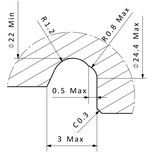
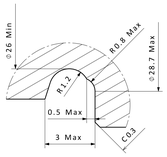
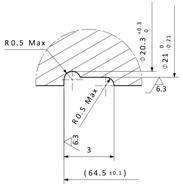


Detail X
Scale: 8:1



Detail V
Scale: 8:1



Detail Y
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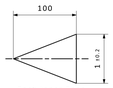
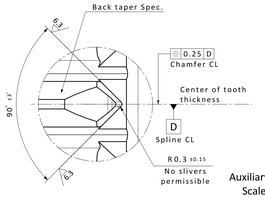
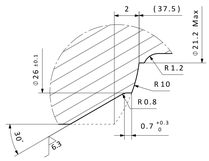
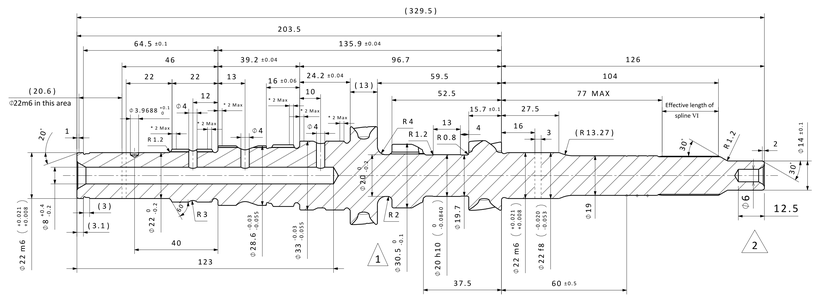




Auxiliary view K
Scale: 5:1



Detail L
Scale: 6:1

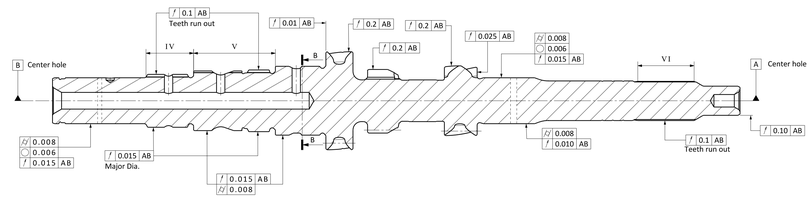


Section view A-A
Scale: 1:1

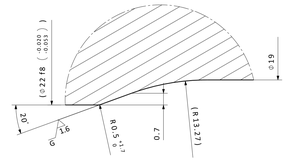
Front view
Scale: 1:1

1

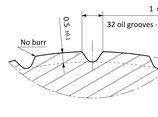
Table 1: Gears Data					
	Symbol	Unit	Value	Value	Value
Gear Data Primary shaft			I 2 nd gear	II R gear	III 1 st gear
centre distance	a	mm	61	47.8	61
face width	b	mm	13	13.5	15.7
normal module	mn	mm	2	2.25	2.1
number of teeth	z		18	11	11
normal pressure angle	alfn	°	20	20	20
helix angle	beta	°	32	0	30
hand of helix			RH	---	RH
basic rack			DIN 867	DIN 867	DIN 867
addendum modification — Nominal	x		-0.2126	0.4	0.4800
reference diameter	d	mm	42.450	24.750	26.674
tip diameter	da	mm	$47^{0/}_{-0.12}$	$30.5^{0/}_{-0.1}$	$33.450^{0/}_{-0.12}$ (33.330~33.450)
root diameter	df	mm	$35.2^{0.148}_{-0.231}$	$21.2^{0/}_{-0.4}$	$22.075^{-0.149}_{-0.231}$
base diameter	dB	mm	39.009	23.257	24.590
base helix angle	betab	°	29.865	0	28.024
tooth thickness — Nominal normal (min~max)	sn (sn.i ~ sn.e)	mm	$2.832^{-0.054}_{-0.084}$	$4.296^{-0.054}_{-0.084}$	$4.032^{-0.054}_{-0.084}$
Dia. measurement over balls (Ball Dia.) — Nominal (min ~ max)	MdK	mm	46.670 $^{0.137}_{-0.141}$ (⌀3.5) (46.455 ~ 46.533)	$34.04^{0}_{-0.08}$ (⌀5)	$35.412^{0.141}_{-0.141}$ (⌀4.5) (35.268 ~ 35.32)
root diameter useable	dNf	mm	39.01	⌀23.47	⌀24.807
tip diameter useable	dNa	mm	⌀45.44	⌀28.95	⌀31.838
Profile Crowning	Cα	µm	2~11	2~11	2~11
Lead Crowning	Cβ	µm	2~11	2~11	2~11
Profile Evaluation Dia. (92% of LAE)		mm	⌀39.01~ ⌀45.44	Ø23,47 ~ Ø28.95	⌀24.807 ~ ⌀31.838
Evaluation Face Width			20% of Face Width redueced symmetrically		
no. of teeth of mating part	zg		35	---	38
Start of Chamfer Dia.	dk	mm	Ø46 (0 / +0.4)	Ø29.7 (0 / +0.4)	Ø32.45 (0 / +0.4)
gear tooth quality(acc.ISO 1328)			8	9	8



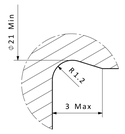
Section view A-A[2]
Scale: 1:1



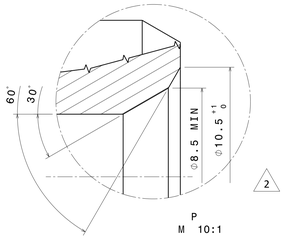
Detail R
Scale: 8:1



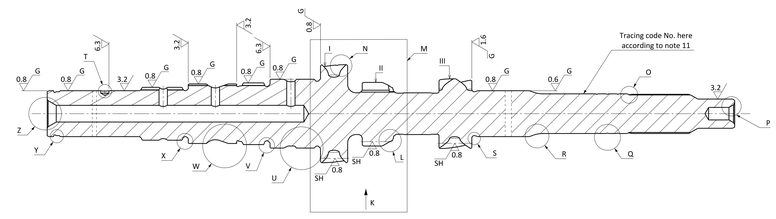
Section view B-B
Scale: 10:1



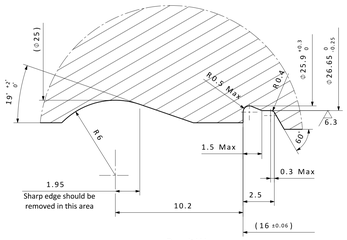
Detail S
Scale: 8:1



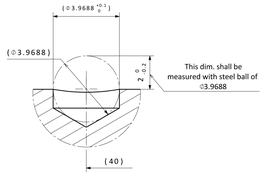
P
M 10:1



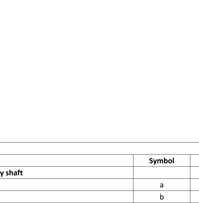
Section view A-A[3]
Scale: 1:1



Detail W
Scale: 6:1

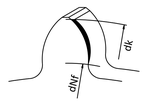


Detail T
Scale: 8:1

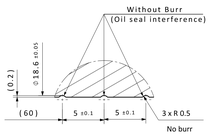


Detail of tip chamfer

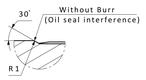
DEBURRING CHAMFER ON dNf=0.2~0.5
DEBURRING CHAMFER ON dk=0.6~0.8



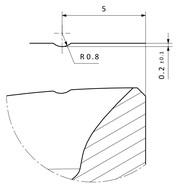
DEBURR & CHAMFER SHOULD BE DONE ON EDGES
THAT HOBBING & SHAPPING TOOLS PREDUCE BURR
ON SINGLE OR DOUBLE SIDE
ONLY ACCORDING TO PATTERN



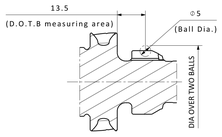
Identification grooves
Detail Q
Scale: 4:1



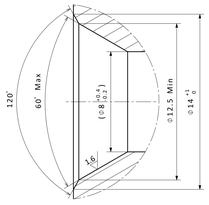
Detail O
Scale: 3:1



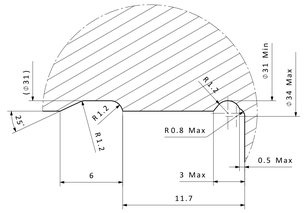
Identification groove
Detail N
Scale: 8:1



Detail M
Scale: 1:1



Detail Z
Scale: 6:1



Detail U
Scale: 5:1

Notes:
1- Material (alternatively): 20CrMoS4, 27CD4, TSCM815H
2- Material quality (SCM420H) according to JIS G 4052
   Material quality (20CrMoS4) according to DIN 3990-5: MQ or ISO 6336-5: MQ
   Material quality (27CD4) according to PSA B53 1495D
   Material quality (TSCM815H) according to MES MM 226A
3- Parts free of burr and machining deposits
4- R configuration marked may vary in case of rolling oil groove
5- Since sags accuracy in areas of * marked Dim. (2Max) by thread rolling of spline.
   Ground out side diameter Dim. may vary from specified value by 0.3mm.
6- Unspecified tolerances shall be as follows angle: ±5°, CH: ±0.3, R: ±0.5
7- Gear tooth root fillet radius shall be max, and free form steps due to shaving
8- Changes in geometry by rolling shall be controlled by geometry before rolling
9- Shall do shot peening (gear surface and root of first gear III) arc height 0.2~0.4 mm, shot size SAE S230 (SB-6)
10- G= Grounding, SH= Shaving
11- Marking should include production date (YYMM) & M & company code (XXXX) and serial number of part.
   Marking procedure optional (Laser, Needle typing, Graving Pen, etc.)
   Min character height is 3mm
   Tracing code No. should be completely obvious

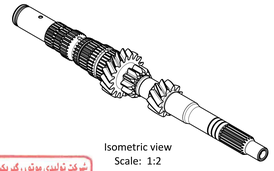
1 (12.5 / , 6.3 / , 3.2 / , 1.6 G / , 0.8 G / , 0.6 G /)

Table 4: Heat Treatment Data (CARB, & HDN All Over) (For Material SCM420H)				
Surface Hardness		58~65 HRC	Teeth Pitch Diameter	At Three Teeth 120° Apart
Core Hardness		28~42 HRC	Teeth Root Diameter	
Hardening Depth (550 HV0.3)	Unground Area	0.4~0.8 mm	Teeth Pitch Diameter	
	Ground Area	0.25 mm Min	Ground Area	
Tempring	Holding Temp.	150℃		
	Holding Time	1 hr Min.		

Table 5: Heat Treatment Data (CARB, & HDN All Over) (For Material 20CrMo54 Or 27CD4 Or TSCM815H)				
Surface Hardness		Min 650 HV10	Pitch Diameter	At Three Teeth 120° Apart
Core Hardness		35~39 HRC	Root Diameter	
Hardening Depth (550 HV0.3)	Unground Area	0.4~0.7 mm	Teeth Pitch Diameter	
	Ground Area	0.25 mm Min	Ground Area	
Tempring	Holding Temp.	150℃		
	Holding Time	1 hr Min.		

مگاموتور
تایید مهندسی محصول

Table 2: Involute Spline Data			
	IV (Gear 5th)	V (Hub clutch 3,4)	VI (Clutch disk)
Root Fillet	Flat Root	Flat Root	Flat Root
Fitting	Side Fit / Major Dia.Fit	Side Fit / Major Dia.Fit	Side Fit
Coefficient of Modification	0	0	0
Diameteral pitch	24/48	24/48	1.0 (Module)
Pressure Angle	30°	30°	30°
Number of Teeth	23	27	18
Pitch Diameter	24.341	28.575	18
Major Diameter	25.4 (g7) (-0.007/-0.028)	29.634 (g7) (-0.007/-0.028)	19 (-0.1/-0.25)
Minor Diameter	22.649 (+0/-0.21)	26.881 (+0/-0.21)	16.2 (+0/-0.18)
Dia.over two pins (Pin Dia.)	27.339 (-0.025/-0.097) (Ø2)	31.589 (-0.029/-0.102) (Ø2)	21.177 (-0.153/-0.222) (Ø2)



Isometric view
Scale: 1:2

شرکت تولیدی موتور، گیربکس و اکسل سفیا (سهامی خاص)
بانک اطلاعات فنی
تاریخ ۹۶/۸/۲۰

NO.	MOD.NO.	DATE	REMARK	BY	CHECK	APPRVD.
2	G3296063	96/8/20	Changed Detail of centering hole	MIRHAJ	FATTAHI	DARVIDH
1	G3296041	96/5/15	Changed tip diameter. (was _31(-0.12/0))	MIRHAJ	FATTAHI	DARVIDH

R&D	DATE	NAME	PROJECT : TIBA MT Imp.	FORM.	QTY 1
DRAWN.	95/1/18	R&D	OLD PT. NO.		
CHECKED	95/2/7	MIRHAJ	ROUGH PT. NO.	SCALE : FREE	SHEET 1
CHECKED	95/2/7	FATTAHI	PART NO : TN03C-32201	SIZE : A0	SHEETS 1
APPRVD.	95/2/7	DARVISH	MATERIAL : SCM420H		
WEIGHT (Kg) 1.210Kg			PART NAME : Shaft Primary		
FREE TOL. : ISO 2768-mk			DRAW NO. : TN03C-32201	REV. R02	

MEGA MOTOR