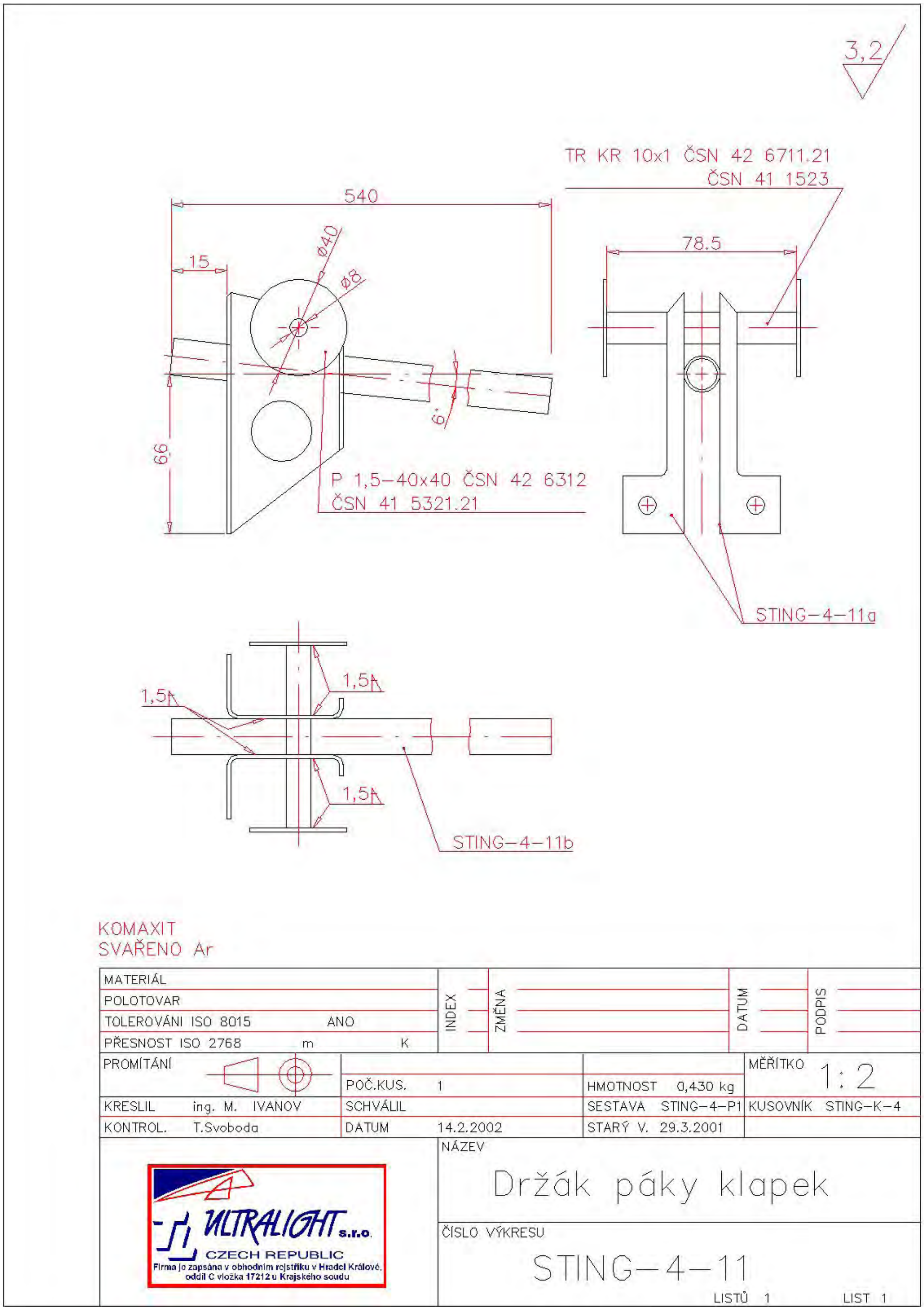
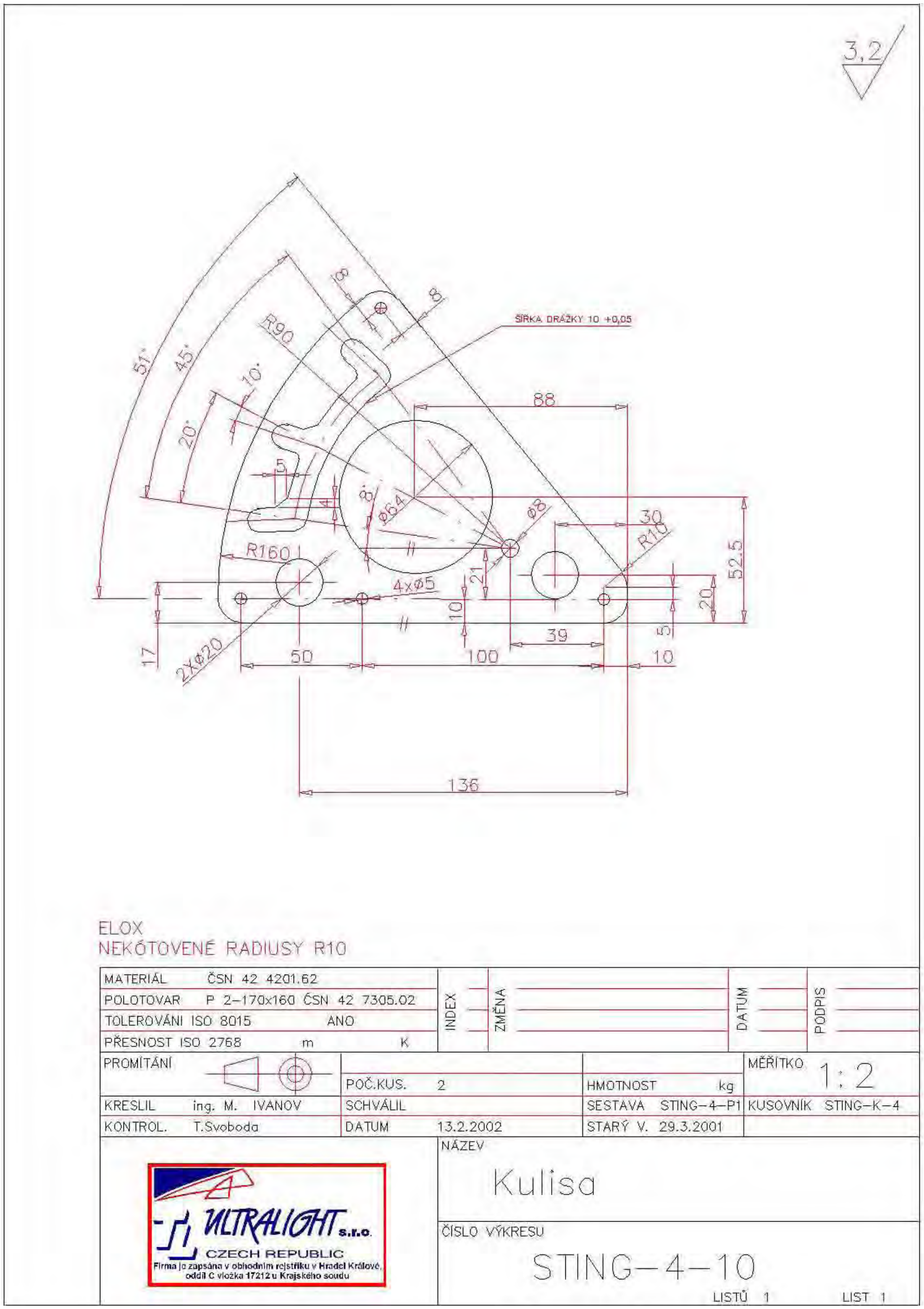
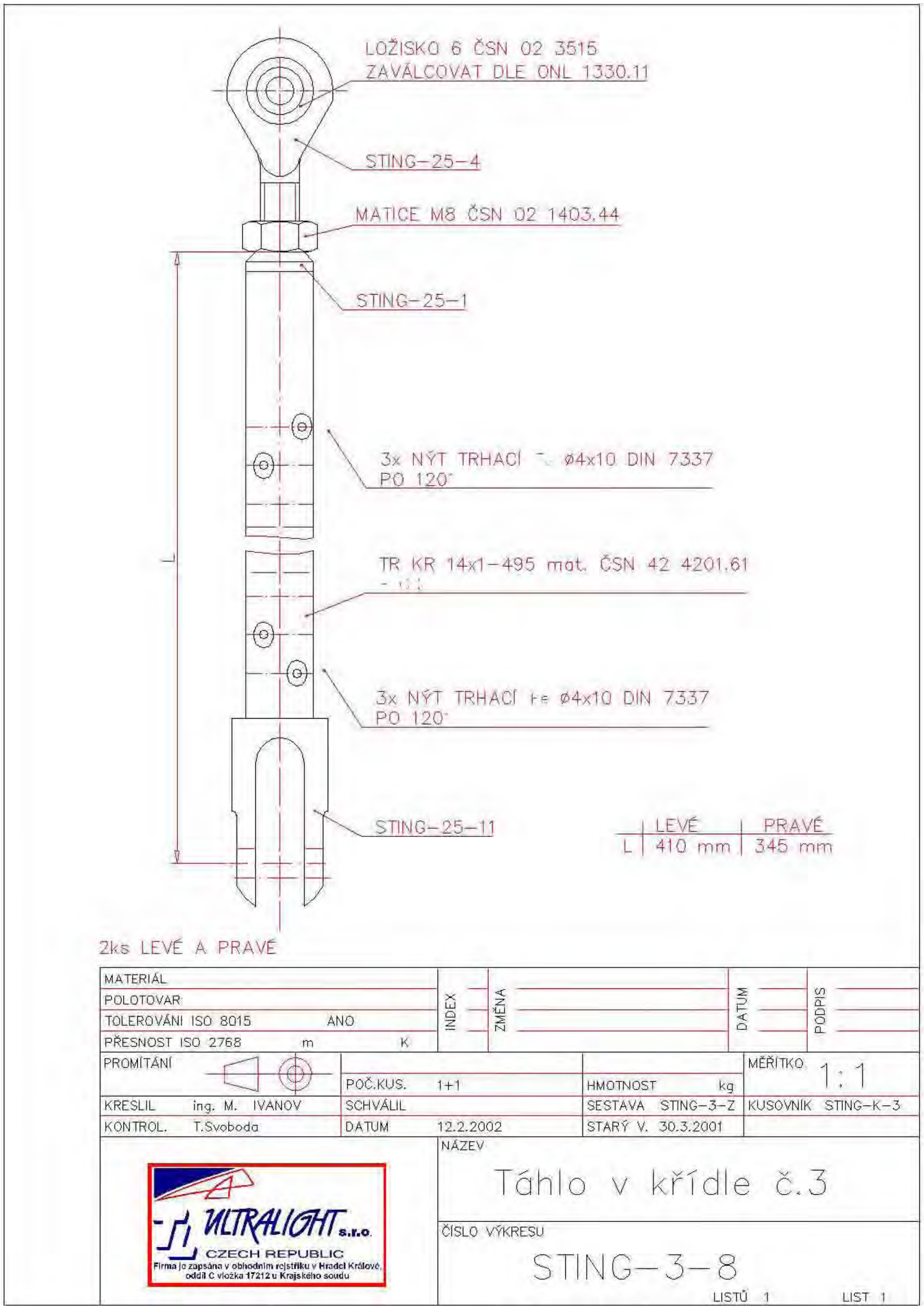
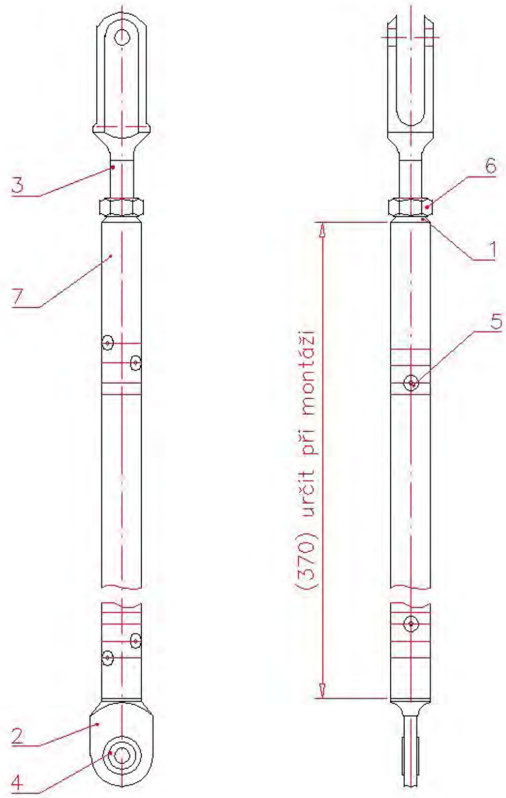

3,2
TR KR 10x1 ČSN 42 6711.21
ČSN 41 1523
540
15
Ø40
Ø8
78.5
6°
66
P 1,5−40x40 ČSN 42 6312
ČSN 41 5321.21
STING−4−11a
1,5
1,5
1,5
1,5
STING−4−11b
KOMAXIT
SVAŘENO Ar
MATERIÁL
POLOTOVAR
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST 0,430 kg
MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING−4−P1
KUSOVNÍK STING−K−4
KONTROL. T.Svoboda
DATUM 14.2.2002
STARÝ V. 29.3.2001
NÁZEV
Držák páky klapek
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING−4−11
LISTŮ 1
LIST 1

.


3,2
ŠÍRKA DRÁŽKY 10 +0,05
51°
45°
10°
20°
R90
R160
88
Ø64
Ø8
30
R10
52,5
4xØ5
2XØ20
21
10
20
39
5
17
50
100
10
136
ELOX
NEKÓTOVENÉ RADIUSY R10
MATERIÁL ČSN 42 4201.62
POLOTOVAR P 2–170x160 ČSN 42 7305.02
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–4–P1
KUSOVNÍK STING–K–4
KONTROL. T.Svoboda
DATUM 13.2.2002
STARÝ V. 29.3.2001
NÁZEV
Kulisa
ULTRALIGHT s.r.o.
CZECH REPUBLIC
ČÍSLO VÝKRESU
STING–4–10
LISTŮ 1
LIST 1


LOŽISKO 6 ČSN 02 3515
ZAVÁLCOVAT DLE ONL 1330.11
STING-25-4
MATICE M8 ČSN 02 1403.44
STING-25-1
3x NÝT TRHACÍ ø4x10 DIN 7337
PO 120°
TR KR 14x1-495 mat. ČSN 42 4201.61
3x NÝT TRHACÍ ø4x10 DIN 7337
PO 120°
STING-25-11
L
LEVÉ 410 mm
PRAVÉ 345 mm
2ks LEVÉ A PRAVÉ
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1+1
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING-3-Z
KUSOVNÍK STING-K-3
KONTROL. T.Svoboda
DATUM 12.2.2002
STARÝ V. 30.3.2001
NÁZEV
Táhlo v křídle č.3
ČÍSLO VÝKRESU
STING-3-8
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC



POZ.	MN.	NÁZEV–RZMĚR	VÝKRES–NORMA	POZNÁMKA
7	1	TR KR 14x1–370	ČSN 42 7710.22	mat.ČSN 42 4201.61
6	1	Matice M8	ČSN 02 1401.25	
5	6	Nýt Fe ø4x8	DIN 7337	
4	1	Ložisko 6	ČSN 02 3515	zaválcovat ONL 1330.11
3	1	Vidlička stavitelná M8	STING–25–6	
2	1	Oko pevně 14/1	STING–25–5	
1	1	Závit. vložka 14/1	STING–25–1	

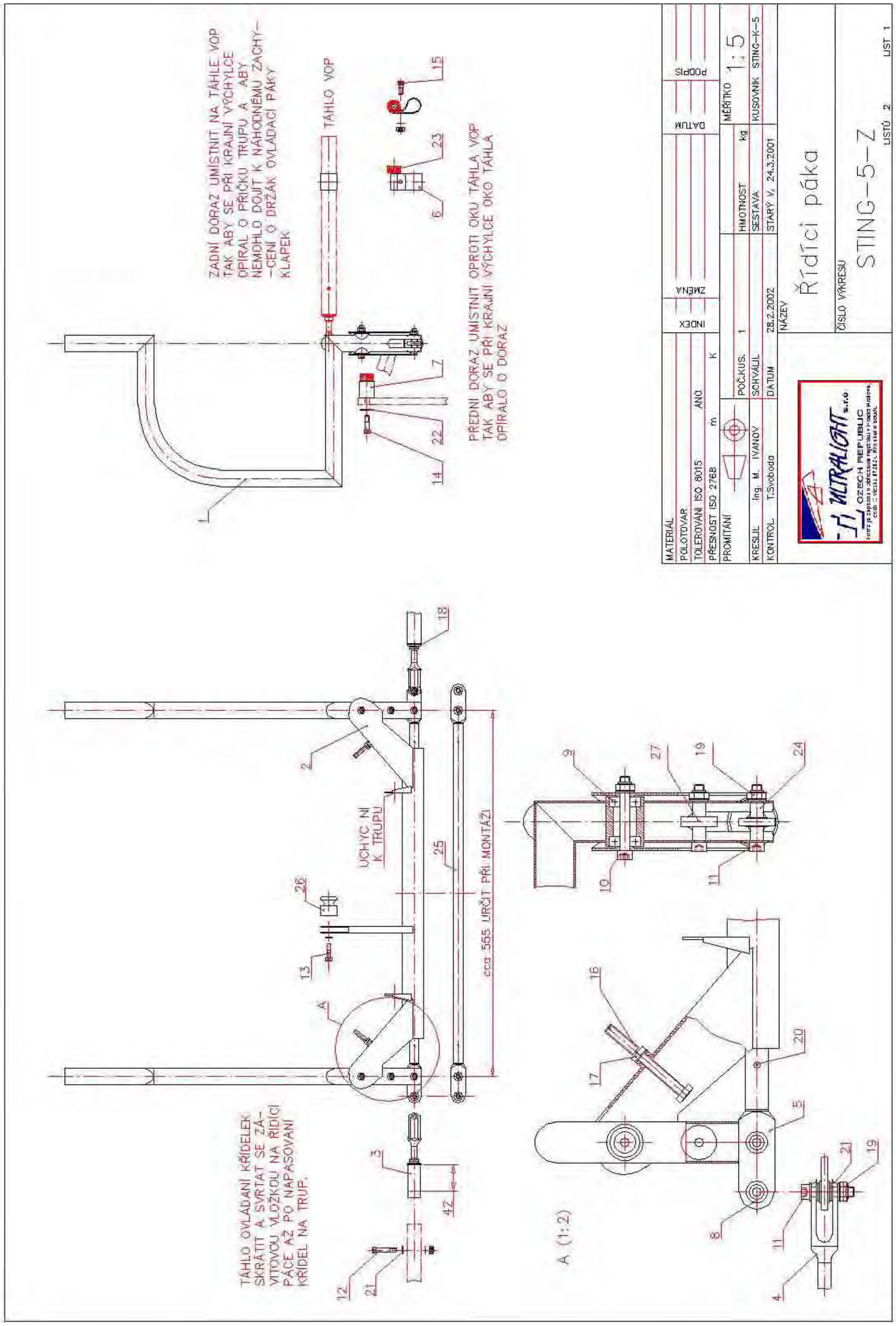
MATERIÁL	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–4–Z	KUSOVNÍK STING–K–4
KONTROL. T.Svoboda	DATUM 29.3.2001	STARÝ V.	

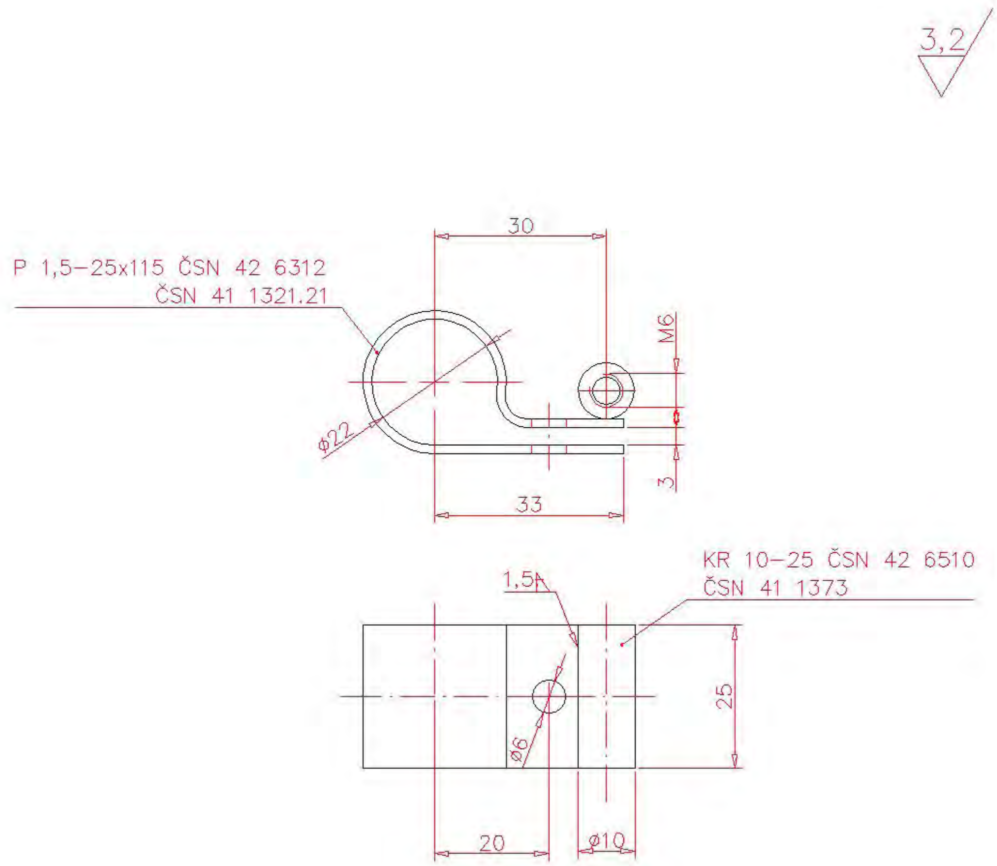
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Táhlo ovládaní klapek

ČISLO VÝKRESU
STING–4–14

LISTŮ 1 LIST 1


ZADNÍ DORAZ UMÍSTNIT NA TÁHLE VOP TAK ABY SE PŘI KRAJNÍ VÝCHYLCE OPÍRAL O PŘÍČKU TRUPU A ABY NEMOHLO DOJÍT K NÁHODNÉMU ZACHY-CENÍ O DRŽÁK OVLÁDACÍ PÁKY KLAPEK
TÁHLO VOP
PŘEDNÍ DORAZ UMÍSTNIT OPROTI OKU TÁHLA VOP TAK ABY SE PŘI KRAJNÍ VÝCHYLCE OKO TÁHLA OPÍRALO O DORAZ
UCHYC NI K TRUPU
cca 555 URČIT PŘI MONTÁŽI
TÁHLO OVLÁDÁNÍ KŘIDÉLEK SKRÁTIT A SVRTAT SE ZÁ-VITOVOU VLOŽKOU NA ŘÍDÍCÍ PÁCE AŽ PO NAPASOVÁNÍ KŘIDEL NA TRUP.
A (1:2)
Řídící páka
STING-5-Z



ZINEK
SVAŘENO Ar

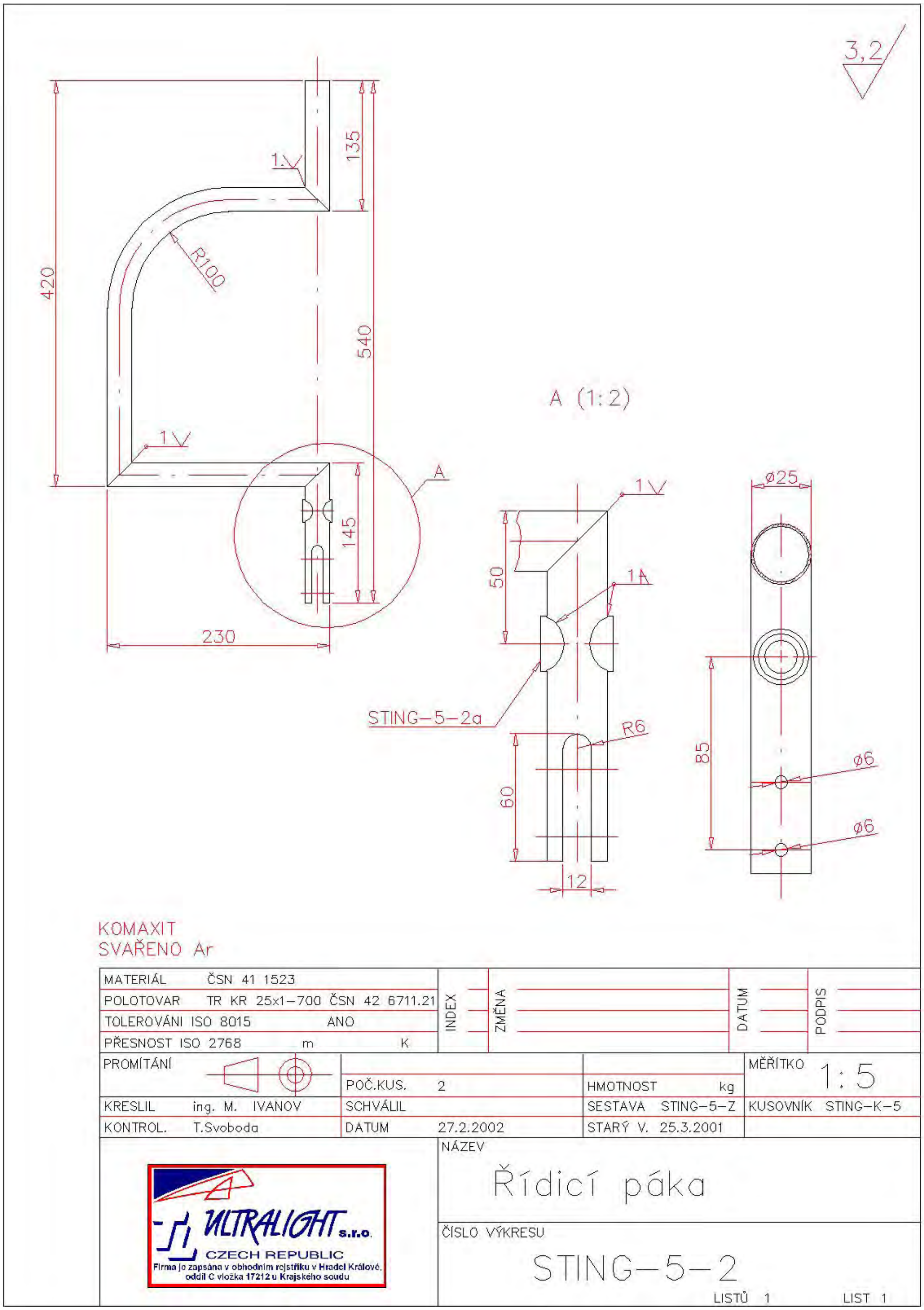
MATERIÁL	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST 0,036 kg	MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–5–Z	KUSOVNÍK STING–K–5
KONTROL. T.Svoboda	DATUM 25.3.2001	STARÝ V.	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

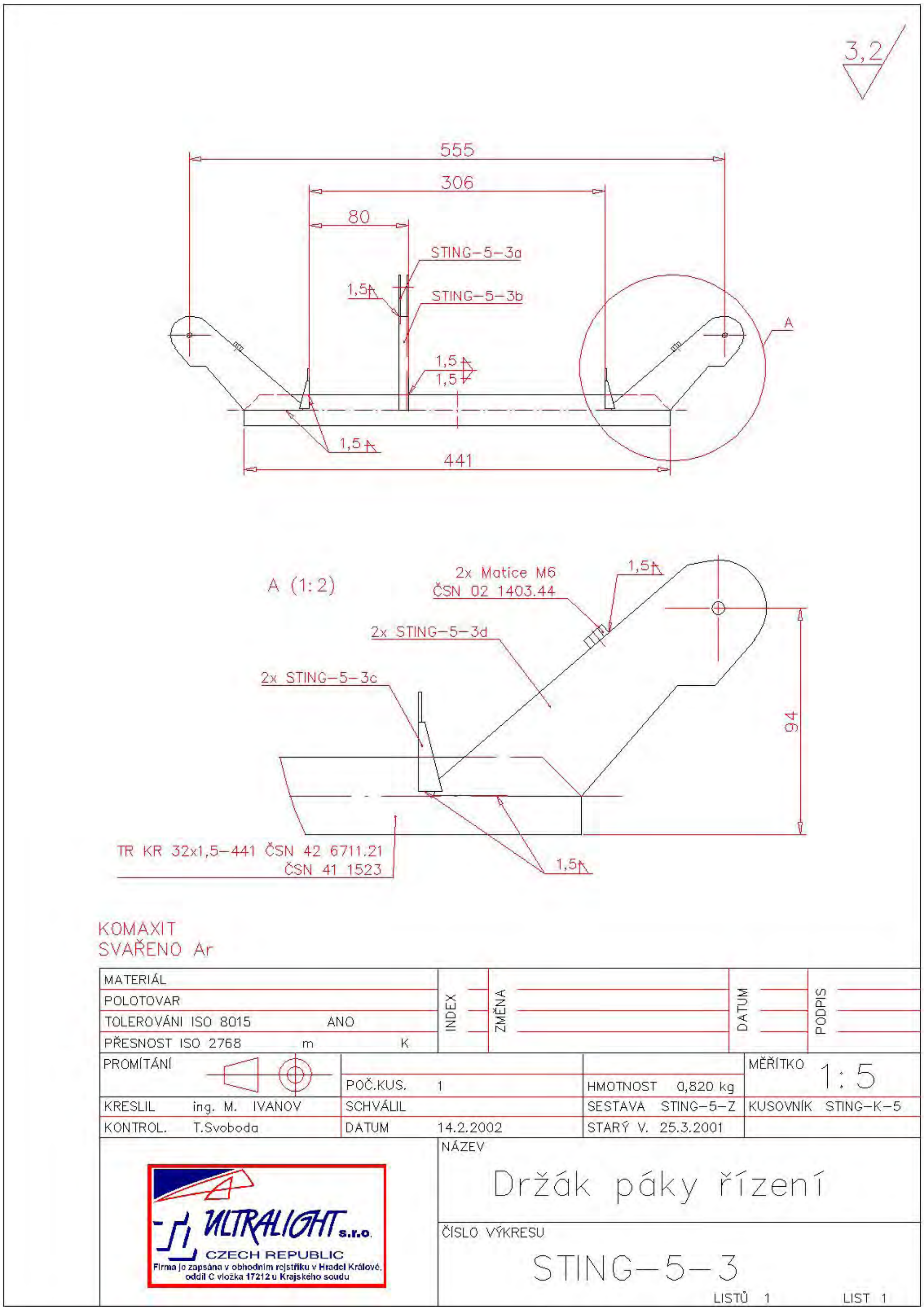
NÁZEV
Doraz zadní

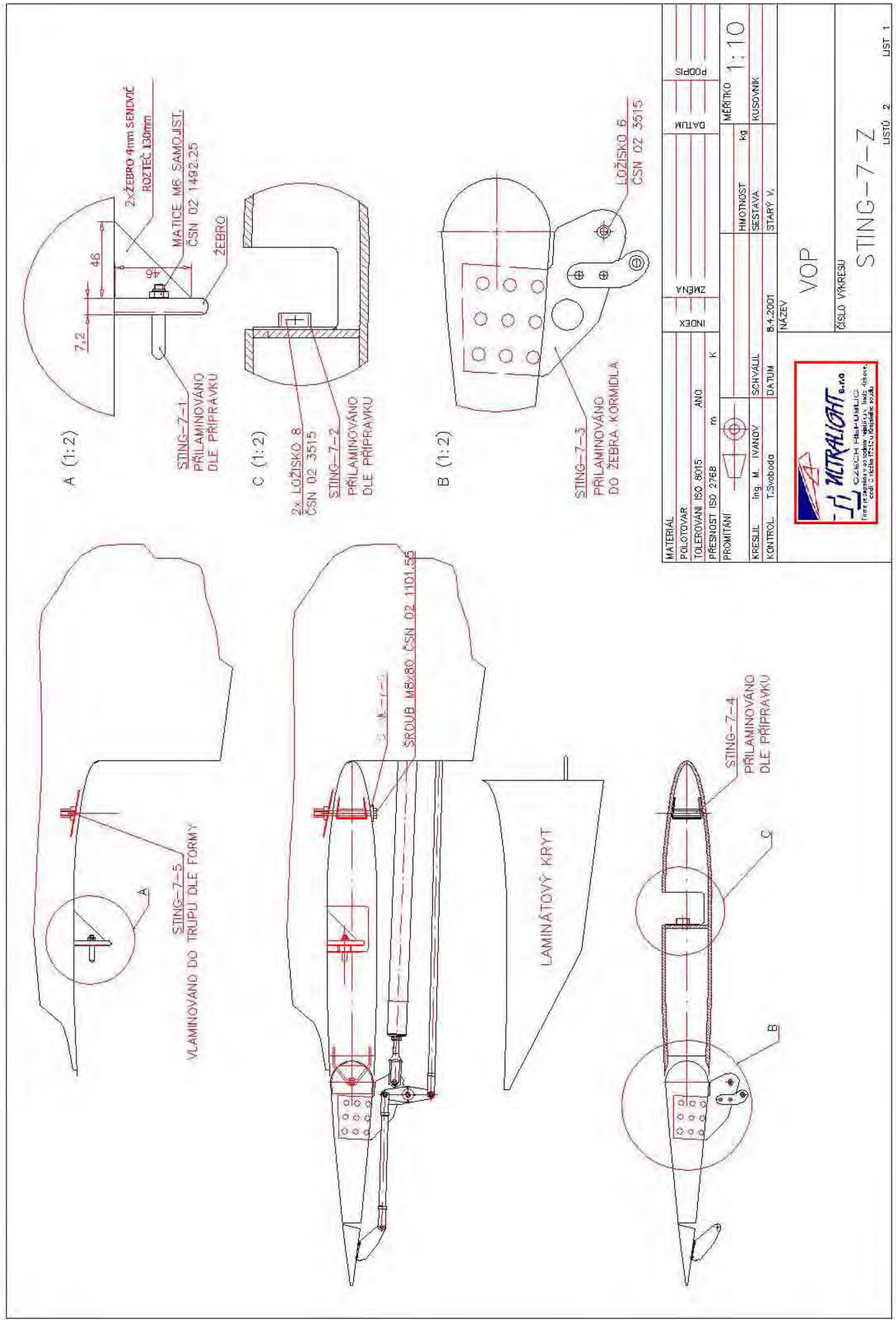
ČÍSLO VÝKRESU
STING–5–1

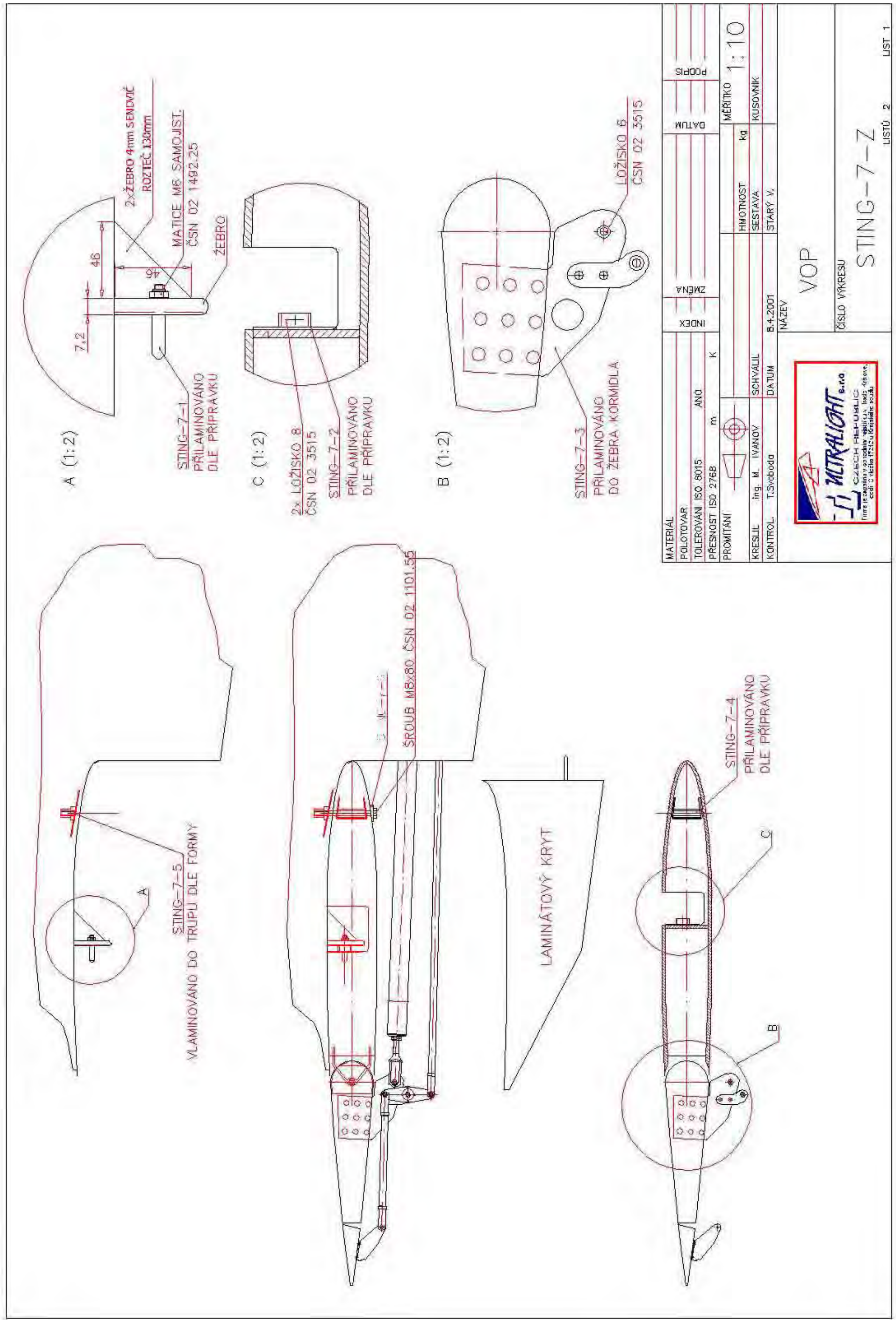
LISTŮ 1 LIST 1

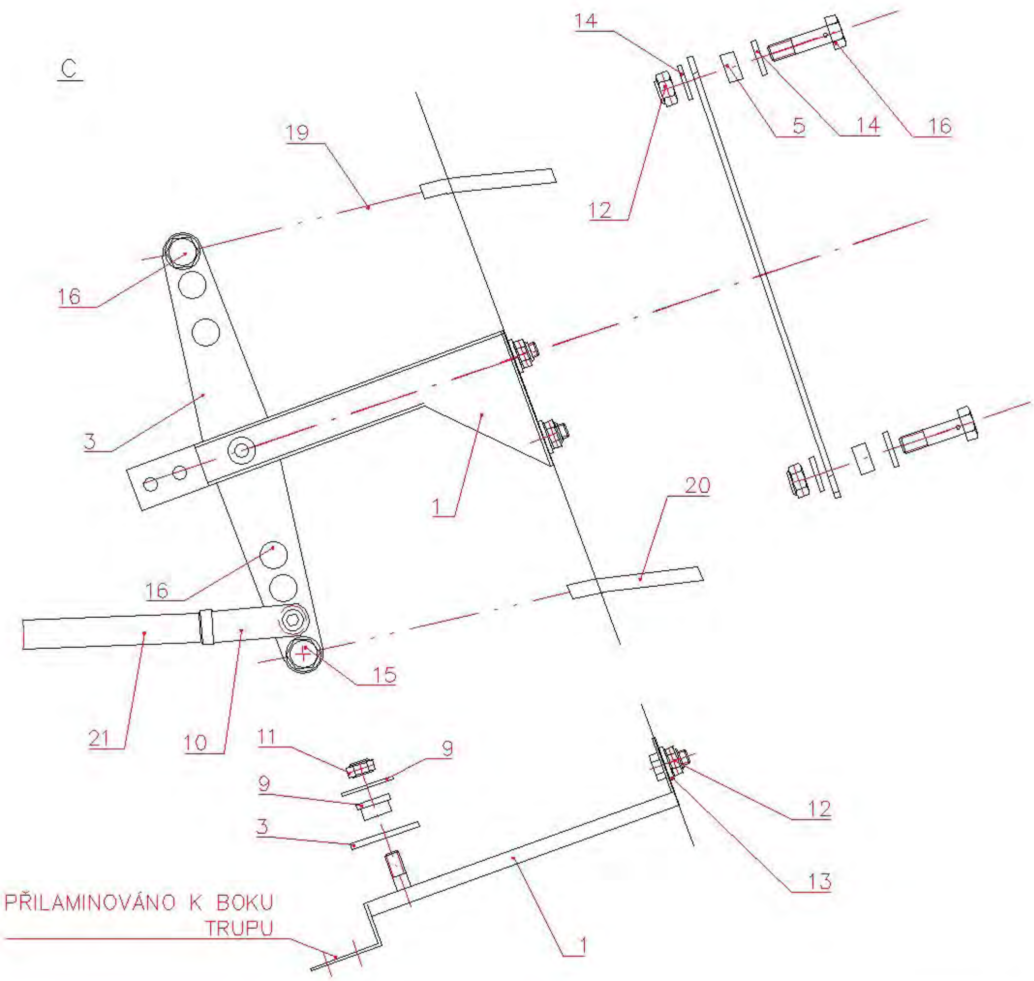

3,2
1
135
420
R100
540
1
A
145
230
A (1:2)
1
ø25
50
1
STING–5–2a
R6
85
ø6
ø6
60
12
KOMAXIT
SVAŘENO Ar
MATERIÁL ČSN 41 1523
POLOTOVAR TR KR 25x1–700 ČSN 42 6711.21
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1:5
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–5–Z
KUSOVNÍK STING–K–5
KONTROL. T.Svoboda
DATUM 27.2.2002
STARÝ V. 25.3.2001
NÁZEV
Řídicí páka
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–5–2
LISTŮ 1
LIST 1

•


3,2
555
306
80
STING–5–3a
STING–5–3b
1,5
1,5
1,5
1,5
A
441
A (1:2)
2x Matice M6
ČSN 02 1403.44
1,5
2x STING–5–3d
2x STING–5–3c
94
TR KR 32x1,5–441 ČSN 42 6711.21
ČSN 41 1523
1,5
KOMAXIT
SVAŘENO Ar
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST 0,820 kg
MĚŘÍTKO 1:5
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–5–Z
KUSOVNÍK STING–K–5
KONTROL. T.Svoboda
DATUM 14.2.2002
STARÝ V. 25.3.2001
NÁZEV
Držák páky řízení
ULTRALIGHT s.r.o.
CZECH REPUBLIC
ČÍSLO VÝKRESU
STING–5–3
LISTŮ 1
LIST 1


A (1:2)
C (1:2)
B (1:2)
2×ŽEBRO 4mm SENDVIČ
ROZTEČ 130mm
MATICE M6 SAMOJIST.
ČSN 02 1492.25
ŽEBRO
STING-7-1
PŘILAMINOVÁNO
DLE PŘÍPRAVKU
2× LOŽISKO 8
ČSN 02 3515
STING-7-2
PŘILAMINOVÁNO
DLE PŘÍPRAVKU
LOŽISKO 6
ČSN 02 3515
STING-7-3
PŘILAMINOVÁNO
DO ŽEBRA KORMIDLA
STING-7-5
VLAMINOVÁNO DO TRUPU DLE FORMY
ŠROUB M8x80 ČSN 02 1101.55
LAMINÁTOVÝ KRYT
STING-7-4
PŘILAMINOVÁNO
DLE PŘÍPRAVKU
VOP
STING-7-Z
1:10
ČÍSLO VÝKRESU
NÁZEV
MĚŘÍTKO
LIST 1
LISTŮ 2
TL ULTRALIGHT s.r.o.
CZECH REPUBLIC


A (1:2)
C (1:2)
B (1:2)
STING-7-1
PŘILAMINOVÁNO DLE PŘÍPRAVKU
STING-7-2
PŘILAMINOVÁNO DLE PŘÍPRAVKU
STING-7-3
PŘILAMINOVÁNO DO ŽEBRA KORMIDLA
STING-7-4
PŘILAMINOVÁNO DLE PŘÍPRAVKU
STING-7-5
VLAMINOVÁNO DO TRUPU DLE FORMY
2× LOŽISKO 8
ČSN 02 3515
LOŽISKO 6
ČSN 02 3515
MATICE M6 SAMOJIST.
ČSN 02 1492.25
ŽEBRO
ŠROUB M6x80 ČSN 02 1101.55
LAMINÁTOVÝ KRYT
VOP
STING-7-Z
1:10



MATERIÁL	INDEX	ZMĚNA	DATUM
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			PODPIS

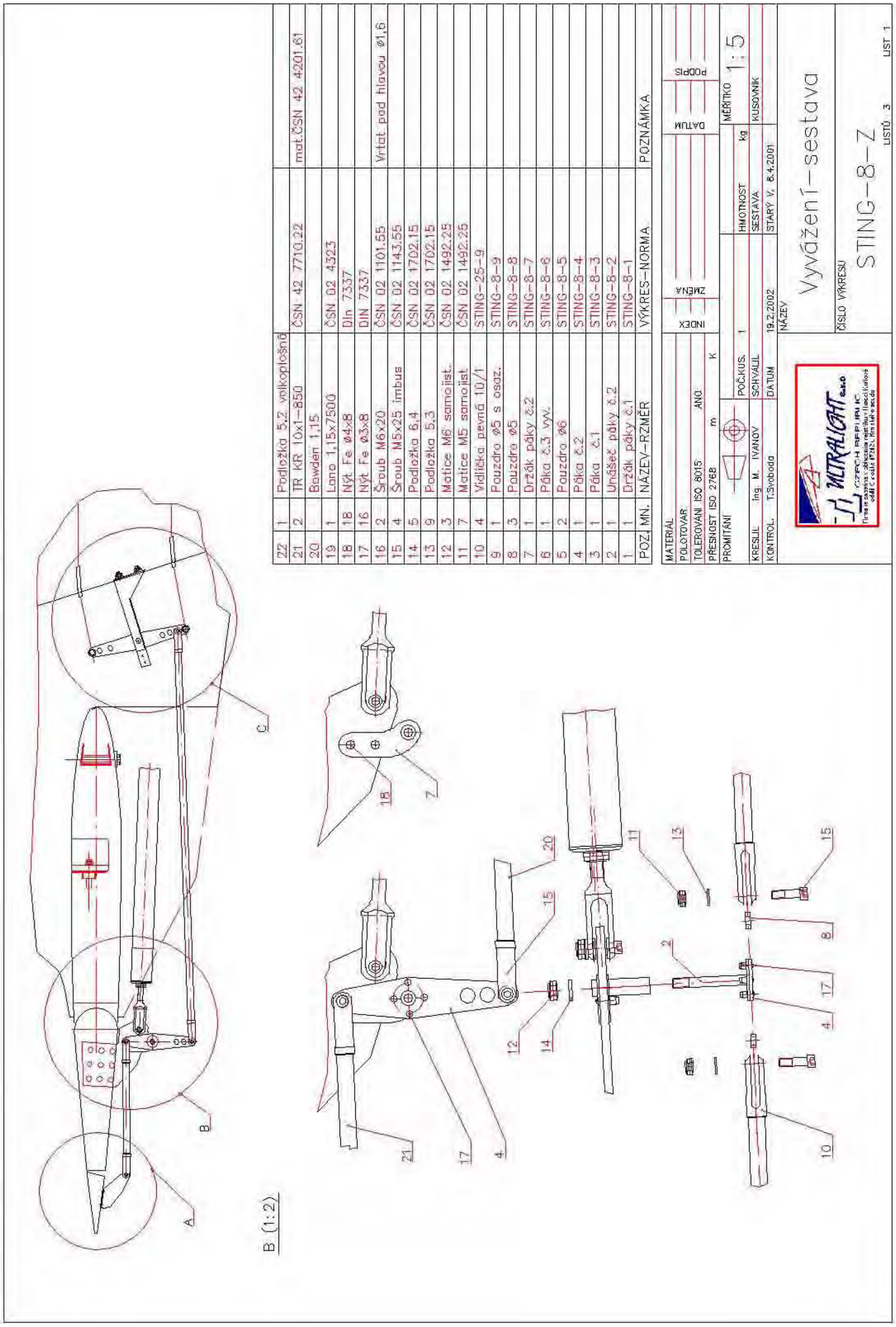
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA	KUSOVNÍK
KONTROL. T.Svoboda	DATUM 8.4.2001	STARÝ V.	

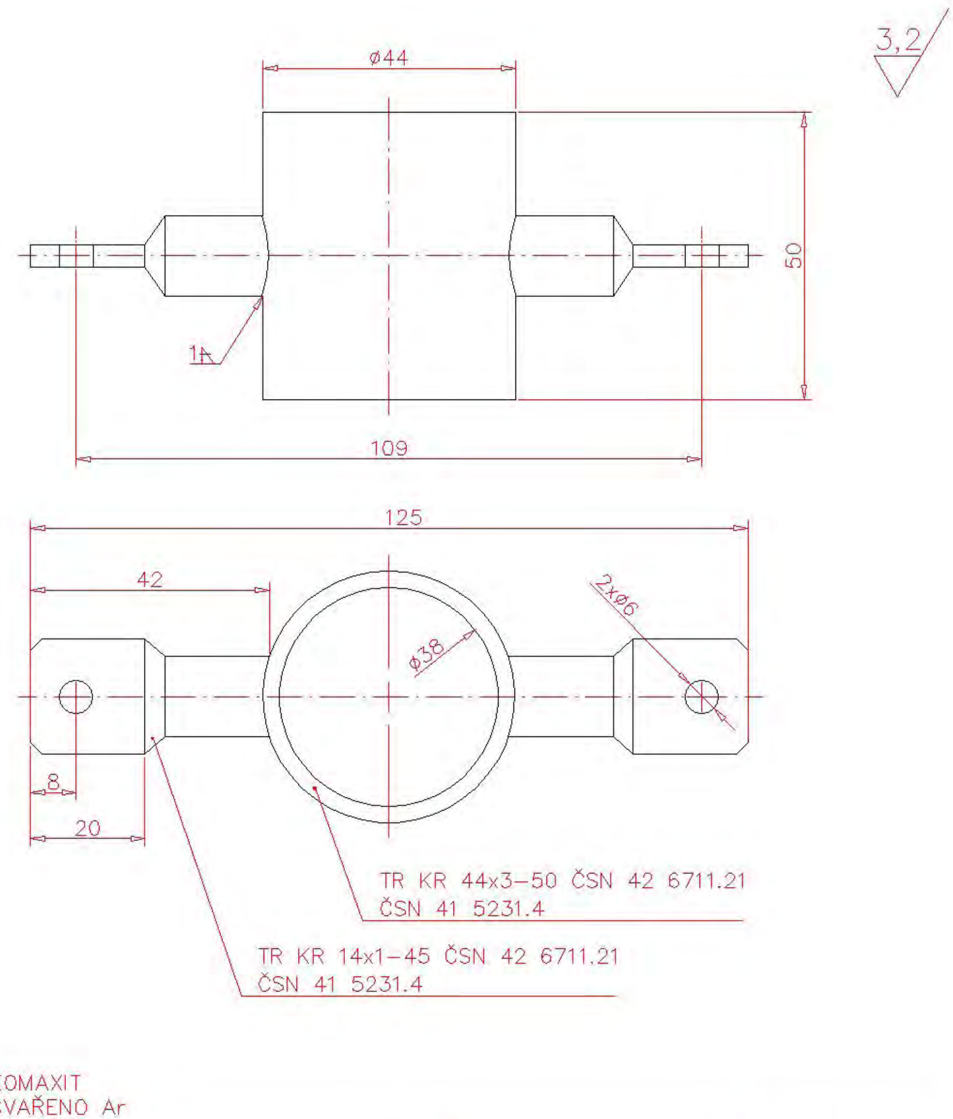
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Vyvážení–sestava

ČÍSLO VÝKRESU
STING–8–Z

LISTŮ 3 LIST 3


22 1 Podložka 5,2 velkoplošná
21 2 TR KR 10x1–850 ČSN 42 7710.22 mat.ČSN 42 4201.61
20 Bowden 1,15
19 1 Lano 1,15x7500 ČSN 02 4323
18 18 Nýt Fe ø4x8 DIn 7337
17 16 Nýt Fe ø3x8 DIN 7337
16 2 Šroub M6x20 ČSN 02 1101.55 Vrtat pod hlavou ø1,6
15 4 Šroub M5x25 imbus ČSN 02 1143.55
14 5 Podložka 6,4 ČSN 02 1702.15
13 9 Podložka 5,3 ČSN 02 1702.15
12 3 Matice M6 samojist. ČSN 02 1492.25
11 7 Matice M5 samojist. ČSN 02 1492.25
10 4 Vidlička pevná 10/1 STING–25–9
9 1 Pouzdro ø5 s osaz. STING–8–9
8 3 Pouzdro ø5 STING–8–8
7 1 Držák páky č.2 STING–8–7
6 1 Páka č.3 vyv. STING–8–6
5 2 Pouzdro ø6 STING–8–5
4 1 Páka č.2 STING–8–4
3 1 Páka č.1 STING–8–3
2 1 Unášeč páky č.2 STING–8–2
1 1 Držák páky č.1 STING–8–1
POZ. MN. NÁZEV–RZMĚR VÝKRES–NORMA POZNÁMKA
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015
PŘESNOST ISO 2768 m
ANO K
PROMÍTÁNÍ
INDEX ZMĚNA DATUM PODPIS
KRESLIL Ing. M. IVANOV
KONTROL. T.Svoboda
POČ.KUS. 1
SCHVÁLIL
DATUM 19.2.2002
HMOTNOST kg
SESTAVA
STARÝ V. 8.4.2001
MĚŘÍTKO 1:5
KUSOVNÍK
TL ULTRALIGHT s.r.o.
NÁZEV
Vyvážení–sestava
ČÍSLO VÝKRESU
STING–8–Z
LISTŮ 3
LIST 1
B (1:2)
A
B
C
1
2
4
7
8
10
11
12
13
14
15
17
18
20
21



MATERIÁL		INDEX / ZMĚNA	DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNÍ ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST kg	MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–11–Z	KUSOVNÍK TL–96–K–11
KONTROL. T.Svoboda	DATUM 27.3.2001	STARÝ V.	

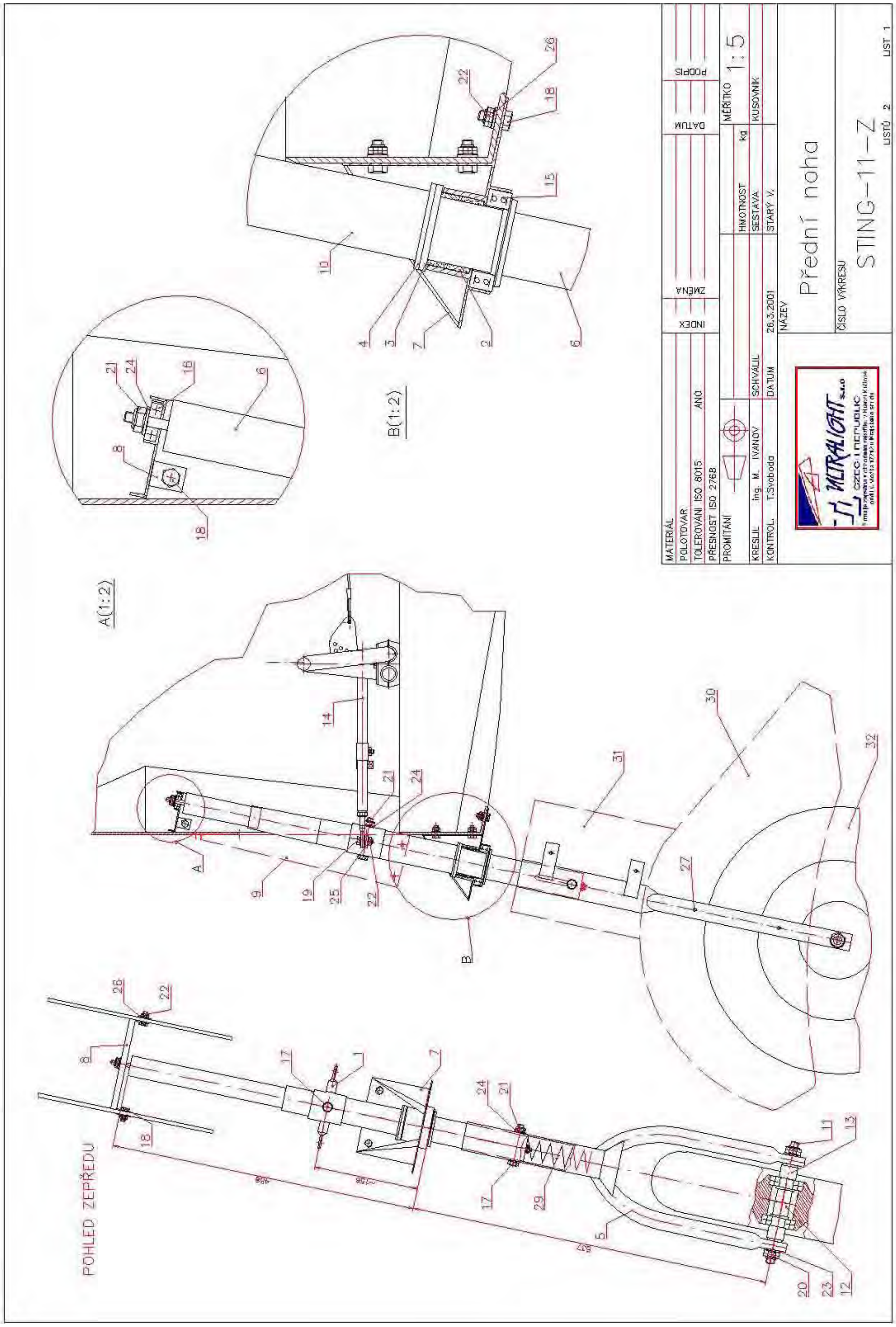
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku u Hradci Králové, oddíl C vložka 17212 u Krajského soudu

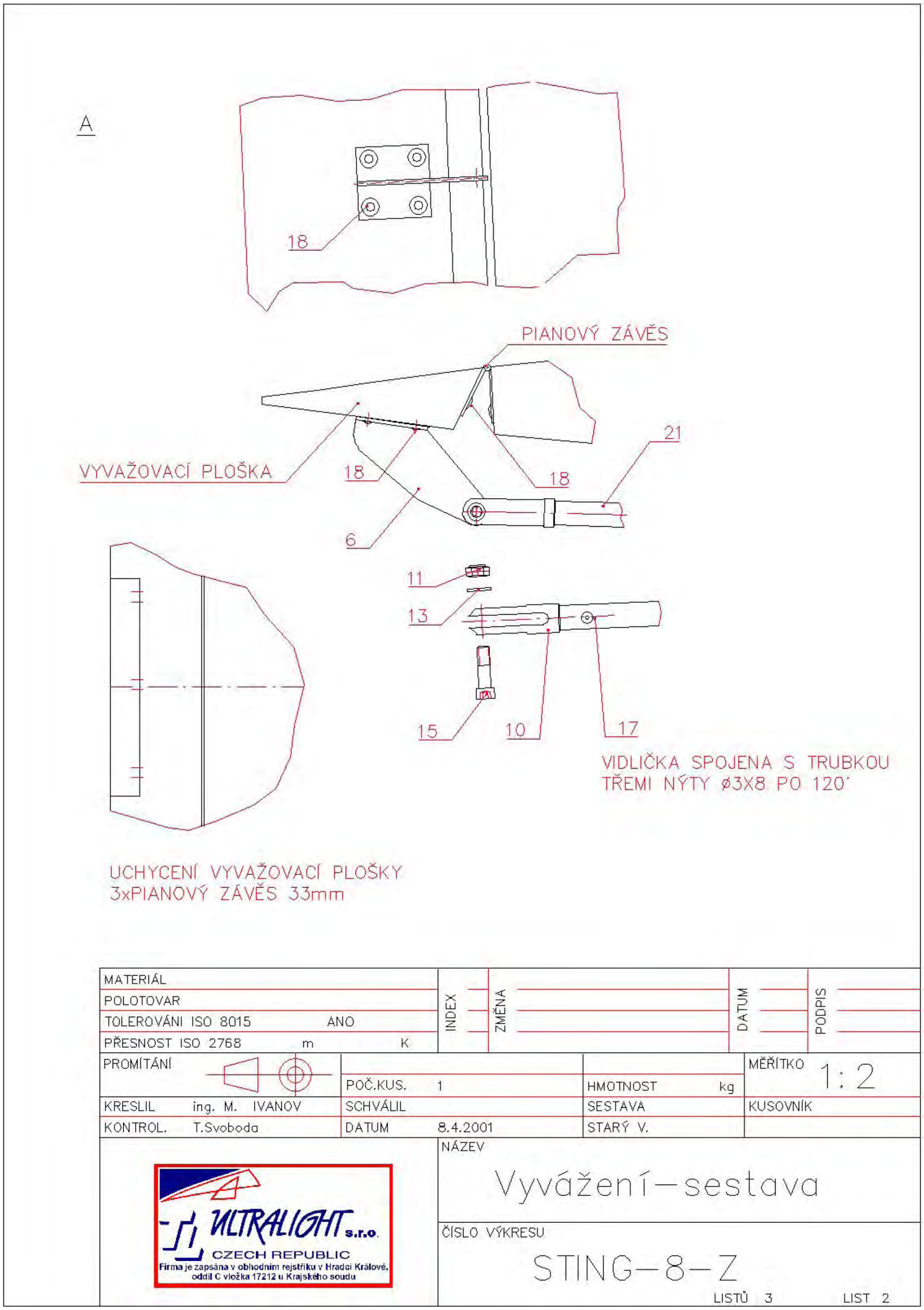
NÁZEV
Vahadlo přední nohy

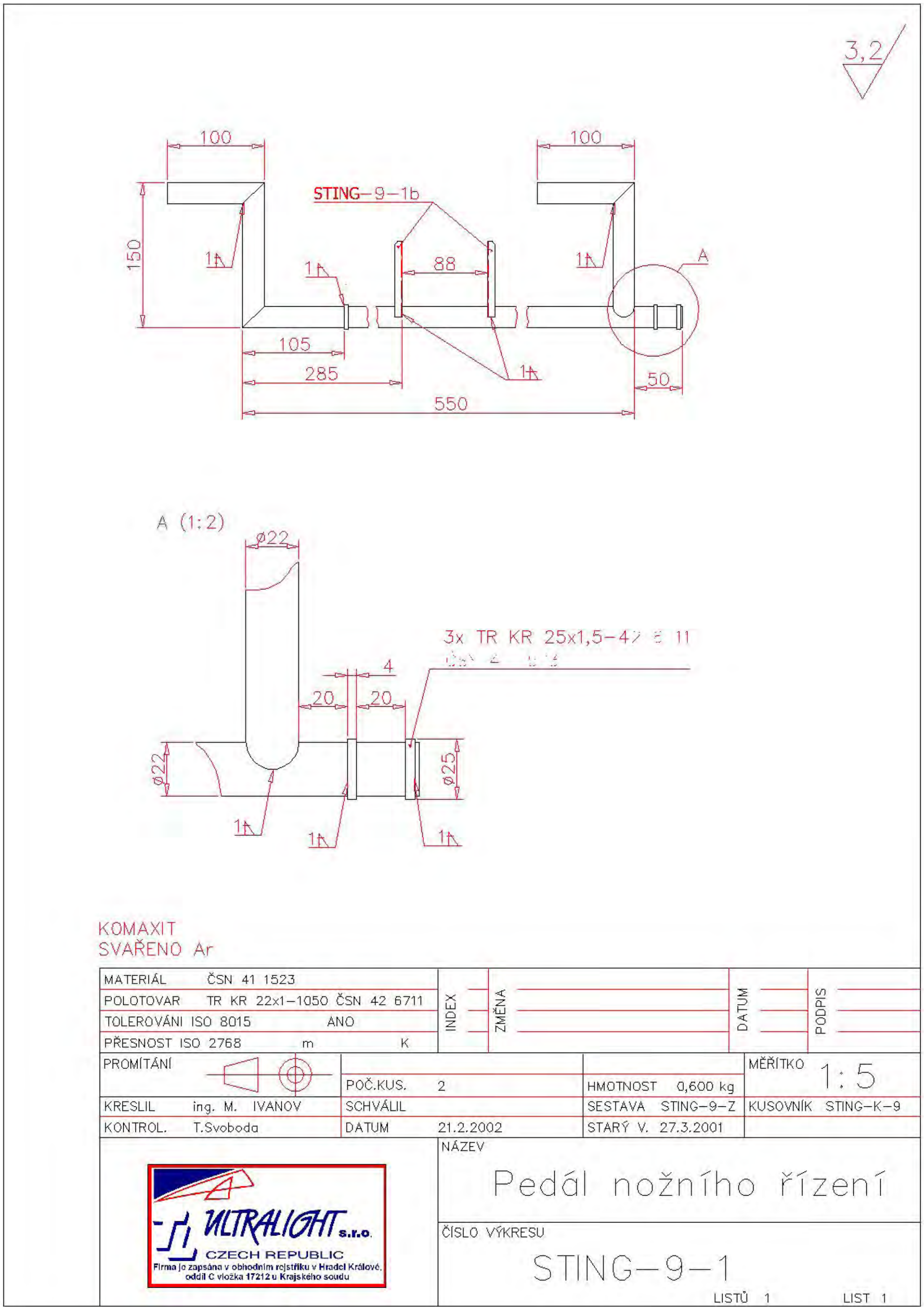
ČÍSLO VÝKRESU
STING–11–1

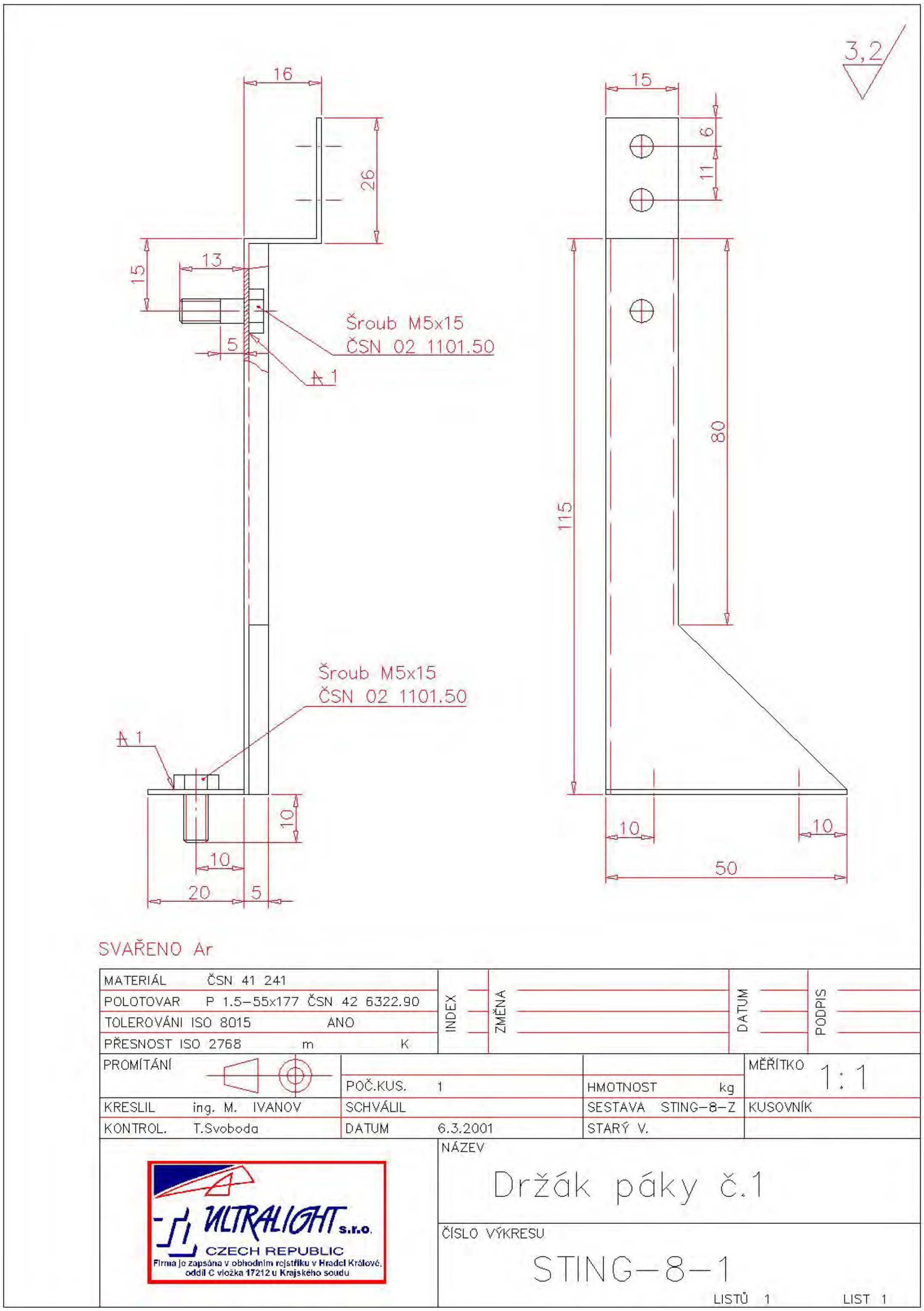
LISTŮ 1 LIST 1

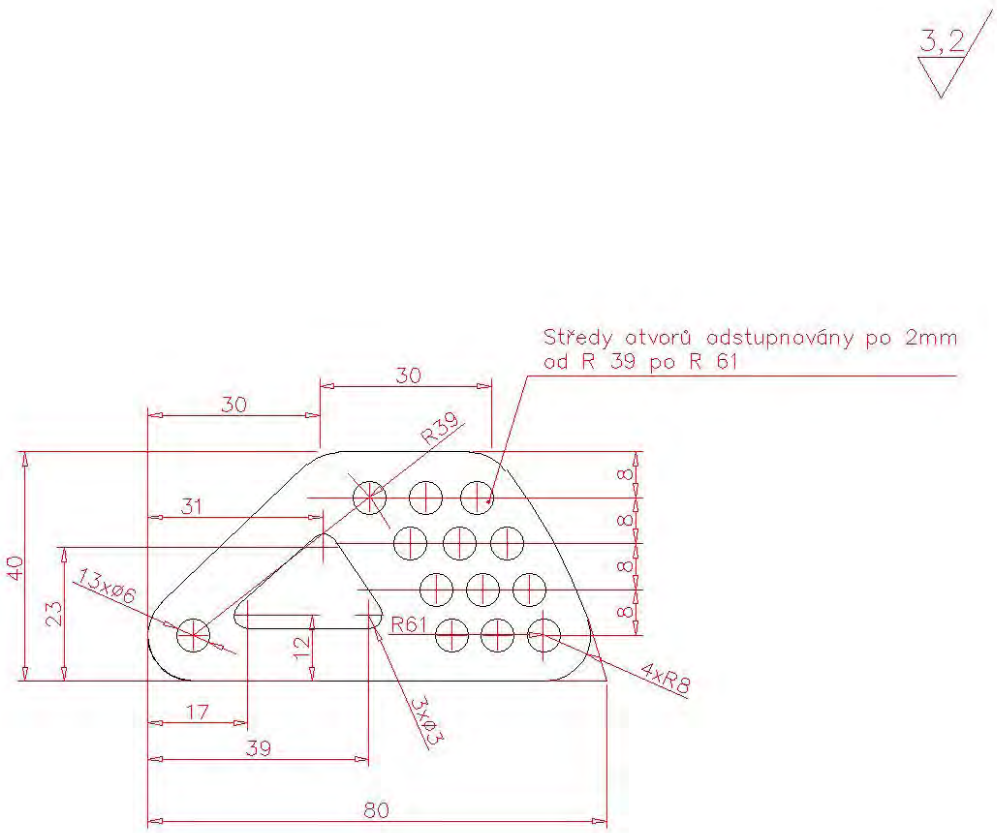
•


Přední noha
STING-11-Z
POHLED ZEPŘEDU
A(1:2)
B(1:2)
1:5

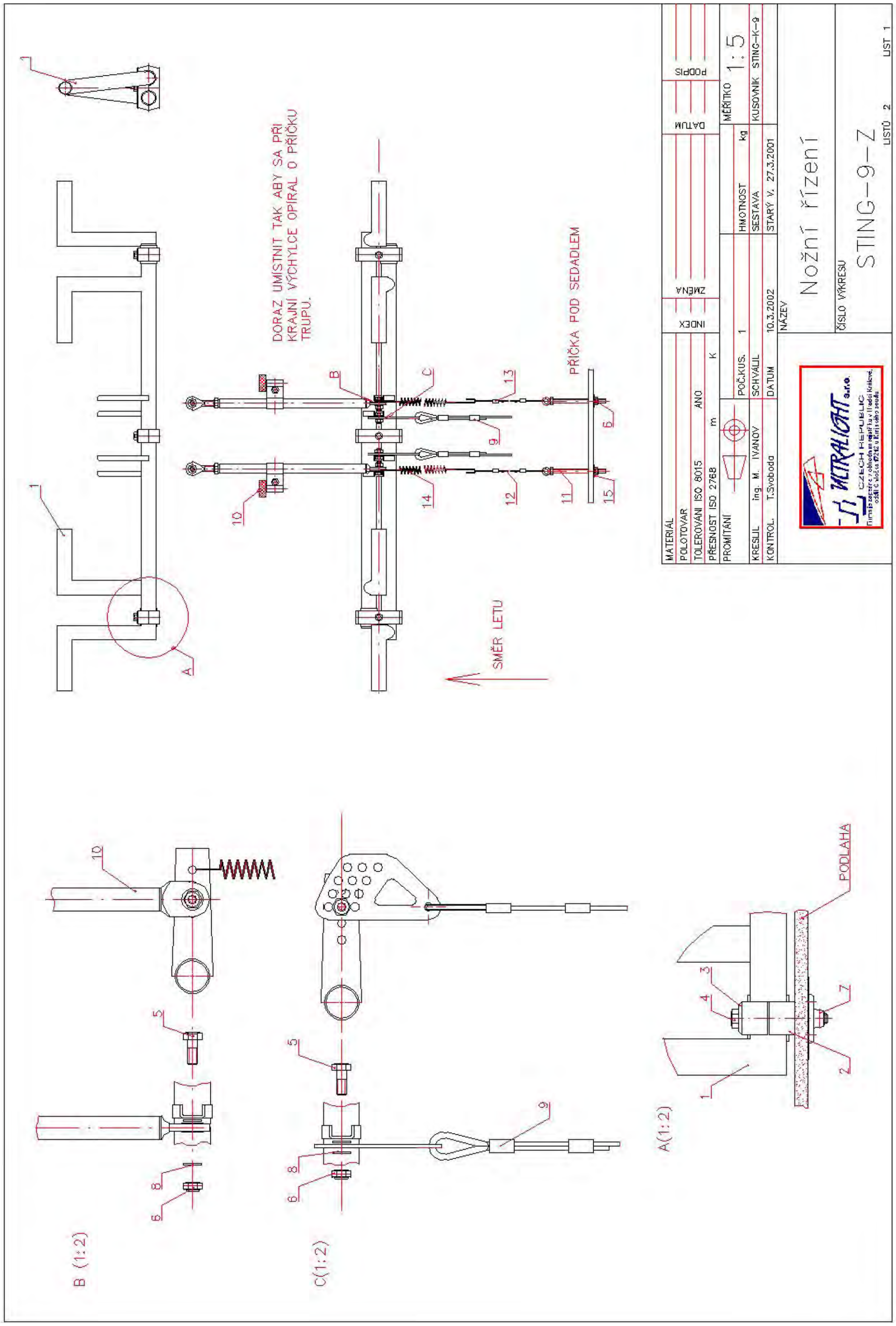

A
18
PIANOVÝ ZÁVĚS
VYVAŽOVACÍ PLOŠKA
18
18
21
6
11
13
15
10
17
VIDLIČKA SPOJENA S TRUBKOU
TŘEMI NÝTY ø3X8 PO 120°
UCHYCENÍ VYVAŽOVACÍ PLOŠKY
3xPIANOVÝ ZÁVĚS 33mm
MATERIÁL
POLOTOVAR
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA
KUSOVNÍK
KONTROL. T.Svoboda
DATUM 8.4.2001
STARÝ V.
NÁZEV
Vyvážení–sestava
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–8–Z
LISTŮ 3
LIST 2

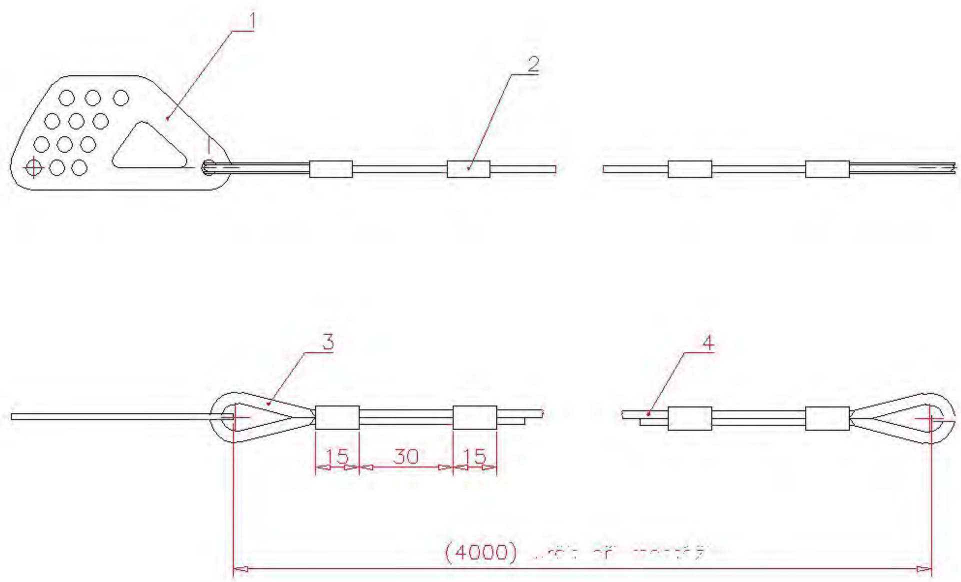

3,2
100
100
STING–9–1b
150
1
1
88
1
A
105
285
1
50
550
A (1:2)
ø22
3x TR KR 25x1,5–4
4
20
20
ø22
ø25
1
1
1
KOMAXIT
SVAŘENO Ar
MATERIÁL ČSN 41 1523
POLOTOVAR TR KR 22x1–1050 ČSN 42 6711
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST 0,600 kg
MĚŘÍTKO 1:5
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–9–Z
KUSOVNÍK STING–K–9
KONTROL. T.Svoboda
DATUM 21.2.2002
STARÝ V. 27.3.2001
NÁZEV
Pedál nožního řízení
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku u Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–9–1
LISTŮ 1
LIST 1


3,2
16
26
15
13
5
Šroub M5x15
ČSN 02 1101.50
1
Šroub M5x15
ČSN 02 1101.50
1
10
10
20
5
15
6
11
80
115
10
10
50
SVAŘENO Ar
MATERIÁL ČSN 41 241
POLOTOVAR P 1.5–55x177 ČSN 42 6322.90
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–8–Z
KUSOVNÍK
KONTROL. T.Svoboda
DATUM 6.3.2001
STARÝ V.
NÁZEV
Držák páky č.1
ČÍSLO VÝKRESU
STING–8–1
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu



MATERIÁL ČSN 41 7240.4		INDEX	ZMĚNA	DATUM	PODPIS
POLOTOVAR P 2–40x80 ČSN 42 5315.11					
TOLEROVÁNI ISO 8015 ANO					
PŘESNOST ISO 2768 m K					
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST 0,023 kg	MĚŘÍTKO 1 : 1		
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–9–5	KUSOVNÍK STING–K–9		
KONTROL. T.Svoboda	DATUM 28.2.2002	STARÝ V. 21.3.2001			
ULTRALIGHT s.r.o. CZECH REPUBLIC Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu	NÁZEV Napínák lana				
	ČÍSLO VÝKRESU STING–9–4				
	LISTŮ 1	LIST 1			


DORAZ UMÍSTNIT TAK ABY SA PRI
KRAJNÍ VÝCHYLCE OPÍRAL O PŘÍČKU
TRUPU.
PŘÍČKA POD SEDADLEM
SMĚR LETU
PODLAHA
B (1:2)
C(1:2)
A(1:2)
Nožní řízení
STING-9-Z
1:5
ULTRALIGHT s.r.o.
CZECH REPUBLIC



POZ.	MN.	NÁZEV–RZMĚR	VÝKRES–NORMA	POZNÁMKA
4	1	Lano ø2,5	ČSN 02 4323	
3	2	Očnice 4	ČSN 02 4490	
2	4	Objímka–nalisovaná	ON 42 7716	dle ČSN 02 4481
1	2	Napínák lana	STING–9–4	

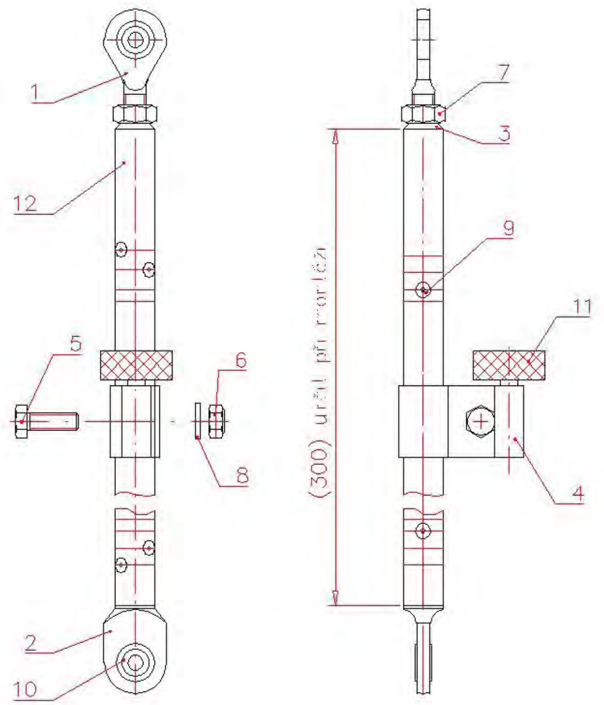
MATERIÁL	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–9–Z	KUSOVNÍK STING–K–9
KONTROL. T.Svoboda	DATUM 27.3.2001	STARÝ V.	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Lano ovl. SOP

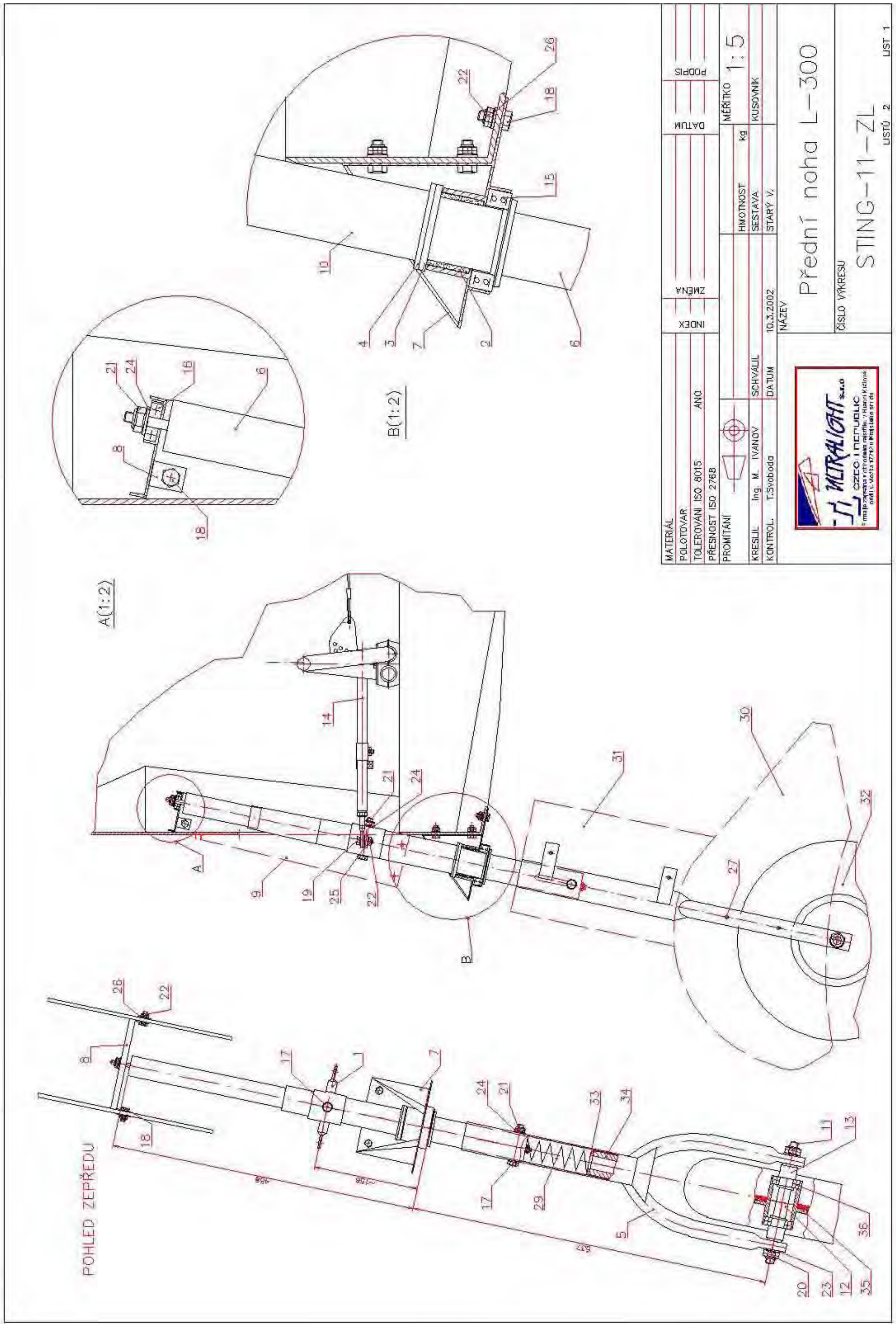
ČÍSLO VÝKRESU
STING–9–5

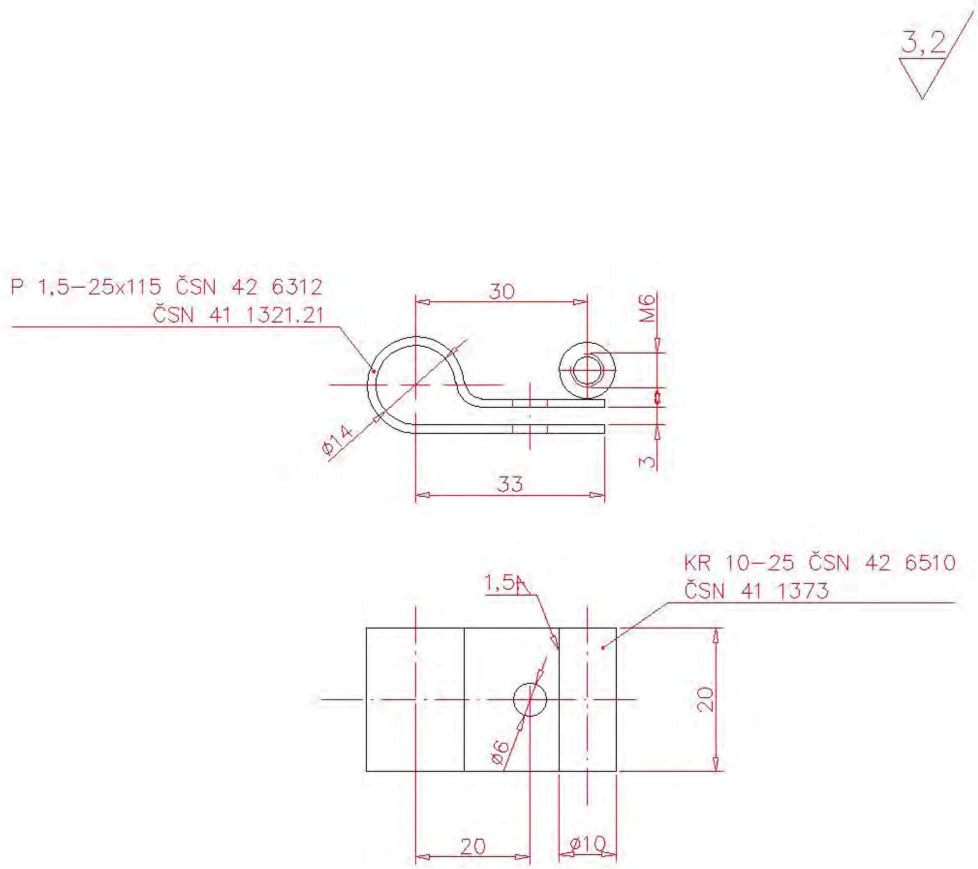
LISTŮ 1 LIST 1



MATERIÁL	
POLOTOVAR	
TOLEROVÁNI ISO 8015	ANO
PŘESNOST ISO 2768	m K
INDEX	ZMĚNA
DATUM	PODPIS
PROMÍTÁNÍ	
POČ.KUS.	2
HMOTNOST	kg
MĚŘÍTKO	1 : 2
KRESLIL	ing. M. IVANOV
SCHVÁLIL	
SESTAVA	STING–9–Z
KUSOVNÍK	STING–K–9
KONTROL.	T.Svoboda
DATUM	27.3.2001
STARÝ V.	
NÁZEV	Táhla př. podv.
ČÍSLO VÝKRESU	STING–9–6
LISTŮ	2
LIST	1

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu


Přední noha L-300
STING-11-ZL
MĚŘÍTKO 1:5
POHLED ZEPŘEDU
A(1:2)
B(1:2)
10.3.2002
T.Svoboda
Ing. M. IVANOV



ZINEK
SVAŘENO Ar

MATERIÁL		INDEX	ZMĚNA
POLOTOVAR		DATUM	PODPIS
TOLEROVÁNÍ ISO 8015	ANO		
PŘESNOST ISO 2768	m K		
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST 0,025 kg	MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–9–Z	KUSOVNÍK STING–K–9
KONTROL. T.Svoboda	DATUM 22.2.2002	STARÝ V. 27.3.2001	

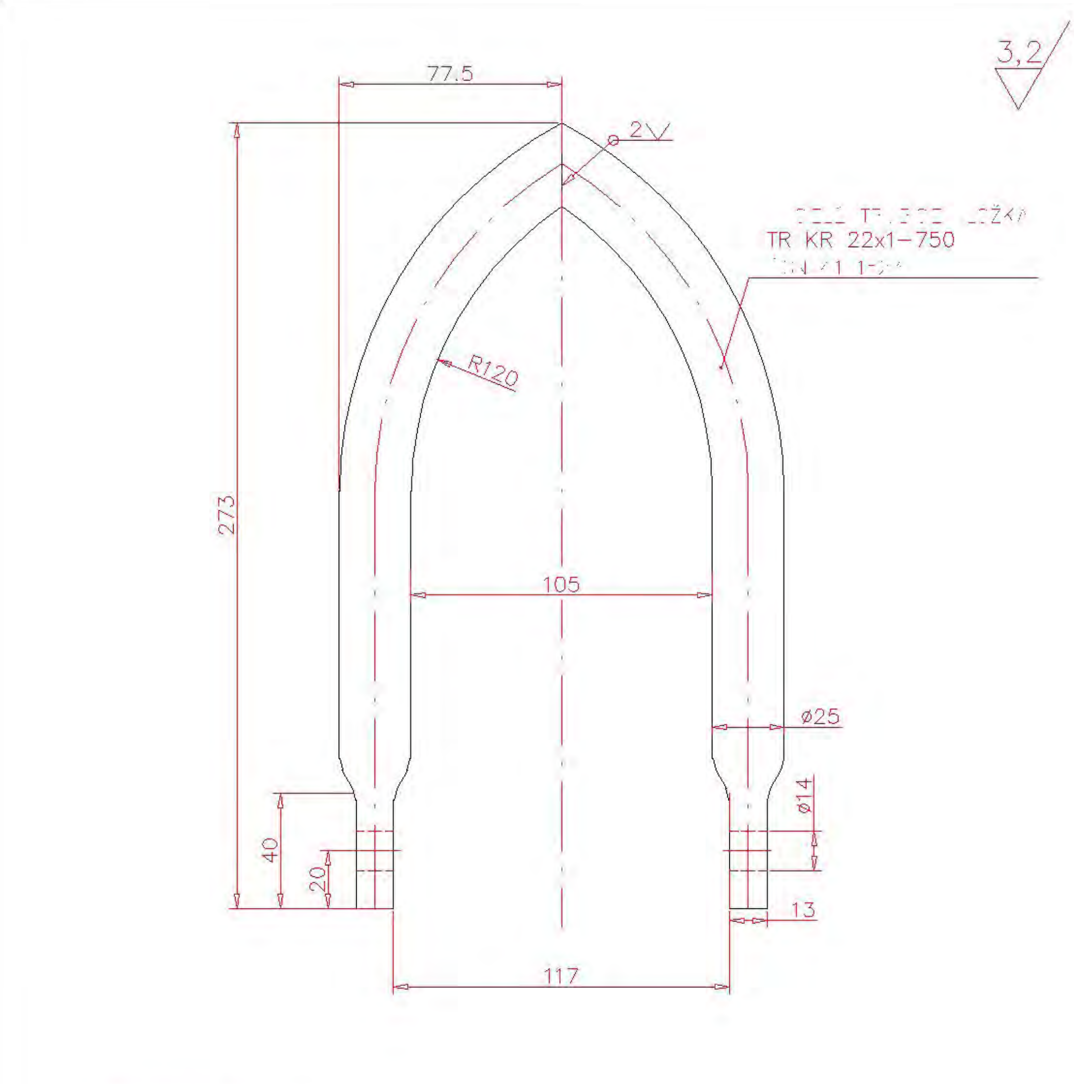
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Doraz směrovky

ČÍSLO VÝKRESU
STING–9–7

LISTŮ 1 LIST 1

•



SVAŘENO Ar

MATERIÁL ČSN 41 1523		INDEX	ZMĚNA	DATUM	PODPIS
POLOTOVAR TR KR 25x1,5–750 ČSN42 6711.2					
TOLEROVÁNI ISO 8015 ANO					
PŘESNOST ISO 2768 m K					
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST kg	MĚŘÍTKO 1 : 2		
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–11–18	KUSOVNÍK STING–K–11		
KONTROL. T.Svoboda	DATUM 10.3.2002	STARÝ V.			

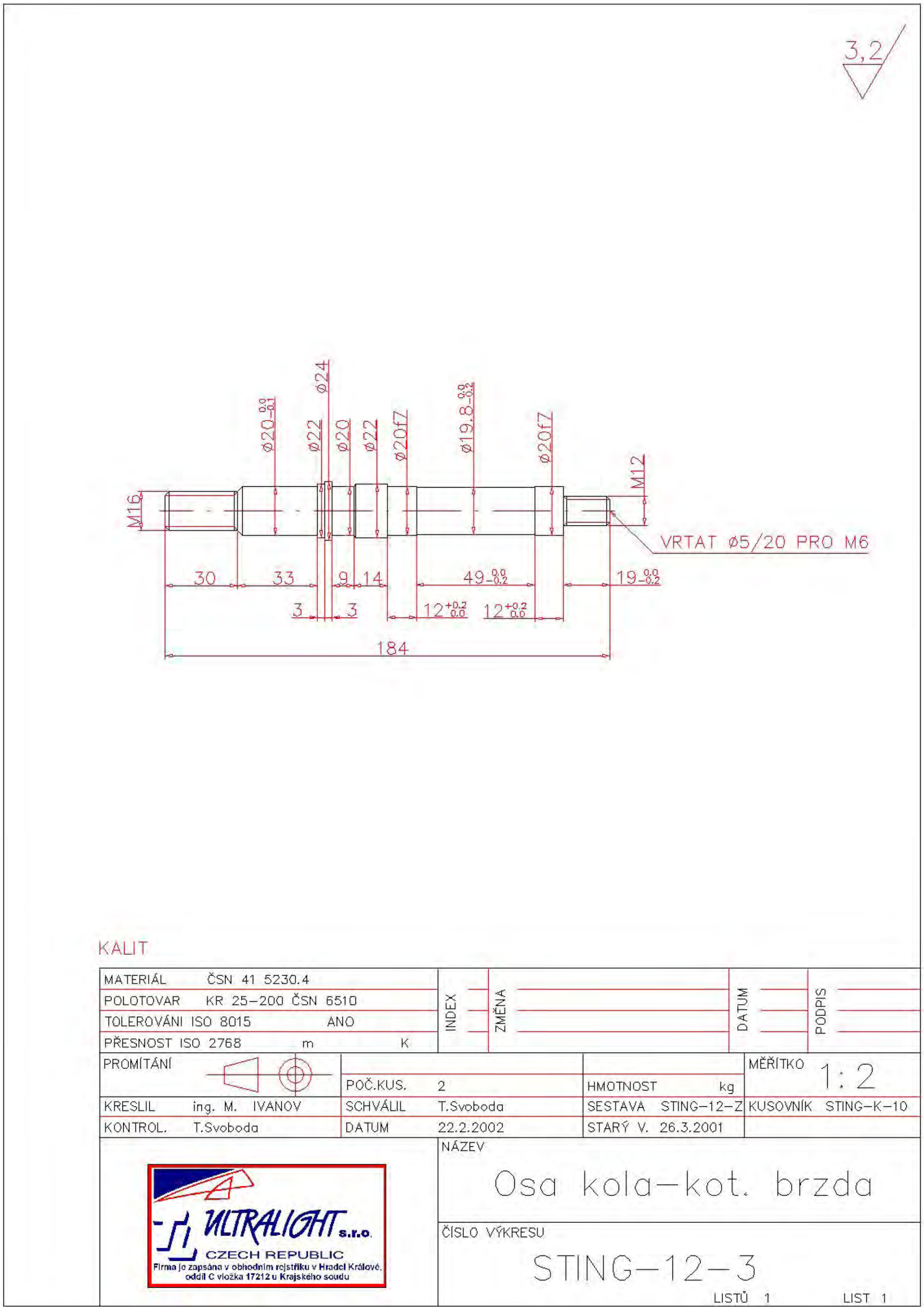
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Vidlice L– oblouk

ČÍSLO VÝKRESU
STING–11–18b

LISTŮ 1 LIST 1

•


3,2
ø20-0.1
ø22
ø24
ø20
ø22
ø20f7
ø19,8-0.2
ø20f7
M16
M12
VRTAT ø5/20 PRO M6
30
33
9
14
49-0.2
19-0.2
3
3
12+0.2
12+0.2
184
KALIT
MATERIÁL ČSN 41 5230.4
POLOTOVAR KR 25-200 ČSN 6510
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL T.Svoboda
SESTAVA STING-12-Z
KUSOVNÍK STING-K-10
KONTROL. T.Svoboda
DATUM 22.2.2002
STARÝ V. 26.3.2001
NÁZEV
Osa kola-kot. brzda
ČÍSLO VÝKRESU
STING-12-3
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC

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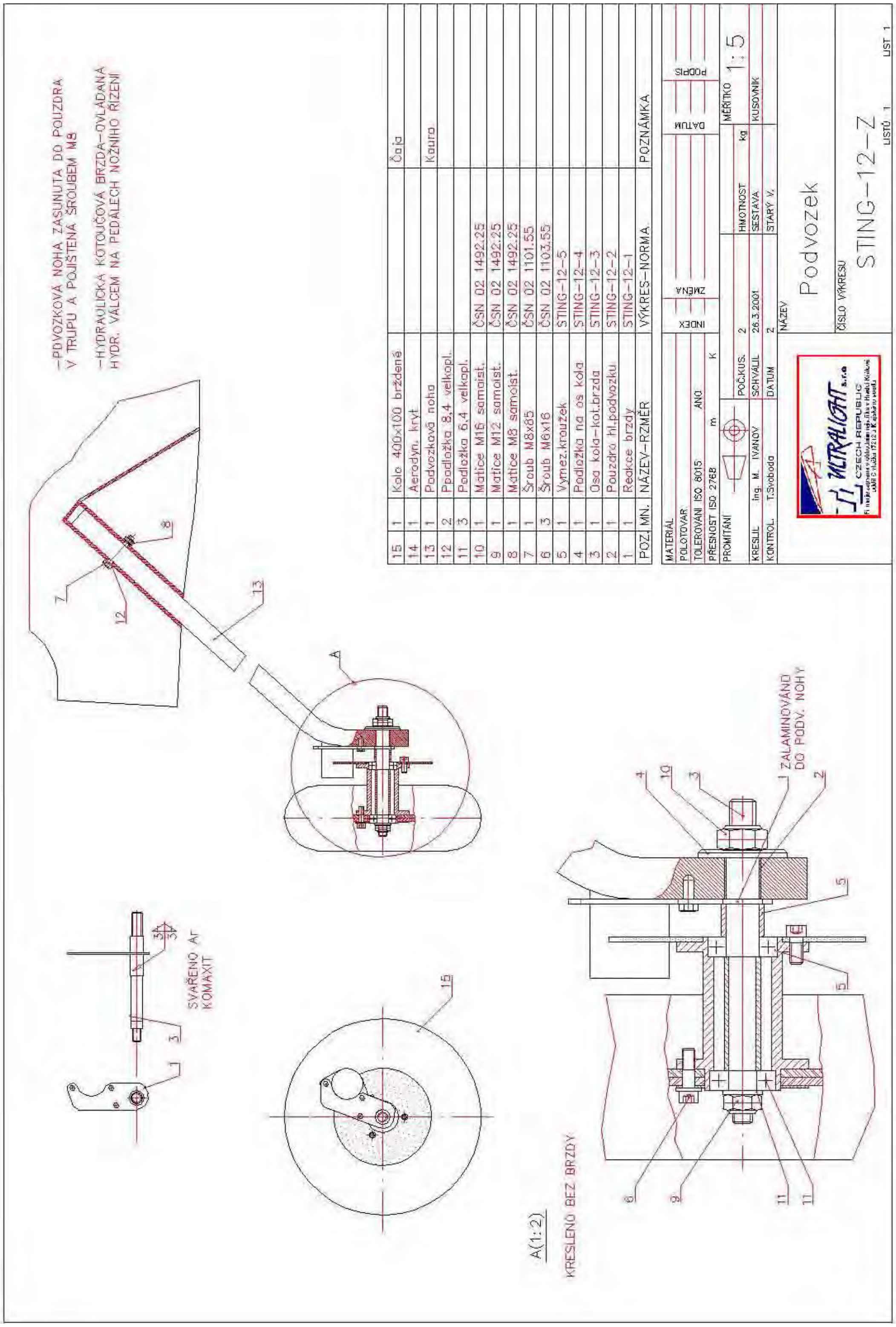
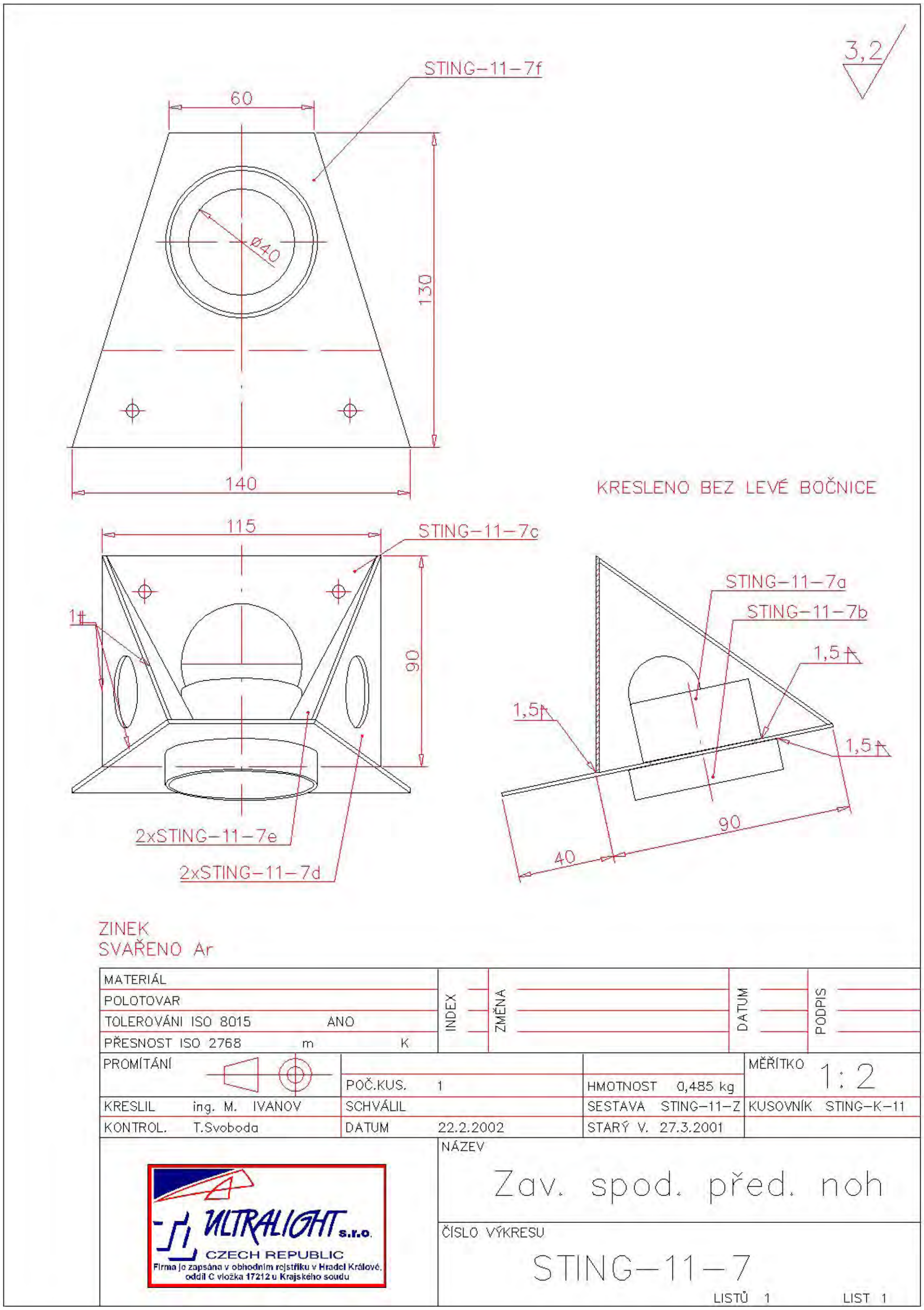
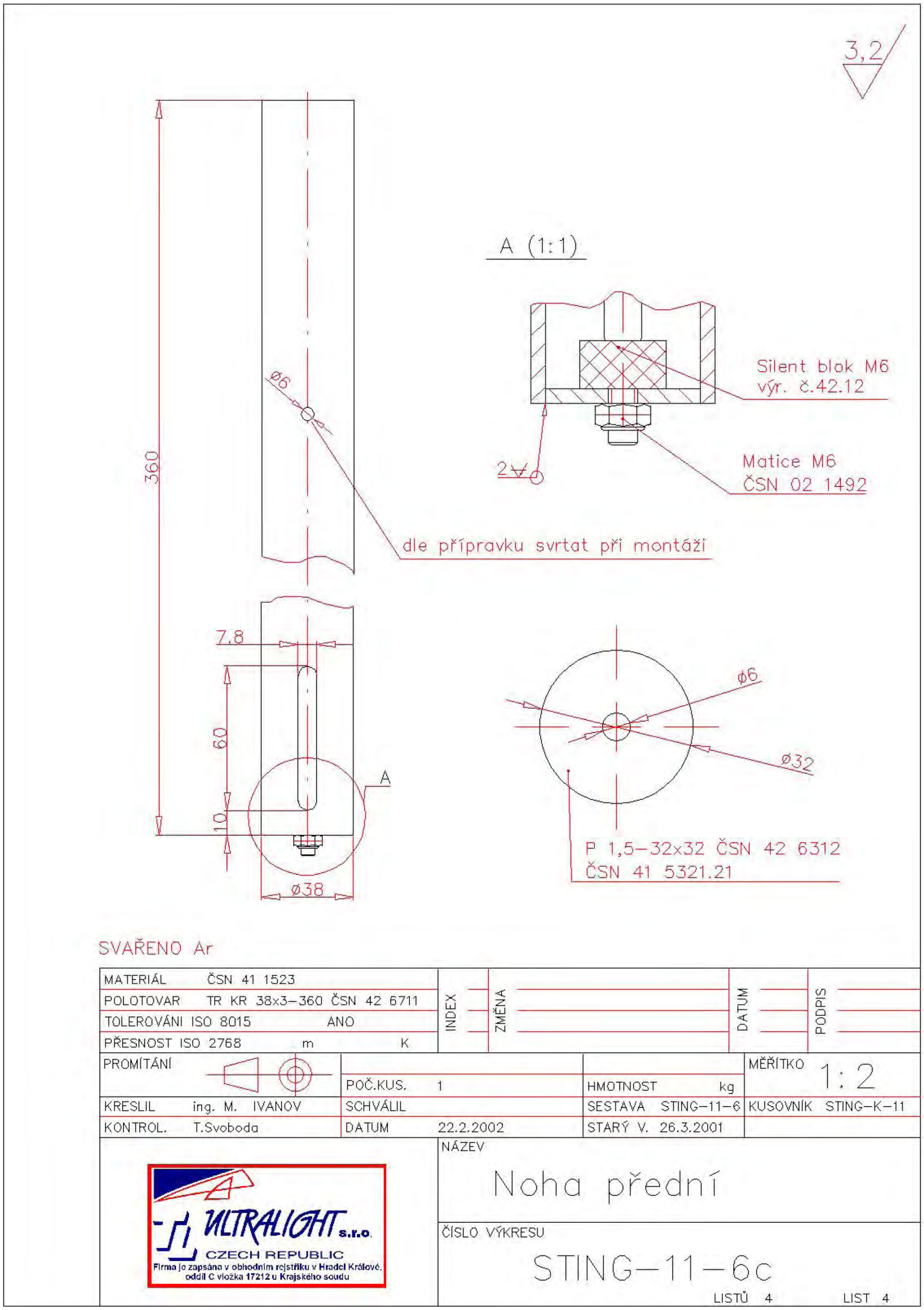
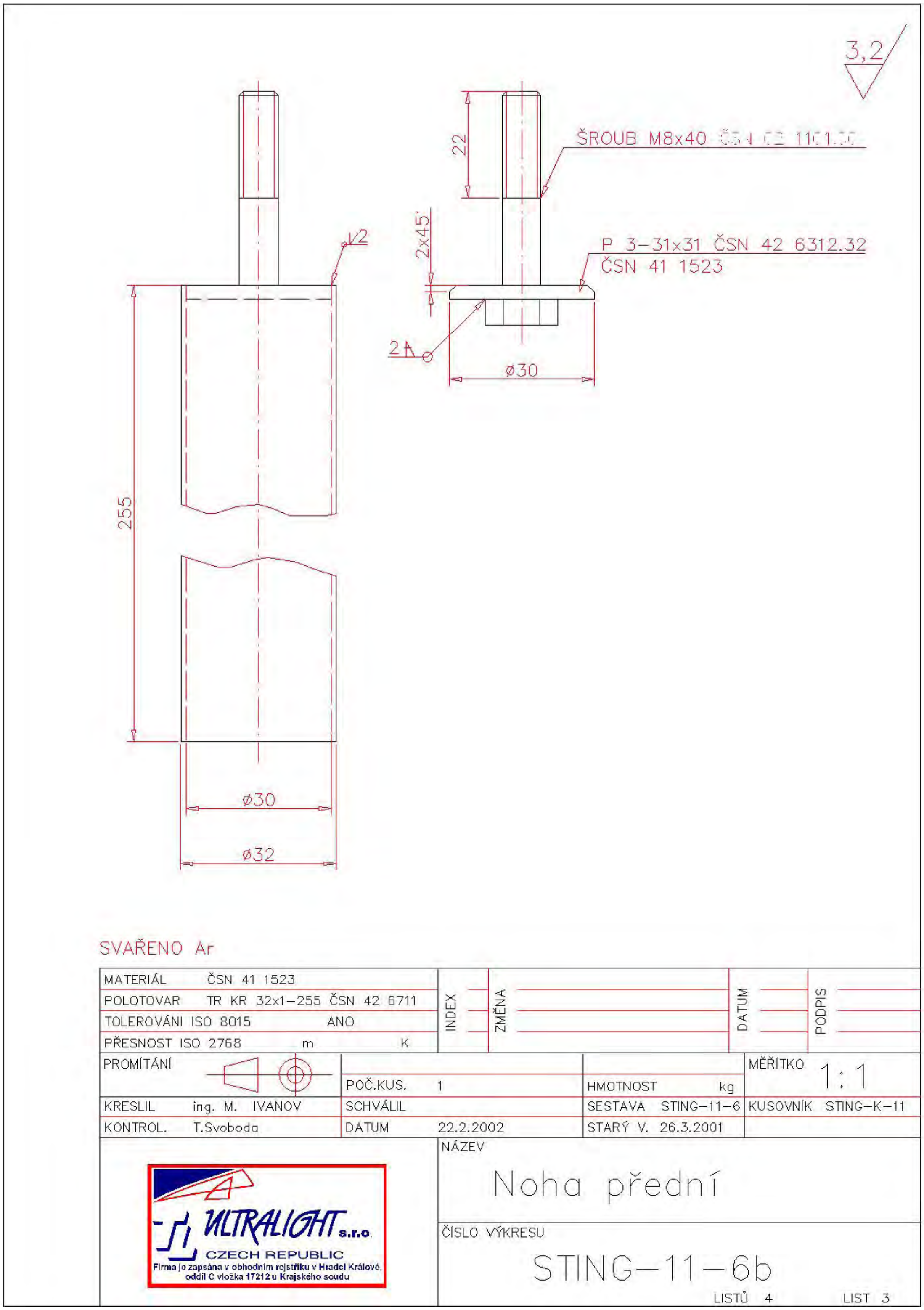
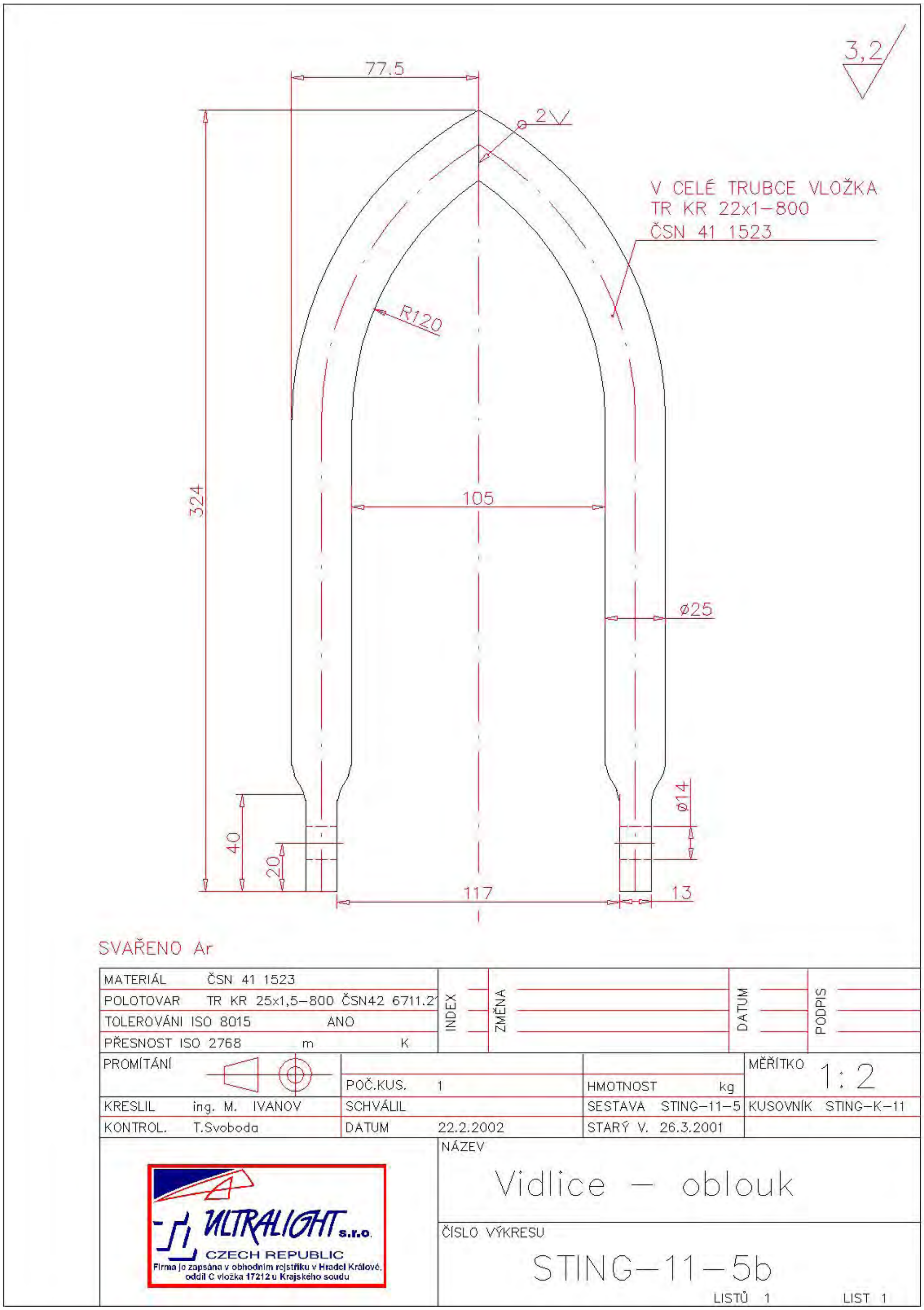
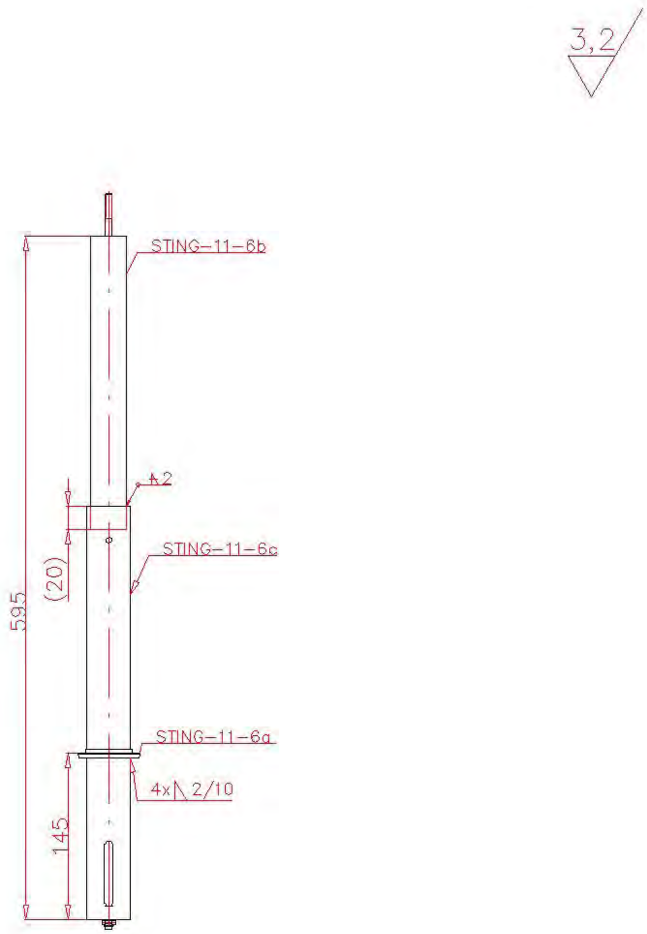

-PODVOZKOVÁ NOHA ZASUNUTA DO POUZDRA V TRUPU A POJIŠTĚNÁ ŠROUBEM M8
-HYDRAULICKÁ KOTOUČOVÁ BRZDA-OVLÁDANÁ HYDR. VÁLCEM NA PEDÁLECH NOŽNÍHO ŘÍZENÍ
15 1 Kolo 400x100 bržděné Čaja
14 1 Aerodyn. kryt Kaura
13 1 Podvozková noha
12 2 Podložka 8,4 velkopl.
11 3 Podložka 6,4 velkopl.
10 1 Matice M16 samojist. ČSN 02 1492.25
9 1 Matice M12 samojist. ČSN 02 1492.25
8 1 Matice M8 samojist. ČSN 02 1492.25
7 1 Šroub M8x85 ČSN 02 1101.55
6 3 Šroub M6x16 ČSN 02 1103.55
5 1 Vymez.kroužek STING-12-5
4 1 Podložka na os kola STING-12-4
3 1 Osa kola-kot.brzda STING-12-3
2 1 Pouzdro hl.podvozku STING-12-2
1 1 Redkce brzdy STING-12-1
POZ. MN. NÁZEV-RZMĚR VÝKRES-NORMA POZNÁMKA
MĚŘÍTKO 1:5
Podvozek
STING-12-Z
SVAŘENO Ar KOMAXIT
ZALAMINOVÁNO DO PODV. NOHY
A(1:2)
KRESLENO BEZ BRZDY


3,2
STING-11-7f
60
ø40
130
140
KRESLENO BEZ LEVÉ BOČNICE
115
STING-11-7c
1
90
STING-11-7a
STING-11-7b
1,5
1,5
1,5
2xSTING-11-7e
2xSTING-11-7d
90
40
ZINEK
SVAŘENO Ar
MATERIÁL
POLOTOVAR
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST 0,485 kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING-11-Z
KUSOVNÍK STING-K-11
KONTROL. T.Svoboda
DATUM 22.2.2002
STARÝ V. 27.3.2001
NÁZEV
Zav. spod. před. noh
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING-11-7
LISTŮ 1
LIST 1


3,2
A (1:1)
Silent blok M6
výr. č.42.12
Matice M6
ČSN 02 1492
2
360
ø6
dle přípravku svrtat při montáži
7,8
60
10
A
ø38
ø6
ø32
P 1,5–32x32 ČSN 42 6312
ČSN 41 5321.21
SVAŘENO Ar
MATERIÁL ČSN 41 1523
POLOTOVAR TR KR 38x3–360 ČSN 42 6711
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–11–6
KUSOVNÍK STING–K–11
KONTROL. T.Svoboda
DATUM 22.2.2002
STARÝ V. 26.3.2001
NÁZEV
Noha přední
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–11–6c
LISTŮ 4
LIST 4


3,2
ŠROUB M8x40
22
2x45°
P 3–31x31 ČSN 42 6312.32
ČSN 41 1523
2
2
ø30
255
ø30
ø32
SVAŘENO Ar
MATERIÁL ČSN 41 1523
POLOTOVAR TR KR 32x1–255 ČSN 42 6711
TOLEROVÁNÍ ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–11–6
KUSOVNÍK STING–K–11
KONTROL. T.Svoboda
DATUM 22.2.2002
STARÝ V. 26.3.2001
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
NÁZEV
Noha přední
ČÍSLO VÝKRESU
STING–11–6b
LISTŮ 4
LIST 3


3,2
77.5
2
V CELÉ TRUBCE VLOŽKA
TR KR 22x1–800
ČSN 41 1523
R120
324
105
ø25
ø14
40
20
117
13
SVAŘENO Ar
MATERIÁL ČSN 41 1523
POLOTOVAR TR KR 25x1,5–800 ČSN42 6711.21
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–11–5
KUSOVNÍK STING–K–11
KONTROL. T.Svoboda
DATUM 22.2.2002
STARÝ V. 26.3.2001
NÁZEV
Vidlice – oblouk
ČÍSLO VÝKRESU
STING–11–5b
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu



SVAŘENO Ar

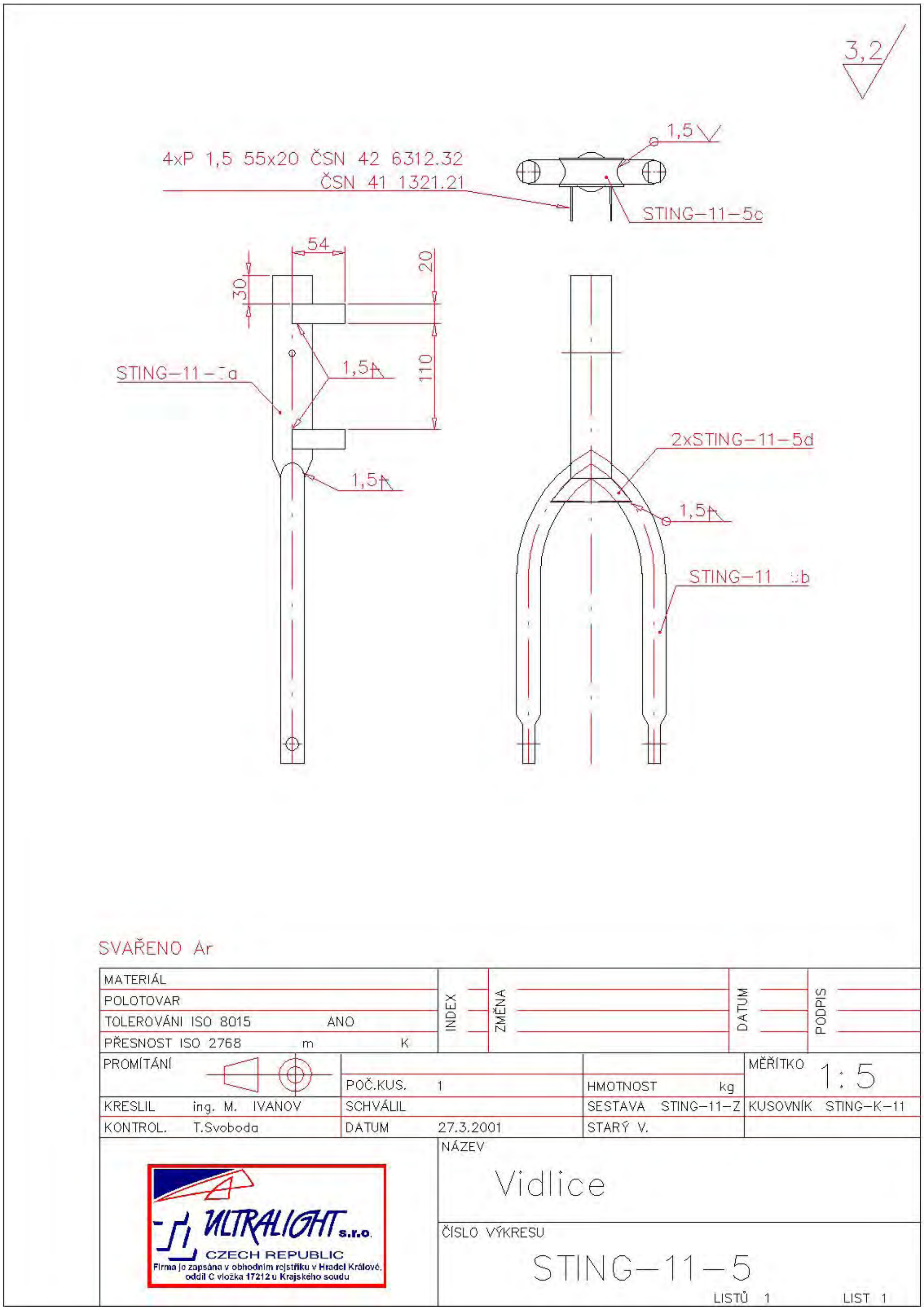
MATERIÁL		INDEX	ZMĚNA / DATUM / PODPIS
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST 1,9 kg	MĚŘÍTKO 1 : 5
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–11–Z	KUSOVNÍK STING–K–11
KONTROL. T.Svoboda	DATUM 22.2.2002	STARÝ V. 27.3.2001	

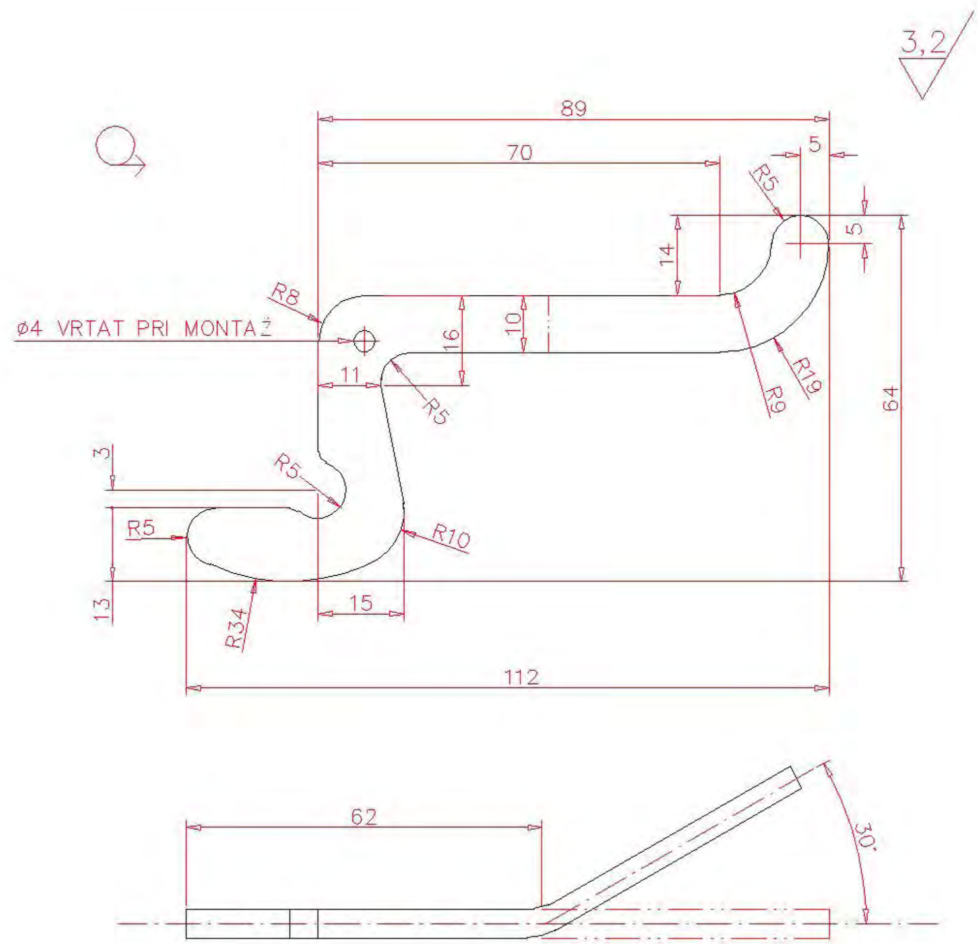
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Noha přední

ČÍSLO VÝKRESU
STING–11–6

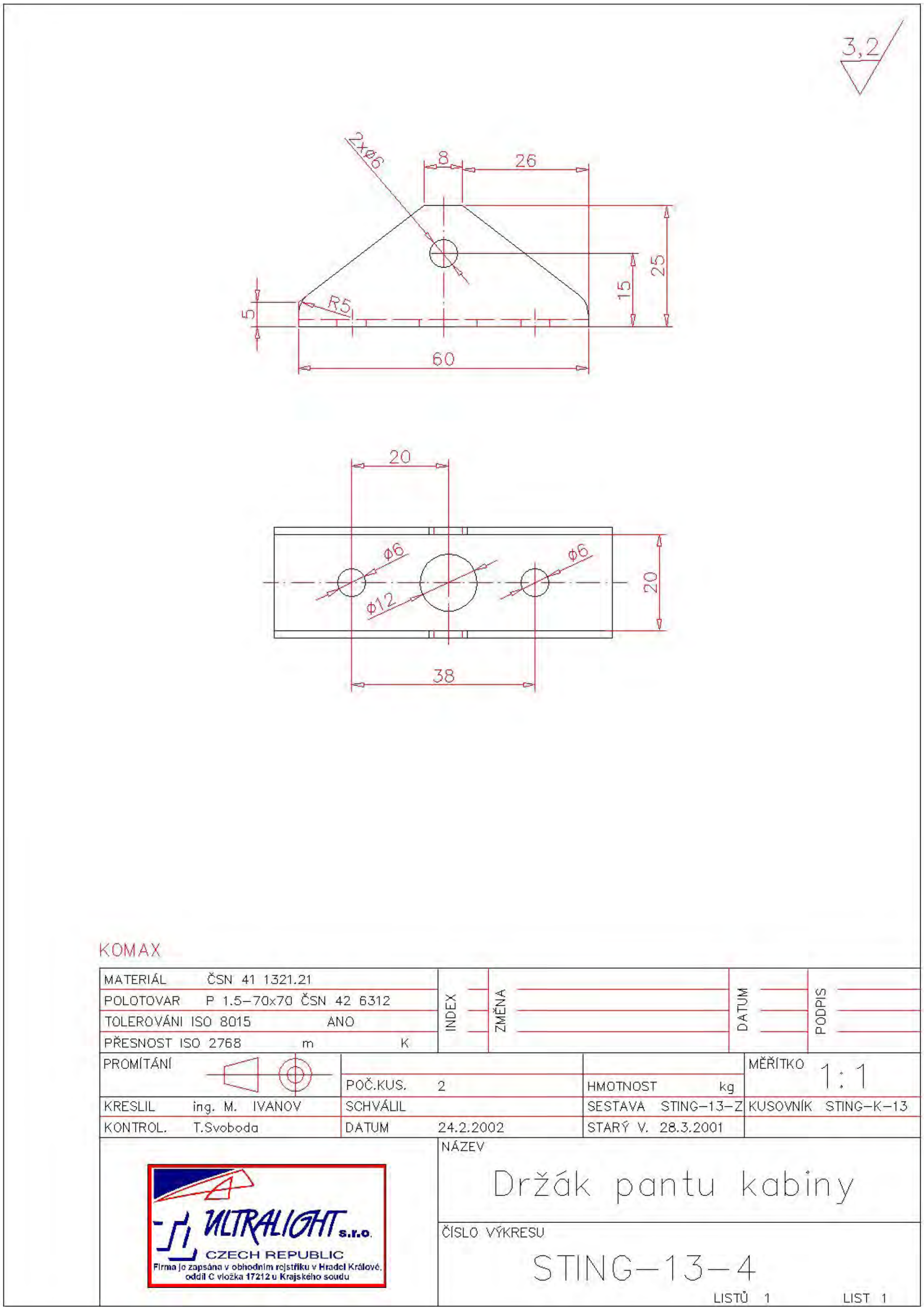
LISTŮ 4 LIST 1

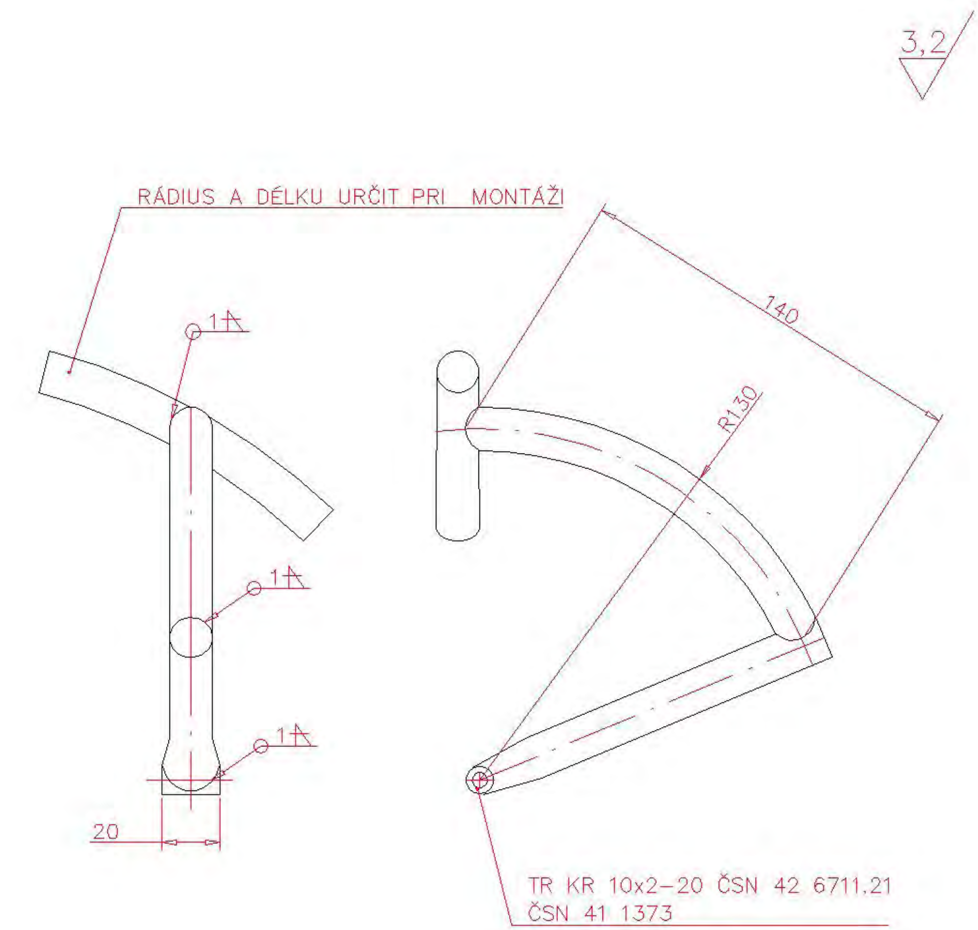

3,2
4xP 1,5 55x20 ČSN 42 6312.32
ČSN 41 1321.21
1,5
STING–11–5c
54
30
20
110
1,5
1,5
2xSTING–11–5d
1,5
SVAŘENO Ar
MATERIÁL
POLOTOVAR
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:5
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–11–Z
KUSOVNÍK STING–K–11
KONTROL. T.Svoboda
DATUM 27.3.2001
STARÝ V.
NÁZEV
Vidlice
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–11–5
LISTŮ 1
LIST 1



ELOX
2ks LEVÝ A PRAVÝ

MATERIÁL ČSN 42 4201.62		INDEX	ZMĚNA	DATUM	PODPIS
POLOTOVAR P 5–64x112 ČSN 42 7305.02					
TOLEROVÁNI ISO 8015 ANO					
PŘESNOST ISO 2768 m K					
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST 0,022 kg		MĚŘÍTKO 1:1	
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–13–Z		KUSOVNÍK STING–K–13	
KONTROL. T.Svoboda	DATUM 28.3.2001	STARÝ V.			
ULTRALIGHT s.r.o. CZECH REPUBLIC Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu	NÁZEV Hák kabíny				
	ČÍSLO VÝKRESU STING–13–5			LISTŮ 1	LIST 1


3,2
2xφ6
8
26
25
15
5
R5
60
20
φ6
φ12
φ6
20
38
KOMAX
MATERIÁL ČSN 41 1321.21
POLOTOVAR P 1.5–70x70 ČSN 42 6312
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–13–Z
KUSOVNÍK STING–K–13
KONTROL. T.Svoboda
DATUM 24.2.2002
STARÝ V. 28.3.2001
NÁZEV
Držák pantu kabiny
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING–13–4
LISTŮ 1
LIST 1



KOMAXIT
SVAŘENO Ar
2ks PRAVÝ A LEVÝ

MATERIÁL ČSN 41 1523	INDEX	ZMĚNA		DATUM	PODPIS
POLOTOVAR TR KR 15x1–360 ČSN 42 6711.21					
TOLEROVÁNI ISO 8015 ANO					
PŘESNOST ISO 2768 m K					

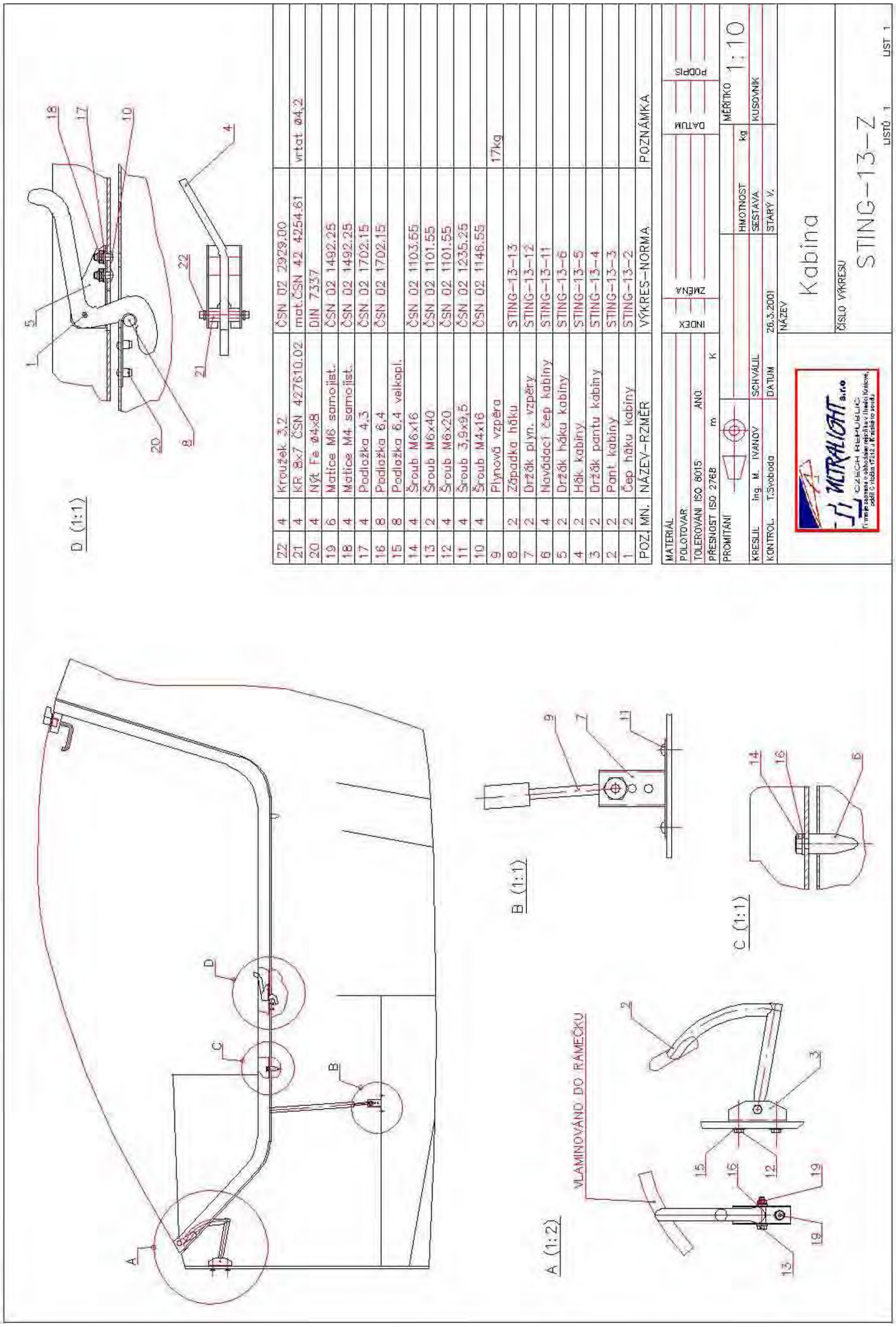
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST 0,145 kg	MĚŘÍTKO 1:2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–13–Z	KUSOVNÍK STING–K–13
KONTROL. T.Svoboda	DATUM 28.3.2001	STARÝ V.	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

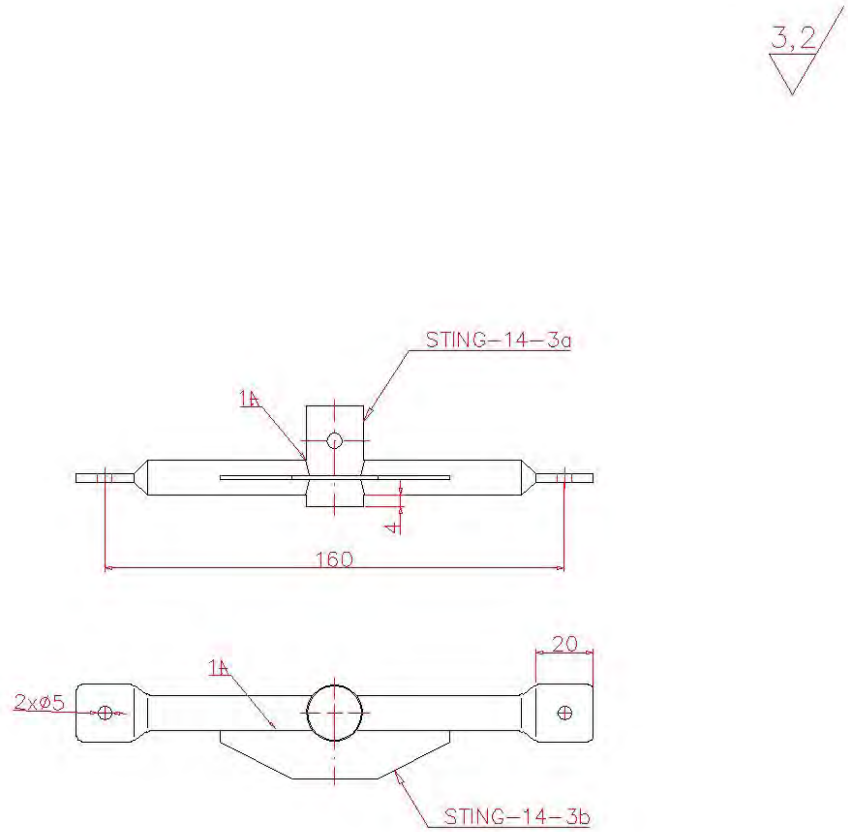
NÁZEV
Pant kabiny

ČÍSLO VÝKRESU
STING–13–3

LISTŮ 1 LIST 1



POZ.	MN.	NÁZEV–RZMĚR	VÝKRES–NORMA	POZNÁMKA
22	4	Kroužek 3,2	ČSN 02 2929.00	
21	4	KR 8x7 ČSN 427610.02	mat.ČSN 42 4254.61	vrtat ø4,2
20	4	Nýt Fe ø4x8	DIN 7337	
19	6	Matice M6 samojist.	ČSN 02 1492.25	
18	4	Matice M4 samojist.	ČSN 02 1492.25	
17	4	Podložka 4,3	ČSN 02 1702.15	
16	8	Podložka 6,4	ČSN 02 1702.15	
15	8	Podložka 6,4 velkopl.		
14	4	Šroub M6x16	ČSN 02 1103.55	
13	2	Šroub M6x40	ČSN 02 1101.55	
12	4	Šroub M6x20	ČSN 02 1101.55	
11	4	Šroub 3,9x9,5	ČSN 02 1235.25	
10	4	Šroub M4x16	ČSN 02 1148.55	
9		Plynová vzpěra		17kg
8	2	Západka háku	STING-13-13	
7	2	Držák plyn. vzpěry	STING-13-12	
6	4	Naváděcí čep kabiny	STING-13-11	
5	2	Držák háku kabiny	STING-13-6	
4	2	Hák kabiny	STING-13-5	
3	2	Držák pantu kabiny	STING-13-4	
2	2	Pant kabiny	STING-13-3	
1	2	Čep háku kabiny	STING-13-2	



SVAŘENO Ar
KOMAXIT

MATERIÁL	ČSN 41 1523	
POLOTOVAR	TR KR 12x1-85 ČSN 42 6711.21	
TOLEROVÁNI ISO 8015	ANO	
PŘESNOST ISO 2768	m	K

INDEX | ZMĚNA | DATUM | PODPIS

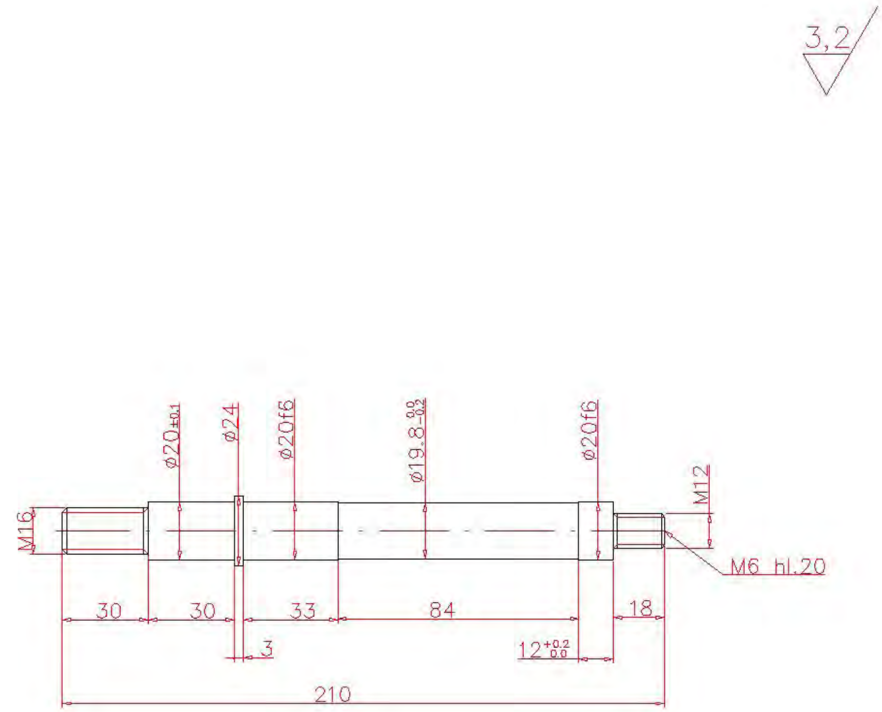
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST 0,088 kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING-14-Z	KUSOVNÍK STING-K-14
KONTROL. T.Svoboda	DATUM 24.2.2002	STARÝ V. 25.3.2001	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Páka SOP

ČÍSLO VÝKRESU
STING-14-3

LISTŮ 1 LIST 1



KALIT

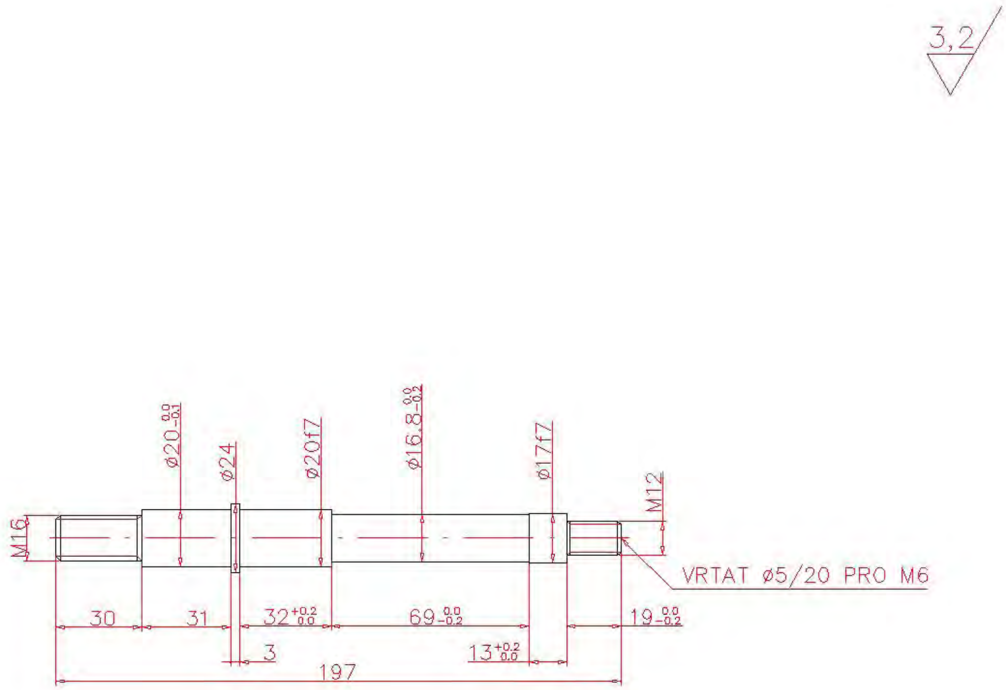
MATERIÁL	ČSN 41 5230.4		INDEX	ZMĚNA		DATUM	PODPIS
POLOTOVAR	KR 25–220 ČSN 6510						
TOLEROVÁNI ISO 8015	ANO						
PŘESNOST ISO 2768	m	K					
PROMÍTÁNÍ		POČ.KUS.	2	HMOTNOST	kg	MĚŘÍTKO	1 : 2
KRESLIL	ing. M. IVANOV	SCHVÁLIL	T.Svoboda	SESTAVA	STING–12–Z	KUSOVNÍK	STING–K–10
KONTROL.	T.Svoboda	DATUM	14.3.2002	STARÝ V.			

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Osa kola TL

ČÍSLO VÝKRESU
STING–12–8

LISTŮ 1 LIST 1



KALIT

MATERIÁL	ČSN 41 5231.4	INDEX	ZMĚNA / DATUM / PODPIS
POLOTOVAR	KR 25–205 ČSN 42 6510		
TOLEROVÁNI ISO 8015	ANO		
PŘESNOST ISO 2768	m K		

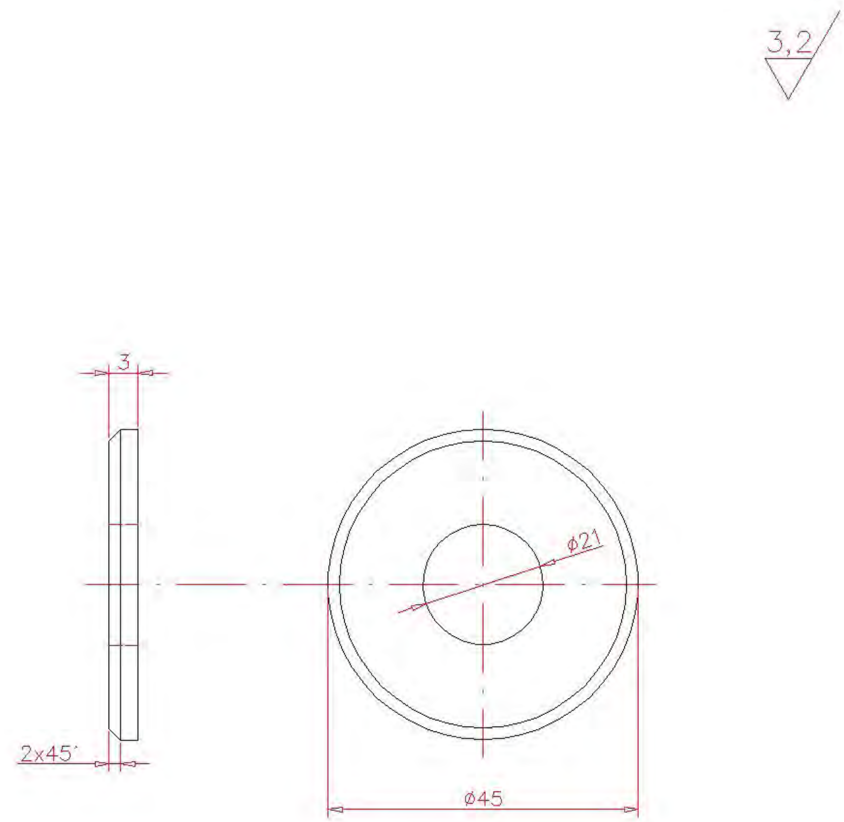
PROMÍTÁNÍ		POČ.KUS.	2	HMOTNOST	kg	MĚŘÍTKO	1:2
KRESLIL	ing. M. IVANOV	SCHVÁLIL	T.Svoboda	SESTAVA	STING–12–Z	KUSOVNÍK	STING–K–10
KONTROL.	T.Svoboda	DATUM	11.3.2002	STARÝ V.			

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Osa laminat. kola

ČÍSLO VÝKRESU
STING–12–6

LISTŮ 1 LIST 1



ELOX

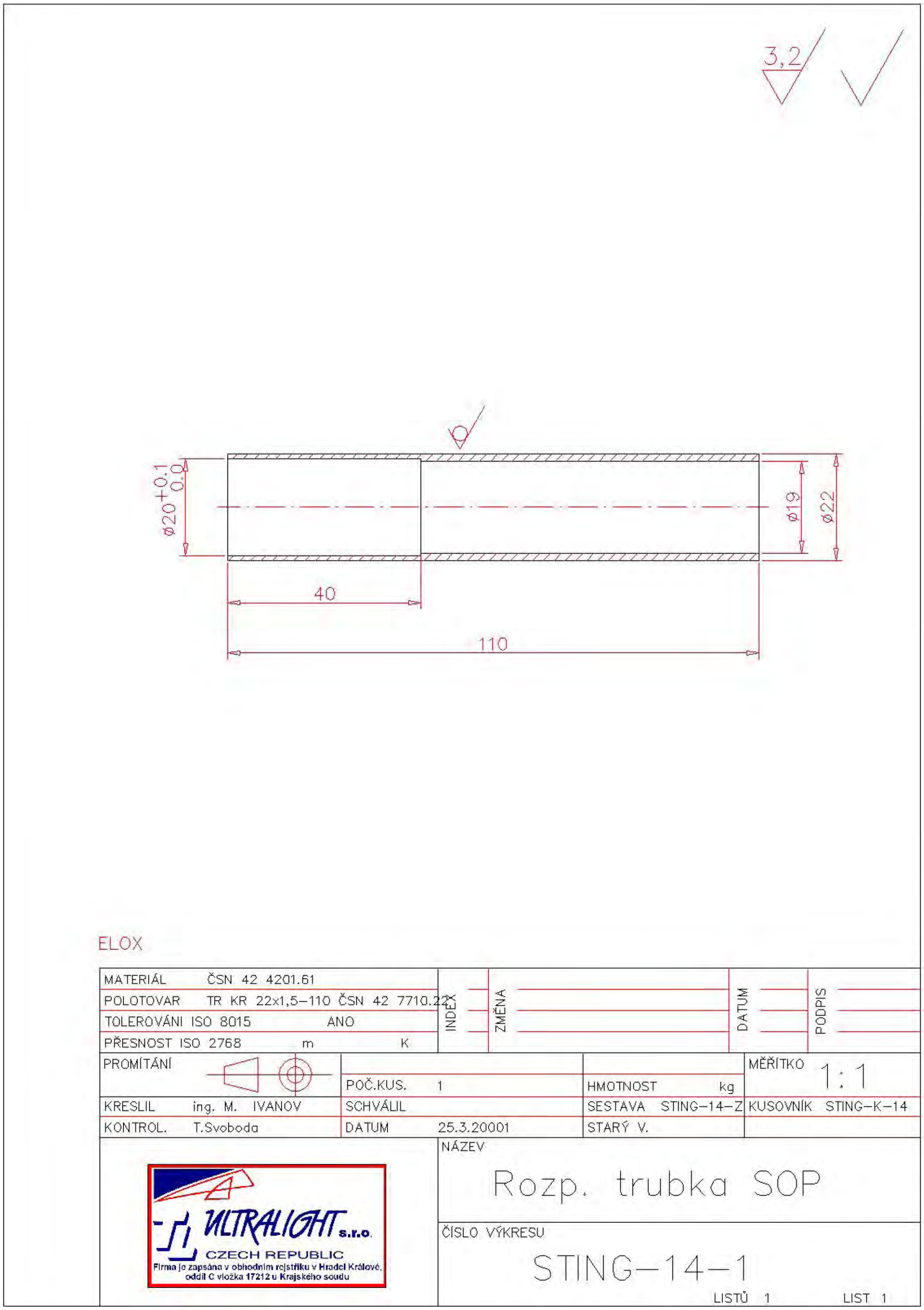
MATERIÁL	ČSN 42 4201.61	INDEX	ZMĚNA / DATUM / PODPIS
POLOTOVAR	P 5–55x55 ČSN 42 7305.62		
TOLEROVÁNÍ ISO 8015	ANO		
PŘESNOST ISO 2768	m K		
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–12–Z	KUSOVNÍK STING–K–12
KONTROL. T.Svoboda	DATUM 22.2.2002	STARÝ V. 26.3.2001	

ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

NÁZEV
Podložka na os kola

ČÍSLO VÝKRESU
STING–12–4

LISTŮ 1 LIST 1


3,2
ø20 +0.1 / 0.0
ø19
ø22
40
110
ELOX
MATERIÁL ČSN 42 4201.61
POLOTOVAR TR KR 22x1,5–110 ČSN 42 7710.22
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–14–Z
KUSOVNÍK STING–K–14
KONTROL. T.Svoboda
DATUM 25.3.20001
STARÝ V.
NÁZEV
Rozp. trubka SOP
ČÍSLO VÝKRESU
STING–14–1
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

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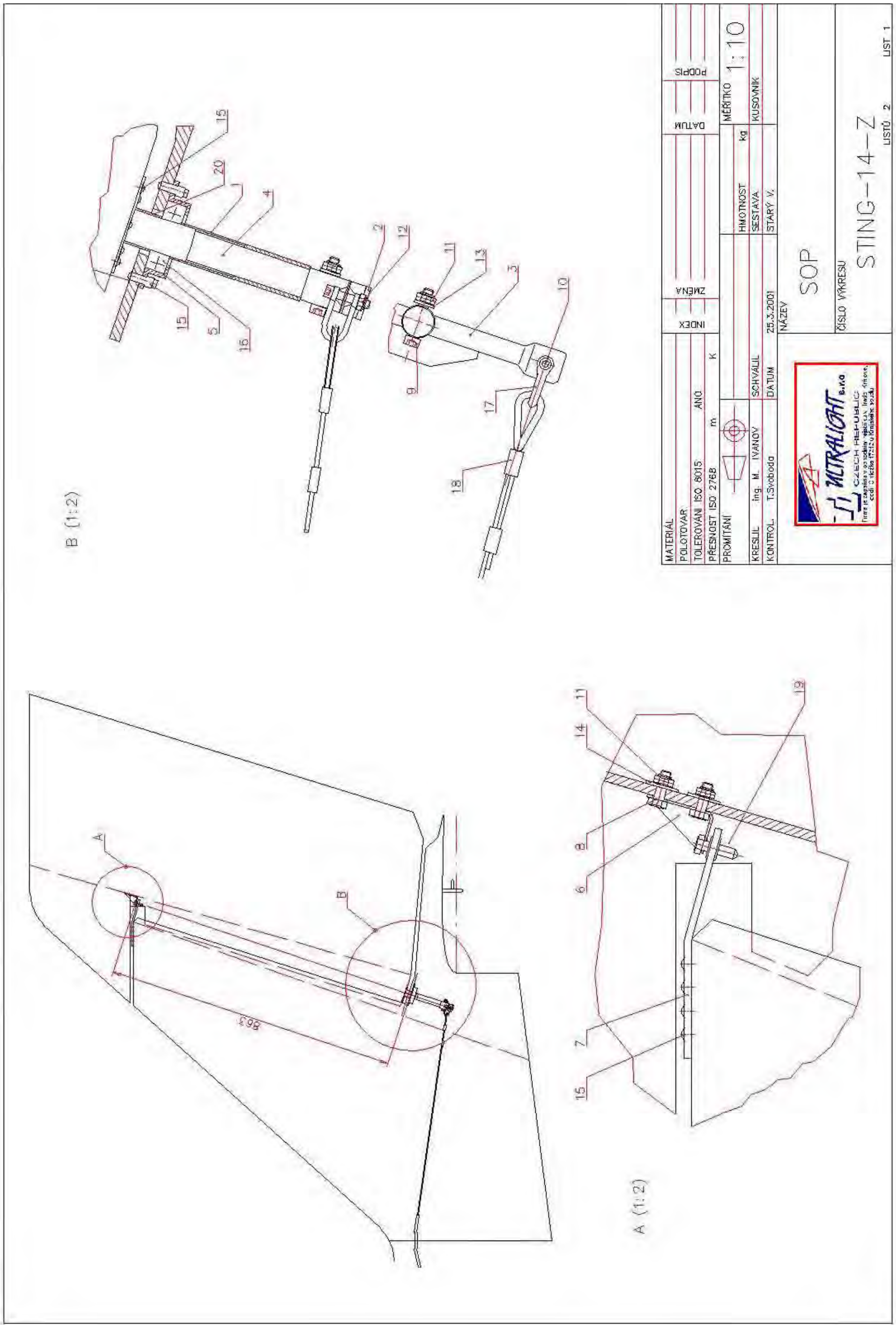
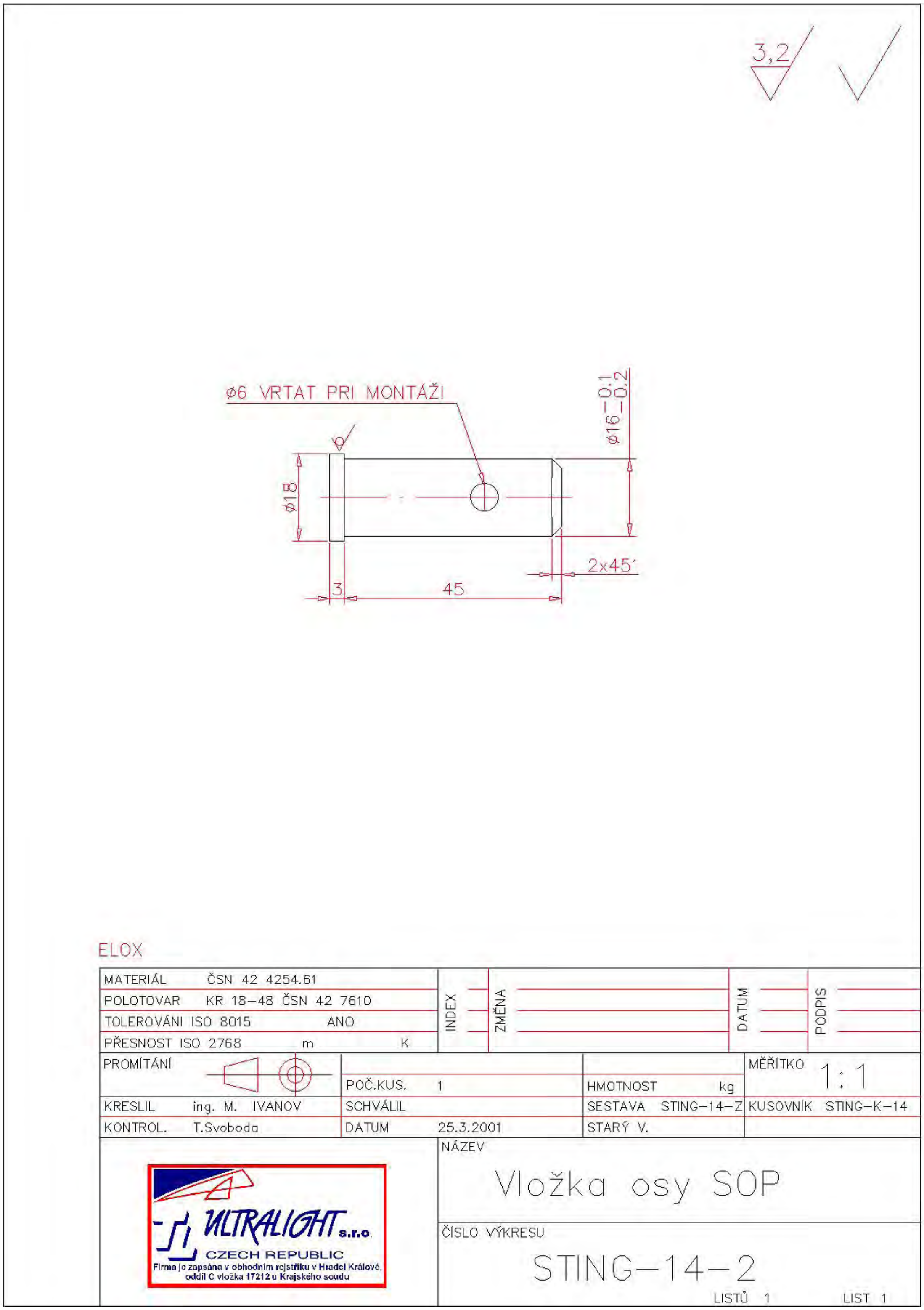

B (1:2)
A (1:2)
1:10
SOP
STING-14-Z

.


3,2
ø6 VRTAT PRI MONTÁŽI
ø16 −0.1 −0.2
ø18
2x45°
3
45
ELOX
MATERIÁL ČSN 42 4254.61
POLOTOVAR KR 18–48 ČSN 42 7610
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–14–Z
KUSOVNÍK STING–K–14
KONTROL. T.Svoboda
DATUM 25.3.2001
STARÝ V.
NÁZEV
Vložka osy SOP
ČÍSLO VÝKRESU
STING–14–2
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu

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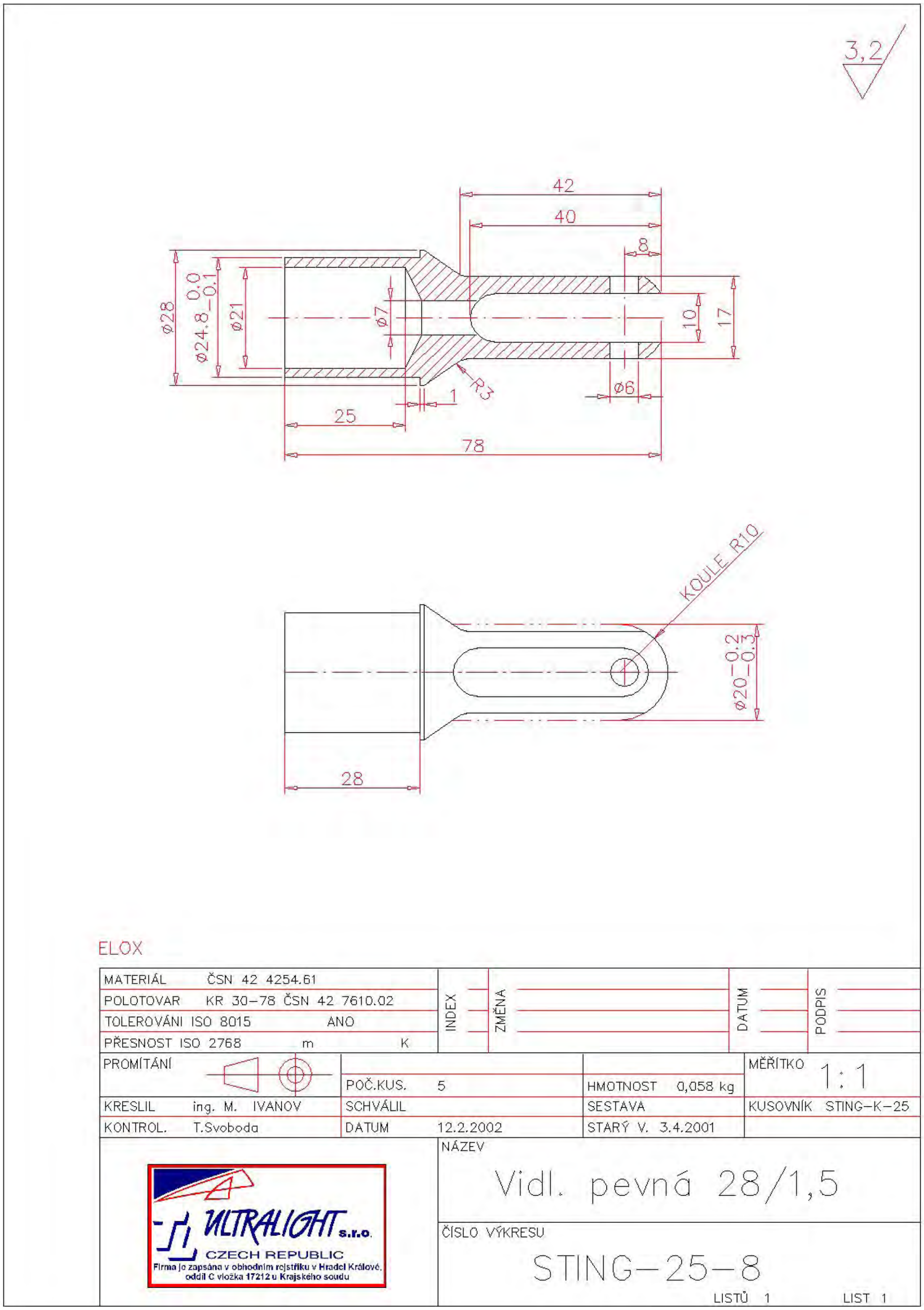
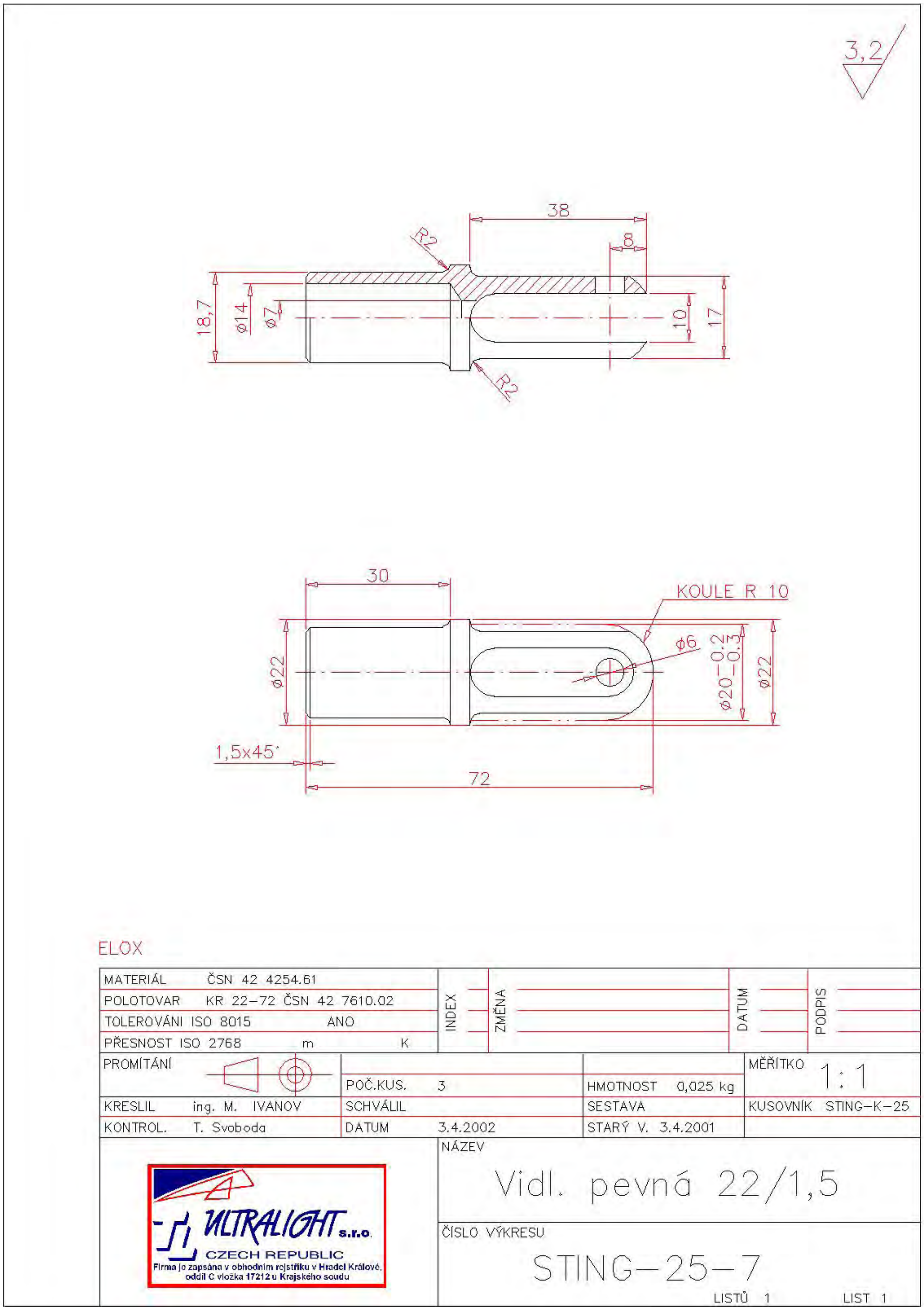
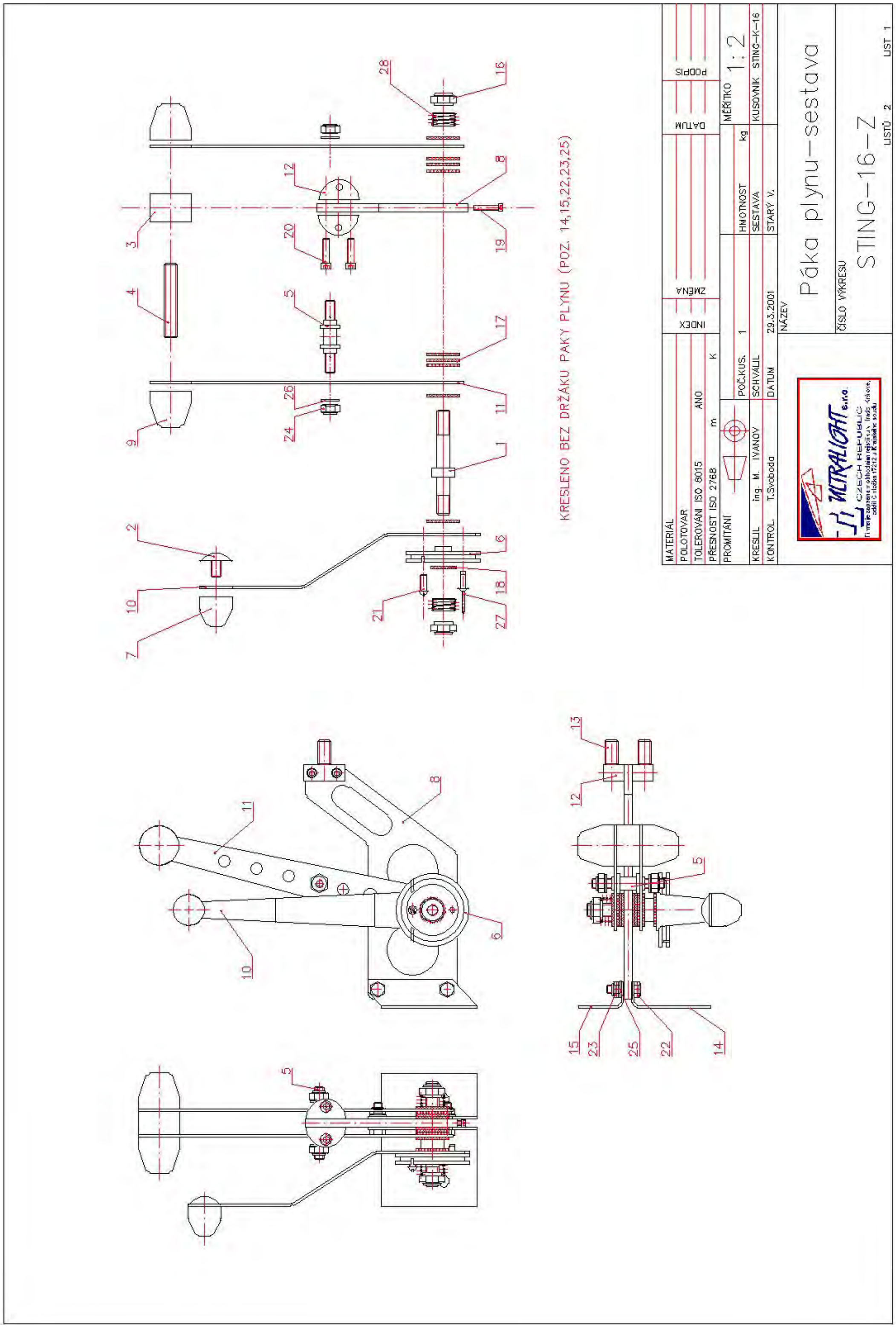
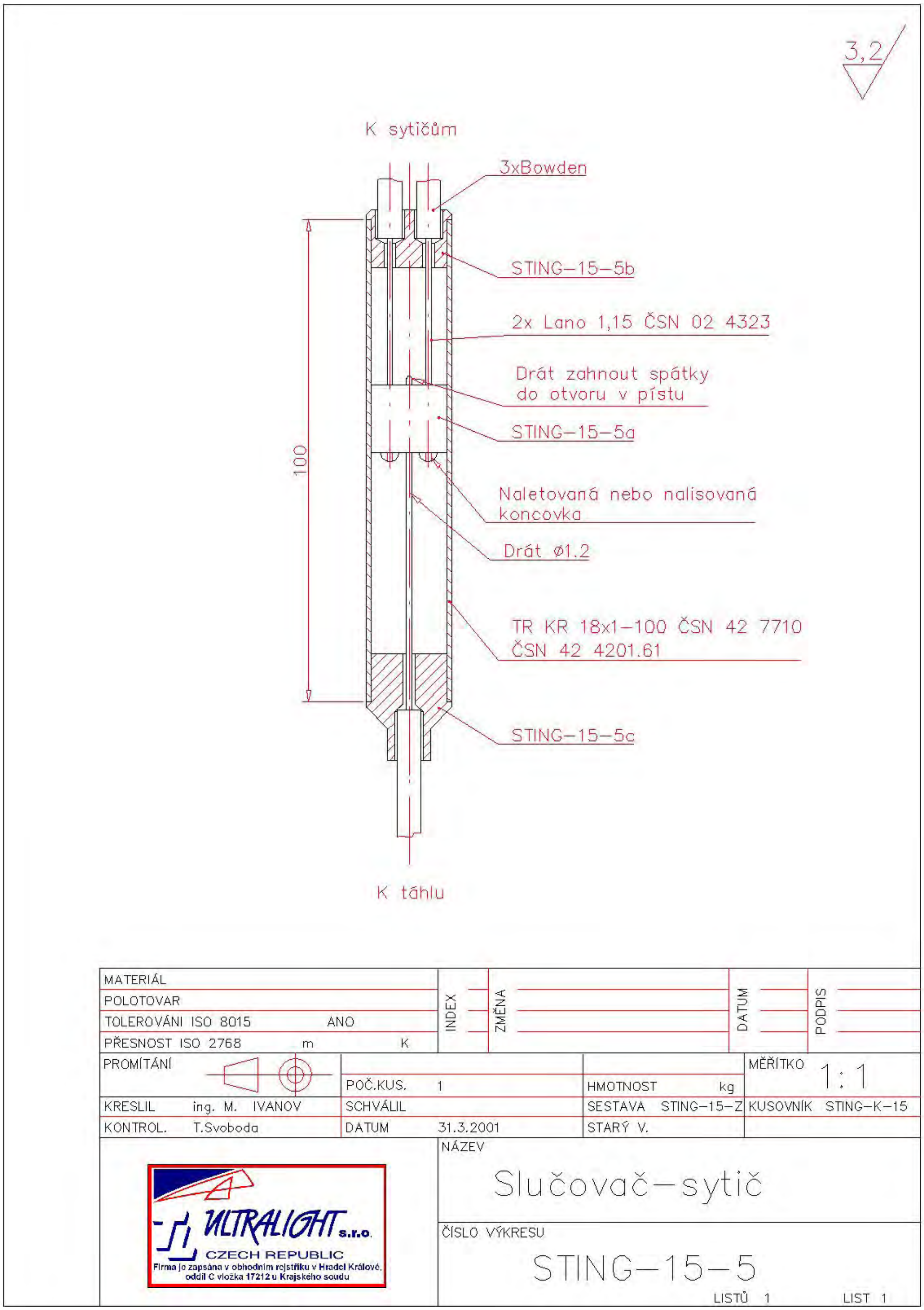
.
.

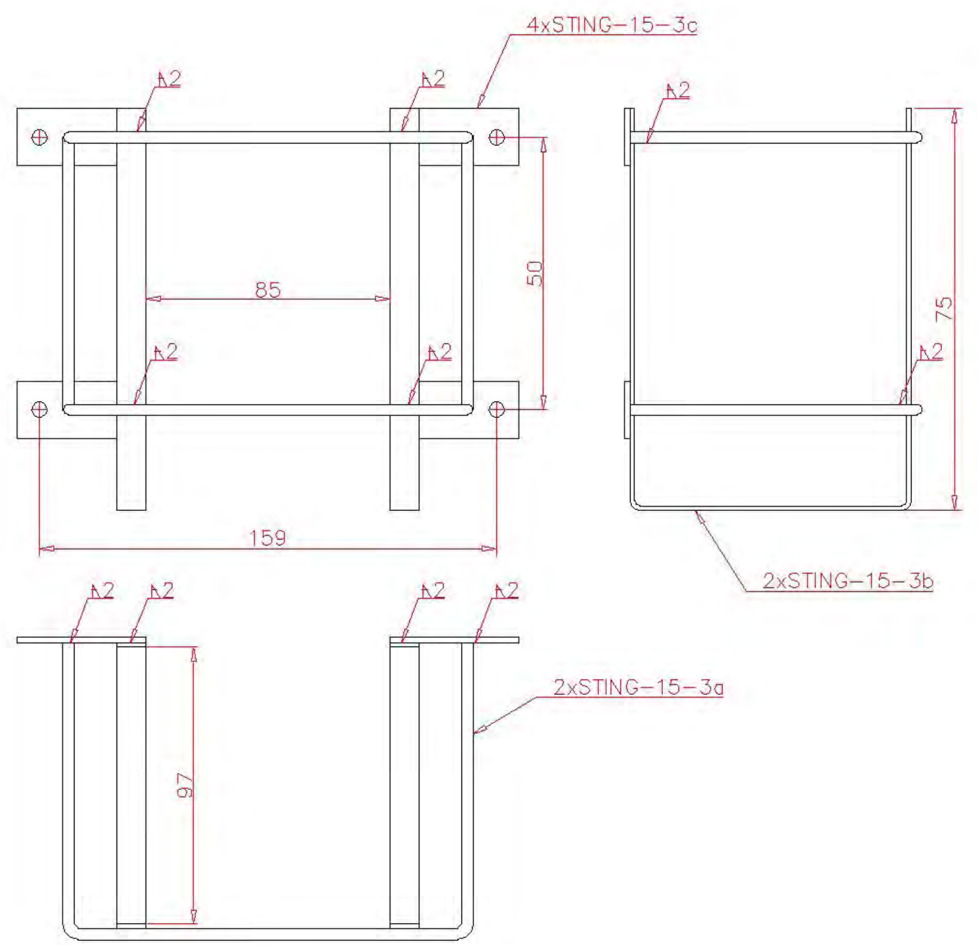

3,2
42
40
8
⌀28
⌀24.8_-0.1 0.0
⌀21
⌀7
10
17
R3
1
⌀6
25
78
KOULE R10
⌀20_-0.3 -0.2
28
ELOX
MATERIÁL ČSN 42 4254.61
POLOTOVAR KR 30–78 ČSN 42 7610.02
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 5
HMOTNOST 0,058 kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA
KUSOVNÍK STING–K–25
KONTROL. T.Svoboda
DATUM 12.2.2002
STARÝ V. 3.4.2001
NÁZEV
Vidl. pevná 28/1,5
ČÍSLO VÝKRESU
STING–25–8
LISTŮ 1
LIST 1
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu


3,2
38
8
R2
18,7
ø14
ø7
10
17
R2
30
KOULE R 10
ø6
ø22
ø20−0,2−0,3
ø22
1,5x45°
72
ELOX
MATERIÁL ČSN 42 4254.61
POLOTOVAR KR 22−72 ČSN 42 7610.02
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 3
HMOTNOST 0,025 kg
MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA
KUSOVNÍK STING−K−25
KONTROL. T. Svoboda
DATUM 3.4.2002
STARÝ V. 3.4.2001
NÁZEV
Vidl. pevná 22/1,5
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
ČÍSLO VÝKRESU
STING−25−7
LISTŮ 1
LIST 1


KRESLENO BEZ DRŽÁKU PÁKY PLYNU (POZ. 14,15,22,23,25)
Páka plynu-sestava
STING-16-Z
1 : 2
STING-K-16
29.3.2001
Ing. M. IVANOV
T.Svoboda


3,2
K sytičům
3xBowden
STING–15–5b
2x Lano 1,15 ČSN 02 4323
Drát zahnout spátky
do otvoru v pístu
STING–15–5a
Naletovaná nebo nalisovaná
koncovka
Drát ø1.2
TR KR 18x1–100 ČSN 42 7710
ČSN 42 4201.61
STING–15–5c
100
K táhlu
MATERIÁL
POLOTOVAR
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
INDEX
ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–15–Z
KUSOVNÍK STING–K–15
KONTROL. T.Svoboda
DATUM 31.3.2001
STARÝ V.
ULTRALIGHT s.r.o.
CZECH REPUBLIC
Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu
NÁZEV
Slučovač–sytič
ČÍSLO VÝKRESU
STING–15–5
LISTŮ 1
LIST 1

•



MATERIÁL			
POLOTOVAR			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 1	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA	KUSOVNÍK STING–K–15
KONTROL. T.Svoboda	DATUM 2.3.2002	STARÝ V. 29.3.2001	

INDEX | ZMĚNA | DATUM | PODPIS

ULTRALIGHT s.r.o.
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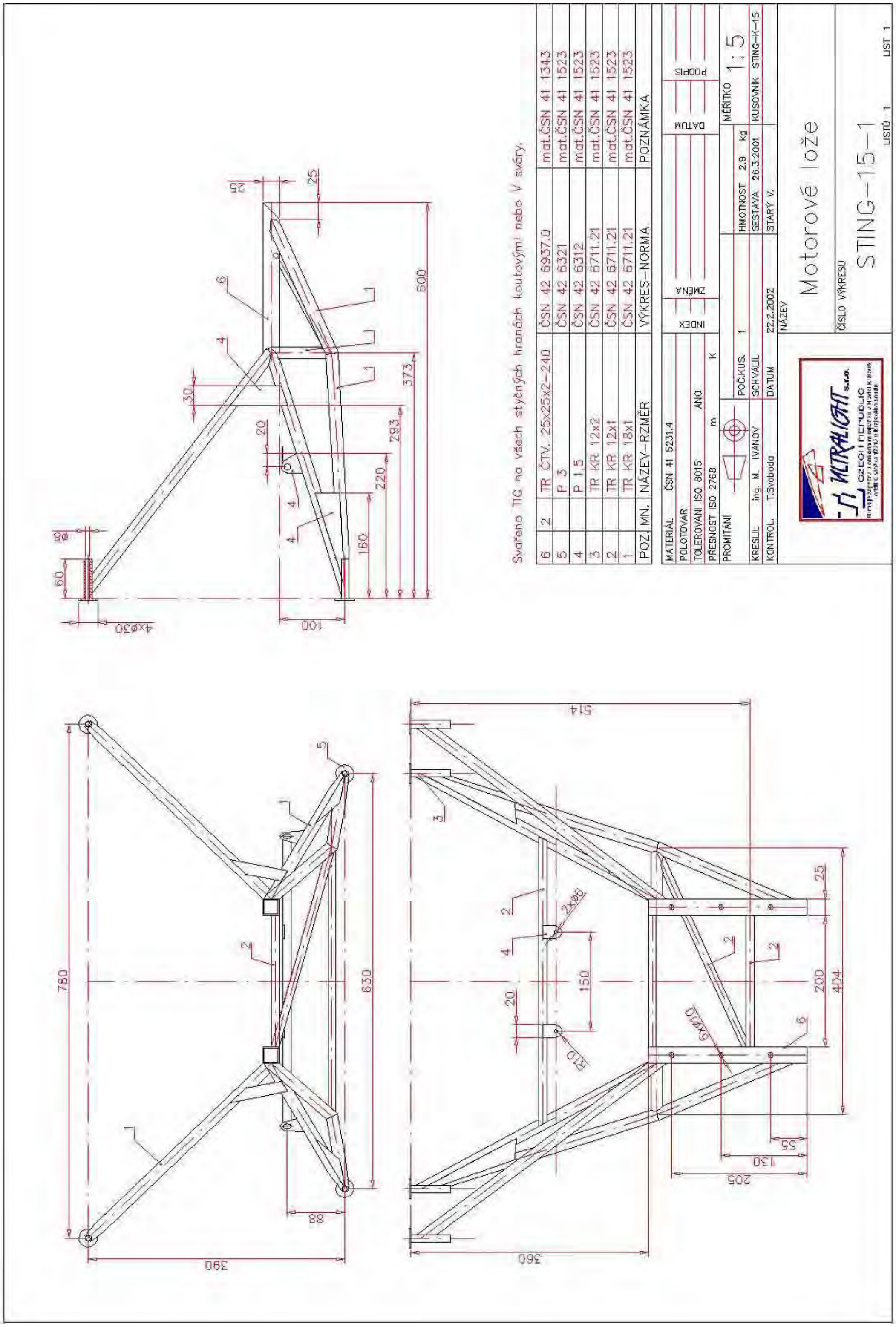
NÁZEV
Držák baterky

ČÍSLO VÝKRESU
STING–15–3

LISTŮ 1 LIST 1


Svařeno TIG na všech styčných hranách koutovými nebo V sváry.
6 | 2 | TR ČTV. 25x25x2–240 | ČSN 42 6937.0 | mat.ČSN 41 1343
5 | | P 3 | ČSN 42 6321 | mat.ČSN 41 1523
4 | | P 1.5 | ČSN 42 6312 | mat.ČSN 41 1523
3 | | TR KR 12x2 | ČSN 42 6711.21 | mat.ČSN 41 1523
2 | | TR KR 12x1 | ČSN 42 6711.21 | mat.ČSN 41 1523
1 | | TR KR 18x1 | ČSN 42 6711.21 | mat.ČSN 41 1523
POZ. | MN. | NÁZEV–RZMĚR | VÝKRES–NORMA | POZNÁMKA
MATERIÁL ČSN 41 5231.4
POLOTOVAR
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PROMÍTÁNÍ
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ZMĚNA
DATUM
PODPIS
KRESLIL Ing. M. IVANOV
KONTROL. T.Svoboda
POČ.KUS. 1
SCHVÁLIL
DATUM 22.2.2002
HMOTNOST 2.9 kg
SESTAVA 26.3.2001
STARÝ V.
MĚŘÍTKO 1 : 5
KUSOVNÍK STING–K–15
NÁZEV
Motorové lože
ČÍSLO VÝKRESU
STING–15–1
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LIST 1
ULTRALIGHT s.r.o.
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600
373
293
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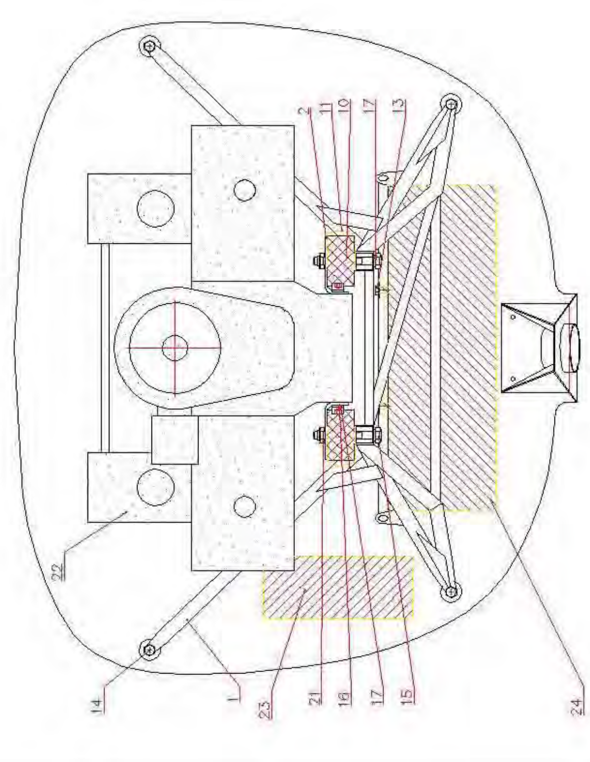
100
25
30
20
60
4xø30
514
780
630
390
360
88
150
2xø6
R10
200
404
205
130
55
25



POZ.	MN.	NÁZEV–RZMĚR	VÝKRES–NORMA	POZNÁMKA
24	1	Chladič vody		Rotax
23	1	Chladič oleje		Rotax
22	1	Motor R 912 (R 912S)		R–ROTAX
21	4	Matice M10 samojist.	ČSN 02 1492.25	
20	4	Matice M8 samojist.	ČSN 02 1492.25	
19	4	Matice M6 samojist.	ČSN 02 1492.25	
18	4	Podložka 6,4 velop.		
17	8	Podložka 10,2 pružná	ČSN 02 1740.05	
16	4	Šroub M10	ČSN 02 1143	originál ROTAX
15	6	Šroub M10x40	ČSN 02 1101.55	
14	4	Šroub M8x95	ČSN 02 1101.55	
13	2	Šroub M6x15	ČSN 02 1103.55	
12	4	Šroub M6x35	ČSN 02 1101.55	
11	4	Autopopruh 50x120	ČSN 80 8751	
10	4	Silent blok M10		Gumokov vyr.č.32.12
9	2	Bowden 1,15 x 800		lano 1,15
8	2	Bowden 1,15x1100		struna 1mm ocel
7	1	Táhlo sytiče		Bowden z V3S
6	1	Páka plynu–sestava	STING–16–Z	
5	1	Slučovač–sytič	STING–15–5	
4	4	Podložka pod lože	STING–15–4	
3	1	Držák baterky	STING–15–3	
2	2	Plech pod motor	STING–15–2	
1	1	Motorové lože	STING–15–1	

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PŘESNOST ISO 2768 m K
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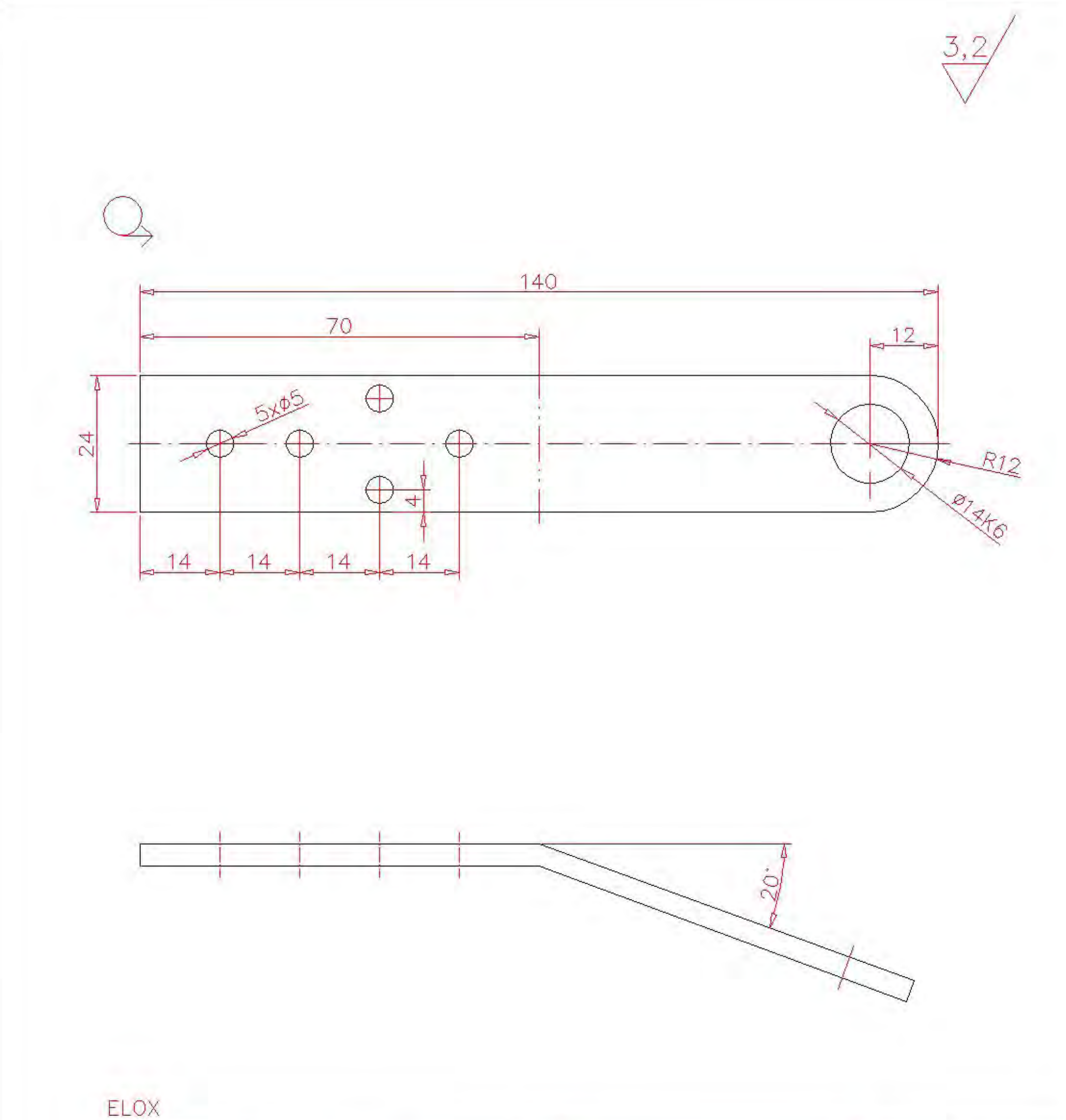
POČ.KUS.
HMOTNOST kg
MĚŘÍTKO 1:5
KRESLIL Ing. M. IVANOV
SCHVÁLIL
SESTAVA 30.3.2001
KUSOVNÍK STING–K–15
KONTROL. T.Svoboda
DATUM 24.2.2002
STARÝ V.

ULTRALIGHT s.r.o. CZECH REPUBLIC

NÁZEV
Uložení motoru
ČÍSLO VÝKRESU
STING–15–Z
LISTŮ 2 LIST 2



MATERIÁL ČSN 42 4201.61
POLOTOVAR P 4–24x140 ČSN 42 7305.62
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K

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PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–14–Z
KUSOVNÍK STING–K–14
KONTROL. T.Svoboda
DATUM 14.2.2002
STARÝ V. 25.3.2001

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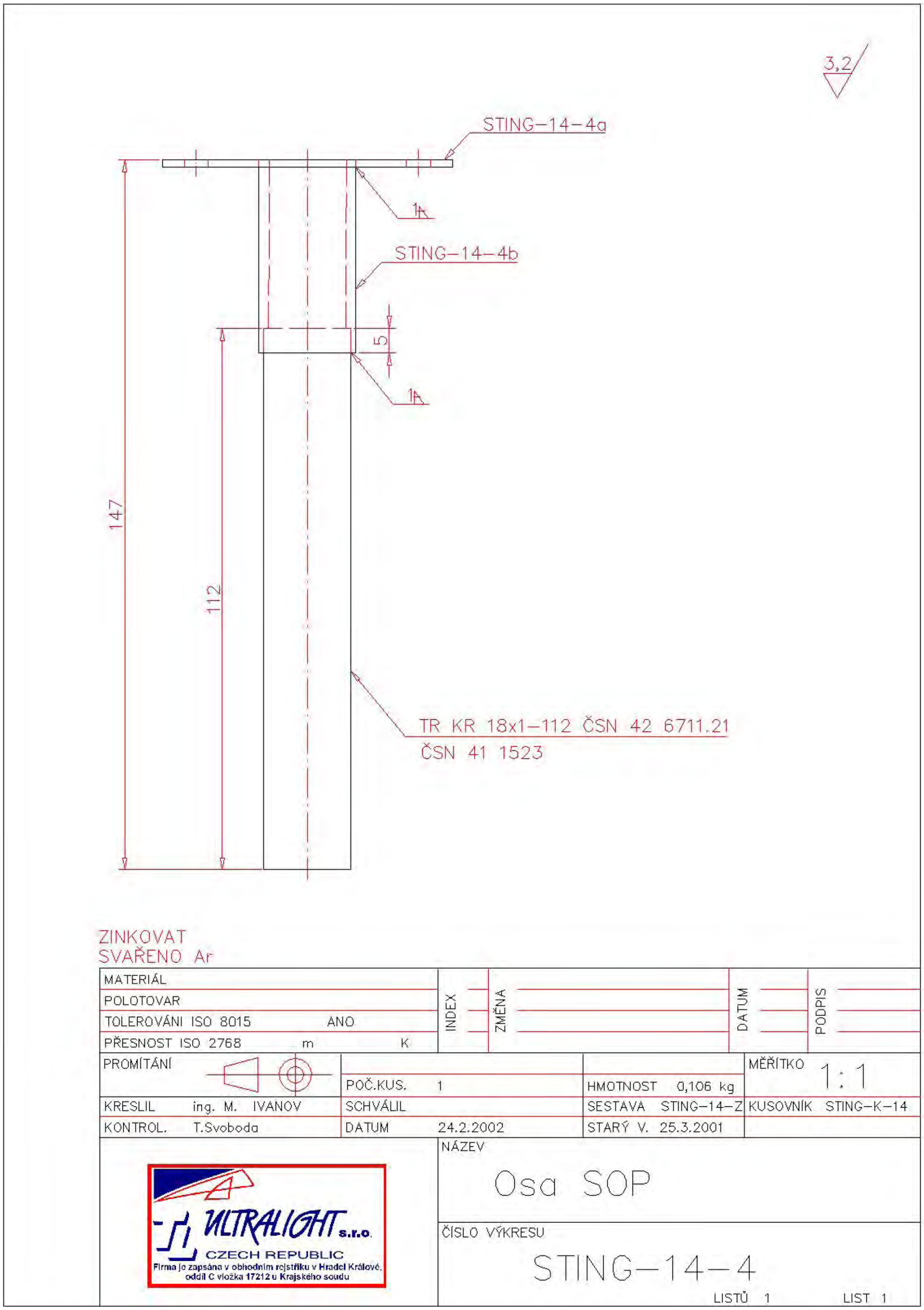
NÁZEV
Závěs SOP vrch.

ČÍSLO VÝKRESU
STING–14–7

LISTŮ 1 LIST 1


3,2
STING–14–4a
1
STING–14–4b
5
1
147
112
TR KR 18x1–112 ČSN 42 6711.21
ČSN 41 1523
ZINKOVAT
SVAŘENO Ar
MATERIÁL
POLOTOVAR
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768 m K
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ZMĚNA
DATUM
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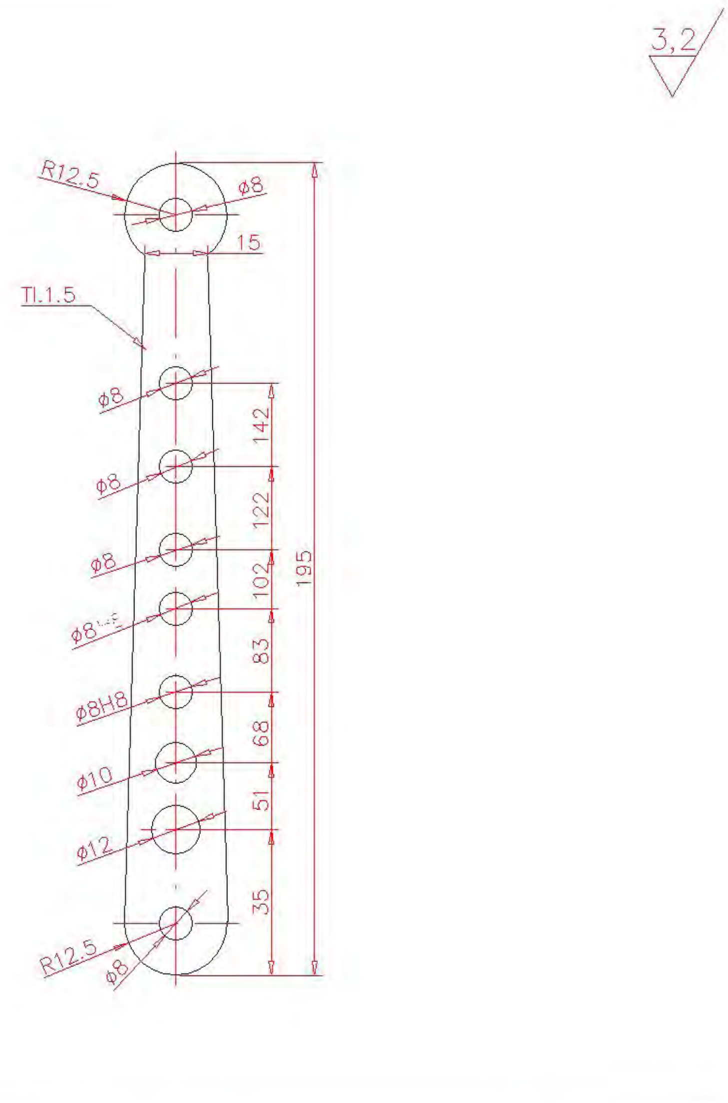
PROMÍTÁNÍ
POČ.KUS. 1
HMOTNOST 0,106 kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA STING–14–Z
KUSOVNÍK STING–K–14
KONTROL. T.Svoboda
DATUM 24.2.2002
STARÝ V. 25.3.2001
NÁZEV
Osa SOP
ULTRALIGHT s.r.o.
CZECH REPUBLIC
ČÍSLO VÝKRESU
STING–14–4
LISTŮ 1
LIST 1



MATERIÁL ČSN 42 4201.62	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR P 1.5–25x195 ČSN 42 7305.62			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 2	HMOTNOST kg	MĚŘÍTKO 1 : 2
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA STING–16–Z	KUSOVNÍK STING–K–16
KONTROL. T.Svoboda	DATUM 26.3.2001	STARÝ V.	

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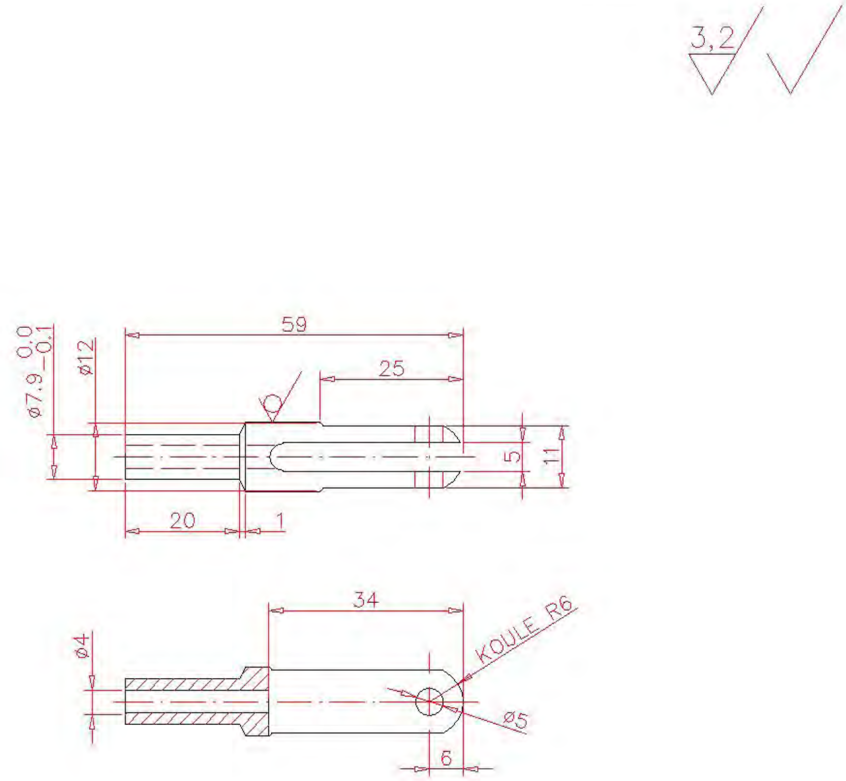
NÁZEV
Páka ovl. plynu

ČÍSLO VÝKRESU
STING–16–11

LISTŮ 1 LIST 1



ELOX

MATERIÁL ČSN 42 4254.61	INDEX	ZMĚNA	DATUM / PODPIS
POLOTOVAR KR 12−60 ČSN 42 7610.02			
TOLEROVÁNI ISO 8015 ANO			
PŘESNOST ISO 2768 m K			
PROMÍTÁNÍ	POČ.KUS. 4	HMOTNOST 0,006 kg	MĚŘÍTKO 1 : 1
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA	KUSOVNÍK STING−K−25
KONTROL. T. Svoboda	DATUM 3.4.2001	STARÝ V.	

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NÁZEV
Vidl. pevná 10/1

ČÍSLO VÝKRESU
STING−25−9

LISTŮ 1 LIST 1

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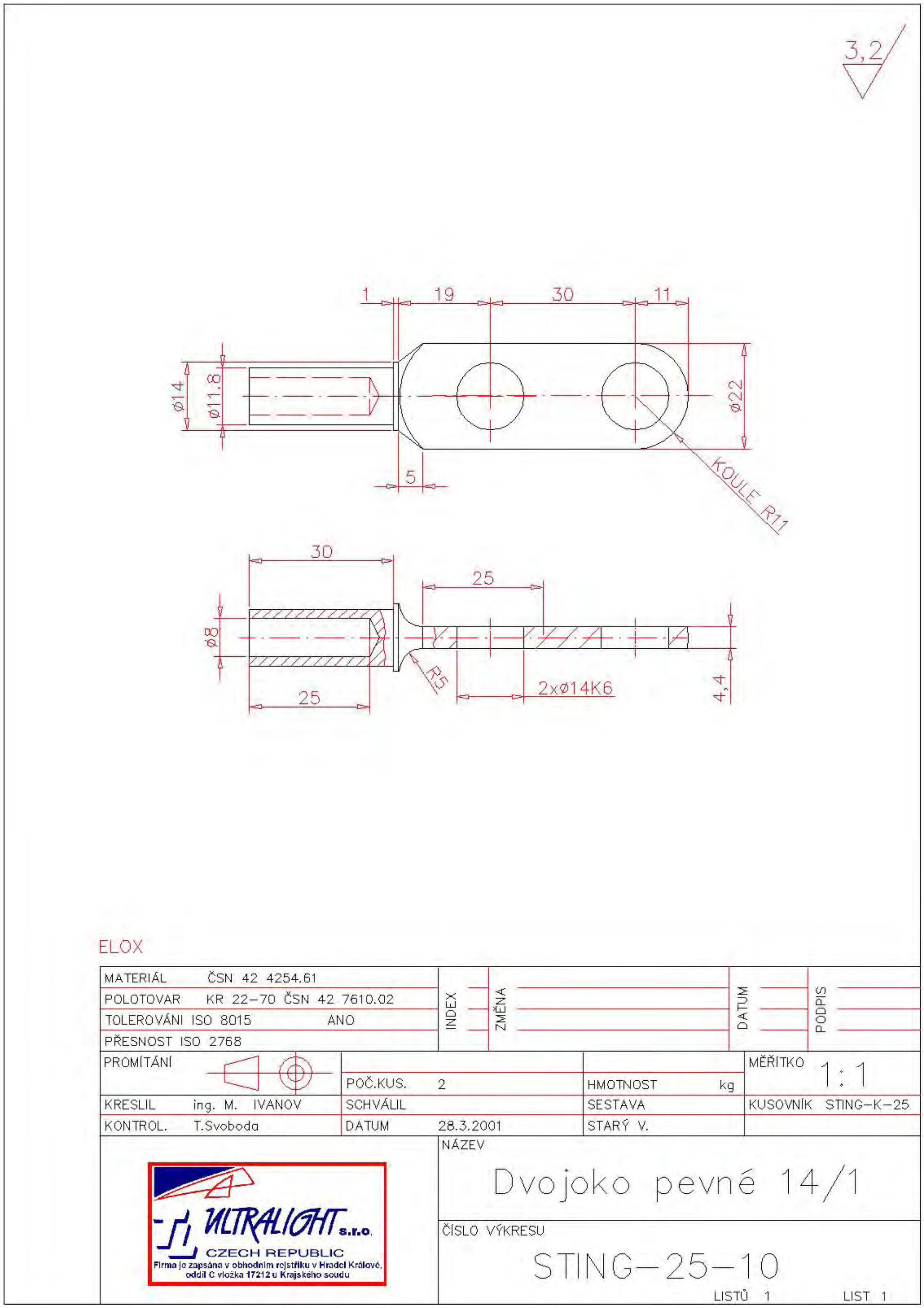
3,2
1
19
30
11
Ø14
Ø11.8
Ø22
5
KOULE R11
30
25
Ø8
R5
2xØ14K6
4,4
25
ELOX
MATERIÁL ČSN 42 4254.61
POLOTOVAR KR 22–70 ČSN 42 7610.02
TOLEROVÁNI ISO 8015 ANO
PŘESNOST ISO 2768
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ZMĚNA
DATUM
PODPIS
PROMÍTÁNÍ
POČ.KUS. 2
HMOTNOST kg
MĚŘÍTKO 1:1
KRESLIL ing. M. IVANOV
SCHVÁLIL
SESTAVA
KUSOVNÍK STING–K–25
KONTROL. T.Svoboda
DATUM 28.3.2001
STARÝ V.
NÁZEV
Dvojoko pevné 14/1
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ČÍSLO VÝKRESU
STING–25–10
LISTŮ 1
LIST 1

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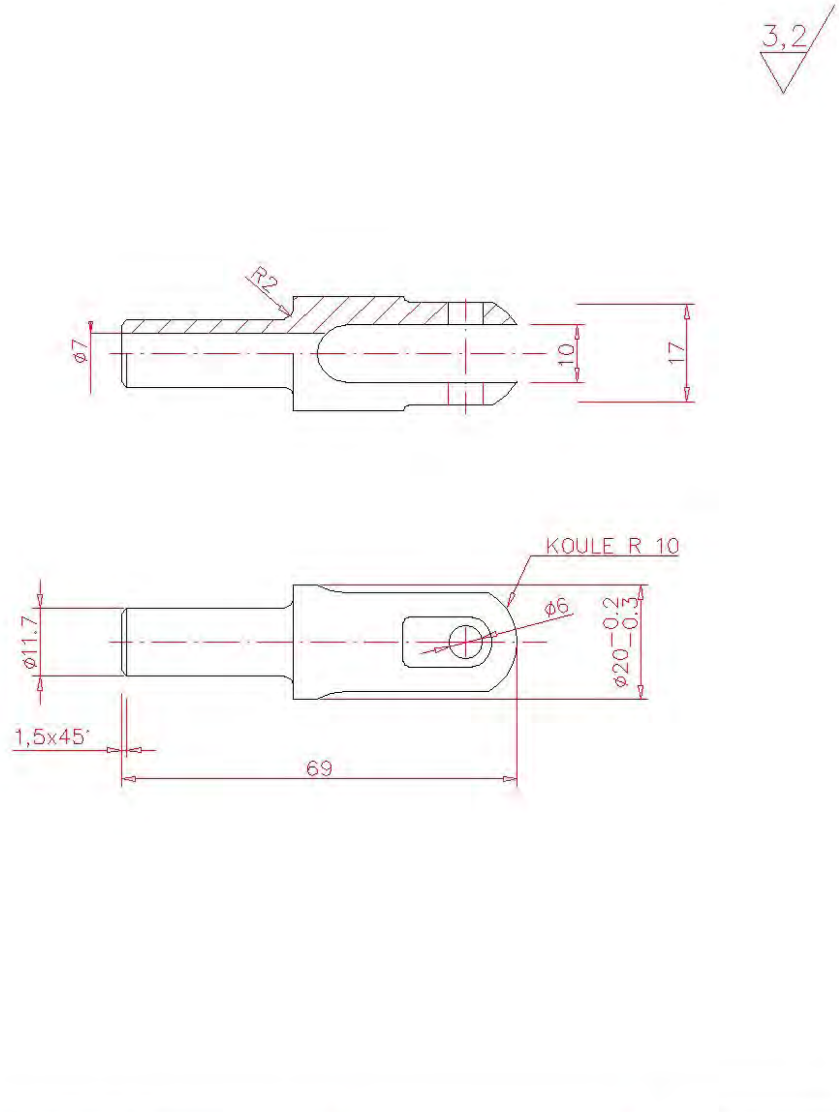

MATERIÁL ČSN 42 4254.61	INDEX	ZMĚNA	DATUM	PODPIS
POLOTOVAR KR 22−72 ČSN 42 7610.02				
TOLEROVÁNI ISO 8015 ANO				
PŘESNOST ISO 2768 m K				
PROMÍTÁNÍ	POČ.KUS. 9	HMOTNOST 0,025 kg	MĚŘÍTKO 1 : 1	
KRESLIL ing. M. IVANOV	SCHVÁLIL	SESTAVA	KUSOVNÍK STING−K−25	
KONTROL. T. Svoboda	DATUM 12.2.2002	STARÝ V.		
ULTRALIGHT s.r.o. CZECH REPUBLIC Firma je zapsána v obchodním rejstříku v Hradci Králové, oddíl C vložka 17212 u Krajského soudu	NÁZEV Vidl. pevná 14/1			
	ČÍSLO VÝKRESU STING−25−11	LISTŮ 1	LIST 1	

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SECTION 4
ENGINE

INTRODUCTION

The engine manufacture supplies engine maintenance and specifications with each aircraft as a CD which will contain PDF files of all maintenance manuals. This section does not replace any Rotax® specifications or procedures.

ENGINE

The aircraft is powered by a normally-aspirated, liquid/air-cooled, gear-reduced drive, dual carburetor-equipped, four-cylinder, four-stroke, horizontally-opposed Rotax 912UL engine with 73.91 cu. in. displacement; and is rated at 80 BHP at 5800 RPM. An optional Rotax 912ULS 95 HP engine may also be installed. Certified 900 series engines are also available. Main accessories associated with the engine include an electric starter, internal alternator, dual electronic ignition modules, engine driven coolant, oil and main fuel pumps. The crankcase is internally cooled by engine oil, and the cylinder heads are cooled by externally by flowing air, as well as internally by circulating coolant.

WARNING

The Rotax® UL engines are not certified. Even though the quality of assembly is of the highest priority to Rotax®, failure of the engine may occur at any time. The operator assumes full responsibility when operating the engine. The operator is also responsible to fly the airplane at all times with the ability to glide and land safely in a predetermined area in case of engine failure.

ENGINE COWLING

The engine cowling consists of two parts: upper cowling and lower cowling. The upper cowling is attached by means of screws the fire wall and to the lower cowling. An access lid which is located left at the fire wall enables the pilot to check oil quantity in the oil tank without removing the upper cowling.

The lower cowling is attached by means of 6 screws to the fire wall. In the front of the split cowl are two oval holes for air inlet to the engine and on the bottom there is an inlet for air to the radiator. On the right side there is a NACA type hole for air inlet to the oil cooler. At the base of the cowling and in front of the fire wall there is an opening for air to exit the engine compartment.

ENGINE CONTROLS

The throttle controls the engine's manifold pressure, and is located on the middle console between the two crew positions. As the throttle is advanced forward, or opened, more fuel will be provided for the engine. As the throttle is moved aft, or closed, less fuel will be provided for the engine. The throttle is at the "idle" position when the lever is completely aft, or "closed".

NOTE

Do not pull hard on the throttle to lower the engine rpm. The engine throttle stops can be bent by high pulling forces from the throttle cables. If the engine rpm is to high, the idle speed should be adjusted by the engine idle screws.

WARNING

Operation of both the engine driven and the auxiliary fuel pump for take-off and landing is not recommended as sufficient pressure is provided by the engine driven pump. The combined pressure output of both pumps has been observed to overcome the carburetor float valve

fuel cutoff, flooding the carburetor, preventing full power engine operation or cause engine failure.

IGNITION-STARTER SYSTEM

Two electrical ignition modules and two spark plugs per cylinder provide engine ignition. Each ignition fires the top plugs for one side of the engine and the lower plugs for the opposite side of the engine.

Two ignition switches are incorporated into the system (IGN1, IGN2). They provide a means of activating and deactivating, or grounding, the two ignition modules. These switches may also assist the operator in isolating engine deficiencies.

Starter operation is controlled by a momentary-push button. The starter solenoid is then energized, which in turn activates the starter.

AIR INDUCTION & EXHAUST SYSTEM

Unlike most conventional aircraft, air for induction is not ducted or baffled into each carburetor. Rather, the engine uses the air flowing around the engine that enters through two air intakes in the cowling behind the prop. An air filter is attached to each carburetor where air is drawn into the induction system. After being mixed with fuel in the carburetors, the fuel/air is then sent through the engine intake manifolds into the cylinders for combustion.
The carburetors are not inter-connected, so the engine can be described as two engines sharing one crankshaft. Because of this arrangement, the carburetors should be balanced at regular intervals or as noted to obtain best engine performance and to minimize engine vibration.

The exhaust system for the aircraft is made up of exhaust manifolds, a muffler, and an exhaust pipe. After the cylinders complete the exhaust stroke, the mixture is expelled through manifolds into a muffler and finally out through an exhaust pipe that extends downward from the engine cowling out the pilot side.

CARBURETOR SYSTEM

The aircraft's Rotax® engine is equipped with two horizontally-mounted, float-type, fixed jet, self-leaning carburetors. The right carburetor fuels the right side of the engine, and the left carburetor fuels the left side of the engine. The purpose of a carburetor is to mix air and fuel for combustion in the engine. Outside air is drawn into the carburetor where a fuel jet will atomize fuel mixing them together. After mixing, the fuel/air mixture is sent to the cylinders for combustion. Both carburetors contain a rubber diaphragm that self-leans the mixture as altitude increases. As air pressure changes, a diaphragm will move a piston controlling the amount of fuel/air sent to the fuel jet.

Each carburetor is also equipped with a small starting carburetor, commonly referred to as a choke, for starting. Starting a cold engine may be difficult, and the cylinders may need more fuel than air to burn. A starting carburetor is used to enrich the fuel/air mixture thus allowing more fuel to enter the combustion chamber. Both starting carburetors are tied to one control knob labeled “choke”,“start carb” or “cold start” located near to the throttle lever in the cockpit. The throttle must be in the idle position for the choke to operate.

ENGINE LIMITATIONS

See the latest engine manufacturer’s manual supplied with the aircraft for more detailed Rotax engine data.

Engine Manufacturer: Rotax® G.m.b.H. Aircraft Engines
Engine Model Number: 912 UL Maximum Power: 80 BHP
Alternate Engine Model Number: 912ULS Maximum Power: 100 BHP

Engine Operating Limits:

Maximum Engine RPM speed: 5800 RPM (5 Minutes Maximum)
Maximum Continuous Engine RPM speed: 5500 RPM (No time limit)
Maximum Cylinder Head Temperature: 239°F (with **.9** bar radiator cap)
Maximum Cylinder Head Temperature: 248°F (with **1.2** bar radiator cap)
Maximum Exhaust Gas Temperature: 1616°F

Oil Temperature,	Minimum: 120°F
	Maximum: 266°F
	Normal: 190 – 230°F
Oil Pressure,	Minimum: 20 psi
	Maximum: 102 psi
	Normal: 29 – 73 psi
Fuel Pressure,	Minimum: 2.2 psi
	Maximum: 5.8 psi

CAUTION

Exceeding the maximum fuel pressure may override the float valves of the carburetors and cause erratic engine operation. The fuel pressure of the additional electrical aux pump must not exceed 4.4psi.

ENGINE OIL SYSTEM

The components of the oil system include: oil reservoir tank, oil cooler, oil filter, engine-driven oil pump, and crankcase. Oil is introduced into the system via a cap in the oil reservoir tank. The engine driven pump then draws the oil from the reservoir, through the oil cooler, through the oil filter, and into the pump. Then the oil is forced into the crankcase oil galleries for engine lubrication where it then drains into the crankcase. Blow-back pressure forces the oil back the reservoir, and the process repeats itself. An over flow line is provided from the reservoir tank which is also the crankcase breather line.

Oil specifications: Oil type is dependant on engine operation conditions. Rotax Service Instructions, SI-18-1997 R5, dated September 2004 are shown in detail in Section 4: Fig. 4-1 and 4-2. Confirm that these are the latest Rotax engine oil recommendations prior to selection. The use of a semi-synthetic motor-cycle oil with gear additives is recommended.

CAUTION

The oil level can only be checked correctly by the dipstick within a few minutes of engine shutdown.

CAUTION

Contact with hot engine oil may cause scalds or severe burns. Take great care when dealing with hot engine oil or the oil level indicator dipstick.

CAUTION

Do not remove the coolant radiator cap when the engine is hot. The coolant will be dangerously hot and is under pressure. Relief of that pressure will cause the coolant to reach a boiling point, expand and spray out of the cap area. Severe burns may occur from hot coolant at normal engine operating temperatures.

NOTE

Rotax® advises that a two minute engine warm-up time is required before takeoff. This two minute warm-up **includes** taxi time.

WARNING

If you inadvertently switch off both ignitions at high RPM, do not turn the switches back on. Allow the engine to come to a stop and restart the engine.

Oil change (L/O,RI,RM,A&P)

- The oil supply for the gearbox is same as the engine oil supply.
- Change the oil after every 25 flight hours or six months.
- Change the filter when changing the oil.
- An oil change uses three (3) liters of oil.

The Rotax 912UL/912ULS engine maintenance handbook requires that you cut open and examine the old filter after each oil change before its disposal. An oil sample should be sent for analysis at each oil change to track the history of the engine oil contents. The oil filter material should be removed, unfolded, and examined carefully for any metallic scraps are an indication of early signals that could signify engine failure. It is recommended that an expert technician do this work.

Total oil volume in the lubrication system of Rotax 912 UL/S engine is 0.83 gallons. The oil tank is located in the engine compartment and oil dipstick is accessible after opening the lid on the upper engine cowling. Oil level must lie between min and max marks (flat part) on the dipstick and must not drop below "MIN" line.

Servicing the oil of the Rotax® 912 engine is dependant mainly upon two factors; fuel type and engine operation temperature. Because of the high lead content, 100LL Avgas, deposits a residue leading to operation difficulties more frequently when Rotax® engines are operated with leaded Avgas fuels. The lead contained in Avgas will deposit in the piston rings and in the rocker arms of the valve train. Use Avgas only while traveling when unleaded fuel is not available. When you return from traveling, change the oil to help eliminate the lead from the engine.

The engine lubrication is a dry sump system. The engine is equipped with a mechanically driven oil pump which ensures oil supply from the tank located on the firewall through the oil cooler and the oil filter to the lubricated locations in the engine. The oil pump is equipped with a pressure regulator, temperature sensor and a pressure transmitter. The oil tank is ventilated by the hose which is ported under the airplane. All EGTs, two cylinder head temperatures, fuel pressure, RPM, manifold pressure, oil pressure and temperature are indicated on the engine EIS system.

Prior to checking the engine oil level, run the engine at idle for a few minutes. Then, shut it down. As an alternate method, turn the engine by pulling the propeller over, by hand, through approximately 20-30 engine compression strokes until air is heard being pushed into the oil reservoir (gurgling sound). This will transfer all of the oil drained into the engine crank case back to the oil reservoir.

WARNING

Before hand-cranking the propeller, <u>ensure that both ignition switches are in the off position</u>. For safety purposes, always treat a propeller as though the engine could start at any time while cranking.

WARNING

Never turn the engine backwards (clockwise when viewed from the front to the rear of the aircraft) permanent damage to the engine may result due to loss of oil pressure to critical components.

Therefore, specific oil types coincide with fuel types and engine temperatures. Fig. 4.1 lists the oil types recommended for use with **unleaded fuels**. Fig. 4.2 lists the oil types recommended for use with **leaded fuels**. The information provided in these figures is in accordance with Rotax® Service Instruction SI-18-1997 R5. This instruction or its latest revision should be followed by the owner/operator.

Open the access panel on the upper cowling. To check the oil, unscrew the cap of the oil reservoir located at the rear of the firewall. Remove the dipstick to check the oil level. A flattened segment at the end of the dipstick represents the oil capacity range. The top of this segment is the MAX limit and the bottom of the segment is the MIN limit. Ensure the oil level is between these limits, but it must **never** fall below the MIN limit. The difference between MIN and MAX is 0.8 Qts.

NOTE

Change filter at every oil exchange.

NOTE

In order to keep all foreign deposits in suspension, only drain the oil after the engine has been warmed.

To best protect your engine, change the engine oil and replace the oil filter every 25 hours of engine operating time or after cross-country operation with 100LL Avgas. To properly change the oil and replace expended components, proceed as follows:

1. Remove the upper engine cowling.
2. Remove oil filler cap and dipstick from the oil reservoir.
3. Remove lid of oil reservoir by unfastening the clamp-down ring.
4. Remove inner screen and baffle insert from oil reservoir. Do not damage the large “O” ring.

WARNING

The careless draining of hot engine oil may cause scalds or burns. Use caution when dealing with hot engine oil.

5. Remove the oil reservoir from the firewall and empty the contents, or remove the drain plug and use a funnel to drain the contents or using a handheld pump, suck out the entire oil contents of the reservoir. Clean the interior reservoir and check for any debris prior to the addition of the new oil.

NOTE

Environmental regulations prohibit dumping of engine oil. To properly dispose of used oil, refill it into empty containers and take it to any participating automotive store or service station for recycling.

6. Unscrew old oil filter and remove it. Use a plastic bag wrapped around it to prevent spillage.
7. Remove the filter and cut off the top. Then cut off the upper and the lower lid of the insert. Remove the middle part of the insert, disassemble and check for metal chips, foreign objects and contamination.

CAUTION

If you detect an increased quantity of metal particles (brass or bronze chips or bearing abrasive), find out the reason and eliminate it before the next flight.

8. Fill the new oil filter half full with new engine oil before installation
9. Install the new oil filter.

NOTE

To ensure a better seal, rub fresh oil around the sealing ring of the new oil filter.

10. Snuggly screw on new oil filter by hand. Turn until hand tight and the seal is compressed – do not over-tighten or use a tool.
11. Place screen and baffle back into the oil reservoir and refasten the reservoir lid. Do not damage the large “O” ring.
12. Refill oil reservoir with new oil until the level is within range marks on the dipstick. Do not overfill because the oil will be blown out the overflow line coating the bottom of the fuselage..
13. Refasten the oil filler cap.
14. Start the engine and check for oil pressure indication. Then, shutdown the engine and check for oil leaks.
15. Recheck the oil level on the dipstick.

Engine Oils Recommended for Use with Unleaded Fuel (92 OCTANE AUTO GAS, ***not 87 Octane 'MoGas'***)

Brand	Name	Type	Viscosity	Use (engine temps & fuel types)
MOBIL®	Mobil 1	APISJ/CF	SAE 5W-30	Full-synthetic oil: for high temps; unleaded fuel only
MOBIL®	Mobil 1	APISJ/CF	SAE 15W-50	Full-synthetic oil: for high temps; unleaded fuel only
SHELL®	Advance VSX 4	APISG	SAE 10W-30	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel
SHELL®	Advance VSX 4	APISG	SAE 15W-50	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel
SHELL®	Advance Ultra 4	APISJ	SAE 10W-40	Full-synthetic motorcycle oil w/ gear additives: for high temps; unleaded fuel only
SHELL®	Formula Shell Synthetic Blend	APISJ	SAE 10W-30	Semi-synthetic oil: for normal-high temps; leaded/unleaded fuel
Yacco®	MVX 500 Synthetic	APISJ	SAE 10W-40	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel
Yacco®	MVX 500 Synthetic	APISJ	SAE 15W-50	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel
Valvoline®	Dura Blend Synthetic	APISJ	SAE 10W-40	Semi-synthetic oil: for normal-high temps; leaded/unleaded fuel
Pennzoil®	Motorcycle Motor Oil	APISH	SAE 20W-50	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel

*normal temperatures are defined as lower than 250ºF

*high temperatures are defined as higher than 250ºF

Figure 4.1 Oil for Unleaded Auto Gas

Engine Oils Recommended for Use with Leaded Fuel (100LL AVGAS)

Brand	Name	Type	Viscosity	Use (engine temps & fuel types)
SHELL®	Advance VSX 4	APIS G	SAE 10W-40	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel
SHELL®	Advance VSX 4	APIS G	SAE 15W-50	Semi-synthetic motorcycle oil w/ gear additives: for normal-high temps; leaded/unleaded fuel
SHELL®	Formula Shell Synthetic Blend	APISJ	SAE 10W-30	Semi-synthetic oil: for normal-high temps; leaded/unleaded fuel
SHELL®	Formula Shell	APISJ	SAE 10W-30	Petroleum-based oil: for normal temps; leaded fuel only
SHELL®	Formula Shell	APISJ	SAE 20W-50	Petroleum-based oil: for normal temps; leaded fuel only
Valvoline®	Dura Blend Synthetic	APISJ	SAE 10W-40	Semi-synthetic oil: for normal-high temps; leaded/unleaded fuel

*normal temperatures are defined as lower than 250ºF

*high temperatures are defined as higher than 250ºF

Figure 4.2 Oil for Leaded Avgas

ENGINE COOLANT (Ethylene Glycol – Non-Silica) (L/O,RI,RM,A&P)

NOTE

Recommended types of cooling liquid are shown in the Rotax service bulletins, generally automotive type for use in aluminum based engines, silica free, ethylene glycol mixed with distilled water in a 50/50 mixture.

Capacity: Total volume of cooling liquid in the engine is about 0.41 gallons. Replenish as required up to maximum of half the coolant overflow bottle. The level in the overflow bottle should be about in the center of the bottle when the engine is *hot.* Filling the bottle with the engine cold may result in overflow after expansion from the hot engine.

Engine cooling is a combination of water and air, the cylinder heads are liquid cooled; the cylinder walls are air cooled. The cooling circuit of the cylinder heads is a closed system containing the pump, an expansion reservoir with the pressure 'radiator' cap (on the engine), a radiator and the overflow reservoir. As a part of the cooling system, the carburetors are heated by a circulation loop between the pump and the radiator. Special care should be taken to assure that all air is bled and purged from the high points of the cooling system which includes the carburetor heat coolant hoses.

CAUTION

Rotax has advised that in some instances, conventional coolant (mixture ratio of 50% water and 50% antifreeze) can vaporize or boil, usually at turbulent flow areas which become 'hot spots', before the maximum permissible cylinder head temperature is reached. This means the liquid cooling system can lose a substantial amount of coolant while operating in the allowed cylinder head temperature range.

Evans NPG+™ coolant is then recommended only if required due to high engine temperatures from normal operation. Operation with Evans NPG+™ may result in higher engine temperatures that can exceed 30 degrees higher than operation with the conventional 50/50 coolant mixture. Evans NPG+™ is a waterless coolant which will not accept water and may not be recognized by line personnel prior to their addition of water to 'top off' the system.

To add engine coolant:

1. Remove the cap and inner screen of the coolant system's overflow bottle located on the upper right (co-pilot side) of the firewall
2. Fill as needed not to exceed the middle of the reservoir.

WARNING

Never add water or water-containing coolant in any circumstance to an Evans NPG cooling system.

SERVICING ANTIFREEZE (L/O,RI,RM,A&P)

Recent Rotax service advisories are available to recommend the coolant for each aircraft conditions of use. The Evans permanent coolant may assist in the elimination of hot spots in the cooling system, but it is not required in this aircaraft and may result in as much as 30 degree higher cylinder head temperatures due to its low heat transfer capability. Please consult your authorized technician for detailed assistance in your unique cooling operation problems.

Use an antifreeze coolant with anti-corrosive ingredients and without silica as prescribed for engine blocks made of aluminum base alloys. Follow the coolant manufacturers' directions, generally mixture concentrations of 50% antifreeze and 50% distilled water will give the best protection and heat exchange.

Do not mix the coolant in a higher concentration than recommended by the antifreeze manufacturer because it can harm individual parts of the cooling system and degrade the transfer of heat. The density of the coolant should be checked prior to winter. Fill the overflow tank to one half full with coolant while the engine is cold.

CAUTION

To prevent scald burns, do not open the radiator/coolant reservoir tank cap when the engine is hot.

While draining the coolant, open the cap of the tank and release the low hose of the radiator, which is located below the engine, to allow the old coolant to drain. After draining, put the hose back in place and tighten the clamp carefully. While changing the coolant, it is also necessary to bleed the air from the high parts of the system such as the constant carburetor heaters.

FUEL

Approved Fuel Grade: 92 Unleaded Auto Gas (Yellow)
Alternate Fuel Grade: 100LL Avgas (Blue)
(100LL is only to be used for ***less*** than 30% of engine operation time)

Total Capacity: 18.0 or 20.5 Gals
Total Unusable: 1.7 Gals

WARNING

When fueling the airplane, ensure the airplane is electrically grounded by verifying that the grounding wire located on the right main gear wheel makes adequate contact with the ground's surface. Also, ensure the fueling container remains adequately grounded to fuel neck ring and nozzle. A ground wire from the refueling container should be attached to the engine exhaust pipe. The exhaust pipe is electrically connected to the aircraft ground system as are all fuel tanks and tank opening ports.

CAUTION

The main tank has a 22.2 gallon total capacity when completely filled to the neck. The wing aux tanks (if installed) have a 6.3 gallon (each) capacity. However, filling the fuel tanks to the top of the filler neck will cause fuel to be vented overboard due to liquid expansion. For this reason, fill the main tank to only 20.5 gallons and the wing aux tanks (if installed) to no more than 6 gallons each.

NOTE

To minimize the chance condensation of water inside the fuel tank, fill and service the fuel tanks after each flight.

'MoGas', motor fuel, available at some airports, is not a suitable fuel. The octane rating for MoGas is usually only 87 and therefore may cause detonation during engine operation.

CAUTION

100LL Avgas is to be used **only as an alternate fuel type** if 92 octane auto fuel is not available. **The use of 100LL Avgas is restricted to *less* than 30% of engine operation time.**

ENGINE MAINTENANCE

Directions needed for the operation of the Rotax engine 912UL/912ULS are in the handbook that you received with the airplane. Keep the engine clean and look for incidental oil leakage that can signal the necessity of authorized service maintenance of the engine. Only the basic steps for maintenance are in this handbook.

Service Life, Repairs and Engine Repairs (L/RM,A&P)

The manufacturer suggests engine/airframe inspections after 25, 100 and annual condition inspections with the tolerance plus or minus ten hours. These tolerances cannot be added. The annual condition inspection is performed once a year regardless of how many flight hours since the previous inspection.

The extension of suggested repairs is found in the original handbook for the 912UL/912ULS Rotax Engine. The handbook is delivered with the airplane. It is a shop handbook that is not written for immediate use. There is no translation of this handbook provided by the aircraft manufacturer and the engine producer assumes that an authorized technician will perform the suggested maintenance of the engine.

The inspections every 25 hours of operation are combined with the changing of the oil and oil filter. The manufacturer does not recommend that the engine use 100LL AVGAS for full time operation. More frequent oil changes would be expected when a high percentage of fuel service is with 100LL AVGAS.

CAUTION

Following every filter exchange, cut the old filter, unfold it and examine it very carefully for any metallic, steel, bronze or aluminum splints, scraps of tamping, etc. Any occurrence of these in the filter usually suggests that there is increased wear or damage of the engine. In addition, an oil sample should be taken with each oil change and submitted for analysis. These practices will assist you in keeping excellent health for your engine.

Some of the tasks during aircraft inspections can be performed by the Owner. Some of the tasks can only be done by an authorized repairman. An authorized service representative should perform these inspections for both the airframe and the engine.

CAUTION

To maintain a safe engine, repairs should be made only by the manufacturer or an authorized technician. During the warranty period, it is recommended that all engine and airframe work be done by an authorized technician or with approval of the manufacturer.

Service Life of Rubber Engine Parts (L/RM,A&P)

All rubber engine parts should be changed after five (5) years from the date of manufacturing. The service life of the rubber engine parts does not fall under "visual" inspection. An authorized technician approved by the manufacturer or the manufacturer should perform these changes.

SERVICING SPARK PLUGS (L/O,RI,RM,A&P)

- Inspect and clean the spark plugs every annual condition inspection (100 hours of operation if commercial use), or if you encounter difficulty in starting the engine. The distance of electrodes is 0.7mm.
- The condition of the spark plugs at the time of inspection can signal other problems with the engine (e.g. non-conducive environment,

temperature, bad air filter, or looseness of valves). The spark plugs should be light brown to brown in color.

- Change the spark plugs after every 200 hours. The Rotax engine manufacturer suggests that. when replacing the plugs you cover the plug threads with a paste that will improve the transfer of heat between the body of the spark plug and the head of the cylinder. If you do not have access to this type of paste, have an authorized technician do the work.
- Check the attachment of the spark plug connectors. They should have a 30N minimum tightening force

Engine Test (L/O,RI,RM,A&P)

1. Perform the test at the place assigned for performing engine tests in a clean area to prevent propeller damage.
2. Equip the aircraft with extinguisher suitable for extinguishing burning liquids and electrical installation.
3. Chock the airplane.
4. Before performing engine test complete the preflight check of the engine and the propeller in accordance with the AOI.
5. Start the engine according to the AOI.
6. After starting the engine, adjust idle RPM so that engine runs stabilized (1800 +100 RPM warm).
7. Check the following parameters:
   - Oil pressure min. 12 psi within 10s (max. 96 psi for a short time after the cold start)
   - Fuel pressure min. 2.2 psi

NOTE

Switch off the engine ignition unless instruments indicate minimum oil pressure within 10 seconds,.

8. As soon as oil pressure reaches 35 psi, warm up the engine.
9. Warm the engine at 2000±50 RPM for at least 2 min.
   - Increase RPM up to 2500±50 RPM warm until oil temperature reaches 122°F
   - Choke OFF
10. Ignition check:
    - Engine speed 4000 RPM
    - Ignition switch switch from position **BOTH ON** to **L**, record RPM drop

- Ignition switch switch from position **BOTH ON** to **R**, record RPM drop

NOTE

RPM drop between both ignition switches ON and L or R must not exceed 300 RPM. Mutual difference between ignition circuits L and R must not exceed 120 RPM.

11. Test of max. RPM on the ground:
12. Throttle FULL
13. Record max. RPM

Adjusting throttle control (L/RM,A&P)

1. Pull the throttle control to the carburetor stop. The throttle lever on the carburetor must also be on the stop. The Bowden cable must be supported in the terminals.
2. Release the nut on the carburetor control lever and stretch the cable slightly and tighten the nut.

CAUTION

Control cable should not be too tight because of a possible deformation of the control stop lever on the carburetor.

3. Check again whether the levers on the carburetor are on the stops. If not, perform adjusting by means of adjustable screw terminals on Bowden cables.
4. In order to prevent the Bowden cables at the carburetor from shifting out from the terminals, secure them with safety wire. Mark al bolted joints with registration paint.

Adjusting choke control (L/RM,A&P)

1. Push in the choke knob to the stops and pull them out again by about 1/8”. The lever of choke control on the carburetor must be on the stop. The bowden must rest on the terminals.
2. Release the bolt on the lever of choke control, slightly loosen the cable and tighten up the bolt.
3. Check again if the knob and the lever on the carburetor are on the stops. If not, adjust the bowden terminals.

4. To prevent the choke Bowden cables from shifting out of the terminal, secure them with safety wire. Mark all bolted joints with registration paint.

Adjusting cabin heating control (L/RI,RM,A&P)

1. Push in the cabin heating knob to the stop and pull it out by about 1/8". The changeover lever on the hot air intake collector must be on the stop. The bowden must rest on the terminal.
2. Release the bolt on the changeover lever, slightly stretch the cable and tighten up the bolt.
3. Check again whether the knob and the lever on the air intake collector are on the stops. If not, carry out adjustment by adjustable bowden terminals.

Checking exhaust system (L/O,RI,RM,A&P)

WARNING

Check exhaust system very carefully. A leaky exhaust can expose the crew to danger by carbon monoxide poisoning, can result in engine power loss, or possibly fire.

Check the exhaust system for cracks. Pay special attention to the following areas:

1. all areas of pipe radius
2. muffler in the area of the input and the output pipe and the collector head
3. all welds and their immediate surrounding
4. carefully check any areas showing local overheating caused by exhaust gases.
5. check the whole exhaust pipe between the engine and the muffler including its attachment to the engine.
6. check outlet pipe from the muffler.

Exchange / Check of air filter (L/O,RI,RM,A&P)

1. Remove the hose clamp attaching the air filter to the carburetor intake.
2. Inspect the air filter and if contaminated, clean it according to instructions in the Maintenance Manual for ROTAX Engine Type 912 Series.
3. Attach the cleaned or new filter to the carburetor with the clamp.
4. Install safety wire to retain the filter.

Engine parts with limited life (L/RM,A&P)

The following parts must be exchanged every 5 years:
1. air hoses to the carburetors
2. all rubber hoses in the engine cooling system
3. all rubber hoses in the engine oil system
4. carburetor flanges
5. carburetor diaphragms
6. fuel pump including fuel hoses
7. engine coolant must be exchanged every two years
8. spark plugs must be exchanged every two years.

Exhaust system removal (L/RM,A&P)
1. Remove the springs from the individual pieces of the exhaust attaching the exhaust pipe to the muffler.
2. Remove individual pieces of pipe from the engine exhaust ports.
3. Remove the bolts and the sleeves on the muffler.
4. If necessary, remove the muffler bracket.

Radiator Removal (L/RM,A&P)
1. Drain the coolant from the cooling system.
2. Remove the clamps attaching the hoses to the radiator.
3. Remove bolts attaching the radiator to the upper and lower brackets of the engine mount.
4. Remove the radiator.
5. On replacement, completely purge all the trapped air out of the coolant system. The high points of the system include the constant temperature carburetor heater system.

Oil cooler removal (L/RM,A&P)
1. Drain oil from the oil system.
2. Remove nuts from the oil cooler necks.
3. Remove the adapters from the cooler necks.
4. Remove nuts from the cooler necks attaching the cooler to the brackets on the engine mount and firewall.
5. On replacement, accomplish the complete oil service for the initial oil installation to completely purge the air out of the engine parts.

Removal of the engine from the airplane (H/RM,A&P)
1. Remove engine cowling.
2. Disconnect and remove the battery.
3. Remove the propeller.
4. Disconnect all electrical system wires and the engine ground wire.
5. Shut the fuel shutoff (drain fuel from the fuel system)

6. Drain oil and coolant from the engine.
7. Disconnect hoses of the oil and the cooling system.
8. Disconnect engine fuel pump
9. Remove the oil cooler and radiator hoses.
10. Disconnect carburetors and carburetor heat hoses.
11. Remove the exhaust system.
12. Close all holes on the engine so that no debris can get into the engine orifices.
13. Suspend the engine from the intake system to balance it on a crane and gradually remove the six bolts attaching the engine to the mount.
14. Put the engine on a suitable support.

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SECTION 5
FUEL SYSTEM

INTRODUCTION

The StingSport fuel system is a simple to operate system which requires no wing mounted trim to compensate for fuel unbalance during normal operation. There are no pressurized fuel lines in the cockpit area. The single main fuel tank is standard. Optional wing tanks may be installed. Some aircraft wing tanks may include switches, lights, pumps and filters but gravity feed to the main tank is standard.

FUEL SYSTEM

The aircraft's fuel system consists of one vented, 18.0/20.5 gallon (usable) main tank; two optional, 6 gallon (useable) vented auxiliary wing tanks; a shut-off valve; a fuel filter; an electric auxiliary pump with green indicator ON light; an engine-driven fuel pump; and two carburetors. There is also a metered "bleed" return from the fuel manifold pressure line that returns to the main tank.

The shut-off valve located next to the fuel gauge has two positions: OPEN (vertical) and CLOSED (horizontal). No fuel will be available from the tank when the valve is in the CLOSED position, but it will be available when in the OPEN position. When closed, the shut-off valve is designed to touch and "poke" the pilot's right leg.

Fuel is drawn from the main tank through the shut-off valve where it then passes through the fuel filter. From there the fuel is drawn through the electric-driven auxiliary pump to the engine-driven pump. Then under pressure to the carburetors, fuel pressure sensor, and the metered fuel return line. When the auxiliary fuel pump is activated, fuel is drawn from the filter and through the by-pass side of the engine-driven pump, and then sent to the carburetors. Whenever the auxiliary pump is ON, a green indicator light located on the center instrument panel will be illuminated. Operation of the auxiliary fuel pump in combination with the engine driven pump will have little effect on fuel pressure since both are rated at the same pressure.

Ventilation of the fuel tank is provided by a vent line from the top of each tank. The main vent line runs up the cockpit side of the firewall, is directed downward, and is exposed outside beneath the cowling. Each of the fuel tanks must receive ventilation for proper operation. Ensure that no blockage occurs in the vent line by compression or on the exposed end of the line where it protrudes from the engine cowling or either of the under wing vents for the aux wing tanks.

CAUTION

The main tank has either an 18.0 or 22.2 gallon total capacity when completely filled to the neck. However, filling the fuel tank to the top of the filler neck will cause fuel to be vented overboard due to liquid expansion. For this reason, fill the main tank to only 18.0 or 20.5 gallons. Similarly the wing tanks have a capacity of 6.3 gallons but should only be filled to 6.0 gallons.

Fuel Grade: ***92 Octane Unleaded Auto Gas***; *100LL Avgas (alternate grade)*

CAUTION

100LL Avgas is to be used **only as an alternate fuel** type if 92 octane auto fuel is not available. **The use of 100LL Avgas is restricted to less than 30% of engine operation time by the engine manufacturer.** If 92 Octane Unleaded is not available during travel, adding 100LL Avgas to partial tanks of 92 Unleaded is acceptable.

CAUTION

The aircraft manufacturer does not recommend the use of additives such as TCP for leaded fuel (Avgas) operations. Following use of Avgas during travel, run the engine to warm the oil. Then, change the oil to reduce the effect of lead on engine life.

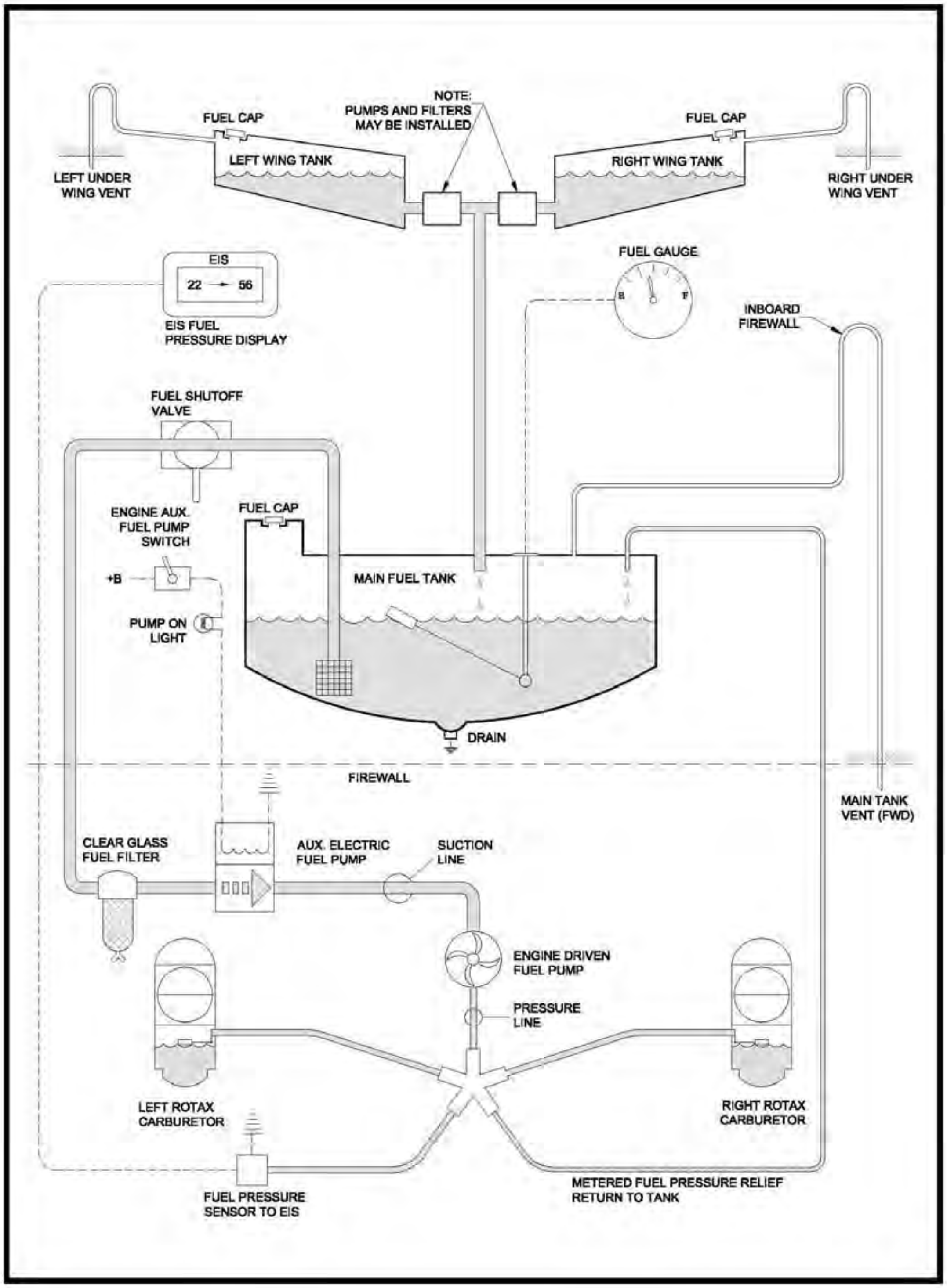

Figure 5.1 *StingSport* Fuel Schematic

FUEL

Approved Fuel Grade: 92 Unleaded Auto Gas (Yellow)
Alternate Fuel Grade: 100LL Avgas (Blue) (for ***less*** than 30% of engine operation time)
Total Capacity: 20.5 Gals Usable
Total Unusable: 1.7 Gals

WARNING

When fueling the airplane, ensure the airplane is electrically grounded by verifying that the grounding wire located on the right main gear wheel makes adequate contact with the ground's surface. Also, ensure the fueling container remains adequately grounded to fuel neck ring and nozzle. A ground wire from the refueling container should be attached to the engine exhaust pipe. The exhaust pipe is electrically connected to the aircraft ground system as are all fuel tanks and tank opening ports.

CAUTION

The main tank has a 22.2 gallon total capacity when completely filled to the neck. The wing aux tanks (if installed) have a 6.3 gallon (each) capacity. However, filling the fuel tanks to the top of the filler neck will cause fuel to be vented overboard due to liquid expansion. For this reason, fill the main tank to only 20.5 gallons and the wing aux tanks (if installed) to no more than 6 gallons each.

NOTE

To minimize the chance condensation of water inside the fuel tank, fill and service the fuel tanks after each flight.

Fuel sender removal (L/RM,A&P)

The fuel sender is located beneath the throttle quadrant. The fuel sender is a multipurpose instrument which contains the fuel pick-up, the tank vent line connection, fuel sensor and electrical connections from the sensor to the fuel gauge.

1. Disconnect the battery.
2. Remove the sides of the throttle quadrant to expose the sender top.
3. Disconnect fuel sender wire.
4. Mark the of the sender top in relation to the installed orientation.
5. Mark the location of the perimeter bolts.

NOTE

One of the bolts is ground to allow reinstallation and should go back into the same location.

6. Unscrew the perimeter bolts and remove fuel sender.
   Note: Take care to not damage the perimeter "O" ring during removal or installation.

Fuel drain valve removal (L/O,RI,RM,A&P)

1. Drain the fuel from the tank.
2. Unscrew the drain valve from the tank (Use Locktite 565 for replacement).
3. Check "O" ring and the spring.
4. Check / Adjustment

Fuel pump check (L/O,RI,RM,A&P)

Check both fuel pump bodies for cracks, including the inlet and the outlet hose. If cracks are detected, immediately exchange the fuel pump for a new pump.

Perform engine inspection and check the both fuel pump bodies, including inlet and outlet hose, for fuel leakage. In case of fuel leakage, find out the cause and if necessary exchange the fuel pump for the new pump.

Safety instructions for filling fuel into the airplane tank(s) (L/O,RI,RM,A&P)

1. The fuel tanks can be filed with fuel only by those individuals who are fully instructed and familiar with all fuel safety instructions.
2. It is prohibited to fill the fuel tank:
   - during rain and storm
   - in a closed space
   - when the engine is operating or with electric system switched on
3. The person filling the fuel tank must not be wearing polyester clothing or any clothing from a material which creates static electricity.

4. Do not smoke, use a cell phone, any static producing device, handle open flame or any electrical device during refueling.

Procedure of fuel tank filing (L/O,RI,RM,A&P)

1. Ground the airplane. The airplane ground point is located on the engine exhaust pipe.
2. Open the fuel tank filler cap.
3. Fill with the necessary quantity of fuel.

CAUTION

When filling fuel into the airplane, avoid fuel contact with the airplane finish which may cause damage to surface of the airplane.

4. When the airplane is filled with fuel, wipe the filler neck fuel and close the fuel neck filler cap.
5. Remove conductive interconnection between the filling device and the airplane.

Checking a fuel sample for contaminates (L/O,RI,RM,A&P)

Perform the fuel tank sample check after every filling the tank with fuel and before the first flight of the day.
The fuel tank drain point is on bottom side of the fuselage between the landing gear.

Fuel sample procedure (L/O,RI,RM,A&P)

1. Open the drain valve by pressing up. The drain will stay open if it is rotated while pressed up. .
2. Drain required quantity of fuel.

NOTE

Draining serves for elimination of impurities and sediments from fuel. Drain so long unless clean fuel flows from the drain valve.

3. Close the drain valve by releasing pressure.

SECTION 6
PROPELLER

INTRODUCTION

The aircraft has a three-bladed, fixed-pitch, ground-adjustable, composite propeller. The core of each blade is made from two types of wood and coated with a carbon-fiber composite. Adjusting the pitch angle of the blades should be performed only by precisely following directions provided the manufacturer. Any cracks or nicks in the blades can cause a catastrophic failure of the propeller. Therefore, if any flaws are discovered in the propeller, have them repaired before operating the engine.

PROPELLER LIMITATIONS

Propeller Manufacturer:	*Woodcomp® Propellers sro*
Propeller Model	SR200
Propeller Blade Angle,	Lowest possible angle (pitch) setting: 16°
	Best climb angle (pitch) setting: 18°
	Maximum cruise angle (pitch) setting: 21.5°
	Maximum possible angle (pitch) setting: 26°

WARNING

Adjusting the propeller blades at a higher setting than 21.5°, in an attempt to obtain a higher cruise speed, will cause the engine RPM to "bog-down", fail to reach a sufficient ground RPM, and will not allow a safe takeoff. Loading the engine with a high propeller pitch (high propeller 'angle of attack' or 'big angle') above 21.5° may also result in engine failure and WILL result in extremely long takeoff rolls and low climb rates.

WARNING

It is imperative that if the pitch of one propeller blade is adjusted, each remaining propeller blade must be adjusted to the exact same degree as the

first. Indications of the blade pitch angles being set differently are rough operation and vibration.

NOTE

High Propeller pitch settings or different pitch settings on each blade will cause vibrations that appear to be a rough idle.

SR200 PROPELLER MAINTENANCE (L/O,RI,RM,A&P)

It is necessary to make an inspection of the propeller, the blades, leading edges, and base parts of the blades at the propeller hub attachment in accordance with the manufacturers' recommendations based on hours of operation. As a part of normal maintenance, clean the blades with mild cleaning agents followed by waxing.

NOTE

Normal maintenance does not include repairs to the propeller blades or the propeller hub. These items are to be accomplished in accordance with the propeller manufacturer's instructions and are not considered line maintenance.

ADJUSTMENT OF PROPELLER PITCH (L/O,RI,RM,A&P)

Required tools include: Phillips screwdriver #2, 13MM wrench and socket, 10MM wrench, 5MM Allen wrench or socket, properly calibrated torque wench to prevent exceeding the bolt tension limits.

1. Check that both ignition switches are OFF.
2. Remove the upper cowling to gain better access to the rear prop bolts.

Figure 6.1 Cowling removal

3. Remove 9 screws holding the propeller spinner. (Place the screws on the storage shelf of the glare shield for ease of replacement.)

Figure 6.2 Removal of the spinner

4. Remove protective covers from the propeller blades check the propeller integrity.
5. Loosen all six of the M4 bolts on each side of each blade, but do not remove the locknuts.
6. Loosen all six of the M8 bolts in the center of the hub, but do not remove the locknuts.

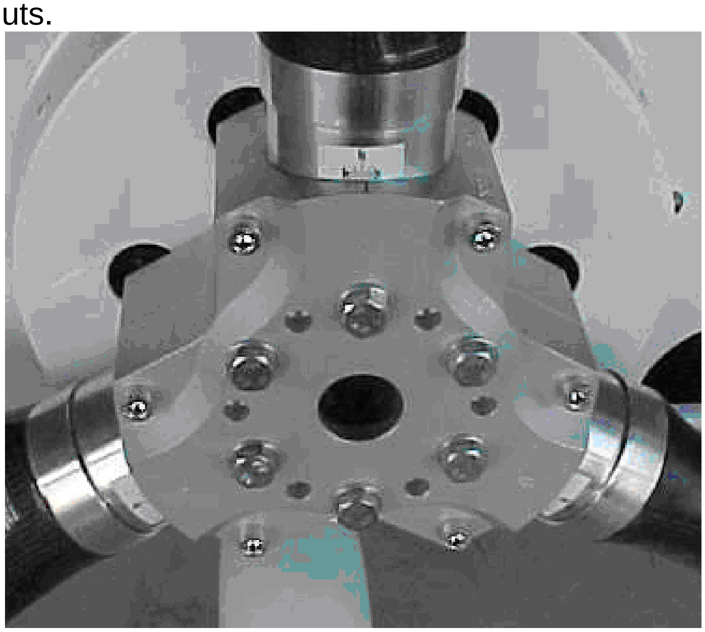

Figure 6.3 Six M4 and Six M8 bolts in hub

7. Adjust all blades to the same propeller pitch angle of attack.

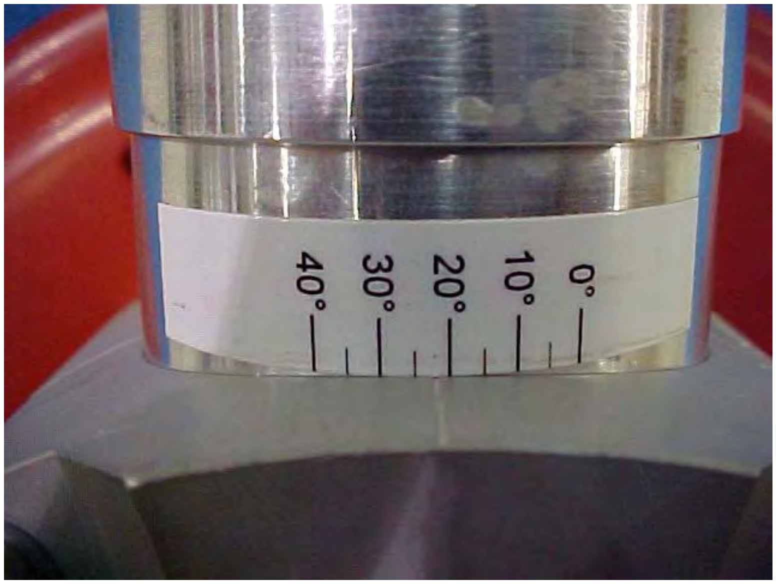

Figure 6.4 Pitch Adjustment angles, some models, note: max blade setting 21.5 deg.

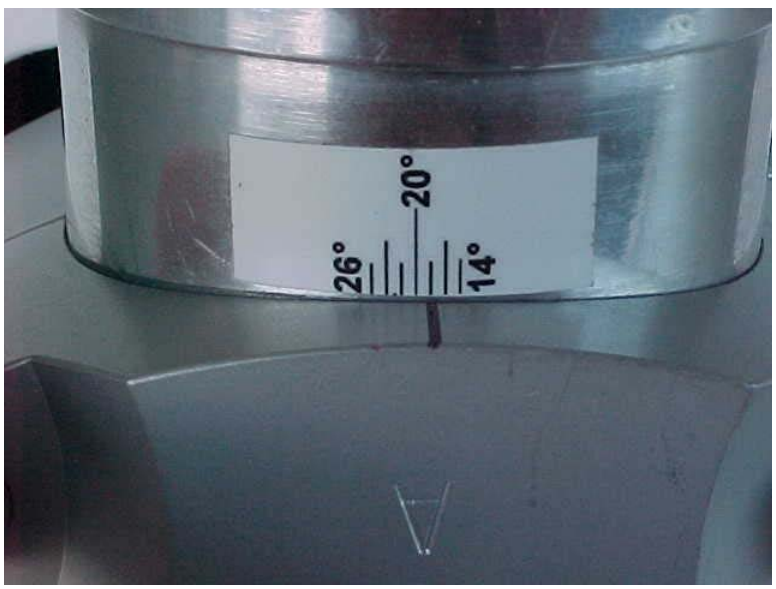

Figure 6.5 Pitch adjustment angles, later models, note: blade A at 18 deg.

8. Lightly tighten the center M8 bolt in each blade as that blade angle is set to hold the propeller pitch while adjusting the remaining blades.

9. Recheck that all blades are exactly at the same pitch.

Figure 6.7 Checking blade C pitch at 18 degrees.

Figure 6.8 Checking blades A and B are also at 18 degrees

10. Tighten the six center M8 bolts gradually in cross series to a torque of 22 Newton Meters (NM) (16.24 Foot Pounds) Hold the locknut with a wrench to prevent turning. Do not over torque!

11. Tighten the M4 bolts on each side of each blade to a torque of 10 NM (7.38 Foot Pounds). Hold the locknut with a wrench to prevent turning. Take care not to over torque. These small bolts require less than half the torque of the M8 bolts and can easily be damaged by a quick twist past their torque value.

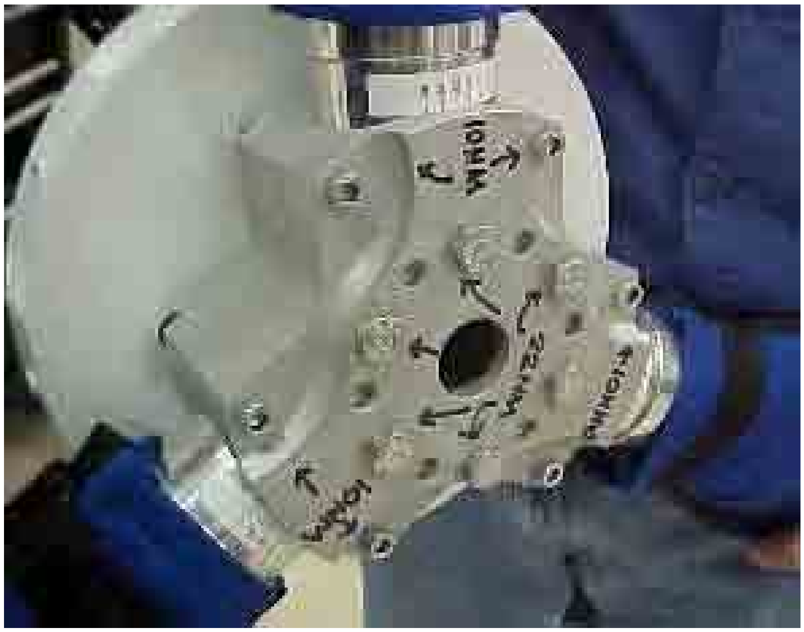

Figure 6.6 Torque markings for each bolt

12. Recheck all bolts to the proper torque and all propeller blades are indexed to the same pitch setting.
13. Align the reference notch in the propeller spinner with the notch in the propeller flange.
14. Install the propeller spinner on the propeller flange and attach it with nine screws from the glare shield.

Removal of the propeller (L/RM,A&P)

1. Remove the upper cowling from the engine.
2. Disconnect the aircraft battery
3. Remove the propeller spinner
4. Loosen the six M4 bolts located two on each side of the blade.
5. Remove the nuts on the engine side of the six M8 bolts and take out the propeller along with other parts from the flange.
6. Store the propeller, parts, and bolts on a safe place to prevent damage..

NOTE

Do not store the propeller by leaning it against the wall and allowing the tips of the blades to bear the weight of the assembly.

Installation of the propeller and propeller tracking (L/RM,A&P)

15. Clean the contacting areas of the flange of the gearbox propeller shaft and the propeller spacer.
16. Put the six M8 bolts through the propeller flange and the spacer into and through the propeller flange from the front of the propeller.
17. Install the washers and self locking nuts on the six M8 bolts but do not tighten.
18. Remove protective covers from the propeller blades check the propeller integrity.
19. Adjust all blades to the same propeller pitch angle of attack.
20. Lightly tighten the center M8 bolt in each blade to hold the propeller pitch as each blade is set at the correct desired pitch.
21. Tighten the center M8 bolts gradually in cross series to a torque of 22 NM.
22. Tighten the remaining M8 bolts gradually in cross series to a torque of 22 NM.
23. Tighten the M4 bolts on each side of each blade to a torque of 10 NM.
24. Recheck all bolts to the proper torque and the propeller blades to the same pitch setting.
25. Remove spark plugs from the engine and secure the airplane against movement.
26. Measure the difference in distance of individual blade tips from a common point after spinning the propeller through a series of rotations. The total difference between all blades can be a maximum of. 0.5”
27. Align the reference notch in the propeller spinner with the notch in the propeller flange.
28. Install the propeller spinner on the propeller flange and attach it with nine screws.
29. Reinstall and torque the spark plugs in the engine.

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SECTION 7
SYSTEMS

INTRODUCTION

This section contains descriptions of various aircraft parts and sub-systems as well as details on their repair and maintenance procedures.

CABIN HEATING AND VENTILATION

Outside air can be vented into the cockpit for cooling purposes by opening any of three vents located in the canopy. Two are located in the canopy next to either crew position above the outboard armrest. They can be opened simply by pushing them out and rotating them to the desired position. Each side vent should be closed and rotated down when parked for rain protection.

The third vent is located at the front of the canopy, and it can only be operated from the pilot's position. A pull knob is located forward of the pilot's armrest which is connected to the vent by a Bowden cable control wire. By pulling the knob aft, the vent opens; to close the vent, push the knob forward.

Warm air for the cabin is directed from behind the engine's radiator into an air scoop. Ducting from this scoop carries the air to a heat box mounted on the firewall. A valve inside the heat box is opened and closed by a Bowden cable linked to a knob labeled Cabin Heat to regulate warm air entering the cockpit. By pulling the knob out, warm air is allowed to flow into the cabin, and by pushing the knob back in, the warm air is closed off and vented overboard.

Venting System

Cockpit ventilation is ensured by two rotating scoop air vents located on the lower canopy sides outboard of the seats. An additional adjustable air inlet is located forward of the glare shield also in the canopy. Quantity of inlet air is controlled by air scoops which are movable in all clock directions and can be opened or closed to adjust the air volume and air flow direction in our out of the cabin

Removal and installation of the canopy air vents (**L/O**,**RI**,**RM**,**A&P**)
The two rotating air vents mounted in the canopy can be removed or installed by slightly squeezing the interior edge of the vent scoop from the exterior and

rotating the scoop slightly as it is removed or replaced. This is should be done carefully to not break the plastic scoop.

Heating System
To minimize the chances for carbon monoxide entering the cockpit, heated air is drawn from the water radiator not from a heat exchanger on the muffler. Ambient inlet air taken through the radiator is heated and supplied through a control flap into the cockpit by a air hose. The amount of hot air is regulated by the **CABIN HEAT** knob on the lower throttle quadrant instrument panel.

Removal of the Cabin Heat control knob (**L/O**,**RI**,**RM**,**A&P**)
(a) Disconnect the control cable on the control flap lever located on the firewall behind the radiator.
(b) Remove the nuts thus releasing the heating control knob.
(c) Remove the heating control knob with cable from the flexible housing

Installation of the Cabin Heat control knob (**L/O**,**RI**,**RM**,**A&P**)
(a) Insert the Cabin Heat control knob into the flexible housing and fasten it from both sides of the lower throttle panel by means of nuts.
(b) Connect the control cable with control flap lever.
(c) Adjust heat control.
(d) Reseal the firewall penetration of the cable.

Adjusting the Cabin Heat (**L/O**,**RI**,**RM**,**A&P**)
To adjust the Cabin Heat to OFF, first rotate the knob to assure that it is not locked then push the knob forward to close the heat control flap and dump the heated air into the slipstream. To increase the heat in the cabin, again assure that the knob is not locked by rotation and pull the Cabin Heat knob aft.

INTERIOR CARE (L/O,RI,RM,A&P)

To remove dust, loose dirt, and other debris from the upholstery and carpet, clean the interior regularly with a vacuum cleaner. Blot up any spilled liquids promptly and use stain remover as needed. Sticky substances can be removed by using a knife or scraper and then stain remover. Clean the instrument panel and control knobs with a very mild, non-conductive cleaner in order to remove oily deposits without compromising any electronic components.

SEATS

The seats of the *StingSport* are fixed and are equipped with an upholstered removable back cushions attached to the aft cockpit bulkhead by Velcro. The seat bases are attached to the lower cockpit frame above the wing spars by screws.

Removal of seats (**L/O**,**RI**,**RM**,**A&P**)

1. Remove the seatbacks from the Velcro and push them aft onto the aft deck for temporary access. The shoulder harness belts are integral to the seat backs but can be removed for maintenance.,
2. Seat bases are removable for inspection or maintenance by removing two screws in the forward corners of the seat pan and three screws in the aft edges of the seat pan.

Cleaning seat and upholstery (**L/O**,**RI**,**RM**,**A&P**)

(a) Take the seats out of the airplane.
(b) Brush impurities, clean with warm water with addition of a small amount of suitable detergent.
(c) Thoroughly dry the seats before reinstalling in the airplane.

SPECIAL TOOLS

The barrel spanner for the spark plugs is provided with the airplane. Normal hand tools in both AN and Metric sizes will be required. Other special tools are not necessary for normal maintenance.

Assembly and Disassembly of the Airplane

Only trained persons should perform assembly and disassembly of the plane.

Disassembly of the Airplane (H/RM,A&P)

It requires two people to disassemble the plane in the following manner:

Fuselage:

- Remove all fuel from the aircraft.
- Lift off the seating area of the seats.
- Set the flap lever to half.
- Remove the aileron push rod connecting bolts.
- Disconnect the aux wing tank fuel lines if installed.
- Disconnect the wing tank ground lines if installed.
- Disconnect, electric, pitot and static lines entering each wing.
- Unscrew the nut from the eccentric spar bolt.
- Loosen the spar bolt cam by turning the bolt lever about 180 degrees.
- Take out the spar bolt joining the two wing spars at the center section.
- Prepare a secure location or support frame in which to place the wings.
- Prepare to lift the wings and support the flaps during the next step.
- Shift the wings out of the center section one at a time.

Tail area:

- Remove the tail cover from the lower aft fuselage.
- Dismantle the trim and push rods to the elevator.

- Remove the safety wire from the horizontal stabilizer lock bolt.
- Remove the horizontal stabilizer lock bolt from the lower aft fuselage.
- Pull the elevator assembly aft and then down to move it off the pins.

Rudder:

- Disconnect the tail mounted position light if installed.
- Remove the rudder yoke bolt from the aft rudder post.
- Pull the rudder yoke down and free from the rudder post.
- Lift the rudder up and clear of the vertical stabilizer.

Assembly of the Airplane (H/RM,A&P)

It requires two to three people to assemble the airplane. Reverse the order of the disassembly.

CAUTION

All self-locking nuts with nylon rings may be reused as long as the nut can not be hand-threaded past the nylon insert. Metal self locking nuts can be used a maximum of three times after which they should be discarded.

After the assembly, perform the following:

- Following assembly, check the geometry of the wing and elevator to make sure they are not damaged and that no force, rubbing or stress occurs when the wings, flaps, elevator and elevator trim are moved.
- Manually vibrate each wing and tail surface while checking for any unusual occurrences of noise, cracking, gaps or distortions.
- Perform the "Before Flight Check" in its entirety.

LANDING GEAR MAINTENANCE

Disassembly of the Front Nose Wheel (L/RM,A&P)

Two people are required to disassemble the front gear strut. Prepare the bracket under the support points to support the weight of the aircraft and raise the nose wheel clear of the ground.

During disassembly, follow these instructions:

- Secure the wheels of the main undercarriage on both sides by chocks.

- Remove the upper and lower engine cowlings.
- Install the nose support bracket over the support points.
- Loosen the nuts from the front wheel axle and unscrew it.
- Remove the axle from the nose wheel and take the wheel out.

While assembling the front wheel, reverse the steps. Mark the final nut position in color.

Disassembly of the Main Gear Wheel (L/O,RI,RM,A&P)

It requires two people to disassemble the wheel of the main undercarriage. When assembling the main gear wheel, perform the below steps in reverse order.

- Secure the second wheel of the main undercarriage and the nose wheel on both sides with chocks.
- Raise the airplane on the wing at the side of the wheel to be disassembled and support it under gear leg.
- Remove the wheel pant.
- Remove the main wheel axle nut.
- Disassemble the three M6 screws holding the brake disk in place on the wheel. The disk may be a tight friction fit to the wheel assembly and may need additional effort to remove it even without the bolts.
- Slide the wheel off the axle, leaving the brake system intact.
- Remove the outboard spacer from the axle.
- Remove the bolt holding wheel pant bracket and the axle assembly to the gear leg.
- Remove the inside nut on the axle assembly
- Remove the axle assembly from the gear leg.
- The metal shaft 'axle-guide' pressed into the gear leg will remain in place..
-

NOTE

Do not disconnect the brake lines from the brake caliper. This will prevent air from entering the line and requiring the brakes to be bled and tested.

Repairing the Tires (L/O,RI,RM,A&P)

We do not recommend using the same procedure for mending airplane tires as auto tires. Change the damaged tire for a new one.

FUEL FILTER CLEANING (L/O,RI,RM,A&P)

How often you should clean or change a fuel filter depends on how well you filter the fuel while filling the tanks. It is recommended that you use fuel filters with a clear housing to allow you to see when the filter is dirty. Following the first filter cleaning/change (check at 10 hours maximum) clean/change the filter after every 25 hours for preventive maintenance.

CAUTION

Filters should be cleaned/changed only when the engine is cool.

Follow these steps when cleaning an inline wing fuel filter: (when installed)

- Close the fuel supply lever.
- Unfasten the clamps on the hose on both sides of the filter. (Leave the clamps on the hoses.)
- Remove the filter while turning the hoses, take precautions not to leak fuel from the hoses. (You can close the hose temporarily by inserting a screw shank size M6).
- Slip the hoses on to the filter and compress their ends against the filter's body.
- Replace the clamps on the hoses in place of the filter's mouthpiece and tighten the clamps. Make sure that each clamp maintains its value. Look for slipped threads or any other problems.
- Some filters also screw together to hold the glass exterior tube. Check that the glass ends are properly held against the end seal caps.
- Secure the clamps or the filter against rubbing or dislocation of any other part or wiring.
- After changing the filter, allow the engine to run for five minutes with no load. Turn off the engine and make sure the filter is filled with fuel and no leaks have occurred.

CAUTION

After changing the fuel filter, pay particular attention to the engine test before flight to make sure the fuel system is functioning.

JACKING THE PLANE (L/O,RI,RM,A&P)

The jacking points are located by the low inside tubes of the engine bed to the body partition are for lifting the front undercarriage. These jacking points are accessible after removing the low part of the engine cowling. Do not forget to secure the wheels of the main undercarriage with chocks on both sides while supporting the airplane on these points.

There are no specific jacking points under the wings. Do not allow any point loading to occur to the lower or upper wing surface. Keep the support across the entire wing and under the wing spar area. Support the wings about 1 meter outboard of the gear. These supports must be made of a sturdy material at least 100mm wide and 1000mm long. This support must have a soft 20mm thick felt or similar foam pad cover, which enables the weight of the airplane to be distributed to its entire area.

CAUTION

"Point" loading on the wing or the fuselage may dent the surface or damage the structure.

MANUFACTURER LABELS

1. The manufacturer's quality assurance label is placed on each laminate part of the aircraft.
2. The manufacturer's data plate is attached at the right side of the aft body in front of the horizontal tail.

CONNECTION SCREW REPAIR (L/O,RI,RM,A&P)

A screw must be changed if it is corroded or cracked. If the threading is compromised, it is necessary to change both the screw and the nut. The replacement screw should be of the same quality and description. Self-ensured nuts with plastic circles are used as long as they can not be threaded by hand past the nylon insert. All-metal nuts can be used a maximum of three times after compressing the ensuring circle with tongs.

RIVET JOINT REPAIR (L/O,RI,RM,A&P)

When the rivet joint is damaged (released or opened) it is necessary to remove the damaged rivet or its remains. Make sure the connections are not damaged and rivet the connection. If the rivet connections are damaged, replace the parts or discuss the repairs with the airplane manufacturer. Use the same quality and type of rivet during repair.

CONTROL REPAIR (H/RM,A&P)

Damaged push-pull bars, connectors, steel cables, bearings and other parts cannot be reused in any way. The manufacturer must supply individual replacement parts. If other relevant steering damage occurs, including an increase slack or binding in the controls, the manufacturer's service center can repair them. After any repair of the controls, a pilot should perform a flight test.

AIRFRAME REPAIR (H/A&P,RS)

The damaged surface should be resin impregnated laminated, sanded and painted when damaged. When damage or perforation of non-structural parts occurs (engine cowlings, wheel covers, cover of front wheel), the repair is done by placing one or two layers of the laminate and resin and then sanding down and painting the surface. Use a two-component resin and follow the directions for use. See Section 10 for more details, procedures and restrictions.

Consult the manufacturer for deeper damage of the airframe or any perforation. The manufacturer will consider the result of the damage on the remainder of the construction and will determine the type of repair that should be made. See Section 10 for more details, procedures and restrictions.

FUEL SYSTEM REPAIR (L/O,RI,RM,A&P)

If the fuel system or its flow of fuel is not tight, repairs should be done immediately. The airplane owner can make sensible repairs (i.e. released sleeve coupling of hoses or filter fouling). Other repairs should be made only by qualified personnel or in the manufacturer's service center.

ENGINE REPAIR (L/RM,A&P)

All engine repairs should be performed only in the manufacturer's service center or otherwise qualified personnel. This includes unnatural noise from the engine bed, increased vibrations, revolution fluctuation, engine misfire, lower output, foul smell (burning), engine values out of sync, starting problems, etc.

ELECTRONIC REPAIR (L/O,RI,RM,A&P)

In case of electronic problems, the pilot can make repairs such as charging the battery and cleaning the contacts and connections of disjointed connectors. Other repairs of the electronic system and other appliances should be performed only by qualified personnel or by the manufacturer's service center.

CAUTION

Any and all damage which might influence the stability of the construction and/or the flight characters should be made known to the manufacturer who will then determine the necessary repairs.

Inspection of the Electronic or Electrical System (L/O,RI,RM,A&P)

All cable connectors must be checked to make sure they are not damaged, loose or corroded. Also check the reliability of the tightness to assure no loose connections in the plane's electrical system construction. If the connectors are corroded, a technician should change them.

Check for possible damage of cables by heat or chafing. Check if all ground connectors are tightened to the common ground return line. This includes the static ground lines for the fuel tanks and ground wire on the right gear leg. Loose connections can be the reason for wire or component overheat, burning and failure to function.

Recharge the battery regularly if the plane will not be flown on a regular basis.

BRAKE SYSTEM

The aircraft has two single-rotor, hydraulically-actuated brakes located on the main landing gear, one on each wheel. Each brake is connected to a brake piston cylinder attached to the toe pedals of the rudder pedals. When the operator presses the left brake pedal, hydraulic pressure is sent down hydraulic line to the left wheel brake pads, which in turn press on both sides of the rotor. The same process also applies the right brake pedal pressure to the right brake rotor.

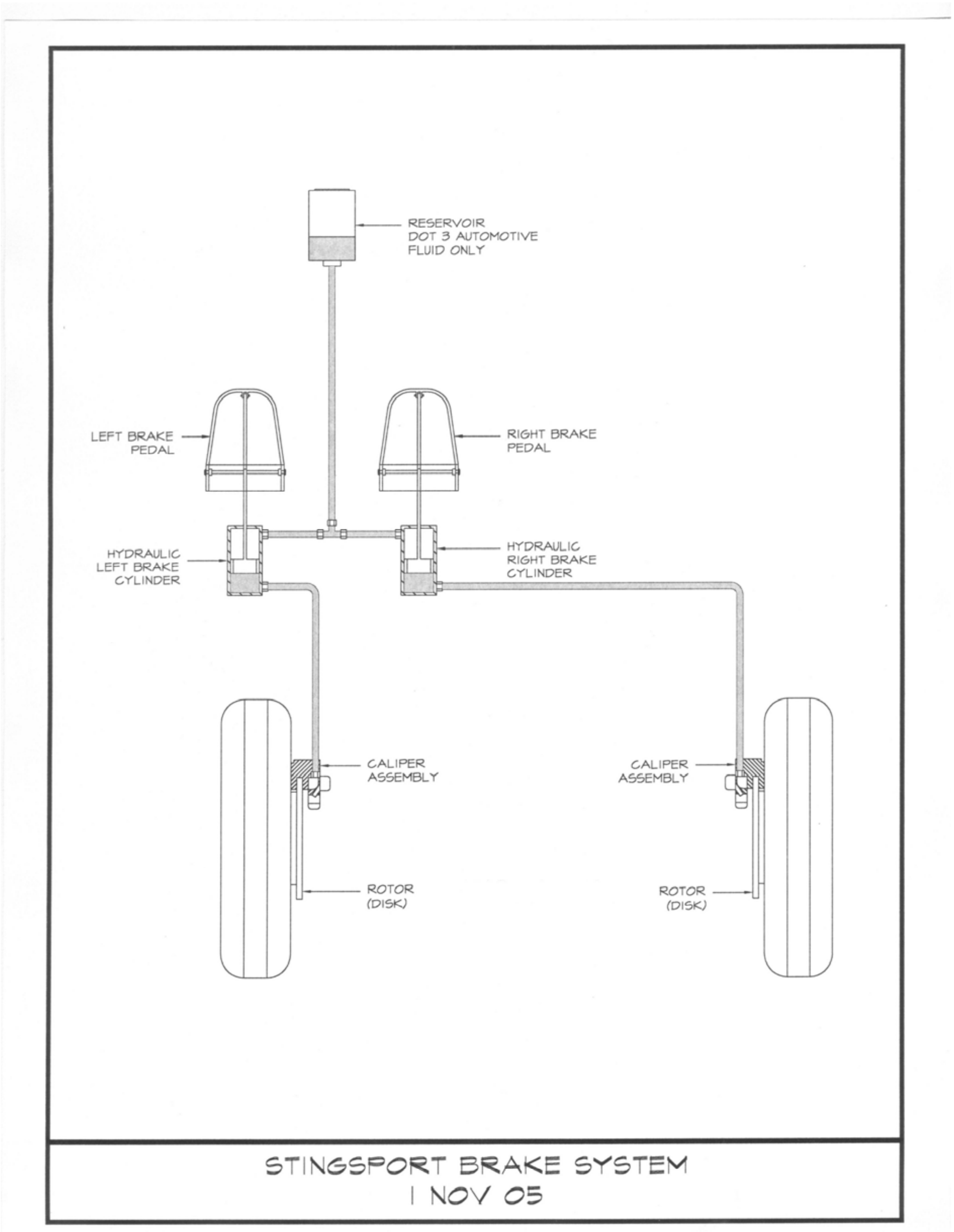


Figure 7.1 StingSport Brake System Schematic

Replacing/removal of the brake pads (L/O,RI,RM,A&P)

Figure 7.2 Brake pad retaining pins

Arrows indicate the location of pad retaining pins.

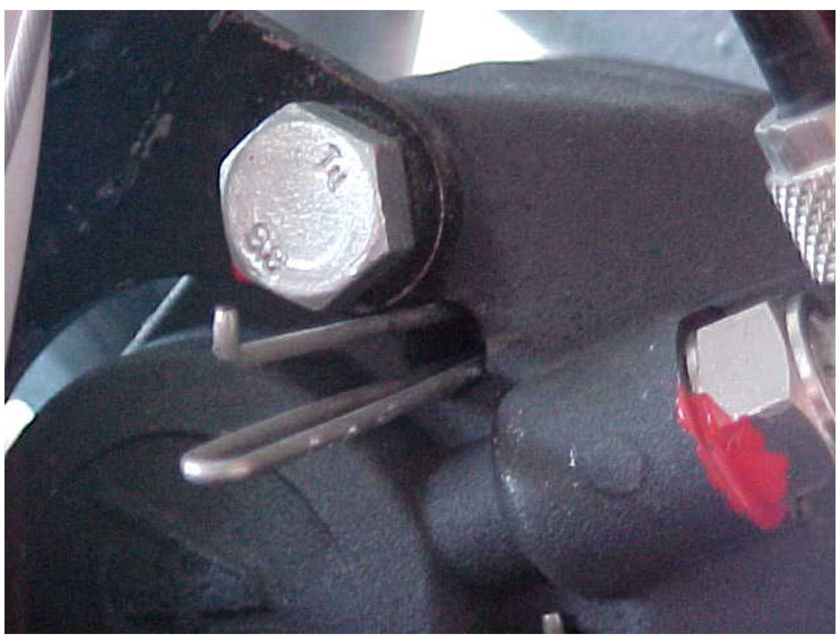


Figure 7.3 Brake pad retaining pin removed

Two pins need to be removed to allow the pad to free.

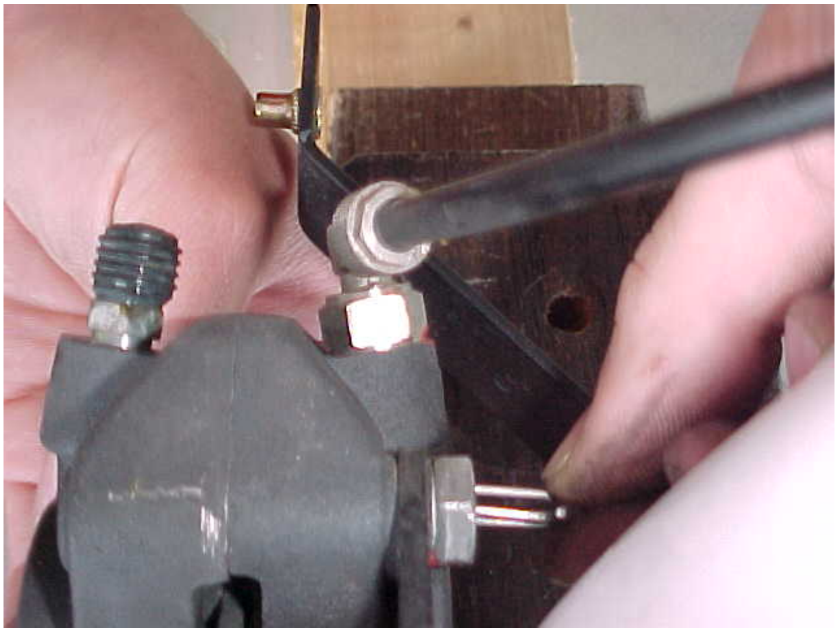


Figure 7.4 Brake pad retaining pin removed

Top view of pulling the two retaining pins that hold the brake pads.

Figure 7.5 Brake pad removal

Now remove the brake pads. One on each side of the disk.

Figure 7.6 Brake pads and retaining pins

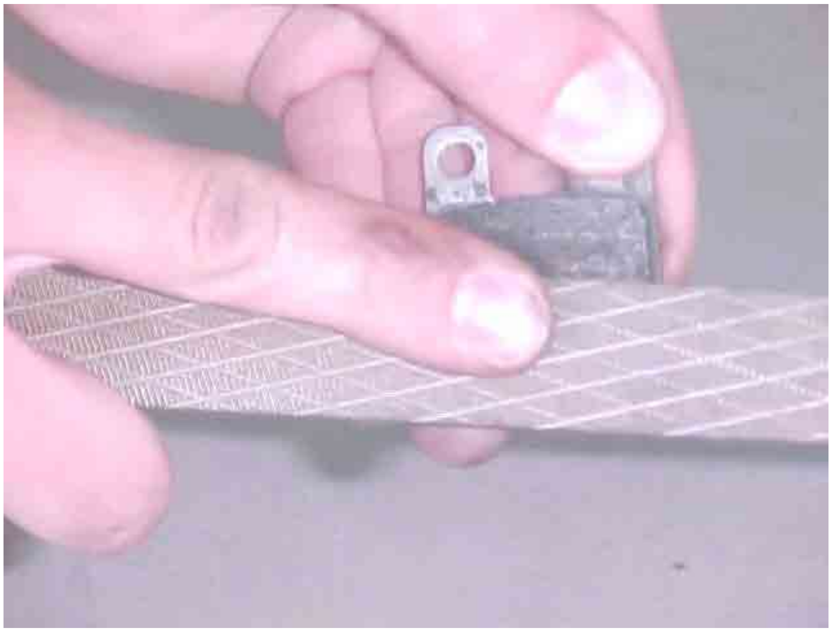


Figure 7.7 Brake pad with file to remove glazed surface

File the pads to remove the glaze caused by lightly applying the brakes during ground operations. Replace them if they are excessively worn.

Figure 7.8 Brake pad repacement

Reinsert the pads and ensure the retaining pins are fully engaged.

Figure 7.9 Brake pad retaining pins installed

Main wheel removal (**L/RI**,**RM**,**A&P**)

Figure 7.10 Nose wheel chocked

First chock the nose wheel of the aircraft.

Figure 7.11 Main wheel with brake caliper

Wheel pant bracket removal is not required for checking brakes or wheel removal To remove the pant bracket, remove the two M3 bolts on the inboard side of the gear leg with an 8 MM wrench.

Figure 7.13 Main wheel

Remove the main gear wheel pant M5 bolt on the outboard of the wheel pant that threads into the axle using a 10mm wrench. Remove both the #2 Phillips screws on the inboard side of the pant and remove it.

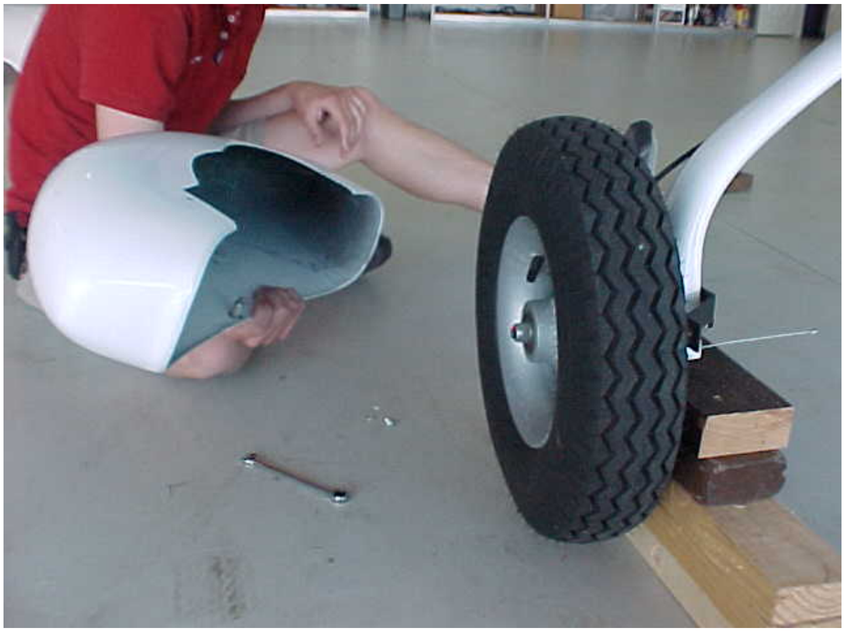


Figure 7.14 Main gear on blocks

Jack the plane up by lifting on the end of the wing, but do not lift by the clear lens cover. Spread the load evenly, place blocks under the gear leg and slowly let the main gear base on the supports.

Caution aircraft may be unstable! Do not rock the aircraft.

Figure 7.15 Main wheel axle nut

Remove the outboard 19MM nut that retains the wheel rim.

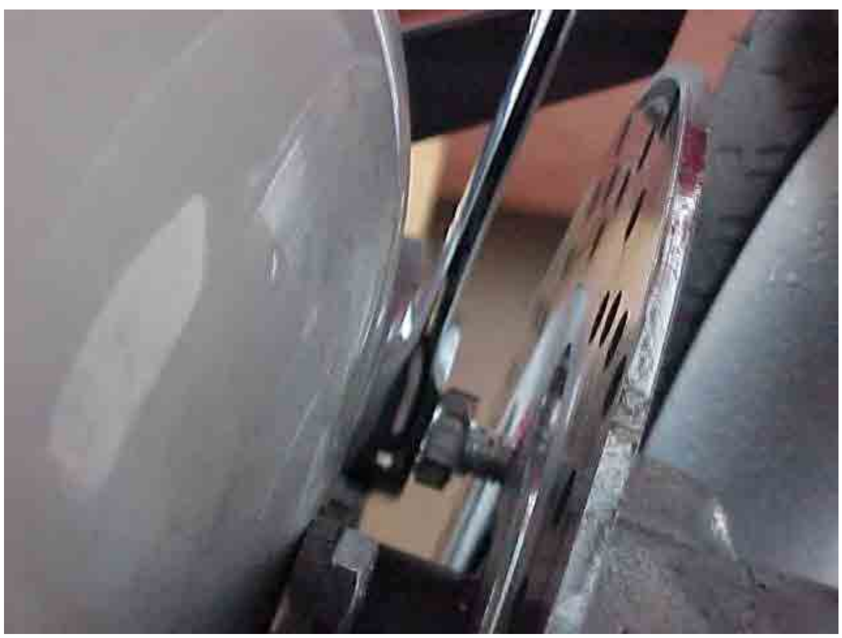


Figure 7.16 Brake disk bolt removed from wheel assembly

Remove the three 13MM bolts that attach the brake disk to the wheel rim.

<u>Do not remove or release the brake line from the brake caliper!</u>

Figure 7.17 Brake disk removed from wheel assembly

Pop the brake disk free from the wheel after the three bolts have been removed, and then remove the wheel rim and tire.

Figure 7.18 Main wheel sliding off the axle.

Note the wheel spacer is located next to the brake disk.
Brake disk and brake caliper remain attached to the gear leg.

Figure 7.19 Main wheel assembly spacer prior to wheel installation

The spacer can remain in place to help in reinstallation.

Figure 7.20 Wheel and spacer in assembly

Main wheel being installed next to brake disk with spacer on axle.

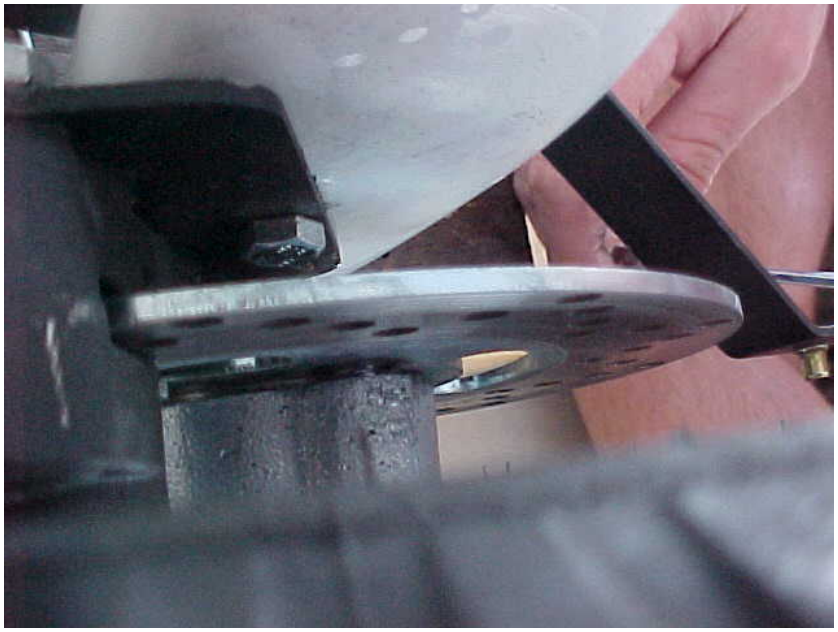


Figure 7.21 Tight tolerance of brake disk to wheel assembly

Start the bolts and tighten them as evenly as possible to keep the disk true to the wheel assembly. Do not warp the disk but assure that it is firmly seated.

Figure 7.22 Brake disk mounted to wheel assembly

Reinstall wheel, ensure spacer is still in place, and attach the brake disk. When installing brake disk bolts apply medium (red) "Locktite" to the threads. Tighten brake disk bolts evenly to eliminate binding.

Figure 7.23 Main wheel axle nut

Reinstall and tighten wheel nut.

Figure 7.24 Main wheel pant outboard spacer to axle nut

Reinstall the wheel pant. Apply “Locktite” to the bolt (above) that threads into the axle Install spacer washers on the bolt on both sides of the wheel pant and slide the pant support spacer on the bolt before screwing it into the end of the axle. Use Locktite on the two #2 Phillips screws that mount on the inboard side of the pant bracket.

Figure 7.25 Main wheel pant installed

Lift the wing again, remove blocks under the gear leg and lower the completed wheel assembly.

Repairing/inspecting the lower/upper nose strut (L/RM,A&P)

Figure 7. 27 Nose strut on supports with chocks on main gear

Secure the main gear wheels with chocks so the aircraft won't move. Place a suitable jack stand under the engine mount at the jack points.

Figure 7.28 Side view of nose support system

Remove nose wheel by removing the axle held on by the two 19mm nuts. Review the exploded view to understand the entire relationship of nose strut system.

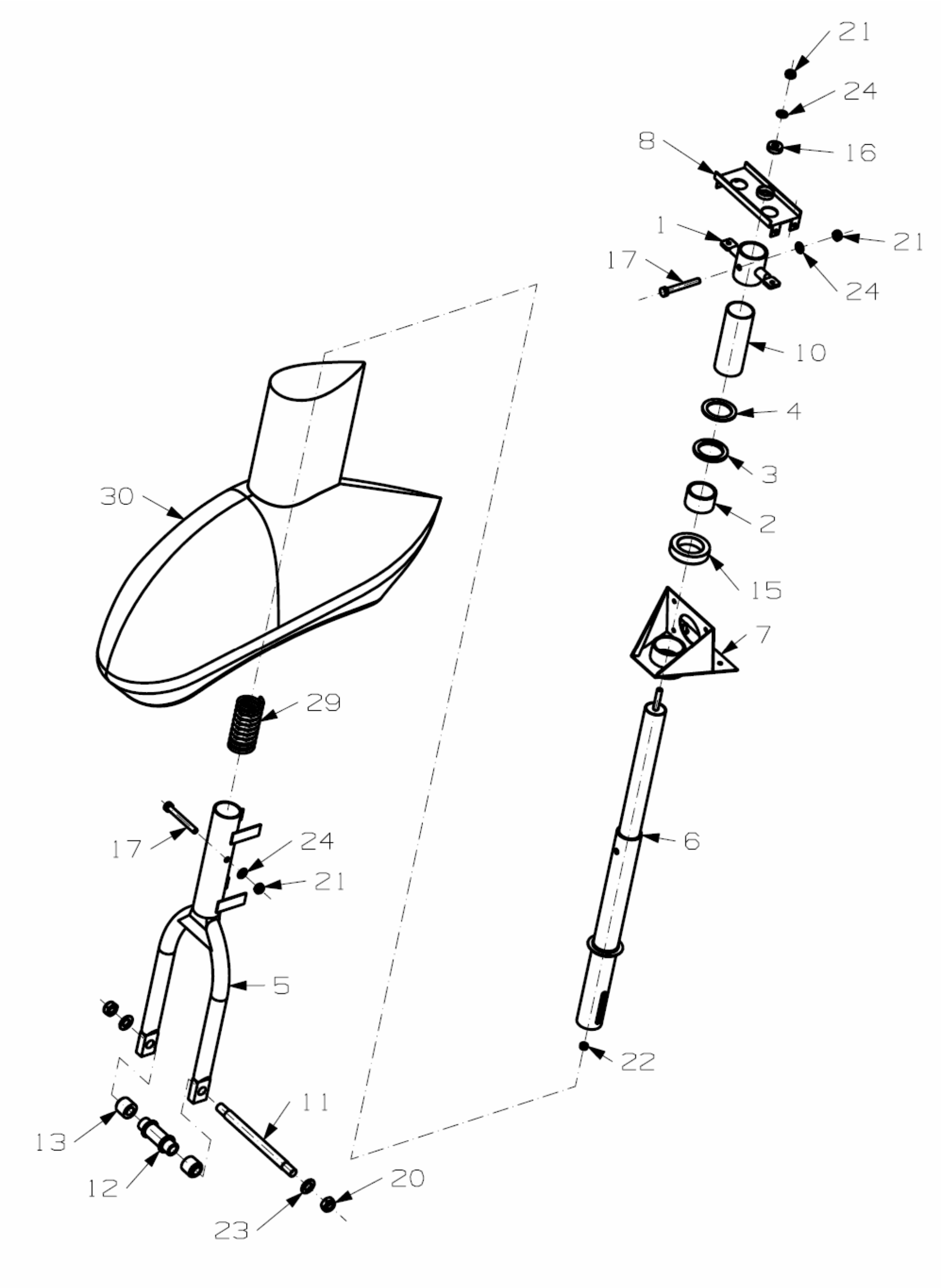


Figure 7.29 Nose strut upper/lower assembly drawing

Figure 7.30 Nose strut firewall cover from above

Figure 7.31 Nose strut firewall cover removed.

Remove the firewall mounted nose strut firewall cover, Figures 7.30 & 7.31
Note: The cover material is made of aluminum on some aircraft.

Figure 7.32 Exposed nose strut bellcrank with bolt, engine side.

Now the nose wheel steering bellcrank will be accessible. From the cabin side of the firewall remove the M8 nut from the bellcrank bolt.

Figure 7.33 Nose strut bellcrank bolt removed

. Remove the M8 bolt from the bellcrank.

Note: In the next step, removing the nut at the top of the strut may allow the strut to fall free from the bearing housings

Figure 7.34 Removal of the M8 nut on the top of the nose strut

Remove the M8 nut located in the cabin side of the firewall from the top of the nose strut. *Now the nose gear strut assembly is free to remove.* Remember the number of spacer washers between the top of the strut M8 nut and the bottom of the upper housing.

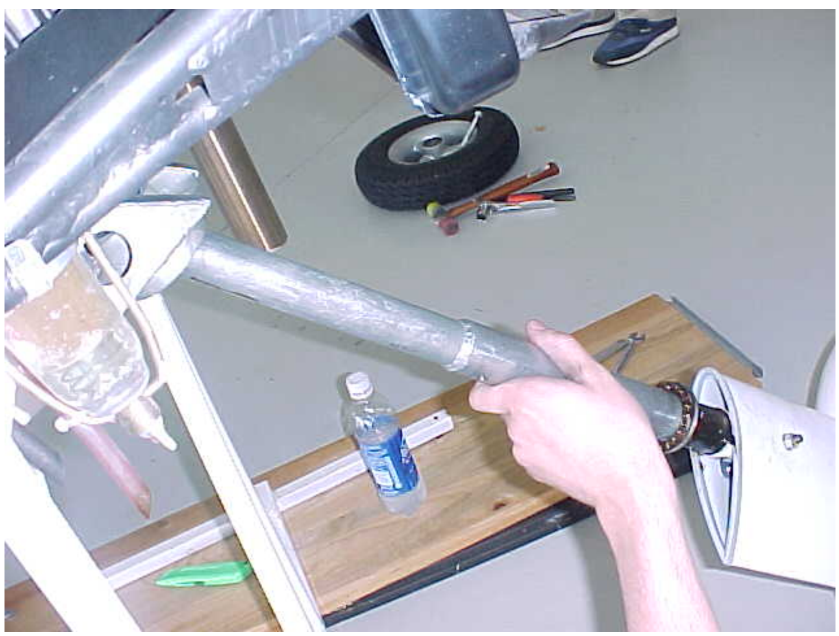


Figure 7.35 Nose strut being removed from firewall mounted bearing housings.

Remove the nose gear strut assembly. Keep track of were the composite spacer and bearing are located. Refer to Fig 29. There are also bearings and bearing races which may come free when removing this assembly.

Figure 7.36 Lower nose strut bearing and race

Use caution during the disassembly the strut and fork of the nose gear. The compressed spring enclosed in the tow parts will need to be expanded slowly.

The nose gear's shock absorption is a compressed spring. The M8 bolt that is exposed and located in the upper top half of the nose gear wheel yoke and pant keeps this assembly together and under spring pressure. Carefully compress the spring while removing this bolt to avoid injury. A large drill press with enough displacement and rating would be ideal. (In photo 7.37 a large drill press with adequate strength and pressure capability was used to release the spring tension.) Make sure you secure both the tool and the strut assembly unit to keep the spring under control.

It does not take a large distance to compress the spring but keep it compressed until the bolt is completely removed, then release the compression slowly to separate the upper strut from the lower wheel yoke and pant.

Figure 7.37 Release spring tension carefully

Figure 7.38 Remove spring retaining bolt after spring is compressed.

Once the spring retaining bolt is removed, the nose gear strut can be removed from the nose gear wheel fork. And the parts can be inspected and/or replaced.

At this time also the lower and upper nose gear strut housings should be inspected for any bending, misshapenness of the housings. Also inspect the firewall attach point for missing or damaged mounting bolts.

Figure 7.39 Lower nose strut bearing housing

Inspect the bearing and bearing races that are in the upper and lower housings. Check the upper strut for straightness of the entire piece and for any cracks forming around the lower end of the notch were the bolt rides. Check the bolt for any damage and replace if deformed or has wear patterns. Check the upper mouth of the wheel yoke (lower strut) for deformation and fit with the upper strut. Check the assembled upper strut and lower yoke for straightness and fit.

Note: Do not lubricate or get oil on the composite spacer. The spacer will expand and cause the nose strut to bind.

Figure 7.40 Nose strut upper tube showing movement slot

Figure 7.41 Detail of movement slot to check for stress cracking

Once the parts have been inspected/replaced, they are ready to go back together. Lubricate the strut and the inside of the nose wheel fork and spring with grease and compress the assembly to reinsert the bolt. After the assembly is back together slide it back up through the lower housing with bearings and spacers that were removed. See Fig 29.

Once it is through the lower housing there should be a plastic washer then the metal washer and then the metal spacer tube.

Figure 7.42 Nose strut in place and bellcrank bolt installed

After passing through the nose gear steering bellcrank, position the strut assembly through the upper bearing housing. Reinstall the spacer washers on the top of the strut. Secure the top of the strut with an M8 nut at the top and then secure the steering bellcrank with an M8 bolt and nut.

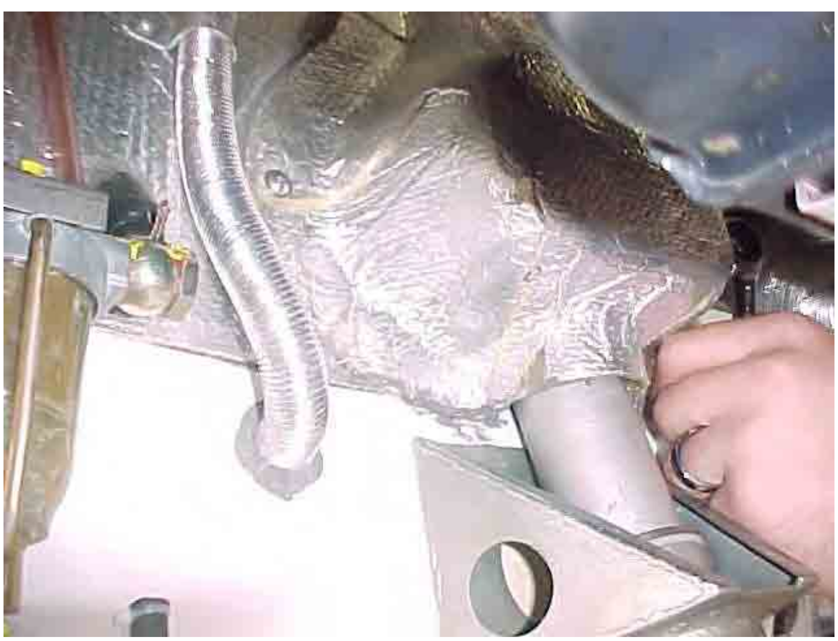


Figure 7.43 Reseal fire resistant material around the firewall cover.

Once all bolts and nuts are secured, replace and seal the nose gear firewall cover box and install the nose wheel. Insure there is free movement of the controls. Remove the stand and taxi the plane to test the work.

Carburetor Balancing (**L/O,RI,RM**,**A&P**)

The Rotax engine uses a dual carburetor set up. This in turn makes carburetor balancing a required part of engine maintenance. Carburetor balancing is needed when the engine starts to run rough at idle or is very hard to start.

The compensation crossover tube installed on the engine joins both intake manifolds and assists in keeping the manifold pressures equal. However it can also mask an out of sync condition of the carbs until the engine becomes difficult to start and runs rough. Special tools consist of two 9mm wrenches and a test system of two vacuum gauges or manifold gauges in line with a filter and shutoff to control vacuum. A commercial carburetor balance kit set is available from most Rotax suppliers.

Figure 7.44 Carb balance equipment with hoses, filters and check valves.

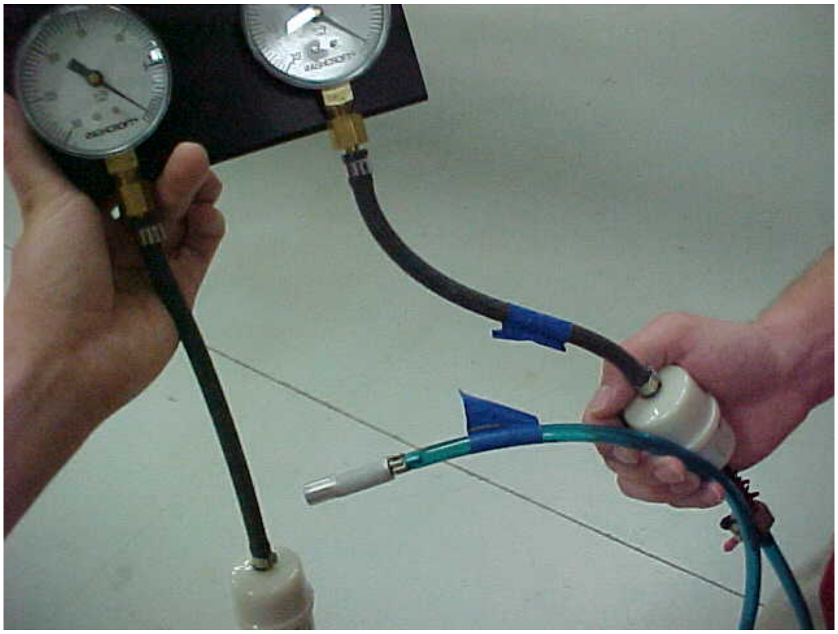


Figure 7.45 Hose for right carb is tagged on both ends.

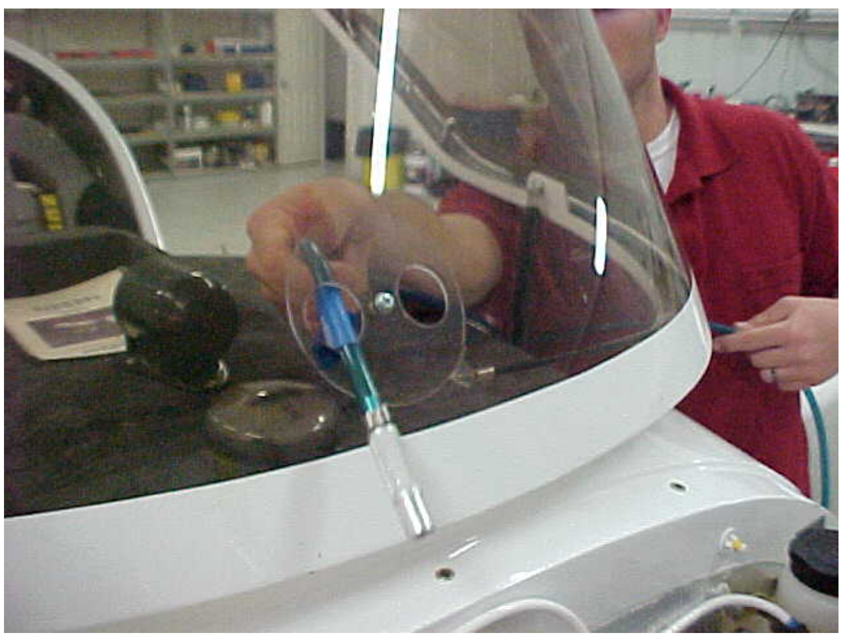


Figure 7.46 Insert hoses through front vent window.

Run the hoses through the front defrost openings. Label one of the hoses from one side of the engine intake to the corresponding gauge so you are able to orientate the hoses correctly while facing forward.

Figure 7.47 Crossover compensation tube between carbs

Uncowl the airplane top and bottom and disconnect the compensation tube. The compensation tube is the silver tube that connects to both intake manifolds.

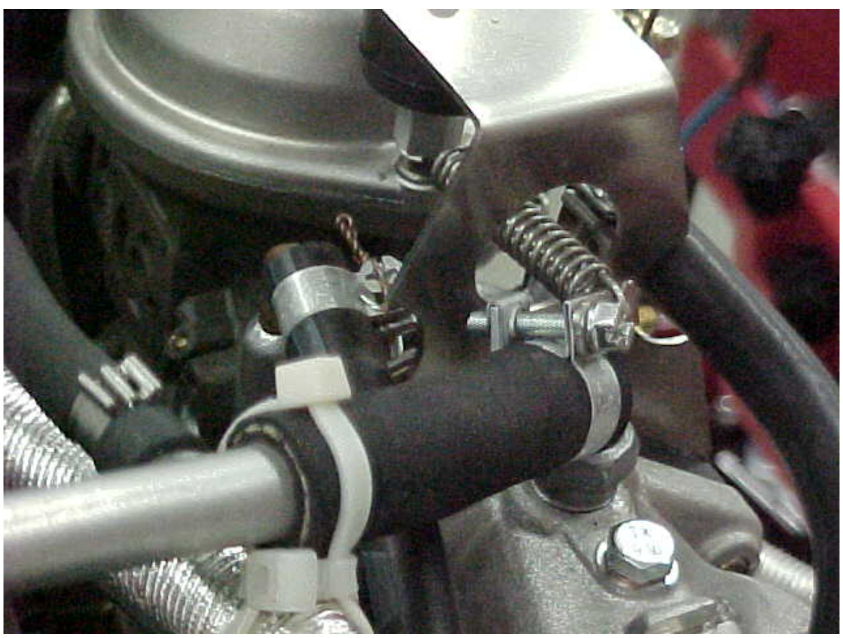


Figure 7.48 Compensation tube attached to carb intake manifold

Remove the spring from the carburetor and remove the clamp.

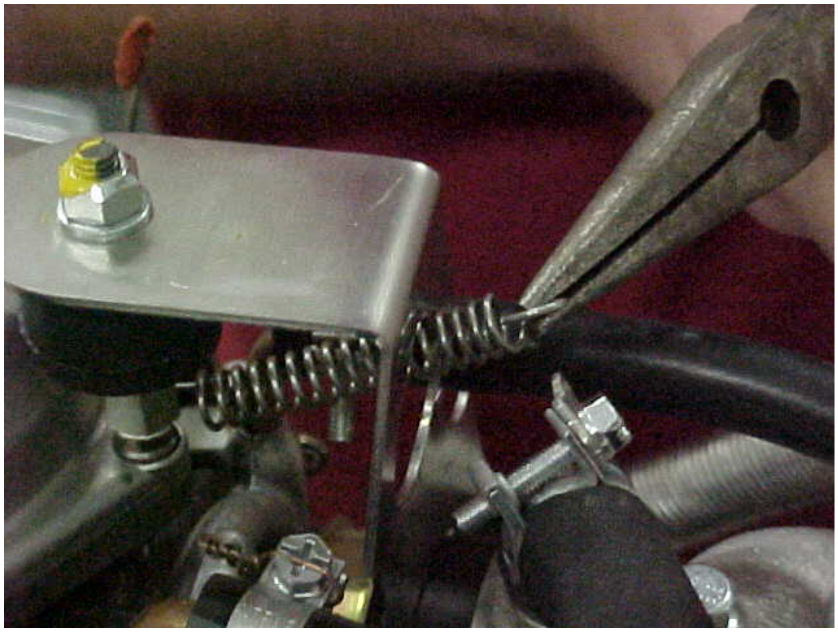


Figure 7.49 Carb support spring removed

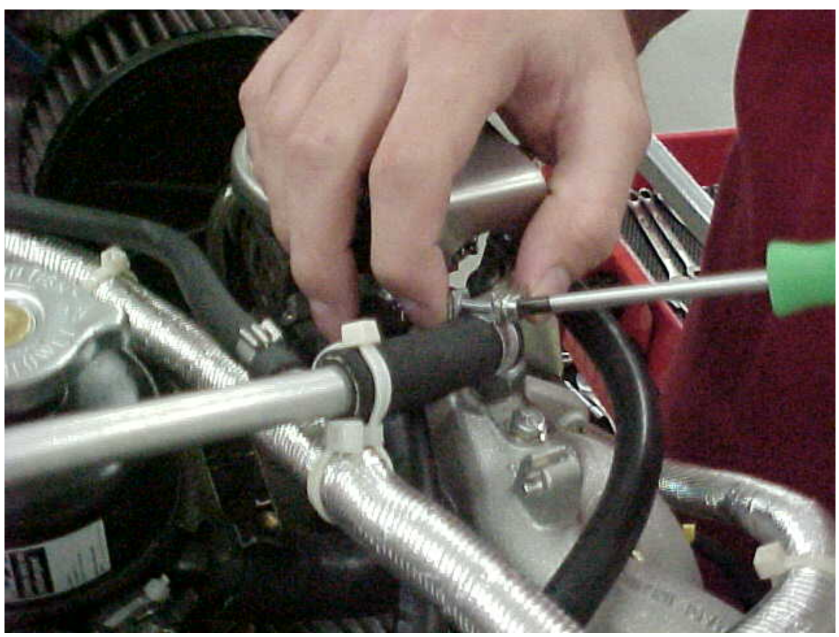


Figure 7.51 Removal of the hose clamp on the compensation tube.

Figure 7.50 Carb support spring and clamp removed

Remove the hose from the manifold.

Figure 7.52 Compensation tube hose removed from carb maifold

Place one hose of the balance test set into the hose on the compensation tube for the other side (right in this photo) of the engine. Install the other hose of the balance test set directly to the manifold (left side engine in this photo).

Figure 7.53 Insert left carb balance hose to left carb intake manifold

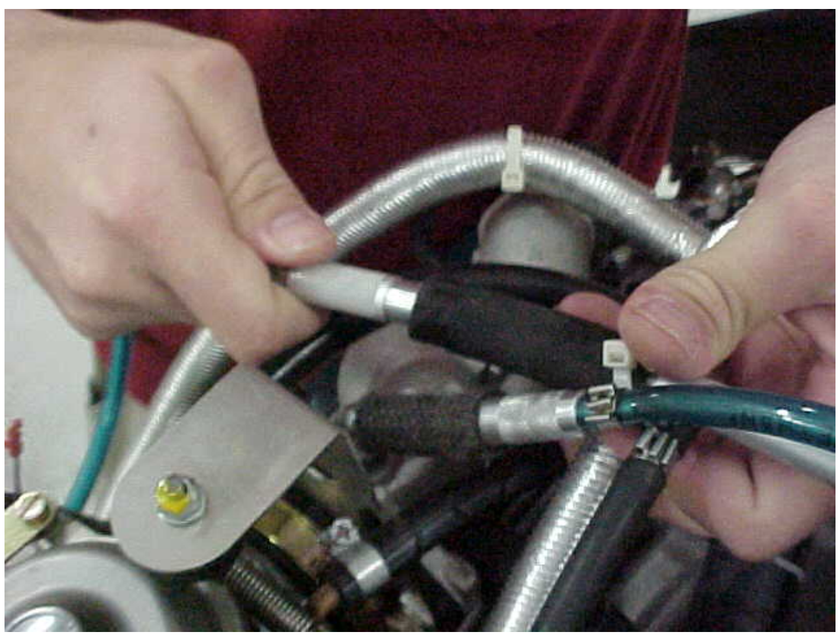


Figure 7.54 Insert right carb balance hose to end of compensation tube

Secure the lines from excessive moving and away from moving parts.
Ensure the throttle control at the carburetor does not get hung up on the hoses.

Figure 7.55 Balance hose inserted through compensation tube.
Note tape ID of right hose to right carb

Figure 7.56 Secure hoses for engine test run

Now the engine is ready to be started according the operating manual.
Once the engine is running and up to temperature, see how far the gauges deviate.
There is no specific number to which they should balance. Both gauges should read the same when balanced at idle.

Figure 7.57 Balance shut offs are used to reduce needle fluctuations

The installed shut off ball valves in the hose lines will allow you to stabilize the air flow to reduce the gauge needles from erratic readings.

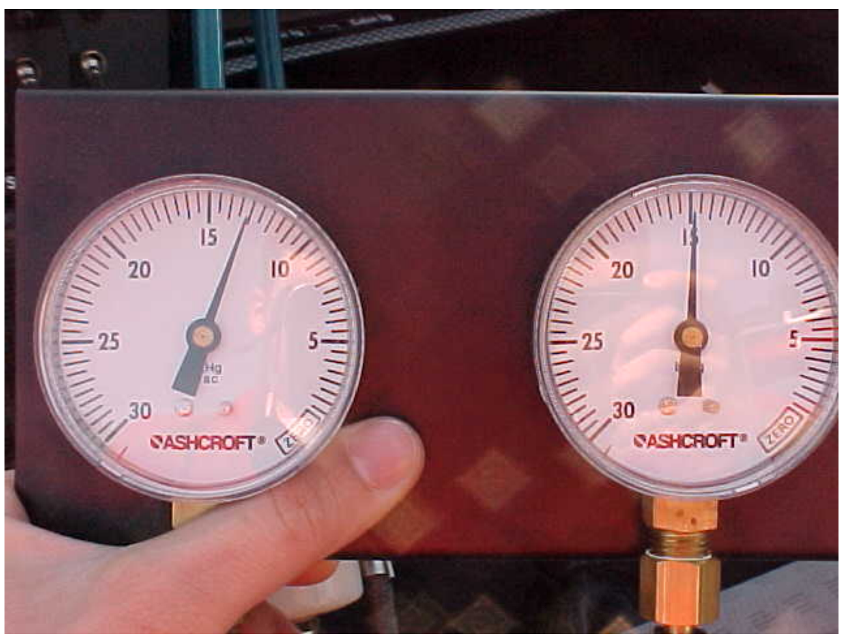


Figure 7.58 Initail reading of imbalanced manifold pressures

To see which carburetor needs to be adjusted requires some analysis. If the engine is idling above 2200 RPM then the lower vacuum needs to be reduced further to idle.

Figure 7.59 From the cockpit, access the throttle cables

Displace each throttle cable between the console to find which helps smooth out the engine and gets the idle RPM down around 1900.

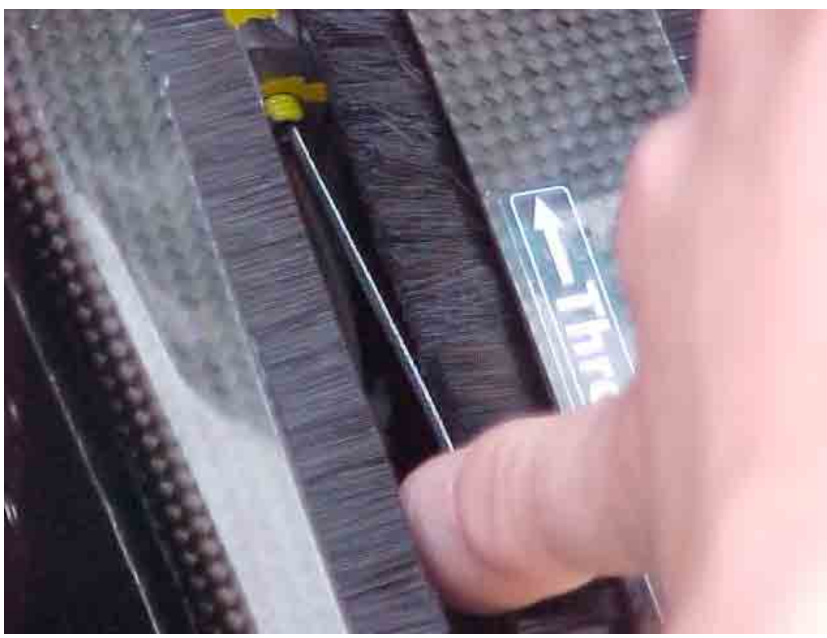


Figure 7.60 Detail of throttle cable access to change carb setting values

Figure 7.61 Balanced carb readings after adjustment

Once you have it determined which carburetor needs adjustment there are adjustment nuts that move the cable housing mount in and out of the boden cable lead mounted on the carburetor.

Adjust the carb controls only with the engine stopped. It might take a few engine runs to get the carbs balanced. There is no good way to say how much adjustment is needed for a set amount of imbalance it just takes some trial and error.

Fuel Filter Cleaning (**L/O,RI,RM**,**A&P**)

During the first ten to fifteen hours of the new aircraft there may be debris and fiberglass shaving caught in the main fuel filter.

Figure 7.62: Fuel Filter Debris

Figure 7.63: Fuel Filter Debris

Figure 7.64: Fuel Filter Debris

To remove the filter to clean it first clip and remove the safety wire, on the wing nut.

Figure 7.65: Fuel Filter Safety Wire

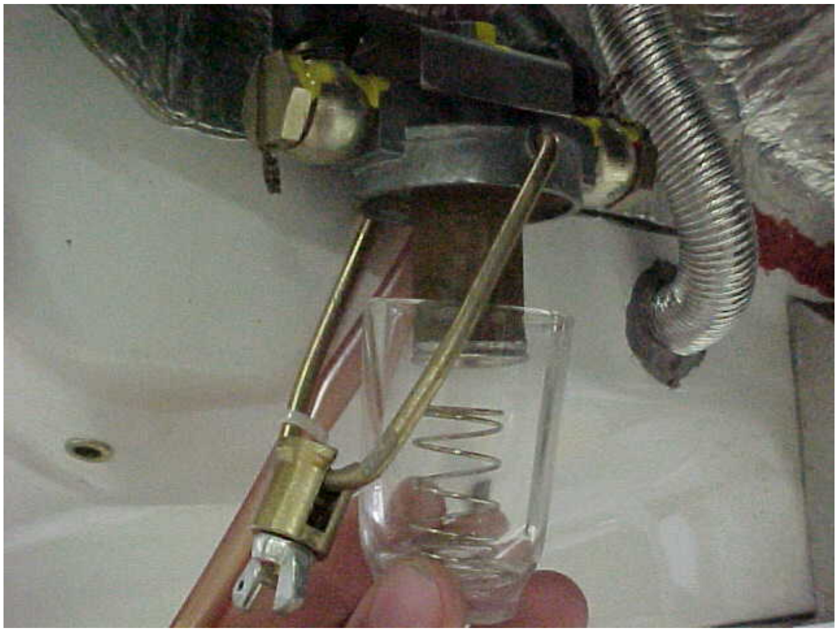


Figure 7.66: Fuel Filter Removed

Remove safety wire is removed, loosen the wing nut, so the support can be swung away and the glass and the filter can be removed. Do not lose the seal that is in the upper housing.

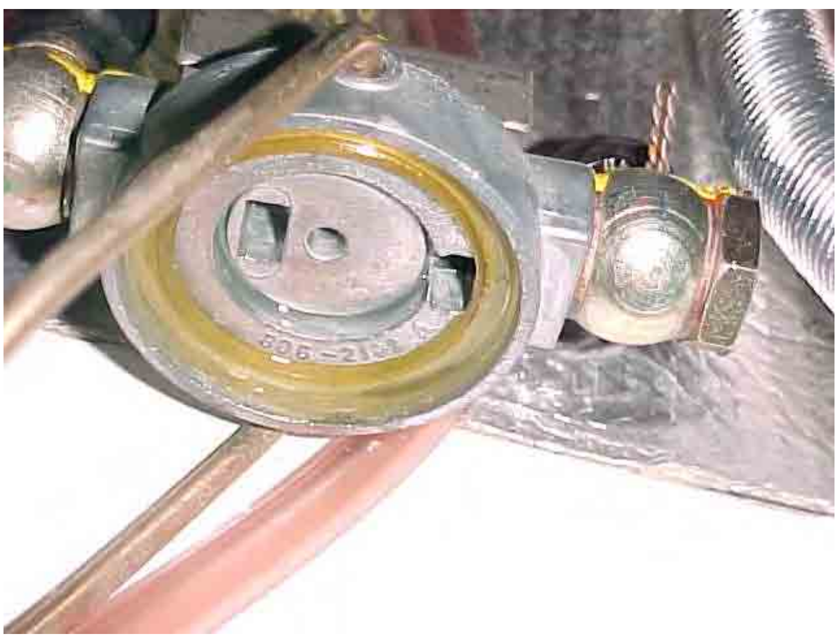


Figure 7.67: Fuel Filter Gasket seal, Body and Clamp

The fuel first enters the exterior of the bowl through the slot on the right, and then exits inside the filter to the engine pump. Debris is trapped between the glass and the exterior face of the filter for easy inspection.

Figure 7.68: Fuel Filter supported by Spring

Once the filter and glass bowl is clean, replace them back into the housing and tighten the wing nut. The spring keeps the filter element held up and sealed against the top of the assembly.

Figure 7.68: Fuel Filter Safety Wire

Finally safety wire the wing nut.

SECURING BOLTED CONNNECTIONS (L/O,RI,RM,A&P)

General

Bolt/nut joint securing is used in order to prevent from their loosening due to vibration or force action on the connected parts, which could result in the damage of the connected parts. Three ways of bolt joint securing are used on the airplane: safety wire, cotter pin and locking washer.

Cotter Pins

Securing by cotter pin is used for bolts subject to rotation. They are used because they can be removed and reinstalled quickly. The diameter of the cotter pin should be the largest size that will fit the slot in the castle nut or the hole in the bolt. To prevent injury the ends of the cotter pin should be bent over the nut and firmly flat against each face of the nut then rolled and tucked.

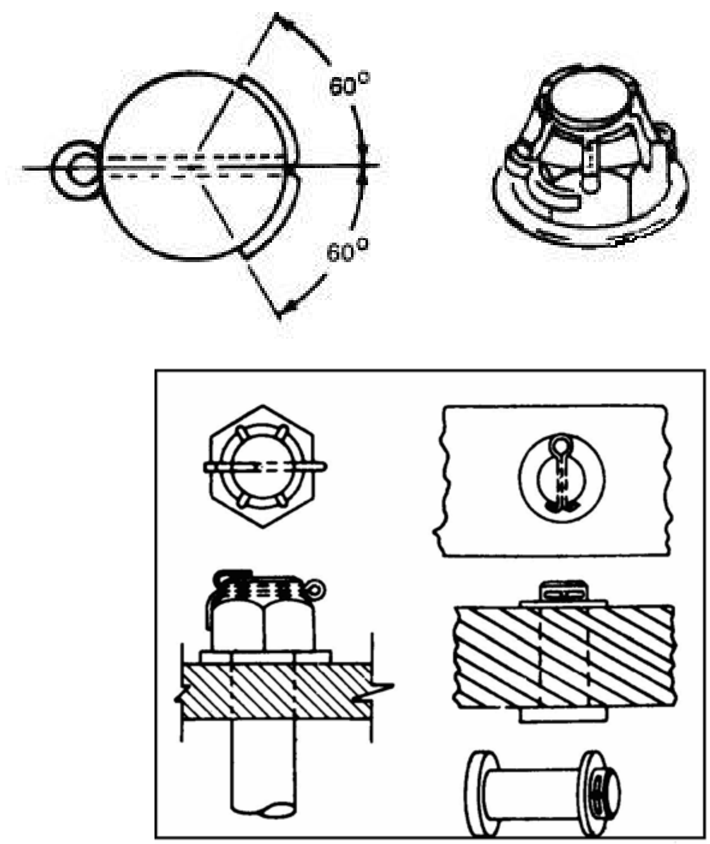


Figure 7.69 Securing bolts or castle nuts with a cotter pin.

Cotter pin removal is very easy: by means of a flat screwdriver straighten up the bent ends of the cotter pin and take the cotter pin out of the hole with small pliers.

CAUTION

When securing castle nuts, always use new cotter pins. Shift the new cotter pin into the hole in the bolt and bend the cotter pin ends as shown in Figure 7.69.

Safety Wire

Procedure of bolt joint securing is by stainless steel wire having diameter of 0.032".

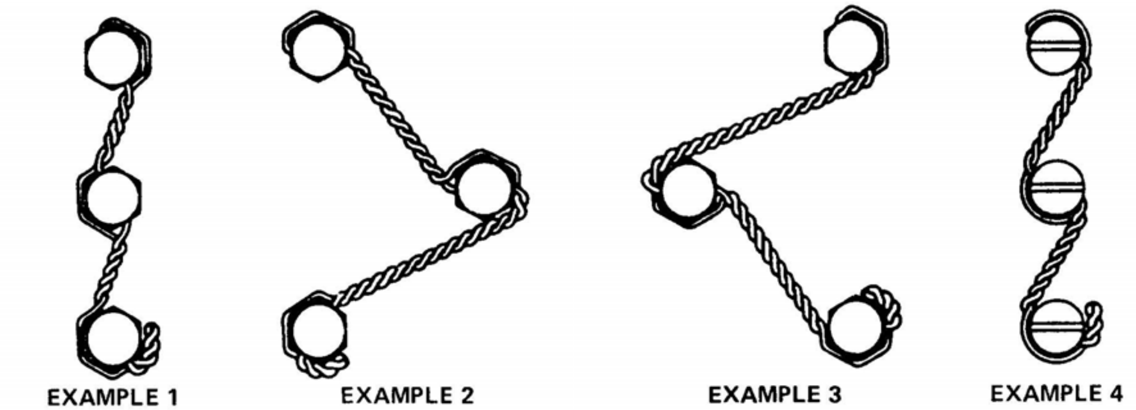


Figure 7.70 Examples of correct direction for drilled bolt safety wire

The installation of safety wire is not intended to retain bolt or nut torque. It is installed to prevent disengagement of screws, nuts, bolts, and other parts for added safety. Do not confuse aluminum wire with stainless steel wire. Wire should only be stainless steel, do not use common wire or ferrous metal which can rust or be attracted by magnetic portions of the aircraft.

Drilled bolts or screws do not need to be safety wired if they are installed with self-locking nuts. Safety wire must be installed in a manner that will prevent the tendency of the part to loosen or rotate. See Fig 7.70.

Safety wire ends are a safety hazard unless they are bent under and inward toward the part to avoid sharp or projecting ends. Safety wire must not be nicked, kinked, or mutilated. When cutting off the end of the twisted wire, leave at least four to six completer turns (1/2" to 5/8") of wound wire to complete a loop.

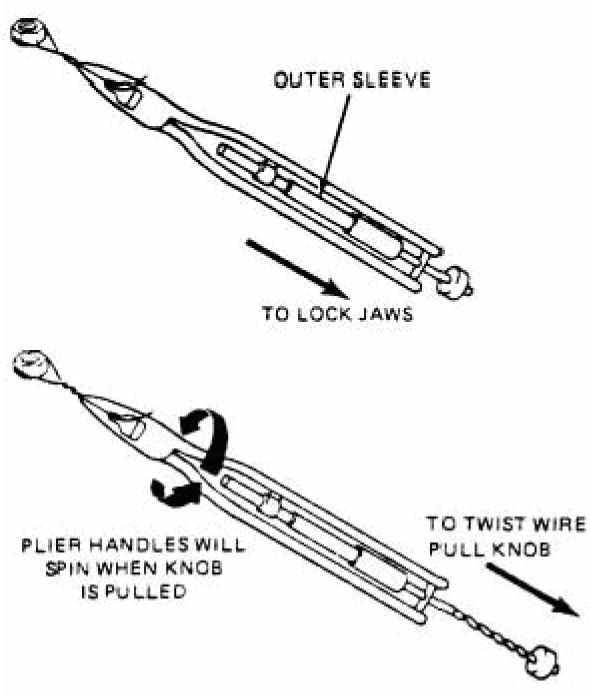


Figure 7.71 Safety wire pliers

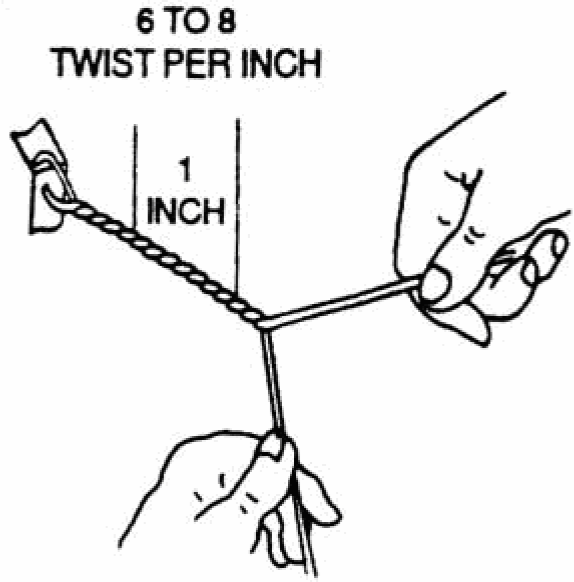


Figure 7.72 Twisting the wire

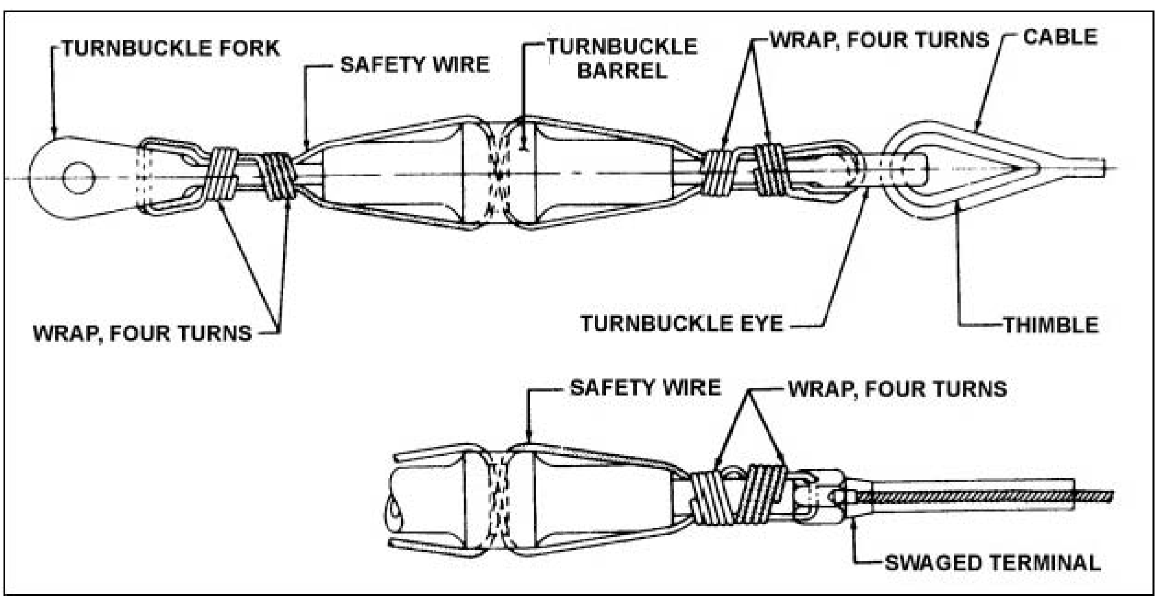


Figure 7.73 Safety wire installation to turnbuckles and swaged terminals

Safety wire procedures, alignment and installation are shown below:

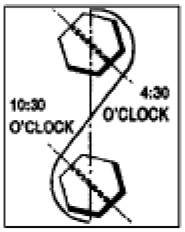
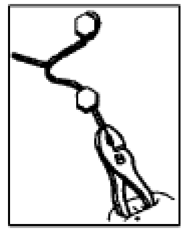
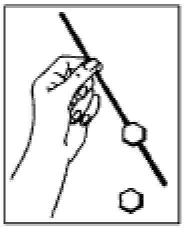
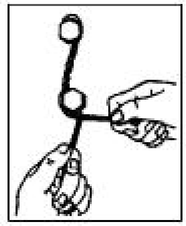
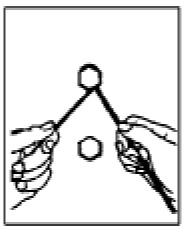
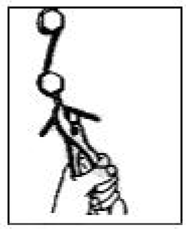
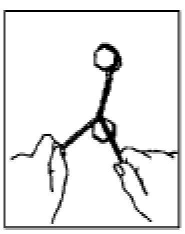
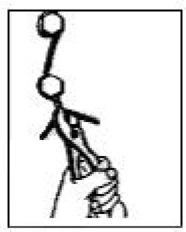
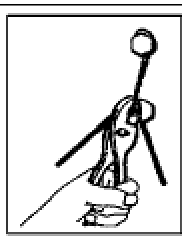
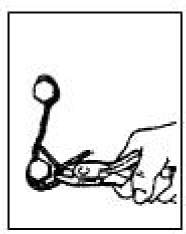
	1. Adjust the correct position of holes for safety wire.		6. Pull the upper wire through the hole in the other bolt. Hold the wire end by pliers tighten it firm.
	2. Pull the safety wire through the hole in one bolt to be secured.		7. Hold the free end of wire by hand, bend it around the bolt head and along with the other end twist it counterclockwise.
	3. Hold the upper end of the wire and wind it around the bolt head and then by the other end of the wire. Make sure that the wire is properly tightened around the head.		8. Hold the twisted end by pliers and twist it tight.
	4. Twist the wire to the hole in the next bolt as tight as possible.		9. Bend the end of the wire under the bolt head.
	5. Tighten the wire and at the same time continue its twisting until perfectly tightened. The twisted wire can have approximately from 3 to 4 threads on the length of 0,4".		10. Cut off the surplus wire.

Figure 7.74 Procedure for securing drilled bolts with safety wire

Inspection of Rod ends

Cracks and subsequent failures of rod ends usually begin at the thread end near the bearing and adjacent to or under the jam nut. (See figure 7.75)

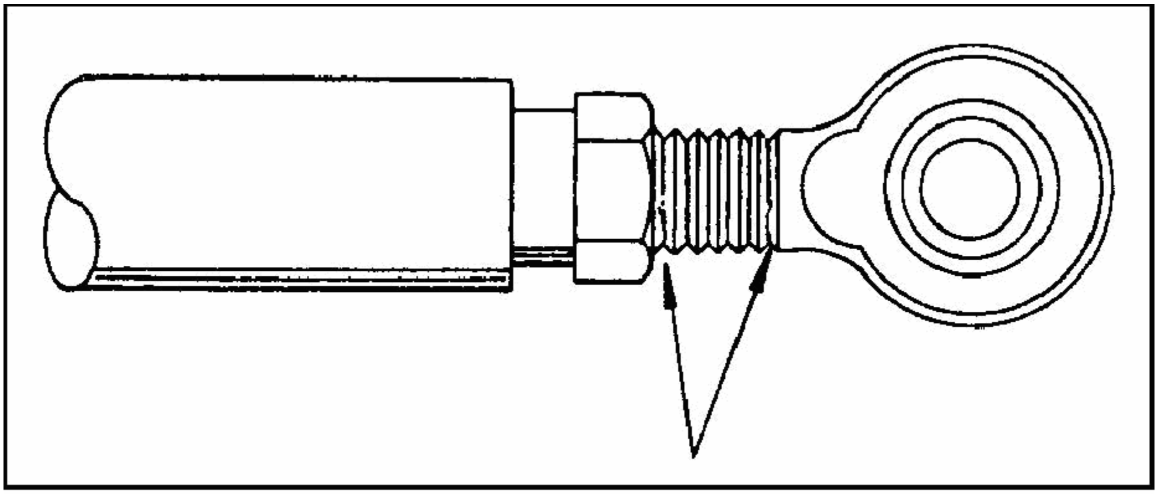


Figure 7.75 Typical locations for rod end cracks

Inspection of push pull tube connections

Elongated holes are especially prevalent in taper-pin holes and bolt holes or at the riveted joints of torque tubes and push-pull rods. (See figure 7.76)

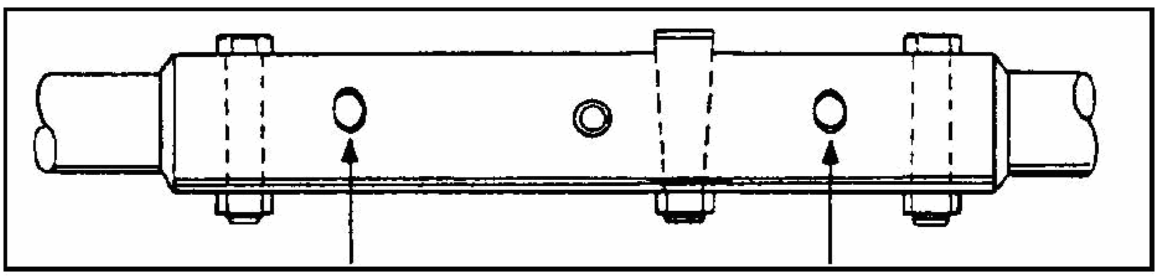


Figure 7.76 Typical locations for elongation of insert holes in push pull tubes.

Cable inspections Swaged Nicopress clamp installation(**L/RI,RM**,**A&P**)

Cable system Inspections

The aircraft uses cable only for the rudders and trim system. These cables are subject to many environmental exterior and interior conditions which can result in deterioration over of a long period of time. Wire or stand breakages is easy to visually recognize when bent into a curve. See Figure 7.77. Other deterioration, such as wear, corrosion and distortion are not so easily seen. Therefore the control cables and all critical areas of fatigue, fairleads, pulleys and swaged connections should receive a detailed inspection at the annual condition inspection for signs of such deterioration.

Figure 7.77 Wire cable strands exposed by bending the cable.

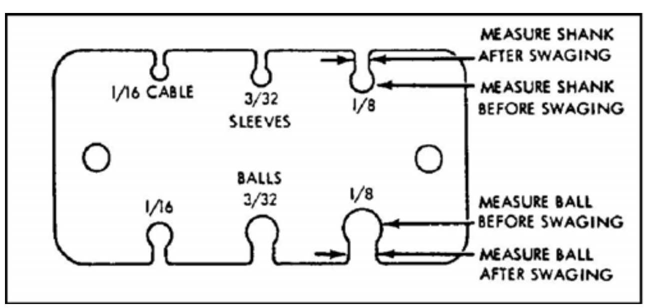
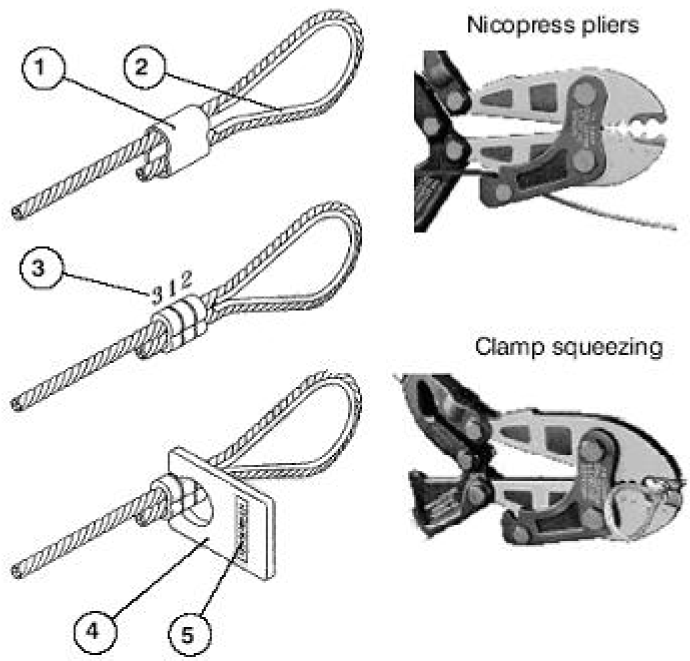


Figure 7.78 Swage terminal shank gauge

Nicopress clamp installation procedure is shown below.



1. Clamp
2. Eye
3. Sequence of squeezing
4. Inspection gauge
5. Gauge No.

FIGURE 7.79 Clamp installation of with Nicopress pliers

Accomplish all procedures in accordance with the manufacturer directions. First pull the cable through the clamp, make a loop around the eye and pull the cable end back through the clamp. The cable end should overlap by about 1 ¼" from the clamp after its puling through. The overlapping will ensure that the cable end will not be pulled back into the clamp during the clamp squeezing. Before actual squeezing the clamp it is also necessary to verify which cable terminal will be used, whether thimble or suspension eye, because some terminals must be put into the cable before actual clamp squeezing.

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SECTION 8
INSTRUMENTS & AVIONICS

INTRODUCTION

Section 8 includes descriptions, limits, EIS settings, and test procedures.

INSTRUMENT PANEL

The specific instruments and/or the configuration in which they are arranged may vary slightly from aircraft to aircraft. The magnetic compass is centered on top of the glare shield behind the utility tray.

StingSport flight instruments are arranged in the basic "T" configuration on the pilot (left) side of the aircraft. Exceptions can include the absence of a particular instrument or a variation in the order of the instruments due to after market changes.

Flight instruments will be arranged in this configuration: (starting from the pilot-side top left) airspeed indicator (ASI), attitude indicator (ADI), altimeter (ALT), (to the second row from the left) turn coordinator (TC), tachometer (TACH), and vertical speed indicator (VSI). The StingSport also includes a slip indicator and remote ELT control and front vent lever on the pilot-side panel.

Other items located on the instrument panel are the avionics stack in the center panel. This is made up of the GPS, Engine Information System (EIS) display, a red EIS alert light, a red battery discharge (low voltage) light, a green auxiliary fuel pump "ON" light, and VHF radio.

Along the base of the center panel are the starter push button, guarded left and right ignition switches, guarded main and instrument switches, a guarded strobe light switch, and the unguarded aux engine fuel pump switch (IGN!, IGN2, MAIN, INST, AUXP). Below the center panel are the fuel shut-off valve, the fuel gauge, the cabin heat control, and the "choke" knob. The aux engine fuel pump will always be located on the last right position and will be unguarded for immediate access. All StingSports will have this switch arrangement.

Located on the co-pilot's panel first row are the transponder and a Hobbs meter. On the second row are three blank 3 1/8 inch instrument locations. Five Breaker switches, for the Landing, Taxi,or XTRA, Cockpit and Position Lights, (TAXI, LAND, XTRA, CKPT, POSN), the intercom control, and 12 circuit breakers, complete this panel. An auxiliary 12 VDC power port is located outboard on the forward portion of each crew seat support.

AIRSPEED INDICATOR MARKINGS

MARKING	KIAS	KCAS	SIGNIFICANCE
White Arc	**38 - 75**	**37-74**	**Full-Flap Operating Range**. Lower limit is maximum weight V_{S0} in landing configuration. Upper limit is maximum speed permiss ble with flaps extended to stage one (Takeoff) setting.
Green Arc	**44 - 118**	**43-117**	**Normal Operating Range**. Lower limit is maximum weight V_S at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed
Yellow Arc	**118 - 164**	**117-162**	**Caution Range**. Operations must be conducted with caution and only in smooth air
Red Line	**164**	**162**	**Never Exceed Speed**. Maximum speed for all operations.

Figure 8.1

ENGINE INSTRUMENTS

The Engine Information System (EIS) is the primary display for monitoring engine operation. The EIS displays the following data: RPM, manifold pressure, fuel pressure, oil temperature, oil pressure, 2 cylinder head temperatures, 4 exhaust gas temperatures, voltage, elapsed engine time, and total engine time. Individual input limitations are preprogrammed into the system. If any of these limits are exceeded, a red EIS alert light will illuminate. The EIS data display will then flash the reading that is in alert.

NOTE

A difference of as much as 200 RPM can exist between the Rotax® tachometer and the RPM indication on the EIS. The EIS digital RPM readout is more accurate and should be relied upon when in doubt.

Engine manifold pressure is monitored in the AUX1 display on the EIS. The indication interpreted from the remote sensor is displayed in two digits with a decimal point and one more digit (eg 25.5) which is an indication of induction air manifold pressure, and is measured in inches of mercury.

Fuel pressure is monitored in the AUX2 display on the EIS. The indication interpreted from the remote sensor is displayed in two digits without a decimal point (eg 35) which is an indication of 3.5 and is measured in pounds per square inch (PSI).

Engine Information System (EIS) Setup (1 Nov 05) (**L/O,RI,RM**,**A&P**)

1. Hold down both the Next/ACK and Previous buttons at the same time for 5 seconds. The unit will enter the **MAIN** program 'set limits mode' and the alert light will stay on.
2. The left (Next/Ack) button will now increase the setting (Up)
3. The center (Previous) button will now lower the setting (Down)
4. The right (Display) button will enter the setting and advance to the (Next) setting.
5. Set Contrast at 2 and push Next,
6. Set Max timer to 0 and push Next,
7. Set Max Oil P to 92 and push Next,
8. Set Min Oil P to 30 and push Next,
9. Set Max Oil T to 256 and push Next,
10. Set Max RPM to 5700 and push Next,
11. Set Max Aux 1 to 0 and push Next,
12. Set Min Aux 1 to 0 and push Next,
13. Set Max Aux 2 to 56 and push Next,
14. Set Min Aux 2 to 22 and push Next,
15. Set Max Volt to 14.8 and push Next,
16. Set Min Volt to 11.0 and push Next,
17. Set Max CHT to 238 and push Next,
18. Set Max EGT to 1600 and push Next,
19. Set Display to 3 and push Next.
20. This will then exit the main program.

Prior to entering the **SECONDARY** program mode, you must read the static amount of the Fuel Pressure display with the power on but the engine off and the aux pump off.

Example to obtain the setting value for minimum fuel pressure on Aux2Off:

1. Turn on power to the EIS display. Read the EIS number shown for Fuel Pressure (AUX2) with the power on but no fuel pump or engine running.
2. If this number is one digit such as 9, place a decimal in front to read '.9'. If the number is two digits such as 11, insert a decimal to read '1.1'.
3. Multiply the number shown by 20, such as .9 x 20 = 18. Then subtract 1, the number will always be odd, so the answer is 17 in this example.
4. If the number is 1.1, then the calculation will be 1.1 X 20 = 22, minus 1 = 21

PITOT-STATIC SYSTEM AND INTRUMENTS

The pitot-static tube consists of a ram air duct located inside a cylindrical static air chamber. With this construction both the ram and static ports are located on the same device which is a tube positioned underneath the right wing. Total system pressure is sensed through the hole in the pitot-tube face and static pressure is sensed through the holes on the tube circumference. Pressure distribution to individual instruments is received by means of flexible plastic hoses.

The tube supplies dynamic ram air pressure to the airspeed indicator, and the static ports supply outside atmospheric pressure to the airspeed indicator, altimeter, mode C encoder, and vertical speed indicator. If installed, the altitude hold portion of the autopilot is also connected to the pitot system.

Pitot-static system scheme

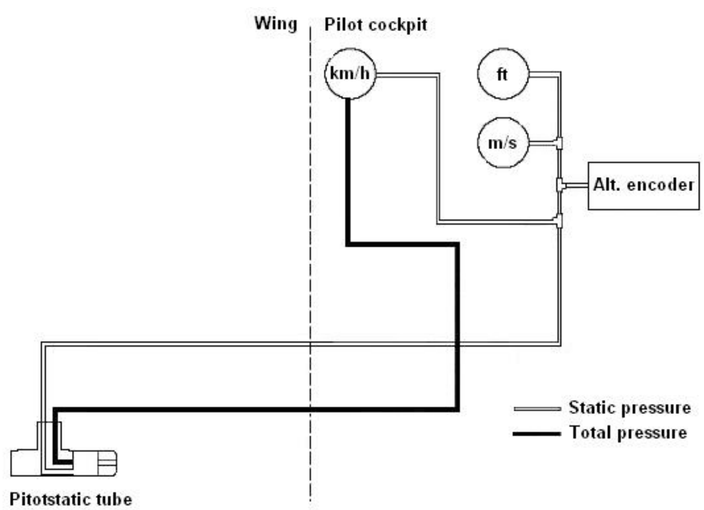

Figure 8.2

Removal of the pitot-static tube (**L/O,RI,RM**,**A&P**)

1. Remove the screw attaching the bracket with the pitot-static tube to the wing.
2. Remove the pitot tube by gently pulling down and rotating the tube to expose the pitot and static hoses. Pull the tube out of the bracket and disconnect the transparent hoses of static and total pressure
3. Disconnect hoses of the pitot-static tube.

Installation of the pitot-static tube (**L/O,RI,RM**,**A&P**)

1. Insert the transparent hoses of total and static pressure line into the bracket of the pitot-static tube. Connect the hoses to the outlets of the pitot-static tube and secure them with clamps.

WARNING

When connecting the pitot-static system hoses pay increased attention. There must not be any incorrect connection! Connect the hose marked STATIC to the outlet marked S. Connect the hose marked PITOT to the outlet marked P.

2. Insert the pitot-static tube in the bracket.
3. Attach the tube by means of the screw through the bracket protruding from the surface of the wing.
4. Carry out check of pitot-static system tightness.

Check of pitot-static system tightness (**L/O,RI,RM**,**A&P**)

1. In the static pressure system create the under pressure by means of an appropriate instrument corresponding to an altitude of 1000 ft indicated on the cockpit altimeter. Drop in the indicated altitude per one minute must not exceed 100 ft.

2. Create in the dynamic pressure tube, by means of a suitable instrument, an overpressure corresponding to the speed of 120 Knots indicated on the ASI. Drop in speed during 3 minutes must not exceed 3 knots.

AIRSPEED INDICATOR

The airspeed indicator (ASI) is the instrument that displays how fast the aircraft is traveling, in knots, through the air. Ram air pressure and static atmospheric pressure supplied by the pitot tube are compared by a diaphragm that expands and contracts as the difference between the two varies. Linkages are connected between the diaphragm and the indicator needle gives the operator a visual reading of the indicated airspeed at any given time.

ALTIMETER

The altimeter (ALT) contains aneroid wafers that expand and contract as atmospheric pressure changes. As altitude increases, the atmospheric pressure decreases, and the aneroid wafers expand. As altitude decreases, the aneroid wafers will contract. Atmospheric pressure is supplied to the altimeter by the static ports on the pitot tube. Mechanical linkages attached to the aneroid wafers move the needles on the altimeter face. A knob on the altimeter's face allows the operator to enter the correct barometric pressure into the Kollsman window.

NOTE

When setting the current barometric pressure in the Kollsman window for the first flight of the day, note the difference between the indicated altitude and the known field elevation. This will give you a correction factor for airborne resetting.

VERTICAL SPEED INDICATOR

The vertical speed indicator (VSI) provides the operator with rate of climb and rate of descent. It acts quite similar to the altimeter. Atmospheric pressure is supplied by the static ports on the pitot tube, and this air is sent into a holding chamber. However, unlike the altimeter, this chamber also has a metered leak attached to it that allows the pressure inside the chamber to eventually equalize with the pressure outside of the chamber. As the aircraft climbs, pressure decreases and this is displayed by the needle on the VSI as a rate of climb. When the aircraft stops climbing, the metered leak allows the pressures to equalize, and thus the indicator needle returns to zero, or no rate of climb. The same holds true for a descent. The indicator will show a rate of descent so long as the aircraft continues to lose altitude, but will return to zero whenever level flight is reached. Because of the metered leak, there is a small delay in the VSI's indication and a change in altitude may be noted first from the altimeter.

Magnetic compass (**L/O,RI,RM**,**A&P**)

The magnetic compass is designed to determine magnetic course of the airplane. The magnetic compass is positioned on the upper glare shield of the instrument panel and consists of a vessel filed with nonfreezing liquid to dampen movement and has a window in the front wall. The compass rose is positioned on the rotary swinging pivot inside the compass.

Magnetic compass compensation

1. Compass compensation must be performed on the approved compass swinging locations, which are at least 300 ft from steel structures, electric leading or other over ground or underground steel equipment or objects.
2. If the compass north is westward from magnetic north, the deviation is westward, i.e. negative. If the compass north is eastward from magnetic north, the deviation is eastward, i.e. positive.

Compensation Procedure:

(a) Turn the airplane to "N" heading; eliminate the deviation by "C" screw.
(b) Turn the airplane to "S" heading, reduce any deviation by half-value by "C" screw and write down the corrected heading.
(c) Turn the airplane to "E" heading, eliminate the deviation by "B" screw.
(d) Turn the airplane to "W" heading, reduce any deviation by half-value by "B" screw and write down the corrected heading.
(e) Enter the individual corrected headings to maintain the magnetic direction on the compass compensation card and position it in the airplane near the magnetic compass.

AVIONICS EQUIPMENT

NOTE

For specific operational and maintenance instructions, see the manufacturer's manual corresponding to each piece of equipment.

TRANSPONDER

The transponder provides altitude information to air traffic control (ATC) radar. The transponder contains a computerized altimeter connected to the pitot-static system that allows it to calculate the aircraft's altitude. This data is then transmitted to the ground radar of ATC. This altitude information passed onto ATC is known as Mode C. The transponder display inside the cockpit reads the present squawk code entered into the system. Control knobs allow the operator to change the digits of the squawk code and enter various modes.

GLOBAL POSITIONING SYSTEM RECEIVER

The global positioning system provides a vast amount of navigational information, such as: present coordinate position, distance, course headings, groundspeed, altitude, ETAs, ETEs, and a scrolling visual representation of the ground and surrounding airspace. Push buttons located on the cockpit display allow the operator to enter information, toggle between screens, and interact with the scrolling map. The operator should consult the provided GPS operations manual for maintaining, updating, or operating the GPS.

NOTE

The Garmin 295GPS internal AA batteries should to be replaced at each annual condition inspection. The battery furnished with the Garmin 396 should be checked at each annual condition inspection and replaced in accordance with the manufacturers instructions.

SECTION 9
ELECTRICAL SYSTEM

INTRODUCTION

Section 9 includes descriptions and wiring diagrams for the aircraft electrical supply and switch layout for the CP lighting panel and the main center switch panel. Some variations occur in the series.

ELECTRICAL SYSTEM AND INSTRUMENTS

The aircraft is equipped with a 12-volt, direct-current electrical system with grounded negative pole. The primary source of electrical energy is provided by the engine mounted interior alternator/generator with total power of 750 W. The internal alternator located at the rear of the engine block will charge the battery up to 13.5 VDC. Power is supplied to the electrical and avionics circuits through a main bus bar located behind center instrument panel, this bus bar is energized anytime the Main switch is ON. Each system is protected by circuit breaker which is permanently on. If some circuit is overloaded, then the circuit breaker disconnects that circuit. The circuit breaker layout is shown on in figure 9.3. The ELT is independent from the aircraft electrical system.

Two 12 VDC auxiliary power ports are installed in the lower right and left vertical surface of each seat. The ports are directly “hot-wired” to the battery and can be used to charge the battery without the operator having to connect additional leads directly to the battery.

CAUTION

Do not attempt to start the engine with a dead battery by using either 12VDC port. The current load will exceed the wire capacity and a fire may result.

The Instrument Switch activates all avionics equipment tied into the circuit. This instrument switch should always be in the OFF position before the main switch is turned on or before the main switch is turned off.

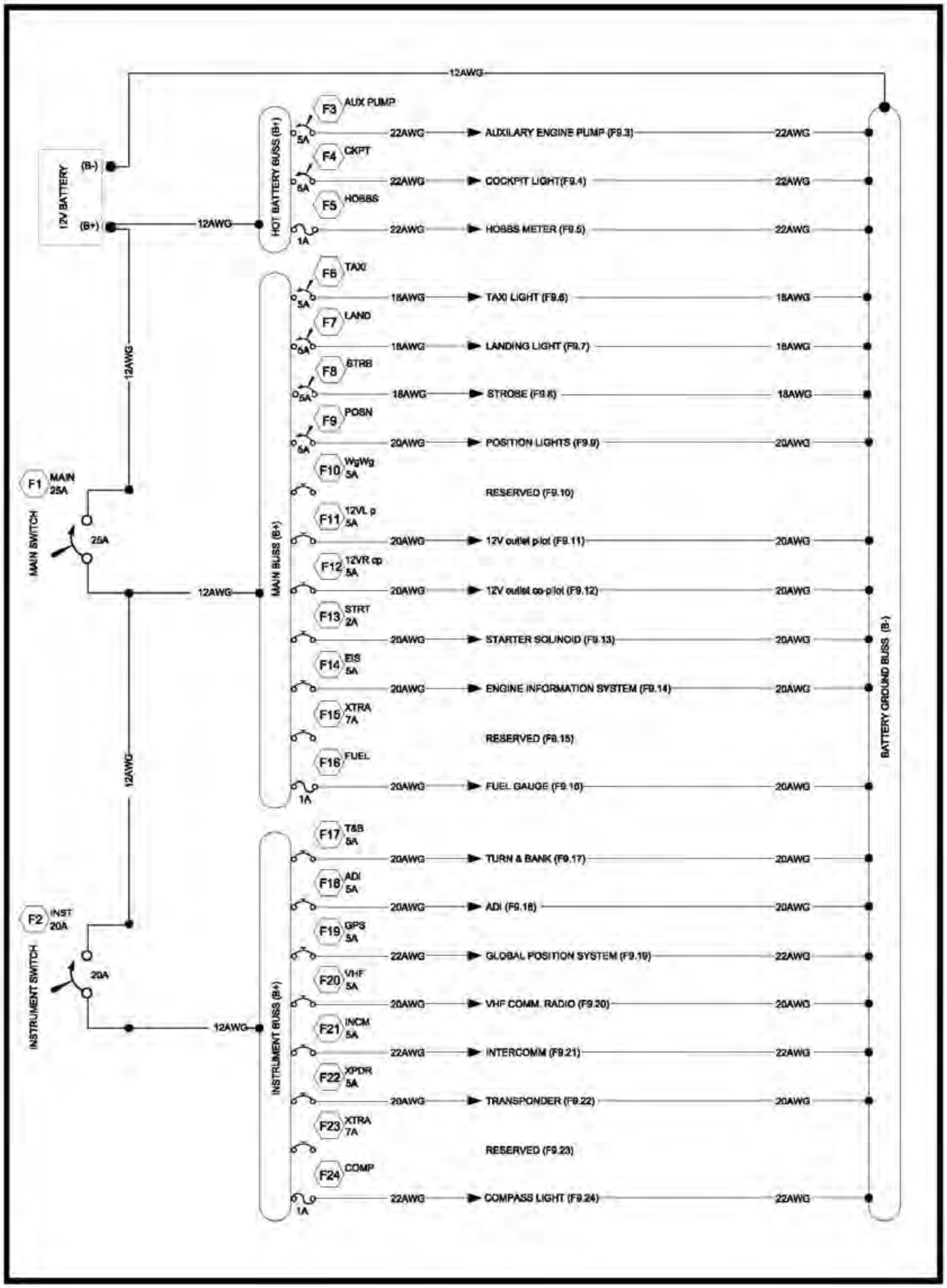

Figure 9.1 StingSport Electrical System

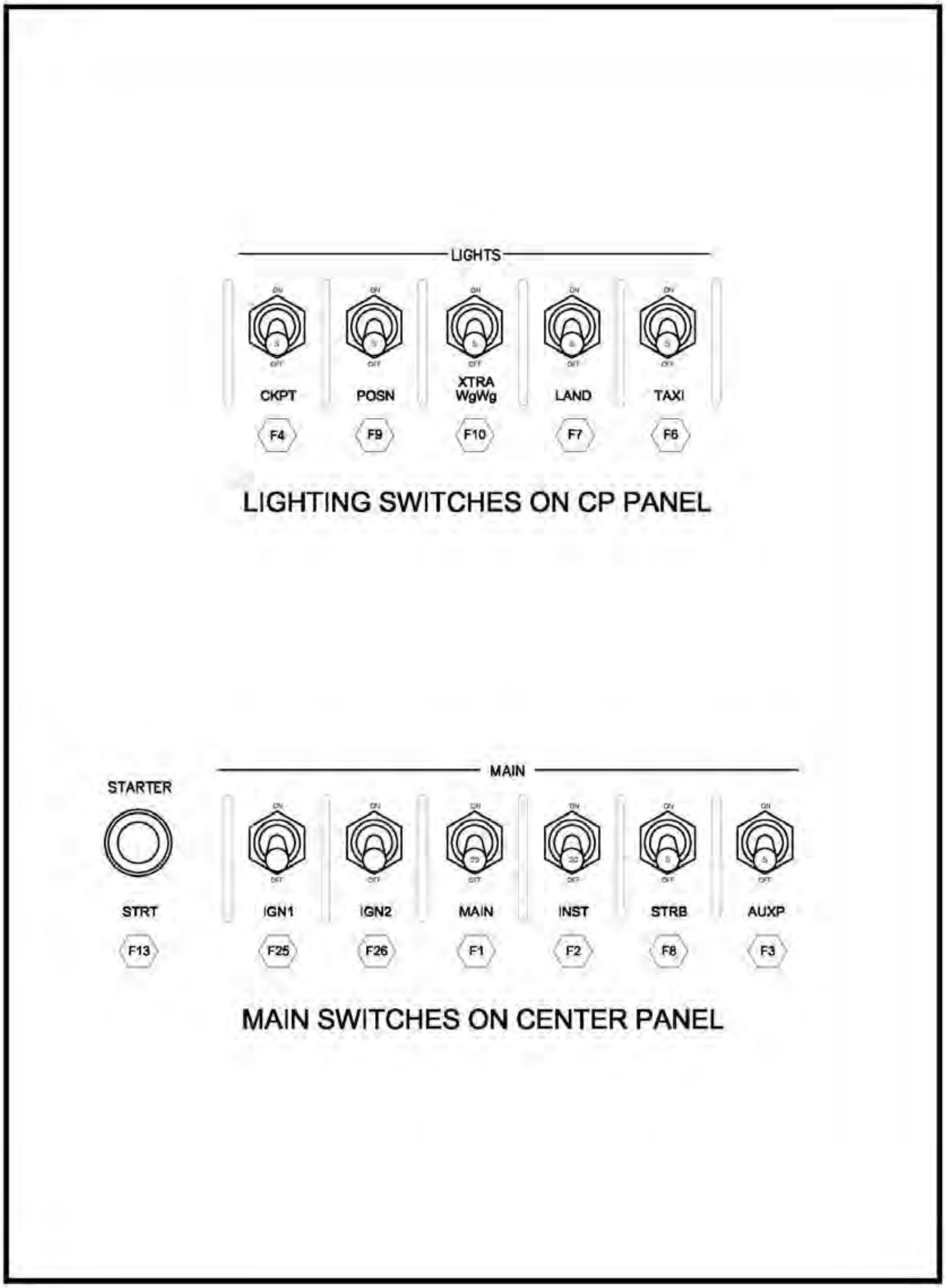

Figure 9.2 StingSport Switch Layout

EXTERIOR LIGHTING

High capacity, anti-collision, safety strobe lights are located on each wingtip and one on the lower aft tail. These lights are encased in a clear-plastic, flush-mounted cover for protection and decreased drag. The center panel has an ON/OFF circuit breaker-switch (CBS) for the strobe lights.

LED high intensity position-navigation lights are mounted on each wing tip and on the lower aft tail. The co-pilot panel has an ON/OFF circuit breaker-switch (CBS) for the position lights.

Two wing tip mounted HID lamps are used for taxi and landing illumination. The co-pilot panel has an ON/OFF circuit breaker-switch (CBS) for each of these (LAND, TAXI) lights.

GENERATOR

The 600 W generator is a part of the engine which supplies electric current through the rectifier. Regulator supplies electric current of 14 V voltage to onboard network. The maximum of approximately 18 amps is provided by the regulator, but only 14 amps should be considered available for use.

Technical parameters of generator:
Maximum output power: 600 W at 5500 RPM
Technical parameters of rectifier - regulator:
Type: electronic
Output voltage: 14 ± 0.3 V (000 ± 250 RPM)
Range of operation temperatures: min. -13 °F max. +194 °F
Weight: 0.6 lbs

CIRCUIT BREAKERS AND FUSES

Circuit breakers and fuses are the best protection for electrical loads and malfunctions. The most common form of protection for this aircraft is circuit breakers (CB) and circuit breaker-switches (CBS). The CBs cannot manually be pulled out to disconnect the circuit. If a surge or over-loading amperage is placed on a CB switch, the built-in circuit breaker will open turning the switch off, thus protecting the circuit. After reducing the electrical load, turn the switch back to the ON position to reset the breaker.

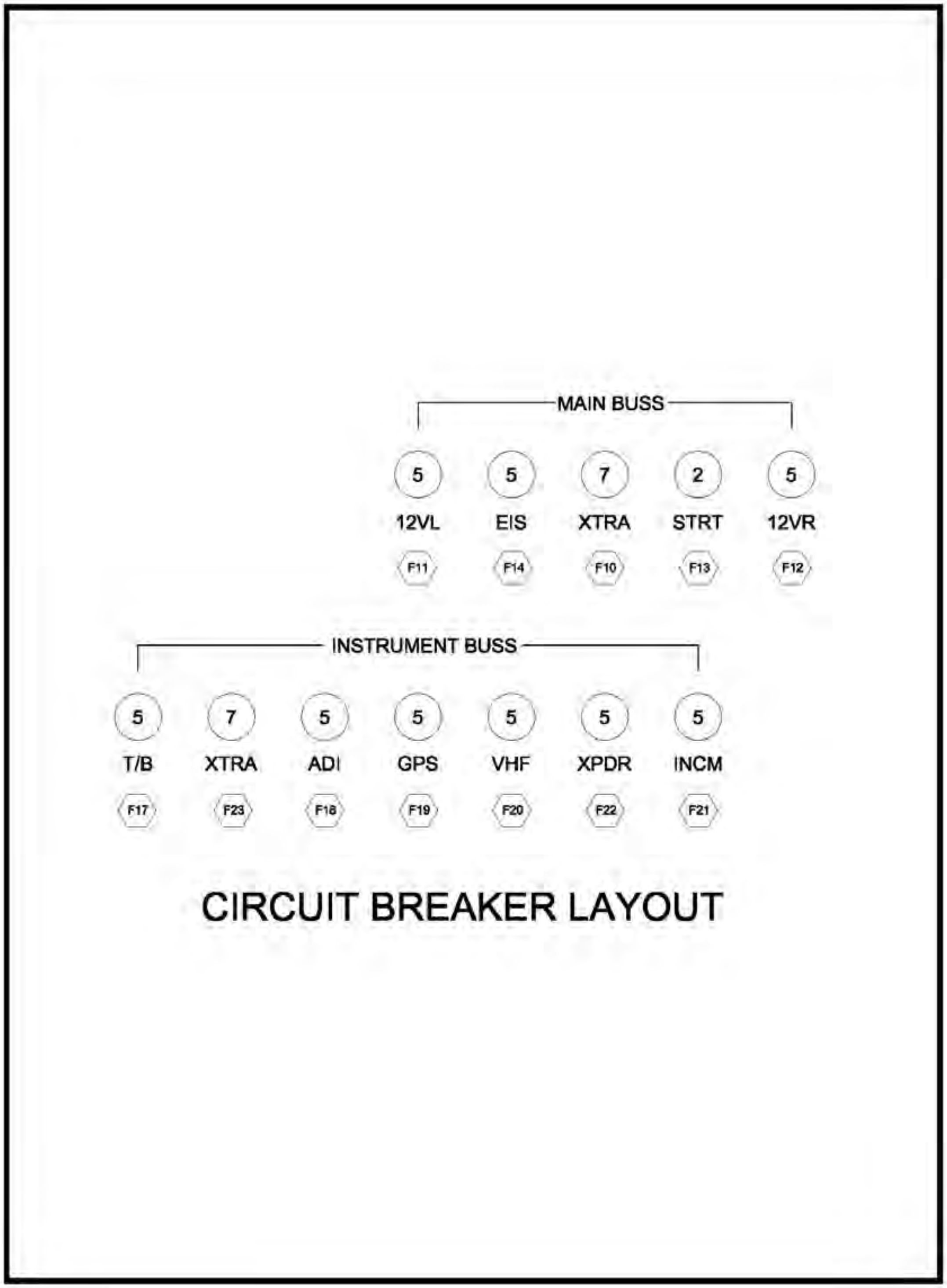

Figure 9.3 – StingSport Co-Pilot Panel Circuit Breaker Layout

BATTERY

Both the GPS and the Emergency Locator Transmitter (ELT) contain internal batteries, and therefore can be operated when Main switch is OFF. The Garmin 295GPS contains six AA batteries. The ELT contains eight D-cell batteries, as well as one small battery in the remote control panel. All batteries should be replaced at each annual inspection. The Garmin 396GPS contains a rechargeable lithium-ion battery pack. The battery furnished with the Garmin 396 should be checked at each annual condition inspection and replaced in accordance with the manufacturers instructions.

The maintenance-free Varta battery or equivalent is installed on firewall. Battery can be charged directly in the airplane after disconnecting from the onboard electrical system.

Aircraft Battery Technical Parameters:
Voltage 12 V
Nominal capacity 24 Ah;
Weight: 17 lbs
Discharging current 1200 mA
Maximum loading 200 A
Range of operation temperatures -22°F to +122°F
Number of cycles, 100% discharging-charging: more than 200
Service life: 4 to 5 years (Service life occurs at 60% of nominal capacity after full charging)

If the airplane is not used for flight for more than one month, remove the battery from the airplane and store it. Always store the battery fully charged at temperature of 68 °F. Daily discharging is less than 0.1 % of battery nominal capacity. Regularly recharge it up to the full capacity once a month.

Removal of the onboard aircraft battery (**L/O,RI,RM**,**A&P**)

1. Remove engine cowl.
2. Disconnect the contacts from the battery.
3. Disconnect the battery hold down(s) and remove the battery from the airplane.

Installation of the onboard aircraft battery (**L/O,RI,RM**,**A&P**)

1. Install the battery into the bracket on the firewall.
2. Fasten it with hold down(s) so that it cannot move in the bracket.
3. Install the additional electrical contacts to the aircraft electrical system.
4. Install electrical grease on the battery contacts to minimize corrosion and install the clamps on them from the aircraft electrical +/- system.
5. Reinstall the engine cowl.

INSPECTION AND OPERATION CHECKS (L/RI,RM,A&P)

The satisfactory performance of an aircraft is dependent upon the continued reliability of the electrical system. Damaged wiring or equipment in an aircraft, regardless of how minor it may appear to be, cannot be tolerated. Reliability of the system is proportional to the amount of maintenance received and the knowledge of those who perform such maintenance. It is, therefore, important that maintenance be accomplished using the best techniques and practices to minimize the possibility of failure.
.

Inspect equipment, electrical assemblies, and wiring installations for damage, general condition, and proper functioning to ensure the continued satisfactory operation of the electrical system. Adjust, repair, overhaul, and test electrical equipment and systems in accordance with the recommendations and procedures in the component manufacturer's maintenance instructions. Replace components of the electrical system that are damaged or defective with identical parts from the aircraft manufacturer's approved equipment, or its equivalent to the original in operating characteristics, mechanical strength, and environmental specifications.

A list of suggested problems to look for and checks to be performed are:

a. Damaged, discolored, or overheated equipment, connections, wiring, and installations.
b. Excessive heat or discoloration at high current carrying connections.
c. Misalignment of electrically driven equipment.
d. Poor electrical bonding (broken, disconnected or corroded bonding strap) and grounding, including evidence of corrosion.
e. Dirty equipment and connections.
f. Improper, broken, inadequately supported wiring and conduit, loose connections of terminals, and loose ferrules.
g. Poor mechanical or cold solder joints.
h. Condition of circuit breaker and fuses.
i. Insufficient clearance between exposed current carrying parts and ground or poor insulation of exposed terminals.
j. Broken or missing safety wire, broken bundle lacing, cotter pins, etc.
k. Operational check of electrically operated equipment such as motors, inverters, generators, batteries, lights, protective devices, etc.
l. Ensure that ventilation and cooling air passages are clear and unobstructed.
m. Voltage check of system with portable precision equipment

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SECTION 10
PAINTING AND COATINGS

INTRODUCTION

Section 10 contains information on cleaning, interior/exterior signage locations, painting, laminate repairs and the finish paint/material specification.

CLEANING AND CARE (L/O,RI,RM,A&P)

CANOPY

The canopy surface should be cleaned only with an aircraft windshield cleaner and one of the micro-fiber cloths which are provided. Do not wipe the canopy in a circular motion. If the canopy is covered with dust, use flowing clean water and lightly wipe the dust away with a clean hand (remove finger rings). This will remove (flow away) the grit that will scratch the plastic surface. Apply a sufficient but modest amount of cleaner to the canopy surface and wipe in a long stroke fore/aft **linear** motion with light pressure until the surface is clear. Attempt to lift the dirt from the surface don't rub it into the canopy or light scratches will appear in the sunlight reflections.

NOTE

Never use glass cleaner, MEK, acetone, benzene, gasoline, fire extinguisher, anti-ice fluid, or lacquer thinner to clean plastic. These materials will attack the plastic and cause it to craze.

Do not use a canvas cover on the canopy because the cover may scratch the plastic surface. Use only the proper canopy cover provided with the aircraft.

PROPELLER CARE (L/O,RI,RM,A&P)

Proper preflight inspections of the propeller blades for nicks and cracks are key to maintaining a good propeller. Wiping down the blades to clean off bugs and grass is also advisable after EVERY flight. Whenever the airplane is parked, place the propeller covers over the blades to ensure that they are protected from the environment. A clean waxed propeller resists stains and is more efficient.

The following is a list of both placards and markings located inside the cockpit and on the exterior of the airplane. These placards and markings provide guidance, instruction, or caution.

PLACARDS

Below the fuel gauge:

ALL AEROBATIC MANEUVERS
INCLUDING SPINS
PROHIBITED

Near the airspeed indicator:

Max flap speeds:
75kt – HALF
65kt – FULL

Forward near the throttle (aircraft without carburetor heat system)

NO CARBURETOR HEAT
Do not fly when
conditions are conductive
to carburetor icing.

Attached to the safety pin on the GRS activation handle:

SAFETY PIN, REMOVE BEFORE FLIGHT

Aft Interior of Main Canopy (2” reverse letters)

LIGHT SPORT

MARKINGS

Above main fuel tank cap:

Attention! Ground aircraft during refueling.

Main fuel tank filler neck rim:

Either:

FUEL CAPACITY 18.0 US GALLONS

Or:

FUEL CAPACITY 20.5 US GALLONS

Aux wing fuel tank filler neck rims: (If installed)

FUEL CAPACITY 6 US GALLONS

Main landing gear wheel pants, nose gear wheel pant:

TP: 30 PSI

Wing trailing edges (x2), left aileron trim tab, elevator trailing edge (x2), rudder trim tab:

NO PUSH

Elevator trim tab:

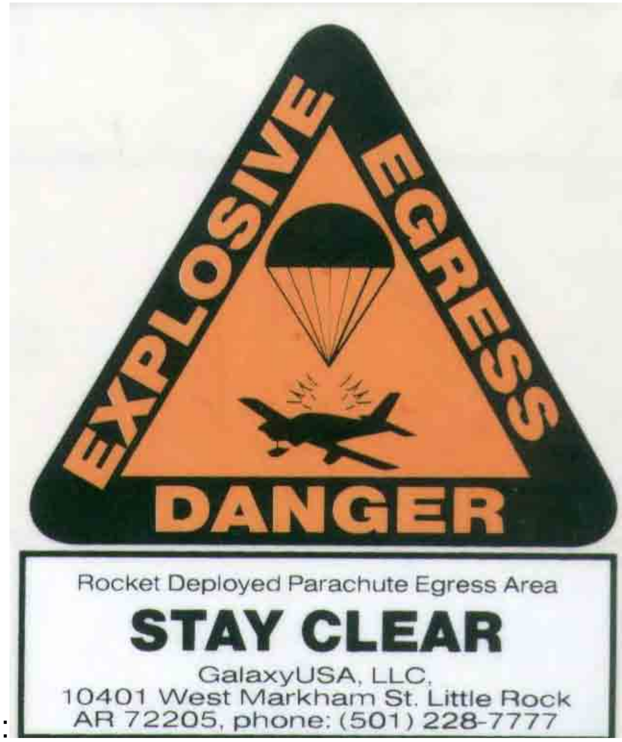
NO LIFT

Copilot side instrument panel:

Passenger Warning: This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements.

Aircraft parachute warning labels
Interior co-pilot panel:

Exterior aft canopy near rocket exit



:

GRS rocket interior front of rocket motor:

DO
NOT
PUSH

Rocket Exhaust Port (if installed):

ROCKET EXHAUST
DO NOT TOUCH

Lower external cowling, pilot side of nose gear:

EXTERNAL POWER
12 VOLTS D.C.

Repair of Laminate parts (L,H/A&P,RS)

Damage classification

Any damage of parts from reinforced plastics with epoxy matrix leads to increased saturation of the matrix with humidity and subsequently to loss of properties. Carry out their repair as soon as possible after the damage has occurred.

According to the damage extent, it can be divided into repairs of:

1. small damage
2. medium damage (not more than 10% of part damaged)
3. heavy damage

General
Epoxy resin mixtures are prepared in a given mass ratio by means of weighing (accuracy of scales 0,002 lb)

Small damage (surface defects, not affecting the spars or other structure)

Repair of damage just by application of mastic and by varnish repair.

Preparatory Sanding
For a good adhesion of repair layers it is necessary to carry out surface sanding at the utmost up to the depth of contact with the lower surface of fabric (do not damage). It is necessary to do surface sanding with overrun of 2” from the damage location smoothly to the top layer. It is suitable to do sanding with grain size of 160. Dry Sanding equipment with suction from the sanding area is used. Al2O3 or equivalent (fused corundum) can be used as sanding material.

Dust removing
Wipe with clean and dry brush or by a vacuum cleaner.

Application of smoothing layer
After preparation of mixture and its eventual thickening to enhance the non curtaining capability (for vertical or lower areas) is performed its application onto the repair area by means of a plastic spatula. For better distribution of deposited material on irregular surface it is possible to form it through the laid PE or PP transparent polyethylene. After proper application the layer is without bubbles.

Deposit thickness is given by necessary thickness of surrounding layers (leveling) and ranges from 0.008” to ½” in one deposit.

Manufacturer	**Type**	**Mixing Ratio**	**Delay**	**Rate of Setting**	**Time of Setting**	**Temperature**	**Fillers**
MGS, A: L285 B: Hardener 285	Epoxy	A:B = 100:40	Process within 50 min (for 0.2kg mixture)	40%	16hours (32hours)	68-95°F (62-68°F)	Aerosil, Microballs
				100%	26hours (72hours) (2hours)	68-95°F (62-68°F) (176°F)	

Figure 10.1 Materials for mixture preparation for application of leveling layer

Sanding

Sanding or eventually sealing the surface is made after setting the mixture and possible tearing of the used polyethylene. It is suitable to start sanding with grain size up to 160 and finish with grain size of at least 400. It is carried out by dry sanding equipment with suction from the sanding area. Al203 or equivalent (fused corundum) can be used as sanding material. Basic material of the part must not be diminished by sanding.

NOTE

Especially in case of carbon stiffener in the basic part, sanding through up to the stiffener must not occur

Finishing

Medium damage

Repair of damage by replacing the stiffener part, by mastic and varnish repair. At such repair it is necessary to distinguish type of used stiffener (especially for sanding):

C (carbon), rovings of fabric of black color
G (glass), rovings from milky white to transparent

Preparatory Sanding:
For good adhesion of repair layers it is necessary to do sanding up to the depth of damage. It is necessary to do surface sanding from the damage area with overrun at the least 1” for every damaged stiffener layer smoothly up to the top layer and then about 2” for finishing and mastic application. It is convenient to do sanding with

sanding material having grain size of 160. It is carried out by dry sanding equipment with suction from sanding area. Al203 or equivalent (fused corundum) can be used as sanding material.

Dust removing

Dust is removed by wiping with a clean and dry brush or by a vacuum cleaner.

Stiffener preparation:

For this kind of repairs use the stiffener G (glass) with plain weave, 150g/m2, with surface protection for epoxy resins. Number of needed stiffener layers depends on depth of damage. It is possible to say that each layer of the mentioned fabric represents at proper saturation by matrix resin thickness of 0.020”. Stiffener layers must be prepared (cut out) gradually from the smallest (the lowest) up to the bigger (upper), each with overrun of ¾”.

Putting layers

After preparing lamination mixture, it is applied to the place of repair by means of rigid brush. The first stiffener is laid into the deposit and it is again saturated by brush. Another layer of stiffener is laid and saturated. When putting the last layer it is necessary to pay attention to a proper saturation and compression of stiffeners so that they cannot “come up" to the surface and subsequent useless damage at final sanding. For better saturation of the surface by resin and securing against curtaining it is possible to put PE or PP transparent foil across the surface. When applied properly, the layer is without bubbles. Repair thickness should exceed surrounding surface in this phase by about 0,020” to 0,040” for finishing.

Sanding

Carry out sanding and eventually apply mastic on the surface after setting, eventually tearing of the foil. It is suitable to begin sanding by abrasive with grain size of 160 and finish by grain size of at least 400. Dry Sanding equipment is used with suction from the sanding area. Al_2O_3 or equivalent can be used as sanding material. It is important not to diminish basic material of the part at sanding.

Heavy damage

At such damage the part must be replaced.

Structural parts

On these parts we do not do other than small surface damage repair. In case of the other damage the part must be replaced.

CAUTION

When repairing, it is necessary to pay attention to timely repair see the text about low of properties at humidity effect.

Small damage

Repairs are made according to instructions with appearance parts.

CAUTION

When repairing, it is necessary to carefully pay attention not to damage any structural part!

Paint repairs (**L/O,RI,RM**,**A&P**)

Safety rules

When working with paints, thinners and solvents follow the following safety rules:

1. it is necessary to follow safety rules for working with flammable and volatile substances
2. working area must be properly aerated
3. it is prohibited to smoke and anyway handle with free fire in a working area
4. use protective working means such as goggles, gloves, respirator, etc.

Recommendation for additional surface treatment of the airplane surface

CAUTION

By applying permanent protective coats weight of airplane is increased and gravity center position is changed. Increase in weight depends on type of coat and its thickness.

Washing and degreasing

It is possible to use both organic solvents and water based solvents.

CAUTION

All paints and solvents must be used only with caution for proper personal and environmental protection and disposal.

Organic solvents – (acetone, metyetylketone (MEK), benzine, toluene)

Applied by spraying on washed surfaces (e.g. mechanical sprayer, jet ejector) or by wiping with wet (by pouring, not by dipping because it would contaminate the whole volume of solvent) textile wad. After applying it, the agent is wiped of by clean absorbing material before solvent evaporation.

Advantages: fast and reliable evaporation even from the corners and borders without additional warming

Disadvantages: it must be used without other dilution (expensive); not ecological (danger of water contamination); detrimental to health (must be carried out in an aerated area with personal protective means); waste (including dripping from the area) must be eliminated in the incinerating plants.

Use: for Al-alloys surfaces, epoxy fiberglass

CAUTION

These agents must not be used for degreasing parts from plastics (PC -Lexan, PMMA Plexiglass)

Water-based agents – (emulgation substances, wetting agents)

Applied also by spraying onto washed surfaces or by wiping with wet (by pouring and dipping) textile wad. After applying it, let it act for some time (see manufacturers recommendation) and then it is rinsed with clear water (by means of sponge dipped in ample amount of water or water jet).

Advantages: (different according to the type of product: it is possible to highly dilute with water (cheap); ecological - waste (including dripping from the surface due to ample amount of water it is necessary to contain it) can be generally eliminated after its additional dilution with water; the least detrimental to health.

Disadvantages: slow and unreliable evaporating from corners and borders, additional warming (drying) mostly required imperfect elimination of water results in wrong adhesion of paint coats; imperfect degreasing of fiberglass parts (not possible to use)

Use: for Al-alloys surfaces and plastics

Application of primer (paint)

In order to reach a uniform resistance to corrosion and smooth surface, carry out this application by means of spraying (air standard gun with the upper vessel, air HVLP gun, airless electric gun). The adjusting of the used gun (given by manufacturer) differs according to the type - air pressure, jet diameter. Primer should be applied in several sprayings (total thickness is not reached at a blow) with defined maximum dwell and total drying time till further treatment or handling.

Primer serves especially for anchoring (adhesion to the substrate) the topcoats and can serve also for eliminating irregularities of the surface (function of filer, for sanding).

Surface	**Manufacturer**	**Type**	**Further Components**	**Surface Mass [lb/inch/ft^2]**	**Recom. Thickness ["]**	**Drying (between spraying / total) / 65°F**
Carbon fiber Fiberglass PC (Lexan), PMMA (Plexiglass)	BASF Glasurit 801-1871 (base)	Epoxy	BASF Glasurit 965-35/2 (hardener) Glasurit 965-50 (thinner)	8.49	0.00098 (at 0.00197 it can be also used as filler)	15 min / 12 hours

Figure 10.2 Recommended primers

Bonding

After total drying of basic coat carry out total bonding of irregularities including repairs of bonding. After drying perform sanding with emery paper with grain size of 240 until the surface is smooth. After sanding clean dust and wipe of with grease remover and perform repairing paint coat by primer (1/3 of coat thickness).

Application of top coat

In order to reach smooth surface apply the paint coat only by spraying. Topcoat serves especially for creating the coat resistant to weather and external effects for aesthetic rendering of the unit. Considering the higher loading by external effects use top materials, exclusively two-component ones, on the acrylic-polyurethane or polyurethane basis, always with guaranteed adhesiveness to the used base coat (according to manufacturer).

Small damage

General

Small damage is a deterioration of corrosion resistance. At repair the situation is made more difficult by the fact that the substrate for repair coats is not a compact surface of basic material but mostly all coats of surface protection (after sanding), of which not all are suitable for (in ageing stage) for good adhesion of paint coats. Therefore accomplish such repairs only by a verified system.

It is suitable to choose a defined edge delimited area (e.g. connection of parts, wing edge) for the scope of the place, which is being repaired transition, is then better blended. In the case that it is not possible to choose the area in this way, it is necessary to take into consideration the higher difficulty of the procedure as for the uniformity of shade and elaboration of coat transition.

Sanding

For good adhesion of the repair coats it is necessary to carry out sanding of the old paint coat at least up to such depth as the depth of damage. Ground area must be larger from 2" to 4" than damaged area. With two-coat type of the topcoat it is necessary to add at least 2" for the run-out of the top coat. Sanding can be started with abrasive having grain size of max. 160 and finish with grain size of 400. It is made by the grinder equipped with the suction from the area of sanding or by manual sanding under water.

Degreasing
It is carried out in the same way as in the case of the total spray coat.

Application of primer
For reaching the satisfactory equal adhesion to carry out a spray coat of the place to be repaired by adhesive interlayer

Surface	Manufacturer	Type	Surface weight [lb/inch/ft^2]	Recomm. Thickness [“]	Drying (total) / 65°F
Al-alloys	BASF Glasurit 934-0	Single-component	4.19	0.00019-0.00039	max 15 min
Epoxy fiberglass					
Old paint coats					

Figure 10.4 Adhesive interlayer

Subsequently the primer is applied according to the table.. Paint coat thickness is given by necessary thickness of surrounding coats (leveling).

CAUTION

In case that the primer was not removed by the previous step, it is not necessary to apply the primer again. The original ground primer with adhesive intercoat is enough. Actual application of primer will be carried out in the same way as for the total spray-coat

Application of top coat
Application of the top coat will be carried out by spraying as for the total spray coat with the exception of used thinners and hardeners. Due to the need of smooth transition to the basic surface it is necessary to use so called “spraying into the surface" using longer time of drying initiations for a good result of work.

FINISH COATINGS COLORS AND NUMBER

Paint number: Rabbe, RAL9003, Signal White
Silicone number: GE Silicone II, White

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