MMW

AUTO INDUSTRIES

(Genuine Parts)

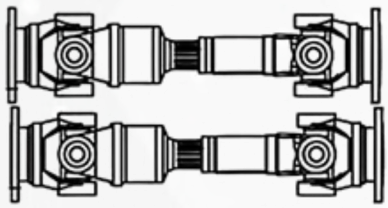
Balancing innovation
with precision

BUSINESS CATALOGUE

PROPELLER SHAFT FOR INDUSTRIAL APPLICATION

Mmwshaft.netlify.app

Mmwautoparts@gmail.com



An ISO-9001 Certified co

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SUCCESS IS A JOURNEY NOT A DESTINATION

MMW Auto industries Products is the National leader in propeller Shafts and its components. With Headquarters in Delhi NCR, MMW auto industries provides superior Power Transmission Solutions for all types of industries, serving the domestic as well as international sector. MMW auto industries brings a fresh and innovative approach for new applications by selecting the perfect product for the required application.

MMW auto industries is a strictly professional company specializing in developing and manufacturing power transmission products. It's technology center possesses the most advanced capacity of product development and consultancy service. Meanwhile, the production department is capable of producing light-duty and heavy-duty transmission product lines with highest precision.

MMW auto industries defines, designs and delivers high-end industrial technology that helps companies excel in their respective business goals. Our goal is to exceed the expectations of every client by offering excellent products & outstanding customer service, hence improving overall efficiency. Our team members are distinguished by their functional and technical expertise combined with their hands-on experience, thereby ensuring that the clients receive the most effective and professional service.

MMW auto industries possesses great market competitiveness attributing to its quality, price and services.

THE SUCCESS OF MMW PROPELLER SHAFT BASED ON:

- **Developing High Quality Products.**
- **Customer - Centric Approach.**
- **Regular Innovations and Feedback.**

PROPELLER SHAFT/ UNIVERSAL JOINT SHAFT

Propeller shafts transmit torque from the driving to the driven unit and are proven components of engineering. They enable the connection between two shafts which are not arranged in line and allow angular deflection in any plane. Length variations between the shaft end are compensated by splined sliding components. The application of propeller Shafts will result in following benefits for the user:

Simplified assembly

No alignment of the units to be connected.

Economical Maintenance

High Class bearings guarantee long service life.

Saving Time

Production down time is reduced by simplified arrangements of total installation.

Features of mmw propeller Shaft

High Quality

Compact Design

High Torque capacity despite small connecting dimensions

U.J. Cross with Low Notch Factor

Low Maintenance

Dimensional Accuracy.

Applications of propeller Shafts

- Steel Plants
- Rolling Mills
- Paper Machinery
- Roller Drives
- Cement Industry
- Vibrating Screens
- Mining Equipments
- Tea Machinery
- Textile Machines

CERTIFICATIONS & QUALITY ASSURANCE

Quality

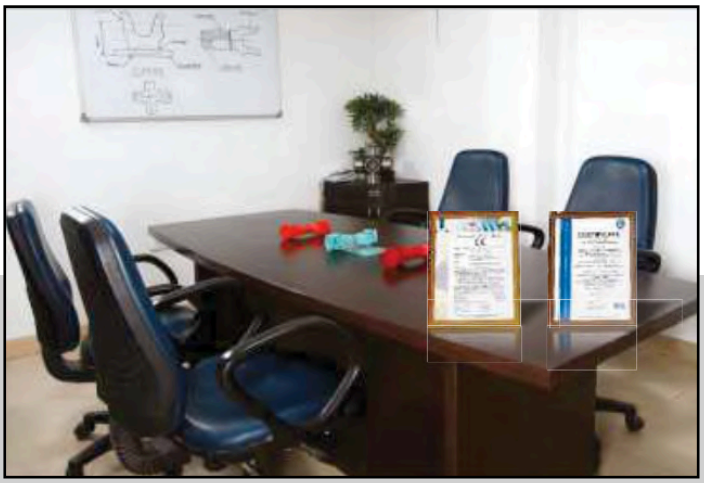
Under proper government regulation, mmw produces the most durable and reliable propeller shaft by the use of modern machines, tools and workers.

The company has a strong infrastructure and a very dynamic management team, with special emphasis on meeting commitments of quality and deliveries.

With continuous efforts on improving quality standards mmw has been re-certified with ISO-9001:2015 certificate by TUV: SUD Germany for quality management.

What we offer :

- We use state-of-the-art measuring machines for quality assurance.
- We offer a variety of certifications & classifications to our customers.
- Production & assembly fixtures are inspected on a regular basis.
- Quality relevant measuring & testing instruments are subject to systematic monitoring.
- Testing is done by qualified professionals.



OUR TESTING FACILITY

TESTING PROCEDURES	DESCRIPTION
Spectro Analysis	To analyze the chemical composition of the material
Hardness Test	To deduce the resistance of a material
Microstructure Analysis	To check the strength, toughness, ductility, hardness, corrosion resistance, high/low temperature behaviour, wear resistance
Dimensional Test	To compare the specified dimensions with the observed dimensions within the provided tolerance.
Ultrasonic Test	To detect internal flaws or to characterize materials through ultrasonic waves
Magnetic Particle Test	To detect surface discontinuities in ferromagnetic materials
Die Penetration Test	To detect flaws in weld joints of propeller shafts

INFRASTRUCTURE

DESIGNS

Type A - Standard

propeller shaft with length compensation

Type B - Fixed length

propeller shaft
without length compensation.

Type C Double Flange

propeller shaft without length compensation, double flange shaft design.

Type D- Long Spline

propeller shaft with
large length compensation

Type E-Super

propeller Shaft having super short design. In this design the length smaller than the minimum compressed length of Type A can be manufactured with Short Stroke.
REES

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LENGTH ABBREVIATION

Propeller Shaft with Length Compensation

Lo Operating Length

Lz Compressed Length of propeller Shaft

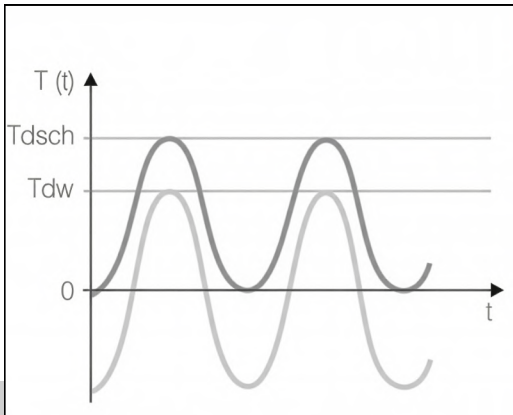
La Available length compensation (stroke)

The distance between the driving and driven machines, together with any length changes during operation, determines the operating length:

Optimum operating length:

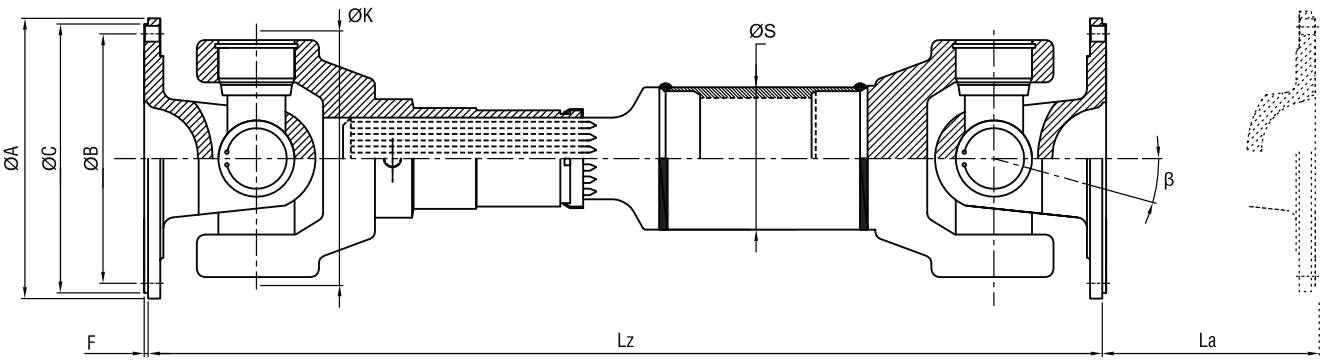
Maximum permissible operating length

TORQUE LOAD.



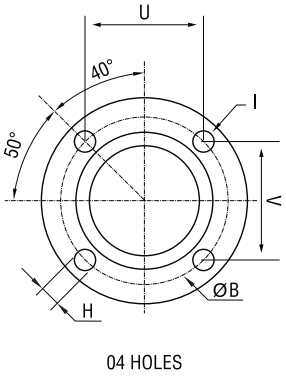
Designation	Explanation
Tdw	The reversing fatigue torque rating. The shatt will have infinite fatigue life up to this torque.
Tdsch	The pulsating one-way fatigue torque rating. The shatt will have infinite fatigue life up to this torque level. Here : Tdsch = 1.5 Tdw
Tk	Maximum permissible torque. Above this value, plastic deformation may occur.
Bearing	
Tb	Permissible torque for rarely occurring peak loads. At torque values above Tb, the bearing tracks might suffer from plastic deformation. This can lead to shorter bearing life.

SERIES W1

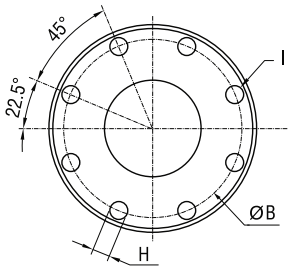


Standard Shaft with Length Compensation

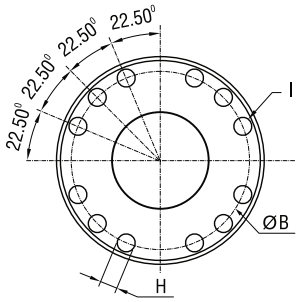
Model No.	U	V
MW 86X	44.90	53.60
MW 97X	51.00	60.80
MW 120X	60.60	73.50
MW 146X	77.70	92.50
MW 146RX	77.60	92.40



04 HOLES



08 HOLES

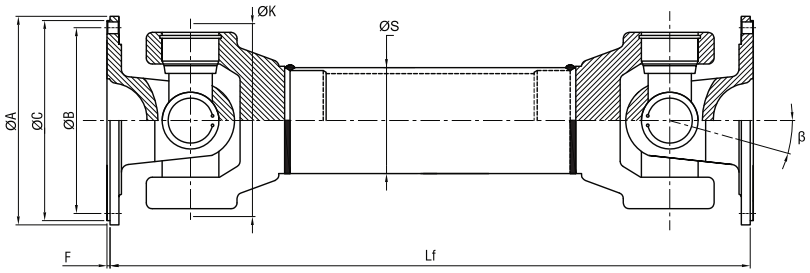


12 HOLES

		Units	MW86X	MW97X	MW120X	MW146X	MW146RX	MW175X	MW203X	MW276X
Tb	Bearing Torque	Nm	786	1062	2812	4550	4550	5586	14600	28000
Tdw	Reversing Fatigue Torque	Nm	393	531	1406	2275	2275	2793	7300	14000
ß	Angle	Degree	14	20	18	20	18	20	15	22
A	Flange dia	mm	86	97	120	146	Rect.	175	203	276
K	Rotational dia	mm	82	98	122	137	148	173	183	215
B(±0.1)	PCD	mm	69.9	79.4	95.3	120.7	120.7	155.5	184	247.65
C(H7)	Spigot Dia	mm	57	60.1	70	95.2	95.2	168	196.85	222.2
F	Spigot Thickness (Male)	mm	2	2	2	2	2	2	2	2.5
H(+0.2)	Hole dia	mm	8.2	9.9	11.2	12.8	12.8	9.8	11.1	16.1
I	No. of holes	Nos.	4	4	4	4	4	8	12	8
S	Pipe dia	mm	63.5	63.5	76.2	89	89	89	114	140
Type A Lz	Minimum Compressed Length	mm	260	333	355	464	422	525	650	750
Type A La	Length Compensation (Stroke)	mm	43	50	60	70	70	70	100	110
Type B Lf	Fixed Length	mm	170	215	235	330	270	380	410	540
Type C Lf	Fixed Length	mm	130	164	164	254	200	280	364	432

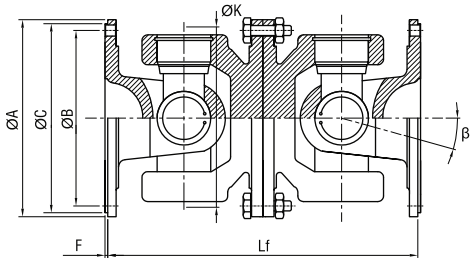
SERIES W1

Type B



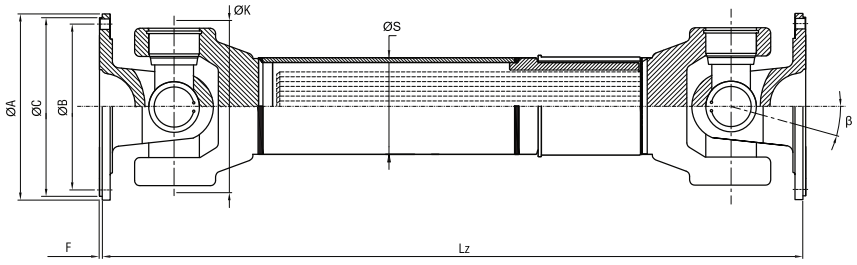
Propeller Shaft without Length Compensation

Type C



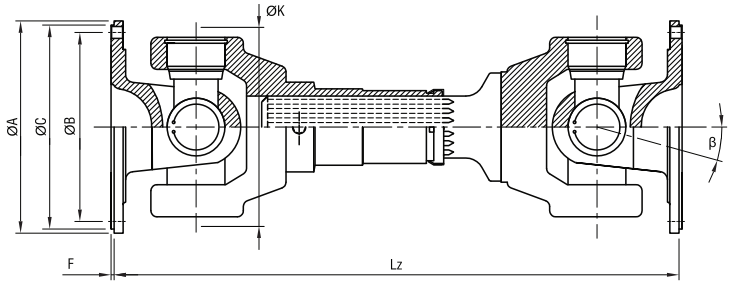
Double Flange Design

Type D



Propeller Shaft with large length compensation

Type E



Propeller Shaft with super short design

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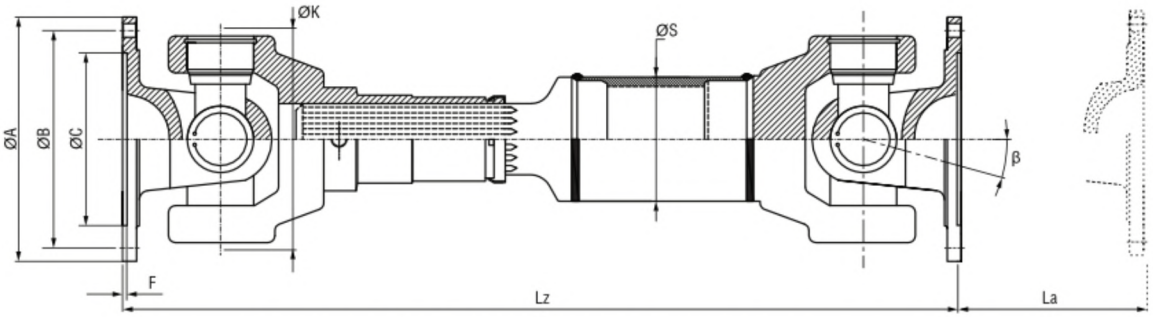
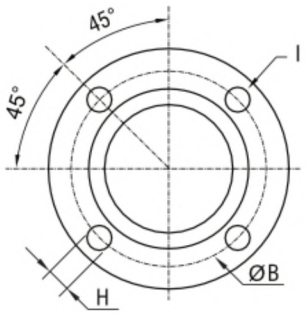
SERIES S

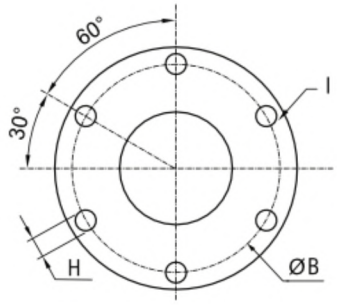
Type
A



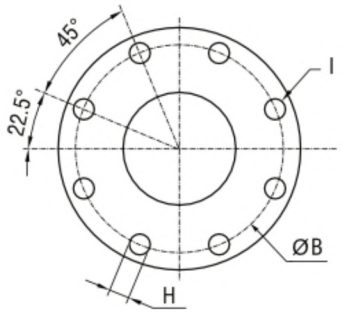
Standard Shaft with Length Compensation



04 HOLES

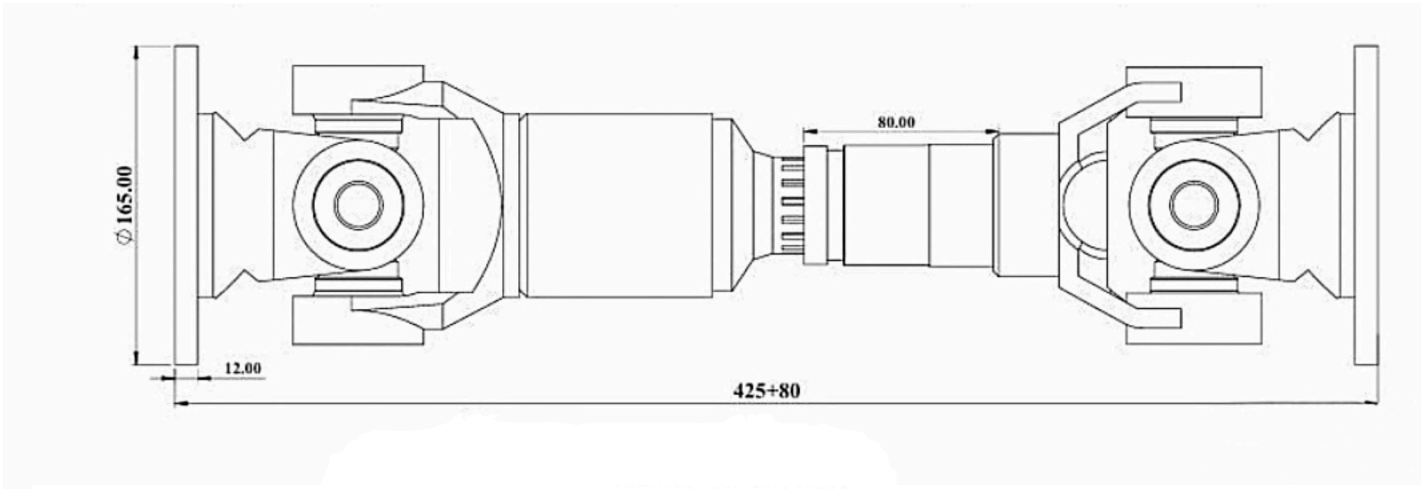


06 HOLES

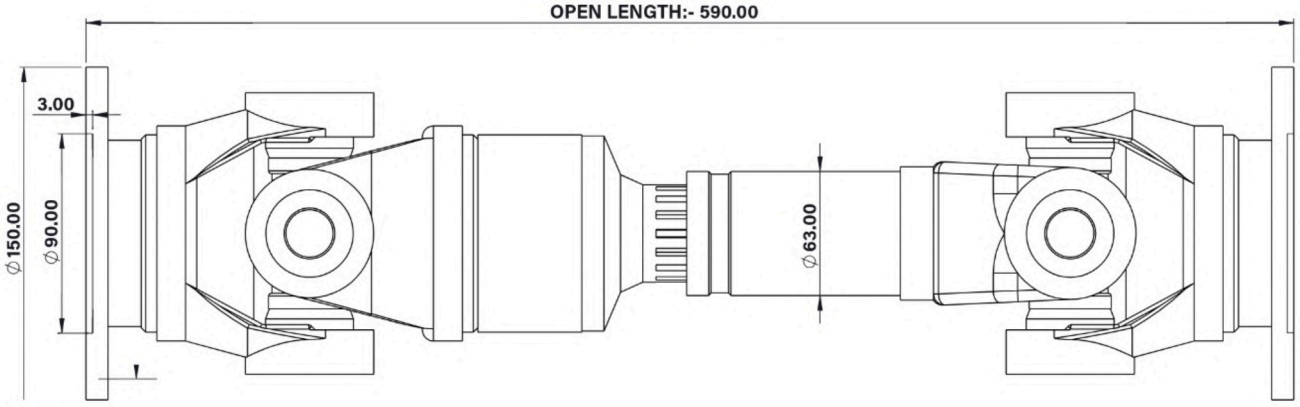


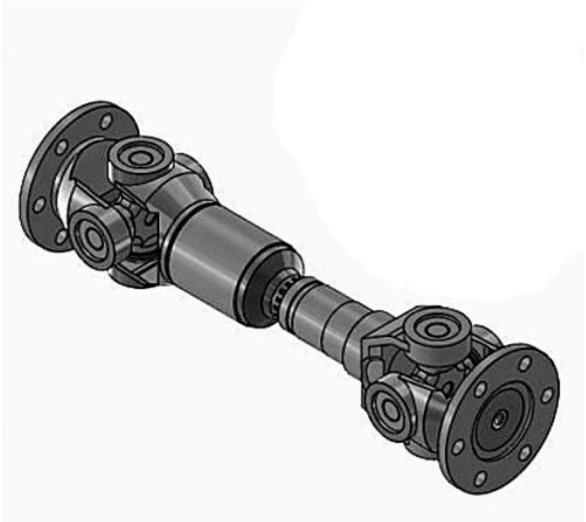
08 HOLES

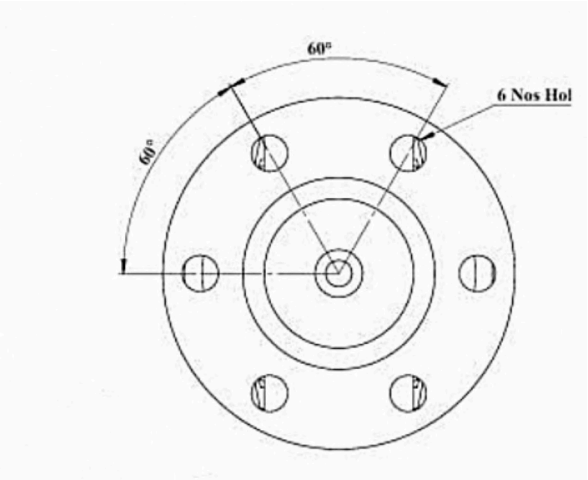
		Units	MW58S	MW65S	MW75S	MW90S	MW100S	MW120S	MW130S	MW150S	MW180S
Tb	Bearing Torque	Nm	500	520	1200	2200	3000	4400	5400	7100	8400
Tdw	Reversing Fatigue Torque	Nm	250	270	370	700	920	1500	1900	2900	3500
ß	Angle	Degree	25	25	25	20	20	20	20	18	20
A	Flange dia	mm	58	65	75	90	100	120	130	150	180
K	Rotational dia	mm	70	70	70	100	100	110	137	150	173
B(±0.1)	PCD	mm	47	52	62	74.5	83.8	101.6	112	130	155.5
C(H7)	Spigot Dia	mm	30	35	42	47	57*	82.5*	82.5*	90	110
F	Spigot Depth	mm	2	2	2	2	2	2	2.5	2	3
H(+0.2)	Hole dia	mm	5	6	6	10	8.1	10.15	10.15	12.20	14.1
I	No. of holes	Nos.	4	4	6	6	6	6	8	8	8
S	Pipe dia	mm	63.5	63.5	63.5	60	60	70	90	90	90
Type A Lz	Minimum Compressed Length	mm	280	280	280	400	400	465	600	587	525
Type A La	Length Compensation (Stroke)	mm	43	43	43	53	53	70	70	90	70
Type B Lf	Fixed Length	mm	180	180	180	272	248	298	370	370	380
Type C Lf	Fixed Length	mm	140	140	140	240	192	216	312	336	280

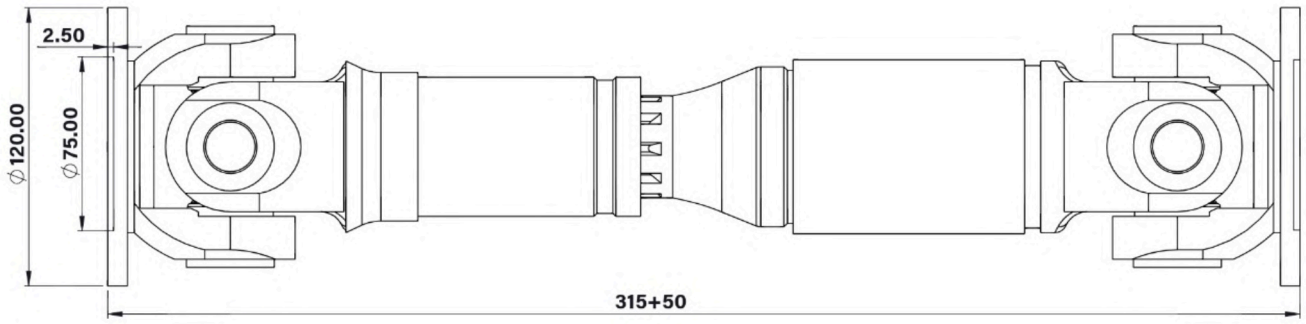


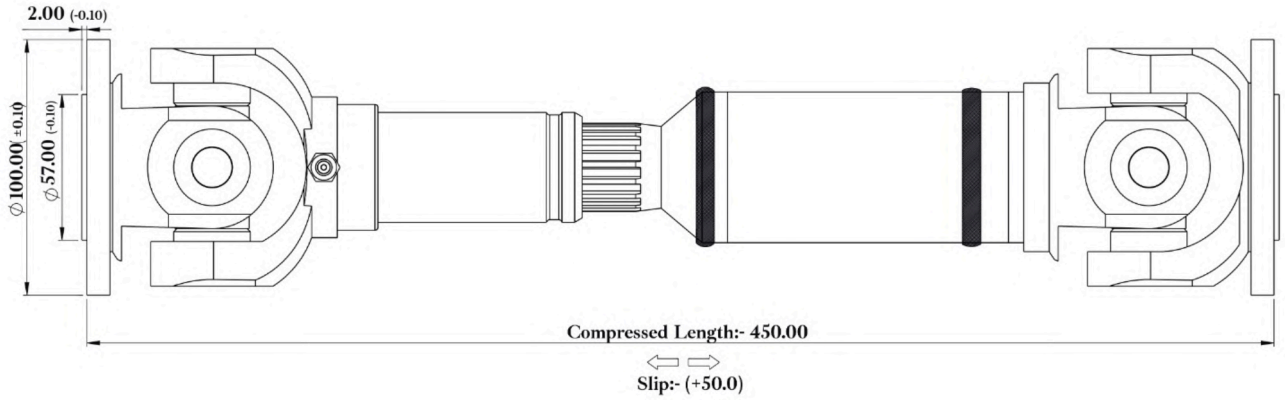
CLOSE LENGTH:- 490.00
OPEN LENGTH:- 590.00

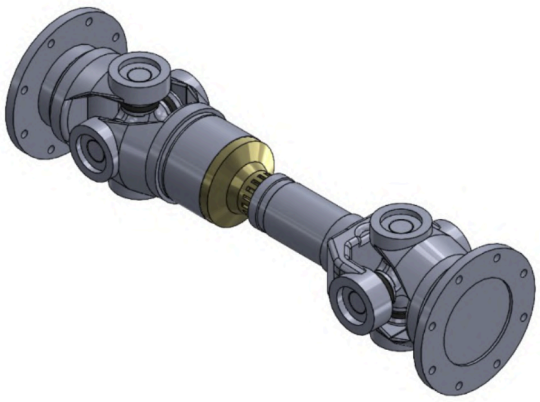


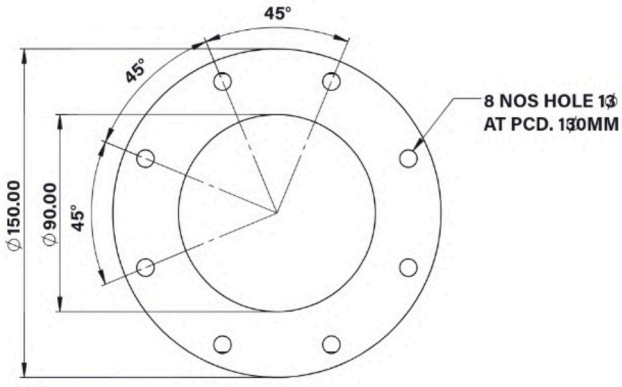


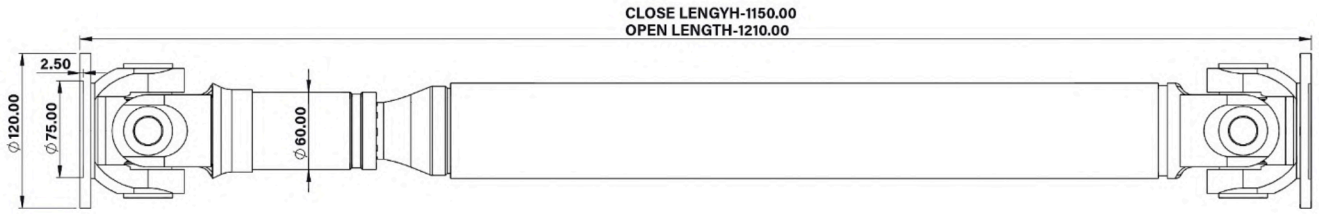


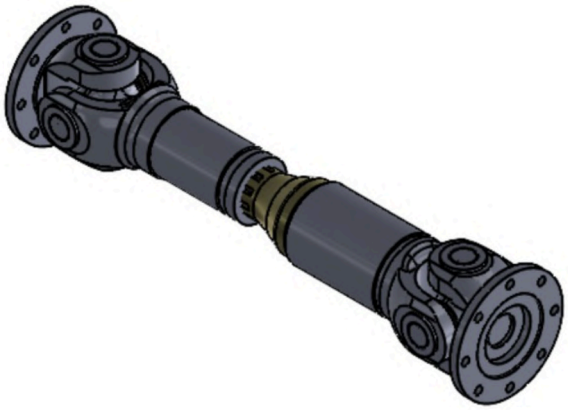

2.50
ϕ120.00
ϕ75.00
315+50

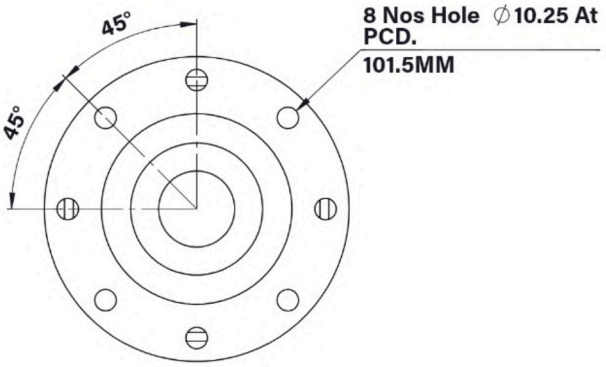

2.00 (-0.10)
ϕ100.00 +0.10
ϕ57.00 (+0.10)
Compressed Length:- 450.00
Slip:- (+50.0)

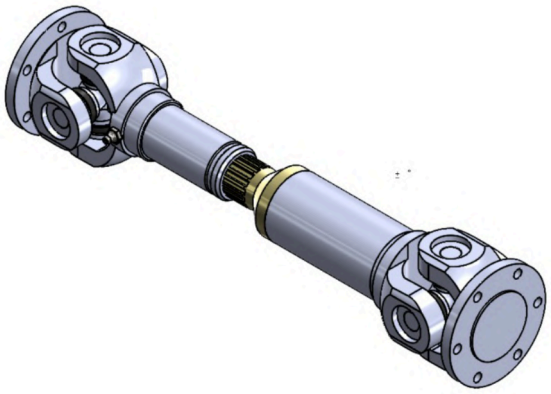


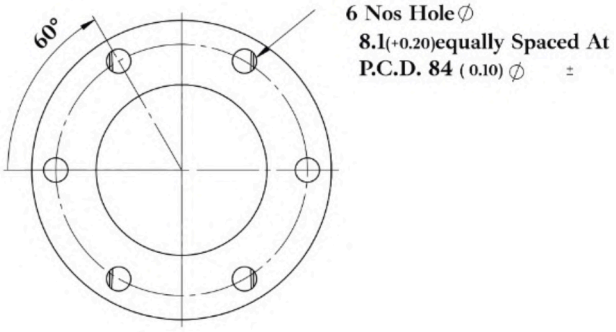

45°
45°
45°
ϕ150.00
ϕ90.00
8 NOS HOLE 13
AT PCD. 130MM

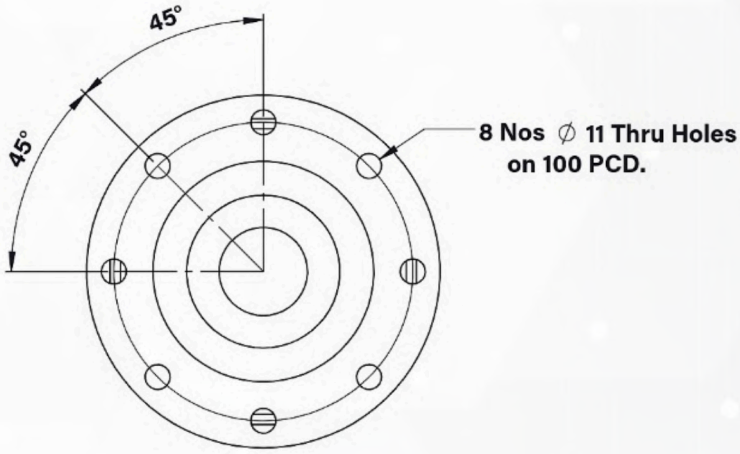

CLOSE LENGYH-1150.00
OPEN LENGTH-1210.00
2.50
∅120.00
∅75.00
∅60.00




45°
45°
8 Nos Hole ∅10.25 At
PCD.
101.5MM




60°
6 Nos Hole∅
8.1(+0.20)equally Spaced At
P.C.D. 84 (0.10) ∅


45°
45°
8 Nos ∅ 11 Thru Holes
on 100 PCD.

Propeller Shaft Assy.

PART No.	PRODUCT

M1034 — LELAYND

PLATE DIA 146(6.00)
PLANE
4 HOLES
21 No.
HOLE SIZE-12.80

39.92X 115.40

APPLICATION - L/L 350/370,BEDFORD

O.E.M REF.

M1078 — LELYAND

PLATE DIA 175(7.00)
PLANE
8 HOLES
15No.
HOLE SIZE-9.50

47.62 X 134.90

APPLICATION - l/l TAURUS

O.E.M REF. MSL 3502027

M1904 — LELYAND

PLATE DIA SQR
PLANE
4 HOLES
15No.
HOLE SIZE-9.50

34 X 126.20

APPLICATION - l/L TUSKER

O.E.M REF.

M1084 — TATA 1210

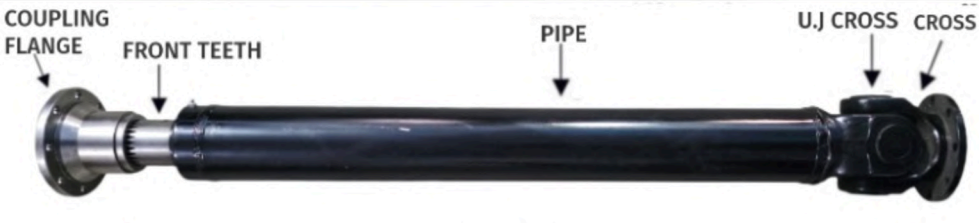


PLATE DIA 120(5.00)
PLANE
8 HOLES
17No.
HOLE SIZE-10.20

38 X 56.70

APPLICATION - TATA 1312,1613

O.E.M REF.

M1039 — TATA 1312

PLATE DIA 130(5.00)
PLANE
8 HOLES
17No.
HOLE SIZE-10.20

46 X 68.70

APPLICATION - TATA 1312,1613

O.E.M REF.

All O.E.M. & Other Manufacturer Part Nos. are for Reference Only
Values in Brackets are Approximate Value in Inches and are for Reference Only

INTERAXLE SHAFT ASSY.

PART No.	PRODUCT

M1001 / RSB 490

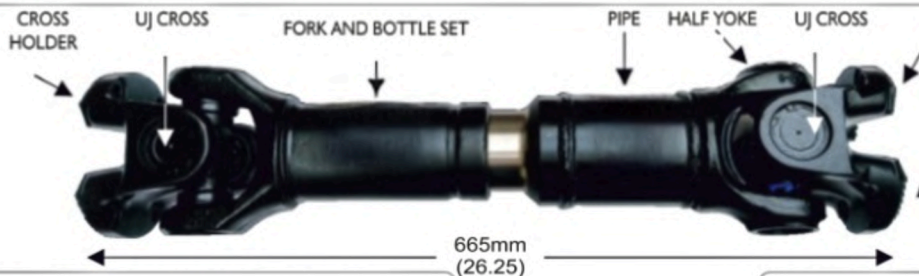


PLATE DIA 150mm (6.0)
SERRATED
4 HOLES
19 No. BOLT
HOLE DIA 13mm

48 X 135

APPLICATION - TATA 4018

O.E.M REF. - 501341120104, 287941120104

M1017 / SPR 2040

PLATE DIA 150mm (6.0)
SERRATED
4 HOLES
19 No. BOLT
HOLE DIA 13mm

47.68 X 135

APPLICATION - TATA 3118 PRIMA

O.E.M REF.

M1024 / RSB 590 / RSB 590 H / SPR 2045 / SPR 2047

PLATE DIA 150mm (6.0)
SERRATED
4 HOLES
19 No. BOLT
HOLE DIA 13mm

52 X 147

APPLICATION - TATA 3118

O.E.M REF. - 220741120402

M1004 / RSB 403

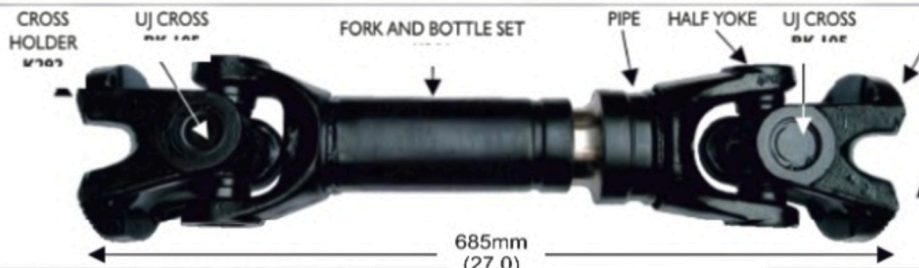


PLATE DIA 150mm (6.0)
SERRATED
4 HOLES
19 No. BOLT
HOLE DIA 13mm

42 X 129

APPLICATION - TATA 2518, RSB TYPE

O.E.M REF.

M1005 / L/L 2214 / SPL 90

PLATE DIA 150mm (6.0)
4 HOLES
19 No. BOLT
HOLE DIA 13mm

41.27 X 126

APPLICATION - AMW 2518, SPICER TYPE

O.E.M REF.

All O.E.M. & Other Manufacturer Part Nos. are for Reference Only
Values in Brackets are Approximate Value in Inches and are for Reference Only

Fig. 1

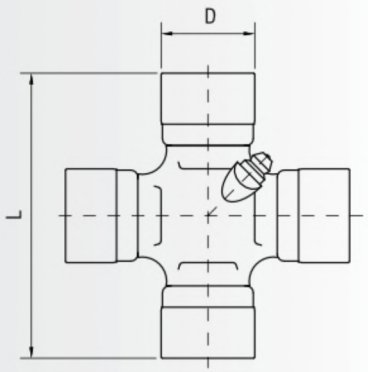


Fig. 2

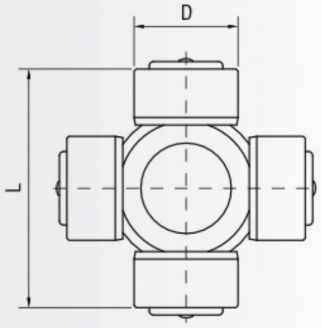
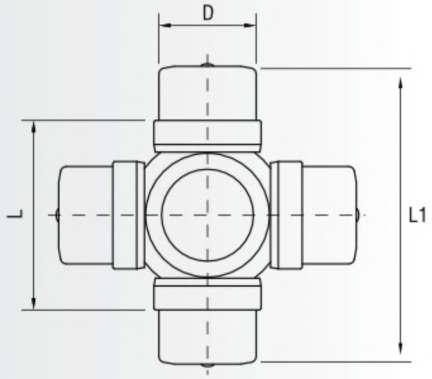


Fig. 3



Our Universal Joint Cross are forged and are made of alloy steel, especially prepared for heavy duty application. Finest quality needles are applied to ensure extra long life.

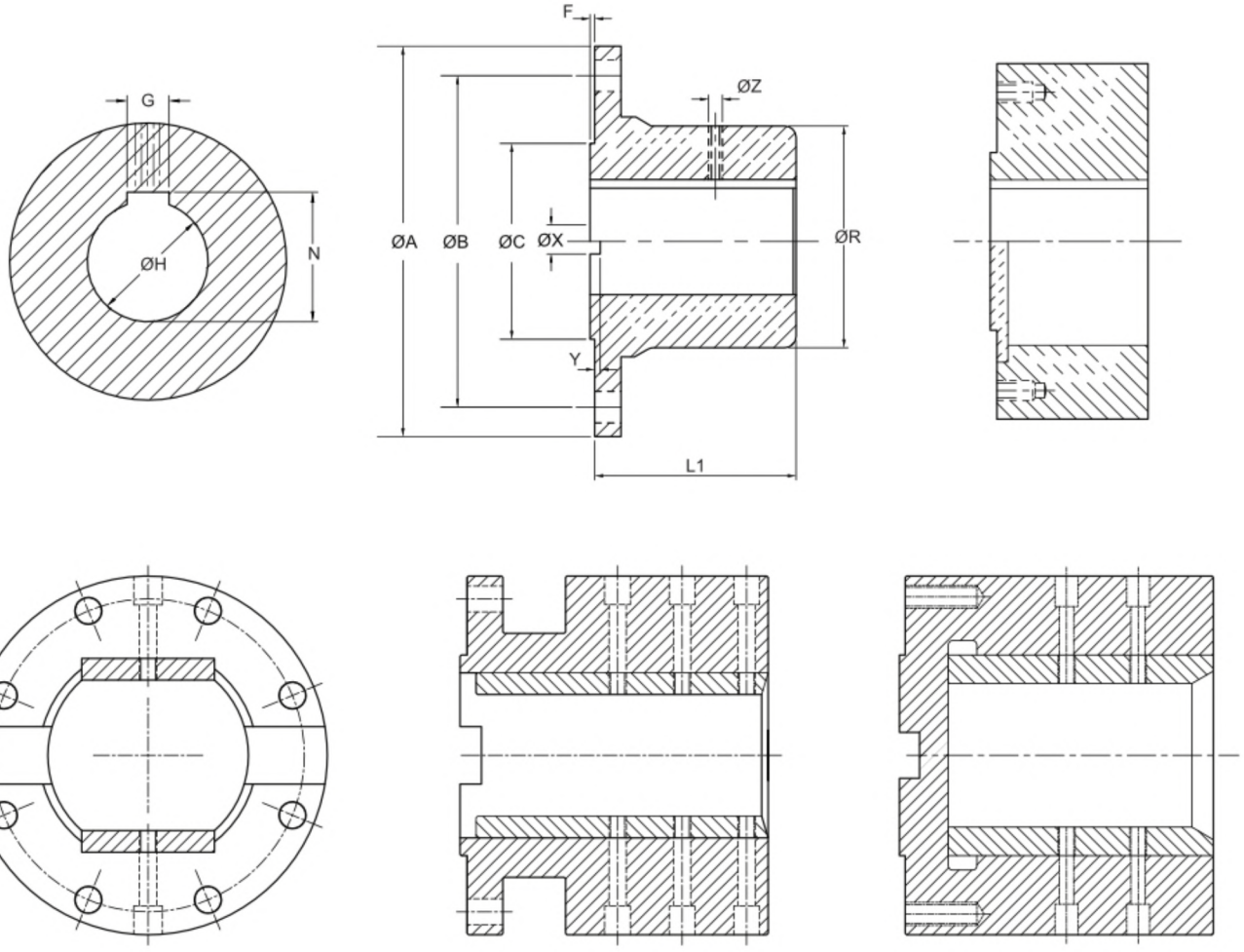
Kindly specify your requirement for the Universal Joint Cross.

a) In case cross joint is required for mmw propeller shaft please mention our shaft model number from series page 10-25.

b) If the cross joint is required as per your specification, kindly choose the type from the above figures and give us the dimensions or submit the detailed diagram.

COMPANION FLANGE/ADAPTORS/HUBS

Standard companion flanges can be manufactured with cylinderical bore holes and face keyways. For design other than this, relevant drawings are required.



Dimension	Value	Unit
Z		mm
R		mm
L1		mm
G		mm
N		mm
H		mm

MMW Genuine Spare Parts

MMW auto industries firmly believes in providing the best and hence, requests all the users to use only original spare parts in order to avoid risks.

Ready stock of spares (standard sizes) enable mmw to provide customers with the spares within 72 working hours.

OUR SERVICES

- Quick delivery of original spares and wearing parts
- Consultation with your spare parts management staff
- Preparation of project-specific spare parts packages

OUR ADVANTAGE

- Safe & reliable operation of all components
- Maximum life time of drive elements
- Excellent fitment of highest quality
- Fast spare parts delivery

COMPONENTS OF MMW PROPELLER SHAFT

1. Flange Yoke
2. Roller Needles
3. Bearing Cup
4. Universal Joint Cross
5. Weld Yoke
6. Pipe
7. Female Spline
8. Male Spline

TRANSMISSION THEORY

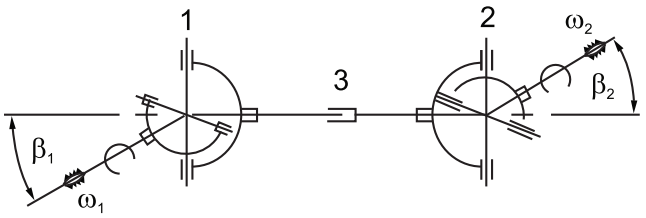
As the drawing shows, universal shaft consists of two joints and one midship shaft.

In order to ensure the stable operation of universal shaft, the angular speed of the driven shaft must be equal to that of the driving one, $\omega 1 = \omega 2$ and therefore three conditions must be satisfied:

a. Yokes must be aligned just as the arrow mark in the drawing shows.

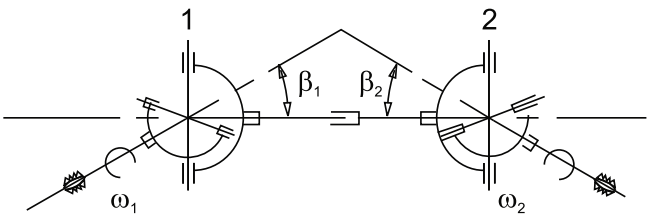
b. Center lines of both the driving and driven shafts must be in the same plane.

c. Deflection angles of the joints must be the same $\beta 1 = \beta 2$.



Z arrangement (axes being parallel)

As shown in the above diagrams, there are two position arrangements, Z and W of the shafts as per the mutual position of both driving and driven axes. Usually, $\beta 1$ is not always equal to $\beta 2$. However the angle deflection $\Delta\beta$ may be controlled between 1 to 1.5 degree when the shaft is operated under high torque and high speed; while under low speed, $\Delta\beta$ should be controlled between 3 to 5 degrees.



W arrangement (axes being intersecting)

Selection

Proper selection should be given priority so as to get perfect operation and ideal lifetime of the universal shafts. General selection procedures are provided in this chapter. However, working condition in practice is more complicated; so full communication with the customers for their requirements, along with application experience of manufacturing, will be helpful in developing reasonable solutions and idealizing operation of the shafts. MMW auto industries would like to provide the customers with a whole set of optimum solution.

The selection of universal shaft is determined not only by the maximum allowable torque and connection type, but also other factors.So in order to make correct selection, customers are required to provide us with relevant technical data as per Selection Sheet at the back of the catalogue.

According to operation conditions, the theoretical torque T of universal shaft is as follows:

T-9.55xP/n(kN.m)
Or T=7.072xP/n (kN.m)

Wherein:
Pk-Norminal power of original motor (kW);
P-Norminal power of original motor (H.P)
n Minimum rotational speed of propeller Shaft at the application.

Wherein:
f= Operation parameter of universal shaft which reflects the safety factor of the operating engine impact.
(for more details please refer to the sheet below)

We determine the specification of the universal shaft according to Tc value and the operation status, reversing or non-reversing.

Under alternative load: TcTpW
Under pulsatory load: Tc<TDSCH

Where
T -Reversing Fatigue Torque (refer table for its value)
T_{DSCH}^{DW}-Pulsating Fatigue Torque (refer torque load)
The outer diameter of universal shaft should be smaller than the installation space, such as the diameter of the roller. Otherwise, other solutions should be provided.

Check limit torque

Peak torque Ts will occur unexpectedly in working condition. In order to prevent the shaft from being out of shape and damaged, the peak torque Ts should be smaller than the limit torque Tk of universal shaft.

That means:

Ts<TK(kN.m)

Wherein:
Ts-Peak torque of equipment, Ts=fsxT (kN.m)
fs - Motor cut-off factor (if the value is uncertain, fs will be 2.75.)

UNIVERSAL SHAFT FACTOR

Load condition	Equipment	f
Light impact load	Generators, Centrifugal Pumps Wood working machines, Belt conveyors Paper - machines, Machine tools	1.1~1.3
Medium shock laod	Compressors (multi-cylinder), Piston pumps (multi-cylinder) Minitype rolling mills, Paper mills	1.3~1.8
Heavy shock load	Marine drive, Transport roller table Continuous tube mills, Continuous working roll table Medium section mills, Compressors (one-cylinder) Pumps (one-cylinder), Ventilator, Presses Straightening machine, Crane travel drive, Wire and bar mills	2-3
Special heavy shock load	Auxiliary drive of crane Reversing working roller table, Winder Scales breaker, Blooming mills	3~5
Extreme heavy shock load	Breast roller drives, Thick sheet cutting machine Reversing slabbing and blooming mills	6~15

CHECK BEARING LIFE

Fatigue lifetime of the shaft's bearing, L_N should be checked through the following formula:

$$L_N = \frac{K_L}{K_1.n.\beta.T^{10/3}} \times 10^{10} \geqslant L_{Nmin}(h)$$

Wherein:
- K_L - Bearing capacity factor
- K_1 - Original motor factor
  - Electro motor : $K_1 = 1$
  - Diesel engine : $K_1 = 1.2$
- n - Minimum operation rotational speed n_{min} (rpm);
- T - Theory torque (kN.m);
- β - Operating joint deflection angle (°)
- L_{Nmin} - Minimum lifetime as per requirement (h)

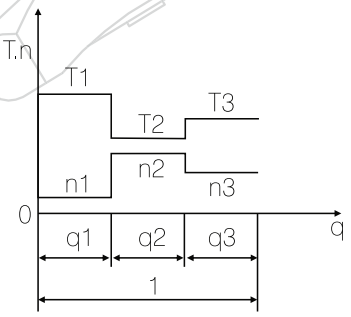
When there is a deflection angle between the horizontal and vertical planes, the resulting angle β is determined by the following formula:

$$tg\ \beta = \sqrt{tg^2\beta_1 + tg^2\beta_2}$$

Wherein:
- β_1 - deflection angle in horizontal plane (°)
- β_2 - deflection angle in vertical plane (°)

Calculation of the bearing life, Ln in formula above is worked out under the condition that the value of bearing load and bearing speed is a constant value. In actual operation, the load and the speed may change in different stages. If the user can well manage such changes, he may figure out the bearing fatigue lifetime by replacing T and n_{min} with equivalent torque T_E and equivalent rotation speed n_E.

Diagram below shows the changes of bearing load and rotational speed in different stages.



The equivalent value can be calculated by the following formula. The relation between operation time t and specific operation time Δti is : qui=Δti/t
Then the equivalent rotational speed is :

$$n_E = q_1 \times n_1 + q_2 \times n_2 + \ldots\ldots\ldots + q_x \times n_x \text{ (rpm)}$$

The equivalent torque T_E is:

$$T_E = 10/3 \sqrt{\frac{q_1.n_1.t_1^{10/3} + q_2.n_2.t_2^{10/3} + \ldots\ldots + q_x.n_x.t_x^{10/3}}{n_E}} \text{ (kN.m)}$$

CHECK ROTATIONAL SPEED

Check Max. Rotational Speed

Maximum rotational speed should be checked as per the following formula if the swing diameter is less than or equal to 390 mm.

$n_{max} \leq [n\beta]$ or $n_{max} \leq [n_L]$

Wherein : $[n\beta]$ - Max allowance rotating speed related to the deflection angle (rpm) Fig. 1.

$[n_L]$ - Max allowance rotating speed related to the operation length (rpm), Fig. 2.

Critical rotational speed

Critical rotational speed should be checked when the long shaft is working in high speed:

$$nc = 1.195 \times 10^8 \frac{\sqrt{D_3^2 + D_4^2}}{A^2} \text{ (rpm)}$$

Wherein : n_c - Critical rotational speed (rpm)

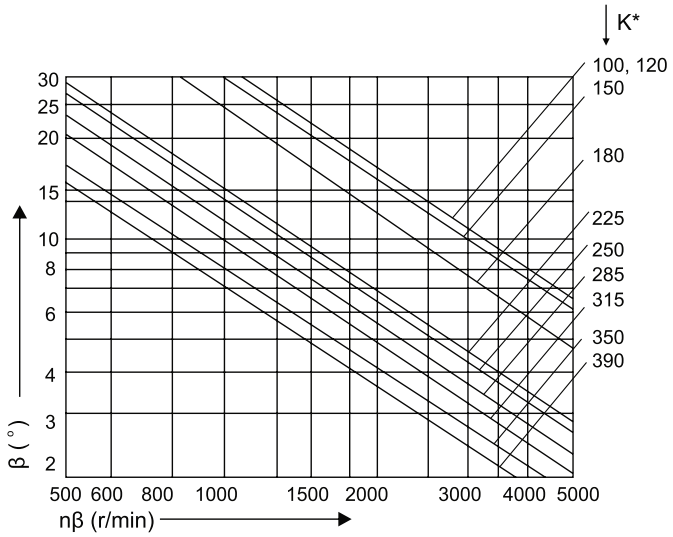
D_3 - The OD of midship tube (mm)

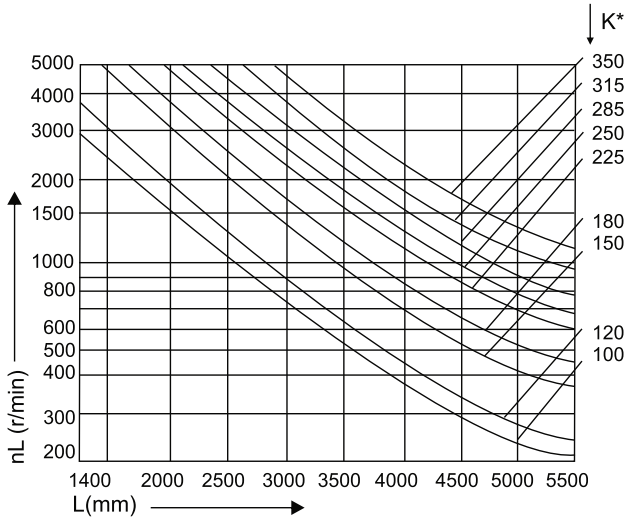
D_4 - The ID of midship tube (mm)

A - The distance between two universal joints (mm).

Under the condition of low speed and small deflection angle, the operation rotational angle will be $n \leq 0.85nc$ (rpm)

Under the condition of high speed and large deflection angle, the operation rotational angle will be: $n \leq 0.65$ (rpm)





BALANCING OF PROPELLER SHAFT

- The balancing of propeller shafts is performed to equalize eccentrically running masses, therefore preventing vibration and reducing the load on any connected equipment
- Balancing is carried out in accordance with ISO Standard 1940, "Balance quality of rotating rigid bodies". According to this standard, the permissible residual unbalance is dependent on the operating speed and mass of the balanced components.
- Balancing is not normally required for rotational speeds below 500 rpm.
- Propeller shaft are balanced in two planes, normally to a balancing accuracy between G16 and G40

BALANCING SPEED

The balancing speed is normally the maximum speed of the equipment.

G-40	Car wheels, wheel rims, wheel sets, **driveshafts** Crankshaft/drives of elastically mounted, fast four-cycle Engines (gasoline or diesel) with six or more cylinders Crankshaft/drives of engines of cars, trucks, and locomotives
G-16	**Driveshafts (propeller shafts, cardan shafts) with special requirements** Parts of crushing machines and agricultural machinery Individual components of engines (gasoline or diesel) for cars, trucks, and locomotives Crankshaft/drives of engines with six or more cylinders under special requirements
G 6, 3	Parts of process plant machines Marine main turbine gears (merchant service) Fans, flywheels, centrifuge drums. Paper machinery rolls, print rolls Assembled aircraft gas turbine rotors. Pump impellers
G 2, 5	Gas and steam turbines, including marine main turbines (merchant service) Rigid turbo-generator rotors Turbo-compressors, turbine-driven pumps. Machine tool drives Computer memory drums and discs

PAINTING

MMW auto industries is a quality-centric company and believes in quality in all aspects. In addition to the production of its top-quality products with the help of efficient engineering and R&D team, mmw also involves itself in rendering excellent paint and packing to its products.

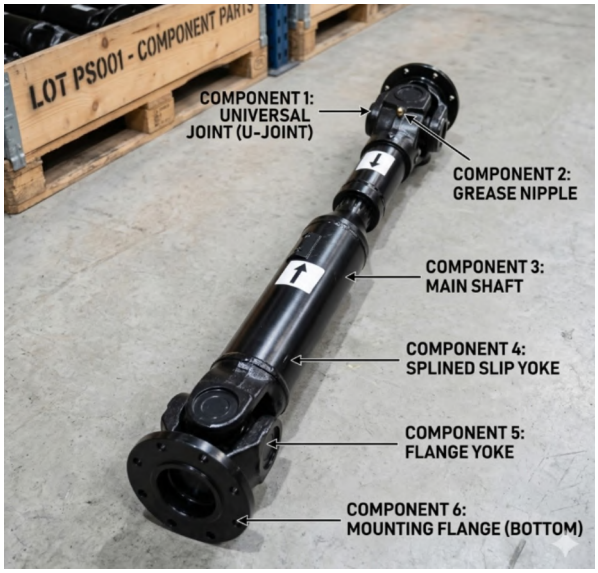
The use of premium paints not only makes your machinery look modern and new, but also adds to the life of your plant as it reduces rusting of the products. MMW auto industries uses modern painting technique which does not cause any health & safety hazard. An exhaust system available at the paint booth reduces the impact of paint on theemployees as well as the environment.

PACKING

MMW auto industries believes in offering the best and hence adds an extra level to the process of design, evaluation and production of packages. We rely on a coordinated system of preparing goods for transport, warehousing, logistics, sale, and end use. Perfect packing not only protects the product, but also eases transportation. In short, our efficient packing contains, protects, preserves, transports, informs and sells.

TRANSPORT & STORAGE

Universal Shafts are delivered as complete units.

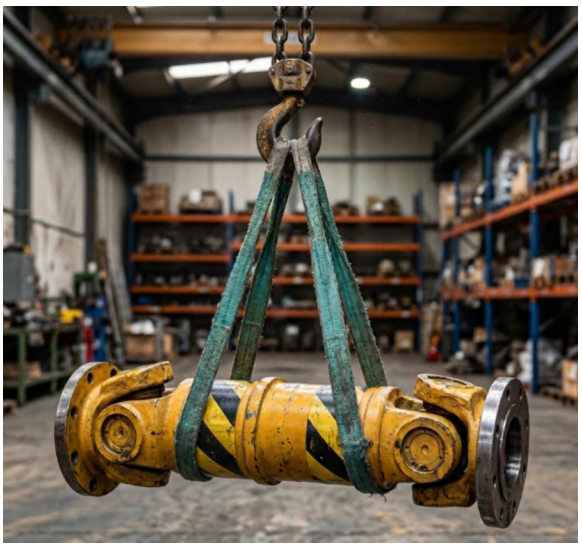


CARE SHOULD BE TAKEN WITH THE FOLLOWING POINTS

The shafts should be transported in horizontal position. For vertical transport an additional protection must be provided in order to avoid the shaft coming apart. The dust cap of the spline seal must not be loaded by the weight of the universal shaft. Nylon rope to be used (for small shaft only).

If balance weights or plates are present it should not be removed .Unbalance will cause uneven running and premature wear of the universal shaft and bearings of the connected units.

Universal shafts, which have been stored for a long time, should be re-greased in working position before installation.



General Maintenance

Maintenance should be carried out at regular intervals, and it is advisable to co-ordinate this with the maintenance work of the other machine parts.

Continuous noise testing

Any deviation from normal working noise should be located and corrected immediately.

Backlash inspection

Examination of the roller bearings and the sliding splined parts should be carried out before lubricating.

Checking of Bolts

The bolts should be checked for tightness when greasing the shaft

INSTALLATION & MAINTENANCE

Universal Joint Shaft

To increase the productivity & life-span of universal shafts, correct installation, rational operation and regular maintenance are vital. Therefore please read the following carefully before using universal shaft.

1. Analysis & Approval

- The quantity of goods must be in accordance with delivery list.
- The measurement of goods according to related purchase order and outline drawings must be checked in accordance.

2. Transportation

- Nylon rope or sling must be used during lifting. The contact angular parts need protection from wire draw off. The weight of product should be considered before any type of tooling adopted.
- Stay alert against human injury caused by joint yoke inclination and spline stretch when lifting and placing universal shaft.
- Any jerk and shock should be avoided in the transportation and storage of universal shaft, hence saving the cover from deforming.
- While carrying the universal shaft, it should be in the horizontal position. Extra fixing action should be taken to avoid the telescope spline part slipping away when it is oblique or carried vertically.

3. Placement

- propeller/ Universal shaft must be placed in dry place to control the humidity and cleanliness.
- Wooden shelf or pallet is needed to place the shaft. Wood block must be used to fix universal shaft to avoid its rolling and to support the spline shaft as well.
- In case the universal shaft is placed in vertical condition, it should be fixed well to avoid inclination.

4. Installation

- Human safety should be top priority when installing universal shaft.Safety protection should be taken at operation site.
- Make sure that there is no dust, oil and paint on the connecting surface while installing.
- In order to ensure the axial angle between A is less than 1 degree, the bearing holes A of both side yokes should be at the same plane when installing universal shaft. Otherwise, a difference of angular speed will happen to the driving end and the driven end. This may cause abnormal vibration of the shaft. Higher the speed, more severe the consequences.

INSTALLATION & MAINTENANCE

A. Weld design with length compensation (A type): strictly make the two arrows marked B on the shaft body aligned. Spline position is fixed and should not be changed during installation.

- Generally the spline shaft should be installed in the driving end and spline position should be kept away from vibration and impact source. However, both ends of the universal shaft can act as driving end.
- In case the universal shaft is stored for more than 6 months, it must be cleaned before usage by lubrication. Corrosive chemical detergent, high-pressure water or steam should not be used for cleaning.

5. Maintenance

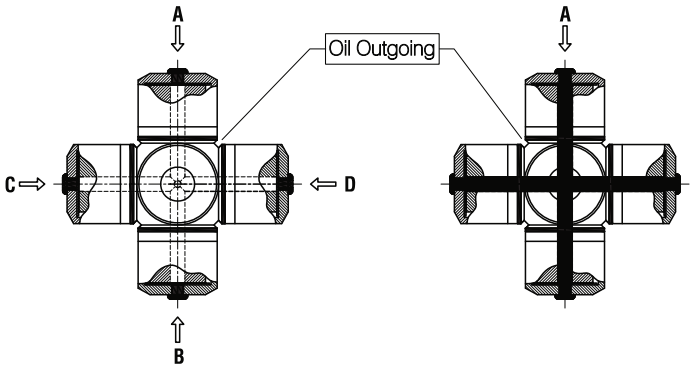
Periodic inspection and maintenance are vital for the reliability and of propeller shafts so as to ensure smooth operation

- The flange bolts of universal shaft should be checked to see if they become loose after the first workday. They must be tightened if found loose as per the specified tightening torque. For some workdays, this process should be repeated until the tightening torque is in a constant condition. Thereafter, the bolts must be analysed from time to time.
- The working condition of propeller shaft must be checked to see if ther are abnormal radial swing and excessive heating. Correct them immediately if such phenomena are found.
- Proper lubrication must be maintained to increase the bearing life of cross kit and spline according to the working condition. Different lubrication methods for different type of universal shafts are as follows.

INSTALLATION & MAINTENANCE

A Spline: if the oiling nipple on the spline shaft is not exposed outside, pull both ends of universal shaft till it is exposed out and conveniently filled with oil.

B. Cross kit: lubrication ways are different according to the specification of universal shaft.



a. For heavy duty series, lubricate the cross Kits from four points (A,B,C,D) till all dirty grease overflows from the other end of the bearing. Then continue greasing till clean grease overflows.

b. For other series, lubricate the cross kits from one point only till all dirty grease overflows from the end of the bearing. Then continue greasing till clean grease overflows.

The lubrication period of bearing and spline under different application are as follows:

Table A. Lubrication Period

Working condition	Lubrication Period
High Temperature	1-2 Weeks
Normal working condition	Continuous working 500 Hours
Discontinuous working condition	3 Months

Table B. Lubrication Trademark

Series	Part of lubrication	Trade Mark
All Series	Bearing & spline	Lithium complex Grease No. 2

When greasing spline and joint bearing, generally the hydraulic pressure should be 15 bar (1.5Mpa). More heavy or more light pressure is not recommended.

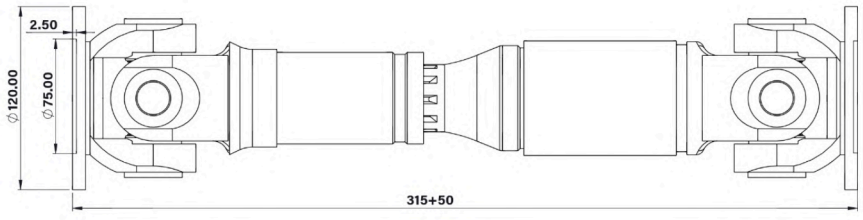
- Repeated checking of thelubrication condition of propeller shafts is essentiall to avoid any damage.
- The maintenance period of universal shaft in common condition is usually from half to one year or with the maintenance work of main machine. Contents of maintenance include:

A. Renew if the wear of bearing runway, cross journal and bearing roller exceeds 0.25mm.

B. Renew if the wear of the contact surface between bearing and snap ring exceeds 0.35mm.

C. Renew if the wear of the match surface of spline exceeds 0.35mm.

Company Name :	
Contact Person Name :	
Designation :	
Mobile No :	
Email ID :	
Address Line 1 :	
Address Line 2 :	



Please fill the maximum data possible						
Technical Data		Application 1	Application 2	Application 3	Application 4	Application 5
Application						
Motor Power (KW) or (H.P.)						
Any one of the following A or B						
Minimum Motor RPM	A					
Gear Box Ratio						
Minimum Rolling RPM	B					
Min Roll Diameter (mm)						
No. of Shaft in one motor						
Compressed Length						
Stroke required						
No. of shaft required						
No. of spare kit required						

If any cardan shaft already exists please provide the maximum possible data as follows						
Angle	β					
Flange Dia	A					
Rotational Dia	K					
PCD	B					
Spigot Dia	C					
Depth	F					
Hole Dia	H					
No. of Holes	I					
Keyway	X * Y					
Pipe dia	S					

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Balancing Innovation
With Precision

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