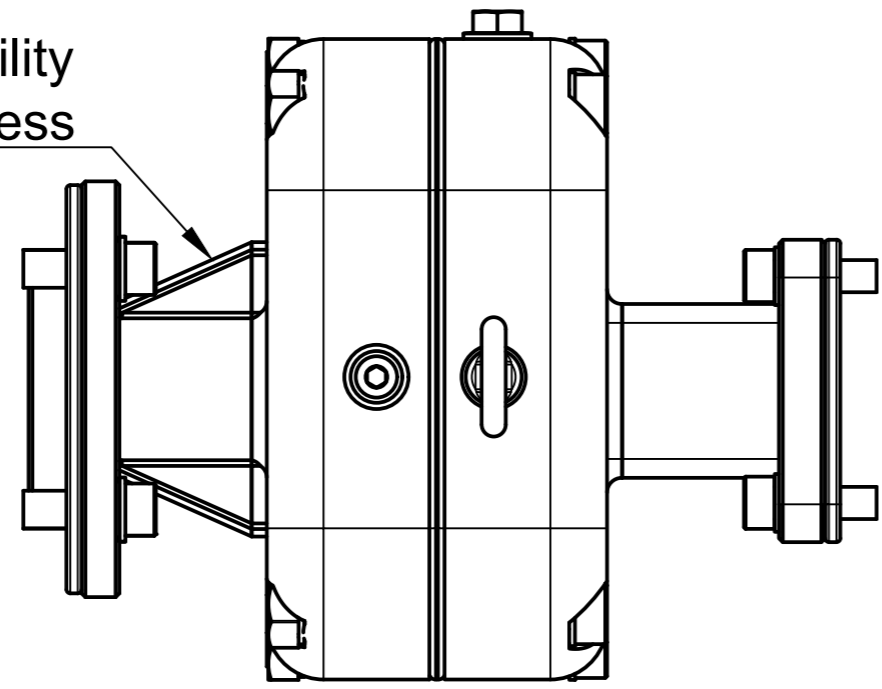


**Notes:**

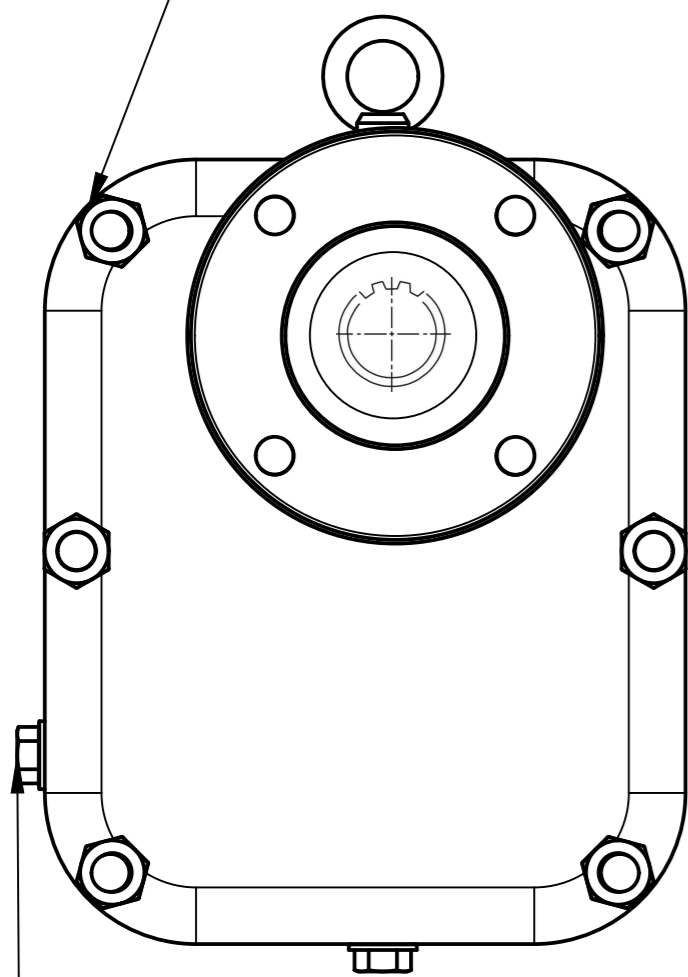
1. Lubrication oil is 2158K961 Hydraulic 100
2. Oil to be filled to 25% of radius of the bottom gear
3. Change oil every 2500 hours
4. Engine oil is Special Tec AA 5W-208
5. Replace lifting hook with M8 plug after installation
6. Pregrease gears before assembly
7. Bearing hammered in as interference fit is present

<b>TOLERANCES UNLESS OTHERWISE STATED:</b>			EXTERNAL VIEW
WHOLE NUMBERS	$\pm 0.25$		DRAWN BY MDB GROUP 51: ZARA IMAN-BUTT, HEBA ALI, MAHMOOD EL MAHALAWY
ONE DECIMAL PLACE	$\pm 0.10$	DRAWING PRODUCED IN ACCORDANCE WITH: BS8888 2020	APPROVED BY: HEBA ALI
TWO DECIMAL PLACES	$\pm 0.05$		
ANGULAR TOLERANCE:	$0^{\circ}15'$		
SURFACE FINISH:	$0.8 \mu\text{M}$		
<b>ALL DIMENSIONS IN MM</b>			
SCHOOL OF ENGINEERING		WEIGHT: 8.4 KG	
SHEET SIZE: A2	07/12/23	ISSUE 1	SHEET 1 OF 5

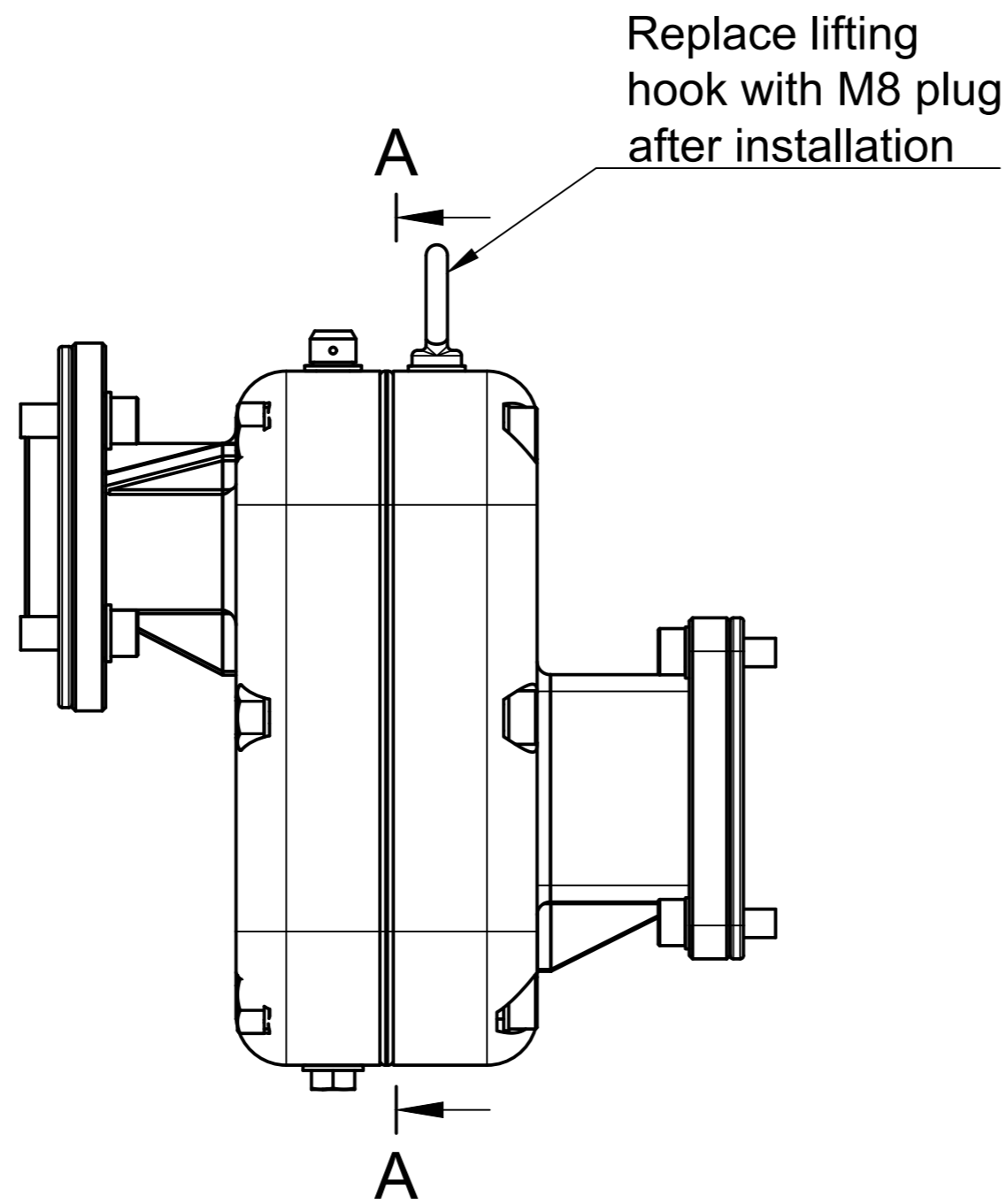
Ribs to provide stability and enhance stiffness



Locknuts used to prevent loosening under torque and vibration forces

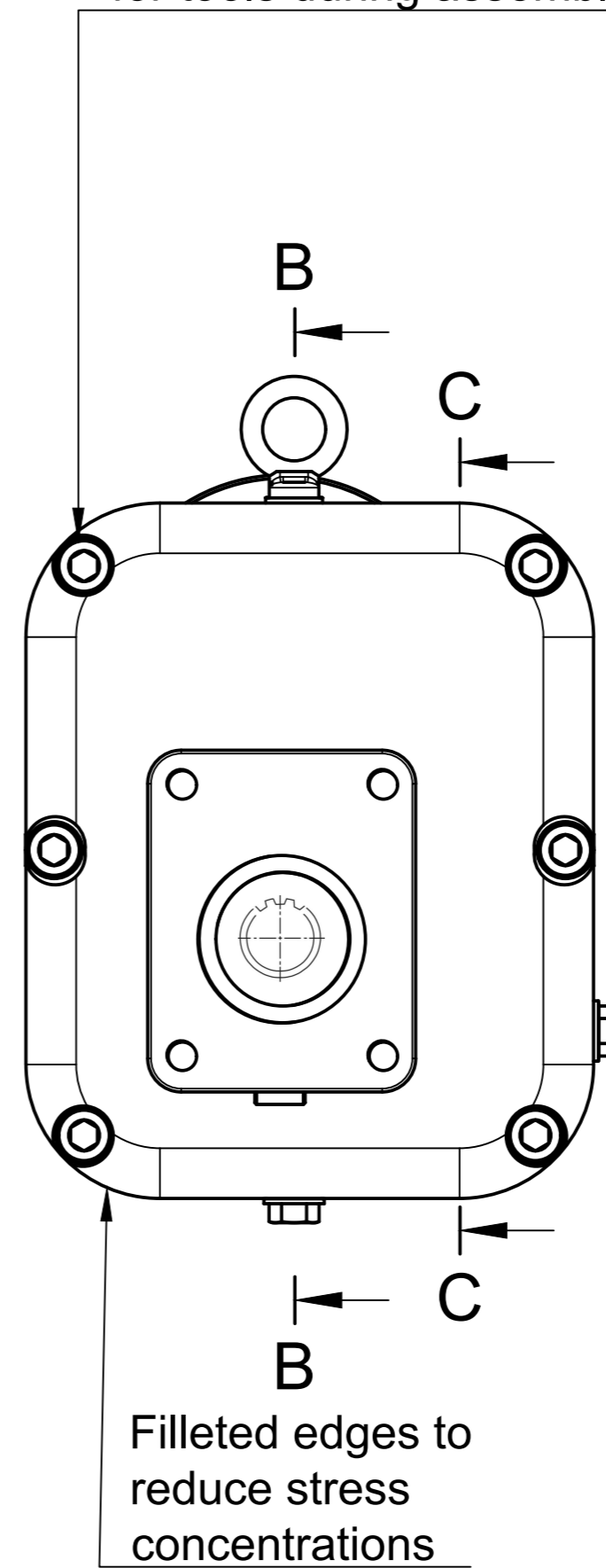


Oil level bolt so oil levels are accurate and remove the need for a dipstick



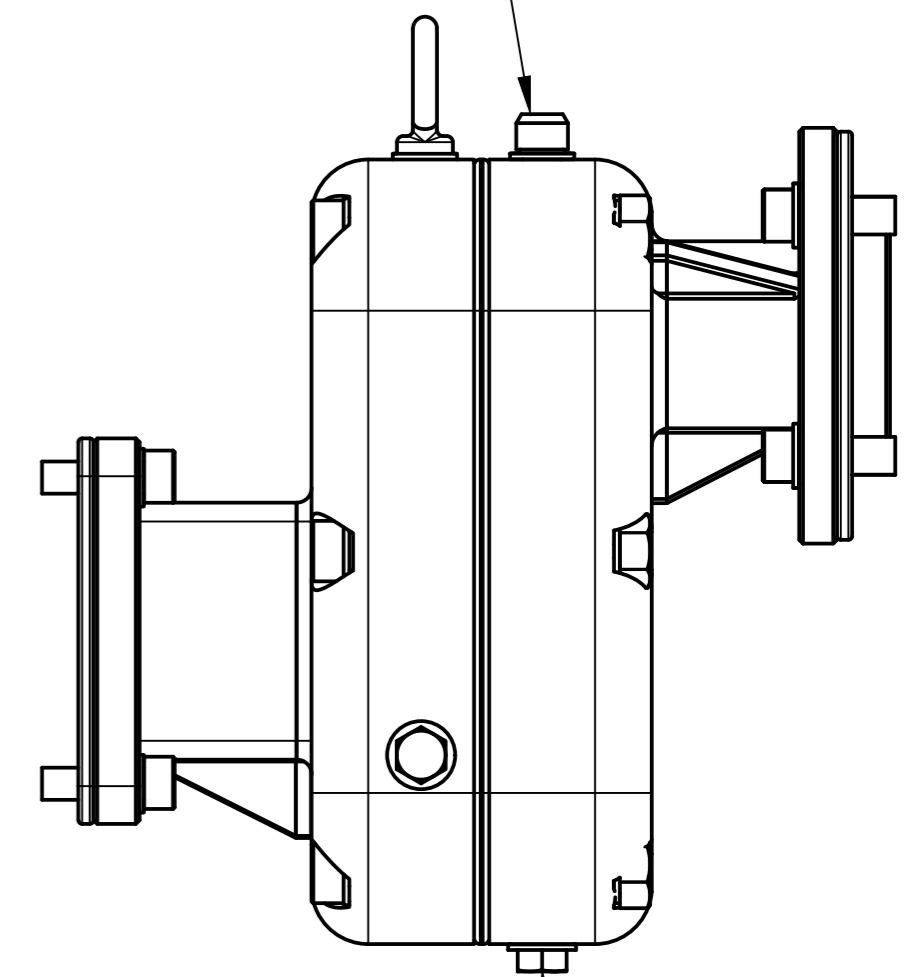
Replace lifting hook with M8 plug after installation

Locknut is held into position by casing to eliminate need for tools during assembly



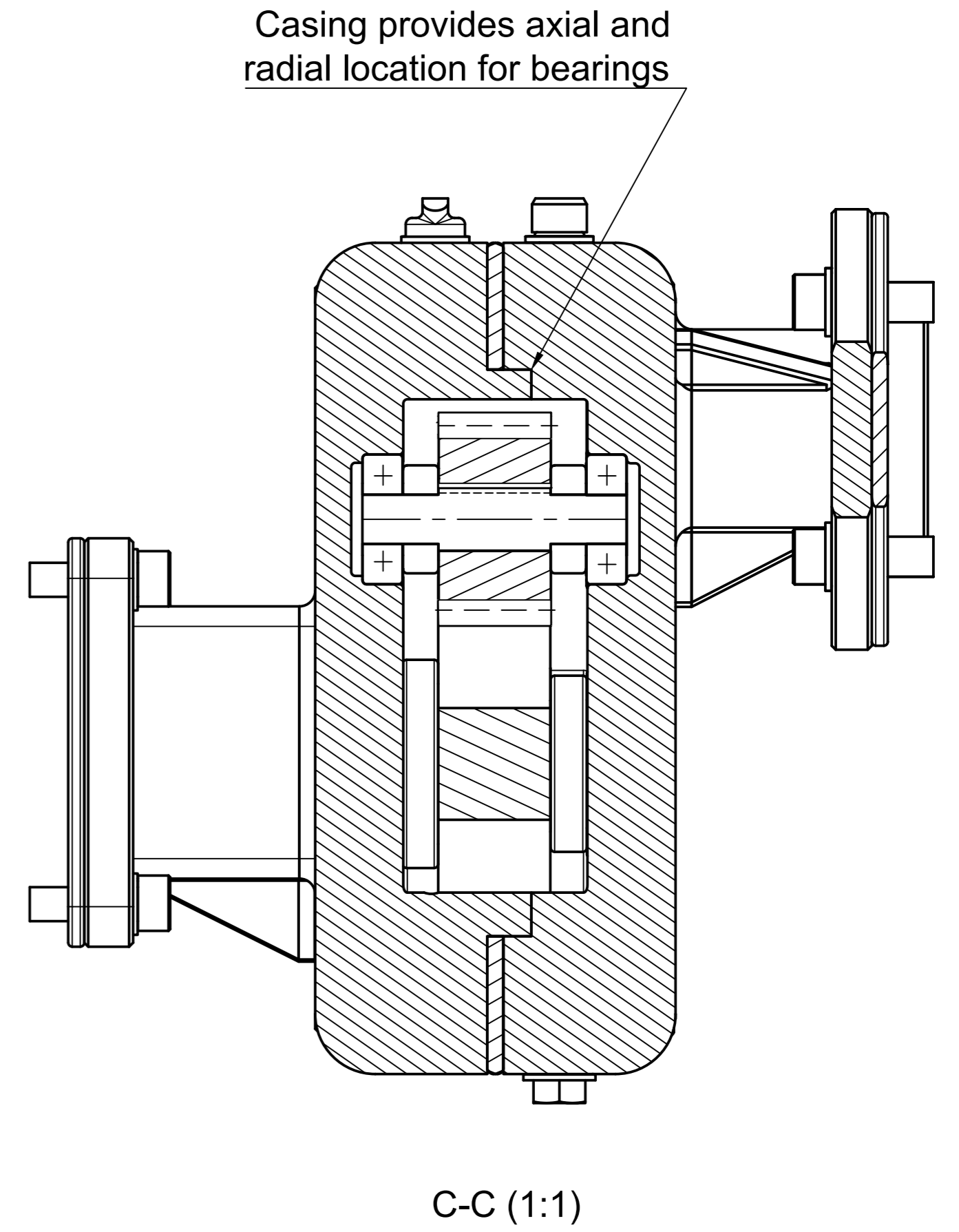
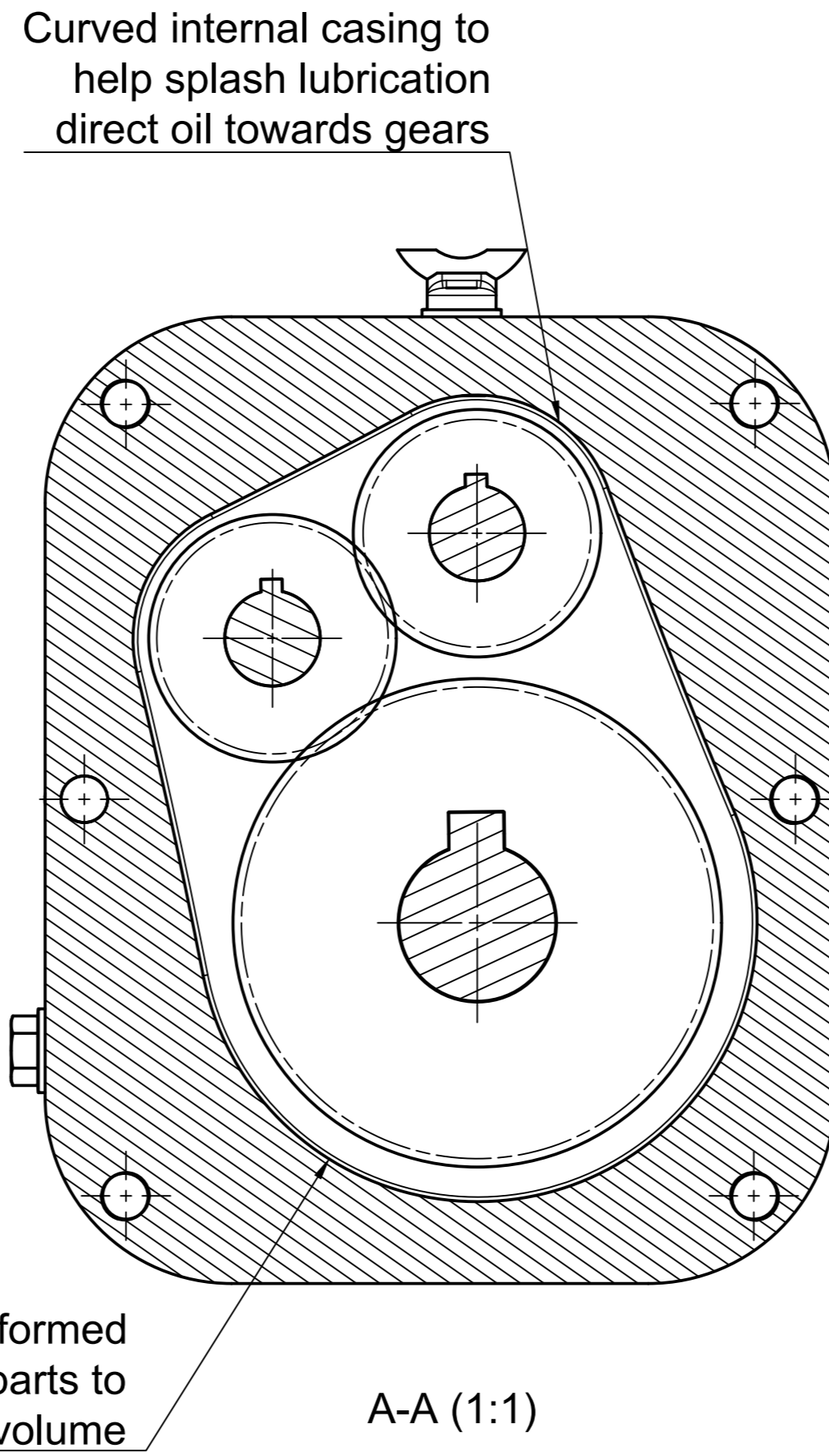
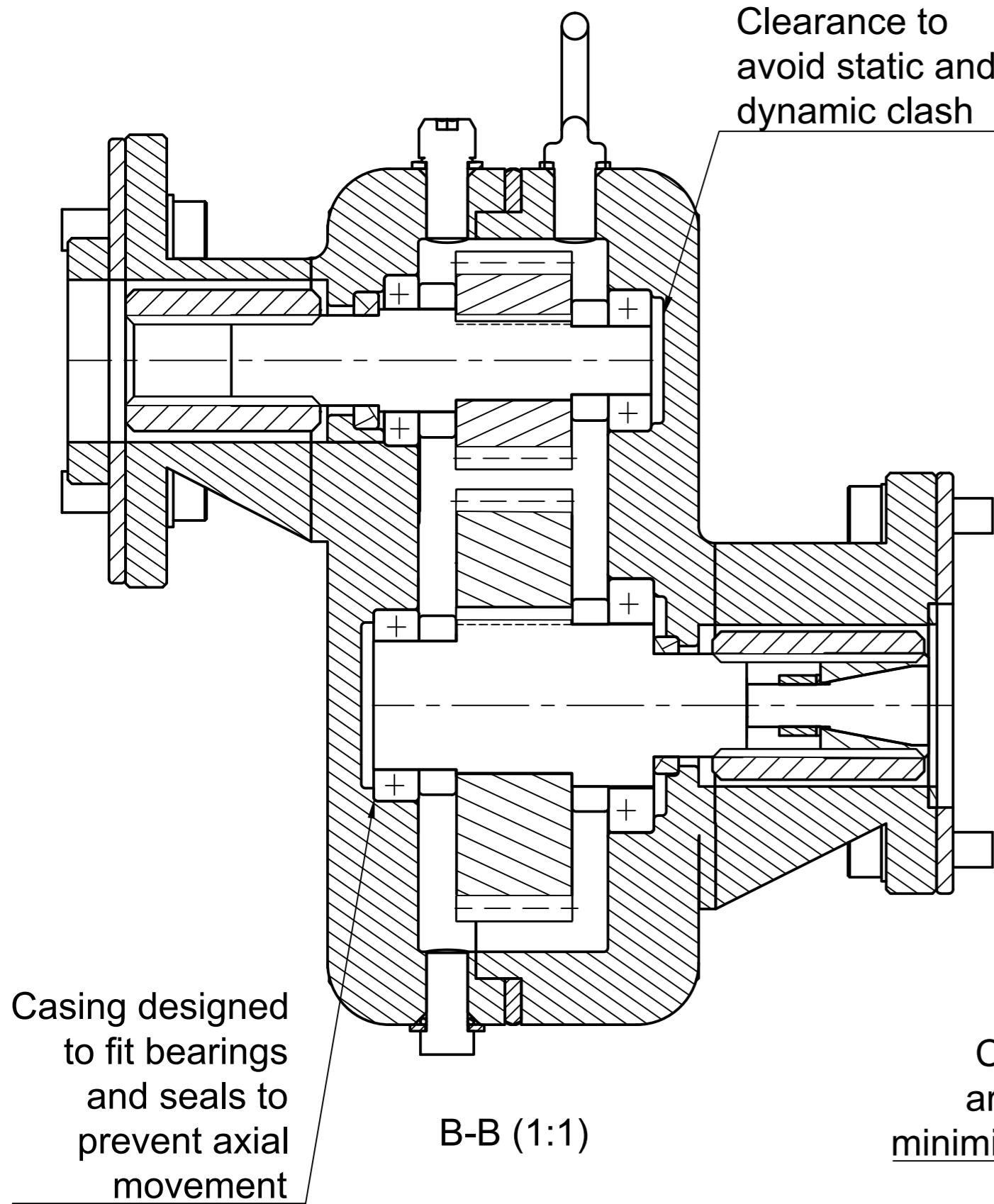
Filleted edges to reduce stress concentrations

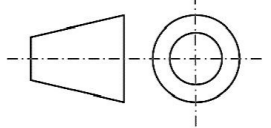
Breather nut for pressure and temperature regulation



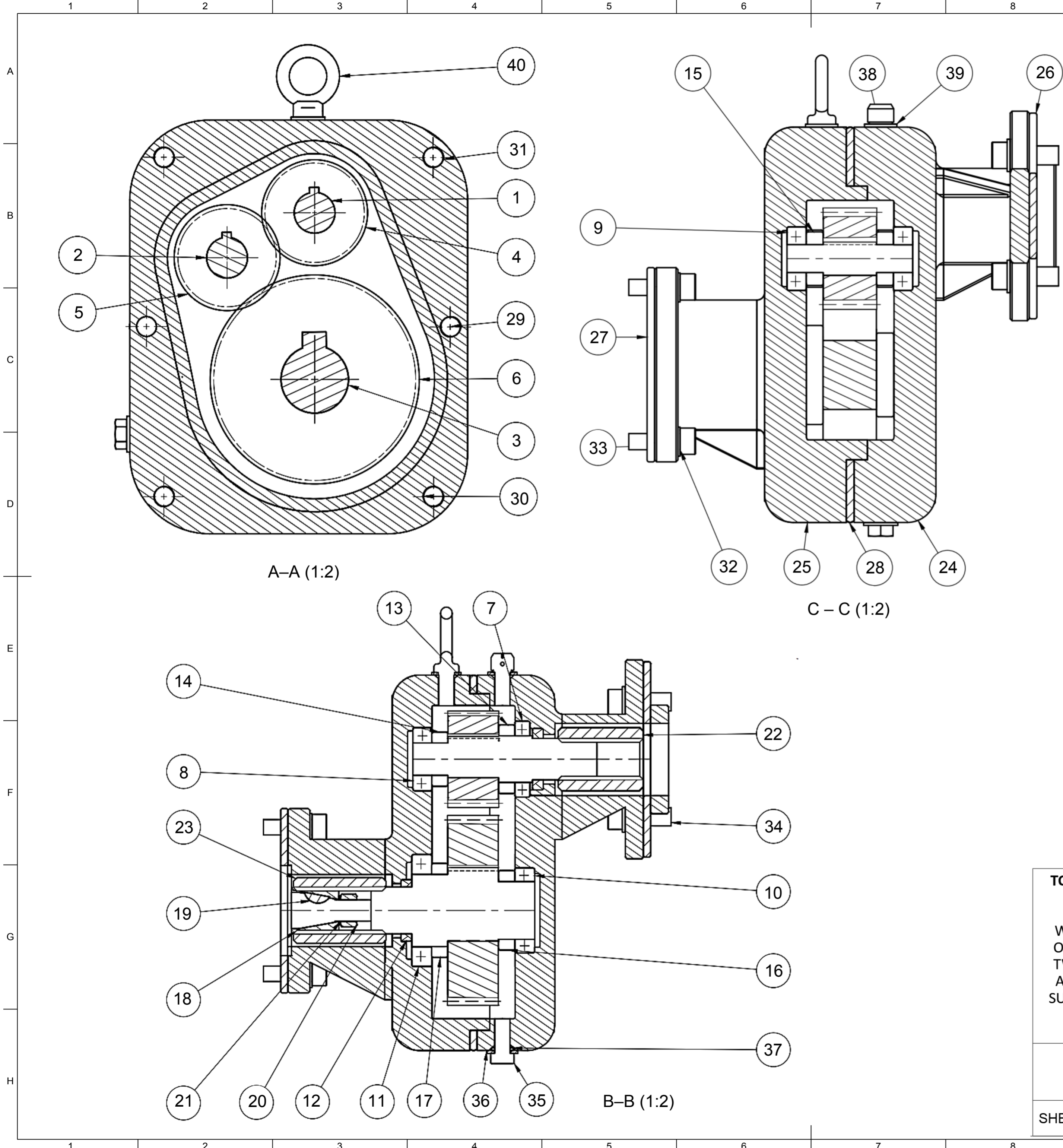
Oil drain bolt located at lowest point to allow all excess oil to drain

<b>TOLERANCES UNLESS OTHERWISE STATED:</b>			EXTERNAL VIEW
WHOLE NUMBERS	$\pm 0.25$		DRAWN BY MDB GROUP 51: ZARA IMAN-BUTT, HEBA ALI, MAHMOOD EL MAHALAWY
ONE DECIMAL PLACE	$\pm 0.10$	DRAWING PRODUCED IN ACCORDANCE WITH: BS8888 2020	SCALE 1:2
TWO DECIMAL PLACES	$\pm 0.05$		APPROVED BY: ZARA IMAN-BUTT
ANGULAR TOLERANCE:	$0^{\circ}15'$		WEIGHT: 8.4 KG
SURFACE FINISH:	$0.8 \mu\text{M}$		SHEET 2 OF 5
<b>ALL DIMENSIONS IN MM</b>			
SCHOOL OF ENGINEERING			
SHEET SIZE: A2	07/12/23	ISSUE 1	



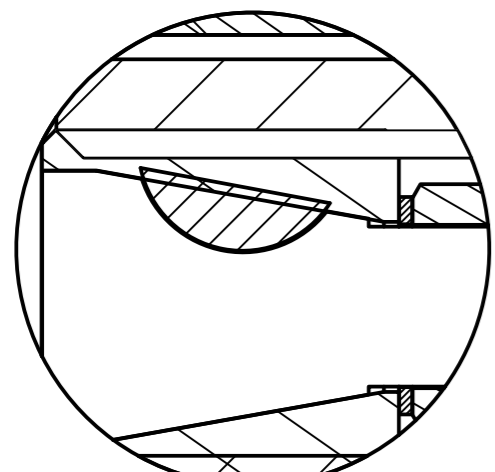
<b>TOLERANCES UNLESS OTHERWISE STATED:</b>  WHOLE NUMBERS $\pm 0.25$ ONE DECIMAL PLACE $\pm 0.10$ TWO DECIMAL PLACES $\pm 0.05$ ANGULAR TOLERANCE: $0^{\circ}15'$ SURFACE FINISH: $0.8 \mu\text{M}$	PROJECTION 	INTERNAL VIEW
		DRAWN BY <b>MDB GROUP</b> 51: ZARA IMAN-BUTT, HEBA ALI, MAHMOOD EL MAHALAWY
<b>ALL DIMENSIONS IN MM</b>	DRAWING PRODUCED IN ACCORDANCE WITH: BS8888	SCALE 1:1
SCHOOL OF ENGINEERING	WEIGHT: 8.4 KG	APPROVED BY: HEBA ALI
SHEET SIZE: A2      07/12/23	ISSUE 1	SHEET 3 OF 5





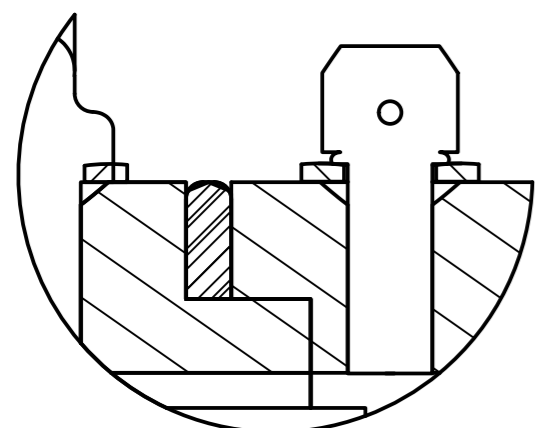
Part No.	Qty	Description	Material/Supplier
1	1	Pinion Shaft	ASTM A29 Medium Carbon Steel
2	1	Idler Shaft	ASTM A29 Medium Carbon Steel
3	1	Wheel Shaft	ASTM A29 Medium Carbon Steel
4	1	Pinion Gear	EN24 Steel Alloy
5	1	Idler Gear	EN8 Medium Carbon Steel
6	1	Wheel Gear	EN8 Medium Carbon Steel
7	1	Pinion Bearing Engine Side	SKF 16005
8	1	Pinion Bearing Pump Side	SKF 4303 ATN9
9	2	Idler Bearing	SKF 4303 ATN9
10	1	Wheel Bearing Engine Side	SKF 16006
11	1	Wheel Bearing Pump Side	SKF 16005
12	2	Shaft Lip Seal	McMaster-Carr 9562K76
13	1	Pinion Spacer Engine Side	McMaster-Carr 96505A127
14	1	Pinion Spacer Pump Side	McMaster-Carr 96505A122
15	2	Idler Spacer	McMaster-Carr 96505A122
16	1	Wheel Spacer Engine Side	McMaster-Carr 96505A131
17	1	Wheel Spacer Pump Side	McMaster-Carr 96505A370
18	1	Pump Coupling Adapter	316 Stainless Steel
19	1	Woodruff Key	A4-80 Stainless Steel
20	1	Pump M12 Nut	McMaster-Carr 7739K189
21	1	Pump M12 Washer	McMaster-Carr 8631T11
22	1	Input Coupling Sleeve	316 Stainless Steel
23	1	Output Coupling Sleeve	316 Stainless Steel
24	1	Front Casing	Grey Cast Iron
25	1	Back Casing	Grey Cast Iron
26	1	Engine Gasket Seal	Nitrile Rubber
27	1	Pump Gasket Seal	Nitrile Rubber
28	1	Gasket Seal	Fluoropolymer
29	8	Casing Bolt M10 x 80 mm	McMaster-Carr 9262K105
30	16	Casing Washer M10	McMaster-Carr 90592A024
31	8	Casing Lock Nut M10	McMaster-Carr 92095A139
32	8	Interface Washer M10	McMaster-Carr 93475A370
33	4	Pump Bolt M8 x 28 mm	McMaster-Carr 94500A323
34	4	Engine Bolt M10 x 28 mm	McMaster-Carr 96505A122
35	2	Oil Plug M10 x 20 mm	McMaster-Carr 93475A260
36	2	Oil Plug Washer M10	McMaster-Carr 7739K189
37	2	Oil O-ring Seal M10	McMaster-Carr 9262K105
38	1	Breather Bolt M10 x 18 mm	McMaster-Carr 8631T11
39	2	Breather Bolt Washer M10	McMaster-Carr 93475A260
40	1	Lifting Hook M10 x 18 mm	McMaster-Carr 3107T45

<b>TOLERANCES UNLESS OTHERWISE STATED:</b>  WHOLE NUMBERS           ± 0.25 ONE DECIMAL PLACE       ± 0.10 TWO DECIMAL PLACES     ± 0.05 ANGULAR TOLERANCE:     0°15' SURFACE FINISH:         0.8 μM  <b>ALL DIMENSIONS IN MM</b>	PROJECTION 	PARTS LIST  DRAWN BY MDB <b>GROUP 51: ZARA</b> IMAN-BUTT, HEBA ALI, MAHMOOD EL-MAHALAWY		
	SCHOOL OF ENGINEERING	DRAWING PRODUCED IN ACCORDANCE WITH: BS8888 2020	APPROVED BY: MAHMOOD EL-MAHALAWY	
SHEET SIZE: A2	07/12/23	WEIGHT: 8.4 KG	ISSUE 1	SHEET 4 OF 5



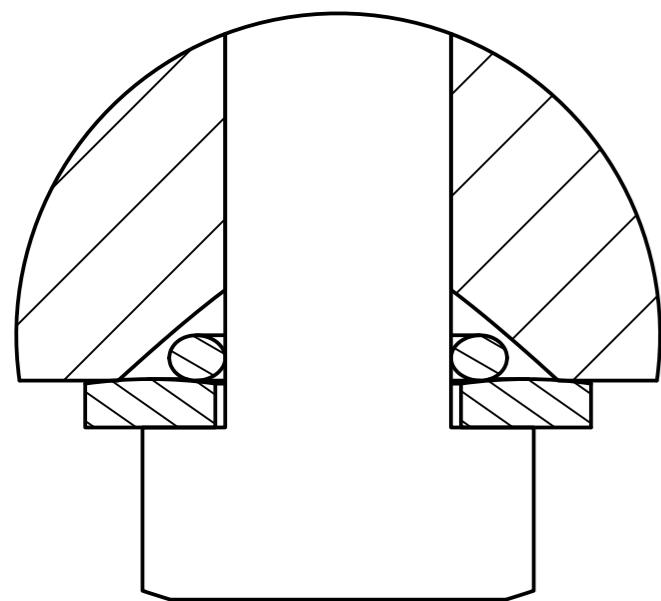
C (2:1)

Woodruff key used for torque transmission from PTO to pump



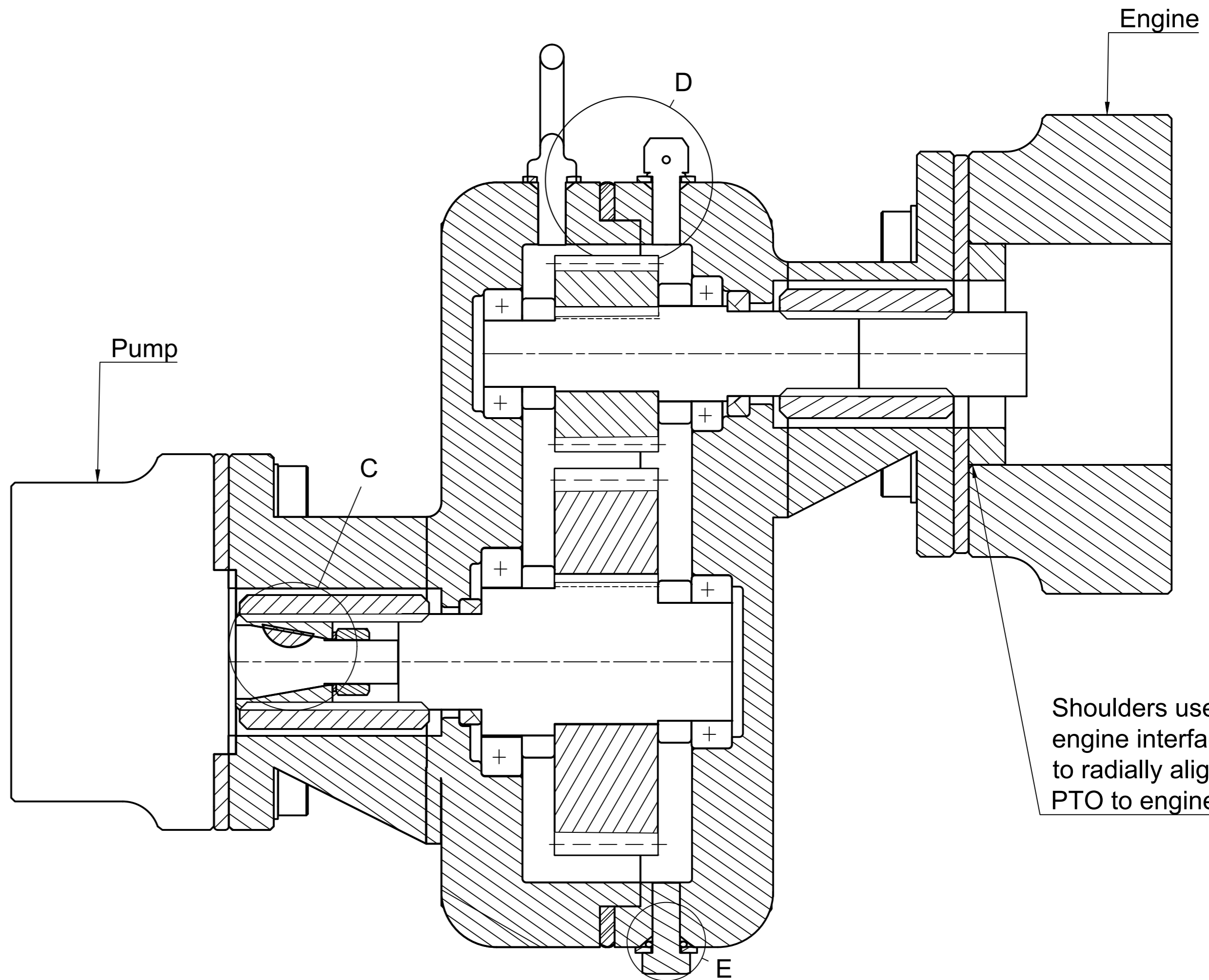
D(2:1)

Shoulders used in casing to assist with radial alignment



E (2:1)

O-ring seal inserted into chamfered oil inlet to prevent leakage



B-B (1:2)

Shoulders used at engine interface to radially align PTO to engine

<b>TOLERANCES UNLESS OTHERWISE STATED:</b>  WHOLE NUMBERS $\pm 0.25$ ONE DECIMAL PLACE $\pm 0.10$ TWO DECIMAL PLACES $\pm 0.05$ ANGULAR TOLERANCE: $0^{\circ}15'$ SURFACE FINISH: $0.8 \mu\text{M}$  <b>ALL DIMENSIONS IN MM</b>	PROJECTION 	DETAILED VIEWS  DRAWN BY MDB GROUP 51: ZARA IMAN-BUTT, HEBA ALI, MAHMOOD EL-MAHALAWY
	DRAWING PRODUCED IN ACCORDANCE WITH: BS8888	SCALE 1:2
SCHOOL OF ENGINEERING	WEIGHT: 8.4 KG	APPROVED BY: HEBA ALI
SHEET SIZE: A2            07/12/23	ISSUE 1	SHEET 5 OF 5