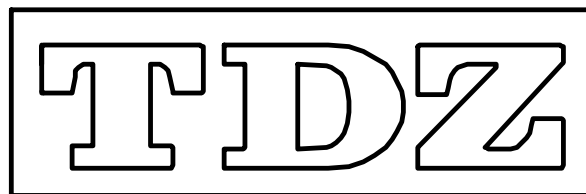


HIDRAULICA



SPARE PARTS FOR HYDRAULIC VANE PUMPS

For over 50 years TDZ's group has been working on the manufacturing of high precision products, like Injection equipments for Diesel engines and Hydraulic equipments.

We manufacture original products for such prestigious Companies as Mercedes-Benz, General Motors (Electromotive Diesel) or Land Rover, just as other spare part brands for the aftersales market. Half our production is exported all over the world.

The present catalogue is an indication of our spare part line for Vickers and Caterpillar Vane Pumps, which includes complete single and double pumps, as well as their cartridges and other parts.

We can supply our own make spare parts for all original references shown on the following sheets. These spare parts are interchangeable functionally and dimensionally. However, internal constructive differences, which do not affect the interchangeability may exist.

This is just an informative catalogue, and even though we have paid a lot of attention to its elaboration, some mistakes, of which we are not responsible, may occur.

Due to the continuous setting up to date of the references, it is possible that some of them are not included on these pages. If so, do not hesitate and contact us.

Zaragoza, August 1st, 1990

SPARE PARTS FOR VICKERS VANE PUMPS

Complete pumps, cartridges and parts for repairs

sV

SPARE PARTS FOR CATERPILLAR VANE PUMPS

Complete pumps, cartridges and parts for repairs

sC

TDZ CARTRIDGE REFERENCES

Cartridges for mobile and industrial applications

Tc

DIRECTIONS FOR USE AND REPAIRS

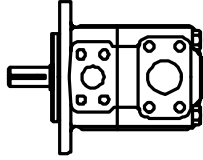
Cartridge identification, rotation change, standards for repairs

Dr

TFDZ

SPARE PARTS FOR VICKERS VANE PUMPS

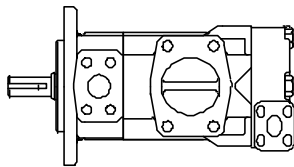
- Complete single and double vane Pumps
- Single and double vane pump Shafts
- Cartridges
- Single and double vane pump Parts
- Cartridge Parts



SINGLE VANE PUMPS

- (F3)25V(Q) - 8, 12, 14, 17, 19, 21 Gal./1200 rpm.
- (F3)26V(Q) -
- (F3)35V(Q) - 21, 25, 30, 35, 38 Gal./1200 rpm.
- (F3)36V(Q) -
- (F3)45V(Q) - 42, 47, 50, 57, 60 Gal./1200 rpm.

High variety of available shafts. Ask for your concrete needs

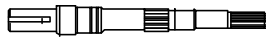


DOUBLE VANE PUMPS

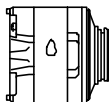
- (F3)2520V(Q) - 8, 12, 14, 17, 19, 21 + 2, 5, 8, 9, 11, 12, 14 Gal./1200 rpm.
- (F3)2620V(Q) -
- (F3)3520V(Q) - 21, 25, 30, 35, 38 + 2, 5, 8, 9, 11, 12, 14 Gal./1200 rpm.
- (F3)3620V(Q) -
- (F3)3525V(Q) - 21, 25, 30, 35, 38 + 8, 12, 14, 17, 19, 21 Gal./1200 rpm.
- (F3)3625V(Q) -
- (F3)4520V(Q) - 42, 47, 50, 57, 60 + 2, 5, 8, 9, 11, 12, 14 Gal./1200 rpm.
- (F3)4525V(Q) - 42, 47, 50, 57, 60 + 8, 12, 14, 17, 19, 21 Gal./1200 rpm.



SINGLE AND DOUBLE SHAFTS



233369	238929	243448	254964	289084	394036	413024
233370	242287	243449	255533	361760	394517	413027
233524	242747	247019	258249	361761	402105	413433
233527	242767	247102	261275	361762	413019	413436
233624	242784	247803	285417	361763	413022	419082
238755	242885	254848	289083	392669	413023	422541

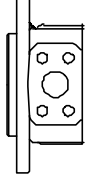







CARTRIDGES

413418	421563	580919	591005	919761	922647	923243
413419	421564	581663	591091	919762	922649	923251
413420	421565	581664	591092	919806	922650	923252
413421	421566	581862	591093	919807	922651	923253
413422	421567	582348	591094	919808	922652	923254
416427	421570	582349	591095	919809	922654	923255
416428	421571	582350	591096	919810	922655	923256
416429	421572	582572	591097	919811	922656	923257
416435	421573	584306	591098	919812	922657	923258
416436	421574	584307	591109	919813	922674	923259
416437	421576	584308	591110	919814	922675	923260
416439	421577	584309	591111	919828	922676	923261
416440	421578	584312	591112	919829	922677	923262
416441	421579	584313	919732	919830	922740	923293
416442	421580	584314	919733	919831	922744	923297
416452	421582	584324	919734	919842	922746	923305
417052	421583	584325	919735	919843	922758	923442
417053	421584	584326	919736	919844	922775	923445
417054	421585	584327	919737	919845	922776	923446
419509	421586	585471	919738	919862	922887	923447
419510	421588	585473	919742	919863	923025	923448
419511	421589	585475	919743	919864	923026	923449
421232	421590	585476	919744	919865	923031	
421233	421591	585477	919745	919925	923032	
421234	421592	585478	919746	919926	923033	
421235	421645	586331	919747	919927	923034	
421236	421646	588573	919748	919928	923039	
421237	421954	588574	919749	919929	923040	
421238	421955	588575	919750	919930	923041	
421239	423096	588576	919755	922543	923042	
421240	423097	588577	919756	922640	923043	
421241	578311	588578	919757	922641	923072	
421242	578312	591002	919758	922642	923122	
421243	578313	591003	919759	922643	923127	
421244	578314	591004	919760	922646	923153	



SINGLE AND DOUBLE VANE PUMP PARTS

							
	BODY	SHAFT SEAL	SHAFT SEAL (Secondary)	BEARING	SNAP RING (Shaft)	SNAP RING (Bearing)	
25 V	942353 233709	394976	429283 413029	1705	120128	191400	
35 V	942355 212647	394973	412009	38441	119982	193144	
45 V	942356 194881	394974 195287	413028	131812	102949	158630	
2520 V	942353 233709	394976	429283 413029	1705	120128	191400	
3520 V	942355 212647	394973	412009	38441	119982	193144	
3525 V	942355 212647	394973	412009	38441	119982	193144	
4520 V	942356 194881	394974 195287	413028	131812	102949	158630	
4525 V	942356 194881	394974 195287	413028	131812	102949	158630	
4535 V	942356 194881	394974 195287	413028	131812	102949	158630	

SINGLE AND DOUBLE VANE PUMP PARTS

INLET BODY	SCREW <small>(inlet Body)</small>	COVER <small>(Double pump)</small>	SCREW <small>(Double pump cover)</small>	COVER <small>(Single pump)</small>	SCREW <small>(Single pump cover)</small>	SEAL KIT <small>(Shaft seals not included)</small>
				224309	96168	922850
				234248	11173	922851
				229633	61321	922852 919850
251263	38523	250824	1296			922856
250818	42023	250824	1296			922859
230189	42955	231532	11163			922862
252283	87947	250824	1296			922863
233699	237138	231532	11163			922865
NOT AVAILABLE	269879	NOT AVAILABLE				922866

SV

CARTRIDGE PARTS: 282 (12 VANES) DESIGN

	INLET PLATE	OUTLET PLATE	ROTOR	VANE KIT (12 vanes + 12 inserts)	SCREW	PIN
25 V	591016 941396	588690	584618	941214	289472	229662
35 V	575480 576265 941399	575479	575478	941019	289475	280031
45 V	578903 941400	580921	578900	941049	289476	220888

SV

25 V		35 V		45 V	
	Gal. 1200 rpm		Gal. 1200 rpm		Gal. 1200 rpm
584610	12	576210	25	581679	42
584612	14	576212	30	582570	45
584614	17	576214	35	581680	50
584616	21	575476	38	578904	60

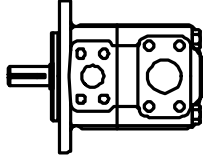
TESTED RING, ROTOR AND VANES READY TO BE ASSEMBLED									
20 V		25 V		30 V		35 V		45 V	
	Gal. 1200 rpm		Gal. 1200 rpm		Gal. 1200 rpm		Gal. 1200 rpm		Gal. 1200 rpm
VK20902	2	VK25908	8	VK30924	24	VK35921	21	VK45942	42
VK20905	5	VK25912	12	VD30924	24	VD35921	21	VD45942	42
VK20908	8	VD25912	12	VK30928	28	VK35925	25	VK45947	47
VK20909	9	VK25914	14	VD30928	28	VD35925	25	VD45947	47
VK20911	11	VD25914	14			VK35930	30	VK45950	50
VK20912	12	VK25917	17			VD35930	30	VD45950	50
VK20914	14	VD25917	17			VK35935	35	VK45957	57
		VK25919	19			VD35935	35	VD45957	57
		VD25919	19			VK35938	38	VK45960	60
		VK25921	21			VD35938	38	VD45960	60
		VD25921	21						

VK*****: Design 180 & 20 (VQ) Pumps; VD*****: Design 282 (12 vanes) Pumps.

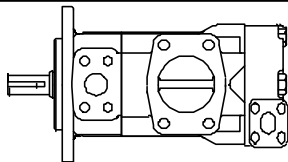
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SPARE PARTS FOR CATERPILLAR VANE PUMPS

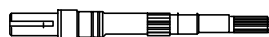
- Complete single and double vane Pumps
- Single and double vane pump Shafts
- Cartridges
- Single and double vane pump Parts
- Cartridge Parts


SINGLE VANE PUMPS

2J 3355	4J 8674	6J 0805	7J 0591	7J 5568	9J 5051	9J 8192
2J 6266	4J 9458	6J 4800	7J 0602	7J 6477	9J 5060	9J 8193
3A 1692	4J 9633	6J 7000	7J 0605	7J 7417	9J 5065	9J 8195
3G 4071	5J 4959	6J 7400	7J 0607	8J 2382	9J 5066	9J 8197
3G 4091	5J 4960	6J 7638	7J 0614	9J 5046	9J 5073	9J 8200
3G 6846	5J 6219	6J 7725	7J 3318	9J 5047	9J 8179	
4J 5723	5J 7655	6J 9836	7J 4748	9J 5048	9J 8190	

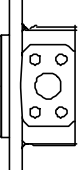





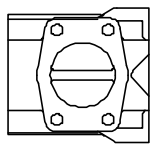

DOUBLE VANE PUMPS

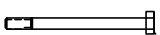


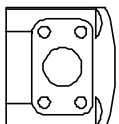
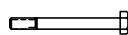
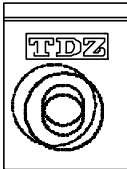
1U 0422	4K 4306	6J 9823	7J 0860	8J 1650	9J 5068	9J 8199
2D 9646	5J 0095	6J 9893	7J 0861	8J 3880	9J 5070	9J 8201
3G 4092	5J 0287	6J 9897	7J 0881	8J 6177	9J 5071	9J 8202
3G 4094	5J 1173	6J 9898	7J 1114	8J 6810	9J 5074	9J 8203
3G 4095	5J 1405	7J 0590	7J 1920	8J 9997	9J 5084	9M 5587
3G 4097	5J 2576	7J 0593	7J 2030	9J 5050	9J 5133	
3K 2786	5J 2684	7J 0594	7J 4349	9J 5052	9J 5134	
3K 6945	5J 8064	7J 0595	7J 4634	9J 5053	9J 8177	
3K 8726	5J 8765	7J 0599	7J 6230	9J 5054	9J 8180	
3R 2446	5J 8798	7J 0604	7J 6245	9J 5055	9J 8182	
4J 0823	65 8970	7J 0609	7J 6258	9J 5058	9J 8184	
4J 6378	6J 1100	7J 0611	7J 6476	9J 5061	9J 8186	
4J 6379	6J 7700	7J 0612	7J 7418	9J 5062	9J 8187	
4J 6569	6J 7730	7J 0616	7J 7419	9J 5063	9J 8188	
4J 9651	6J 7738	7J 0740	8J 0151	9J 5064	9J 8189	
4K 3331	6J 8880	7J 0741	8J 0182	9J 5067	9J 8196	


SINGLE AND DOUBLE SHAFTS



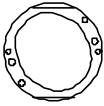




4J 0974	5J 0147	650723	7J 6228	9J 5090	9J 5095	9M 9931
4J 1660	5J 1219	658094	7J 6229	9J 5091	9J 5100	9M 9964
4J 2088	5J 1571	7J 0615	8J 0205	9J 5092	9J 5101	
4J 6353	5J 1764	7J 2155	8J 8624	9J 5093	9J 5102	
4J 7780	5J 9761	7J 3976	9J 5088	9J 5094	9J 5104	

SINGLE AND DOUBLE VANE PUMP PARTS









						
BODY	SHAFT SEAL	SHAFT SEAL (Secondary)	BEARING	SNAP RING (Shaft)	SNAP RING (Bearing)	INLET BODY
1U 3937	2J 7764	3G 2325	2J 7762	1J 6474	2D 1518	4J 1658
1U 3966	2J 8169	3G 9193	2L 5271	1L 8497	2J 8172	4J 2457
1U 3968	4D 0866	3G 9194	3L 1425		3F 6389	4J 3429
2J 7760	4J 0980	5P 9382	6B 1124		3J 7719	4J 4670
2J 8165	5P 0903	5P 9383			3K 4027	4K 0413
7J 4733	5P 0904	6V 2318			4M 5285	
7J 8081	9J 7814	8J 6888			4M 7652	
9J 5120		8J 6889				
9J 5121		9J 5150				
9J 5123		9J 5151				
9J 5124		9J 5152				

						
SCREW (Inlet Body)	COVER (Double pump)	SCREW (Double pump cover)	COVER (Single pump)	SCREW (Single pump cover)	SEAL KIT (Shaft seals not included)	
1D 4572	4J 1657	1M 0811	3D 6156	1D 4569	4J 0983	5J 0102
1D 4596	4K 0415	2B 0947	4J 0975		4J 1783	8J 9982
1D 4597		T 319	4J 1395		4J 3380	8J 9984
1D 4599		5P 4849			4J 4705	9J 3000
1K 6580					4J 6354	9J 5106
2D 1504					4J 7947	9J 5107
4J 1668					4J 9259	9J 5108
4J 3427					4J 9278	9J 5109
5A 8606					4J 9279	9J 5110
					4J 9280	9J 5111
					4J 9281	9J 5112
					4J 9282	9J 5113
					4J 9286	9J 5114
					4J 9287	9J 5115
					4J 9289	9J 5119

CARTRIDGE PARTS

						
INLET PLATE	OUTLET PLATE	RING	ROTOR	VANE KIT <small>(10 vanes + 10 inserts)</small>	SCREW	PIN
4J 3382 6J 7620 6J 7622 6J 9073 6J 9075	4J 0976 4J 1664 6J 7621 6J 8112 6J 9074	4J 0973 4J 1309 4J 3539 4J 4668 4J 5192 4J 7477 4J 8937 4K 1791 5J 1255 5J 5926 6J 1576 6J 3139 9T 5064 9T 5072 9T 5080	4J 5251 4J 7475 4J 7476 4K 0403 5J 5928 647310 9T 5104 9T 5109	4J 0982 4J 1397 4J 2462 4K 0735 647311 9T 5054 9T 5058	4B 2538 4K 0405	4J 1393 4J 1665 4K 0407 5J 0079

SC

							
INLET PLATE <small>VQ cartridges</small>	OUTLET PLATE <small>VQ cartridges</small>	PLATES & SEALS KIT	FLEX SIDE PLATES <small>(2 units)</small>	"O" RINGS <small>(2 units)</small>	SEAL PACK SUBASSEM. <small>("O" ring not included)</small>	SCREW	PIN
9T 5046 9T 5047 9T 5049 9T 5052	9T 5089 9T 5090 9T 5093 9T 5095	1U 0378 1U 0379 1U 0380 1U 0381	9T 5096 9T 5098 9T 5100 9T 5102	3G 1265 3G 2191 3G 2240 3G 2715 3G 9199 3G 9200 3G 9201 8C 3078 8C 3079 092062	3G 1264 3G 2192 3G 2241 3G 2714	9T 5110 9T 5112 9T 5114 544673	9T 5041 9T 5042 9T 5044 544672

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TDZ CARTRIDGE REFERENCES

-TDZ cartridge references for single, double & triple
Vickers and Caterpillar vane pumps.



TDZ CARTRIDGES REFERENCES

MOBILE APPLICATIONS

CR: NBR seal, 10 vanes

CT: VITON seal, 10 vanes

CQ: NBR seal, 10 vanes, with bimetalic plates

CF: VITON seal, 10 vanes, with plates

SINGLE PUMPS TRHU DRIVE SINGLE PUMPS DOUBLE PUMPS (FIRST CARTRIDGE)						
PUMP TYPE	FLOW		CAST IRON PLATES (VK) ROTATION		BIMETALIC PLATES (VQ) ROTATION	
	gal/min. (1200 rpm)	l/min. (1000 rpm)	RIGHT	LEFT	RIGHT	LEFT
20V V*20	2	8	CR10102	CR11102	CQ10102	CQ11102
	5	18	CR10105	CR11105	CQ10105	CQ11105
	8	27	CR10108	CR11108	CQ10108	CQ11108
	9	29	CR10109	CR11109	CQ10109	CQ11109
	11	36	CR10111	CR11111	CQ10111	CQ11111
	12	39	CR10112	CR11112	CQ10112	CQ11112
	14	46	CR10114	CR11114	CQ10114	CQ11114
25V V*25 V*4T 2520V* V*43	8	26	CR10005	CR11009	CQ10005	CQ11009
	12	40	CR10000	CR11004	CQ10000	CQ11004
	14	45	CR10001	CR11005	CQ10001	CQ11005
	17	55	CR10002	CR11006	CQ10002	CQ11006
	19	60	CR10004	CR11008	CQ10004	CQ11008
	21	67	CR10003	CR11007	CQ10003	CQ11007
	24	80	CR10007	CR11011	CQ10007	CQ11011
27	88	CR10006	CR11010	Not mounted in VQ model		
30V	24	76	CR10010	CR11012	CQ10010	CQ11012
	28	88	CR10011	CR11013	CQ10011	CQ11013
35V V*35 V*6T 35**V V*6*	21	66	CR10024	CR11028	CQ10024	CQ11028
	25	81	CR10020	CR11024	CQ10020	CQ11024
	30	97	CR10021	CR11025	CQ10021	CQ11025
	35	112	CR10022	CR11026	CQ10022	CQ11026
	38	121	CR10023	CR11027	CQ10023	CQ11027
	45	142	CR10025	CR11029	CQ10025	CQ11029
45V V*45 V*7T 45**V V*7*	42	138	CR10030	CR11034	CQ10030	CQ11034
	47	148	CR10031	CR11035	CQ10031	CQ11035
	50	162	CR10032	CR11036	CQ10032	CQ11036
	57	180	CR10034	CR11038	CQ10034	CQ11038
	60	193	CR10033	CR11037	CQ10033	CQ11037
	67	214	CR10035	CR11039	CQ10035	CQ11039
	75	240	CR10036	CR11040	CQ10036	CQ11040
DOUBLE PUMPS (SECOND CARTIDGE)						
2520V 3520V 4520V V*43 V*63 V*73	2	8	CR20020	CR21026	CQ20020	CQ21026
	5	18	CR20021	CR21027	CQ20021	CQ21027
	8	27	CR20022	CR21028	CQ20022	CQ21028
	9	29	CR20026	CR21032	CQ20026	CQ21032
	11	36	CR20023	CR21029	CQ20023	CQ21029
	12	39	CR20024	CR21030	CQ20024	CQ21030
	14	46	CR20025	CR21031	CQ20025	CQ21031
3525V 4525V V*64 V*74	8	26	CR20015	CR21019	CQ20015	CQ21019
	12	40	CR20010	CR21014	CQ20010	CQ21014
	14	45	CR20011	CR21015	CQ20011	CQ21015
	17	55	CR20012	CR21016	CQ20012	CQ21016
	19	60	CR20014	CR21018	CQ20014	CQ21018
	21	67	CR20013	CR21017	CQ20013	CQ21017
	24	80	CR20017	CR21021	CQ20017	CQ21021
27	88	CR20016	CR21020	Not mounted in VQ model		
4535V V*76	21	66	CR20004	CR21008	CQ20004	CQ21008
	25	81	CR20000	CR21004	CQ20000	CQ21004
	30	97	CR20001	CR21005	CQ20001	CQ21005
	35	112	CR20002	CR21006	CQ20002	CQ21006
	38	121	CR20003	CR21007	CQ20003	CQ21007
	45	142	CR20005	CR21009	CQ20005	CQ21009

TDZ CARTRIDGES REFERENCES



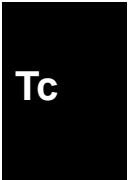
INDUSTRIAL APPLICATIONS

CR: NBR seal, 10 vanes

CS: NBR seal, 12 vanes

CV: VITON seal, 12 vanes

SINGLE PUMPS TRHU DRIVE SINGLE PUMPS DOUBLE PUMPS (FIRST CARTRIDGE)				
PUMP TYPE	FLOW		RIGHT	
	gal/min. (1200 rpm)	l/min. (1000 rpm)		
25V VS4T 2520VS VS43	8	26	CS10008	CS11008
	12	40	CS10012	CS11012
	14	45	CS10014	CS11014
	17	55	CS10017	CS11017
	19	60	CS10019	CS11019
	21	67	CS10021	CS11021
	24	80	CS10024	CS11024
	27	88	CS10027	CS11027
35V VS35 VS6T 35**VS VS6*	21	66	CS30021	CS31021
	25	81	CS10025	CS11025
	30	97	CS10030	CS11030
	35	112	CS10035	CS11035
	38	121	CS10038	CS11038
	45	142	CS10045	CS11045
45V VS45 VS7T 45**VS VS7*	42	138	CS10042	
	47	148	CS10047	
	50	162	CS10050	
	57	180	CS10057	
	60	193	CS10060	
	67	214	CS10067	
	75	240	CS10075	
DOUBLE PUMPS (SECOND CARTRIDGE)				
**20VS VS*3	2	8	CR20020	CR21026
	5	18	CR20021	CR21027
	8	27	CR20022	CR21028
	9	29	CR20026	CR21032
	11	36	CR20023	CR21029
	12	39	CR20024	CR21030
	14	46	CR20025	CR21031
3525VS 4525VS VS64 VS74	8	26	CS40008	CS41008
	12	40	CS40012	CS41012
	14	45	CS40014	CS41014
	17	55	CS20017	CS21017
	19	60	CS20019	CS21019
	21	67	CS20021	CS21021
	24	80	CS20024	CS21024
27	88	CS20027	CS21027	
4535VS VS76	21	66	CS40021	CS41021
	25	81	CS20025	CS21025
	30	97	CS20030	CS21030
	35	112	CS20035	CS21035
	38	121	CS20038	CS21038
	45	142	CS20045	CS21045



TFDZ

DIRECTIONS FOR USE AND REPAIRS

- Cartridge identification, rotation change, standards for repairs.

Due to the difficulty in finding out spare cartridge references, either for the loss of the pump feature plate, or for the lack of the machine spare part catalogue, it is most convenient to include some sheets to identify the sample accurately and to give some advice for a right assembly.

To identify properly cartridge and pump, use the 3 following pages as follows:

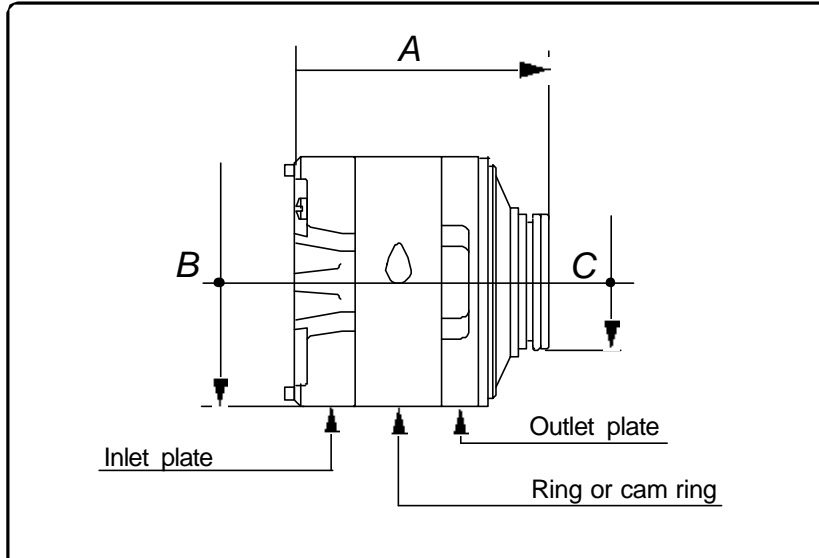
- DIMENSIONS AND FLOW

Find out pump type and flow in the dimensions chart, look the figure engraved on the ring as shown (gallons/min. at 1200 rpm).

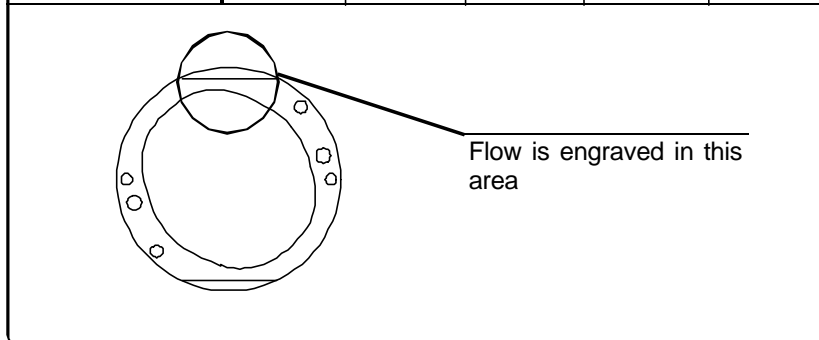
- SUPPORT BUSHING AND SHAFT ROTATION

Locate support bushing to know whether the cartridge belongs to a single or double pump. On this page there are also some clues to identify shaft rotation.

DIMENSIONS AND FLOW



DIMENSIONS in mm.	PUMP TYPE				
	20V	25V	30V	35V	45V
A	81,8	99,5	110,5	118,4	140,5
B	82,6	96,8	96,8	114,25	133,3
C	47,15	52,15	52,15	72,15	80,15
WEIGHT aprox. in Kg.	2,300	3,800	4,100	6,400	10,200
FLOW in Gal. at 1.200 rpm	2	8	24	21	42
	5	12	28	25	47
	8	14		30	50
	9	17		35	57
	11	19		38	60
	12	21			
	14				

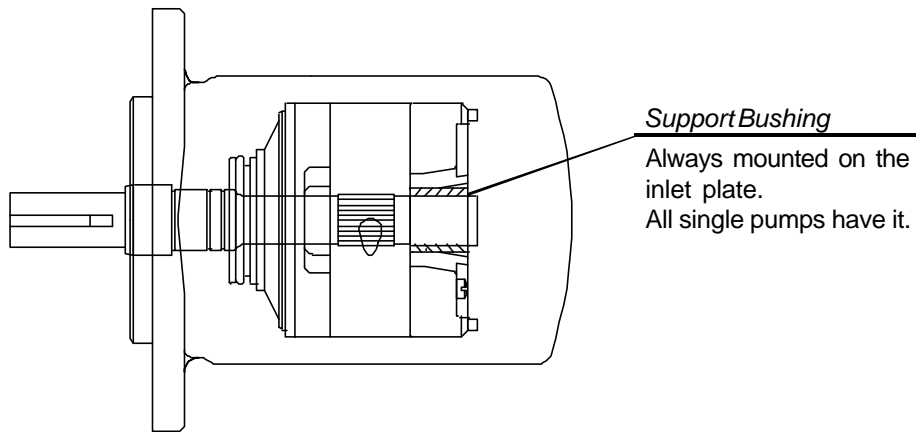


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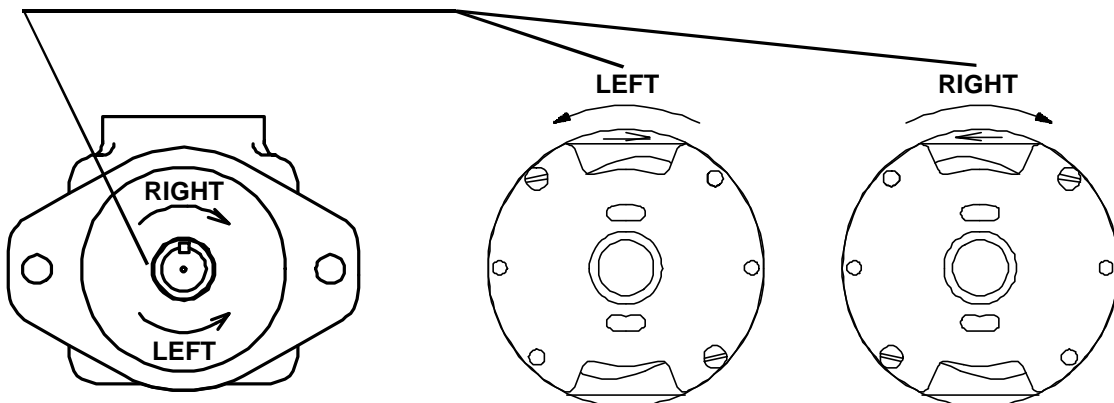
PUMP ROTATION

To determine pump rotation look at it from the shaft end side. So, if clockwise it is right hand rotation, on the contrary, it is left hand rotation.

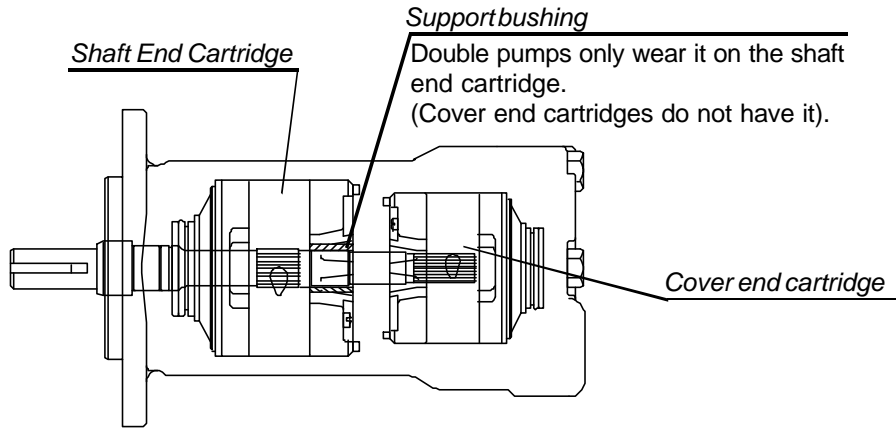
When taking out cartridge and putting it on to the outlet plate take into account that rotation is seen on the other way round; anyway, an arrow engraved in the ring or cam ring shows the real turning sense. (See pictures.)



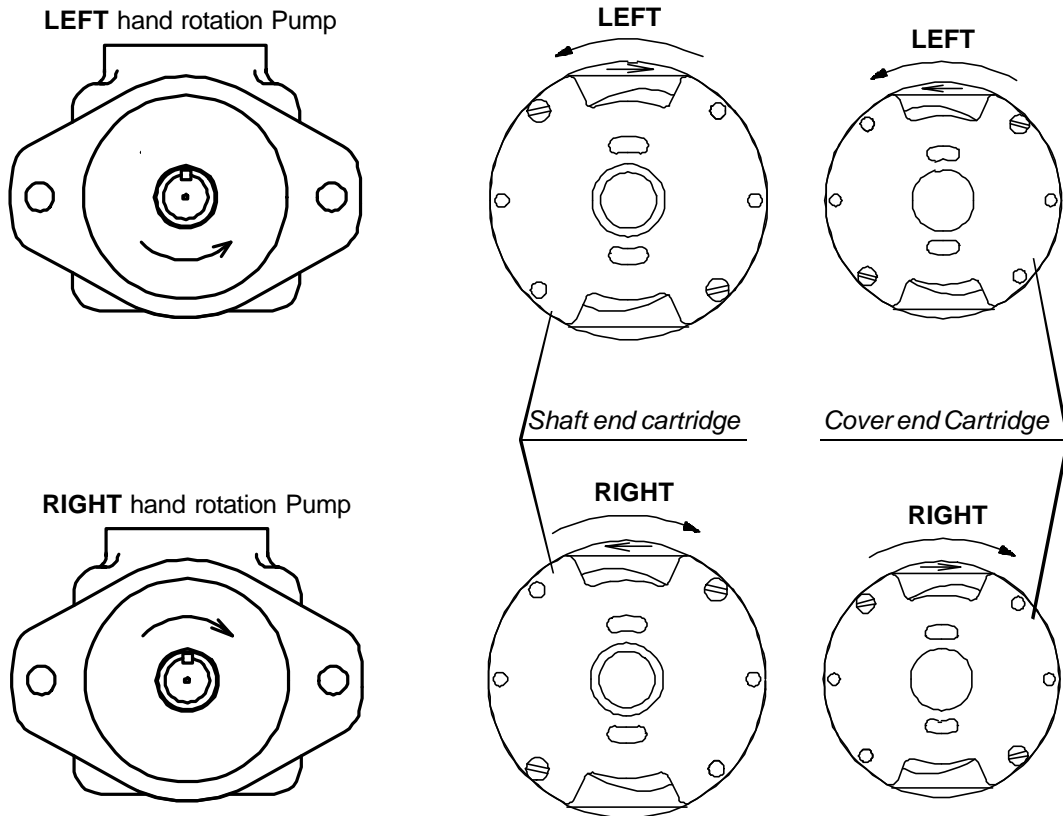
Pump rotation is viewed from the shaft end side.



PUMP ROTATION



Double pump special feature is that their 2 cartridges are opposite to each other, therefore when putting them on the outlet plate, they will apparently have opposite turning sense. Anyway, the arrow in the ring shows the correct rotation. (Pump and cover end cartridge rotation always coincide.)



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Since this is a high precision kit (mechanized in tolerances within thousandth of millimeter), any abrasive impurity can injure it in a few minutes or damage it to shorten its performance, before disassembling it is necessary that working place, tools and worker hands are completely clean and neat.

Please avoid any blow, however insignificant, taking special care with all edge sides, ring seat points and inlet and outlet plates.

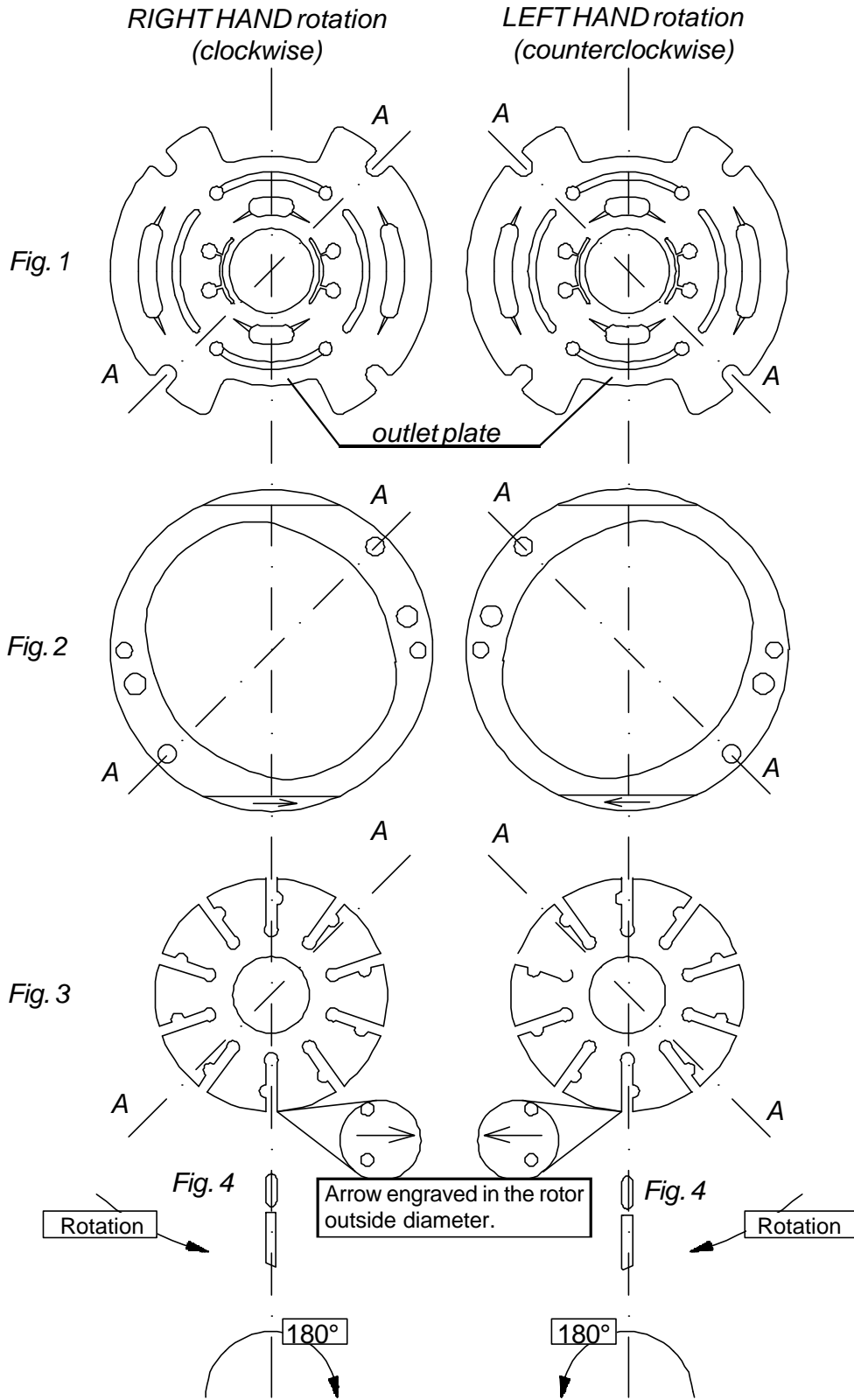
All these preventive measures taken, proceed as follows:

- 1° Lean the cartridge, holding it tightly, at the work bench on the outlet plate. Loosen the 2 screws which fix the kit, take them out as well as the pins (if there are any). Take out inlet plate shifting it laterally, as due to the protective oil it may be gummed up. Place it at the bench on a clean paper, white preferably.
- 2° Do the same with vanes, rotor and ring.
Place the rotor, once disassembled, onto the outlet plate with arrow showing the required turning sense (see detail in the circle, fig. 3), afterwards, put inserts into vanes (fig. 4), and finally, introduce them in the slots, well at the bottom, with vane closing edge in forward rotation, as arrow shows in the corresponding picture.
- 3° Be sure there is no small dirty particles at the leaning surface, put ring on to the outlet plate, placing it in the required turning sense. Make coincide chamfer edges, in which flow and arrow are engraved, with inlet or admission port.
- 4° Set inlet plate, pins and the 2 screws as shown in the pictures, taking into account that these last ones must be in opposite position to the one they had before disassembling. (To do so, just turn ring, rotor and vanes 180°). Fasten the screws moderately and dip the whole cartridge kit into clean hydraulic oil for a while. After these steps it is ready to be assembled.

Please pay good attention to the cartridge and pump rotation, as they do not always coincide. Be very careful to identify them properly. (See previous pages.)

CHANGE OF CARTRIDGE ROTATION

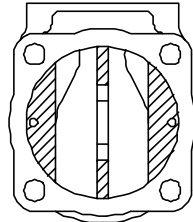
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CARTRIDGE REPLACEMENT

To have a successful cartridge replacement be sure to follow these warnings:



1° - Check if due to the use there is a tread on the cartridge seat zone (dark area in the picture).

If so, deepness must not be higher than 0,01 mm. (This could be observed even with a fingernail), being most convenient in such a case grinding or changing the pump body with this fault, as otherwise noise and performance values won't be the right ones. (In case you can't grind the seat, TDZ has -available for sale- a simple machine specially designed for this purpose).

2° - Look at the cartridge to be replaced, if wear is normal just change oil in tank circuit and change or clean filters.

3° - Should the used cartridge shows seizure in rotor, outlet & inlet plates, disassemble the pump completely. Check that the key is in good condition (it could be cut out). Then, put the shaft between points to make sure it is not twisted or crooked. Change it in case of any fault.

Take all the oil out of the circuit and other parts. Clean the tank carefully. If there is available any used cartridge mount it and start the machine for at least 15 minutes, driving all controls. To do so, spend the least possible amount of oil, since it will have to be replaced after this operation, although it could be reused again, after being filtrated in a filter no bigger than 5 microns, as it still keeps additives).

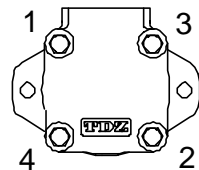
Replace or clean all filters, mount the new cartridge and fill the tank till the level with new oil.

**CARTRIDGE REPAIRS
MINIMAL CLEARANCE BETWEEN CAM RING AND ROTOR**

MODEL	Inches	Millimetres
20V	0.0007	0,018
25V	0.0008	0,020
30V	0.0012	0,030
35V	0.0011	0,028
45V	0.0014	0,036
* Vane length must be from 0,005 to 0,010 mm. (0,0002 to 0,0004 inches) less than rotor thickness.		

To rebuild cartridges it is necessary to use grinding & lapping machines, as well as measurement tools able to work in microns.

TIGHTEN TORQUE FOR PUMP SCREWS

	Reference	Tighten torque in Kp.m.		
SINGLE PUMPS	25V	7,6	±0,7	
	35V	12,5	±0,7	
	45V	36,6	±1,4	
DOUBLE PUMPS	25-20V	Inlet body	9,7	±0,7
		Cover	6,2	±0,7
	35-20V	Inlet body	12,5	±0,7
		Cover	6,2	±0,7
	35-25V	Inlet body	12,7	±0,7
		Cover	9,7	±0,7
	45-20V	Inlet body	36,6	±1,4
		Cover	6,2	±0,7
45-25V	Inlet body	36,6	±1,4	
	Cover	9,7	±0,7	
45-35V	Inlet body	36,6	±1,4	
	Cover	12,7	±0,7	
<p><i>Tighten the screws, with a torque no bigger than 0,5 to 1 Kp.m before beginning the last or final tighten.</i></p> <p><i>Follow the order shown in the picture.</i></p>				

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