CHAPTER

20

STANDARD PRACTICES - AIRFRAME

CONTENT

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GENERAL

This chapter contains standard practices related with other chapters of this Manual.

NOTE

The standard practices related only to chapter AIRPLANE STRUCTURE are issued in chapter 51.

TIGHTENING OF SCREW JOINTS, TIGHTENING OF CONTROL CABLES

This part of chapter contains instructions for tightening the threaded joints of airplane structure, for tightening the control cables and for installation of engine and propeller to airplane.

General

a) The torque allowances may be utilized when tightening the nuts being locked with cotter pins during their proper positioning with nut cut-out opposite to hole in bolt. When tightening the nuts and screws being locked the other way, e.g. by lock washer or by safety wire, it is recommended to preset the torque wrench to prescribed mean value and to tighten the joint.

b) The issued torque data are valid for clean, dry threads without any corrosion. It is not applicable for tightening the duralumin or self-locking nuts.

1. Prescribed torque data

Joint	Nut	Torque (Nm)
Mounting of horizonatal stabilizer	Fig. 55-2, item 2; 6; 9	44 to 49
Upper wing mount	Fig. 57-3, item 5	23 to 27
Bottom wing mount	Fig. 57-4, item 5	
Propeller joint	Fig. 61-1, item 2	85 to 90
Firewall bushings	Fig. 61-4, item 5; Fig. 75-2, item 11	20
Engine mount	Fig. 71-2, item 7	33 to 35

2. Prescribed elongation of mount bolts

Joint	Mount bolts elongation mm (in) Fig. 53-6, item 1
Joining of fwd and rear fuselage section	0,12 to 0,14 (0,0047 to 0,0055)

3. Prescribed tension of control cables

Cable	Cable tension
Rudder cables (Fig. 27-10, item 1)	350 to 450 N (77 to 100 lbft)
Elevator cable (Fig. 27-17, item 1; 2)	60 to 80 N (13 to 18 lbft)
Flap control cables (Fig. 27-20, item 2; 3)	Cable slacking: 6 to 10 mm (0,24 to 0,40 in)
Nose wheel control cables (Fig. 32-32, item 1; 2)	Distance between spring turns (Fig. 32-32, item 4): 0,15 to 0,20 mm (0,006 to 0,008 in)

EFFECTIVITY: All

REPAIRS

This chapter contains instructions for repairs related to the other chapters of this manual.

REAMING OF HOLES IN MOUNTS

CAUTION

THE HOLE REAMING IN MOUNTS MAY BE CARRIED OUT EXCEPT AIRPLANE MANUFACTURER BY AUTHORIZED REPAIR SHOP. THIS SHOP IS OBLIGED TO MAKE PERTINENT RECORDS TO AIRPLANE LOGBOOK CONTAINING NAME OF REPAIRED MOUNT AND ACTUAL DIAMETER OF REPAIRED MOUNT.

The manufacturer supplies pins, bolts and bordering bushings of articulated bearings with excessive diameter for the mounts the denting of hole of which is presupposed. The heads of excess diameter pins and bolts are provided with numerical marking of actual diameter without decimal point, e.g. number 121 expresses 12,1 mm diameter, number 122 expresses 12,2 mm etc.

General instructions for reaming the holes in mounts:

- check cleanness and correct state of tools, fixtures and jigs before beginning the work.
- check after remaining, i.e. after increase of hole, if the minimum dimensions of fork or eye are maintained K min., M min.
- check if the cutting edges of reamers are faultless – never use reamers with faulty cutting edges.
- the diameter of used reamer should exceed the diameter of hole to be reamed for 0,1 mm. Do not enlarge any hole above maximum diameter during first repair (overhaul). If it is not unconditionally necessary, e.g. in case of increased ovalness or in case of corrosion.
- rinse the reaming chips during reaming with high rate.
- deburr the hole edges with countersink.
- clean reamed holes thoroughly and check them with pertinent caliber.
- make sure the minimum dimensions of fork or eye, K min., M min are maintained.
- clean and store used tools, jigs and fixtures.
- mark the reamed holes of mounts with red circle and actual diameter, e.g. 12,1 with red color at suitable spot.
- use during assembly the pins, bolts and/or bordering bushings with pertinent excessive diameter.

NOTE

The recommended reamers, calibers, fixtures, jigs and excess diameter pins, bolts and bordering bushings are optional and may be supplied on order by airplane manufacturer.

REPLACEMENT OF ARTICULATED BEARINGS WITH BORDERING BUSHINGS

The articulated bearings with bordering bushings are used in rear wing mount (Fig. 57-8, item 9; 11) and in nose landing gear mounts (Fig. 32-10, item 7; 11; 13; 17).

In border that the radial allowance of bordering bushings may be maintained it is necessary to replace bordering bushing together with articulated bearing.

Instuctions for replacement of articulated bearings with bordering bushings:

a) Remove faulty articulated bearing:
- grind off the locking border of bushing (Fig. 20-1, item A)
- press the articulated bearing with bordering bushing from the hole (item B)

b) Installation of new articulated bearing:
- ream, if needed the holes with excessive diameter for bordering bushing in nose landing gear leg
- press articulated bearing (1) with bordering bushing (2) into the hole (item C)

NOTE

The rear wing mount is provided with Z 42.2113-01.03; bordering bushing and nose landing gear leg uses bushings listed in section 32-20-00 (APPROVED REPAIRS).

- border the bordering bushing (item D).

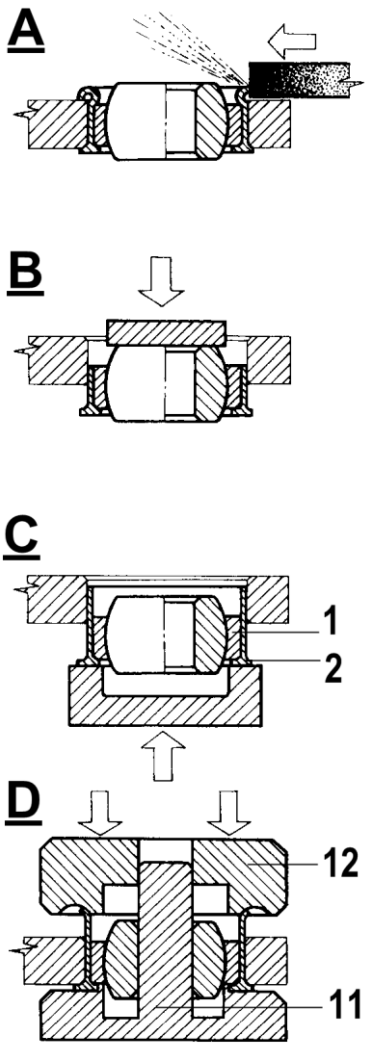
Recommendation

The bordering of bordered bushing may be made by 31-Z42-3052 pressing fixture. Insert pin (11) into the hole. Border the bordering bushing gradually with three stepped nuts (12).

c) Check shape and dimensions of locking border of bushing (Fig. 20-2).

d) Check state and serviceability of bushings:
- no scratches or cracks may be detected in the spot of bordering
- the articulated bearing should revolve lightly and continuously. Make the articulated bearing freely movable in internal bearing ring by means of mandrel while lubricating the bearing with mixture of oil w ith 10% MOLYCOTE additive. Clean bearing with degreasing agent and grease it properly afer repair.

e) Check resistance to motion when deflecting the articulated bearing (Fig. 20-3):
- act upon arm l=50 mm (2 in) by P=3 N (0,6 lbft) force
- check if the deflection of arm axis is at least 5^{o} from the mean position. In case it is necessary to release the articulated bearing it is possible to use lapping paste to release internal ring. Clean lapping paste thoroughly if used.



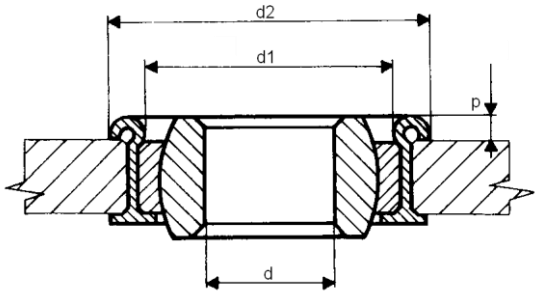
A ... grinding the borde of bushing off
B ... pressing the articulated bearing with bordering bushing out
C ... pressing the articulated bearing with bordering bushing in
D ... bordering

1 ... articulated bearing
2 ... bordering bushing

Recommended fixture:
11 ... pin
12 ... matrix
} 33-Z42-1895 pressing fixture

Fig. 20-1 Replacement of articulated bearing with bordering bushing

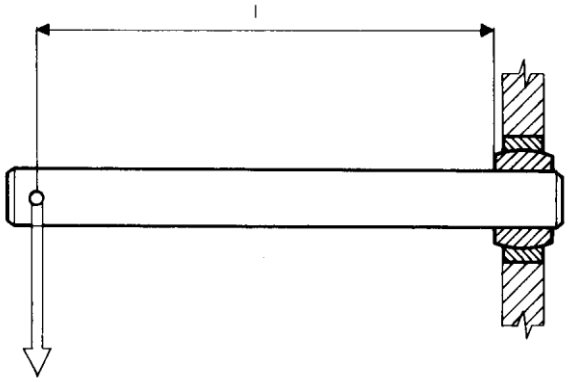
EFFECTIVITY: All



d .. internal diameter of articulated bearing
d_1 ... internal diameter of bushing border
d_2 ... external diameter bushing border
p .. thickness of bushing border

Dimension	Articulated bearing			
	In nose landing gear legs		In rear wing mount	
	8 ČSN 02 3511		12 ČSN 02 3511	
d (mm)	∅ 8 J8	0,3145-0,3154	∅ 12 J8	0,472-0,473
d_1 (mm)	$\varnothing\ 16{,}2^{\ 0}_{-0{,}2}$	0,62-0,64	$\varnothing\ 20{,}3^{+0{,}5}_{\ 0}$	0,80-0,82
d_2 (mm)	$\varnothing\ 19{,}4^{+0{,}2}_{\ 0}$	0,76-0,77	$\varnothing\ 23{,}5^{+0{,}5}_{\ 0}$	0,92-0,95
p (mm)	$1{,}3^{\ 0}_{-0{,}3}$	0,04-0,05	$1{,}3^{\ 0}_{-0{,}3}$	0,04-0,05

Fig. 20-2 Dimension of border of bordering bushing



l = 50 mm
P = 3 N

Fig. 20-3 Check of resistance to movement of articulated bearing

REPAIR OF COUPLING ELEMENTS

1. Bolts

Fault	Remedy
1) Defective bolt heads making the removal or installation diffucult, or defective threads	Replace bolt for new one
2) Lightly damaged thread	Cut defective thread with button
3) Corroded bolt heads	Remove corrosion and repair paint coating with S 2008 primer

2. Fitting bolts

Fault	Remedy
1) Defective bolt heads making the removal or installation difficult, defective threads 2) Lightly damaged or corroded thread 3) Dented, warn out and/or corrosive bolt shank 4) Cracks	Replace fitting bolts with new ones
5) Corroded bolt heads	Remove corrosion and repair painting with S 2008 primer

3. Nuts

Fault	Remedy
1) Defective hexagon or thread 2) Corroded nuts	Replace nuts with new ones

4. Washers

Fault	Remedy
1) Deformed washers	Replace washers with new ones

NOTE

Replace lock washers, after any removal with new ones of the same dimension.

EFFECTIVITY: All

5. Safety rings

Fault	Remedy
1) Defective and corroded safety rings	Replace safety ring with new ones

6. Turnbuckles

Fault	Remedy
1) Defective, corroded threads of turnbuckle	Replace turnbuckles with new one

NOTE

Replace locking means of turnbuckles, e.g. cotter pins, allways with new ones.

REPLACEMENT OF BONDING

When replacing bonding it is necessary:

- to clean the contact area of bonding to metal base
- install new bonding and paint it with red color within one hour from the moment of cleaning the contact area.