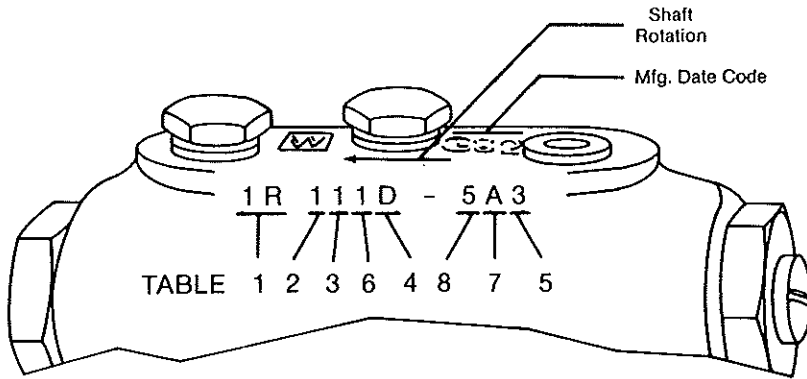


Replacement Parts List, Service Instructions and Code Analysis

"R" Series Fuel Units


TABLE 1

SINGLE STAGE	
TYPE	RPM
1R	1725
21R	3450
31R	1425
41R	2850
TWO STAGE	
TYPE	RPM
2R	1725
22R	3450
32R	1425
42R	2850

TABLE 3

IN. CODE	MAX. RATED PRESSURE
0	No Valve
1	150 PSI
2	300 PSI
3	20 PSI
4	45 PSI
5	100 PSI
6	125 PSI
8	80 PSI

TABLE 5

Nozzle Code
See Page 2

TABLE 6

Gear Size
See Page 4

TABLE 8

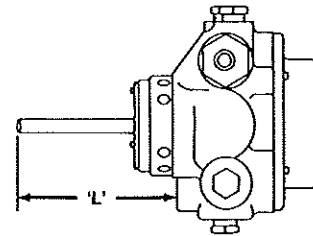
DESIGN SERIES	
CODE	CHANGE
None	Obsolete Design
1	Same Size Press. & Suction Gears Except RR
2	Obsolete Design
3	Suction Gear One Size Larger than Press. Gear
4	Same as 1 Except Lip Seal Pressed in Hub
5	Same as 3 Except Lip Seal Pressed in Hub

TABLE 2

Number of Cleaner Blades — 0, 1, 2, 3 or 6

TABLE 4

ROTATION AND OUTLET LOCATION		
IN. CODE	ROTATION FROM SHAFT END	OUTLET
A	Clockwise	Left
B	Counter Clockwise	Right
C	Counter Clockwise	Left
D	Clockwise	Right


TABLE 7

CUSTOMER VARIATIONS — LENGTH 'L' FROM MOUNTING FACE TO SHAFT END																				
IN. CODE	'L'	*	IN. CODE	'L'	*	IN. CODE	'L'	*	IN. CODE	'L'	*	IN. CODE	'L'	*	IN. CODE	'L'	*	IN. CODE	'L'	*
A	3 ¹ / ₈	1	AL	2 ⁵ / ₁₆	1	BK	1 ¹³ / ₁₆	1	CD	3 ¹ / ₈	1, 8	CX	1 ⁹ / ₁₆	1, 5	DP	1 ⁵ / ₁₆	1, A1	EG	3 ³ / ₈	1, 7, A4
B	2 ¹ / ₁₆	1	AM	2 ¹⁹ / ₃₂		BL	3 ¹ / ₈	3	CE	3 ¹ / ₈	9	CY	3 ¹ / ₈	1	DQ	3 ³ / ₈	1	EH	1 ⁷ / ₈	1, 7, A2
C	3 ¹ / ₁₆	1	AO	2 ¹³ / ₁₆	3	BN	3 ¹¹ / ₁₆	4	CF	3 ¹ / ₈	1, 9	CZ	3 ¹ / ₈	1	DR	2 ⁷ / ₈	1, A2			
D	3 ¹ / ₈	1	AQ	3 ¹ / ₁₆	1, 3	BO	2 ⁷ / ₈	1	CG	3 ¹ / ₈	6, 9	DA	1 ¹ / ₂	5	DS	1 ¹³ / ₁₆	1, 5, 9			
E	3 ¹⁷ / ₃₂		AS	2 ¹⁵ / ₁₆	3	BP	1 ⁷ / ₈	1	CH	3 ¹ / ₈	1, 9	DB	1 ³ / ₆₄	A1	DT	3 ³ / ₈	1, 5, 9			
F	3 ¹ / ₈		AU	2 ⁵ / ₁₆		BQ	1 ⁷ / ₈	1	CJ	1 ¹ / ₄	6, A1	DC	3 ¹ / ₁₆	1, 8	DU	1 ⁷ / ₈				
G	1 ⁵ / ₈		AX	2		BR	3 ¹¹ / ₁₆	3	CK	3 ¹ / ₈	1	DD	1 ¹ / ₁₆	1	DV	3 ³ / ₈	4			
H	3 ¹ / ₁₆		AY	3 ¹ / ₁₆		BS	2	1	CL	1 ¹⁵ / ₁₆	7	DE	1 ⁷ / ₈	4	DW	3 ¹ / ₁₆	5			
K	3 ¹ / ₁₆		AZ	3 ¹ / ₁₆	1, 3	BT	2 ¹ / ₄		CM	2 ⁷ / ₈	A2	DF	2 ¹⁵ / ₁₆	4	DX	1 ⁷ / ₈	9			
R	3 ¹ / ₁₆		BA	3 ¹ / ₈	1, 3	BU	3 ¹ / ₄	1	CN	3 ¹ / ₁₆	1, 4	DG	1.850	4	DZ	3 ³ / ₈	1, 5, 9			
U	3 ¹ / ₈		BB	3 ¹ / ₁₆	A2	BV	2 ⁷ / ₁₆	6	CO	3 ¹ / ₁₆	1, A2	DH	3 ¹ / ₈	1, 9	EA	3 ¹ / ₈	1, 9			
X	3 ¹⁷ / ₃₂		BC	1 ¹ / ₁₆		BW	3 ¹ / ₈	1, 6	CQ	2 ⁷ / ₁₆	1, A2	DJ	2.362	4	EB	1 ⁷ / ₈	5, 9			
AA	2 ⁷ / ₁₆	1	BD	1 ¹ / ₂		BX	2 ⁷ / ₁₆		CR	3 ¹⁷ / ₃₂	7	DK	3.268	4	EC	3 ³ / ₈	1			
AB	3 ¹ / ₁₆	3	BE	3 ¹ / ₄	A2	BY	1 ¹⁵ / ₃₂	1, A1	CT	1 ⁷ / ₈	1	DL	1 ¹ / ₁₆		ED	1 ⁷ / ₈	1, 7			
AG	1.95	4	BF	3 ¹ / ₈	1	BZ	2 ⁵ / ₈	A2	CU	3 ¹ / ₈	1, 7	DM	3 ¹ / ₂	1	EE	1 ¹¹ / ₁₆				
AH	3 ¹ / ₈	1, 3	BG	3 ¹ / ₈	A2	CA	3 ¹⁷ / ₃₂	4	CV	2 ⁷ / ₁₆		DN	3 ¹ / ₈	1, A2	TO	1 ⁷ / ₈	3			
AI	3 ¹ / ₈	1, A2	BH	3 ¹ / ₁₆	3	CC	3 ¹ / ₈	8	CW	2 ⁷ / ₁₆	1, 5	DO	1 ⁷ / ₈	1	EF	3 ¹ / ₈	1, 5			

***OTHER VARIATIONS:**

1 = Has body flange
2 = No cutoff nozzle

3 = Stepped shaft
4 = Order from factory by pump type
5 = Special shaft bearing

6 = Seal drain to bypass
7 = 1/4" nozzle outlet
8 = 3/8" inlet and return ports
9 = All synthetic parts are viton

A1 = Tang drive
A2 = Ball bearing

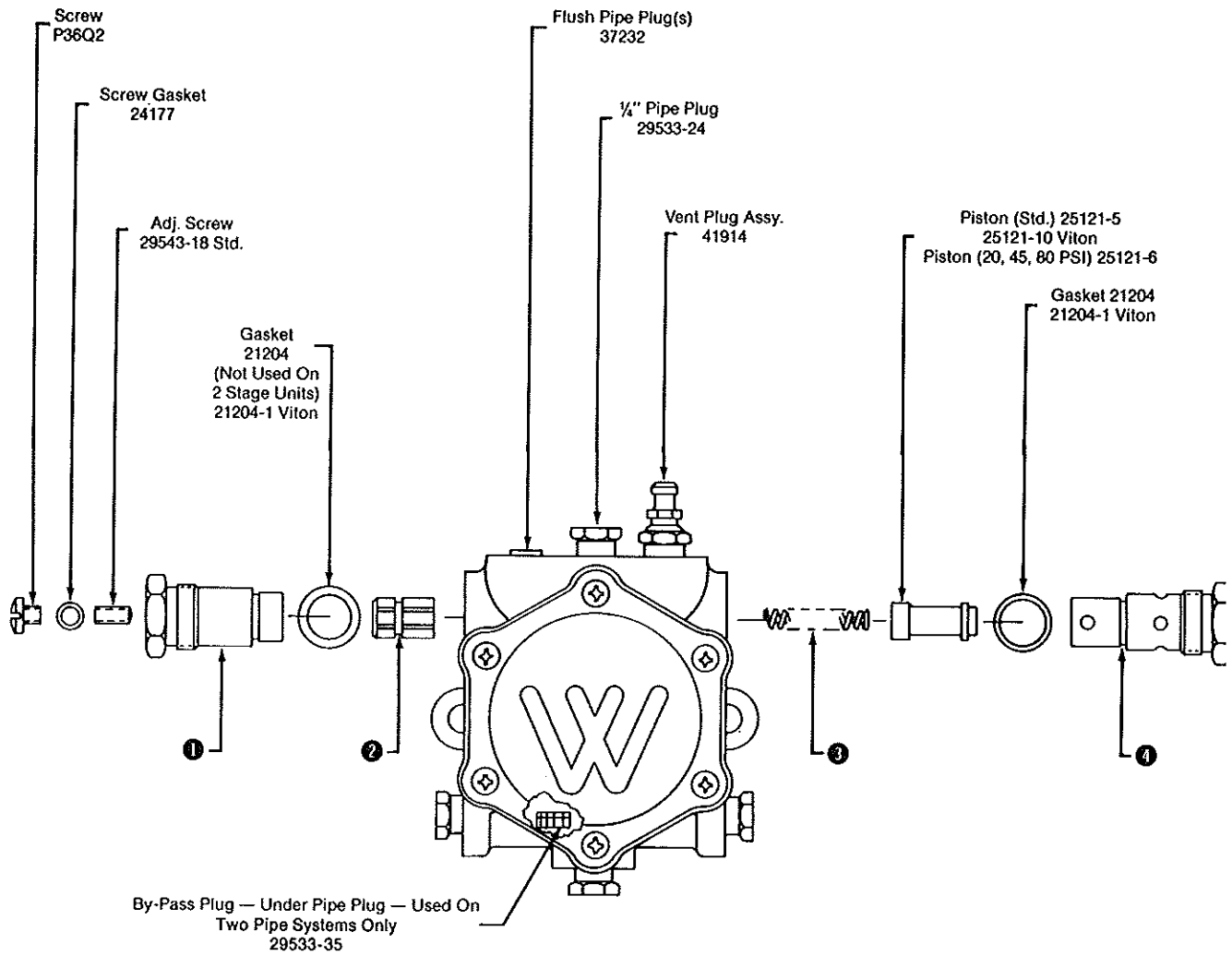


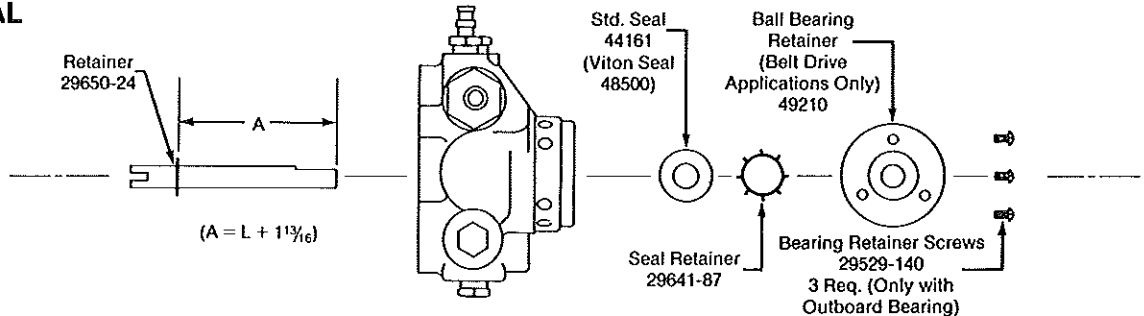
TABLE 3 PRESSURE CODE	① PLUG	② SPRING CAP	③ SPRING
1	21192	19878-1	19877
2	27918	27919	27921
3	27918	27919-3	27922 *27922-1
4	27918	19878-1	27922
5	21192	19878	19877
6	21192	19878-4	19877
8	21192	19878-2 **19878-10	42878 **19877
Transfer	25124-19	—	—

*For 3/4" and 1" pressure gear 1725 RPM and 3/8" @ 3450 RPM.
**For 3/16" pressure gears.

PUMP TYPE	TABLE 5		① PLUG & GUIDE ASSY.	② GUIDE ONLY	OUTLET PORT
	NOZZLE CODE	GUIDE SLOTING			
R Except 20 & 80 PSI Units	1, 2, 15	2 Std.	25124	25122-2	1/8
	3, 4	None	25124-1	25122-1	1/8
	5, 6	2 Deep	25124-7	25122-3	1/8
	13, 14	None	25124-5	25122-7	1/4 NC †
20 & 80 PSI	3, 4	None	25124-12	25122-8	None
RR	3, 4	None	25124-5	25122-7	1/4 NC †
Transfer	No Digit	None	25123-3	None	1/4 NC †

†NC = No cutoff.

LIP SEAL

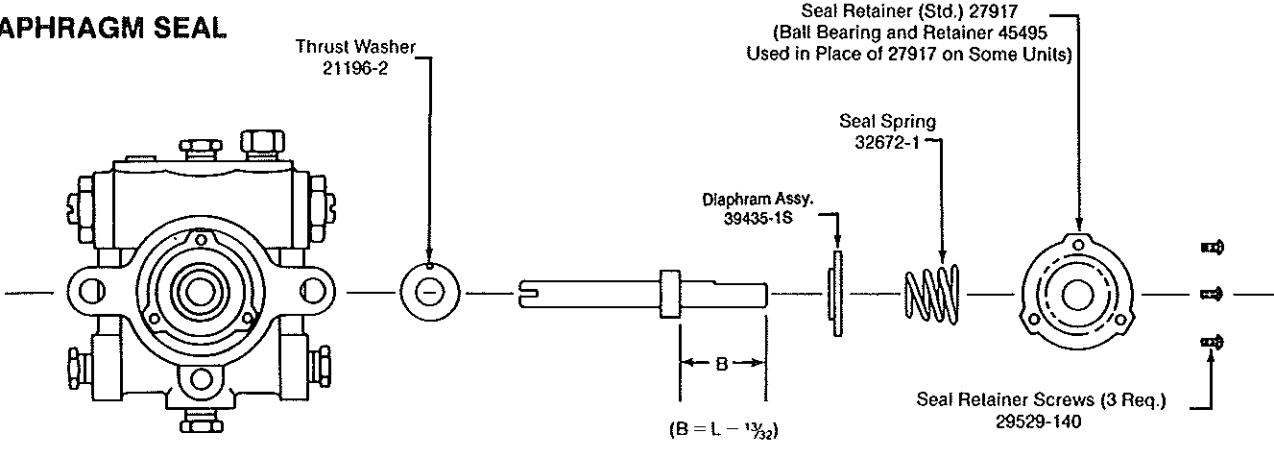


LIP SEAL DRIVE SHAFTS

SINGLE STAGE		PRESSURE GEAR SIZE					
SHAFT EXTEN. SEE TABLE 7	PRESSURE GEAR SIZE						
	1/8	3/16	1/4	3/8	1/2	3/4	
3 1/16		49218	49219				
3/4							
3/8	49217	49218-1	49219-1	49220			
2 7/8							
2 19/32				49220-1			
2 5/8		49218-2					
2 7/16		49218-3					
1 7/8		49218-4	49219-2				
1 1/16		49218-5					
1R00 SERIES TRANSFER UNITS							
3/8					49222-1		
1 7/8				49221	49222	49223	

TWO STAGE		PRESSURE GEAR SIZE						
SHAFT EXTEN.	PRESSURE GEAR SIZE							
	1/8 & 3/16	3/16 & 1/4	1/4 & 3/8	1/4 & 1/4	3/8 & 1/2	3/4 & 1	1 & 1	
3 1/16	49224	49225	49226	49242	49227	49228	49229	
3/4					49227-1			
3/8	49224-1	49225-1		49242-1	49227-2	49228-1		
2 7/8						49228-2		
2 19/32								
2 5/8					49227-3			
2 7/16	49224-2	49225-2	49226-2		49227-4	49228-4	49229-1	
1 7/8		49225-3			49227-5	49228-5		
1 1/16		49225-4						
2 STAGE STEPPED (5/16 OD)								
3 1/16		49376						

DIAPHRAGM SEAL



DIAPHRAGM SEAL DRIVE SHAFT ASSEMBLIES				
PRESSURE GEAR THICKNESS	COUPLING END DIA.	MODEL		
		1R & 21R	2R & 22R -3	2R & 22R -1
1/8	7/16	49586	49593	
3/16	7/16	49587	49594	
3/16	5/16	—	49595	
1/4	7/16	49588	49597	49596
3/8	7/16	49589	49598	
3/8	5/16	—	—	
3/4	7/16	—	49599	
1	7/16	—	49600	

The above part numbers shown are for 3 1/16 extension shafts as measured from the pump mounting face. Shafts can be cut to required length before assembly. Table 7, page 1 gives correct length from mounting face to shaft end for all pumps. To order exact replacement shafts specify complete pump code. Stepped shafts are turned to 5/16" dia. at coupling end.

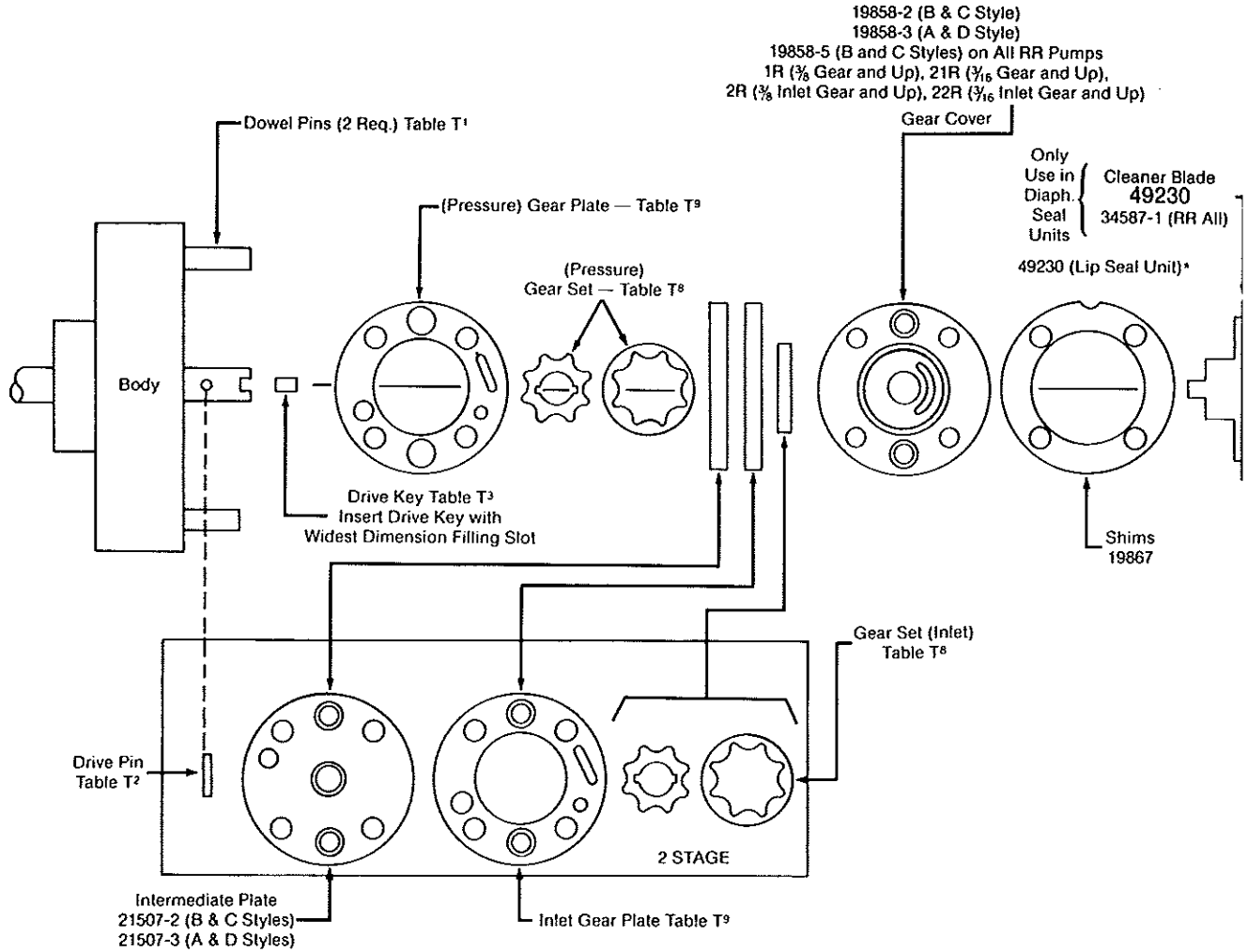
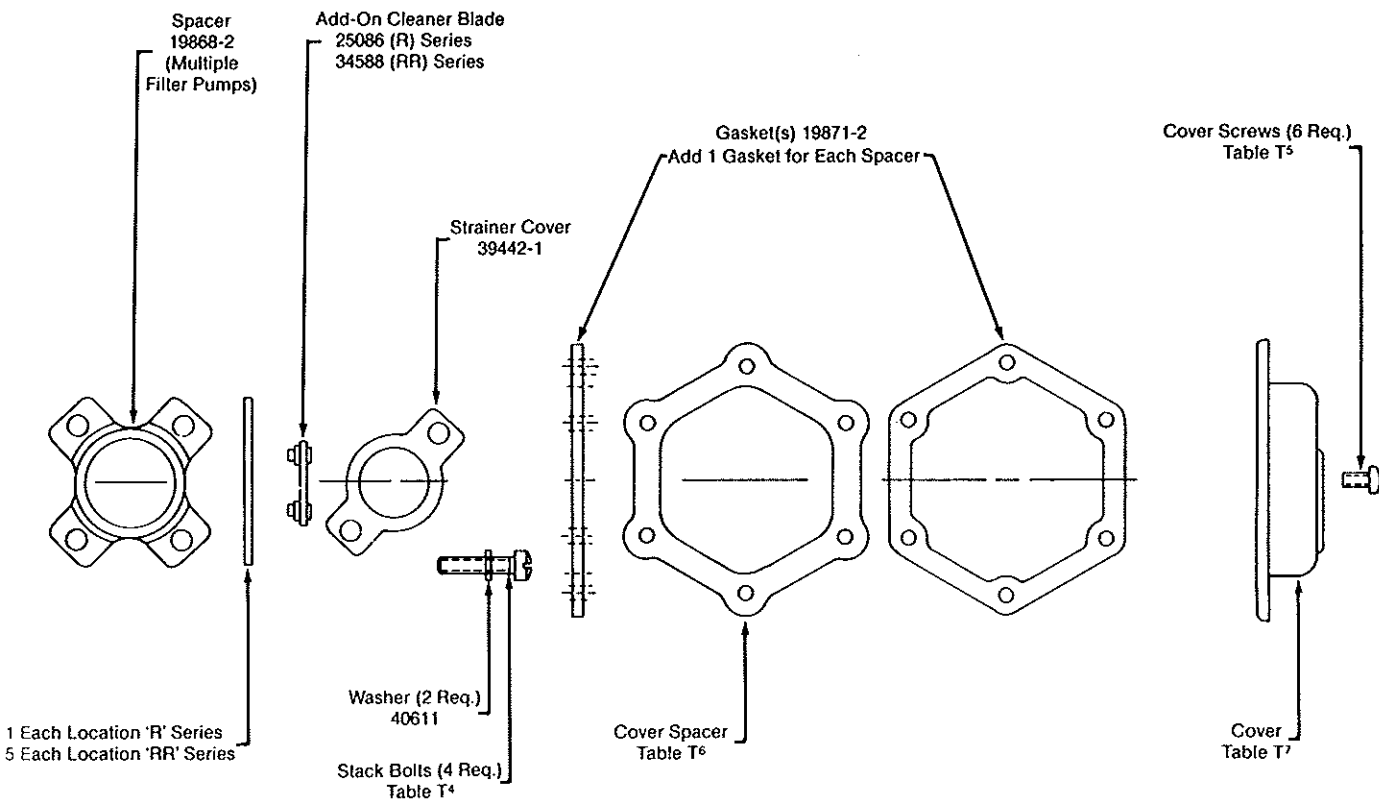


TABLE 6		TABLE T ⁸		TABLE T ⁹
GEAR SIZE CODE	NOMINAL SIZE	GEAR SETS ONLY		GEAR PLATES ONLY ALL
		0-150 PSI — 'R' SERIES	300 PSI — 'R' ALL 'RR'	
0	$\frac{1}{8}$ "	1100005		19859-5
1	$\frac{3}{16}$ "	1100006		19859-3
2	$\frac{1}{4}$ "	1100007		24818-3
3	$\frac{3}{8}$ "	1100008		25082-3
4	$\frac{1}{2}$ "	1100009		(2)24818-3
6	$\frac{3}{4}$ "	1100010		(2)25082-3
8	1"	1100011		(2)25082-3 (1)24818-3



GEAR SIZE		NO. OF FILTERS	TABLE T ¹	T ²	T ³	T ⁴	T ⁵	T ⁶	T ⁷
PRESS	INLET		DOWEL PIN NUMBER	DRIVE PIN	DRIVE KEY	STACK BOLTS NUMBER	COVER SCREWS NUMBER	COVER SPACER	COVER
1/8	None	1	20149-6	—	37231	29521-53	29529-140	—	19870A
3/16	None	0	19860	—	21417	29521-53	29529-140	—	19870A
3/16	None	1	19860	—	21417	29521-54	29529-140	—	19870A
3/16	None	2	19860	—	21417	29521-24	29529-140	—	20141A
1/4	None	1	19860-1	—	21417	29521-54	29529-140	—	19870A
3/8	None	2	25887	—	21417	29521-24	29529-140	—	20141A
3/8	None	6	25887	—	21417	29521-49	29521-99	25084-1	20141A
3/8	None	0	25887	21512	—	29521-24	29521-140	—	19870A
1/2	None	3	20149-11	—	21417	29521-48	29529-140	—	20141A
1/2	None	0	20149-11	21512	—	29521-24	29529-140	—	20141A
3/4	None	0	20149-20	21512	—	29521-48	29521-140	—	20141A
1/8	3/16	1 *	20149-7	37322	21417	29521-48	29529-140	—	20141A
1/8	3/16	2	20149-7	37322	21417	29521-49	29529-140	—	20141A
3/16	1/4	0	20149-1	21512	21417	29521-48	29529-140	—	20141A
3/16	1/4	1	20149-1	21512	21417	29521-49	29529-140	—	20141A
3/16	1/4	2 •	20149-1	21512	21417	29521-49	29529-140	—	20141A
3/16	1/4	3 *	20149-1	21512	21417	29521-50	29521-78	—	20141A
1/4	1/4	1	20149-4	21512	21417	29521-49	29529-140	—	20141A
1/4	1/4	2	20149-4	21512	21417	29521-49	29521-99	25084-1	20141A
1/4	3/8	3	20149-13	21512	21417	29521-51	29521-99	25084-1	20141A
3/8	1/2	2	20149-5	21512	21417	29521-51	29521-99	25084-1	20141A
3/8	1/2	3 *	20149-5	21512	21417	29521-52	29521-69	25656-1	20141A
3/8	1/2	6 □	20149-5	21512	21417	29521-46	29521-69	25656-1	20141A
3/4	1	0 *	20149-8	21512	21512 pin	29521-102	29521-78	—	20141A
3/4	1	6 ▲	20149-8	21512	21512 pin	29521-56	29521-80	(2)25656-1	20141A
1	1	6	20149-9	21512	21512 pin	29521-101	29521-94	(2)25656-1 (1)25084-1	20141

* Two stage RR use 20141A cover, 29521-78 (1") cover screw.

• Two stage RR use 20141A cover, 29521-78 (1) cover screw, and 29521-89 (1 7/8) stack screws.

□ Two stage RR use 20141A cover, 29521-78 (1") cover screw, and 29521-102 (2) stack screws.

▲ Two stage RR use 20141A cover, 29521-68 (2") cover screw, and 29521-92 (3 3/4) stack screws, and (1) cover spacer.

DISASSEMBLY

Step 1: Plug all ports and wash exterior of pump with mineral spirits.

Step 2: Remove Valve Section (see page 2). Use 1" box or open end wrench to remove valve adjusting plug and plug and guide assembly.

Caution: Be sure to remove or loosen the adjusting plug to relieve spring pressure from the piston seat before loosening the plug and guide assembly.

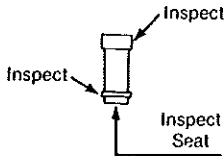
Step 3: Remove Gear Section (see pages 4 and 5). After removing cover screws tap the side of front cover with a plastic hammer as this cover has a tendency to adhere to the body.

Caution: On two stage (diaphragm seal) units be sure that the pressure gear drive pin has been removed or the drive shaft cannot be removed in step 4.

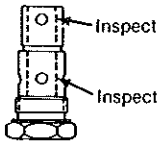
Step 4: Remove Seal Section (see page 3). After the three retainer screws have been removed all parts except the thrust washer will come out by pulling on the drive shaft on diaphragm seal units.

On lip seal units, shaft must be removed from inside pump (after disassembling the gear stack). With shaft removed, retainer and seal can be pried out with screwdriver if replacement is necessary. Care must be taken not to scratch the hub bore while prying out seal. Do not remove seal if it is performing satisfactorily. Once seal is removed, it will be distorted and must be replaced.

INSPECTION OF PARTS



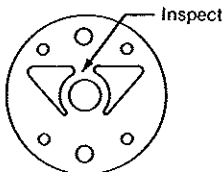
Inspect piston assembly for wear or damage to the seat and points shown.



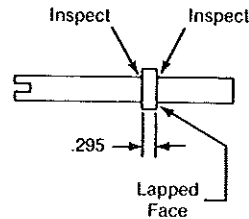
Inspect piston guide for wear on inside of guide at points shown. (Low delivery and/or piston chatter may result from excessive wear at these points.)



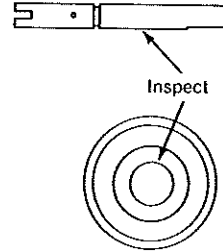
Inspect gear assembly for wear by checking to see how well the gears mesh. Clearance over .002 may cause low delivery.



Inspect gear cover plate and intermediate plate for wear or scoring on face. Inspect cleaner blade tips for wear and flatness.



Diaphragm Seal Units: Inspect drive shaft assembly for wear on both sides of seal nose. Seal nose face must be relapped before assembling into unit. Use ST14R lapping tool. Replace shaft if seal nose worn more than .040.



Lip Seal Units: Consider replacing shaft if there is wear in the area contacted by the seal lips.

Inspect diaphragm assembly for damage to rubber part and wear on the lapped surface. If the slightest amount of wear appears on the lapped surface replace the part.

Lip Seal: Replace if leaking. If seal rubber is swelled or softened due to chemical contaminants in the fuel, replace with viton seal #48500 (see page 3). If rubber is firm but lips are worn, check pumping system for excessive inlet pressure and/or abrasive contamination.

ASSEMBLY

Step 1: Wash all parts with mineral spirits and be sure your work area is clean.

Step 2: Assemble Seal Section (see page 3). Be sure the tongue on thrust washer fits into the seal lubrication hole on body on diaphragm seal models.

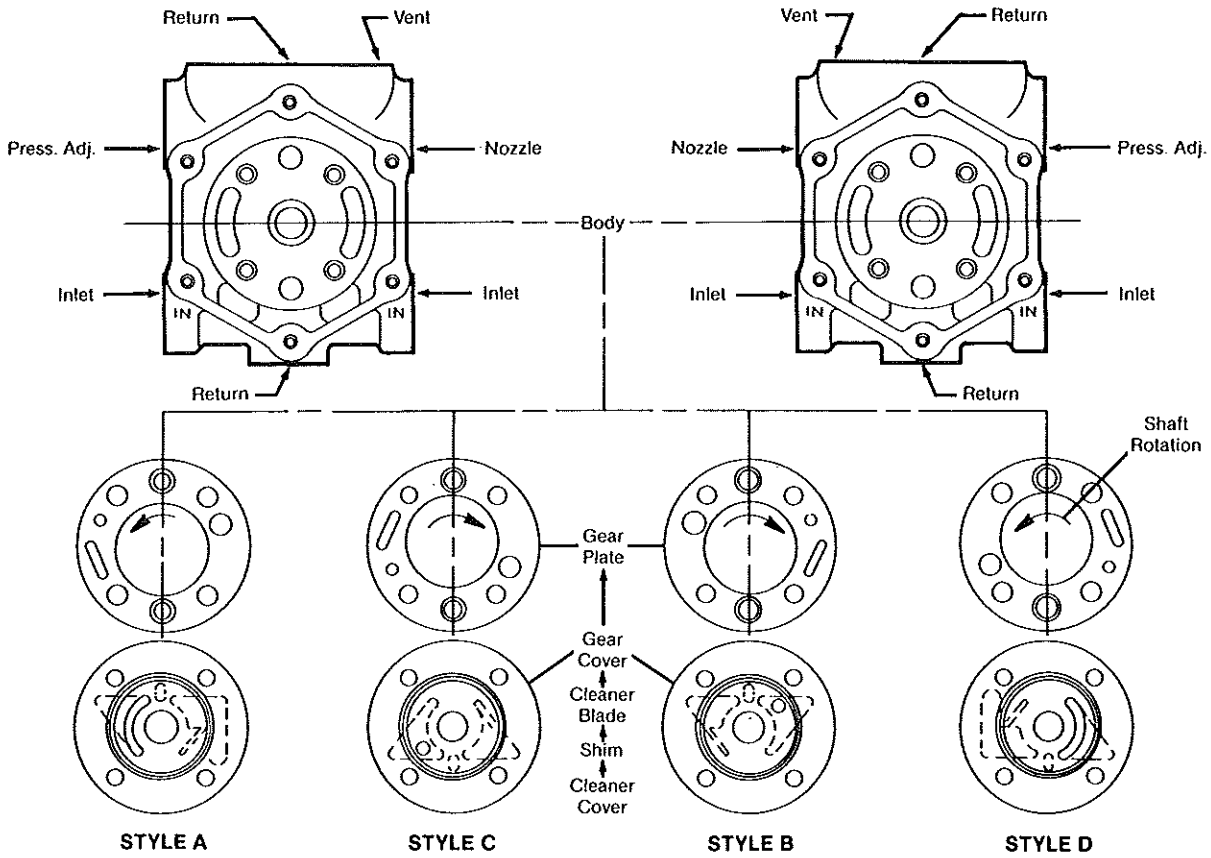
Lip seal models: Oil the seal lips before inserting the shaft. Rotate the shaft slowly while forcing shaft flat thru the seal to avoid damaging the seal lips.

Step 3: Assemble Gear Section (see pages 4 and 5). Refer below for correct plate position. Rotate drive shaft when tightening the gear coverplate screws to insure optimum alignment.

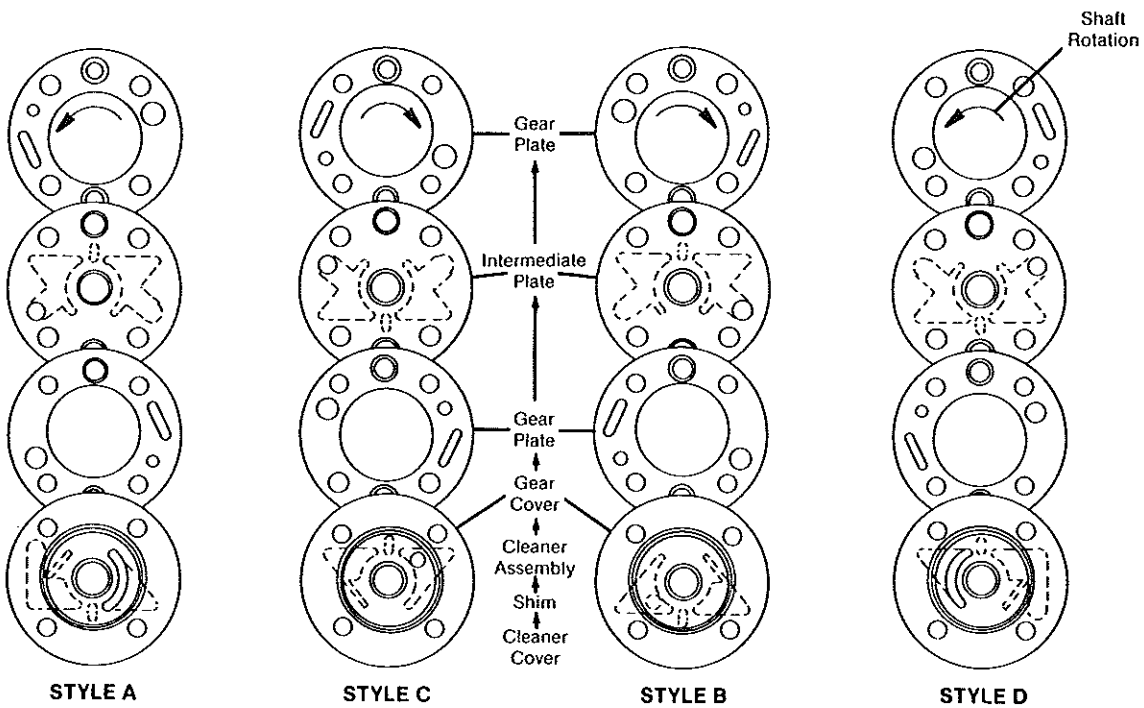
Step 4: Assemble Valve Section (see page 2). A & C style plug and guide assembly in left port as viewed from shaft end. B & D style plug and guide assembly (item 18) right in right port as viewed from shaft end.

Step 5: Operationally test in accordance with normal test procedures. (See page 8 for simplified test set-up.)

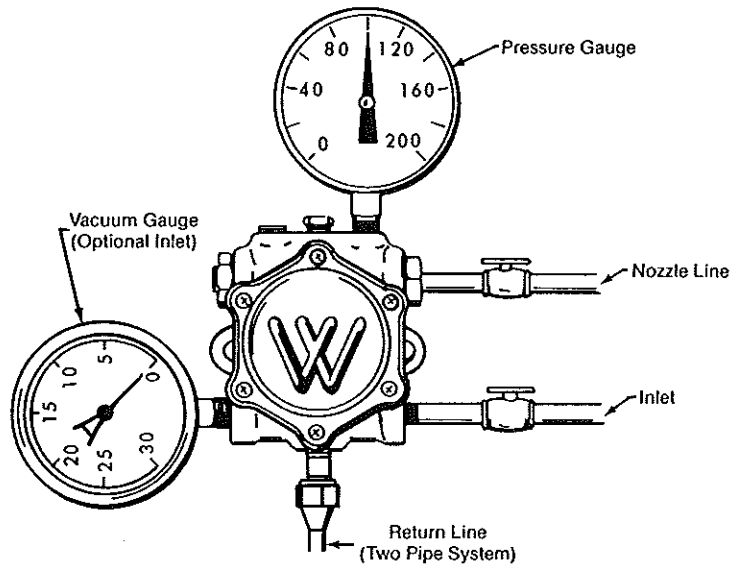
"R" SERIES — SINGLE STAGE



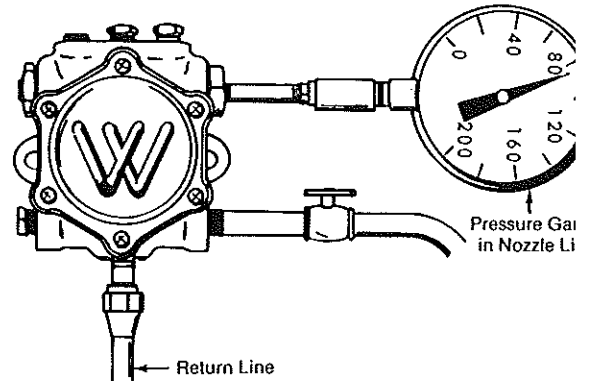
"R" SERIES — TWO STAGE



SIMPLIFIED TEST SET-UP AND PROCEDURE



SET-UP A



SET-UP B

Test all units with by-pass installed for two pipe system.

Delivery and vacuum test — Set-up A above.

1. Set pressure adjusting screw to required pressure.
2. Measure nozzle delivery at set pressure.
3. Close inlet valve to check vacuum.

Cutoff Test — Set-up B above. (For units equipped with internal cutoff only.)

1. Set pressure at rated pump pressure.
2. Shut off motor. Pressure should hold at 80% or above rated pressure. If pressure drops to 0 PSI, cutoff leaks.

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