



CANSTAR

Instruments Inc.

BONDURA ®

***The
PIN
that
eliminates pivot wear
and maintains structural stiffness***



Bondura ®

- For safety's sake



Certificate number D-3638
DNV-OS-E101-Drill Plant
API Spec 8C/ISO13535, 4th edition

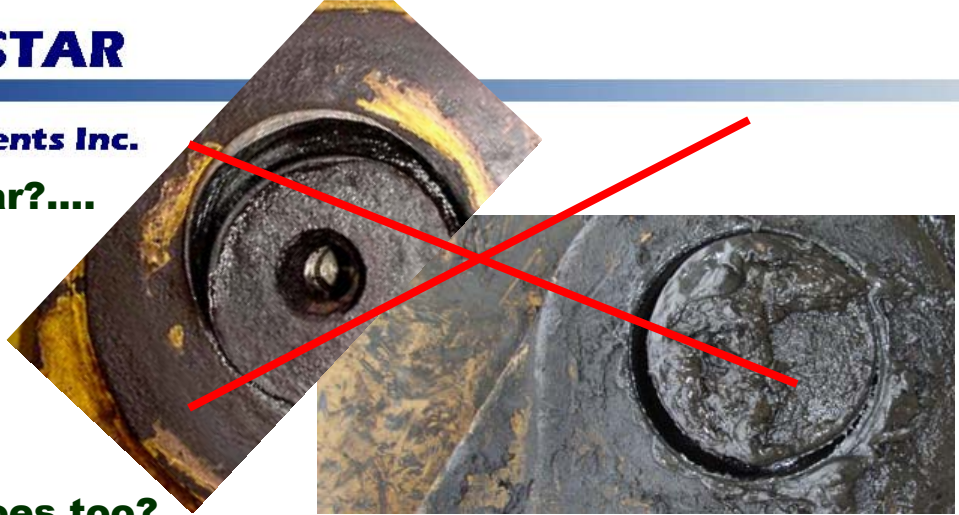
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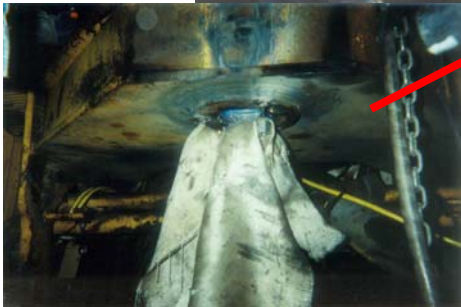
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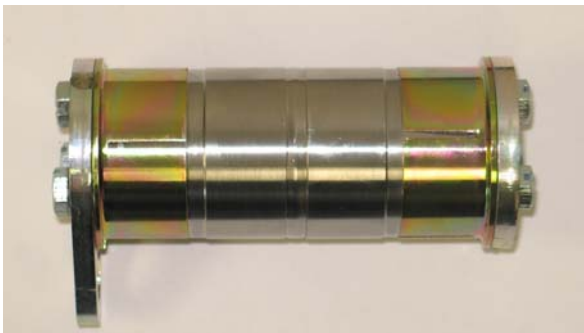
Problems look familiar?....



Fixing the problem does too?.....



Use the BONDURA PIN and eliminate pivot wear!



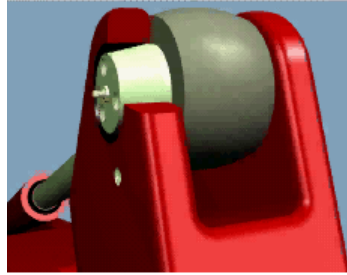


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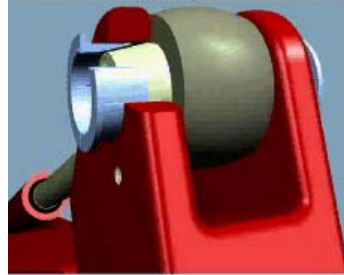
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This is how the BONDURA pins works:

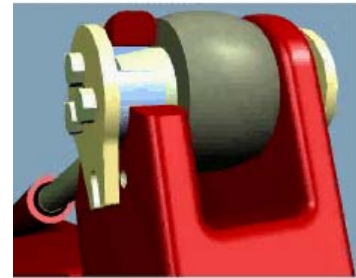
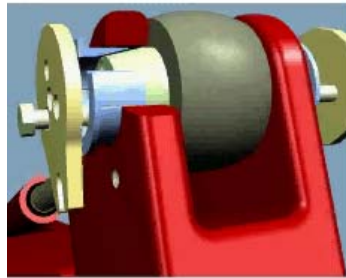
1) The pin is inserted



2) The tapered sleeves are introduced



3) and 4) The locking plates are attached with standard bolts



5) and 6) These bolts are tensioned to specified torque:



7) and 8) Result:

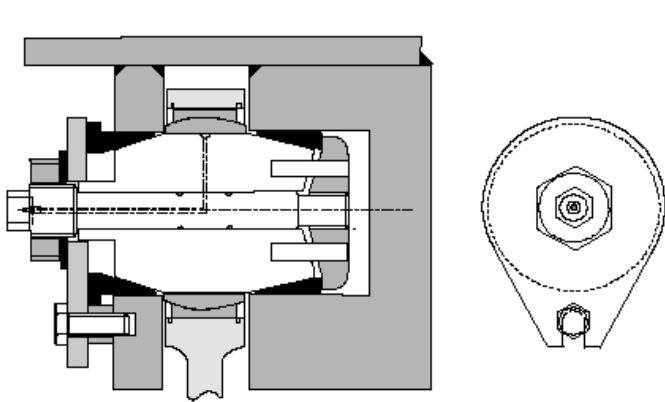




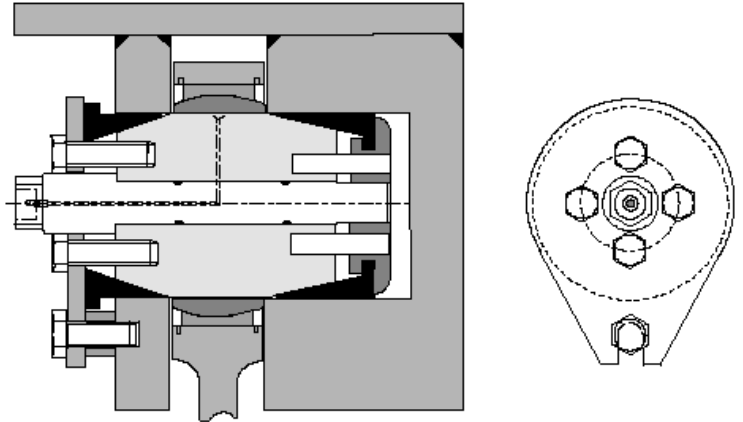
Standard BONDURA® PIN models:

Model 6.1

is used in fixed joint applications, with access or limited access from only one side. The inner tapered sleeve is tightened via the inner shaft, thus allowing both tapered sleeves to be serviced from one side.



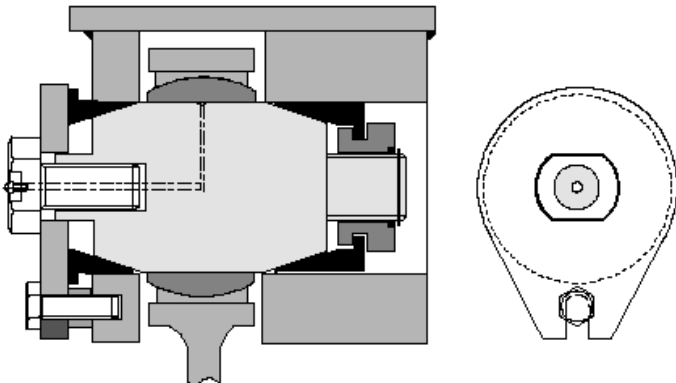
BONDURA® 6.1 diameter 30-57mm



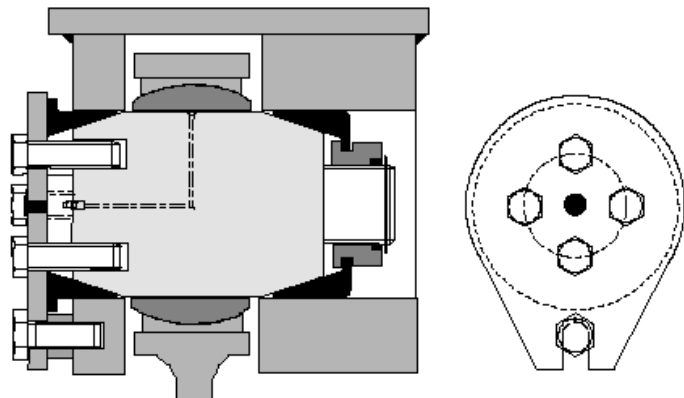
BONDURA® 6.1 diameter 60-180mm

Model 6.2

is used in non-fixed joints, where one or both supports are extra wide. The 6.2 is also used in applications where the bolt cannot protrude past the support on one side, but where there is access to tighten the bolts from both sides.



BONDURA 6.2 diameter 30-65mm

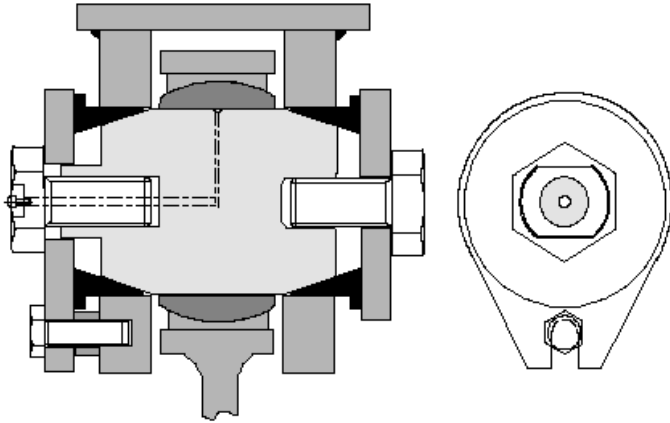
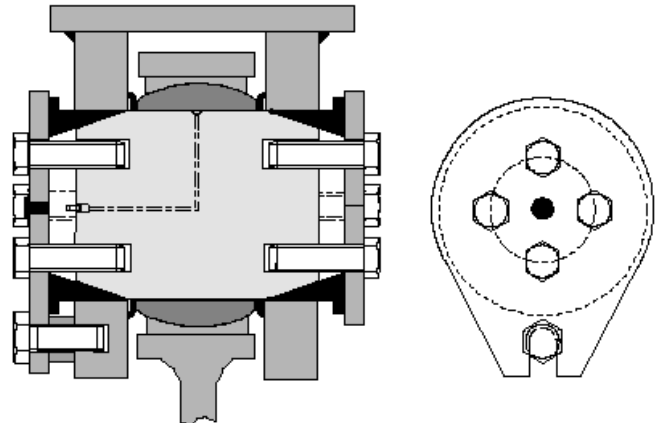


BONDURA 6.2 diameter 70-120mm

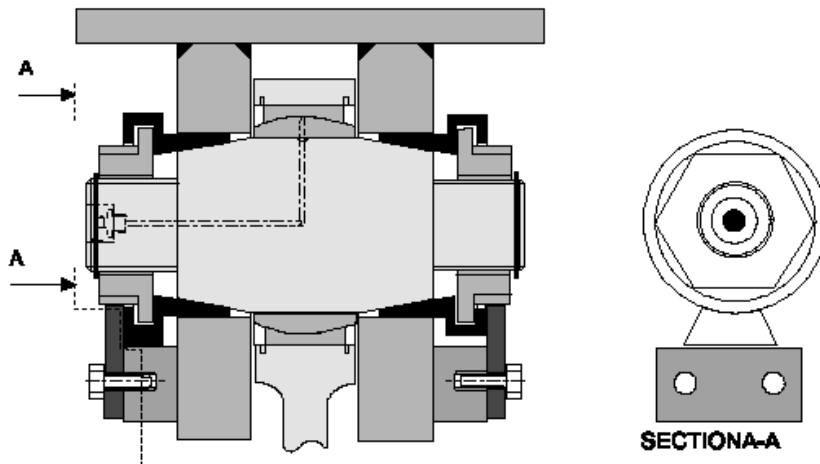
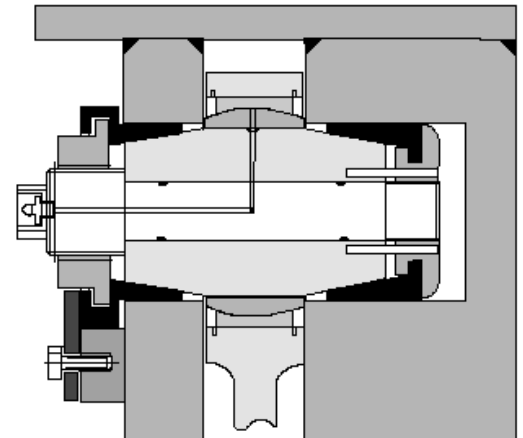
**CANSTAR****Instruments Inc.****Model 6.6**

is used in non-fixed joints applications.

The pin requires access from both sides in order to tighten the bolts

**BONDURA® 6.6** diameter 20-65mm**BONDURA® 6.6** diameter 70-320mm**Model 3.3 and 3.1**

are now mainly replaced by 6.1 and 6.6: used only for applications that require special bolt positions.

**BONDURA® 3.3** diameter 30-200mm**BONDURA® 3.1** diameter 60-140mm

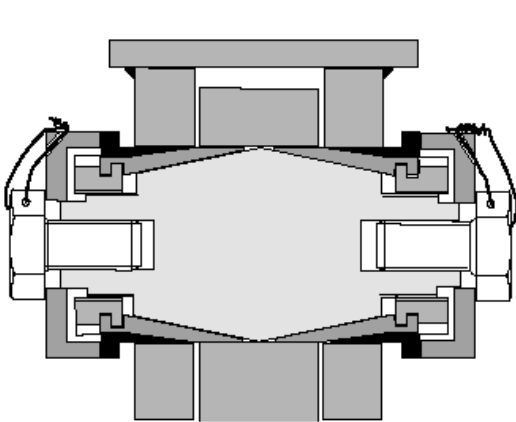


Model 36.36

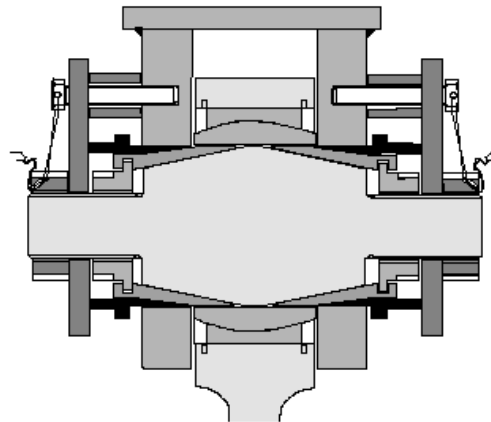
Has expanding taper sleeves on both outer and inner support, ensuring a fixed connection in both the support and the inner segment.

Applications examples: Fixed structural connections, such as framed structures and when joining sections.

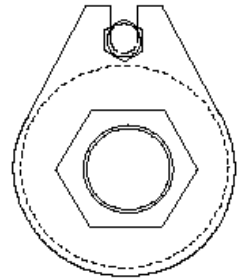
It is also used in self-aligning plain bearings where the BONDURA® Pin is locked to the inner sleeve of the bearing: It ensures that the inner race of the bearing does not turn on the BONDURA® Pin



BONDURA® 3.6.3.6 diameter 30-80mm



BONDURA® 3.6.3.6



diameter 90-320mm

Model 66.66

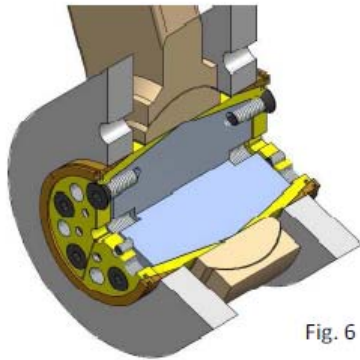
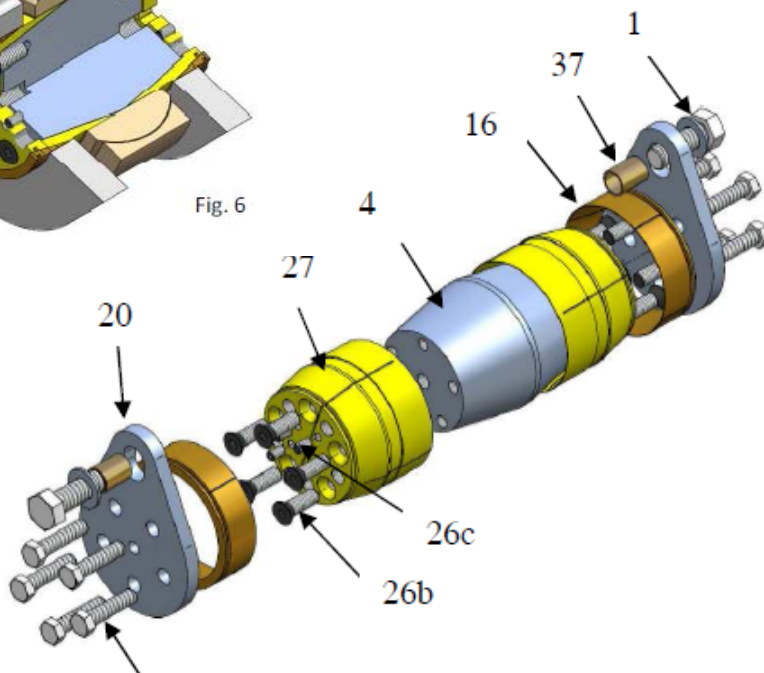


Fig. 6



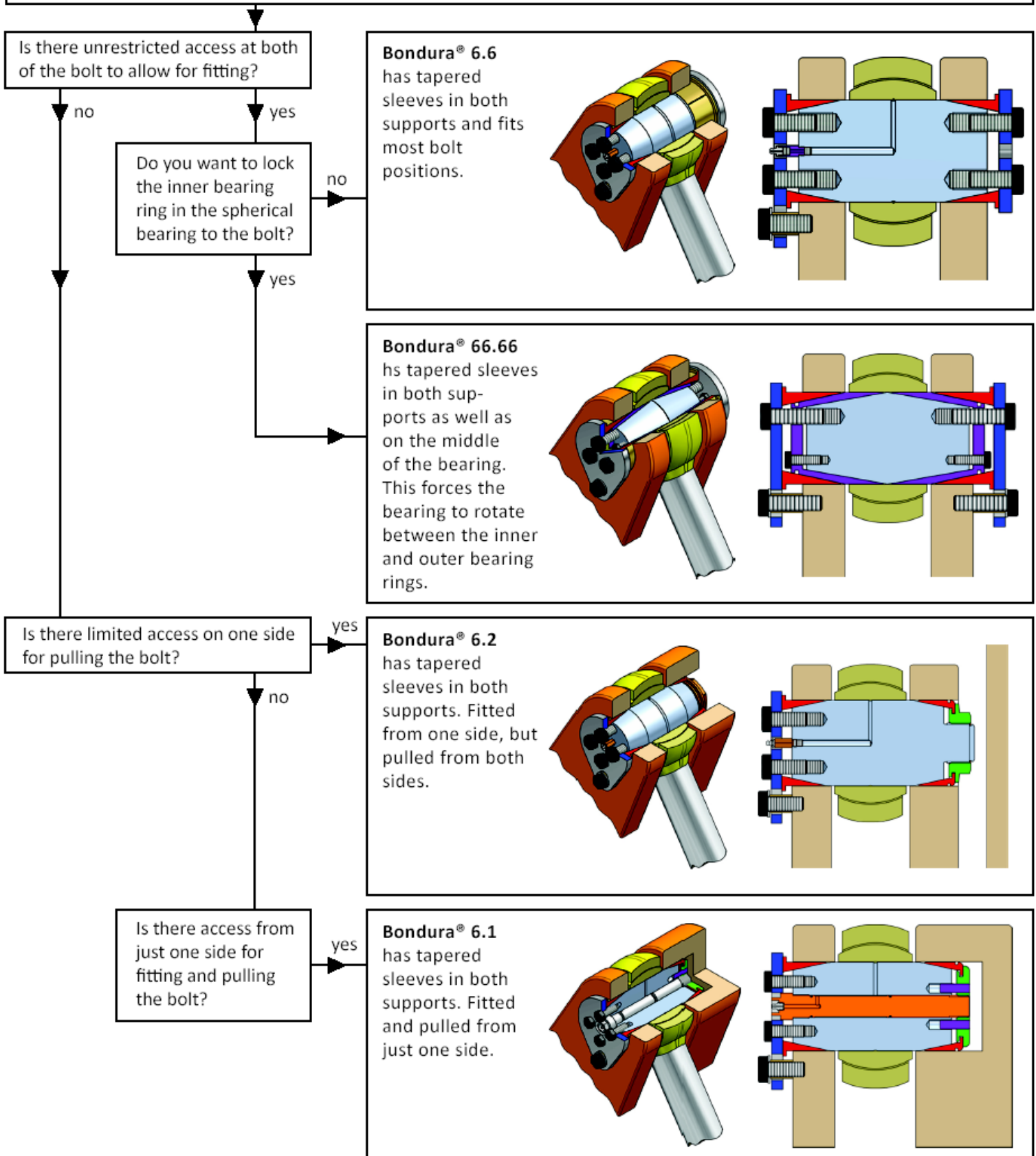
Descriptions

- | | |
|-----|--------------------------|
| 1 | Locking screw |
| 4 | Bolt |
| 16 | Outer cone |
| 20 | Locking plate |
| 26 | Outer cone screw |
| 26b | Inner cone screw |
| 26c | Pin screw |
| 27 | Inner cone |
| 37 | Clamping screw protector |



BONDURA Pin Selection:

The following four standard types of Bondura® bolt are intended for **adjustable joints** with a support at each of the bolt



**Support (Clevis) Tolerances:**

Since the BONDURA Pin has expanding tapered cone sleeves, it is not necessary to design and manufacture equipment which fits tightly into the clevis. A clearance tolerance of +0.2mm (~ 0.008") to +0.3mm (~0.012") is adequate. The surface finish of the clevis holes can be machined to standard practice. With the installation of the Bondura Pin will be with the clevis one solid and stiff structural component.

BONDURA Pin tolerances:

BONDURA Pins are supplied with a polished surface, Ra 0.2µm, using BONDURA Pin materials HRC-63 and the standard BONDURA Pin steel. Other materials are machined to a surface finish of Ra 0.8µm. The standard diameter tolerance is ISO h7.

Play and ovality:

If the bolt hole in the support (clevis) is more than 2mm larger than the pin diameter, an oversized tapered cone can be used. In principle it is quite possible to take up larger amounts of play in a support hole, but generally speaking the ovality should be no more than 1.0mm. Oversized cones can be supplied for all models of the BONDURA Pin.

Pin Locking:

BONDURA Pins are additionally locked to prevent pin rotation, in case the pre-tensioning force and make-up torque is lost, using the anti-rotation screw. Would the anti-rotation screw have sheared, than this it the tattle-tale for bearing-lock, lack of lubrication or sliding surface wear. All bolts can be furnished with holes for locking wire.

Part number description:

Once your application information has been received, we will specify the BONDURA Pin designation, which will be used to process your order.

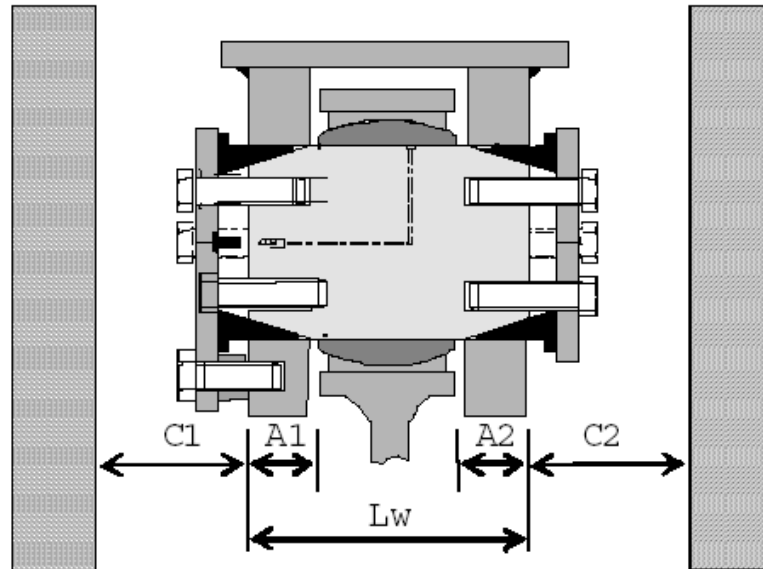
i.e. 6.6 – 100 – 1000 – L – 50 – 50 – ov102 – MQ

6.6	BONDURA Pin model
100	Pin diameter in mm
1000	Pin length in mm
L	L=single lubrication, D= Double lubrication, U= no lubrication in the pin
50	tapered length on the locking side of the pin
50	tapered length on the free side of the pin
Ov102	Any excess tapered sleeve measurements in mm
MQ	material type

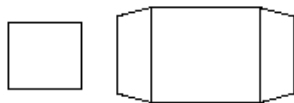
**Materials available:**

Material quality	Steel types in materials group	Available dimensions Ø mm	Yield stress Rp 0,2Minimum Mpa (N/mm ²)	Tensile strength Rm Minimum MPa (N/mm ²)	Standard surface
MQ-1 High strength hardened steel High rupture strength Selected when the yield stress and tensile strength need to be high and corrosion resistance is not a decisive factor. Steel which is in stock complies with materials requirements *)	SIS2541 34CrNiMo6 EN 1.6582 SNC-16 AISI4140	20-90 >90-150 >150-240 >240-360	800 700 600 540	1000 900 800 740	Ra 0,8µm ISO h7
MQ-2 Corrosion-resistant, high strength hardened steel High rupture strength Resistant to sea water Selected if corrosion resistance is a decisive factor, while at the same time the yield stress and tensile strength are high. Steel which is in stock complies with materials requirements *)	S165M EN 1.4418 SIS2387 X4CrNiMo16-5 17/4 PH DH1150	20-360	700	900	Ra 0,8µm ISO h7
MQ-3 HRC-63 Bolt Norge's bolt steel HRC-63 High strength hardened steel High rupture strength Hardened, abrasion-proof surface (55-63 Rockwell C) Non-corrosive bearing surface (hard chrome) Resistant to bolt and bearing wear Abrasion-proof steel with a very hard surface and a high-strength, tough core. Similar yield stress and tensile strength as MQ-1 and MQ-2 Steel which is in stock complies with materials requirements *)	HRC-63	Ø30 h7 Ø38,1 (1,5" h7) Ø40 h7 Ø44,45 (Ø1¼" h7) Ø45 h7 Ø50 h7 Ø60 h7 Ø63,5 (Ø2,5" h7) Ø70 h7 Ø80 h7 Ø90 h7 Ø100 h7 Ø120 h7 Other dimensions can be manufactured on demand	700	900	Ra 0,2µm ISO h7
MQ-4 Alloyed structural steel High impact resistance Selected when there are no requirements relating to high strength and corrosion resistance. Steel which is in stock complies with materials requirements *)	St.52 S355 SS2172 520M	20-70 >70-90 >90-140 >140-190 >190-360	325 315 295 285 275	490 490 470 450 450	Ra 0,8µm ISO h7
MQ-5 BNS Bolt Norge's bolt steel BNS High rupture strength Hardened, abrasion-proof surface Non-corrosive bearing surface (hard chrome) Resistant to bolt and bearing wear Abrasion-proof steel with a very hard surface and a high-strength, tough core.	BNS Cromax-482	Lagerføres i de fleste dimensjoner fra Ø25 - Ø125mm fra Ø1,0" - Ø5,0" Other dimensions can be manufactured on demand	580	850	Ra 0,2µm ISO h7

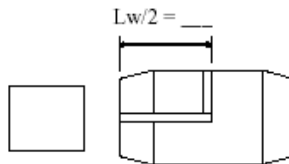
*) materials comply with the materials requirements specified in: DNV "Standard for Certification 2.22 – Lifting Appliances" 2008; "DNV-OS-E101 – Drill Plant" 2008; API Spec 8C "Specification for Drilling and Production, Hoisting Equipment" 2003. Pins can be supplied with traceability to Control Certificate EN 10204 3.1 (3.1b).

**CANSTAR****Instruments Inc.****Customer application information sheet****Company name:** _____**Machine model:** _____**Pin Location:** _____**Required Pin load:** _____**Min. Temperature:** _____**Required tests:** _____**Contact name:** _____**Tel #:** (____) _____**Email:** _____**Material:** _____**Applicable standards:** _____**Requested BONDURA model:** _____

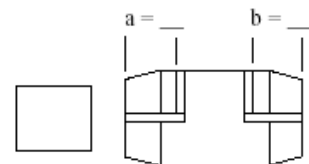
Please give us the following information :



no lubrication in pin



lubrication in pin



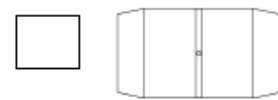
lubrication in pin

Ø bolt : _____**Lw** : _____**A1** : _____**A2** : _____**C1** : _____**C2** : _____

When lubrication :



groove in bearing



groove on bolt

When ovality :

Left support :
max : _____ min : _____Right support :
max : _____ min : _____



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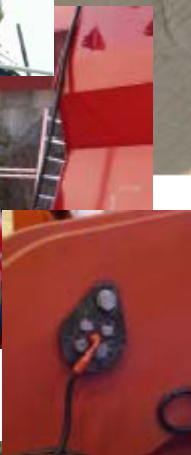
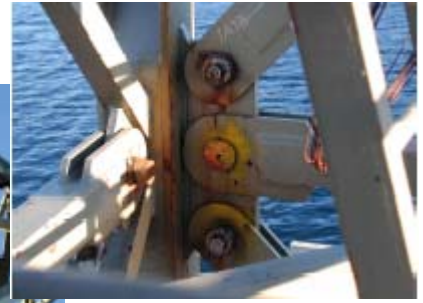
Application pictures:





CANSTAR

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Canstar Instruments Inc.

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