



## PRODUCT TECHNICAL BULLETIN 36286 GRADER ARTICULATION – KING PIN RETAINING



**Date:** 31-10-2023  
**Issue:** A (release)  
**Prepared for:** Industry/ End Users

**Applicable machines:** Graders installed with Bolt in King Pins

REVISION:A

1-3

Bulletin 36286  
12-14 Martin Drive  
Tomago 2322  
02 4028 0400



## Background:

This bulletin seeks to notify end users as of a potential hazard relating to the underground grader king pin joint that is installed on later graders (serial numbers 039 – 044) produced by Cougar Mining Equipment.

Additionally, Graders originally installed with interference fit pins may have been upgraded to the later bolted design. This can be identified by the presence of the flanged pin, with counterbored bolts on the top of the hitch assembly.

## Communication:

Where bolted king pin assemblies are not properly torqued and periodically inspected for the correct tension, bolts may become loose and allow the bottom pin to fall out. Note that both the pin retaining cap and the King Pin flange bolts must become loose for this failure mode to eventuate.

Proper maintenance and inspection must be carried out at specific intervals as stated below.

## Recommendations:

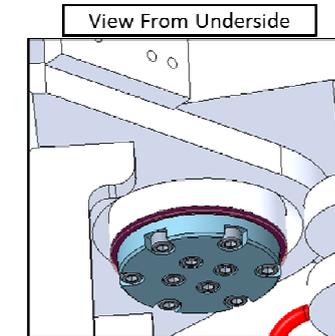
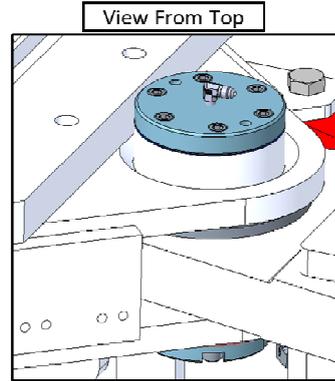
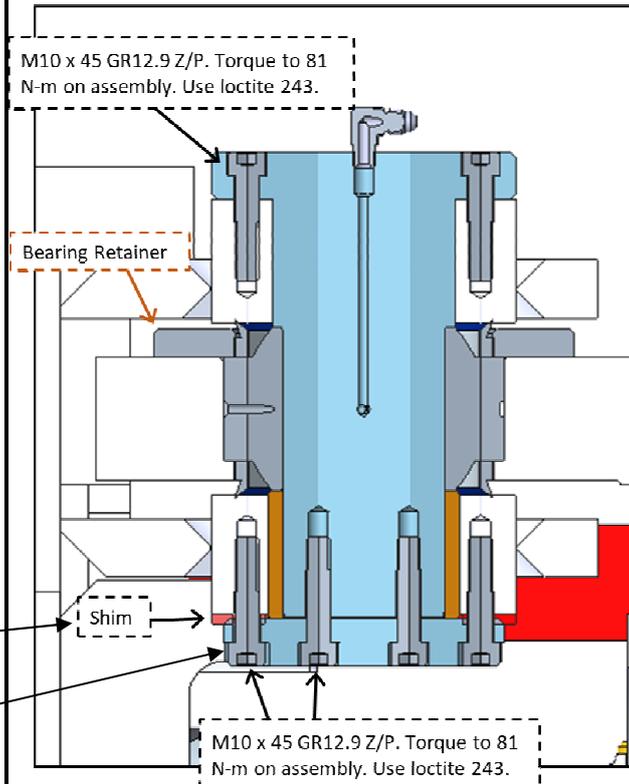
- The top and bottom articulation pins are retained by a series m10 x 45 grade 12.9 Z/P socket head cap screws. These fasteners are assembled with Loctite 243 and torqued to 81 N-m as per 7-221646-700 Rev F. CME recommends checking monthly that they remain tight.  
**Note: due to the use of thread locker they cannot be Torque tested, but only checked that they remain tight.**
- If a loose bolt is found, it should be replaced with a new bolt fitted with Loctite 243 and Torqued to 81 N-m as per 7-221646-700 Rev F. Do not re-tighten the bolt as the remaining fatigue life may be reduced. Refer to the images below for details of the fastener arrangement.
- It is also important to check the bearing retainers for tightness. This can be done by tapping the retainers with a hammer or bar. Refer images below and drawing 7-221646-700 Rev F for details.
- If the retainers are found to be loose, the articulation needs to be split to access the m8 x 35 grade 12.9 Z/P low head cap screws that fasten them. These fasteners are assembled with Loctite 243 and torqued to 41 N-m.

Please distribute this bulletin to all relevant personnel

### Cougar Mining Equipment Contacts in respect to this bulletin:

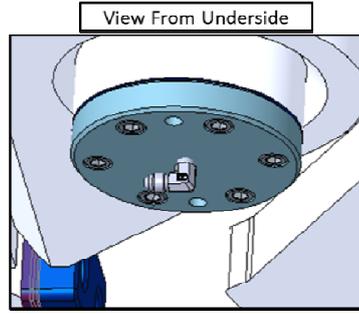
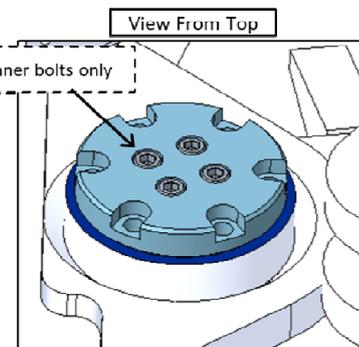
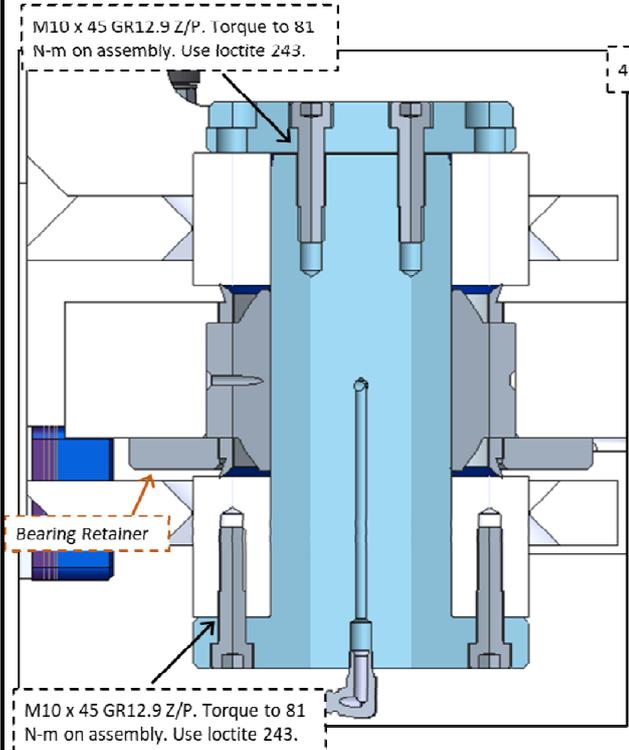
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	<a href="mailto:Sean.spencer@cougarme.com.au">Sean.spencer@cougarme.com.au</a>	
Spare Parts Manager	Greg Davies	0422 025 295
	<a href="mailto:greg.davies@cougarme.com.au">greg.davies@cougarme.com.au</a>	

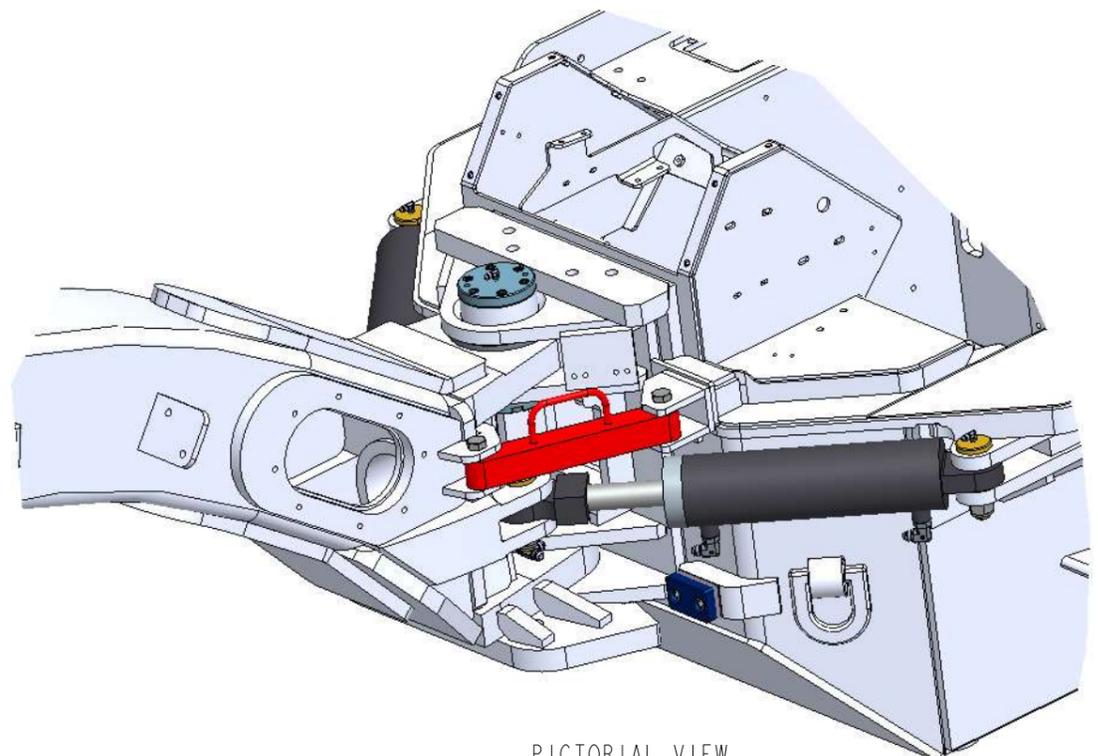
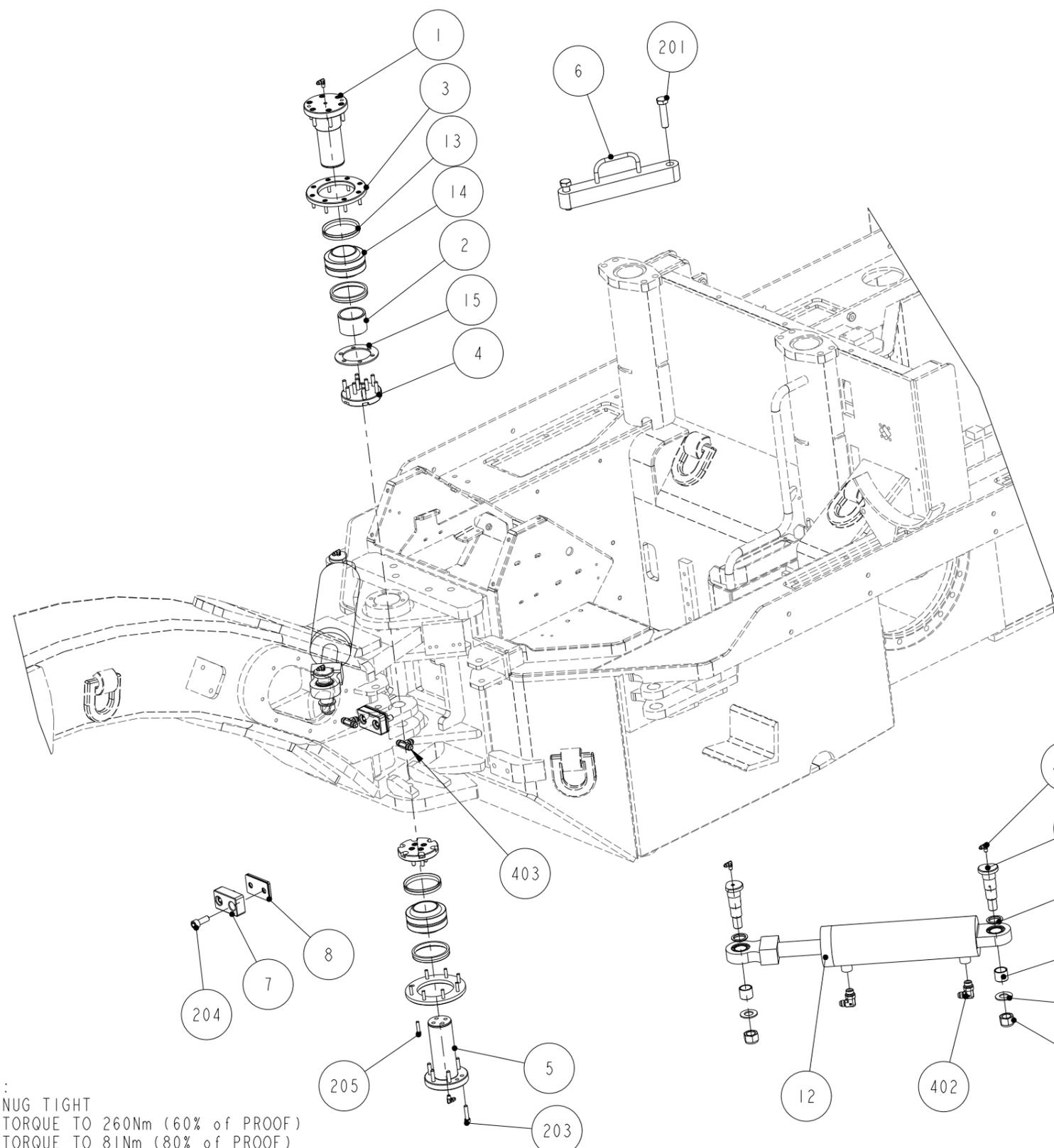
### Articulation *Top* King Pin Arrangement



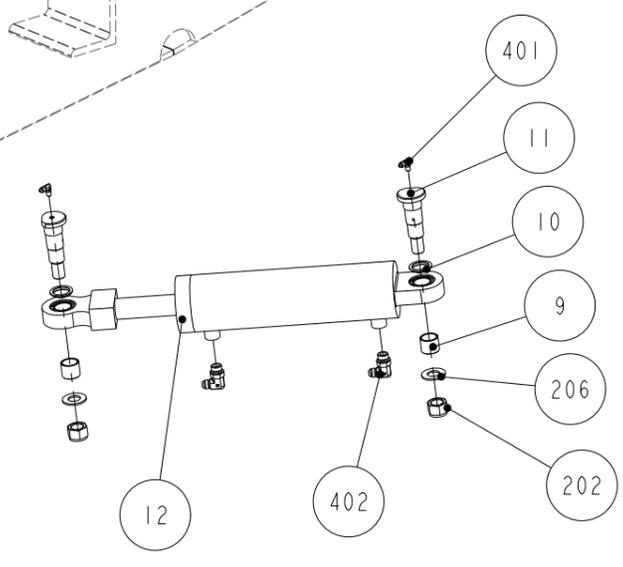
Note: Outer Bolts and Shim on lower side of top pin are not used on Grader 039-042

### Articulation *Bottom* King Pin Arrangement





PICTORIAL VIEW  
(N.T.S.)



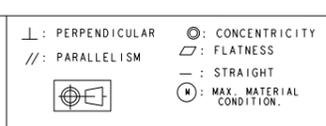
EXPLODED PICTORIAL VIEW  
(N.T.S.)

NOTES:  
 - BOLT TORQUES:  
 - M20 8.8 SNUG TIGHT  
 - M16 12.9 TORQUE TO 260Nm (60% of PROOF)  
 - M10 12.9 TORQUE TO 81Nm (80% of PROOF)  
 - M8 12.0 TORQUE TO 41Nm (80% of PROOF)  
 - 1" NYLOC NUT GR8 SNUG TIGHT  
 - APPLY LOCTITE 243 TO ALL M8 AND M10 FASTENERS  
 - ADJUST ARTICULATION HARDSTOPS (ITEMS 7-026822-700) BY USING SHIMMS (7-026823-700) TO ACHIEVE CLOSED CYLINDER PIN CENTRE 700mm



REV.	DATE	DESCRIPTION	DRAWN	CHECK.
F	27/10/2023	NOTES UPDATED	AH	BMD
E	31/05/2023	DCN-21005 SHEET 2 ADDED SHOWING SHIMMING DETAILS. BOM UPDATED	AH	BMD
D	03/03/2023	ARTICULATION CYLINDER PIN CHANGED, T BUSH ADDED	MR	
C	19-12-2022	FASTENER KIT UPDATED	TPM	
B	7-11-2022	BOM UPDATE	AH	
A	14-01-2021	RELEASED FOR PARTS MANUAL	HSE	

DO NOT SCALE  
 IF IN DOUBT, ASK  
 UNINDICATED TOLERANCES TO ISO 286-2:  
 JS12 FOR MACHINING, JS14 FOR FABRICATION & ± 0.5° FOR ANGLE



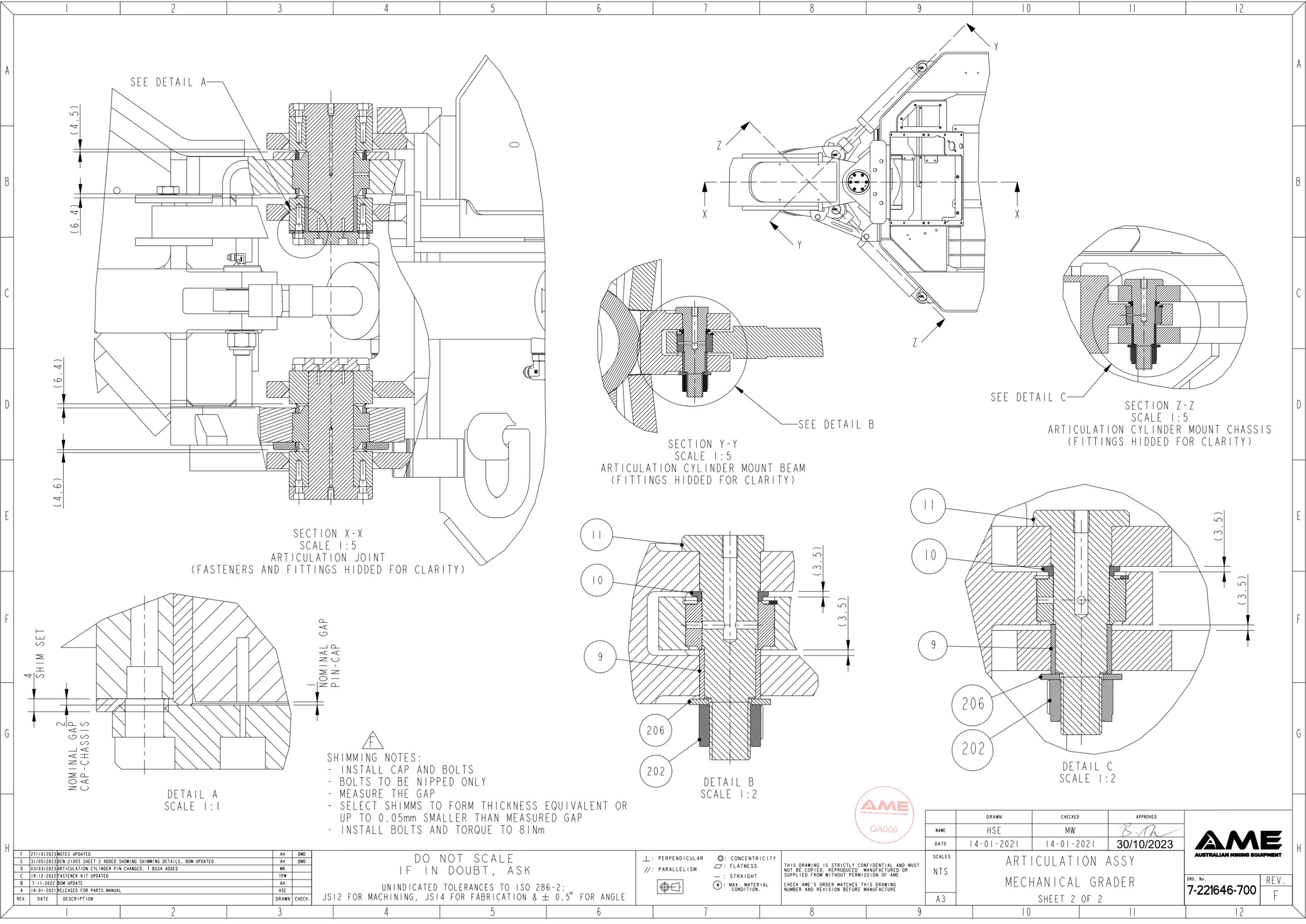
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 CHECK AME'S ORDER MATCHES THIS DRAWING NUMBER AND REVISION BEFORE MANUFACTURE

	DRAWN	CHECKED	APPROVED
NAME	HSE	MW	<i>B.A.H.</i>
DATE	14-01-2021	14-01-2021	30/10/2023
SCALES	ARTICULATION ASSY		
NTS	MECHANICAL GRADER		
A3	SHEET 1 OF 2		

**AME**  
 AUSTRALIAN MINING EQUIPMENT

DRG. No.  
**7-221646-700**

REV.  
 F



REV.	DATE	DESCRIPTION	DRAWN	CHECK.
F	27/10/2023	NOTES UPDATED	AH	BMD
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⊥	PERPENDICULAR	⊙	CONCENTRICITY
∥	PARALLELISM	▭	FLATNESS
		—	STRAIGHT
		⊙	MAX. MATERIAL CONDITION

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DATE	14-01-2021	14-01-2021	30/10/2023
SCALES	ARTICULATION ASSY		
NTS	MECHANICAL GRADER		
A3	SHEET 2 OF 2		

<b>AME</b> AUSTRALIAN MINING EQUIPMENT	
DRG. No. <b>7-221646-700</b>	REV. F

# PARTS LIST

**Drawing No:** 7-221646-700

**Description:** ARTICULATION ASSY - GRADER

**Revision No:** F

**Date Approved:** 27/10/2023

Line No	Code	Rev	Description:	Unit	Quantity
1	7-025093-700	C	King Pin Articulation Hitch Mechanical Grader	Each	1
2	7-025094-700	A	Bush Top Pin Articulation Hitch Mechanical Grader	Each	1
3	7-025095-700	A	Bearing Retainer Articulation Hitch Mechanical Grader	Each	2
4	7-025215-700	B	Pin Cap Articulation Hitch Mechanical Grader	Each	2
5	7-026319-700	A	KING PIN HITCH BOTTOM - GRADER	Each	1
6	7-026354-700	B	ARTICULATION TIE ROD	Each	1
7	7-026822-700	A	ARTICULATION STOP - GRADER	Each	2
8	7-026823-700	A	ARTICULATION STOP SHIM SET - GRADER	Each	2
9	7-060291-700	B	Steering Cylinder Bush Articulation Hitch	Each	4
10	7-060559-700	A	Articulation Pin T Bush	Each	4
11	7-060560-700	A	Steer Pin - Grader	Each	4
12	7-072695-700	B	Articulation Cylinder Mechanical Grader	Each	2
13	7-138040-700	B	Custom Face Lip Seal Articulation Hitch Mechanical	Each	4
14	7-180109-763	-	Spherical Plain Bearing Od 120 x Id 70 Type Esx-2Ls	Each	2
15	7-193655-700	B	SHIM SET, ARTICULATION ASSEMBLY GRADER	Each	1
200	7-610317-700	B	Fastener Kit - Articulation Assembly - Grader	Each	1
400	7-630256-700	A	Fittings Kit - Articulation Assy Grader	Each	1

# PARTS LIST

**Drawing No:** 7-610317-700

**Description:** Fastener Kit - Articulation Assembly - Grader

**Revision No:** B

**Date Approved:** 1/06/2023



*B.A.*

05/06/2023

Line No	Code	Rev	Description:	Unit	Quantity
201	BM20X8088Z		BOLT M20 80 LONG CLASS 8.8 ZINC	Each	2
202	NN1C8Z		1 UNC GR.8 Z/P NYLOC NUT	Each	4
203	SCM10X45129Z		M10 X 45 12.9 Z/P SKT HD CAP SCREW	Each	26
204	SCM16X40129Z		M16 X 40 12.9 Z/P SKT HD CAP SCREW	Each	4
205	SLM8X35129Z		M8 X 35 12.9 Z/P SKT LOW HD CAP SCREW	Each	16
206	W18Y		1" GR.8 Z/Y FLAT ROUND WASHER	Each	4

# PARTS LIST

**Drawing No:** 7-630256-700

**Description:** Fittings Kit - Articulation Assy Grader

**Revision No:** A

**Date Approved:** 8/11/2022



*B.A.R.*

05/06/2023

Line No	Code	Rev	Description:	Unit	Quantity
401	7-187242-702	-	ELBOW 90 02BSPTm-07JICm	Each	6
402	7-187247-714	-	Elbow 90 12JICm-14Unom	Each	4
403	7-187363-712	-	Tee 12JICm-12JICm-12JICm	Each	2