

**Rock and Gravel
Spreader**

SERIAL # _____

WORK ORDER # _____

Chandler Equipment Company Personnel

Bill Chandler	Chief Executive Officer Advertising & Marketing Dealer / Distributor Arrangements
Brannon Chandler	General Manager Production & Scheduling Warranty, Sales and Service
Linda Chandler	Office Manager Accounts Payable
Andrea Thompson	Administrative Assistant Inside Sales
Lisa Johnson	Accounts Receivable Collections
Michael Sosebee	Sales Manager
Gene Dye	Outside Sales Mid-South Regional Sales Manager
Mike Gillum	Outside Sales Mid-Atlantic Regional Sales Manager
Dan McCorvey	Outside Sales Southeast Regional Sales Manager
Michael Anderson	Precision Ag Products
Wes Hobgood	Parts & Service
Kimbro Grizzle	Parts & Service
Mark Edwards	Service
Danny Smith	Engineering

Basic Operation of Chandler Rock and Gravel Spreader

Basic Start Up:

1) Engage Power Take Off (PTO)

- A) Using cable or air shifter engage PTO
- B) After engaging PTO run hydraulic system for 10 minutes. This will allow the hydraulic oil to reach proper operating temperature.
- C) Not allowing hydraulic oil to warm up could damage some components and Void warranty.

2) Adjusting Discharge Gate Height

- A) While watching Gate Height Indicator press Gate Switch to raise gate to desired height.

3) Starting Flow of Material

- A) Set switches on controller as follows:
 - 1) Conveyor Dial to 6
 - 2) Spinner Dial to 3
 - 3) High/Low Switch to Low
 - 4) Disengage Clutch
 - 5) This will start conveyor and spinners, as material is flowing adjust conveyor speed to desired amount and spinner speed for desired width of spread.
 - 6) After setting spread width you may need to change to high side on conveyor to reach desired amount of material flow.

Caution: Never load unit with gate open

Maintenance

We are pleased you selected our equipment. We feel, as we are sure you do, that equipment must be maintained properly and made to last as long as possible. Outlined below are areas to be properly maintained.

1) Gates:

The gates and gate slides are manufactured heavy carbon steel. The only maintenance required should be occasionally cleaning slides.

2) Conveyor Chain:

Frequent cleaning and adjusting conveyor chains is advisable.

3) Bearings:

Although Chandler spreaders come with factory pre-greased bearings, we recommend that you grease all bearings before using your spreader.

Do Not over grease bearings

Only one shot of grease pre day.

Over greasing bearings will shorten the life of the bearings.

4) Hydraulic System:

A) Hydraulic filters should be changed every 120-200 hours or every four months.

Chandler spreader comes with 10-micron filters.

Use of filters not meeting these specifications could damage hydraulic components and void warranty.

B) Hydraulic Oil

Kendall Four Seasons

ISO VG 46

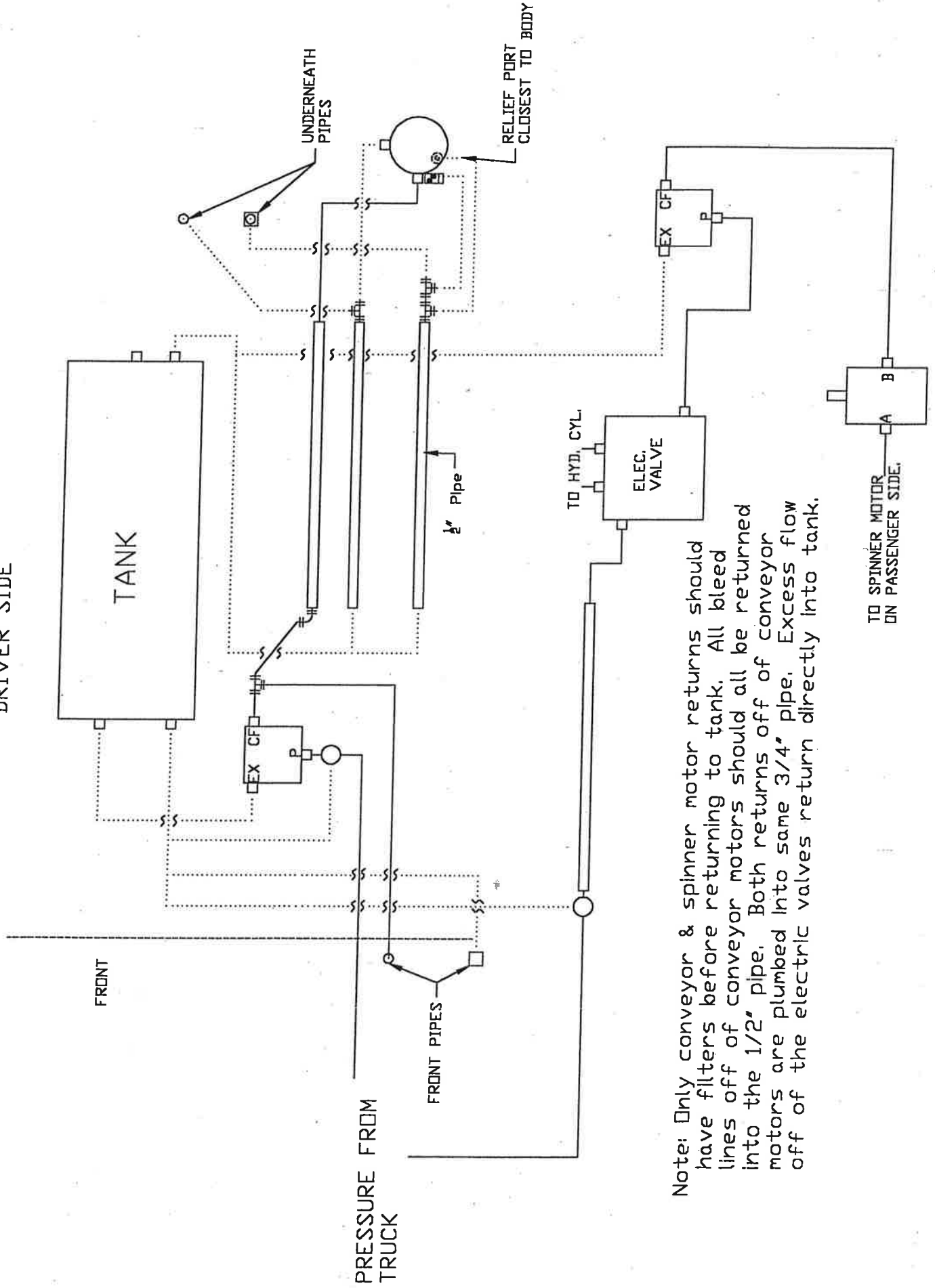
SAE 15W

C) Hydraulic Oil Level – Chandler spreader come with oil level sight gauge.

Oil level should be to the top line on the gauge. Never let oil level get less than half way down on sight gauge

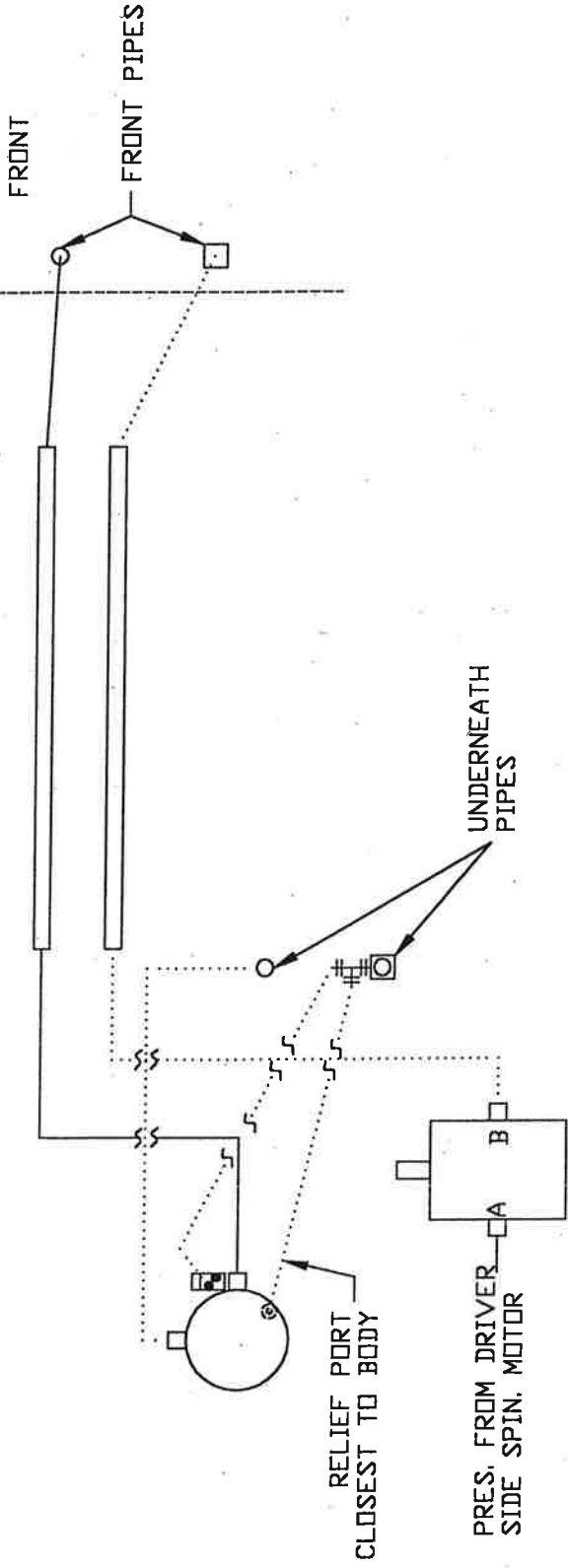
ROCK BODY HYDRAULIC DIAGRAM

DRIVER SIDE



Note: Only conveyor & spinner motor returns should have filters before returning to tank. All bleed lines off of conveyor motors should all be returned into the 1/2" pipe. Both returns off of conveyor motors are plumbed into same 3/4" pipe. Excess flow off of the electric valves return directly into tank.


PASS. SIDE




 ELEC. PRIORITY VALVE

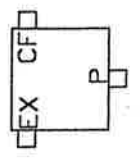

 PRESSURE LINES


 RETURN LINES

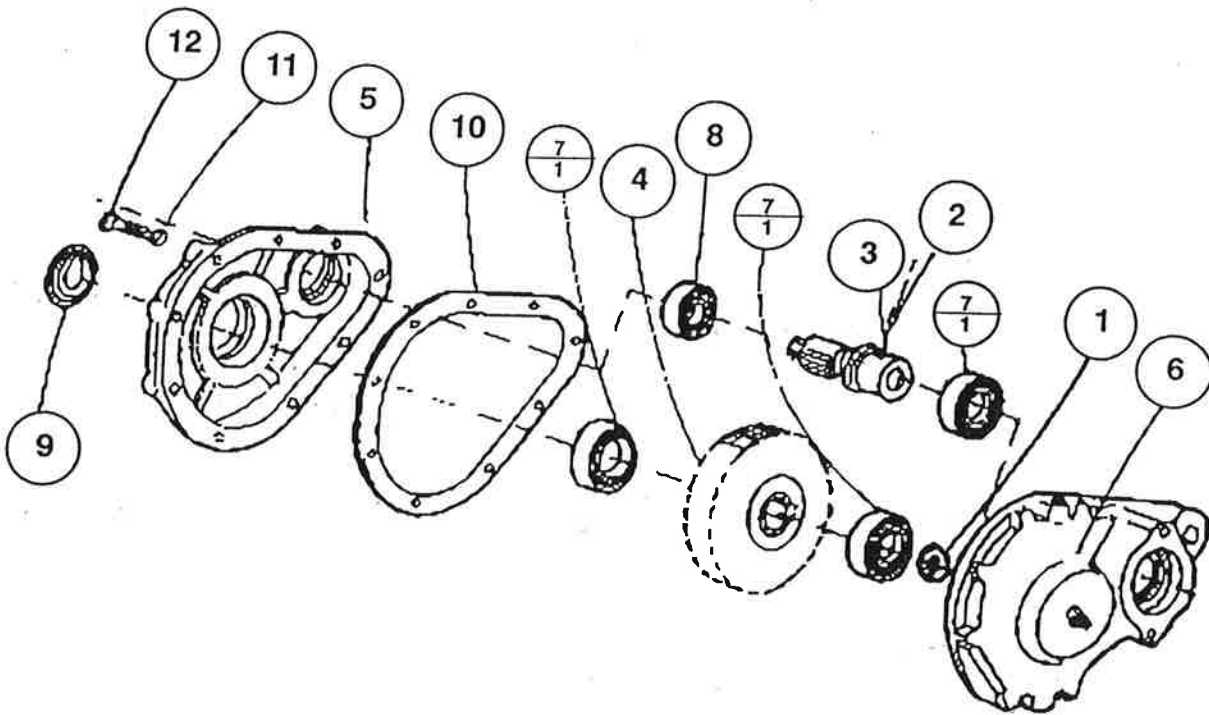

 RELIEF VALVE


 CONVEYOR MOTOR
 (SL 14 ROSS)


 SPINNER MOTOR

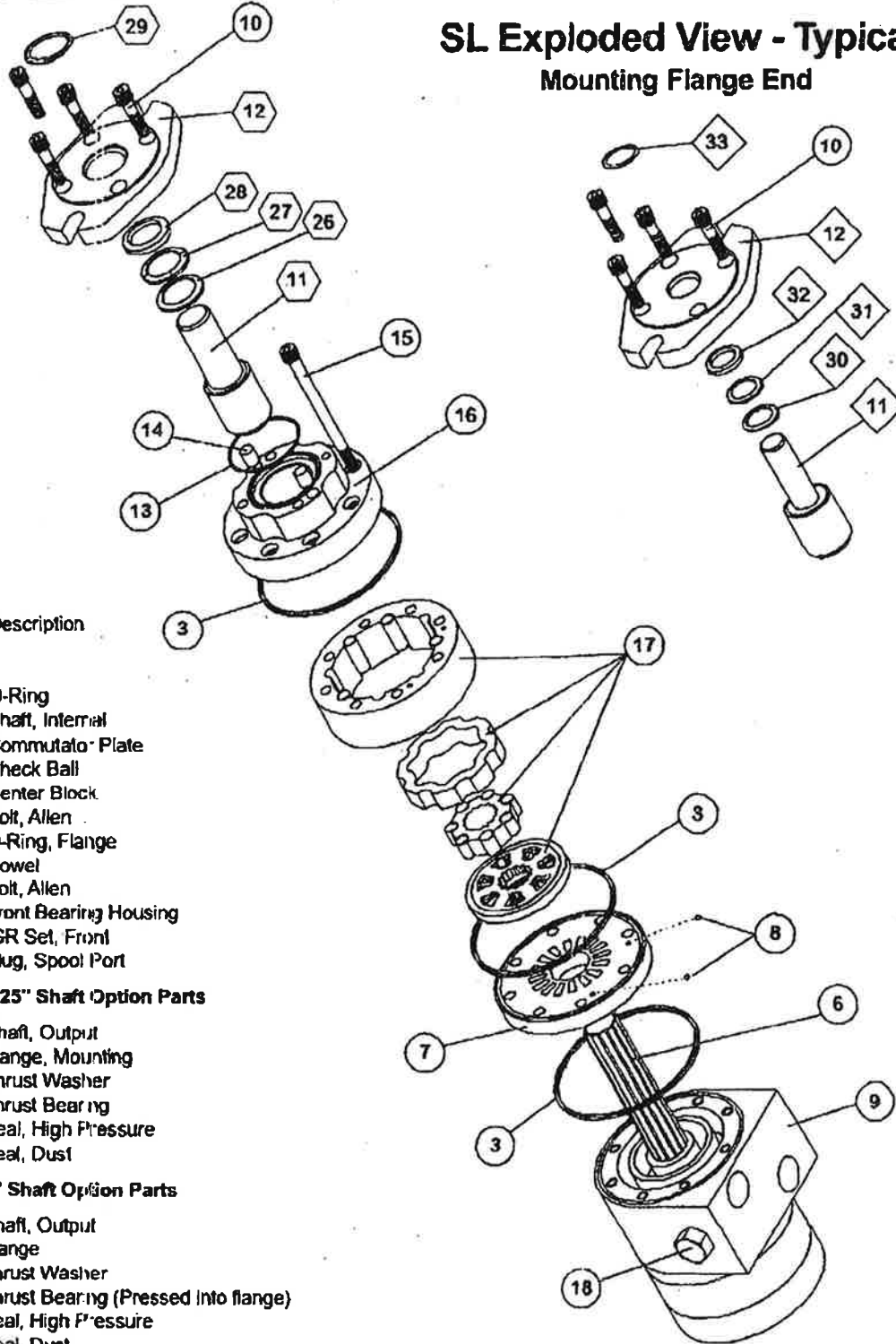


SINGLE SPEED REDUCER 301075 STANDARD



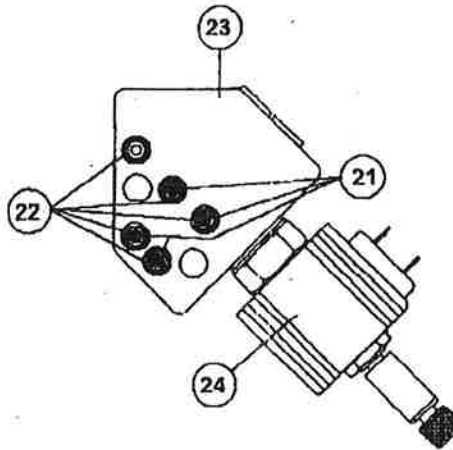
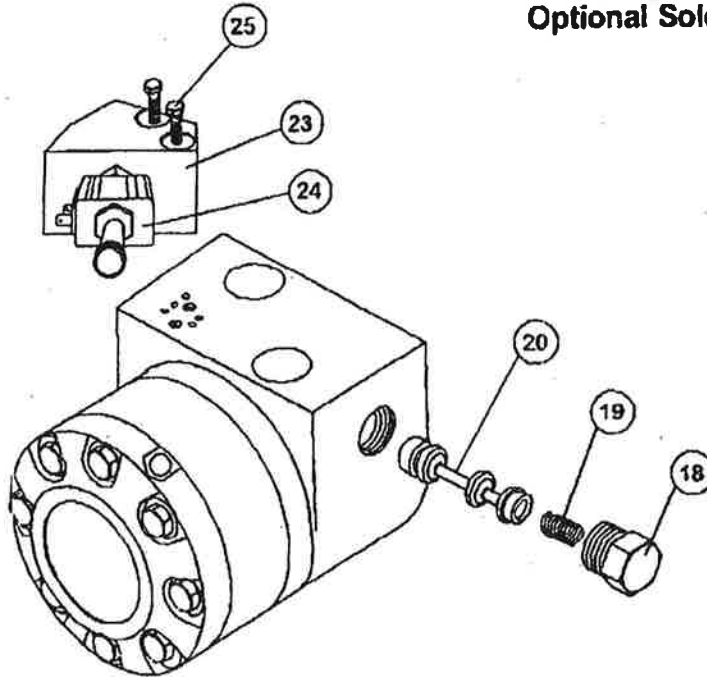
<u>Ref.</u>	<u>Part Description</u>	<u>Part #</u>
1	Washer	N/A
2	Plug - Delrin	N/A
3	Gear - Pinion - 11 Tooth	100-R-1-08
4	Gear - 67 Tooth	100-R-1-07
5	Housing - Inboard	100-R-1-09
6	Housing - Outboard	100-R-1-10
7	Bearing - Output	100-R-1-03
8	Bearing - Pinion	100-R-1-04
9	Oil Seal	100-R-1-05
10	Gasket	100-R-1-06
11	Washer - Lock	N/A
12	Screw - Cap	N/A
*	Complete Gear Case	100-R-1-01

SL Exploded View - Typical Mounting Flange End



- | Item No. | Description |
|-------------------------------------|--------------------------------------|
| 3 | O-Ring |
| 6 | Shaft, Internal |
| 7 | Commutator Plate |
| 8 | Check Ball |
| 9 | Center Block |
| 10 | Bolt, Allen |
| 13 | O-Ring, Flange |
| 14 | Dowel |
| 15 | Bolt, Allen |
| 16 | Front Bearing Housing |
| 17 | IGR Set, Front |
| 18 | Plug, Spool Port |
| <p>○ = 1.25" Shaft Option Parts</p> | |
| 11 | Shaft, Output |
| 12 | Flange, Mounting |
| 26 | Thrust Washer |
| 27 | Thrust Bearing |
| 28 | Seal, High Pressure |
| 29 | Seal, Dust |
| <p>◇ = 1" Shaft Option Parts</p> | |
| 11 | Shaft, Output |
| 12 | Flange |
| 30 | Thrust Washer |
| 31 | Thrust Bearing (Pressed into flange) |
| 32 | Seal, High Pressure |
| 33 | Seal, Dust |

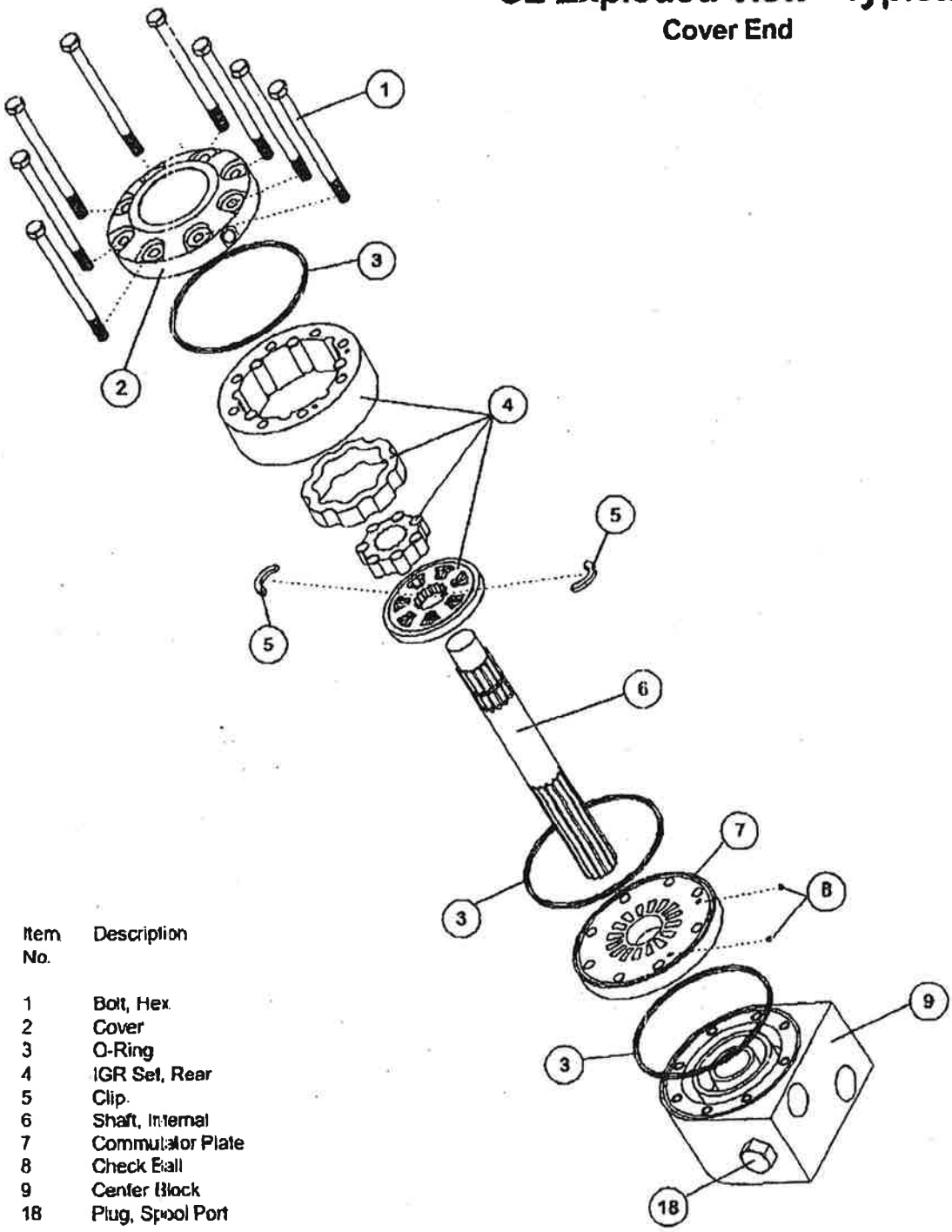
SL Exploded View - Typical Optional Solenoid



Solenoid Block
Bottom View

Item No.	Description
18	Plug, Spool Port
19	Spring, Valve
20	Valve
21	Check Ball, Solenoid Block
22	O-Ring Solenoid
23	Solenoid Block
24	Solenoid
25	Hex Bolt

SL Exploded View - Typical Cover End



Item No.	Description
1	Bolt, Hex.
2	Cover
3	O-Ring
4	IGR Set, Rear
5	Clip
6	Shaft, Internal
7	Commutator Plate
8	Check Ball
9	Center Block
18	Plug, Spool Port

SL Service Parts List Chart Continued

1.25" DIA. SHAFT	EXPLODED VIEW				
	ITEM #	26	27	28	29
	DESCRIPTION	THRUST WASHER	THRUST BEARING	SEAL HIGH PRESSURE	SEAL DUST
	Service Part #	2271	2270	2150	1435

1" DIA. SHAFT	EXPLODED VIEW				
	ITEM #	30	31	32	33
	DESCRIPTION	THRUST WASHER	THRUST BEARING (pressed into flange)	SEAL HIGH PRESSURE	SEAL DUST
	Service Part #	1323	1585	2175	1325

OPTION GROUP	EXPLODED VIEW			
	ITEM #	2	24	20
	DESCRIPTION	COVER	SOLENOID	VALVE
	Service Part #	M110c-8 Standard M110c-23 Encoder	1824 with Manual Override 2891 without Manual Override	1825 Open Center 2792 Closed Center

SEAL KITS COMPLETE	1" OUTPUT SHAFTS				1.25" OUTPUT SHAFTS			
	Kit # 3037				Kit # 3163			
	Includes;	P/N	QTY	Description	Includes;	P/N	QTY	Description
		1046	6	Body O-rings		1046	6	Body O-Rings
		1060-34	1	Flange O-ring		1060-34	1	Flange O-Ring
		1325	1	Dust Seal		1435	1	Dust Seal
		2175	1	1.063" Dia. High Pressure Seal		2150	1	1.311" Dia. High Pressure Seal
		032841	5	Solenoid Block O-Rings		032841	5	Solenoid Block O-Rings
		1585	1	Thrust Bearing				

SL Service Parts List Chart

		EXPLODED VIEW						
		ITEM #	3	5	7	8	13	14
SERIES	SL	DESCRIPTION	O-RING	CLIP	COMMUTATOR PLATE	CHECK BALL	O-RING FLANGE	DOWEL
	Service Part #	1046	1660	3190	1021	1060-34	1028-2	
		EXPLODED VIEW						
		ITEM #	18	19	21	22	23	25
SERIES	SL	DESCRIPTION	PLUG, SPOOL PORT	SPRING	CHECK BALLS SOLENOID BLOCK	O-RING SOLENOID	SOLENOID BLOCK	HEX BOLT
	Service Part #	75013-10	1826	1320	032B41	1823	021442	

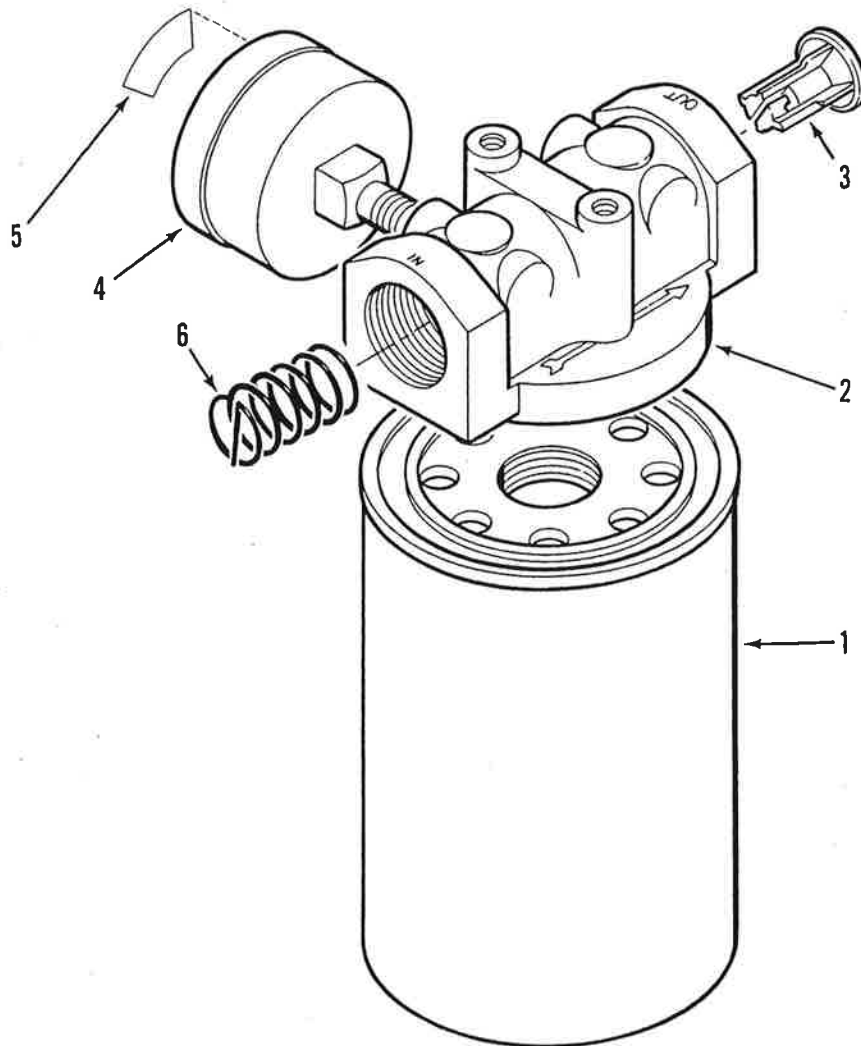
		EXPLODED VIEW					
		ITEM #	6	1	4	15	17
DISPLACEMENT GROUP	07	DESCRIPTION	SHAFT, INTERNAL STANDARD	HEX BOLT	IGR SET REAR	BOLT ALLEN	IGR SET FRONT
	Service Part #	2865-072	(2249-072)	021363	2904-1	2992-072	2917-1
	11	Service Part #	2865-108	(2249-108)	021428	2904-2	2992-108
	14	Service Part #	2865-142	(2249-108)	021356	2904-3	2992-108
	18	Service Part #	2865-176	(2249-176)	021306	2904-4	2992-276
	21	Service Part #	2865-212	(2249-212)	021382	2904-5	2992-212
	26	Service Part #	2865-258	(2249-258)	021437	2904-6	2992-258

		EXPLODED VIEW		
		ITEM #	9	16
HOUSING GROUP		DESCRIPTION	CENTER BLOCK	FRONT BEARING HOUSING
	Service Part #	PA-2534 (7/8-14 O-ring, Pilot Act.)	PA-2985-2 (1/4-19 BSPP)	
	Service Part #	PA-2535 (7/8-14 O-ring Solenoid)	PA-2985-1 (7/16-20 O-Ring)	
	Service Part #	PA-3106 (BSPP Pilot Act.)		
	Service Part #	PA-3111 (BSPP Solenoid)		
	Service Part #	PA-2817 (Manifold, Pilot Act.)		

		EXPLODED VIEW			
		ITEM #	11		
		DESCRIPTION	1" DIA. SHAFT, OUTPUT	1.25" DIA.	
	Service Part #	2970-0	1" Key	2928-3	1.25" Key
	Service Part #	2970-1	6B Spline	2928-4	1.25" Taper
	Service Part #	2970-2	25mm Key	2928-5	1.25" 14T Spline
	Service Part #	2970-6	7/8" 13T Spline	2928-8	32mm Key

		EXPLODED VIEW			
		ITEM #	12		
SHAFT GROUP		DESCRIPTION	1" DIA. SHAFT	FLANGE (WITH SEALS)	1.25" DIA. SHAFT
	Service Part #	PA-2983-1	1" Shaft "A" Flange	PA-2984-1	1.25" Shaft "A" Flange
	Service Part #	PA-2983-2	1" Shaft "B" Flange	PA-2984-2	1.25" Shaft "B" Flange

PARTS ORDERING INFORMATION

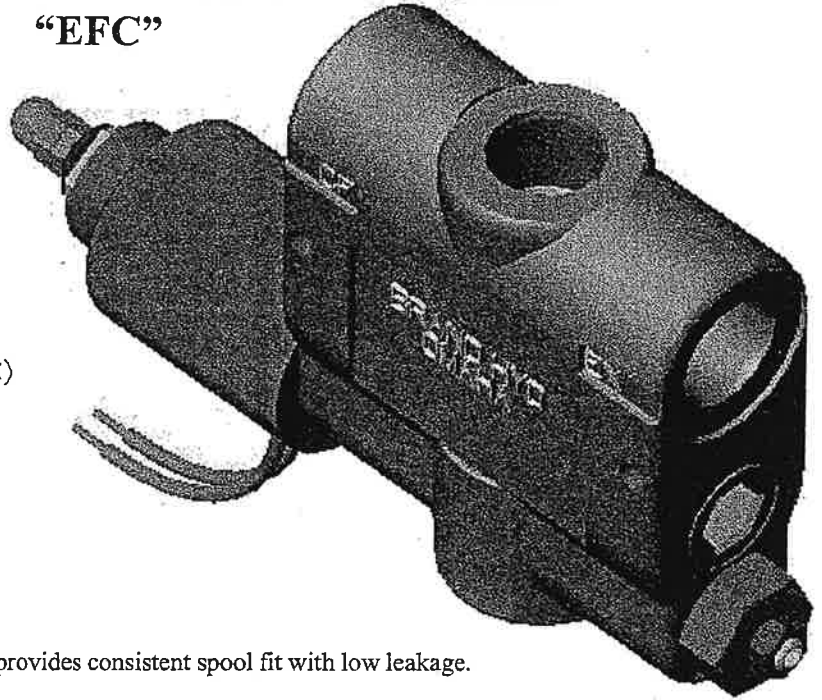
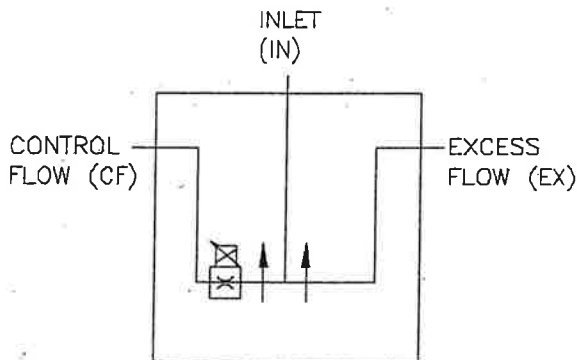


PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QUANTITY REQ'D
1	See Table 1	Filter Element	1
2	7502-XXX	Head Casting*	1
3	8402-001	By-Pass Poppet	1
4	K-23028	Compound Indicator (pressure) with No. 6673-001 Decal	1
5	11918-001 6673-001	30" Vacuum Indicator Indicator Decal, Red for Compound Indicators only	1
6	See Table 2	By-Pass Spring	1

*Filter Head Casting is not available as a spare part. Order complete Filter Assembly (See Filter Catalog No. PC-3020).

ELECTRONICALLY ADJUSTABLE PROPORTIONAL PRESSURE COMPENSATED FLOW CONTROL "EFC"



FEATURES:

- **DIAMOND LAPPED SPOOL BORE** provides consistent spool fit with low leakage.
- **O'RING PORTS** to eliminate leakage.
- **EVERY EFC IS TESTED** for shutoff, linearity, max. flow, crack open flow and pressure compensation.
- **STANDARD 3-PORT** allows for pressure compensated flow out of two ports.
- **OPTIONAL 2-PORT** allows for pressure compensated flow out of one port.
- **OPTIONAL FREE REVERSE FLOW** allows fluid to move from the CF (control flow) port to the inlet.
- **MANUAL OVERRIDE** when electrical power is lost.

SPECIFICATIONS:

- See flow chart for capacity.
- **3000 psi (207 bar) rating.**
- **Weighs 8-1/2 lbs. (3.9 kg).**
- **Standard Port size #12SAE (1-1/16 - 12).**
- **10-Micron Filtration Recommended.**
- **Coil - 12 volts DC standard.**
 - 9.6 ohms.
 - 15 watts.
 - 1.0 amp max.
- **Pulse Frequency (90 to 115 hz).**
- **Response Time - 0.031 (375 ms).**
 - 0.020 (900 ms).
 - 0.093 (175 ms to 350 ms depending on flow).
- **Spool leakage (50 ml/min. @1000 psi on EX port).**

MATERIALS:

- **Cast Iron Body**
- **Heat Treated Steel Spools**
- **Buna N O'Rings**
- **Heat Treated Free Reverse Check Seat**

EFC – GENERAL INFORMATION

The Brand, electronically adjustable proportional pressure compensated flow control is an electronically controlled version of the original FC51 style flow control valve. The EFC performance as a flow control is very similar to the FC51 because they both use the same spring and compensator spool. Thus, the control flow port (CF) and the excess flow port (EX) remain usable and pressure compensated.

The main advantage of the EFC over the FC51 is that the flow can be adjusted proportionally with a solenoid instead of manually. As the current to the solenoid increases the variable orifice moves and proportionally opens an orifice in the valve (similar to positioning the rotary side lever on the manual FC's). The solenoid is connected to our EC – series controls which can be sold with the EFC. We also give the choice of a dashpot size, which allows the customer to select a valve that responds to the control box at different rates. A few other advantages are that the EFC offers 2-port and free reverse flow.

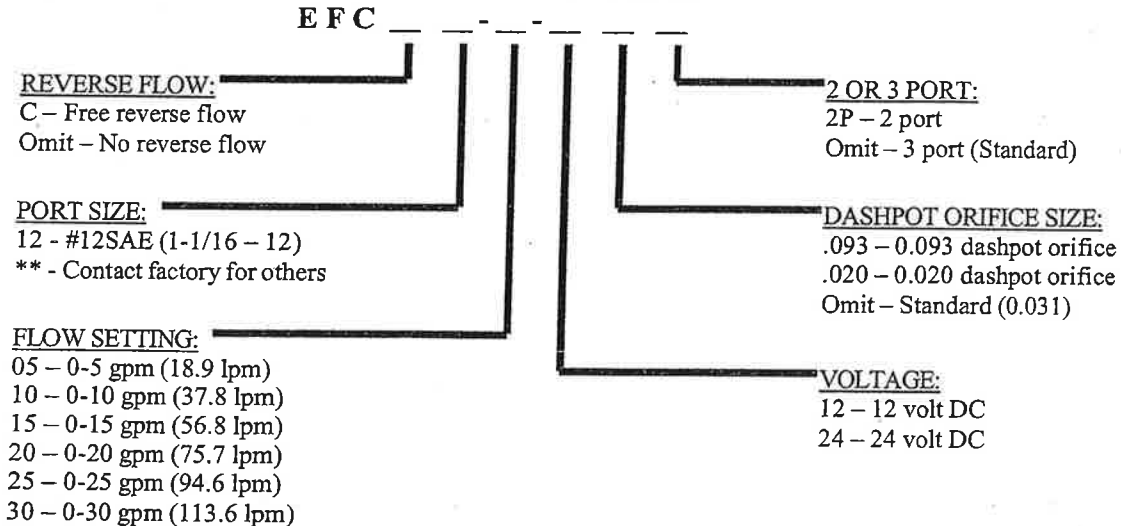
2-PORT- The 2-port (2P) option is a modified version of the standard 3-port EFC. This option lets the customer use the control flow port while the excess port is plugged. A special compensator spool was designed to eliminate hunting that can occur between pressure compensated valves and pumps. To use the EFC 2-port a pressure compensated pump is required because the fluid is not able to return to tank when the control flow port is shut off. The 2-port can be converted to a 3-port (by removing the EX plug), but it will not have the same characteristics as the standard 3-port. (See chart on next page for 2-port EFC)

FREE REVERSE FLOW- The free reverse flow option was designed to be used primarily where cylinders and motors are needed to go in reverse. The flow can only go in reverse from controlled flow (CF) to the inlet (IN). Flow is not metered when it goes in reverse. The non metered flow travels into the compensator spool, past the guided ball check and then through the inlet. The steel ball seat inside the compensator spool is heat treated to assure a long life.

EFC – EXAMPLES OF COMMON MODEL CODES:

EFC12-10-12.....10 gpm 3-port with 12 volt coil
 EFC12-10-122P.....10 gpm 2-port with 12 volt coil
 CEP1000.....10 gpm 3-port with EC-12-01 control

EFC – CREATING A MODEL CODE FOR EFC'S:



EFC WITH ELECTRONIC CONTROL:

C E P 0 0

REVERSE FLOW:
 C – Free reverse flow
 Omit – No reverse flow

CONTROLS:
 D – EC-12-02 (Dashmount)
 Omit – EC-12-01 (Weather proof box)

FLOW SETTING:
 05 – 0-5 gpm (18.9 lpm)
 10 – 0-10 gpm (37.8 lpm)
 15 – 0-15 gpm (56.8 lpm)
 20 – 0-20 gpm (75.7 lpm)
 25 – 0-25 gpm (94.6 lpm)
 30 – 0-30 gpm (113.6 lpm)

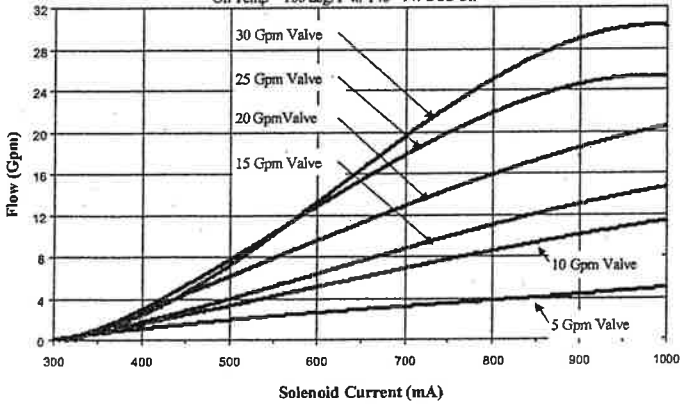
2 OR 3 PORT:
 2P – 2 port
 Omit – 3 port (Standard)

DASHPOT ORIFICE SIZE:
 .093 – 0.093 dashpot orifice
 .020 – 0.020 dashpot orifice
 Omit – Standard (0.031)

EFC FLOW & SOLENOID CURRENT INFO FOR 2-PORT AND 3-PORT:

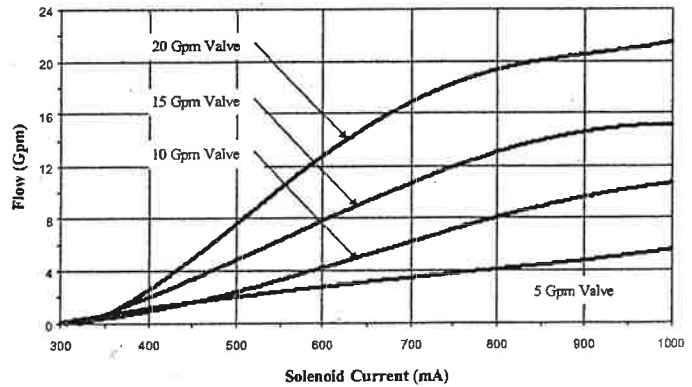
Flow vs. Solenoid Current for EFC 3-Port

Oil Temp = 100 deg. F w/ 140 - 147 SUS Oil

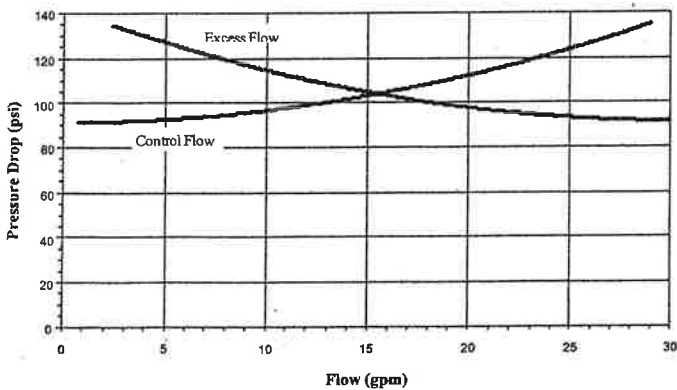


Flow vs. Solenoid Current for EFC 2-Port

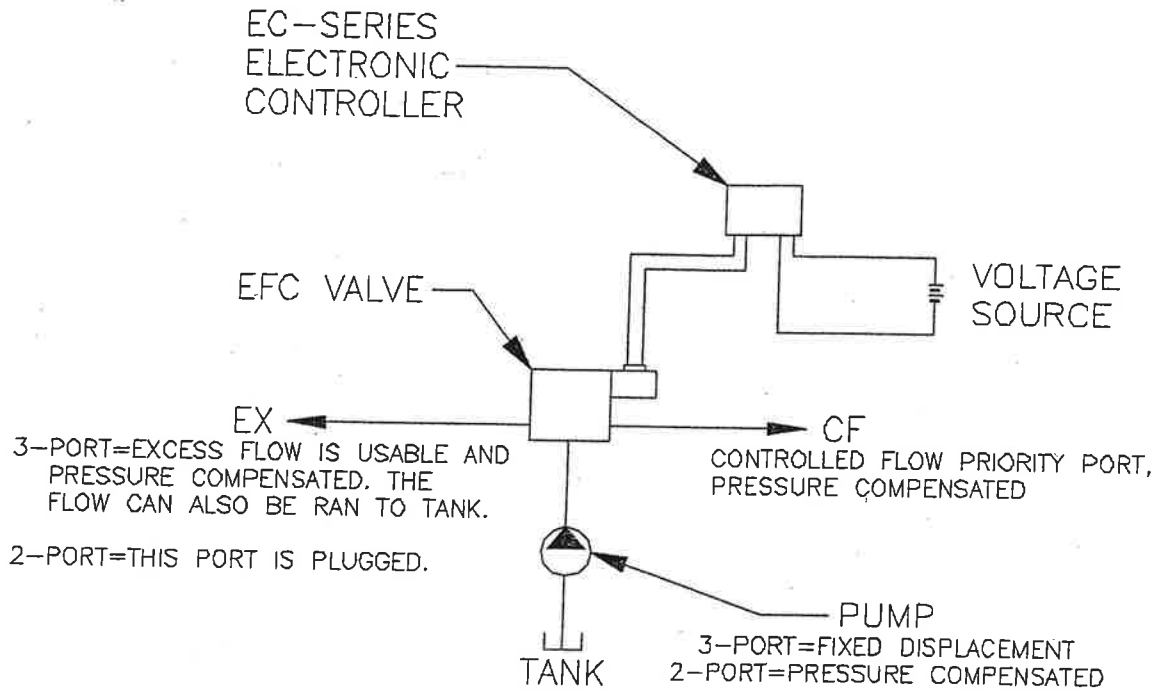
Oil Temp = 100 deg. F w/ 140 - 147 SUS Oil



Pressure Drop vs. Flow for EFC Series



2 & 3 PORT SCHEMATIC DRAWING:



DIMENSIONAL DATA:

