MARINE HYDRAULIC GEARBOX

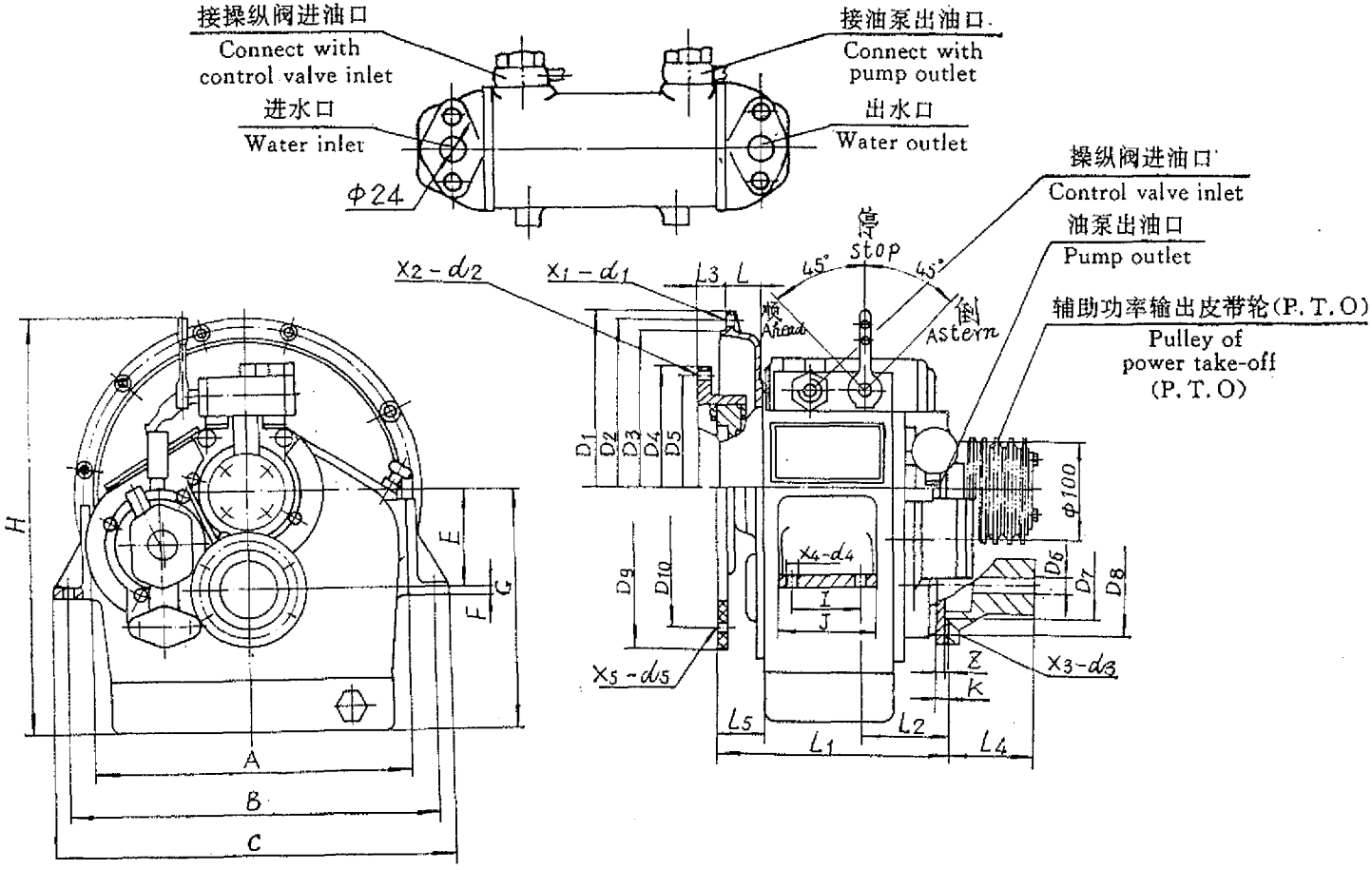
MA 100

MA 125

MA 142

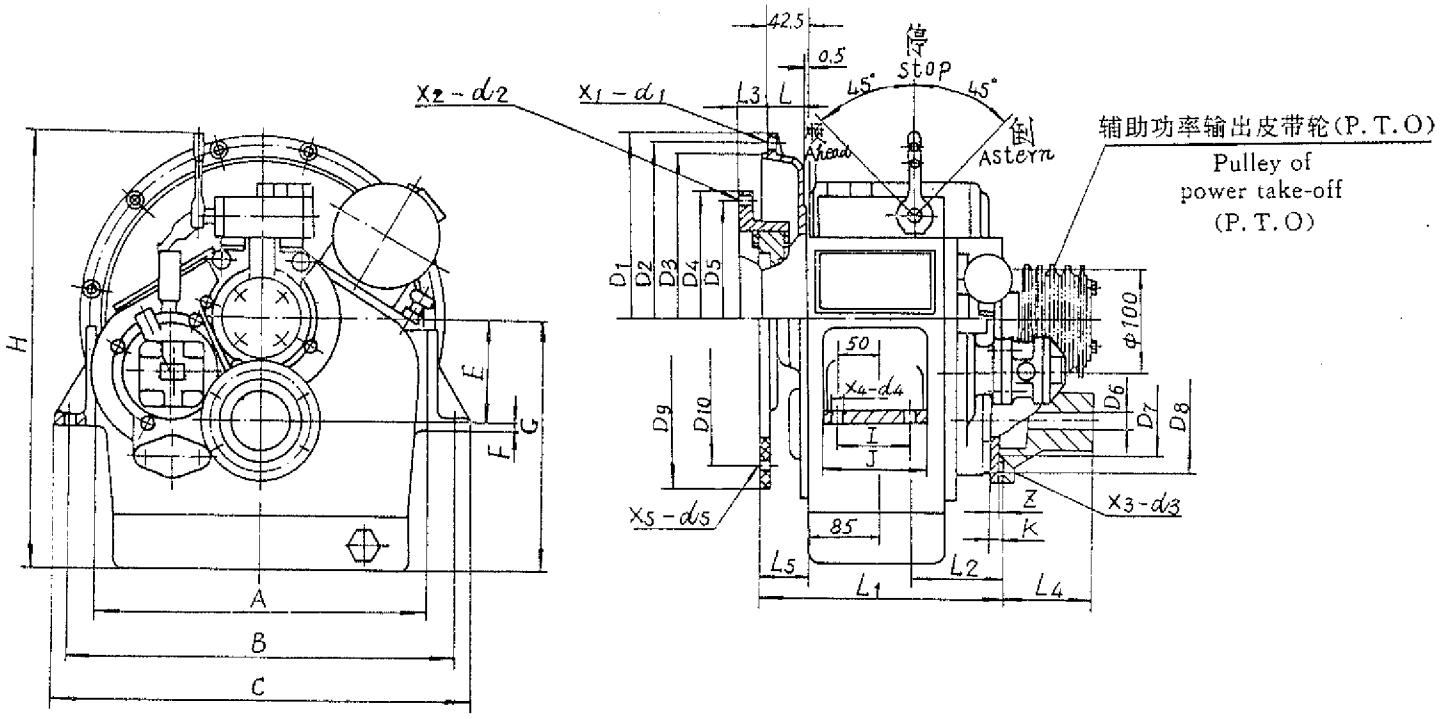
MANUAL & PARTS LIST

CONTENTS



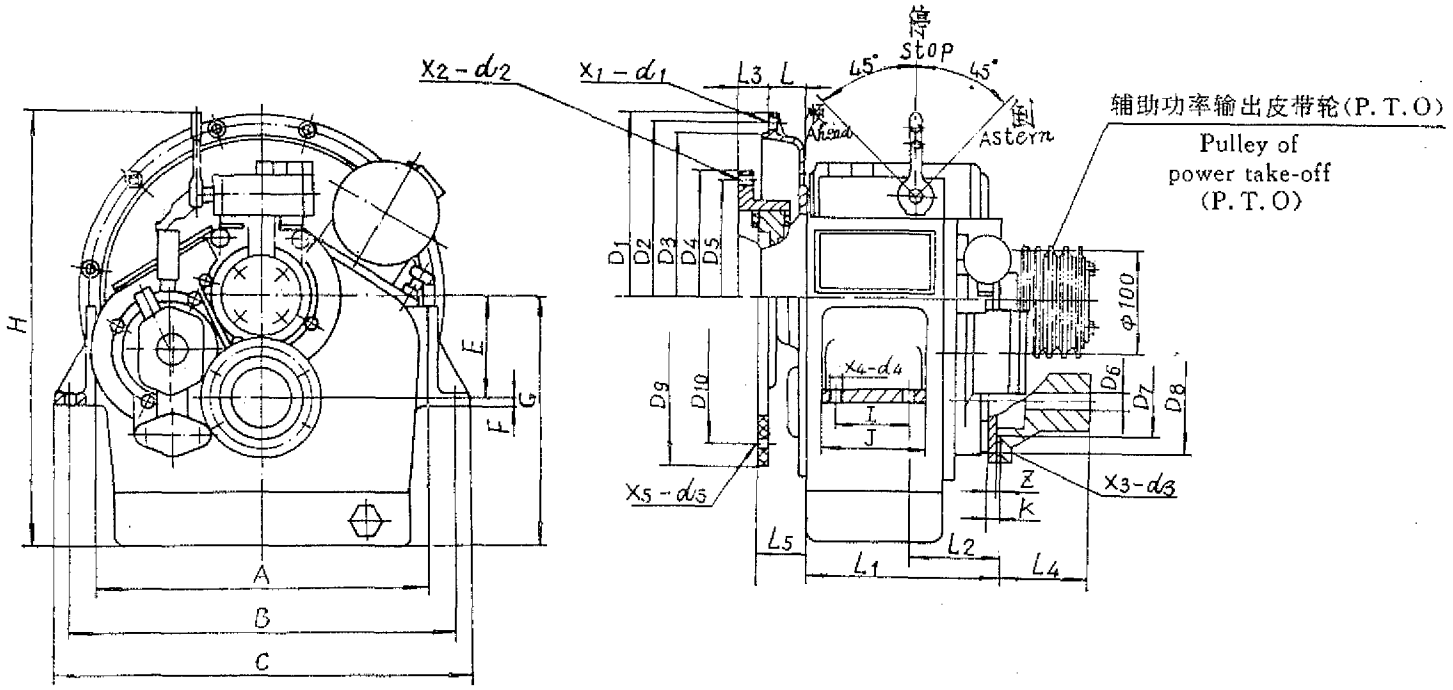
MA 100A船用齿轮箱安装尺寸图

Mounting Dimensions of Model MA100A



MA 125A船用齿轮箱安装尺寸图

Mounting Dimensions of Model MA125A



MA 142A船用齿轮箱安装尺寸图

Mounting Dimensions of Model MA142A

尺寸 Size / 型号 Model	A	B	C	E	F	G	H	L	连接罩壳 Bell housing (SAEJ617C) No.	D_1	D_2	D_3	输入联轴节 Input coupling (SAEJ620d)	D_4	D_5
MA100A	340	390	420	100	5	245	420	38	3	φ451	φ428.6	φ409.9	11½″	φ352.42	φ333.38
									4	φ403.4	φ381.0	φ361.95	10″	φ314.32	φ295.28
									5	φ355	φ333.4	φ314.3	7½″	φ241.3	φ222.25
MA125A	394	454	494	125	5	296	485	42	2	φ489	φ466.7	φ447.7	11½″	φ352.42	φ333.38
													10″	φ314.32	φ295.28
									3	φ451	φ428.6	φ409.5	11½″	φ352.42	φ333.38
													10″	φ314.32	φ295.28
									4	φ403	φ381.0	φ361.9	10″	φ314.32	φ295.28
MA142A	460	520	560	142	5	338	540	42	2	φ489	φ466.7	φ447.7	11½″	φ352.42	φ333.38
													10″	φ314.32	φ295.28
									3	φ451	φ428.6	φ409.5	11½″	φ352.42	φ333.38
													10″	φ314.32	φ295.28

尺寸 Size / 型号 Model	D_6	D_7	D_8	L_1	L_2	L_3	L_4	I	J	K	Z	x_1-d_1	x_2-d_2	x_3-d_3	x_4-d_4	平板式橡胶联轴节 Rubber transmission plate D_9	D_{10}	L_5	x_5-d_5
MA100A	φ23	φ70	φ90	260	96	39 30.2	80	70	110	12	4	12-φ11 8-φ11	8-φ11 8-φ9	6-φ11.8	2-φ13	φ350	φ320	62	6-φ11
MA125A	φ23	φ70	φ98.4	322	114	39.6 53.8 39.6 53.8 53.8	92	100	160	12	4	12-φ11	8-φ11	6-φ11.8	4-φ17	φ 50	φ320	73	6-φ11
MA142A	φ30	φ76.2	φ120.6	266.5	125	39.6 53.8 39.6 53.8	118	100	160	15	4	12-φ11	8-φ11	6-φ13.8	4-φ17	特殊设计 On request			

FOREWORD

In order to bring into play the function of the gearbox and obtain a long and reliable service, it is advised to study this manual carefully and be familiar with the technical feature and the operation, as well as maintenance.

For model MA100, the cooler is not fixed on the gearbox. When installating the power unit, ought to choose the suitable place for fixing cooler and connecting oil or water pipe correctly according to the mounting dimensions.

In a column order No, x means an alternative part. If need, Should be marked when ordering.

Care should be taken that the contents covered in this manual may be somewhat differents from the structure of the newly-made products, it is merely due to the improvements of our products in the lapse of time.

SECTION I General

Marine gearbox series MA possess the capacities of ahead and astern, clutching and disclutching, reducing speed and bearing the propeller thrust. They can be coupled with various marine diesel engines according to their Capacity Chart so as to form a complete marine power unit, which is suitable for small boats navigating in inland rivers or in coasts.

The gearbox Feasures are as follows:

1. The hydraulic system built in the gearbox made the operation easy from the bridge with remote control. A unit of pressure delay stepping up is fitted in the hydraulic control system and the clutch is smooth in engagement and thorough in disengagement.

2. Two sets of multiplate clutches are mounted at the output end and easy to dis-and reassemble and maintain.

3. The housing is integral to ensure its rigidity and the precision for engaging.

4. Both ahead and astern are identical in reduction ratios and can transmit the rated power, especially suitable for boats equipped with twin-engines, which with the same rotation, and twin-propellers.

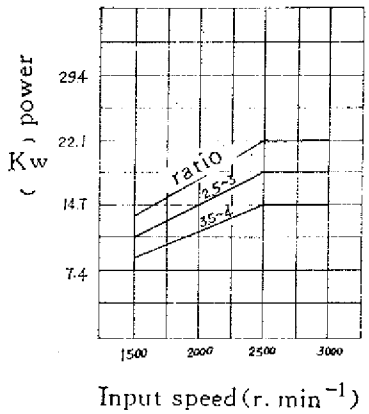
5. The emergency set is provided to ensure the boat travelling continously in case of severe hydraulic failure.

6. Bell housing and flexible input coupling are connected with the engine, so as to be looked-perfectly the whole unit and easily in mounting.

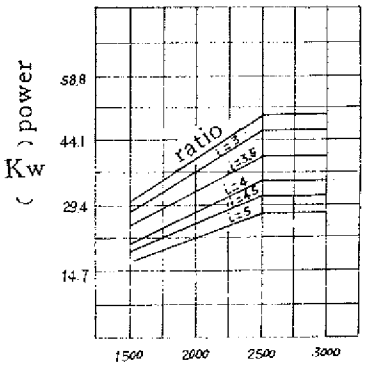
7. The range of the speed reduction ratios is wider as follows. Customer can choose it reasonably in accordance with the data of the engine or the boat and with transmission capacity.

Nominal ratio		1.5:1	2:1	2.5:1	3:1	3.5:1	4:1	4.5:1	5:1	5.5:1
Actual ratio	MA100	1.6:1	2:1	2.55:1	3.11:1	3.59:1	3.88:1			
	MA125		2.03:1	2.46:1	3.04:1	3.57:1	4.05:1	4.39:1	4.7:1	
	MA142		1.97:1	2.52:1	3.03:1	3.54:1	3.95:1	4.5:1	5.06:1	5.47:1

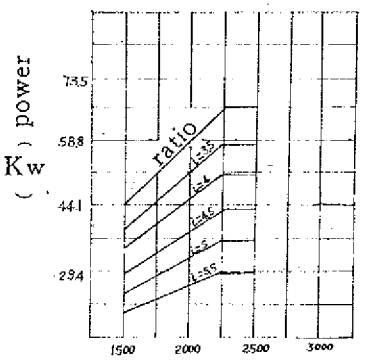
MA100齿轮箱



MA125齿轮箱



MA142齿轮箱



SECTION II Technical Data

Model	MA100A	MA125A	MA142A
Transmission	3 shaft with 5 helical gears		
Centre distance(mm)	100	125	142
Rated input speed(r/min)	1500–3000	1500–3000	1500–2500
Ratio and transmission capacity	(detail as Fig.1)		
Rated propeller thrust(N)	3000	5500	8500
Permissible inclination angle	10° longitudinally 15° transversely		
Control type	Hydraulic control		
Time for reversing(s)	≤10		
Rotational direction of input shaft (facing the output end foreward)	Counter-clockwise		
Rotational direction of output at ahead position	Contrary to that of input shaft		
Hydraulic pressure(MPa)	1—1.3		
Initial oil pressure(MPa)	0.15—0.4		
Max. oil temp.(℃)	≤80		
Flow of cooling water(L/min) (inlet water temp.≤30℃)	~15	~25	~35
Oil grade	HC—11, HQ—10 or SAE—30		
Oil capacity(L)	~2	~4.8	~5.8
Type of connected with engine	Flexible coupling		
Overhaul (bearing life) (h)	6000		
Overall dimensions (L×W×H)	289×420×420	343×494×485	367×560×540
Net weight(kg)	−60	−100	−130

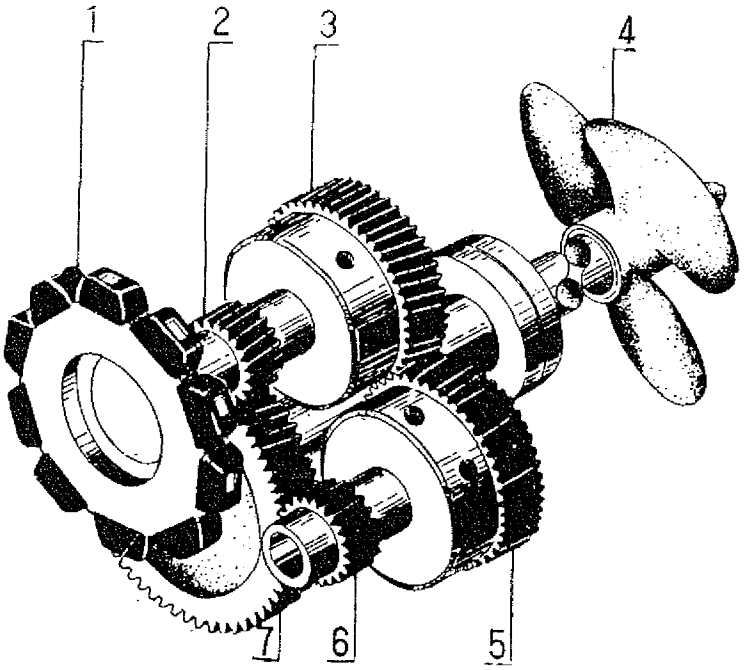
SECTION III Constructional Features and Dis- and Re-assembling of Gearbox

The said gearbox consists of input shaft, transmission shaft, output shaft, housing and hydraulic control system etc. Its principle of transmission as shown in Fig.2.

The power flow is:

Ahead 1—3—2—7—4

Astern 1—3—5—6—7—4



1. Input coupling
2. Ahead pinion
3. Ahead clutch
4. Output shaft
5. Astern clutch
6. Astern pinion
7. Driven gear

Fig.2 Diagram for Transmission System

1. Input Shaft Assembly

The input shaft assembly consists of input flange, input shaft, friction plates, piston and gear etc., connected with engine by flexible coupling of which have two types, toothed rubber block and rubber transmission plate, be selected by customers.

The clutch is of wet-type multi-plates and the friction plates are made of powdered alloy and steel separately. In case of any crack on the plate surface, or crushed mark on toothface, or warp with inclination of over 1.0 mm, or worn

out so such as its thickness is. For MA142A, the powder plate≤2.4 mm and the steel plate≤1.7 mm, and for MA100A or MA125A, the powder plate≤1.8 mm and the steel plate≤1.3 mm, they are must be renewed.

When disassembling and inspecting, the clutch housing together with piston, friction plates and input shaft etc. are to be drawn out as shown in Fig.3. For reassembling, the clutch housing should be turned while pushed along so that the internal friction plates can be slipped into the clutch bracket in turn.

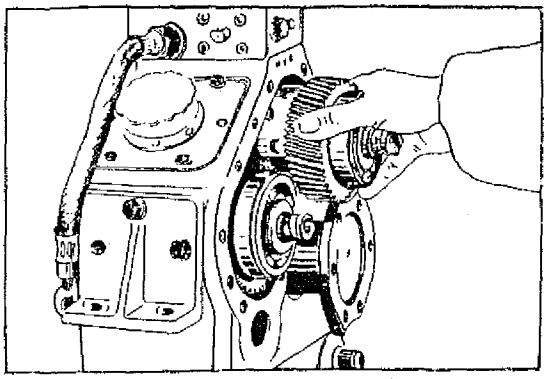


Fig.3 Dis- and Re-assembling of ClutchAssembly

The emergency set is fitted on the clutch. In case of severe hydraulic failure and not be repaired instantly, use it for engaging the clutch mechanically to ensure travelling. In this case, as shown in Fig.4, first stop the engine, remove the rear-end cover of input shaft, and screw two inner-hex screws on the rear end of clutch housing alternatively forward by the wrench to make the piston pressing against the friction plates. Thus, the clutch could be connected mechanically. Then reassemble the end-cover and start the engine. Note: When starting the engine speed must be below 80% of its rated speed and the oil level over 20 mm of the upper mark on the oil dipstick. When back to the port and to be repaired, the emergency screws should be turned in oppsite direction to be fastened on clutch housing.

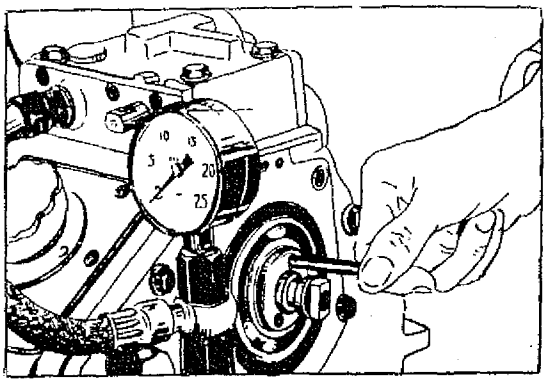


Fig.4 Using of the Emergency set

2. Transmission Shaft Assembly

Its construction is similar to the input shaft assembly except that there is no coupling at the fore end and the oil pump is driven by the rear end of the Transmission shaft. And the parts of both assemblies are available except the Transmission shaft and the clutch housing. Its dis- and re-assembling is as same as the input shaft assembly.

3. Output Shaft Assembly

The output shaft and the driven gear are connected in conical fitting with key. The ahead or astern thrust are supported by the bearing at the fore end. According to the customer's request, at the output shaft end, a companion coupling can be fitted, and its hole with allowance is for machining by user according to connecting mode.

When disassembling first unscrew the fastening nut at the fore end of output shaft, then screw two bolts in tbe special tool into the holes of driven gear (see Fig.5) and turn the screw lever of special tool to separate the fore-end bearing and the driven gear from the shaft, and the shaft can be drawn out.

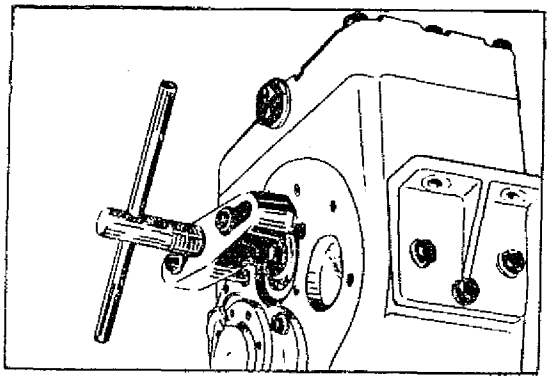


Fig.5 Detachment of the Driven Gear

When reassembling, both the bearing and the gear are to be fasten on the shaft by means of the nut.

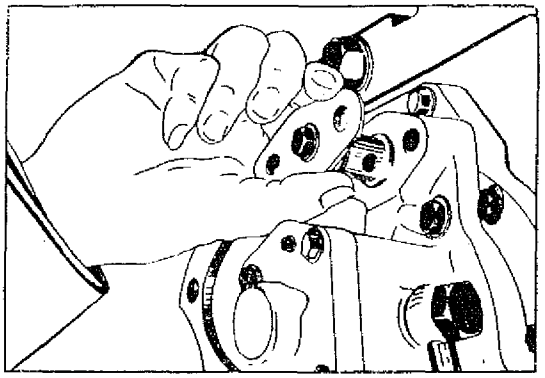


Fig.6 Dedachment of the Oil Filter

4. Housing Assembly

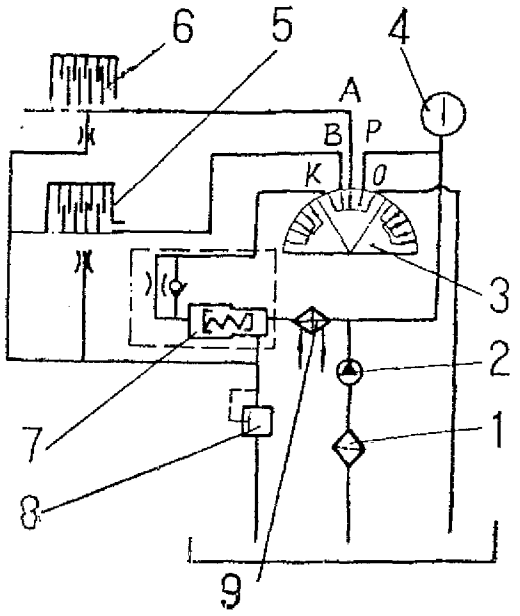
The housing is designed as a integral and there are a cover at the rear and an inspection hole on the side for observing the mesh condition of clutch or gear. The supports are removable, and can be replaced by user according to the installation condition. In addition, the bell housing is separable from the housing body and can be changed with type of diesel.

Under the pump, there is an oil filter which can be drawn out by unscrewing the two bolts, as shown in Fig.6.

5. Hydraulic Control System

The hydraulic system consists of oil pump and control valve etc. The working principle is as shown in Fig.7 in which the control valve is under idle and the passage is disconnected with holes A, B and K. When the control valve is at AHEAD position (turn the valve lever 45° ahead), hyd. oil enters into the buffer-valve and the ahead clutch, simultaneous to be opened to P and B, K.

When reversing, the control lever should be remained under idle for 2—3 sec. so as to disengage the ahead clutch and then turn the lever onto ASTERN position (turn the lever 45° astern), make P connect with A, K, such engaging the astern clutch. On the contrary, the control lever should be remained under idle for 2—3 sec. then turnned onto AHEAD position.



1. Filter
2. Pump
3. Control valve
4. Hydraulic pressure gauge
5. Ahead clutch
6. Astern clutch
7. Buffer valve
8. Overflow valve
9. Cooler

Fig.7 Diagram for Hydraulic System

The oil pump is driven by output shaft directly. The control valve is installed on the top of the housing by which controls the duties of ahead and astern, engaging and disengaging of gearbox. The buffer-valve can make operation pressure raising gradually to ensure the reversing smooth.

There are seal rings on the piston, input shaft and transmission shaft. The rings are with two radial gaps and can be broken in assembling. The break-end of both half ring should be aligned and in pairs for using.

The oil cooler is provided to keep the oil temperature under the permitted limits. Cooling water is offered by the water pump driven by diesel. The temperature of inlet water must be lower than 30℃.

6. Auxilary Power Take-off (P. T. O) Unit

The P. T. O unit can be assembled at the rear end of input shaft for customer's particular demand as shown in the double-dot line in the diagram of

mounting dimension. The data are as following:

Gearbox Model	Triangle belt		Transmission Torque (N·m)
	Type	Qty.	
MA100A	O	2	≤7
MA125A	A	4	≤21
MA142A	A	4	≤21

SECTION IV Installation and Operation

1. Installation

Before installating, a new gearbox is necessary to open the side cover for observing the surfaces of the parts which should be not rusted. The input and output couplings should be ready to rotate freely by hand.

For the gearbox with bell housing, the alignment Between the input shaft and the engine flywheel can be easily achieved by fastening their bell housings by means of bolts tightly. If no bell housing, the concentricity between the input coupling of the gearbox without housing and the engine flywheel and the run-out of the end face all should be corrected within 0.13 mm as Fig. 8 and 9. The concentricity and the run-out of the end face between the gearbox output flange and the coupling of the stern shaft must not be exceed 0.08 mm max. Be sure that the complete unit is aligned according to the requirement and then screw the all bolts tightly, and the reamer bolts should be used for connecting the supporters and the common baseplate.

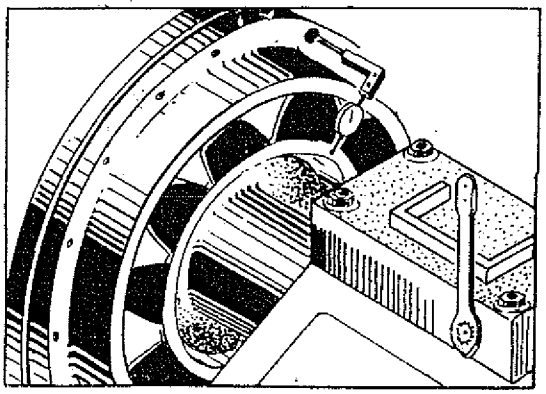


Fig. 8 Correcting the Concentricity between Gearbox and Flywheel

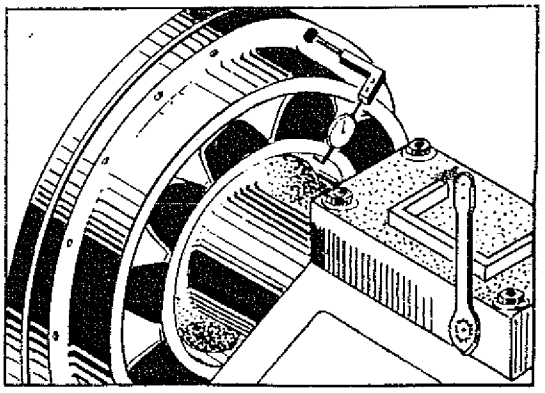


Fig. 9 Correcting the Run-Out of the End Face between Gearbox and Flywheel

2. Trial Run

After installation, fill in specified oil until the oil level reaches the upper mark on the oil dipstick, and pour less oil into the pump outlet. The oil must be clean, no water and dirt, and it is not permitted to be mixed with other different oil.

After starting the engine, if no pressure indicated on the gauges for one minute, stop the engine, check shoot trouble and then start the engine to its rated speed and inspect it again. The gearbox can be put into normal operation after reversing two or three times at 75% rated speed and no abnormal noise.

3. Normal Operation

During the normal operation, when reversing, the engine speed should be reduced below 75% rated speed and let the control lever of the gearbox ramain at STOP position for 2—3 sec. except for an emergency.

In order to keep the gearbox running in proper condition, regular inspection and maintenance should be arranged: change the oil after 500—600 running hours and inspect or replace the friction dises after 2,000 running hours. If the gearbox is to be stored or stopped running for long time, the inspection and maintenance are necessary periodically.

4. Adjusting of Initial Hydraulic Pressure

The oil pressure that the control lever is under idle is the initial hydraulic pressure, which should be adjusted at 0.15—0.4 MPa due to the different engine speed or the worn out of the oil seal. It can be adjusted by the adjusting bolts on the overflow valve (see Fig.10) and then tightened by the nut.

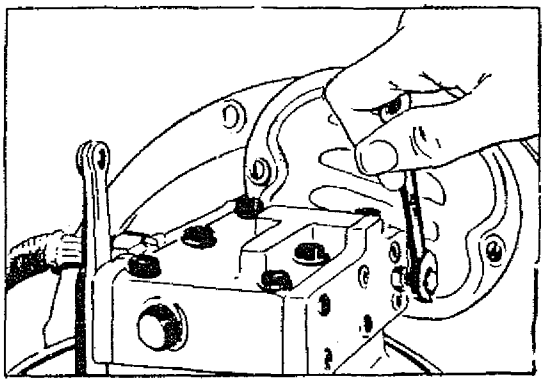


Fig.10 Adujsting of Initial Hydraulic Pressure

5. Trouble Shootings

General trouble shootings are as shown in following table:

Trouble Shootings

No.	Trouble	Cause	Remedies
1.	Vibration of gearbox	(1) Misalignment at installation	(1) Read just it acc. to the manual
		(2) Damaged toothed rubber block	(2) Renew it
		(3) Loose connecting bolts of couplings	(3) Tighten the fittings
		(4) Torsional vibration	(4) Readjusting acc. to calculation of torsional vibration
2.	Clutch slipping	(1) Oil level too low or sealing at suction damaged or filter choked	(1) Fill in oil or renew sealings or clean filter
		(2) Throttling hole in control valve obstructed	(2) Clean the throttling hole
		(3) Stuck friction plates or piston	(3) Clean and repair
		(4) Leakage of sealings	(4) Renew the sealings
3.	Turning in company	(1) Friction plates seriously warped or stuck	(1) Repair or renew
		(2) Back spring failure	(2) Renew
		(3) Stuck piston	(3) Clean and repair
		(4) Oil viscosity too high	(4) Use specified oil
		(5) Emergency screws loose out	(5) Turn the screws back, and tighten
4.	Abnormal noise	(1) Damaged toothed rubber block	(1) Renew
		(2) Damaged bearings	(2) Renew
		(3) Loose connecting bolts	(3) Tighten them

No.	Trouble	Cause	Remedies
5.	Excessive oil temperature	(1) Clutch slipping or turning in company (2) Chocked cooler (3) No cooling water (4) Oil level too high (5) Cooling water leak into oil	(1) Refer to Item No.2 and No. 3 (2) Clean (3) Repair (4) Lower the oil level (5) Repair cooler and renew oil

五、零 件 目 录

SECTION V Parts Lists

1．输入联轴节、输入轴部件(图11)

Input Coupling, Input Shaft Assembly (Fig.11)

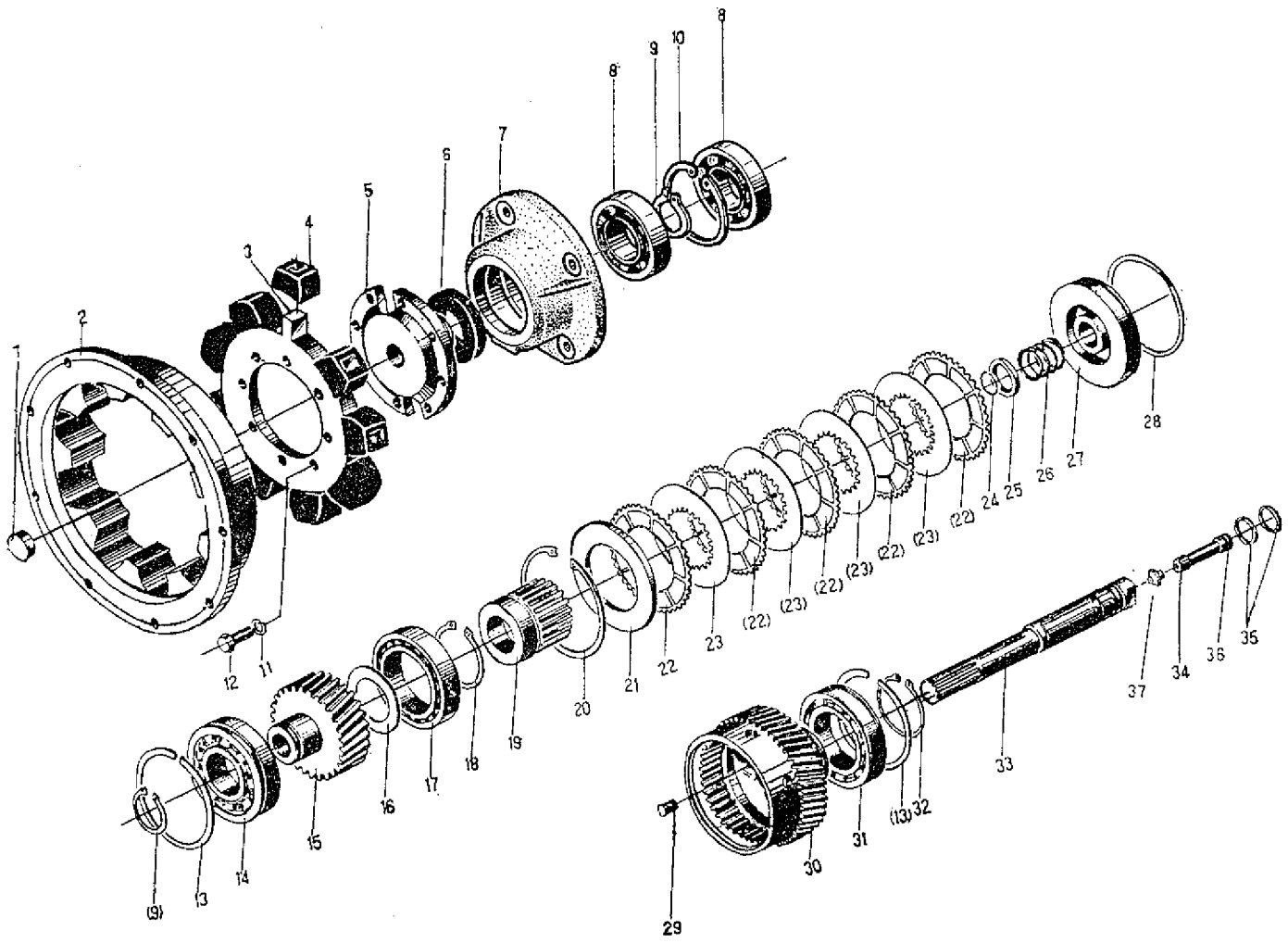
序号 No.	名 称 Name	订 货 号 Order No.	每台数量 Qty. MA100A	MA125A	MA142A	备 注 Remarks
1	闷 塞 Plug	100—01—008	1			
		125—01—003		1	1	
2	联轴节内齿圈 Internal toothed ring	Q05—10—03 Q05—10—04 Q05—10—05	1			SAE7½″ SAE11½″ 配285柴油机飞轮 For 285 Diesel flywheel SAE11½″ SAE10″
		Q05—11—02A Q05—11—02X1A		1	1	
3	联轴节外齿圈 External toothed ring	Q05—10—01	1			
		Q05—11—01		1	1	
	橡胶传动盘部件 Rubber transmission plate assembly	100—06—000X1	1			
4	齿形橡胶块 Toothed rubber block	Q26—06—01	10	16	16	

序号 No.	名　称 Name	订　货　号 Order No.	每台数量 Qty.			备　注 Remarks
			MA100A	MA125A	MA142A	
5	输入法兰 Input flange	100—01—002A	1			
		125—01—002A		1	1	
6	骨架油封 Oil seal	SPD 45×62×8 HG4—692—67	1			
		SPD 50×68×8 HG4—692—67		1	1	
7	前　盖 Front cover	100—01—001A	1			
		125—01—001A		1		
		142—01—001A			1	
8	单列向心球轴承 Bearing	108GB276—82	2			
		208GB276—82		2	2	
9	轴用挡圈 Snap ring (for shaft)	35GB894—76	1			
		40GB894—76	1	1	1	
		45GB894—76		1	1	
10	孔用挡圈 Snap ring (for hole)	68GB893—76	1			
		75GB893—76		1	1	
11	垫　圈 Washer	8GB93—76	8			
		10GB93—76		8	8	
12	螺　栓 Bolt	M8×25GB21—76	8			
		M10×25GB21-76		8	8	
13	轴承外圈止动环 Stop ring for bearing	80GB305—82	2			
		90GB305—82		2		
		110GB305—82			2	
14	外圈带止动槽单列向心球轴承 Bearing	50307GB277—82	1			
		50308GB277—82		1		
		50408GB277—82			1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA100A	MA125A	MA142A	备注 Remarks
15	主动齿轮 Pinion	100—01—201/1.5 100—01—201/2 100—01—201/2.5 100—01—201/3 100—01—201/3.5 100—01—201/4	1			
		125—01—201/2 125—01—201/2.5 125—01—201/3 125—01—201/3.5 125—01—201/4 125—01—201/4.5 125—01—201/5		1		
		142—01—201/2 142—01—201/2.5 142—01—201/3 142—01—201/3.5 142—01—201/4 142—01—201/4.5 142—01—201/5 142—01—201/5.5			1	
16	隔圈 Spacer	100—01—203	1			
		125—01—203		1		
		142—01—203			1	
17	单列向心球轴承 bearing	110GB276—82	1			
		111GB276—82		1		
		212GB276—82			1	
18	轴用挡圈 Snap ring (for shaft)	50GB894—76	1			
		55GB894—76		1		
		60GB894—76			1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA100A	MA125A	MA142A	备注 Remarks
19	离合器座 Clutch bracket	100—01—202 125—01—202 142—01—202	1	1	1	
20	孔用挡圈 Snap ring (for hole)	90GB893—76 130GB893—76	1	1	1	
21	承压板 Thrust plate	100—01—003 142—01—002	1	1	1	
22	外摩擦片 External disc	100—01—009 MB170—01—012	6	8	5	
23	内摩擦片 Internal disc	100—01—010 142—01—006	5	7	4	
24	轴用挡圈 Snap ring (for shaft)	26GB894—76 30GB894—76	1	1	1	
25	挡圈 Spacer	100—01—011 142—01—007	1	1	1	
26	返回弹簧 Return spring	100—01—007 142—01—005	1	1	1	
27	活塞 Piston	100—01—005 142—01—004	1	1	1	
28	活塞环 Piston ring	100—01—004 142—01—003	1	1	1	
29	螺钉 Screw	M8×10GB77—76 M10×12GB77-76	2	2	2	
30	传动齿轮 Transmission gear	100—01—102 125—01—102 142—01—102	1	1	1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA100A	MA125A	MA142A	备注 Remarks
31	外圈带止动槽的单列向心球轴承 Bearing	50110GB277—82	1			
		50210GB277—82		1		
		50212GB277—82			1	
32	轴用挡圈 Snap ring (for shaft)	50GB894—76	1	1		
		60GB894—76			1	
33	输入轴 Input shaft	100—01—101	1			
		125—01—101		1		
		142—01—101			1	
34	分油塞 Dividing oil plug	100—01—103	1		1	
		125—01—103		1		
35	封油环 Seal ring	100—01—006	2	2	2	
36	压紧螺钉 Fastening bolt	125—01—104		1		
37	铜垫 Copper washer	100—01—104	1		1	



输入联轴节、输入轴部件

Input Coupling, Input Shaft Assembly

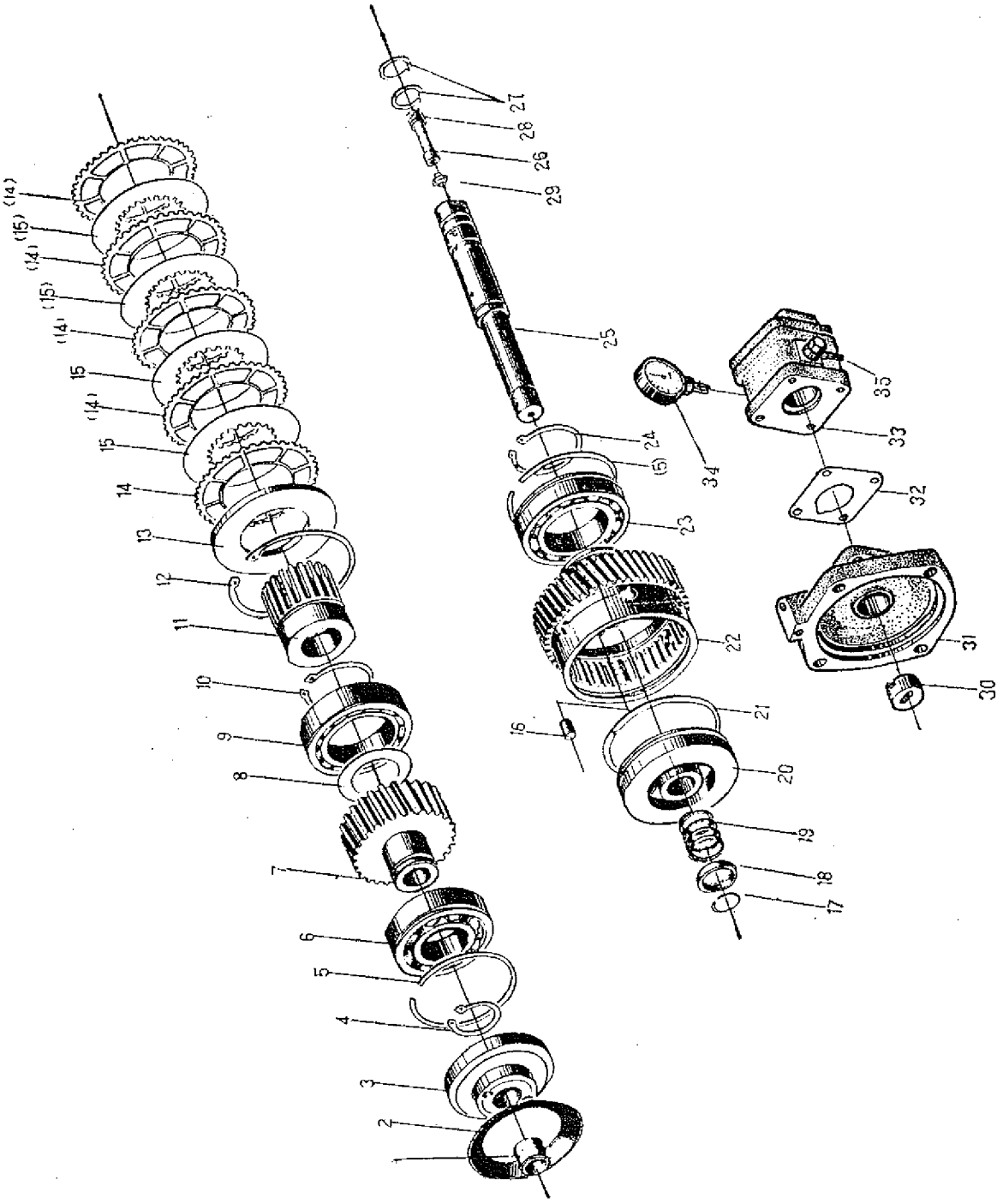
2. 传动轴部件
Transmission Shaft Assembly

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
1	轴承 Bearing	100—02—002	1		1	
		125—02—002		1		
2	碟形弹簧 Dished spring	100—02—003	1		1	
3	轴承座 Bearing housing	100—02—001	1			
		142—02—001			1	
4	轴用挡圈 Snap ring (for shaft)	35GB894—76	1			
		40GB894—76		1	1	
5	轴承外圈止动环 Stop ring for bearing	80GB305—82	2			
		90GB305—82		2		
		110GB305—82			2	
6	外圈带止动槽的单列向心球轴承 Bearing	50307GB277—82	1			
		50308GB277—82		1		
		50408GB277—82			1	
7	主动齿轮 Pinion	100—01—201/1.5	1			for ratio 1.5 Z=30
		100—01—201/2				for ratio 2 Z=26
		100—01—201/2.5				for ratio 2.5 Z=22
		100—01—201/3				for ratio 3 Z=19
		100—01—201/3.5				for ratio 3.5 Z=17
		100—01—201/4				for ratio 4 Z=16
		125—01—201/2		1		for ratio 2 Z=32
		125—01—201/2.5				for ratio 2.5 Z=28
		125—01—201/3				for ratio 3 Z=24
		125—01—201/3.5				for ratio 3.5 Z=21
		125—01—201/4				for ratio 4 Z=19
		125—01—201/4.5				for ratio 4.5 Z=18
		125—01—201/5				for ratio 5 Z=17
		142—01—201/2			1	for ratio 2 Z=37
		142—01—201/2.5				for ratio 2.5 Z=31
		142—01—201/3				for ratio 3 Z=27
		142—01—201/3.5				for ratio 3.5 Z=24
		142—01—201/4				for ratio 4 Z=22
		142—01—201/4.5				for ratio 4.5 Z=20
		142—01—201/5				for ratio 5 Z=18
		142—01—201/5.5				for ratio 5.5 Z=17

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
8	隔圈 Spacer	100—01—203	1			
		125—01—203		1		
		142—01—203			1	
9	单列向心球轴承 Bearing	110GB276—82	1			
		111GB276—82		1		
		212GB276—82			1	
10	轴用挡圈 Snap ring (for shaft)	50GB894—76	1			
		55GB894—76		1		
		60GB894—76			1	
11	离合器座 Clutch bracket	100—01—202	1			
		125—01—202		1		
		142—01—202			1	
12	孔用挡圈 Snap ring (for hole)	90GB893—76	1	1		
		130GB893—76			1	
13	承压板 Trust plate	100—01—003	1	1		
		142—01—002			1	
14	外摩擦片 External disc	100—01—009	6	8		
		MB170—01—012			5	
15	内摩擦片 Internal disc	100—01—010	5	7		
		142—01—006			4	
16	螺钉 Screw	M8×10GB77—76	2	2		
		M10×12GB77—76			2	
17	轴用挡圈 Snap ring (for shaft)	26GB894—76	1	1		
		30GB894—76			1	
18	挡圈 Spacer	100—01—011	1	1		
		142—01—007			1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
19	返回弹簧 Return spring	100—01—007 142—01—005	1	1	1	
20	活塞 Piston	100—01—005 142—01—004	1	1	1	
21	活塞环 Piston ring	100—01—004 142—01—003	1	1	1	
22	传动齿轮 Transmission gear	100—02—102 125—02—102 142—02—102	1	1	1	
23	外圈带止动槽的单列向心球轴承 Bearing	50110GB277—82 50210GB277—82 50212GB277—82	1	1	1	
24	轴用挡圈 Snap ring (for shaft)	50GB894—76 60GB894—76	1	1	1	
25	传动轴 Transmission shaft	100—02—101 125—02—101 142—02—101	1	1	1	
26	分油塞 Dividing oil plug	100—01—103 125—01—103	1	1	1	
27	封油环 Seal ring	100—01—006	2	2	2	
28	压紧螺钉 Fastening bolt	125—01—104		1		
29	铜垫 Copper washer	100—01—104	1		1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
30	油泵联轴节 Coupling for oil pump	100—02—005	1			
		125—02—001		1	1	
31	油泵座 Oil pump bracket	100—02—004	1			
		125—04—013		1		
		142—02—002			1	
32	油泵纸垫 Oil pump gasket	125—04—016	1	1	1	
33	油泵 Oil pump	BB—B6D	1	1	1	
34	压力表 Oil pressure gauge	Y60 0～2.5Mpa				
	油管组件 Oil pipe assembly	Q06—01A—200	1	1	1	
	接头螺钉 Connector	14×1.5 Q21—19	6	7	7	
	接头螺钉 Conector	14×1.5 Q21—20	1	1	1	
	紫铜垫圈 Copper washer	14Q20—03	16	17	17	
35	工作油管 Hydraulic oil pipe	125—00—100	1	1	1	
		125—00—200	1	1	1	
	润滑油管 Lublicating pipe	100—00—200	1	1	1	



传 动 轴 部 件

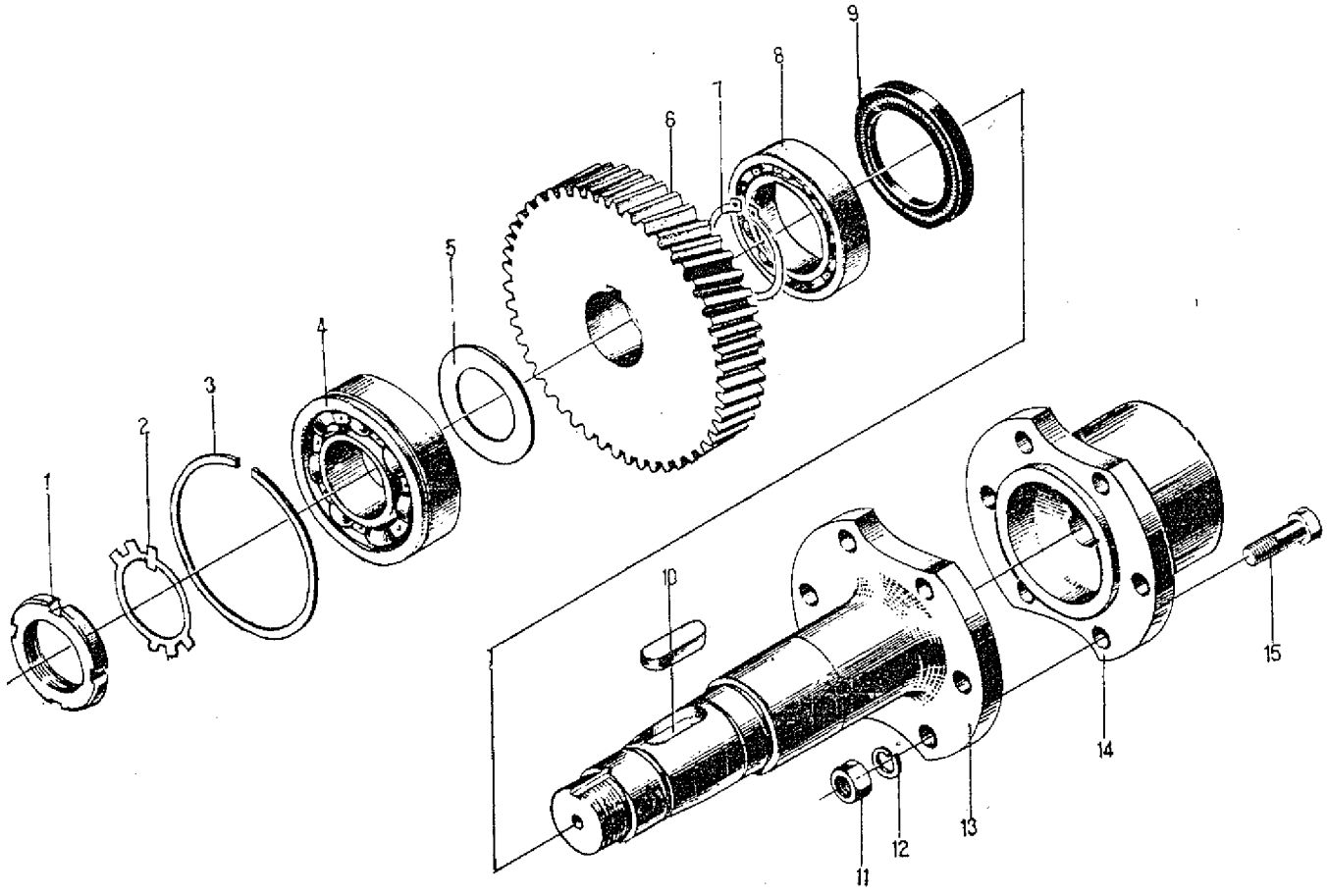
Transmission Shaft Assembly

3. 输出轴部件

Output Shaft Assembly

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
1	圆螺母 Nut	M33×1.5GB812-76	1			
		M39×1.5GB812-76		1		
		M45×1.5GB812-76			1	
2	止动垫圈 Lock washer	33GB858—76	1			
		39GB858—76		1		
		45GB858—76			1	
3	轴承外圈止动环 Stop ring for bearing	80GB305—82	1			
		110GB305—82		1		
		120GB305—82			1	
4	外圈带止动槽的单列向心球轴承 Bearing	50307GB277—82	1			
		50408GB277—82		1		
		50409GB277—82			1	
5	隔圈 Spacer	100—01—203	1			
		125—01—203		1		
		142—01—203			1	
6	从动齿轮 Driven gear	100—03—002/1.5	1			for ratio 1.5 Z=48
		100—03—002/2				for ratio 2 Z=52
		100—03—002/2.5				for ratio 2.5 Z=56
		100—03—002/3				for ratio 3 Z=59
		100—03—002/3.5				for ratio 3.5 Z=61
		100—03—002/4				for ratio 4 Z=62
		125—03—001/2		1		for ratio 2 Z=65
		125—03—001/2.5				for ratio 2.5 Z=69
		125—03—001/3				for ratio 3 Z=73
		125—03—001/3.5				for ratio 3.5 Z=75
		125—03—001/4				for ratio 4 Z=77
		125—03—001/4.5				for ratio 4.5 Z=79
		125—03—001/5				for ratio 5 Z=80
		142—03—002/2				for ratio 2 Z=73
		142—03—002/2.5				for ratio 2.5 Z=78
		142—03—002/3				for ratio 3 Z=82
		142—03—002/3.5				for ratio 3.5 Z=85
		142—03—002/4				for ratio 4 Z=87
		142—03—002/4.5				for ratio 4.5 Z=90
		142—03—002/5				for ratio 5 Z=91
		142—03—002/5.5				for ratio 5.5 Z=93

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
7	轴承外圈止动环 Stop ring for bearing	40GB305—82	1			
	轴用挡圈 Snap ring (for shaft)	50GB894—76 55GB894—76		1	1	
8	单列向心短圆柱滚子轴承 Bearing	2108GB283—81 2110GB283—81 2210GB283—81	1	1	1	
9	双口型骨架油封 Oil seal	SD45×68×12 HG4—692—67	1			
		SD55×80×12 HG4—692—67		1		
		SD60×90×12 HG4—692—67			1	
10	平键 Key	12×35GB1096—79 14×55GB1096—79	1	1	1	
11	螺母 Nut	M10GB52—76 M12GB52—76	6	6	6	
12	弹簧垫圈 Spring washer	10GB93—76 12GB93—76	6	6	6	
13	输出轴 Output shaft	100—03—001 125—03—003 142—03—001	1	1	1	
14	推进器联轴节 Companion coupling	100—03—003X1 125—F2—001 142—F1—001	1	1	1	
15	螺栓 Bolt	M10×40GB27—76 M12×50GB27—76	6	6	6	



输 出 轴 部 件

Output Shaft Assembly

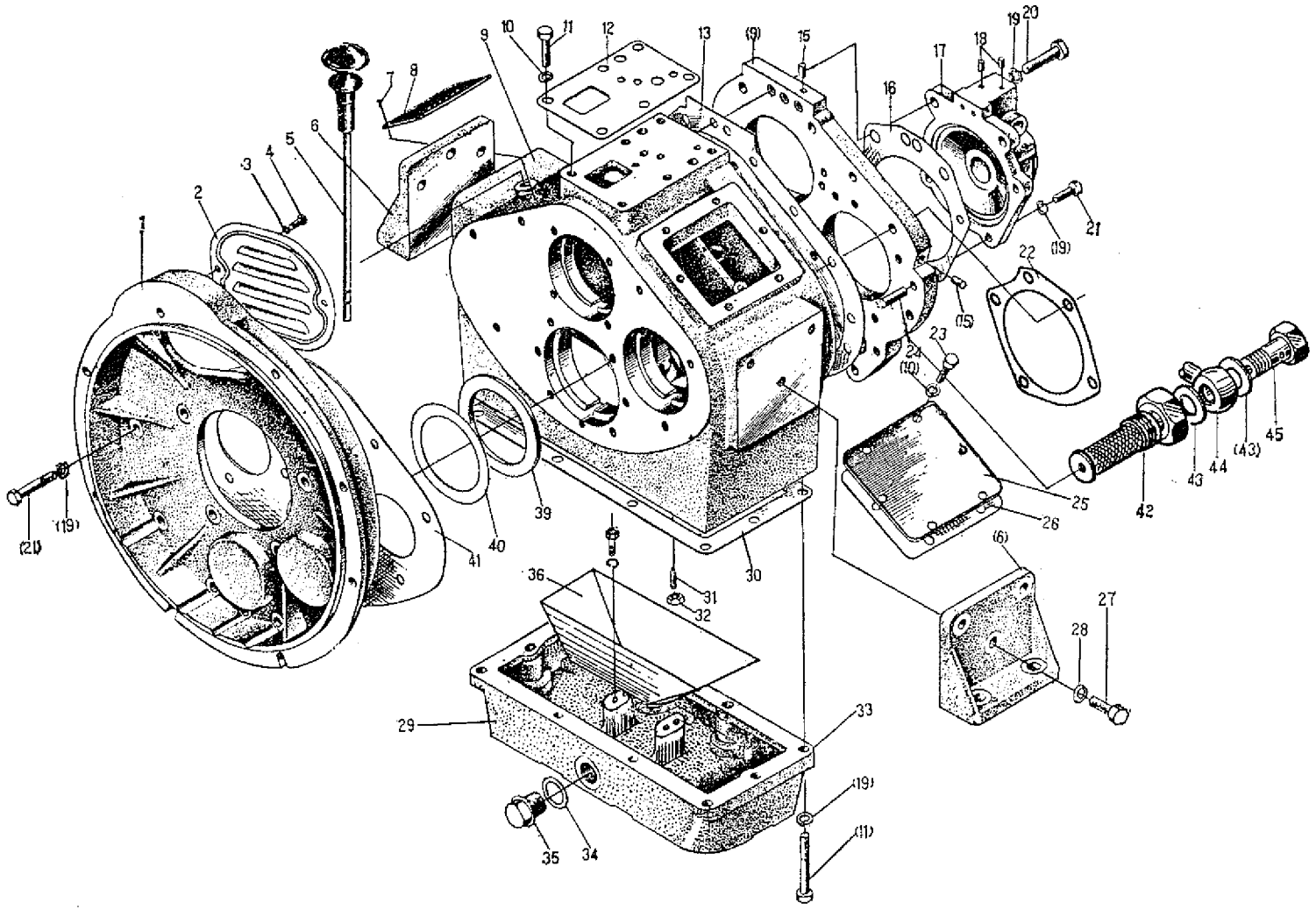
4. 箱 体 部 件
Housing Assembly

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
1	前盖板 Front cover	100—04—011	1			for no bell housing
		125—04—012		1		for no bell housing
		142—04—008			1	for no bell housing
	联接罩壳 Bell housing	100—04—011X1	1			SAE No3 根据订货
		100—04—011X2	1			SAE No5 选用.
		100—04—011X	1			SAE No4
		125—04—012X1		1		SAE No3
		125—04—012X2		1		SAE No4
		125—04—012X3		1		SAE No2
		142—04—008X1			1	SAE No2 Available according
		142—04—008X2			1	SAE No3 to order
2	罩壳盖板 Cover	0601A—0018	1	1	1	
3	弹簧垫圈 Spring washer	6GB93—76	2	2	2	
4	半圆头螺钉 Screw	M6×10GB67—76	2	2	2	
5	油标尺组件 Dipstick	100—04—240	1			
		125—04—200		1		
		142—04—200			1	
6	支架 Support	100—04—013	2			
		125—04—010		2	2	
7	铆钉 Rivet	2×4GB827—76	4	4	4	
8	铭牌 Name plate	Q25—01—01	1	1	1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
9	箱体 Housing	100—04—100	1			
		125—04—100		1		
		142—04—100			1	
10	平垫圈 Washer	B8GB97—76	12	8	8	
11	六角螺栓 Bolt	M8×50GB30—76	16	6	6	
		M8×55GB30—76		6	12	
		M8×30GB30—76		6		
12	操纵阀纸垫 Gasket	100—04—004	1	1	1	
13	后箱盖纸垫 Gasket	100—04—005A	1			
		125—04—001		1		
		142—04—001A			1	
15	闷塞 Plug	φ7Q21—25	2	2	2	
16	输入轴后端盖纸垫 Gasket	100—04—007	1			
		125—04—003		1		
		142—04—003			1	
17	输入轴后端盖 End cover	100—04—006	1			
		100—04—006X1	1			for P.T.O
		125—04—002		1		
		125—04—002X		1		for P.T.O
		142—04—002			1	
		142—04—002X			1	for P.T.O
18	闷塞 Plug	Q06—03—15	2			
		φ7Q21—25		2	2	
19	弹簧垫圈 Spring washer	8GB93—76	36	45	30	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
20	六角螺栓 Bolt	M8×35GB30—76	2			
		M8×45GB30—76		2	2	
21	六角螺栓 Bolt	M8×25GB30—76	27	11	6	
		M10×30GB30—76			21	
22	油泵座纸垫 Gasket	100—04—008A	1			
		125—04—009A		1		
		142—04—007A			1	
23	螺栓 Bolt	M8×12GB30—76	6	10	10	
24	销 Pin	8×25GB118—76	2			
		8×30GB118—76		2	2	
25	侧盖板 Upper cover	100—04—003	1			
		125—04—015		1		
		142—04—013			1	
26	侧盖板纸垫 Gasket	100—04—001	1	1		
	连接板纸垫 Gasket	125—04—011		1	2	
27	六角螺栓 Bolt	M10×25GB30—76	6			
		M10×30GB30—76		22	10	
28	弹簧垫圈 Spring washer	10GB93—76	6	22	39	
29	底壳 Bottom cover	100—04—014Bx	1			带X为平板式，选用件，用于i≤3:1 X means an alternative Part for i≤3:1
		100—04—014B	1			
		125—04—005A		1	1	
		125—04—005Ax		1	1	
30	底壳纸垫 Gasket	100—04—009	1			
		125—04—004		1	1	

序号 No.	名称 Name	订货号 Order No.	每台数量 Qty. MA 100A	MA 125A	MA 142A	备注 Remarks
31	圆柱端紧定螺钉 Screw	M6 25GB75—76	1	1	1	
32	螺母 Nut	M6GB52—76	1	1	1	
34	铜垫圈 Copper washer	22Q20—03	1	1	1	
35	放油螺塞 Drain plug	Q21—15	1	1	1	
36	挡油罩 Shroud	125—04—006		1	1	
39	垫圈 Washer	100—04—010 125—04—008 142—04—004	1	1	1	
40	调整垫片 Shim	100—04—015 404—0033 142—04—005	0—2	1—2	1—2	
41	前盖板纸垫 Gasket	100—04—012 125—04—007 142—04—006	1	1	1	for no bell housing
	联接罩壳纸垫 Gasket	100—04—012X1 125—04—007X 142—04—006X1	1	1	1	
42	滤清器焊接件 Welding assembly of filter	100—05—105 100—05—101 100—05—102 125—04—301	1	1	1	4件焊接成一体 as integral
43	紫铜垫圈14 Copper washer	Q21—03	2	2	2	
44	吸油管 Suction pipe	125—04—302	1	1	1	
45	接头螺钉 Connector	Q21—19	1	1	1	



箱 体 部 件

Housing Assembly