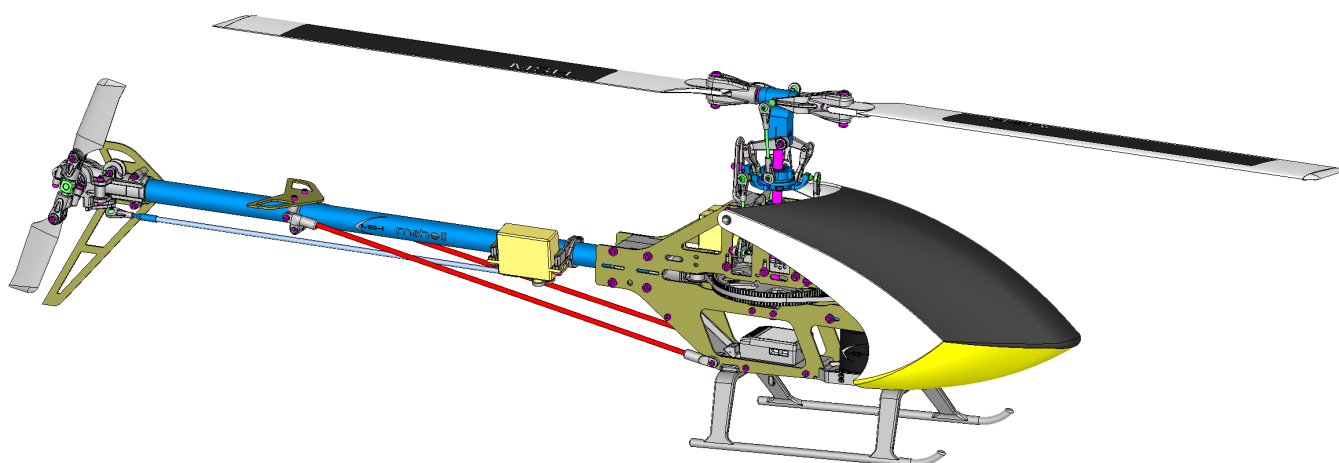


RC helicopter

PRÔTOS *Mini*

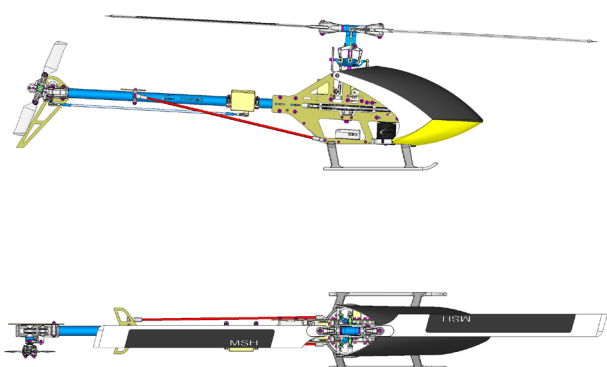
instructions manual

Flybarless



Main rotor diameter:	736mm (3s) - 786mm (6s)
Tail rotor diameter:	157mm
Length without main blades:	739mm
Length with main blades:	904mm (3s) - 929mm (6s)
Main blades length:	325mm (3s) - 350mm (6s)
Overall height:	223mm
Tail rotor-Main rotor ratio:	4,29
Main pulley:	120T
Weight AUW without battery:	645gr

RC helicopter Instruction Manual



Index

3	safety rules
4	assembly tools required
5	R/C equipment required for assembly
6	motor pinion teeth choice
7-13	main frame assembly
14-19	head assembly
20-30	tail assembly
31-33	motor installation
34-35	battery, ESC and canopy installation
35	belt tensioning diagram

Always follow these rules for safety

Operate the helicopter in open areas with no people nearby.

Do NOT operate the helicopter in the following places and situations (or else you risk severe accidents):

- in places where children gather or people pass through
- in residential areas and parks
- indoors and in limited space
- in windy weather or when there is rain, snow, fog or other precipitation

If you do not observe these instructions you may be held liable for personal injury or property damage!

Always check the R/C system prior to operating your helicopter.

When the R/C system batteries get weaker, the operational range of the R/C system decreases.

Note that you may lose control of your model when operating it under such conditions.

Keep in mind that other people around you might also be operating a R/C model.

Never use a frequency which someone else is using at the same time.

Radio signals will be mixed and you will lose control of your model.

If the model shows irregular behavior, bring the model to a halt immediately and disconnect the batteries.

Investigate the reason and fix the problem.

Do not operate the model again as long as the problem is not solved, as this may lead to further trouble and unforeseen accidents.

In order to prevent accidents and personal injury, be sure to observe the following:

Before flying the helicopter, ensure that all screws are tightened.

A single loose screw may cause a major accident.

Replace all broken or defective parts with new ones, as damaged parts lead to crashes.

Never approach a spinning rotor. Keep at least 10 meters/yards away from a spinning rotor blades.

Do not touch the motor immediately after use. It may be hot enough to cause burns.

Perform all necessary maintenance.

PRIOR TO ADJUSTING AND OPERATING YOUR MODEL, OBSERVE THE FOLLOWING

Operate the helicopter only outdoors and out of people's reach as the main rotor operates at high rpm!

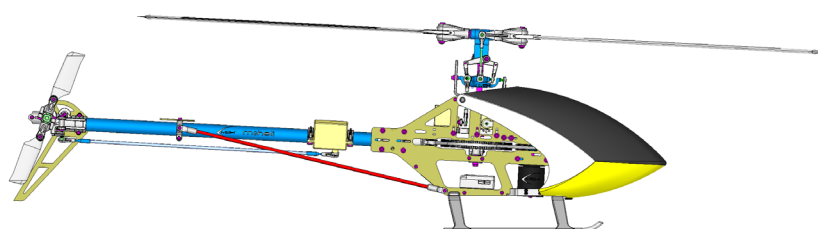
While adjusting, stand at least 10 meters

Novice R/C helicopter pilots should always seek advice from experienced pilots to obtain hints with assembly and for pre-flight adjustments.






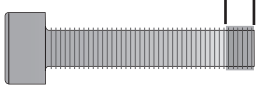
Note that a badly assembled or insufficiently adjusted helicopter is a safety hazard!

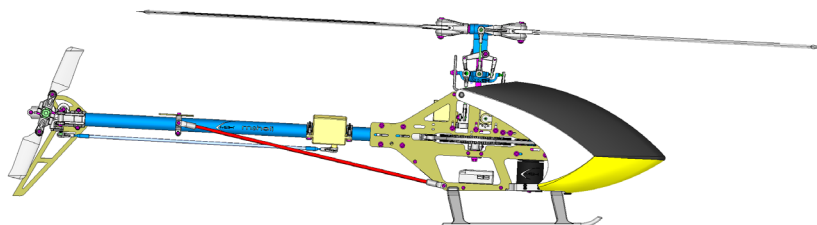
In the beginning, novice R/C helicopter pilots should always be assisted by an experienced pilot and never fly alone!

MSHeli Srl
Italy



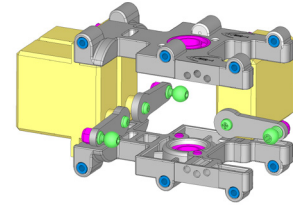
Tools required for assembly

 <p>1.5 / 2 / 2.5 mm Hexagon screw drivers</p>	 <p>Philips Screw driver</p>
 <p>Needle nose pliers</p>	 <p>Slow curing EPOXY</p>
 <p>where indicated use</p>  <p>Thread lock MEDIUM (blue)</p>	

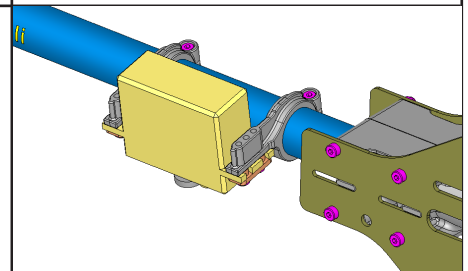


R/C equipment required for assembly

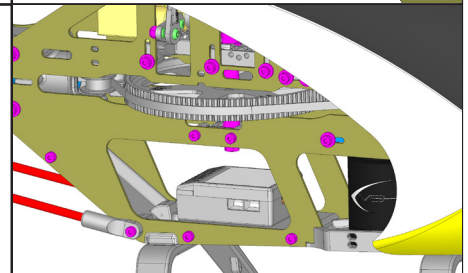
Swashplate servos supported:
3 micro servos



Tail servo supported:
Mini and Regular size servos

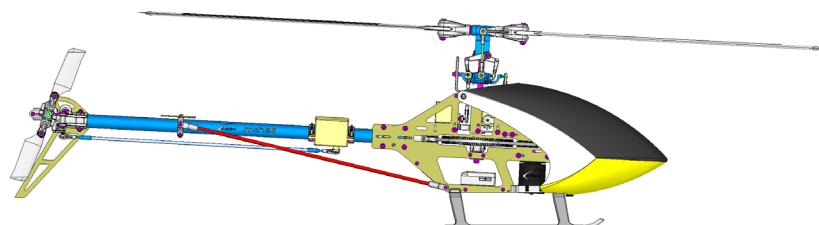
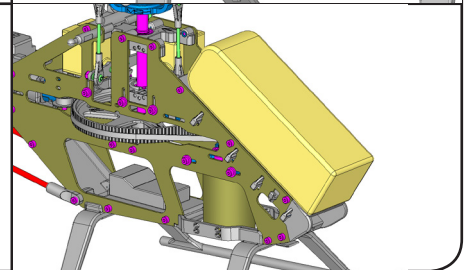


Trasmitter / Receiver:
Satellites:
Spektrum : DSM 2 - DSM X
Futaba : S-Bus - S-Bus 2
HOTT SumD
MPX Srxl



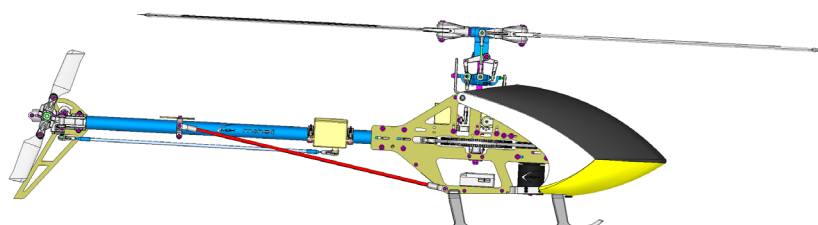
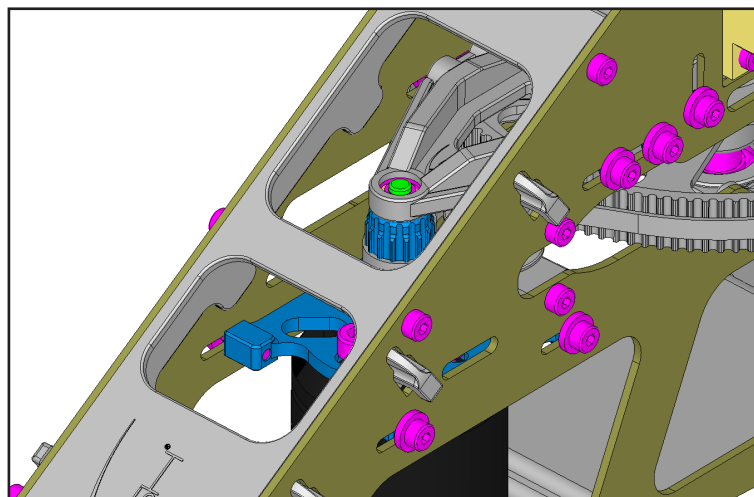
Standard receiver: all

Battery pack:
LiPo 3s 2000-2500mAh
or
LiPo 6s 1300-1400mAh

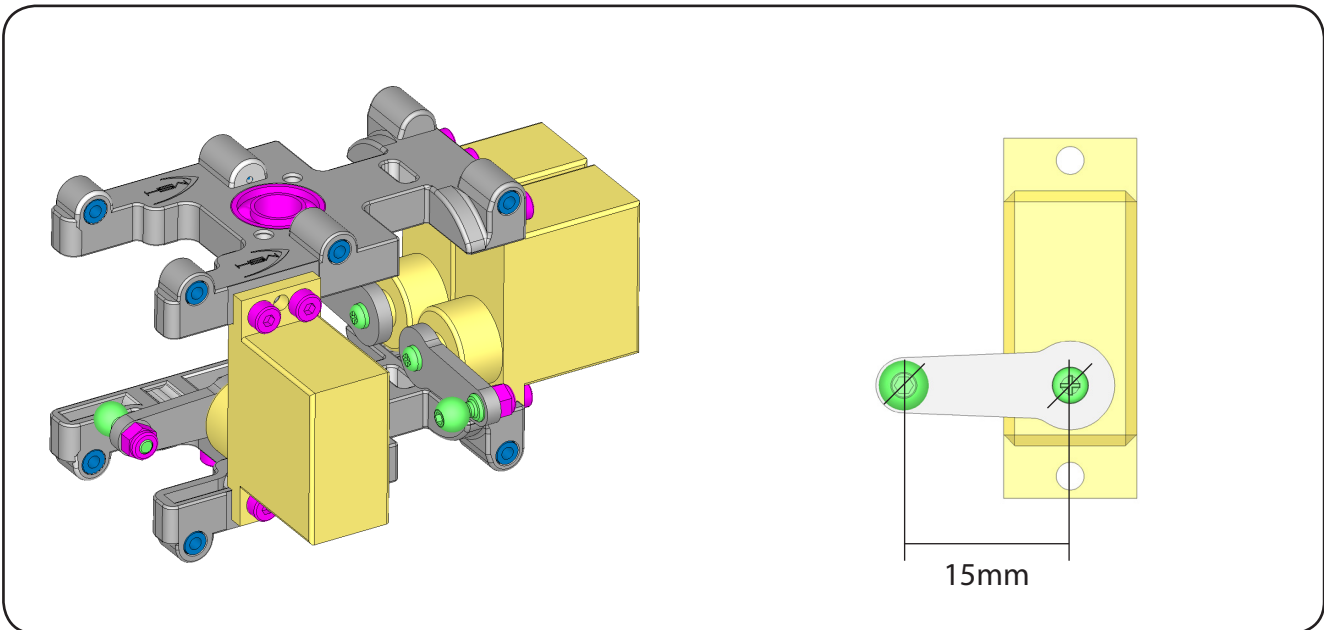
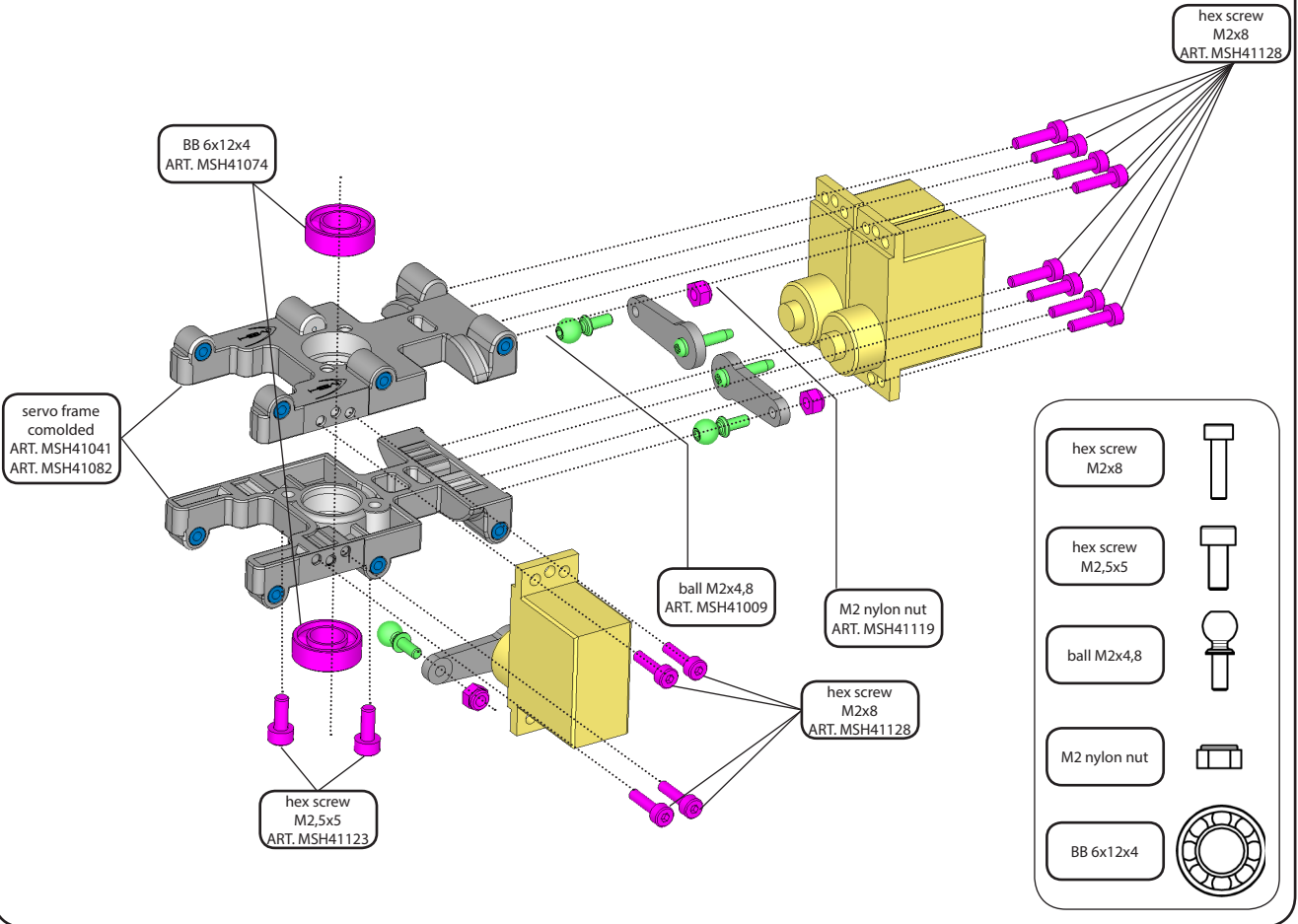


Motor pinion teeth choice

Fly style	Battery type 3s	Battery type 6s
Beginner	14-15	13-14
Sport	15-16	14-15
Soft 3D	16	15
Hard 3D	17	16



BAG A



BAG B

pin
2,5x12



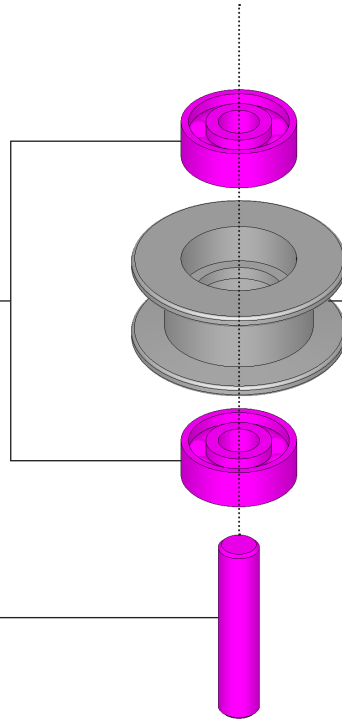
BB 2,5x7x2,5



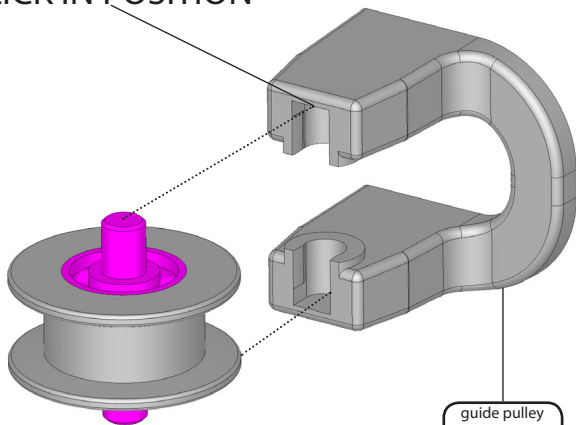
BB 2,5x7x2,5
ART. MSH41034

guide pulley
ART. MSH41034

pin
2,5x12
ART. MSH41034

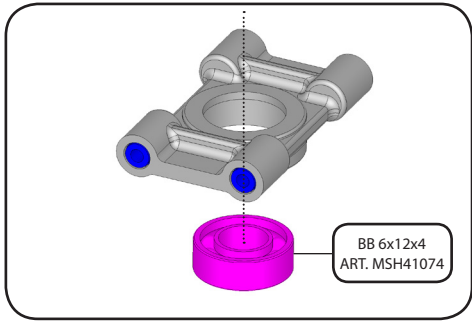


CLICK IN POSITION

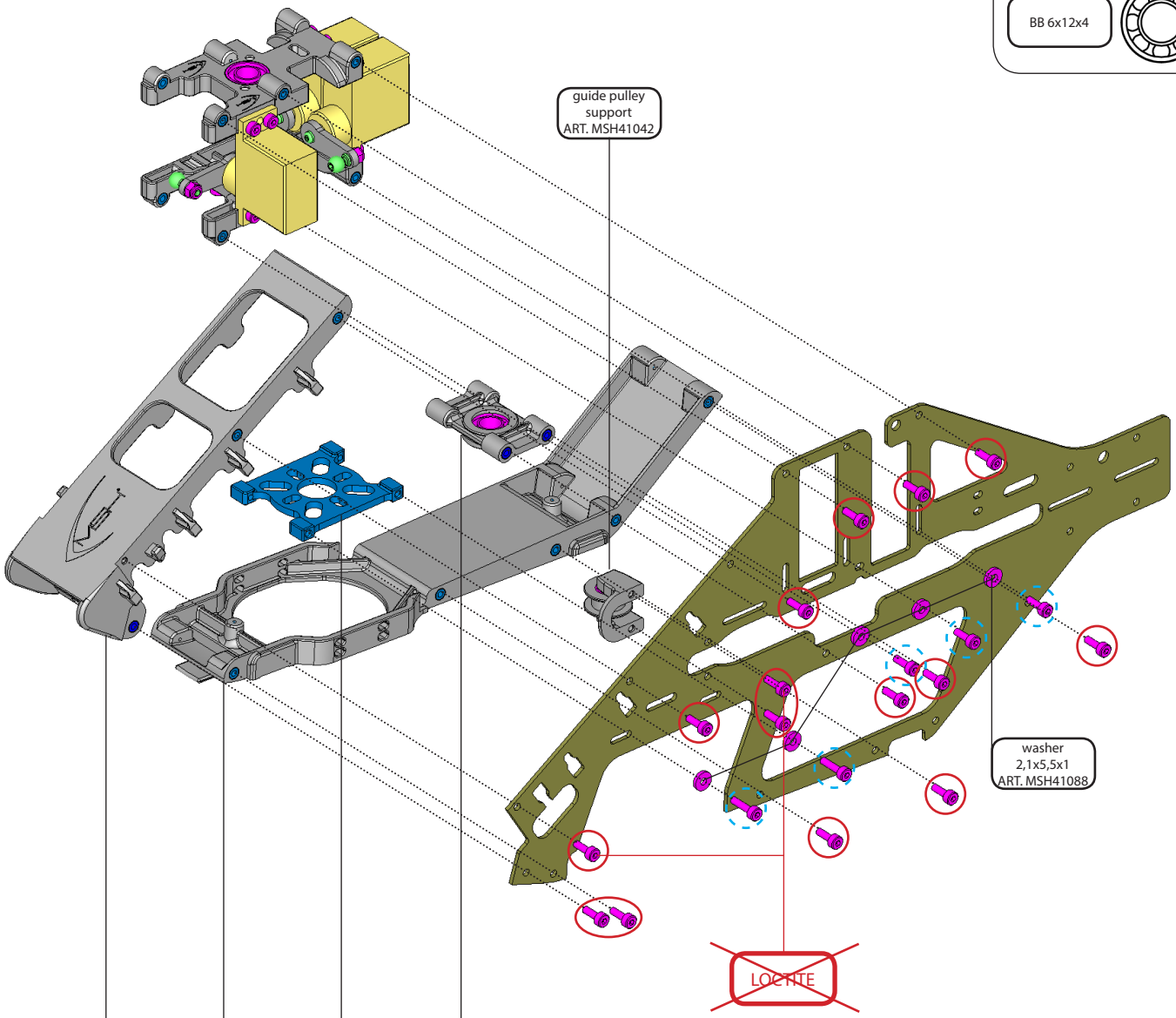


guide pulley
support
ART. MSH41042

BAG B



- hex screw M2x6
- hex screw M2x8
- washer 2,1x5,5x1
- BB 6x12x4



- battery plate
ART. MSH41091
- lower plate
ART. MSH41091
- motor mount
ART. MSH41057
- 3° BB support
ART. MSH41091

washer
2,1x5,5x1
ART. MSH41088

LOCTITE
hex screw
M2x8
ART. MSH41128

LOCTITE
hex screw
M2x6
ART. MSH41122

BAG B

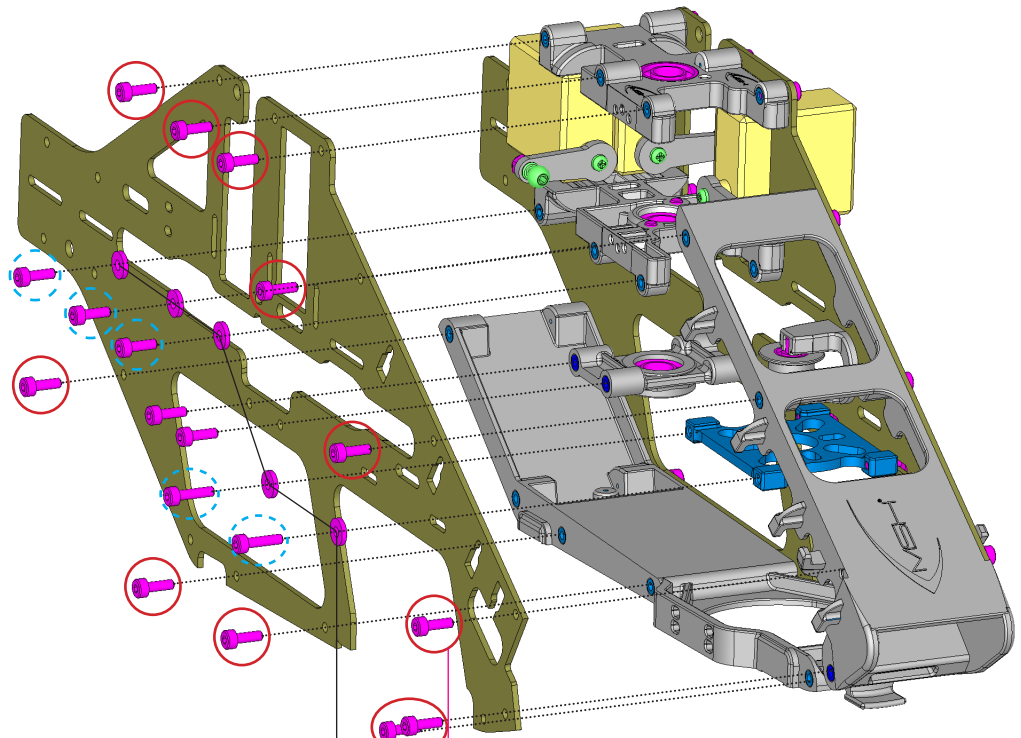
hex screw
M2x6



hex screw
M2x8



washer
2,1x5,5x1

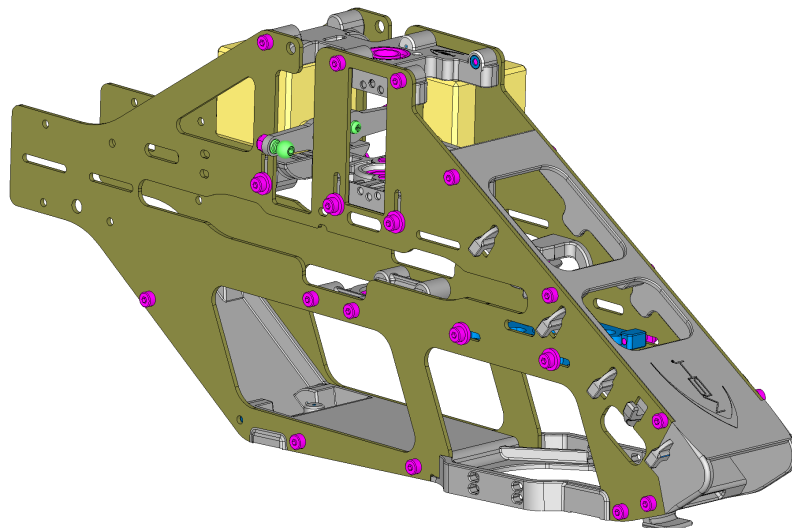


LOCTITE
hex screw
M2x8
ART. MSH41128

LOCTITE
hex screw
M2x6
ART. MSH41122

washer
2,1x5,5x1
ART. MSH41088

~~LOCTITE~~

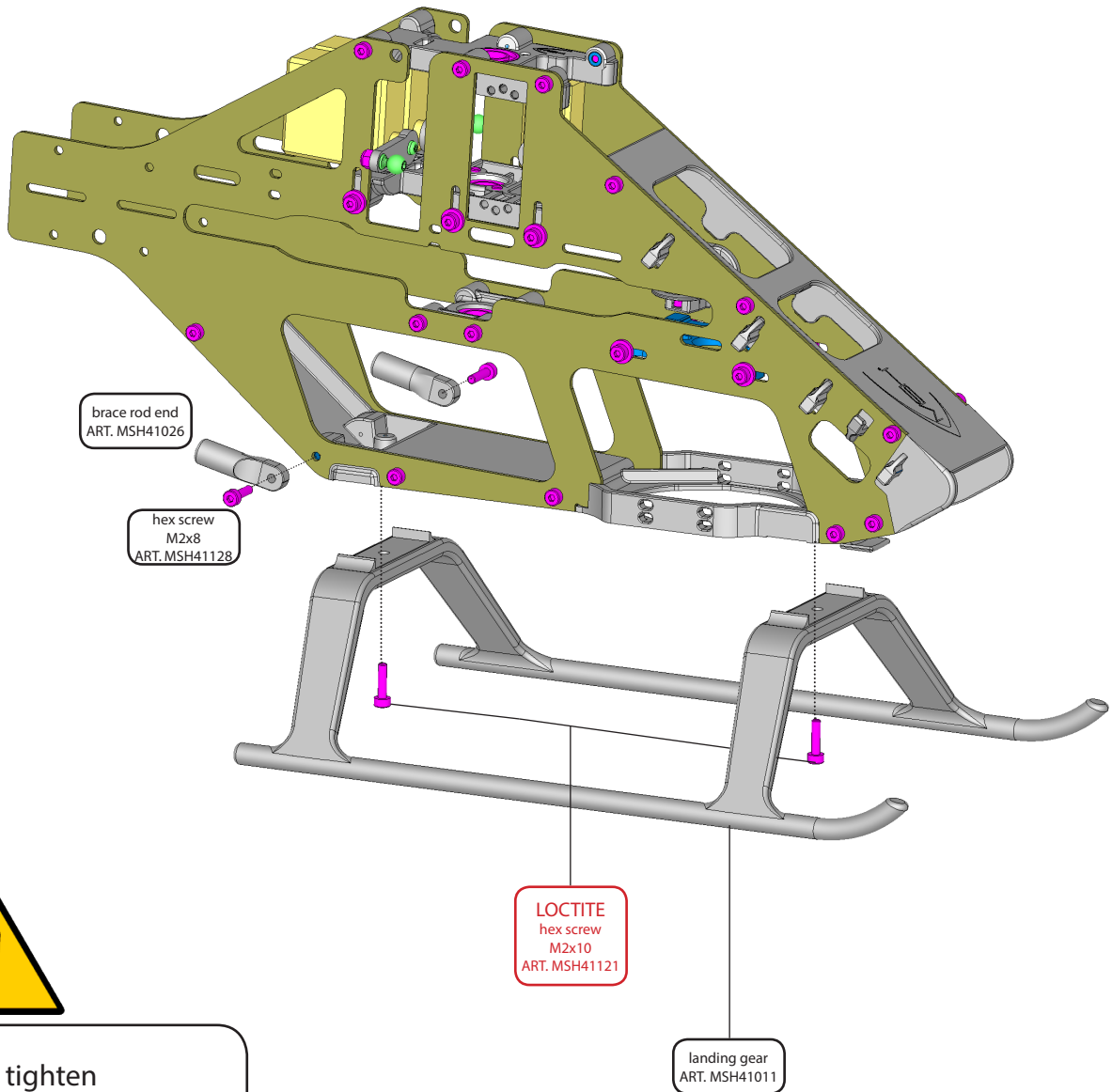


BAG B

hex screw
M2x10



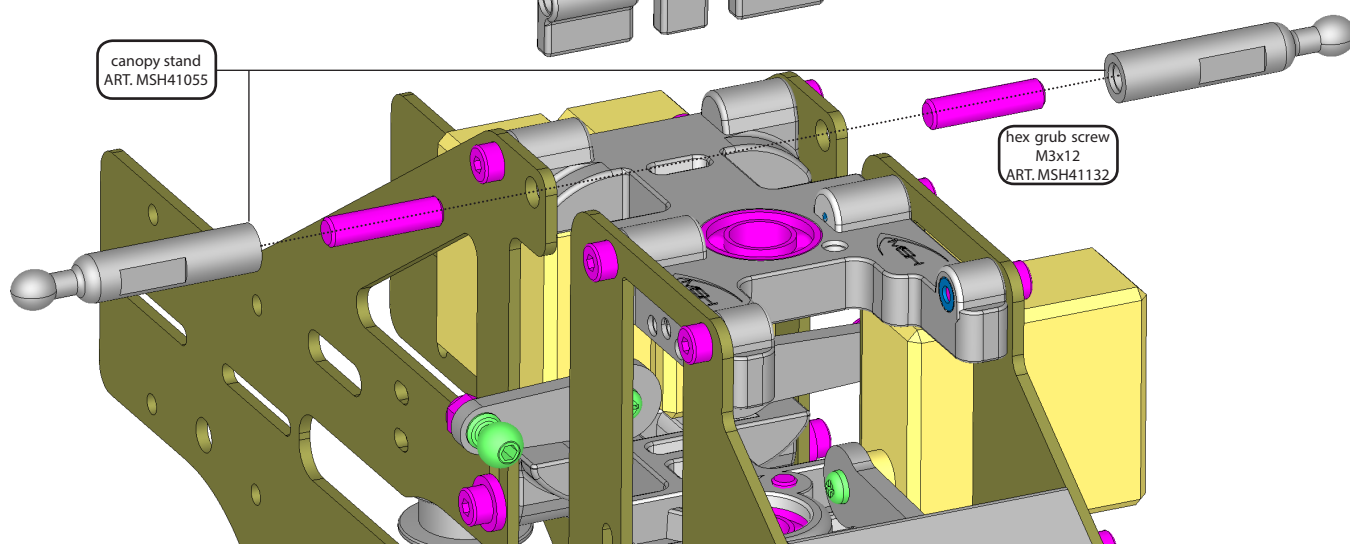
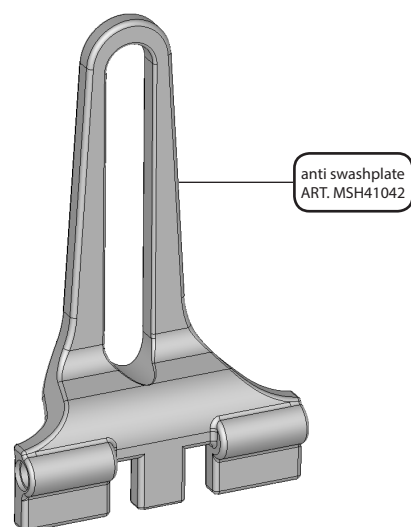
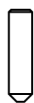
hex screw
M2x8



do not tighten
brace rod ends screws yet

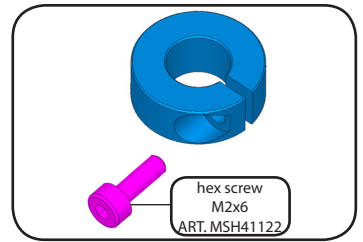
BAG B

hex grub screw
M3x12

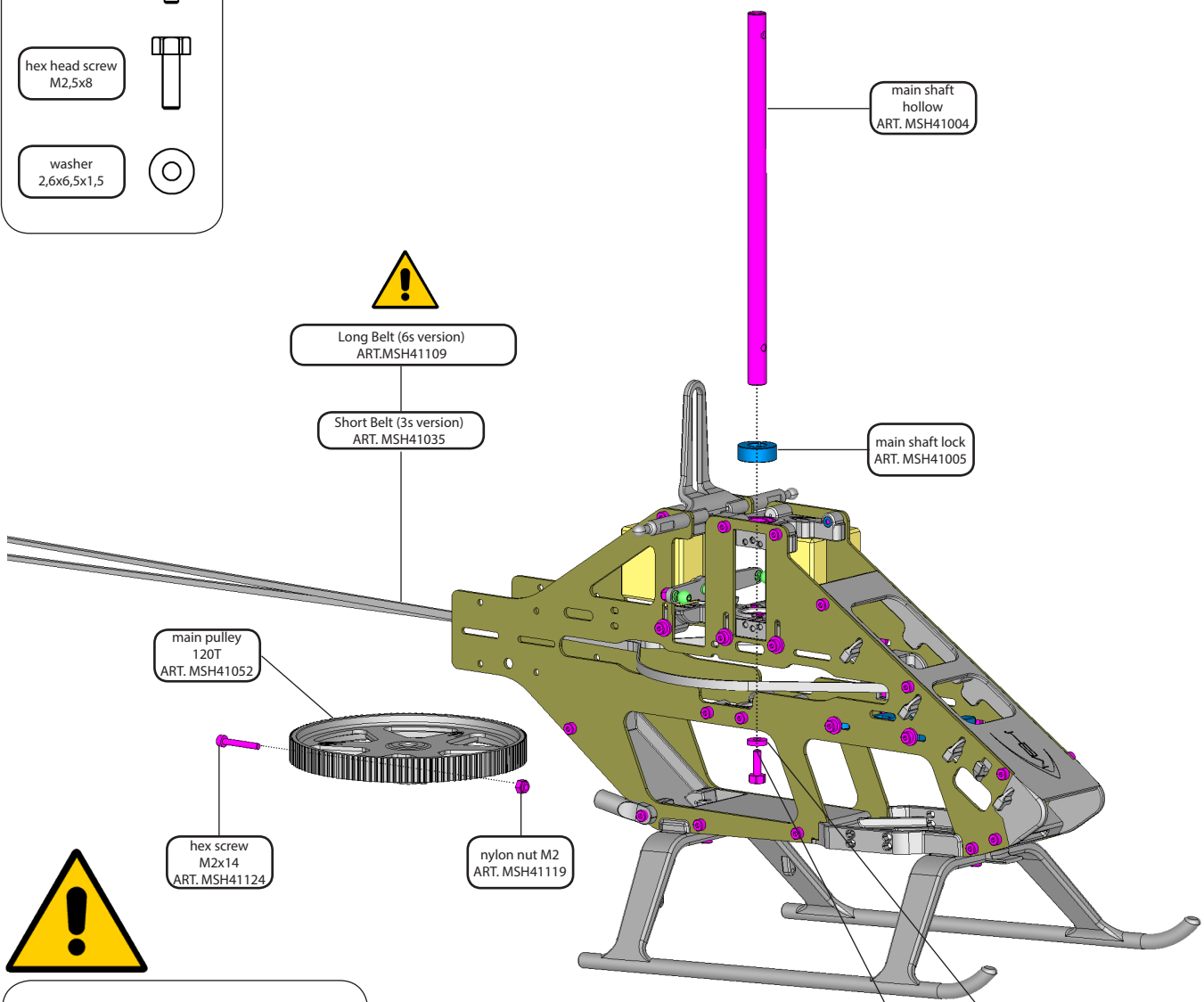


tighten antiswashplate spin
with hex grub screw M3x12
BEFORE mounting canopy stands

BAG C



- hex screw M2x14
- nylon nut M2
- hex screw M2x6
- hex head screw M2,5x8
- washer 2,6x6,5x1,5



Long Belt (6s version)
ART. MSH41109

Short Belt (3s version)
ART. MSH41035

main shaft hollow
ART. MSH41004

main shaft lock
ART. MSH41005

main pulley
120T
ART. MSH41052

hex screw
M2x14
ART. MSH41124

nylon nut M2
ART. MSH41119

LOCTITE
hexagonal head screw
M2,5x8
ART. MSH41004

washer
2,6x6,5x1,5
ART. MSH41004

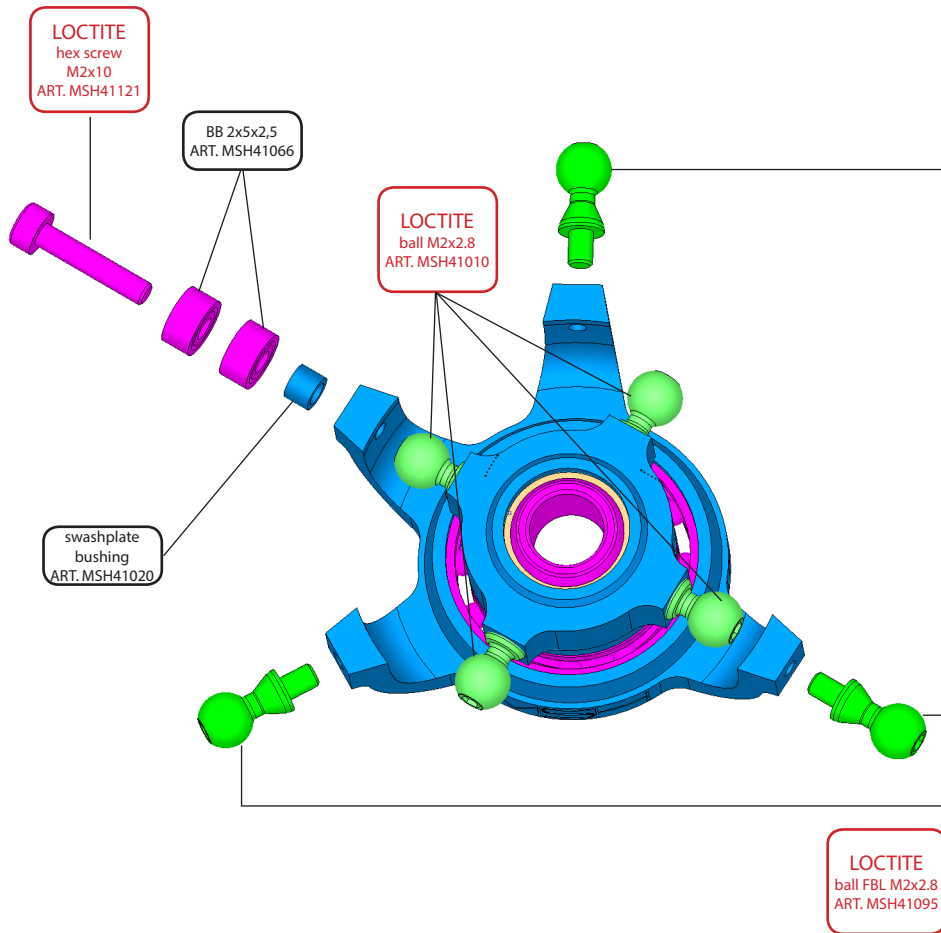


when tightening shaft collar
check that there is no vertical
play in main shaft assembly.

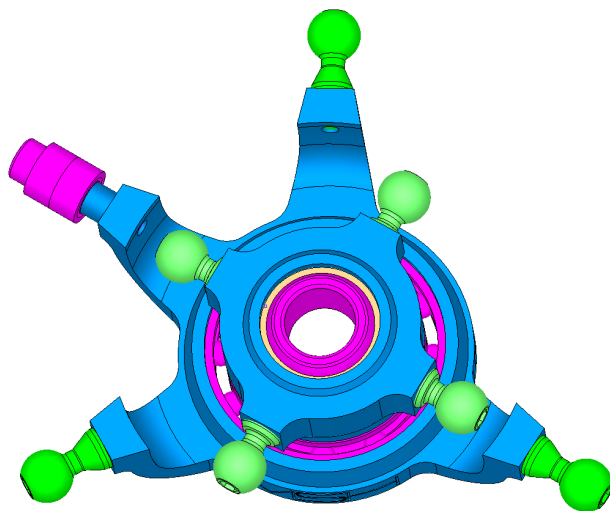
before sliding main shaft in
position make sure belt is
already in position

insert main shaft with M2,5
threaded hole facing down

BAG C



hex screw M2x10	
nylon nut M2	
ball FBL M2x2,8	
BB 2x5x2,5	
swashplate bushing	



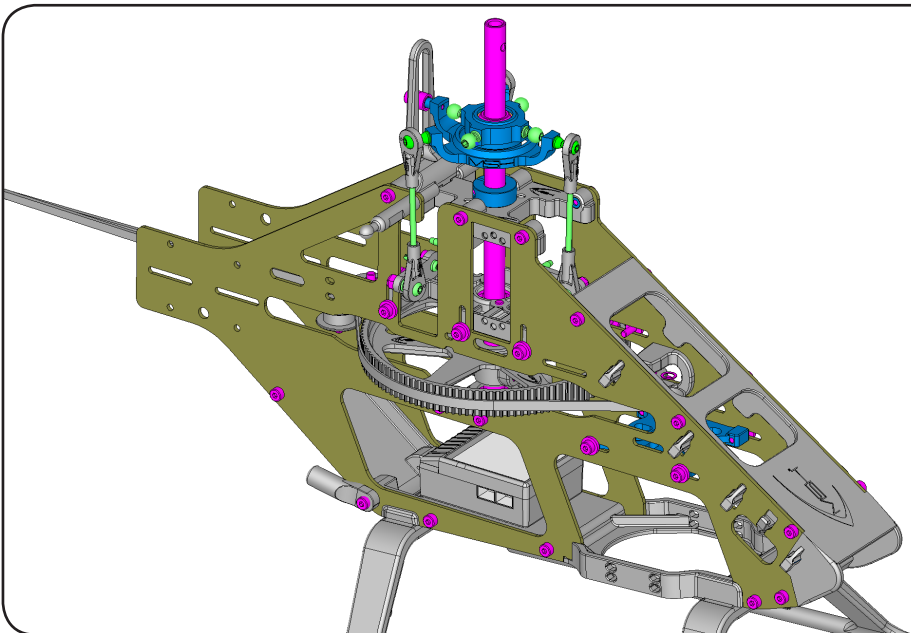
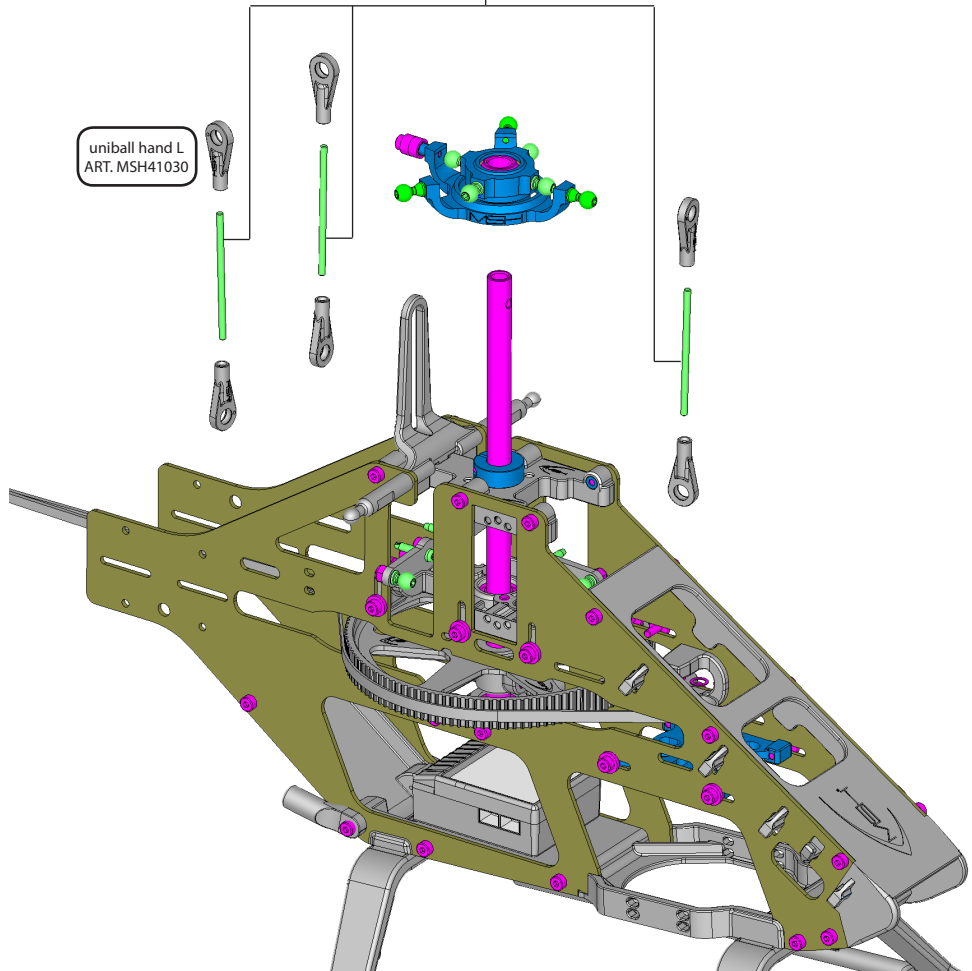
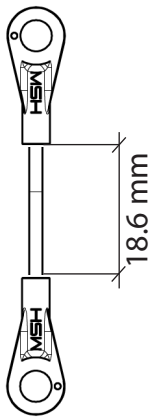
BAG C

uniball hand L

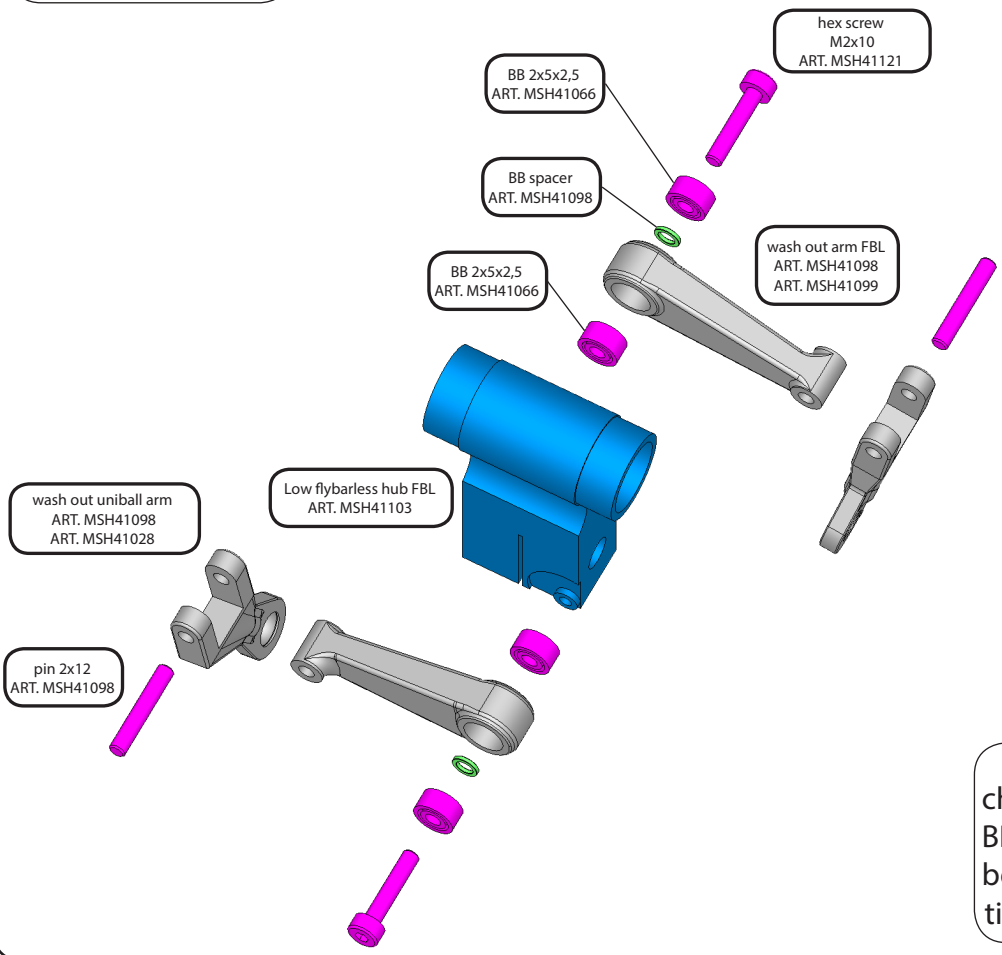


uniball hand L
ART. MSH41030

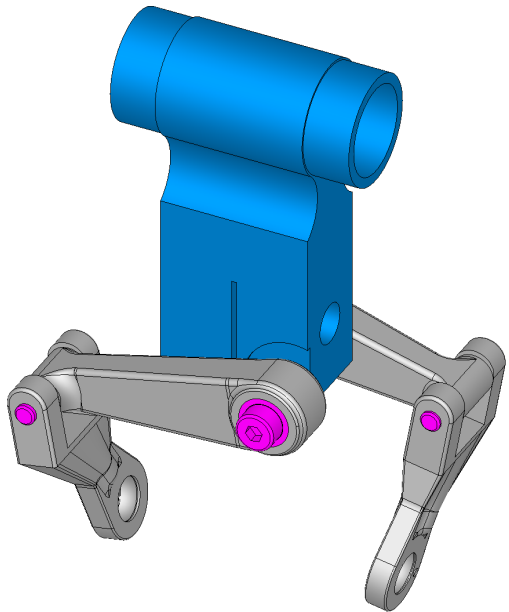
rod D 35mm
ART. MSH41023



BAG D



check carefully that BB spacer is in position between BB before tightening assembly



BAG D

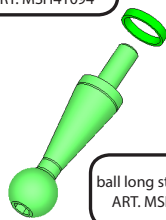
ball long stand grips



ball long stand grips spacer

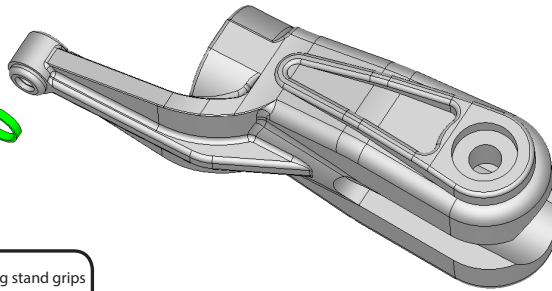


ball long stand grips spacer
ART. MSH41094



ball long stand grips
ART. MSH41094

main blade holder
ART. MSH41039



thrust BB
4x8x2,5



washer
4.1x6x0.2



BB 4x8x3



washer
4.1x6x0.2
ART. MSH41039

SMALLER
inside Ø

LARGER
inside Ø

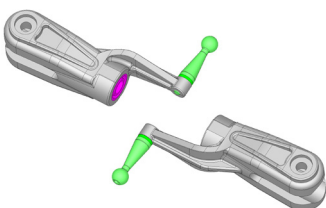
BB 4x8x3
ART. MSH41071

thrust BB
4x8x2,5
ART. MSH41065

apply grease



BB 4x8x3
ART. MSH41071



BAG D

- hex screw M2,5x8
- washer 6x8x0.1
- spindle spacer
- washer 2,6x6,5x1,5

LOCTITE
hex screw
M2,5x8
ART. MSH41096

washer
2,6x5,6x0,5
ART. MSH41096

stepped face outside

dumper main head
ART. MSH41097

spindle spacer
LARGE FBL
ART. MSH41003

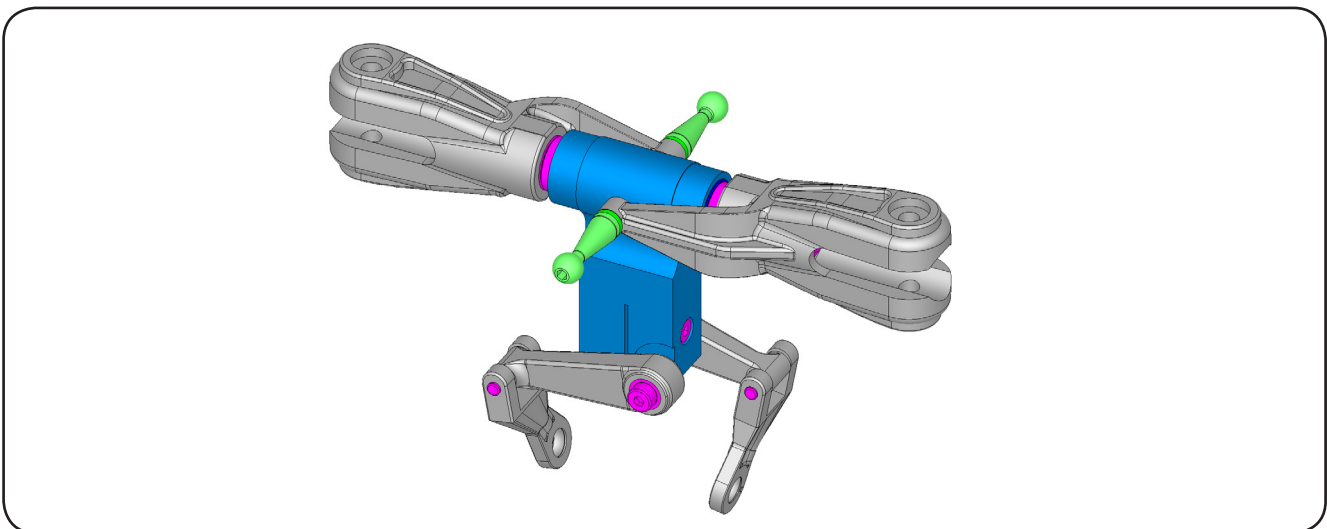
long spindle FBL
ART. MSH41096

hub side | blade side

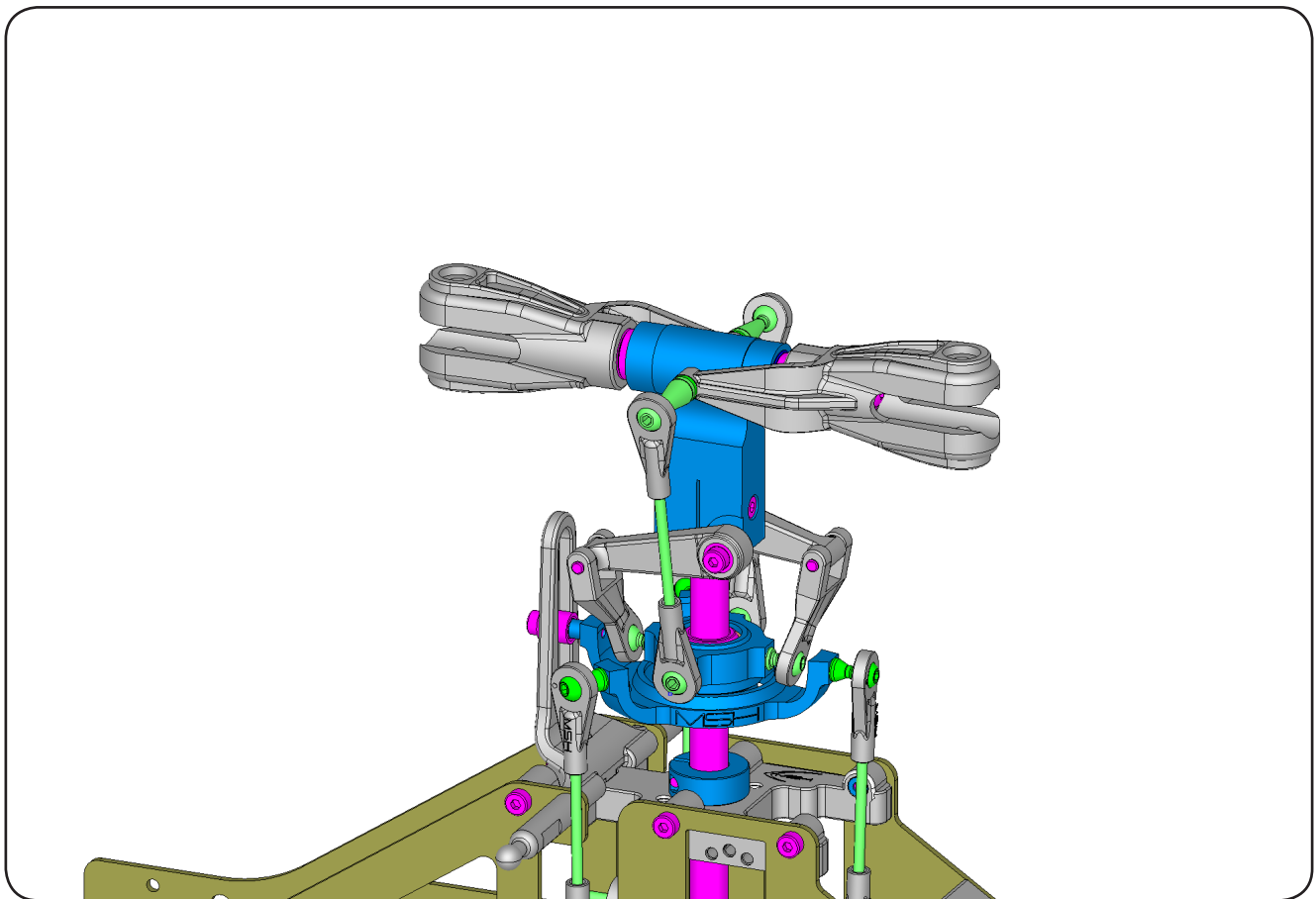
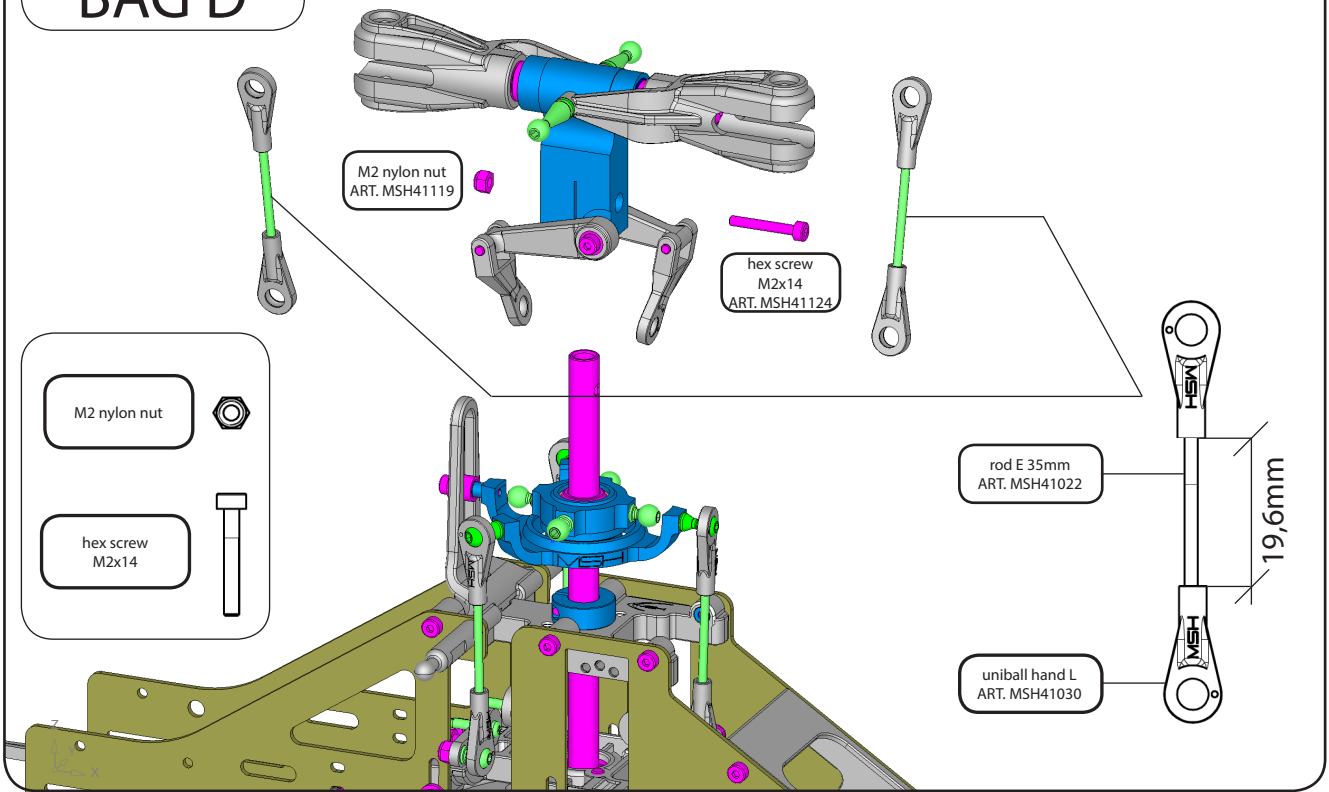


Spindle spacer is a stepped washer, please make sure that, the stepped side faces BB 4x8x3.

apply a thin layer of grease on the spindle to help it sliding in position.
make sure no grease touches threaded part of spindle.



BAG D



BAG E

BB 2.5x7x2.5



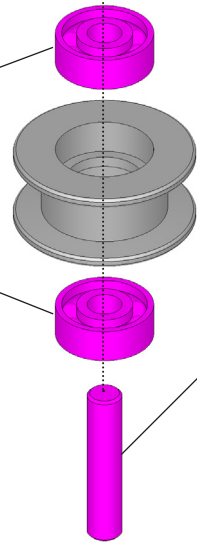
pin
2,5x12



BB 2.5x7x2.5
ART. MSH41067

guide pulley
ART. MSH41034

pin 2,5x12
ART. MSH41034



self tapping screw

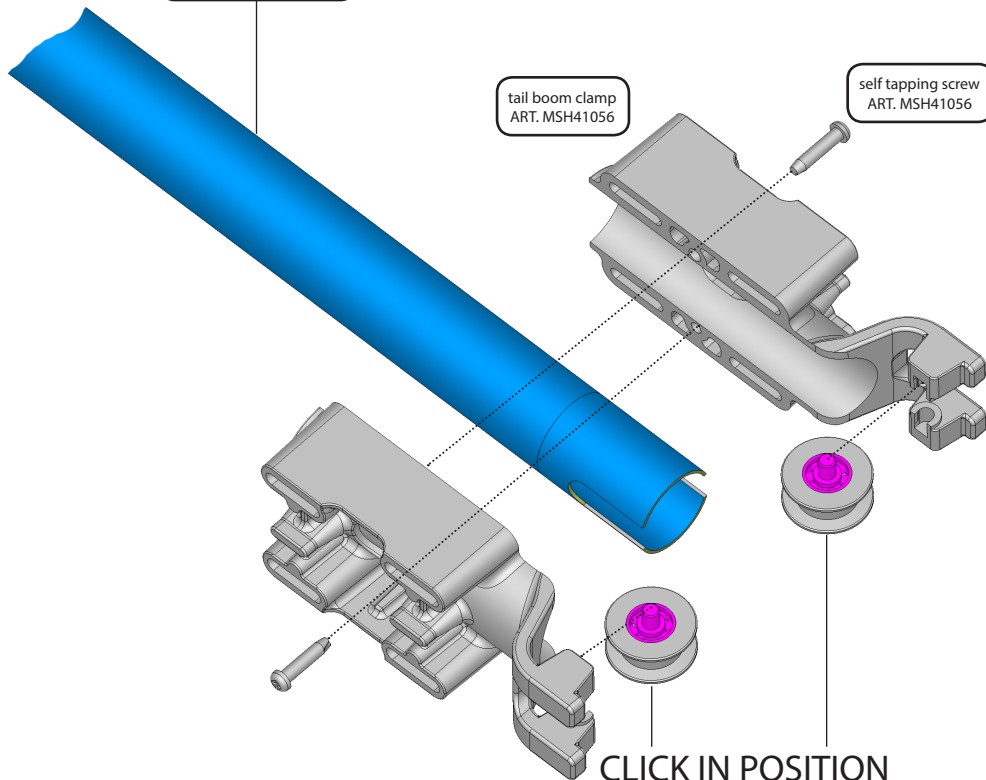


Long Boom (6s version)
ART. MSH41107

Short Boom (3s version)
ART. MSH41025

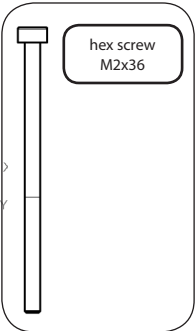
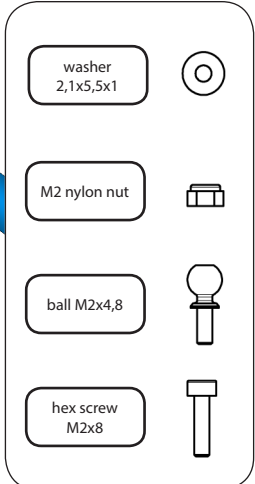
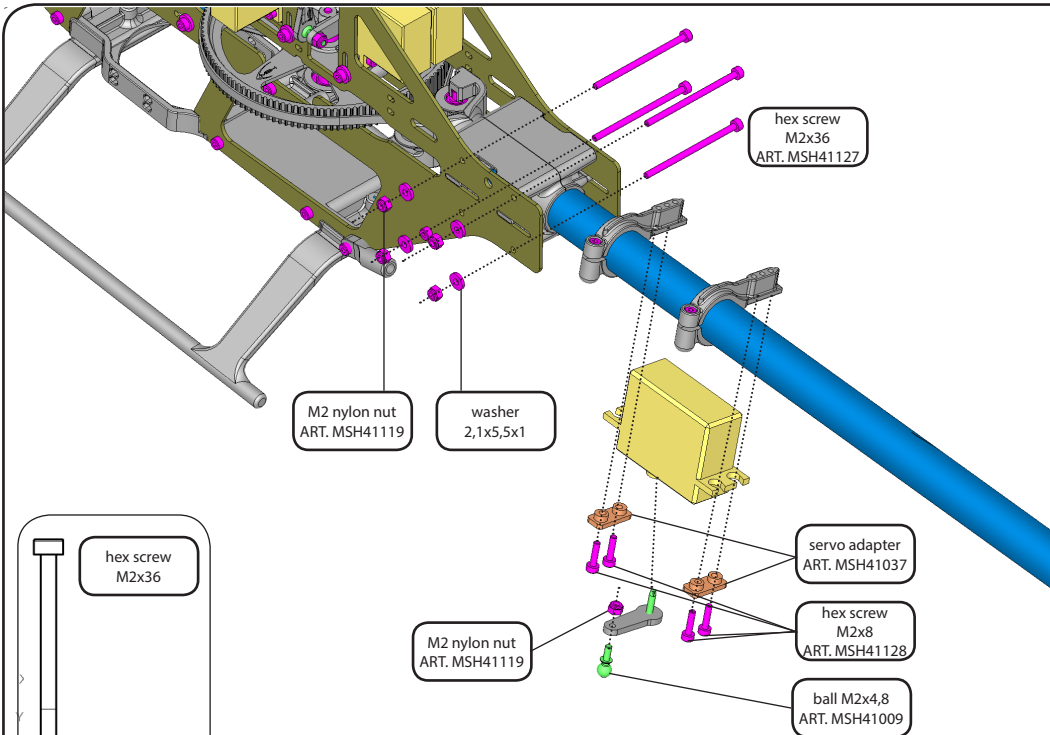
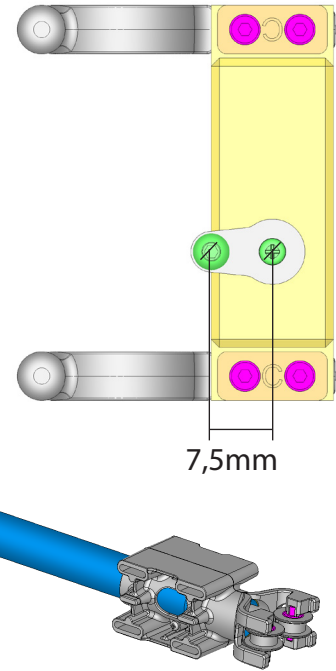
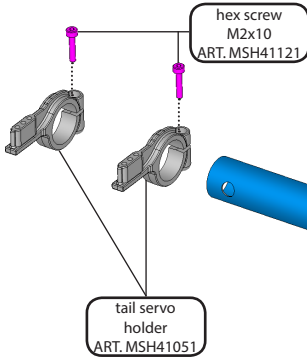
tail boom clamp
ART. MSH41056

self tapping screw
ART. MSH41056

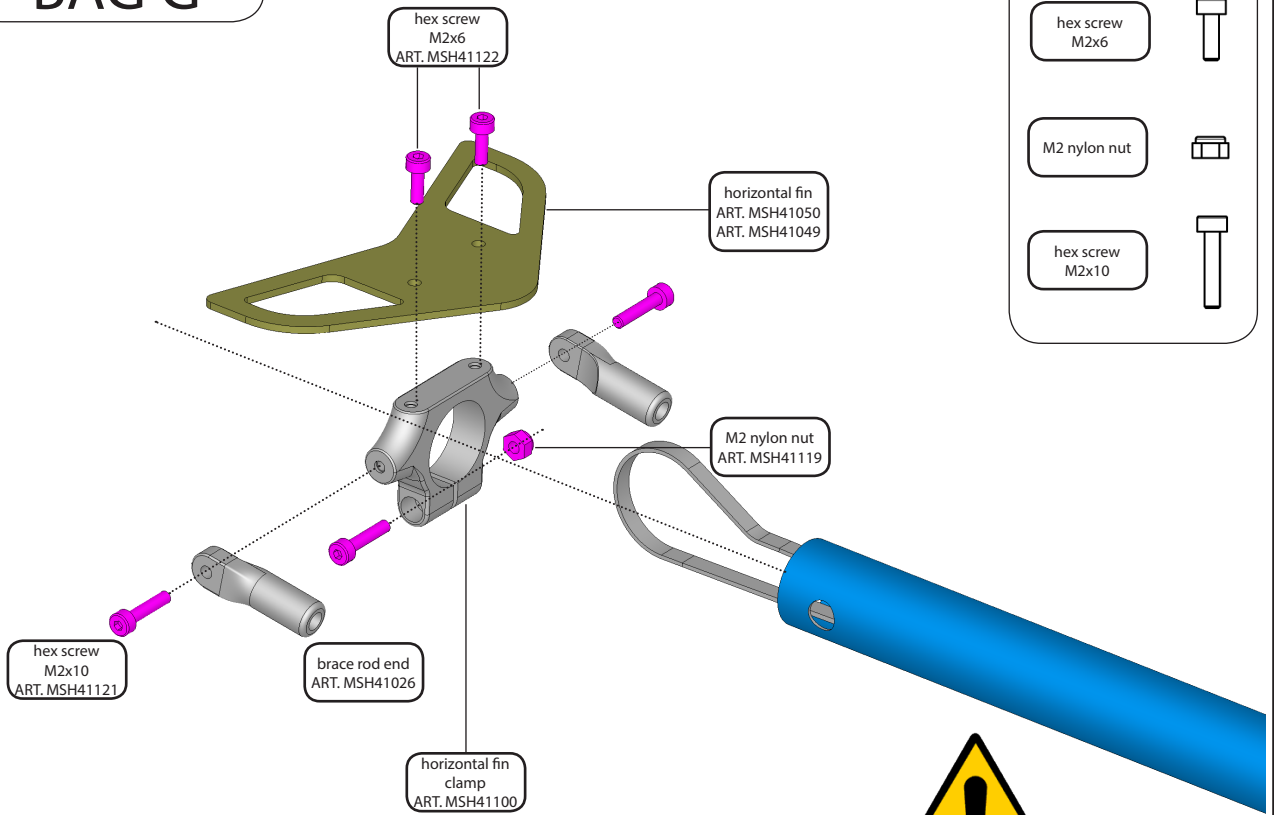


CLICK IN POSITION

BAG E



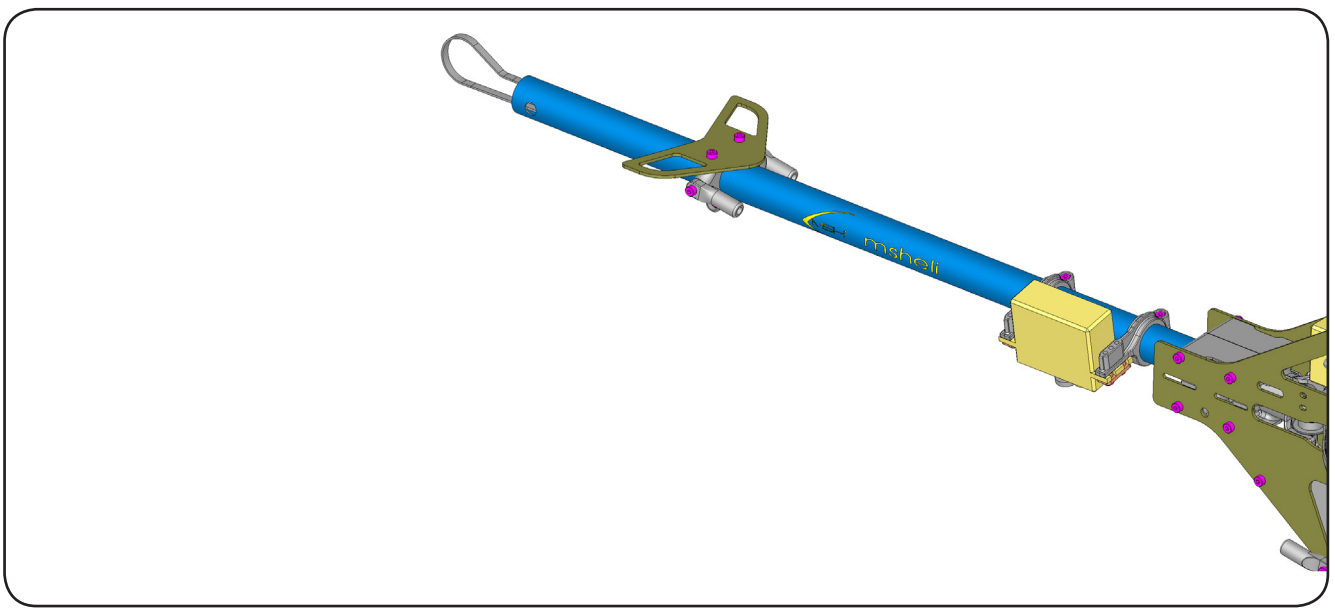
BAG G



- hex screw M2x6
- M2 nylon nut
- hex screw M2x10



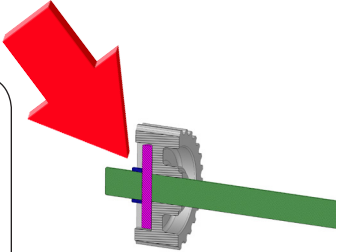
do not tighten M2x10 brace rod ends screws yet



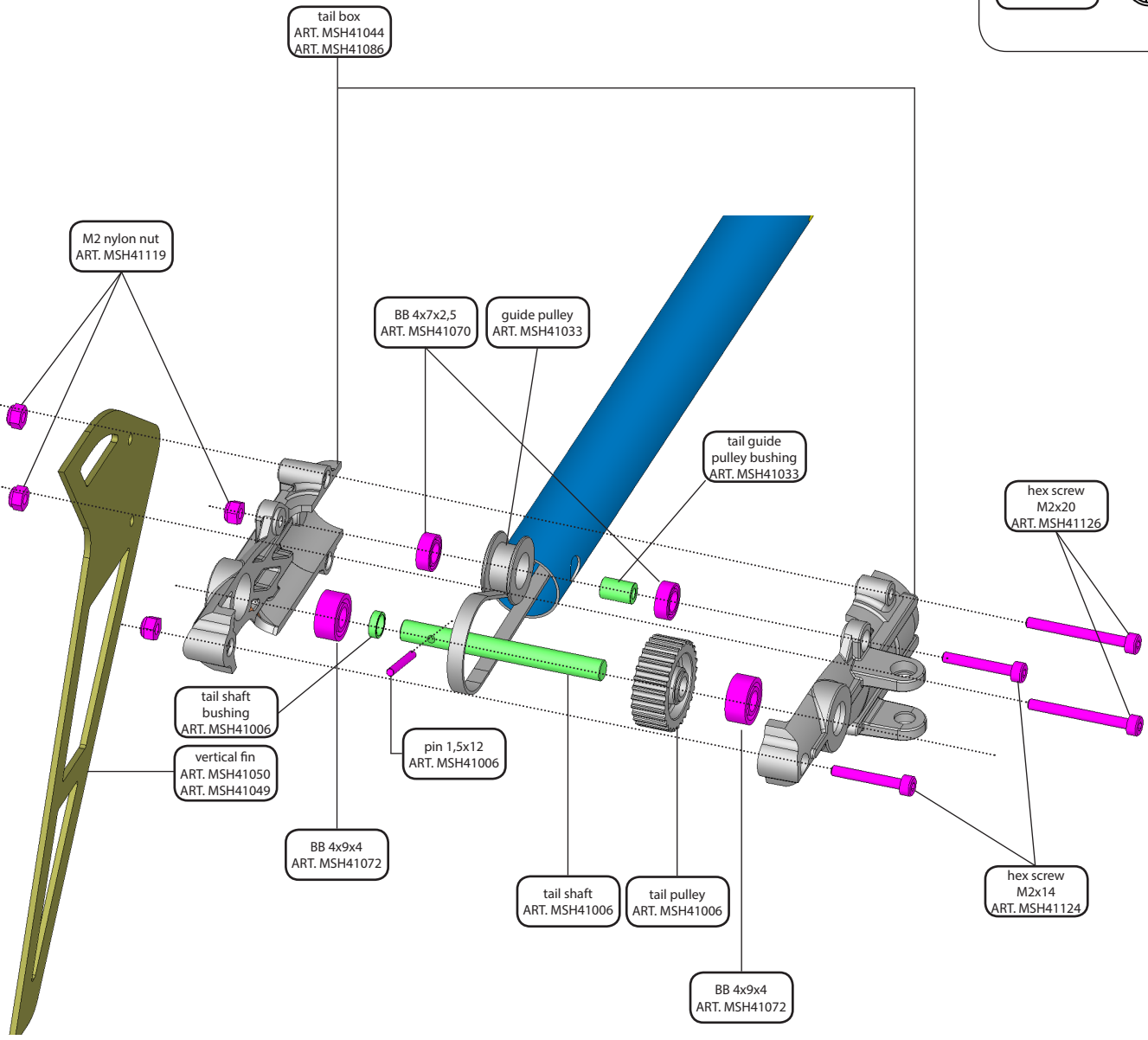
BAG F



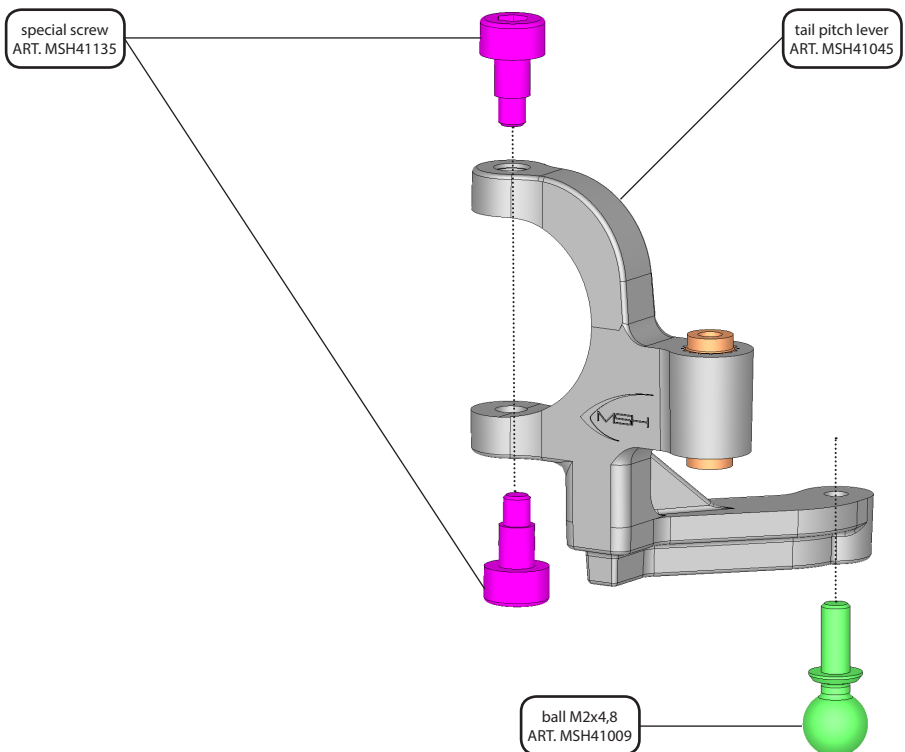
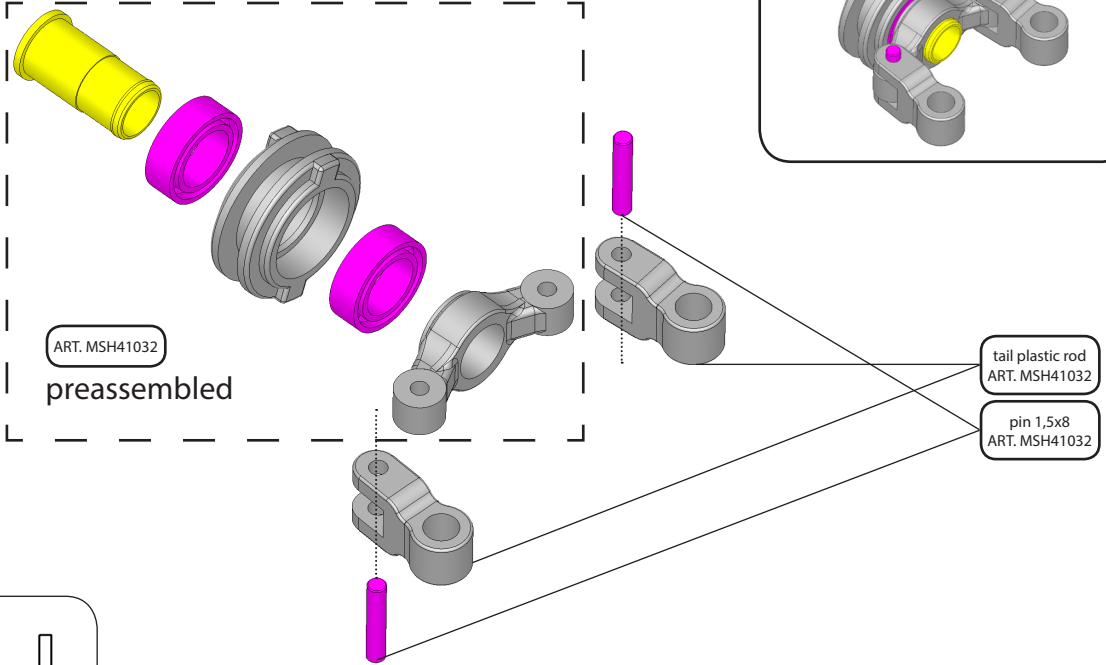
make sure that tail shaft bushing is halfway inserted in tail pulley over the pin in picture



- hex screw M2x20
- hex screw M2x14
- M2 nylon nut
- pin 1,5x12
- tail shaft bushing
- BB 4x9x4
- BB 4x7x2,5



BAG F



BAG F

1

2

3

4

follow steps in pics
carefully to insert lever in
position

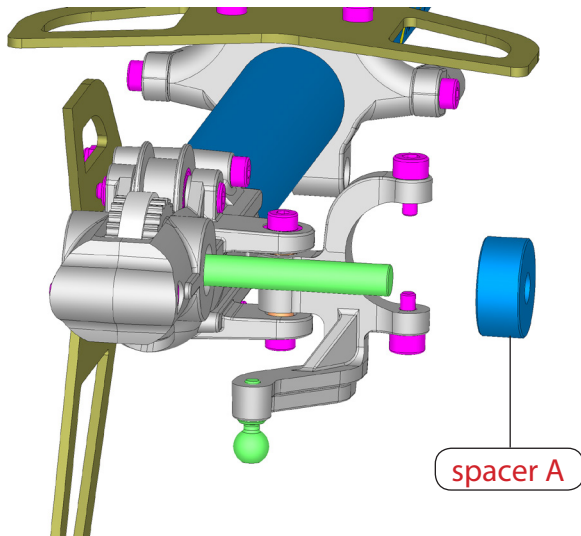
BAG F

hex screw M2x6

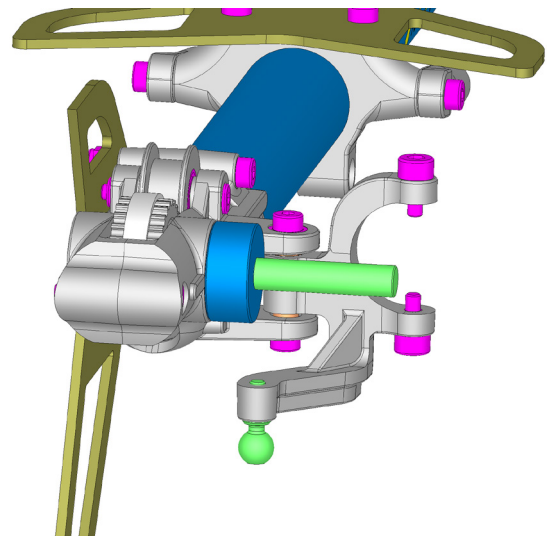
BB 2x5x2

BAG F

1



2



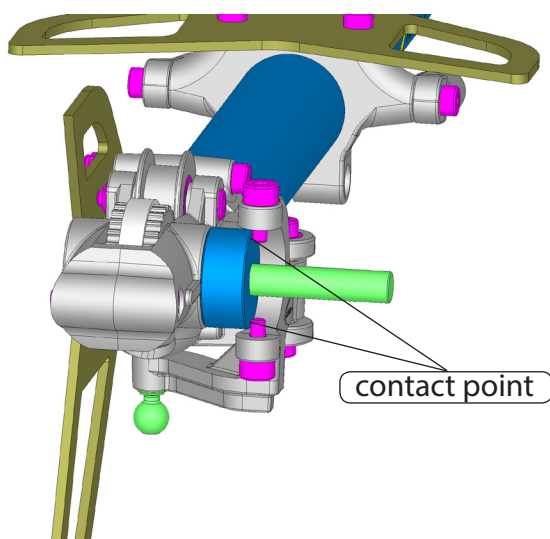
Insert **spacer A** on tail shaft and slide it to the left against the tail box. Turn the tail pitch lever until tail pitch lever special screws touch the **spacer A**. Check that both screws touch the spacer at the same time.

If one screw touches before gently twist the lever until they touch together.

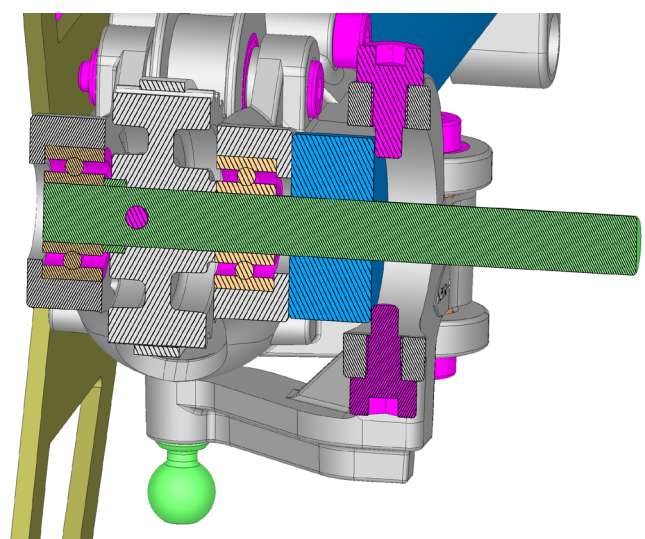
Warming up lever makes job easier.

Remember to remove **spacer A** after the job is completed.

3



4



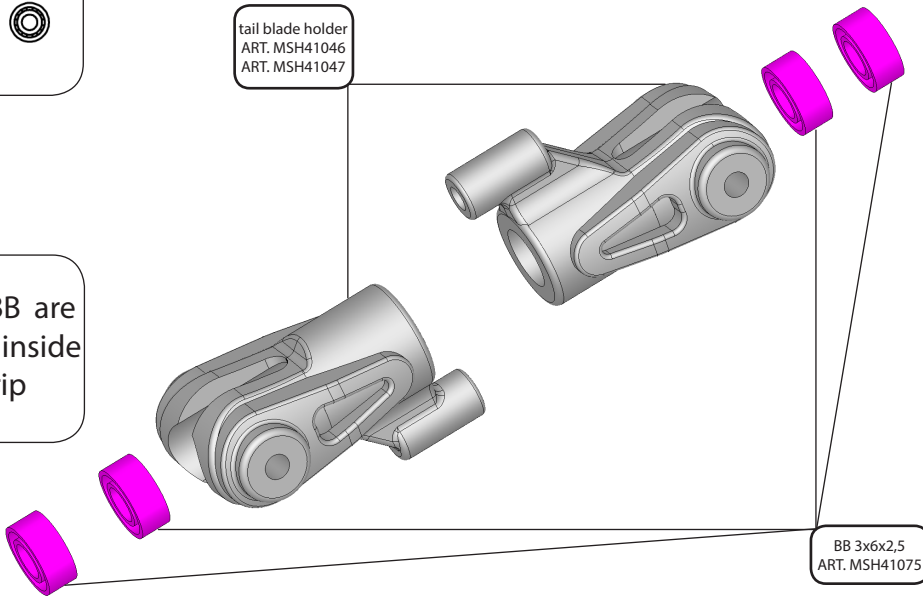
BAG F

BB 3x6x2,5



make sure BB are fully seated inside tail blade grip

tail blade holder
ART. MSH41046
ART. MSH41047



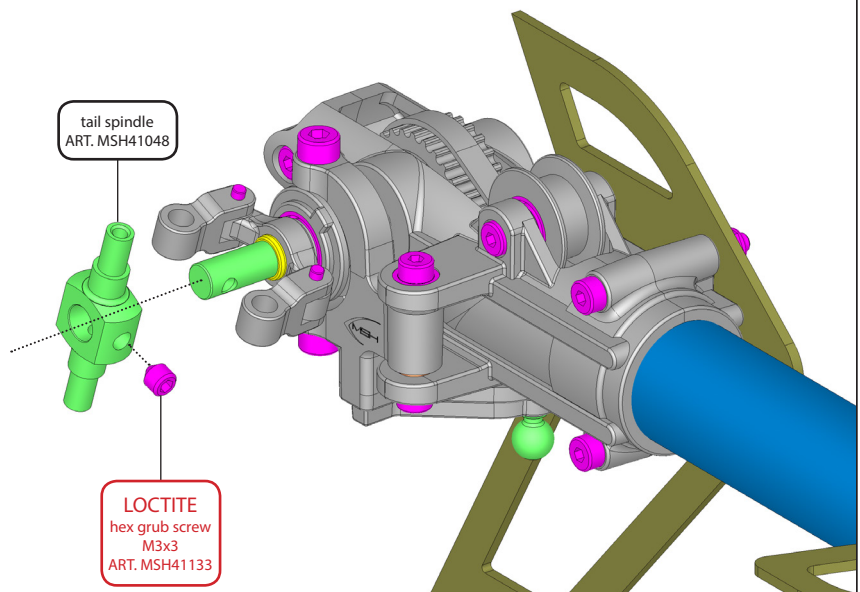
BB 3x6x2,5
ART. MSH41075

hex screw grub
M3x3

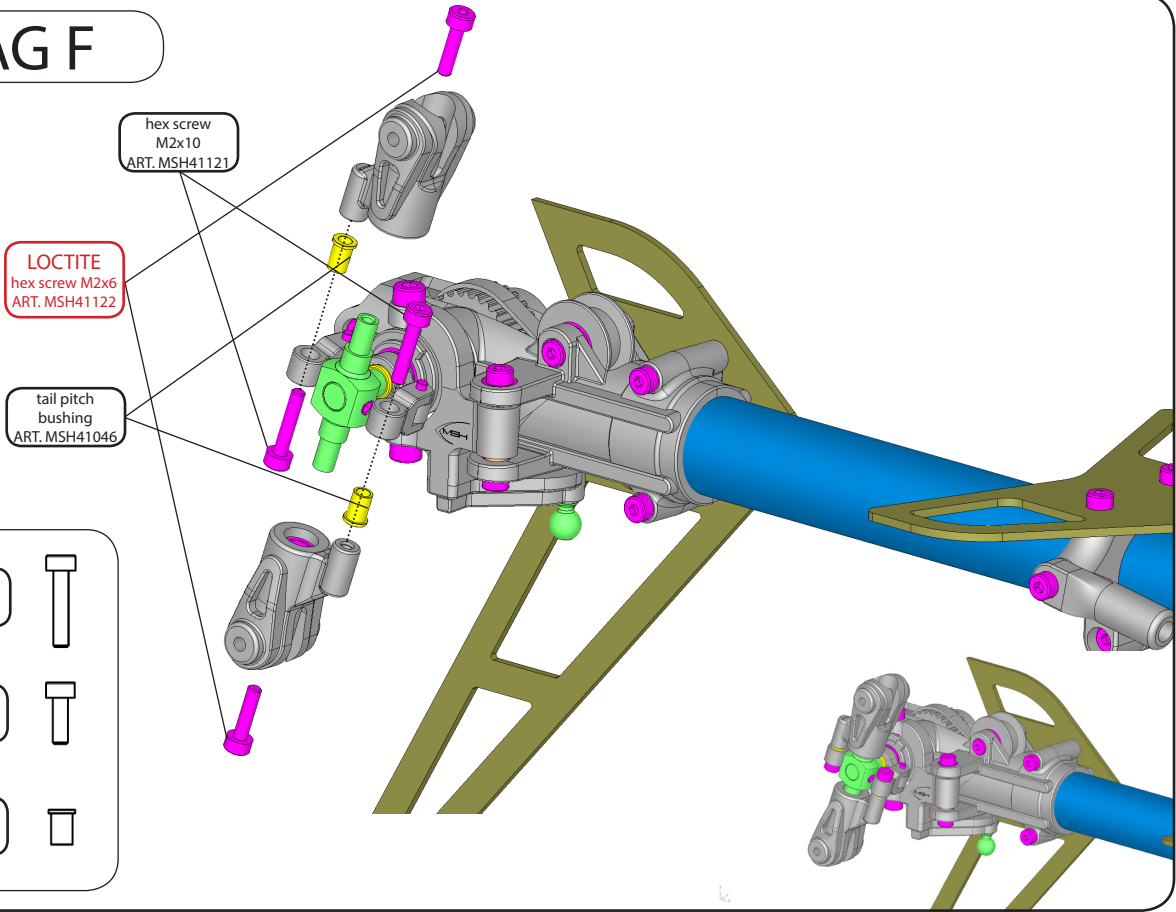


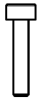


tail spindle
ART. MSH41048

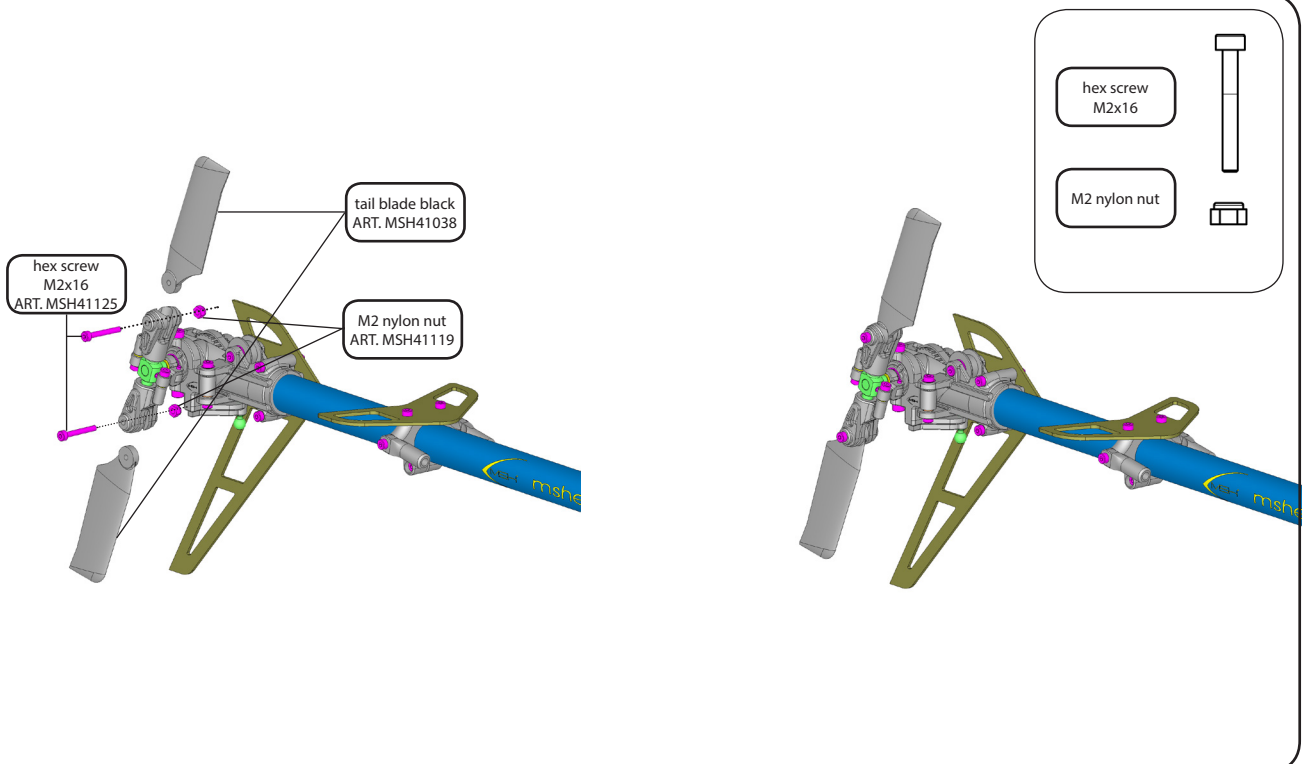
LOCTITE
hex grub screw
M3x3
ART. MSH41133





BAG F



- hex screw M2x10 
- hex screw M2x6 
- tail pitch bushing 



- hex screw M2x16 
- M2 nylon nut 

BAG L

slow curing epoxy



Long control rod
ART.MSH41108

Short control rod (3s version)
ART. MSH41024

tail control rod fitting
ART. MSH41108
ART. MSH41024

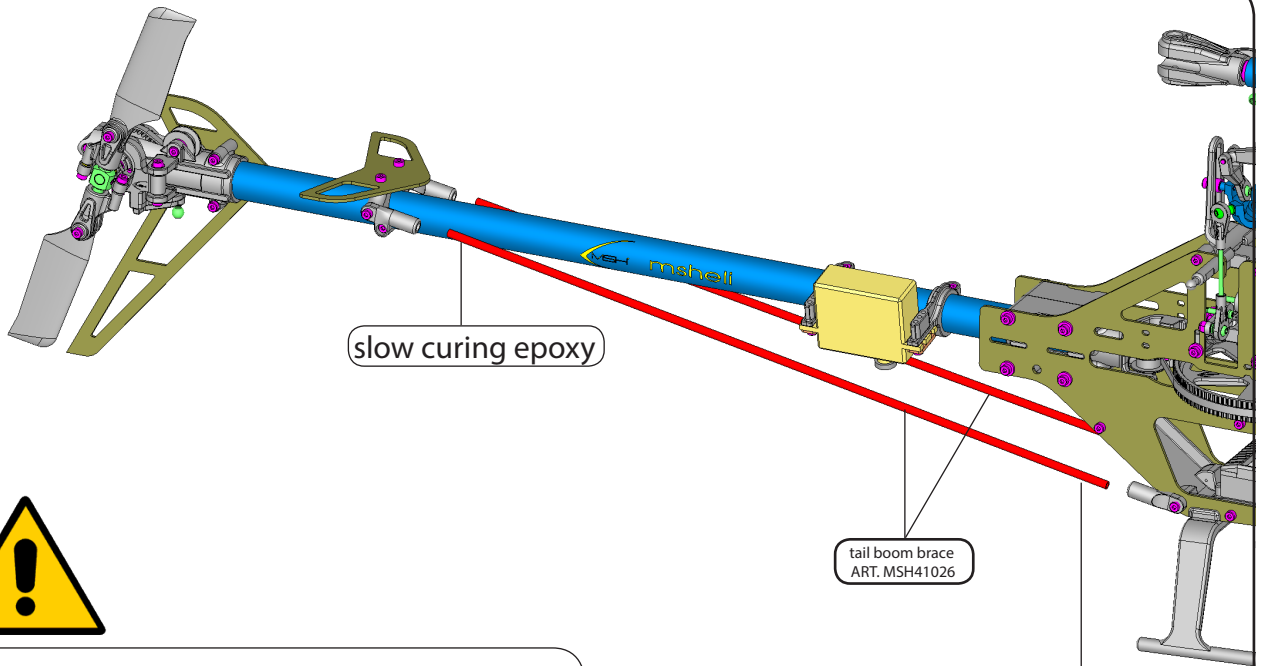


uniball hand L
ART. MSH41030



slow curing epoxy

gently remove coating with sandpaper on 10mm at the end of control rod and boom brace.



slow curing epoxy

tail boom brace
ART. MSH41026

slow curing epoxy

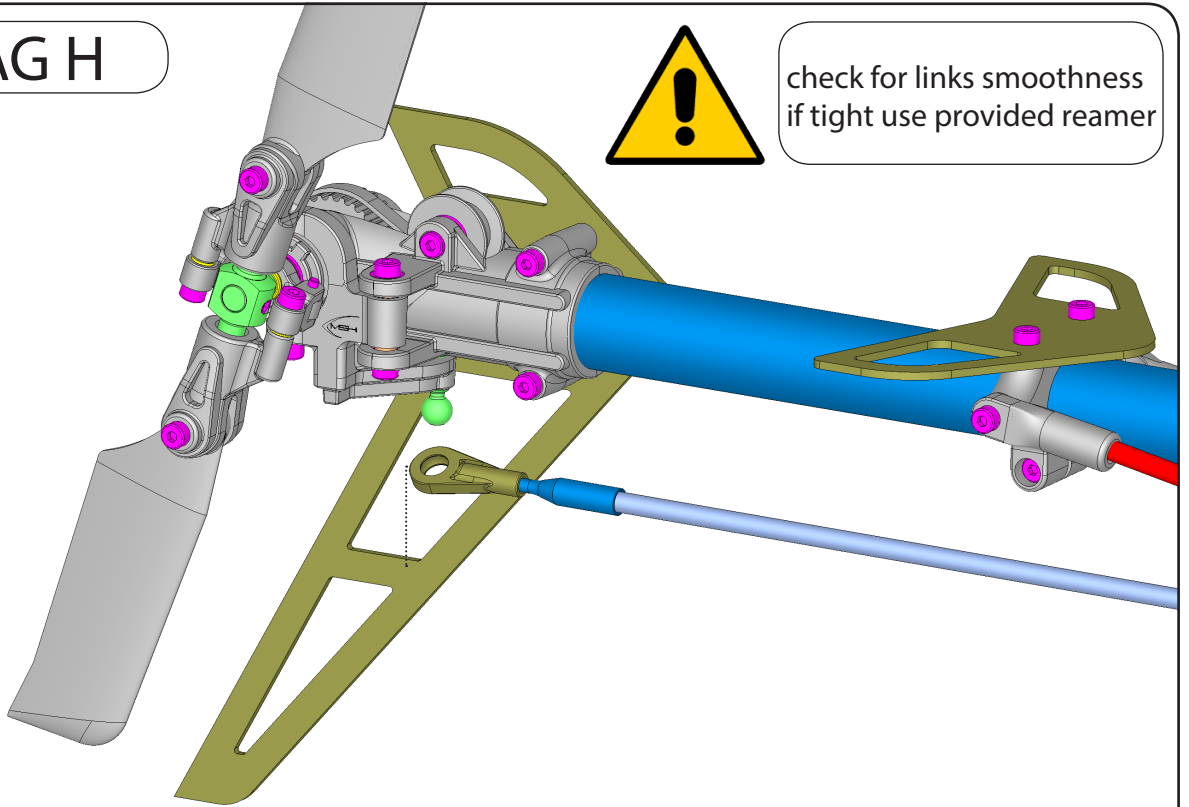


after the braces are in position with epoxy tighten the 4 screw at the brace rod ends. remember apply threadlock on the front ones.

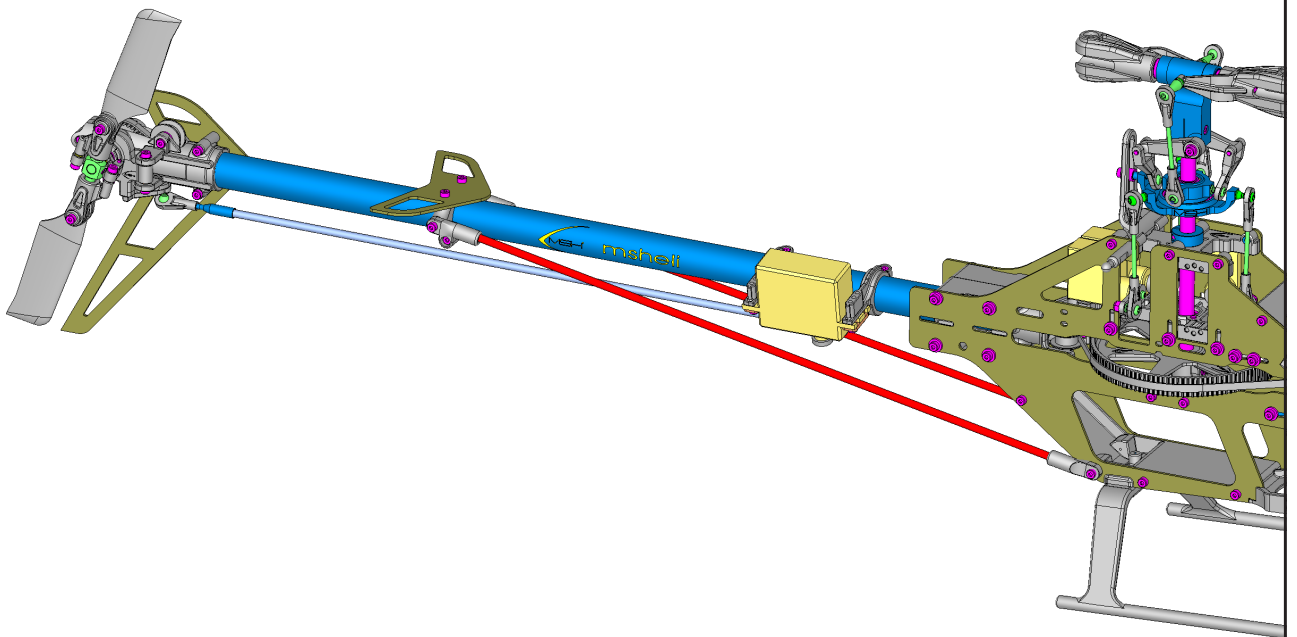
BAG H



check for links smoothness
if tight use provided reamer

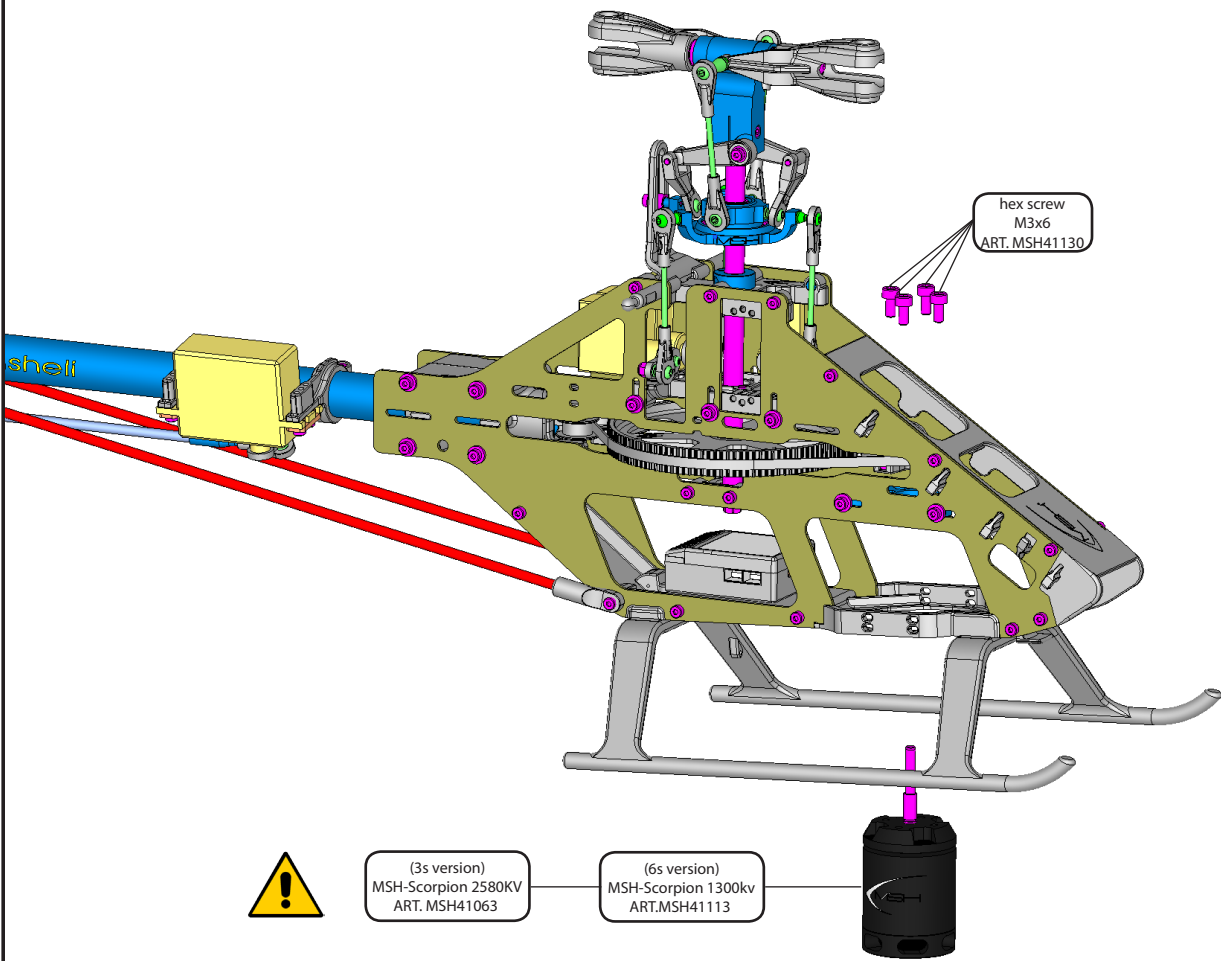


-x



BAG H

hex screw
M3x6

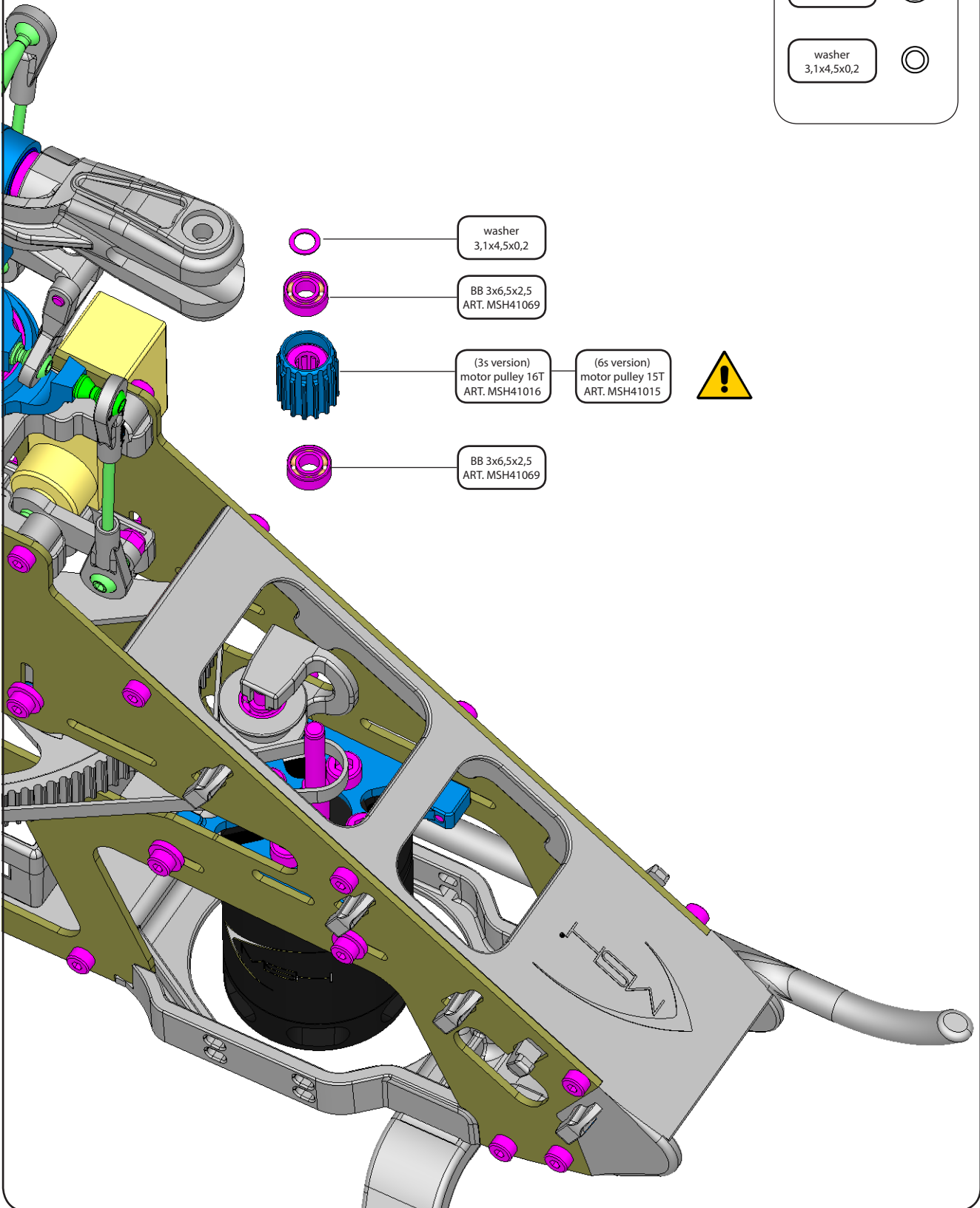


BAG H

BB 3x6,5x2,5



washer
3,1x4,5x0,2



washer
3,1x4,5x0,2



BB 3x6,5x2,5
ART. MSH41069



(3s version)
motor pulley 16T
ART. MSH41016

(6s version)
motor pulley 15T
ART. MSH41015



BB 3x6,5x2,5
ART. MSH41069

BAG F

hex screw
M2x8



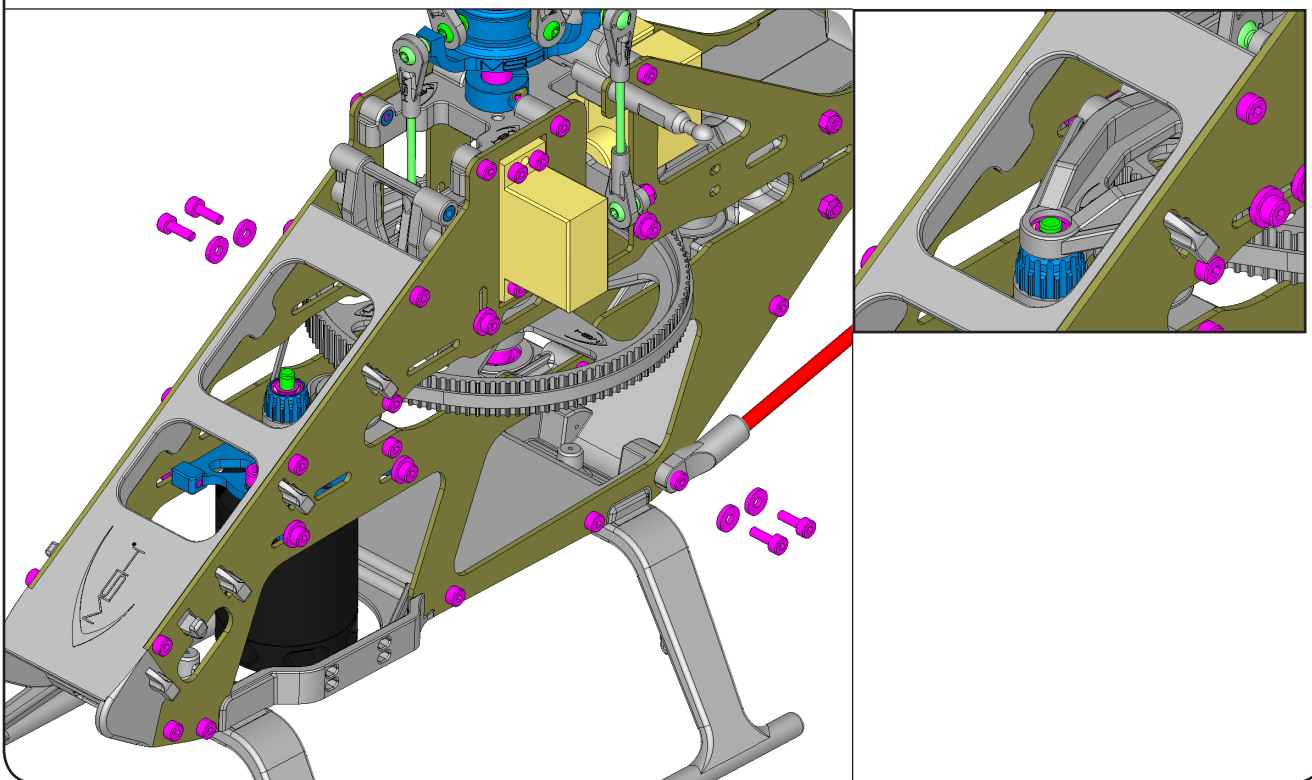
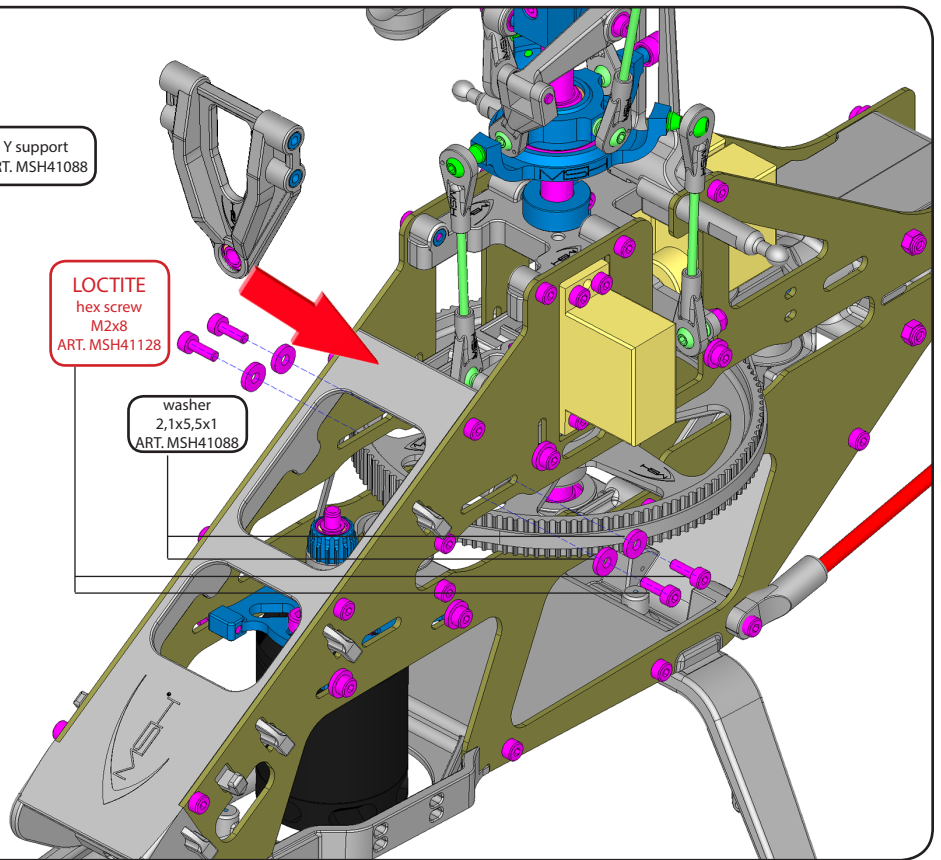
washer
3,1x4,5x0,2



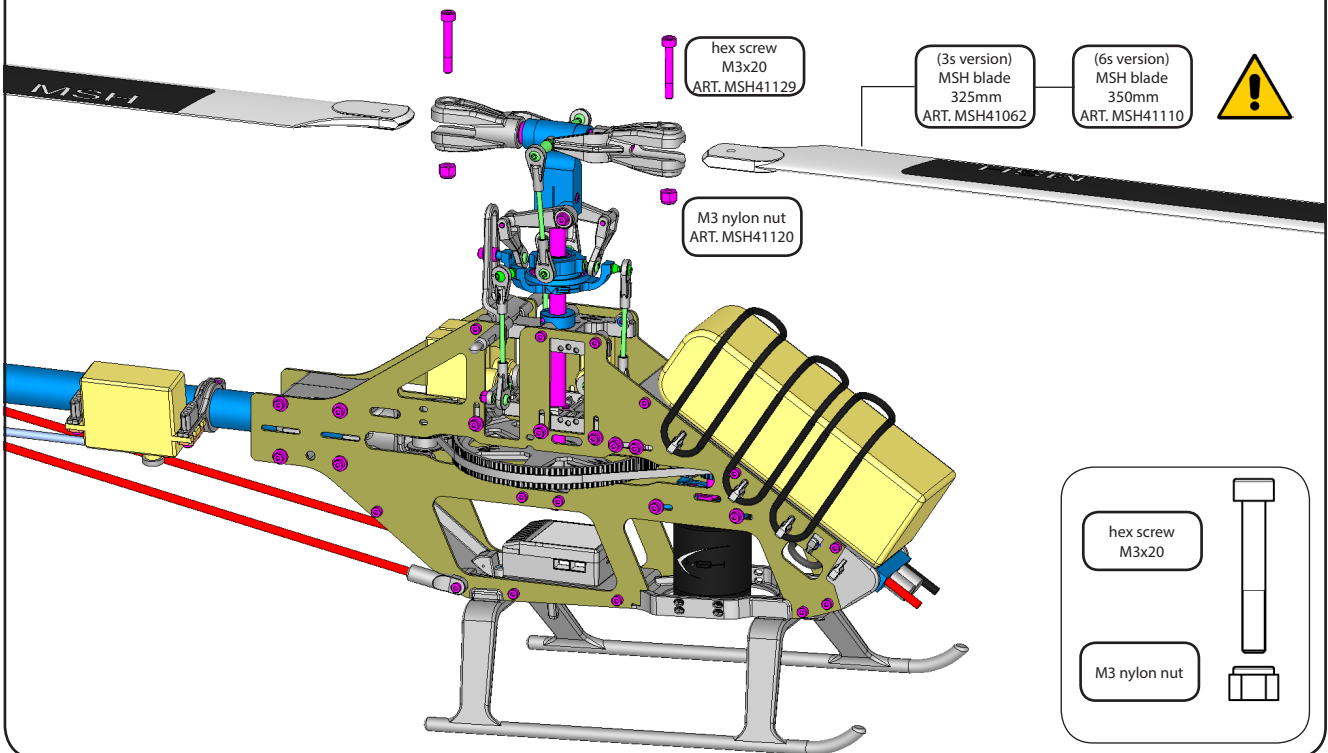
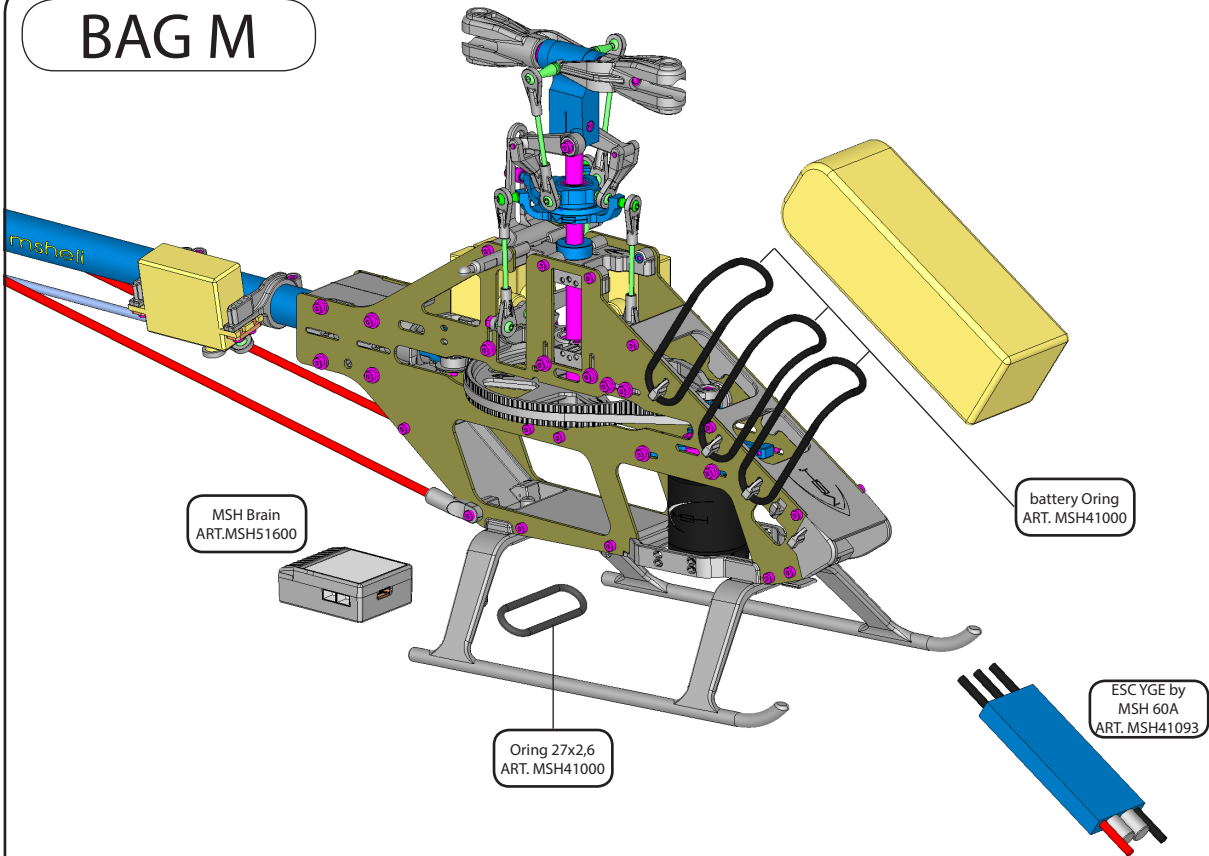
Y support
ART. MSH41088

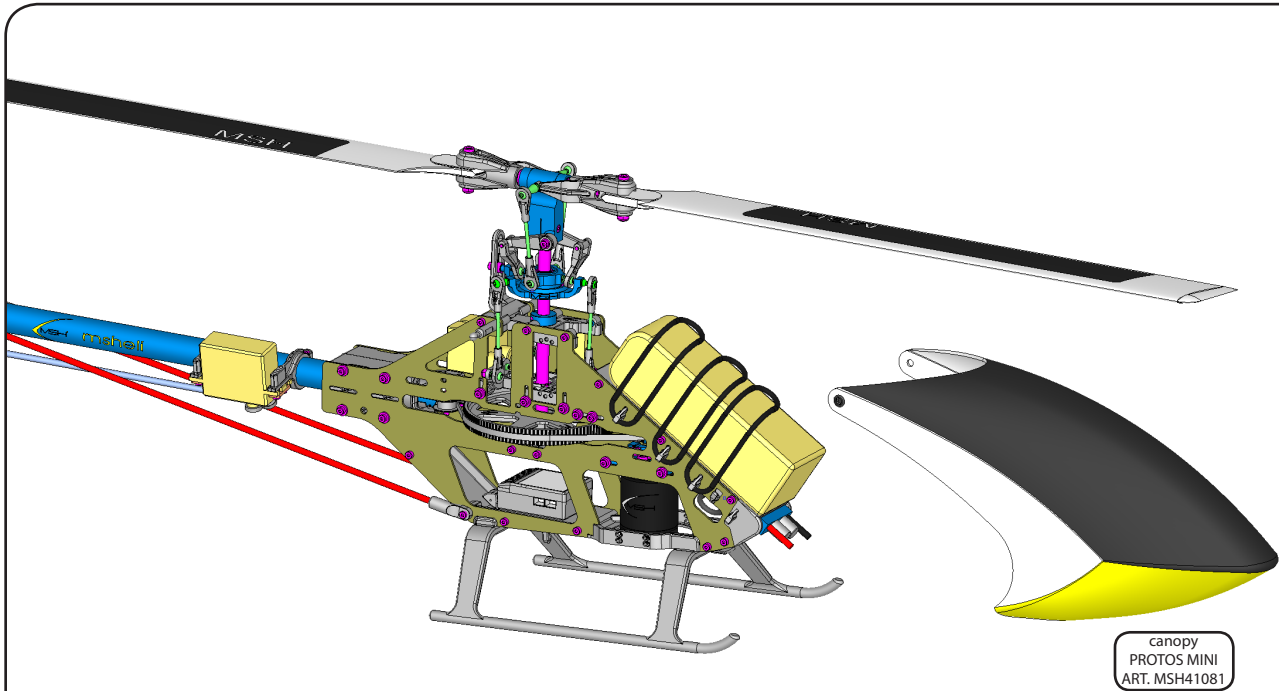
LOCTITE
hex screw
M2x8
ART. MSH41128

washer
2,1x5,5x1
ART. MSH41088



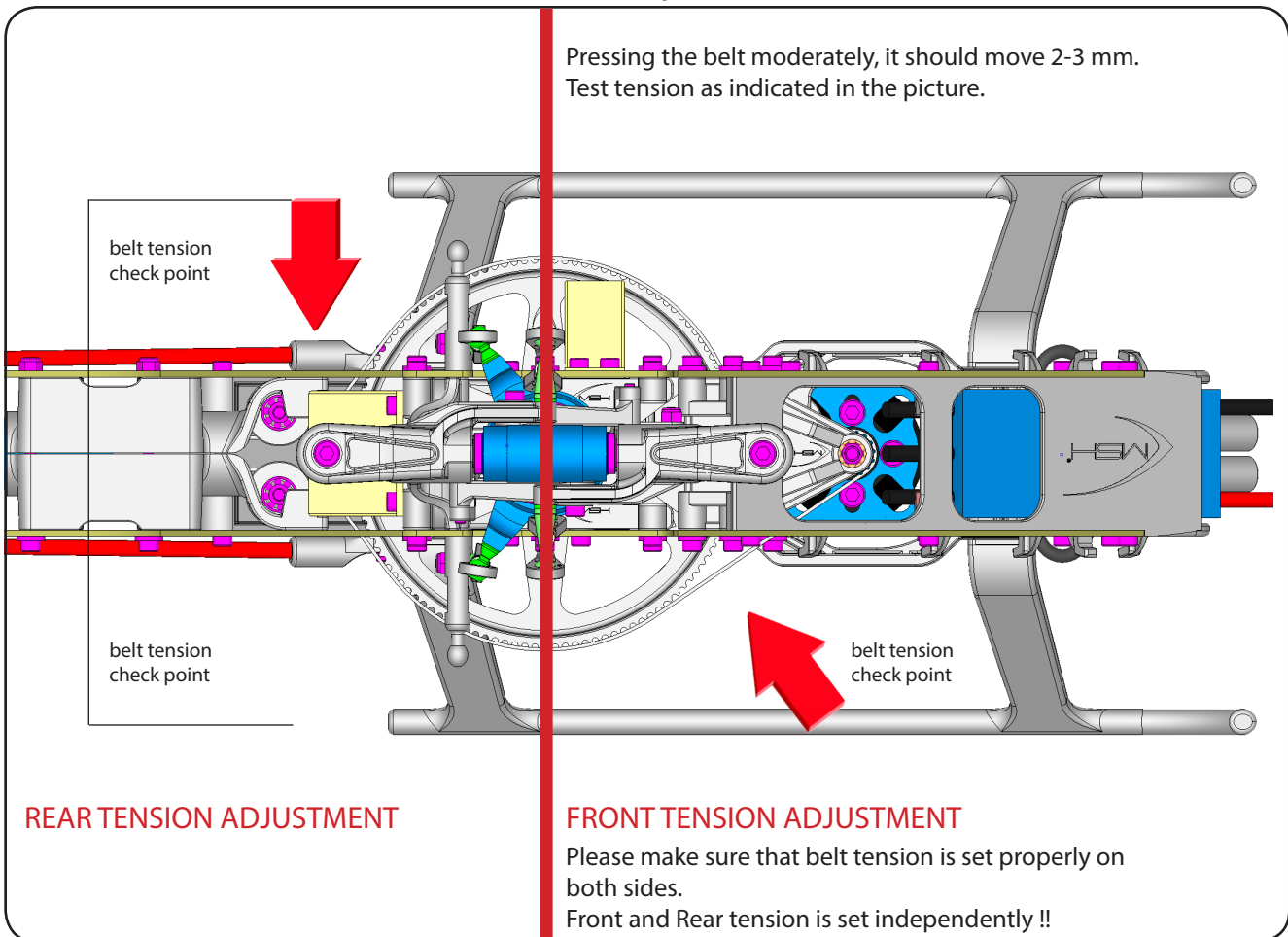
BAG M





belt tension adjustment

Pressing the belt moderately, it should move 2-3 mm.
Test tension as indicated in the picture.



REAR TENSION ADJUSTMENT

FRONT TENSION ADJUSTMENT

Please make sure that belt tension is set properly on both sides.
Front and Rear tension is set independently !!

MSHeli s.r.l.
Uboldo
ITALY

specification and design are subject to change without notice
LOCTITE are a registered mark