MTM200-407

TM 200B

service manual

ECAMAR
PROPULSORES MARINOS
1989

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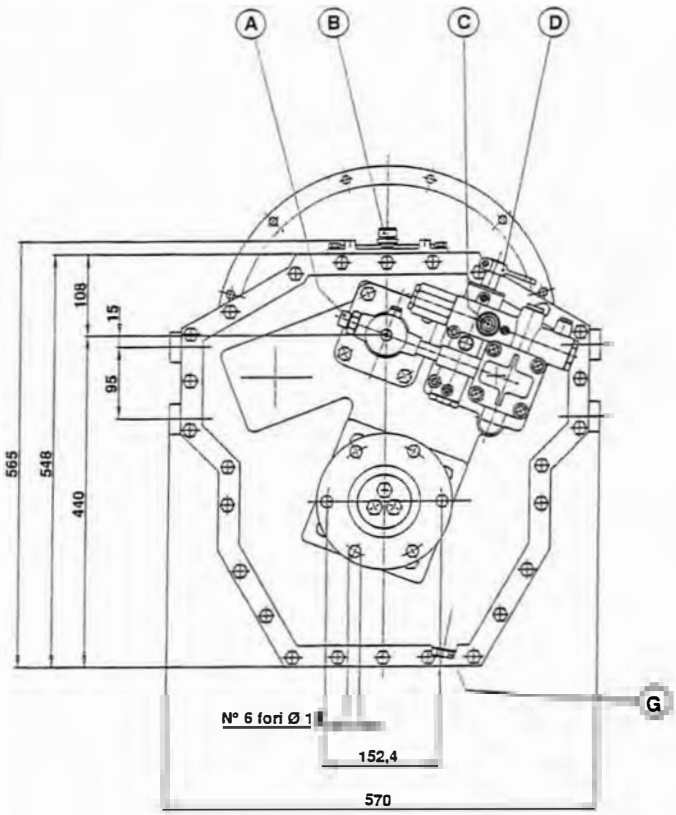
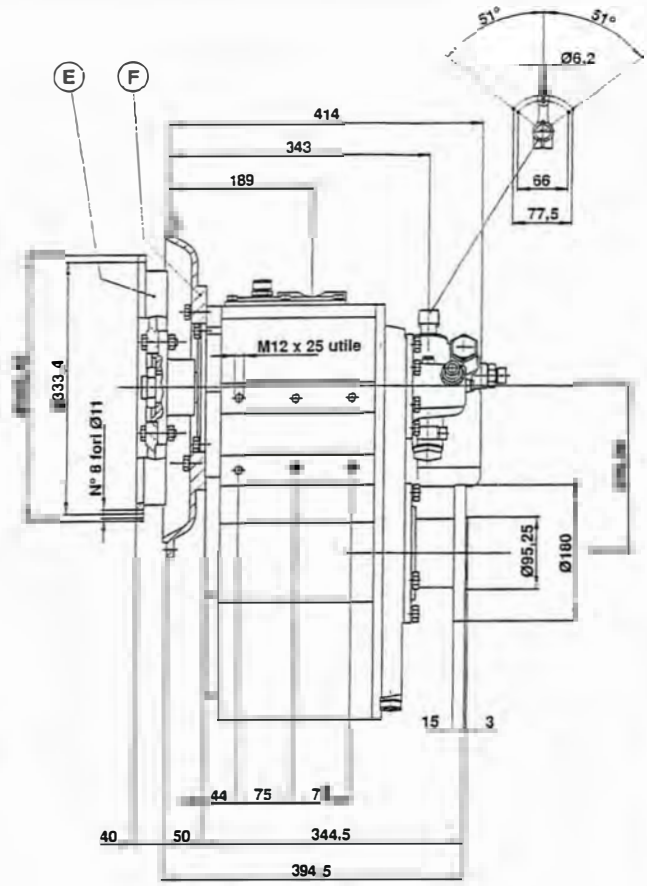
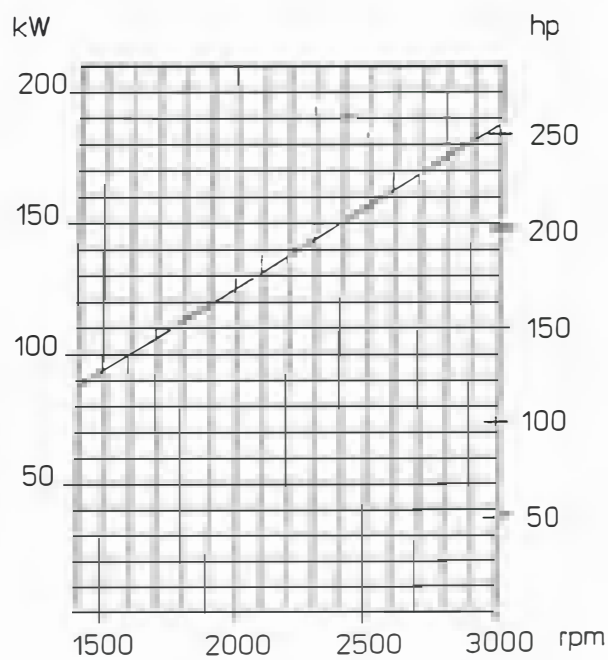




Ⓐ - Ritorno olio da scambiatore - Oil from cooler - Retour huile de l'échangeur
Ⓑ - Tappo carico olio - Filling plug - Bouchon de remplissage
Ⓒ - Mandata olio allo scambiatore - Oil to cooler - Refoulement huile ou échangeur
Ⓓ - Leva comando - Actuating lever - Levier de commande
Ⓔ - Giunto - Coupling - Joint: 11"1/2
Ⓕ - Campana - Mounting flange - Cloche: SAE1 - SAE 2 - SAE 3
Ⓖ - Tappo scarico olio - Oil drain plug - Bouchon de vidange

Diagramma di potenza
Power curve
Diagramme de puissance



Caratteristiche tecniche
Technical data
Caractéristiques techniques

Rapporto - Ratio - Rapport		3,60	4,48
Coppia max - Lavoro Max torque - Continuous Couple maxi - Continu	Nm	610	
Velocità max entrata Max input speed Vitesse maxi à l'entrée		3000 RPM	
Peso a secco Weight without oil Poids sans huile		235 Kg.	

OPERATING PROCEDURE

- In forward speed motion is trasmitted by means of the clutch unit mounted on the input shaft.
- In forward speed, the rotating direction of the marine gear output flange is opposite to engine direction.
- In reverse speed, motion transmission is achieved by means of a clutch unit mounted on the intermediate shaft.
- Clutches are driven by the oil pressure raised by a pump controlled by the intermediate shaft and are able to trasmit full power both in forward and in reverse speed.
- The reduction ratio is the same in forward as well as in reverse speed.

INSTALLATION

- TM 200B marine gear can be connected to engine rotating counterclockwise (as seen from the flywheel side) only.
- Before connecting the marine gear output flange to the propeller axle, it is necessary to make sure that its misalignment does not exceed 0,05 mm.
- The remote control must be connected so that the control lever can rotate completely from the forward speed position to the reverse speed position and a correct neutral position can be ensured. From the neutral position, forward speed is achieved by rotating the control lever counterclockwise.
- The heat exchanger connection is achieved as shown in fig.1.
- The marine gear is supplied without oil; therefore, before starting it, fill it up to the maximum level marked on the dispstick; then start the engine to allow the piping system to fill up and check the oil level again.

Make sure that the control cable is easily movable.

Make sure that the control cable is able to perform the complete lever stroke both in forward and in reverse and that it is well positioned in neutral.

USE

- The engagement of forward speed and reverse speed and the shifting to neutral position must be carried out while the engine is running at minimum speed.

The gearbox is supplied without oil. Before the first start-up it must be filled up to the maximum level marked on the dipstick.

Before to start the engine make sure that the gearbox is in neutral position.

The gearbox should only be shifted with the engine at idle speed so as to avoid that the gearbox or the coupling may be damaged.

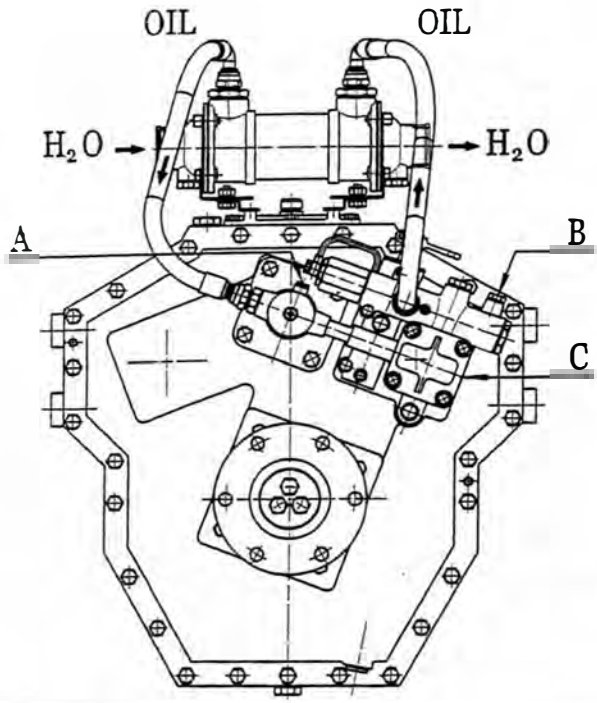
MAINTENANCE

- Check oil level daily.
- Change the oil for the first time after 50 working hours: afterwards, replace the oil after 1000 working hours (or, at the longest, every 12 months).
- Whenever the oil is replaced, clean the filter (ref. 74).
- Clutches require no adjustment.

Disassembly and assembly of the gearbox or of its parts is to be made by specialized technicians only.

LUBRICATION

- Use class CD (API service classification) oil SAE 20 W 40.
- Oil quantity for the marine gear with standard cooler: 13 l.
- Max oil temperature: 90°C.
- Oil pressure measured at 1000 RPM engine speed, oil temperature 60°C, is to be between 16 and 18 bar. Pressure gauge connections M10x1 are placed, refer to fig.1, on A (forward) and C (reverse).



Schema applicazione scambiatore – Attacchi manometri

Exchanger application diagram – Pressure gauge connections

Schema d'applicatione de l'echangeur – Fixations des manometres

Prese per manometri:

- ✓ A. Press. Marcia Avanti M 10x1
- ✓ B. Press. Pompa M 12x1,5
- ✓ C. Press. Marcia Indietro M 10x1

Pressure gauge intakes:

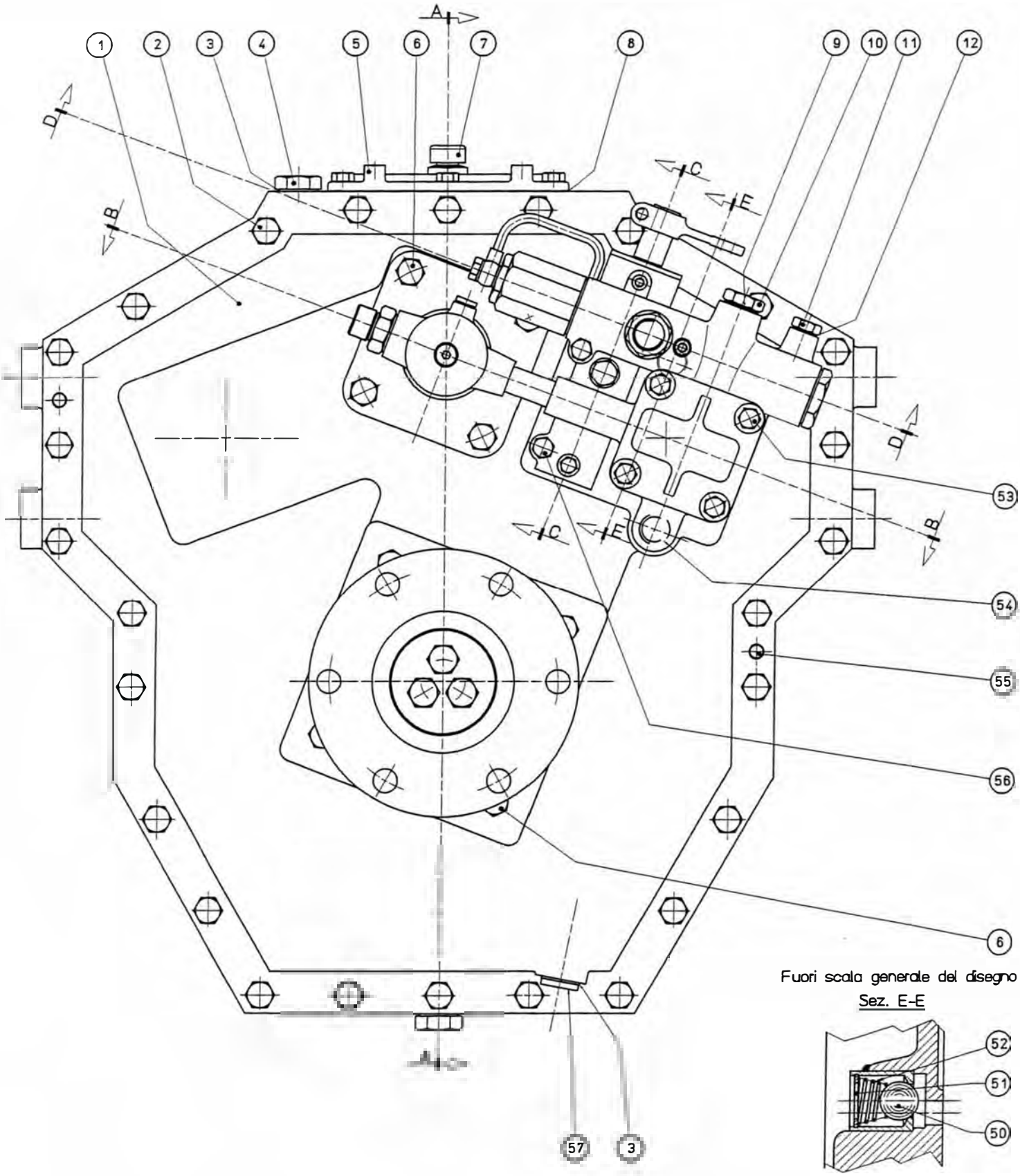
- ✓ A. Forward speed pressure M 10x1
- ✓ B. Pump pressure M 12x1.5
- ✓ C. Reverese speed pressure M 10x1

Prises pour manometres:

- ✓ A. Press. Marche-avant M 10x1
- ✓ B. Press. Pompe M 12x1,5
- ✓ C. Press. Marche-arrière M 10x1

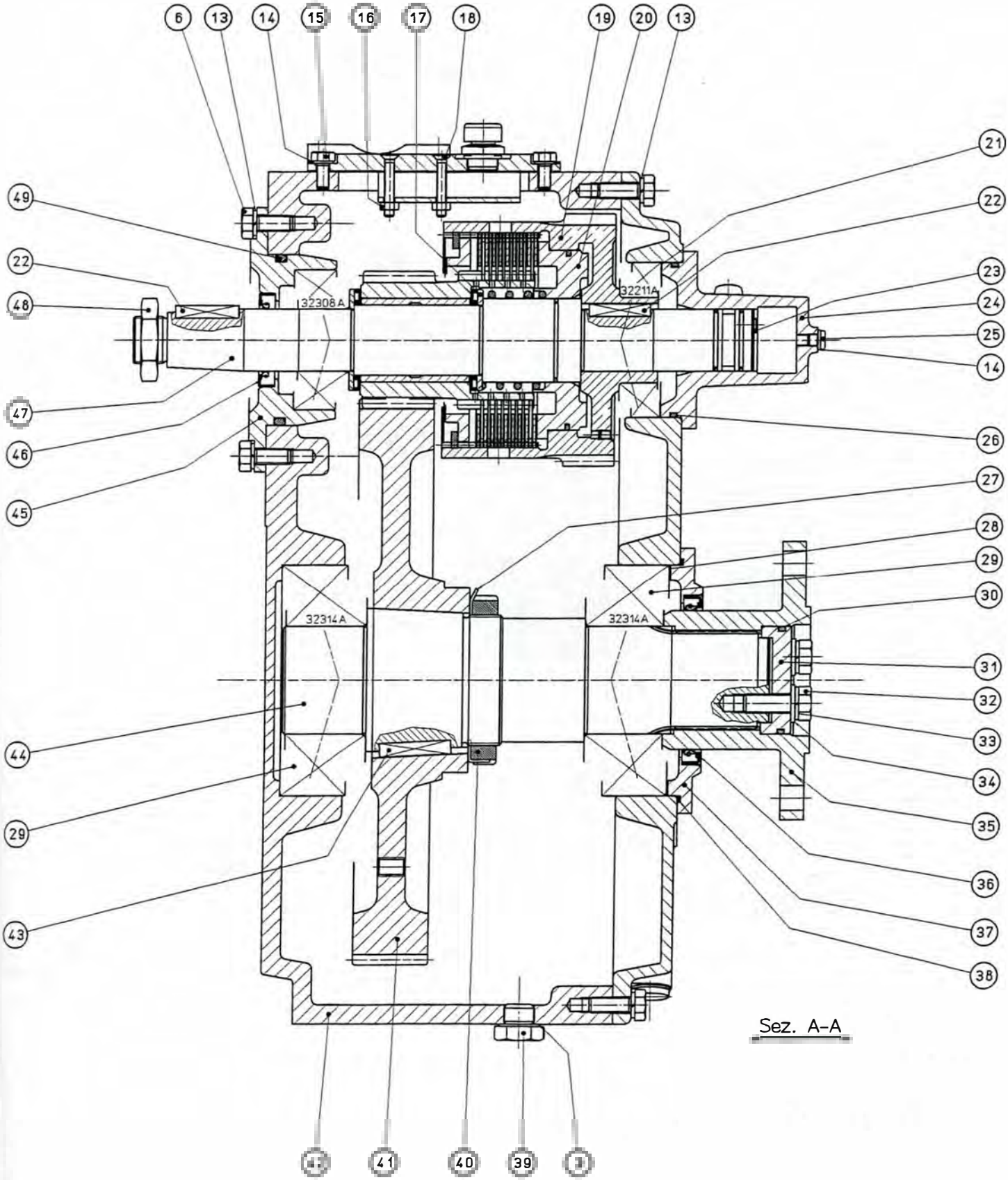
GUASTO–FAILURE-DEFAULT	CAUSA-CAUSE-CAUSE	RIMEDIO-SOLUTION-REMEDE
– Pressione olio troppo bassa	– Valvola regolatrice sporca (65)	– Smontare valvola, pulire e sostituire molle (66,67)
	– Livello olio troppo basso	– Ripristinare livello
	– Pompa olio guasta	– Sostituire pompa
	– Anelli di tenuta sugli alberi frizione rotti(114)	– Smontare e sostituire
– Pressione olio troppo alta	– Valvola regolatrice sporca (65)	– Smontare valvola e pulire
– Surriscaldamento	– Livello olio eccessivo	– Portare olio a livello prescritto
	– Portata acqua di raffreddamento insufficiente	– Portare al giusto valore
	– Scambiatore sporco o intasato	– Smontare e pulire
	– La frizione slitta	– Verificare la pressione dell'olio nel circuito di comando. Se la pressione è troppo bassa regolarsi come detto. Se la pressione è normale occorre smontare e sostituire i dischi frizione.
	– Eccessivo carico sull'invertitore	– Ridurre la potenza del propulsore
	– Precarico sui cuscinetti non corretto	– Ripristinare precarico alberi (max 0,05-min.0,02 mm.)
	– Cuscinetto danneggiato	– Sostituire il cuscinetto
– Too low oil pressure	– Dirty bypass valve (65)	– Remove valve, clean and change springs (66,67)
	– Too low oil level	– Restore oil level
	– Failure in oil pump	– Replace pump
	– Broken O rings on clutch shaft (114)	– Remove and replace them
– Too high oil pressure	– Dirty bypass valve (65)	– Remove valve and clean it
– Overheating	– Excessive oil level	– Bring oil down to required level
	– Insufficient cooling water intake	– Bring up to correct quantity
	– Dirty or clogged exchanger	– Remove and clean
	– Clutch slipping	– Check oil pressure in the transmission circuit. If the pressure is too low, proceed as indicated above. If pressu re is normal, remove and replace clutch plates.
	– Exchanger overload	– Reduce propulsor power
	– Incorrect bearing preloading	– Reset shaft preloading (max 0,05-min 0,02 mm.)
	– Damaged bearing	– Replace bearing
– Pression d'huile trop basse	– Vanne de réglage sale (65)	– Démonter la vanne et nettoyer. Remplacer les ressorts (66,67)
	– Niveau d'huile insuffisant	– Rétablir le niveau
	– Pompe à huile en panne	– Remplacer la pompe
	– Cassure des bagues d'étanchéité sur axes embrayage (114)	– Démonter et remplacer
– Pression d'huile trop haute	– Vanne de régulation sale (65)	– Démonter la vanne et nettoyer
– Surchauffe	– Niveau d'huile excessif	– Amener l'huile au niveau indiqué
	– Débit d'eau de refroidissement insuffisant	– Amener à la bonne valeur
	– Echangeur sale ou bouché	– Démonter et nettoyer
	– L'embrayage glisse	– Vérifier la pression de l'huile dans le circuit de commande.Si la pression est trop basse, procéder de la façon indiquée.Si la pression est normale, il faut démonter et remplacer les disques d'embrayage.
	– Charge excessive sur l'inverseur	– Réduire la puissance du propulseur.
	– Mauvaise pré-charge sur roulements	– Rétablir la pré-charge des axes (max 0,05-min 0,02 mm.)
	– Roulement endommagé	– Remplacer le roulement.

Rif. Ref.	Denominazione Denomination	Quantità Quantity	Codice Code	Rif. Ref.	Denominazione Denomination	Quantità Quantity	Codice Code
83	Perno - Pin	1	2035021	105	Disco conduttore – Clutch Plate	18	2022027
84	Rosetta - Washer	2	4611108	106	Disco condotto – Steel Plate	16	2022029
85	Vite - Screw	1	4615253	107	Campana – Clutch Housing	1	2011086
86	Vite - Screw	1	2064006	108	Molla – Spring	2	2020026
87	Piastrina – Plate	1	2054015	109	Fascia elastica – Seal Ring	2	2024001
88	Leva di comando – Lever	1	2037036	110	Fascia elastica – Seal Ring	2	2024003
89	Distributore – Selector valve	1	2056052	111	Linguetta – Key	1	4620066
90	Vite - Screw	1	4615214	112	Guarnizione OR – O Ring	1	4598108
91	Rosetta - Washer	1	4611106	113	Tappo – Plug	2	4588011
92	Molla - Spring	1	2020027	114	Fascia elastica – Seal Ring	4	2024004
93	Sfera – Ball	1	4630010	115	Boccola di guida - Bushing	1	2050003
94	Guarnizione OR – O Ring	4	4598067	116	Vite – Screw	2	4615221
95	Cuscinetto – Bearing	3	4622055	117	Ingr. condotto pompa – Pump Gear	1	2061198
96	Gabbia - Bearing	4	4607045	118	Coperchio pompa – Cover	1	2010092
97	Tappo conico – Plug	1	2055024	119	Ingr. conduttore pompa – Pump Gear	1	2061197
98	Albero di ingresso – Input Shaft	1	2021149	120	Boccola – Bushing	4	4584001
99	Rasamento – Spacer	2	2016028	121	Guarnizione OR – O Ring	1	4598052
100	Ralla – Thrnst Block	4	4603027	122	Guarnizione OR – O Ring	2	4598024
101	Pignone r 3.60 – Gear Ratio 3.60	2	2061599	123	Tubo - Hose	1	2042026
	Pignone r 4.48 – Gear Ratio 4.48	2	2061600	124	Tubo - Hose	1	2042025
102	Boccola – Bushing	2	2050030	125	Tappo – Plug	3	2055036
103	Piatto di ritenuta – Back Plate	2	2022028	126	Cuscinetto - Bearing	1	4622082
104	Seeger	2	4601135				



Fuori scala generale del disegno

Sez. E-E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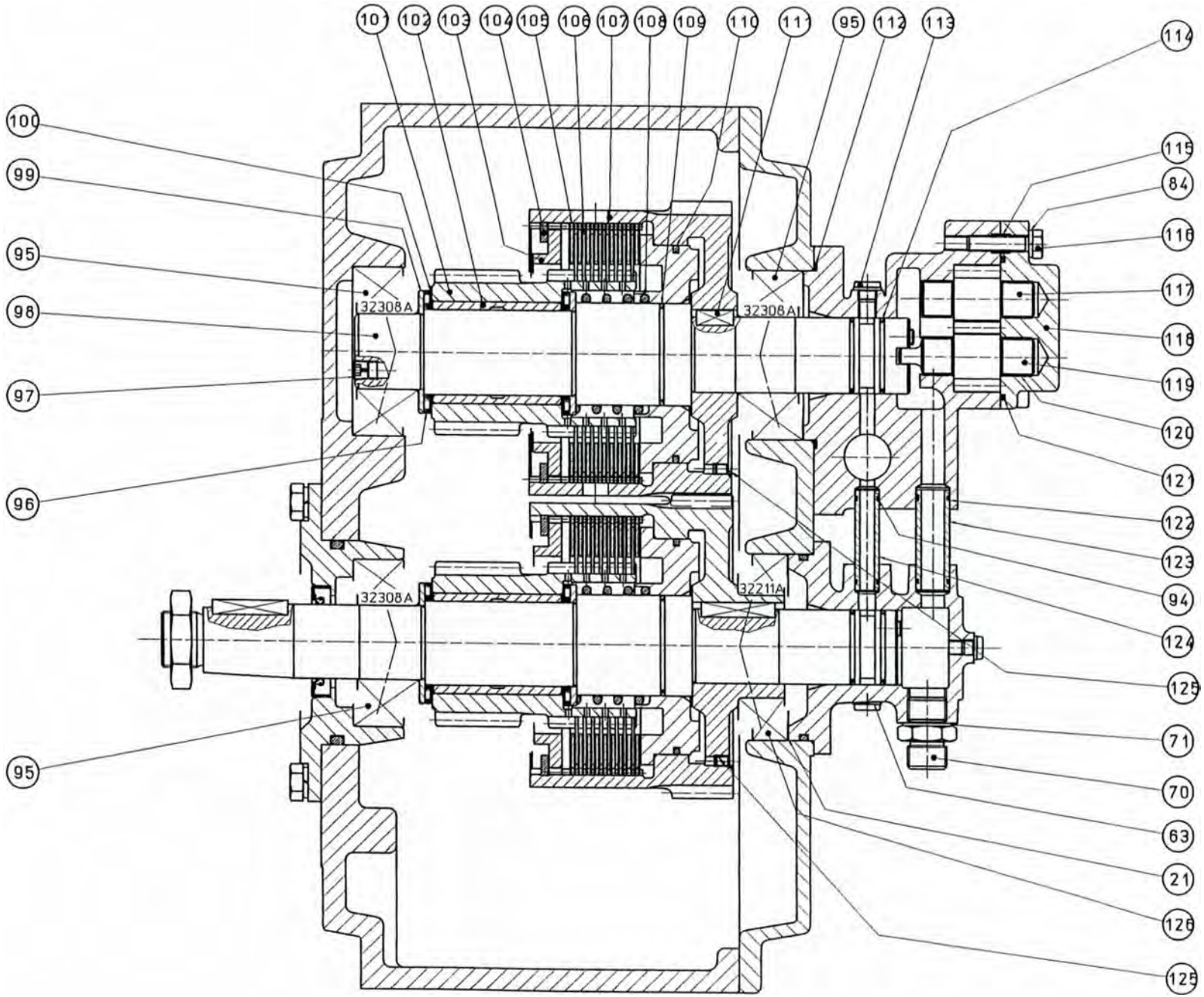
Sez. A-A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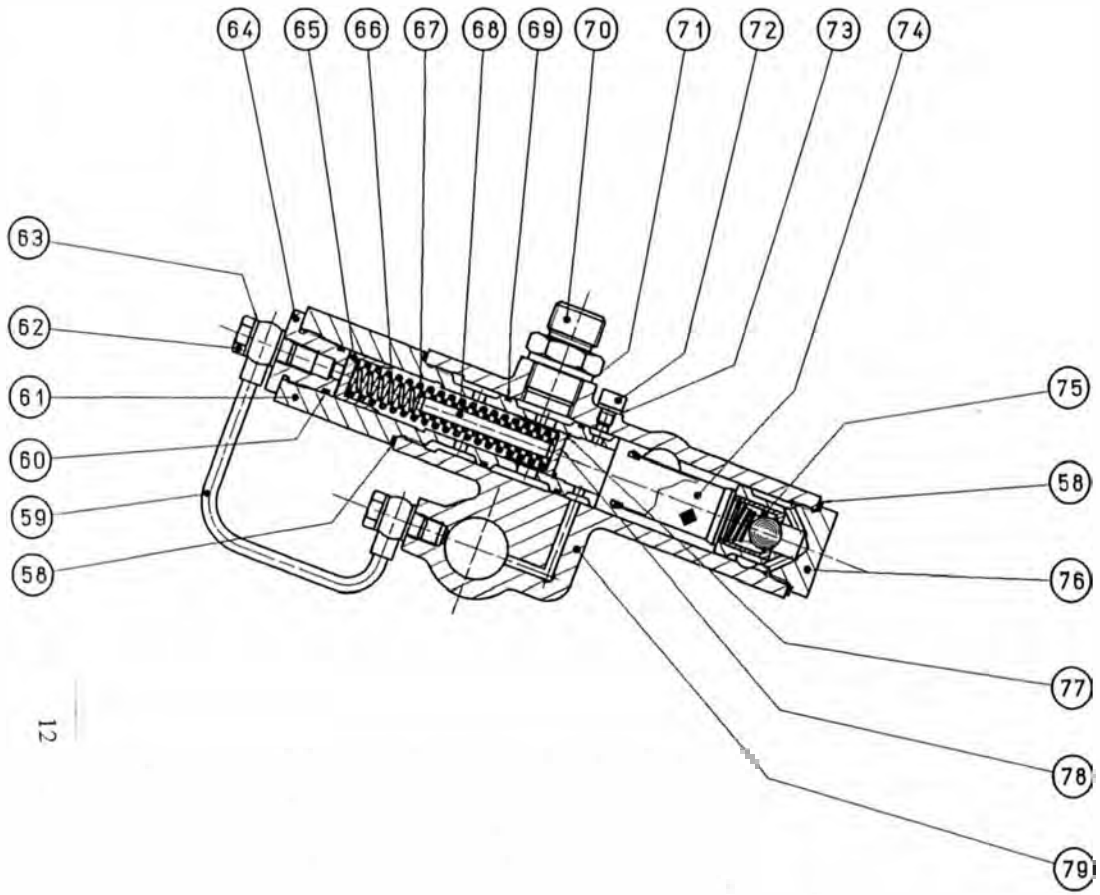
Sez. B-B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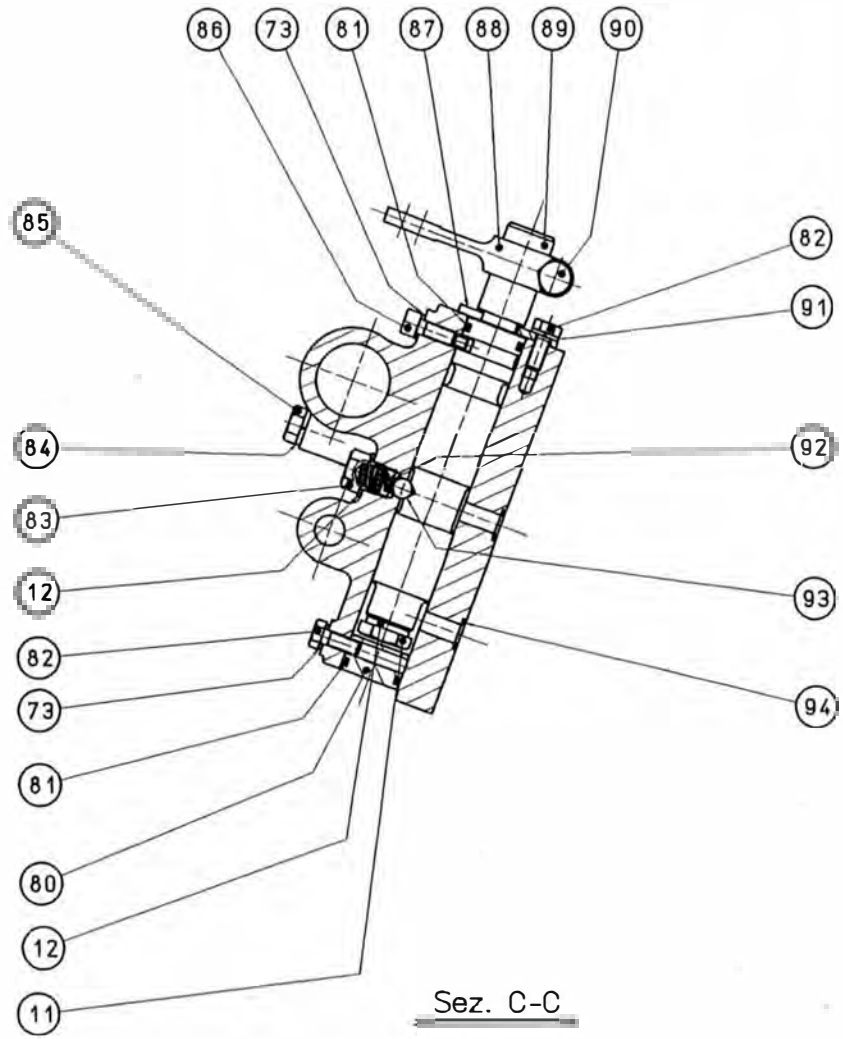
Sez. D-D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Sez. C-C