BABV

KESIMPULAN DAN SARAN

5.1 Kesimpulan

1. Hasil Perhitungan dan pembahasan dapat disimpulkan :

   RB = 393.33 N

   RA = 316.67 *N*

   σ = $223829{,}55 N/m^2$

   σ yang diizinkan = 16×10^6 N/m^2

   Hasil Lendutan Lantai dasar =2,5 mm

   Hasil Lendutan Lantai dua = 4,81 mm

2. Beban lebih berat di roda belakang dimana ruang bakar, *turbocharger*, Pompa oli , tangki oli masuk ada pada posisi tengah pada kerangka dan kontrol panel listrik dan gas ada di bagian belakang

3. Tegangan yang diizinkan lebih besar dari tegangan maksimum , diasumsikan beban yang paling berat dijadikan acuan pada 4panampang maka dapat dipastikan aman

4. Melihat factor diatas maka penulis menyimpulkan bahwa perhitungan ini dapat dipakai

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LAMPIRAN

PRODUCT DATA SHEET

304/304L STAINLESS STEEL

UNS S30400/UNS S30403

AK Steel

AK Steel Type 304 is a variation of the basic 18-8 grade, Type 302, with a higher chromium and lower carbon content. Lower carbon minimizes chromium carbide precipitation due to welding and its susceptibility to intergranular corrosion. In many instances, it can be used in the "as-welded" condition, while Type 302 must be annealed in order to retain adequate corrosion resistance.

Type 304L is an extra low-carbon variation of Type 304 with a 0.03% maximum carbon content that eliminates carbide precipitation due to welding. As a result, this alloy can be used in the "as-welded" condition, even in severe corrosive conditions. It often eliminates the necessity of annealing weldments except for applications specifying stress relief. It has slightly lower mechanical properties than Type 304.

Typical uses include architectural mouldings and trim, kitchen equipment, welded components of chemical, textile, paper, pharmaceutical and chemical industry processing equipment.

AVAILABLE FORMS

AK Steel produces Type 304 Stainless Steel in thicknesses from 0.01" to 0.25" (0.025 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

COMPOSITION

	Type 304 %	Type 304L %
Carbon	0.08 max.	0.03 max.
Manganese	2.00 max.	2.00 max.
Phosphorus	0.045 max.	0.045 max.
Sulfur	0.030 max.	0.030 max.
Silicon	0.75 max.	0.75 max.
Chromium	18.00-20.00	18.0-20.0
Nickel	8.00-12.00	8.0-12.0
Nitrogen	0.10 max.	0.10 max.
Iron	Balance	Balance

SPECIFICATIONS

AK Steel Types 304 and 304L Stainless Steels are covered by the following specifications:

Type 304	Type 304L
AMS 5513	AMS 5511
ASTM A 240	ASTM A 240
ASTM A 666	ASTM A 666

MECHANICAL PROPERTIES

Typical Room Temperature Mechanical Properties

	UTS ksi (MPa)	0.2% YS ksi (MPa)	Elongation %in 2" (50.8 mm)	Hardness Rockwell
Type 304L	85 (586)	35 (241)	55	B80
Type 304	90 (621)	42 (290)	55	B82

AK STEEL 304/304L STAINLESS STEEL DATA SHEET

PHYSICAL PROPERTIES

Density, 0.29 lbs/in³
8.03 g/cm³

Electrical Resistivity, microhm-in (microhm-cm)
68°F (20°C)– 28.4 (72)
1200°F (659°C)– 45.8 (116)

Specific Heat, BTU/lb/°F (kJ/kg •K)
32-212°F (0-100°C)–0.12 (0.50)

Thermal Conductivity, BTU/hr/ft²/ft/°F (W/m•K)
at 212°F (100°C) – 9.4 (16.2)
at 932°F (500°C) – 12.4 (21.4)

Mean Coefficient of Thermal Expansion, in/in/°F (µm/m• K)
32- 212°F (0- 100°C)– 9.4x 10^{-6} (16.9)
32- 600°F (0- 315°C)– 9.6 x 10^{-6} (17.3)
32-1000°F (0- 538°C) –10.2 x 10^{-6} (18.4)
32-1200°F (0- 649°C)–10.4 x 10^{-6} (18.7)

Magnetic Permeability, H = 200 Oersteds, Annealed - 1.02 max.

Modulus of Elasticity, ksi (MPa)
28.0x 10^3 (193 x 10^3) in tension
11.2 x 10^3 (78x 10^3) in torsion

Melting Range, °F (°C) – 2550 - 2650 (1399 - 1454)

CORROSION RESISTANCE

These steels exhibit excellent resistance to a wide range of atmospheric, chemical, textile, petroleum and food industry exposures.

OXIDATION RESISTANCE

The maximum temperature to which Types 304 and 304L can be exposed continuously without appreciable scaling is about 1650°F (899°C). For intermittent exposure, the maximum exposure temperature is about 1500°F (816°C).

HEAT TREATMENTS

Type 304 is non-hardenable by heat treatment. Annealing: Heat to 1900-2050°F (1038 - 1121°C), then cool rapidly. Thin strip sections may be air cooled, but heavy sections should be water quenched to minimize exposure in the carbide precipitation region.

Stress Relief Annealing: Cold worked parts should be stress relieved at 750°F (399°C) for 1/2 to 2 hours.

FORMABILITY

Types 304 and 304L have very good drawability. Their combination of low yield strength and high elongation permits successful forming of complex shapes. However, these grades work harden rapidly. To relieve stresses produced in severe forming or spinning, parts should be full annealed or stress-relief annealed as soon as possible after forming.

WELDABILITY

The austenitic class of stainless steels is generally considered to be weldable by the common fusion and resistance techniques. Special consideration is required to avoid weld "hot cracking" by assuring formation of ferrite in the weld deposit. Types 304 and 304L are generally considered to be the most common alloys of this stainless class. When a weld filler is needed, AWS E/ER 308, 308L or 347 are most often specified. Types 304 and 304L Stainless Steels are well known in reference literature and more information can be obtained in this way.

METRIC CONVERSION

Data in this publication are presented in U.S. customary units. Approximate metric equivalents may be obtained by performing the following calculations:

Length (inches to millimeters) – Multiply by 25.4

Strength (ksi to megapascals or meganewtons per square meter) – Multiply by 6.8948

Temperature (Fahrenheit to Celsius) – (°Fahrenheit - 32) Multiply by 0.5556

Density (pounds per cubic inch to kilograms per cubic meter) – Multiply by 27,670

AK Steel

Customer Service 800-331-5050

AK Steel Corporation
9227 Centre Pointe Drive
West Chester, OH 45069

www.aksteel.com

7100-0088 7/07

◀TOYOTA										
AE101	09.94-04.97	4	1.6	78	4AFE		BIC117			
AE102	09.94-08.97	4	1.8	77-85	7AFE		BIC117			
AE112R	10.98-10.99	4	1.8	85	7AFE		BIC117			
	10.99-09.01	4	1.8	85	7AFE		BIC117			
	10.99-10.01	4	1.8	85	7AFE		BIC117			
ZZE122	08.00-	4	1.8	99	1ZZFE		0221 504 020			
	09.01-01.04	4	1.8	99	1ZZFE		0221 504 020			
Corona										
ST141	06.83-04.87	4	2.0	73	2SC					BIM126
						10.85-12.86	BIC117			
RT142	08.84-12.86	4	2.4	87	22REC	08.84-10.85	GT40R			
						11.85-12.86	BIC068			
Cressida										
MX32	04.77-12.80	4	2.6	90-95	4M		SU12R	STT		
							GT40R	STP		
							GT40RT	TRT		
MX62	09.80-07.84	6	2.8	95	5ME		BIC064			
	09.80-04.86	6	2.8	95	5ME		BIC064			
MX73	08.84-08.88	6	2.8	95	5ME		BIC064			
	11.84-08.88	6	2.8	125	5MGE		BIC068			
Crown										
MS65	02.71-09.74	6	2.6	100	4M		SU12R	STT		
							GT40R	STP		
							GT40RT	TRT		
MS85	10.74-08.79	6	2.6	100	4M		SU12R	STT		
							GT40R	STP		
							GT40RT	TRT		
MS111	09.79-08.80	6	2.6	100	4M		SU12R	STT		
							GT40R	STP		
							GT40RT	TRT		
MS112	09.79-07.83	6	2.8	107	5ME		0221 119 030			
	08.80-07.83	6	2.8	107	5ME		BIC064			
MS123	08.83-09.85	6	2.8	107	5ME		0221 119 090			
	09.85-08.87	6	2.8	125	5MGE		BIC068			
Hilux										
RN10	03.68-01.71	4	1.5	55-63	2R		0221 119 027			
RN13	02.71-04.72	4	1.6	49	12R		0221 119 027			
RN16	02.71-04.72	4	1.6	49	12R		0221 119 027			
RN20LKR	05.72-07.78	4	1.8	49	12R		GT40R			
							SU12R			
RN25LKR	05.72-07.78	4	1.6	49	12R		GT40R			
							SU12R			
RN36	01.79-07.83	4	2.0	65	18R		0 221 119 046			
YN62/67/60/65	09.83-08.88	4	2.0	65	3Y		BIC333			
RN50/55,58/61/67	01.86-07.98	4	2.4	80	22R		0221 122316			
YN50/55	08.86-07.98	4	1.6	50	1Y		BIC333			
YN58/62/63/67	08.86-07.98	4	2.2	75	4Y		BIC333			
YN51/56	08.87-08.88	4	1.8	65	2Y		BIC333			
YN85	08.88-08.94	4	1.8	57	2Y					BIM126
						08.88-01.90	BIC333			
						02.90-08.94	BIC702			
YN106	08.88-08.94	4	2.2	69	4Y					BIM126
						08.88-01.90	BIC333			
						02.90-08.94	BIC702			
YN110	08.88-08.94	4	2.2	69	4Y					BIM126
						08.88-01.90	BIC333			
						02.90-08.94	BIC702			
YN85	01.89-10.94	4	1.8	57	2Y	01.89-03.90	BIC333			
						03.90-10.94	BIC702			
RNZ147R	10.98-12.02	4	2.0	68	1RZ		BIC117			

T3/T4 hybrid universal turbo kit

spesifikasi:

The packages Includes:

1 x T3/T4 Hybrid Turbo Charger: 100% Brand New T3/T4 Hybrid Turbocharger! High Quality Guaranteed! This turbo can easily do 25 PSI, and 500+ hp on b series swaps, standard t3/t4 flange, perfect for any 4-6 cylinder applications. Power performance output capability = 25-35 psi. Cnc machined flanges. High quality t04e with a forged turbine propeller wheel!

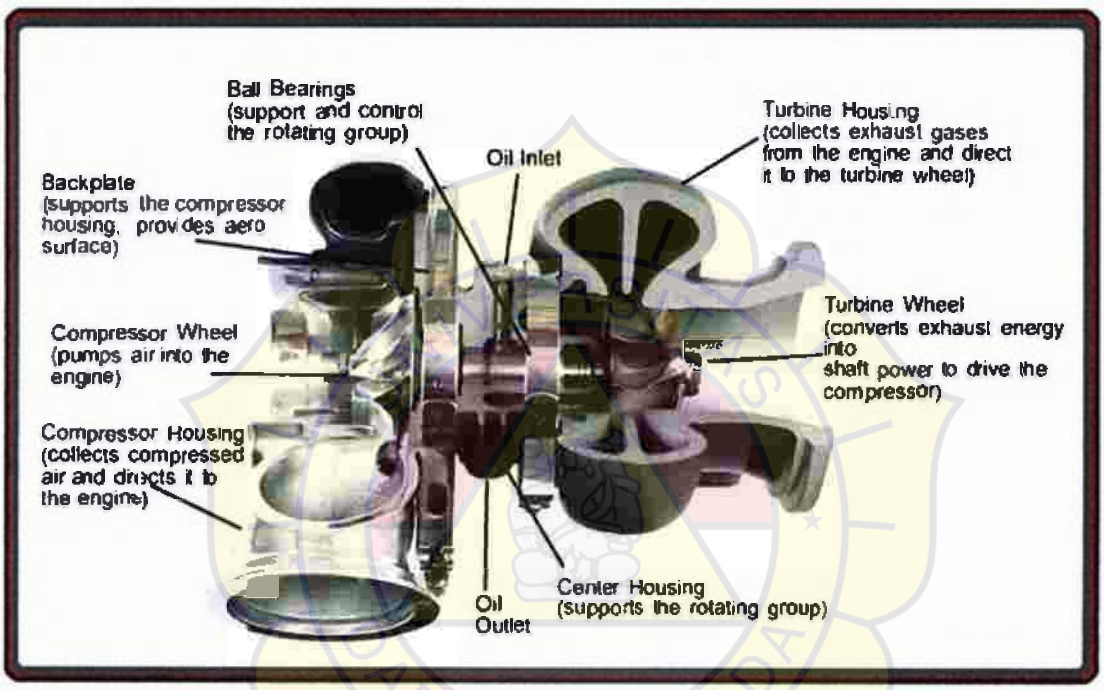
Turbo Specification:
-Inlet Diameter: 3"
-Outlet Diameter: 2"
-Oil Inlet: 1/8 NPT
-Compressor Wheel: .57 Trim
-A/R Compressor: .50 A/R
-A/R Turbine: .63 A/R

Turbine wheel:
-Exducer: 2.48"
-Mayor: 2.89"

Compressor wheel:
-Exducer: 2.07"
-Mayor: 2.36"

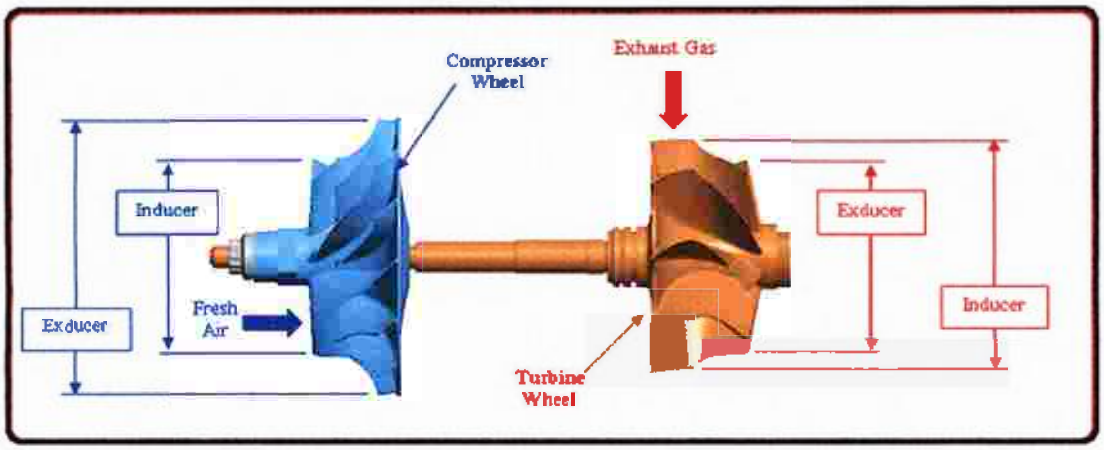
Choosing a turbo

Find a turbo your budget can easily cope with, as you'll be spending a fair bit more on ancillaries. Try not to use too small a turbo as their turbine efficiencies can be so low as to make the engine a poor performer at best or a non-starter at the worst. Small turbo's can also have miss-matched compressor/turbine flow characteristics for our use, but which are OK for a turbo.



Anatomy Of a Turbocharger

The shaft assembly should spin freely with no axial play (good thrust bearing), but there will be radial wobble if you grab the end of the shaft at either compressor or turbine, as long as neither compressor or turbine scrape against the housings without oil in the "brass bush" bearings, they should be fine when there is oil pressure to them. Check for bent or damaged blades, reject the turbo if there are any signs of damage, as you will be running it harder than on any engines it might have come from.



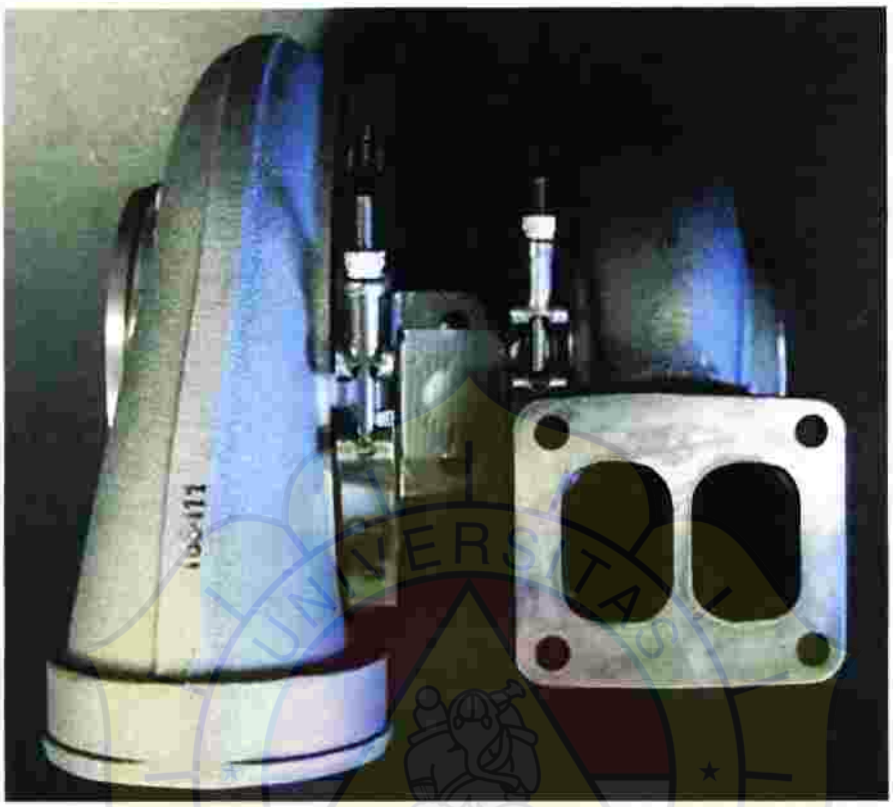
Compressor/Turbine Shaft Assembly

Try using a turbo from at least a 3 litre engine or bigger which has a compressor wheel inlet (Inducer, see diagram above) diameter of 1.75"-2.00" or larger. If possible find one designed for high pressure "boost", something off a large generator or industrial stationary engine that's setup for continuous heavy boost. If you can view the entire compressor wheel with its housing removed, a compressor wheel that has its inducer diameter of around 2/3rds of the overall diameter (Exducer, see diagram above) is a good possibility, e.g. 3" inducer and 4.5" exducer diameter. Modern ones will probably have a bit better efficiency and hopefully a little more safety built into it. The relative sizes of the compressor wheel inducer and the turbine wheel exducer, also needs to be considered. Try and find a turbo whose turbine exducer area is around 20%-25% larger than the compressors inducer area. The table below lists a few examples in terms of diameters rather than area which is easier to gauge:

Compressor Inducer Diameter (inches)	Turbine Exducer Diameter (inches)
2	2.3
2.5	2.8
3	3.4
3.5	3.9
4	4.5

Bear in mind that your turbo does not have to match these numbers exactly they are just a guide. A turbo whose compressor inducer is 2" and turbine exducer is 2.2" or 2.4" for example, may actually perform better than another turbo that also has a compressor inducer of 2" and turbine exducer of 2.3" as the table suggests. This is due to the many other variables such as relative hub/blade ratios and blade angles that can affect final performance.

The turbine housing should be of the "open" variety with no centre divide where the hot gases go in (see picture below), the divide causes a loss in efficiency because of all that extra friction, and you'll end up with less thrust from your engine if you use a divided housing.



Divided Turbine Housing

Additionally, some turbine housings have internal waste-gates (see picture below) found on smaller automotive vehicles, particularly diesels. Internal waste-gates are built into the turbine housing and consist of a "flapper" valve, crank arm, rod end, and pneumatic actuator and provide a means to control the compressor boost pressure of the engine. For our purposes, waste gates are not a good thing, the hole in the turbine housing will need to be sealed and they are a general indication that there may be a mismatch of compressor/turbine, i.e. the turbine/housing may be too small compared to the compressor. Some automotive turbochargers do not use a waste-gate at all as do many used in large commercial diesel applications. Turbochargers without a waste-gate are referred to as 'free-floating'.

Internal Waste-gate

To find max RPM of your chosen turbo, that corresponds to the groups accepted maximum compressor tip speed of 1450 feet per second, it can be worked out by measuring the outlet diameter (exducer) of the compressor in inches, multiply by "PI"(3.142) to get circumference in inches, divide that by 12 to get the circumference in feet, divide that into 1450, to get RPM/sec then multiply by 60 for RPM, e.g. our compressor is 4.5 inches overall so 4.5" X 3.142 = 14.13" div by 12 = 1.1775 ft circumference 1450 ft/sec div by 1.1775= 1231.4 rps X 60=73,884 RPM max.

5.2 Saran

Berdasarkan pegamatan pada saat desain, penulis dapat memberikan saran sebagai berikut :

- Optimalisasi pengerjaan saat perancangan harus teliti dan memahami teori-teori mengenai turbin gas
- Saat melakukan perhitungan harus memiliki ketelitian