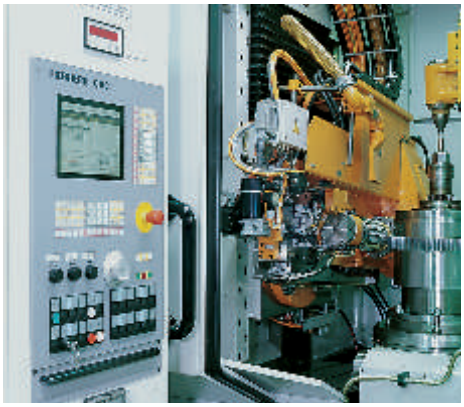
JAURE®

GEAR SPINDLE COUPLINGS

REGAL™

Index



Introduction

Manufacturing plant in Zizurkil.

JAURE's competence in power transmission system, is based on more than 40 years experience in the development and manufacturing of couplings and power transmission elements.

This is particularly testified by the most 4extensive supply of the gear couplings and spindles all over the world, being one of the world's leaders in the fields of power transmission.

Gear spindles are designed according to customers specifications, resulting in most of the cases special solutions. JAURE Engineering Department closely cooperates with customer's engineers to create the best product for their needs.

Rolling mill couplings that connect the drives and the rolls were often taken for granted. However, market demand for greater productivity and improved qua-lity of rolled products, has driven the design and manufacture of equipment to accommodate high operating spe-eds, torques and misalignments with minimum maintenance.

Gear spindles are a critical component of the drive train. Strip quality and thickness control can be influenced by the performance of the drive spindles. The modern and efficient gear type spindle, requires less maintenance and is much more economical than its predecessors. Gear spindles provide constant angular velocity at misalignment angles, which ensures even transmission of power. This results in uniform sizes and improved surface quality of rolled products.
In addition, the inherent dynamic balance characteristics of gear type flexible spindles minimize vibration, thus increasing the operating life of bearings, gears, and other components of the drive train.

Computer–aided designs and the latest manufacturing CNC machines and testing equipment, ensure that our products always reflect the state of the art of drive components. Furthermore research and development, including Finite Element Analysis and solid modelling design methods assure our customers that their equipment will be optimized by their application.

The design, manufacturing and sales of all of our gear couplings and drive components are integrated into our Quality System, according to UNE-EN-ISO 9001. This Quality Policy covers all the different departments at JAURE.

Gear Spindles Description

Jaure gear spindles are specially designed for those applications where driving and driven components are necessarily misaligned and where service dictates a changeable amount of misalignment.

A more common application for gear spindles is for ferrous and non-ferrous rolling mill drives, where technology is in continuous development to achieve a higher product quality with lower and maintenance costs.

Gear spindles are critical components of the drive train, and for this reason Jaure strives to meet the demands of the most up-to-date mill equipment. Gear spindles are designed to ensure performance, operating efficiency, less and easier maintenance. All of the above advantages have been realized by developing tooth profile, surface heat treatment, and quality materials and seals.

Complete wire mill spindles.

Hot strip mill spindles.

Steckel mill spindles.

Telescopic quick disengaging spindles.

To accommodate load and no load misalignment with minimum backlash, it is necessary to crown the flanks and the tips of the hub teeth. Teeth are also designed to allow higher no load angle to easy roll change.

Spindles with fully crowned gear teeth offer operational benefits of maximum load carrying capacity with minimum size, maximum reliability, and long life.

Materials used in the production of spindle gear elements include both medium carbon and forged alloy steels.

The material and heat treatment combinations commonly used for spindles applications are shown in page 6.

A vital aspect having a direct affect on spindles life and performances is the provision of quality seals for efficient retention of the gear lubricant for exclusion of external contaminates.

Hot strip mill spindles.

Product Description

Modern Rolling mills and revamping of old mills, require or are implementing new developments as: new machine design concepts, better metalurgical practices, as well as the application of process control and automation. Consequently, mechanical components including gear spindles are becoming a critical component of the drive train.

To be able to transmit large torques at large misalignment, spindle gear couplings use fewer teeth than conventional gear couplings, high-strength alloyed steels, and surface hardening : either nitriding or carburizing. This is the case, for instance, in hot and cold rolling mills, continuous casting installations, straightening presses, rotary furnaces, etc

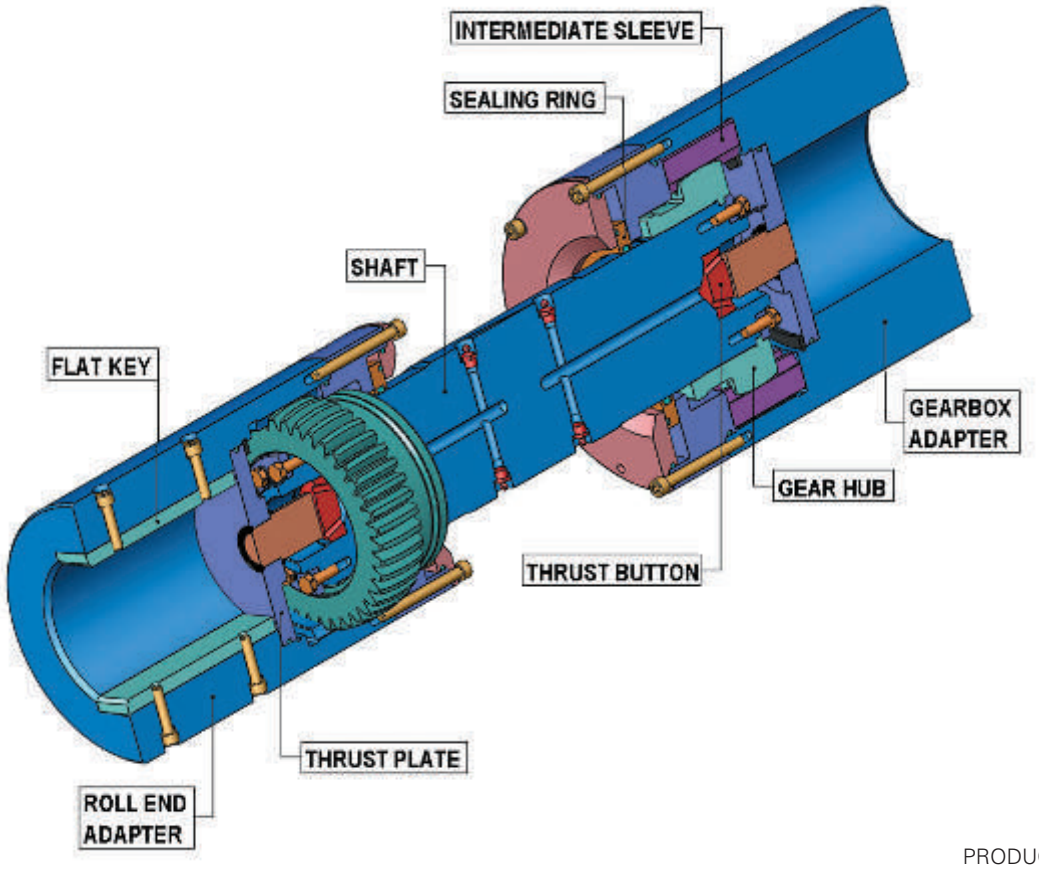
Each Jaure® mill spindle is custom designed for a particular application. Torque amplification factors (TAF) are also considered when designing the spindle and all the effort is done at design stage to decrease the stresses on the gear mesh. The gear tooth profile is specially designed to optimize the load capability for each single application.

Furthermore optimal design features and custom modifications are reviewed in our application analysis to ensure maximum service life with minimum downtime.

Because of the high contact pressures and the high sliding velocities between the teeth, the lubricant includes a large amount of anti-wear additives.

Special sealing system avoids overflow of lubricant and keeps contamination out of the grease chamber.

Special attention is given to the materials and heat treatment used in each application in order to maximize the spindle life and reliability. Furthermore Jaure employs modern CNC manufacturing in order to ensure high accuracy and even distribution of the loads.



PRODUCT DESCRIPTION

Gear Tooth Design

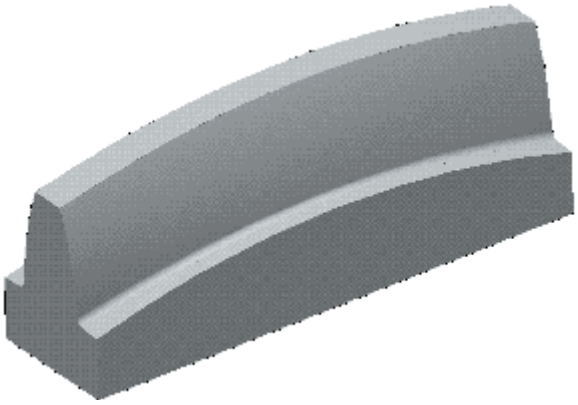
A gear coupling is one of the simplest and most common types in use today. It is also one of the most difficult to design and evaluate, because of the number of variables that can affect its successful operation. Some of these variables are:

1) Tooth design
2) Material
3) Lubrication

The main concept of the gear tooth design is optimization of the tooth geometry to obtain a higher percent of teeth in contact at the coupling operation conditions. In order to perform this optimization, it is very important to understand the variables that effect the actual percent of teeth in contact.

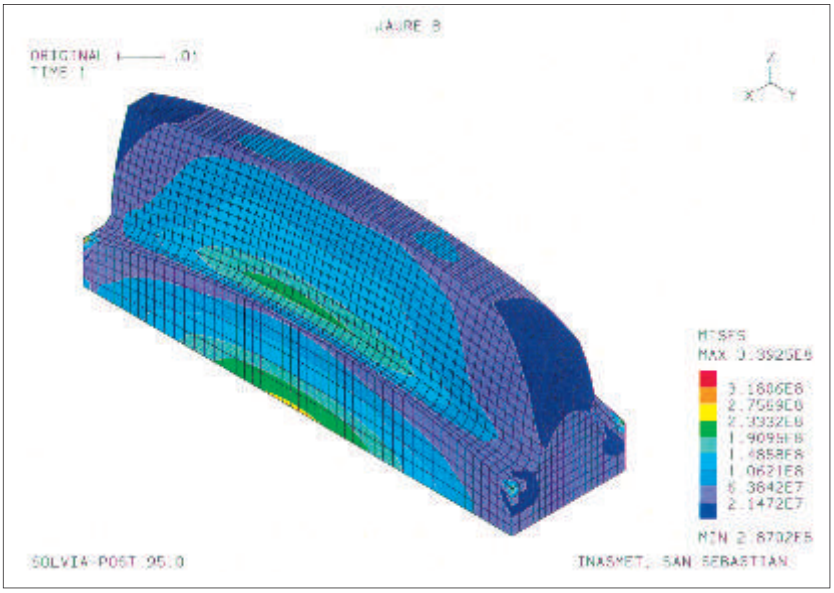
Misalignment Angle

Theoretically, there are only two teeth in contact when misalignment is present and no load is applied. There must be a load applied to obtain contact of more than two teeth. The degree of misalignment partly determines the number of teeth in contact for a given amount of torque. The lower the angle, the more teeth in contact and greater the torque capacity.



Flank curvature

This is the main contributor besides the misalignment angle in determining the gap between each tooth set. An optimized flank curvature will produce minimal gaps between each tooth set while maintaining an acceptable compressive stress. Proper flank crowning reduces contact stress, prevents tooth end bending and increases the contact area by moving the load closer to the centre of the tooth. JAURE® can also design a compound curvature on the tooth flank to maximise the working area of the tooth, reducing the Hertz contact stresses.



Tooth Loading

There are three basic loading conditions which can contribute to tooth failure:

- Hertz or compressive stress
- Bending stress
- Contact pressure/sliding velocity component

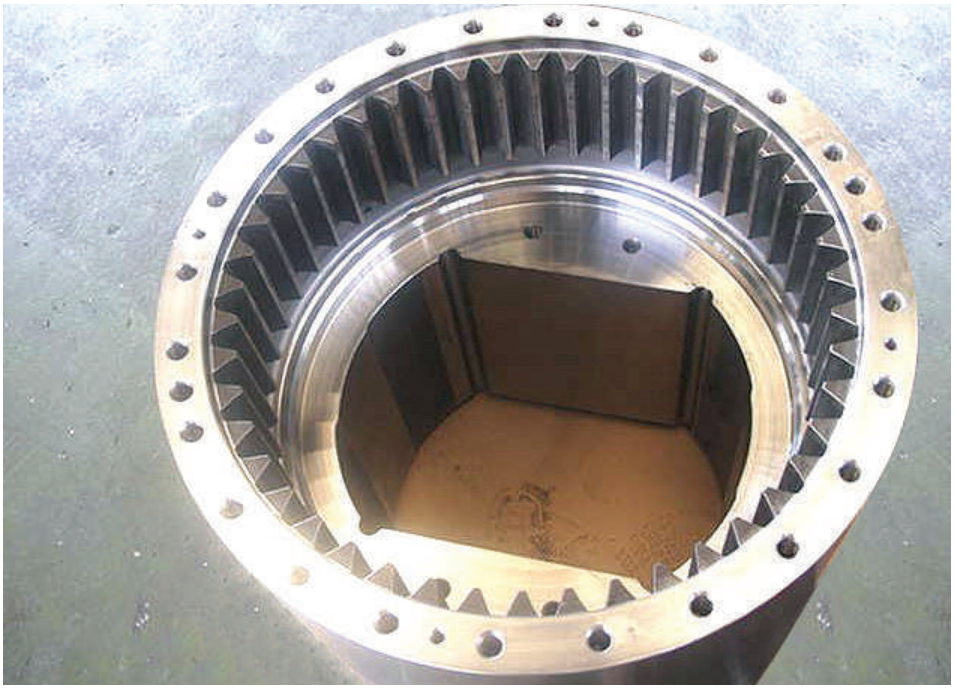
All of these and other variables must be considered in the design of a gear spindle. The Jaure Engineering Department designs spindles based on over 40 years of experience in spindle design. The misalignment angle and each type of tooth loading and misalignment angle are considered, and the right material and heat treatment with the right design of the tooth are determined to suit your application.

Gear Tooth Materials And Heat Treatments

Materials used by Jaure® in the production of gear spindle components include a proper combination of steel and heat treatment, depending on the stressing level and the required operating life. The best heat treatment for a coupling gear tooth gives the correct combination of core hardness versus case depth and hardness to be used. For maximum strength and durability, its desirable to harden selected outer surfaces of spindles parts while leaving the inner cores ductile for shock resistance. Several heat treatment methods are available for case hardening the gear tooth components including nitriding, induction hardening, and carburizing.

The selections of a proper combination of steel and heat treatment, depending on the stressing level and the required operating life, are:

- **NA** Heat treated nitrided alloy steel. This is for medium torque, high angle and high speed applications. Nitriding is also preferred for high temperature and high speeds applications where it is more durable than other forms of hardening.
- **NHA** Heat treated nitrided alloy high-strength steel. For medium to high torques.
- **CHA** Heat treated and carburized alloy high-strength steel. The carburizing process imparts a hard, deep case over a ductile and shock resistant core to resist wear and abrasion. Mainly used in high torque applications.



Carburized coupling box.

Nitrided hubs.

Gear Size Selection

1) To compute torque to be transmitted, multiply it by service factor (SF) and torque factor (KA):

$$T = \frac{P_a \cdot 9{,}55}{n} \cdot SF \cdot KA \ (kNm)$$

where:

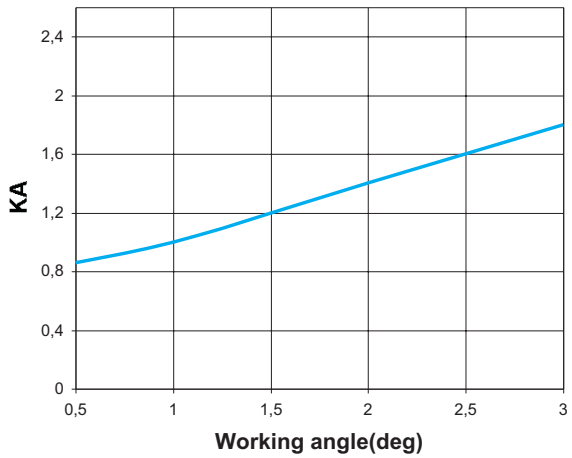
Pa = Absorbed power [kW]
n = RPM

2) Select the service factor SF from Table 1.

APPLICATION	SF
Auxiliary Mill Equipment	1.5
Wire, Small Bar and Rod Mills: All Stands	
Medium Bar and Section Mills: Finishing Stands	
Cold Mills: Non-Reversing	1.75
Straighteners	
Medium Bar and Section Mills: Roughing Stands	
Large Bar and Section Mill: Finishing Sands	
Cold Mills: Reversing	2.0
Hot Strip Mills: Non-Reversing Finishing Stands	
Large Bar and Section Mills: Non-Reversing Roughing Stands	
Tube Mill Main Drive	
Hot Strip Mills: Non-Reversing Roughing Stands	2.5
Edgers, Non-Reversing	
Hot Strip Mills: Reversing Roughing Stands	2.75
Large Bar and Section Mills: Reversing Roughing Stands	
Edgers, Reversing.	
Steckel Mills	
Reversing Slab, Plate and Blooming Mills	3.0

Table 1

3) Compute Torque factor KA, depending by working angle shown on graphic 1:



Graphic 1

4) Select spindle size from engineering data on page 8. The torque capacity varies with spindle size and gearing material. Choose a spindle size and a gearing material with:

$$T_{nom} > T$$

5) And also check that:

$$T_{max} > T \times TAF$$

where:

T_{max} = Peak Torque (KNm)
TAF = Torque amplification factor

6) Check the maximum speed n, has to be equal or lower than the selected size coupling maximum speed multiplied by the speed factor KS, depending by operating misalignment, shown on graphic 2:

$$n \leq K_s \cdot n_{max}$$

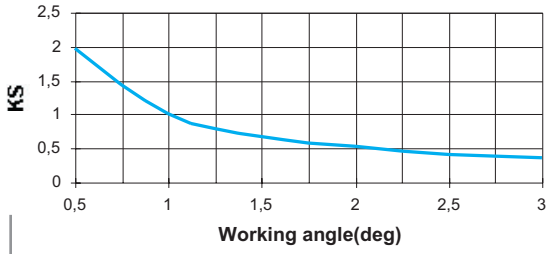


Table 3

• For angles greater than 3°, consult JAURE.

CONVERSION TABLE	
1 mm	= 0,0394 inch
1 inch	= 25,4 mm
1 m	= 39,4 inch = 3.283 ft
1 Kg	= 2,2046 ibs (weight)
1 ib (wt)	= 0,4536 Kg
1 N	= 0,2248 ibs (force)
1 ib (f)	= 4,4482 N
1 Nm	= 0,7376 ib-ft
1 ib-ft	= 1,3558 Nm
1 Kgm	= 23,76 ib-ft
1ib-ft	= 0,1382 kgm
1 KW	= 1,34 HP
1 HP	= 0,746 kw

Gear Size Selection

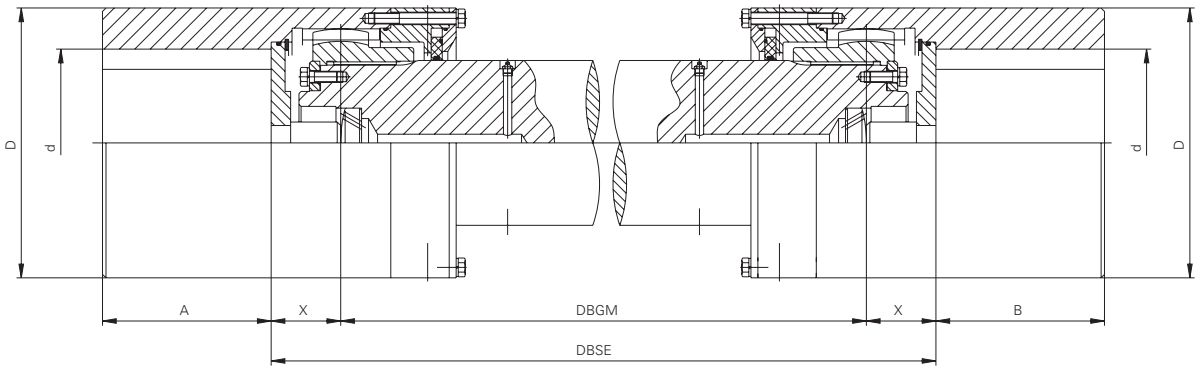
SIZE	Heat treated nitr. Alloy steel (NA)			Heat treat. Nitr. Alloy high-strength steel (NHA)			Heat treat. Carb. Alloy (1) high-strength steel (CHA)		
	Nominal Torque	Peak Torque	Peak Torque	Nominal Torque	Peak Torque	Peak Torque	Nominal Torque	Peak Torque	Peak Torque
	T_{nom} (KNm)	T_{max} (KNm)	n_{max} (rpm)	T_{nom} (KNm)	T_{max} (KNm)	n_{max} (rpm)	T_{nom} (KNm)	T_{max} (KNm)	n_{max} (rpm)
AL-100	5	13	1.9750	7	18	2.955	11	28	2.522
AL-115	7	18	1.860	10	25	2.790	15	37	2.381
AL-130	9	23	1.790	13	32	2.685	20	50	2.291
AL-150	16	40	1.670	23	57	2.505	36	90	2.138
AL-180	25	62	1.560	36	90	2.340	56	140	1.997
AL-200	40	100	1.430	58	145	2.145	90	225	1.830
AL-250	65	162	1.320	94	235	1.980	5146	365	1.690
AL-275	95	237	1.200	137	342	1.800	213	532	1.536
AL-300	130	325	1.080	188	470	1.620	292	730	1.382
AL-330	185	462	960	268	670	1.440	416	1.040	1.229
AL-360	220	550	860	319	797	1.290	495	1.237	1.101
AL-400	345	862	750	500	1.250	1.125	776	1.940	960
AL-440	410	1.025	650	594	1.485	975	922	2.305	832
AL-480	610	1.525	610	884	2.210	915	1.372	3.430	781
AL-520	780	1.950	525	4.131	2.827	788	1.755	4.387	672
AL-550	850	2.125	510	1.232	3.080	765	1.912	4.780	653
AL-590	1.120	2.800	475	1.624	4.060	713	2.520	6.300	608
AL-640	1.300	3.250	430	1.885	4.712	645	2.925	7.312	550
AL-700	1.750	4.375	390	2.537	6.342	585	3.937	9.842	499
AL-760	2.000	5.000	350	2.900	7.250	525	4.500	11.250	448
AL-830	2.800	7.000	310	4.060	10.150	465	6.300	15.750	397
AL-880	3.100	7.750	290	4.495	11.237	435	6.975	17.437	371
AL-950	3.500	8.750	270	5.075	12.687	405	7.875	19.687	346
AL-1000	3.800.	9.500	250	5.510	13.775	375	8.550	21.375	320
AL-1100	4.100	10.250	200	5.945	14.862	300	9.225	23.062	256

(1) If AL-S design is required the distance "x" will vary from the one stated in the catalog. Please consult Jaure.

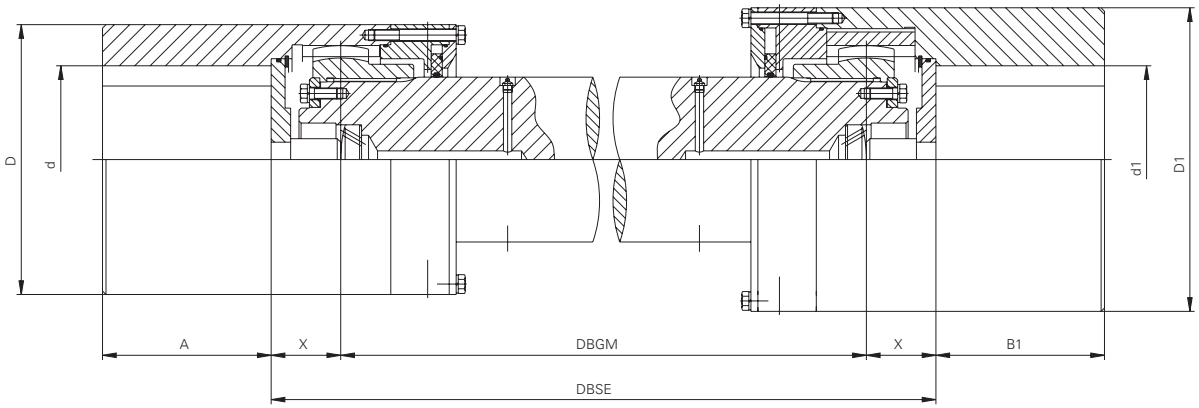
SIZE	Dimensions							Maximum(2) bores		Weight (Kg.)		
	D (mm)	D1 (mm)	A (mm)	A1 (mm)	B (mm)	B1 (mm)	X (mm)	d_{max} (mm)	$d1_{max}$ (mm))	Coupl. End A	Coupl. End B	Coupl. Shaft (3)
AL-100	100	150	75	110	75	110	35	70	105	4	14	4
AL-115	115	155	85	115	85	115	40	80	110	7	15	5
AL-130	130	165	100	125	100	125	45	90	120	9	18	6
AL-150	150	175	110	130	110	130	50	105	125	14	22	8
AL-180	180	200	135	150	135	150	55	130	145	24	32	12
AL-200	200	220	150	165	150	165	60	145	160	32	42	14
AL-250	250	280	190	210	190	210	70	180	200	60	82	23
AL-275	275	305	205	230	205	230	75	195	220	78	105	28
AL-300	300	320	225	240	225	240	80	215	230	100	120	33
AL-330	330	350	245	260	245	260	85	235	250	131	154	40
AL-360	360	385	270	290	270	290	95	260	275	167	202	48
AL-400	400	425	300	320	300	320	105	285	305	225	267	59
AL-440	440	470	330	350	330	350	115	315	335	295	355	72
AL-480	480	510	360	380	360	380	125	345	365	377	447	86
AL-520	520	550	390	410	390	410	135	370	395	472	554	101
AL-550	550	585	410	440	410	440	145	390	420	554	659	113
AL-590	590	630	440	470	440	470	155	420	450	675	812	131
AL-640	640	680	480	510	480	510	165	455	485	849	1.008	154
AL-700	700	745	520	555	520	555	170	500	535	1.094	1.303	185
AL-760	760	810	570	605	570	605	175	545	580	1.380	1.653	219
AL-830	830	885	620	660	620	660	180	590	630	1.771	2.123	262
AL-880	880	925	660	700	660	700	185	630	670	2.089	2.479	295
AL-950	950	1.010	710	755	710	755	200	380	720	2.593	3.083	345
AL-1000	1.000	1.065	745	795	745	795	215	715	760	2.998	3.582	383
AL-1100	1.100	1.170	820	875	820	875	225	785	835	3.924	4.674	465

NOTES:
(1) This design is only valid with an intermediate sleeve. See page 4.
(2) Dimensions dmax and d1max are valid for shaped bore on roll end side and finished bore and keyway UNI 6604-DIN 6885 on drive end side.
(3) Shaft's weight is for a 100 mm length.

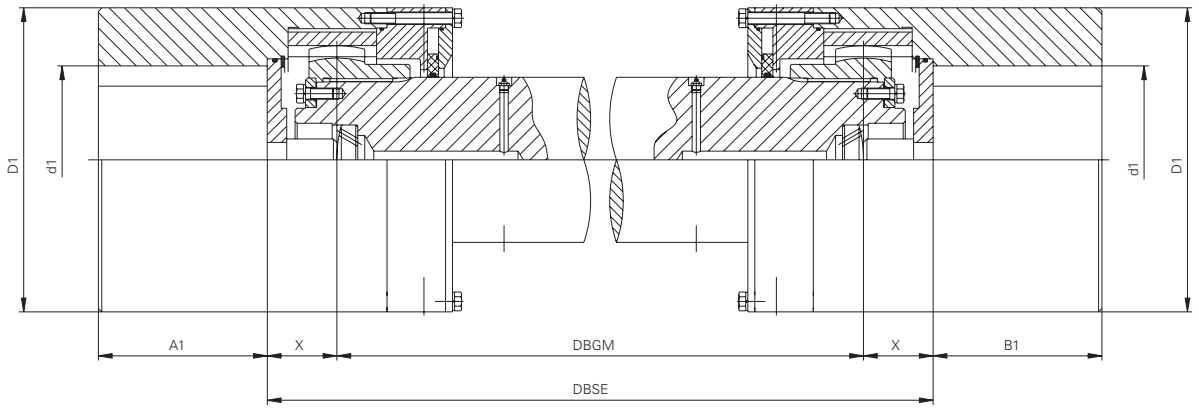
Standard Designs



AL-S

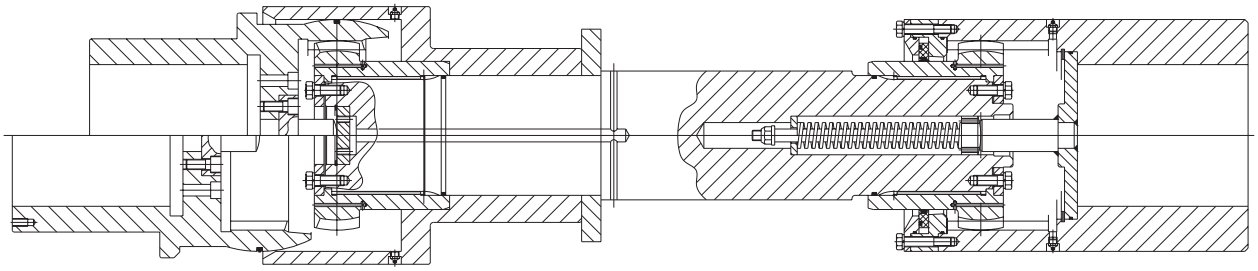


AL-SD

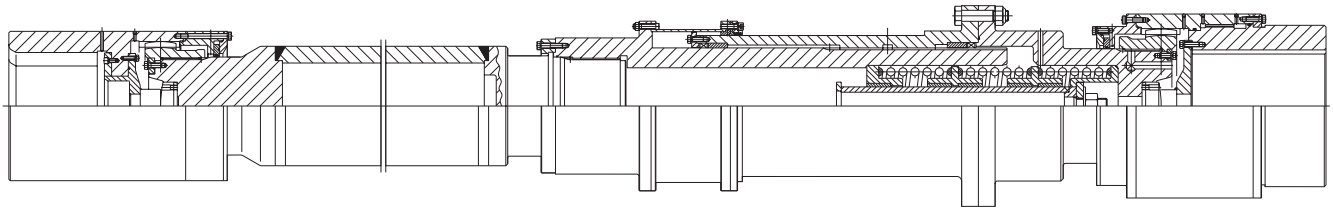


AL-D

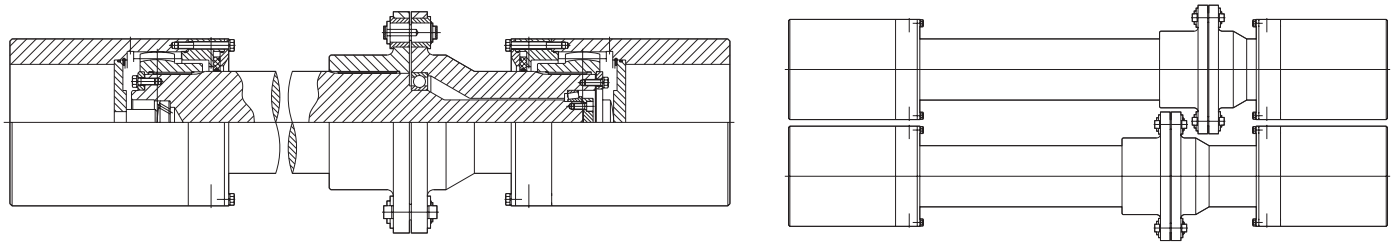
Special Designs



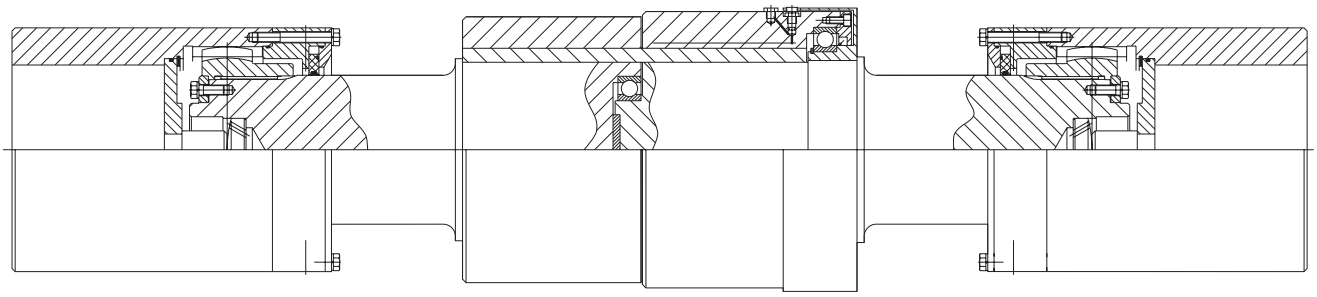
Quick disenganging



Telescopic type



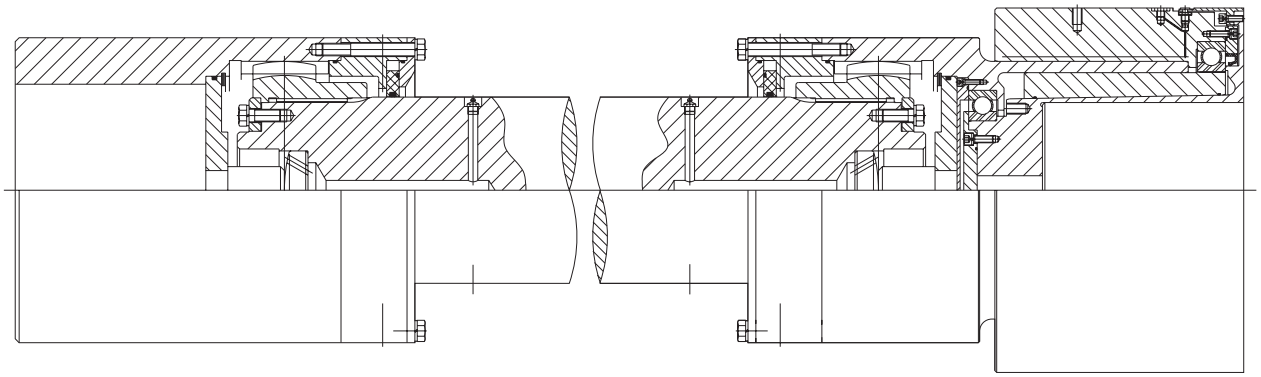
AL-SBR



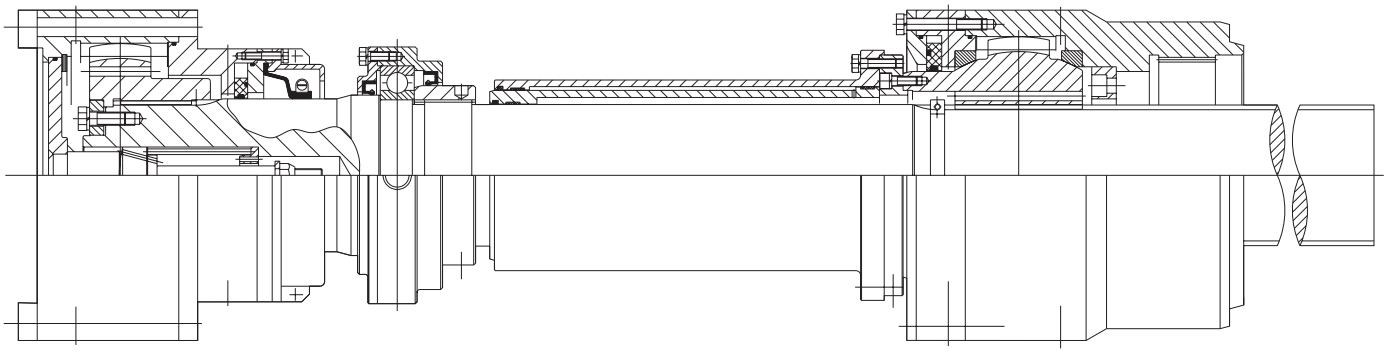
AL-S-SAFESET* 1

* SAFESET is believed to be the trademark and/or trade name of Voith Turbo Safeset AB and is not owned or controlled by Regal Beloit America, Inc.

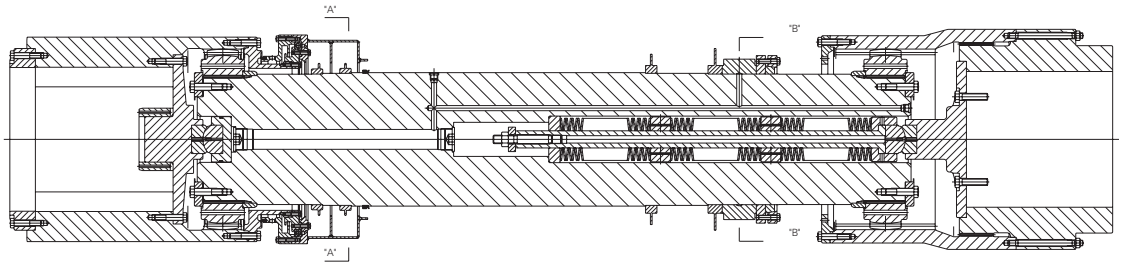
Special Designs



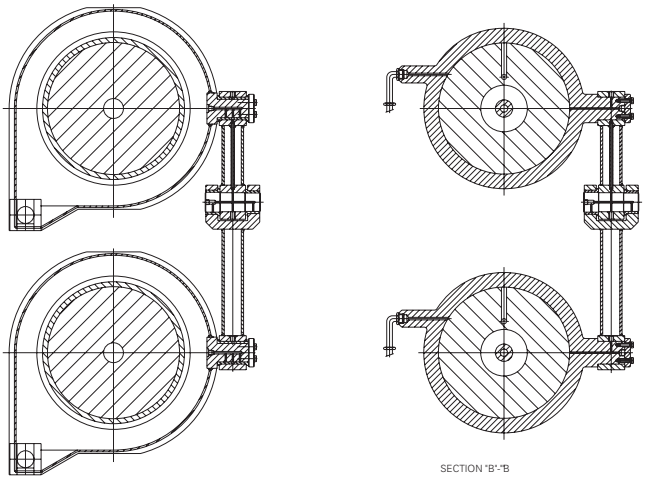
AL-S-SAFESET* 2



AL-ST



Continous lubrication



Oil-lubrication

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Spindle Accesories

1) A serious roll entry problem is caused by drooping roll sleeve when spindle support is located under the shaft. This can be overcome with the use of a spring loaded sleeve aligning device, fig 1, which holds the roll sleeve in line with the spindle shaft when the roll is removed, and maintains it
aligned and ready for re-entry of new roll.

2) Special seal, which assures a complete grease unleackage under the worst working conditions is shown in fig.2:

3) Numerous means of roll end connection are available. The simplest, provided for bases spindles, is a shaped bore in the spindle sleeve having the same configuration as the roll end with minimum clearance to allow roll removal and re-entry.

A similar but preferable connection is the use of flat, round or piloting ring inserts, fig 3. and 4, which are replaceable when the inevitable wear does occur. These keys and piloting rings are made of heat-treated alloy steel for maximum usable life.

4) Automatic tapered keys, fig.5 are the best device for tight sleeve-to-roll connection with ease of roll removal and replacement. It consists of a pair diametrically opposed tapered keys which are snugly scated against the spade flats when a roll is inserted, but which follow the roll neck for a limited distance during removal and produce ample
clearance across the flats for roll removal and re-entry.

5) Flat journal profiles for spindle sleeves on the end roller

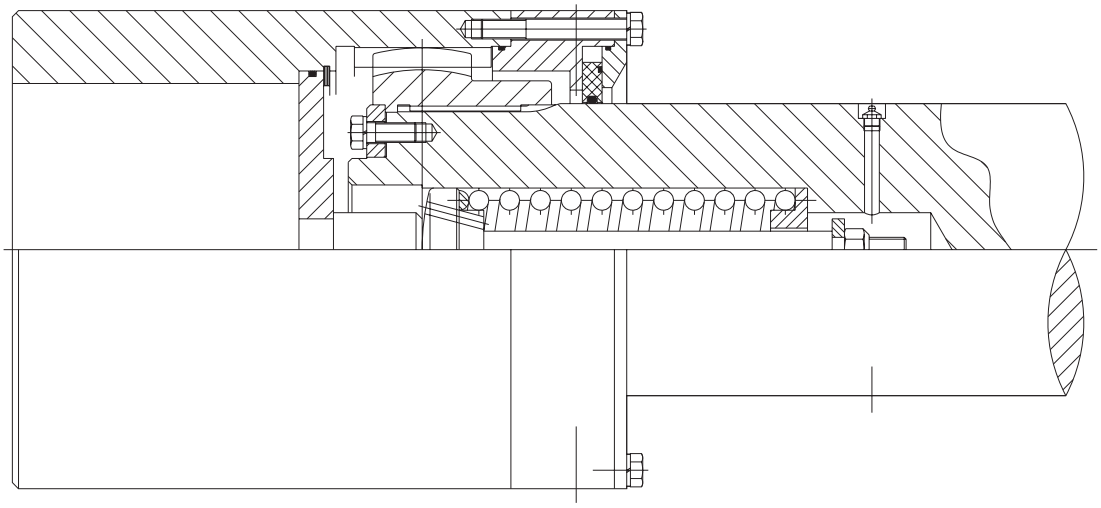


Figure 1 Shock absorber unit

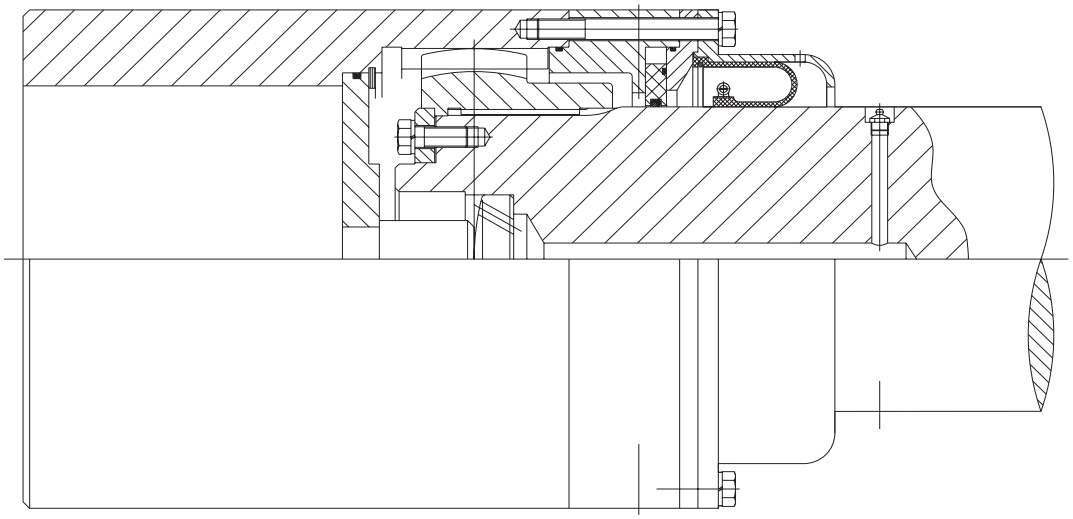


Figure 2 Special seal

Spindle Accesories

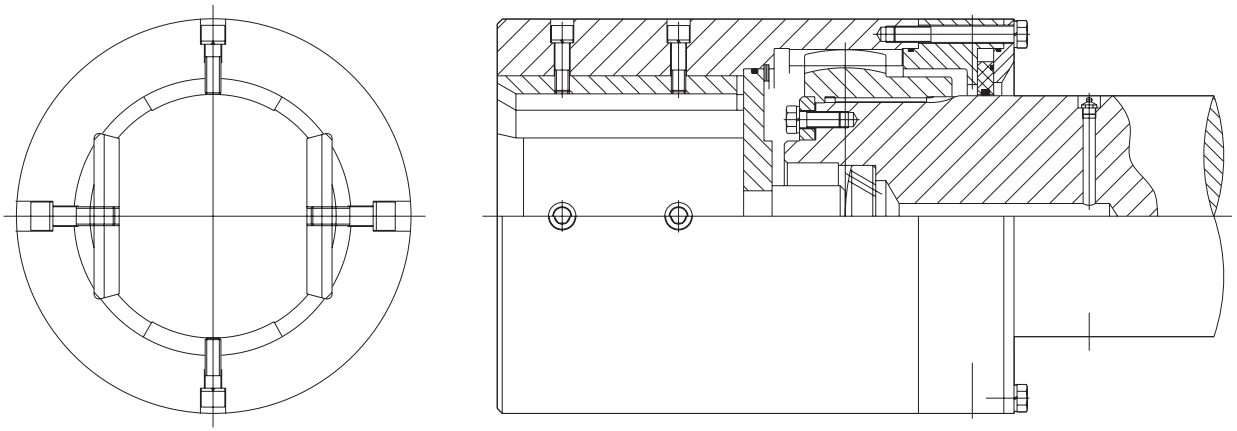


Figure 3 Replaceable wear flats

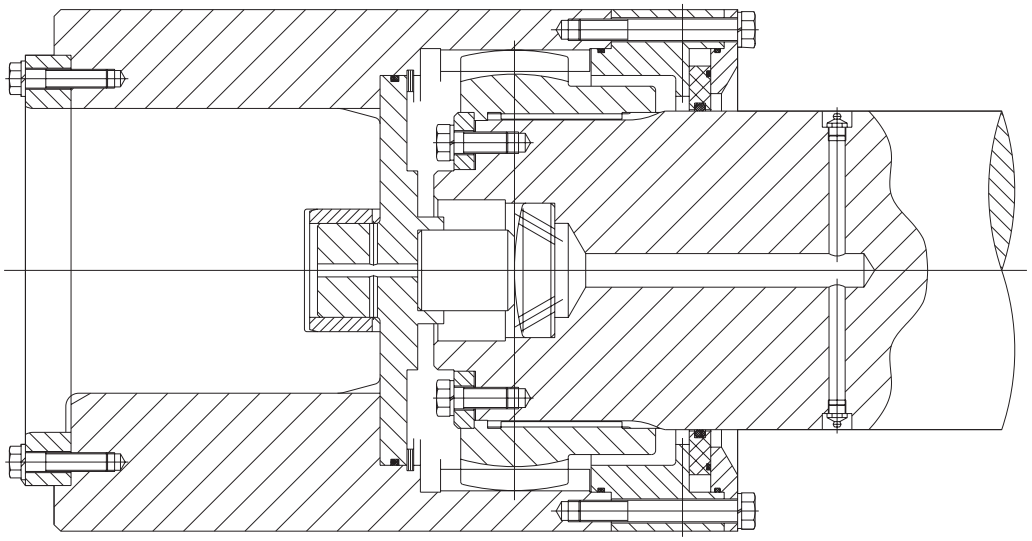


Figure 4 Centering rings

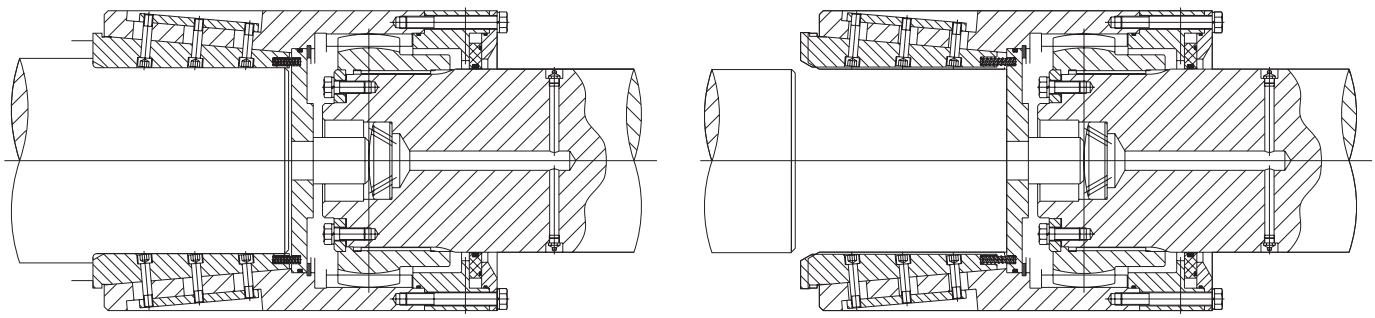


Figure 5 Automatic locking key

Spindle Accesories

A serious roll entry problem is caused by drooping roll sleeve when spindle support is located under the shaft. This can be overcome with the use of a spring loaded sleeve aligning device (figure 1), which holds the roll sleeve in line with the spindle shaft when the roll is removed, and maintains it aligned and ready for
Fig.**6**

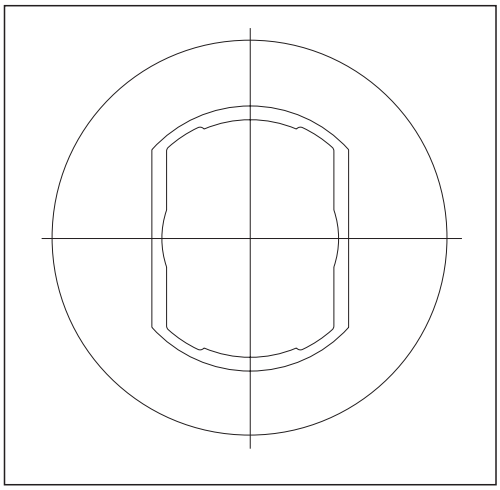


Figure 6 Slotted profile

Slotted profile for flat journals, used preferably in bores that are large in relationship to outer diameter of sleeve. Slanted surfaces around diameter centre roller journal exactly. Bore can be given optional special treatment to increase its surface strength and wear resistance.

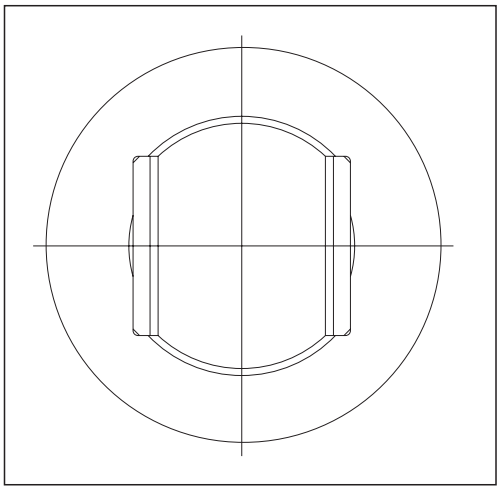


Figure 7 Flat journal profile with steel jaws

Fig.**7**
Flat journal profile with inserted, hardened and ground steel jaws. High wear resistance even despite angular vibrations or thrusts that would otherwise damage coupling sleeve during a roller change. Easy to replace steel jaws if necessary. Cost-efficient stock keeping.
Fig.**8**
Flat journal profile with inserted jaws and guide profiles made of hard plastic. Good protection against formation of frictional corrosion when aggressive cooling agents are used. Cost-efficient stock keeping since only plastic parts have to be kept. Easy to replace parts subject to wear.

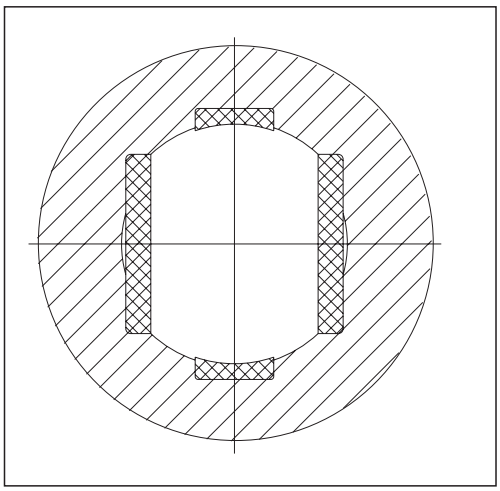
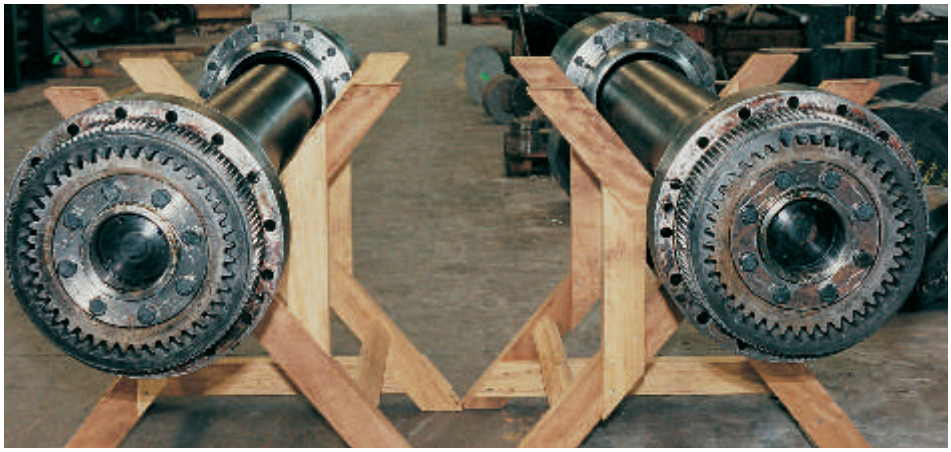


Figure 8 Flat jounal profile with plastic jaws

Spindle Maintenance And Lubrication Instructions

The gear spindles must be lubricated on site with rolls in working position. If the spindle is lubricated with the rolls removed an excess of grease will come out once the roll is in. This pump of excess of grease can damage the seals.



SPINDLE COUPLING LUBRICATION

If an abnormally short life of the spindles is observed the first thing to check is the lubricant. A lack of proper lubrication will generate heat and will not dissipate it, therefore the spindle will fail by overheating.

a) Recommended greases.

Gear spindle couplings require very special lubricants with highly refined base oils that have high viscosity indexes, excellent extreme pressure qualities, water resistance and adhesiveness. The lubricant used should provide a low friction film between the working surfaces to reduce the possibility of wear. The lubricant should also have extreme pressure capability and good capacity for dissipating the heat generated from sliding and rolling action of mating gear teeth.

Grease technical features [1]	
NLGI Grade	Between 1 and 2
Thickener type	Lithium complex
Dropping point	175÷240ºC
Oil	Synthetic
Oil viscosity at 40ºC	Higher than 800 Cst
Oil viscosity at 100ºC	Higher than 45 Cst
MoS2	5-10%
EP additive [2]	Required
Timken EP Test	Higher than 30 Kg
Oxidation inhibitors	Required
Soap percentage	5-10 %

1) For speeds above 1000 rpm consult our Technical Dep. In this case the grease should have good centrifugal separation resistance.
2) Verify that EP grease used environmentally friendly with lack of lead and chlorine.

Examples of greases that comply with the above features are:
- BESLUX BMX H-1 from BRUGAROLAS
- MOBILUX EP-111 from MOBIL
- MULTIFAK EP-2 from TEXACO
- KLUBERLUB BE 41-1501 from KLUBER

b) Method of lubrication.

When installing or reinstalling the spindle, be sure also to hand-pack the teeth with grease prior to greasing by normal methods, to ensure that the teeth will not run dry for the first few minutes of operation until the lubricant works its way to the gear mesh.

In order to proceed with greasing, remove one of the vent plugs and pump grease using one of the grease nipples placed in the spindle shaft or adapters. The lubrication would be completed when the grease comes out of the vent hole continuously. Do not forget to screw back the vent plugs since the spindle coupling can loose all the grease.

Always lubricate at both sides of the spindle.

c) Lubrication frequency.

- **At start up,** lubricate after few hours of operation, check and grease if necessary.

- **At break in period,** for the first month of operation lubricate every 3 days.

- **In normal operation,** lubricate every 15 days. For applications involving reversing, sever shock or high misalignment, lubricate at least weekly.

If excessive rolling fluid or contaminants are present, ambient temperatures are a problem, or excesive running temperatures on the gear mesh (>70ºC), more frequent lubrication may be necessary.
For longer lubrication periods, please ask our technical departament.
When a telescopic shaft exists, use a grease nipple on the shaft in order to lubricate the spline. The spline should be lubricated every 2/4 months depending on the shifting.

Spindle Maintenance And Lubrication Instructions

SPINDLE COUPLING MAINTENANCE

Scheduled inspections should be performed in order to achieve a long spindle life and proper operation. These first inspections are advised to be:

1) after 1-2 weeks.
2) after 4-6 weeks.
3) after 8-10 weeks.

Later on, the inspections are to be carried out every 5-6 months or every 4000-6000 hours, at least once a year. During these inspections, the spindle should be thoroughly cleaned and the following checking have to be performed:

a) Flange bolts tightening.

b) Gear teeth wear control.

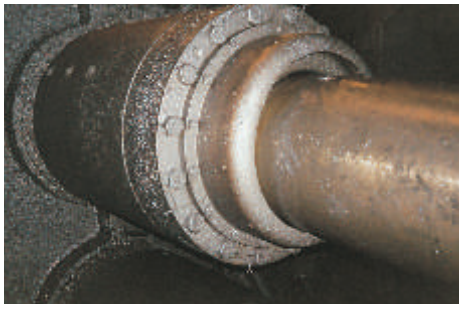
c) Noise and vibrations. In case of anomalous noise/ or vibrations, check immediately the cause.

d) Be sure that no excessive grease leakage is present, caused by seal wear, grease nipple and plugs failure.

Damaged components should be replaced. If toothed components are not replaced, it is advantageous to re-engage the teeth in the same mesh in which they were running. Top and bottom spindles should be interchanged to equalize tooth wear.

Always maintain an inventory of spare parts sufficient to ensure continuity of plant operation.

All rotating parts must be guarded to prevent accidents according to national and local safety rules.



Spindle special seal for harsh environments.

Problems And Causes

1. Anomalous gearing wear

- Lubricant deficiency due to:
  - Improper lubrication schedules
  - Seal wear or failure
  - Grease plug leakage
  - Inadequate quantity of grease
- Operation under conditions different from the original project
- Excessive backlash between roll neck and sleeve bore

2. Teeth Failure

- Excessive misalignment
- Overloads
- Excessive backlash

3. Flange bolts loosening and failure

- Flange and shaft mechanical contact
- Improper bolt tightening torque
- Excessive spindle vibrations

4. Roll sleeve bore anomalous wear

- Inadequate lubrication
- Sleeve overheating in operation causing a reduction of bore surface hardness
- High spindle vibrations
- Worn out or excessively rough roll neck surfaces

5. Vibrations

- Roll sleeve bore excessive wear
- Flange bolts loosening or failure
- Excessive gearing wear

After Sales And Reconditioning Services

Repair and maintenance program

At the urging of gear spindle users, Jaure® has been engaged in the repair of the gear-type spindle couplings for over 40 years.

The program we have established allows us to provide our customers with a quick turnaround and at reduced costs compared with buying a new coupling.

Additionally, in analyzing the damaged couplings sent to us, we are able to advise our customers on improved maintenance procedures, so that the repaired units most often have a longer service life than the original coupling.

Analysis of the received coupling.

Our analysis has three aspects:

1) We observe the unit's damaged parts. For instance: Do the teeth show excessive misalignment? Are the seals showing signs of leakage? Is the lubricant contaminated or was it subjected to high temperatures?

2) If in doubt of material quality, we cut samples of the damaged components and send them for metallurgical analysis.

3) We discuss the application with the customer's maintenance personnel, and try to improve the maintenance. In some cases, through these discussions we find out that the coupling is not adequate for the application.

Our technicians have many years of experience in this field, and our engineers are often consulted in deciding which repairs are necessary.

A complete report is drafted of the technician's findings, and a list of the required repairs (including prices) is made and sent to our customer for approval. No work is done without customer consent.

Actual repair procedure

The most costly components are the hubs and the intermediate gear rings. All effort is made to salvage these components. In many cases damaged teeth can be restored to very near their original condition, and parts can be reused. If repairing these components would reduce the quality of the coupling, then we recommend their replacement. In the case of very old couplings, we are able to offer replacement components made of better and newer materials, or better heat treatments, thus improving the life expectancy of the repaired coupling.

Some of the components are routinely replaced; this is always the case with the square keys, and any bolts or nuts that have worn or damaged threads. Also, all seals are replaced, so that the lubricant is held within the coupling, and water and or dirt is prevented to enter the coupling.

Inventory program of replacement parts

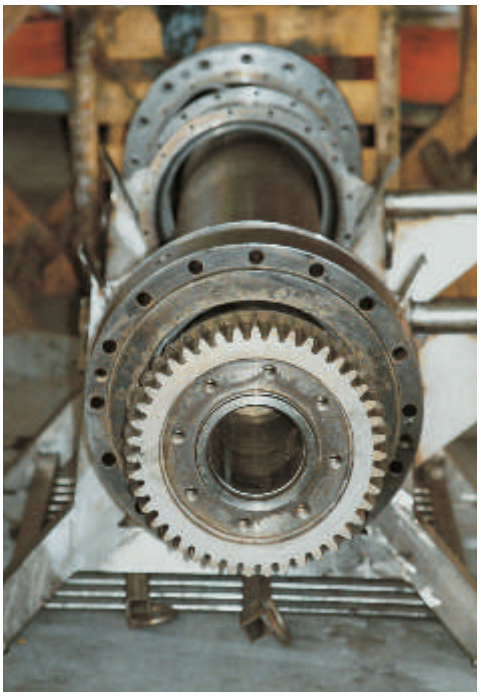
Jaure has kept record of all repairs made since the coupling repair program was implemented. Using these records, we can now predict which parts will be in demand. Therefore, Jaure has established a stock of parts most frequently required for repairs. We are thus able to offer a quick turnaround, as seldom do we need to manufacture parts from scratch after the coupling is sent to us.

With many of our repeat customers we establish a program frequency of repairs, so that we are able to stock special components even before we receive a coupling. Parts are replaced only if necessary.

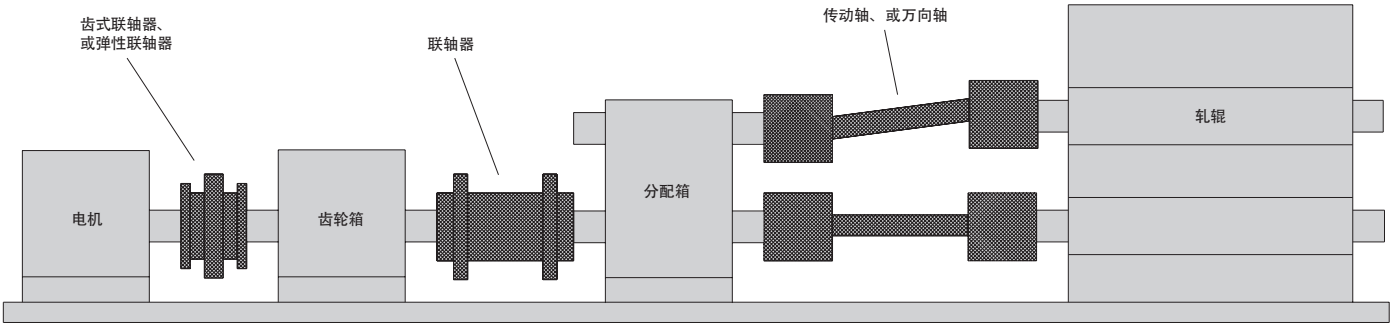
Advantages of the Jaure repair program

Jaure will repair your coupling in the shortest time possible.
Jaure will repair your gear-type spindle coupling at lower cost than a new coupling.
Jaure will work with your maintenance department to increase expected life of repaired units.
Jaure technicians and engineers have a broad experience, both in manufacturing new spindle couplings, and in the repair of damaged gear-type spindle couplings.

You can rely on Jaure to have the best job done, at a competitive price.



Jaure® Supply Program For Steel/Aluminium Mills

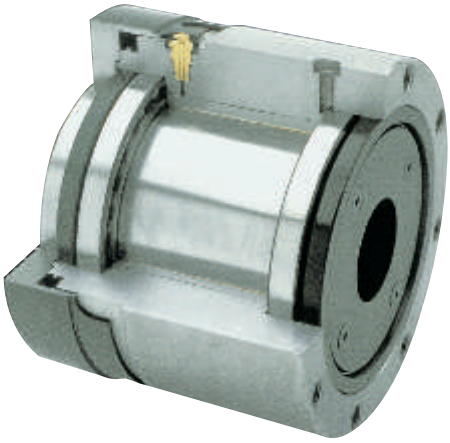


MT Crowned Tooth Gear Coupling.
(Nominal Torque up to 7.000 kNm)

MTX - 800 Spacer Gear Spacer Coupling.
For Steckel Mill Main Drive

AL Gear Spindle.
(Nominal Torque up to 6500 kNm)

MMG Elastomeric Coupling.
(Nominal Torque up to 1600 kNm)

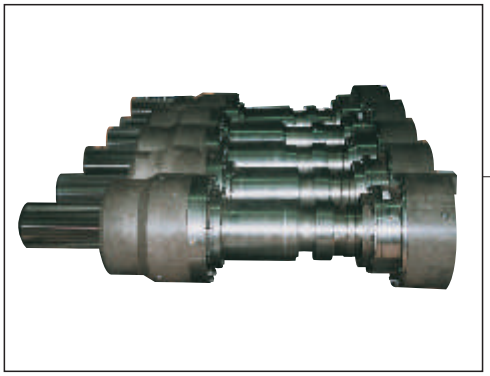


Safety element*

JG Universal Joint.
(Nominal Torque up to 3500 kNm)

(1) Safeset® is a trade mark from Voith.

Steel/Aluminium Mills Application List



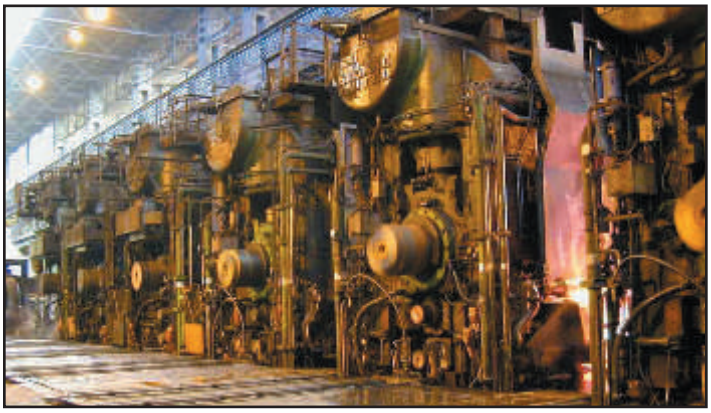
Mayor Applications	Gear Spindle	Universal Joint	Elastomeric (1) Coupling	Gear Coupling	Disc Coupling (Lamidisc®)
Bar/Rod Mill main drive	✔	✔	✔	✔	
Wire mill	✔	✔	✔	✔	
Coilers			✔	✔	
Pinch rolls	✔	✔	✔	✔	
Straighteners	✔	✔		✔	
Cold mill main drive	✔	✔		✔	
Hot strip mill main drive	✔	✔	✔	✔	
Plate/Steckel mill main drive	✔	✔	✔	✔	
Edger drives	✔	✔	✔	✔	
Tube mill main drive	✔	✔	✔	✔	
Runout/Entry/Exit table drives			✔	✔	
Cranes			✔	✔	✔
Casters			✔	✔	✔

(1) Elastomeric couplings in silicon plexing element also available.

Applications And Manufacturing

Hot mill spindle.

Hot strip mill spindles with safeset®



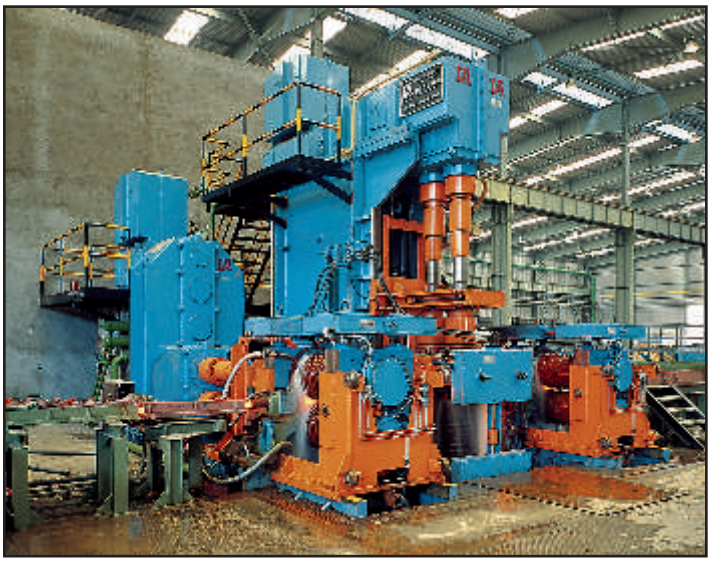
Hot strip mill

Cold rolling mill spindles.

Spindles with shear pins

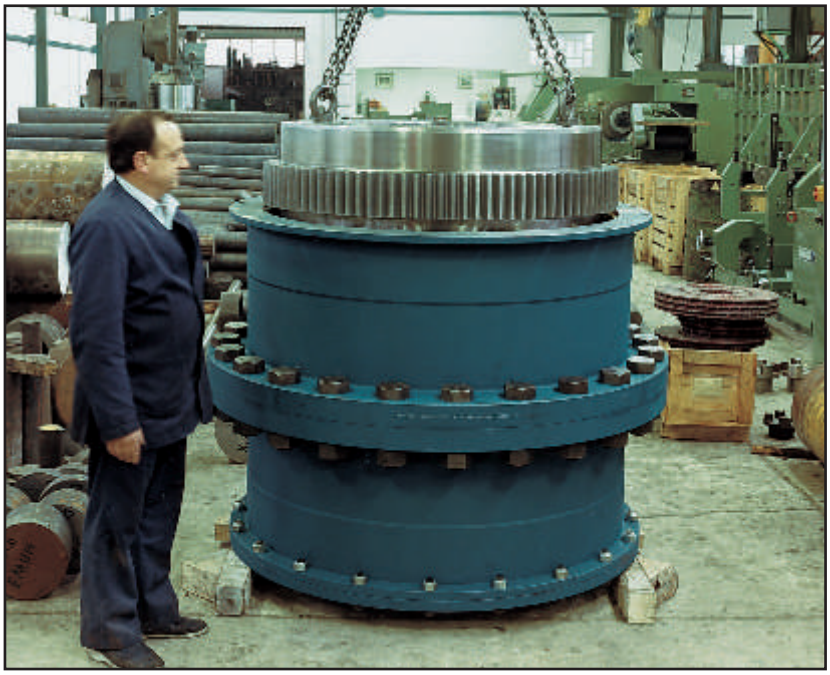
Continuous lubricated spindle.

SAFESET® is a trade mark from VOITH

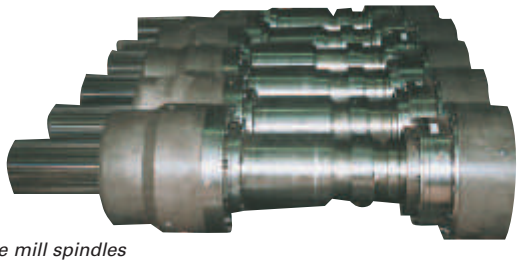


Horizontal and Vertical Stands with JAURE Spindles

Applications And Manufacturing

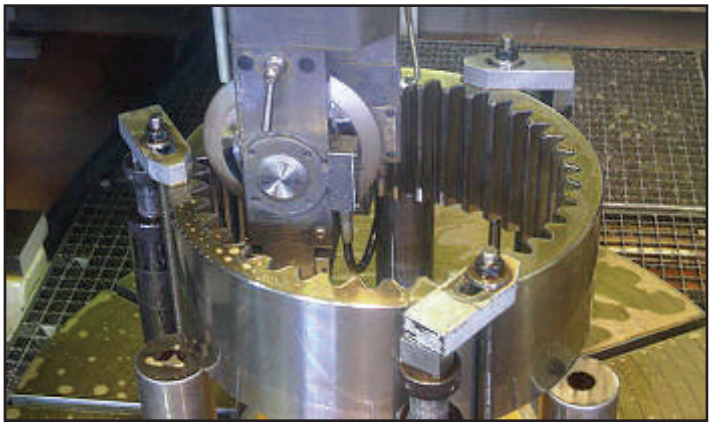


MT-730 Main Drive Gear Coupling



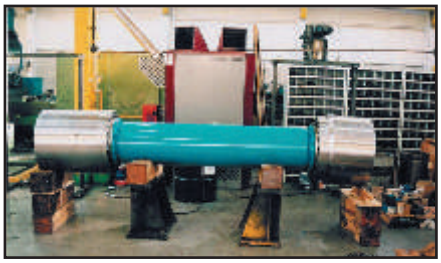
Wire mill spindles

Coupling Box deburring



Internal sleeve grinding.

Steckel mill telescopic spindles



Hot strip mill spindle at maintenance

Main Drive Gear Coupling

Pumping oil into a spindle with Safeset®

Skin Pass gear spindles

Selection Data Required

Name _____

Company _____

Phone _____ Fax _____ E-mail _____

Date _____

Inquiry Number _____

Mill Type _____

Number of Stands _____

Number of Required Assemblies _____

Please include your comments: _____

Please include your comments _____

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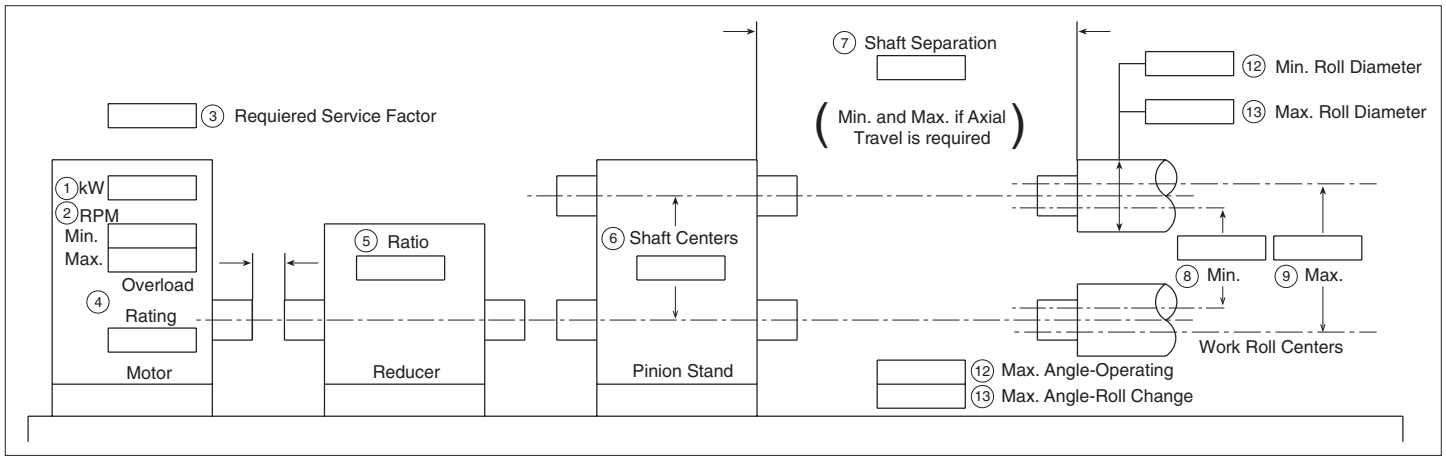
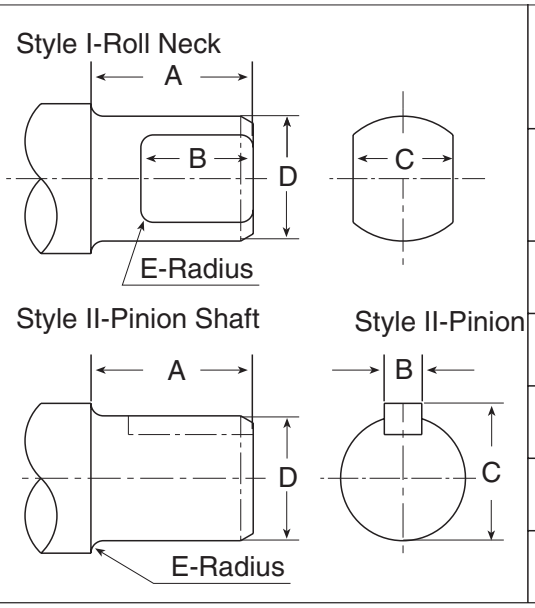
Selection Data Required

Please provide the following information in the boxes provided:





14 Bore Requirements

Style	Pinion Shaft	R	oll Neck	
A	Engagement Length		Engagement Length	
B	Key Width		Flat Length	
C	Key Depth		Across Flats	
D	Shaft Dia.		Neck Dia.	
E	Radius		Radius	

Please note any other mill characteristics such as:
- Method of Roll Change
- Drive Orientation (Vertical or Horizontal, etc)
- Operating Environment
- Unidirectional of Reversing Drive
- Restrictions on Diameter
- Any Other Pertinent Information

JAURE®

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Technical Service: 800-626-2093

www.RegalPTS.com/Jaure

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