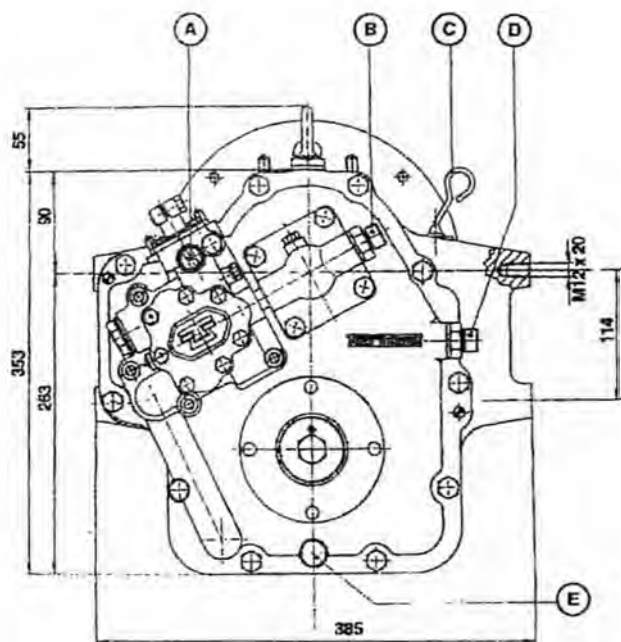


TM880A

service manual



TM 880A - DIMENSIONI - DIMENSIONS - DIMENSIONS



- (A) - Indicatore di folle - Neutral indicator - Indicateur point mort
- (B) - Filtro olio da scambiatore - Oil from cooler - Retour huile de l'échangeur (1/2") gas
- (C) - Asta livello olio - Oil dipstick - Bouchon de niveau
- (D) - Mandata olio allo scambiatore - Oil to cooler - Refoulement huile au échangeur
- (E) - Tappo scarico olio - Oil drain plug - Bouchon de vidange
- (F) - Tappo carico olio - Filling plug - Bouchon de remplissage
- (G) - Campana - Mounting flange - Cloche: SAE 3, SAE 4 (X=12,5/33), BW (X=13,5)
- (H) - Leva comando - Actuating lever - Levier de commande

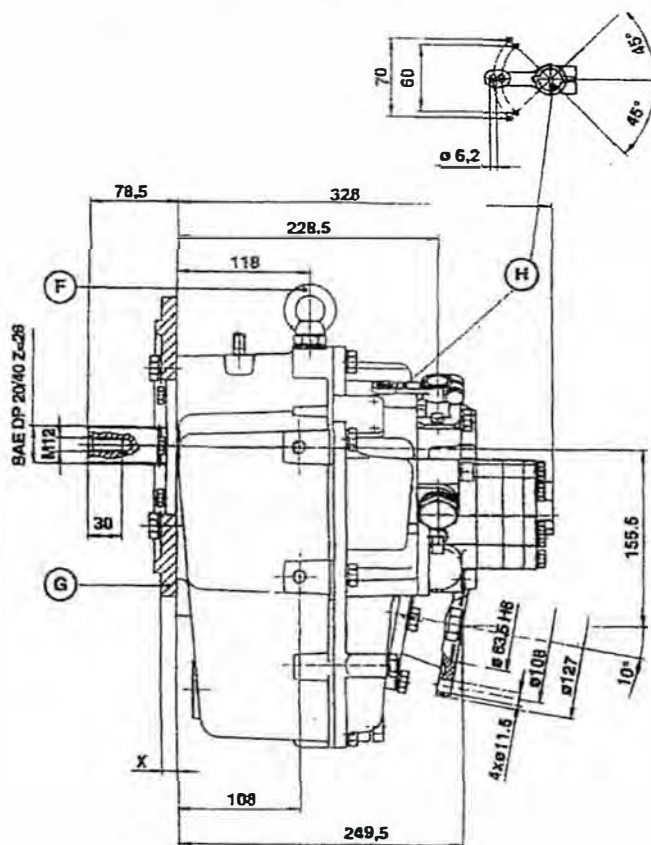
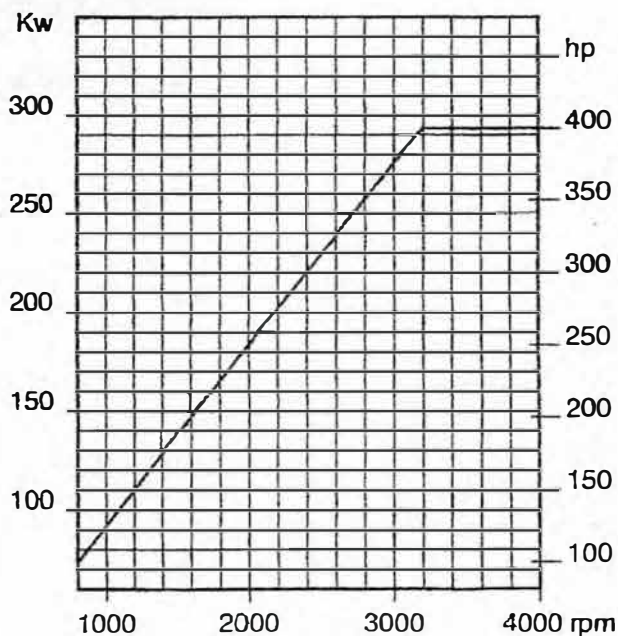


Diagramma di potenza (diporto) Power curve (pleasure) Diagramme de puissance (plaisance)



Caratteristiche tecniche Technical data Caractéristiques techniques

Rapporto - Ratio - Rapport		1,53	2,08
Coppia max - Diporto Max torque - Light duty Couple maxi - Plaisance	Nm	880	880
Velocità max entrata Max input speed Vitesse maxi à l'entrée		4000RPM	
Peso a secco Weight without oil Poids sans huile		54Kg.	

OPERATING PROCEDURE

- In forward speed motion is transmitted 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 transmit full power both in forward and in reverse speed.
- The reduction ratio is the same in forward as well as in reverse speed.

INSTALLATION

- TM880A 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 dipstick; 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.123).
 - 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: 3,7 l.
- Max oil temperature: 90°C.
- Oil pressure measured at 1000 RPM engine speed, oil temperature 60°C, is to be between 23 and 26 bar. Pressure gauge connections M8x1 are placed, refer to fig.1, on A (forward) and C (reverse).

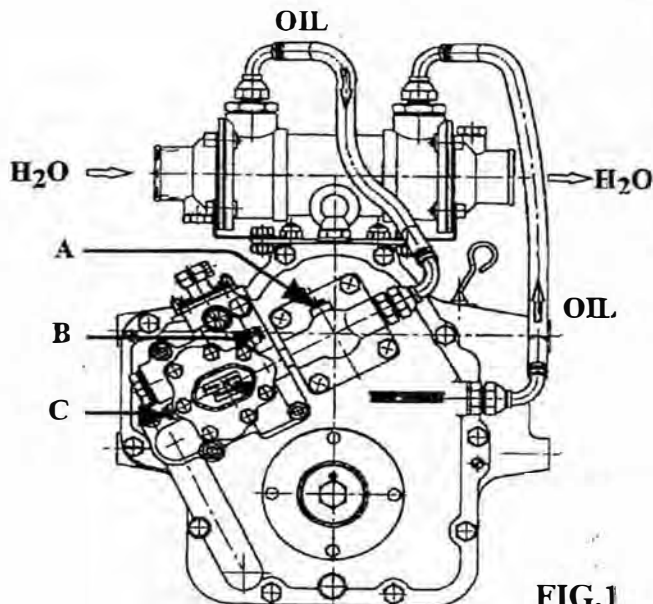


FIG.1

Schema applicazione scambiatore – Attacchi manometri

Exchanger application diagram – Pressure gauge connections

Schema d'application de l'échangeur – Fixations des manomètres

Presse per manometri: M8x1

– A.Press.Marcia Avanti

– B.Press.Pompa

– C.Press.Marcia Indietro

Pressure gauge intakes: M8x1

– A.Forward speed pressure

– B.Pump pressure

– C.Reverse speed pressure

Prises pour manomètres: M8x1

– A.Press.Marche-avant

– B.Press.Pompe

– C.Press. Marche-arrière

GUASTO-FAILURE-DEFAULT	CAUSA-CAUSE-CAUSE	RIMEDIO-SOLUTION-REMEDE
– Pressione olio troppo bassa – Pressione olio troppo alta – Surriscaldamento	– Valvola regolatrice sporca (89) – Livello olio troppo basso – Pompa olio guasta – Anelli di tenuta sugli alberi frizione rotti(11),(34) – Valvola regolatrice sporca (89) – Livello olio eccessivo – Portata acqua di raffreddamento insufficiente – Scambiatore sporco o intasato – La frizione slitta – Eccessivo carico sull'invertitore – Precarico sui cuscinetti non corretto – Cuscinetto danneggiato	– Smontare valvola e pulire – Ripristinare livello – Sostituire pompa – Smontare e sostituire – Smontare valvola e pulire – Portare olio a livello prescritto – Portare al giusto valore – Smontare e pulire – 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. – Ridurre la potenza del propulsore – Ripristinare precarico alberi(max 0.08-min.0.02) – Sostituire il cuscinetto
– Too low oil pressure – Too high oil pressure – Overheating	– Dirty bypass valve (89) – Too low oil level – Failure in oil pump – Broken O rings on clutch shaft (11),(34) – Dirty bypass valve (89) – Excessive oil level – Insufficient cooling water intake – Dirty or clogged exchanger – Clutch slipping – Exchanger overload – Incorrect bearing preloading – Damaged bearing	– Remove valve and clean – Restore oil level – Replace pump – Remove and replace them – Remove valve and clean it – Bring oil down to required level – Bring up to correct quantity – Remove and clean – Check oil pressure in the transmission circuit. If the pressure is too low, proceed as indicated above. If pressure is normal, remove and replace clutch plates. – Reduce propulsor power – Reset shaft preloading(max 0.08-min 0.02) – Replace bearing
– Pression d'huile trop basse – Pression d'huile trop haute – Surchauffe	– Vanne de réglage sale (89) – Niveau d'huile insuffisant – Pompe à huile en panne – Cassure des bagues d'étanchéité sur axes embrayage (11),(34) – Vanne de régulation sale (89) – Niveau d'huile excessif – Débit d'eau de refroidissement insuffisant – Echangeur sale ou bouché – L'embrayage glisse – Charge excessive sur l'inverseur – Mauvais préchargement sur	– Démontez la vanne et nettoyez – Rétablir le niveau – Remplacer la pompe – Démontez et remplacez – Démontez la vanne et nettoyez – Amener l'huile au niveau indiqué – Amener à la bonne valeur – Démontez et nettoyez – 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. – Réduire la puissance du propulseur.

RICAMBI Per ordinare i ricambi specificare il tipo di invertitore, il numero di serie, il rapporto, il numero di riferimento del disegno, la quantità.

SPARE PARTS When ordering spare parts specify the gearbox model, the serial number, ratio, reference number indicated on the drawing and desired quantity.

PIÈCES DÉTACHÉES Pour la commande de pièces détachées, veuillez spécifier le type de 'inverseur, le numéro de série, le rapport, le numéro de rep. du plan ainsi que la quantité.

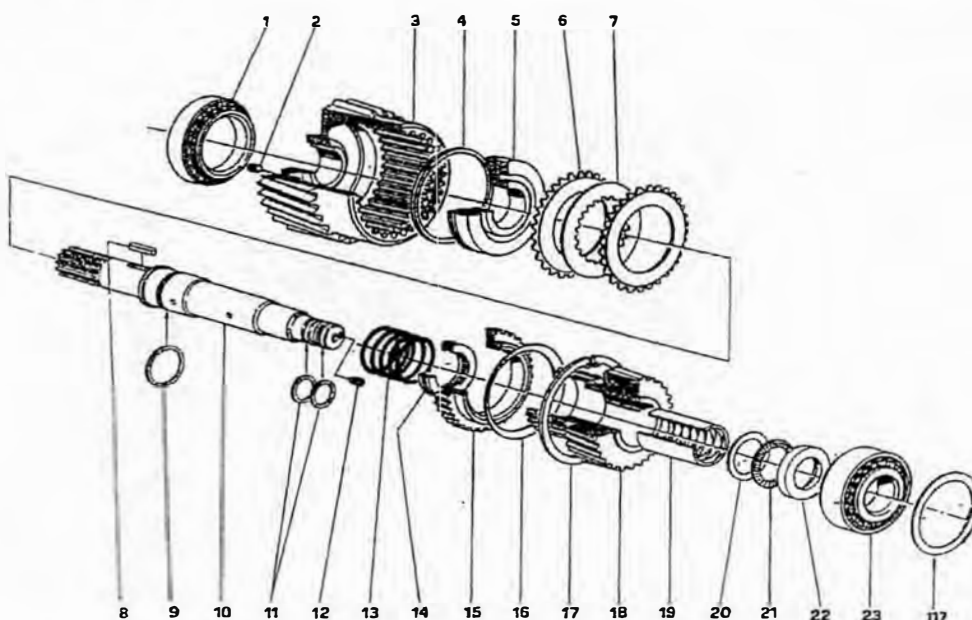
ERSATZTEILE Zum Bestellen von Ersatzteilen den Typ des Wendegetriebes, die Fabriknummer, die Untersetzung, die Bezugsnummer der Zeichnung und die Menge angeben.

REPUESTOS Para pedir los repuestos hay que especificar el tipo de inversor, el número de serie, la relación (ratio), el número de referencia del dibujo y la cantidad.

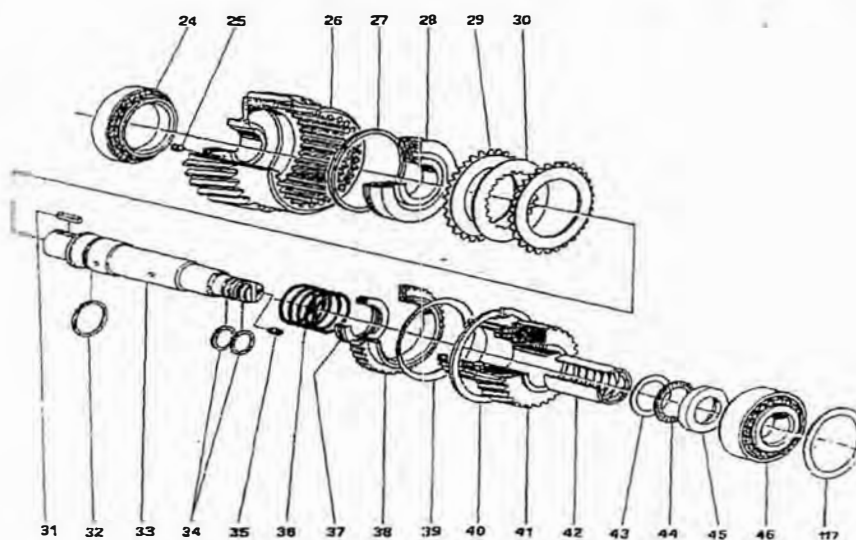
Rif. Ref.	Denominazione Denomination	Quantità Quantity	Codice Code	Rif. Ref.	Denominazione Denomination	Quantità Quantity	Codice Code
1	Cuscinetto - Bearing	1	4622084	40	Anello seeger - Seeger	1	4601105
2	Tappo - Plug	1	4588006	41	Pignone Rapp.1,53 - Gear, Ratio 1,53	1	2061429
3	Campana frizione - Clutch housing	1	2011227	41	Pignone Rapp.2,08 - Gear, Ratio 2,08	1	2061430
4	Fascia elastica - Seal ring	1	2024005	41	Pignone Rapp.2,60 - Gear, Ratio 2,60	1	2061431
5	Pistone - Piston	1	2017006	42	Boccola - Bushing	1	2050014
6	Disco friz. conduttore - Clutch plate	9	2022030	43	Ralla - Thrust block	1	4603020
7	Disco friz. condotto - Steel plate	8	2022050	44	Cuscinetto regg.Ax4060 - Thrust bearing	1	4607020
8	Chiavetta - Key	1	4620068	45	Rasamento - Ring	1	2016016
9	Fascia elastica - Seal ring	1	2024006	46	Cuscinetto - Bearing	1	4622045
10	Albero primario - Input shaft	1	2021344	47	Cuscinetto - Bearing	1	4622076
11	Fascia elastica - Seal ring	2	2024007	48	Chiavetta - Key	TM 880 A r 1,53	1
12	Tappo conico - Plug	1	4588006	49	Albero - shaft		
13	Molla - Spring	1	2020051	50	Corona - Gear		
14	Cuscinetto - Bearing	1	2065001	51	Distanziale - Spacer		
15	Disco di ritenuta - Spacer ring	1	2022051	48	Chiavetta - Key	TM 880 A r 2,08	1
16	Molla a tazza - Spring	1	2020049	49	Albero - shaft		
17	Anello seeger - Seeger	1	4601105	50	Corona - Gear		
18	Pignone Rapp.1,53 - Gear, Ratio 1,53	1	2061426	51	Distanziale - Spacer		
18	Pignone Rapp.2,08 - Gear, Ratio 2,08	1	2061427	48	Chiavetta - Key	TM 880 A r 2,60	1
18	Pignone Rapp.2,60 - Gear, Ratio 2,60	1	2061428	49	Albero - shaft		
19	Boccola - Bushing	1	2050014	50	Corona - Gear		
20	Ralla - Thrust block	1	4603020	51	Distanziale - Spacer		
21	Cuscin. reggisplinta - Thrust bearing	1	4607020	52	Cuscinetto - Bearing	1	4622071
22	Rasamento - Ring	1	2016016	53	Flangia uscita - Output flange	1	2062231
23	Cuscinetto - Bearing	1	4622045	54	Guarnizione OR - "O" ring	1	4598029
24	Cuscinetto - Bearing	1	4622084	55	Rosetta - Washer	1	2014064
25	Tappo - Plug	1	4588006	56	Spina elastica - Pin	1	4613005
26	Campana frizione - Clutch housing	1	2011228	57	Rondella elastica - Washer	1	4611116
27	Fascia elastica - Seal ring	1	2024005	58	Vite - Screw	1	4615479
28	Pistone - Piston	1	2017006	59	Vite - Screw	6	4615214
29	Disco friz. conduttore - Clutch plate	9	2022030	60	Rondella elastica - Washer	6	4611108
30	Disco friz. condotto - Steel plate	8	2022050	61	Coperchietto - Cover	1	2010210
31	Chiavetta - Key	1	4620068	62	Paraolio - Oil seal	1	4595129
32	Fascia elastica - Seal ring	1	2024006	63	Tappo di sfiato - Breather	1	2055032
33	Albero di rinvio - Intermediate shaft	1	2021345	64	Targhetta - Name plate	1	2028004
34	Fascia elastica - Seal ring	1	2024006	65	Prigioniero - Stud	2	4617081
35	Tappo conico - Plug	1	4588006	66	Rondella - Washer	1	4609021
36	Molla - Spring	1	2020051	67	Golfare - Eyebolt	1	4642010
37	Cuscinetto - Bearing	1	2065001	68	Rondella - Washer	1	4609011
38	Disco di ritenuta - Spacer ring	1	2022051	69	Tappo - PLug	1	2055033
39	Molla a tazza - Spring	1	2020049	70	Asta livello olio - Gauge	1	2070050

Rif. Ref.	Denominazione Denomination	Quantità Quantity	Codice Code	Rif. Ref.	Denominazione Denomination	Quantità Quantity	Codice Code
71	Prigioniero - Stud	2	4617063	121	Rondella - Washer	1	4609009
72	Coperchio - Cover	1	2010282	122	Tappo - Plug	1	4588009
73	Rondella - Washer	1	4609030	123	Filtro olio - Oil filter	1	2056039
74	Raccordo - Nipple	1	4624002	124	Anello seeger - Seeger ring	1	4601017
75	Valvola by pass - By pass valve	1	1036001	125	Molla - Spring	1	2020045
76	Rondella - Washer	1	4609009	126	Sfera - Ball	1	4630020
77	Tappo - Plug	1	4588009	127	Rondella - Washer	1	4609028
78	Coperchio - Cover	1	2010202	128	Tappo - Plug	1	2055037
79	Rondella - Washer	1	4609030	129	Coperchio albero secondario - Cover	1	2010209
80	Raccordo - Nipple	1	4624002	130	Paraolio - Oil seal	1	4596183
81	Guarnizione OR - "O" ring	1	4598016	131	Tappo - Plug	1	4588034
82	Leva di comando - Lever	1	2037036	132	Rondella - Washer	1	4609015
83	Rondella elastica - Washer	1	4611108	133	Vite - Screw	1	4615318
84	Vite - Screw	1	4615214	134	Rondella elastica - Washer	1	4611110
85	Vite - Screw	2	4615134	135	Tubo di aspirazione - Pipe	1	2042085
86	Rondella elastica - Washer	2	4611106	136	Spina - Dowel pin	2	4614010
87	Piastrina - Plate	1	2054024	137	Paratia - Bulkhead	1	2026011
88	Stelo distributore - Selector valve	1	2056072	138	Vite - Screw	2	4615202
89	Valvola - Valve	1	2056073	139	Scatola - Housing	1	2009097
90	Rondella elastica - Washer	4	4611110	140	Spessore di registro - Shim	x	2013184
91	Vite - Screw	4	4615301				
92	Rondella elastica - Washer	5	4611110				
93	Vite - Screw	5	4615301				
94	Rondella elastica - Washer	1	4611110				
95	Vite - Screw	1	4615334				
96	Rondella - Washer	1	4609009				
97	Tappo - Plug	1	4588009				
98	Tubo di raccordo - Pipe	1	2042016				
99	Guarnizione OR - "O" ring	2	4598067				
100	Tubo di raccordo - Pipe	1	2042017				
101	Guarnizione OR - "O" ring	2	4598024				
102	Rondella elastica - Washer	2	4611110				
103	Vite - Screw	2	4615302				
104	Coperchio pompa lato mot.-Cover	1	2010292				
105	Ingran.condotto pompa - Pump gear	1	2061456				
106	Rondella - Washer	9	4611110				
107	Vite - Screw	9	4615310				
108	Vite - Screw	4	4615238				
109	Rondella elastica - Washer	4	4611108				
110	Corpo pompa - Pump body	1	2010291				
111	Vite - Screw	3	4615144				
112	Boccola - Bushing	4	4584002				
113	Ingran. condutt.pompa - Pump gear	1	2061446				
114	Spina - Dowel pin	2	4614013				
115	Corpo distributore - Valve body	1	2056090				
116	Tappo a espansione - Plug	1	4587022				
117	Spessore di registro - Shim	x	2013189				
118	Molla - Spring	1	2020087				
119	Vite - Screw	2	4615317				
120	Rondella elastica - Washer	2	4611110				

ALBERO DI ENTRATA – INPUT SHAFT – ARBRE D'ENTREE



ALBERO DI RINVIO – INTERMEDIATE SHAFT – ARBRE DE RENVOI



ALBERO DI USCITA – OUTPUT SHAFT – ARBRE DE SORTIE

