BAB V

KESIMPULAN DAN SARAN

5.1 KESIMPULAN

Sebelum dilakukan kesimpulan dari Tugas Akhir ini, maka akan dilakukan pengumpulan dari pengolahan data yang akan disajikan dalam bentuk tabel, sehingga memudahkan untuk melihat perbandingan yang telah dilakukan pada pengolahan data. Ada beberapa hal yang dapat disimpulkan dari hasil analisis dan pembahasan persoalan keandalan suku cadang mesin tenun dan pengendalian persediaan suku cadang prioritas yang optimal.

Tabel 5.1 Ringkasan Pengolahan Data

PARAMETER	PROJECTILE	PROJECTILE RETURNER	BRAKE BAND CONE
α	2.4395	3.1641	3.7
λ	0.0037	0.0034	0.00324
a	76	69	64
μ	38	34	32
Q OPTIMAL	41	37	36
r OPTIMAL	54	49	46
s OPTIMAL	16	15	14
TC OPTIMAL	Rp. 353.801,74	Rp. 360.268,68	Rp. 305.127,18
TP OPTIMAL	0.9999	0.9999	0.9999
KEANDALAN	0.142993	0.163074	0.186697

Kesimpulan tersebut adalah :

1. Dari sekian banyak suku cadang yang diganti maka akan dilakukan pemilihan suku cadang prioritas dengan menggunakan metode analisa pareto. Hasil dari analisa pareto didapatkan tiga suku cadang prioritas berdasarkan jumlah modal terserap. Adapun suku cadang tersebut adalah projectile, projectile returner dan brake band cone.
2. Harga-harga parameter untuk masing-masing suku cadang adalah :
   - Projectile mempunyai parameter skala = 0,0037 dan parameter bentuk = 2,4395

- Projectile Returner mempunyai parameter skala = 0,0034 dan parameter bentuk = 3,1641
- Brake Band Cone mempunyai parameter skala = 0,00324 dan parameter bentuk = 3,7

5. Kebutuhan suku cadang projectile sebesar 75 buah dan tingkat keandalannya 0,142993. Untuk ekspektasi kebutuhan suku cadang projectile returner sebesar 69 buah dan tingkat keandalannya 0,163074. Sedangkan untuk ekspektasi kebutuhan suku cadang brake band cone sebesar 64 buah dan tingkat keandalannya 0,186697.
6. Biaya yang dikeluarkan dalam sistem persediaan untuk suku cadang projectile sebesar Rp. 353.801,74. Untuk suku cadang projectile returner sebesar Rp. 360.268,68. Sedangkan untuk suku cadang brake band cone sebesar Rp. 305.127,18 dan tingkat ketersediaan semua suku cadang digudang sebesar 0,9999 atau 99%.
7. Penghematan yang dapat ditekan untuk suku cadang prioritas antara model yang sudah ada di perusahaan dengan analisis penulis sebesar Rp. 49.912,4
8. Ketiga suku cadang tersebut dianggap cukup vital dalam pengoperasian mesin tenun, karena apabila ada kerusakan pada

suku cadang prioritas maka mesin tenun dapat dinyatakan tidak layak untuk memproduksi karung.

7. Semakin tinggi tingkat keandalannya, maka semakin kecil kebutuhan suku cadang yang dibutuhkan, begitu juga sebaliknya.

5.2 SARAN

1. Hasil penelitian ini akan lebih baik apabila ditunjang dengan data yang lebih lengkap, untuk itu pihak perusahaan diharapkan selalu menyimpan dengan rapi data-data yang selalu berhubungan dengan kegiatan operasi yang berada didalam lingkup pengoperasionalan perusahaan.
2. Hasil dari penelitian ini dapat juga dilakukan pada suku cadang yang lainnya, semakin banyaknya suku cadang yang dikendalikan persediaan semakin rendah total ongkos yang dikeluarkan.

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LAMPIRAN A :
UJI KECUKUPAN DATA

PENGUJIAN KECUKUPAN DATA PT. PUPUK KUJANG

Suku cadang

Projectile

Sub-grup	DATA											Jumlah	Rata-rata	Jml kwadrat
1	222.00	210.00	209.00	185.00	178.00	168.00	166.00	133.00	40.00	264.00	238.00	2002.00	182.00	398872.00
2	276.00	289.00	300.00	311.00	315.00	261.00	260.00	269.00	223.00	230.00	236.00	2959.00	269.00	806219.00
												4961.0		1205091.00

UJI KECUKUPAN DATA

Jumlah data (N)	=	22
Jumlah data subgrup (n)	=	11
Jumlah kelas	=	2
Data terbesar	=	315
Data terkecil	=	40
Rata-rata	=	225.5
Std dev	=	64.14
α	=	0.05
Z	=	2
s	=	0.15
Std(x)	=	19.34
Z x Std(x)	=	38.68
N	=	22
N'	=	13.73
Data	=	CUKUP

PENGUJIAN KECUKUPAN DATA PT. PUPUK KUJANG

Suku cadang

Projectile Returner

Sub-grup	DATA											Jumlah	Rata-rata	Jml kwadrat
1	226.00	200.00	196.00	192.00	183.00	187.00	132.00	115.00	100.00	228.00	232.00	1970.00	179.09	373600.00
2	319.00	327.00	330.00	337.00	346.00	353.00	316.00	234.00	260.00	284.00	315.00	3411.00	310.09	1072477.00
												6381.0		1446277.00

UJI KECUKUPAN DATA

Jumlah data (N)	=	22
Jumlah data subgrup (n)	=	11
Jumlah kelas	=	2
Data terbesar	=	353
Data terkecil	=	100
Rata-rata	=	244.6
Std dev	=	78.72
α	=	0.05
Z	=	2
s	=	0.15
Std(x)	=	23.73
Z x Std(x)	=	47.47
N	=	22
N'	=	17.58
Data	=	CUKUP

PENGUJIAN KECUKUPAN DATA PT. PUPUK KUJANG

Suku cadang

Brake Band Cone

Sub-grup	DATA											Jumlah	Rata-rata	Jml kwadrat
1	224.00	221.00	210.00	150.00	135.00	95.00	230.00	275.00	273.00	269.00	268.00	2350.00	213.64	540100.00
2	310.00	294.00	305.00	308.00	291.00	285.00	280.00	279.00	241.00	246.00	265.00	3104.00	282.18	881394.00
												5454.0		1421500.00

UJI KECUKUPAN DATA

Jumlah data (N)	=	22
Jumlah data subgrup (n)	=	11
Jumlah kelas	=	2
Data terbesar	=	310
Data terkecil	=	95
Rata-rata	=	247.9
Std dev	=	57.49
α	=	0.05
Z	=	2
s	=	0.15
Std(x)	=	17.33
Z x Std(x)	=	34.67
N	=	22
N'	=	**9.125**
Data	=	**CUKUP**

LAMPIRAN B :
UJI KESESUAIAN

PENGUJIAN
KESESUAIAN DISTRIBUSI

PROJECTILE

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B0	ln(Xi).XiB0	ln(Xi)^2	Xi^B0.ln(Xi)^2
1	0.40	-0.916	0.2	0.04	-0.04	0.84	0.03
2	1.33	0.285	1.8	2.72	0.78	0.08	0.22
3	1.65	0.501	2.7	5.80	2.90	0.25	1.45
4	1.68	0.519	2.8	6.18	3.21	0.27	1.66
5	1.78	0.577	3.2	7.57	4.36	0.33	2.52
6	1.85	0.615	3.4	8.67	5.33	0.38	3.28
7	2.09	0.737	4.4	13.30	9.80	0.54	7.23
8	2.10	0.742	4.4	13.52	10.03	0.55	7.44
9	2.22	0.798	4.9	16.43	13.10	0.64	10.45
0	2.23	0.802	5.0	16.69	13.39	0.64	10.74
1	2.30	0.833	5.3	18.61	15.50	0.69	12.91
2	2.36	0.859	5.6	20.37	17.49	0.74	15.02
3	2.38	0.867	5.7	20.98	18.19	0.75	15.77
4	2.54	0.932	6.5	26.36	24.57	0.87	22.91
5	2.59	0.952	6.7	28.23	26.86	0.91	25.56
6	2.60	0.956	6.8	28.61	27.34	0.91	26.12
7	2.61	0.959	6.8	29.00	27.82	0.92	26.69
8	2.76	1.015	7.6	35.29	35.82	1.03	36.37
9	2.89	1.061	8.4	41.47	44.01	1.13	46.71
0	3.00	1.099	9.0	47.28	51.94	1.21	57.07
	3.11	1.135	9.7	53.65	60.88	1.29	69.07
	3.15	1.147	9.9	56.11	64.39	1.32	73.88

Ho = Data (projectile) mengikuti dist. weibull

H1 = Data tidak mengikuti dist. weibull

$\overline{X} = 2.26; \overline{X}^2 = 5.11$

$\sum_{i=1}^{22} 120.56; Sd = 0.64$

$$\hat{\beta}_0 = \frac{\overline{X}}{Sd} = 3.51$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 496.9$$

$$\sum_{i=1}^{22} \ln Xi = 16.473$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 477.68$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 473.10$$

maka,

$$f(\hat{\beta}_0) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_0) = 1.5918$$

$$f'(\hat{\beta}_0) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_0) = -2.4008$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B1	ln(Xi).XiB1	ln(Xi)^2	Xi^B1.ln(Xi)^2
1	0.40	-0.916	0.2	0.02	-0.02	0.84	0.02
2	1.33	0.285	1.8	3.29	0.94	0.08	0.27
3	1.65	0.501	2.7	8.08	4.05	0.25	2.03
4	1.68	0.519	2.8	8.71	4.52	0.27	2.35
5	1.78	0.577	3.2	11.09	6.40	0.33	3.69
6	1.85	0.615	3.4	13.03	8.02	0.38	4.93
7	2.09	0.737	4.4	21.68	15.98	0.54	11.78
8	2.10	0.742	4.4	22.11	16.41	0.55	12.17
9	2.22	0.798	4.9	27.88	22.24	0.64	17.73
10	2.23	0.802	5.0	28.41	22.79	0.64	18.27
11	2.30	0.833	5.3	32.32	26.92	0.69	22.42
12	2.36	0.859	5.6	35.99	30.90	0.74	26.53
13	2.38	0.867	5.7	37.28	32.32	0.75	28.03
14	2.54	0.932	6.5	48.91	45.59	0.87	42.50
15	2.59	0.952	6.7	53.05	50.49	0.91	48.05
16	2.60	0.956	6.8	53.91	51.51	0.91	49.22
17	2.61	0.959	6.8	54.78	52.56	0.92	50.42
8	2.76	1.015	7.6	69.17	70.22	1.03	71.29
9	2.89	1.061	8.4	83.82	88.95	1.13	94.40
0	3.00	1.099	9.0	97.96	107.61	1.21	118.23
1	3.11	1.135	9.7	113.84	129.16	1.29	146.55
2	3.15	1.147	9.9	120.07	137.77	1.32	158.08

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_1 = 3.51 - \frac{1.5918}{-2.4008}$$

$$\hat{\beta}_1 = 4.1730$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 945.4$$

$$\sum_{i=1}^{22} \ln Xi = 16.473$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 925.32$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 928.96$$

maka,

$$f(\hat{\beta}_1) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_1) = 0.2122$$

$$f'(\hat{\beta}_1) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_1) = -1.8053$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B2	ln(Xi).XiB2	ln(Xi)^2	Xi^B2.ln(Xi)^2
1	0.40	-0.916	0.2	0.02	-0.02	0.84	0.02
2	1.33	0.285	1.8	3.36	0.96	0.08	0.27
3	1.65	0.501	2.7	8.39	4.20	0.25	2.10
4	1.68	0.519	2.8	9.06	4.70	0.27	2.44
5	1.78	0.577	3.2	11.58	6.68	0.33	3.85
6	1.85	0.615	3.4	13.65	8.40	0.38	5.16
7	2.09	0.737	4.4	22.91	16.89	0.54	12.45
8	2.10	0.742	4.4	23.38	17.35	0.55	12.87
9	2.22	0.798	4.9	29.61	23.61	0.64	18.83
10	2.23	0.802	5.0	30.18	24.20	0.64	19.41
11	2.30	0.833	5.3	34.41	28.66	0.69	23.87
12	2.36	0.859	5.6	38.39	32.97	0.74	28.31
13	2.38	0.867	5.7	39.79	34.50	0.75	29.92
4	2.54	0.932	6.5	52.46	48.90	0.87	45.59
5	2.59	0.952	6.7	56.99	54.24	0.91	51.62
6	2.60	0.956	6.8	57.93	55.36	0.91	52.89
7	2.61	0.959	6.8	58.89	56.49	0.92	54.20
8	2.76	1.015	7.6	74.66	75.80	1.03	76.96
9	2.89	1.061	8.4	90.79	96.35	1.13	102.25
0	3.00	1.099	9.0	106.40	116.90	1.21	128.42
1	3.11	1.135	9.7	123.99	140.68	1.29	159.62
2	3.15	1.147	9.9	130.91	150.21	1.32	172.35

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_2 = 4.1730 - \frac{0.2122}{-1.8053}$$

$$\hat{\beta}_2 = 4.2905$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 1017.8$$

$$\sum_{i=1}^{22} \ln Xi = 16.473$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 998.04$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 1003.41$$

maka,

$$f(\hat{\beta}_2) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_2) = 0.0278$$

$$f'(\hat{\beta}_2) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_2) = -1.73$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B3	ln(Xi).XiB3	ln(Xi)^2	Xi^B3.ln(Xi)^2
1	0.40	-0.916	0.2	0.02	-0.02	0.84	0.02
2	1.33	0.285	1.8	3.40	0.97	0.08	0.28
3	1.65	0.501	2.7	8.59	4.30	0.25	2.15
4	1.68	0.519	2.8	9.28	4.81	0.27	2.50
5	1.78	0.577	3.2	11.89	6.86	0.33	3.95
6	1.85	0.615	3.4	14.03	8.63	0.38	5.31
7	2.09	0.737	4.4	23.69	17.47	0.54	12.87
8	2.10	0.742	4.4	24.18	17.94	0.55	13.31
9	2.22	0.798	4.9	30.70	24.48	0.64	19.53
10	2.23	0.802	5.0	31.30	25.10	0.64	20.13
11	2.30	0.833	5.3	35.74	29.77	0.69	24.79
12	2.36	0.859	5.6	39.92	34.28	0.74	29.43
13	2.38	0.867	5.7	41.39	35.89	0.75	31.12
14	2.54	0.932	6.5	54.73	51.02	0.87	47.56
15	2.59	0.952	6.7	59.51	56.63	0.91	53.89
16	2.60	0.956	6.8	60.50	57.81	0.91	55.24
17	2.61	0.959	6.8	61.51	59.01	0.92	56.61
18	2.76	1.015	7.6	78.19	79.38	1.03	80.59
19	2.89	1.061	8.4	95.27	101.11	1.13	107.30
20	3.00	1.099	9.0	111.84	122.87	1.21	134.99
21	3.11	1.135	9.7	130.55	148.12	1.29	168.06
22	3.15	1.147	9.9	137.91	158.24	1.32	181.56

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_3 = 4.2905 - \frac{0.0287}{-1.73}$$

$$\hat{\beta}_3 = 4.2937$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 1064.1$$

$$\sum_{i=1}^{22} \ln Xi = 16.473$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 1044.67$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 1051.20$$

maka,

$$f(\hat{\beta}_3) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_3) = -$$

Karena nilai $\{f(\hat{\beta}_3) = -\}$ maka iterasi tidak dilanjutkan.
Hasil dari hitungan iterasi tersebut akan ditabelkan

j	$\hat{\beta}_j$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j}$	$\sum_{i=1}^{22} X_i^{\hat{\beta}} \ln Xi$	$\sum_{i=1}^{22} X_i^{\hat{\beta}} (\ln Xi)^2$	$f(\hat{\beta}_j)$	$f'(\hat{\beta}_j)$
0	3.51	496.9	477.68	473.10	1.5918	-2.4008
1	4.17	945.4	925.32	928.96	0.2122	-1.8053
2	4.29	1017.8	998.04	1003.41	0.0278	-1.73

$\beta = 4.29$

$$\alpha = \left[\frac{1017.8}{22}\right]^{1/4.29}$$

$$= 2.4$$

Lakukan perhitungan untuk menentukan interval kelas dengan menggunakan persamaan sebagai berikut :

$$ai = \alpha\left[-\ln(1-ip)\right]^{1/\beta}$$

dengan diketahui :

$\beta = 4.29$; $k = 6$
$\alpha = 2.4$; $p = 0.167$

$a0 = 0$

$a1 = \alpha\left[-\ln(1-0.167)\right]^{1/4.29} = 1.6147$

$a2 = \alpha\left[-\ln(1-(2)(0.167)\right]^{1/4.29} = 1.9457$

$a3 = \alpha\left[-\ln(1-(3)(0.167)\right]^{1/4.29} = 2.2049$

$a4 = \alpha\left[-\ln(1-(4)(0.167)\right]^{1/4.29} = 2.4552$

$a5 = \alpha\left[-\ln(1-(5)(0.167)\right]^{1/4.29} = 2.7530$

$a6 = \infty$

Hasil dari perhitungan diatas untuk menentukan besarnya kelas guna menyelesaikan pengujian kesesuaian.

CLASS INTERVAL	Oi	Ei	$\frac{(Oi-Ei)^2}{Ei}$
(0,1.6147)	2	3.674	0.7627
(1.6147,1.9457)	4	3.674	0.0289
(1.9457,2.2049)	2	3.674	0.7627
(2.2049,2.4552)	5	3.674	0.4785
(2.4552,2.7530)	5	3.674	0.4785
(2.7530,~)	4	3.674	0.0289
	22	22	2.5402

Dengan level of significance α = 0.05, maka didapat nilai chi-squere.

$X^2_{0,05;3} > X^2_0$

$7.815 > 2.54$

Dari hasil tersebut diketahui bahwa H0 diterima, artinya bahwa data mengikuti distribusi Weibull.

PENGUJIAN
KESESUAIAN DISTRIBUSI

2. PROJECTILE RETURNER

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B0	ln(Xi).XiB0	ln(Xi)^2	Xi^B0.ln(Xi)^2
1	1.00	0.000	1.0	1.00	0.00	0.00	0.00
2	1.15	0.140	1.8	1.54	0.22	0.02	0.03
3	1.32	0.278	1.7	2.37	0.66	0.08	0.18
4	1.67	0.513	2.8	4.93	2.53	0.26	1.30
5	1.83	0.604	3.3	6.55	3.96	0.37	2.39
6	1.92	0.652	3.7	7.60	4.96	0.43	3.24
7	1.95	0.668	3.8	7.98	5.33	0.45	3.56
8	2.00	0.693	4.0	8.63	5.98	0.48	4.15
9	2.26	0.815	5.1	12.63	10.30	0.66	8.39
10	2.28	0.824	5.2	12.98	10.70	0.68	8.81
11	2.32	0.842	5.4	13.70	11.53	0.71	9.70
12	2.34	0.850	5.5	14.07	11.96	0.72	10.17
13	2.50	0.916	6.3	17.28	15.84	0.84	14.51
14	2.84	1.044	8.1	25.69	26.82	1.09	27.99
15	3.15	1.147	9.9	35.46	40.69	1.32	46.69
16	3.16	1.151	10.0	35.81	41.20	1.32	47.41
17	3.19	1.160	10.2	36.88	42.78	1.35	49.63
18	3.27	1.185	10.7	39.83	47.19	1.40	55.91
19	3.30	1.194	10.9	40.98	48.93	1.43	58.42
20	3.37	1.215	11.4	43.75	53.15	1.48	64.57
21	3.46	1.241	12.0	47.48	58.94	1.54	73.16
22	3.53	1.261	12.5	50.53	63.74	1.59	80.39

H0 = Data (projectile returner) mengikuti dist. weibull

H1 = Data tidak mengikuti dist. weibull

$\overline{X} = 2.45; \overline{X}^2 = 6.0025$

$\sum_{i=1}^{22} X_i^2 = 144.63; Sd = 0.79$

$$\hat{\beta}_0 = \frac{\overline{X}}{Sd} = 3.11$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 467.7$$

$$\sum_{i=1}^{22} \ln Xi = 18.393$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 507.38$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 570.60$$

maka,

$$f(\hat{\beta}_0) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_0) = 1.6004$$

$$f'(\hat{\beta}_0) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_0) = -3.22$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B1	ln(Xi).XiB1	ln(Xi)^2	Xi^B1.ln(Xi)^2
1	1.00	0.000	1.0	1.00	0.00	0.00	0.00
2	1.15	0.140	1.8	1.65	0.23	0.02	0.03
3	1.32	0.278	1.7	2.72	0.75	0.08	0.21
4	1.67	0.513	2.8	6.34	3.25	0.26	1.67
5	1.83	0.604	3.3	8.81	5.32	0.37	3.22
6	1.92	0.652	3.7	10.47	6.83	0.43	4.45
7	1.95	0.668	3.8	11.07	7.39	0.45	4.94
8	2.00	0.693	4.0	12.13	8.40	0.48	5.83
9	2.26	0.815	5.1	18.83	15.35	0.66	12.52
10	2.28	0.824	5.2	19.43	16.02	0.68	13.20
11	2.32	0.842	5.4	20.69	17.41	0.71	14.65
12	2.34	0.850	5.5	21.34	18.14	0.72	15.42
13	2.50	0.916	6.3	27.08	24.81	0.84	22.73
14	2.84	1.044	8.1	42.85	44.73	1.09	46.69
15	3.15	1.147	9.9	62.22	71.39	1.32	81.91
16	3.16	1.151	10.0	62.93	72.41	1.32	83.31
17	3.19	1.160	10.2	65.11	75.53	1.35	87.61
18	3.27	1.185	10.7	71.18	84.34	1.40	99.92
19	3.30	1.194	10.9	73.56	87.83	1.43	104.86
20	3.37	1.215	11.4	79.34	96.39	1.48	117.10
21	3.46	1.241	12.0	87.23	108.28	1.54	134.40
22	3.53	1.261	12.5	93.75	118.25	1.59	149.15

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_1 = 3.60 - \frac{1.6004}{-3.22}$$

$$\hat{\beta}_1 = 3.60$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 799.7$$

$$\sum_{i=1}^{22} \ln Xi = 18.393$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 883.04$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 1003.82$$

maka,

$$f(\hat{\beta}_1) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_1) = 0.211$$

$$f'(\hat{\beta}_1) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_1) = -2.488$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B2	ln(Xi).XiB2	ln(Xi)^2	Xi^B2.ln(Xi)^2
1	1.00	0.000	1.0	1.00	0.00	0.00	0.00
2	1.15	0.140	1.8	1.67	0.23	0.02	0.03
3	1.32	0.278	1.7	2.78	0.77	0.08	0.21
4	1.67	0.513	2.8	6.60	3.39	0.26	1.74
5	1.83	0.604	3.3	9.24	5.59	0.37	3.38
6	1.92	0.652	3.7	11.03	7.19	0.43	4.69
7	1.95	0.668	3.8	11.68	7.80	0.45	5.21
8	2.00	0.693	4.0	12.82	8.88	0.48	6.16
9	2.26	0.815	5.1	20.10	16.39	0.66	13.36
10	2.28	0.824	5.2	20.76	17.11	0.68	14.10
11	2.32	0.842	5.4	22.13	18.62	0.71	15.67
12	2.34	0.850	5.5	22.84	19.42	0.72	16.51
13	2.50	0.916	6.3	29.14	26.70	0.84	24.46
14	2.84	1.044	8.1	46.58	48.62	1.09	50.75
15	3.15	1.147	9.9	68.20	78.25	1.32	89.79
16	3.16	1.151	10.0	69.00	79.39	1.32	91.34
17	3.19	1.160	10.2	71.44	82.87	1.35	96.13
18	3.27	1.185	10.7	78.26	92.72	1.40	109.85
19	3.30	1.194	10.9	80.93	96.63	1.43	115.37
20	3.37	1.215	11.4	87.43	106.22	1.48	129.05
21	3.46	1.241	12.0	96.34	119.58	1.54	148.43
22	3.53	1.261	12.5	103.71	130.81	1.59	164.99

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_2 = 3.60 - \frac{0.211}{-2.488}$$

$$\hat{\beta}_2 = 3.68$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 873.7$$

$$\sum_{i=1}^{22} \ln Xi = 18.393$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 967.19$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 1101.23$$

maka,

$$f(\hat{\beta}_2) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_2) = 0.017$$

$$f'(\hat{\beta}_2) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_2) = -2.3945$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B3	ln(Xi).XiB3	ln(Xi)^2	Xi^B3.ln(Xi)^2
1	1.00	0.000	1.0	1.00	0.00	0.00	0.00
2	1.15	0.140	1.8	1.67	0.23	0.02	0.03
3	1.32	0.278	1.7	2.78	0.77	0.08	0.21
4	1.67	0.513	2.8	6.62	3.40	0.26	1.74
5	1.83	0.604	3.3	9.28	5.61	0.37	3.39
6	1.92	0.652	3.7	11.08	7.23	0.43	4.71
7	1.95	0.668	3.8	11.73	7.83	0.45	5.23
8	2.00	0.693	4.0	12.88	8.93	0.48	6.19
9	2.26	0.815	5.1	20.21	16.48	0.66	13.44
10	2.28	0.824	5.2	20.88	17.21	0.68	14.18
11	2.32	0.842	5.4	22.26	18.73	0.71	15.77
12	2.34	0.850	5.5	22.98	19.53	0.72	16.61
13	2.50	0.916	6.3	29.32	26.87	0.84	24.62
14	2.84	1.044	8.1	46.92	48.98	1.09	51.12
15	3.15	1.147	9.9	68.75	78.88	1.32	90.51
16	3.16	1.151	10.0	69.56	80.03	1.32	92.08
17	3.19	1.160	10.2	72.02	83.55	1.35	96.92
18	3.27	1.185	10.7	78.91	93.49	1.40	110.77
19	3.30	1.194	10.9	81.61	97.44	1.43	116.34
20	3.37	1.215	11.4	88.18	107.13	1.48	130.16
21	3.46	1.241	12.0	97.18	120.63	1.54	149.73
22	3.53	1.261	12.5	104.63	131.97	1.59	166.45

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_3 = 3.68 - \frac{0.017}{-2.3945}$$

$$\hat{\beta}_3 = 3.68$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 880.5$$

$$\sum_{i=1}^{22} \ln Xi = 18.393$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 974.93$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 1110.20$$

maka,

$$f(\hat{\beta}_3) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_3) = 0$$

Karena nilai $\{f(\hat{\beta}_3) = 0\}$ maka iterasi tidak dilanjutkan.
Hasil dari hitungan iterasi tersebut akan ditabelkan

j	$\hat{\beta}_j$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j}$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j} \ln Xi$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j} (\ln Xi)^2$	$f(\hat{\beta}_j)$	$f'(\hat{\beta}_j)$
0	3.11	467.7	507.38	570.6	1.604	-3.22
1	3.60	799.7	883.04	1003.82	0.211	-2.488
2	3.68	873.7	967.19	1101.23	0.017	-2.3945
3	3.68	880.5	974.93	1110.20	0	-2.388

$\beta = 3.68$

$\alpha = \left[\frac{880.5}{22}\right]^{1/3.68}$

$= 2.72$

Lakukan perhitungan untuk menentukan interval kelas dengan menggunakan persamaan sebagai berikut :

$$ai = \alpha\left[-\ln(1-ip)\right]^{1/\beta}$$

dengan diketahui :

$\beta = 3.68$; $k = 6$

$\alpha = 2.72$; $p = 0.167$

$a0 = 0$

$a1 = \alpha\left[-\ln(1-0.167)\right]^{1/3.68} = 1.713$

$a2 = \alpha\left[-\ln(1-(2)(0.167)\right]^{1/3.68} = 2.129$

$a3 = \alpha\left[-\ln(1-(3)(0.167)\right]^{1/3.68} = 2.463$

$a4 = \alpha\left[-\ln(1-(4)(0.167)\right]^{1/3.68} = 2.7924$

$a5 = \alpha\left[-\ln(1-(5)(0.167)\right]^{1/3.68} = 3.192$

$a6 = \infty$

Hasil dari perhitungan diatas untuk menentukan besarnya kelas guna menyelesaikan pengujian kesesuaian.

CLASS INTERVAL	Oi	Ei	$\frac{(Oi-Ei)^2}{Ei}$
(0,1.713)	4	3.674	0.0289
(1.713,2.129)	4	3.674	0.0289
(2.129,2.463)	4	3.674	0.0289
(2.463,2.792)	1	3.674	1.9461
(2.792,3.192)	4	3.674	0.0289
(3.192,~)	5	3.674	0.4785
	22	22	2.54

Dengan level of significance α = 0.05, maka didapat nilai chi-squere.

$X^2_{0,05;3} > X^2_0$

$7.815 > 2.54$

Dari hasil tersebut diketahui bahwa H0 diterima, artinya bahwa data mengikuti distribusi Weibull.

PENGUJIAN
KESESUAIAN DISTRIBUSI

3. BRAKE BAND CONE

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B0	ln(Xi).XiB0	ln(Xi)^2	Xi^B0.ln(Xi)^2
1	0.95	-0.051	0.9	0.80	-0.04	0.00	0.00
2	1.35	0.300	1.8	3.65	1.09	0.09	0.33
3	1.50	0.405	2.3	5.74	2.33	0.16	0.94
4	2.10	0.742	4.4	24.48	18.16	0.55	13.47
5	2.21	0.793	4.9	30.50	24.19	0.63	19.18
6	2.24	0.806	5.0	32.33	26.07	0.65	21.03
7	2.30	0.833	5.3	36.23	30.17	0.69	25.13
8	2.41	0.880	5.8	44.31	38.98	0.77	34.28
9	2.46	0.900	6.1	48.41	43.58	0.81	39.23
10	2.65	0.975	7.0	66.71	65.01	0.95	63.36
11	2.68	0.986	7.2	70.03	69.03	0.97	68.05
12	2.69	0.990	7.2	71.16	70.42	0.98	69.68
13	2.73	1.004	7.5	75.83	76.16	1.01	76.49
14	2.75	1.012	7.6	78.26	79.16	1.02	80.08
15	2.79	1.026	7.8	83.28	85.45	1.05	87.68
16	2.80	1.030	7.8	84.58	87.08	1.06	89.66
17	2.85	1.047	8.1	91.28	95.60	1.10	100.12
18	2.91	1.068	8.5	99.86	106.66	1.14	113.93
19	2.94	1.078	8.6	104.37	112.55	1.16	121.38
20	3.05	1.115	9.3	122.27	136.35	1.24	152.05
21	3.08	1.125	9.5	127.54	143.48	1.27	161.40
22	3.10	1.131	9.6	131.15	148.38	1.28	167.88

H0 = Data (brake band cone) mengikuti dist. weibull

H1 = Data tidak mengikuti dist. weibull

$\overline{X} = 2.48; \overline{X}^2 = 6.15$

$\sum_{i=1}^{22} X_i^2 = 142.15; Sd = 0.57$

$\hat{\beta}_0 = \frac{\overline{X}}{Sd} = 4.31$

$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 1432.8$

$\sum_{i=1}^{22} \ln Xi = 19.195$

$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 1459.87$

$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 1505.37$

maka,

$$f(\hat{\beta}_0) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$f(\hat{\beta}_0) = 1.8838$

$$f'(\hat{\beta}_0) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$f'(\hat{\beta}_0) = -1.459$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B1	ln(Xi).XiB1	ln(Xi)^2	Xi^B1.ln(Xi)^2
1	0.95	-0.051	0.9	0.75	-0.04	0.00	0.00
2	1.35	0.300	1.8	5.37	1.61	0.09	0.48
3	1.50	0.405	2.3	9.69	3.93	0.16	1.59
4	2.10	0.742	4.4	63.74	47.29	0.55	35.09
5	2.21	0.793	4.9	84.84	67.28	0.63	53.35
6	2.24	0.806	5.0	91.49	73.79	0.65	59.51
7	2.30	0.833	5.3	106.09	88.36	0.69	73.60
8	2.41	0.880	5.8	137.81	121.23	0.77	106.63
9	2.46	0.900	6.1	154.61	139.17	0.81	125.28
10	2.65	0.975	7.0	234.52	228.55	0.95	222.74
11	2.68	0.986	7.2	249.78	246.24	0.97	242.74
12	2.69	0.990	7.2	255.04	252.38	0.98	249.74
13	2.73	1.004	7.5	277.02	278.21	1.01	279.41
14	2.75	1.012	7.6	288.58	291.93	1.02	295.31
15	2.79	1.026	7.8	312.88	321.03	1.05	329.39
16	2.80	1.030	7.8	319.22	328.67	1.06	338.41
17	2.85	1.047	8.1	352.48	369.16	1.10	386.62
18	2.91	1.068	8.5	396.10	423.09	1.14	451.93
19	2.94	1.078	8.6	419.51	452.41	1.16	487.88
20	3.05	1.115	9.3	515.32	574.66	1.24	640.82
21	3.08	1.125	9.5	544.36	612.36	1.27	688.87
22	3.10	1.131	9.6	564.45	638.62	1.28	722.54

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_1 = 4.31 - \frac{1.8838}{-1.459}$$

$$\hat{\beta}_1 = 5.60$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 5383.6$$

$$\sum_{i=1}^{22} \ln Xi = 19.195$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 5559.92$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 5791.93$$

maka,

$$f(\hat{\beta}_1) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_1) = 0.4035$$

$$f'(\hat{\beta}_1) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_1) = -0.9015$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B2	ln(Xi).XiB2	ln(Xi)^2	Xi^B2.ln(Xi)^2
1	0.95	-0.051	0.9	0.73	-0.04	0.00	0.00
2	1.35	0.300	1.8	6.14	1.84	0.09	0.55
3	1.50	0.405	2.3	11.62	4.71	0.16	1.91
4	2.10	0.742	4.4	89.01	66.04	0.55	49.00
5	2.21	0.793	4.9	121.22	96.13	0.63	76.23
6	2.24	0.806	5.0	131.52	106.07	0.65	85.54
7	2.30	0.833	5.3	154.33	128.54	0.69	107.07
8	2.41	0.880	5.8	204.74	180.09	0.77	158.42
9	2.46	0.900	6.1	231.82	208.68	0.81	187.84
10	2.65	0.975	7.0	363.61	354.36	0.95	345.35
11	2.68	0.986	7.2	389.24	383.72	0.97	378.28
12	2.69	0.990	7.2	398.11	393.94	0.98	389.82
13	2.73	1.004	7.5	435.30	437.17	1.01	439.05
14	2.75	1.012	7.6	454.95	460.23	1.02	465.57
15	2.79	1.026	7.8	496.48	509.41	1.05	522.68
16	2.80	1.030	7.8	507.35	522.38	1.06	537.85
17	2.85	1.047	8.1	564.69	591.41	1.10	619.40
18	2.91	1.068	8.5	640.55	684.20	1.14	730.84
19	2.94	1.078	8.6	681.56	735.00	1.16	792.63
20	3.05	1.115	9.3	851.17	949.17	1.24	1058.46
21	3.08	1.125	9.5	903.09	1015.91	1.27	1142.83
22	3.10	1.131	9.6	939.16	1062.56	1.28	1202.19

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_2 = 5.60 - \frac{0.4035}{-0.9015}$$

$$\hat{\beta}_2 = 6.05$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 8576.4$$

$$\sum_{i=1}^{22} \ln Xi = 19.195$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 8891.54$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 9291.48$$

maka,

$$f(\hat{\beta}_2) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_2) = 0.0233$$

$$f'(\hat{\beta}_2) = \frac{-n}{\beta^2} - \frac{n\sum_{i=1}^{n} X_i^{\hat{\beta}_0} (\ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}} + \frac{n(\sum_{i=1}^{n} X_i^{\hat{\beta}_0} \ln Xi)^2}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f'(\hat{\beta}_2) = -0.789$$

NO.	RANK (Xi)	Xi=ln(Xi)	Xi^2	Xi^B3	ln(Xi).XiB3	ln(Xi)^2	Xi^B3.ln(Xi)^2
1	0.95	-0.051	0.9	0.73	-0.04	0.00	0.00
2	1.35	0.300	1.8	6.20	1.86	0.09	0.56
3	1.50	0.405	2.3	11.77	4.77	0.16	1.93
4	2.10	0.742	4.4	91.01	67.52	0.55	50.10
5	2.21	0.793	4.9	124.14	98.44	0.63	78.06
6	2.24	0.806	5.0	134.74	108.67	0.65	87.64
7	2.30	0.833	5.3	158.24	131.80	0.69	109.77
8	2.41	0.880	5.8	210.21	184.91	0.77	162.65
9	2.46	0.900	6.1	238.17	214.39	0.81	192.99
10	2.65	0.975	7.0	374.40	364.87	0.95	355.59
11	2.68	0.986	7.2	400.92	395.24	0.97	389.63
12	2.69	0.990	7.2	410.10	405.81	0.98	401.57
13	2.73	1.004	7.5	448.61	450.54	1.01	452.48
14	2.75	1.012	7.6	468.97	474.41	1.02	479.91
15	2.79	1.026	7.8	512.00	525.34	1.05	539.02
16	2.80	1.030	7.8	523.26	538.76	1.06	554.72
17	2.85	1.047	8.1	582.72	610.29	1.10	639.17
18	2.91	1.068	8.5	661.41	706.48	1.14	754.63
19	2.94	1.078	8.6	703.97	759.16	1.16	818.69
20	3.05	1.115	9.3	880.12	981.46	1.24	1094.47
21	3.08	1.125	9.5	934.09	1050.78	1.27	1182.06
22	3.10	1.131	9.6	971.58	1099.25	1.28	1243.69

$$\hat{\beta}_j = \hat{\beta}_{j-1} - \frac{f(\hat{\beta}_{j-1})}{f'(\hat{\beta}_{j-1})}$$

$$\hat{\beta}_3 = 6.05 - \frac{0.0233}{-0.789}$$

$$\hat{\beta}_3 = 6.08$$

Diketahui:

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} = 884734$$

$$\sum_{i=1}^{22} \ln Xi = 19.195$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} \ln Xi = 9174.73$$

$$\sum_{i=1}^{22} X_i^{\hat{\beta}_0} (\ln Xi)^2 = 9589.34$$

maka,

$$f(\hat{\beta}_3) = \frac{n}{\beta} + \sum_{i=1}^{n} \ln Xi - \frac{n\sum_{i=1}^{n} X_i^{\beta} \ln Xi}{\sum_{i=1}^{n} X_i^{\beta}}$$

$$f(\hat{\beta}_3) = 0$$

Karena nilai $\{f(\hat{\beta}_3) = 0\}$ maka iterasi tidak dilanjutkan.
Hasil dari hitungan iterasi tersebut akan ditabelkan

j	$\hat{\beta}_j$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j}$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j} \ln Xi$	$\sum_{i=1}^{22} X_i^{\hat{\beta}_j} (\ln Xi)^2$	$f(\hat{\beta}_j)$	$f'(\hat{\beta}_j)$
0	4.31	1432.8	1459.87	1505.37	1.8838	-1.459
1	5.60	5383.6	5559.92	5791.93	0.4035	-0.9015
2	6.05	8576.4	8891.54	9291.48	0.0233	-0.789
3	6.08	8847.4	9174.73	9589.34	0	-0.785

$$\beta = 6.08$$

$$\alpha = \left[\frac{8847.4}{22}\right]^{1/6.08}$$

$$= 2.67$$

Lakukan perhitungan untuk menentukan interval kelas dengan menggunakan persamaan sebagai berikut :

$$ai = \alpha\left[-\ln(1-ip)\right]^{1/\beta}$$

dengan diketahui :

$\beta = 6.08$; $k = 6$
$\alpha = 2.67$; $p = 0.167$

$a0 = 0$

$a1 = \alpha\left[-\ln(1-0.167)\right]^{1/6.08} = 2.020$

$a2 = \alpha\left[-\ln(1-(2)(0.167)\right]^{1/6.08} = 2.303$

$a3 = \alpha\left[-\ln(1-(3)(0.167)\right]^{1/6.08} = 2.515$

$a4 = \alpha\left[-\ln(1-(4)(0.167)\right]^{1/6.08} = 2.713$

$a5 = \alpha\left[-\ln(1-(5)(0.167)\right]^{1/6.08} = 2.94$

$a6 = \infty$

Hasil dari perhitungan diatas untuk menentukan besarnya kelas guna menyelesaikan pengujian kesesuaian.

CLASS INTERVAL	Oi	Ei	$\frac{(Oi-Ei)^2}{Ei}$
(0,2.020)	2	3.674	0.7627
(2.020,2.303)	4	3.674	0.028
(2.303,2.515)	2	3.674	0.7627
(2.515,2.713)	3	3.674	0.1236
(2.713,2.940)	6	3.674	1.4725
(2.940,~)	4	3.674	0.028
	22	22	3.177

Dengan level of significance α = 0.05, maka didapat nilai chi-squere.

$X^2_{0,05;3} > X^2_0$

$7.815 > 3.177$

Dari hasil tersebut diketahui bahwa H0 diterima, artinya bahwa data mengikuti distribusi Weibull.

LAMPIRAN C :
UJI DISTRIBUSI DUA PARAMETER

PENGUJIAN DISTRIBUSI
WEIBULL DUA PARAMETER

1. PROJECTILE

NO.	RANK (ti)	Xi=ln(ti)	Mi	(Xi+1)-Xi	(Xi+1-Xi)/Mi
1	40	3.689	1.023439	1.201	1.173953
2	133	4.890	0.524405	0.216	0.411126
3	165	5.106	0.358790	0.018	0.050220
4	168	5.124	0.276618	0.058	0.209023
5	178	5.182	0.227895	0.039	0.169255
6	185	5.220	0.195983	0.122	0.622393
7	209	5.342	0.173760	0.005	0.027471
8	210	5.347	0.157692	0.056	0.352395
9	222	5.403	0.145834	0.004	0.030819
10	223	5.407	0.137052	0.031	0.225517
11	230	5.438	0.130662	0.026	0.197092
12	236	5.464	0.126260	0.008	0.066837
13	238	5.472	0.123640	0.065	0.526234
14	254	5.537	0.122763	0.019	0.158792
15	259	5.557	0.123763	0.004	0.031137
16	260	5.561	0.127019	0.004	0.030222
17	261	5.565	0.133316	0.056	0.419158
18	276	5.620	0.144273	0.046	0.319019
19	289	5.666	0.163552	0.037	0.228403
20	300	5.704	0.201355	0.036	0.178841
21	311	5.740	0.301693	0.013	0.042360
22	315	5.753			

$$S.hitung = \frac{\sum_{i=(r/2)+1}^{r-1} \frac{X_{i+1} - X_i}{M_i}}{\sum_{i=r}^{r-1} \frac{X_{i+1} - X_i}{M_i}}$$

$$S.hitung = \frac{2.001}{5.471}$$

$$S.hitung = 0.366$$

$$Untuk.(n = 22;95\%), maka:$$

$$S.tabel = 0{,}64$$

S. hitung < S. tabel

0,366 < 0,64 ; berarti terima H0 yang berdistribusi Weibull dua parameter.

PENGUJIAN DISTRIBUSI
WEIBULL DUA PARAMETER

2. PROJECTILE RETURNER

NO.	RANK (ti)	Xi=ln(ti)	Mi	(Xi+1)-Xi	(Xi+1-Xi)/Mi
1	100	4.605	1.023439	0.140	0.136561
2	115	4.745	0.524405	0.138	0.262907
3	132	4.883	0.358790	0.235	0.655514
4	167	5.118	0.276618	0.091	0.330753
5	183	5.209	0.227895	0.048	0.210664
6	192	5.257	0.195983	0.016	0.079110
7	195	5.273	0.173760	0.025	0.145706
8	200	5.298	0.157692	0.122	0.775040
9	226	5.421	0.145834	0.009	0.060415
10	228	5.429	0.137052	0.017	0.126899
11	232	5.447	0.130662	0.009	0.065694
12	234	5.455	0.126260	0.066	0.523838
13	250	5.521	0.123640	0.128	1.031327
14	284	5.649	0.122763	0.104	0.843889
15	315	5.753	0.123763	0.003	0.025610
16	316	5.756	0.127019	0.009	0.074390
17	319	5.765	0.133316	0.025	0.185792
18	327	5.790	0.144273	0.009	0.063300
19	330	5.799	0.163552	0.021	0.128340
20	337	5.820	0.201355	0.026	0.130892
21	346	5.846	0.301693	0.020	0.066390
22	353	5.866			

$$S.hitung = \frac{\sum_{i=(r/2)+1}^{r-1} \frac{X_{i+1} - X_i}{M_i}}{\sum_{i=r}^{r-1} \frac{X_{i+1} - X_i}{M_i}}$$

$$S.hitung = \frac{3.073}{5.923}$$

$$S.hitung = 0.518$$

$$Untuk.(n = 22;95\%), maka:$$

$$S.tabel = 0,64$$

S. hitung < S. tabel

0,518 < 0,64 ; berarti terima H0 yang berdistribusi Weibull dua parameter.

PENGUJIAN DISTRIBUSI
WEIBULL DUA PARAMETER

3. BRAKE BAND CONE

NO.	RANK (ti)	Xi=ln(ti)	Mi	(Xi+1)-Xi	(Xi+1-Xi)/Mi
1	95	4.554	1.023439	0.351	0.343350
2	135	4.905	0.524405	0.105	0.200914
3	150	5.011	0.358790	0.336	0.937797
4	210	5.347	0.276618	0.051	0.184569
5	221	5.398	0.227895	0.013	0.059165
6	224	5.412	0.195983	0.026	0.134875
7	230	5.438	0.173760	0.047	0.268863
8	241	5.485	0.157692	0.021	0.130220
9	246	5.505	0.145834	0.074	0.510157
10	265	5.580	0.137052	0.011	0.082138
11	268	5.591	0.130662	0.004	0.028504
12	269	5.595	0.126260	0.015	0.116905
13	273	5.609	0.123640	0.007	0.059037
14	275	5.617	0.122763	0.014	0.117631
15	279	5.631	0.123763	0.004	0.028909
16	280	5.635	0.127019	0.018	0.139346
17	285	5.652	0.133316	0.021	0.156276
18	291	5.673	0.144273	0.010	0.071091
19	294	5.684	0.163552	0.037	0.224589
20	305	5.720	0.201355	0.010	0.048611
21	308	5.730	0.301693	0.006	0.021454
22	310	5.737			

$$S.hitung = \frac{\sum_{i=(r/2)+1}^{r-1} \frac{X_{i+1} - X_i}{M_i}}{\sum_{i=r}^{r-1} \frac{X_{i+1} - X_i}{M_i}}$$

$$S.hitung = \frac{0.867}{3.864}$$

$$S.hitung = 0.224$$

$$Untuk.(n = 22;95\%), maka:$$

$$S.tabel = 0{,}64$$

S. hitung < S. tabel

0,224 < 0,64 ; berarti terima H0 yang berdistribusi Weibull dua parameter.

LAMPIRAN D : PARAMETER KEANDALAN

PARAMETER KEANDALAN
DISTRIBUSI WEIBULL

1. PROJECTILE

NO.	RANK (ti)	Xi=ln(ti)	R(ti)	Yi	Xi.Yi	Xi^2
1	40	3.689	0.96875	-3.4499	-12.726	13.607832
2	133	4.890	0.92411	-2.5392	-12.418	23.915515
3	165	5.106	0.87946	-2.0523	-10.479	26.070679
4	168	5.124	0.83482	-1.7118	-8.771	26.255007
5	178	5.182	0.79018	-1.4461	-7.493	26.850881
6	185	5.220	0.74554	-1.2254	-6.397	27.252115
7	209	5.342	0.70089	-1.0345	-5.527	28.540535
8	210	5.347	0.65625	-0.8646	-4.623	28.591559
9	222	5.403	0.61161	-0.7100	-3.836	29.188923
10	223	5.407	0.56696	-0.5666	-3.064	29.237507
11	230	5.438	0.52232	-0.4316	-2.347	29.572707
12	236	5.464	0.47768	-0.3027	-1.654	29.853458
13	238	5.472	0.43304	-0.1780	-0.974	29.945746
14	254	5.537	0.38839	-0.0558	-0.309	30.662071
15	259	5.557	0.34375	0.0656	0.365	30.878338
16	260	5.561	0.29911	0.1881	1.046	30.921180
17	261	5.565	0.25446	0.3138	1.746	30.963887
18	276	5.620	0.20982	0.4456	2.505	31.588906
19	289	5.666	0.16518	0.5882	3.333	32.108391
20	300	5.704	0.12054	0.7494	4.275	32.533135
21	311	5.740	0.07589	0.9472	5.437	32.945223
22	315	5.753	0.03125	1.2429	7.150	33.092092
		117.787		-12.028	-54.762	634.576

$$\sum X_i = 117.787$$
$$\sum X_i^2 = 634.576$$
$$(\sum X_i)^2 = 13873.777$$
$$\sum Y_i = -12.028$$
$$\sum X_i.Y_i = -54.762$$

$$\beta = \frac{n.\sum (Xi.Yi) - \sum Xi.\sum Yi}{n.\sum X_i^2 - \sum (X_i)^2}$$

$$\beta = \frac{22.(-54,762) - ((117,787)(-12,028))}{22.(634,576) - 13.873,777}$$

$$\beta = \frac{211,98}{86,90}$$

$$\beta = 2,4395$$

$$C = \frac{\sum X_i^2.\sum Yi - \sum Xi.\sum (Xi.Yi)}{n.\sum X_i^2 - \sum (Xi)^2}$$

$$C = \frac{(634,576).(-12,028) - ((117,787).(-54,762))}{22.(634,576) - 13.873,777}$$

$$C = \frac{-1182,428}{86,90}$$

$$\dot{C} = -13,61$$

$$\theta = \exp(-\frac{C}{\beta}) = \exp(-\frac{-13,61}{2,4395}) = 270.426$$

$$\lambda = \frac{1}{\theta} = \frac{1}{270.426} = 0.0037$$

$$\alpha = \beta = 2,4395$$

PARAMETER KEANDALAN
DISTRIBUSI WEIBULL

2. PROJECTILE RETURNER

NO.	RANK (ti)	Xi=ln(ti)	R(ti)	Yi	Xi.Yi	Xi^2
1	100	4.605	0.96875	-3.4499	-15.887	21.207592
2	115	4.745	0.92411	-2.5392	-12.048	22.514381
3	132	4.883	0.87946	-2.0523	-10.021	23.841755
4	167	5.118	0.83482	-1.7118	-8.761	26.193861
5	183	5.209	0.79018	-1.4461	-7.533	27.138746
6	192	5.257	0.74554	-1.2254	-6.442	27.641258
7	195	5.273	0.70089	-1.0345	-5.455	27.804524
8	200	5.298	0.65625	-0.8646	-4.581	28.072167
9	226	5.421	0.61161	-0.7100	-3.848	29.382200
10	228	5.429	0.56696	-0.5666	-3.076	29.477794
11	232	5.447	0.52232	-0.4316	-2.351	29.666948
12	234	5.455	0.47768	-0.3027	-1.651	29.760528
13	250	5.521	0.43304	-0.1780	-0.983	30.486531
14	284	5.649	0.38839	-0.0558	-0.315	31.910910
15	315	5.753	0.34375	0.0656	0.378	33.092092
16	316	5.756	0.29911	0.1881	1.083	33.128568
17	319	5.765	0.25446	0.3138	1.809	33.237428
18	327	5.790	0.20982	0.4456	2.580	33.523639
19	330	5.799	0.16518	0.5882	3.411	33.629476
20	337	5.820	0.12054	0.7494	4.362	33.873365
21	346	5.846	0.07589	0.9472	5.538	34.180846
22	353	5.866	0.03125	1.2429	7.292	34.415447
		119.707		-12.028	-56.502	654.180

$$\sum X_i = 119.707$$
$$\sum X_i^2 = 654.180$$
$$(\sum X_i)^2 = 14329.765$$
$$\sum Y_i = -12.028$$
$$\sum X_i.Y_i = -56.502$$

$$\beta = \frac{n.\sum (Xi.Yi) - \sum Xi.\sum Yi}{n.\sum X_i^2 - \sum (X_i)^2}$$

$$\beta = \frac{22.(-56,502) - ((119,707)(-12,028))}{22.(654,180) - 14.329,765}$$

$$\beta = \frac{196,79}{62,19}$$

$$\beta = 3,1641$$

$$C = \frac{\sum X_i^2.\sum Yi - \sum Xi.\sum (Xi.Yi)}{n.\sum X_i^2 - \sum (Xi)^2}$$

$$C = \frac{(654,180).(-12,028) - ((119,707).(-56,502))}{22.(654,1809) - 14.329,765}$$

$$C = \frac{-1104,792}{62,19}$$

$$C = -17,76$$

$$\theta = \exp(-\frac{C}{\beta}) = \exp(-\frac{-17,76}{3,1641}) = 298.867$$

$$\lambda = \frac{1}{\theta} = \frac{1}{298.867} = 0.0034$$

$$\alpha = \beta = 3,1641$$

PARAMETER KEANDALAN
DISTRIBUSI WEIBULL

3. BRAKE BAND CONE

NO.	RANK (ti)	Xi=ln(ti)	R(ti)	Yi	Xi.Yi	Xi^2
1	95	4.554	0.96875	-3.4499	-15.710	20.737795
2	135	4.905	0.92411	-2.5392	-12.456	24.061721
3	150	5.011	0.87946	-2.0523	-10.283	25.106466
4	210	5.347	0.83482	-1.7118	-9.153	28.591559
5	221	5.398	0.79018	-1.4461	-7.806	29.140161
6	224	5.412	0.74554	-1.2254	-6.631	29.285913
7	230	5.438	0.70089	-1.0345	-5.626	29.572707
8	241	5.485	0.65625	-0.8646	-4.742	30.082997
9	246	5.505	0.61161	-0.7100	-3.909	30.308675
10	265	5.580	0.56696	-0.5666	-3.161	31.133385
11	268	5.591	0.52232	-0.4316	-2.413	31.259135
12	269	5.595	0.47768	-0.3027	-1.694	31.300795
13	273	5.609	0.43304	-0.1780	-0.999	31.466174
14	275	5.617	0.38839	-0.0558	-0.313	31.548118
15	279	5.631	0.34375	0.0656	0.370	31.710546
16	280	5.635	0.29911	0.1881	1.060	31.750854
17	285	5.652	0.25446	0.3138	1.774	31.950634
18	291	5.673	0.20982	0.4456	2.528	32.186597
19	294	5.684	0.16518	0.5882	3.343	32.303079
20	305	5.720	0.12054	0.7494	4.287	32.721967
21	308	5.730	0.07589	0.9472	5.427	32.834044
22	310	5.737	0.03125	1.2429	7.130	32.908262
		120.509		-12.028	-58.977	661.962

$$\sum X_i = 120.509$$
$$\sum X_i^2 = 661.962$$
$$(\sum X_i)^2 = 14522.419$$
$$\sum Y_i = -12.028$$
$$\sum X_i.Y_i = -58.977$$

$$\beta = \frac{n.\sum (Xi.Yi) - \sum Xi.\sum Yi}{n.\sum X_i^2 - \sum (X_i)^2}$$

$$\beta = \frac{22.(-58,977) - ((120,509)(-12,028))}{22.(661,962) - 14.522,419}$$

$$\beta = \frac{152}{40.7}$$

$$\beta = 3.7$$

$$C = \frac{\sum X_i^2.\sum Yi - \sum Xi.\sum (Xi.Yi)}{n.\sum X_i^2 - \sum (Xi)^2}$$

$$C = \frac{(661,962).(-12,028) - ((120,509).(-58,977))}{22.(661,962) - 14.522,419}$$

$$C = \frac{-856}{40.7}$$

$$C = -21.1$$

$$\theta = \exp(-\frac{C}{\beta}) = \exp(-\frac{-21,1}{3,7}) = 307.969$$

$$\lambda = \frac{1}{\theta} = \frac{1}{307.969} = 0.00324$$

$$\alpha = \beta = 3.7$$

LAMPIRAN E :
TABEL CHI-SQUERE

ν	α							
	0.995	0.99	0.975	0.95	0.05	0.025	0.01	0.005
1	0.0^4393	0.0^3157	0.0^3982	0.0^3393	3.841	5.024	6.635	7.879
2	0.0100	0.0201	0.0506	0.103	5.991	7.378	9.210	10.597
3	0.0717	0.115	0.216	0.352	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	11.070	12.832	15.086	16.750
6	0.676	0.872	1.237	1.635	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	36.415	39.364	42.980	45.558
25	10.520	11.524	13.120	14.611	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	40.113	43.194	46.963	49.645
28	12.461	13.565	15.308	16.928	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	43.773	46.979	50.892	53.672

LAMPIRAN 7 :
TABEL POISON DIST. FUNCTION

r	μ			r	μ		
	32	34	38		32	34	38
0				33	0,6150	0,4772	0,2355
1				34	0,6792	0,5454	0,2914
2				35	0,7379	0,6117	0,3509
3				36	0,7901	0,6744	0,4138
4				37	0,8352	0,7319	0,4784
5				38	0,8732	0,7834	0,5429
6				39	0,9044	0,8283	0,6059
7				40	0,9293	0,8664	0,6657
8				41	0,9488	0,8980	0,7211
9				42	0,9636	0,9237	0,7712
10				43	0,9747	0,9439	0,8155
11				44	0,9827	0,9596	0,8538
12	0,0000			45	0,9884	0,9714	0,8861
13	0,0001	0,0000		46	0,9924	0,9801	0,9127
14	0,0003	0,0001		47	0,9951	0,9864	0,9343
15	0,0007	0,0002		48	0,9969	0,9909	0,9514
16	0,0014	0,0005	0,0000	49	0,9981	0,9940	0,9647
17	0,0028	0,0009	0,0001	50	0,9988	0,9961	0,9747
18	0,0052	0,0019	0,0002	51	0,9993	0,9975	0,9822
19	0,0093	0,0037	0,0005	52	0,9995	0,9986	0,9877
20	0,0159	0,0067	0,0010	53	0,9997	0,9991	0,9916
21	0,0259	0,0116	0,0019	54	0,9998	0,9994	0,9944
22	0,0406	0,0191	0,0035	55	0,9999	0,9996	0,9963
23	0,0609	0,0302	0,0062	56	1,0000	0,9998	0,9976
24	0,0881	0,0459	0,0103	57		0,9999	0,9985
25	0,1228	0,0674	0,0166	58		1,0000	0,9990
26	0,1656	0,0953	0,0259	59			0,9994
27	0,2162	0,1306	0,0389	60			0,9996
28	0,2741	0,1734	0,0565	61			0,9997
29	0,3380	0,2235	0,0796	62			0,9998
30	0,4061	0,2804	0,1089	63			0,9999
31	0,4765	0,3427	0,1448	64			1,0000
32	0,5468	0,4089	0,1874				

LAMPIRAN 9 :
TABEL UJI DIST. DUA PARAMETER

Percentiles of the distribution of S and expected values of M_i (*Continued*)

n	i	M_i	0.75	0.80	0.85	0.90	0.95	0.99
20	1	1.025866						
	2	0.527046						
	3	0.361682	0.75	0.80	0.85	0.90	0.95	0.99
	4	0.279798	0.50	0.55	0.61	0.68	0.78	0.90
	5	0.231417	0.67	0.71	0.75	0.80	0.86	0.94
	6	0.199905	0.54	0.58	0.62	0.67	0.75	0.86
	7	0.178167	0.64	0.67	0.71	0.75	0.81	0.89
	8	0.162684	0.55	0.58	0.62	0.66	0.73	0.82
	9	0.151549	0.62	0.65	0.68	0.72	0.77	0.85
	10	0.143674	0.55	0.58	0.61	0.65	0.71	0.80
	11	0.138448	0.61	0.63	0.66	0.69	0.74	0.83
	12	0.135580	0.55	0.58	0.61	0.64	0.69	0.77
	13	0.135306	0.60	0.62	0.65	0.68	0.72	0.80
	14	0.137120	0.55	0.57	0.60	0.63	0.68	0.76
	15	0.142527	0.59	0.61	0.63	0.66	0.71	0.78
	16	0.152861	0.55	0.57	0.59	0.62	0.67	0.74
	17	0.171810	0.58	0.60	0.62	0.65	0.69	0.76
	18	0.209721	0.55	0.57	0.59	0.62	0.66	0.72
	19	0.311257	0.58	0.59	0.61	0.64	0.68	0.74
	20		0.55	0.56	0.58	0.61	0.65	0.71
21	1	1.024594						
	2	0.525657						
	3	0.360159	0.75	0.80	0.85	0.90	0.95	0.99
	4	0.278117	0.50	0.56	0.62	0.69	0.78	0.90
	5	0.229551	0.68	0.71	0.76	0.80	0.86	0.94
	6	0.197821	0.54	0.58	0.62	0.67	0.74	0.85
	7	0.175815	0.64	0.67	0.71	0.75	0.80	0.89
	8	0.160009	0.55	0.58	0.62	0.66	0.73	0.82
	9	0.148471	0.62	0.65	0.68	0.72	0.77	0.85
	10	0.140087	0.55	0.58	0.61	0.65	0.70	0.80
	11	0.134200	0.60	0.63	0.66	0.69	0.74	0.82
	12	0.130451	0.55	0.58	0.60	0.64	0.69	0.77
	13	0.128702	0.59	0.62	0.64	0.68	0.72	0.79
	14	0.129025	0.55	0.57	0.60	0.63	0.67	0.75
	15	0.131756	0.59	0.61	0.63	0.66	0.70	0.78
	16	0.137659	0.55	0.57	0.60	0.63	0.67	0.74
	17	0.148341	0.58	0.60	0.62	0.65	0.69	0.76
	18	0.167481	0.55	0.57	0.59	0.62	0.66	0.73
	19	0.205352	0.58	0.60	0.62	0.64	0.68	0.75
	20	0.306285	55	0.56	0.58	0.61	0.65	0.72
	21		0.57	0.59	0.61	0.63	0.67	0.73

Percentiles of the distribution of S and expected values of M_t (*Continued*)

n	t	M_t	0.75	0.80	0.85	0.90	0.95	0.99
24	1	1.021431						
	2	0.522233						
	3	0.356436	0.75	0.80	0.85	0.90	0.95	0.99
	4	0.274051	0.50	0.56	0.62	0.69	0.78	0.90
	5	0.225086	0.67	0.71	0.76	0.81	0.86	0.94
	6	0.192892	0.54	0.58	0.62	0.68	0.75	0.85
	7	0.170338	0.64	0.67	0.71	0.75	0.81	0.89
	8	0.153877	0.55	0.58	0.62	0.67	0.73	0.83
	9	0.141549	0.62	0.65	0.68	0.72	0.77	0.86
	10	0.132195	0.56	0.58	0.61	0.66	0.71	0.80
	11	0.125099	0.61	0.63	0.66	0.70	0.75	0.83
	12	0.119811	0.55	0.58	0.61	0.64	0.70	0.78
	13	0.116054	0.60	0.62	0.65	0.68	0.73	0.80
	14	0.113677	0.55	0.58	0.60	0.64	0.68	0.76
	15	0.112638	0.59	0.61	0.64	0.67	0.71	0.78
	16	0.113007	0.55	0.57	0.60	0.63	0.67	0.74
	17	0.114990	0.58	0.60	0.62	0.65	0.69	0.76
	18	0.119014	0.55	0.57	0.59	0.62	0.66	0.73
	19	0.125889	0.58	0.60	0.62	0.64	0.68	0.75
	20	0.137235	0.55	0.57	0.59	0.61	0.65	0.72
	21	0.156679	0.57	0.59	0.61	0.64	0.67	0.73
	22	0.194285	0.55	0.56	0.58	0.61	0.64	0.71
	23	0.293473	0.57	0.59	0.60	0.63	0.66	0.72
	24		0.54	0.56	0.58	0.60	0.64	0.69

Percentiles of the distribution of S and expected values of M_s (*Continued*)

n	i	M_s	0.75	0.80	0.85	0.90	0.95	0.99
22	1	1.023439						
	2	0.524405						
	3	0.358790	0.75	0.80	0.85	0.90	0.95	0.99
	4	0.276618	0.50	0.55	0.61	0.68	0.77	0.90
	5	0.227895	0.67	0.71	0.75	0.80	0.86	0.94
	6	0.195983	0.54	0.58	0.63	0.68	0.75	0.85
	7	0.173760	0.64	0.67	0.71	0.75	0.81	0.89
	8	0.157692	0.55	0.58	0.62	0.66	0.72	0.82
	9	0.145834	0.62	0.65	0.68	0.72	0.77	0.85
	10	0.137052	0.55	0.58	0.61	0.65	0.70	0.80
	11	0.130662	0.61	0.63	0.66	0.69	0.74	0.82
	12	0.126260	0.55	0.58	0.61	0.64	0.69	0.78
	13	0.123640	0.60	0.62	0.65	0.68	0.72	0.80
	14	0.122763	0.55	0.58	0.60	0.63	0.68	0.75
	15	0.123763	0.59	0.61	0.63	0.67	0.71	0.78
	16	0.127019	0.55	0.57	0.60	0.62	0.67	0.74
	17	0.133316	0.58	0.60	0.62	0.65	0.69	0.76
	18	0.144273	0.55	0.57	0.59	0.62	0.66	0.73
	19	0.163552	0.58	0.60	0.62	0.64	0.68	0.75
	20	0.201355	0.55	0.57	0.59	0.61	0.65	0.72
	21	0.301693	0.57	0.59	0.61	0.64	0.67	0.73
	22		0.54	0.56	0.58	0.61	0.64	0.70
23	1	1.022389						
	2	0.523269						
	3	0.357557	0.75	0.80	0.85	0.90	0.95	0.9
	4	0.275268	0.50	0.55	0.61	0.68	0.77	0.8
	5	0.226417	0.67	0.71	0.75	0.80	0.86	0.9
	6	0.194351	0.55	0.59	0.63	0.68	0.76	0.8
	7	0.171948	0.64	0.68	0.71	0.76	0.82	0.8
	8	0.155666	0.56	0.59	0.63	0.67	0.73	0.8
	9	0.143549	0.62	0.65	0.68	0.72	0.78	0.8
	10	0.134451	0.56	0.59	0.62	0.66	0.71	0.8
	11	0.127667	0.61	0.63	0.66	0.70	0.75	0.8
	12	0.122768	0.55	0.58	0.61	0.64	0.69	0.7
	13	0.119503	0.60	0.62	0.65	0.68	0.73	0.8
	14	0.117764	0.55	0.57	0.60	0.63	0.68	0.7
	15	0.117577	0.59	0.61	0.63	0.67	0.71	0.7
	16	0.119120	0.55	0.57	0.60	0.63	0.67	0.7
	17	0.122799	0.58	0.60	0.63	0.65	0.69	0.7
	18	0.129416	0.55	0.57	0.59	0.62	0.66	0.7
	19	0.140590	0.58	0.60	0.62	0.64	0.68	0.
	20	0.159966	0.55	0.57	0.59	0.61	0.65	0.
	21	0.197679	0.57	0.59	0.61	0.63	0.67	0.
	22	0.297435	0.55	0.56	0.58	0.60	0.64	0.
	23		0.57	0.58	0.60	0.63	0.66	0.

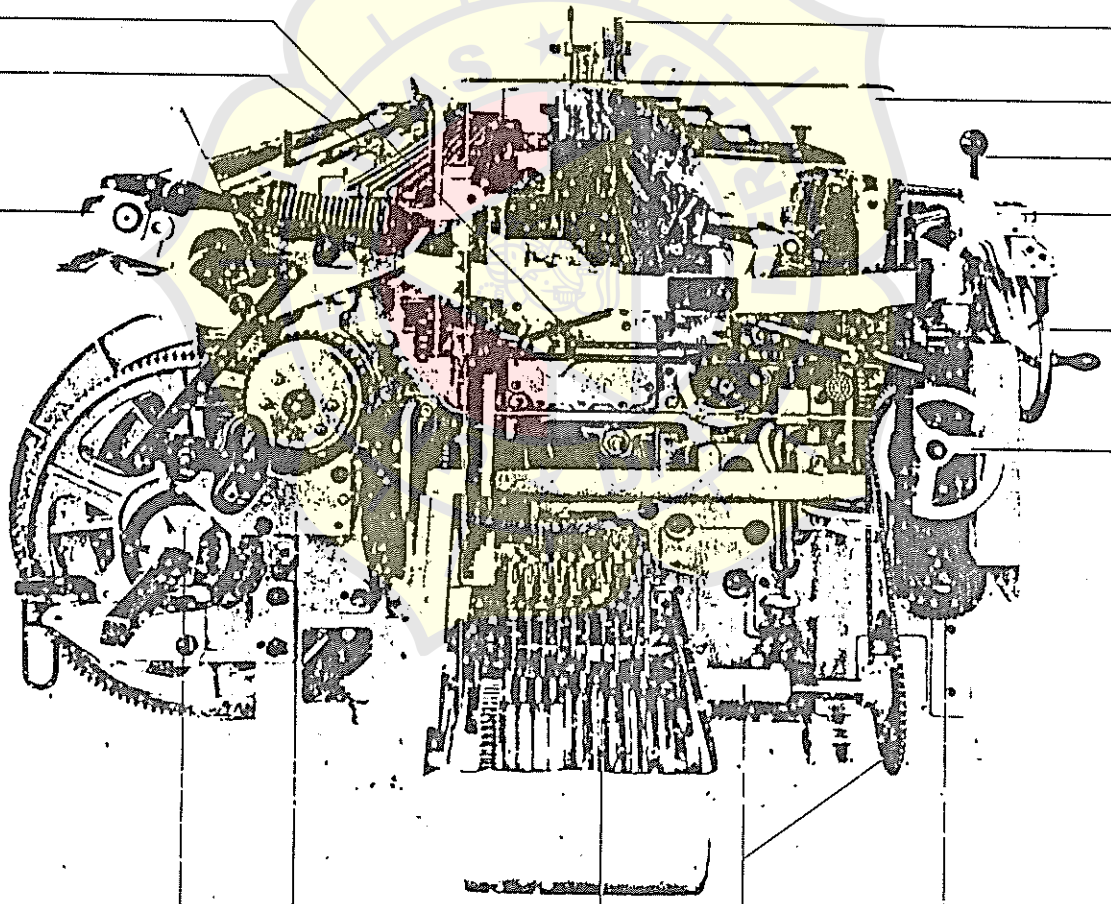
LAMPIRAN H :
GAMBAR MESIN TENUN

Mit geöffneter Exzentermaschine

With open tappet motion

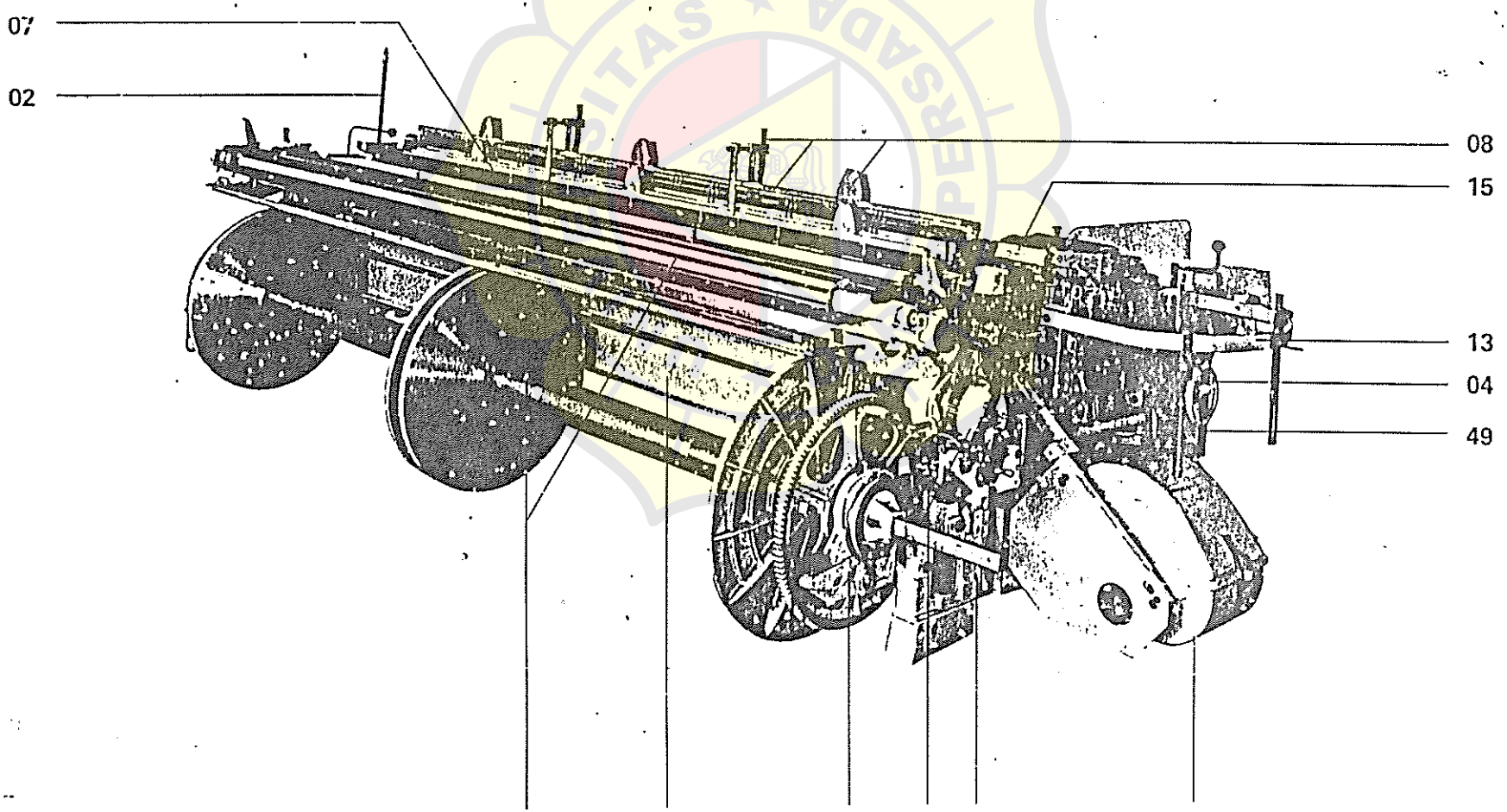
Avec mécanique d'armure à cames ouverte

130"ES



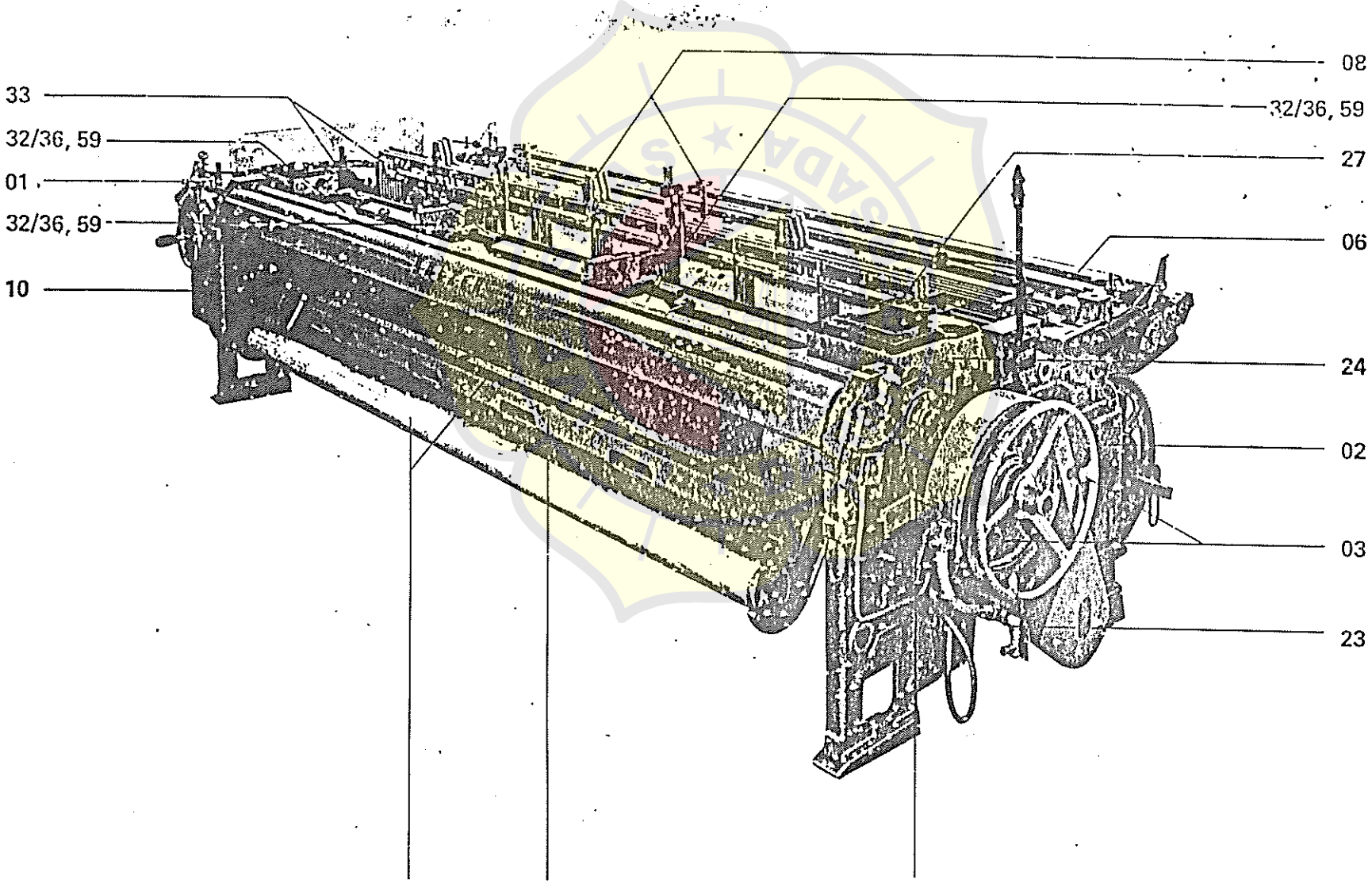
130"ES

Mit Exzentermaschine, Kettbaumseite
With tappet motion, warp beam side
Avec mécanique d'armure à cames, côté d'ensouple

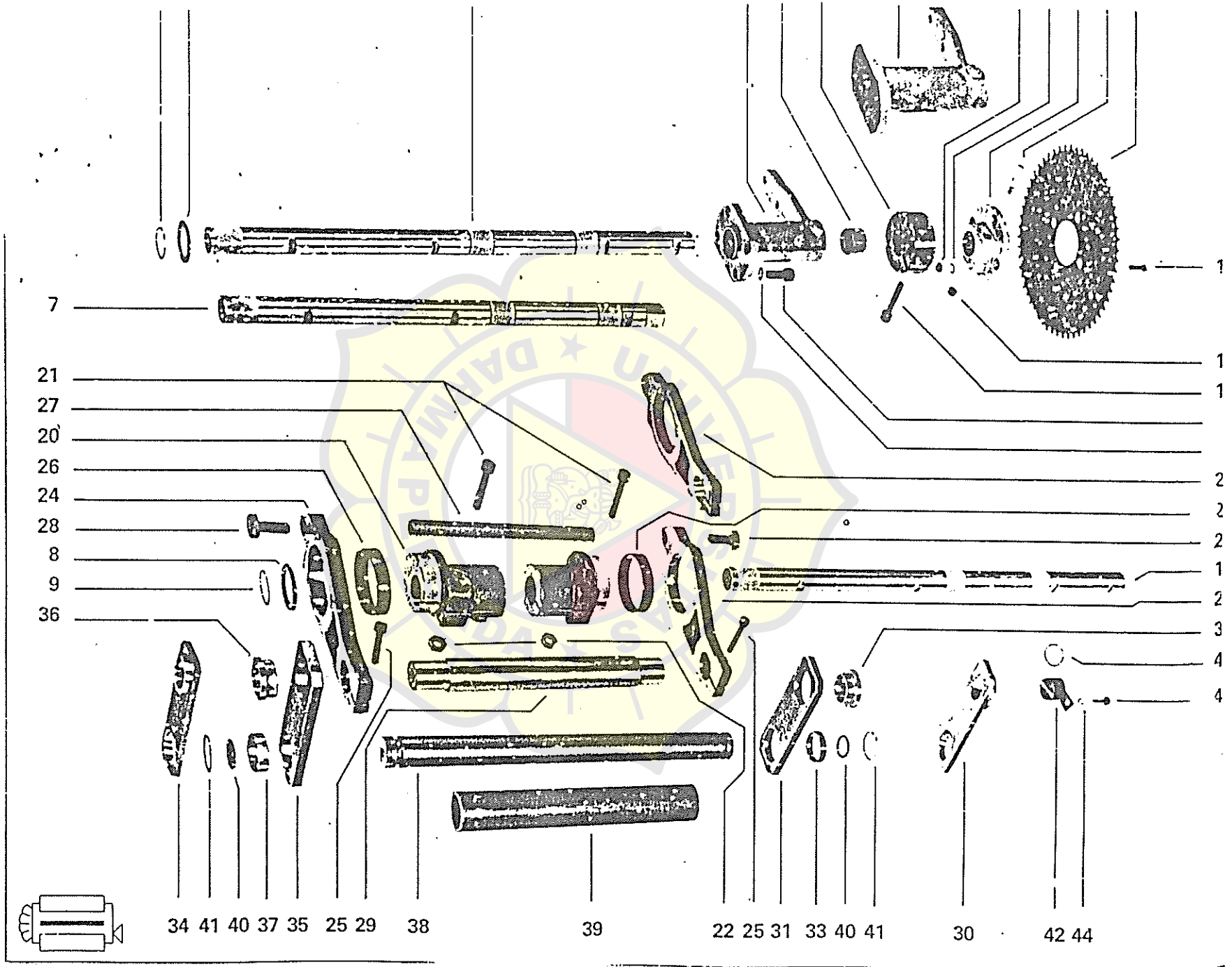


130" ES

Antrieb- und Warenbaumseite
Drive- and cloth beam side
Côté entrainement et appel du tissu



LAMPIRAN 1 :
GAMBAR SUKU CADONG NESTI TEMUN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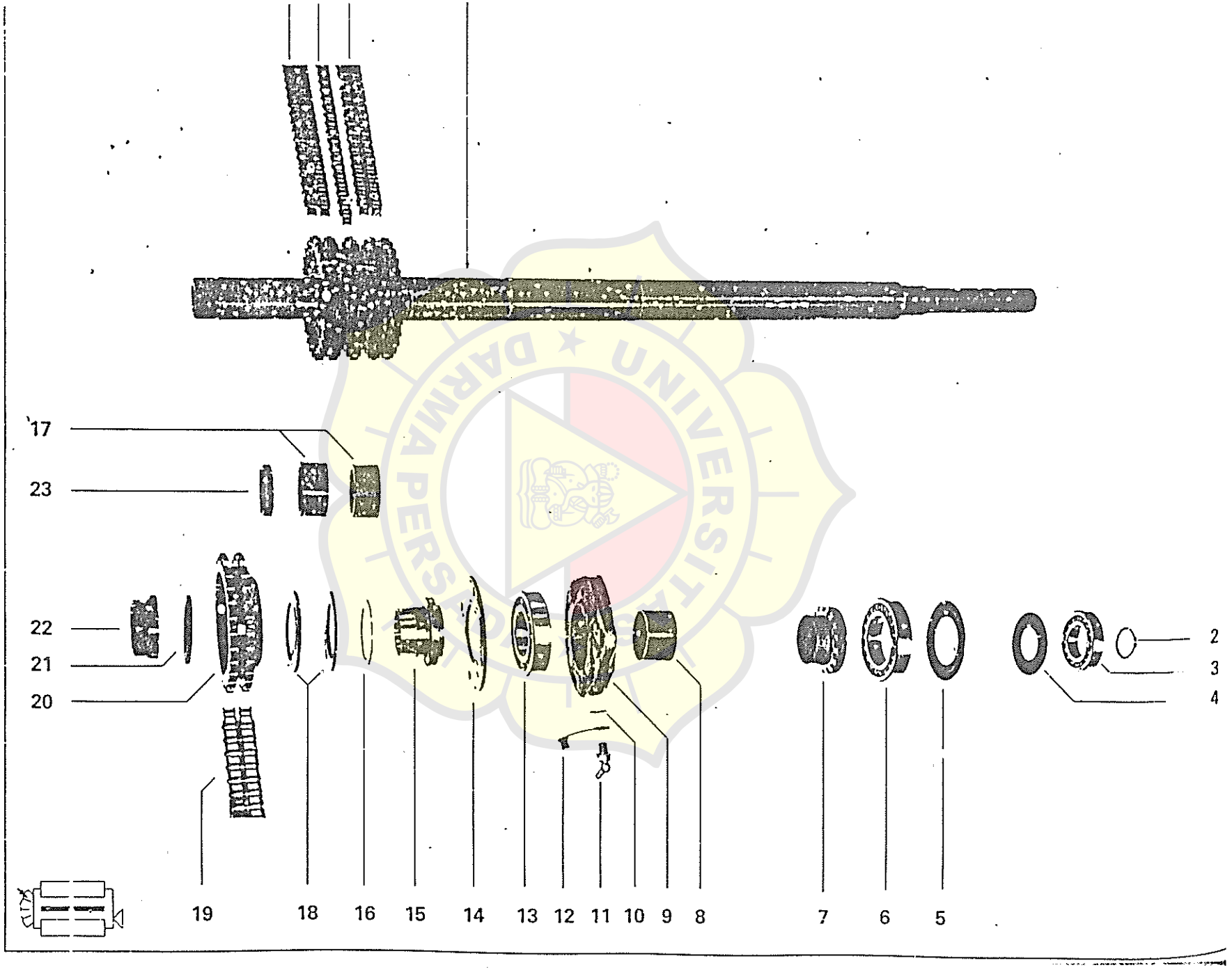
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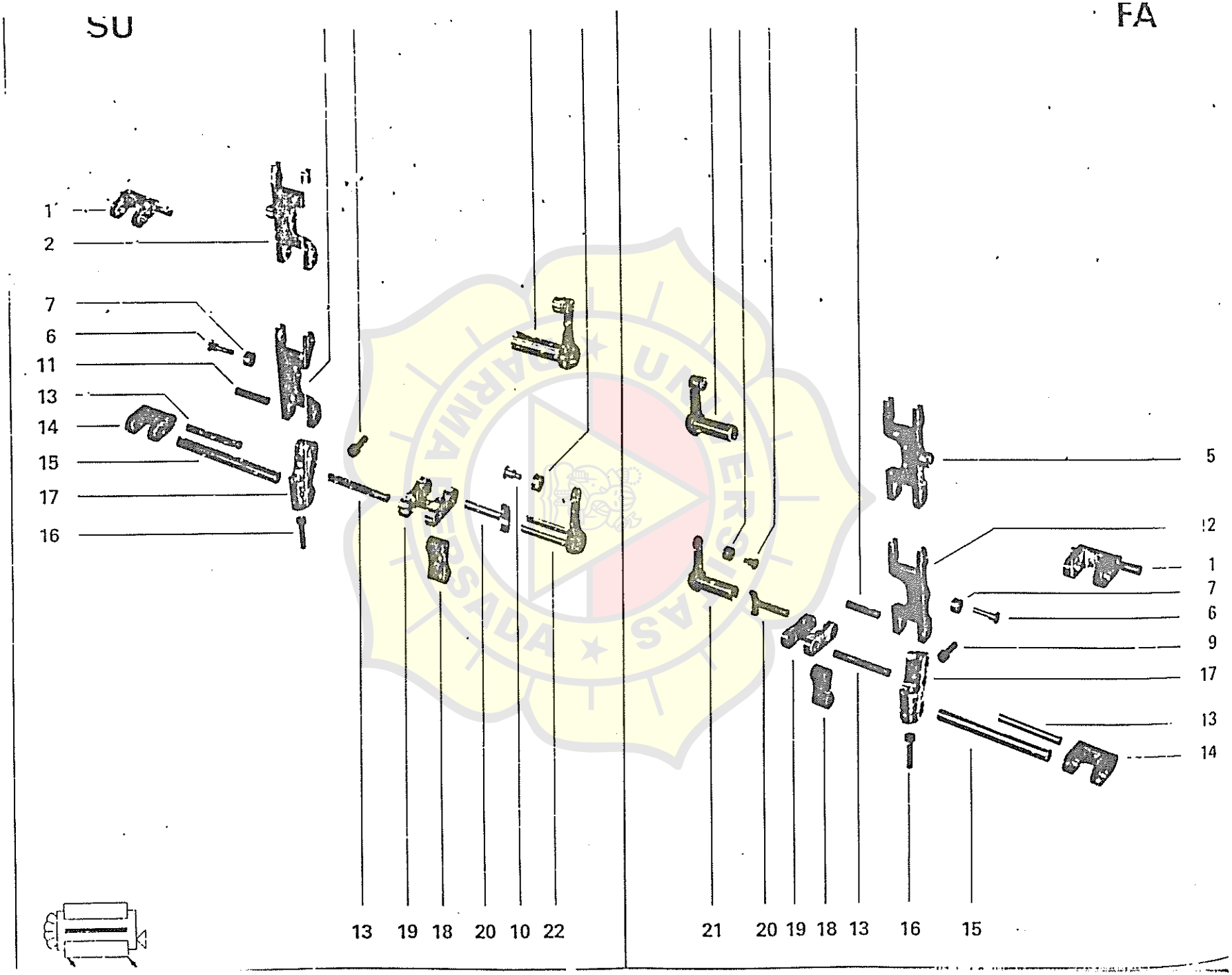
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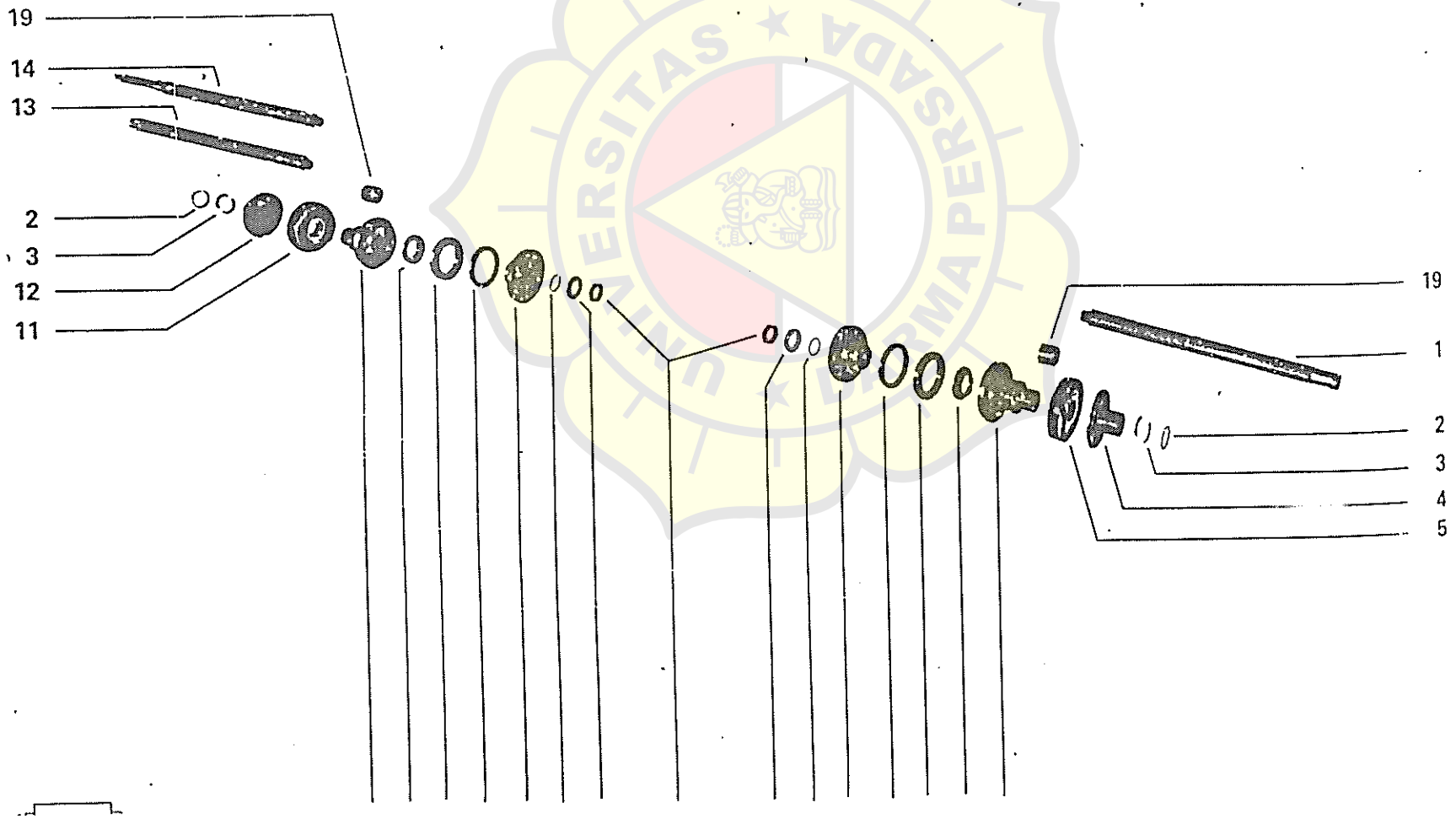

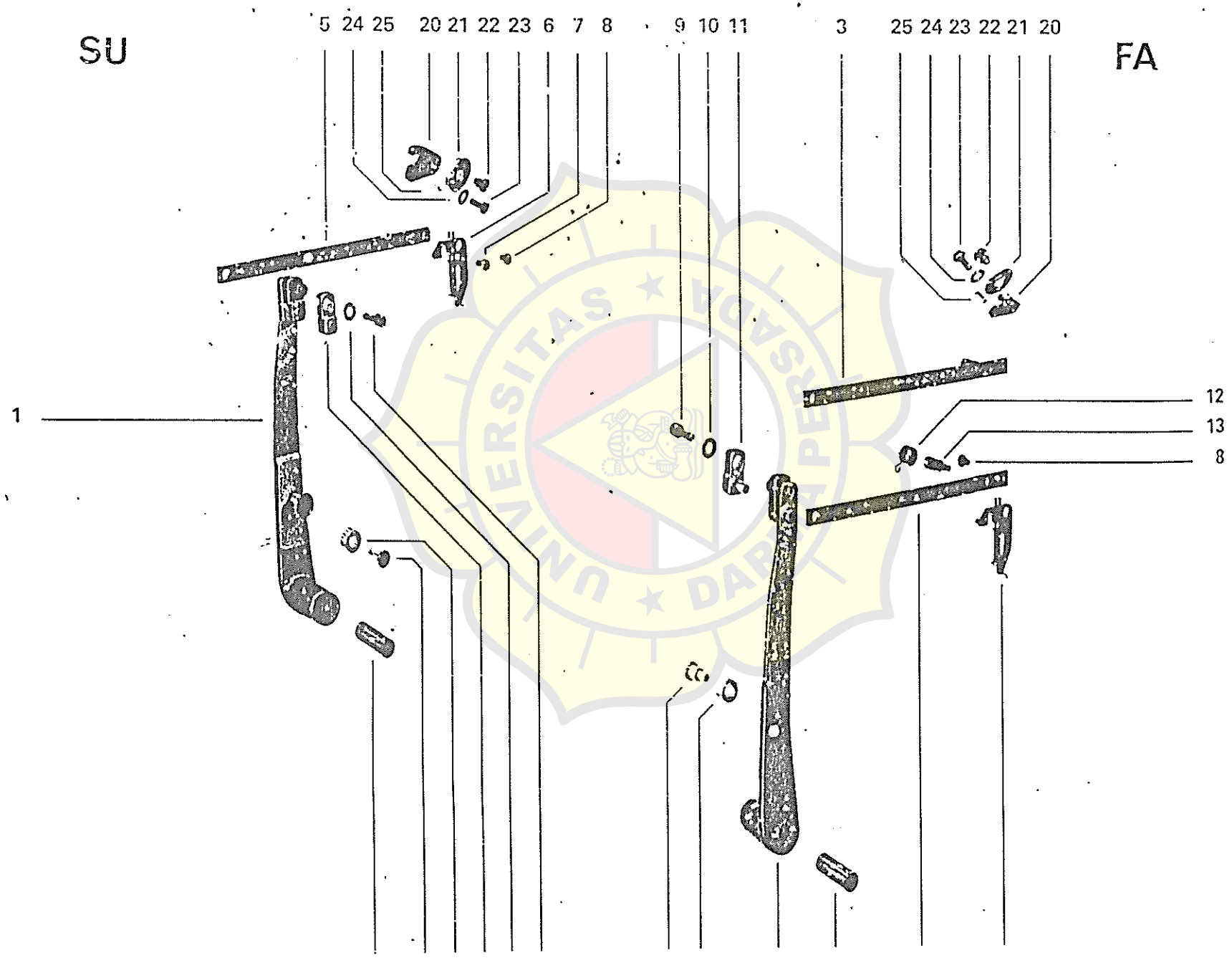
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9 10 11
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25 24 23 22 21 20
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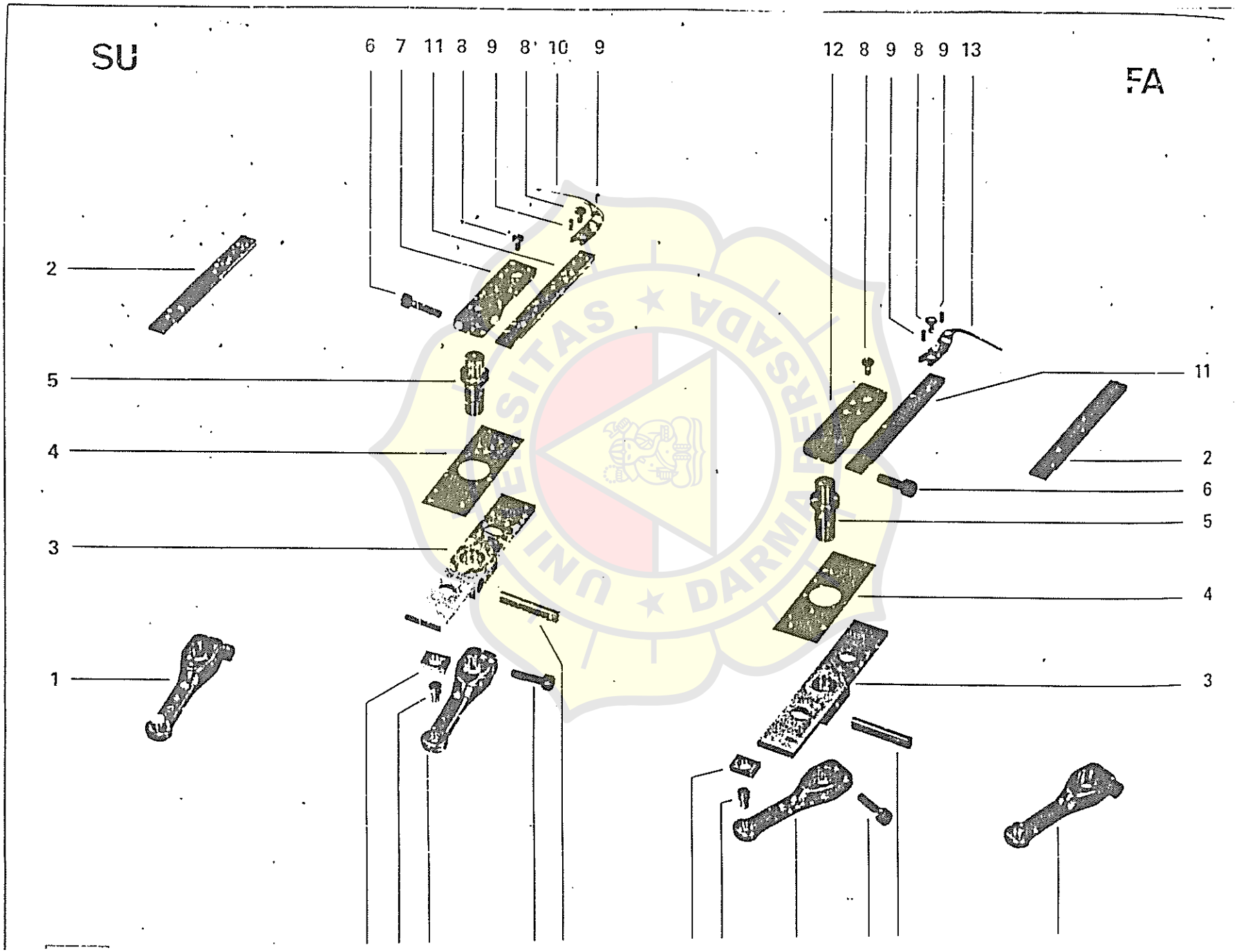
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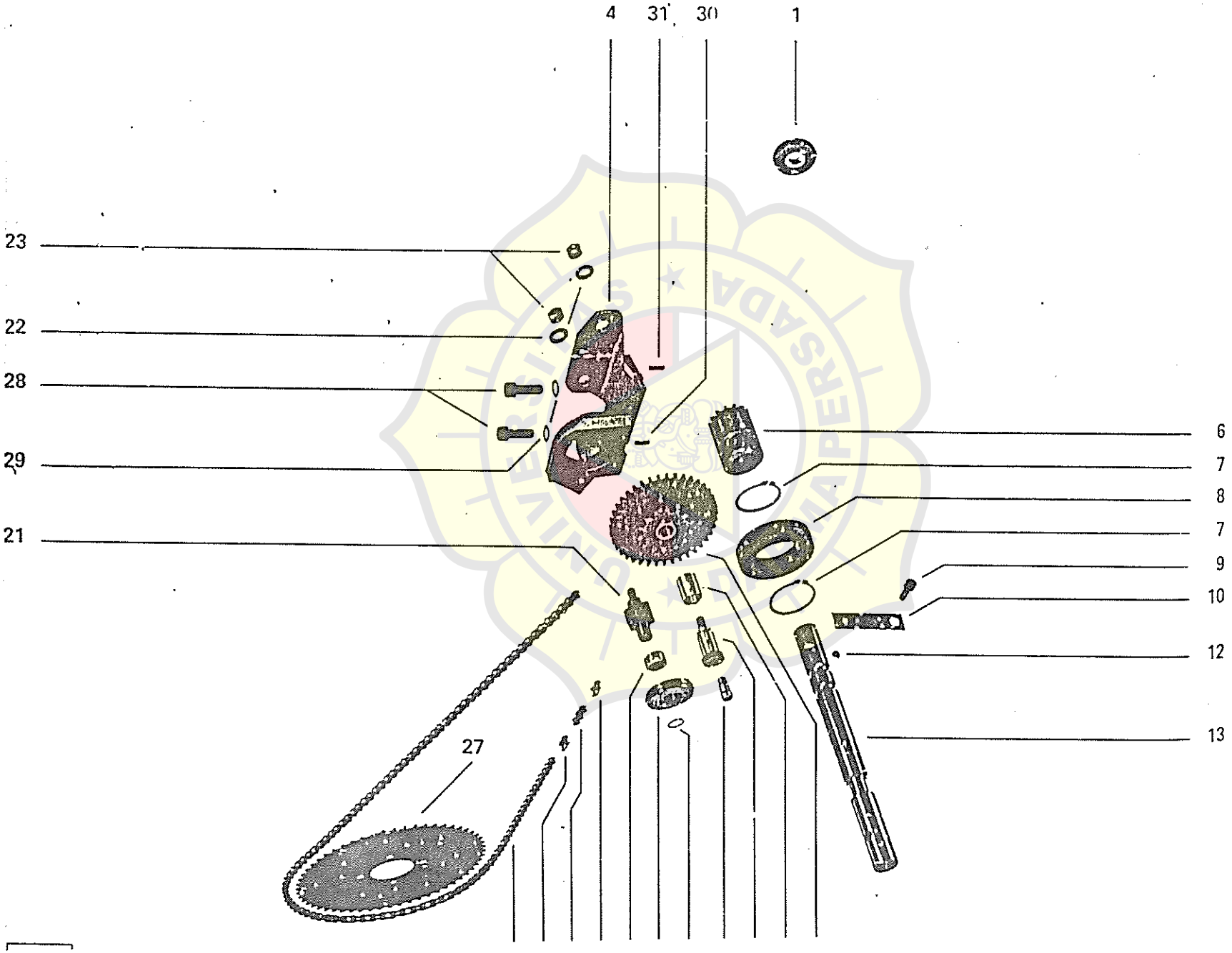
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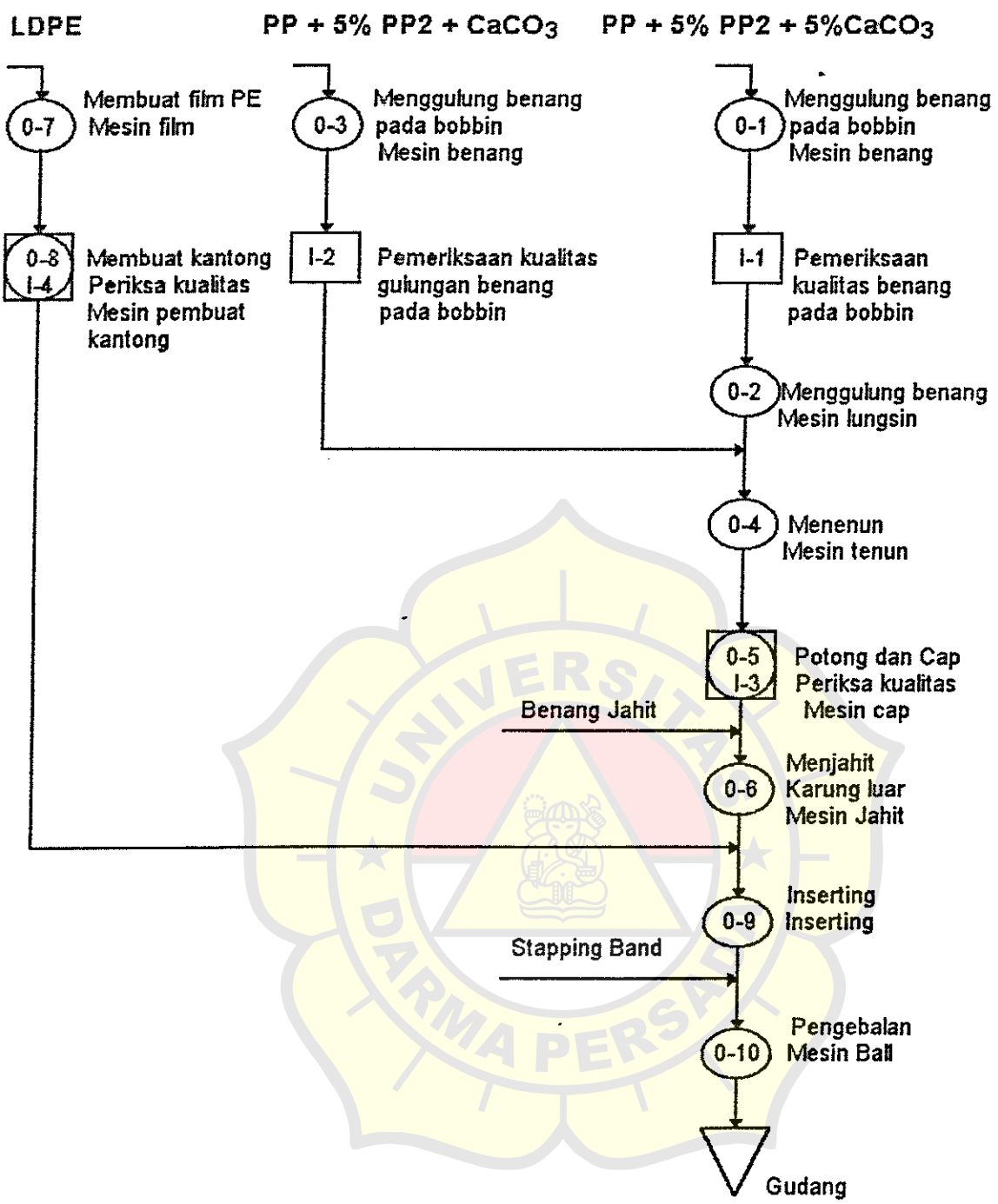
LAMPIRAN I :
DAFTAR SUKU CADNG

PENGGANTIAN SUKU CADANG
PERIODE JAN 1997 - JAN 1998

NO.	KODE STOCK	SUKU CADANG	JML MODAL YG DISERAP (Rp)	JML MODAL KUM. (Rp)	PERSEN (%)	PERSEN (%) KUMULATIF
1	17923634	PROJECTILE	3864000	3864000	10.95	10.95
2	17947312	PRCJECTILE RETURNER	1542000	5406000	4.37	15.32
3	17904869	BRAKE BAND CONE	1295000	6701000	3.67	18.99
4	17931369	WELT CARRIER FEEDER	1242000	7943000	3.52	22.51
5	17948769	LOWER BRAKE LINING	1188000	9131000	3.37	25.88
6	17916913	BUSCH	1128000	10259000	3.20	29.08
7	17957318	WEG FOOT FA	1108800	11367800	3.14	32.22
8	17957911	TUCKING NEEDLE S4	1095150	12462950	3.10	35.32
9	17933117	PROJECTILE OPENER	1080000	13542950	3.06	38.38
10	17948815	REAR BRAKE LINING	1067500	14610450	3.02	41.40
11	17926692	REAR LEVER	1037000	15647450	2.94	44.34
12	17948718	FRONT BRAKE LINING	994375	16641825	2.82	47.16
13	17940881	PICKING LINK 7,15	913200	17555025	2.59	49.75
14	17934369	PROJECTILE FEEDER G.	910000	18465025	2.58	52.33
15	17957563	WEG FA	905500	19370525	2.57	54.90
16	17926161	FILLING BRAKE BAND	805000	20175525	2.28	57.18
17	17957512	WEG SU	799500	20975025	2.26	59.44
18	17939565	PRESSISION CYLINDER	755300	21730325	2.14	61.58
19	17952316	SPECIAL HUT	687375	22417700	1.95	63.53
20	17941616	PICKING SHOE	596000	23013700	1.69	65.22
21	17957962	TUCKING NUDLE FA	578000	23591700	1.64	66.86
22	17911211	SLIDE PICEL	555900	24147600	1.57	68.43
23	17923511	PROJECTILE GRIPPER	554600	24702200	1.57	70.00
24	17942817	GUIDE TEETH	544500	25246700	1.54	71.54
25	17943891	SUPPORTING PIECE FA	510400	25757100	1.45	72.99
26	17943902	SUPPORTING PIECE SU	510400	26267500	1.45	74.44
27	17950518	PROJECTILE FEELER D1	471600	26739100	1.34	75.78
28	17923812	RIVET PROJECTILE	429400	27168500	1.22	77.00
29	17917669	TREADE LEVER NO.2	402600	27571100	1.14	78.14
30	17926358	BRAKE BANEL	400000	27971100	1.13	79.27
31	17941365	TORSION ROD	380500	28351600	1.08	80.35
32	17967208	CROSS COUPLING	370000	28721600	1.05	81.40
33	17951611	BOLT D1	357750	29079350	1.01	82.41
34	17937660	COMPLATE D1	347250	29426600	0.98	83.39
35	17963638	SIUD BOLT	336000	29762600	0.95	84.34
36	17951816	FAS OPENER	274500	30037100	0.78	85.12
37	17908767	SCREW M4X137 mm	247800	30284900	0.70	85.82
38	17904087	WEDGE 8X5X45	247000	30531900	0.70	86.52
39	17907582	GEAR WHEEL HUB	234000	30765900	0.66	87.18
40	17951115	SPRING UP	219200	30985100	0.62	87.80
41	17911814	BOLT	216600	31201700	0.61	88.41
42	17903617	STUD BOLT	215000	31416700	0.61	89.02
43	17946146	GUIDE PIECE PROJECTILE	206700	31623400	0.59	89.61
44	17936663	CENTERING BLADE	194600	31818000	0.55	90.16
45	17950364	SPRING CUP	190800	32008800	0.54	90.70
46	17904079	WEDGE 8X5X24	188000	32196800	0.53	91.23
47	17903668	STUD	185000	32381800	0.52	91.75
48	17915810	LINGKAGE DRIVE HARNESS	180000	32561800	0.51	92.26
49	17957563	GRIPPER FA	175350	32737150	0.50	92.76
50	19124615	BALL BEARING SRF	170500	32907650	0.48	93.24
51	84809617	U-BELT A 80	158600	33066250	0.45	93.69
52	17935861	SLIDE PIECE RH/ES	151000	33217250	0.43	94.12
53	17916182	INTERMIDIATE SUPPORT	150000	33367250	0.42	94.54
54	17957569	FOT S4	150000	33517250	0.42	94.96
55	84809617	V BELT	144000	33661250	0.41	95.37
56	17958519	SPECIAL SCREW FA	137700	33798950	0.39	95.76
57	17917618	TREADLE LEVER	134200	33933150	0.38	96.14
58	17917715	TREADLE	134200	34067350	0.38	96.52
59	17917715	TREADLE LEVER NO.3	134200	34201550	0.38	96.90
60	17917766	TREADLE LEVER NO.4	134200	34335750	0.38	97.28
61	17958527	SPECIAL SCREW	124250	34460000	0.35	97.63
62	15202645	CERAK BELT	117000	34577000	0.33	97.96
63	17994869	BRAKE BAND	110700	34687700	0.31	98.27
64	17908210	BREAKING RING	105000	34792700	0.30	98.57
65	17934563	FEEDER GRIPER	102800	34895500	0.29	98.86
66	17903269	RUBBER RING D.50	97650	34993150	0.28	99.14
67	17505566	SELT RING	82000	35075150	0.23	99.37
68	19129119	BEARING NSK 4-309NR	54000	35129150	0.15	99.52
69	17966830	RUBBER STRIP	40000	35169150	0.11	99.63
70	17111016	BALL BEARING	37500	35206650	0.11	99.74
71	17958560	SPRING WEG	36300	35242950	0.10	99.84
72	17909011	CET OF DRIVE ROFT	35000	35277950	0.10	99.94
73	17945310	SLIDE	19000	35296950	0.05	99.99
74	17918169	RIVET LINGKAGE	2100	35299050	0.01	100.00
			35299050		100.00	

LAMPIRAN K :
PROSES PRODUKSI



Peta Proses Operasi
Pembuatan Karung Plastik