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Attention - **Ian Roduner, Simon Ross**

Item - **Hitachi EX3600 Boom& Stick**

Order Number - **PO110**

Austin Job Number – **4068**

Scope of Work

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JOB NUMBER - 4068

EX3600 EXCAVATOR BOOM & STICK
MINESPEC PARTS - NEBO

SCOPE OF WORK

ITEM	DESCRIPTION - EX3600 EXCAVOTOR BOOM & STICK REPAIRS ON-SITE @ NEBO	COMMENTS	PARTS & MATERIAL REQUIREMENTS	SUPPLIER	To be signed off when Line items are complete		FINAL NOTES
1.0	**BOOM CRACK REPAIRS**				**Sign**	**Date**	
1.1	Repair 2 x Cracks in Boom	Allowance for 2 x Cracks 50mm Long	Allowance made for use of the Site Truck	Austin's		29/02/2016	Additional Cracks were found and repaired / Cost was maintained
	Other						
2.0	**BOOM FIELD WELD REPAIRS**				**Sign**	**Date**	
2.1	Fill and Blend Field Repairs that have poor profiles from overgrinding of existing field repairs	Allowance for 3 areas approximately 200mm x 300mm	Allowance made for use of the Site Truck	Austin's		29/02/2016	Additional areas were identified and repaired / Cost was maintained
	Other						
3.0	**BORE & BUSH DIMENSIONAL INSPECTIONS ON BOOM**				**Sign**	**Date**	
3.1	Measure and record all Bush and Bore Dimensions	Supply QA Documentation	Austbore to Complete	Austbore		29/02/2016	Many areas found to be out of Spec and require reclaiming as per Austbore Report
	Other						
4.0	**PAINT BOOM**				**Sign**	**Date**	
4.1	Sand entire Boom in Preparation for Painting	Light sand with orbital sander only to improve new paint adherence, no allowance has been made to feather any damaged existing paint	Labour Allowance only- No Site Truck Allowance	Austin's		29/02/2016	Completed
4.2	Assist with Hydraulic hose and grease line removal and manipulation for painting	**Minespec Parts to assist with crane or forklift where required to suspend hoses for painting purposes**	Labour Allowance only- No Site Truck Allowance	Austin's / **Minespec**		29/02/2016	Completed
4.3	Paint Boom Hitachi Orange	Austin's to Supply Paint (Hitachi Orange)	Labour Allowance only -Site Truck Allowance in Line Item 7.3	Austin's			Completed
4.4	~~Install new Decals~~	**Minespec Parts to supply Decals**	Labour Allowance only- No Site Truck Allowance	**Minespec**			Decals were not installed as the Boom was painted on Friday, the hours allocated to this task were used in other areas where additional welding was required that was outside the original scope of work
	Other						
5.0	**BORE & BUSH DIMENSIONAL INSPECTIONS ON STICK**				**Sign**	**Date**	
5.1	Measure and record all Bush and Bore dimensions on Stick	Supply QA Documentation	Austbore to Complete	Austbore		29/02/2016	Many areas found to be out of Spec and require reclaiming as per Austbore Report
5.2	~~Measure and record all Bush and Bore dimensions on H-Links, Banana Links~~ and Pins	Supply QA Documentation	Austbore to Complete	Austbore		29/02/2016	H-Links and Banana bars were not measured because they were not on-site. Hours allocated to this task were used elsewhere
	Other						
6.0	**PAINT STICK**				**Sign**	**Date**	
6.1	Sand Entire Stick in preparation for Painting	Light sand with orbital sander only, to improve new paint adherence, no allowance has been made to feather any damaged existing paint	Labour Allowance only- No Site Truck Allowance	Austin's		29/02/2016	Completed
6.2	Assist with Hydraulic Hose and Grease line removal and manipulation for painting	**Minespec Parts to assist with crane or forklift where required to suspend hoses for painting purposes**	Labour Allowance only- No Site Truck Allowance	Austin's / **Minespec**		29/02/2016	Completed
6.3	Paint Stick Hitachi Orange	Austin's to Supply Paint (Hitachi Orange)	Labour Allowance only -Site Truck Allowance in Line Item 7.3	Austin's		29/02/2016	Completed
6.4	~~Install new Decals~~	**Minespec Parts to supply Decals**	Labour Allowance only- No Site Truck Allowance	**Minespec**			
	Other						
7.0	**GENERAL**				**Sign**	**Date**	
7.1	Travel to Nebo & return	Allowance for 2 x Personnel	Site Truck & Ute required			29/02/2016	
7.2	Accommodation & Meals	Allowance for 4 x Nights	**Minespec supply**	**Minespec**			Reduced to 2 nights, rather than the entire week
7.3	Site Truck required for Compressed Air Supply	Austin Supply Site Truck	**Minespec to supply replenishment Diesel**	**Minespec / Austin's**		29/02/2016	
	Other			**TOTAL**			

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Job Overview

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Overview;

The EX3600 Hitachi Boom & Stick had minor repairs completed On-Site @ Minespec Nebo Yard. Details of the repairs are as follows.

- Crack repairs were completed to acceptable standard & tested In-House by our Boilermakers. MPI & Visual Test Only

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- Areas with poor profile & overgrinding from existing field repairs were built up & blended flush to an acceptable finish. In – House testing was completed on these areas after blending – MPI & Visual Only

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- Measured and recorded all Bush and Bore Dimensions on Boom & Stick. QA Documentation will be supplied separately
- Prepped both Stick & Boom for painting.






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In-House Test Report

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NDT REPORT

Report No:	**4068** -01
Client:	**Minespec Parts**
Date:	**02-03-2016**

Subject: Magnetic particle & visual examination about one [1] Hitachi EX3600 Boom & Stick

Test Location: 56 Len Shield Street, Paget QLD 4740

Job No: 4068
Inspected By: Jamie Morello & Sean Grieves

Results of Examination:
Results of examination are detailed in Sections 1 of this report. All measurements provided in millimetres unless stated otherwise.

Reported By: **Michael Samson**

Report Issue Date: **02-03-2016**

SECTION 1

IN-HOUSE TESTING
MAGNETIC PARTICLE & VISUAL EXAMINATION

Summary of results as per below:

Photograph 1.1 -	All cracking detailed in photograph 1.1 were found to have been repaired with no visual defects.

Photograph 1.1
General view of cracking examined on one EX3600 Boom & Stick

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Bushes, Bores & Pins Dimensional Inspection

An Austin Engineering Ltd Company.

Bore and Alignment Inspection Report for EX3600 Boom & Stick

CLIENT:	Austin Eng	JOB NUMBER	J14786
PRODUCT ID/Serial Number:	EX3600 Boom, Stick and relevant parts.	SITE:	MineSpec
BORE CHECK BY:	Andy Pangilinan & Richard Sing (INITIAL CHECKS)	DATE	22/02/2016
LINE BORE BY		DATE	
GREASE FLOW Checked BY:		DATE	

BORE and FACE DIMENSIONS (Make note of whether bushes are in or out)

Position		Bore Specification	Actual					Checked (Name)			Date
			Left Outer	Left Inner	Right Inner	Right Outer	Comments	Andy Pangilinan & Richard Sing			22/02/2016
Boom Cylinder Bores (D)	X	200.00 ± 0.1	201.51	201.19	200.51	200.45	Re-do				
	Y		201.05	200.65	200.14	200.06					
Boom Lift- Cylinder Bores (A)	X	230.00 ± 0.1	230.49	230.65	230.56	230.75	Re-do				
	Y		230.27	230.5	230.25	230.47					
Boom to Stick (E)	X	255.40 - 255.45	255.25	255.1	255.12	255.3	OK				
	Y		255.24	255.04	255.11	255.36					
Boom to Main Frame (B)	X	255.40 - 255.45	220.37	220.24	220.36	220.69	OK				
	Y	220.50-220.60 (Bush)	220.3	220.24	220.22	220.35					
Stick to Bucket	X	230.40 - 230.45	200.42	200.57	201.4	201.08	Re-do				
	Y	200.50-200.60 (Bush)	200.3	200.3	201.01	202.38					
Stick to Boom	X	255.40 - 255.45	200.18	200.15	200.2	200.18	OK				
	Y	220.50-220.60 (Bush)	200.22	200.22	200.28	200.22					
Stick Cylinder to Bucket Bores	X	180.00-180.10	180.83	180.44	180.06	180.06	Re-do left hand side only				
	Y		180.43	180.18	180.10	180.06					
Stick to Link Bores	X	155.25 - 155.29	130.26	130.28	130.24	130.18	Probably leave these				
	Y	130.30 - 130.40 (Bush)	130.3	130.51	130.24	130.29					
	X										
	Y										
Pin 1 Boom to Stick		219.80 to 219.90		219.80	219.82			Has slight groove marks as well as being at bottom tolerance			
Pin 2 Boom to Stick				219.760	219.720			Out of tolerance			
Pin 1 Stick Cylinder		199.70 to 199.80		199.660	199.670			Out of tolerance			

GREASE GROOVES and PORTS

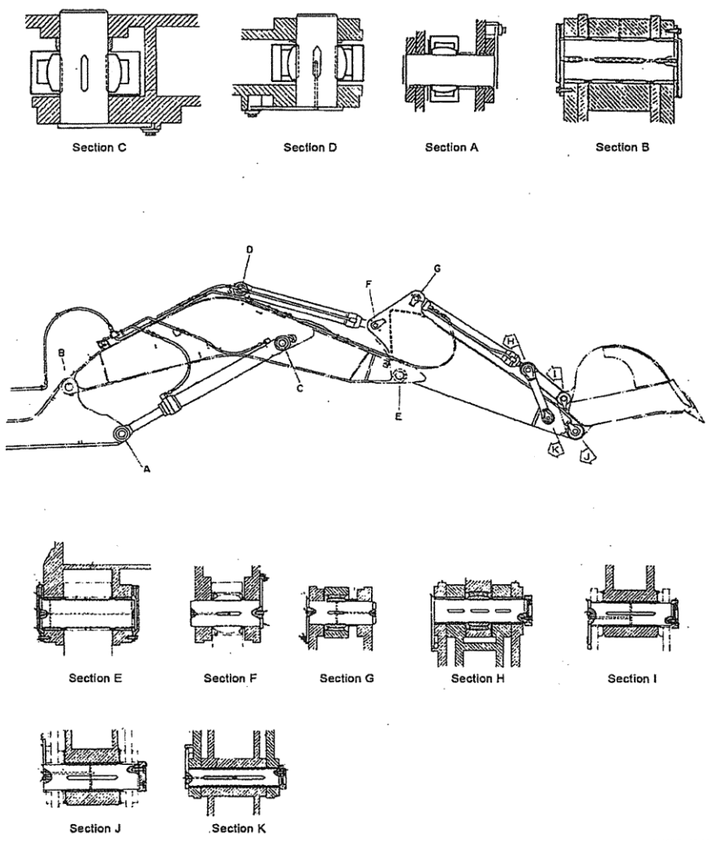
All Grease grooves/ports are cleaned prior to fitting bushes and are clear of old grease and contaminants. Ports are checked for alignment and flow after Bush fitment and witnessed by Client Representative.

Position	Left	Right	Checked and Cleaned by	Checked (Name / Company)	Date

GENERAL NOTES AND COMMENTS

FRONT ATTACHMENT/Bushing and Point

Pins and Bushings (Backhoe)



FRONT ATTACHMENT/Bushing and Point

unit: mm

Locations	Part Name		Standard Dimensions	Allowable Limit
A : Boom Cylinder / Main Frame	Pin	O.D.	$230^{-0.1}_{-0.2}$	229
	Bushing	I.D.	$230^{+0.7}_{+0.6}$	231.5
	Bushing	O.D.	$265^{+0.55}_{+0.5}$	—
	Bearing	I.D.	230±0.1	231.5
B : Boom / Main Frame	Pin	O.D.	$220^{-0.1}_{-0.2}$	219
	Bushing	I.D.	$220^{+0.5}_{+0.5}$	221.5
	Bushing	O.D.	$255^{+0.45}_{+0.4}$	—
C : Boom Cylinder / Boom	Pin	O.D.	$230^{-0.1}_{-0.2}$	229
	Pin Hole	I.D.	$230^{+0.1}_{0}$	—
	Bearing	I.D.	230±0.1	231.5
D : Boom / Arm Cylinder	Pin	O.D.	$200^{-0.2}_{-0.3}$	199
	Pin Hole	I.D.	$200^{+0.1}_{0}$	—
	Bearing	I.D.	200±0.1	201.5
E : Boom / Arm	Pin	O.D.	$220^{-0.1}_{-0.2}$	219
	Bushing	I.D.	$220^{+0.6}_{+0.5}$	221.5
	Bushing	O.D.	$255^{+0.45}_{+0.4}$	—
F : Arm Cylinder / Arm	Pin	O.D.	$200^{-0.2}_{-0.3}$	199
	Bearing	I.D.	200±0.1	201.5
	Pin Hole	I.D.	$200^{+0.1}_{0}$	—
G : Arm / Bucket Cylinder	Pin	O.D.	$180^{-0.2}_{-0.3}$	179
	Bearing	I.D.	180±0.1	181.5
	Pin Hole	I.D.	$180^{+0.1}_{0}$	—
H : Bucket Cylinder / Link	Pin	O.D.	$180^{-0.1}_{-0.2}$	179
	Bushing	I.D.	$180^{+0.5}_{+0.4}$	181.5
	Bushing	O.D.	$210^{+0.39}_{+0.35}$	—
	Bearing	I.D.	180±0.1	181.5
I : Link / Bucket	Pin	O.D.	$170^{-0.1}_{-0.2}$	169
	Bushing	I.D.	$170^{+0.5}_{+0.4}$	171.5
	Bushing	O.D.	$200^{+0.39}_{+0.35}$	—
J : Arm / Bucket	Pin	O.D.	$200^{-0.1}_{-0.2}$	199
	Bushing	I.D.	$200^{+0.6}_{+0.5}$	201.5
	Bushing	O.D.	$230^{+0.45}_{+0.40}$	—
K : Arm / Link	Pin	O.D.	$130^{-0.1}_{-0.2}$	129
	Bushing	I.D.	$130^{+0.4}_{+0.3}$	131.5
	Bushing	O.D.	$155^{+0.29}_{+0.25}$	—

NOTE: 1 mm=0.03937 in

NOTE: O.D.=Out side diameter
I.D.=Inner side diameter