

# PARTS & SERVICE NEWS

REF NO.	AT99198
DATE	Jan. 6, 2000

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**SUBJECT:** REPAIR OF POWER TILT BUSHING ON GD825A-2

**PURPOSE:** To introduce modification procedures for bushings in the power tilting mechanism on GD825A-2 motor graders (undergone the work equipment minor change)

**APPLICATION:** GD825A-2 Motor Graders, Serial Nos. 12053 thru 12087  
Serial Nos. 12091 thru 12094  
(39 units in total: Refer to page 7 for details by countries.)  
※ The modification for the two units in Australia of Serial 12051 and 12052 which experienced actual failures, has already been requested separately.

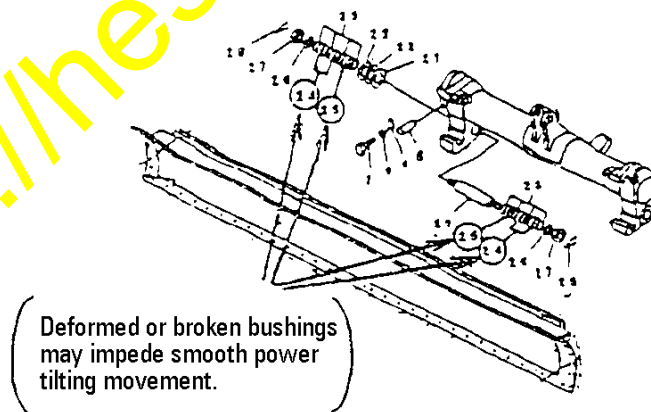
**FAILURE CODE:** 7C8N40

## DESCRIPTION:

### 1-1. Introduction

With the GD825A-2 motor graders of the type with which the minor change of the work equipment has been made, the bushings being used at the supporting points of the power tilting mechanism may wear or be deformed in an earlier stage to impede smooth power tilting movement.

To prevent such failures, make the modification being introduced in this Service News following the modification procedures outlined herein.



(Fig. 1)

1.2 Determined modification method

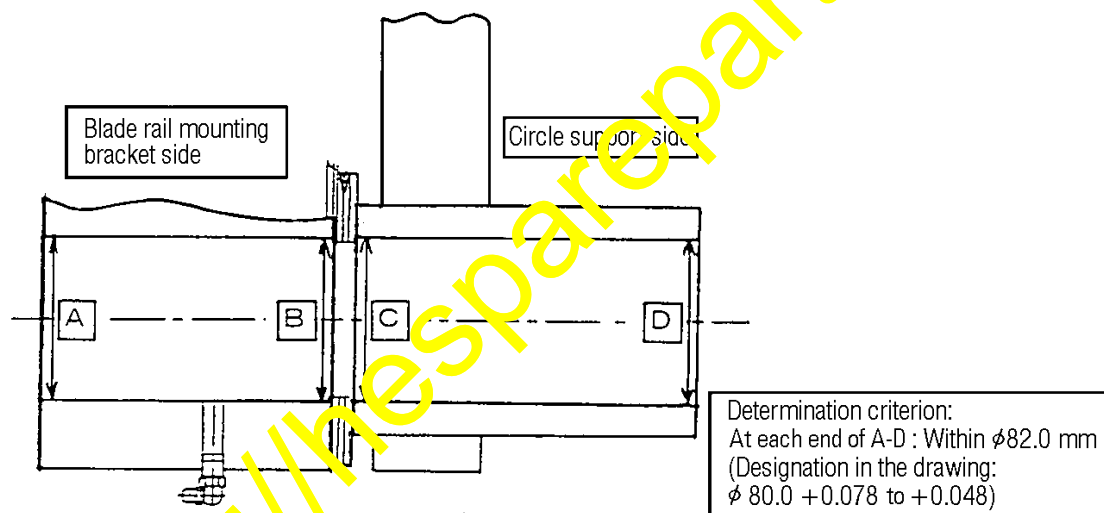
1) We have temporarily shipped the parts necessary for the modification of ① Changing the DU bushings to steel bushings and ② Changing the 75-mm-dia. shaft to 65-mm-dia. shaft to your location. When replacing the current parts with the improved parts, check the dimensions at the ends of the bushing insertion hole (Refer to the diagram below) to make sure they are within the determination criterion, before starting the replacing work.

※ According to our preliminary survey, the modification will be completed on all the applicable vehicles by replacing the parts with those we have forwarded.

2) When deformation or wear of the hole exceeding the determination criterion has been found to be present, follow the procedures designated on Page 9 and after to implement the modification of cutting the bushing support section and replacing it before drilling the bushing support section, then replacing the bushings with the over-sized ones.

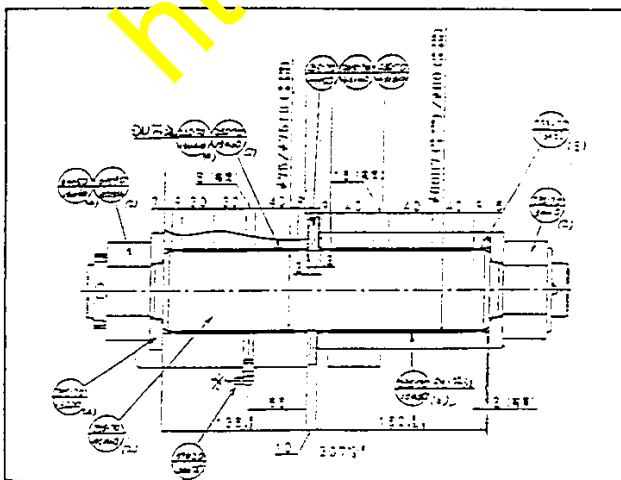
Nonetheless, since the parts necessary for this modification have not yet been forwarded, temporarily replace the existing parts with the new parts we have forwarded before contacting our factory. Then, the necessary parts to replace the bushings with the over-size bushings will be forwarded.

Inspection methods for the bushing insertion hole and determination criterion



Make the above inspections on both L.H and R.H sides of the chassis (total 8 points)

Enlarged view



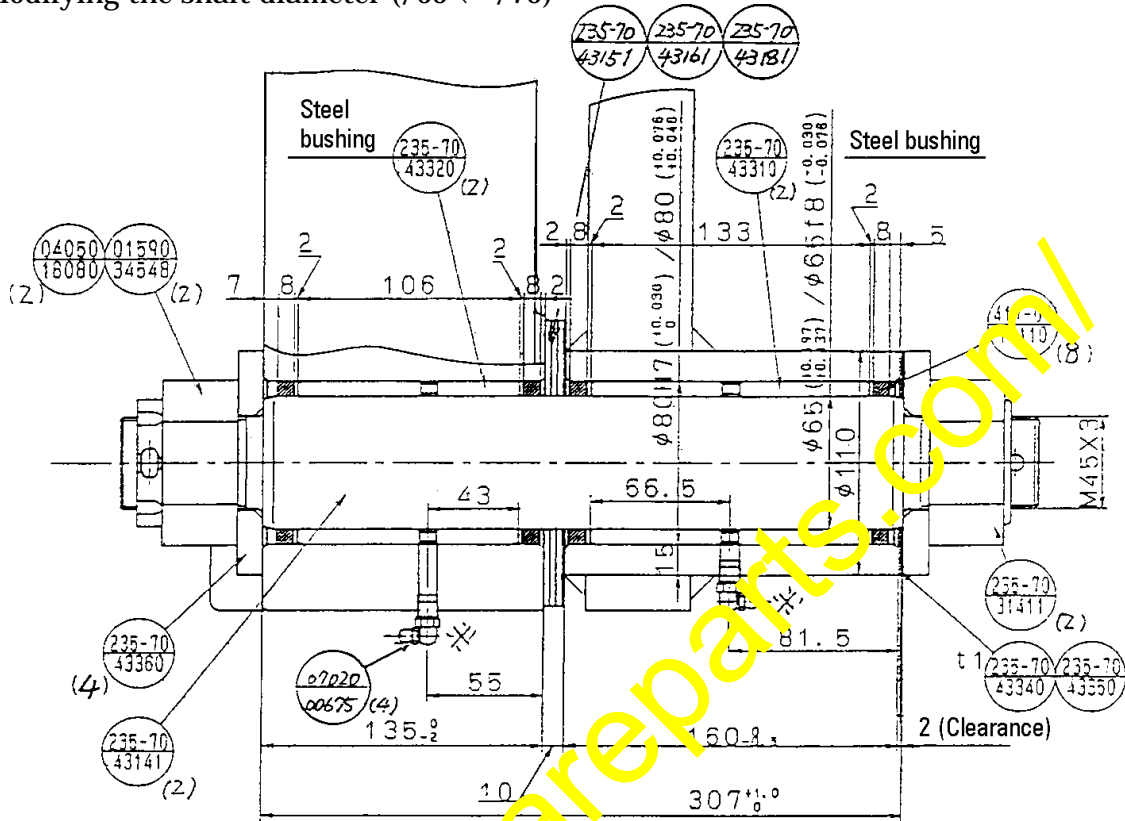
## 2. List of parts

- ① Changing the DU bushings → Steel bushings } Necessary parts of these  
 ② Modifying the shaft diameter ( $\phi 65 \leftarrow \phi 75$ ) } modifications

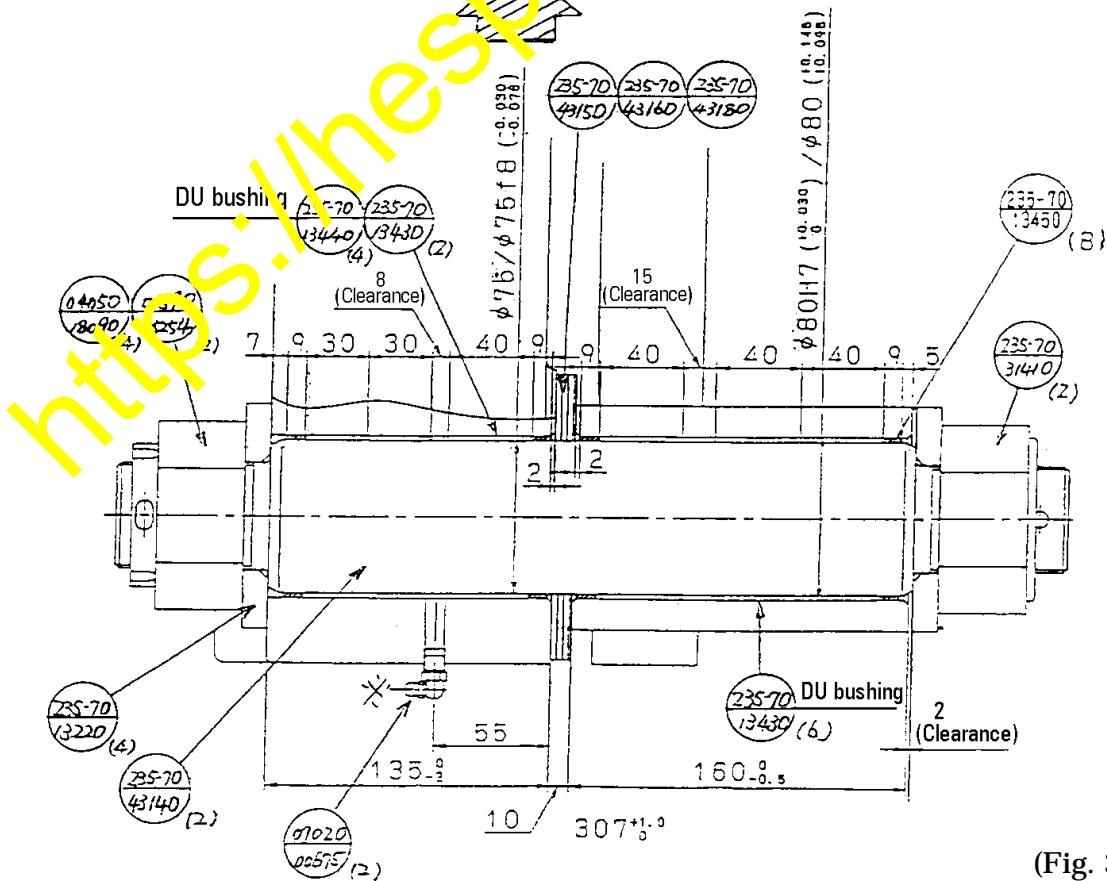
Part No.	Part Name	Purpose of part	Q'ty	Remarks	
235-70-43141 (235-70-43140)	Shaft (Shaft)	Replacement	2 (2)		
235-70-31411 (235-70-31410)	Nut (Nut)		2 (2)		
235-70-43360 (235-70-13220)	Washer (Washer)		4 (4)		
01590-34548 (01590-35254)	Nut (Nut)		2 (2)		
04050-18080 (04050-18090)	Pin (Pin)		2 (2)		
235-70-43151 (235-70-43150)	Washer (Washer)		6 (6)		
235-70-43161 (235-70-43160)	Shim (Shim)		6 (6)		
235-70-43181 (235-70-43180)	Shim (Shim)		6 (6)		
235-70-43310 (235-70-13430)	Bushing (Bushing)		2 (6)		
235-70-43320 (235-70-13440)	Bushing (Bushing)		2 (4)		
235-70-43340	Shim		Addition	6	
235-70-43350	Shim			6	
417-09-11150 (235-70-13450)	Seal, dust (Seal)		Replacement	8 (8)	
07074-00675	Fitting	Addition	4		

3. Contents of the modification (The schematic decagrams indicated below are for the R.H side of the chassis.)

- (1) Changing the DU bushings to steel bushings
- (2) Modifying the shaft diameter ( $\phi 65 \leftarrow \phi 75$ )



(Fig. 2)

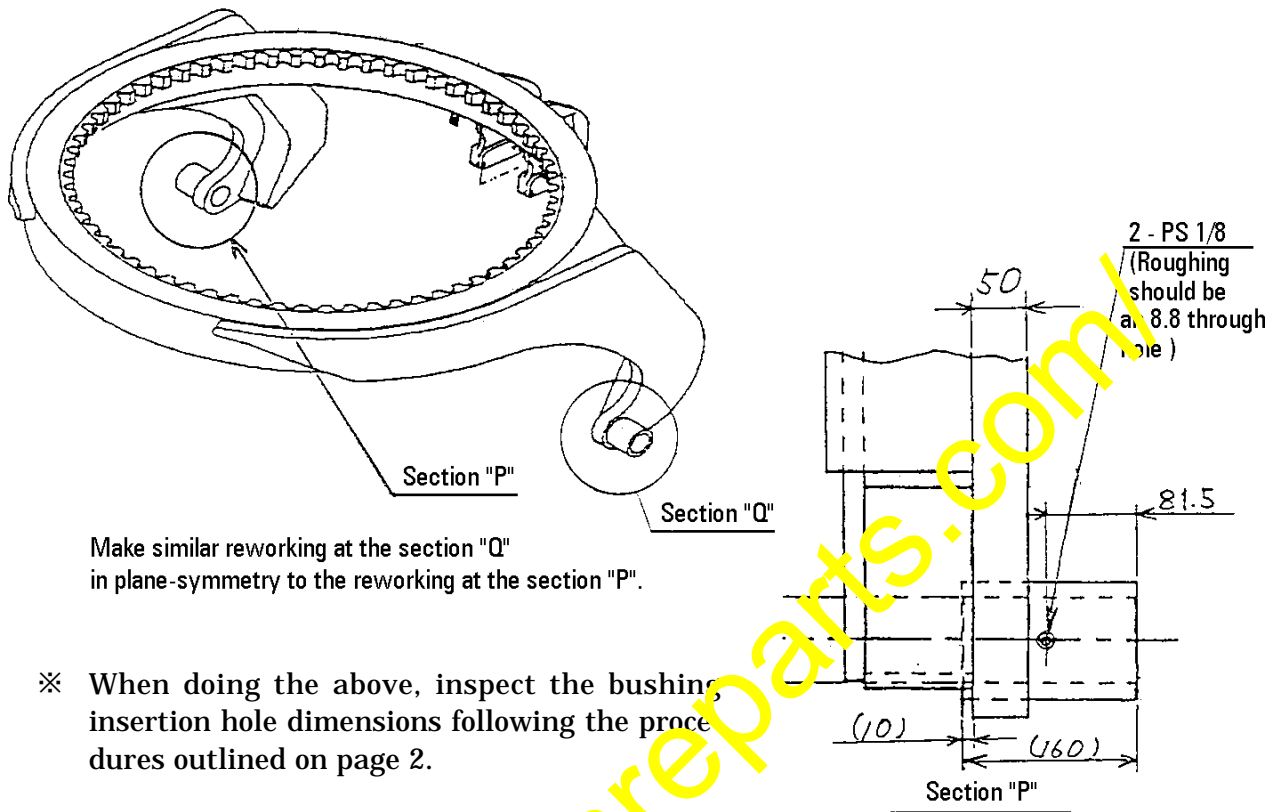


(Fig. 3)

※ Install the grease fitting in the section toward rear of the chassis.

(3) Reworking with the circle support

Rework to supplement holes to install the grease fitting in the circle support (on the L.H and R.H sides).



- ※ When doing the above, inspect the bushing insertion hole dimensions following the procedures outlined on page 2.

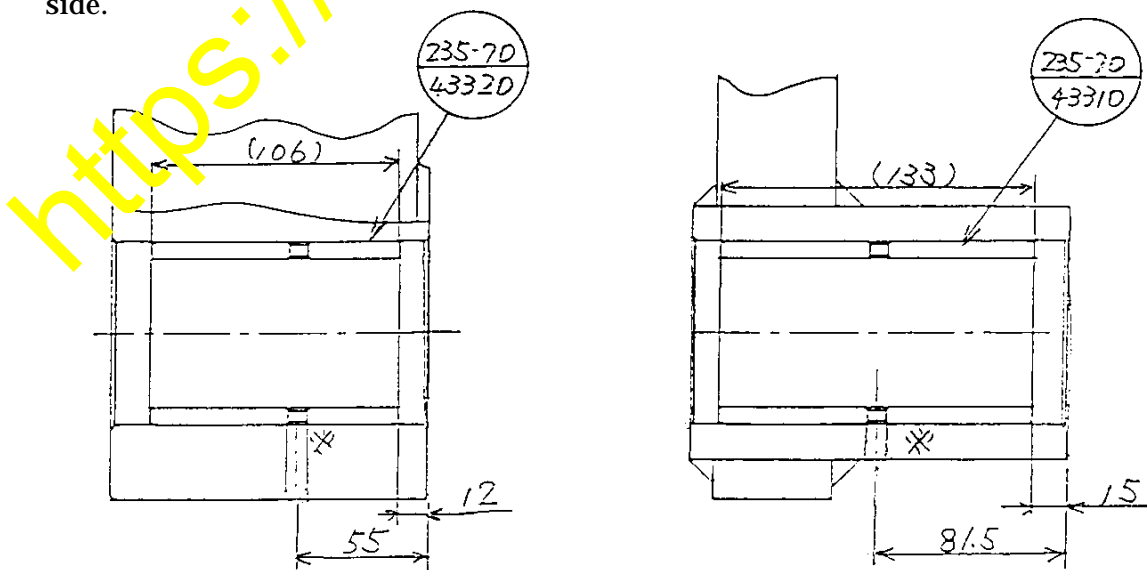
Reworking to supplement grease fittings to the circle support

(Fig. 5)

(4) Inserting the bushings

Insert the blade rail mounting bracket bushing and the circle support bushing according to the designations given in Fig. 6 and Fig. 7.

Since the bushings are being provided with greasing hole, align the hole with the grease fitting hole on the blade rail mounting bracket side and on the circle support side.



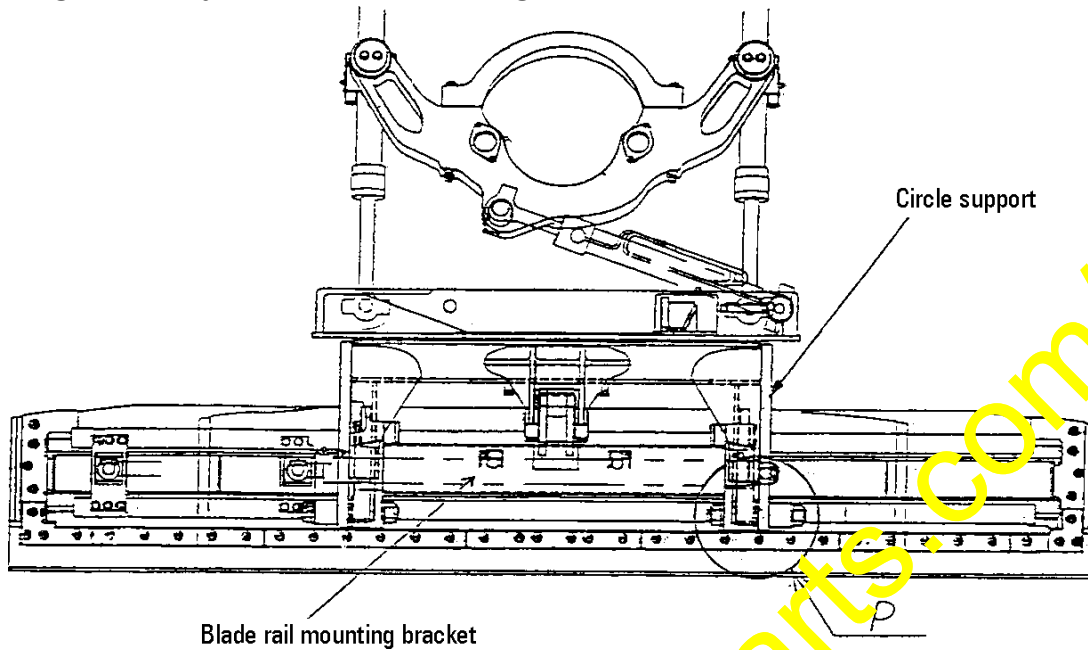
- ※ The grease fitting holes should face the rear of chassis.

Blade rail mounting bracket section (Fig. 6)

Circle support section (Fig. 7)

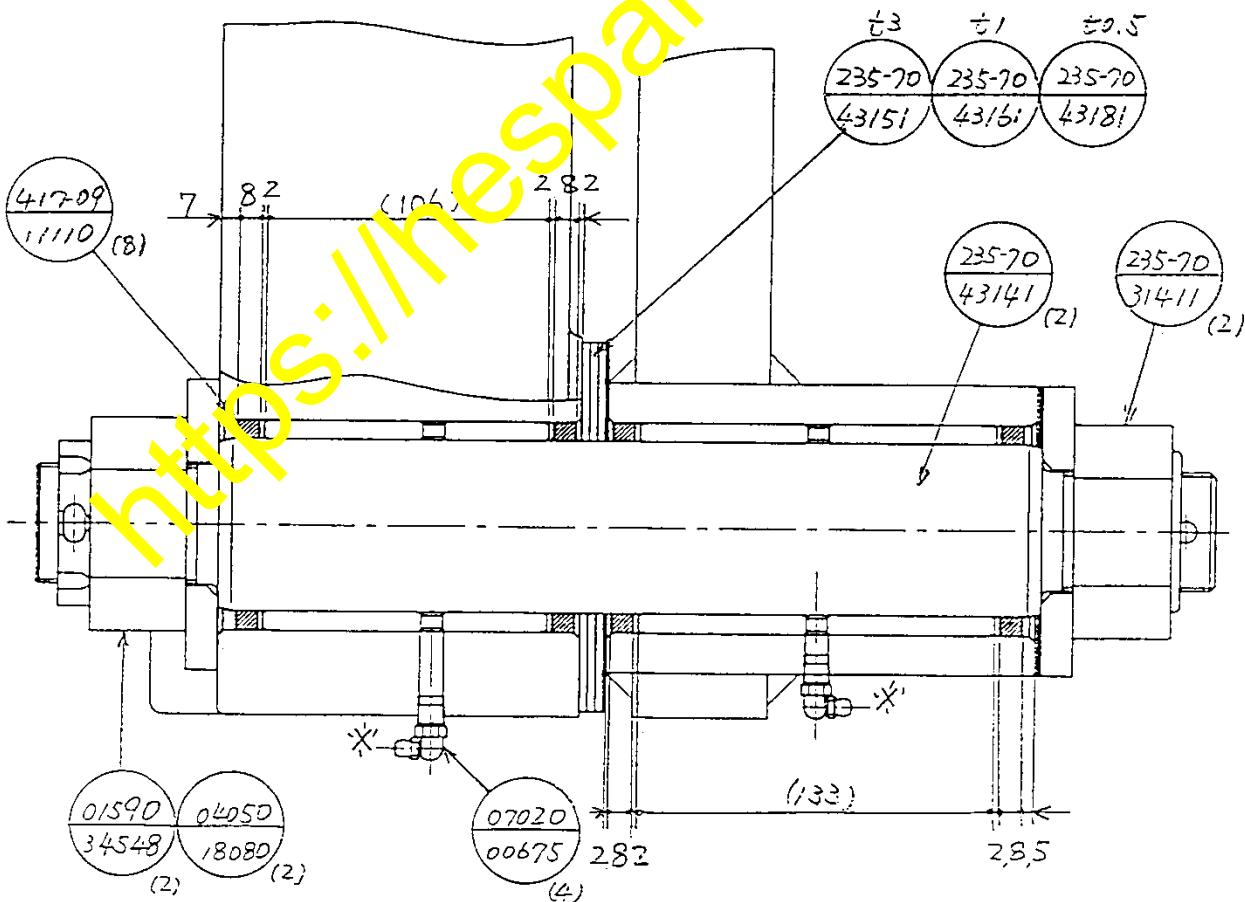
(5) Installation and adjustments

Install the shaft and bushings according to the designations given in Fig. 8 and Fig. 9 and adjust the clearance using shims.



Rear view of the work equipment (Fig. 8)

The schematic decagram given below is for the R.H side of the chassis. Make similar installation and adjustment on the L.H side in a symmetrical manner.

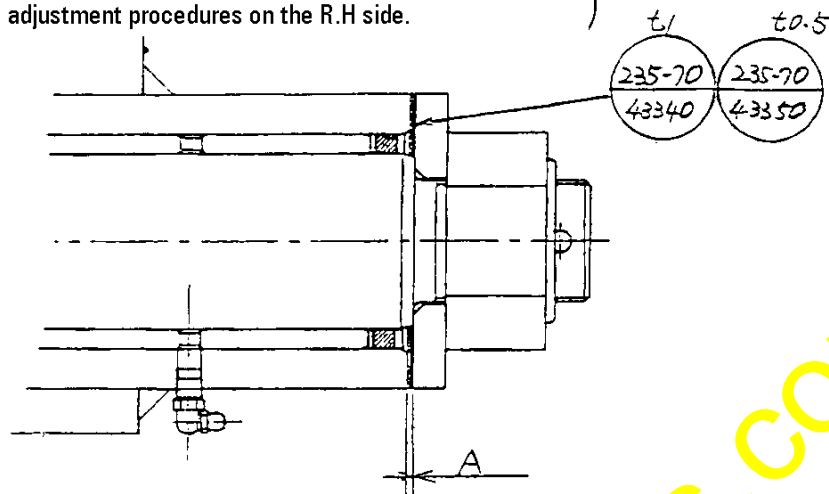


※ Install the grease fitting in the section toward rear of the chassis.

Dust seal dimensions and clearance adjustment dimensions using shims (Fig. 9)

Clearance adjustment at the end of the circle support

(The schematic decagram given below is of the R.H side of the chassis. Make similar installation and adjustment on the L.H side in plane-symmetry to the installation and adjustment procedures on the R.H side.)



(Fig. 10)

Supplementing shims 235-70-43340 and 235-70-43350, adjust the clearance "A" to 0.5 mm or less.

<Reference>

Country by country listing of the serial numbers and quantities of the applicable vehicles

UZUBEKISTAN	10	12069, 70, 71, 72, 73, 74, 75, 76, 77, 78
CHINA	8	12057, 58, 65, 66, 79, 80, 81, 82
SOUTH AFRICA	4	12053, 54, 63, 64
MOROCCO	4	12091, 92, 93, 94
USA(KMS)	3	12059, 60, 83
TURKY	3	12055, 56, 61
TANZANIA	2	12084, 87
PHILIPPINE	2	12062, 85
SENEGAL	1	12067
MONGOLIA	1	12068
MAURITANIA	1	12086
Total	39	

## 4. List of parts

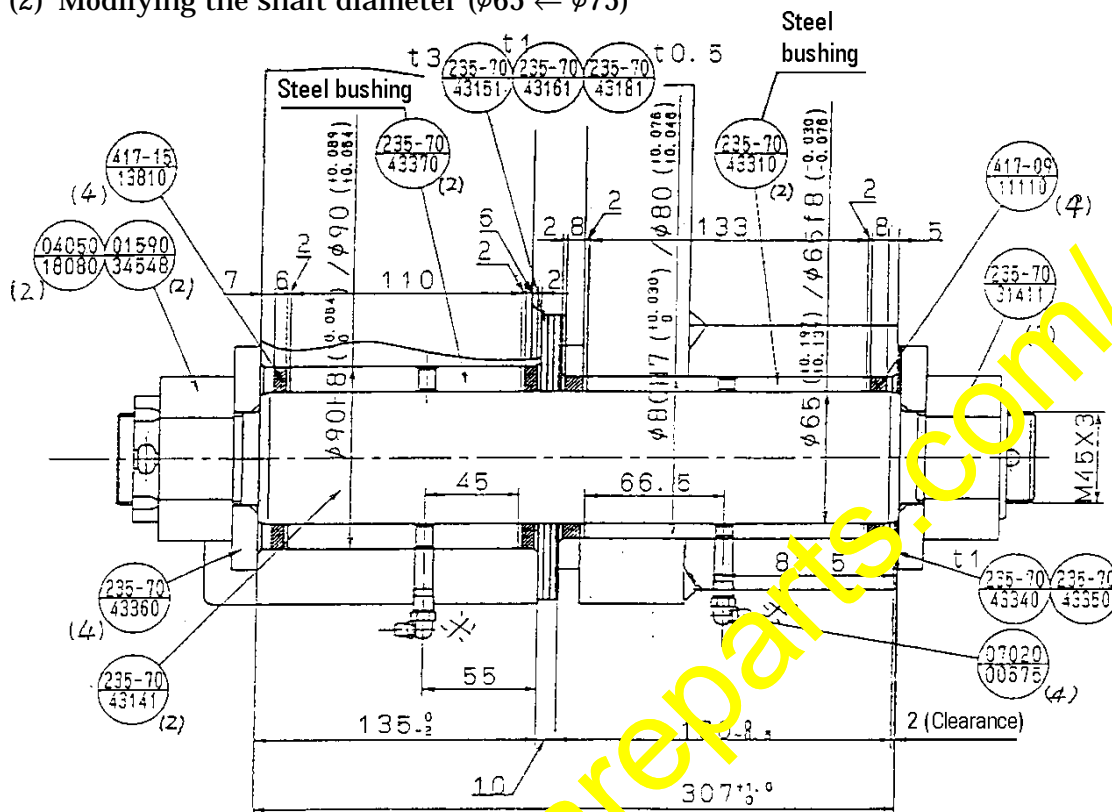
The modification procedures described hereafter are for the case when deformation or wear of the bushing insertion hole has been found to exceed the criterion and when it becomes necessary to replace the bushings with over-size bushings, cutting the bushing support section and replacing it.

Part No.	Part Name	Purpose of part	Q'ty	Remarks
235-70-43141 (235-70-43140)	Shaft (Shaft)	} Replacement	2 (2)	} These parts are already listed on pages 3 and 4 and they are in duplications.
235-70-31411 (235-70-31410)	Nut (Nut)		2 (2)	
235-70-43360 (235-70-13220)	Washer (Washer)		4 (4)	
01590-34548 (01590-35254)	Nut (Nut)		2 (2)	
04050-18080 (04050-18090)	Pin (Pin)		2 (2)	
235-70-43151 (235-70-43150)	Washer (Washer)		6 (6)	
235-70-43161 (235-70-43160)	Shim (Shim)		6 (6)	
235-70-43181 (235-70-43180)	Shim (Shim)		6 (6)	
235-70-43310 (235-70-13430)	Bushing (Bushing)		2 (6)	
(235-70-13440)	(Bushing)		Disused	
235-70-43370	Bushing	Addition	2	Parts exclusively necessary for this modification
235-70-43340	Shim	} Addition	6	} These parts are already listed on page 3 and they are in duplications.
235-70-43350	Shim		6	
417-09-11120 (235-70-13430)	Seal, dust (Seal)	Replacement	4 (8)	} Parts exclusively necessary for this modification
417-15-13310	Seal, dust		4	
07020-00675	Fitting	} Addition	4	These parts are already listed on page 3 and they are in duplications.
235-99-11910	Bracket, L.H		1	} Part exclusively necessary for this modification
235-99-11920	Bracket, R.H		1	

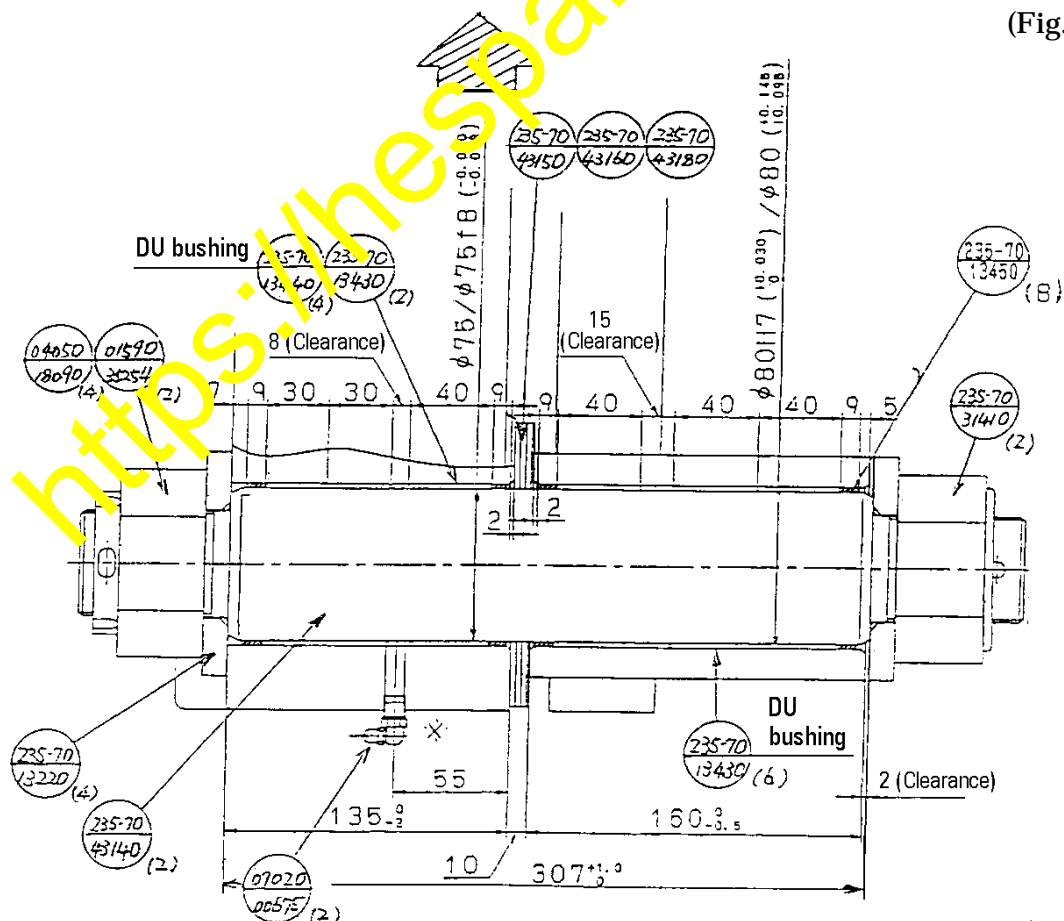


5. Contents of the modification (The schematic decagrams indicated below are for the R.H side of the chassis.)

- (1) Changing the DU bushings to steel bushings
- (2) Modifying the shaft diameter ( $\phi 65 \leftarrow \phi 75$ )



(Fig. 2)



(Fig. 3)

※ Install the grease fitting in the section toward rear of the chassis.

6. Modification procedures

(1) Precautions before starting the modification work

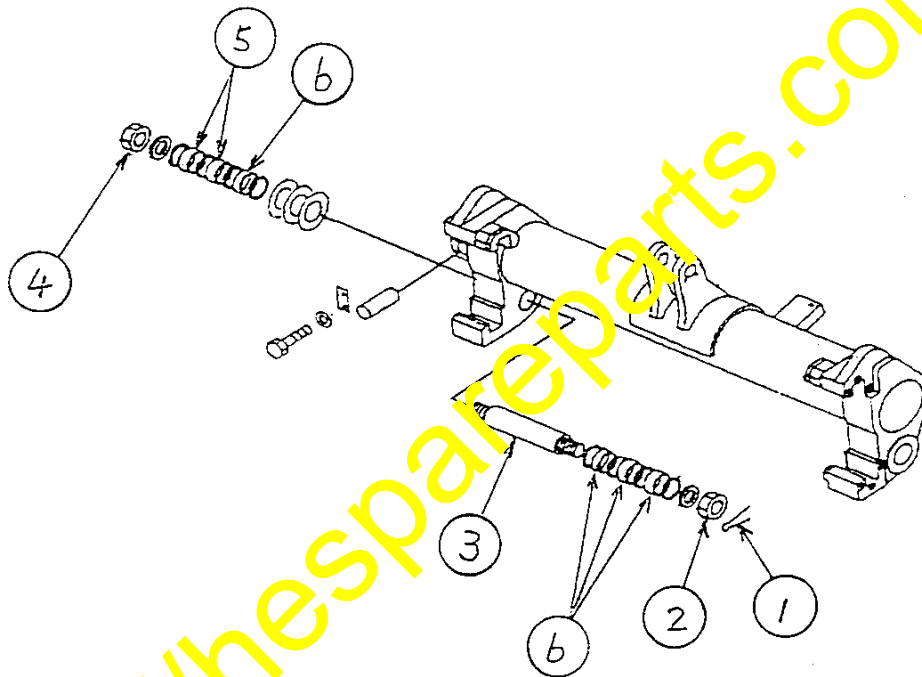
Before making the modification of the bushings of the power tilting mechanism, land the blade on a level surface. After that, do the following.

(2) Removing the power tilting shaft and bushings

1. Referring to Fig. 4, remove the pin ①, loosen the nut ② to pull out the shaft ③.

[ Since the nut ④ is of the loosening proof structure internally, loosen the nut ②. ]

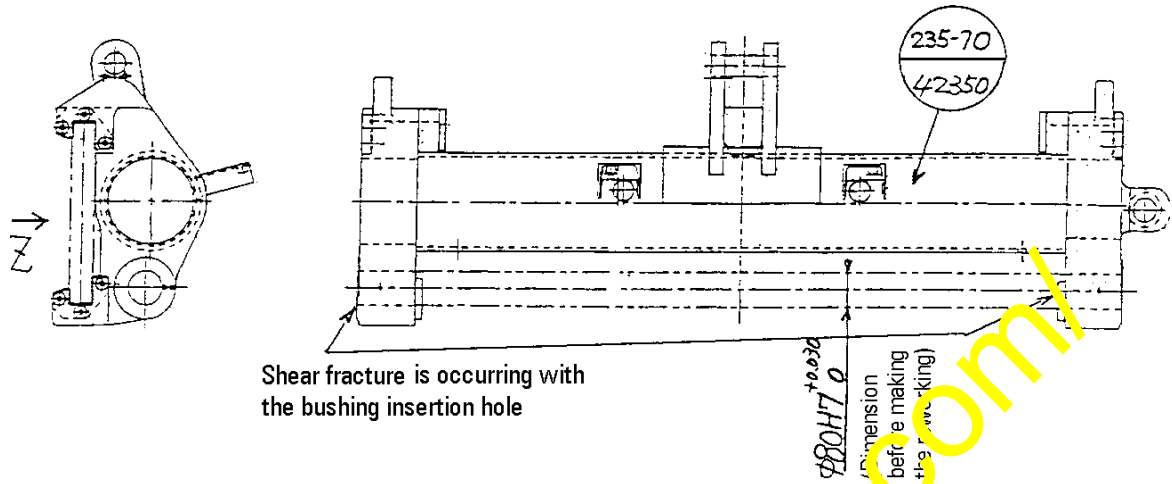
2. Remove the bushings ⑤ and ⑥.



Power tilting shaft and bushings (Fig. 4)

(3) Reworking with the blade rail mounting bracket

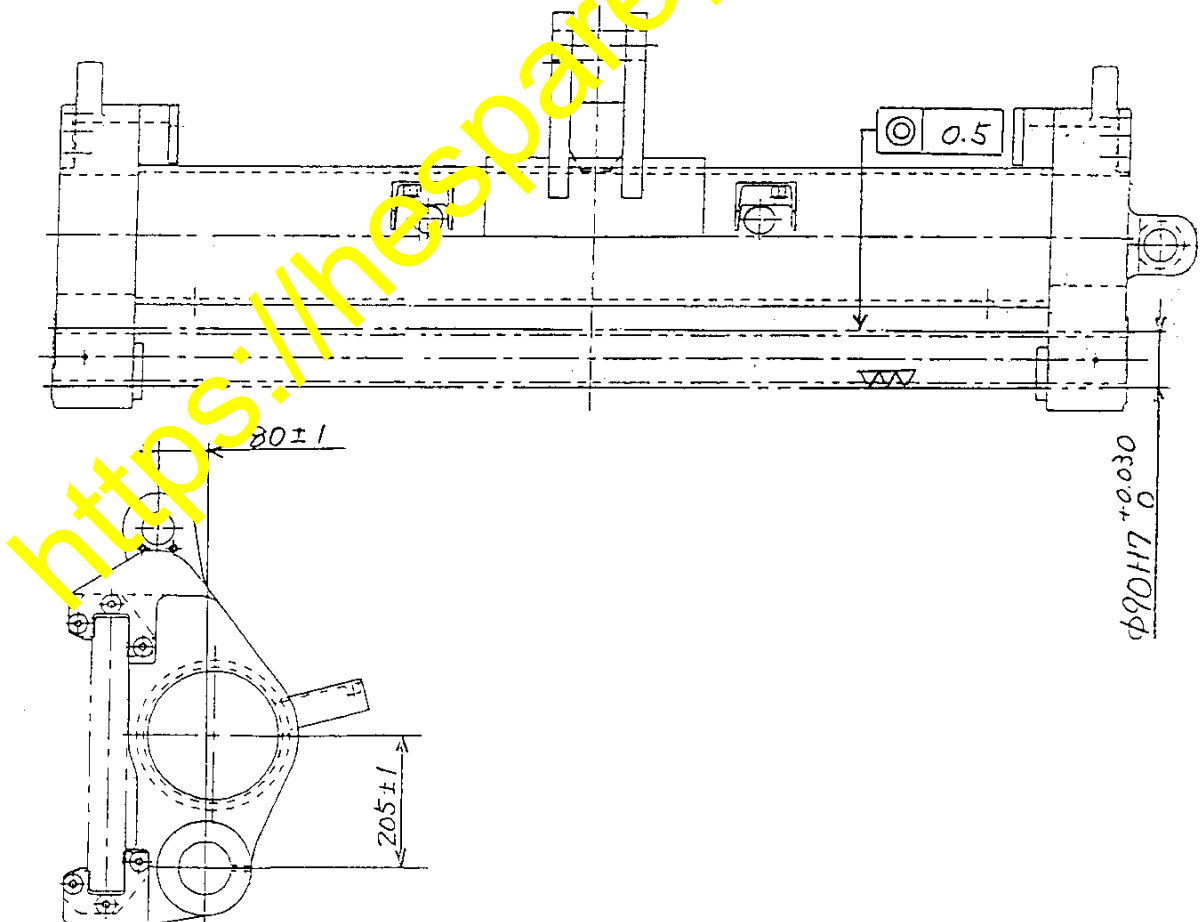
In case the bushing insertion hole is found deformed by partial and excessive contact, rework to the dimensions according to Fig. 5 below.



Shear fracture is occurring with the bushing insertion hole

Reworking dimensions for the blade rail mounting bracket (Fig. 5)

- To cut off the deformed section of the hole, enlarge the hole by drilling to  $\phi 90H7 +0.030/0$ .
- The hole dimension should be according to Fig. 6 below.



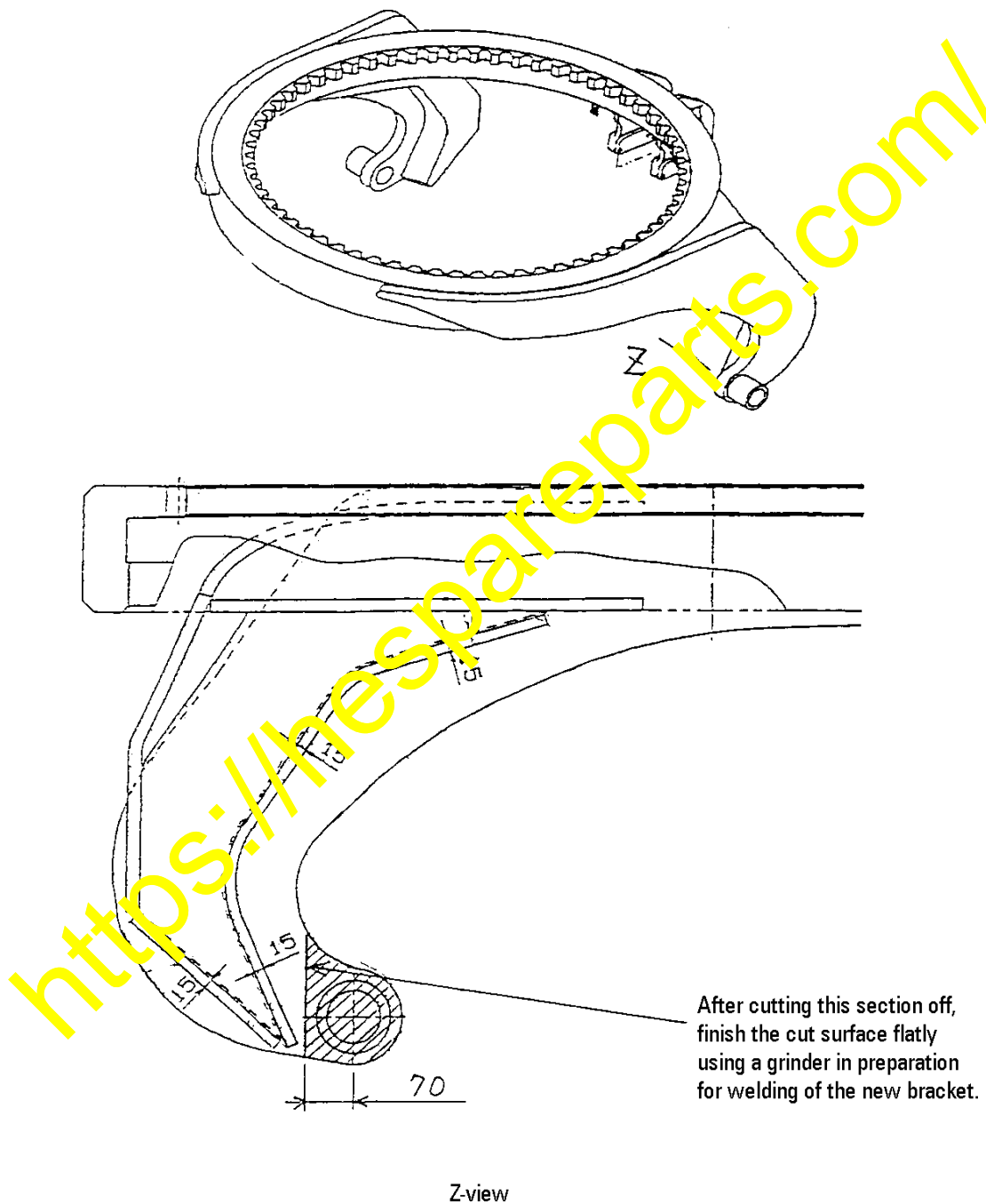
Blade rail mounting bracket hole dimensions (Fig. 6)

(4) Reworking with the circle support

Since shear fracture may be occurring with the bushing insertion hole, cut off to remove the hatched sections according to the designations given in Fig. 7 and weld the brackets 235-99-11910 and 235-99-11920.

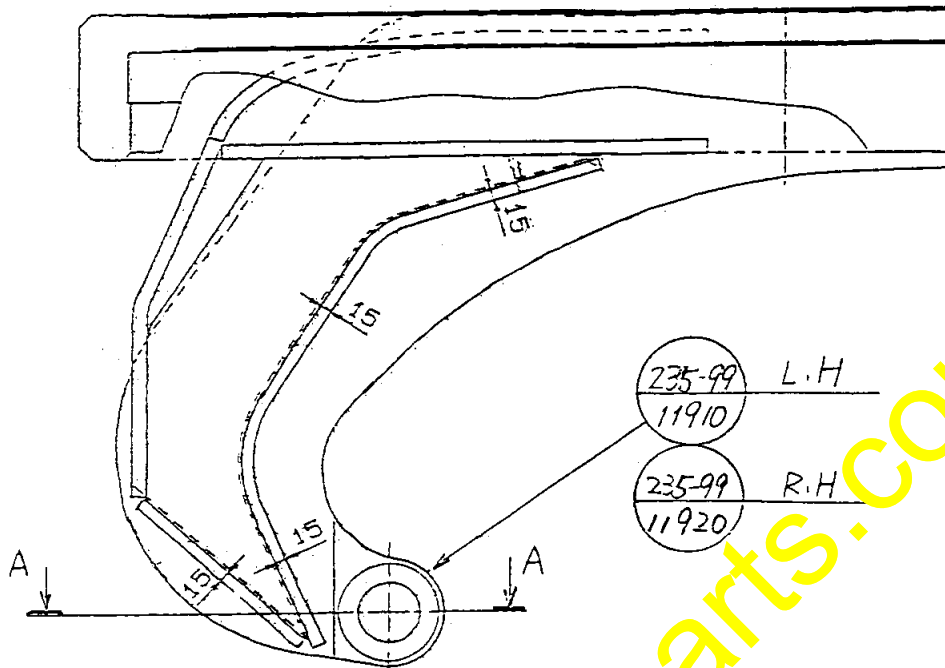
1. Cutting off the bushing insertion section of the circle support

Cut off to remove the bushing insertion section of the circle support, namely, the hatched section, according to the designations given in Fig. 7.

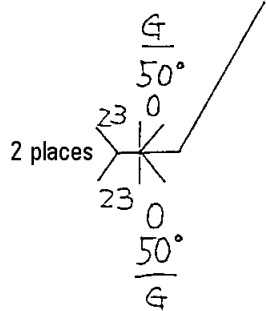
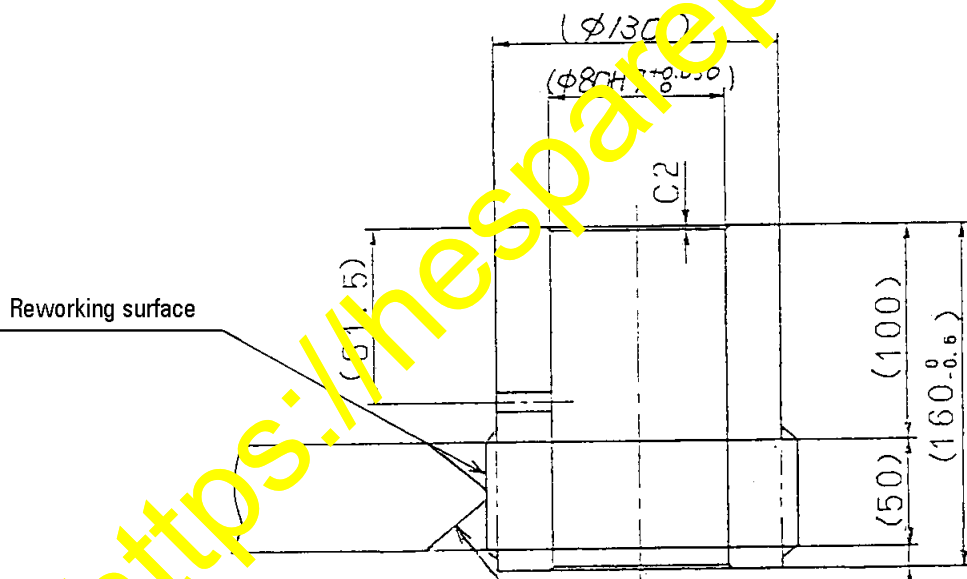


Reworking with the circle support (Cutting) (Fig. 7)

2. Welding the bushing insertion section to the circle support  
 The schematic decagrams given below are of the L.H side of the chassis. Make similar welding on the R.H side in a symmetrical manner.



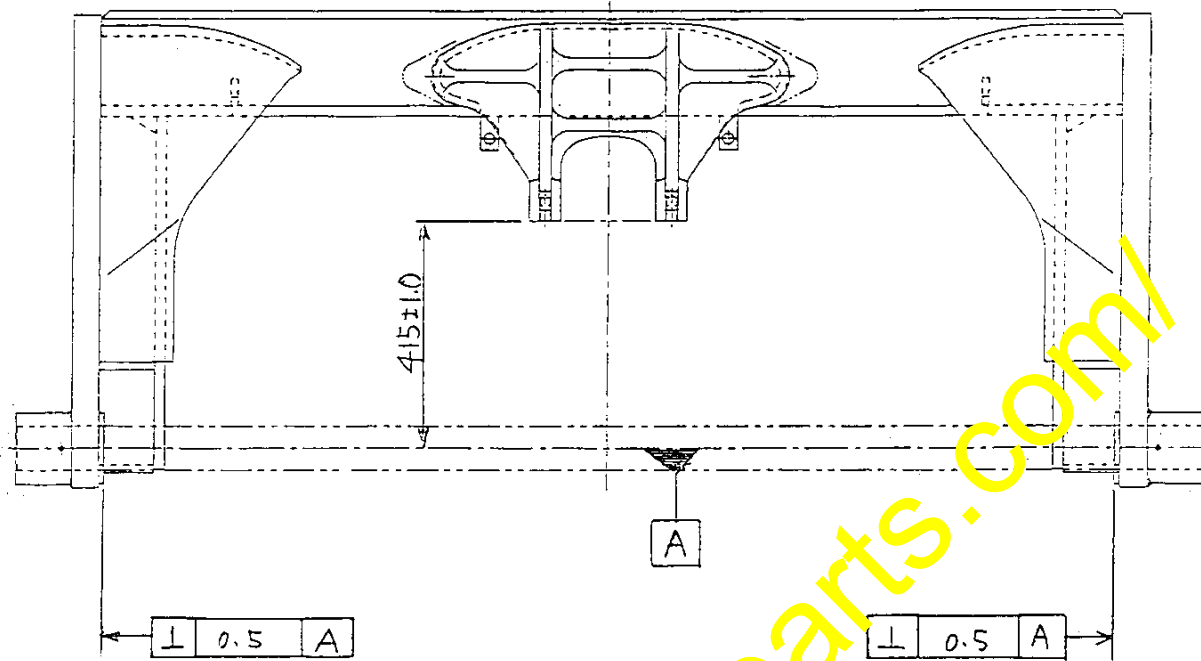
235-99 11910	L.H
235-99 11920	R.H



- Providing the welding groove according to the above diagram, weld the bracket 235-99-11910 and bracket 235-99-11920 to the circle support body.
- When the welding work has been done, finish the welded surfaces not to allow any dent using a grinder.

Cross-section "A-A" (on the LH side of the circle support)  
 Reworking with the circle support (Welding) (Fig. 8)

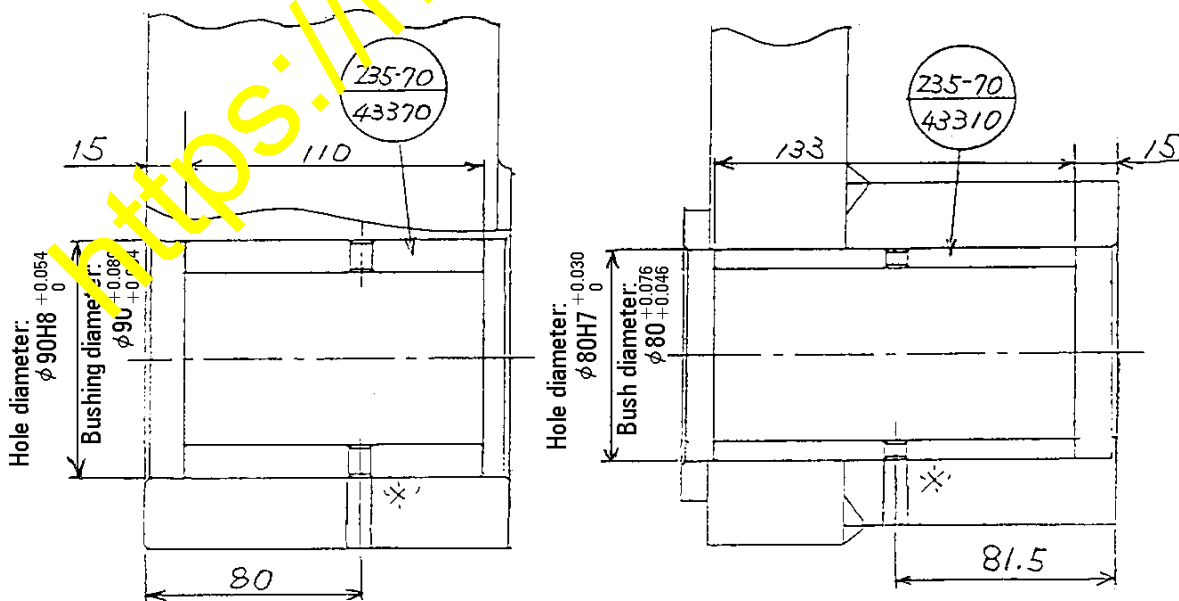
3. Dimensions after finishing the welding work for the circle support  
 Shown in Fig. 9 below are the dimensions after finishing the welding work for the circle support according to "Section 2" on the preceding page.



Dimensions after finishing the welding work (Fig. 9)

- (5) Inserting the bushings (The schematic diagrams given below are of the R.H side of the chassis. Insertion on the L.H side is to be done in the manner mirrored to the R.H side.)

Since the bushings are being provided with greasing hole, align the hole with the grease fitting hole on the blade rail mounting bracket side and on the circle support side.

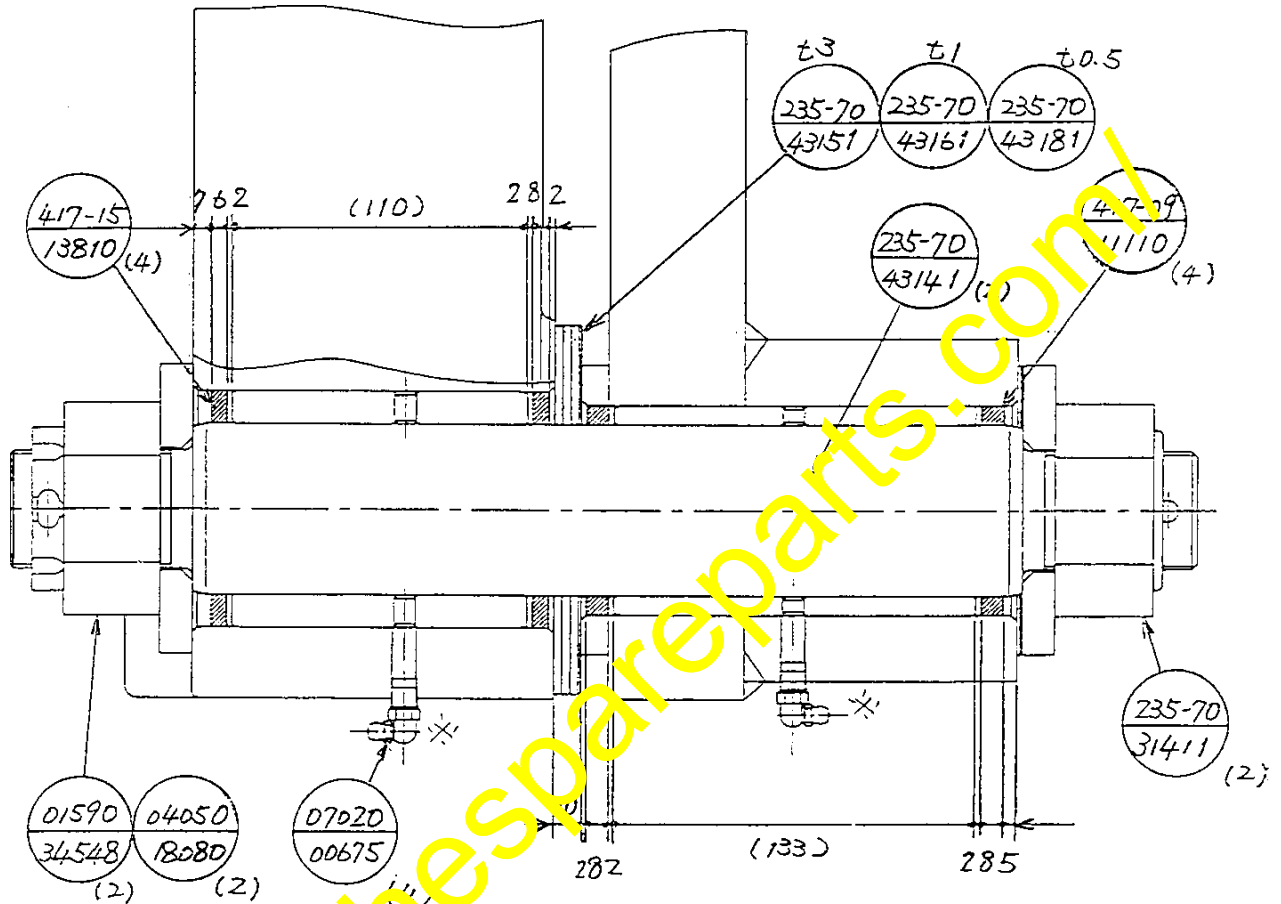


※ The grease fitting holes should face the rear of chassis.

Blade rail mounting bracket section (Fig. 10) Circle support section (Fig. 11)

- (6) Installation and adjustments (The schematic decagram given below is of the R.H side of the chassis. Make similar installation and adjustment on the L.H side in the manner mirrored to the R.H side.)

Install the shaft and bushings according to the designations given in Fig. 12 below and adjust the clearance using shims.



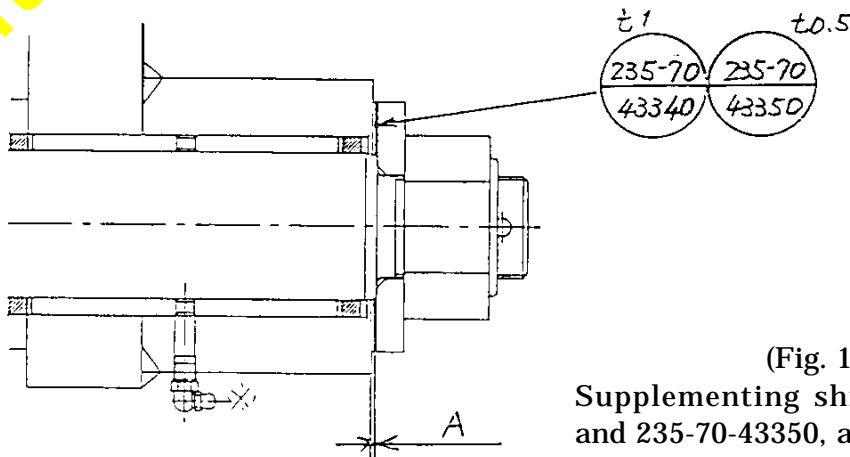
※ Install the grease fitting in the section toward rear of the chassis.

**Dust seal dimensions and clearance adjustment dimensions using shims (Fig. 12)**

Clearance adjustment at the end of the circle support

(The schematic decagram given below is of the R.H side of the chassis.

Make similar installation and adjustment on the L.H side in the manner mirrored to the R.H side.)



(Fig. 13)

Supplementing shims 235-70-43340 and 235-70-43350, adjust the clearance "A" to 0.5 mm or less.