CRITICAL TO QUALITY CHARACTERISTICS MARKED THUS : ⊖	UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING:— APPLIED PRACTICES 41A282000	SURFACES ✓	TOLERANCES ON MACHINED DIMENSIONS: FRACTIONS ± / DECIMALS ± / ANGLES ±	REV NO.

FCF 41X275957TL

GENERAL ELECTRIC

84D705067 CONT ON SHEET SH NO.

TITLE

WHEEL & AXLE MOUNTING

FIRST MADE FOR THAILAND UM22C PO 2225

SEE SEPARATE PARTS LIST

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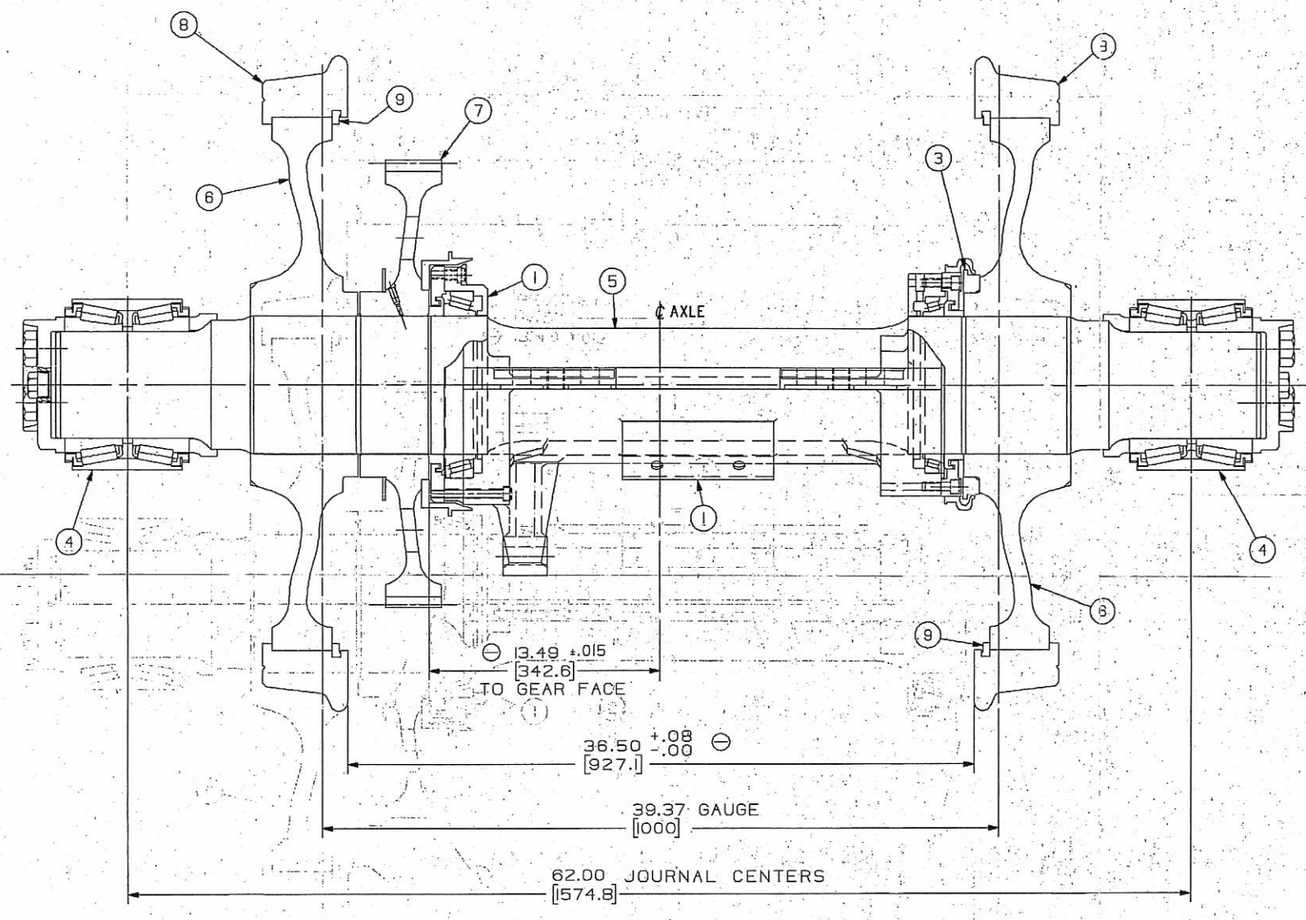
12) A2+A4



(G1) SEE NOTES
WEIGHT = LATER

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GENERAL ELECTRIC COMPANY
TRANSPORTATION SYSTEMS DIVISION

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สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWI/SRT/NPSE/G/L/0026
บริษัทรถไฟนครหลวงจำกัด
มหาชน
วันที่ 10 ธ.ค. 68

NOTES
1. WHEELSET TO BE ASSEMBLED IN ACCORDANCE WITH GONINAN SPECIFICATION REN/7200/SPN.005 & GONINAN DWG B51571.
2. WHEELSETS ARE TO BE ASSEMBLED IN LOCO SETS IN WHICH WHEEL SIZES SHALL NOT DIFFER BY MORE THAN 8 TAPES IN SIZE.
3. WHEELS MOUNTED ON THE SAME AXLE MUST BE OF THE SAME TAPE SIZE.
4. WHEELS TO BE PRESSED ONTO AXLE WITHIN A TONNAGE RANGE OF 77 - 113 TONNES (85-125 U.S. TONS)

LOCO ROAD NOS. 4523-4560
LOCO SERIAL NOS. 48681-48718
ORDER NO. 4854
RSR SPECIFICATION NO. CSD-21/2536

REVISIONS	PART OR GROUP	CURRENT REVISION
	PRINTS TO	
	2023	

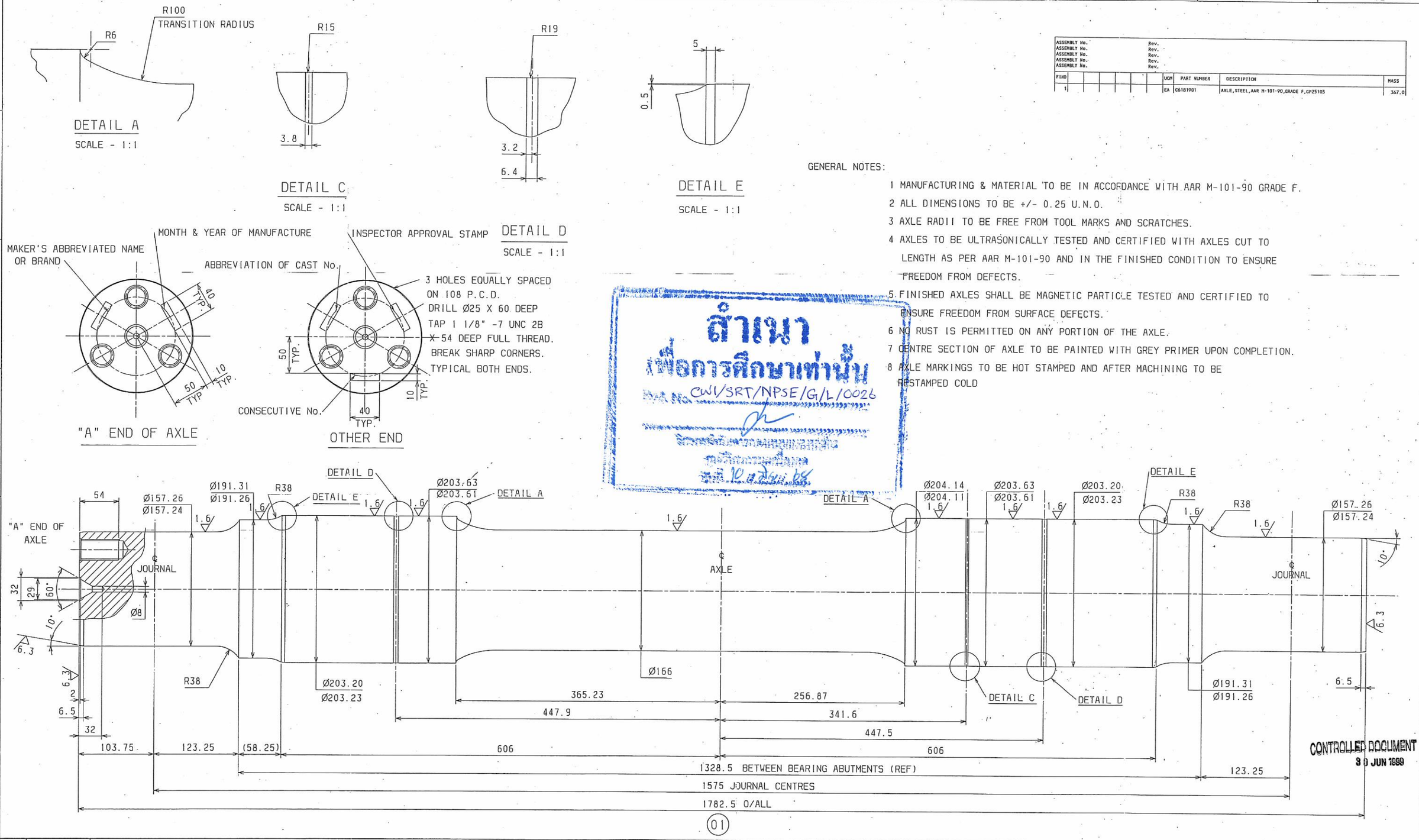
PLOT SCALE .25

PLAN REF. GON. #B51571

MADE BY A.MOHNKERN 3-29-95	APPROVALS	TSBD	DIV OR DEPT	84D705067
ISSUED		ERIE	LOCATION CONT ON SHEET	SH NO.
		AIAG	LO	

FIND							UOM	PART NUMBER	DESCRIPTION	MASS
1							EA	C6181901	AXLE,STEEL,AAR M-101-90,GRADE F,GP25103	367.0

ASSEMBLY No. Rev.
ASSEMBLY No. Rev.
ASSEMBLY No. Rev.
ASSEMBLY No. Rev.
ASSEMBLY No. Rev.



GENERAL NOTES:

1 MANUFACTURING & MATERIAL TO BE IN ACCORDANCE WITH AAR M-101-90 GRADE F.
2 ALL DIMENSIONS TO BE +/- 0.25 U.N.O.
3 AXLE RADII TO BE FREE FROM TOOL MARKS AND SCRATCHES.
4 AXLES TO BE ULTRASONICALLY TESTED AND CERTIFIED WITH AXLES CUT TO LENGTH AS PER AAR M-101-90 AND IN THE FINISHED CONDITION TO ENSURE FREEDOM FROM DEFECTS.
5 FINISHED AXLES SHALL BE MAGNETIC PARTICLE TESTED AND CERTIFIED TO ENSURE FREEDOM FROM SURFACE DEFECTS.
6 NO RUST IS PERMITTED ON ANY PORTION OF THE AXLE.
7 CENTRE SECTION OF AXLE TO BE PAINTED WITH GREY PRIMER UPON COMPLETION.
8 AXLE MARKINGS TO BE HOT STAMPED AND AFTER MACHINING TO BE RESTAMPED COLD

สำเนา
เพื่อการศึกษาเท่านั้น
CWI/SRT/NPSE/G/L/0026
10 ส.ค. 68
CONTROLLED DOCUMENT
30 JUN 1999

NO	A
BY	SGM
CHKD	KT
APPRD	
ZONE	F4
REVISION & DATE	- TOLERANCED DIAMETERS 203.23/203.20 WERE PREVIOUSLY DIMENSIONED DIC AS Ø203 - NOTE 9 NOW CHANGED TO NOTE 8 15/02/1995

PARENT ASSEMBLY/S: B51571 BOGIE WHEELSET & BEARING ASSEMBLY

REFERENCE DRAWINGS:

FABRICATION TOLERANCES UNLESS OTHERWISE NOTED	
UP TO 300mm	± 1.0mm
301mm TO 3000mm	± 2.0mm
> 3000mm	± 3.0mm

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A.GONINAN & CO.LTD.
BROADMEADOW N.S.W. ACN 000 003 136

CM22-7I DUAL CAB D.E. LOCO
AXLE DETAIL

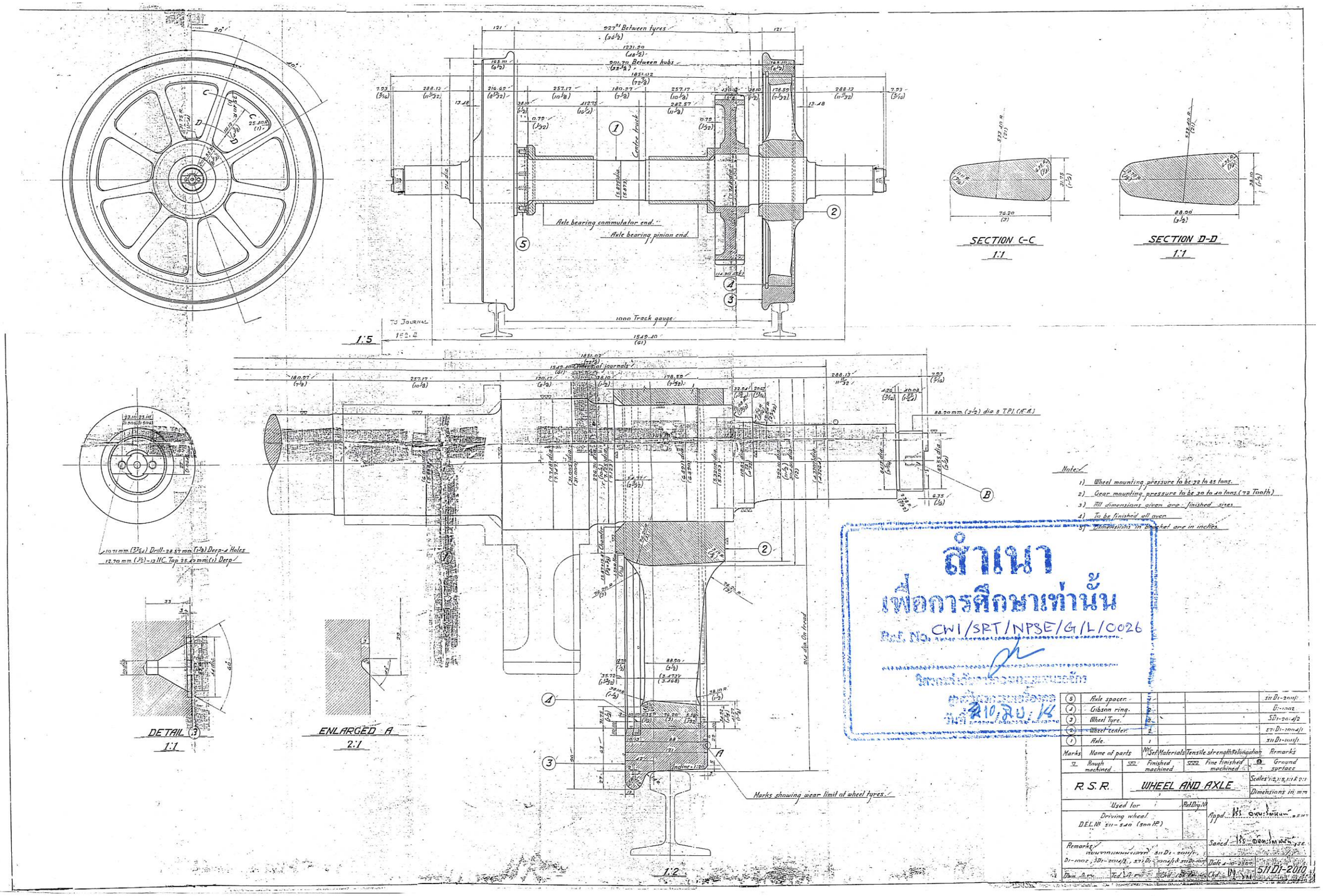
DATE	16/12/94
SCALE	1:2.5 1:1
DRAWN	S.Teo
CHECKED	
ENGINEER	
APPROVED	

THIRD ANGLE PROJECTION

A1

C 61819 REV. A

ก.ค. 14) A1.



สำเนา
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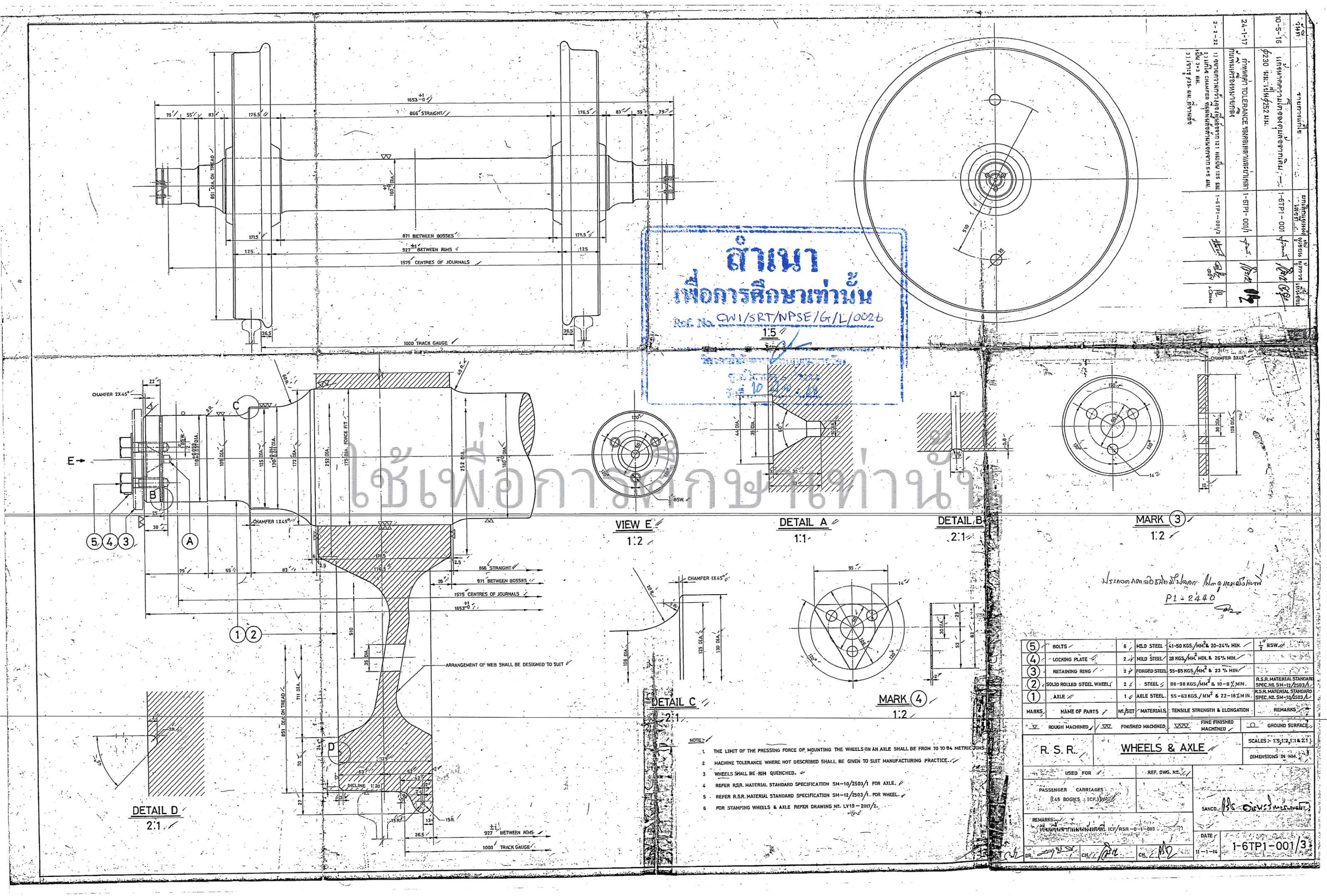
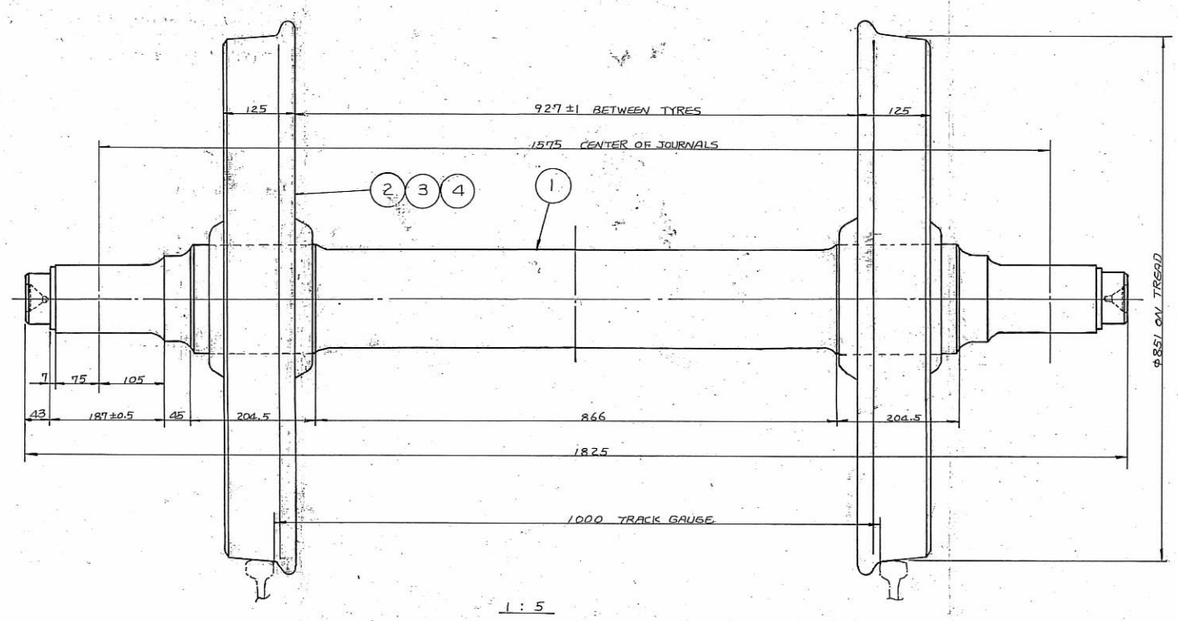
Ref. No. CWI/SPT/NPSE/G/L/0026
10 ส.ค. 14



สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CW1/SRT/NPSE/G/L/0026
ใช้เพื่อการศึกษาเท่านั้น



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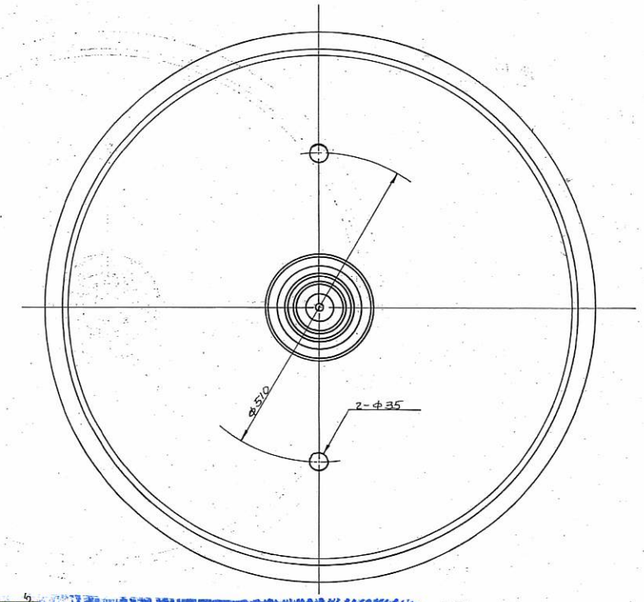

SECTION D-D

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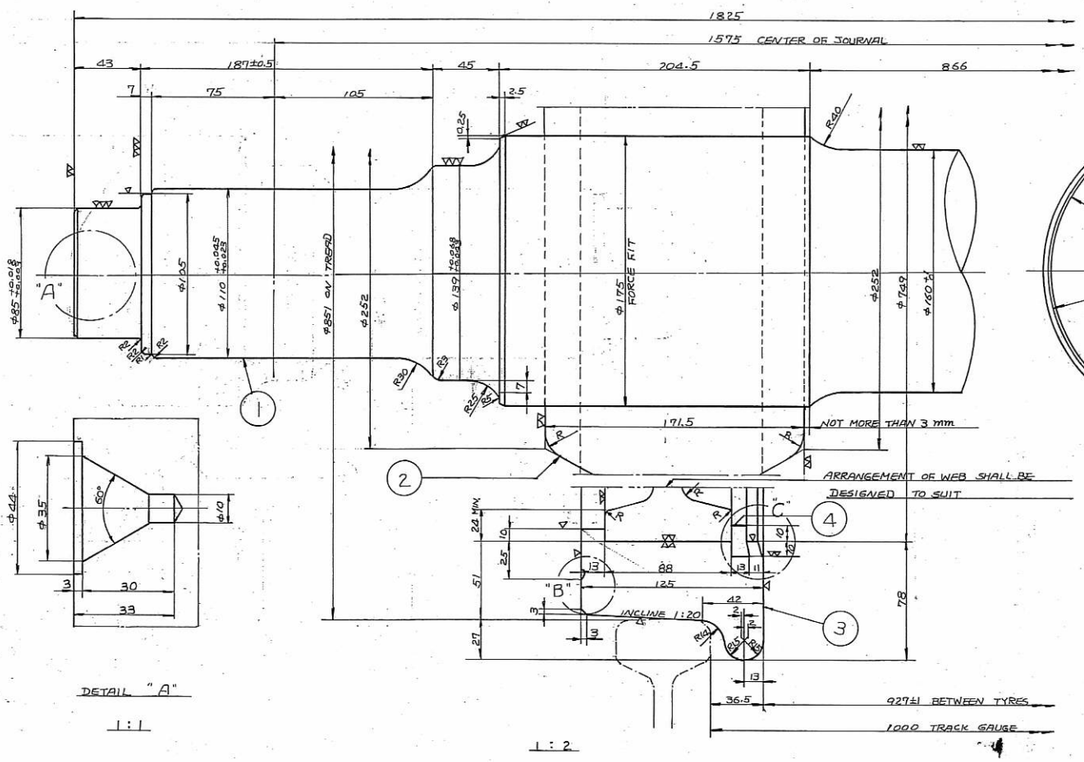

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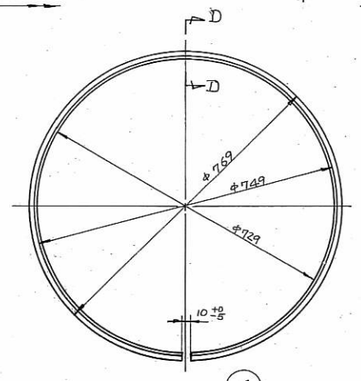
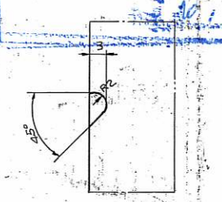


MARK 4

1 : 7.5

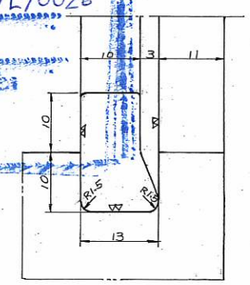
DETAIL "A"

1 : 1



ENLARGED AT "B"

2 : 1



ENLARGE AT "C"

SHOWING THE FIXING OF GIBSON RING BEFORE BEADING

NOTE:

1. THE LIMIT OF PRESSING FORCE OF MOUNTING WHEEL ON AN AXLE SHALL BE FROM 70 TO 80 METRIC TONS.
2. MACHINING TOLERANCE, WHERE NOT DESCRIBED, SHALL BE GIVEN TO SUIT MANUFACTURING PRACTICE.
3. STAMPING FOR IDENTIFICATION ON THE WHEELS AND AXLE SETS SHALL BE DONE TO R.S.R. DRAWING No

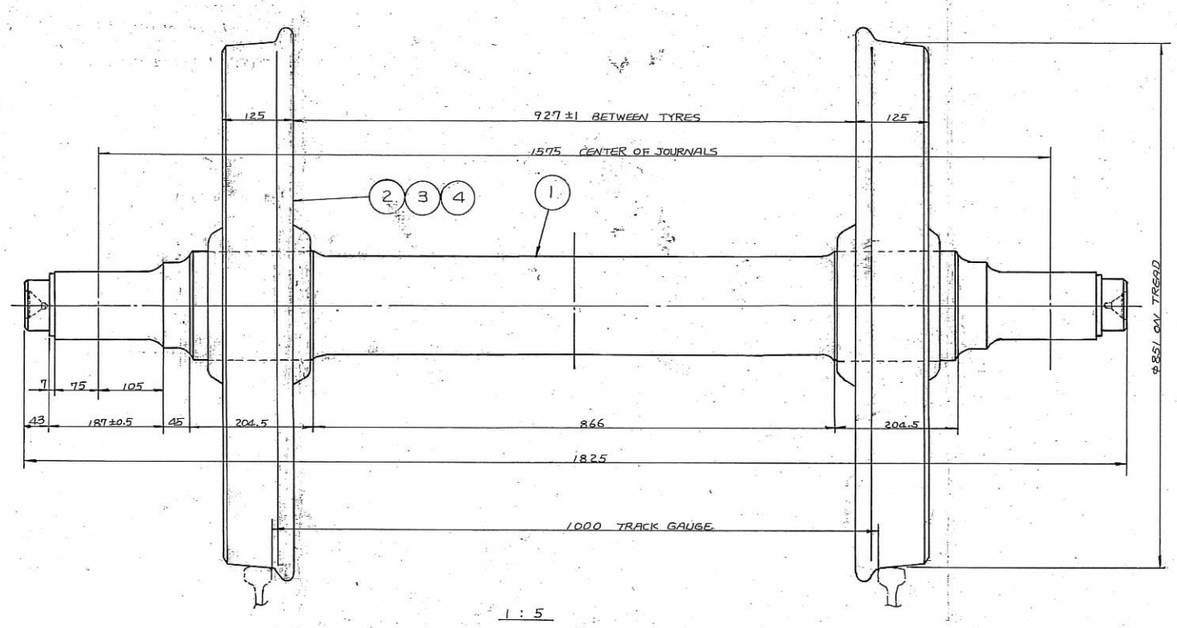
อ้างอิง
เพื่อการศึกษาเท่านั้น
GWI/BRT/NPSE/G/L/0026
10.12.16

BOGIE TYPE KUM-L2-L2A

MARKS	NAME OF PARTS	No / BOGIE	MATERIALS	TENSILE STRENGTH & ELONGATION	REMARKS
4	GIBSON RING	4	STEEL		
3	WHEEL TYRE	4	STEEL		SM-13/2503
2	ROLLER DISC WHEEL (CENTER)	4	STEEL		SM-11/2503
1	AXLE	2	AXLE STEEL		SM-10/2503/1

▽ ROUGH MACHINED ▽▽ FINISHED MACHINED

RSR.	WHEEL AND AXLE (AIR CON'D, NON AIR CON'D)	SCALE: 1:5 1:1 DIMENSIONS IN MM
USED FOR	REF. DWG. No	
	MAKER: KOHEMA CO. KOREA DWG. No. B1013-BB318	
REMARKS:		SANCD. _____ EMT.
DR. _____ CH. _____	CH. _____	DATE 1-12 TP1-001



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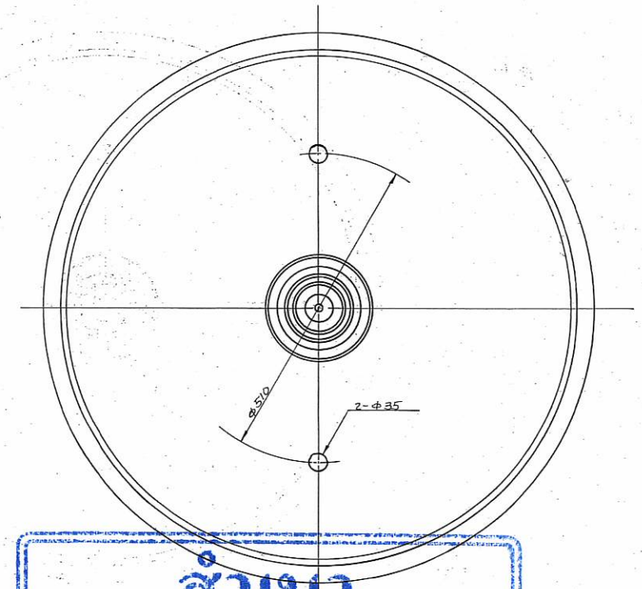
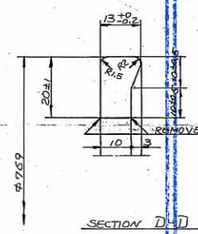
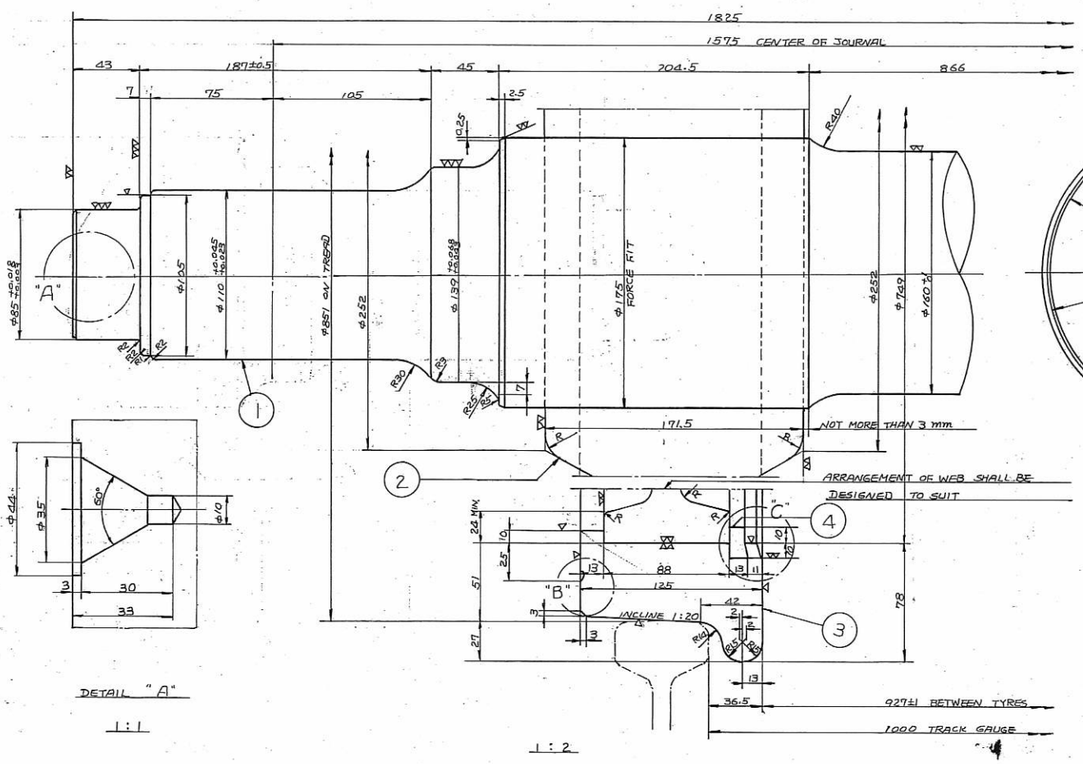




SECTION D-D

1 : 1

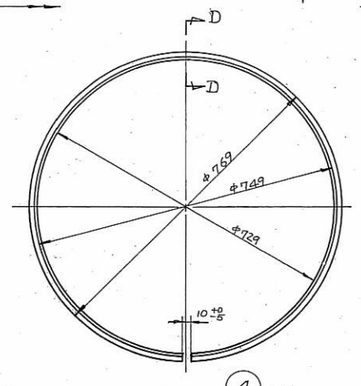
สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWI/SRT/NPSE/G/L/0026
วิทยาลัยเทคนิคนนทบุรี
วันที่ 10 ส.ค. 66



1 : 2

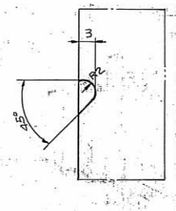
DETAIL "A"

1 : 1



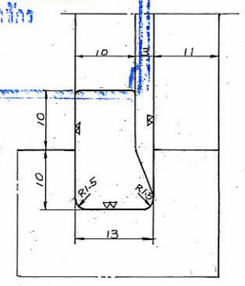
MARK 4

1 : 7.5



ENLARGED AT "B"

2 : 1



ENLARGE AT "C"

SHOWING THE FIXING OF GIBSON RING BEFORE BEADING

NOTE:

1. THE LIMIT OF PRESSING FORCE OF MOUNTING WHEEL ON AN AXLE SHALL BE FROM 70 TO 84 METRIC TONS.
2. MACHING TOLERANCE, WHERE NOT DESCRIBED, SHALL BE GIVEN TO SUIT MANUFACTURING PRACTICE.
3. STAMPING FOR IDENTIFICATION ON THE WHEELS AND AXLE SETS SHALL BE DONE TO RSR DRAWING Nº

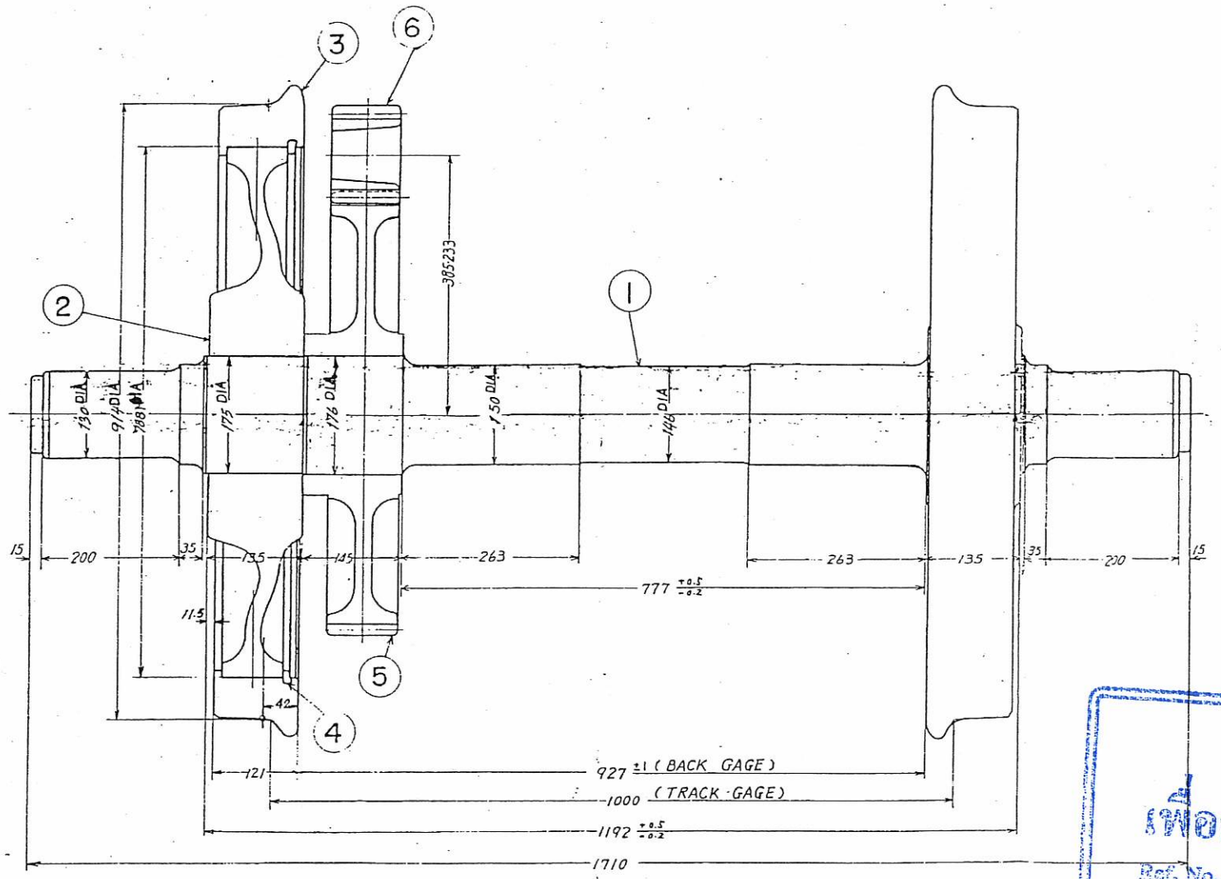
AXLE TYPE KHM-L2-L2A

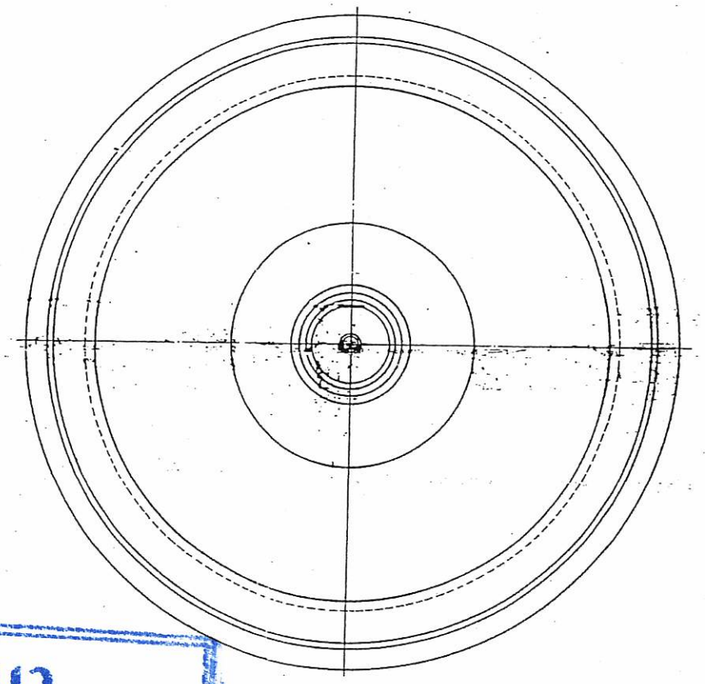
MARKS	NAME OF PARTS	Nº/BOGIE	MATERIALS	TENSILE STRENGTH & ELONGATION	REMARKS
4	GIBSON RING	4	STEEL		
3	WHEEL TYRE	4	STEEL		SM-13/2503
2	CENTER ROLLER DISC WHEEL	4	STEEL		SM-11/2503
1	AXLE	2	AXLE STEEL		SM-10/2503/1

▽ ROUGH MACHINED ▽▽ FINISHED MACHINED

RSR.	WHEEL AND AXLE (AIR CON'D , NON AIR CON'D)	SCALE: 1:5 1:1 DIMENSIONS IN MM
USED FOR	REF. DWG. Nº	
	MAKER : KOHEMA CO. KOREA DWG.Nº B1013-BB318	
REMARKS :		SANCD. _____ EMT.
DR. _____ CH. _____ CH. _____	DATE	1-12 TP1-001

A2





สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CW1/SFT/NPSE/G/L/0026

NOTE:
1). WHEEL MOUNTING PRESSURE 69 — 82.5 TONS.
2). GEAR MOUNTING PRESSURE 69.5—83 TONS.

7					
6	PINION	1			DWG.No 1-611D8-00 004
5	GEAR	1			〃 1-611D1-002
4	GIBSON RING	2			〃 - D1-1002/1
3	TYRE	2			〃 SD1-2014/1
2	WHEEL DISC	2			〃 1-611D1-005
1	AXLE	1			DWG.No 611D1-1039

[redacted]

SCALE	DRN	T. Hayashi 28. Jan. '69
1/5	CHD	C. Takeuchi 31. Jan. 68
	APPD	Y. Yamazaki 1. Feb. '68

Hitachi, Ltd.
Tokyo Japan

WHEEL AND AXLE
611 D1-1038/1
MITO WORKS DRG. NO. MB-390-000

STATE RAILWAY OF THAILAND

WHEELS AND AXLE

Used for	Revised	Remarks	Scale: 1:5
DEL No 611-615		ขนาดบนแผ่นแบบ เป็นไปตาม MB-390-000	All dimension are in mm.
			Date 23-5-06

Ted. Ckd. Ckd. Sanctd. 611D1-1038/1

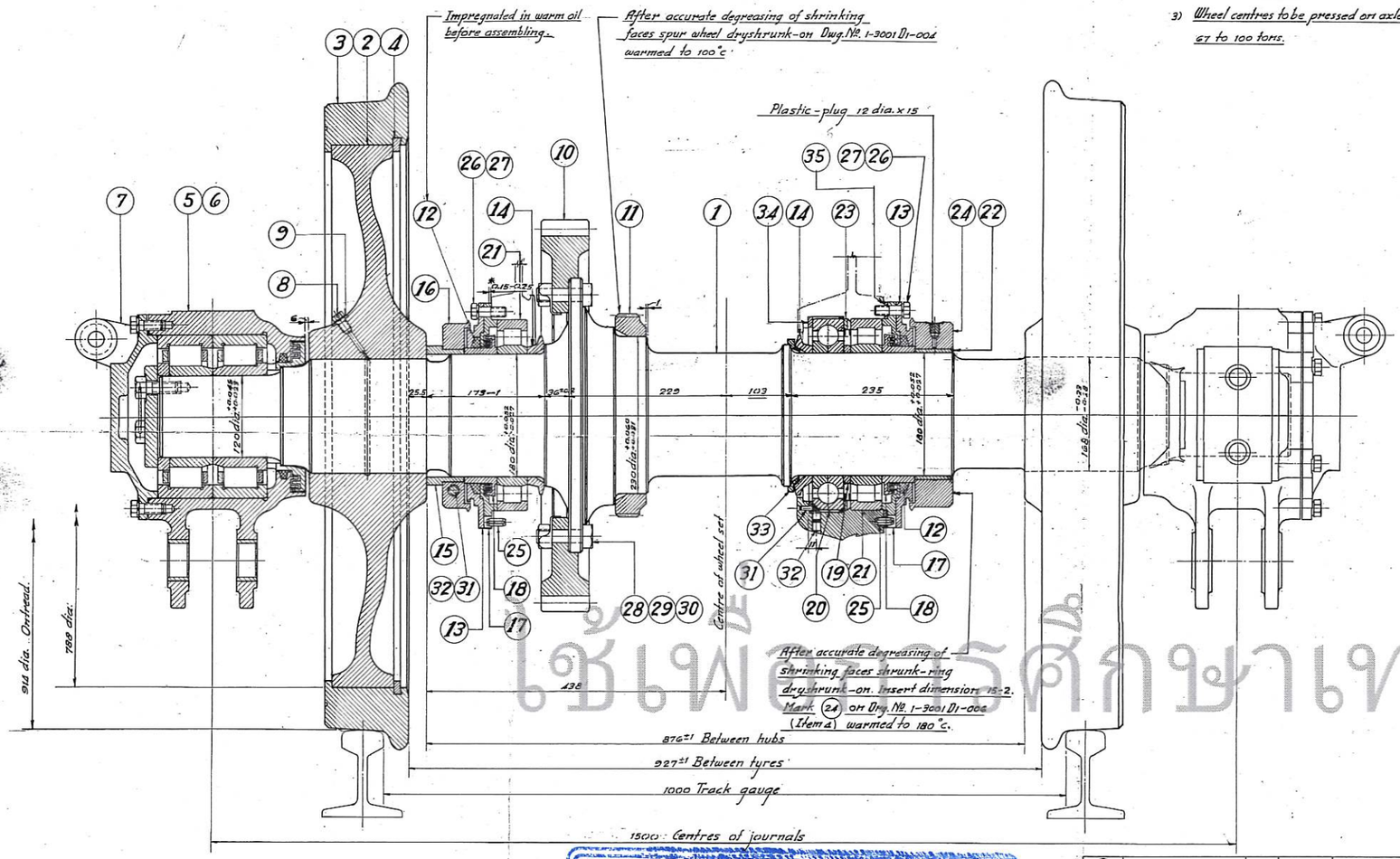
NO	REVISIONS	DATE	SIG
14-11-10	ได้มีการเปลี่ยน WHEEL CENTER จาก SPOKE WHEEL เป็น ROLLED DISC WHEEL ตามหนังสือ ปกท. ลว.16 ต.ค.10 ป. ปป. ตามหนังสือ ชก.4/ฉ 31/747 ลว.30 ธ.ค.09	611D1-1038	
วันที่	รายการแก้ไข	ยกเลิกแผ่นเลขที่	ผู้เขียน / ผู้ตรวจ

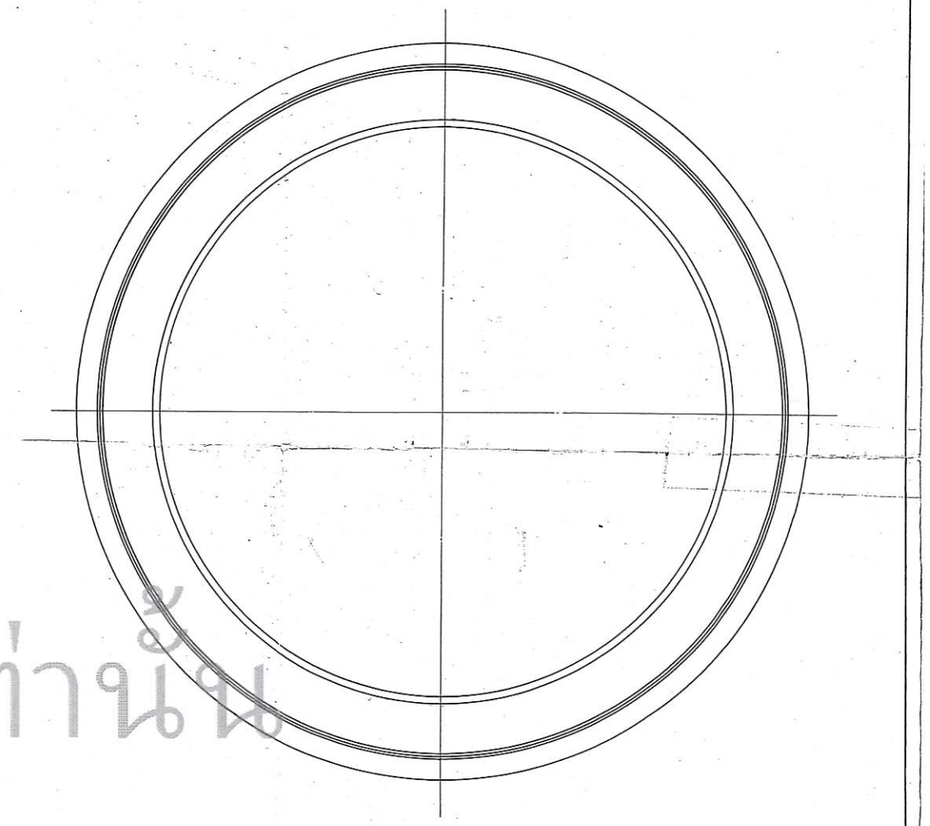
FILED OR ROUGH GROUND | ROUGH MACHINED | FINISHED MACHINED | FINE FINISHED MACHINED

* Take attention when assembling axial play 0.15÷0.25 must be kept. Refinishing of Dwg.№ 1-3001 D1-006 (Item 6) if necessary.

Note:-

1) After finishing of wheel axle before shrinking of wheels axle gear must be mounted.
2) All bearings to be mounted should be warmed to 80°c.
3) Wheel centres to be pressed on axle with 67 to 100 tons.





สำเนา
เพื่อการศึกษาเท่านั้น
CWI/SRT/NPSE/G/L/0026
11 ส.ค. 64

Marks	Name of parts	No/Set	Materials	Tensile strength & elongation	Remarks
35	Distance-ring	1			Dwg.№ 1-3001 D1-011.
34	Distance-ring	1			Dwg.№ 1-3001 D1-010
33	Distance collar.	1			Dwg.№ 1-3001 D1-009
32	Dowel 12 m_6 x 16	1			DIN 7
31	Dowel 8 m_6 x 14	1			
30	Locking plate 21	12	Steel.		DIN. 93.
29	Hex. nut M20	12	Steel.	80 kg/mm² & 12 %	DIN. 934.
28	Hex. fitted bolt M20 n_6 x 58	12			Dwg.№ 1-3001 D1-007 (Item 14)
27	Spring washer A 12	16	Spring-steel.		DIN. 127.
26	Hex. screw M.12 x 40	16	Steel.	80 kg/mm² & 12 %	DIN. 931.
25	Spring cotter 10 x 24	2	Spring-steel.		DIN 1481.
24	Shrunk-ring	2			Dwg.№ 1-3001 D1-006 (Item 4)
23	Distance-ring	1			Dwg.№ 1-3001 D1-007 (Item 12).
22	Sleeve	1			Dwg.№ 1-3001 D1-007 (Item 10)
21	CYL. roller bearing NU 1036 MA C3 NH	2			DIN 5412 0637 188
20	Grooved ball-bearing 87 1036 MAS C4	1			0585 195
19	Distance-ring	1			Dwg.№ 1-3001 D1-007 (Item 13)
18	Labyrinth-ring	2			Dwg.№ 1-3001 D1-006 (Item 8)
17	Labyrinth-cover	2			Dwg.№ 1-3001 D1-006 (Item 6)
16	Ring, 2-parted	1			Dwg.№ 1-3001 D1-008
15	Sleeve	1			Dwg.№ 1-3001 D1-007 (Item 11)
14	Centrifugal ring	2			Dwg.№ 1-3001 D1-007 (Item 9)
13	Cover.	2			Dwg.№ 1-3001 D1-006 (Item 7)
Marks	Name of parts	No/Set	Materials	Tensile strength & elongation	Remarks

Marks	Name of parts	No/Set	Materials	Tensile strength & elongation	Remarks
12	Felt-ring 200 x 230 x 12	2	Felt.		
11	Spur wheel	1			Dwg.№ 1-3001 D1-004
10	Toothed-rim	1			Dwg.№ 1-3001 D1-005
9	Gasket A 14/20	2			DIN. 7603.
8	Cap screw 1/2 R.X.8	2	Steel.	Min. 37 kg/mm². & 25 %	DIN 910.
7	Cover	2			Dwg.№ 1-3001 D2-004
6	Axle box casing	2			Dwg.№ 1-3001 D2-003
5	Axle roller bearing	2			Dwg.№ 1-3001 D2-002
4	Gibson ring	2			Dwg.№ D1-1002
3	Tyre	2			Dwg.№ SD1-2014/1
2	Wheel disc	2			Dwg.№ 1-3001 D1-003
1	Axle	1			Dwg.№ 1-3001 D1-002
Marks	Name of parts	No/Set	Materials	Tensile strength & elongation	Remarks

B1/2/D 3001 (01)

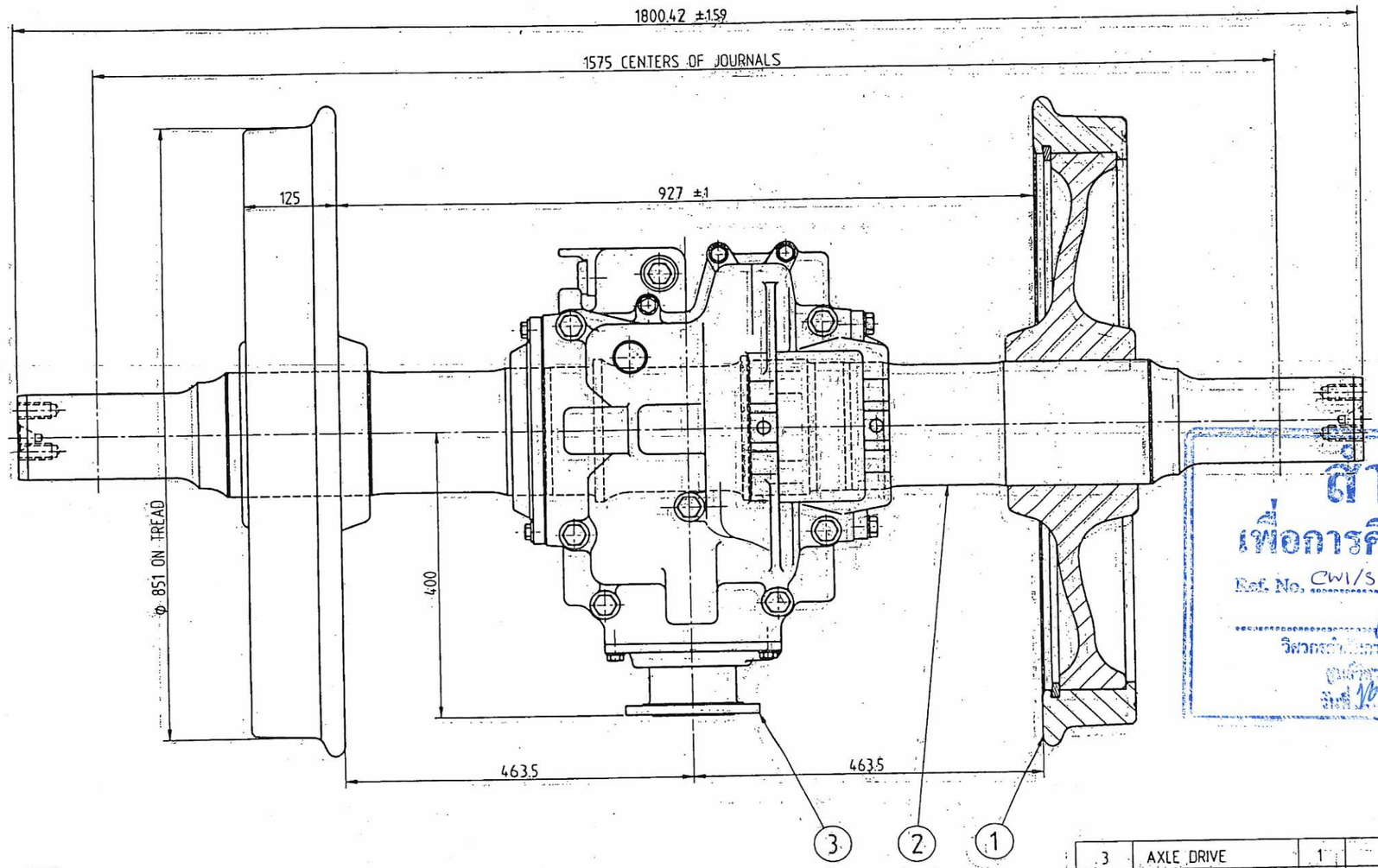
R. S. R.	WHEEL SET	Scale 1:4
		Dimensions in mm.
Used for	Ref. Dwg. №	
Driving wheels D.H.L. № 3001 - 3027	See table (อ.ก.ล/0.14/349 2 ก.ย. 10)	App.

Remarks: ได้จัดทำขึ้นจากแผนผังเลขที่ 1-3001 D1-001 แบบ 731-834.05-00 (ฉบับแก้ไข) เพื่อใช้ประกอบราคาซื้อ

B1/B3 D. 3001 (01)

Dr. | Ch. | Ch. | Date 3-5-2510

2-3001 D1-003



สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWI/SRT/NPSE/G/L/0026
วิศวกรรมการการขนส่งทางรถไฟ
วันที่ 21-4-64

NOTE.

1. THE LIMIT OF THE PRESSING FORCE OF MOUNTING WHEELS ON AN AXLE SHALL BE FROM 70 TO 84 TONS (METRIC-TONNES)
2. VARIATION IN THE DIAMETER BETWEEN THE PAIR OF WHEELS IS NOT MORE THAN 1mm
3. THE STAMPING SHALL CONFORM TO DRAWING NO.TR210018

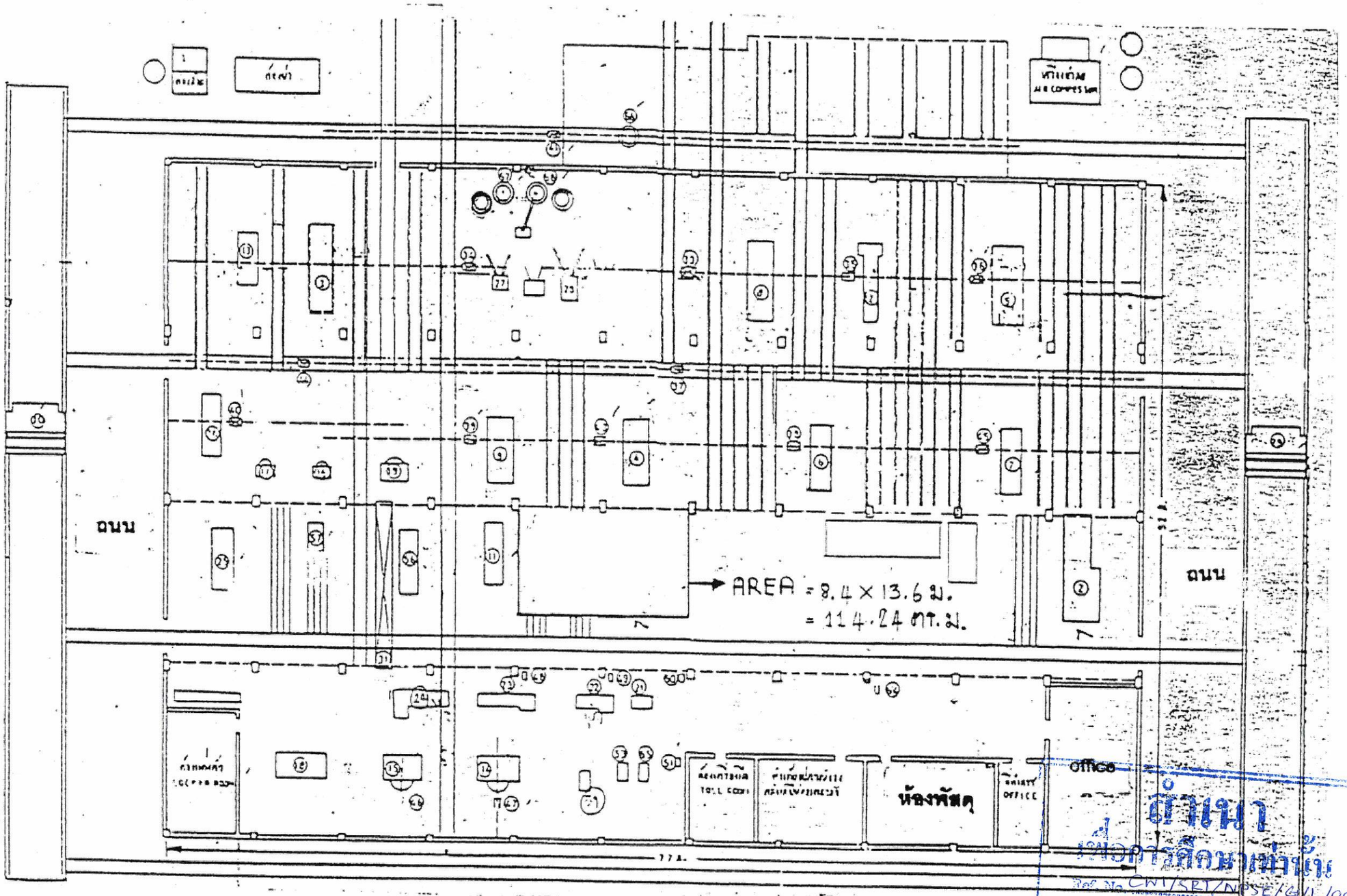
MARKS	NAME OF PARTS	Nº/SET	MATERIALS	TENSILE STRENGTH&ELONGATION	REMARK
3	AXLE DRIVE	1			TR310097
2	AXLE (DRIVING)	1			TR220012
1	WHEEL	2			TR210017

R S R.	WHEEL AND AXLE ASSEMBLY (DRIVING)	SCALES- 1/5 DIMENSION IN MM.

USED FOR	REF DWG. Nº	
TWENTY (20) AIR-CONDITIONED DIESEL HYDRAULIC RAILCARS	TR200013	APP. ---- EMT
REMARKS: CONTRACT NO.: CSDR-9/2536 CONTRACT DATE: OCT.14.1993 MAKER: DAEWOO HEAVY INDUSTRIES. LTD		SANCO. ---- SEM
DR. S.J. Song / DR. J.S. Kwak / CH.		DATE

23-5

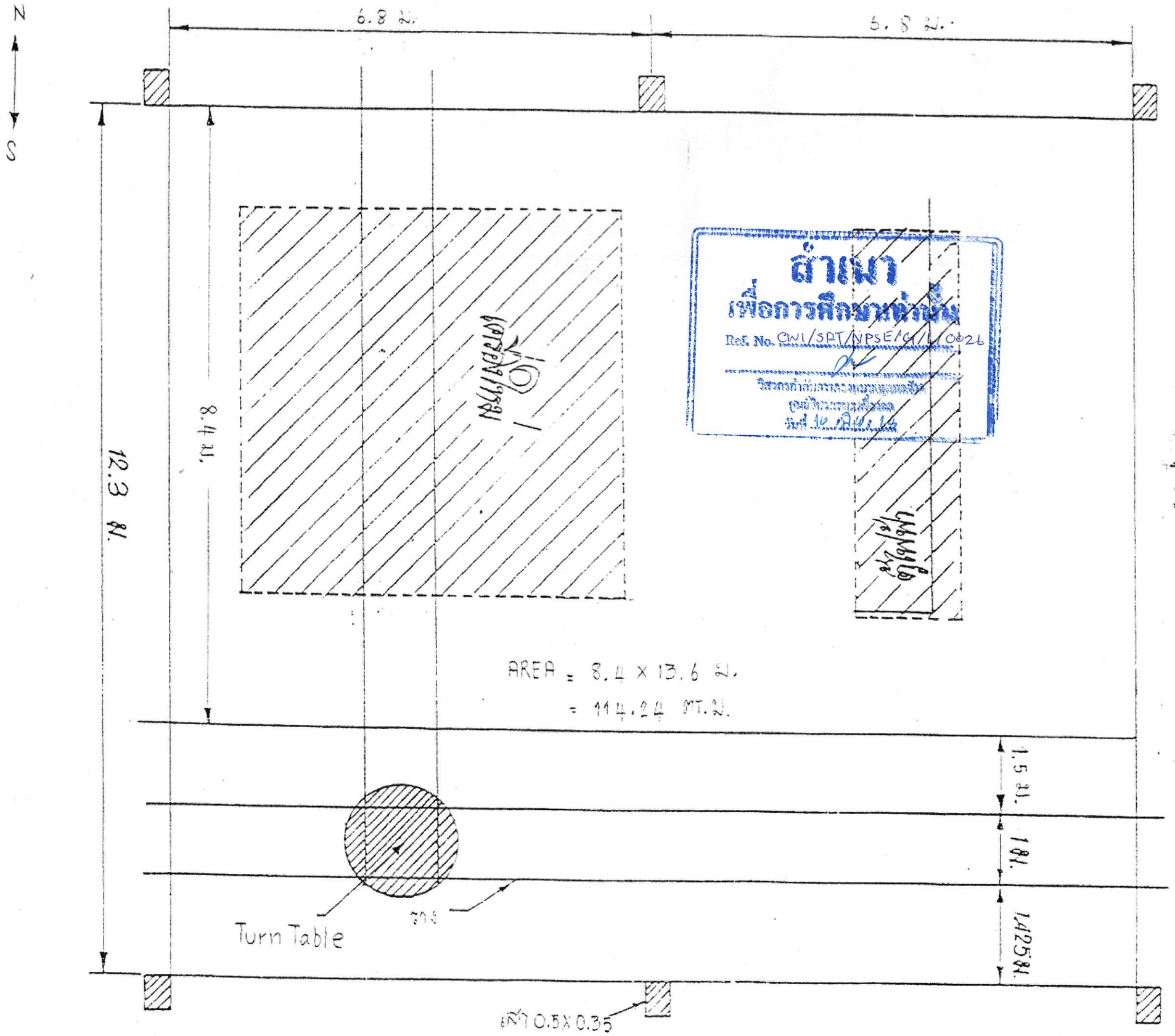
Lay out of wheel shop



สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWT/SRT/NDSE/GVL/10026
วิทยาลัยเทคโนโลยีและการจัดการ
ศูนย์วิชาการมหาสารคาม
วันที่ 10 / ส.ค. 68

แสดงตำแหน่งเครื่องจักรต่างๆและจุดติดตั้ง AUTOMATIC HEAVY DUTY PORTAL LATHE

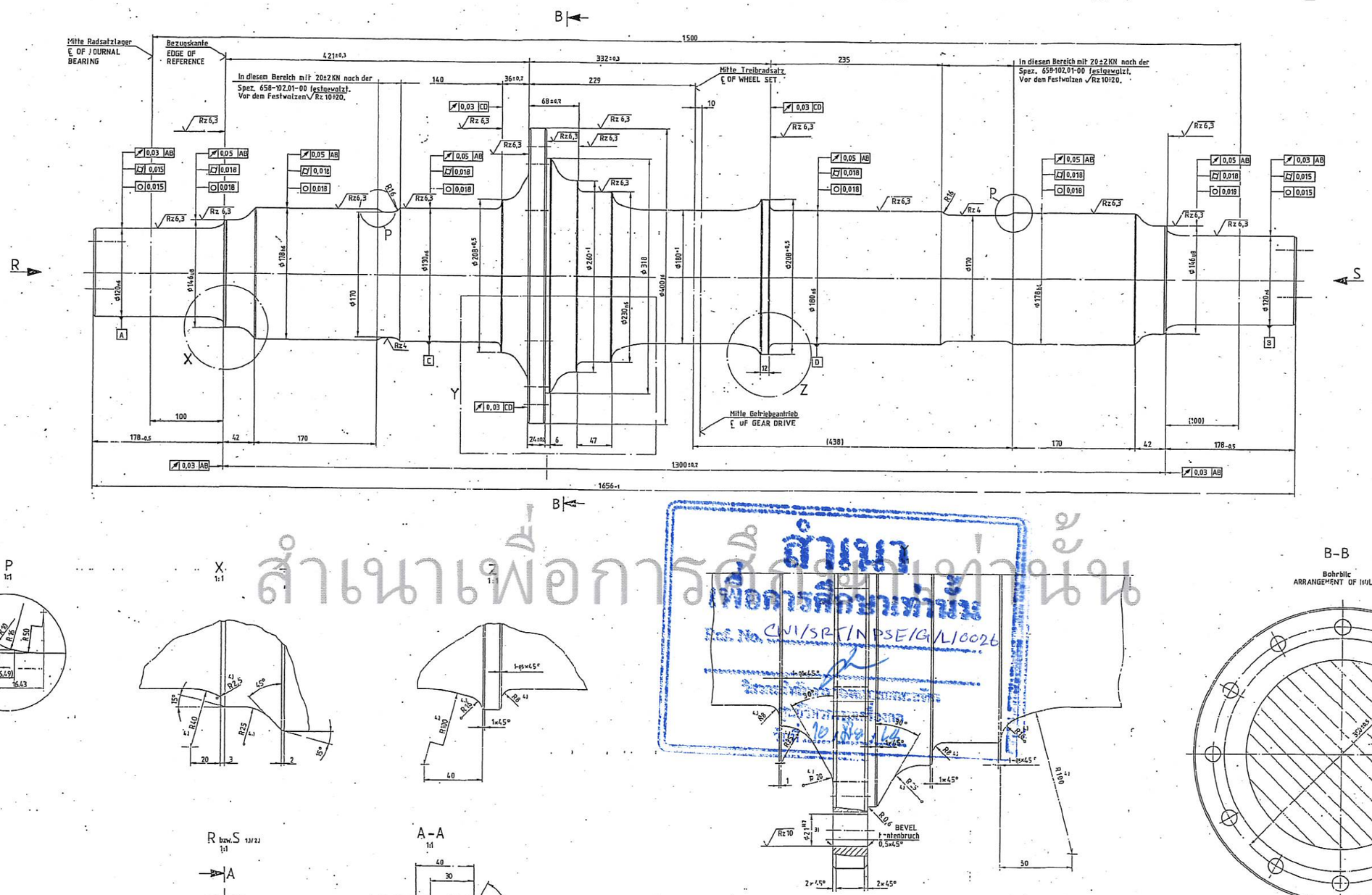
DIAGRAM A

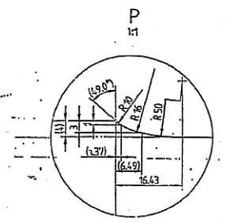


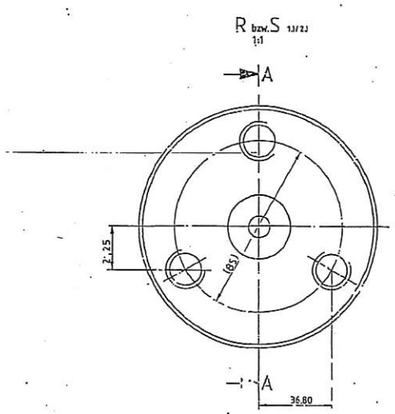
แผนผังบริเวณที่ตั้งเขื่อน
ที่จะขางเครื่องจักร

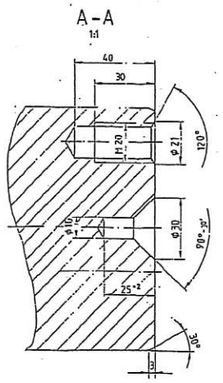
กต.ว.ไท/-สลอ.

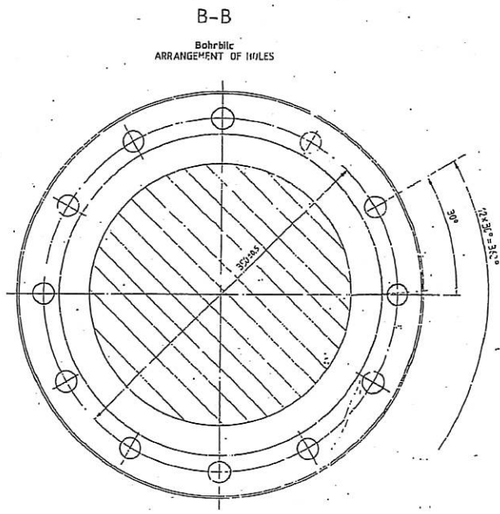
DIAGRAM B











สำเนาเพื่อการศึกษาเท่านั้น
สำเนา
เพื่อการศึกษาเท่านั้น

Fertigungshinweise

1). Vor dem Abdrehen des Warmstempels des Werkstoffhersteller (Firmenzeichen, Lieferjahr und Schmelze) muß dieser von der Abnahme auf die fertig bearbeitete Stirnfläche umgestempelt werden.

2). Stempelung nach Zeichnung 628-111.04-00

3). 12 Bohrungen, vorgebohrt auf d ≦ 20mm, gleichmäßig auf dem Umfang verteilt, zusammen mit dem Zahnrad aufgebohrt und aufgerieben.

4). Ausrundungen und Übergänge poliert- R_z ≦ 4µm

5). Gesamtbearbeitung: R_z25 (R_z10, R_z6,3, R_z4)

6). Rohteil-Nr.: 218-111.45-01

7). Technische Lieferbedingung: WN 192 04 jedoch s Pkt 8

8) Werkstoff: ✻

9) Zugehöriger Labyrinthring siehe : 218-116.11-03

10) Meßblatt hierzu siehe : 218-111.11-00 Bl.3

TO BE OBSERVED DURING FABRICATION:

1.) BEFORE THE STAMP OF THE UNMACHINED PART IS MACHINED IT HAS TO BE STAMPED TO THE FINALLY WORKED END SURFACE BY A CHECKER.

2) STAMP ACCORDING TO DRW 628-111.04-00.

3) 12 HOLES DRILLED SMALLER FIRST TO DIA ≦ 20mm, SYMMETRICALLY, BORED IN COMMON WITH THE GEARWHEEL AND REAMED.

4.) RADII AND TRANSITION POLISHED – R_z ≦ 4µm

5.) MACHINING GENERALLY: R_z 25 (R_z 10, R_z 6.3, R_z 4)

6.) UNMACHINED PART'S NO. 218-11145-01

7.) TECHNICAL TERMS OF DELIVERY HENSCHEL STANDARD 192 04, HOWEVER SEE PT.8

8.) MATERIAL: ✻

9.) ACCORDING LABYRINTH RING 218-116.11-03

10.) MEASURING CHART CORRESPONDING SEE 218-111.11-00 Bl.3

✻ Werkstoff:

26 NiCrMoV 14,5 nach ESU-Verfahren hergestellt, vergütet

Werkstoffspezifikation

Mechanische Eigenschaften:

	längs	quer
Streckgrenze $R_{p0,2}$ ≧ 600 N/mm²		≧ 600 N/mm²
Zugfestigkeit R_m = 850 bis 900 N/mm²		800 bis 900 N/mm²
Bruchdehnung A_5 ≧ 20%		13%
Brucheinschnürung Z ≧ 60%		50%
Kerbschlagarbeit A_v ≧ 120		80 J (-20°C, ISO-V)

Chemische Zusammensetzung in Gew.%:

C = 0,23 b/s 0,29	Cr = 1,30 bis 1,80
Si = max 0,30	Ni = 3,25 b/s 3,60
Mn = 0,20 bis 0,50	Mo = 0,30 bis 0,50
P = max 0,010	V = max 0,15
S = max 0,015	

Andere techn. Lieferbedingungen nach WN 192 04

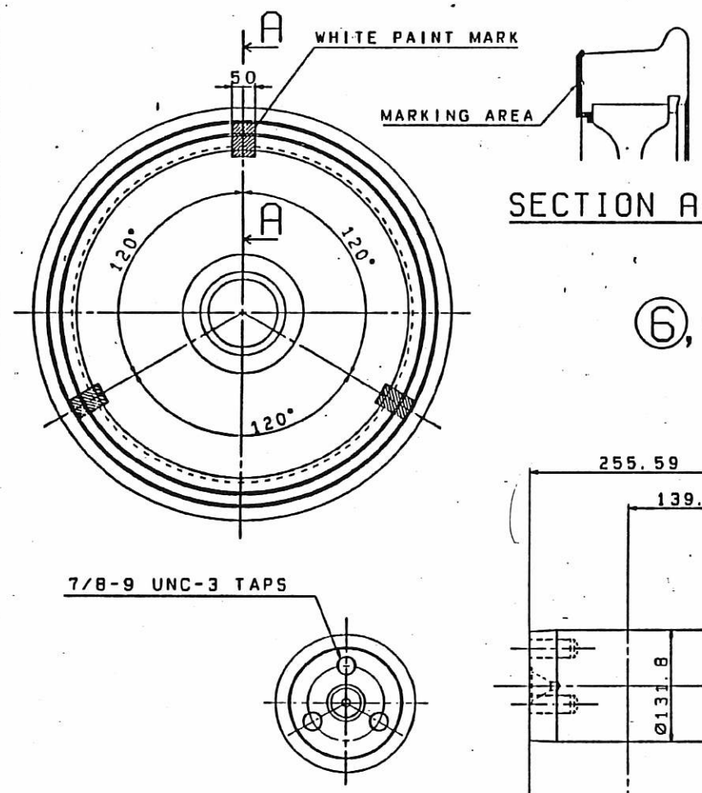
400	j6	+0,018 −0,018
230	n6	+0,060 +0,031
180	n6	+0,043 +0,017
178	h8	0 −0,015
145	h8	+0,053 +0,040
120	h8	+0,045 +0,025
Nennmaß	Toleranzklasse	Abmaße in mm

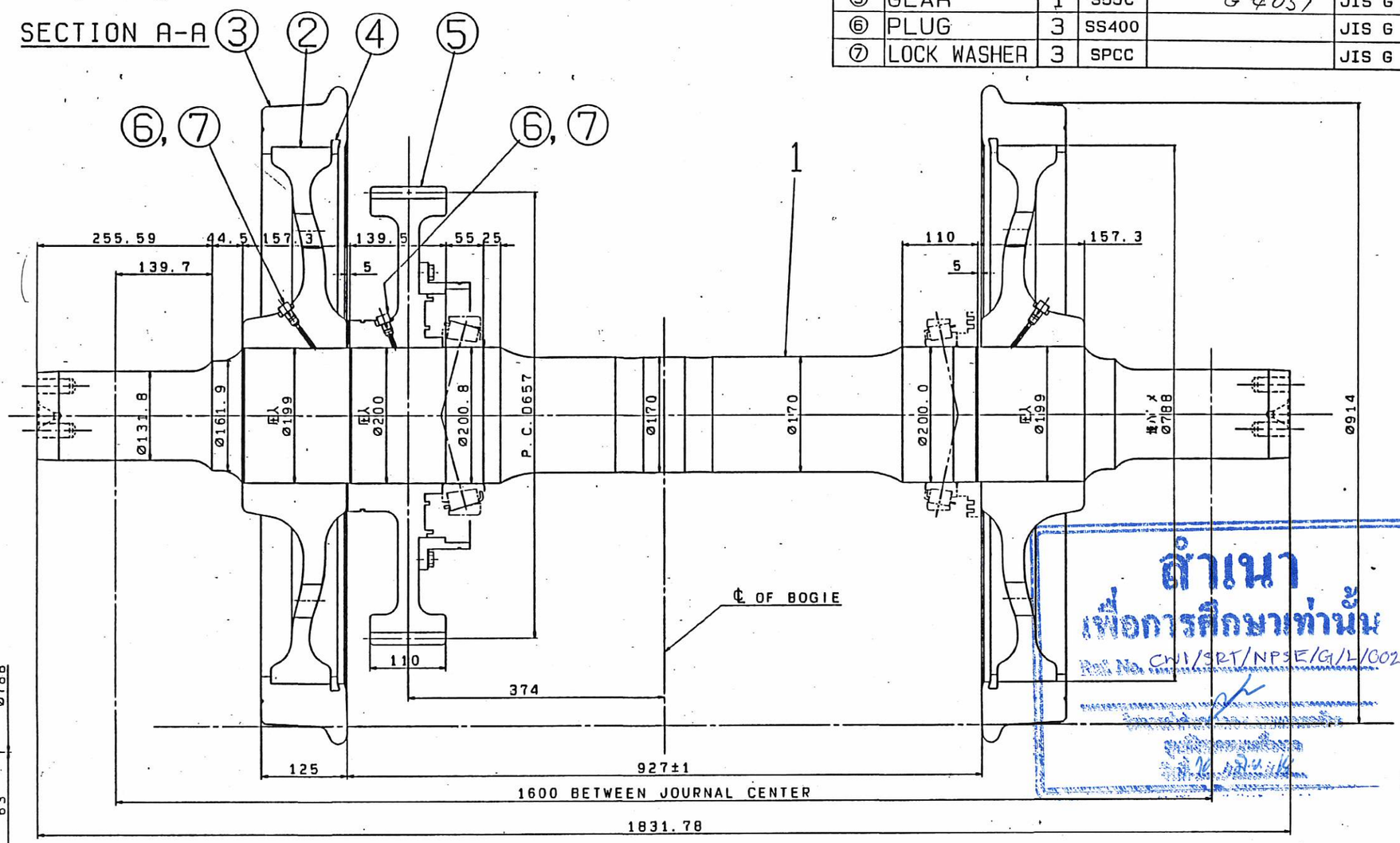
UC	15	
	13.11.85	

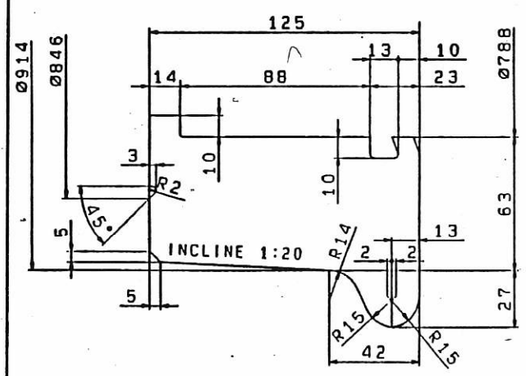
AXLE
Radsatzwelle

218-111.11-01

MARKS	NAME OF PARTS	NO/SET	MATERIALS	TENSILE STRENGTHGELONGATION	REMARKS
①	AXLE	1	SFA60A		JIS E 4502
②	WHEEL CENTER	2			RSR SPEC NO.SH-11/2503
③	WHEEL TYRE	2			RSR SPEC NO.SH-13/2503/1
④	GIBSON RING	2			BS24 PART6-1975 GRADE 622
⑤	GEAR	1	S55C	G 4051	JIS G 4501
⑥	PLUG	3	SS400		JIS G 3101
⑦	LOCK WASHER	3	SPCC		JIS G 3141







TREAD AND FLANGE CONTOUR

NOTE:
THE WHEELS AND GEAR ARE PRESSED ON AXLE.

สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CNI/SRT/NPSE/G/L/0026

DATE	AMENDED DESCRIPTION	REVISION	DRAWER	CHECK	APP.

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H.FINISHED	ROUGH MACHINED	FINISHED MACHINED	FINE FINISHED MACHINED	G GROUND SURFACE

R.S.R	WHEEL AND AXLE	SCALE 1/5, 1/2, 1/10 DIMENSIONS IN MM.

USED FOR	REF.DWG.NO
DEL.No.4501-4522 (HTC)	

REMARKS

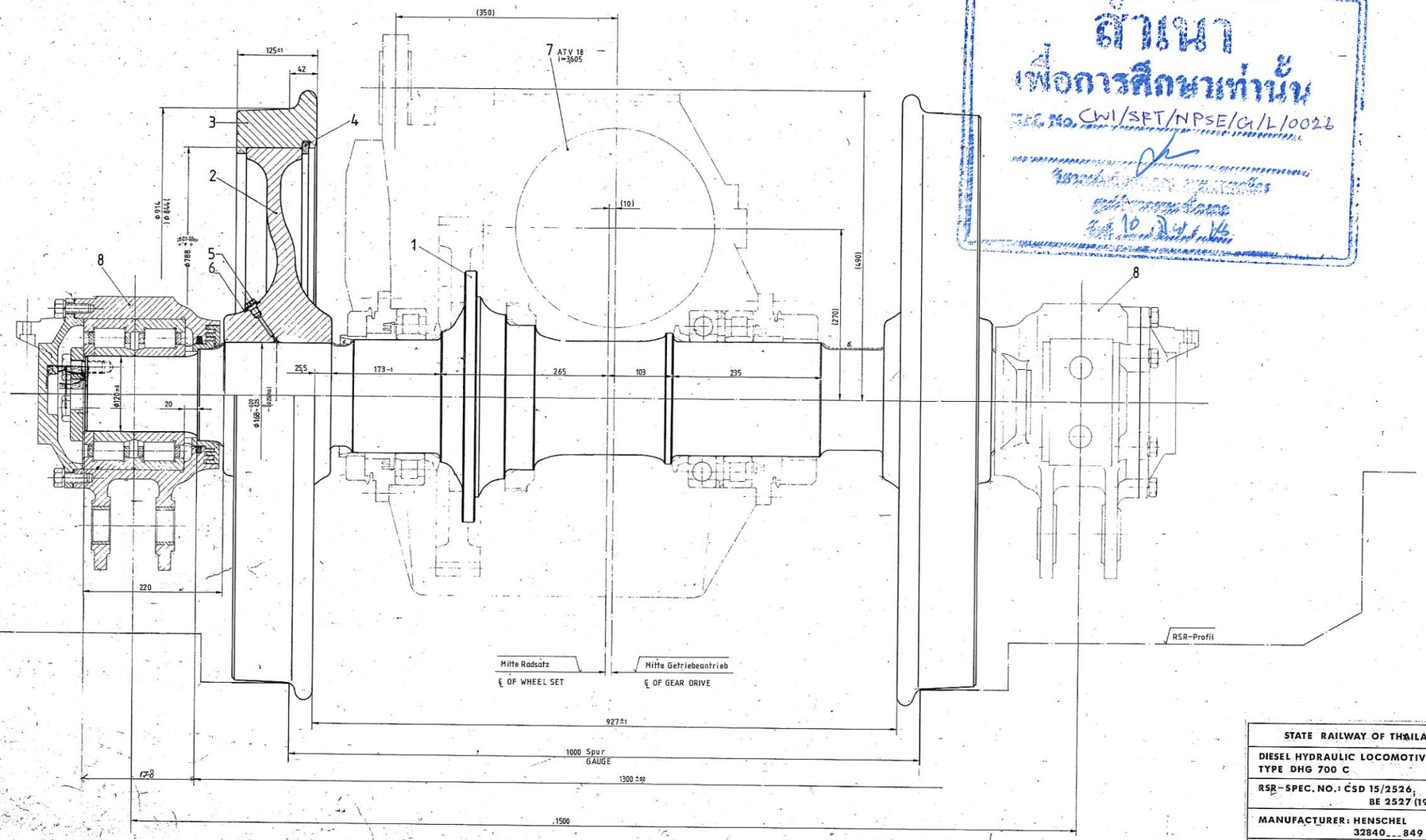
DR. M. Tachibana CH. Y. Oku CH. S. Akashi

APP.

SANCD.

DATE

2L107230-3021-



Teil 1÷6 = 1025 kg

1. Zulässiger Unterschied der Laufkreisdurchmesser der Räder eines Radsatzes, sowie der Räder einer Lokomotive darf 0,3‰ nicht überschreiten = 0,27 mm.-
2. Zulässige Planlaufabweichung an den inneren Stirnflächen der Radfelge = 0,5 mm.
3. Zulässige Rundlaufabweichung im Laufkreisdurchmesser einschl. Unrundheit = 0,3 mm
4. Zulässige Formabweichung des Laufprofiles = ± 0,5 mm.-
5. Zum Aufpressen des Rades auf die Achse wird als Schmiermittel Molybdändisulfit (Molykote, Paste G) verwandt.-

Aufpreßdruck 52 - 74 Mp.-

6. Vor der Achslagermontage sind die gestrichelt gekennzeichneten Flächen mit dem Fertiganstrich versehen.-

1. PERMISSIBLE DIFFERENCE IN TREAD CIRCLE DIAMETER OF THE TWO WHEELS IN ONE WHEEL SET AS WELL AS OF ALL WHEELS IN ONE LOCOMOTIVE MUST NOT EXCEED 0,3 ‰ = 0,27 mm.
2. PERMISSIBLE DEVIATION FROM VERTICAL PLANE AT THE INNER FRONT FACE OF THE WHEEL RIM = 0,5 mm.
3. PERMISSIBLE ECCENTRICITY OF TREAD DIA INCLUSIVE OVALNESS = 0,3 mm.-
4. PERMISSIBLE SHAPE DEVIATION OF TREAD-PROFILE = ± 0,5 mm -
5. IN MOUNTING WHEEL ON AXLE IT IS RECOMMENDED THAT MOLYKOTE - "PASTE G" TO BE USED AS LUBRICANT.

PRESS-ON PRESSURE 52 TO 74 Mp

6. BEFORE MOUNTING THE AXLE BOXES THE SURFACES MARKED WITH DOTTED LINES ARE TOP COATED.

Anweisung zum Aufschrumpfen der Räder auf die Achswelle
(nur für Erstausrüstung)

1. Räder gleichmäßig auf 270°C anwärmen.-
2. Räder auf die Achswelle aufschrumpfen.-
3. Anpreßversuch: 63 Mp - an einem Rad pro Lok.

APPLICATION OF SHRINKING WHEELS ON AXLES
(ONLY FOR FIRST MOUNTING)

1. HEAT EACH WHEEL UNIFORMLY TO 270° C -
2. SHRINK WHEELS ON AXLE
3. DEPRESSING TEST: 63 Mp - ONE WHEEL PER LOCO.

NO./LOCO	DESCRIPTION	REF. LETT.	MATERIAL	SPEC NO.	WT/SCH (KG)
–	JOURNAL BEARING	8			
–	AXLE GEAR ATV 18	7			
2	WASHER 14×20	6			
2	SCREW R 14×8	5			
2	RETAINING RING	4	MR St 37-2		4,15
2	TYRE	3	US 85		170,-
2	WHEEL	2	M St 50-2N		178,-
1	AXLE	1	25 CrMo		320,-

STATE RAILWAY OF THAILAND

DIESEL HYDRAULIC LOCOMOTIVE
TYPE DHG 700 C

RSR-SPEC. NO.: CSD 15/2526,
BE 2527 (1984 A.D.)

MANUFACTURER: HENSCHEL
32840__849

SCALE: WHEEL SET I/III

DRAWING NO: 0.11

Benennung	Werkstoff	Werkstoff-Nr.	LZ Nr.	Teilzeichnung	Tag	Name
Art der Änderung						

Gesamtgewicht: kg

THYSSEN HENSCHEL
Kassel

LKLL:

1984 Tag Name
Bearbeitet 6.12. Bayer
Geprüft 14.12.
Normgeprüft
Freigabe:

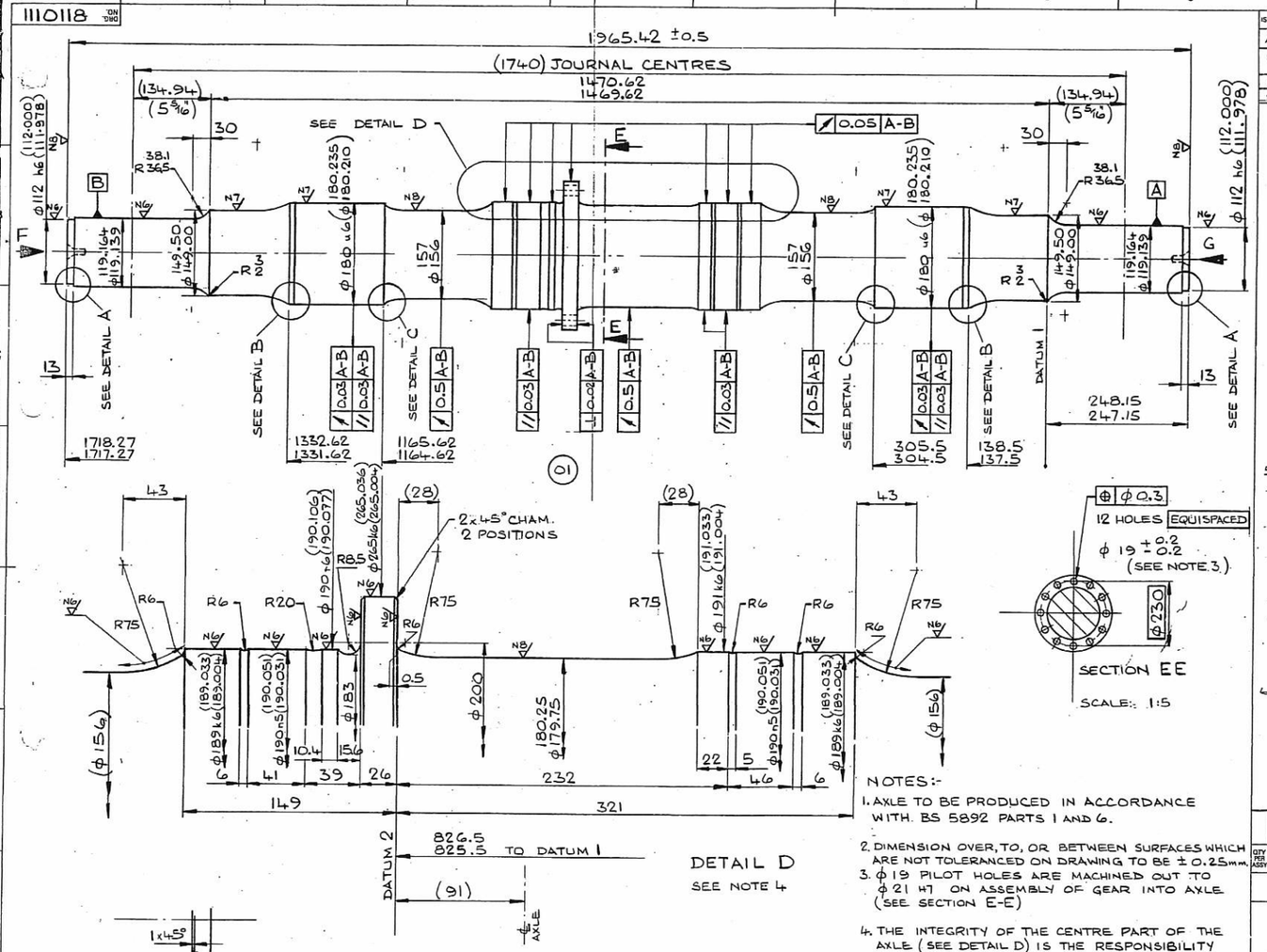
HAS (1)

1:25 Treibradsatz I/III

628-111-01-00

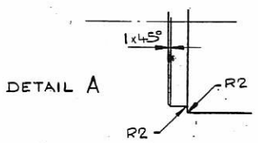
Ersetzt für: Ersetzt durch:

1110118 ON '90



DETAIL D

SEE NOTE 4



DETAIL A

THIS DRG TO BE READ IN CONJUNCTION WITH 1110116

NOTES:-

1. AXLE TO BE PRODUCED IN ACCORDANCE WITH BS 5892 PARTS 1 AND 6.
2. DIMENSION OVER, TO, OR BETWEEN SURFACES WHICH ARE NOT TOLERANCED ON DRAWING TO BE ± 0.25mm.
3. φ 19 PILOT HOLES ARE MACHINED OUT TO φ 21 H7 ON ASSEMBLY OF GEAR INTO AXLE (SEE SECTION E-E)
4. THE INTEGRITY OF THE CENTRE PART OF THE AXLE (SEE DETAIL D) IS THE RESPONSIBILITY OF KAELBLE-GMEINDER.

ISSUE	GRID REF.	ALTERATION	
A		FIRST ISSUE	MFD
B	BJ 89	AT DIM. φ112 h6 (112.000 / 111.978) MACHINING SYMBOL WAS N8.	MFD
C		TITLE BLOCK: CONTRACT Nº ADDED	MFD
D		NOTE 5 APPENDED. ECN Nº T3-15 0002	

สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CW1/SRT/NPSE/G/L/0026
วิศวกรที่ปรึกษาโครงการ
วันที่ 10 ก.ย. 65

NOTES:- (CONTINUED)

5. THE FOLLOWING TESTS ARE REQUIRED
   a) IMPACT. b) MICRO. STRUCTURE. c) FALLING WEIGHT. TEST d) ULTRASONIC e) MAGNETIC PARTICLE INSPECTION (MPI) f) VISUAL
   NOTE THAT ITEMS a) b) AND d) ARE EXECUTED IN ACCORDANCE WITH BS 5892 PART. 1
   ITEM c) IS CARRIED OUT IN ACCORDANCE WITH THAILAND RSR SPEC. SM-10/2503/1
   e) IS CARRIED IS CARRIED OUT ON TRANSITION RADII ONLY. NO DEFECTS ARE PERMISSIBLE
   f) IS CARRIED OUT. i) IF NOT MPI'D
   ii) IF MPI, ALL VISIBLE AREAS
   DEFECT LEVELS TO BE AS SPECIFIED IN AAR SPEC. AAR-M-101-83 APPENDIX A: DEFECTS MAY BE REMOVED IN AREAS SPECIFIED & AS SPECIFIED IN AAR SPEC.
6. FOR SUITABLE CORROSION PROTECTION SEE BREL PROCUREMENT SPEC DES/PB/89/080

QTY PER ASSY	REF	DESCRIPTION	PART NUMBER	DRG. PART ISSUE	PART STATUS	MATERIAL SPEC. ETC.	WT kg
01		POWER AXLE	111-0118-01	02	C	STEEL TO BS 5892 GD A1T	319

BREL LIMITED

PART STATUS: (PART STAT)

BLANK = DRAFT (FOR USE ON PRE-PRODUCTION DESIGNS ONLY)

C = CURRENT (APPROVED BY ENGINEERING FOR USE ON PRODUCTION DESIGNS)

ISS	DATE	DRAWN	CHECK	ENDRS	APPRV
D	19.10.90	DP	DJC		
C	17.6.90	DP	SJR		
B	23.2.90	DP	P.D.B.		
A	13-7-89	N.R.	ALAN REAL		

PROJECT

TITLE: DETAIL OF AXLE (POWER)

RSR CONTRACT CSDR-8/2530

DRG. NO. 1110118

SCALE 1:2.5 1:1 1:5

THE TOLERANCE ON DIMENSIONS FOR WHICH NO LIMITS ARE GIVEN SHALL BE AS SHOWN BELOW

NOMINAL SIZE	OVER	0	6	30	120	400	1000
	TO	6	30	120	400	1000	
MACHINED		± 0.2	± 0.5	± 0.8	± 1.2	± 2	± 3
FABRICATED		± 1	± 1	± 1.5	± 2	± 3	± 4

PROJECTION — DO NOT SCALE

UNLESS OTHERWISE STATED:

DIMENSIONS ARE IN MILLIMETRES

DRAWING PRACTICE TO BREL LIMITED PROCEDURE NO. DES/STD/86/100

SCREW THREADS ARE TO BS 3643 CLASS 6H/6g

WELDING TO BE TO BS 3019 PT.1 (ALUM. T.I.G.) BS 3571 PT.1 (ALUM. M.I.G.) BS 5135 QUALITY CAT D (STEEL)

SHARP EDGES TO BE DEBURRED

MACHINED SURFACES TO BE ✓ (BS 1134)

BOLTED JOINTS TO BE IN ACCORDANCE WITH BREL LIMITED PROCEDURE NO. CED/WPS/88/002

EXPOSED EDGES OF GAS CUT PLATE TO BE TO BREL LIMITED PROCEDURE ...o. CED/WPS/89-014

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A2

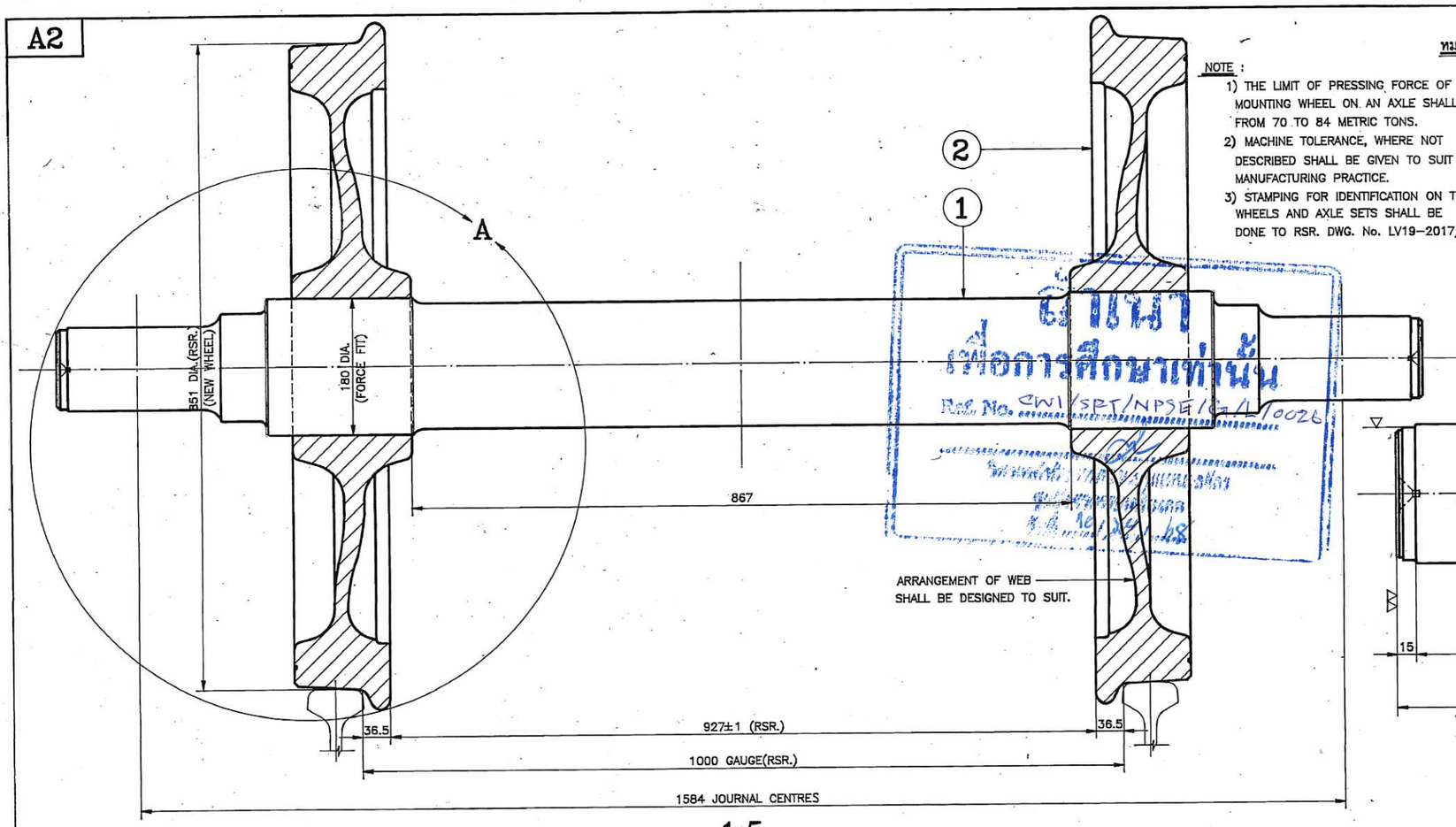
NOTE :

1) THE LIMIT OF PRESSING FORCE OF MOUNTING WHEEL ON AN AXLE SHALL BE FROM 70 TO 84 METRIC TONS.
2) MACHINE TOLERANCE, WHERE NOT DESCRIBED SHALL BE GIVEN TO SUIT MANUFACTURING PRACTICE.
3) STAMPING FOR IDENTIFICATION ON THE WHEELS AND AXLE SETS SHALL BE DONE TO RSR. DWG. No. LV19–2017/2

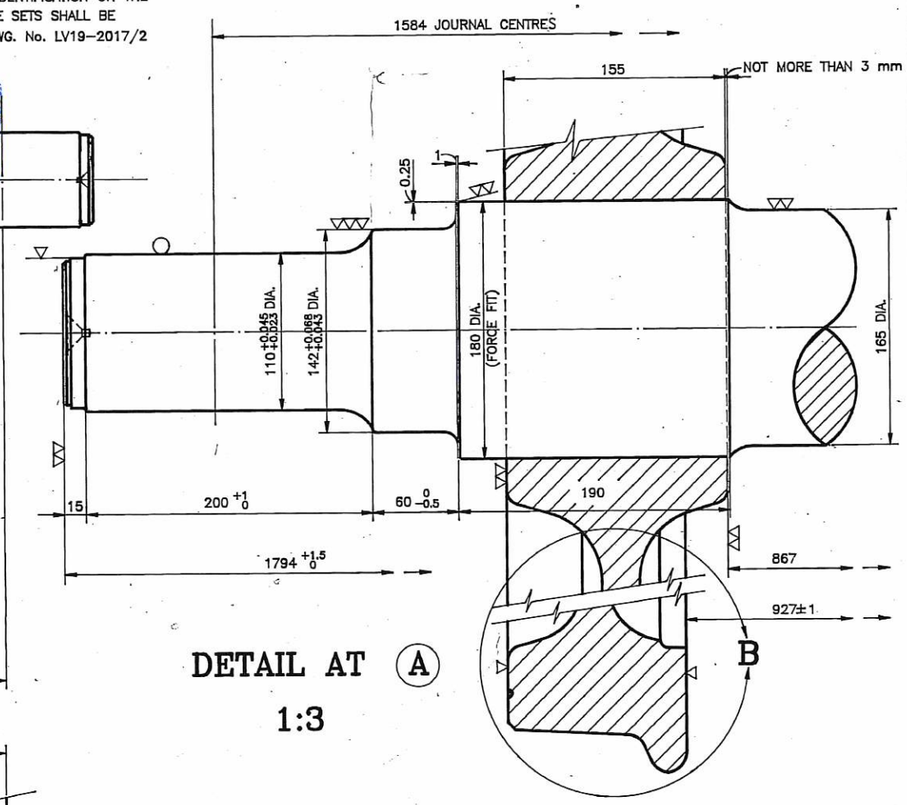
<u>หมายเหตุ</u> : การ REGAUGE ล้อพร้อมเพลาของแคร่รถโดยสาร JR–WEST จาก TRACK GAUGE 1,067 มม. เป็น 1,000 มม. ตามขนาดทางของ รฟท. โดยการเปลี่ยนเฉพาะเพลา (อุปกรณ์อื่นๆใช้ของเดิม) ให้ดำเนินการดังนี้

1) จัดหาเพลาใหม่ตามแผนผัง เลขที่ JR–W1–002
2) ล้อดลับลูกกลิ้งและหมอเพลาใช้ของเดิมที่ติดตั้งมากับแคร่รถโดยสาร JR–WEST
3) กลิ้งเปลี่ยน CONTOUR ของพื้นล้อและบังใบจากเดิมเป็น VIDURA CONTOUR
4) ขนาดความโตของล้อริดทิบ (SOLID WHEEL) เมื่อกลิ้งเปลี่ยนเป็น VIDURA CONTOUR แล้วจะต้องอยู่ในเกณฑ์มาตรฐานของ รฟท. คือ ล้อใหม่ Ø 851 มม. กลิ้งครั้งสุดท้าย Ø 781 มม. เลิกใช้การเมื่อ Ø 767 มม.

สำหรับล้อที่บางหรือมีความโตไม่ได้ขนาดตามที่กำหนดให้ดำเนินการจัดทำเป็นล้อชนิดอัดปลอก ตามมาตรฐานของ รฟท.

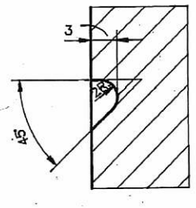


1:5



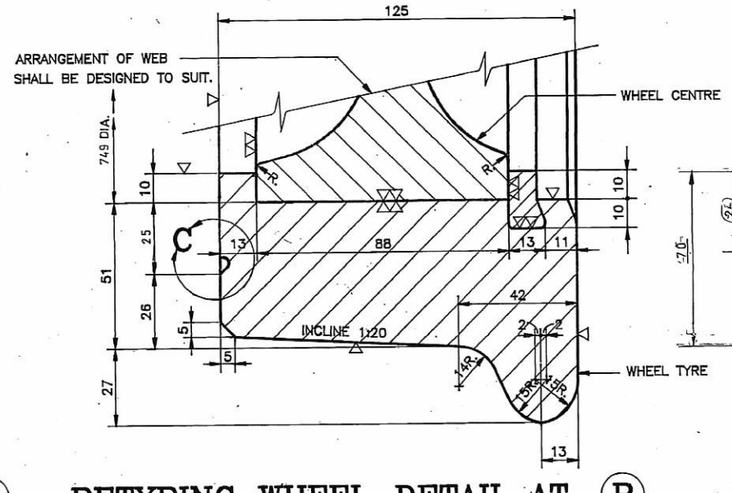
DETAIL AT (A)

1:3

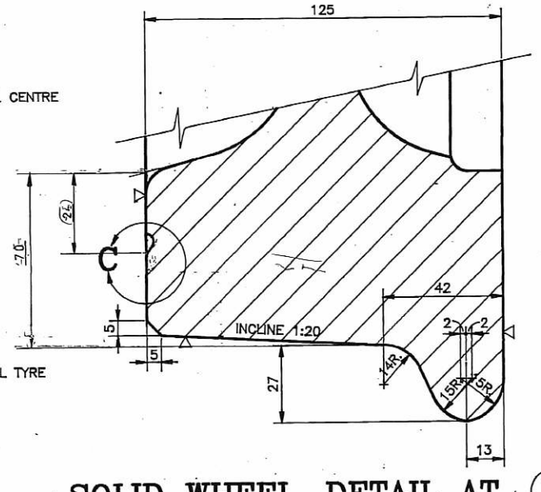


ENLARGED AT (C)

2:1



RETYRING WHEEL DETAIL AT (B)



SOLID WHEEL DETAIL AT (B)

RSR.CONTOUR (VIDURA CONTOUR)

1:1.5

MARKS	NAME OF PARTS	No./SET	MATERIALS	TENSILE STRENGTH&ELONGATION	REMARKS
(2)	RETYRING WHEEL	2			RSR. DWG.No. P1–2439/1
	SOLID WHEELS				JR–WEST DWG.No.VD–4780
(1)	AXLE	1			RSR. DWG.No.JR–W1–002

= HAND FINISHED; = ROUGH MACHINED; = FINISHED MACHINED; = FINE FINISHED MACHINED; = GROUND SURFACE

RSR. **WHEELS & AXLE**

SCALES 1:1.5,1:3,1:5,2:1

DIMENSIONS IN mm

USED FOR	REF. DWG. No.
JR–WEST CARS DONATED FOR RSR.	VC 4509 VC 4510 VD 4780 (JR WEST)

REMARKS: แผนผังนี้จัดทำขึ้นเพื่อใช้ในการจัดทำหรือเพื่อการ REGAUGE ล้อพร้อมเพลา สำหรับรถโดยสาร JR–WEST

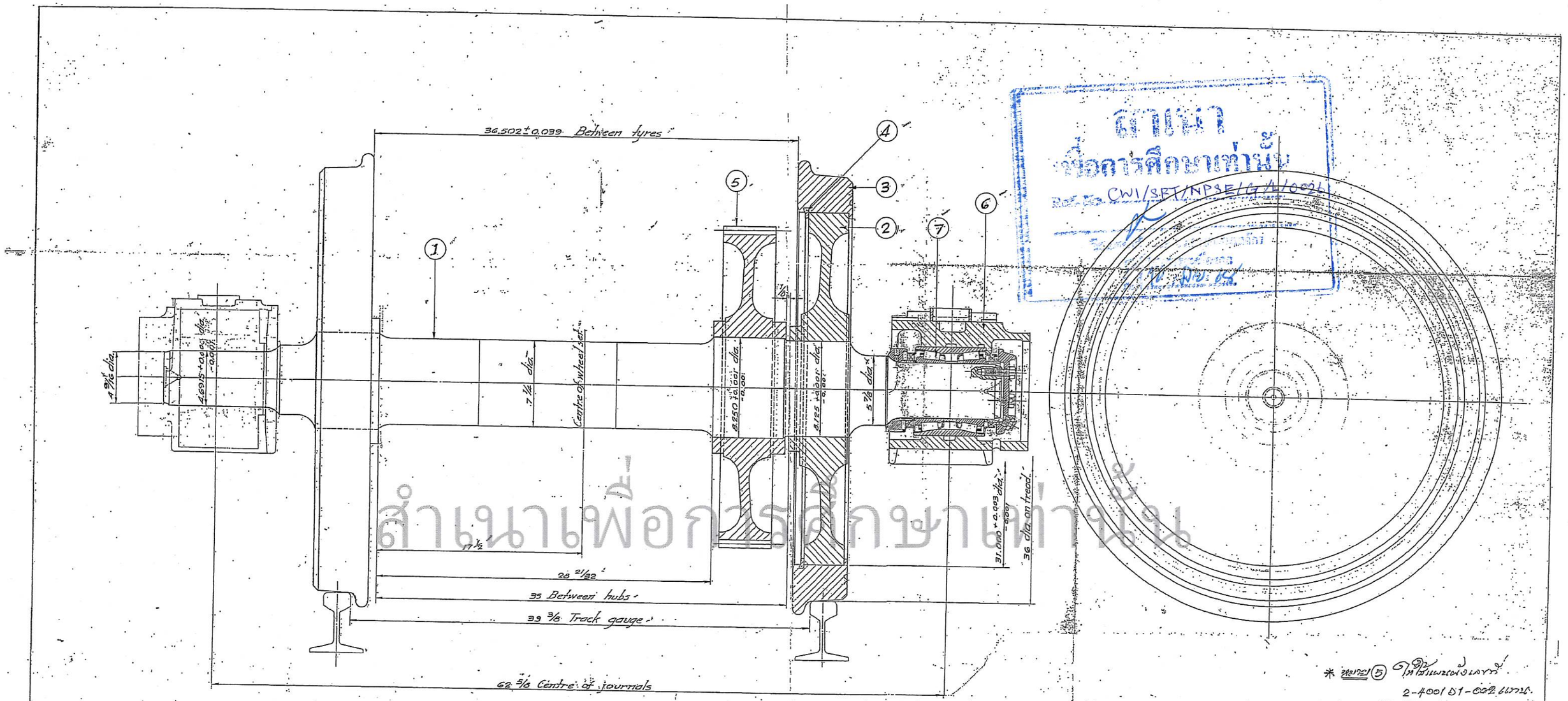
APP. _____ EMT.

SANCD. _____ SEM.

DR. _____ CH. _____ CH. _____

DATE 29/6/41

JR–W1–001A



สำเนาเพื่อการศึกษาท่านั้น

สำเนา
เพื่อการศึกษาท่านั้น
Ref. No. CWI/SET/NPSE/G/1/0026
วันที่ 10 พ.ย. 2526

* ชิ้นส่วน (5) ดูที่แบบเฉพาะเลขที่ 2-4001 D1-002 แทนได้
(DRIVING SPUR GEAR)

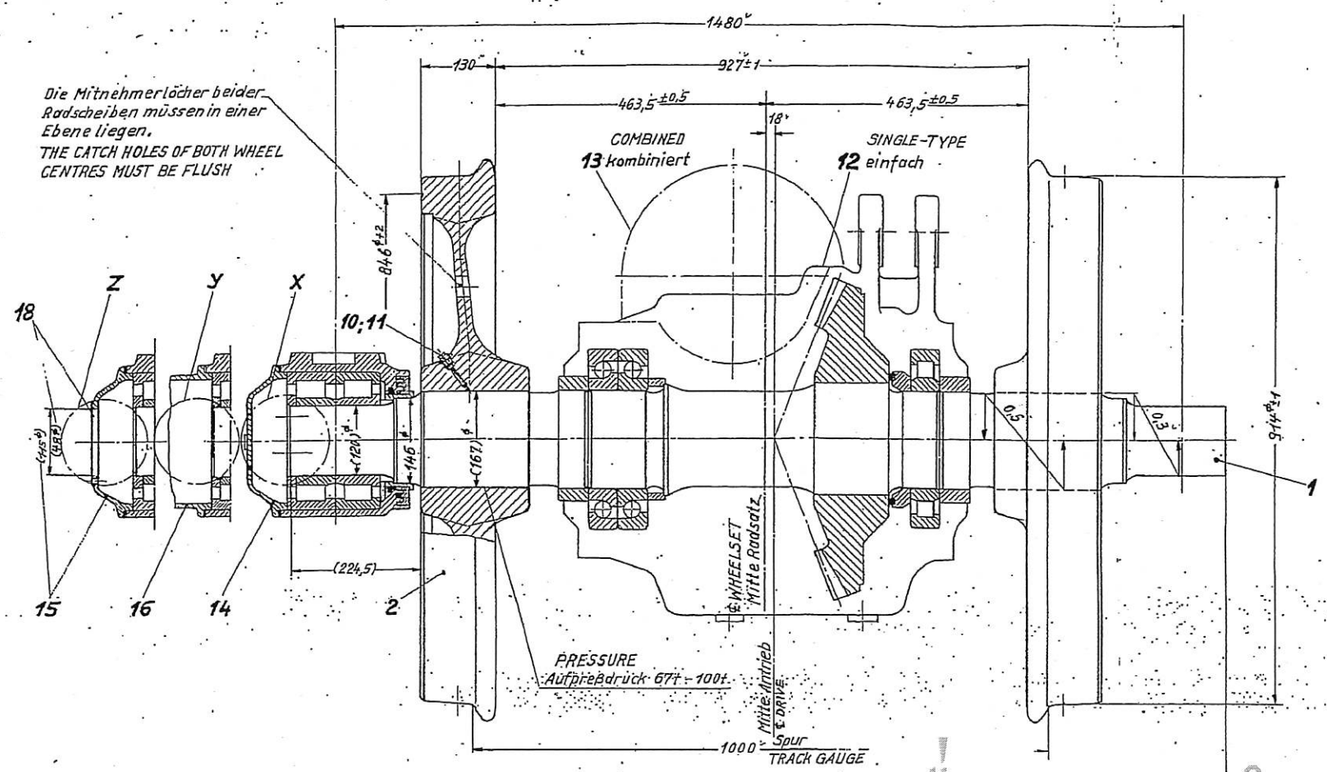
Marks	Name of parts	No/Set	Materials	tensile strengths elongation	Remarks
7	Axle roller bearing set	2			1-4001 D2-005
6	Axle box	2			1-4001 D2-003
5	Gear	1			1-4001 D2-001 2-4001 D2-002
4	Gibson ring	2			D1-1002/1
3	Wheel tyre	2			5D1-2014/1
2	Wheel disc	2			1-4001 D1-002
1	Axle	1			4001 D1-1013/1

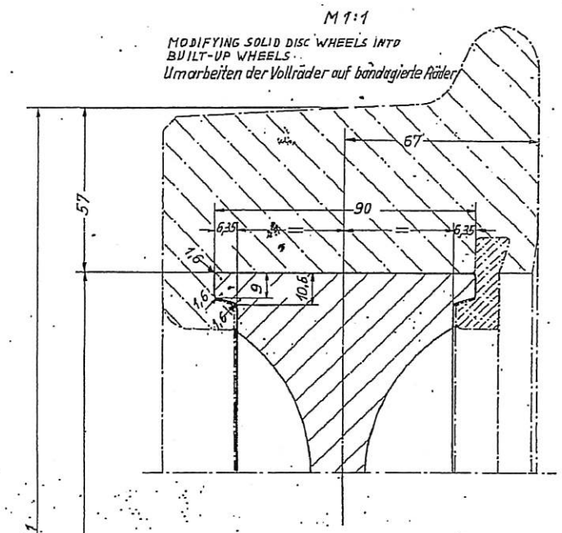
Note:-

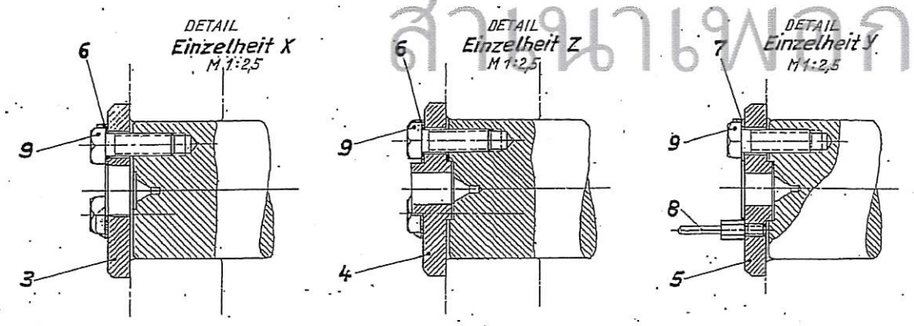
1) Wheel mounting pressure 12-17 tons for each inch of diameter of the wheel seat.

2) Gear mounting pressure 6-12 tons for each inch of diameter of the gear seat.

R. S. R.	WHEEL SET ASSY	Scale:- 1:5
		Dimensions in inches
Used for	Ref. Drg. No.	
Driving wheels DEL. No. 4001-4050. (GE 1320 HP)	See table	
Remarks: ใช้ร่วมกับแผนผังเลขที่ 41C 600795, 41D 700701 และ E 26022 ตามลำดับ		Sanod [illegible] B1 [illegible] 11.4.61
Dr. [illegible]	Ch. [illegible]	Ch. [illegible] 20/7/101
Date	1-4001 D1-001	







สำเนาเพื่อการศึกษาเท่านั้น
สำเนา
เพื่อการศึกษาเท่านั้น
CWI/SPT/NPSE/G/L/0026

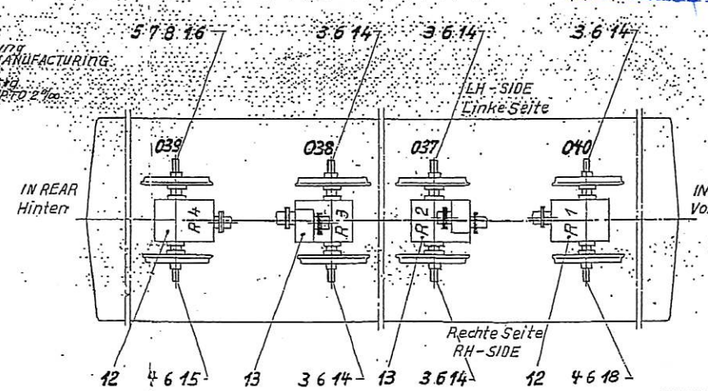
1 Zulässiger Unterschied der Laufkreis ⌀ der Räder eines Radsatzes sowie der Räder einer Antriebsgruppe bis 0,3mm bei Neufertigung
PERMISSIBLE DIFFERENCE IN TREAD CIRCLE ⌀ OF THE WHEELS OF A WHEELSET AND OF THE WHEELS OF A DRIVING GROUP UP TO 0,3mm WHEN MANUFACTURING

2 Zulässiger Unterschied der Laufkreis ⌀ der Räder eines Radsatzes sowie der Räder einer Antriebsgruppe bis 2 ‰ im Betrieb zulässig
2 PERMISSIBLE DIFFERENCE IN TREAD CIRCLE ⌀ OF THE WHEELS OF A WHEELSET AND OF THE WHEELS OF A DRIVING GROUP IN OPERATION PERMISSIBLE UP TO 2 ‰

3 Zulässige Rundlaufabweichung beim Rundlauf in den Zentrierungen 0,5mm
3 PERMISSIBLE DEVIATION WHEN RUNNING IN CENTERINGS

4 Zulässige Rundlaufabweichung am Laufkreis ⌀ beim Rundlauf in den Zentrierungen 0,3mm
4 PERMISSIBLE DEVIATION IN TREAD CIRCLE ⌀ WHEN RUNNING IN CENTERINGS

5 Zulässige Formabweichung des Laufprofils ± 0,5mm
5 PERMISSIBLE DEVIATION IN RUNNING SECTION



MAX. PERMISSIBLE PEAK-TO-VALLEY HEIGHT
R_t 16 µm, TO DIN 3141 RANGE 2 (t_{max} 0,004 mm)

zul größte Rauhtiefe R_t in µm nach Reihe 2 DIN 3141
▽100 ▽▽25 ▽▽▽6,3 ▽▽▽▽1

1	–	–	–	Rollenachslager vollst. ROLLER AXLE BEARING	1-08-12.30.61-014		18	für elektr. Ferngeber FOR A.C. GENERATOR	B2				
1	1	1	1	Stempelung STAMPING	2-08-12.10.46-053		17		–				
–	1	–	–	Rollenachslager vollst. ROLLER AXLE BEARING	1-08-12.30.61-012		16	für Schleuderschutz FOR ANTI-SLIP DEVICE	B2				
–	1	–	–	Rollenachslager vollst. ROLLER AXLE BEARING	1-08-12.30.61-013		15	Geschwindigkeitsmesser SPEEDOMETER	B2				
1	–	2	2	Rollenachslager, vollst. ROLLER AXLE BEARING	1-08-12.30.61-011		14	Normalachsdeckel STANDARD COVER	B2				
–	–	1	1	Achsgetriebe, kombiniert AXLE GEAR COMBINED	0-50-57.00.61-056		13		812				
1	1	–	–	Achsgetriebe, einfach SINGLE-TYPE AXLE GEAR	0-50-57.00.61-087		12		607				
2	2	2	2	Dichtring A 14×20 COPPER GASKET	DIN 7603	Cu	11		0,005				
2	2	2	2	Verschlußschraube R 1/4" SCREW PLUG	DIN 910	m 55	10		0,02				
6	6	6	6	Sechskantschraube M20×60 HEX. BOLT	DIN 933	m 8 G	9		0,21				
–	3	–	–	Gewindestift THREADED PIN	4-08-12.94.41-002		8		0,06				
–	1	–	–	Sicherungsblech SAFETY PLATE	4-08-12.96.11-012		7		0,15				
2	1	2	2	Sicherungsblech SAFETY PLATE	4-08-12.96.11-011		6		0,15				
–	1	–	–	Druckplatte THRUST PLATE	4-08-12.12.81-007		5		2,5				
1	1	–	–	Druckplatte THRUST PLATE	4-08-12.12.81-006		4		2,7				
1	–	2	2	Druckplatte THRUST PLATE	4-08-12.12.81-005		3		2,2				
2	2	2	2	Vollrad 91+1 SOLID DISC WHEEL	1-08-12.11.15-009		2		375				
1	1	1	1	Treibachswelle DRIVING AXLE-SHAFT	0-08-12.12.14-013		1		265				
×	–	–	–	Treibradsatz, vollst. DRIVING WHEELSET COMPLETE	-040		–	R1	1793				
–	×	–	–	Treibradsatz, vollst. DRIVING WHEELSET COMPLETE	-039		–	R4	1793				
–	–	×	–	Treibradsatz, vollst. DRIVING WHEELSET COMPLETE	-038		–	R3	1997				
–	–	–	×	Treibradsatz, vollst. DRIVING WHEELSET COMPLETE	-037		–	R2	1997				

d	c	b	a	Änderungs-Mitteilung	Tag	Name
				1 Umbaubeschreibung geändert	23.5.86	Kl.

Verwendbar für: 046.322 (021057)

	Tag	Name
Gez.	12.7.	Gr.
Geprüft	22.7.	Kr.

Maßstab 1:5 1:2,5 1:1

Treibradsatz, vollst.
DRIVING WHEELSET COMPLETE

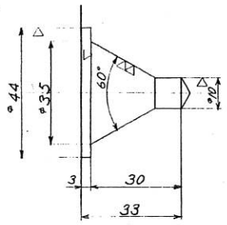
1-08-12.10.46-037 040

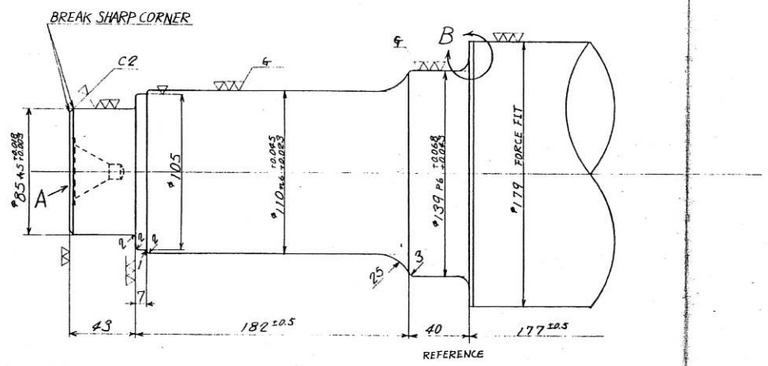
RSR

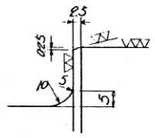
RSR Nº 259.1/1986

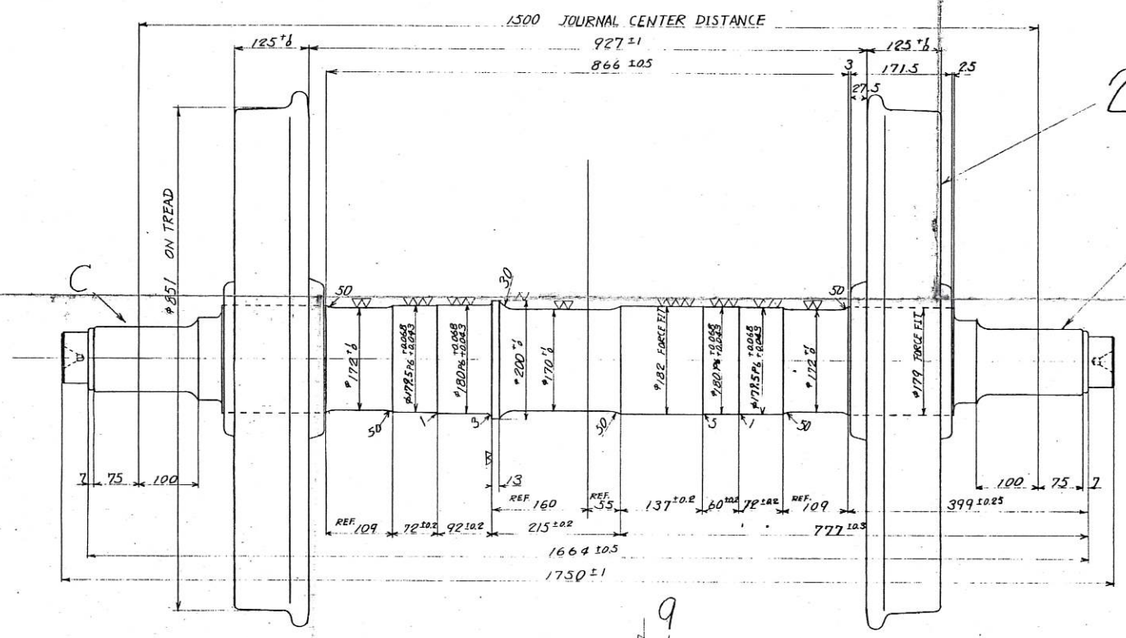
FRIEDL. KRUPP MASCHINENFABRIKEN ESSEN
Abt.: Ko 12

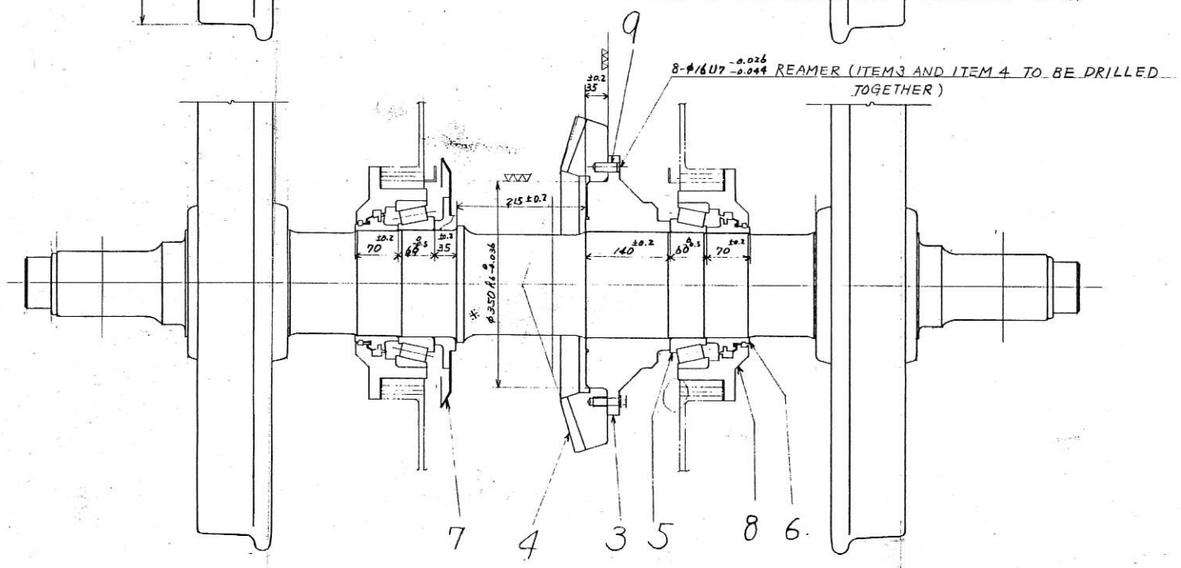
Ersatz für:
Ersetzt durch:











NOTE

1. VARIATION IN THE DIAMETER BETWEEN THE PAIR WHEELS SHOULD BE LESS THAN 1 MM.
2. THE LIMIT OF THE PRESSING FORCE TO FIT WHEELS ON AN AXLE SHALL BE FROM 70 TO 84 TONS (METRIC TONS).
3. THE STAMPING SHALL CONFORM TO THE DRAWING NO. D150-05651.
4. THE LIMIT OF THE PRESSING FORCE TO FIT GEAR BOSS ON AN AXLE SHALL BE FROM 26 ~ 37 TON (METRIC TONS). TAGET INTERFERENCE FROM 0.13 MM TO 0.14 MM.
5. TARGET INTERFERENCE OF KNOCK PIN (ITEM 9) IS FROM 0.02 MM TO 0.3 MM.

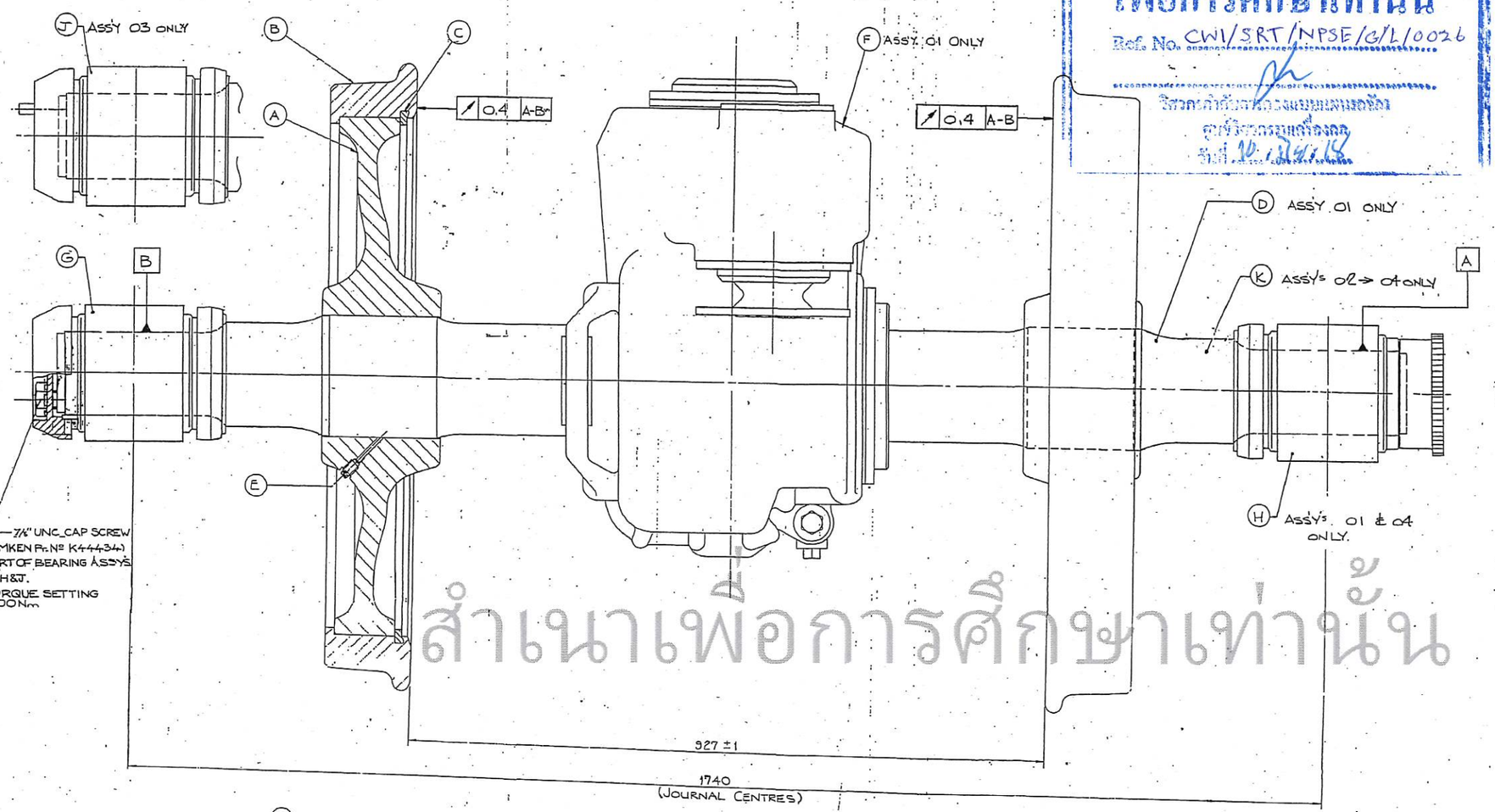
MARKS	NAME OF PARTS	No./SET	MATERIALS	TENSILE STRENGTH & ELONGATION	REMARKS
9	KNOCK PIN	8	S45C		E150-14825
8	BEARING HOUSING OF DRIVING AXLE	2	SC46		GOCO GC 54378
7	OIL RING ASS'Y	1	ASS'Y		GOCO GC 54383
6	SLINGER OF DRIVE SHAFT	2	S45C		GOCO GC 54382
5	TAPER ROLLER BEARING	2	ASS'Y	# 32036	GOCO GO 54385
4	SPIRAL BEVEL GEAR	1	SCM420H		GOCO GC 54380
3	GEAR BOSS	1	S45C		GOCO DWG NO GC 54381, C150-14789
2	WHEEL	2	ASS'Y		B150-14106
1	AXLE	1	AXLE STEEL	55-63 kg/mm² & MIN 22-18% (RSR SPEC NO SM-10/CS031)	

R S R.	WHEELS AND AXLE (D)	SCALES — 1/1, 1/2, 1/5 DIMENSIONS IN MM
USED FOR DRC1101 ~ 1126 CARRIAGES DRE1201 ~ 1264 CARRIAGE AND DRC1201 ~ 1232 (ATS) ATR	REF. DWG. No. B150-14621 TOKYU CAR	APP. _____ EMT. SANCD. _____ SEM.
REMARKS —		DATE 1-1101DRC1-001
DR. _____ CH. _____	CH. _____	

THN. 1/1

DRG NO. 5030368

A·0



สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWI/SRT/NPSE/G/L/0026

สำเนาเพื่อการศึกษาเท่านั้น

ISSUE	GRID REF	ALTERATION	
A		FIRST ISSUE.	MFD
B		MADE UP FOR T3-15b.	
		M & Q COLUMN RE-WRITTEN. BEARING ASSEMBLIES ADDED PICTORIALLY. ITEMS G, H, & K	
	P3	OIL INJECTION GROOVE RE-POSITIONED	MFD
	F5	ITEMS 03 & 04 ADDED.	
	F5	NOTE 7, LAST TURNING DIAMETER WAS Ø799	
		NOTES 9, 10, & 11 REPLACED WITH NEW NOTES	
		NOTE 6 RE-WRITTEN.	
C	1G5	NOTES 7 & 8 CHANGED FROM READING '0.25" TO 0.3	
D	C1	PART SECTION & NOTE ADDED.	MFD
		PART Nºs FOR ITEMS G, H & J ADDED.	

W	X	Y	Z	QUANTITY	REF	DESCRIPTION	CAT./PART NO.	MATERIAL SPEC. ETC.	WT kg
-	1	1	1		K	TRAILER AXLE	111-0117-01		
-	-	1	-		J	BEARING ASSY WITH DRIVING LUG	400-0158-44		
1	-	-	1		H	BEARING ASSY. WITH TOOTHED WHEEL	400-0158-46	-	
1	2	1	1		G	BEARING ASSY WITH CAP.	400-0158-45	-	
1	-	-	-		F	FINAL DRIVE	400-0169-84		
2	2	2	2		E	OIL INJECTION PLUG	859046-01	-	
1	-	-	-		D	POWER AXLE	111-0118-01		
2	2	2	2		C	GIBSON RING	111-0535-01		
2	2	2	2		B	TYRE	111-0114-01	-	
2	2	2	2		A	WHEEL CENTRE	111-0115-01		
▲	▲	▲	▲	1	04	ASSEMBLY OF WHEELSET TRAILER	5030368-04	COMPRISING OF ITEMS A-C, E, G, H & K	
				1	03	ASSEMBLY OF WHEELSET TRAILER	5030368-03	COMPRISING OF ITEMS A-C, E, G, J & K	
				1	02	ASSEMBLY OF WHEELSET TRAILER	5030368-02	COMPRISING OF ITEMS A-C, E, G & K	
				1	01	ASSEMBLY OF WHEELSET POWER	5030368-01	COMPRISING OF ITEMS A-H	

BREL LIMITED

(01) ASSEMBLY OF WHEELSET (POWER) SHOWN

(02) ASSEMBLY OF WHEELSET (TRAILER)

(03) ASSEMBLY OF WHEELSET (TRAILER WITH PROVISION FOR SPEED PROBE)

(04) ASSEMBLY OF WHEELSET (TRAILER WITH PROVISION FOR W.S.P.)

NOTES.

1. WHEELSET ASSEMBLY TO COMPLY WITH THE REQUIREMENTS OF B.S. 5892 PART 6 FOR PASSENGER CARRYING STOCK.
2. WHEELS TO BE SHRINK FITTED TO AXLE.
3. THE CAVITY RESULTING FROM THE WHEEL BOSSES OVERHANGING THEIR RESPECTIVE SEATS SHALL BE FILLED WITH CORROSION RESISTANT MATERIAL ESSO RUSTBAN 324 OR SHELL ENSIS COMPOUND 356 OR SUITABLE ALTERNATIVE
4. ELECTRICAL RESISTANCE TESTS ARE NOT REQUIRED UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
5. OIL INJECTION HOLE PLUG TO BE SECURED FINGER TIGHT TO THREAD END THEN A FURTHER HALF TURN TO LOCK.
6. FOR SUITABLE CORROSION PROTECTION SEE WHEELSET PROCUREMENT SPEC DES/PS/89/080
7. TREAD DIAMETER IS 851 WHEN NEW WITH A FINAL TURNING DIAMETER OF 811 TREAD DIAMETER OF FINISH MACHINED WHEELS ON SAME AXLE SHALL BE WITHIN 0.3 OF EACH OTHER. TREAD PROFILE IS TO RSR DRG. Nº PG1-2151
8. THE MAXIMUM DIFFERENCE BETWEEN DIAMETERS OF ANY WHEEL WITHIN MATCHED WHEELSETS PER BOGIE SHALL NOT EXCEED 0.3 mm.
9. WHEN WHEELSETS ARE TO BE STORED, ALL OUTER SURFACES OF BEARING TO BE GENEROUSLY COATED WITH GREASE AND THEN ENVELOPED WITH A HEAVY GAUGE POLYTHENE BAG WHICH SHOULD BE COMPLETELY SEALED WITH A BROAD ADHESIVE TAPE TO PREVENT INGRESS OF WATER.
10. WHEELSET TO BE EXEMPT FROM DYNAMIC BALANCING.
11. SUFFICIENT MEASURES TO BE TAKEN TO ENSURE IMBALANCE ON WHEELSET DOES NOT EXCEED 0.125 kg m.

THE TOLERANCE ON DIMENSIONS FOR WHICH NO LIMITS ARE GIVEN SHALL BE AS SHOWN BELOW

NOMINAL SIZE	OVER	0	6	30	120	400	1000
	TO	6	30	120	400	1000	2000
MACHINED		± 0.2	± 0.5	± 0.8	± 1.2	± 2	± 3
FABRICATED		± 1	± 1	± 1.5	± 2	± 3	± 4

NOMINAL SIZE	OVER	2000	4000	8000	12000	16000	20000
	TO	4000	8000	12000	16000	20000	
MACHINED		± 4	± 5	± 6	± 7	± 8	± 9
FABRICATED							

UNLESS OTHERWISE STATED:
SCREW THREADS ARE TO BS 3643 CLASS 6H/g
MACHINED SURFACES TO BE N8 (BS 1134)

SHARP EDGES TO BE DEBURRED.
TEMPORARY OR PERMANENT CONNECTIONS OR ATTACHMENTS OTHER THAN THOSE SHOWN ON THE DRAWING ARE NOT PERMITTED WITHOUT THE APPROVAL OF THE ENGINEERING DIRECTOR
BREL LIMITED
DIMENSIONS ARE IN MILLIMETRES.

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THE ENGINEERING DIRECTOR.
BREL LIMITED
ST PETER'S HOUSE, GOWER ST., DERBY, DE1 1AH

PROJECTION DO NOT SCALE

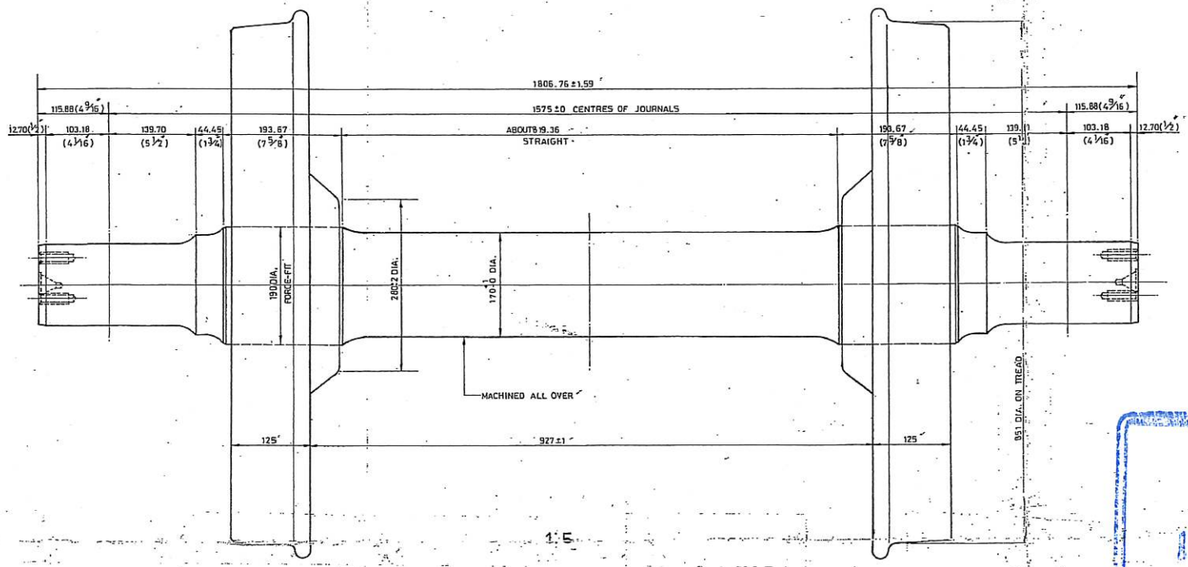
DATE	ORDER	SEE	NO. OF VEHICLES/BOGIES	NUMBERS	CLASS
					T3-15b T3-15A

TITLE
ASSEMBLY OF WHEELSET (POWER & TRAILER)

ISSUE	DATE	DRAWN	CHECK	ENDRS	APPV
D	5/5/90	DP.	PD.B.	TC	
C	21/10/89	AEW/TWE	PD.B.	TC	
B	19/7/88	AEW/TWE	PD.B.	TC	
A	8-5-89	P.D.ELSEY	PD.B.	TC	SD.Jones

DRG NO. 5030368

+2



ล้อพร้อมเพลาตามแผนผังนี้ ใช้การได้กับแคร่โบกี้รถสินค้าพิกัดน้ำหนักกดเพลาบนราง สูงสุด 15 เมตริกตัน ดังนี้ :-

— แคร่ BARBER STABILIZED BOGIE :-

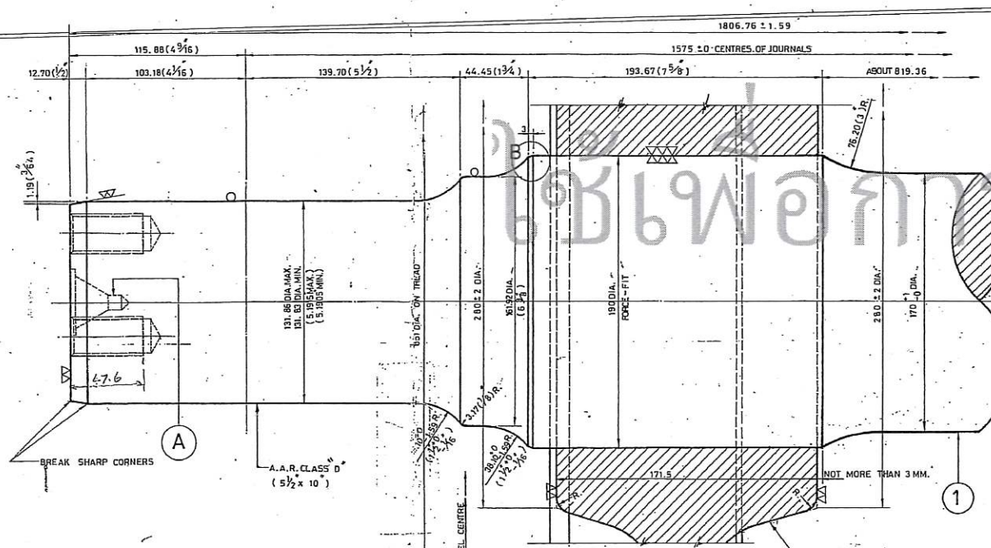
บตญ.	158	คัน
บทต.	60	"
บพท.	20	"
บทต.	40	"
บทค.	60	"
แคร่สำรอง	40	แคร่

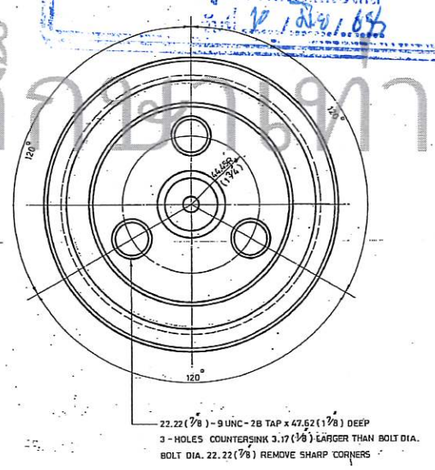
— แคร่ KHM. A-3 RIDE CONTROL BOGIE :-

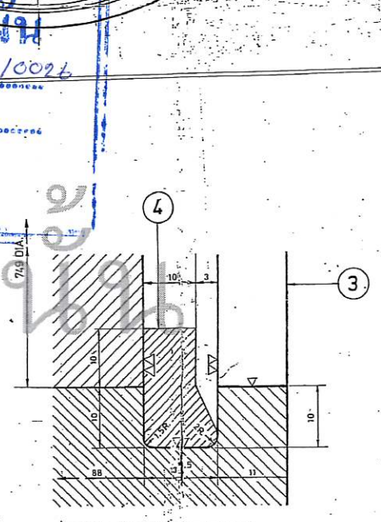
บทก.	72	คัน

ฯ ล ฯ.

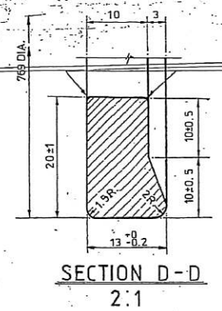
สำเนา
เพื่อการศึกษาเท่านั้น
Doc. No. CWI/SRT/NPSE/G/L/0026
วิทยาลัยเทคนิคกรุงเทพมหานคร
ศูนย์วิทยบริการ
วันที่ 12 / มิ.ย. / 68



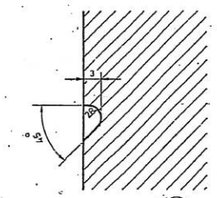




DETAIL SHOWING THE FIXING OF GIBSON RING BEFORE BEADING
2:1

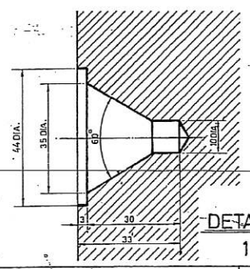


SECTION D-D
2:1

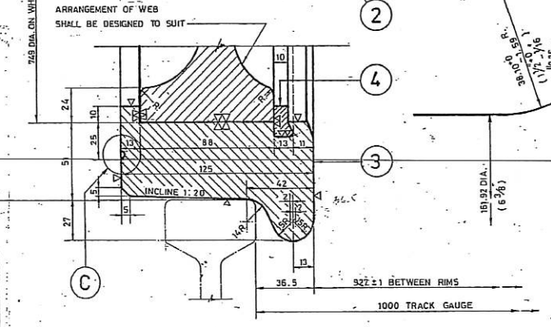


DETAIL (C)
2:1

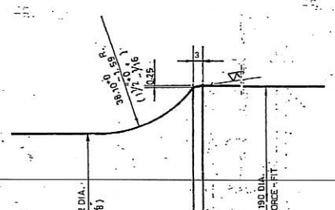
FOR GUIDANCE ONLY



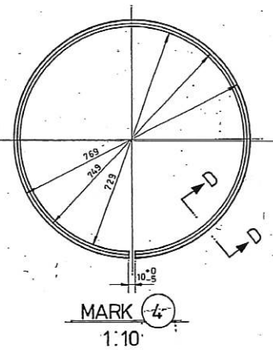
DETAIL (A)
1:1



1:2



DETAIL (B)
1:1



MARK (4)
1:10

NOTE:-

1. THE LIMIT OF THE PRESSING FORCE OF MOUNTING WHEELS ON AN AXLE SHALL BE FROM 70 TO 80 TONS (METRIC-TONNES)
2. THE STAMPING SHALL CONFORM TO THE RSR. DRAWING Nº LV19-2017/2
3. VARIATION IN THE DIAMETER BETWEEN THE PAIR OF WHEELS NOT MORE THAN 1 MM.
4. MACHINE TOLERANCE, WHERE NOT DESCRIBED, SHALL BE GIVEN TO SUIT MANUFACTURING PRACTICE
5. INCH EQUIVALENT IS ACCEPTABLE

MARKS	NAME OF PARTS	Nº SET	MATERIALS	TENSILE STRENGTH & ELONGATION	REMARKS
4	GIBSON RING	2	MILD STEEL	39-47 KG./MM² & MIN. 26% (BS.24: PART6: 1925, GRADE 622)	THIS DRAWING OR DWG. Nº LV1-2005/5
3	WHEEL TYRE	2	STEEL	88-98 KG/MM² & MIN. 10-8% (RSR. SPEC. Nº SM.-13/2503/1)	THIS DRAWING OR DWG. Nº LV1 — 2032/3
2	ROLLED DISC WHEEL CENTRE	2	STEEL	52-63 KG/MM² & MIN. 22-15% (RSR. SPEC. Nº SM.-11/2503)	THIS DRAWING
1	AXLE	1	AXLE STEEL	55-63 KG/MM² & MIN. 22-18% (RSR. SPEC. Nº SM.-10/2503/1)	THIS DRAWING

▽ = ROUGH MACHINED ▽▽ = FINISHED MACHINED ▽▽▽ = FINE FINISHED MACHINED D = GROUND SURFACE ⌒ = HAND FINISHED

R S R.

WHEELS & AXLE (TYPE V AP) WITH RETYRING ROLLED DISC WHEELS FOR ROLLER BEARING

SCALES:- 1:1, 1:1.5, 1:10, 2:1

DIMENSIONS IN MM.

USED FOR	REF. DWG. Nº
BOGIE GOODS WAGONS (15 M.TONS MAX. AXLE LOAD ON RAIL, AAR. STANDARD CLASS "D" 5½"x10")	0231/73/162

REMARKS:- เขียนขึ้นเพื่อใช้ในการจัดหาล้อเดี่ยวสามใส่รางรถไฟ ฉนวงเทา - สีเทา

CR. CH. CH.

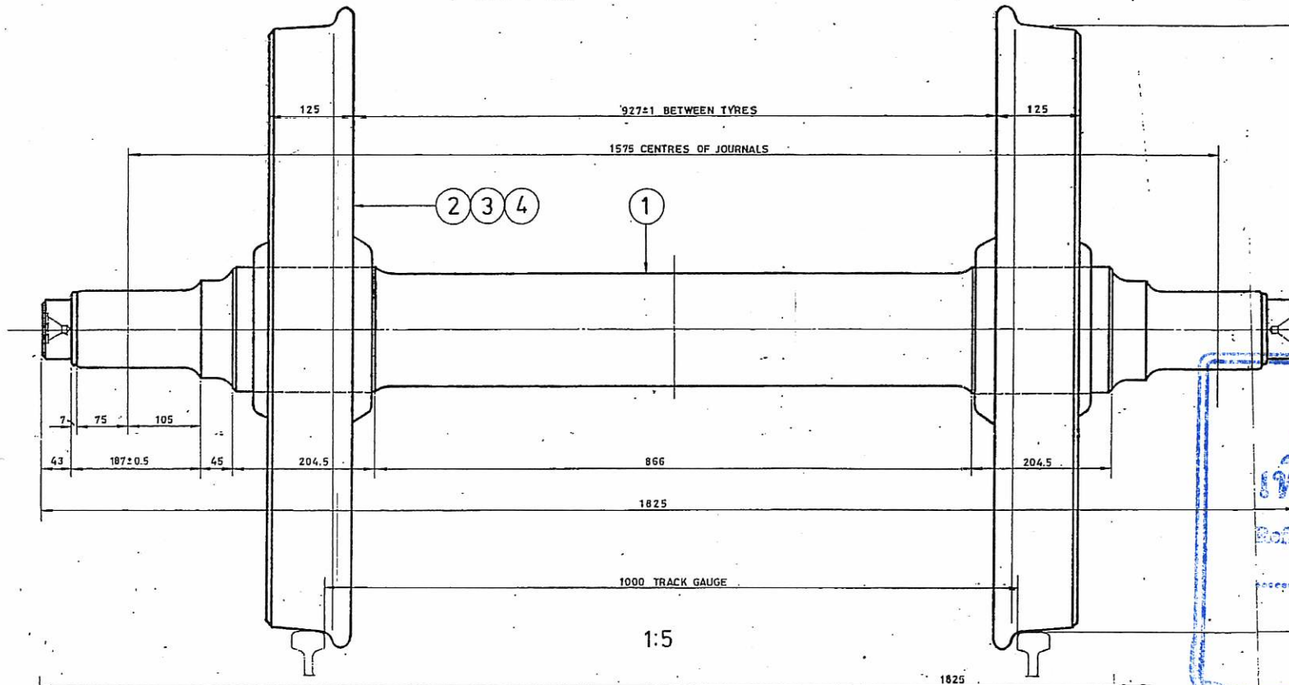
APP. EMT. SEM. SANCO. CME.

DATE 17-4-24

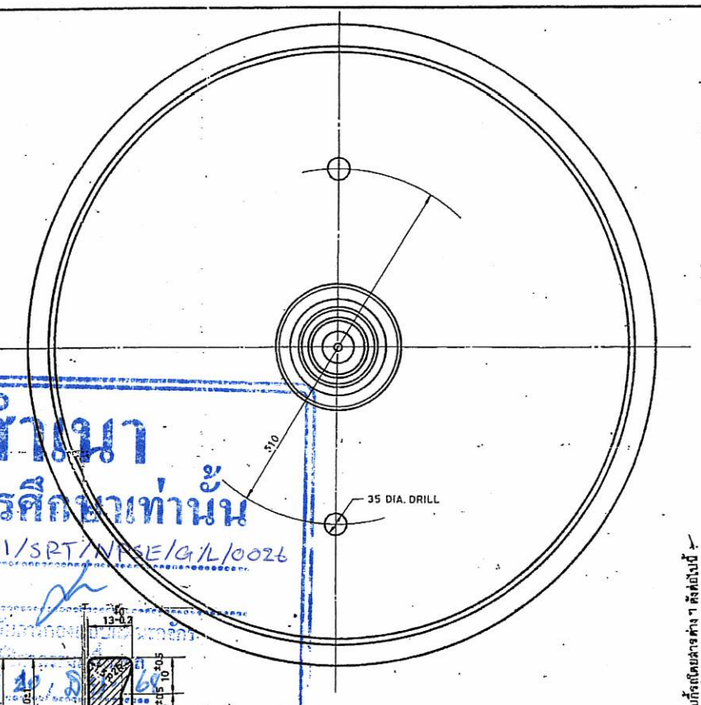
G1 - 2257/1

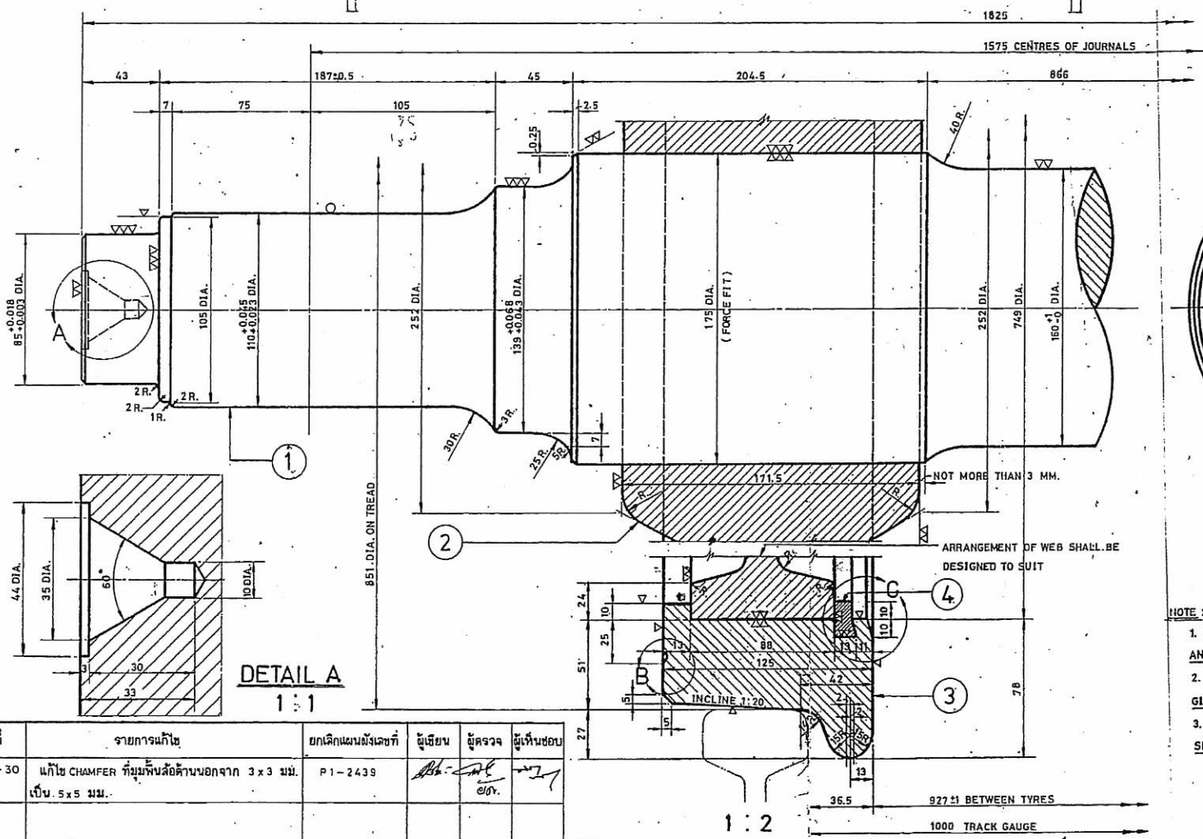
วันที่	รายการแก้ไข	ยกเลิกแผนผังเลขที่	ผู้เขียน	ผู้ตรวจ	ผู้เห็นชอบ
13-1-30	แก้ไข CHAMFER ที่มุมหึ้นล้อด้านนอกจาก 3 x 3 มม. เป็น 5 x 5 มม. และเพิ่มความหนาที่ขอบของ WHEEL - CENTRE จาก 21 มม. เป็น 24 มม.	G1-2257			

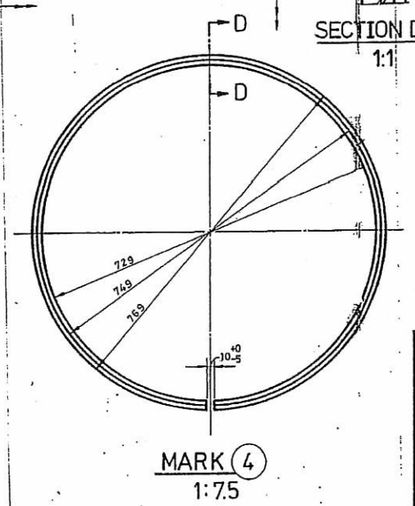
ใช้เพื่อการศึกษาเท่านั้น

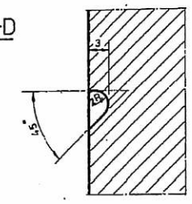


1:5

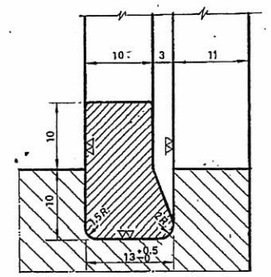








ENLARGED AT B
2:1



ENLARGED AT C
SHOWING THE FIXING OF GIBSON RING BEFORE BEADING

4	GIBSON RING	2	STEEL	39–47 Kg/mm² & 26 % min. (BS24:PART6:1957 : GRADE 622)	THIS DRAWING OR Dwg. №. LV1–2005/5
3	WHEEL TYRE	2	STEEL	88–98 Kg/mm² & 10–8 % min. (RSR. SPEC. №. SM-13/2503/1)	THIS DRAWING OR Dwg. №. LV1–2032/3
2	ROLLED DISC WHEEL CENTRE	2	STEEL	52–63 Kg/mm² & 22–15 % min. (RSR. SPEC. №. SM-11/2503)	LATEST REVISION OR RSR. APPROVED EQUAL
1	AXLE	1	AXLE STEEL	55–63 Kg/mm² & 22–18 % min. (RSR. SPEC. №. SM-10/2503/1)	LATEST REVISION OR RSR. APPROVED EQUAL
MARKS	NAME OF PARTS	№/SET	MATERIALS	TENSILE STRENGTH & ELONGATION	REMARKS

▽ ROUGH MACHINED ▽▽ FINISHED MACHINED ▽▽▽ FINE FINISHED MACHINED ○ GROUND SURFACE

R S R.

WHEELS & AXLE
WITH RETYRING ROLLED DISC WHEELS FOR CYLINDRICAL TYPE ROLLER BEARING

SCALE: 1:7.5, 1:5, 1:2, 1:1, 2:1
DIMENSIONS IN MM.

USED FOR	REF. DWG. №.
PASSENGER CARRIAGES WITH JNR. DESIGN BOGIES (AXLE LOAD ON RAIL 12 M. TONS)	1–6PH2–002A

REMARKS: จัดทำขึ้นเพื่อใช้ในการจัดซื้อแคร่โบกี้ สำหรับรถโดยสารตามโครงการฯ ปี 2520–2524

APP. EMT.
SANCD. SEM.
DR. CH. CH.
DATE 8-2-21
Dwg.№. P1-2439/1

วันที่	รายการแก้ไข	ยกเลิกแผนผังเลขที่	ผู้เขียน	ผู้ตรวจ	ผู้เห็นชอบ
13-1-30	แก้ไข CHAMFER ที่มุมพื้นล้อด้านนอกจาก 3 x 3 มม. เป็น 5 x 5 มม.	P1-2439			

NOTE :-
1. THE LIMIT OF PRESSING FORCE OF MOUNTING WHEEL ON AN AXLE SHALL BE FROM 70 TO 84 METRIC TONS.
2. MACHINE TOLERANCE, WHERE NOT DESCRIBED SHALL BE GIVEN TO SUIT MANUFACTURING PRACTICE.
3. STAMPING FOR IDENTIFICATION ON THE WHEELS AND AXLE SETS SHALL BE DONE TO RSR. Dwg. №. LV19–2017/2

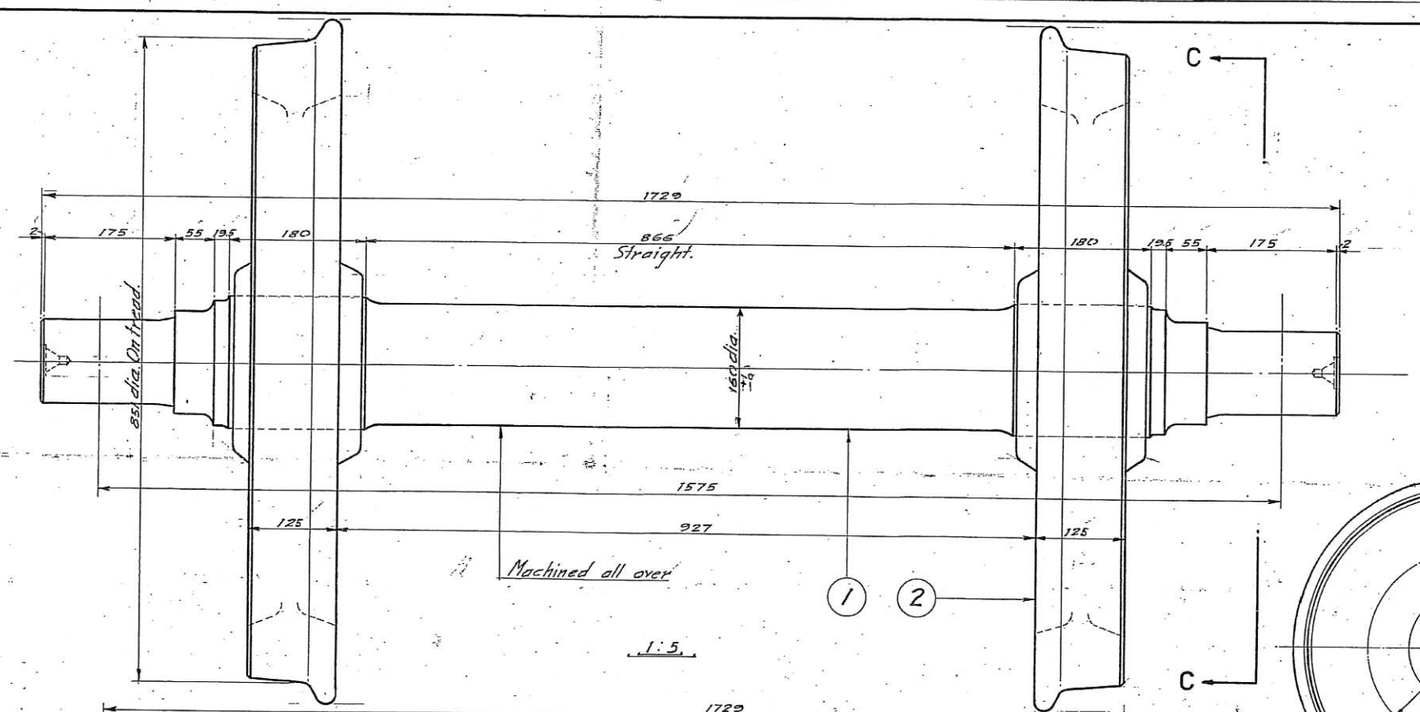
40	แผ่น	BTV. 1001-1002	4
60	"	BSC. 1001-1002	4
72	"	แผ่น TB-65	24
12	"	" KD-213(ARS.2)	2

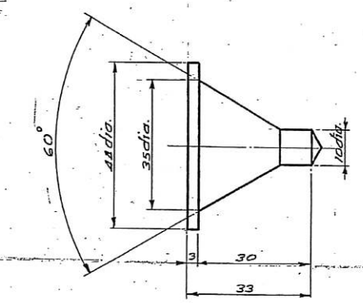
150	แผ่น	KHM-L	100
266	"	KHM-L2	68
100	"	KHM-L2A	32
260	"		

แผ่น	PC-26		
"	PC-26A		
"	TS-209		
"	KW-20		

สำเนา
เพื่อการศึกษาเท่านั้น
Doc. No. CW1/SRT/NBSE/G/L/0026

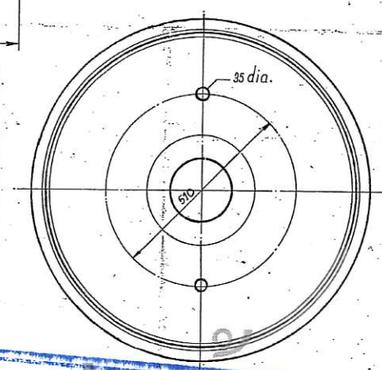
ลำดับที่	รายการแก้ไข	ยกเลิกแบบดังเลขที่	ผู้เขียน	ผู้ตรวจ	ผู้อนุมัติ
	1. ขยายความกว้างของมงผลู้อจาก 121 มม. เป็น 125 มม. 2. แก้ไข CHAMFER ที่มุมมงผลู้อด้านนอกจาก 5×5 มม.เป็น 3×3 มม. 3. กำหนดให้เจาะรู ø 35 มม. ทะลุหลู้อ 4. กำหนด RSR. SPEC ของวัสดุเพิ่มเติม 5. แก้ไขเลขที่แบบผนังจาก BW 16/1 เป็น PG1-2106	BW.16/1			

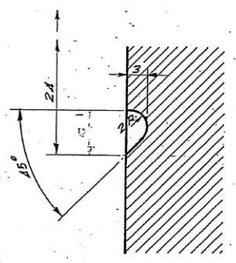




DETAIL (A)

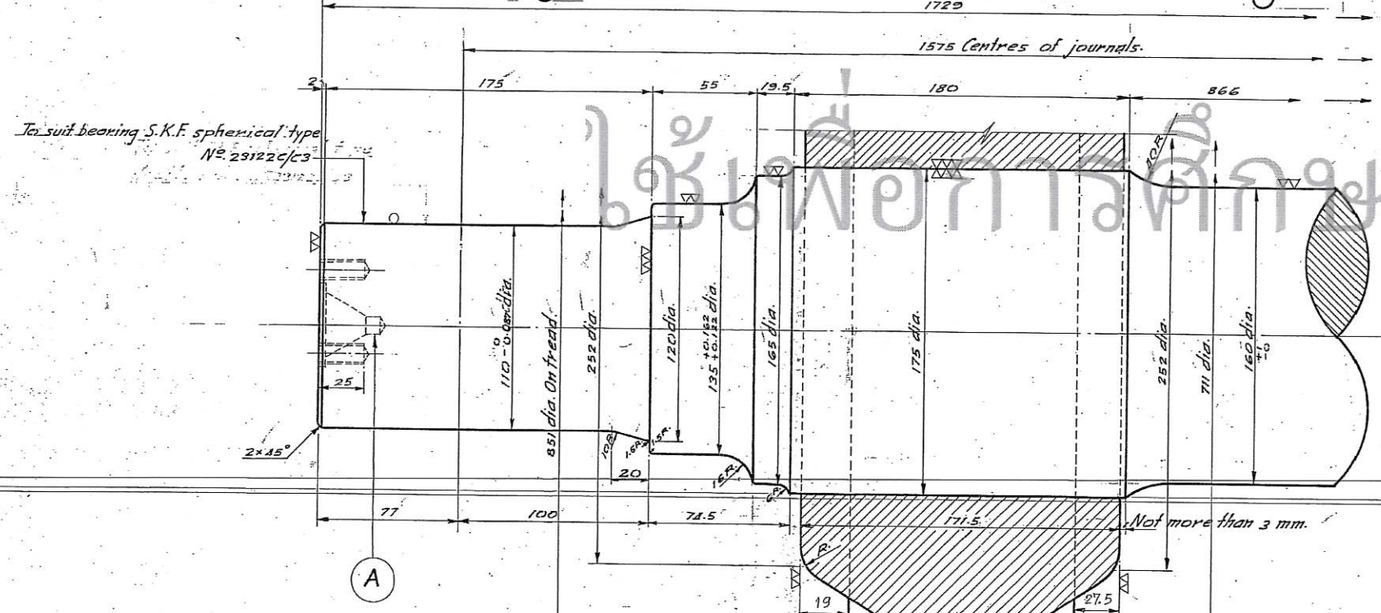
1:1

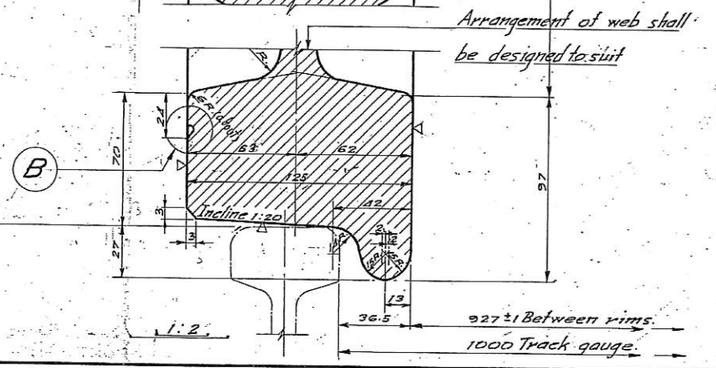




DETAIL (B)

2:1





Note:-

(1) The limit of the pressing force of mounting wheels on an axle shall be from 70 to 82 tons (Metric ton)

(2) Machine tolerance, where not described shall be given to suit manufacturing practice.

(3) For stamping wheels & axle see Drg. No. LV19-2017/2

(2)	Solid rolled steel wheels	2	Steel	RSR. SPEC. No SM-13/2503	Lastest revision or RSR. approvved equal.
(1)	Axle	1	Axle steel.	RSR. SPEC. No SM-10/2503/1.	
Marks.	Name of parts.	No set	Materials	Tensile strength & elongation	Remarks.

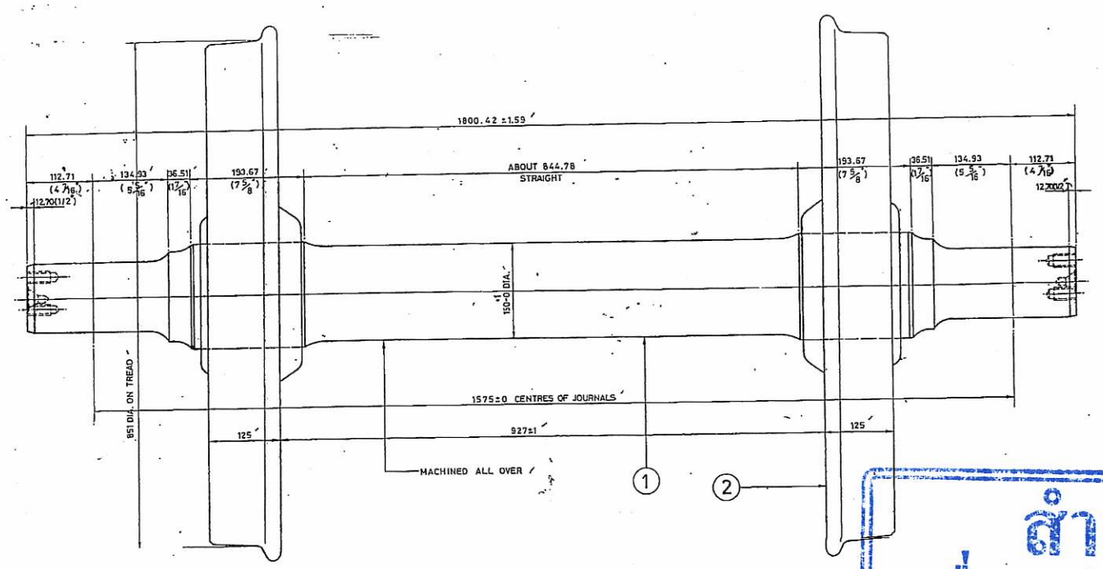
▽ = Rough machined. ▽▽ = Finished machined. ▽▽▽ = Fine finished machined. ○ = Ground surface.

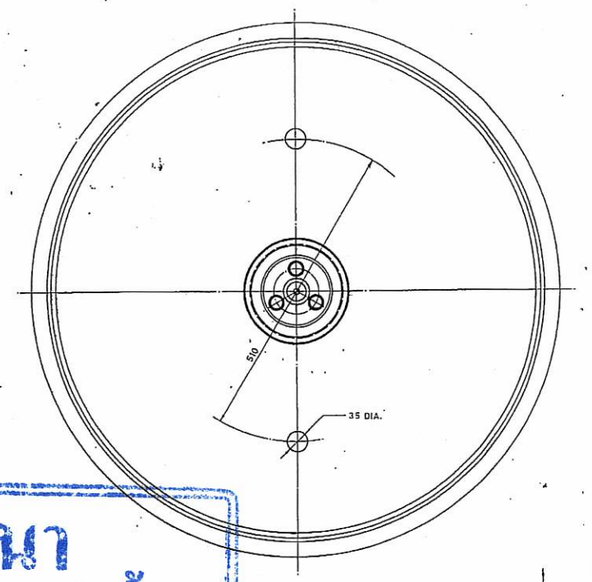
R.S.R.	WHEELS & AXLE FOR SPHERICAL TYPE ROLLER BEARING	Scale 1:5, 1:2, 1:10, 1:1, 2:1 Dimensions in mm.
Used for: Goods wagons & Bogie carriages. Axle load 12 m.tons.	Ref. Drg. No.	Drawn / App. / Sanctd.
Remarks:-		Date 21-9-08
Dr.	Ch.	Ch.

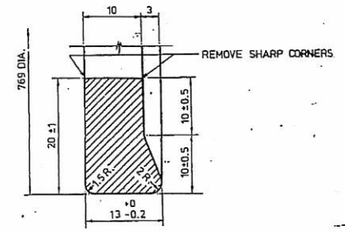
PG1-2106

BW 16/1

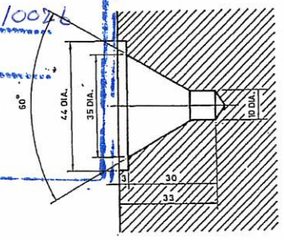
ใช้เพื่อการศึกษาเท่านั้น
สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CW-03/RT/1/PSE/01/L/0026



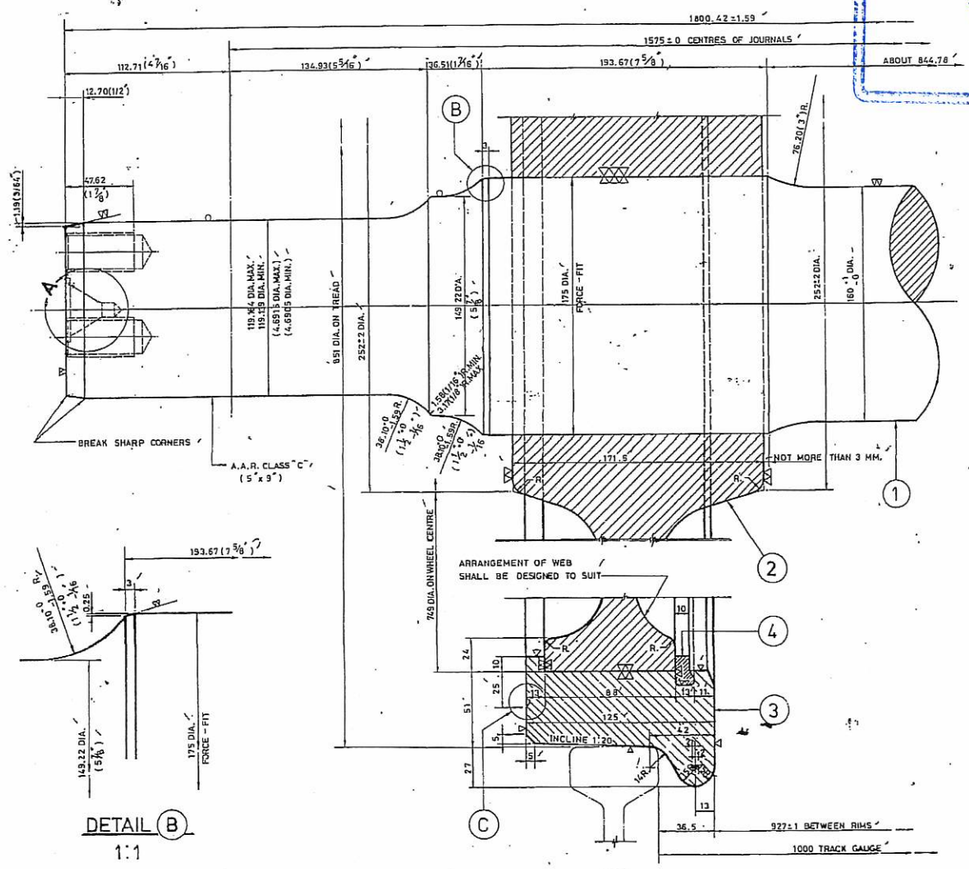




SECTION D-D
2:1

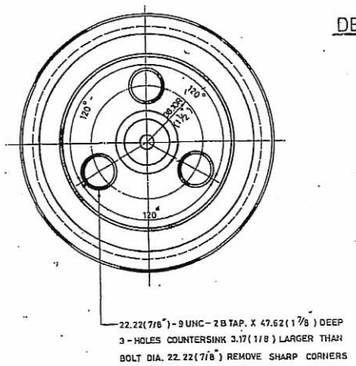


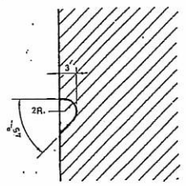
DETAIL (A)
1:1



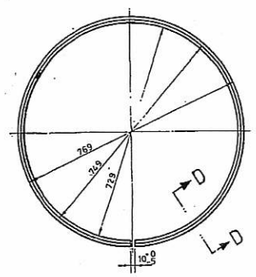
1:2

DETAIL (B)
1:1

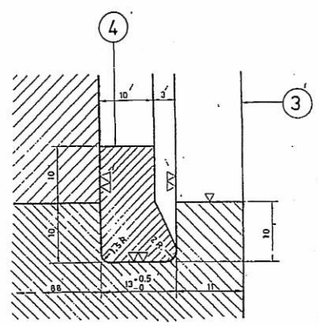




DETAIL (C)
2:1



MARK (4)
1:10



DETAIL SHOWING THE FIXING OF GIBSON RING BEFORE BEADING
2:1

NOTES:-

1. THE LIMIT OF THE PRESSING FORCE OF MOUNTING WHEELS ON AN AXLE SHALL BE FROM 70 TO 84 TONS (METRIC - TONNES)
2. THE STAMPING SHALL CONFORM TO THE RSR. DRAWING Nº LV19 - 2017/2
3. VARIATION IN THE DIAMETER BETWEEN THE PAIR OF WHEELS NOT MORE THAN 1 MM.
4. MACHINE TOLERANCE, WHERE NOT DESCRIBED SHALL BE GIVEN TO SUIT MANUFACTURING PRACTICE

หมายเหตุ :-

ล้อพร้อมเพลาตามแผนผังนี้ ใช้กับแคร่โบกี้ที่มีเพลาล้อขนาดใหญ่ เส้น ๑๐ บนท. 21 คัน, บนทป. 36 คัน, บนท. 17 คัน และแคร่กาหี่ (KHM-L,M) 36 แห่ง เป็นต้น และใช้กับกับรอยรับค้ำ 4 อัน ซึ่งต้องบรรทุก 15 เมตริกตัน ที่จะดัดแปลงล้อพร้อมเพลาชนิดใช้ PLAIN BEARING ให้เป็นชนิดใช้ AXLE ROLLER-BEARING (A.A.R. CLASS "C") ได้ด้วย.

PG1-2151

MARKS	NAME OF PARTS	Nº SET	MATERIALS	TENSILE STRENGTH & ELONGATION	REMARKS
4	GIBSON RING	2	MILD STEEL	39-47 KG/MM² & MIN. 26% (BS.24: PART 6 1975, GRADE 622)	THIS DRAWING OR DWG. Nº [illegible]
3	WHEEL. TYRE	2	STEEL	88-98 KG/MM² & MIN. 10-8% (RSR. SPEC. NSSM-1212503(1))	THIS DRAWING OR DWG. Nº [illegible]
2	ROLLED DISC WHEEL CENTRE	2	STEEL	52-63 KG/MM² & MIN. 22-15% (RSR. SPEC. Nº SM-1212503)	THIS DRAWING OR DWG. Nº [illegible]
1	AXLE	1	AXLE STEEL	55-63 KG/MM² & MIN. 19-17% (RSR. SPEC. Nº SM-1212503(1))	THIS DRAWING

⌓ = HAND FINISHED | ▽ = ROUGH MACHINED | ▽▽ = FINISHED MACHINED | ▽▽▽ = FINE FINISHED MACHINED | ⌒ = GEOMETRICAL TOLERANCE

RSR.

WHEELS & AXLE (TYPE [illegible]) WITH RETYRING [illegible] WHEELS FOR ROLLER BEARING

SCALE 1:5, 1:10, 2:1

DIMENSIONS IN MM.

USED FOR	REF. DWG.
CARRIAGES AND WAGONS (14.0 M.TONS. MAX. AXLE LOAD ON RAIL, AAR. STANDARD CLASS "C" 5"x9")	P2-1225 (JOURNAL BOX ASSEMBLY) [illegible]/98/62

REMARKS:- ออกแบบขึ้นโดยกำหนด JOURNAL ตาม A.A.R. STANDARD CLASS "C" (5"x 9") เพื่อใช้แทนรายการจำเพาะการจัดหาแคร่โบกี้สำหรับรถโดยสารจำนวน 36 แห่ง ปี พ.ศ. 2528

DR. [illegible] CH. [illegible] CH. [illegible]

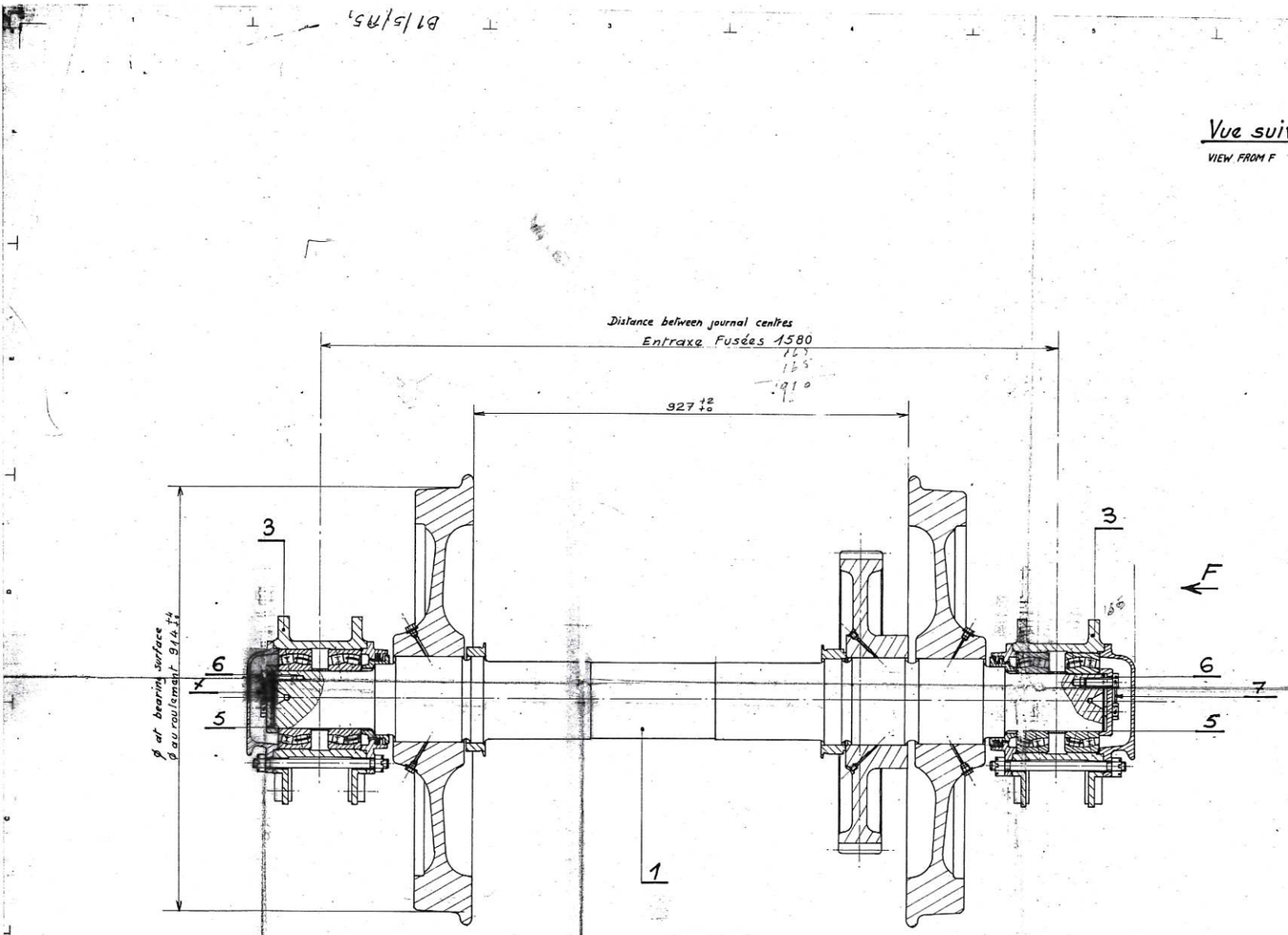
APP. [illegible]

SANCD. [illegible]

DATE 29-10-[illegible]

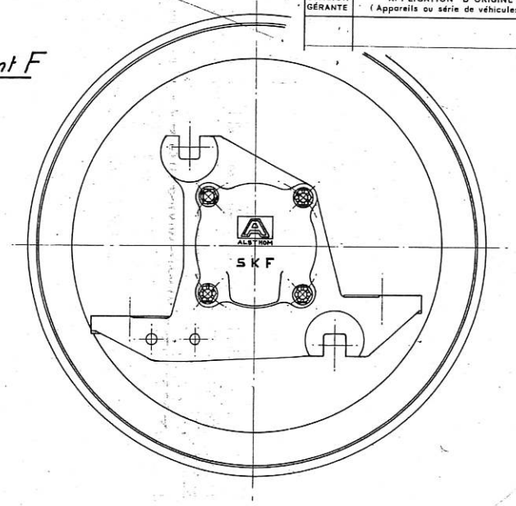
PG1-2151

สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWI/SRT/NPSE/G/L/0076
วิทยาลัยเทคนิคการขนส่งทางราง
ศูนย์วิชาการเครื่องกล
วันที่ 10 ส.ค. 68



Vue suivant F

VIEW FROM F



DIVISION GÉRANTE	APPLICATION D'ORIGINE (Appareils ou série de véhicules)	Nº DU DESSIN D'ENSEMBLE

Couple de serrage des Vis Rep 6 = 11,9 m daN

Screw tightening torque, item 6 = 11,9 m daN

Roller bearing stop 404569

Arrêt de roulement 404569

PIÈCES NUMÉROS CONSTRUCTEURS	DESSINS	REPÈRES	NOMBRE DE PIÈCES	DÉSIGNATION DES PIÈCES	MATIÈRES, NORMES, DESSINS SPÉCIFICATIONS TECHNIQUES	MASSES UNITAIRES EN Kg
		15				
		14				
		13				
		12				
		11				
		10				
		9				
		8				
		7	2	Fil frein Ø1,8 Long^r 450	Fil acier ST93	0,01
	8021231-332	6	6	Vis HM 20 - 60T (tête percée	classe 6.6 E27311	0,185
	6018274 Rep 1	5	2	Bague d'arrêt		
		4				
	REP 101 9006994	3	2	Boîte essieu normale		
		2				
	8023695	1	1	Essieu complet extrême		

DATES	NOMS	ALSTHOM 38, AVENUE KLEBER - 75 - PARIS (16e)
ÉTABLI	ALSTHOM	
DESSINÉ 12-3-71	HIVERT	TR 8025132
VÉRIFIÉ		
TOLÉRANCES GÉNÉRALES F1 00010	ÉCHELLE 0,2	ESSIEU BOITE NORMAL
COMPLÉTÉ		SNCF
VÉRIFIÉ		
HOMOL.		

MODIFICATIONS CONSTRUCTEURS

MODIFICATIONS S.N.C.F.

Drawing number	Qty required	Items	Symbols	Designation	Unit weight	Material of reference drawings	Tech. spec.	Standard spec.
		67						
		66						
		65						
		64						
		63						
		62						
		61						
		60						
		59						
		58						
		57						
		56						
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		15						
		14						
		13						
		12						
		11						
		10						
		9						
		8						
	2	7		Lock-wire Ø 1,8 - Length 450	0,01	Bright steel wire Class 6.6 E 27.311		93
	6	6		Screw HM 20 - 60 T (drilled head)	0,185			
Item 1 Ø 018 274	2	5		Stop ring				
		4						
Item 101 Ø 006 994	2	3		Standard axle-box				
		2						
Ø 023 695	1	1		End axle assembly				

Scale

STANDARD AXLE AND AXLE-BOX ASSEMBLY

Date

Dra

Ver

Methods

8025132

Symbols | Total | Material | Technical specs | Standard specs

Models

Revisions

8025132

RSR ②

Loco Series AD 2400 D1

Ord. number N°3198 12 March 1973

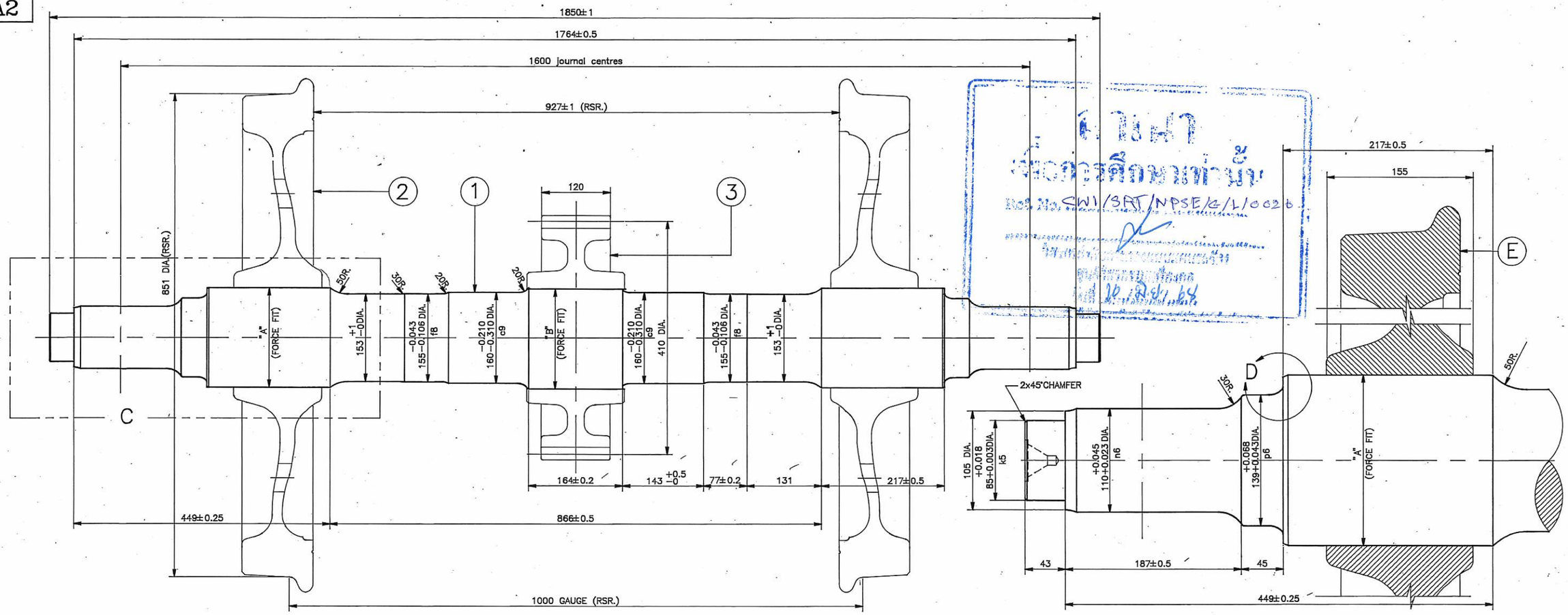
n. 5

ALSTHOM
38, AVENUE KLÉBER - 75 - PARIS (16e)
TÉL. PARIS (1) 727.77.79

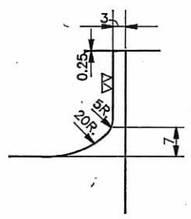
TR. 8025132

สำเนา
เพื่อการศึกษาเท่านั้น
Ref. No. CWI/SRT/NPSE/G/L/0026
วันที่ ๒๑ ม.ค. ๖๔

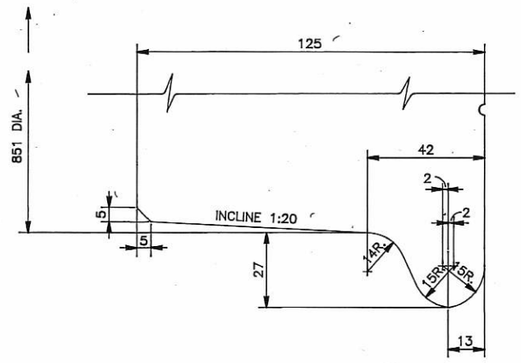
A2



DETAIL AT (C)
1:3



DETAIL (D)
1:1



DETAIL AT (E)
RSR. WHEEL CONTOUR
1:1.5

หมายเหตุ

1) แผนผังนี้แสดงมิติการประกอบเพลากำลังที่จัดหาใหม่กับล้อและเฟืองขับที่ถอดจากเพลาล้อ JR-WEST ของเดิม
2) เพลาที่จัดหาใหม่ตามแผนผังนี้สามารถประกอบใช้งานกับล้อตามมาตรฐานของการรถไฟฯได้ด้วย

แคร่แบบ (BOGIE TYPE)	มิติเป็นมิลลิเมตร "A"	"B"
DT 22A	167DIA.	168DIA.
DT 22C	175DIA.	176DIA.

MARKS	NAME OF PARTS	NO/SET	MATERIALS	TENSILE STRENGTH&ELONGATION	REMARKS
(3)	REVERSING GEAR	1	S45C		
(2)	WHEELS	2	ASS'Y		JR-WEST
(1)	AXLE	1	AXLE STEEL	RSR.SPEC. No.SM10/2503/1 55–63kgs/mm & 22–18%min	LASTEST REVISION OR RSR. APPROVED EQUAL

⌒ = HAND FINISHED ▽ = ROUGH MACHINED ▽▽ = FINISHED MACHINED ▽▽▽ = FINE FINISHED MACHINED ○ = GROUND SURFACE

RSR.

WHEELS & AXLE REGAUGING

SCALES 1:1,1:1.5,1:3,1:5

DIMENSIONS IN mm

USED FOR	REF. DWG. No.
BOGIE TYPE DT22A,DT22C (DRIVING WHEELS) JR–WEST DIESEL RAILCARS KIHA 28 & KIHA 58	JR–W DWG.NO. DD4663 JRW–DR2–0008

APP _____ EMT.

SANCD. _____ SEM.

REMARKS: จัดทำขึ้นตามบันทึก ญกง. ลงวันที่23พย.41 ท้ายบันทึกกองซ่อมบำรุงรถดีเซลรางเขตกรุงเทพ เลขที่ วซร.236/ว.44/2541 ลงวันที่ 27ตค.41

DR. _____ CH. _____ CH. _____

DATE 18/2/42

JRW–DR2–0009