

CONTENTS

Technical Tips	3	Cross Reference Table	10
Application Cautionary Statements	6	Regeneration Outline Drawings and Performance Curves	14
Pressure Sensitive Regeneration Assemblies Table	7	Full Time Regeneration	14
Full Time Regeneration Assemblies Table	8	Pressure Sensitive Regeneration	46
Sun Regeneration Circuit Using Other Sun Cartridge Valves	9	Assembly Model Code Index	116

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This New Product Solutions: Regeneration Valve Assemblies and Optional Circuit Methods
is published by Sun Hydraulics Corporation,
1500 West University Parkway, Sarasota, FL 34243 USA.

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Sarasota, FL 34243 USA

Printed in England

TECHNICAL TIPS

Regenerative circuits are used to provide faster cylinder extension speeds by taking the oil from the rod end and diverting it to the head end of the cylinder. This means that the effective area during extension is the rod area that will give a faster speed but also a **reduced force**. This means that by using a cylinder with a 2:1 area ratio between piston and rod, equal speeds and forces can be obtained in both directions without using a double rod.

Two Types of Sun Regeneration Valve Assemblies

Sun Hydraulics manufactures two types of regeneration valve assemblies:

- The **full time regeneration** assembly uses a pilot-to-close check valve and a standard check valve to provide continuous regeneration with the reduced output force from the cylinder. It has a limited number of applications and is most commonly used for providing fast extension speeds with low force.
- The **pressure sensitive regeneration** assembly uses a pilot-to-close check valve and a counterbalance valve to provide a regeneration function. This is used on many applications such as compacting machines. The first part of the cylinder extension occurs when there is very little load (for example during initial compaction) and regeneration provides a fast extension speed. When the load resistance increases, the pressure on the full-bore side starts to increase and will pilot open a counterbalance valve connecting the rod side to tank and take the circuit out of regeneration. This then provides a slower speed as it is now operating on the full-bore area but also a corresponding increase in force. Regenerative circuits **do not** affect the retraction speed of the cylinder.

Hydraulic Cylinder Ratio

The choice of hydraulic cylinder ratio will have a significant effect on the performance of your system.

- Cylinders are manufactured in an almost unlimited combination of ratios. These ratios affect the speed of extension and retraction of the cylinders. With a 2:1 ratio cylinder, extend speed will equal the retract speed.
- Another issue is the pressure required to move the cylinder as the ratio varies. In machines that require large diameter cylinder rods for column

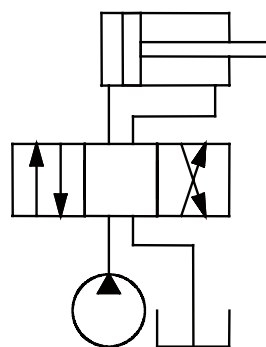
strength, the ratio is larger and oil for regeneration is reduced.

- Small diameter cylinder rods provide a larger oil supply due to the small cylinder ratio.
- Low ratios will require more pressure to move even the cylinder alone and in a pressure sensitive regeneration assembly, the regeneration function may cease too soon or never function.

The following examples show the basic calculations used to determine the speed of extension of the cylinder in regeneration.

The cylinder dimensions used in all examples are as follows:

Bore Diameter (Head End) 50 mm
Rod Diameter 35 mm



With a 10 L/min. flow from the pump

50mm Bore Diameter = 1964 mm sq. area
35mm Rod Diameter = 962 mm sq. area

$$\text{Cylinder Ratio} = \frac{\text{Head End Area}}{(\text{Head End Area} - \text{Rod Area})} = \frac{\text{Head End Area}}{\text{Annular Area}}$$

$$\text{Cylinder Ratio} = \frac{1964^2 \text{ mm}}{(1964 \text{ mm}^2 - 962 \text{ mm}^2)} = >2:1 \text{ Ratio}$$

Cylinder Extend Speed *without* Regeneration

$$\text{Extend Speed} = \frac{(\text{Pump Flow L/min}) 1000}{(\text{Head Area})/100} = \frac{(10)(1000)(100)}{1964} = 509 \text{ cm / min.}$$

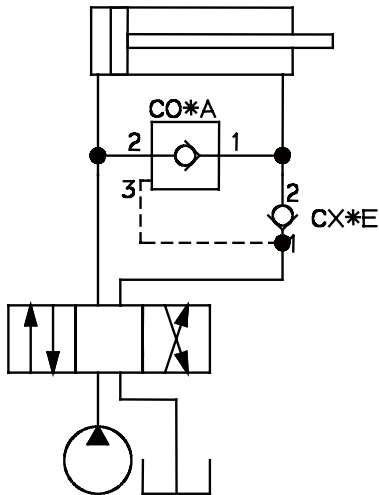
$$\text{Retract Speed} = \frac{(\text{Pump Flow L/min}) 1000}{(\text{Annular Area})/100} = \frac{(10)(1000)(100)}{1002} = 998 \text{ cm / min.}$$

Cylinder Extend Speed *with* Regeneration

Rod side oil is redirected to the head end of the cylinder instead of the directional valve and adds to the flow going into the head end. The extend speed is due to the pump flow replacing the cylinder rod volume.

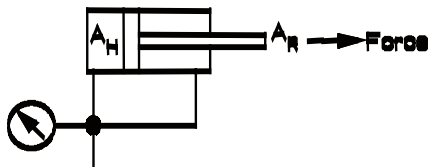
Extend Speed in Regeneration Mode

$$\begin{aligned}
 &= \frac{(\text{Pump Flow L/min})(1000)}{(\text{Rod Area})} \\
 &= \frac{(10)(1000)}{(962/100)} = \frac{(10)(1000)(100)}{962} \\
 &= 1039 \text{ cm / min.}
 \end{aligned}$$



The net force output available during regeneration is less than the force available in a standard extend function.

A_H = Head End Area
 A_R = Rod Area
 Supply Pressure = P



$$\begin{aligned}
 P(A_H) - P(A_H - A_R) &= \text{Force Output} \\
 P(A_H) - P(A_H) + P(A_R) &= \text{Force Output} \\
 P(A_R) &= \text{Force Output}
 \end{aligned}$$

The output force available is the product of pressure in the cylinder and area of the rod.

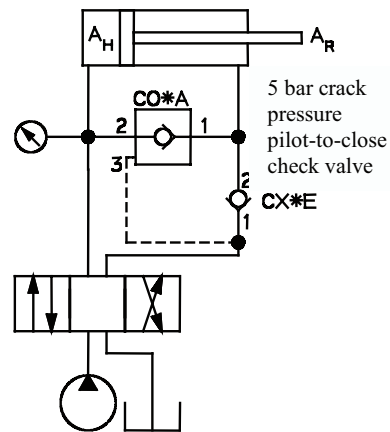
Without regeneration, the force output would be equal to

the product of pressure in the cylinder and the head end area.

Extend pressure required in regeneration is dependent on the cylinder ratio and pilot-to-close check valve crack pressure. The regeneration assemblies manufactured by Sun Hydraulics incorporate a 5 bar crack pressure pilot-to-close check valve. See the following circuit.

Supply Pressure = P

$$\begin{aligned}
 P(A_H) - (P + 5)(A_H - A_R) &= 0 \\
 P(A_H) &= (P + 5)(A_H - A_R) \\
 P(A_H) &= P(A_H) + 5A_H - P(A_R) - 5(A_R) \\
 P(A_H) - P(A_H) &= 5A_H - P(A_R) - 5(A_R) \\
 0 &= 5A_H - P(A_R) - 5(A_R) \\
 P(A_R) &= 5(A_H - A_R) \\
 P &= \frac{5(A_H - A_R)}{A_R} = \text{Extend Pressure}
 \end{aligned}$$



NOTE: The circuit shown above may not support a load in the extend mode. See Cautionary Notes at end of this section.

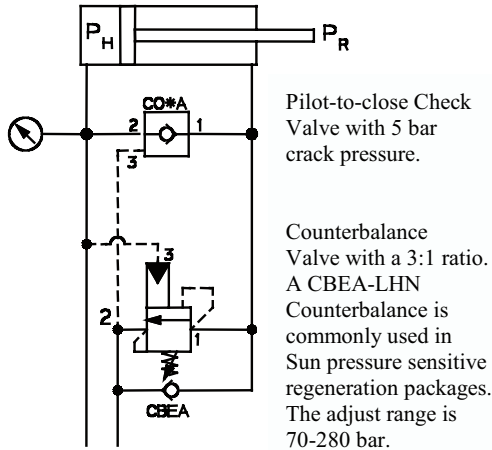
Pressure P is the minimum supply pressure required to extend the cylinder with a 5 bar crack pressure pilot-to-close check valve. This value does not include any system load on the cylinder or seal friction in the cylinder. The actual pressure required to extend the cylinder will be greater than this calculation.

Sun Hydraulics manufactures two types of regeneration assemblies; (1) Full Time and (2) Pressure Sensitive.

- Full time does what the name implies. It provides regeneration *all the time*.
- The pressure sensitive type has an adjust that allows setting the pressure where regeneration ceases.
- Pressure sensitive regeneration uses a Sun counterbalance valve. The adjust range for the regeneration function is *not* the adjust range of the counterbalance valve.

Consider the following Sun pressure sensitive regeneration circuit:

P_H = Pressure in Head End of Cylinder
 P_R = Pressure in Rod End of Cylinder
 P_{CB} = Setting of Counterbalance Valve. Valve starts to open.
 $P_R = P_H + 5$ (in Regeneration Mode)
 $P_{CB} = P_R + \text{Ratio} (P_H)$



NOTE: The circuit shown above may not support a load in the extend mode. See Cautionary Notes at end of this section.

The minimum setting where regeneration speed to start to diminish:

$$P_{CB} = P_R + (\text{Ratio})(P_H)$$

$$P_{CB} = (P_H + 5) + 3 (P_H)$$

$$70 = 4 P_H + 5$$

$$P_H = 16 \text{ bar}$$

The maximum setting would be:

$$280 = 4 P_H + 75$$

$$P_H = 69 \text{ bar}$$

Note: The adjust range for regeneration to speed to start to diminish is 16 bar-69 bar.

Potential Problems for Consideration

Using the cylinder dimensions from the examples (50mm Bore and 35mm Rod) the extend pressure calculation:

$$P = \frac{5 (A_H - A_R)}{A_R} = \frac{5 (1964 - 962)}{962} = 5.2 \text{ bar}$$

5 bar is required to extend the cylinder without any load and not including any seal friction.

System Variations

Larger Rod Diameter (ie. Outrigger Cylinders)

50mm Bore Diameter (1964mm² Head Area)
 40mm Rod Diameter (1257mm² Rod Area)

- 10 L/min Pump Flow
- Extend Speed without Regeneration

$$\frac{(10 \text{ L/min})(1000)}{1964 \text{ mm}^2/100} = 509 \text{ cm / min.}$$
- Extend Speed with Regeneration

$$\frac{(10 \text{ L/min})(1000)}{1257 \text{ mm}^2/100} = 796 \text{ cm / min.}$$
- Retract Speed

$$\frac{(10 \text{ L/min})(1000)}{(1964 - 1257 \text{ mm}^2)/100} = 998 \text{ cm / min.}$$
- Extend pressure with a 5 bar crack pressure pilot-to-close check valve.

$$P = \frac{5 (A_H - A_R)}{A_R} = \frac{5 (1964 - 1257)}{1257} = 2.8 \text{ bar}$$

Small Rod Diameter

50mm Bore Diameter (1964 mm sq. Head Area)
 30mm Rod Diameter (707 mm sq. Rod Area)

- Extend Speed without Regeneration

$$\frac{(10 \text{ L/min})(1000)}{(1964 \text{ mm}^2)/100} = 509 \text{ cm / min.}$$
- Extend Speed with Regeneration

$$\frac{(10 \text{ L/min})(1000)}{707 \text{ mm}^2/100} = 1414 \text{ cm / min.}$$
- Retract Speed

$$\frac{(10 \text{ L/min})(1000)}{(1964 - 707 \text{ mm}^2)/100} = 796 \text{ cm / min.}$$
- Extend pressure with a 5 bar crack pressure pilot-to-close check valve.

$$P = \frac{5 (A_H - A_R)}{A_R} = \frac{5 (1964 - 707) \text{ mm}^2}{707 \text{ mm}^2} = 9 \text{ bar}$$

Regeneration Features Summary

Large Rod Diameter

- Reduced Regeneration Speed Advantage
- High Retract Speed
- Lower Extend Pressure
- Higher Force Output in Regeneration

Small Rod Diameter

- Increased Regeneration Speed Advantage
- Lower Retract Speed
- Higher Extend Pressure
- Lower Force Output in Regeneration

Worst case example with a cylinder ration of 1.16:1 and a 5 bar crack pressure pilot-to-close check.

$$\text{Cylinder Ratio} = \frac{A_H}{(A_H - A_R)} = 1.16:1 \quad \begin{array}{l} \text{(Very Small Rod} \\ \text{Diameter in} \\ \text{relation to Bore)} \end{array}$$

$$\text{If: } A_H = 1.16 \quad (A_H - A_R) = 1$$

$$\text{Then } A_R = 0.16$$

$$\text{Pressure to Extend } P = \frac{5(A_H - A_R)}{A_R} = \frac{5(1)}{0.16} = 31.2 \text{ bar}$$

In this example, depending on the setting of the counterbalance valve, regeneration may cease upon application of flow due to the high extend pressure without external load.

Formulas

Formulas for calculation of flow rates in regeneration circuits.

$$\text{Flow out of Rod End} = \frac{(D_b^2 - D_r^2)}{D_b^2} \times \text{Pump Flow}$$

$$\text{Combined Flow} = \left(\frac{D_b^2}{D_r^2} \right) \times \text{Pump Flow} \\ \text{(Pump Flow plus} \\ \text{Regenerative Flow)}$$

$$\text{Retraction Flow} = \frac{D_b^2}{(D_b^2 - D_r^2)} \times \text{Pump Flow} \\ \text{(Flow out of} \\ \text{Blind End during} \\ \text{Retraction)}$$

D_b = Blind End Cylinder Bore Diameter

D_r = Rod Diameter

Application Cautionary Statements

Full Time Regeneration Assemblies

- Regeneration does not cease at any time during the cycle.
- Extreme cylinder ratios may prevent the system from moving. Heat may be a problem when regeneration occurs but system pressure is high and oil is flowing through the system relief valve.
- Cylinder force is reduced at all times.

Pressure Sensitive Regeneration Assemblies

- Regeneration may cease too soon or never occur due to system pressure required.
- The assumption that the adjust range of the regeneration package is the same as the counterbalance valve is incorrect.
- Extreme cylinder ratios may prevent the regeneration package from operating at all.

General Issues for both Types of Sun Regeneration Packages

1. **It is important to remember to size hydraulic lines correctly to allow for the increase flow going into the full bore side of the cylinder.**
2. The pilot-to-close check valve has a 5 bar crack pressure. A rod down cylinder application or a load on the cylinder that would tend to extend the rod is extremely dangerous. A rod down application could suddenly fall as the rod oil flows through the pilot-to-close check valve to the blind end of the cylinder. The blind end of the cylinder would cavitate but could not hold the load.
3. To prevent the problem of unexpected rod motion, a load control valve must be installed in the rod port. A Sun vented pilot-to-open check valve or vented counterbalance valve can provide load locking or load control and locking. Only vented versions of those cartridges must be used to have a functional system.
4. The effective adjustment range for the pressure sensitive regeneration assembly is not the same as the adjustment range of the counterbalance valve used in the assembly. Refer to the previous pages of technical tips to determine the regeneration adjust range for the specific counterbalance valve.

Pressure Sensitive Regeneration Assemblies	
<i>Line Mounted Assemblies</i>	<i>Sandwich Mounted Assemblies</i>
12 GPM / 45 L/min.	10 GPM / 40 L/min.
SERIES 1 CARTRIDGES	D03/CETOP 3
YDCC-LHN-A*	YDCA-LHN-AA
YDCD-LHN-A*	YDCG-LHN-B*
25 GPM / 95 L/min.	25 GPM / 95 L/min.
SERIES 2 CARTRIDGES	D05/CETOP 5
YDEK-LHN-A*	YDEM-LHN-B*
YDEG-LHN-A*	YDEH-LHN-AK
YDEF-LHN-A*	YDES-LHN-BA
YDEC-LHN-A*	YDER-LHN-BA
YDED-LHN-A*	YDEE-LHN-BA
50 GPM / 190 L/min.	25 GPM / 95 L/min.
SERIES 3 CARTRIDGES	D05 X, Y/CETOP 5 X, Y
YDGC-LHN-A*	YDEL-LHN-BB
YDGC-LHN-AP	
YDGD-LHN-A*	
YDGD-LHN-AP	
YDGD-LHN-AQ	
YDGL-LHN-AP	
YDGL-LHN-AQ	
YDGL-LHN-A4	
YDGL-LHN-A5	
100 GPM / 380 L/min.	50 GPM / 190 L/min.
SERIES 4 CARTRIDGES	D07/CETOP 7
YDHC-LHN-A5	YDFE-LHN-AB
120 GPM / 450 L/min.	YDFG-LHN-AB
YDJC-LHN-AN	40 GPM / 150 L/min.
240 GPM / 910 L/min.	D08/CETOP 8
YDJC-LHN-A6 Dual Cartridges	YDFF-LHN-CA Dual Cartridges
YDJC-LHN-AS Dual Cartridges	
	60 GPM / 230 L/min.
	YDFJ-LHN-CA
	YDFK-LHN-CA
	80 GPM/300 L/min.
	YDGE-LHN-CA
	YDGF-LHN-CA

Flow ratings are nominal.

See performance curves on following page for detailed pressure flow characteristics.

* Indicates optional port types available.

Full Time Regeneration Assemblies	
<i>Line Mounted Assemblies</i>	<i>Sandwich Mounted Assemblies</i>
	15 GPM / 60 L/min.
	D03/CETOP 3
	YDCK-XCN-AA
	YDCF-XCN-AA
30 GPM / 115 L/min.	25 GPM / 95 L/min.
SERIES 2 CARTRIDGES	D05/CETOP 5
YDEP-XCN-A*	YDEV-XCN-BA
	YDET-XCN-BA
	YDEN-XCN-BA
60 GPM / 230 L/min.	25 GPM / 95 L/min.
SERIES 3 CARTRIDGES	D05 X, Y/CETOP 5 X, Y
YDGK-XCN-A*	YDEW-XCN-BB
YDGJ-XCN-A*	
240 GPM / 910 L/min.	50 GPM / 190 L/min
SERIES 4 CARTRIDGES	D07/CETOP 7
YDJD-XCN-AS	YDFH-XCN-AB
	YDFI-XCN-AB
	60 GPM / 230 L/min.
	D08/CETOP 8
	YDFL-XCN-CA
	YDFM-XCN-CA
	90 GPM / 340 L/min.
	YDGH-XCN-CA
	YDGI-XCN-CA

Flow ratings are nominal.

See performance curves on following page for detailed pressure flow characteristics.

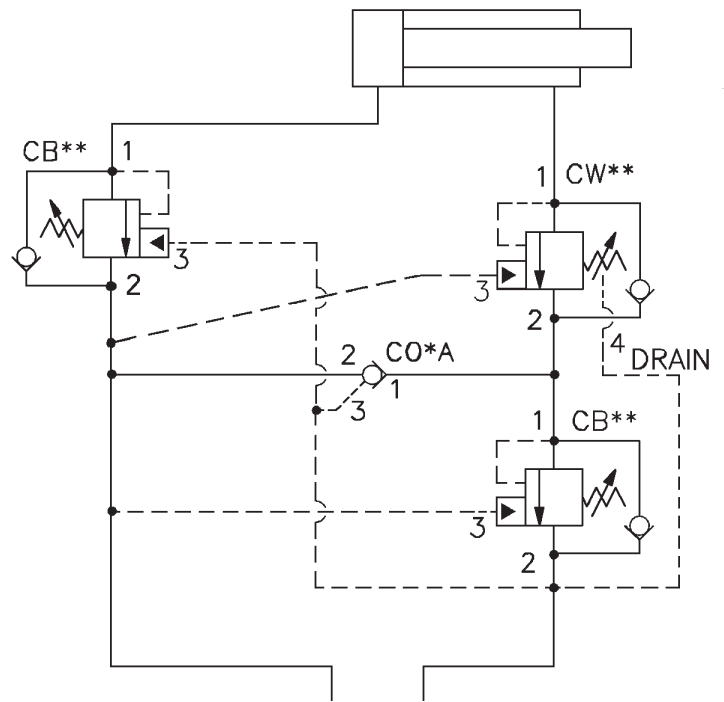
* Indicates optional port types available.

Sun Regeneration Circuit Using Other Sun Cartridge Valves

Regeneration Circuit with Pressure Unloading and Load Holding in both Extend and Retract Mode

(This example circuit demonstrates another method of Regeneration, but is not available as a pre-packaged assembly.)

- This concept can be used where the load may tend to extend the cylinder as well as causing it to retract.
- Pressure sensitive regeneration system provides regeneration with progressive unloading up to full force operation.
- Both counterbalances to be sized for appropriate flows (i.e. cap end counterbalance must be sized for pump plus rod end flow, while rod end counterbalance is sized for rod end flow only.)
- With work ports drained and counterbalance valves adjusted to appropriate pressure settings, cylinder should not move in either direction.



CB** Counterbalance Valve
 CW** Vented Counterbalance Valve
 CO*A Pilot-to-close Check Valve

Cross Reference Table

Full Time to Pressure Sensitive Regeneration

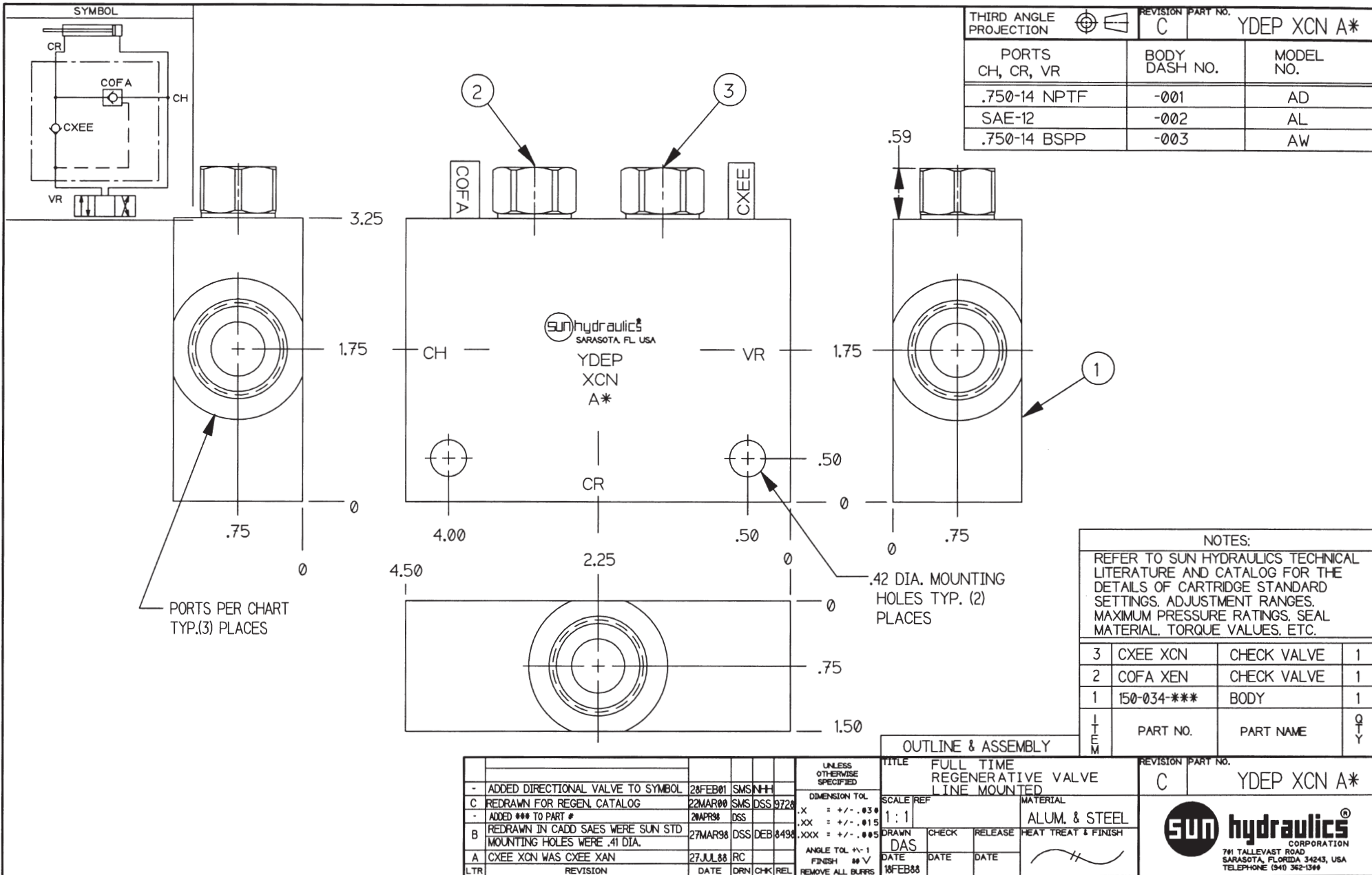
<i>Pressure Sensitive Regeneration Assembly Model Code</i>	<i>Page Loca- tion</i>	<i>Sun Part Number for Body</i>	<i>Full Time Regeneration Assembly Model Code</i>	<i>Page Loca- tion</i>
YDCA-LHN-AA	86	150-281	YDCF-XCN-AA	24
YDEK-LHN-A*	50	150-034	YDEP-XCN-A*	14
YDES-LHN-BA	90	152-188	YDET-XCN-BA	28
YDER-LHN-BA	88	152-187	YDEV-XCN-BA	26
YDEE-LHN-BA	94	150-015	YDEN-XCN-BA	30
YDFE-LHN-AB	96	151-146	YDFI-XCN-AB	36
YDFG-LHN-AB	98	152-746	YDFH-XCN-AB	34
YDGC-LHN-A*	56	150-784-00*	YDGK-XCN-A*	16
YDGD-LHN-A*	60	150-785-00*	YDGJ-XCN-A*	18
YDGF-LHN-CA	104	151-537	YDGH-XCN-CA	44
YDJC-LHN-AS	82	151-496-00*	YDJD-XCN-AS	20
YDEC-LHN-A*	48	150-034-00*	YDEP-XCN-A*	14
YDFJ-LHN-CA	116	153-055	YDFL-XCN-CA	38
YDFK-LHN-CA	108	153-056	YDFM-XCN-CA	40

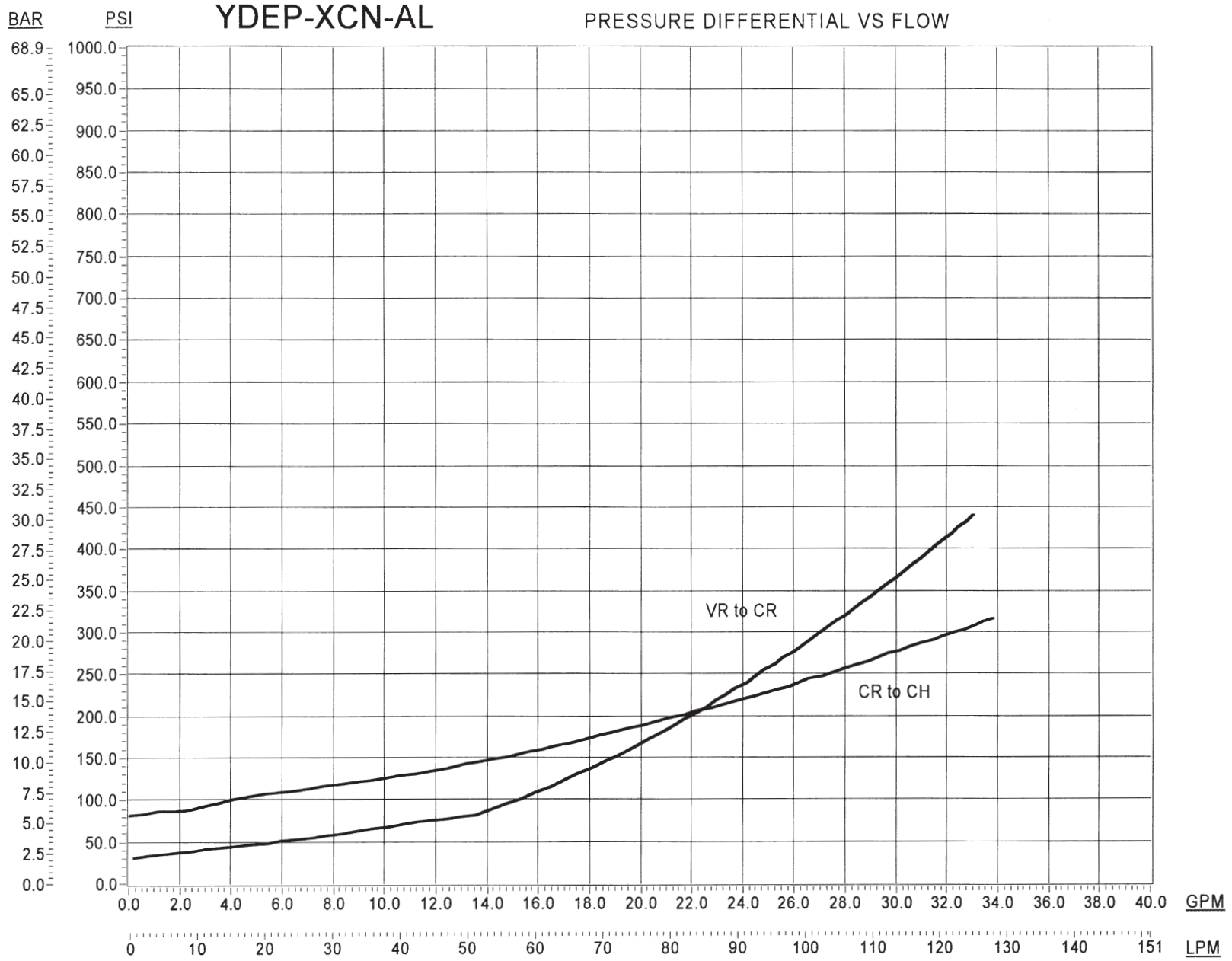
* Indicates optional port types available.

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SYMBOL

PORTS PER CHART TYP. (3) PLCS.

SUN hydraulics
SARASOTA, FL. USA
YDGK XCN A*

MOUNTING HOLES :
INCH : .375-16UNC x .62 DP.
METRIC : M10 x 1.5-6H x .62 DP. TYP (2) PLACES

THIRD ANGLE PROJECTION

REVISION	PART NO.
B	YDGK XCN A*

PORT TYPE	MODEL NO.	BODY DASH NO.	THREAD TYPE
.750-14 NPTF	AD	-001	INCH
1.000-11.5 NPTF	AE	-002	INCH
1.250-11.5 NPTF	AF	-003	INCH
SAE-12	AL	-004	INCH
SAE-16	AM	-005	INCH
SAE-20	AN	-006	INCH
.750-14 BSPP	AW	-007	METRIC
1.000-11 BSPP	AX	-008	METRIC
1.250-11 BSPP	AY	-009	METRIC

NOTES:

REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

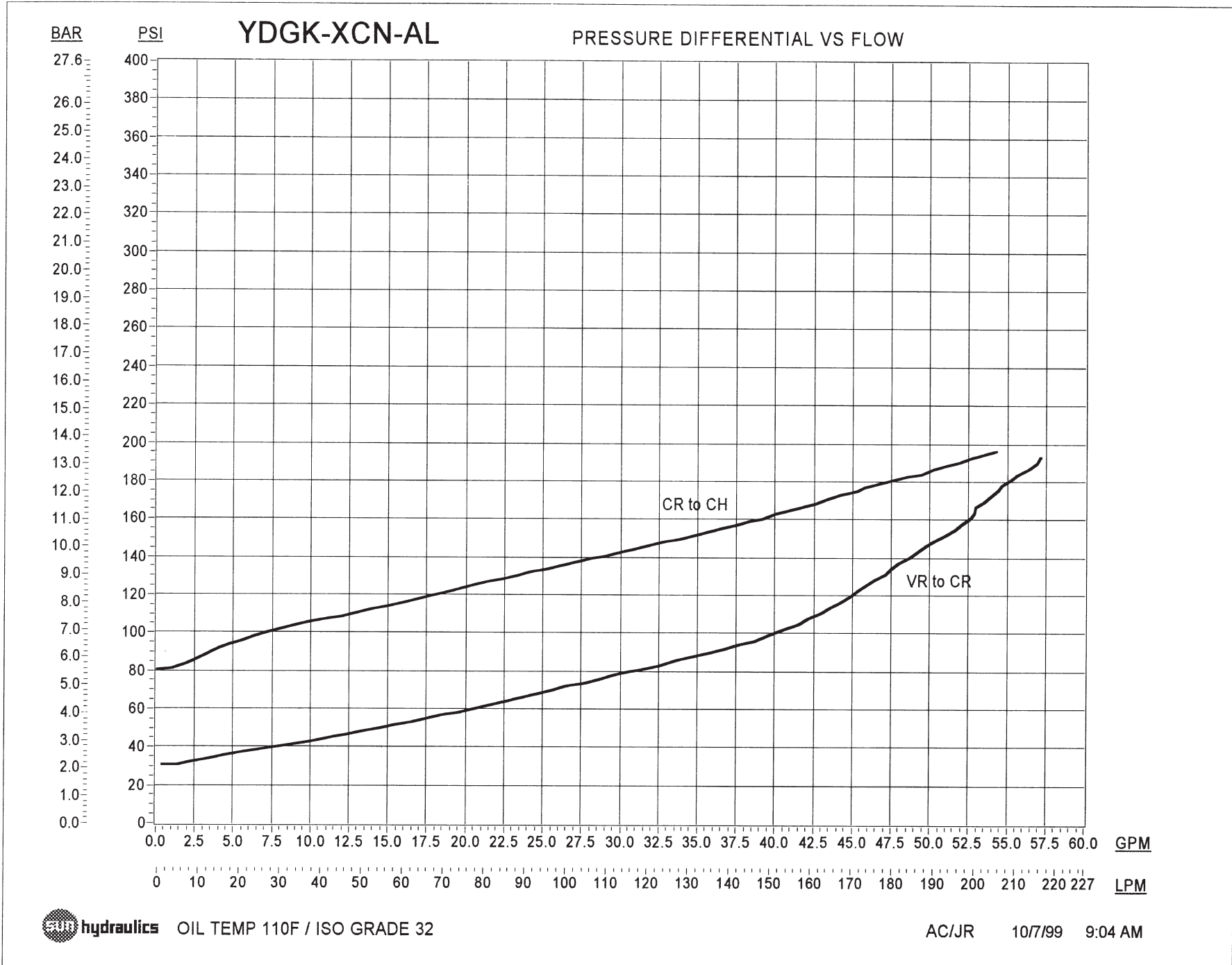
ITEM	PART NO.	PART NAME	QTY
3	COHA XEN	CHECK VALVE	1
2	CXGE XCN	CHECK VALVE	1
1	150-784-***	BODY	1

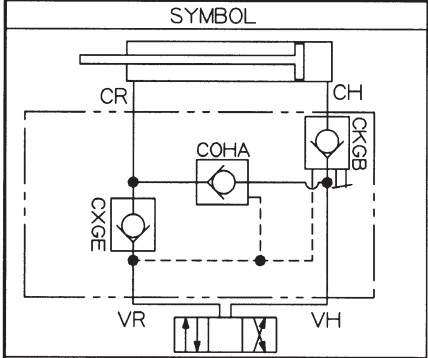
OUTLINE & ASSEMBLY

TITLE	FULL TIME	LINE MOUNT	REGENERATIVE VALVE
SCALE	REF	MATERIAL	ALUMINUM
1:2		HEAT TREAT & FINISH	
DRAWN	CHECK	RELEASE	
BRS		6382	
DATE	DATE	DATE	
24FEB95		24FEB95	

UNLESS OTHERWISE SPECIFIED	DIMENSION TOL
.X = +/- .030	
.XX = +/- .015	
.XXX = +/- .005	
ANGLE TOL +/- 1	
FINISH #/V	
REMOVE ALL BURRS	

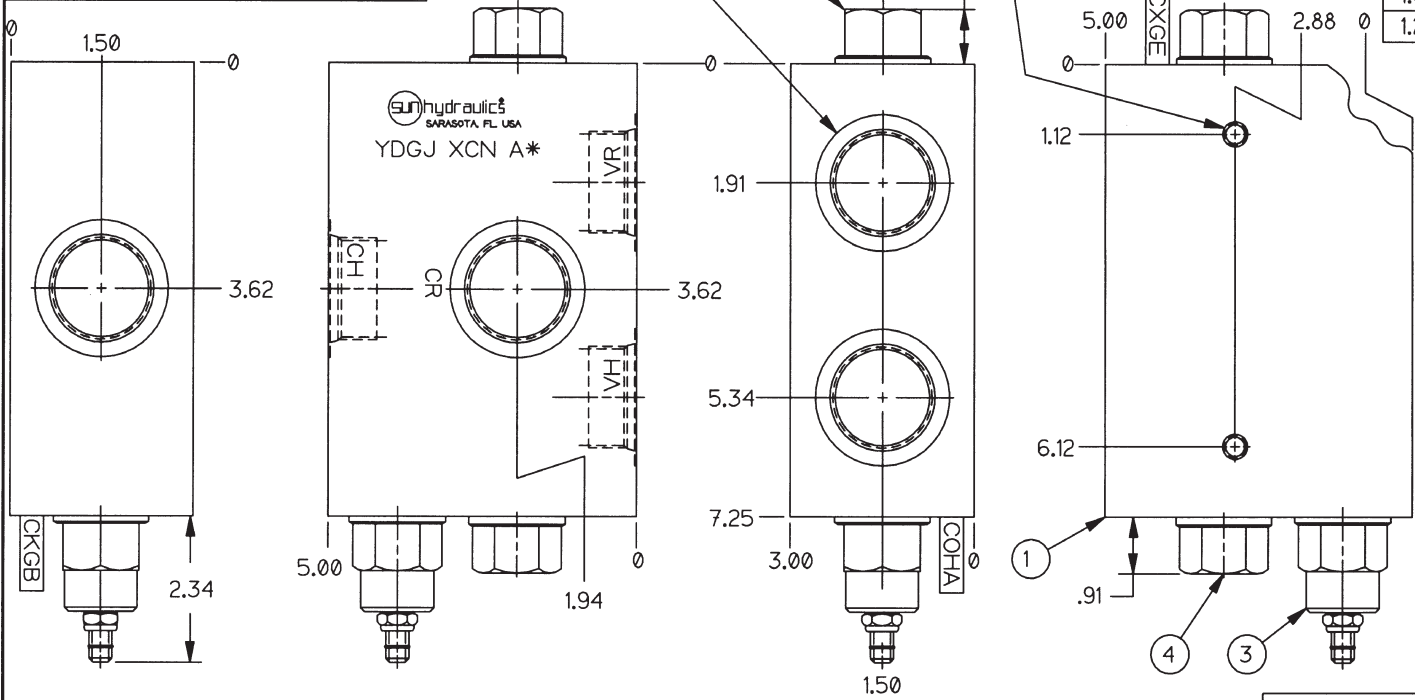
REVISION	DATE	DRN	CHK	REL
B	22MAR00	SMS	DSS	9723
A	28FEB95	BRS	GBB	5366
LTR				





PORTS PER CHART
TYP. (4) PLCS.

MOUNTING HOLES :
INCH : .375-16UNC
x .62 DP.
METRIC : M10 x
1.5-6H x .62 DP.
TYP (2) PLACES



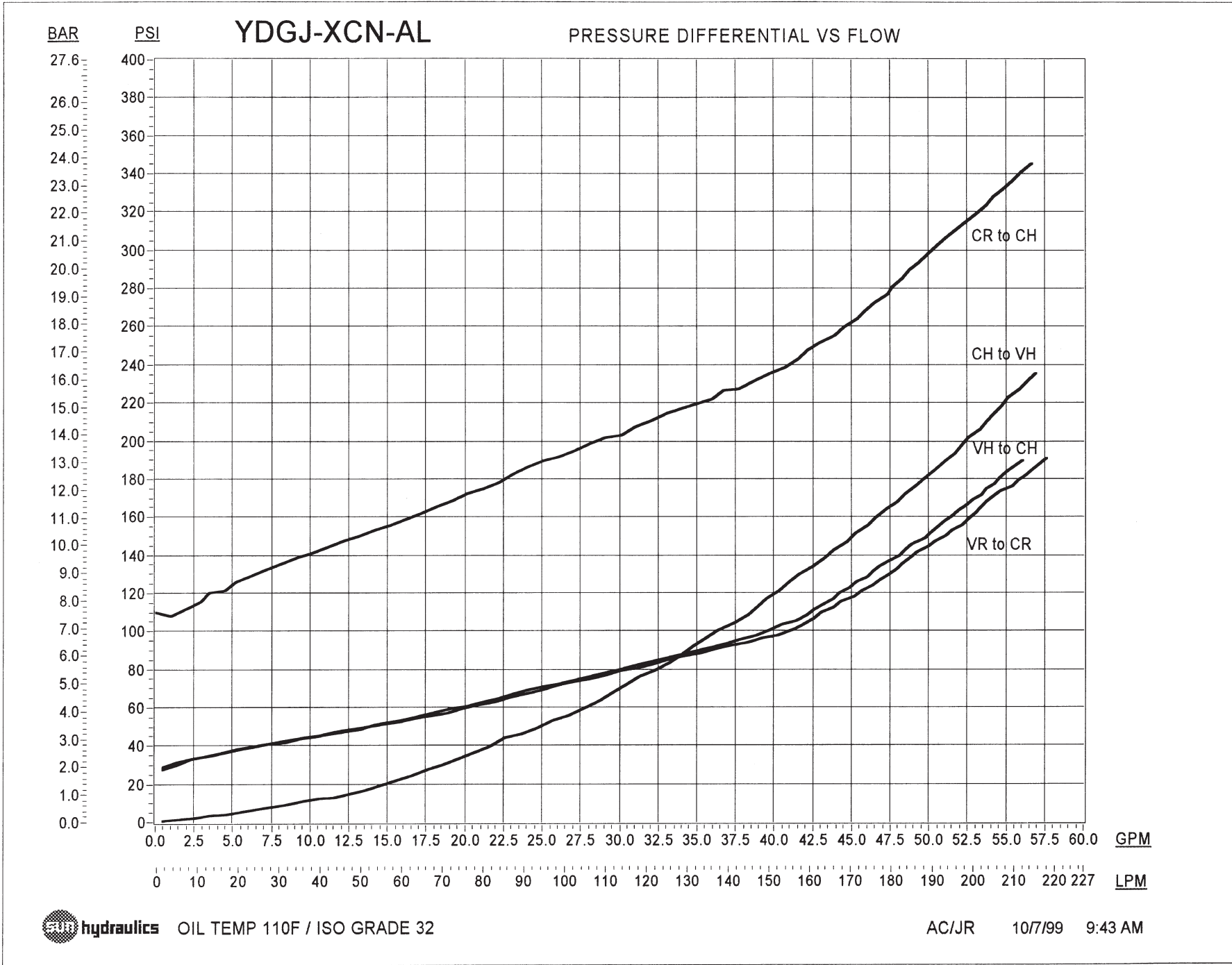
THIRD ANGLE PROJECTION	REVISION	PART NO.	
	B	YDGJ XCN A*	
PORT TYPE	MODEL NO.	BODY DASH NO.	THREAD TYPE
.750-14 NPTF	AD	-001	INCH
1.000-11.5 NPTF	AE	-002	INCH
1.250-11.5 NPTF	AF	-003	INCH
SAE-12	AL	-004	INCH
SAE-16	AM	-005	INCH
SAE-20	AN	-006	INCH
.750-14 BSPP	AW	-007	METRIC
1.000-11 BSPP	AX	-008	METRIC
1.250-11 BSPP	AY	-009	METRIC

NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
4	COHA XEN	CHECK VALVE	1
3	CKGB LCN	CHECK VALVE	1
2	CXGE XCN	CHECK VALVE	1
1	150-785-***	BODY	1

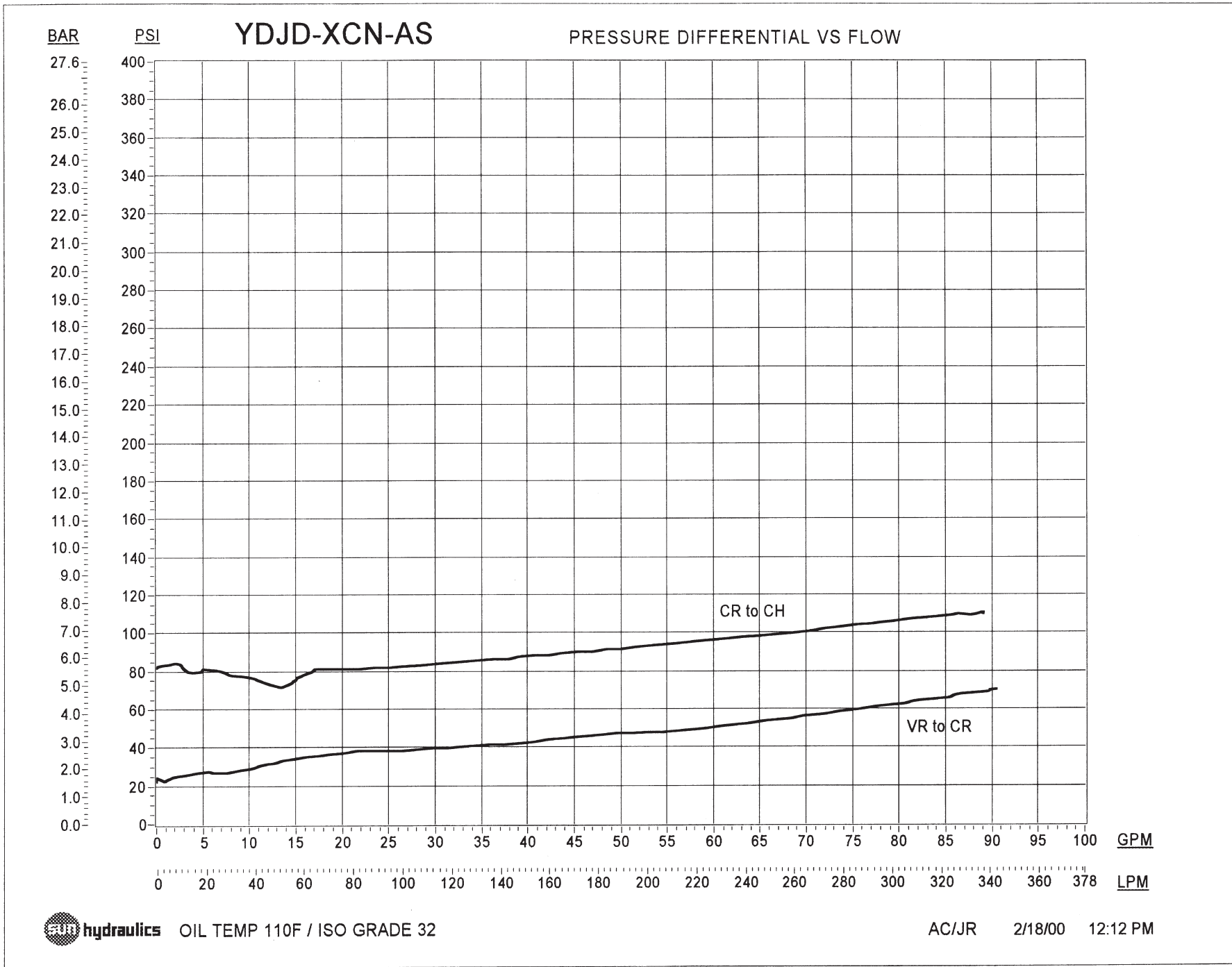
OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED				TITLE			REVISION		PART NO.	
DIMENSION TOL.				SCALE			MATERIAL		HEAT TREAT & FINISH	
-	ADDED DIRECTIONAL VALVE TO SYMBOL	28FEB01	SMS NHH	1:2	FULL TIME LINE MOUNT REGENERATIVE VALVE WITH CYL. LOCK			B	YDGJ XCN A*	
B	REDRAWN FOR REGEN. CATALOG REVISED SYM.	22MAR00	SMS DSS 9723	DRAWN BRS	CHECK	RELEASE	5649	ALUM. & STEEL		
A	DELETED CBGA NOTE	24FEB95	BRS 6342	DATE 12MAY94	DATE	DATE		SUN hydraulics CORPORATION		
LTR	REVISION	DATE	DRN CHK REL	FINISH # # V REMOVE ALL BURRS	DATE 12MAY94	DATE	DATE	791 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300		



OIL TEMP 110F / ISO GRADE 32

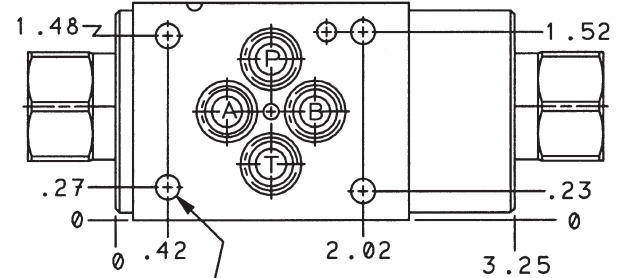
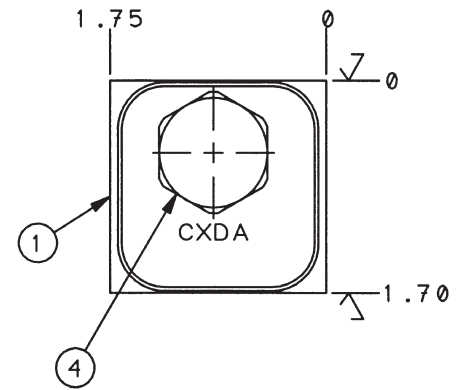
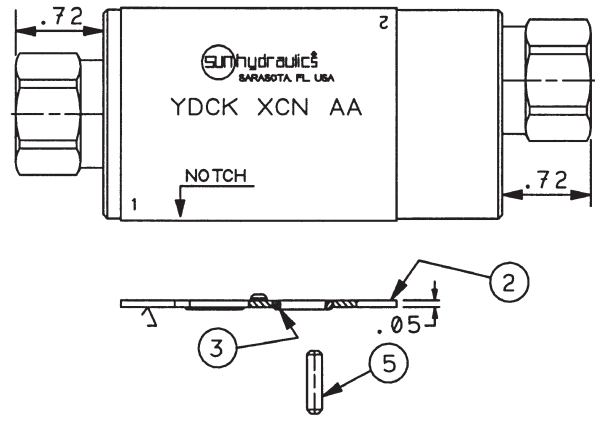
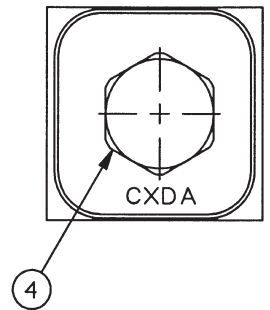
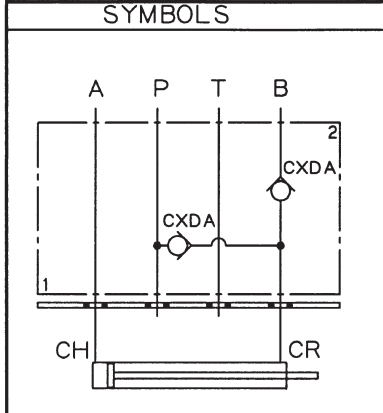
AC/JR 10/7/99 9:43 AM



OIL TEMP 110F / ISO GRADE 32

AC/JR 2/18/00 12:12 PM


THIRD ANGLE PROJECTION  REVISION PART NO. A YDCK XCN AA

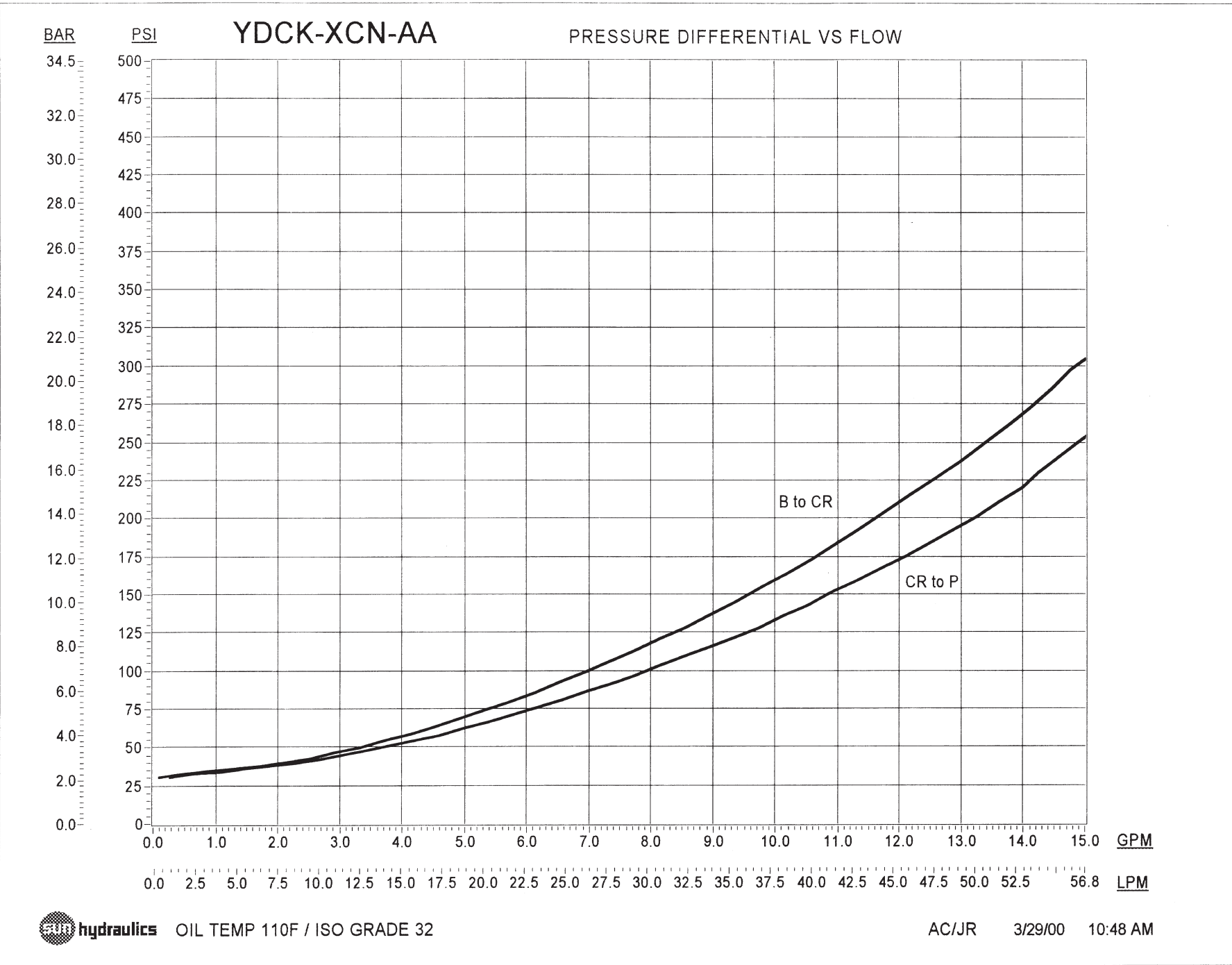


ISO 03 PATTERN
 .20 DIA MOUNTING HOLES
 TYP (4) PLACES

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

5	811-001-006	PIN	1
4	CXDA XCN	CHECK VALVE	2
3	500-001-012	"O" RING	4
2	700-002	SEAL PLATE	1
1	153-553	BODY	1
	PART NO.	PART NAME	QTY

				UNLESS OTHERWISE SPECIFIED			TITLE ISO-03 FULL TIME REGENERATION VALVE B TO P FLOW			REVISION PART NO. A YDCK XCN AA		
				DIMENSION TOL			SCALE REF 1:1			MATERIAL ALUMINUM		
				.X = +/- .030			DRAWN CHECK RELEASE			HEAT TREAT & FINISH		
				.XX = +/- .015			DA/ STW 6009					
				.XXX = +/- .005			DATE DATE DATE					
A REDRAWN FOR REGEN. CATALOG				22MAR9	SMS	DSS	3723	DATE DATE DATE			 CORPORATION 791 TALLEYVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300	
LTR REVISION				DATE	DRN	CHK	REL	REMOVE ALL BURRS			© 1999 SUN HYDRAULICS CORPORATION	



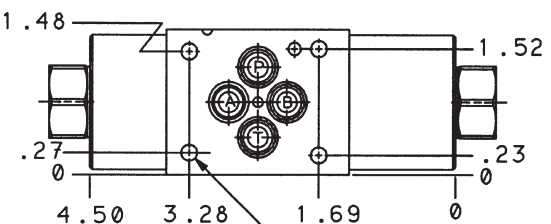
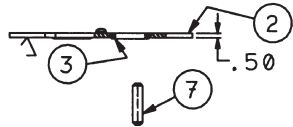
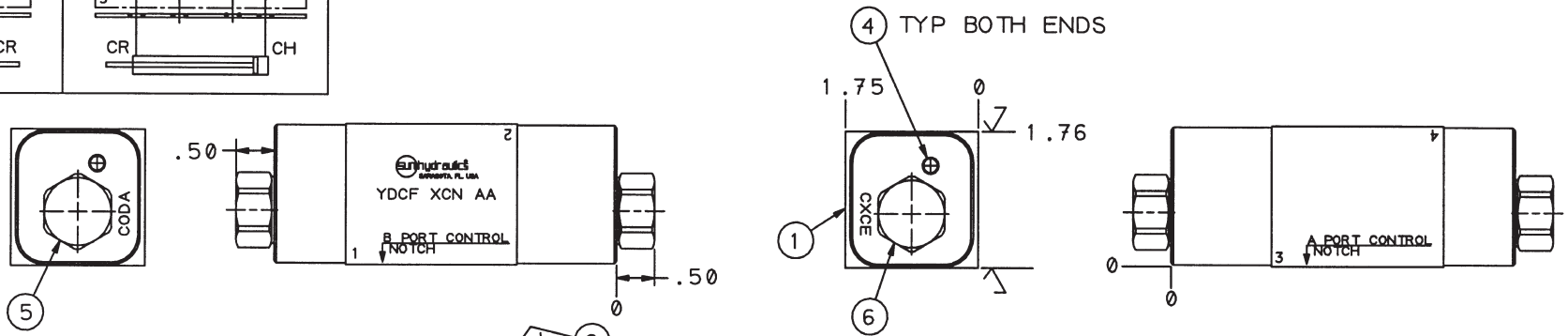
SYMBOLS

FLOW B TO A

FLOW A TO B

THIRD ANGLE PROJECTION

REVISION PART NO. C YDCF XCN AA



ISO #3 PATTERN
.20 DIA MOUNTING HOLES
TYP (4) PLACES

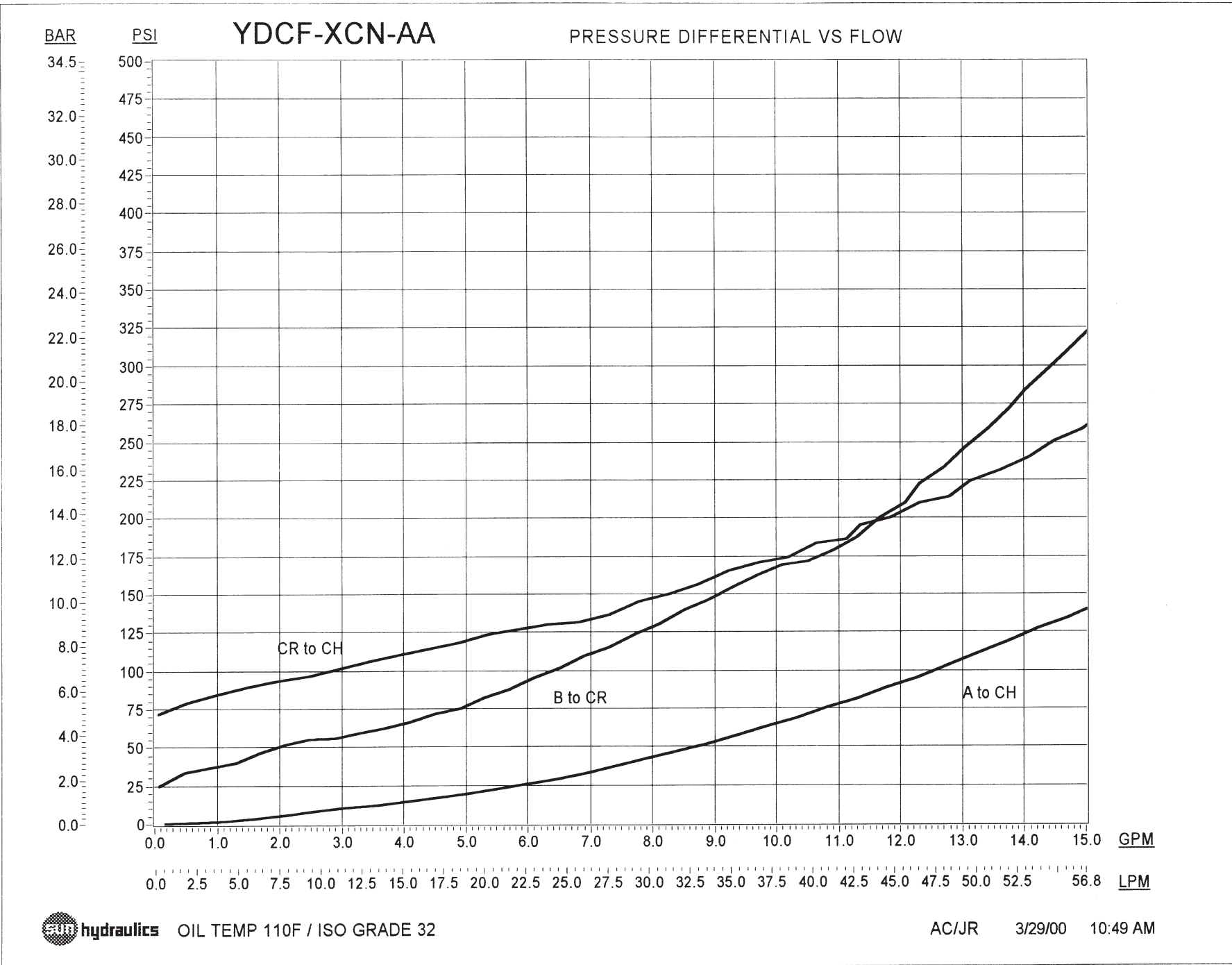
NOTES:

REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
7	811-001-006	PIN	1
6	CXCE XCN	CHECK VALVE	1
5	CODA XEN	CHECK VALVE	1
4	850-004-218	PLUG	2
3	500-001-012	O-RING	4
2	700-002	SEAL PLATE	1
1	150-281	BODY	1

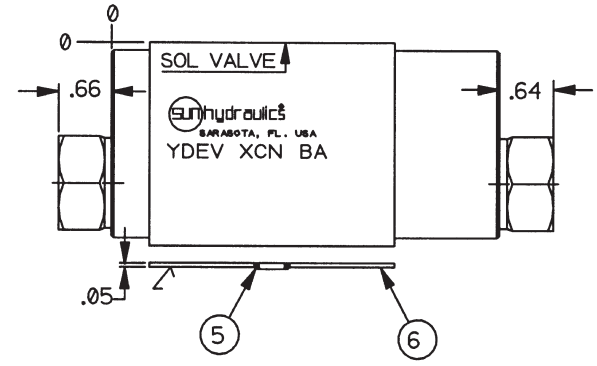
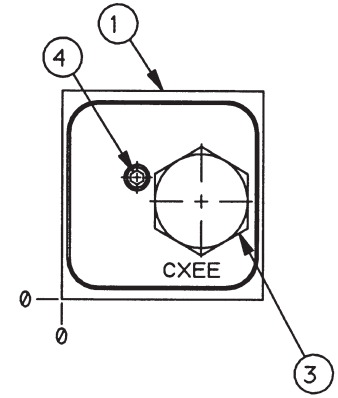
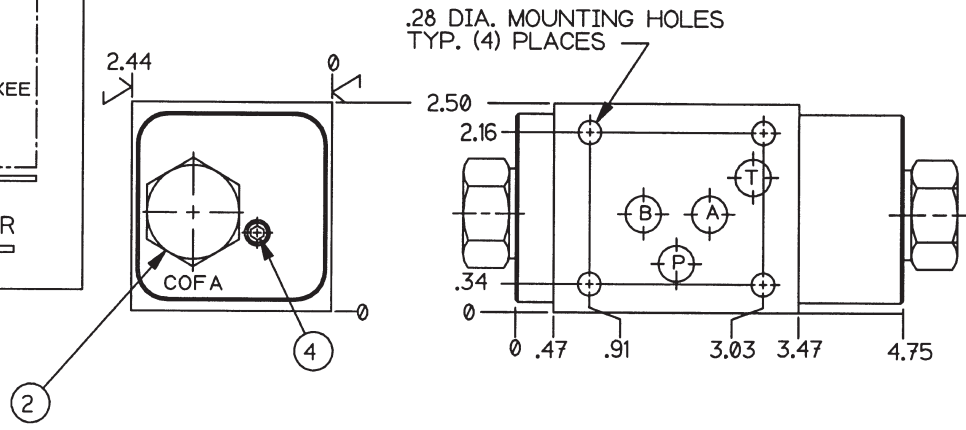
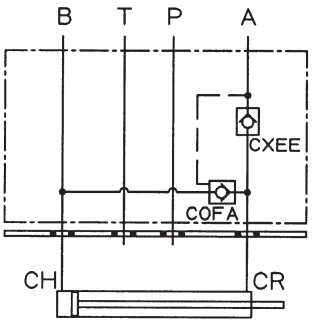
OUTLINE & ASSEMBLY					TITLE			REVISION PART NO.																																																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5">UNLESS OTHERWISE SPECIFIED</td> <td colspan="3">FULL TIME ISO #3 REGENERATION VALVE FLOW B TO A OR A TO B</td> <td colspan="3">C YDCF XCN AA</td> </tr> <tr> <td colspan="5">DIMENSION TOL</td> <td colspan="3">SCALE REF</td> <td colspan="3">MATERIAL</td> </tr> <tr> <td colspan="5">.X = +/- .030</td> <td colspan="3">1:15</td> <td colspan="3">6061-T6 ALUM.</td> </tr> <tr> <td colspan="5">.XX = +/- .015</td> <td colspan="3">DRAWN</td> <td colspan="3">HEAT TREAT & FINISH</td> </tr> <tr> <td colspan="5">.XXX = +/- .005</td> <td colspan="3">BRS</td> <td colspan="3">RJB 3115</td> </tr> <tr> <td colspan="5">ANGLE TOL +/- 1</td> <td colspan="3">DATE</td> <td colspan="3">DATE</td> </tr> <tr> <td colspan="5">FINISH 80 V</td> <td colspan="3">DATE</td> <td colspan="3">DATE</td> </tr> <tr> <td colspan="5">REMOVE ALL BURRS</td> <td colspan="3">05JUN91</td> <td colspan="3">06JUN91</td> </tr> </table>					UNLESS OTHERWISE SPECIFIED					FULL TIME ISO #3 REGENERATION VALVE FLOW B TO A OR A TO B			C YDCF XCN AA			DIMENSION TOL					SCALE REF			MATERIAL			.X = +/- .030					1:15			6061-T6 ALUM.			.XX = +/- .015					DRAWN			HEAT TREAT & FINISH			.XXX = +/- .005					BRS			RJB 3115			ANGLE TOL +/- 1					DATE			DATE			FINISH 80 V					DATE			DATE			REMOVE ALL BURRS					05JUN91			06JUN91			REVISION PART NO.		
					UNLESS OTHERWISE SPECIFIED					FULL TIME ISO #3 REGENERATION VALVE FLOW B TO A OR A TO B			C YDCF XCN AA																																																																																		
DIMENSION TOL					SCALE REF			MATERIAL																																																																																							
.X = +/- .030					1:15			6061-T6 ALUM.																																																																																							
.XX = +/- .015					DRAWN			HEAT TREAT & FINISH																																																																																							
.XXX = +/- .005					BRS			RJB 3115																																																																																							
ANGLE TOL +/- 1					DATE			DATE																																																																																							
FINISH 80 V					DATE			DATE																																																																																							
REMOVE ALL BURRS					05JUN91			06JUN91																																																																																							
C REDRAWN FOR REGEN CATALOG					22MAR00			SMS DSS 9723																																																																																							
B REVISED STAMPING & ADDED IT#7					08NOV92			BRS #880																																																																																							
A CXCE WAS SHOWN AS A P.O. CHECK					06APR92			RJB 3615																																																																																							
IN SYMBOL																																																																																															
LTR REVISION					DATE			DRN CHK REL																																																																																							





THIRD ANGLE PROJECTION  REVISION PART NO.
 B YDEV XCN BA

SYMBOLS



NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

6	700-001	SEAL PLATE	1
5	500-001-014	SEAL "O"RING	5
4	340-001	PIPE PLUG	2
3	CXEE XCN	CHECK VALVE	1
2	COFA XEN	CHECK VALVE	1
1	152-187	BODY	1

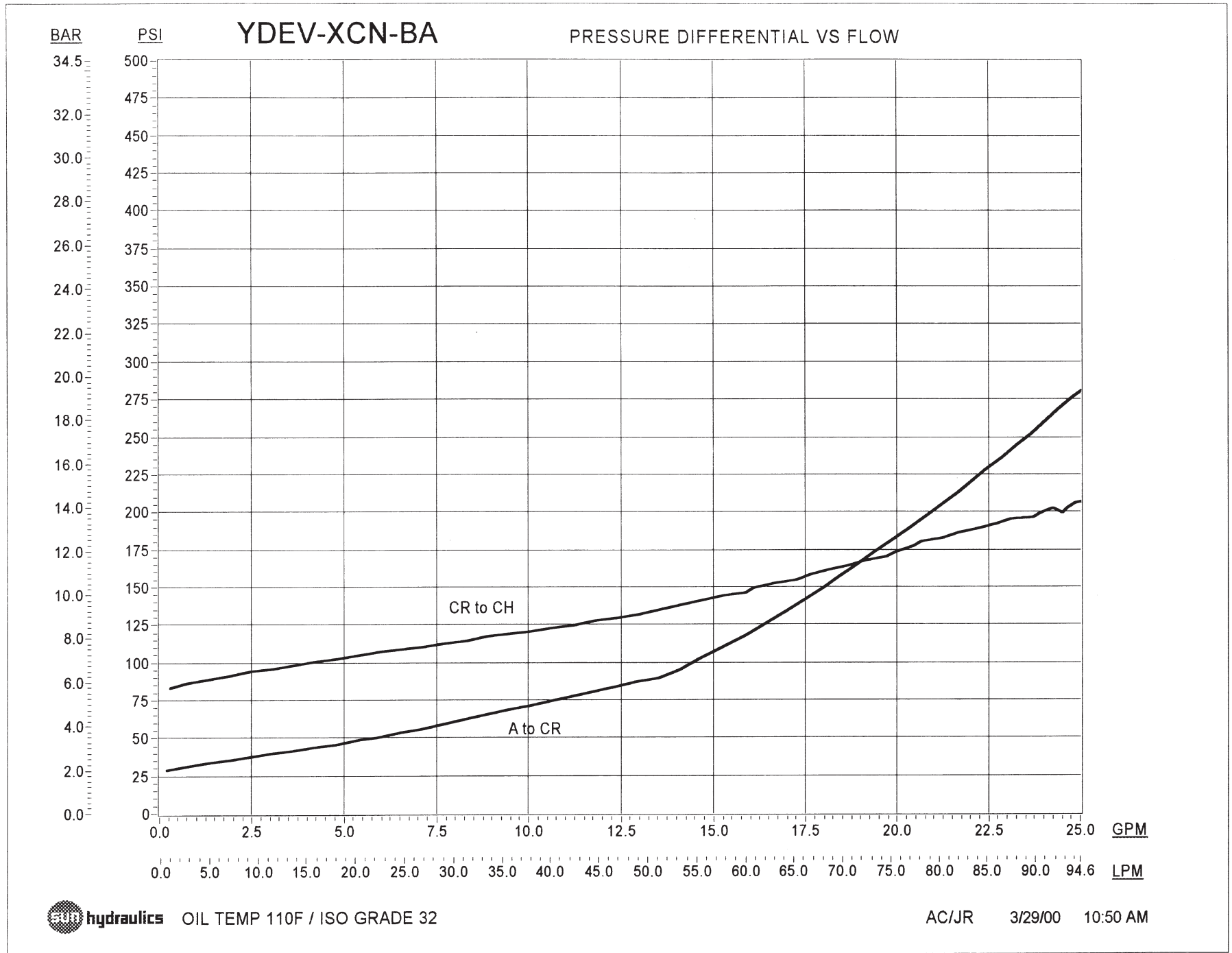
ITEM	PART NO.	PART NAME	QTY
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OUTLINE & ASSEMBLY

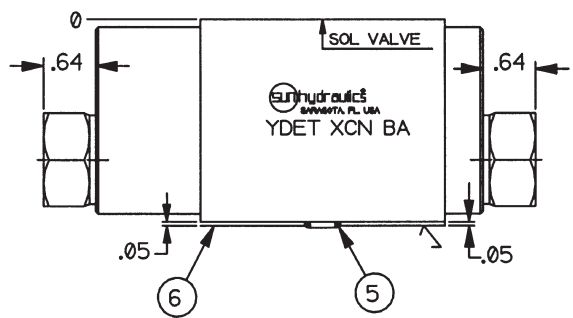
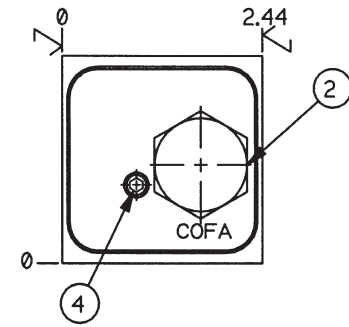
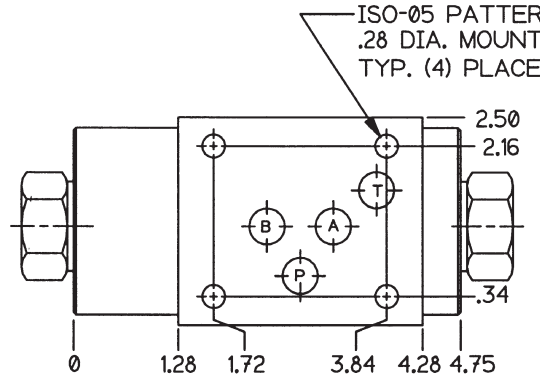
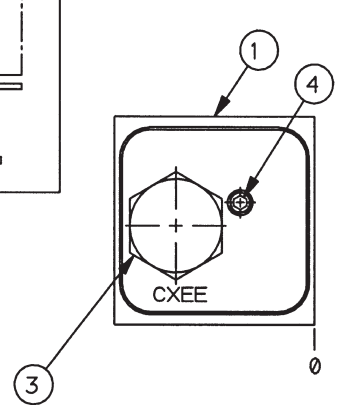
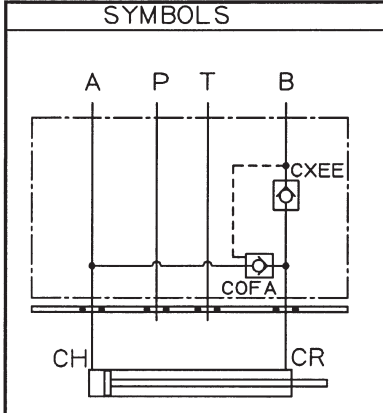
				UNLESS OTHERWISE SPECIFIED			TITLE ISO-05 REGENERATIVE FULL TIME FLOW A TO B			REVISION PART NO. B YDEV XCN BA		
				DIMENSION TOL			SCALE REF			MATERIAL ALUMINUM		
				.X = +/- .030			: 15			HEAT TREAT & FINISH		
				.XX = +/- .015			DRAWN BRS			CHECK RJB		
				.XXX = +/- .005			DATE 13JUN91			RELEASE DATE 18JUN91		
B REDRAWN FOR REGEN. CATALOG				22MAR90 SMS DSS 3723			DATE 13JUN91			DATE 21JUN91		
A TITLE WAS B TO A				20AUG92 RJB 5997			FINISH #0					
LTR REVISION				DATE DRN CHK REL			REMOVE ALL BURRS					



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THIRD ANGLE PROJECTION  REVISION PART NO.
 D YDET XCN BA



NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
6	700-001	SEAL PLATE	1
5	500-001-014	SEAL "O"RING	5
4	340-001	PIPE PLUG	2
3	CXEE XCN	CHECK VALVE	1
2	COFA XEN	CHECK VALVE	1
1	152-188	BODY	1

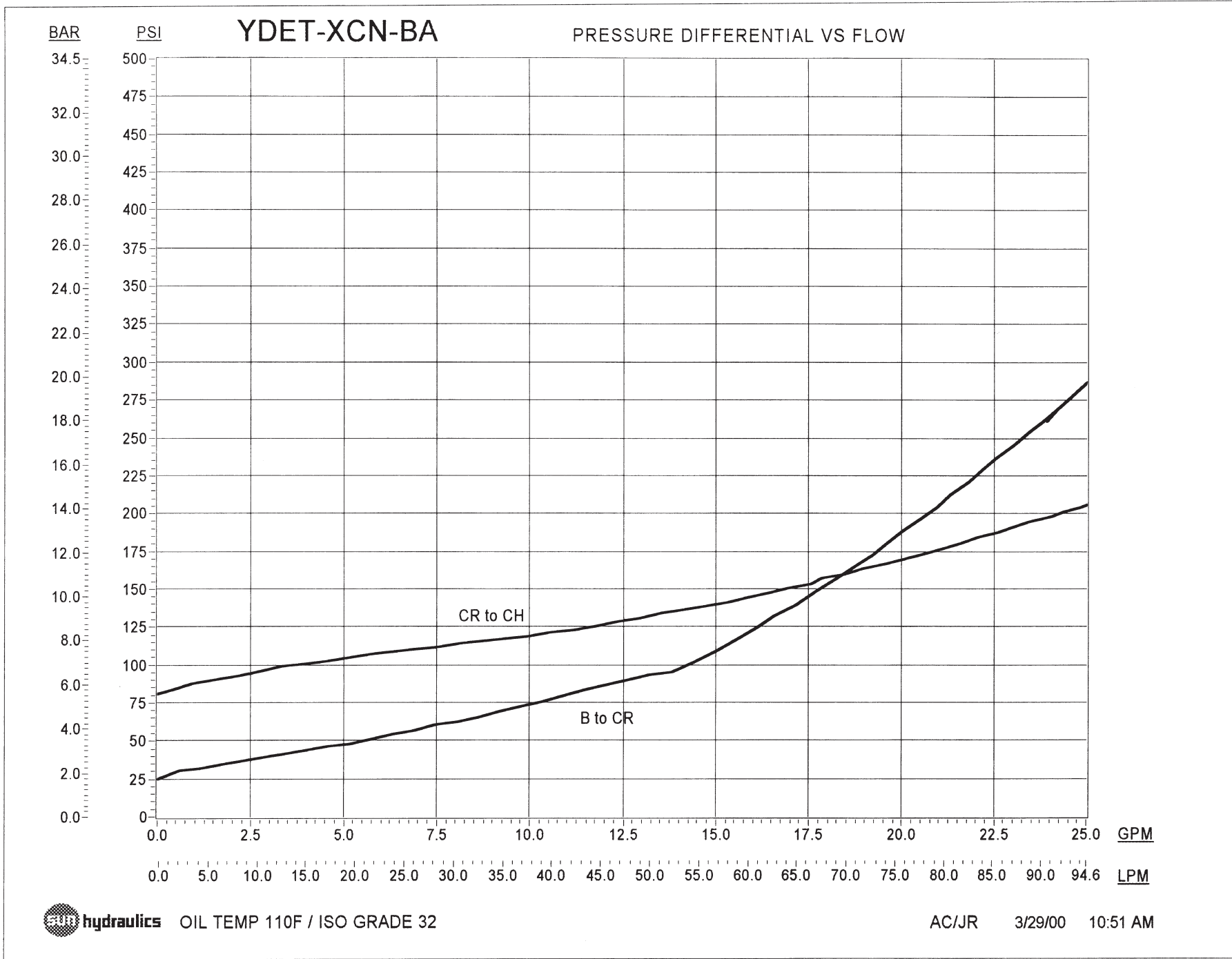
UNLESS OTHERWISE SPECIFIED				DIMENSION TOL			SCALE REF			MATERIAL		
D	REDRAWN FOR REGEN. CATALOG	22MAR00	SMS DSS	9722	.X	= +/- .030	1:1.5		ALUMINUM			
C	ADDED SOL VALVE STAMPING	19OCT93	BRS	5044	.XX	= +/- .015			HEAT TREAT & FINISH			
B	REVISED CARTRIDGE STAMPING	18MAY93	BRS	4654	.XXX	= +/- .005						
A	TITLE WAS A TO B	28AUG92	RJB	3997	ANGLE TOL	±.1						
-	REVISED SYMBOL	08JUL91	BRS		FINISH	30 V						
LTR	REVISION	DATE	DRN	CHK	REL	REMOVE ALL BURRS	13JUN91	18JUN91	18JUN91			

OUTLINE & ASSEMBLY

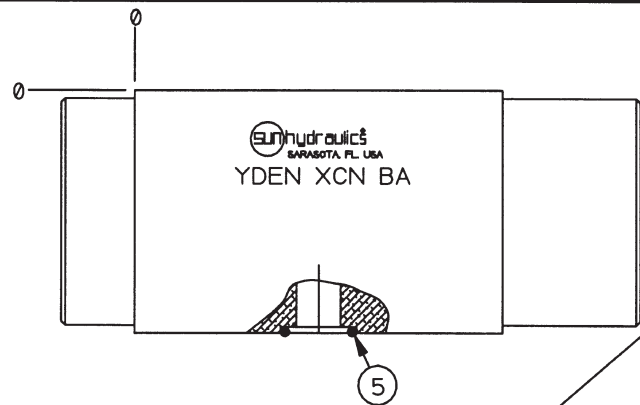
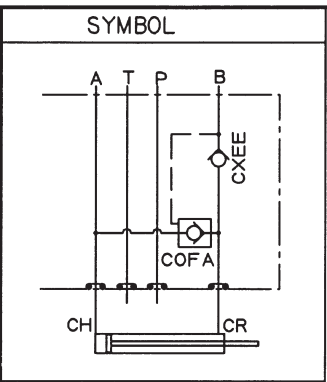
TITLE ISO-05 FULL TIME REGENERATIVE VALVE FLOW B TO A

REVISION PART NO. D YDET XCN BA

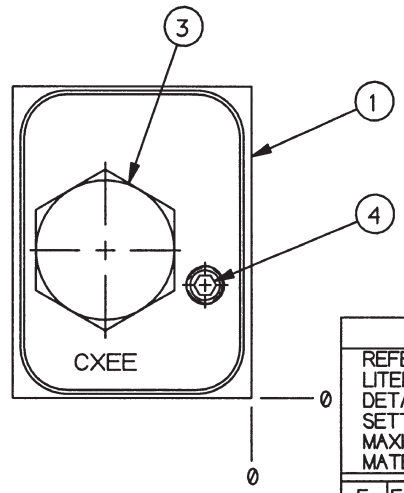
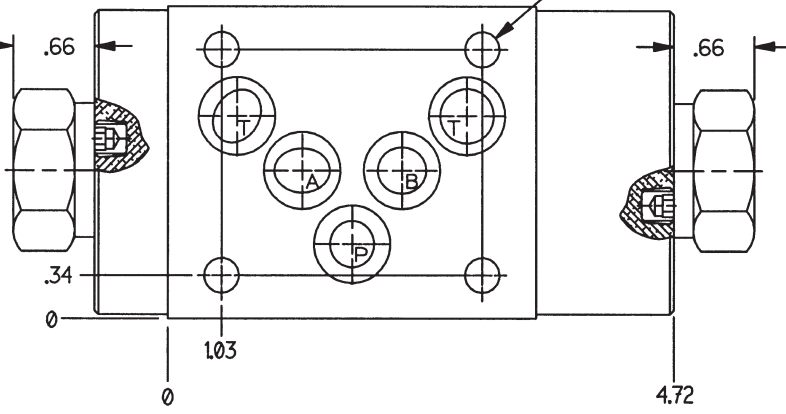
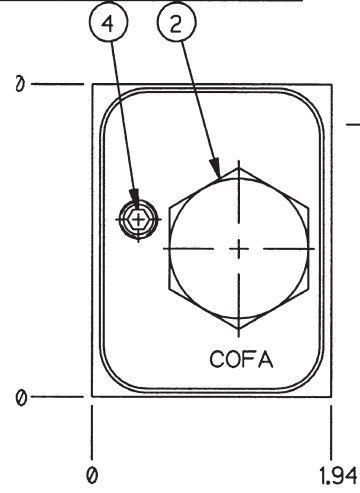
SUN hydraulics
 CORPORATION
 701 TALLEVAST ROAD
 SARASOTA, FLORIDA 34243, USA
 TELEPHONE (810) 362-1300



THIRD ANGLE PROJECTION  REVISION PART NO. B YDEN XCN BA

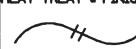


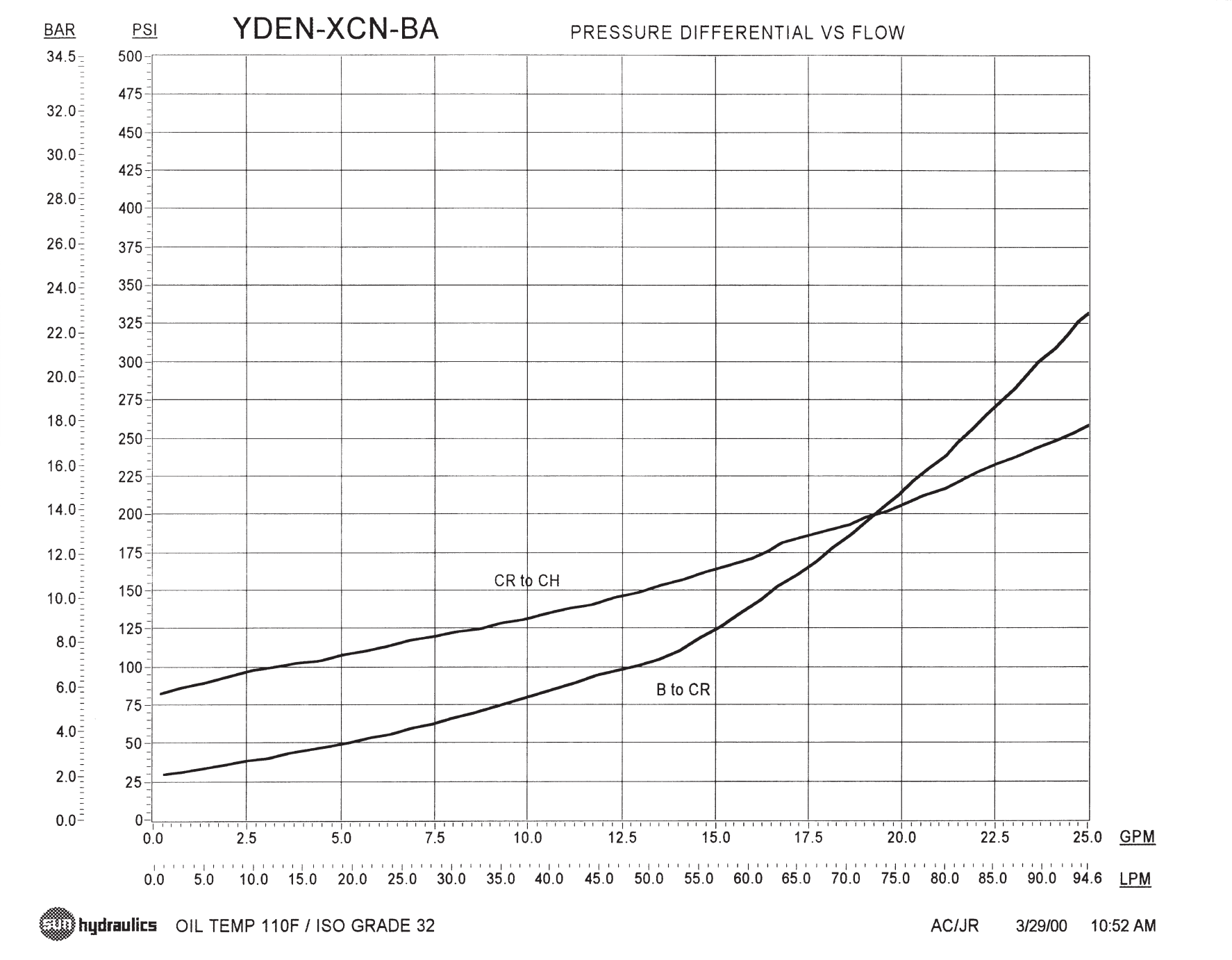
ISO-05 PATTERN
.28 DIA. MOUNTING HOLES
THRU TYP. (4) PLCS.

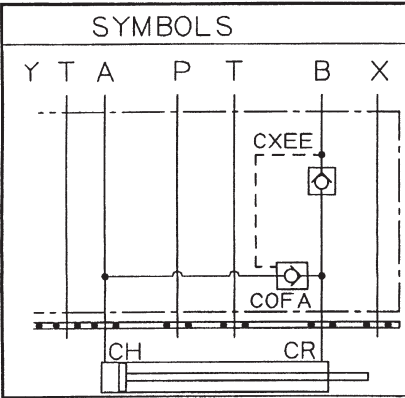


NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

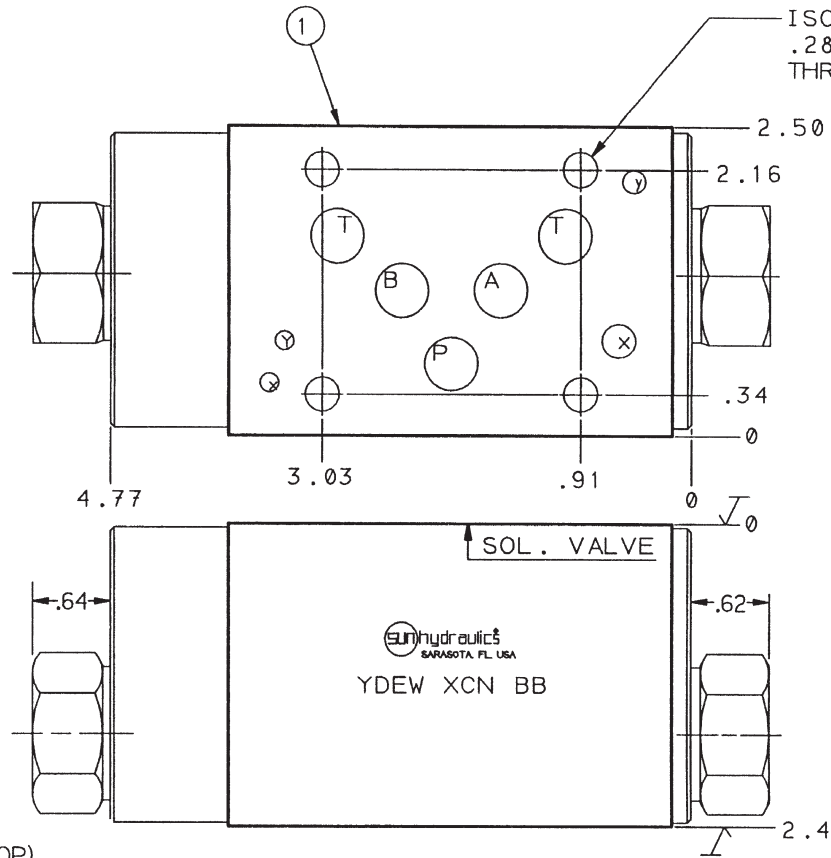
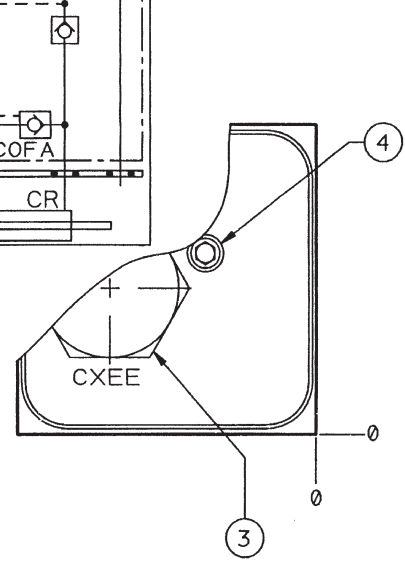
ITEM	PART NO.	PART NAME	QTY
5	500-001-014	"O" RING	5
4	340-001	PIPE PLUG	2
3	CXEE XCN	CHECK VALVE	1
2	COFA XEN	CHECK VALVE	1
1	150-015	BODY	1

OUTLINE & ASSEMBLY					TITLE ISO-05 SANDWICH FULL TIME REGENERATIVE VALVE FLOW B TO A			REVISION PART NO. B YDEN XCN BA	
UNLESS OTHERWISE SPECIFIED					SCALE REF 1:1			MATERIAL ALUM. & STEEL	
DIMENSION TOL					DRAWN CHECK RELEASE			HEAT TREAT & FINISH	
.X = +/- .030					DAS RJB 1461				
.XX = +/- .015					DATE DATE DATE			701 TALLEYBAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (813) 362-1369	
.XXX = +/- .005					21SEP87 21SEP87 21SEP87			© 1999 SUN HYDRAULICS CORPORATION	
ANGLE TOL +/- 1									
FINISH #0 ✓									
REMOVE ALL BURRS									
REVISION									

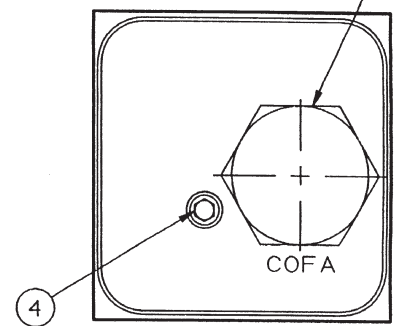




REVISION PART NO.
YDEW XCN BB



ISO-05 X,Y PATTERN
.28 DIA MOUNTING HOLE
THRU TYP. (4) PLCS.



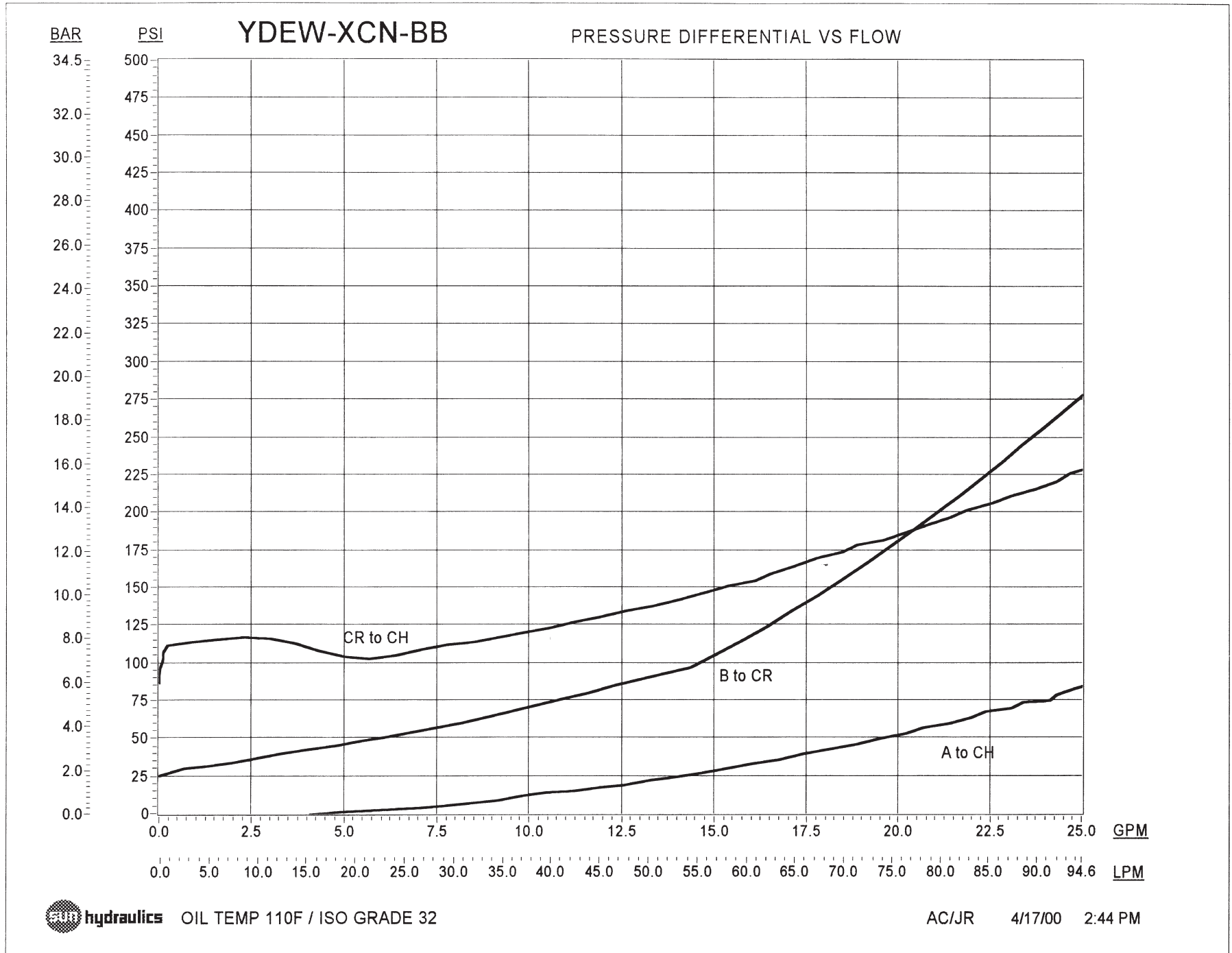
INSTALLATION REQUIRES SEAL KIT:
 990-120-009 BUNA-N FOR ISO-05 X,Y (U.S.)
 990-120-010 VITON FOR ISO-05 X,Y (U.S.)
 990-120-011 BUNA-N FOR ISO-05 X,Y (EUROPEAN/CETOP)
 990-120-012 VITON FOR ISO-05 X,Y (EUROPEAN/CETOP)
 (KIT INCLUDES SEAL PLATE AND ORINGS)

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
4	340-001	PIPE PLUG	2
3	CXEE XCN	CHECK VALVE	1
2	COFA XEN	CHECK VALVE	1
1	150-700	BODY	1

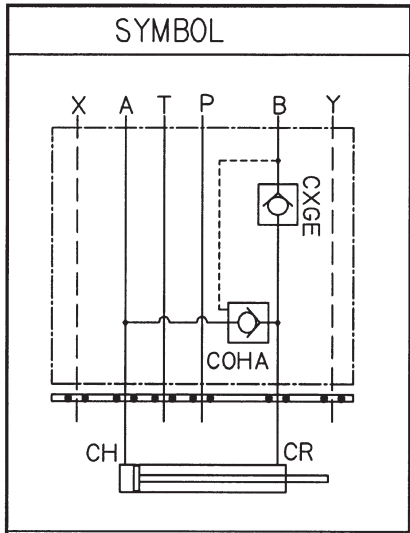
OUTLINE & ASSEMBLY

TITLE ISO-05 X,Y PATTERN FULL TIME REGENERATIVE VALVE FLOW B TO A		REVISION PART NO. YDEW XCN BB	
DIMENSION TOL XX = +/- .015 XXX = +/- .005		MATERIAL ALUM & STEEL	
MACHINING STANDARD S-88		HEAT TREAT & FINISH	
ANGLE TOL +/- 1 FINISH #4		DRAWN SMS CHECK NHH RELEASE 9737	
REMOVE ALL BURRS .005 MAX BREAK		DATE 10APR00 DATE 10APR00 DATE 10APR00	
LTR	REVISION	DATE	DRN CHK REL

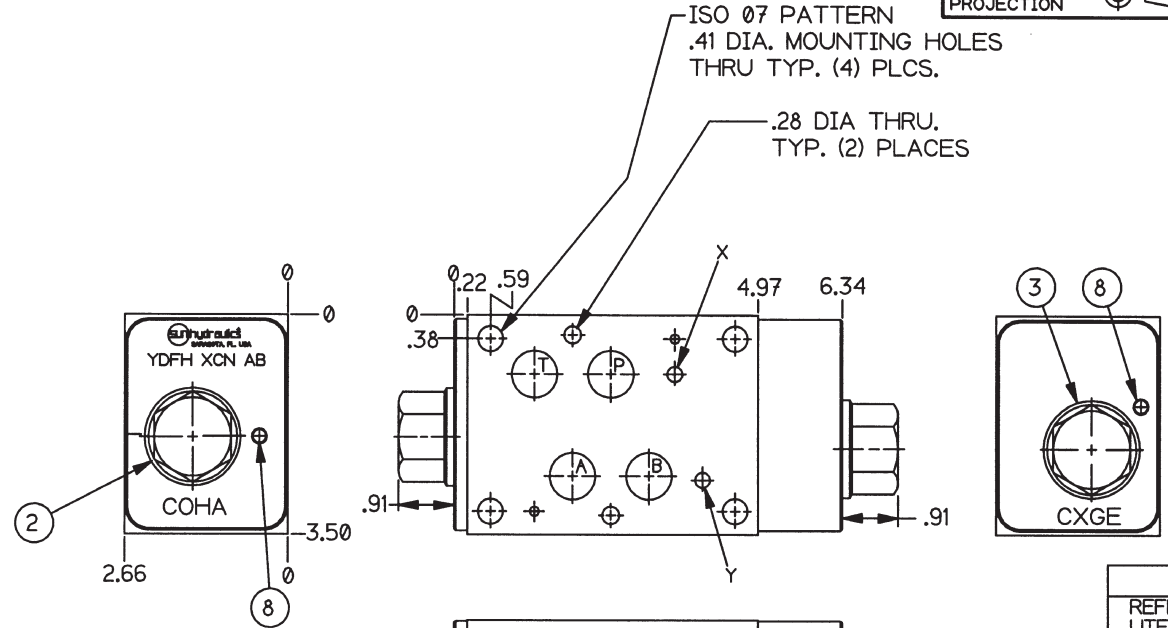


OIL TEMP 110F / ISO GRADE 32

AC/JR 4/17/00 2:44 PM



THIRD ANGLE PROJECTION REVISION PART NO. D YDFH XCN AB

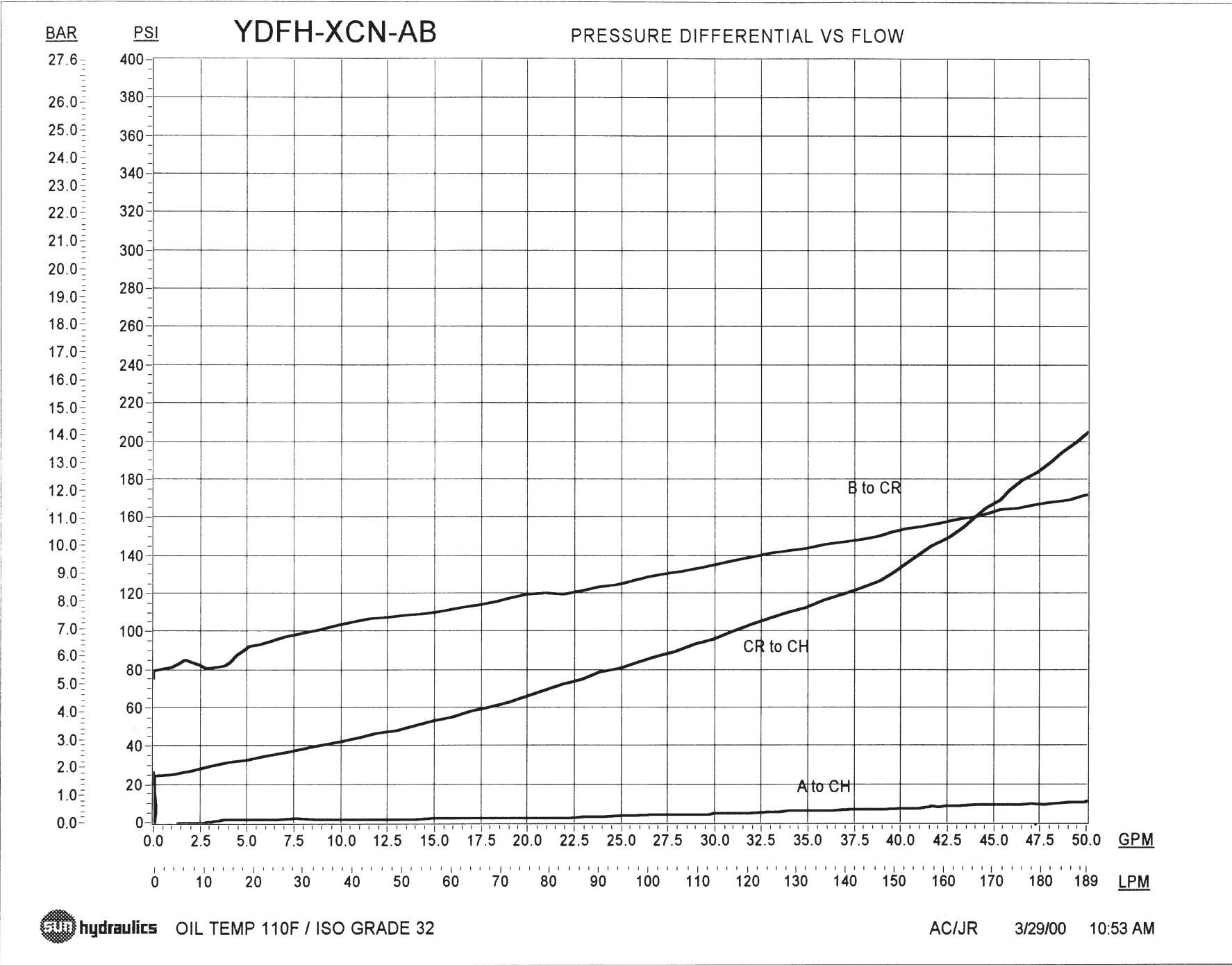


NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
8	850-004-250	KOENIG PLUG	2
7	700-006	SEAL PLATE	1
6	500-001-111	"O" RING	2
5	500-001-118	"O" RING	4
4	811-001-006	PIN	2
3	CXGE XCN	COUNTERBALANCE VALVE	1
2	COHA XEN	CHECK VALVE	1
1	152-746	BODY	1

OUTLINE & ASSEMBLY

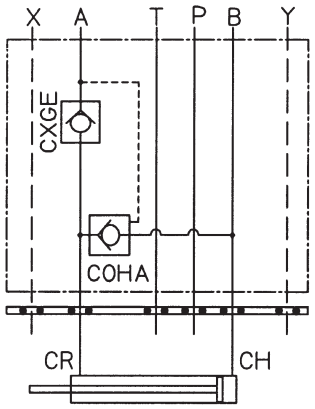
UNLESS OTHERWISE SPECIFIED					TITLE ISO-07 FULL TIME REGENERATIVE VALVE FLOW B TO A			REVISION PART NO. D YDFH XCN AB	
DIMENSION TOL					SCALE REF	MATERIAL			 CORPORATION 791 TALLEYVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (810) 362-1300
D REDRAWN FOR REGEN. CATALOG 23MAR90 SMS DSS 9723					X = +/- .030	1:2	ALUM. & STEEL		
C MOVED COHA SLIGHTLY 28APR94 RJB 5686					.XX = +/- .015		HEAT TREAT & FINISH		
B CORRECTED NOTE#4 11DEC92 DAS 4237					.XXX = +/- .005	DRAWN	CHECK	RELEASE	
A REMOVED REGENERATION NOTE 1MAY92 BRS					ANGLE TOL +/- 1	RJB	DAS	3435	
LTR REVISION					FINISH 80 V	DATE	DATE	DATE	
					REMOVE ALL BURRS	18DEC91	19DEC91	19DEC91	



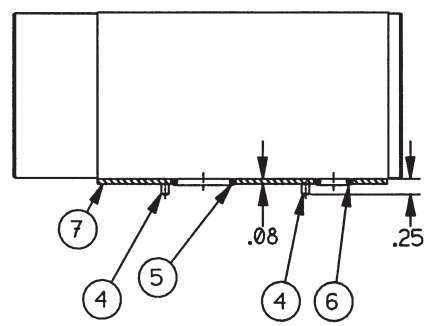
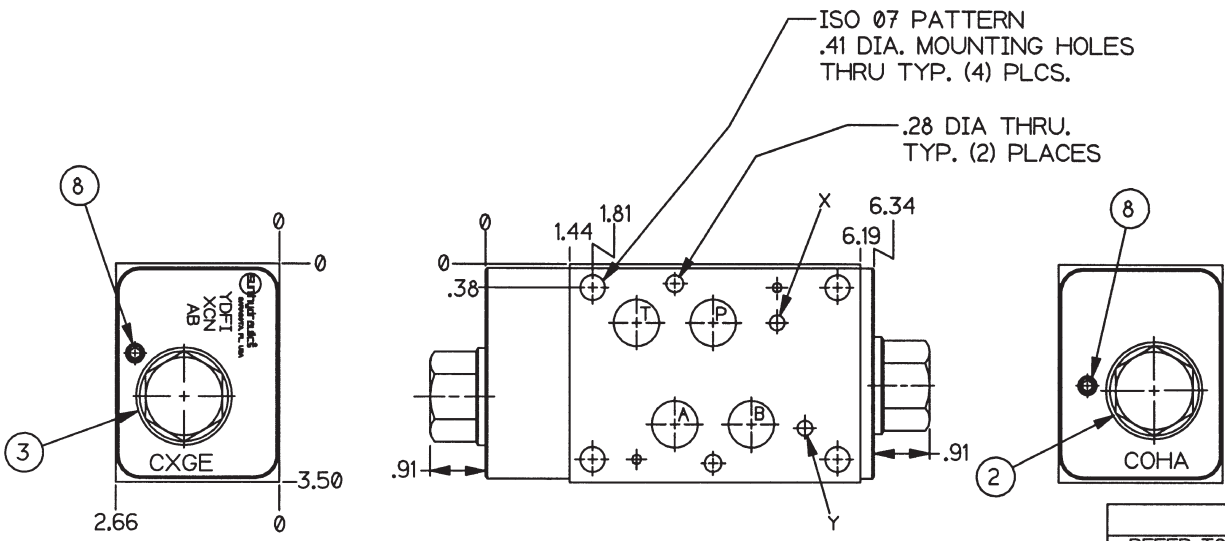
OIL TEMP 110F / ISO GRADE 32

AC/JR 3/29/00 10:53 AM

SYMBOL



THIRD ANGLE PROJECTION REVISION PART NO.
A YDFI XCN AB



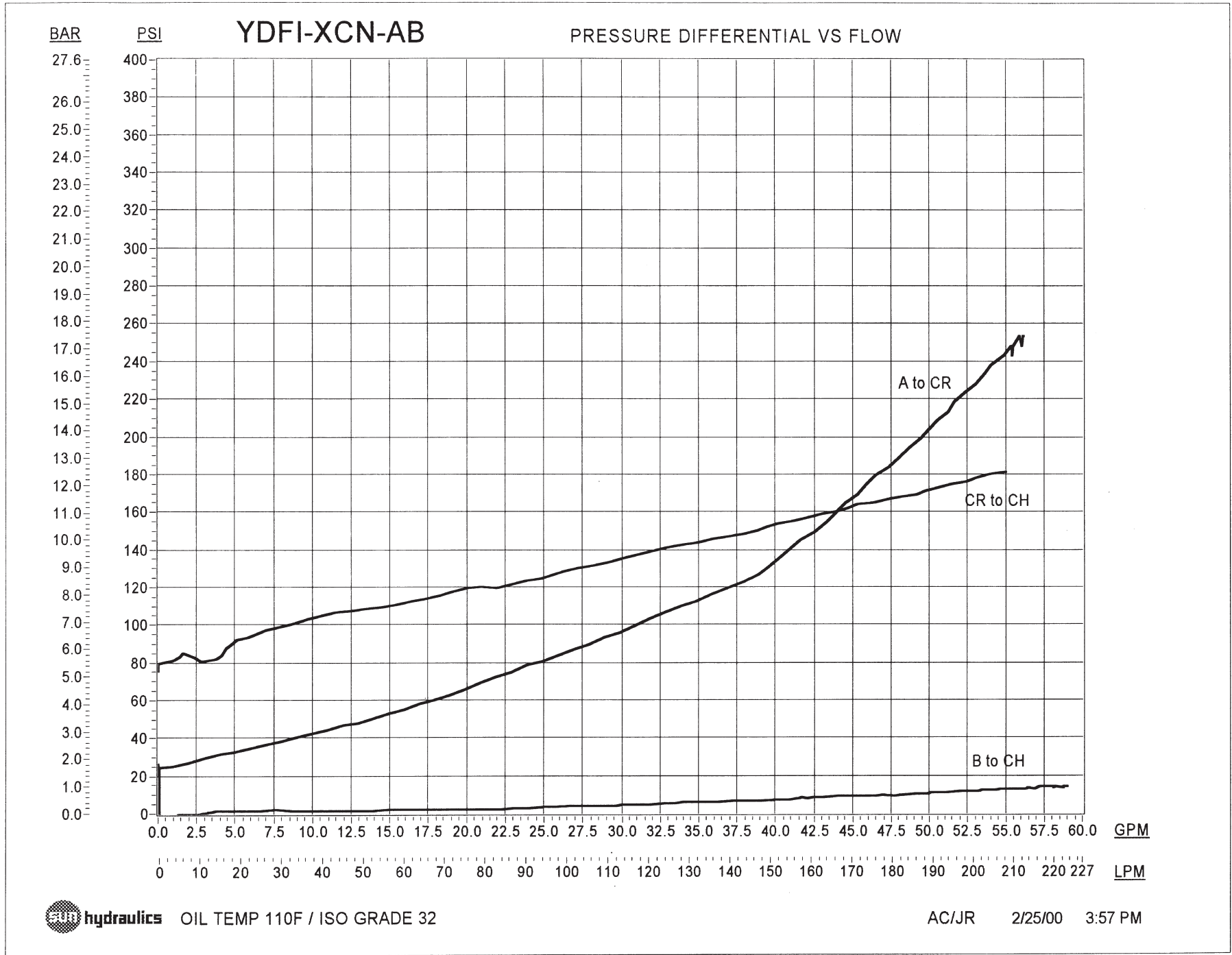
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
8	340-001	PIPE PLUG	2
7	700-006	SEAL PLATE	1
6	500-001-111	"O" RING	2
5	500-001-118	"O" RING	4
4	811-001-006	PIN	2
3	CXGE XCN	CHECK VALVE	1
2	COHA XEN	CHECK VALVE	1
1	151-146	BODY	1

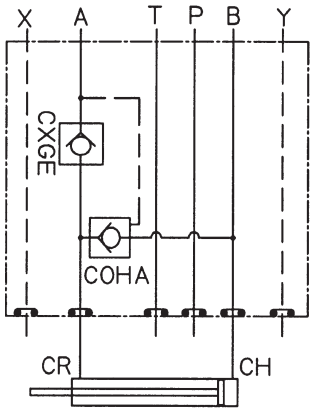
OUTLINE & ASSEMBLY

				UNLESS OTHERWISE SPECIFIED			TITLE ISO-07 FULL TIME REGENERATIVE VALVE FLOW A TO B			REVISION PART NO. A YDFI XCN AB	
				DIMENSION TOL			SCALE REF			MATERIAL	
				.X = +/- .030			1:2			ALUM. & STEEL	
				.XX = +/- .015			DRAWN CHECK RELEASE			HEAT TREAT & FINISH	
				.XXX = +/- .005			BRS RJB 2149			H	
A REDRAWN FOR REGEN. CATALOG				23MAR89	SMS	DSS	9723	DATE	DATE	DATE	
LTR REVISION				DATE	DRN	CHK	REL	05JUL89	05JUL89	05JUL89	





SYMBOL



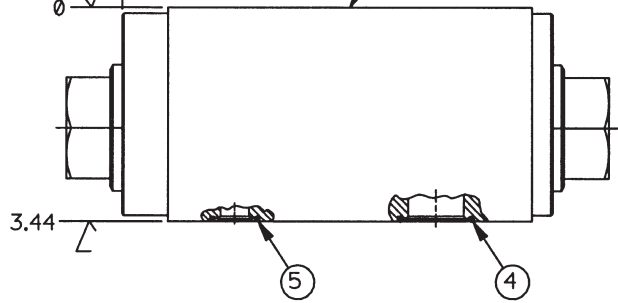
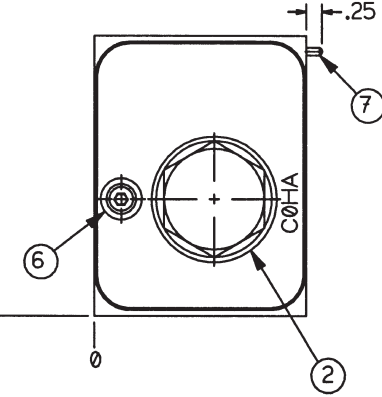
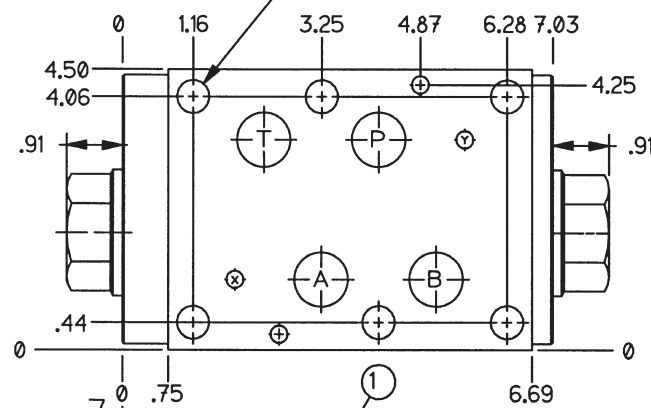
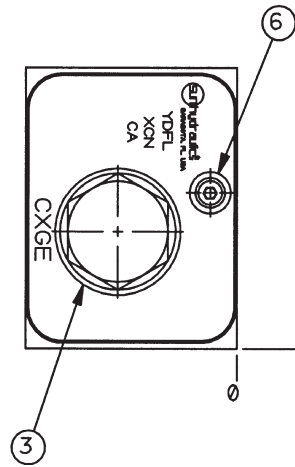
THIRD ANGLE PROJECTION



REVISION PART NO.
A YDFL XCN CA

YDFL XCN CA

ISO-08 PATTERN
.53 DIA MOUNTING HOLES
THRU TYP. (6) PLCS.



NOTES:

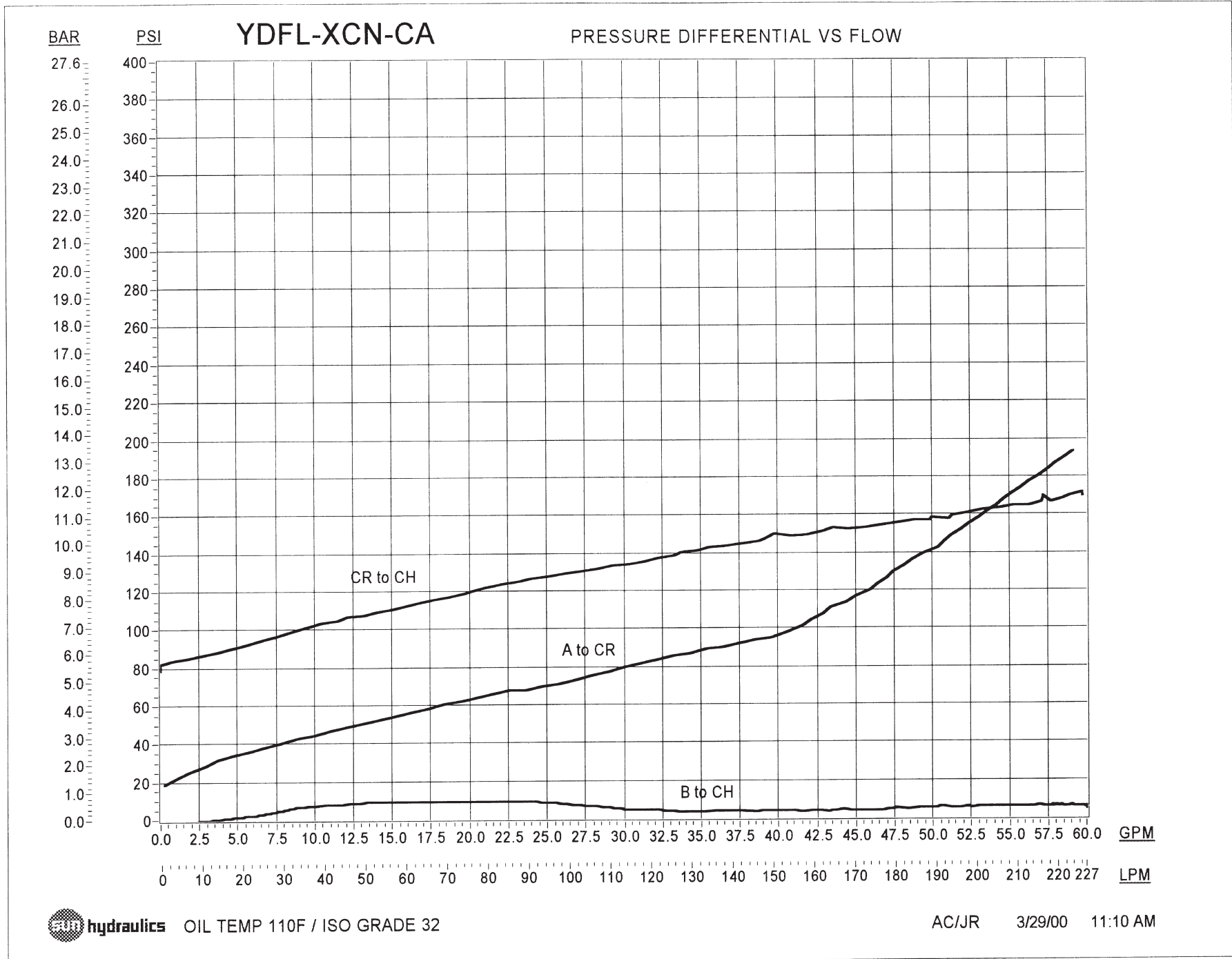
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

7	811-001-002	PIN	1
6	A330-006-004	"O" RING BOSS PLUG	2
5	500-001-114	"O" RING	2
4	500-001-121	"O" RING	4
3	CXGE XCN	CHECK VALVE	1
2	COHA XEN	CHECK VALVE	1
1	153-055	BODY	1
ITEM	PART NO.	PART NAME	QTY

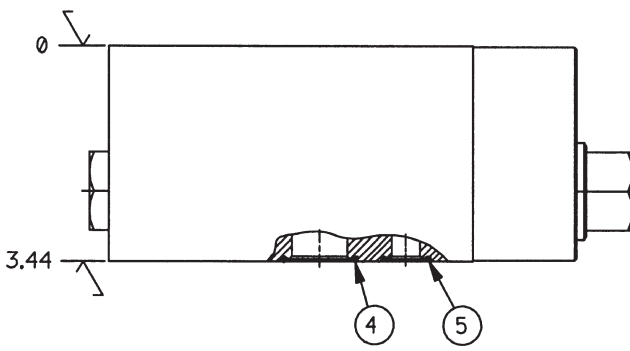
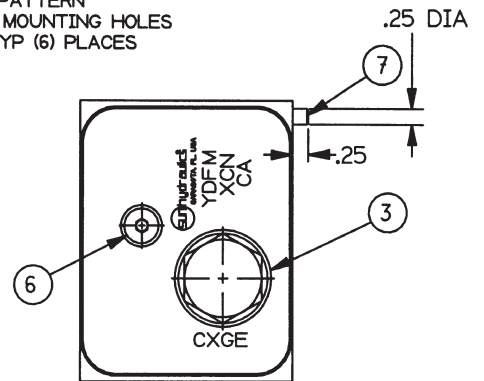
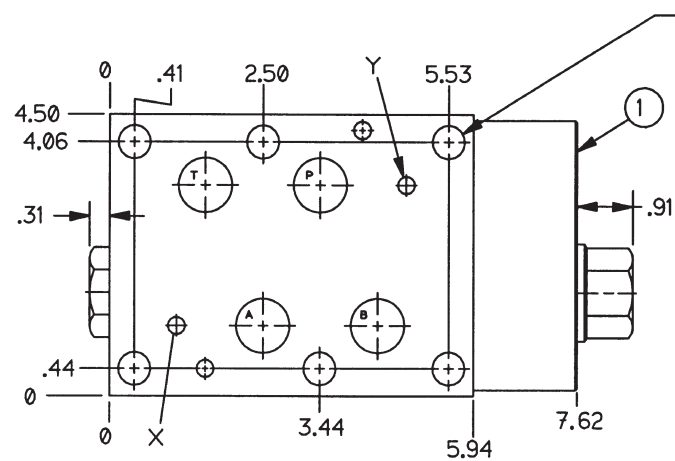
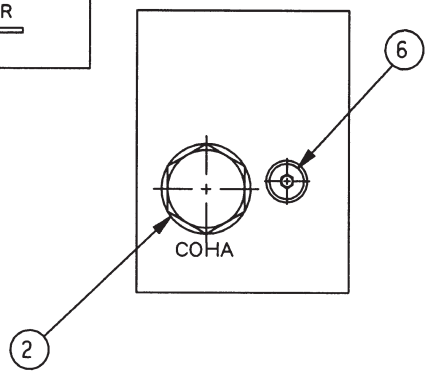
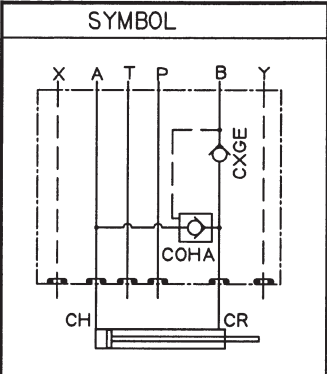
OUTLINE & ASSEMBLY

					TITLE ISO-08 FULL TIME REGENERATIVE VALVE FLOW A TO B			REVISION PART NO. A YDFL XCN CA	
UNLESS OTHERWISE SPECIFIED					SCALE REF 1:2		MATERIAL ALUMINUM		
DIMENSION TOL .X = +/- .03 # .XX = +/- .015 .XXX = +/- .005					DRAWN DAS		CHECK 4245		HEAT TREAT & FINISH
ANGLE TOL +/- 1 FINISH # V REMOVE ALL BURRS					DATE 11DEC92		DATE 14DEC92		DATE
IT#7 WAS IT#8 OLD IT#7 DELETED IT#6 WAS 330-006-004 REDRAWN FOR REGEN. CATALOG					23MAR90		SMS		DSS 9723
LTR					REVISION		DATE		DRN CHK REL





THIRD ANGLE PROJECTION  REVISION PART NO.
A YDFM XCN CA



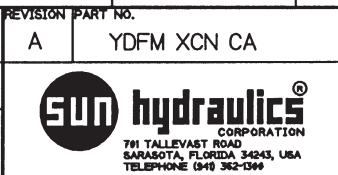
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

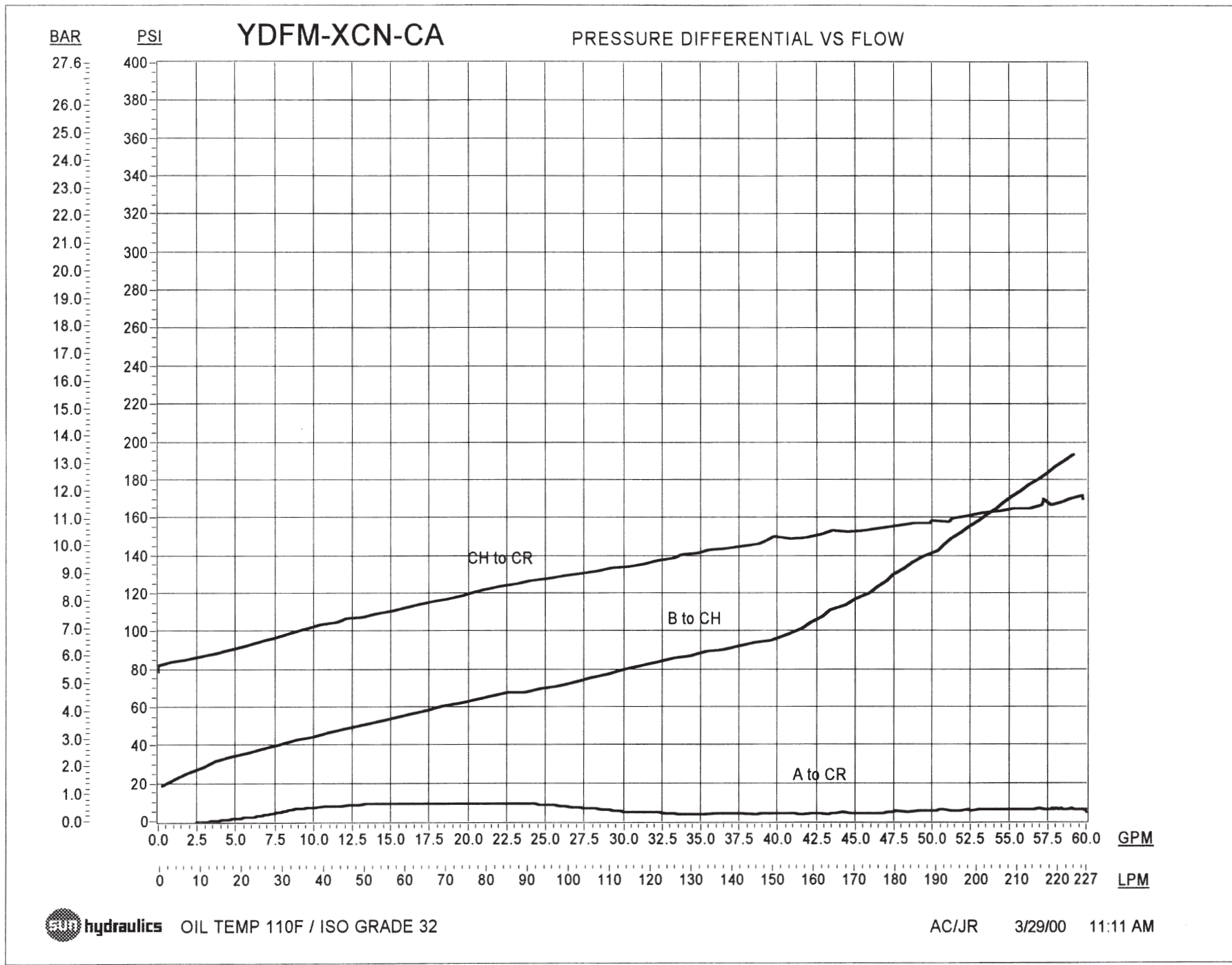
7	811-001-002	PIN	1
6	A330-006-004	"O" RING BOSS PLUG	2
5	500-001-114	"O" RING	2
4	500-001-121	"O" RING	4
3	CXGE XCN	CHECK VALVE	1
2	COHA XEN	CHECK VALVE	1
1	153-056	BODY	1

ITEM	PART NO.	PART NAME	QTY
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LTR	REVISION	DATE	DRN	CHK	REL
A	IT#7 WAS IT#8 OLD IT#7 DELETED IT#6 WAS 330-006-004 REDRAWN FOR REGEN. CATALOG	23MAR90	SMS	DSS	9723

UNLESS OTHERWISE SPECIFIED		TITLE ISO-08 FULL TIME REGENERATIVE VALVE FLOW B TO A		REVISION PART NO. A YDFM XCN CA	
DIMENSION TOL		SCALE REF 1:2		MATERIAL ALUM. & STEEL	
.X = +/- .030		DRAWN DAS		HEAT TREAT & FINISH	
.XX = +/- .015		CHECK		DATE	
.XXX = +/- .005		RELEASE		DATE	
ANGLE TOL +/- 1		DATE		DATE	
FINISH # V		DATE		DATE	
REMOVE ALL BURRS		01DEC92			

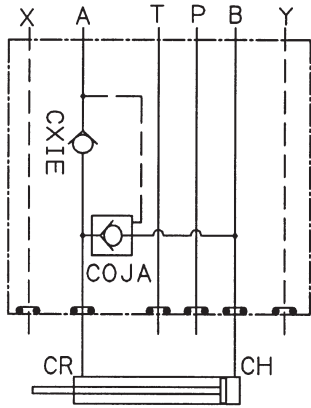




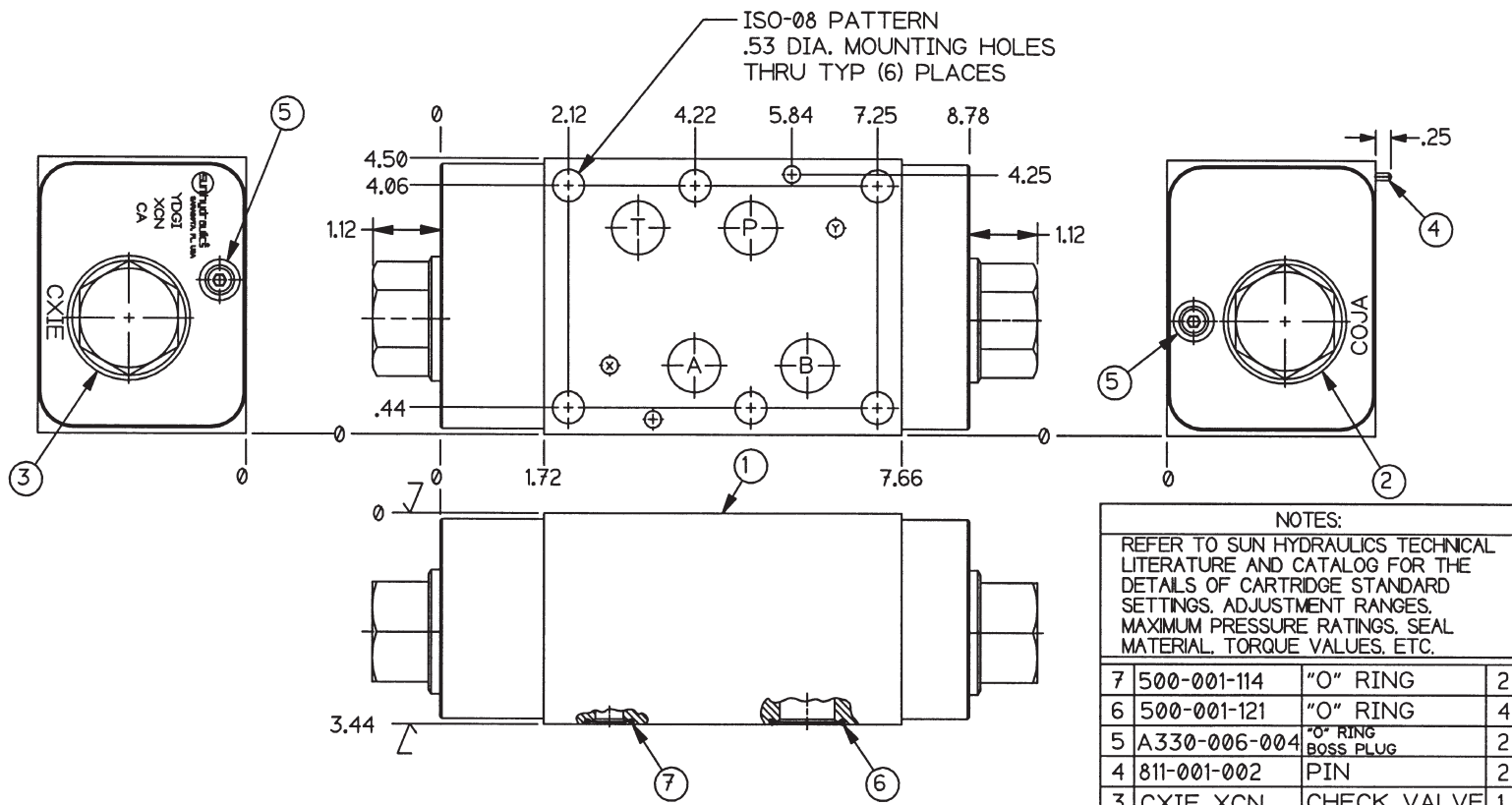
OIL TEMP 110F / ISO GRADE 32

AC/JR 3/29/00 11:11 AM

SYMBOL



THIRD ANGLE PROJECTION REVISION PART NO.
B YDGI XCN CA



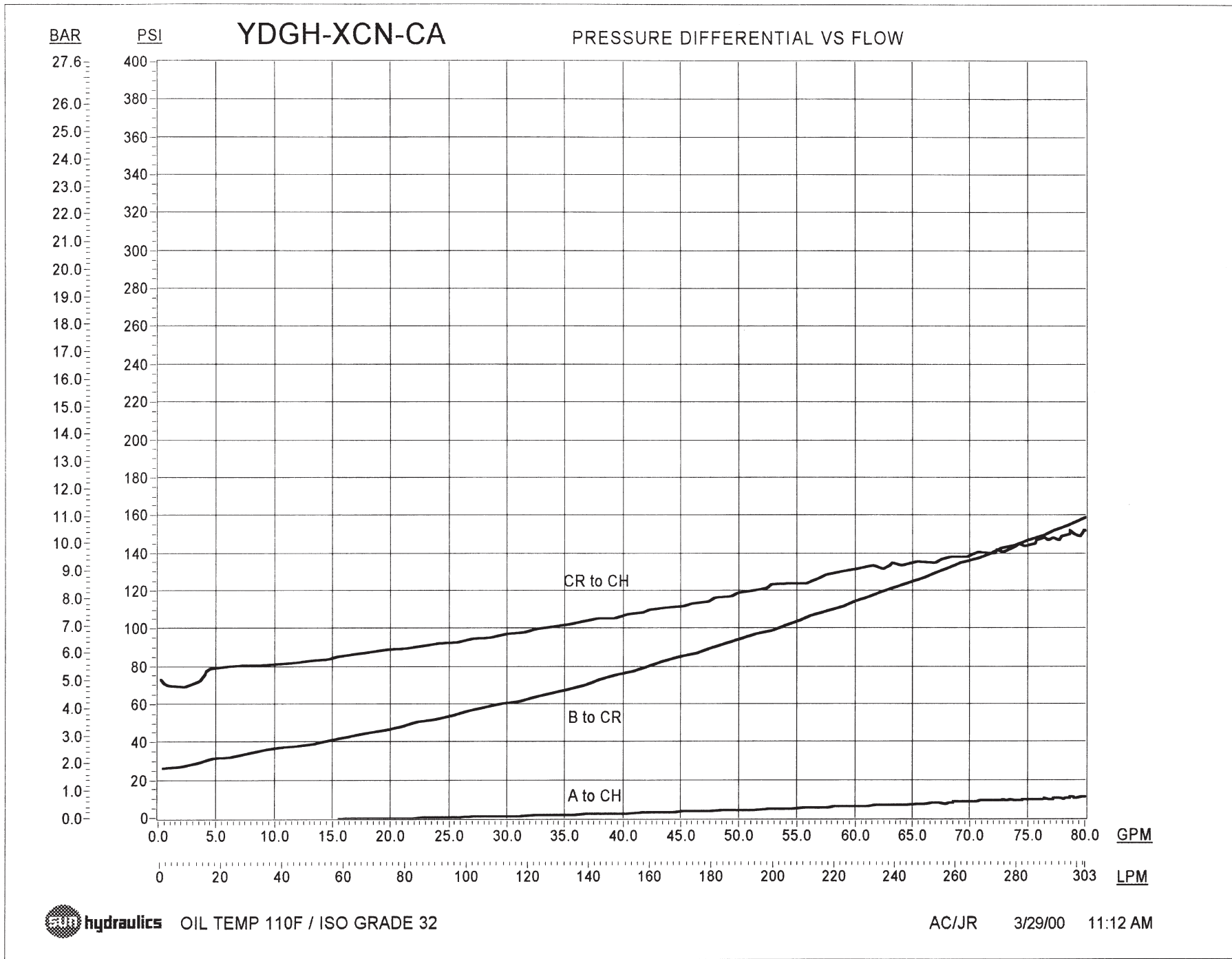
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.


7	500-001-114	"O" RING	2
6	500-001-121	"O" RING	4
5	A.330-006-004	"O" RING BOSS PLUG	2
4	811-001-002	PIN	2
3	CXIE XCN	CHECK VALVE	1
2	COJA XEN	CHECK VALVE	1
1	151-196	BODY	1

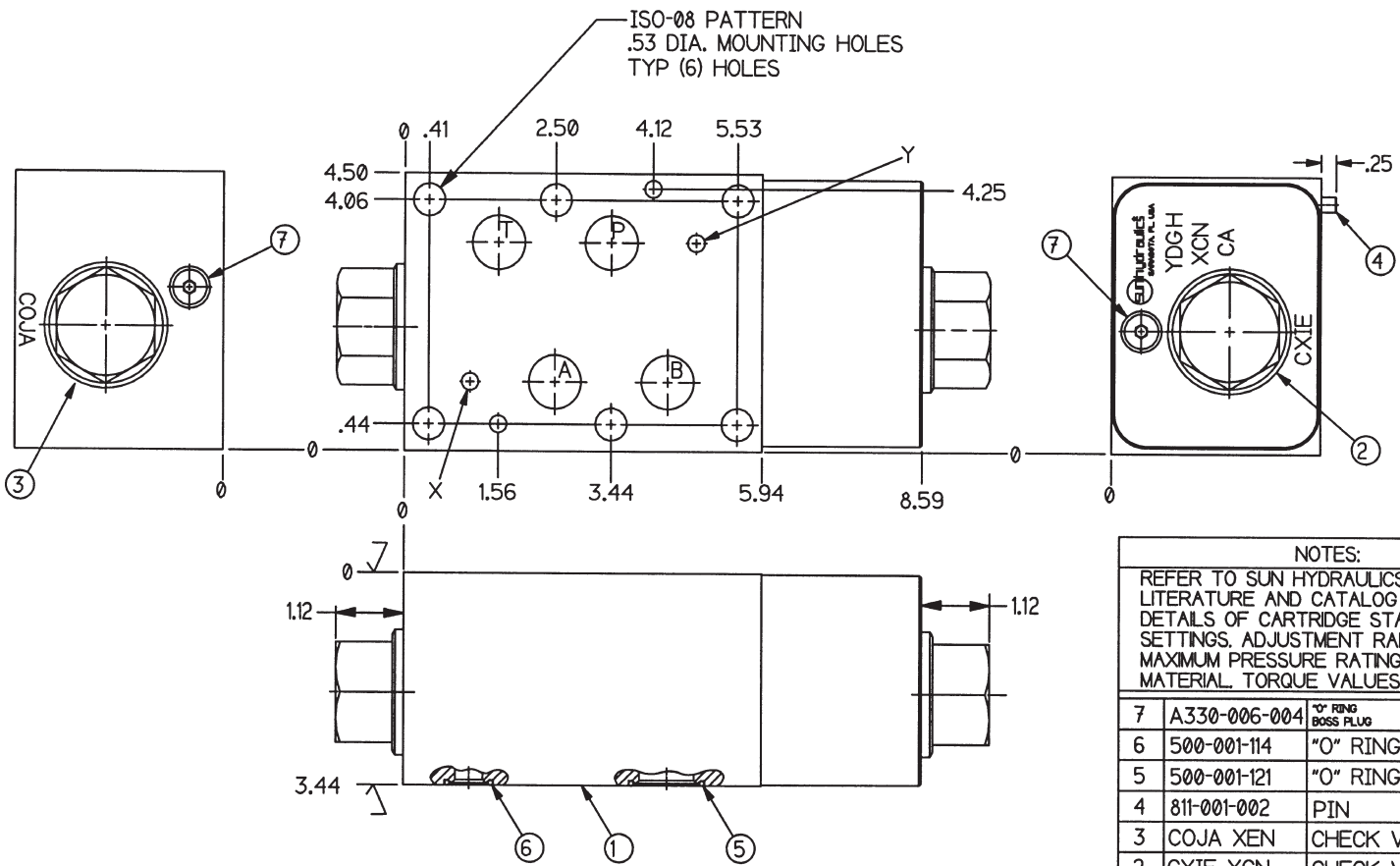
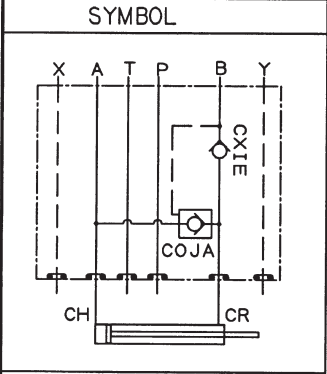
ITEM	PART NO.	PART NAME	QTY
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OUTLINE & ASSEMBLY

				UNLESS OTHERWISE SPECIFIED			TITLE ISO-08 FULL TIME REGENERATIVE VALVE FLOW A TO B			REVISION PART NO. B YDGI XCN CA	
				DIMENSION TOL			SCALE REF			MATERIAL	
				.X = +/- .030			1:2			ALUM. & STEEL	
				.XX = +/- .015			DRAWN BRS			HEAT TREAT & FINISH	
				.XXX = +/- .005			CHECK GB			4930	
				ANGLE TOL +/- 1			DATE 17AUG93			DATE 18AUG93	
				FINISH #0 V			DATE 17AUG93			DATE 18AUG93	
				REMOVE ALL BURRS							
IT#7 WAS IT#8 IT#6 WAS IT#7 OLD IT#6				23MAR00 SMS DSS 9723						<p>SUN hydraulics CORPORATION 791 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1399</p>	
B WAS DELETED IT#5 WAS 338-006-004 REDRAWN FOR REGEN. CATALOG											
A IN NOTE#5 75 PSI WAS 30 PSI				29SEP93 BRS 5030							
LTR REVISION				DATE DRN CHK REL							



THIRD ANGLE PROJECTION  REVISION PART NO.
 A YDGH XCN CA



NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

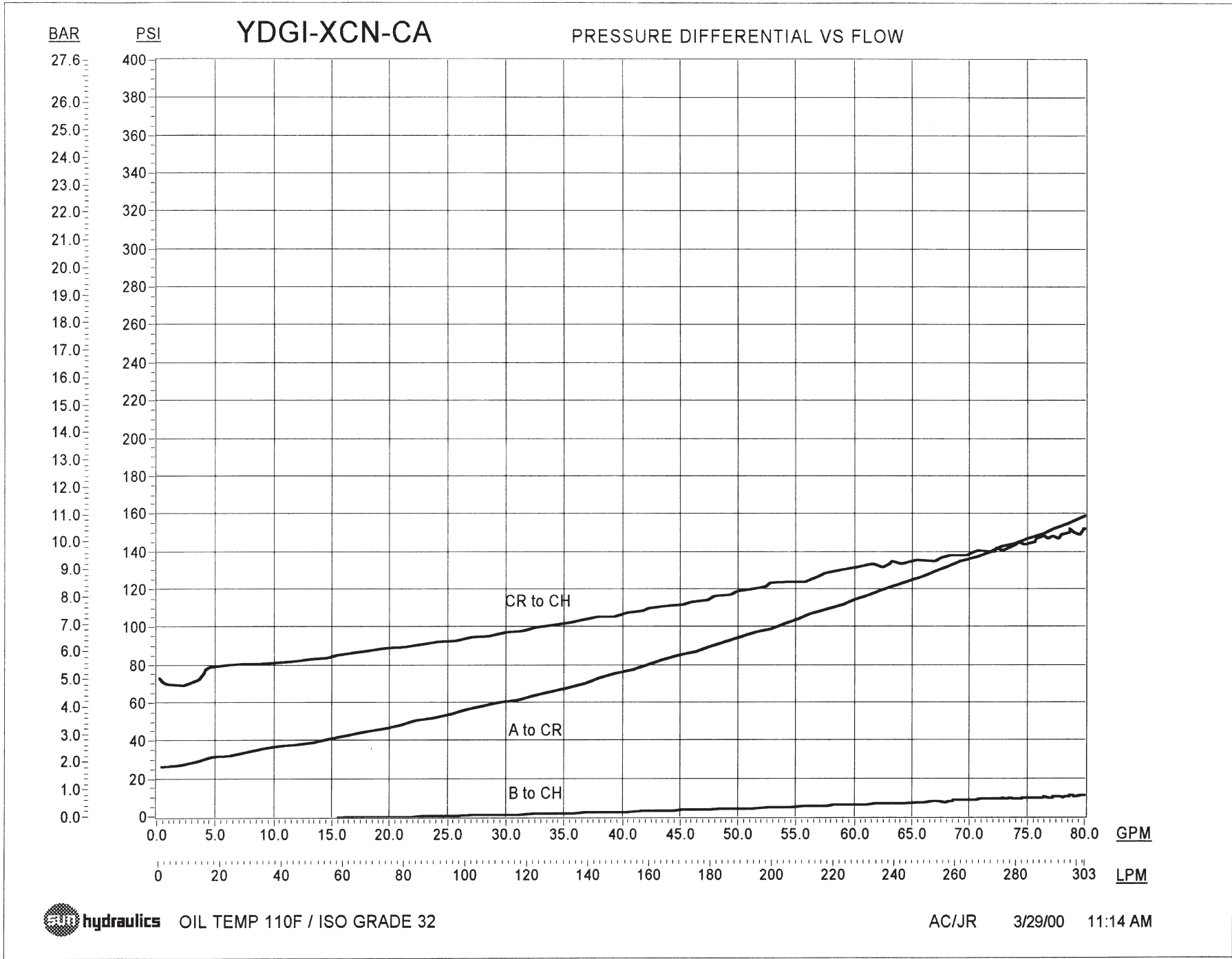
7	A330-006-004	1" RING BOSS PLUG	2
6	500-001-114	"O" RING	2
5	500-001-121	"O" RING	4
4	811-001-002	PIN	1
3	COJA XEN	CHECK VALVE	1
2	CXIE XCN	CHECK VALVE	1
1	151-537	BODY	1

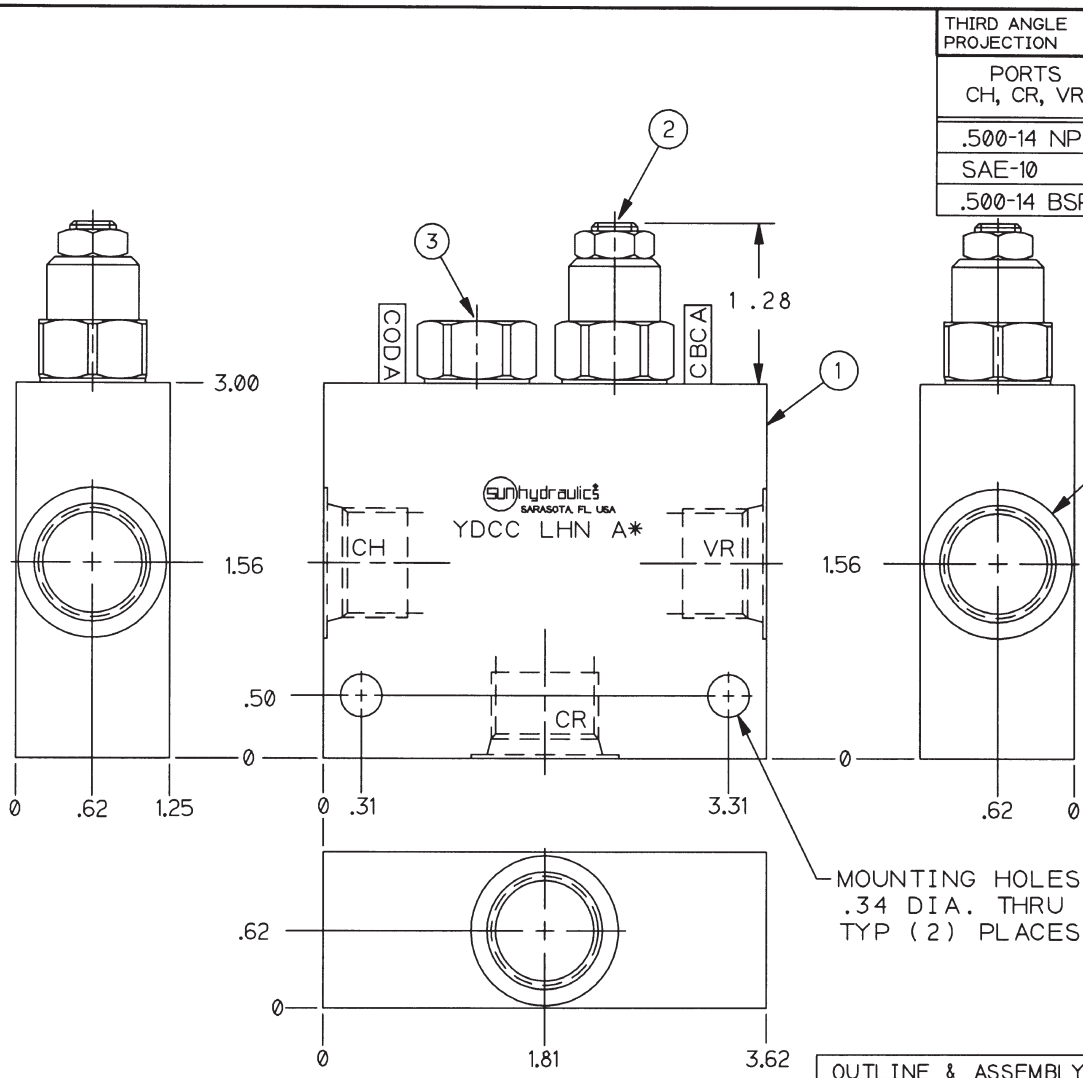
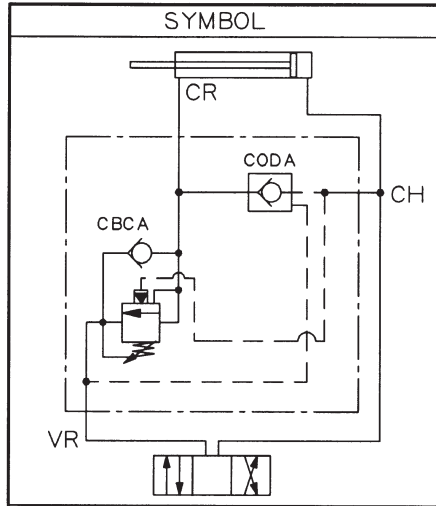
ITEM	PART NO.	PART NAME	QTY
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OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED					TITLE ISO-08 FULL TIME REGENERATIVE VALVE FLOW B TO A			REVISION PART NO. A YDGH XCN CA			
DIMENSION TOL.					SCALE REF			MATERIAL			
.X = +/- .030					1:2			ALUM. & STEEL			
.XX = +/- .015					DRAWN BRS			HEAT TREAT & FINISH			
.XXX = +/- .005					CHECK DAS			X			
ANGLE TOL +/- 1					DATE 11MAY92						
FINISH #0					DATE 11MAY92						
REMOVE ALL BURRS					DATE 11MAY92						
A DELETED IT#8 IT#7 WAS 338-006-004 REDRAWN FOR REGEN. CATALOG					23MAR90	SMS	DSS	9723			
LTR REVISION					DATE	DRN	CHK	REL			







THIRD ANGLE PROJECTION	REVISION PART NO.	
	B	YDCC LHN A*
PORTS CH, CR, VR	BODY DASH NO.	MODEL NO.
.500-14 NPTF	-001	AC
SAE-10	-002	AK
.500-14 BSPP	-003	AV

NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUE, ETC.

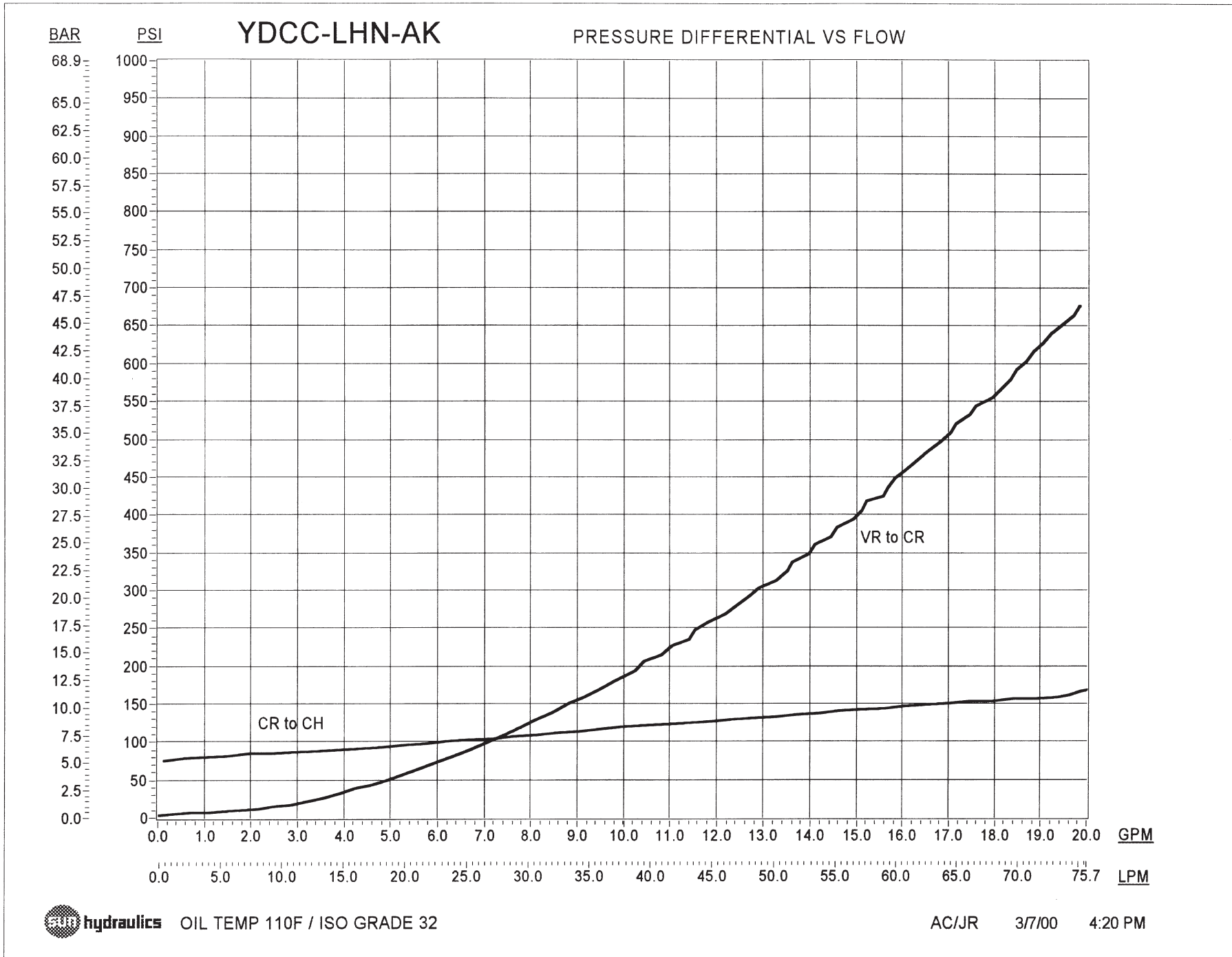
ITEM	PART NO.	PART NAME	QTY
3	CODA XEN	CHECK VALVE	1
2	CBCA LHN	COUNTERBALANCE VALVE	1
1	150-816-***	BODY	1

UNLESS OTHERWISE SPECIFIED				TITLE PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED				REVISION PART NO.			
DIMENSION TOL				SCALE REF				MATERIAL			
.X = +/- .030				1:1				ALUM. & STEEL			
.XX = +/- .015				DRAWN HHP				CHECK JDA			
.XXX = +/- .005				DATE 21 MAY 82				RELEASE DATE 05 JUN 82			
ANGLE TOL +/- 1				DATE				HEAT TREAT & FINISH			
FINISH #0 V				DATE				H			
REMOVE ALL BURRS				DATE							

ITEM

791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1300

ADDED DIRECTIONAL VALVE TO SYMBOL	28FEB81	SMS	INH
LHN WAS LAN REDRAWN FOR REGEN. CATALOG	23MAR88	SMS	DSB 9723
REDRAWN ON CADD WITHOUT CHANGE.	24FEB84	BRS	
LTR	REVISION	DATE	DRN CHK REL



OIL TEMP 110F / ISO GRADE 32

AC/JR 3/7/00 4:20 PM

SYMBOL

SUN hydraulics
SARASOTA, FL. USA

YDEC LHN A*

THIRD ANGLE PROJECTION

REVISION PART NO. H YDEC LHN A*

PORTS CH, CR, VR	BODY DASH NO.	MODEL NO.
.750-14 NPTF	-001	AD
SAE-12	-002	AL
.750-14 BSPP	-003	AW

PORTS PER CHART TYP. (3) PLACES

4.2 DIA. MOUNTING HOLES THRU TYP. (2) PLACES

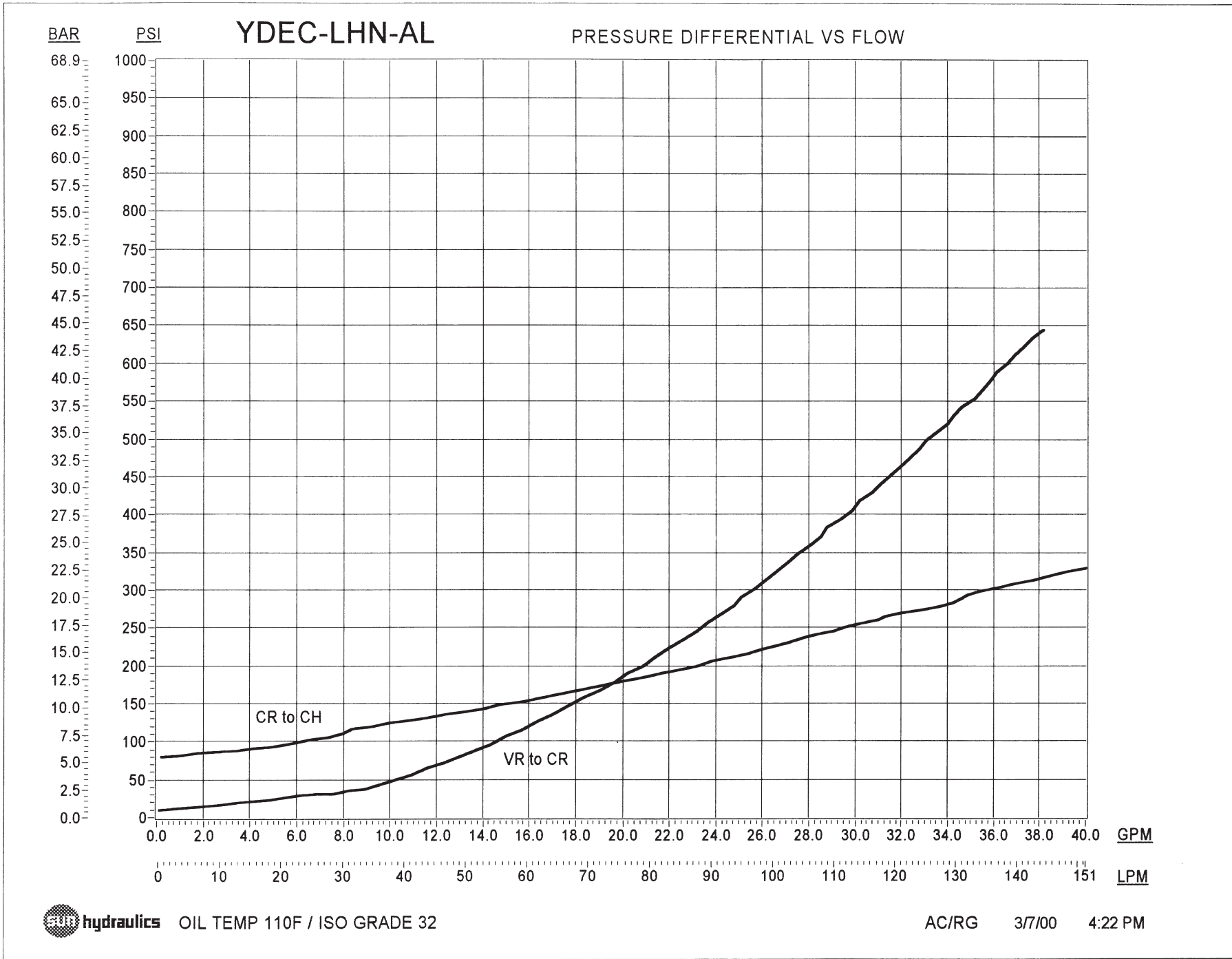
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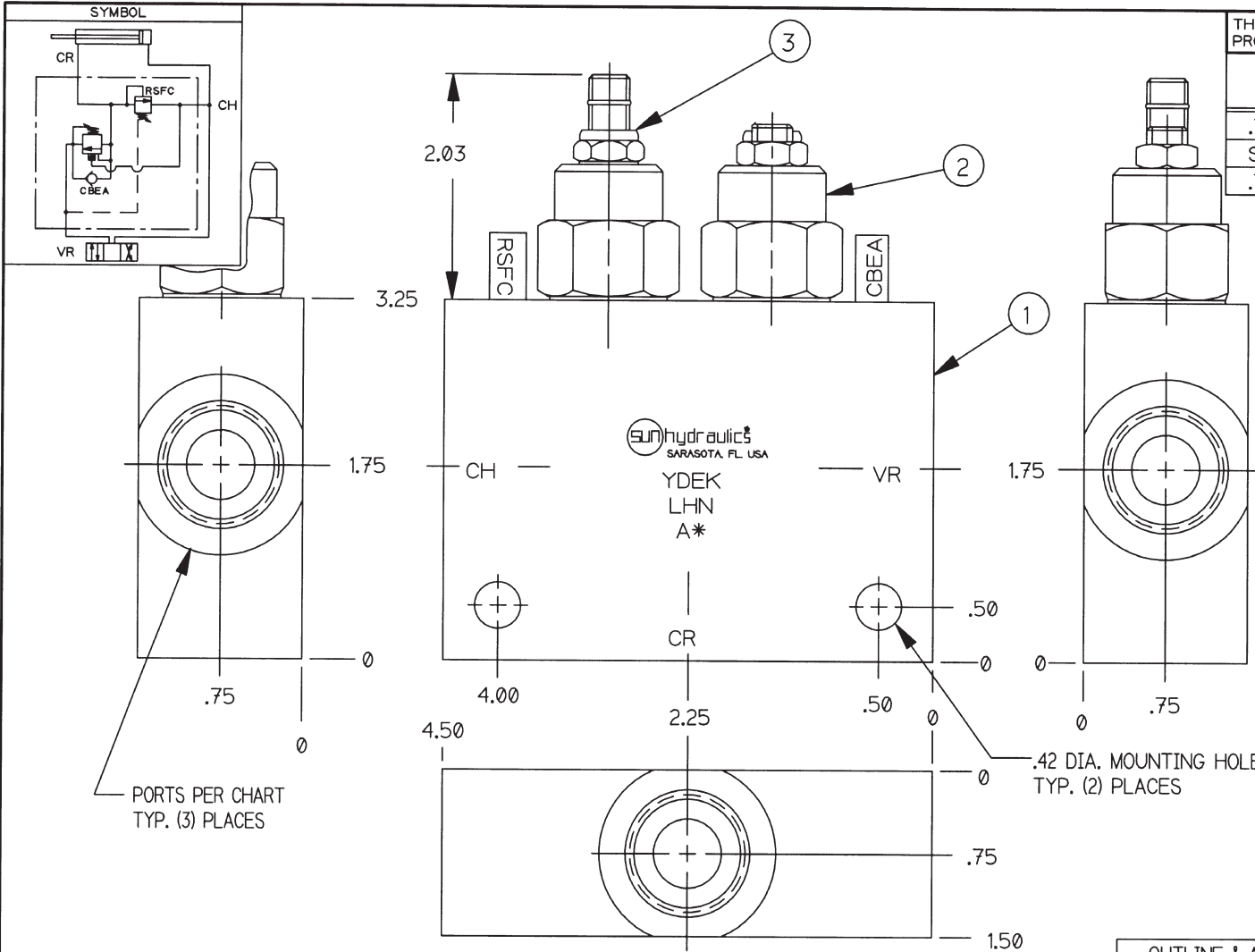
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
3	CBEA LHN	COUNTERBALANCE VALVE	1
2	COFA XEN	CHECK VALVE	1
1	150-034-***	BODY	1

OUTLINE & ASSEMBLY

REVISION	DATE	DRN	CHK	REL	TITLE	SCALE REF	MATERIAL	HEAT TREAT & FINISH
-	28FEB01	SMS	NH		PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED	1:1	ALUM. & STEEL	
H	23MAR00	SMS	DSS	9723				
-	20APR98	DSS						
G	26MAR98	DSS	DEB	8498				
F	04OCT84	KWL	HP					
LTR	REVISION				DATE	DATE	DATE	





THIRD ANGLE PROJECTION		REVISION PART NO. C	YDEK LHN A*
PORTS CH, CR, VR	BODY DASH NO.	MODEL NO.	
.750-14 NPTF	-001	AD	
SAE-12	-002	AL	
.750-14 BSPP	-003	AW	

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

3	RSFC LAN	SEQUENCE VALVE	1
2	CBEA LHN	COUNTERBALANCE VALVE	1
1	150-034-***	BODY	1
1	PART NO.	PART NAME	QTY

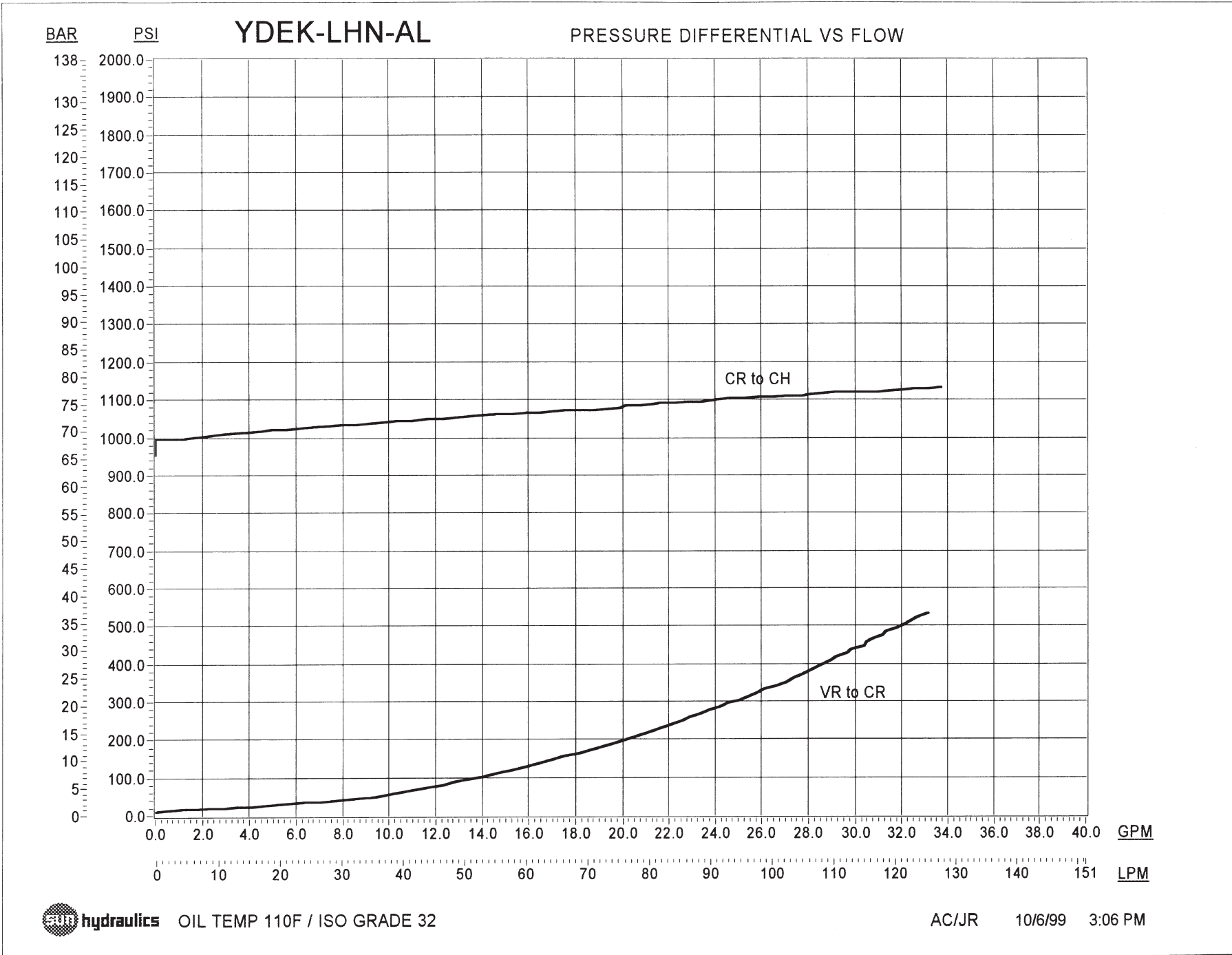
-	ADDED DIRECTIONAL VALVE TO SYMBOL	28FEB01	SMS	NHH	
C	RSFC LAN WAS RSFC FAN LHN WAS LAN REDRAWN FOR REGEN. CATALOG	23MAR00	SMS	DSS	9723
-	ADDED *** TO PART #	20APR98	DSS		
B	REDRAWN IN CADD SAES WERE SUN STD MOUNTING HOLES WERE .41 DIA	26MAR98	DSS	DEB	8498
A	3.25 WAS 3.00	25JUN80	RJC		
LTR	REVISION	DATE	DRN	CHK	REL

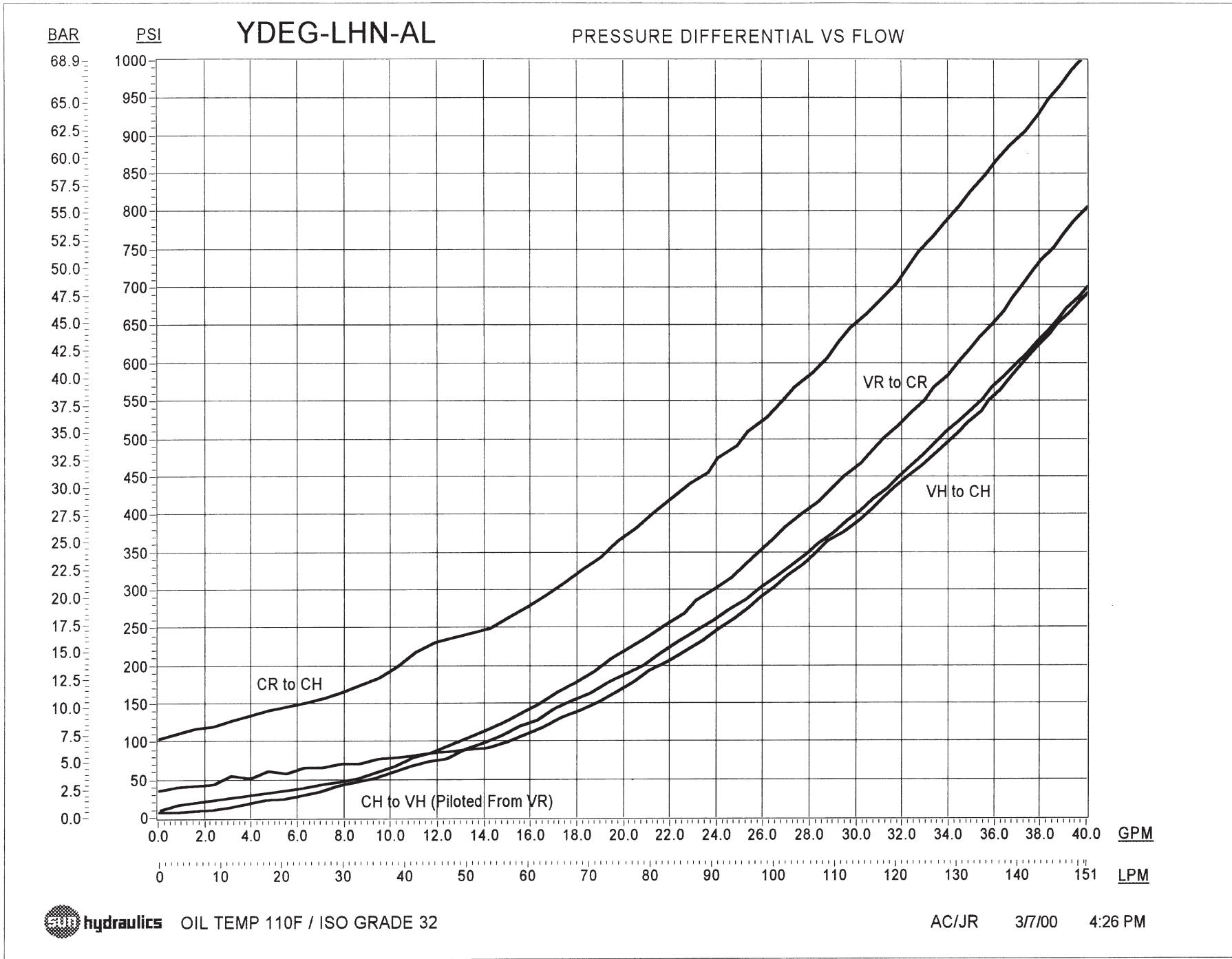
UNLESS OTHERWISE SPECIFIED		TITLE PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED		REVISION PART NO. C YDEK LHN A*	
DIMENSION TOL		SCALE REF 1:1		MATERIAL ALUM. & STEEL	
.X = +/- .030		DRAWN HHP		HEAT TREAT & FINISH	
.XX = +/- .015		CHECK JDA			
.XXX = +/- .005		RELEASE			
ANGLE TOL +/- 1		DATE 24OCT79		DATE 30OCT79	
FINISH #0 V					
REMOVE ALL BURRS					

OUTLINE & ASSEMBLY

REVISION PART NO. C YDEK LHN A*

SUN hydraulic CORPORATION
 791 TALLEYVAST ROAD
 SARASOTA, FLORIDA 34243, USA
 TELEPHONE (941) 362-1360





SYMBOL

PORTS CR, CH	PORTS VR, VH	BODY DASH NO.	MODEL NO.
1.000-11.5 NPTF	.750-14 NPTF	-001	AE
1.000-11 BSPP	.750-14 BSPP	-002	AX
SAE-16	SAE-12	-003	AM

NOTES:

REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
6	340-001	PIPE PLUG	1
5	CKEB LCN	CHECK VALVE	1
4	CKEB XCN	CHECK VALVE	1
3	COFA XEN	CHECK VALVE	1
2	CBEA LHN	COUNTERBALANCE VALVE	1
1	150-108-***	BODY	1

OUTLINE & ASSEMBLY

REV	DESCRIPTION	DATE	BY	CHK	REL
A	QPEA LHN WAS QPEA XAN				
B	NOTE1 ADDED 3OPS NOTES WAS 4000PSI				
C	ADDED STAMPING COFA XEN WAS XAN				
D	CBEA WAS QPEA				
E	CKEB XCN WAS QPEA XAN				

UNLESS OTHERWISE SPECIFIED: DIMENSION TOL. SCALE: 1:1. MATERIAL: ALUM. & STEEL. FINISH: 88-V. REMOVE ALL BURRS. DATE: 03/27/73. DRAWN: RJK. CHECK: RELEASE: HEAT TREAT & FINISH.

ITEM

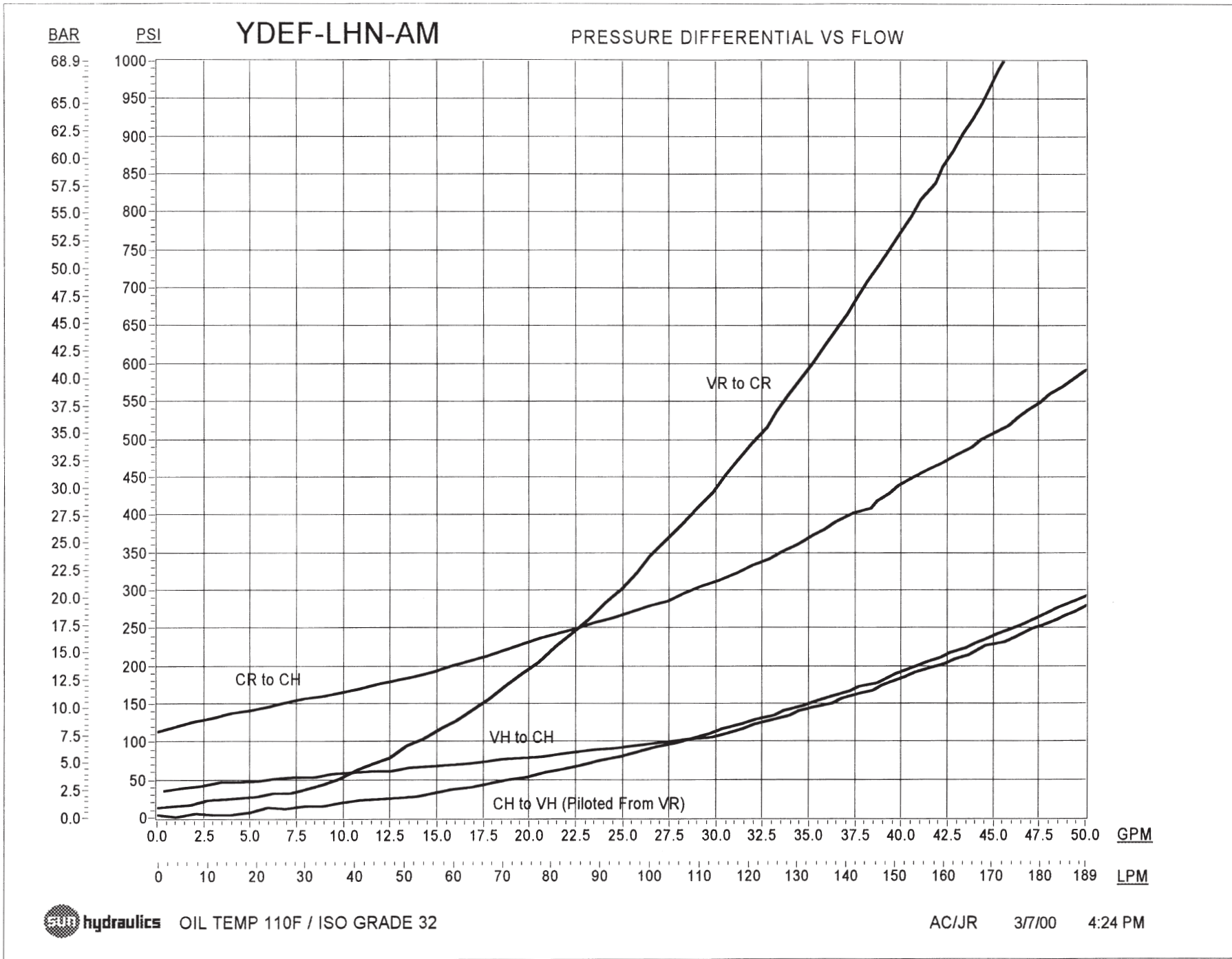
ITEM	PART NO.	PART NAME	QTY
6	340-001	PIPE PLUG	1
5	CKEB LCN	CHECK VALVE	1
4	CKEB XCN	CHECK VALVE	1
3	COFA XEN	CHECK VALVE	1
2	CBEA LHN	COUNTERBALANCE VALVE	1
1	150-108-***	BODY	1

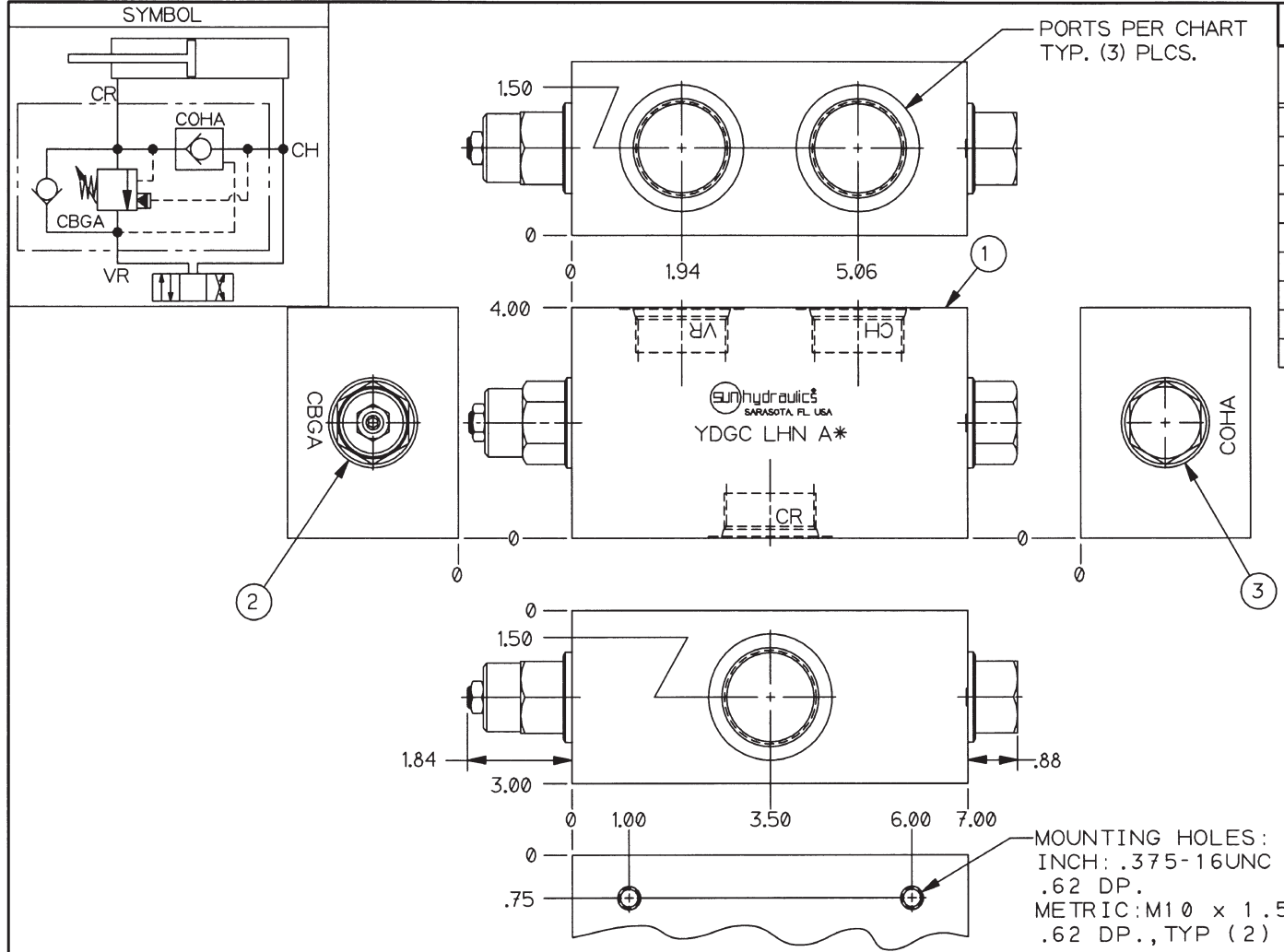
.41 DIA. MOUNTING HOLES
TYP. (2) PLCS.

ALL PORTS PER CHART



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THIRD ANGLE PROJECTION	REVISION PART NO.		
	D	YDGC LHN A*	
PORT TYPE	MODEL NO.	BODY DASH NO.	THREAD TYPE
.750-14 NPTF	AD	-001	INCH
1.000-11.5 NPTF	AE	-002	INCH
1.250-11.5 NPTF	AF	-003	INCH
SAE-12	AL	-004	INCH
SAE-16	AM	-005	INCH
SAE-20	AN	-006	INCH
.750-14 BSPP	AW	-007	METRIC
1.000-11 BSPP	AX	-008	METRIC
1.250-11 BSPP	AY	-009	METRIC

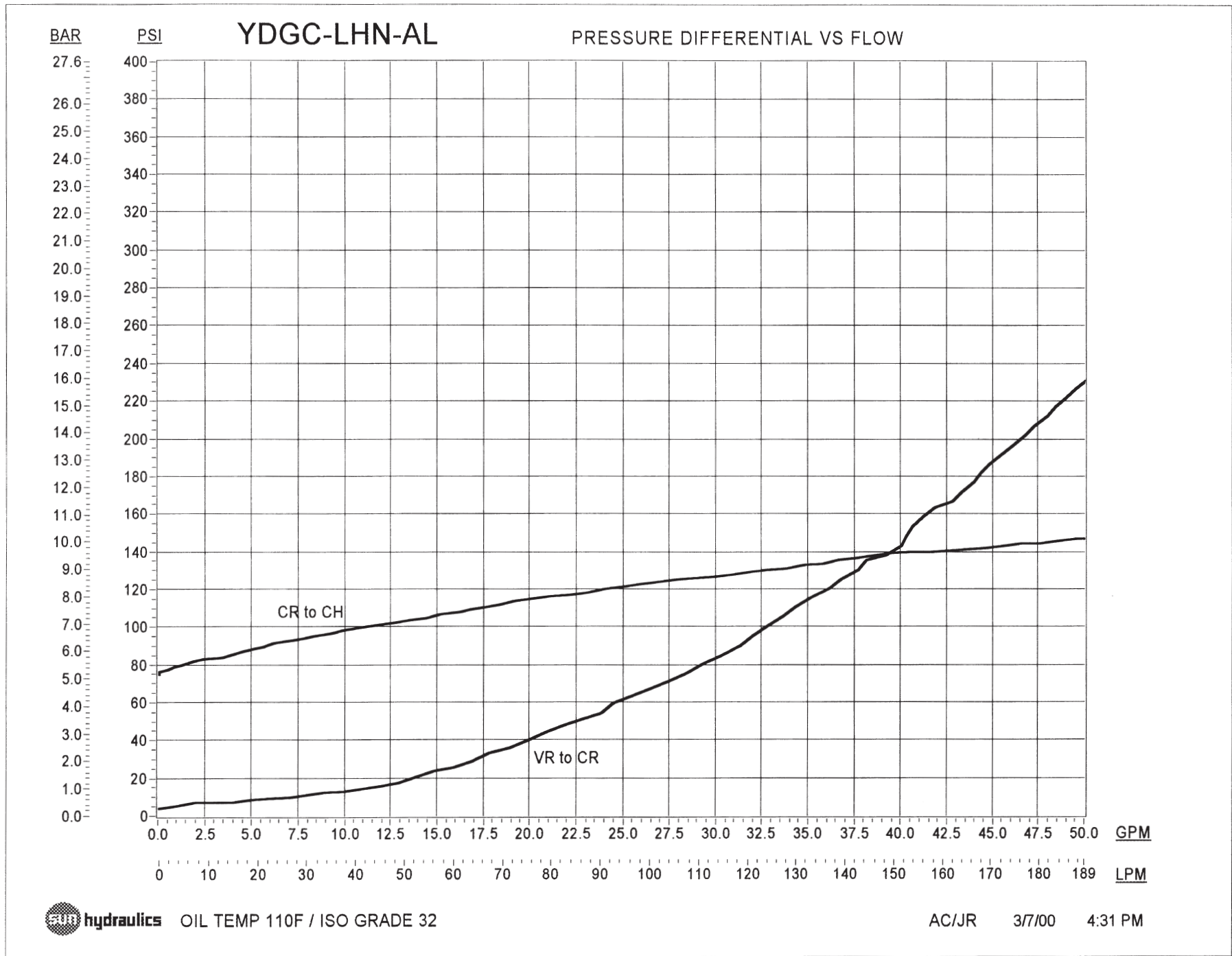
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

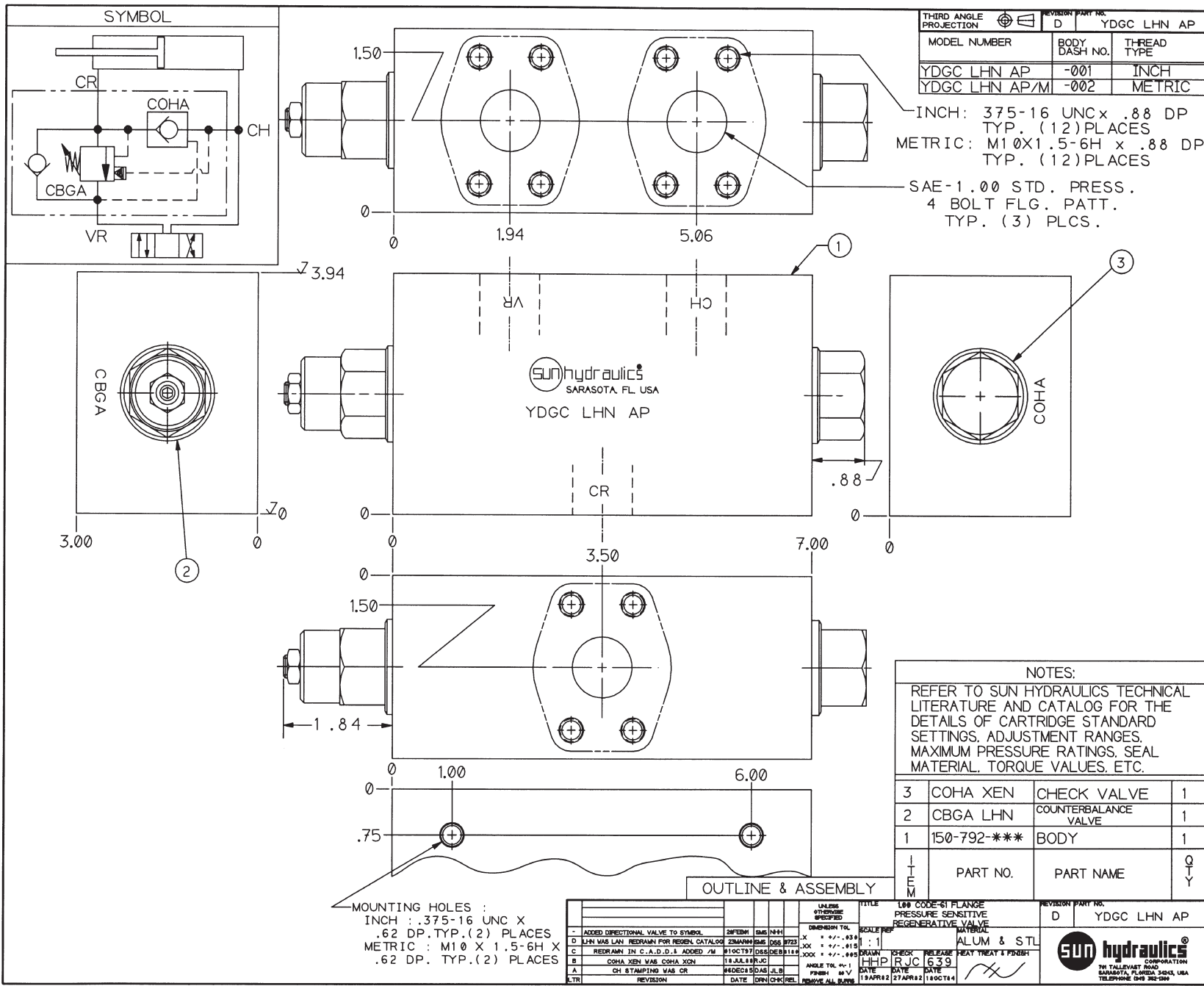
ITEM	PART NO.	PART NAME	QTY
3	COHA XEN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	150-784-***	BODY	1

OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED				TITLE PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE			REVISION PART NO.	
DIMENSION TOL				SCALE REF	MATERIAL		D	YDGC LHN A*
.X = +/- .030				1:2	ALUMINUM			
.XX = +/- .015					HEAT TREAT & FINISH			
.XXX = +/- .005					HHP RJC 639			
ANGLE TOL +/- 1				DATE	DATE	DATE		
FINISH #V				18APR82	27APR82	18OCT82		
REMOVE ALL BURRS								
LITERATURE				REVISION				
- ADDED DIRECTIONAL VALVE TO SYMBOL				28FEB01	SMS	NHH		
D REDRAWN FOR REGEN. CATALOG LHN WAS LAN				23MAR00	SMS	DSS 9723		
C REDRAWN ON CADD, ADDED NOTES 2 & 6				29 JUL 93	BRS	RJB		
LITERATURE				DATE	DRN	CHK	REL	







THIRD ANGLE PROJECTION	REVISION PART NO.	D	YDGC LHN AP
MODEL NUMBER	BODY DASH NO.	THREAD TYPE	
YDGC LHN AP	-001	INCH	
YDGC LHN AP/M	-002	METRIC	

INCH: 375-16 UNC x .88 DP
TYP. (12) PLACES
METRIC: M10X1.5-6H x .88 DP
TYP. (12) PLACES
SAE-1.00 STD. PRESS.
4 BOLT FLG. PATT.
TYP. (3) PLCS.

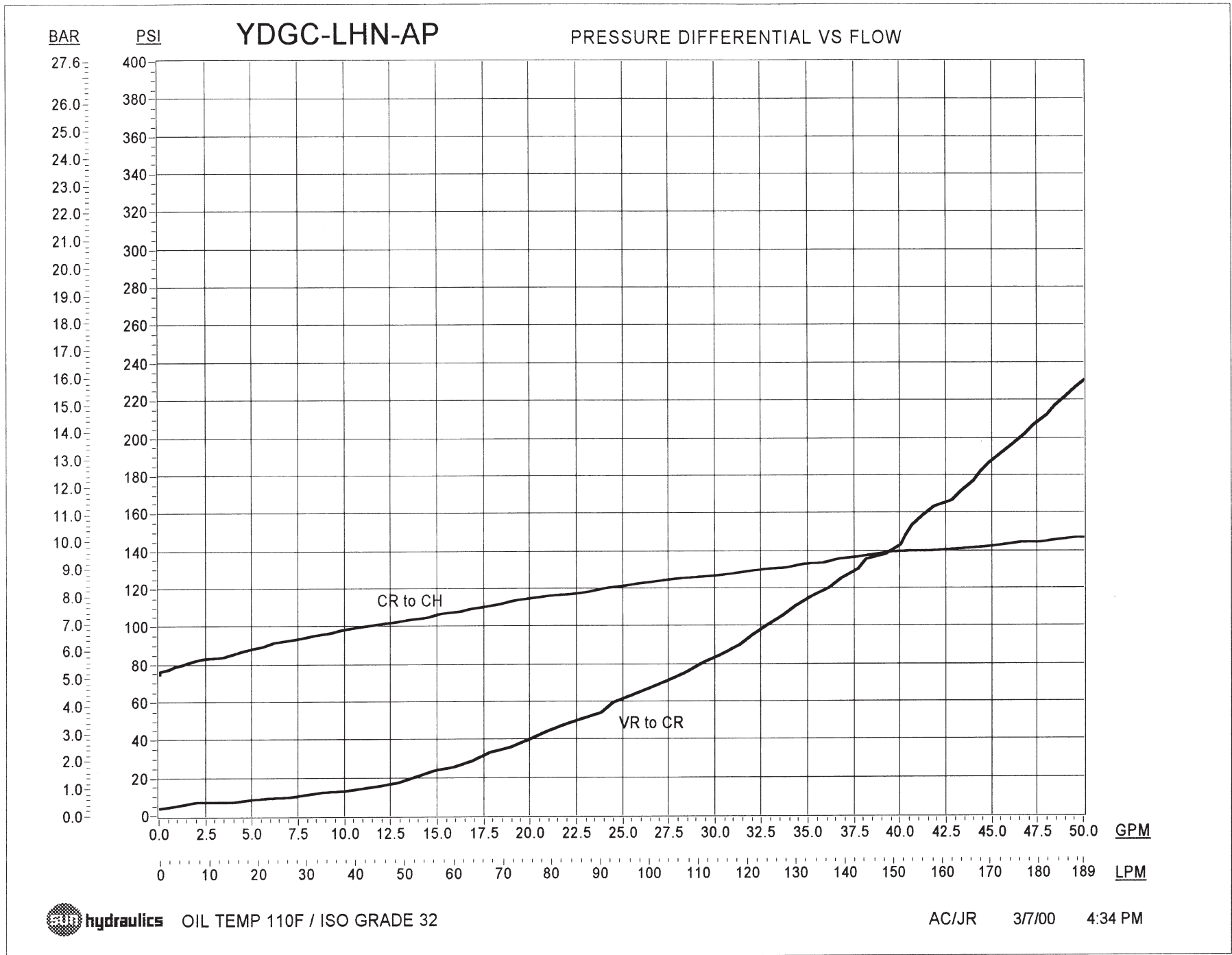
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

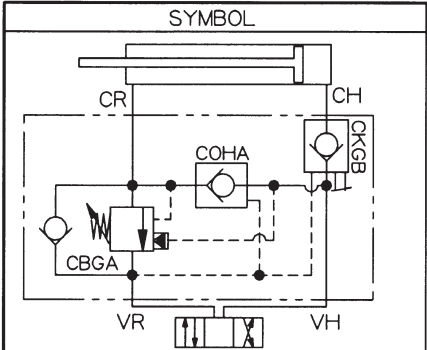
3	COHA XEN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	150-792-***	BODY	1
ITEM	PART NO.	PART NAME	QTY

MOUNTING HOLES :
INCH : .375-16 UNC X
.62 DP, TYP. (2) PLACES
METRIC : M10 X 1.5-6H X
.62 DP, TYP. (2) PLACES

UNLESS OTHERWISE SPECIFIED		TITLE		1.00 CODE-61 FLANGE PRESSURE SENSITIVE REGENERATIVE VALVE		REVISION PART NO.	
DIMENSION TOL.		SCALE		MATERIAL		D YDGC LHN AP	
X = +/- .03		1 : 1		ALUM & STL			
Y = +/- .015		DRAWN		CHECK		TREAT TREAT & FINISH	
Z = +/- .005		HHP RJC 639		DATE		DATE	
ANGLE TOL. +/- 1		DATE		DATE		DATE	
FINISH #0 V		19 APR 82		27 APR 82		19 OCT 84	
REVISION		DATE		DATE		DATE	

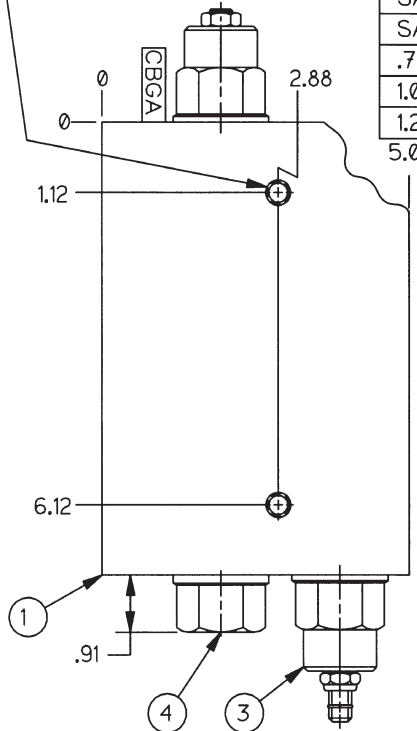
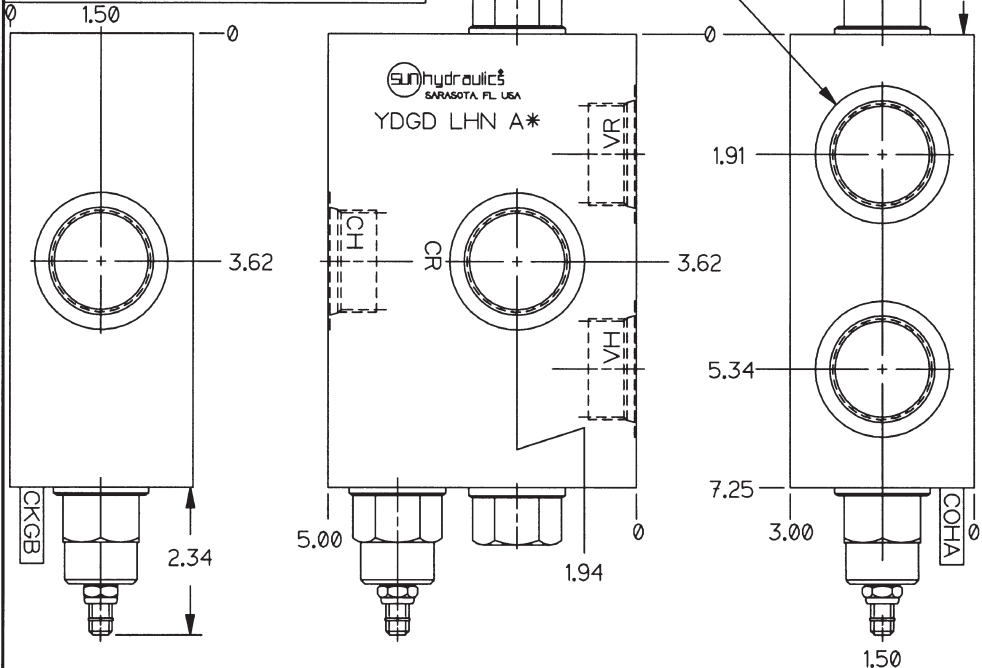






PORTS PER CHART
TYP. (4) PLCS.

MOUNTING HOLES:
INCH: .375-16UNC
x .62 DP.
METRIC: M10 x
1.5-6H x .62 DP.
TYP (2) PLACES



THIRD ANGLE PROJECTION	REVISION	PART NO.	
	C	YDGD LHN A*	
PORT TYPE	MODEL NO.	BODY DASH NO.	THREAD TYPE
.750-14 NPTF	AD	-001	INCH
1.000-11.5 NPTF	AE	-002	INCH
1.250-11.5 NPTF	AF	-003	INCH
SAE-12	AL	-004	INCH
SAE-16	AM	-005	INCH
SAE-20	AN	-006	INCH
.750-14 BSPP	AW	-007	METRIC
1.000-11 BSPP	AX	-008	METRIC
1.250-11 BSPP	AY	-009	METRIC

NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
4	COHA XEN	CHECK VALVE	1
3	CKGB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	150-785-***	BODY	1

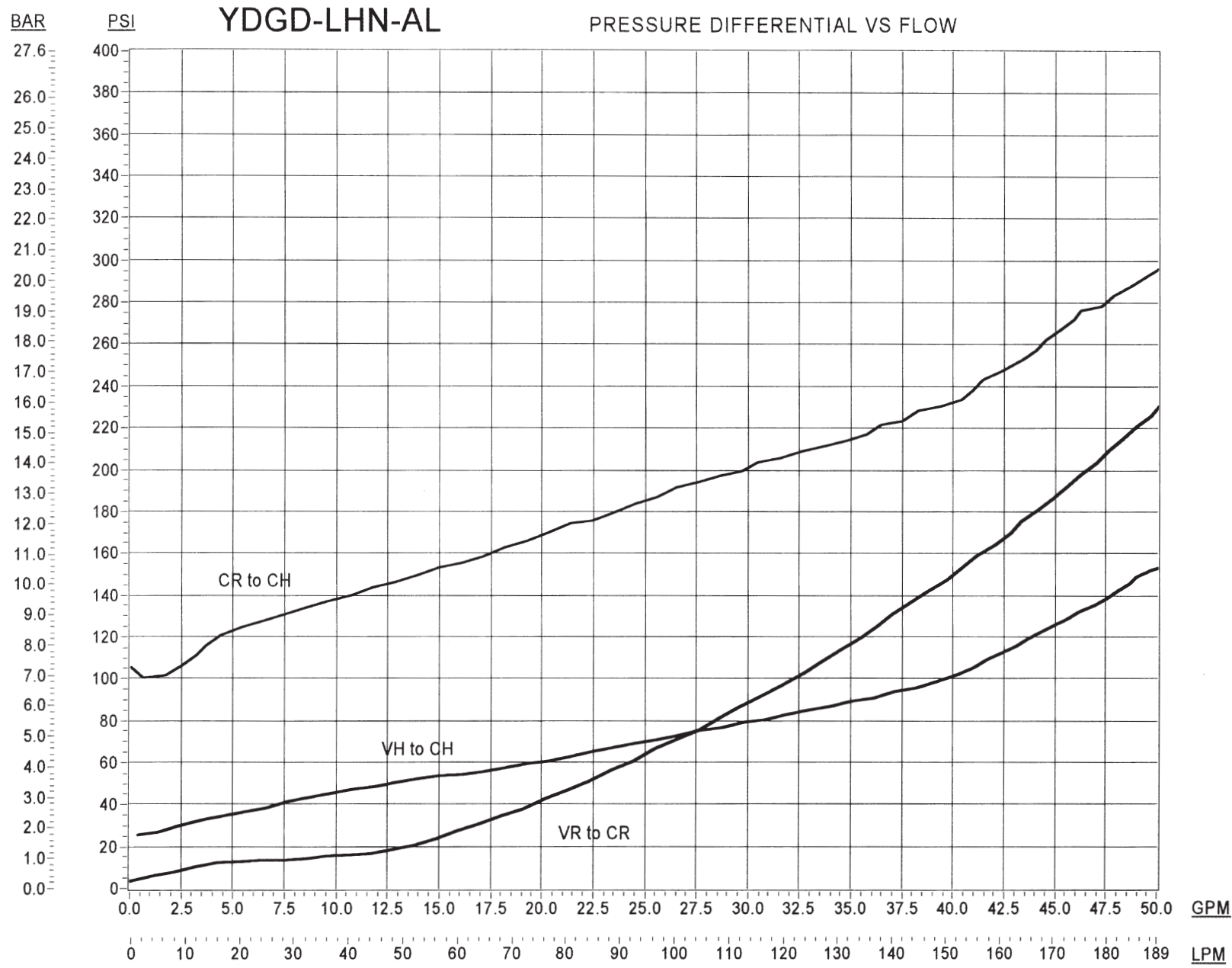
OUTLINE & ASSEMBLY

-	ADDED DIRECTIONAL VALVE TO SYMBOL.	28FEB01	SMS	INH	
-	CORRECTED MTG. HOLE VIEW	28DEC00	SMS	DSS	
C	REDRAWN FOR REGEN. CATALOG	23MAR00	SMS	DSS	9723
B	DRAWING PART NO. WAS YDGD LAN A*.	11 MAY94	BRS		
-	ITEM 2 WAS CBGA LHN				
-	ITEM 3 WAS CKGA LCN #2 WAS COHA XCN	08 JUL88	RJC		
A	ADDED METRIC MOUNTING HOLE NOTE.	14 NOV85	DAS	RJB	
LTR	REVISION	DATE	DRN	CHK	REL

UNLESS OTHERWISE SPECIFIED			TITLE: PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE		
DIMENSION TOL			SCALE REF		
.X	= +/- .030		1:2	MATERIAL: ALUM. & STEEL	
.XX	= +/- .015			HEAT TREAT & FINISH	
.XXX	= +/- .005				
ANGLE TOL	± 1		DRAWN: HHP	CHECK: RJC	RELEASE: 639
FINISH	Ø V		DATE: 22APR82	DATE: 27APR82	DATE: 18OCT84
REMOVE ALL BURRS					


REVISION	PART NO.
C	YDGD LHN A*

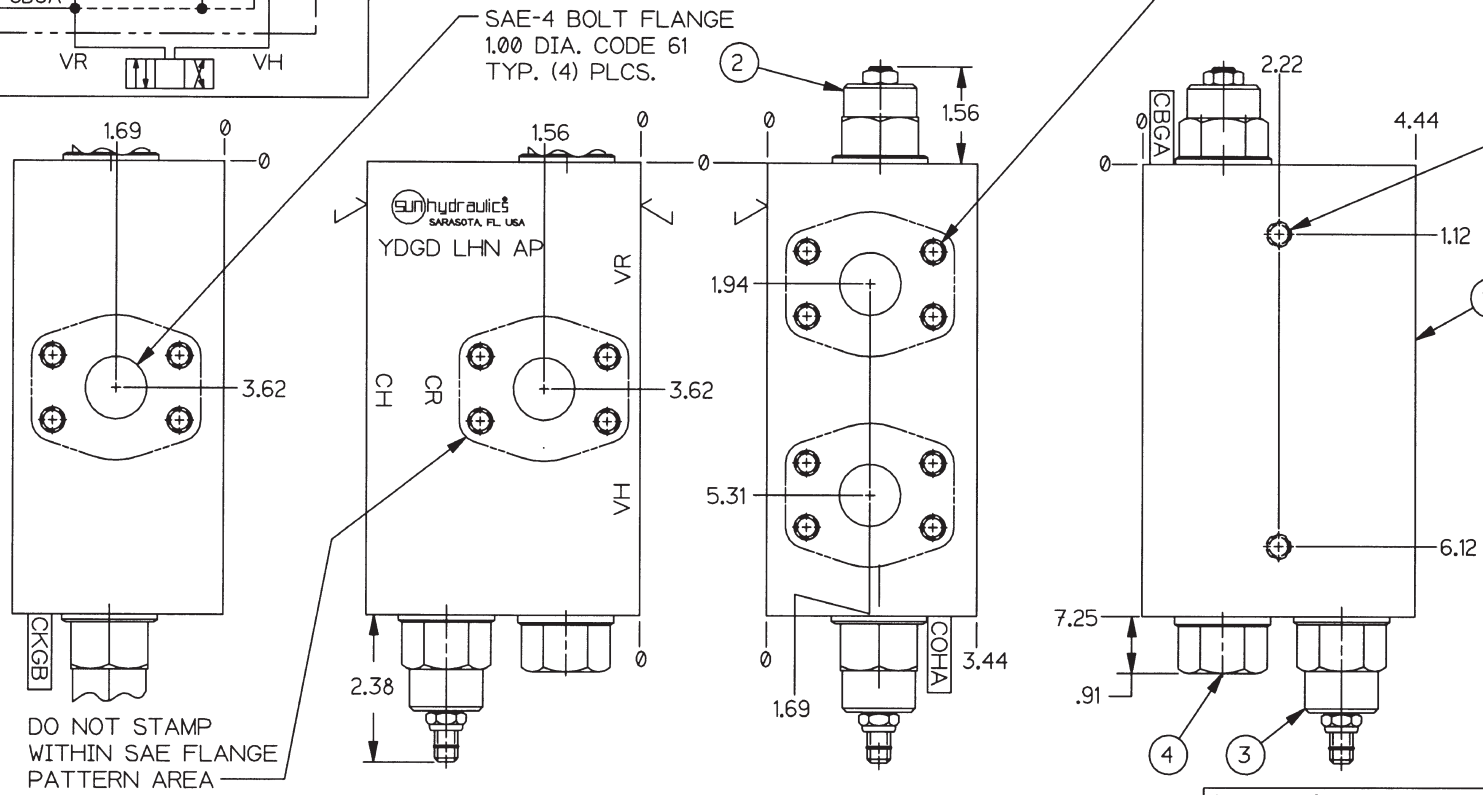
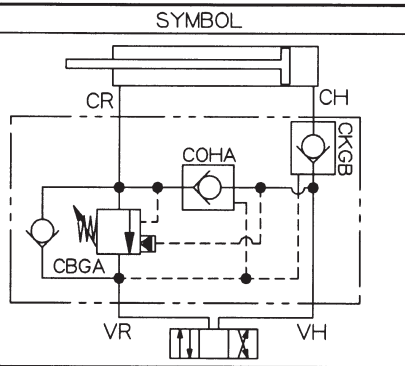




OIL TEMP 110F / ISO GRADE 32

AC/JR 3/14/00 9:45 AM

THIRD ANGLE PROJECTION  REVISION PART NO.
 B YDGD LHN AP




NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

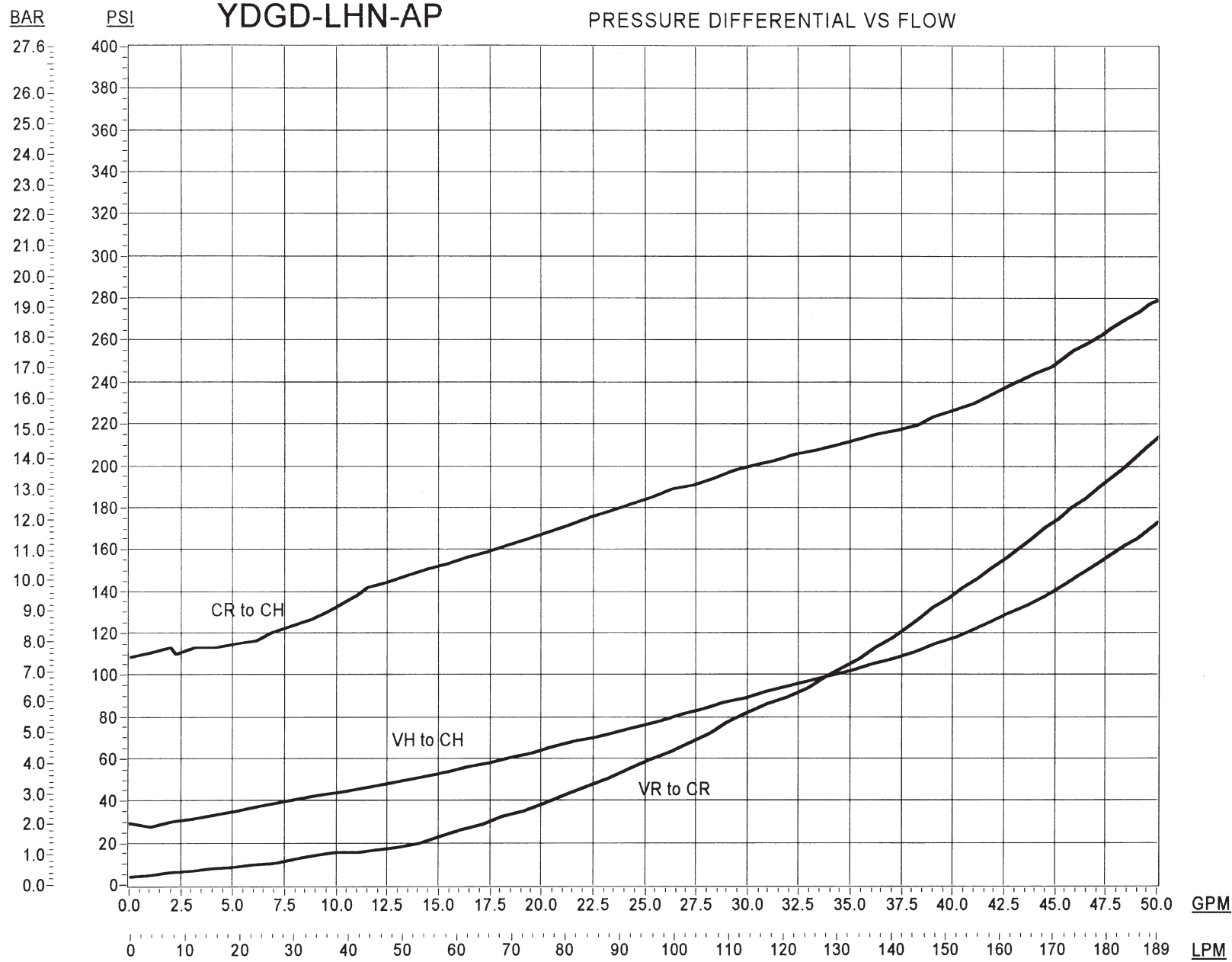
ITEM	PART NO.	PART NAME	QTY
4	COHA XEN	CHECK VALVE	1
3	CKGB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	150-787	BODY	1

UNLESS OTHERWISE SPECIFIED				TITLE PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE				REVISION PART NO.			
DIMENSION TOL				SCALE REF				MATERIAL			
- = +/- .030				1:2				ALUM. & STEEL			
B LHN WAS LAN REDRAWN FOR REGEN. CATALOG				DRAWN IHP				HEAT TREAT & FINISH			
A COHA XEN WAS COHA XCN				CHECK RJC				639			
CKGB LCN WAS CKGA LBN				RELEASE DATE				18OCT84			
LTR REVISION				DATE 22APR82				DATE 27APR82			
				DATE 18OCT84							

OUTLINE & ASSEMBLY




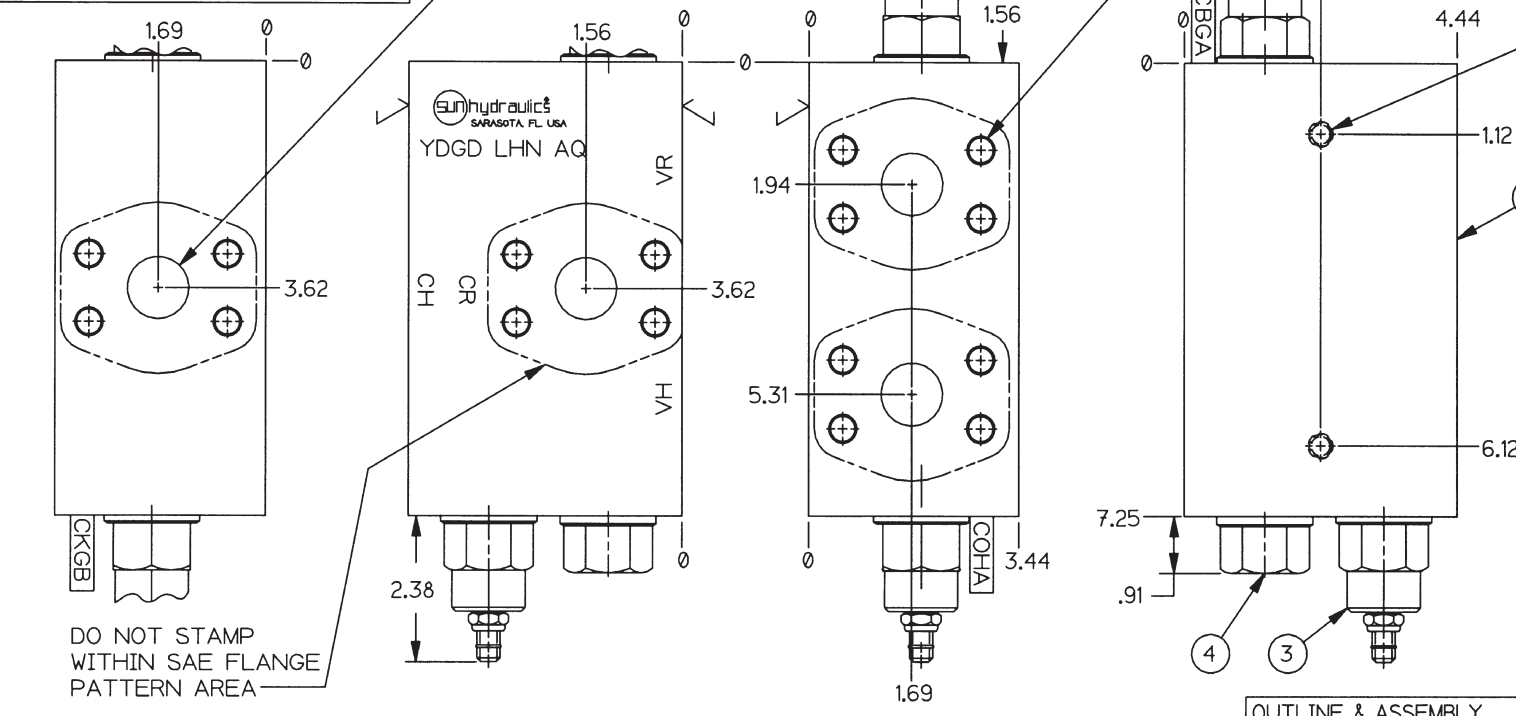
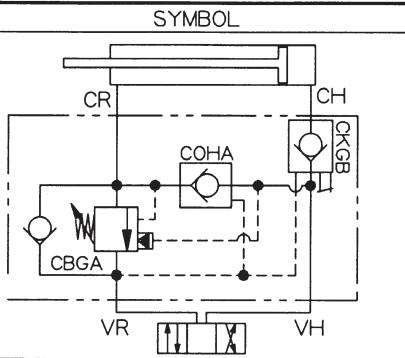
SUN HYDRAULICS CORPORATION
 791 TALLEVAST ROAD
 SARASOTA, FLORIDA 34243, USA
 TELEPHONE (941) 362-1500



OIL TEMP 110F / ISO GRADE 32

AC/JR 3/7/00 4:35 PM

THIRD ANGLE PROJECTION  REVISION PART NO.
 B YDGD LHN AQ



NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

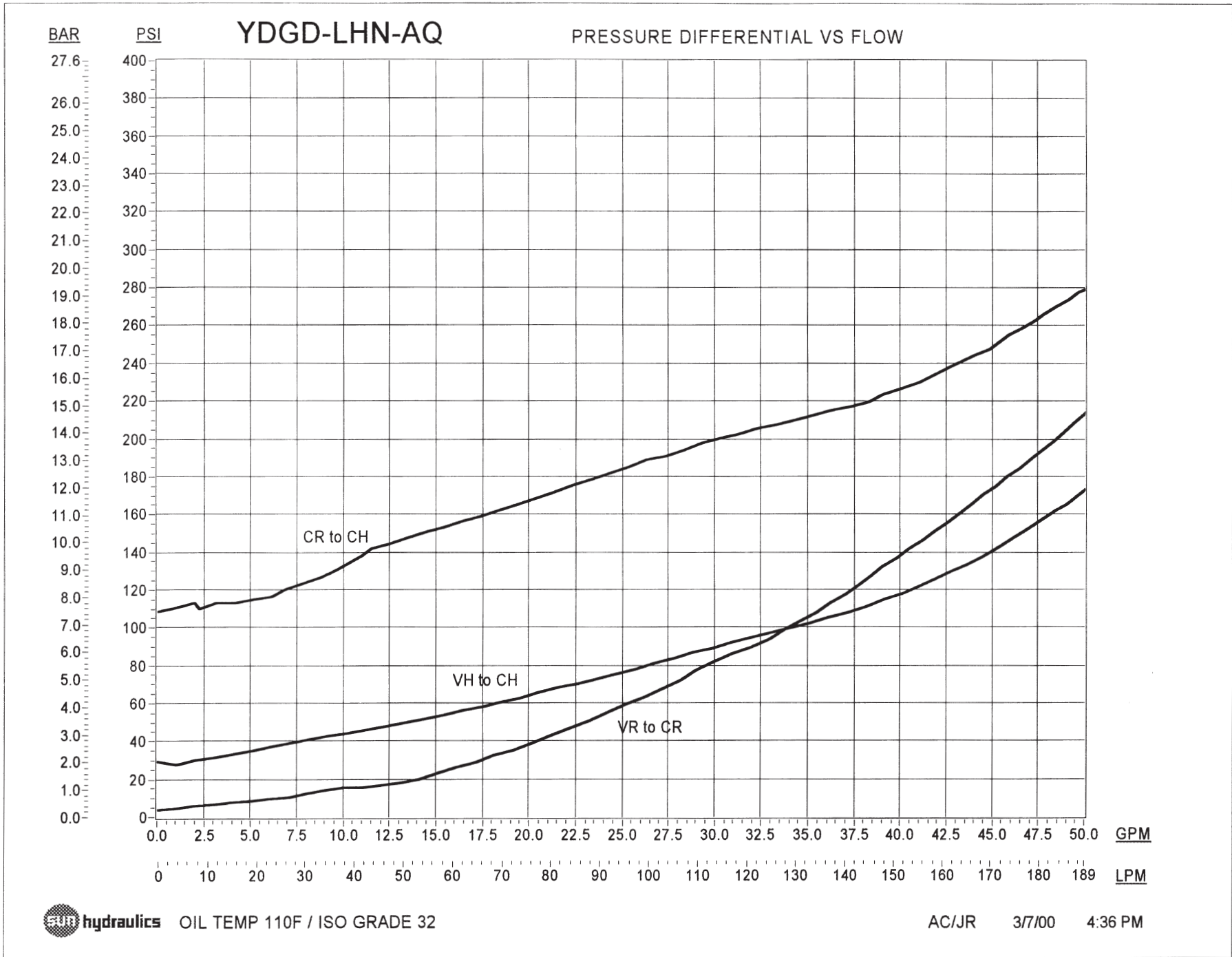
4	COHA XEN	CHECK VALVE	1
3	CKGB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	150-788	BODY	1

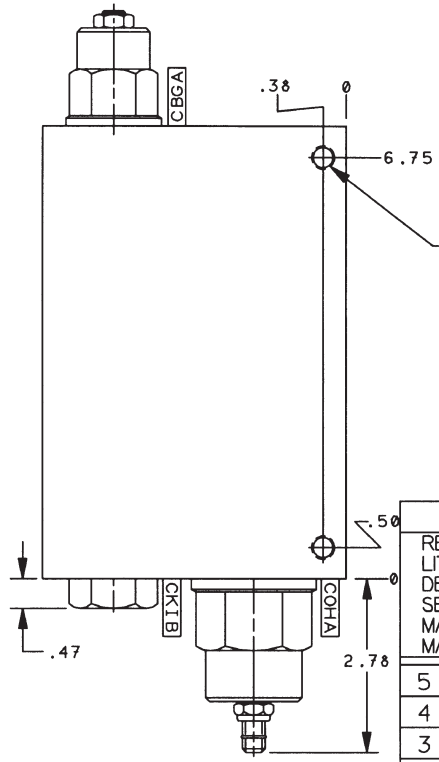
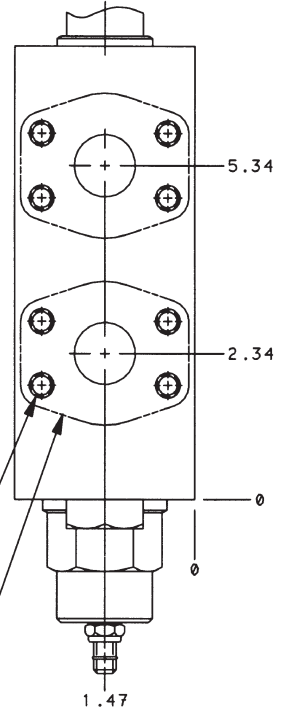
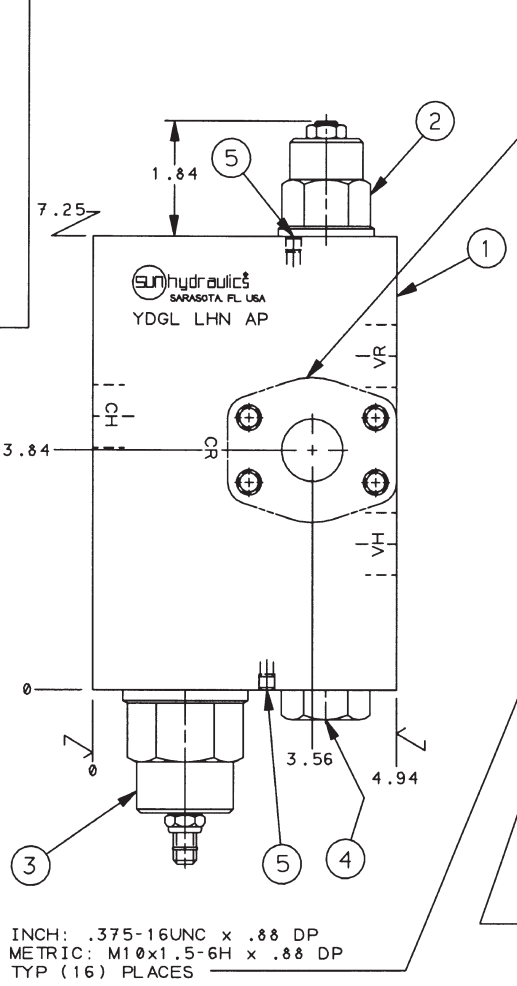
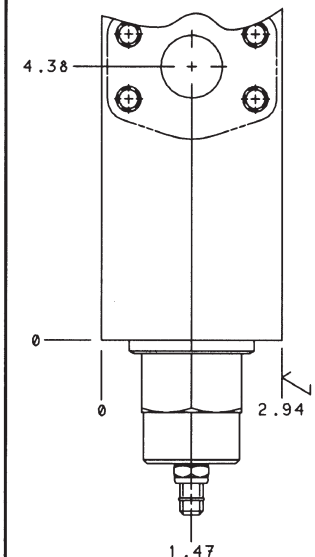
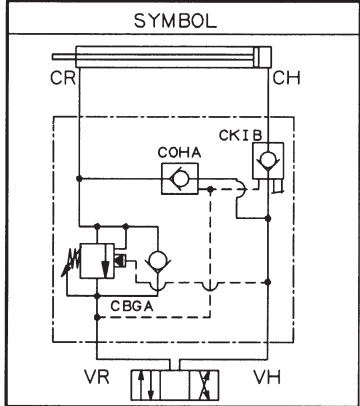
ITEM	PART NO.	PART NAME	QTY
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OUTLINE & ASSEMBLY

				UNLESS OTHERWISE SPECIFIED			TITLE: PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE			REVISION: B		PART NO.: YDGD LHN AQ			
				DIMENSION TOL.			SCALE: REF 1:2			MATERIAL: ALUM. & STEEL					
- ADDED DIRECTIONAL VALVE TO SYMBOL				28FEB01	SMS	NH	DRAWN: HHP			HEAT TREAT & FINISH					
B LHN WAS LAN REDRAWN FOR REGEN. CATALOG				23MAR00	SMS	DSS	9723	CHECK: RJC			RELEASE: 639				
A COHA XEN WAS COHA XCN				18JUL88	RJC	DATE: 22APR82			DATE: 27APR82			DATE: 18OCT84			
CKGB LCN WAS CKGA LBN							FINISH: #0 ✓								
LTR REVISION				DATE	DRN	CHK	REL	REMOVE ALL BURRS							







INCH: .375-16UNC x .88 DP
 METRIC: M10x1.5-6H x .88 DP
 TYP (16) PLACES

1.00 SAE CODE 61
 4-BOLT FLANGE PATTERN
 TYP (4) PLACES

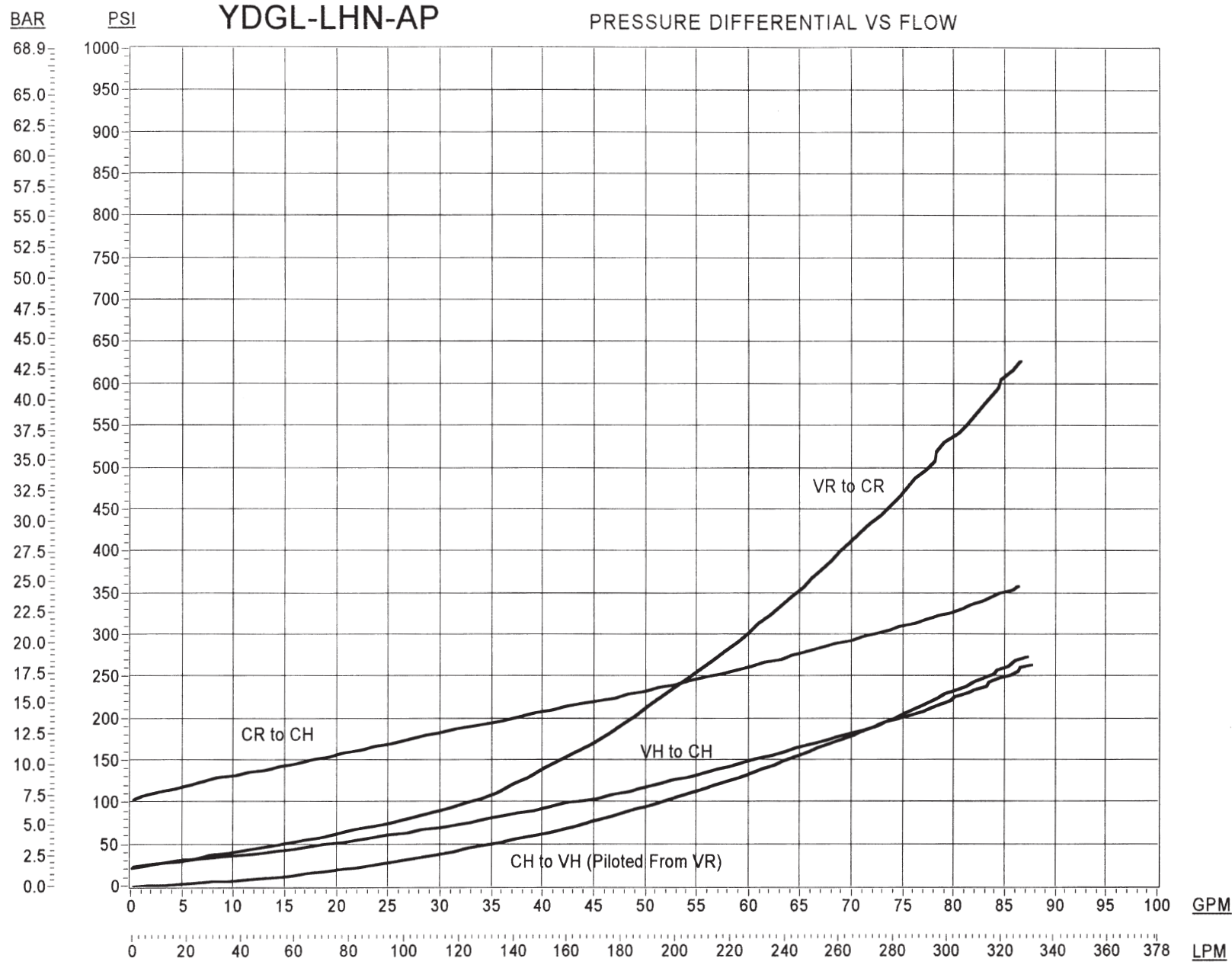
THIRD ANGLE PROJECTION	REVISION A	PART NO. YDGL LHN AP
MODEL NUMBER	BODY DASH NO.	THREAD TYPE
YDGL LHN AP	-001	INCH
YDGL LHN AP/M	-002	METRIC

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

5	850-004-250	KOENIG PLUG	2
4	COHA XEN	CHECK VALVE	1
3	CKIB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	153-839-***	BODY	1
ITEM	PART NO.	PART NAME	QTY

OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED				TITLE PRESSURE SENSITIVE REGENERATIVE VALVE 1.00 CODE-61 FLANGE			REVISION PART NO. A YDGL LHN AP	
DIMENSION TOL				SCALE REF	MATERIAL			<p>901 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300</p>
.X = +/- .030 .XX = +/- .015 .XXX = +/- .005				1/2	ALUM. & STEEL			
ADDED DIRECTIONAL VALVE TO SYMBOL 2#FEB91 SMS/NH				DRAWN	CHECK	RELEASE	HEAT TREAT & FINISH	
A REDRAWN FOR REGEN. CATALOG 23MAR90 SMS/DSS/9723				DAS	STW	7078		
LTR REVISION				DATE	DATE	DATE		
				2#FEB96	2#FEB96	2#FEB96		
				REMOVE ALL BURRS				



OIL TEMP 110F / ISO GRADE 32

AC/JR 2/18/00 11:05 AM

SYMBOL

DO NOT STAMP WITHIN PATTERN AREA

MOUNTING HOLES:
INCH: .375-16UNC x .62 DP
METRIC: M10x1.5-6H x .62 DP
TYP (2) PLACES

NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

THIRD ANGLE PROJECTION	REVISION A	PART NO. YDGL LHN AQ
MODEL NUMBER	BODY DASH NO.	THREAD TYPE
YDGL LHN AQ	-001	INCH
YDGL LHN AQ/M	-002	METRIC

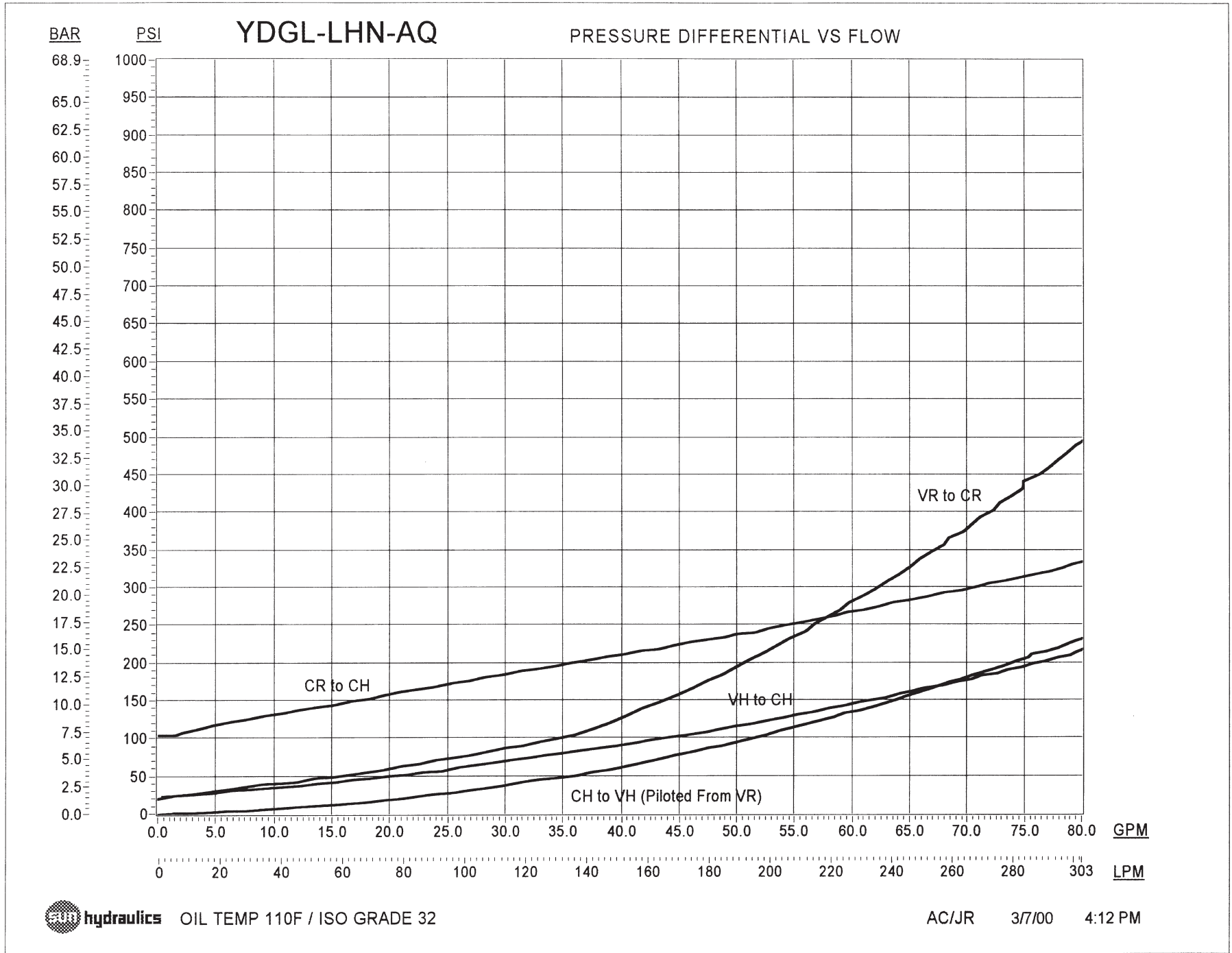
INCH: .438-14UNC x 1.12 DP
METRIC: M10x1.5-6H x 1.12 DP
TYP (16) PLACES

1.25 SAE CODE 61
4-BOLT FLANGE PATTERN
TYP (4) PLACES

OUTLINE & ASSEMBLY			
QTY	PART NO.	PART NAME	QTY
5	850-004-250	KOENIG PLUG	2
4	COHA XEN	CHECK VALVE	1
3	CKIB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	153-840-***	BODY	1

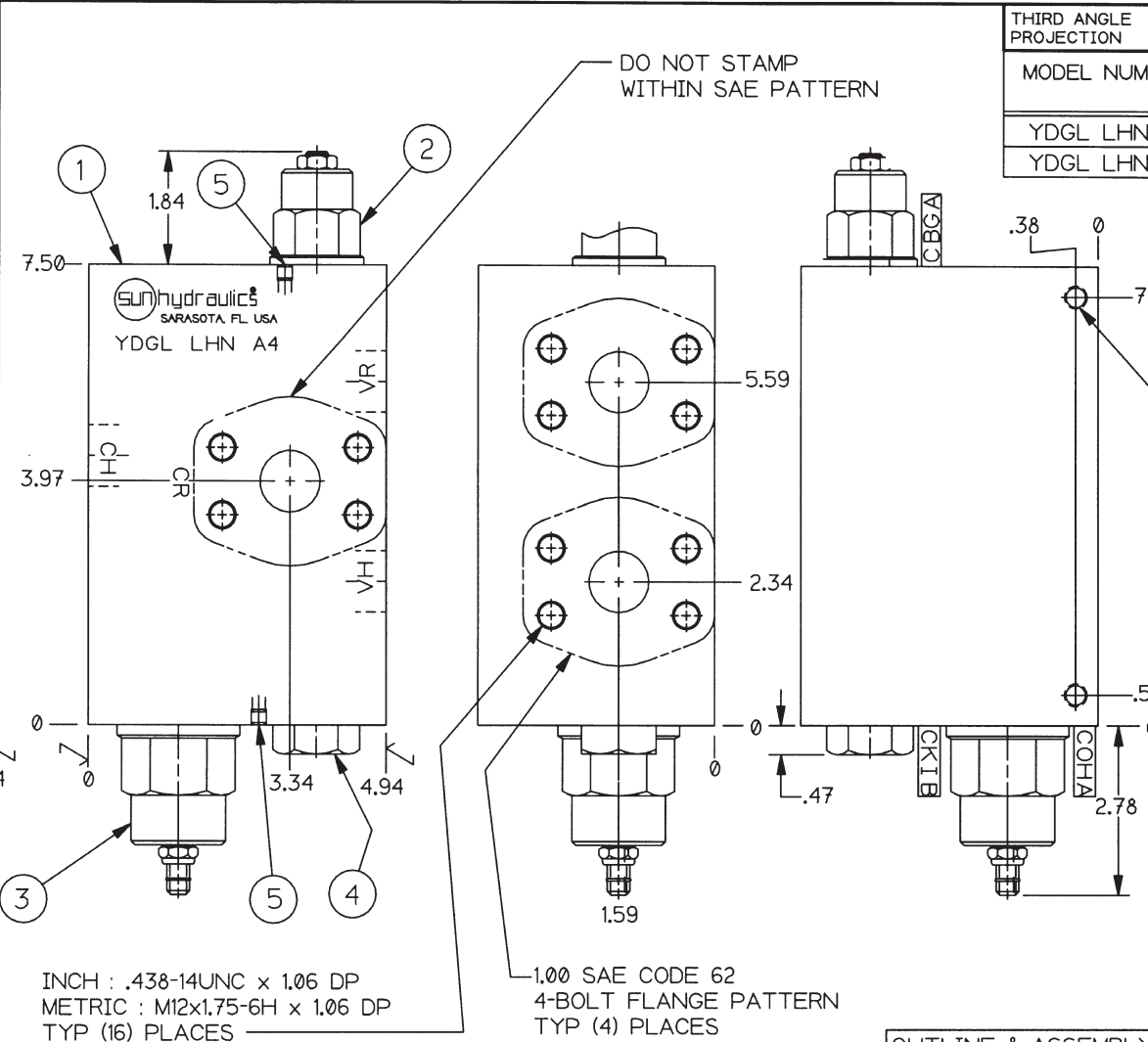
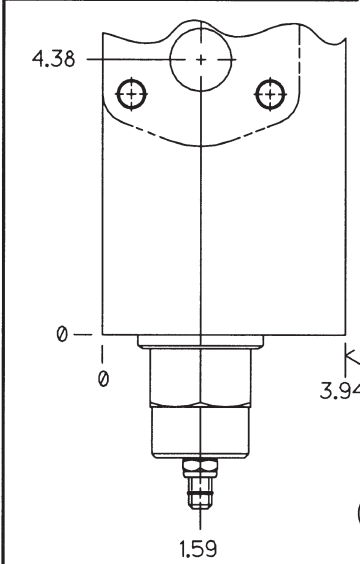
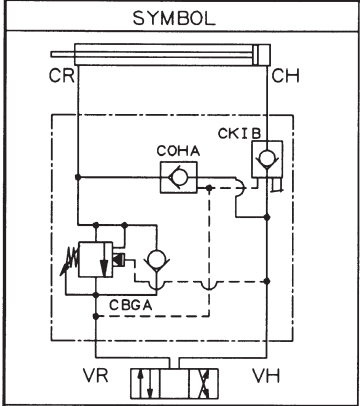
UNLESS OTHERWISE SPECIFIED		TITLE PRESSURE SENSITIVE REGENERATIVE VALVE 1.25 CODE-61 FLANGE		REVISION A PART NO. YDGL LHN AQ	
DIMENSION TOL		SCALE REF 1/2	MATERIAL ALUM. & STEEL		
.X = +/- .030		DRAWN DAS	CHECK STW	RELEASE 7078	HEAT TREAT & FINISH
.XX = +/- .015		DATE 2#FEB96	DATE 2#FEB96	DATE 2#FEB96	
.XXX = +/- .005		ANGLE TOL +/- 1			
FINISH #8 V		REMOVE ALL BURRS			
LTR REVISION		DATE	DRN	CHK	REL
- ADDED DIRECTIONAL VALVE TO SYMBOL		28FEB01	SMS	NHH	
A REDRAWN FOR REGEN. CATALOG		23MAR00	SMS	DSS	9723

791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1300



OIL TEMP 110F / ISO GRADE 32

AC/JR 3/7/00 4:12 PM



THIRD ANGLE PROJECTION	REVISION A	PART NO. YDGL LHN A4
MODEL NUMBER	BODY DASH NO.	THREAD TYPE
YDGL LHN A4	-001	INCH
YDGL LHN A4/M	-002	METRIC

MOUNTING HOLES :
 INCH : .375-16UNC x .62 DP
 METRIC : M10x1.5-6H x .62 DP
 TYP (2) PLACES

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
5	850-004-250	KOENIG PLUG	2
4	COHA XEN	CHECK VALVE	1
3	CKIB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	153-841-***	BODY	1

INCH : .438-14UNC x 1.06 DP
 METRIC : M12x1.75-6H x 1.06 DP
 TYP (16) PLACES

1.00 SAE CODE 62
 4-BOLT FLANGE PATTERN
 TYP (4) PLACES

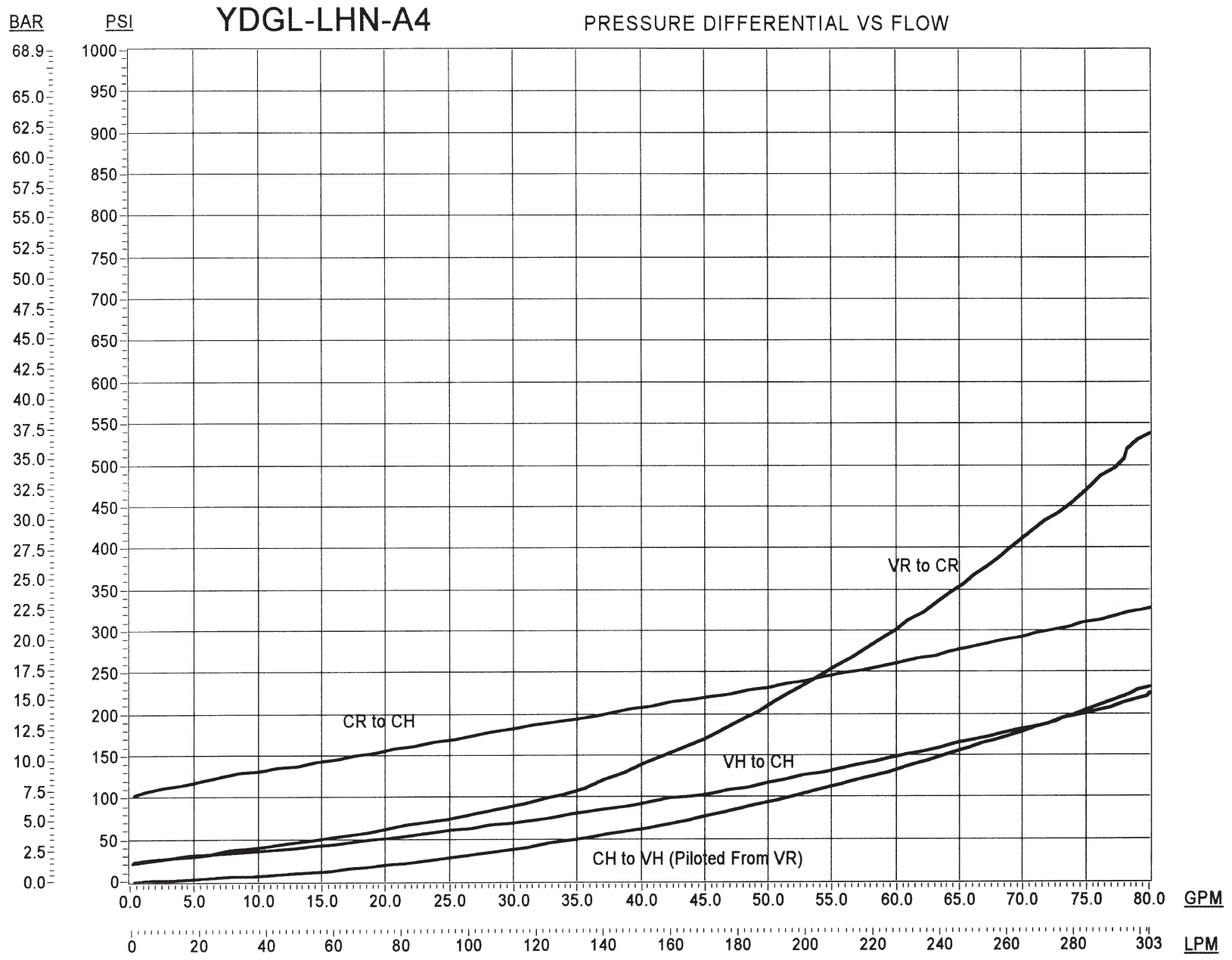
OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED	TITLE	REVISION	PART NO.
DIMENSION TOL	SCALE REF	MATERIAL	
.X = +/- .030	1/2	ALUMINUM	
.XX = +/- .015	DRAWN	HEAT TREAT & FINISH	
.XXX = +/- .005	DAS		
ANGLE TOL +/- 1	CHECK		
FINISH #0 V	STW		
REMOVE ALL BURRS	RELEASE		
	7078		
	DATE	DATE	DATE
	20FEB96	20FEB96	20FEB96

ADDED DIRECTIONAL VALVE TO SYMBOL	20FEB01	SMS	NHH
REDRAWN FOR REGEN. CATALOG	23MAR00	SMS	DSS 9723
REVISION	DATE	DRN	CHK REL

REVISION A PART NO. YDGL LHN A4

791 TALLEVAST ROAD
 SARASOTA, FLORIDA 34243, USA
 TELEPHONE (941) 362-1300



SYMBOL

DO NOT STAMP WITHIN PATTERN AREA

1.25 SAE CODE 62
4-BOLT FLANGE PATTERN
TYP (4) PLACES

THIRD ANGLE PROJECTION	REVISION	PART NO.
	A	YDGL LHN A5
MODEL NUMBER	BODY DASH NO.	THREAD TYPE
YDGL LHN A5	-001	INCH
YDGL LHN A5/M	-002	METRIC

NOTES:

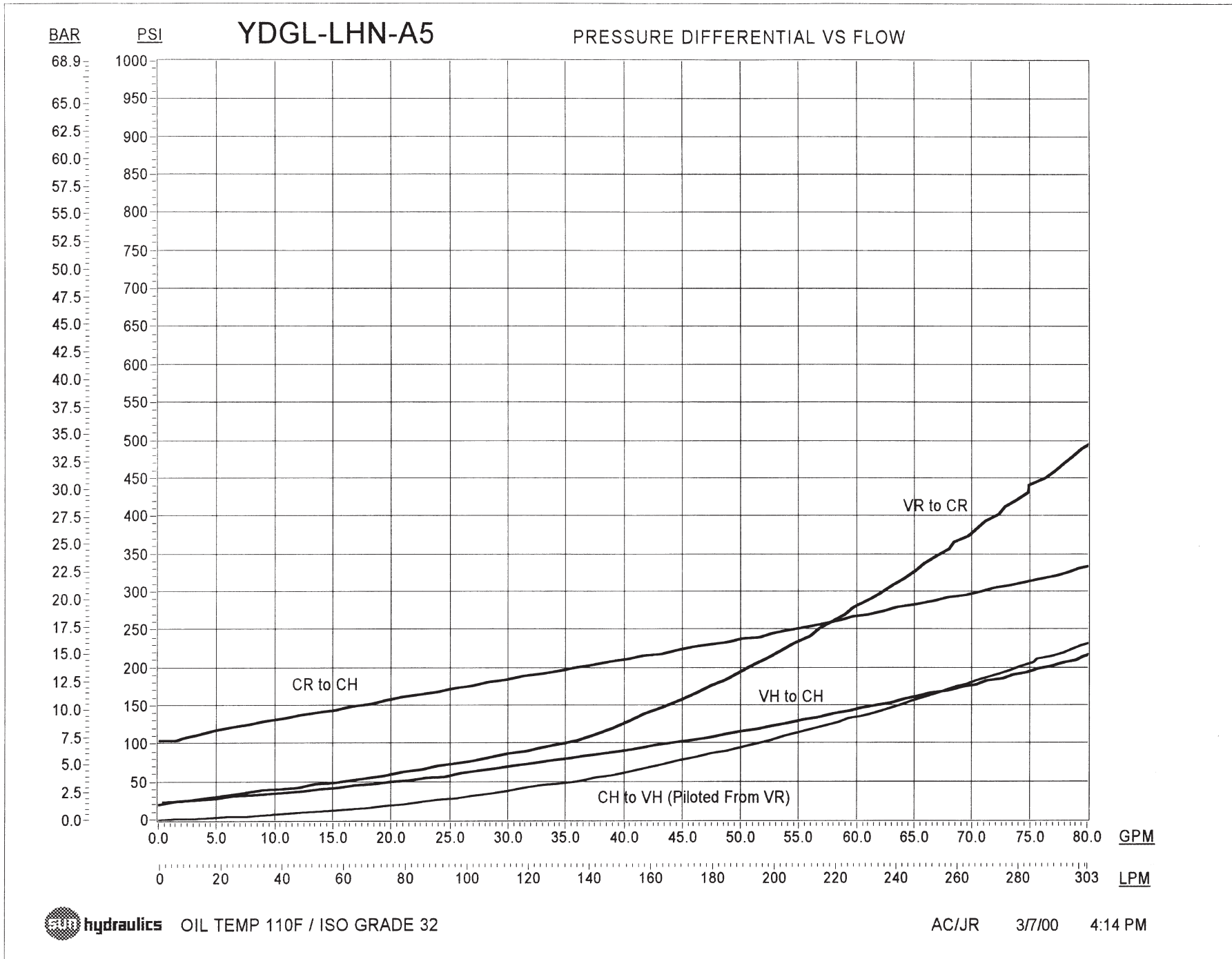
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
5	850-004-250	PLUG	2
4	COHA XEN	CHECK VALVE	1
3	CKIB LCN	CHECK VALVE	1
2	CBGA LHN	COUNTERBALANCE VALVE	1
1	153-842-***	BODY	1

OUTLINE & ASSEMBLY

TITLE		PRESSURE SENSITIVE REGENERATIVE VALVE 1.25 CODE-62 FLANGE	
SCALE REF		1:2	
DRAWN		CHECK	
DAS		STW	
RELEASE		7078	
DATE		DATE	
2#FEB96		2#FEB96	
FINISH		80 V	
REMOVE ALL BURRS		2#FEB96	

UNLESS OTHERWISE SPECIFIED		TITLE		REVISION		PART NO.	
DIMENSION TOL		SCALE REF		A		YDGL LHN A5	
.X = +/- .030		MATERIAL		CORPORATION		<p>791 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300</p>	
.XX = +/- .015		ALUM. & STEEL		CORPORATION			
.XXX = +/- .005		HEAT TREAT & FINISH		CORPORATION			
- ADDED DIRECTIONAL VALVE TO SYMBOL		2#FEB01		SMS		NHH	
A REDRAWN FOR REGEN. CATALOG		23MAR00		SMS		DSS 9723	
LTR REVISION		DATE		DRN		CHK REL	



OIL TEMP 110F / ISO GRADE 32

AC/JR 3/7/00 4:14 PM

SYMBOL

1.25 SAE CODE 62 4 BOLT FLANGE PATTERN, TYP(3) PLACES.
 INCH : .500-13UNC x 1.00 DP
 METRIC : M14x2.0-6H x 1.00 DP.
 TYP (12) PLACES
 (8) SHOWN , (4) OPPOSITE

MOUNTING HOLES :
 INCH : .375-16UNC x .75 DP.
 TYP. (2) PLCS.
 METRIC : M10x1.5-6H x .75 DP.
 TYP. (2) PLCS.

THIRD ANGLE PROJECTION

MODEL NUMBER	BODY DASH NO.	THREAD TYPE
YDHC LHN A5	-001	INCH
YDHC LHN A5/M	-002	METRIC

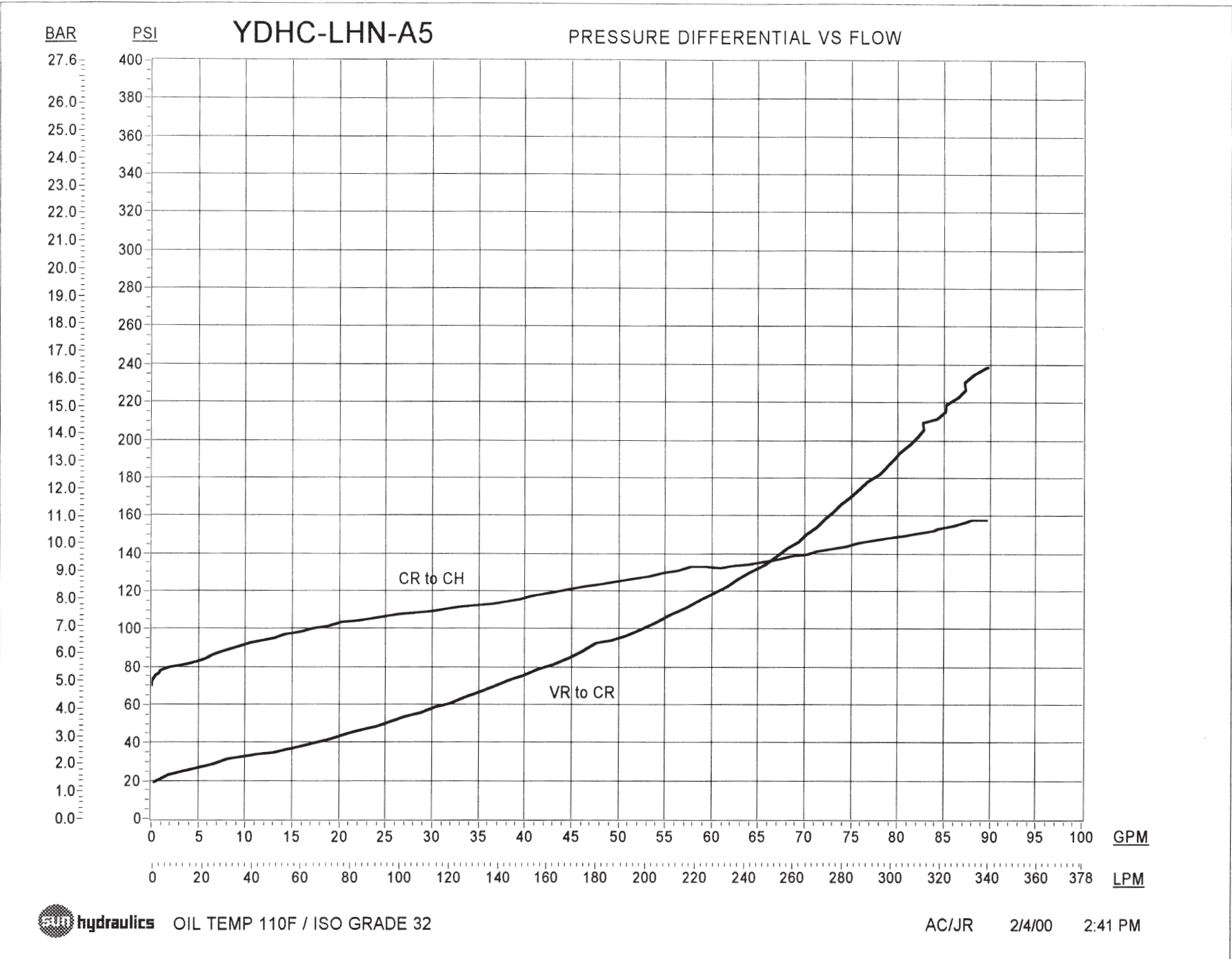
NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.


3	COHA XEN	CHECK VALVE	2
2	CBGA LHN	COUNTERBALANCE VALVE	2
1	152-611-***	BODY	1

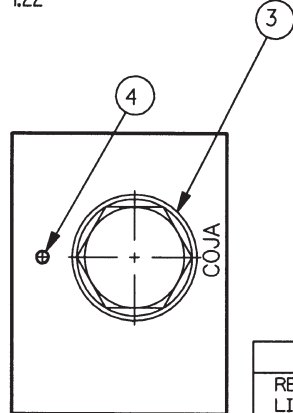
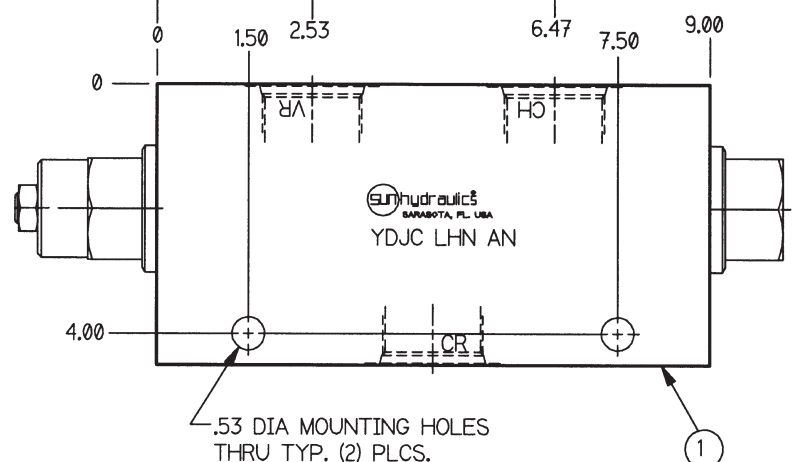
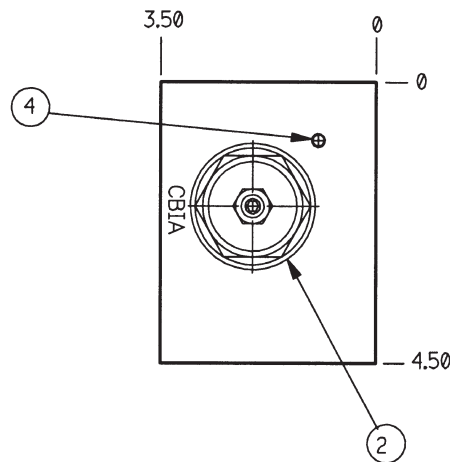
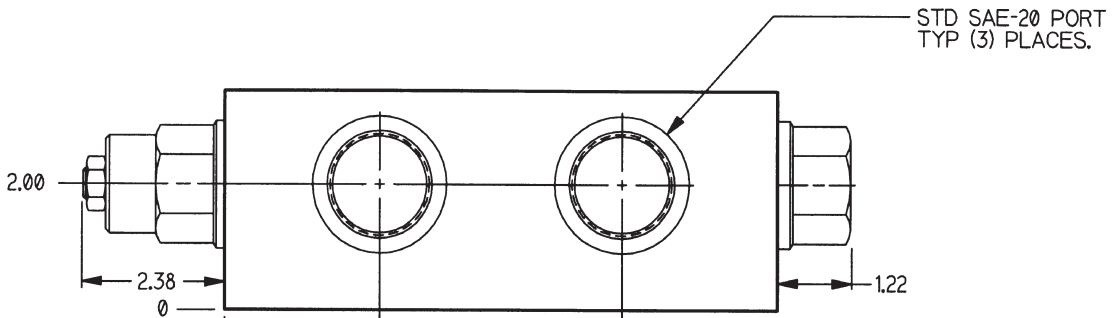
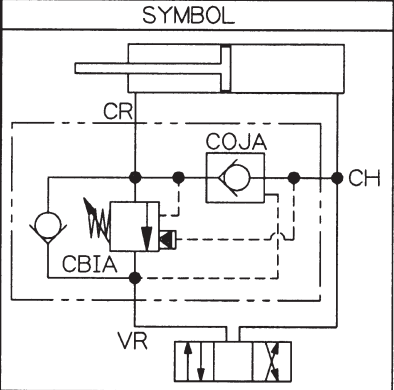
+	REVISION	PART NO.	PART NAME	QTY
	A	YDHC LHN A5		

OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED		TITLE PRESSURE SENSITIVE REGENERATIVE VALVE 1.25 CODE-62 FLANGE		REVISION PART NO.	
DIMENSION TOL		SCALE REF	MATERIAL	A YDHC LHN A5	
.X = +/- .030		1/2	ALUMINUM		
.XX = +/- .015		DRAWN R/B	HEAT TREAT & FINISH		
.XXX = +/- .005		CHECK DAS			
ANGLE TOL +/- 1		RELEASE			
FINISH #8 V		DATE			
REMOVE ALL BURRS		DATE 4/20/91			
- ADDED DIRECTIONAL VALVE TO SYMBOL	28FEB01	SMS N-H			
A REDRAWN FOR REGEN. CATALOG	23MAR00	SMS DSS 9723			
LTR REVISION	DATE	DRN/CHK/REL			



THIRD ANGLE PROJECTION  REVISION B PART NO. YDJC LHN AN



NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.


ITEM	PART NO.	PART NAME	QTY
4	850-004-218	KOENIG PLUG	2
3	COJA XEN	CHECK VALVE	1
2	CBIA LHN	COUNTERBALANCE VALVE	1
1	152-754-001	BODY	1

OUTLINE & ASSEMBLY

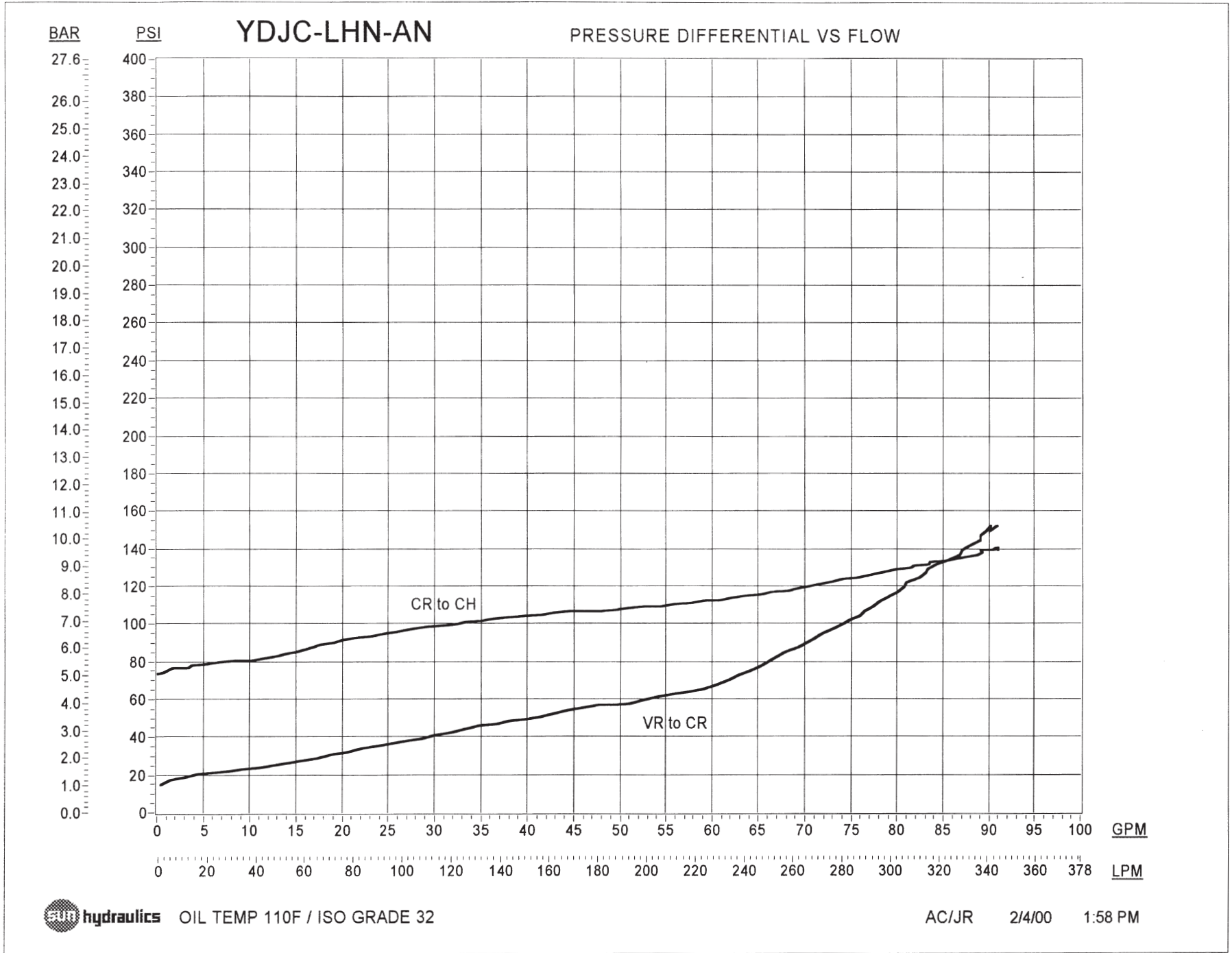
REVISION	DATE	DRN	CHK	REL
-	ADDED DIRECTIONAL VALVE TO SYMBOL	28FEB01	SMS	NH*
B	IT.1 PART NO. WAS 152-754	11 JUL 00	GH	
A	REDRAWN FOR REGEN. CATALOG	23MAR00	SMS	DSS 9723
LTR	REVISION	DATE	DRN	CHK REL

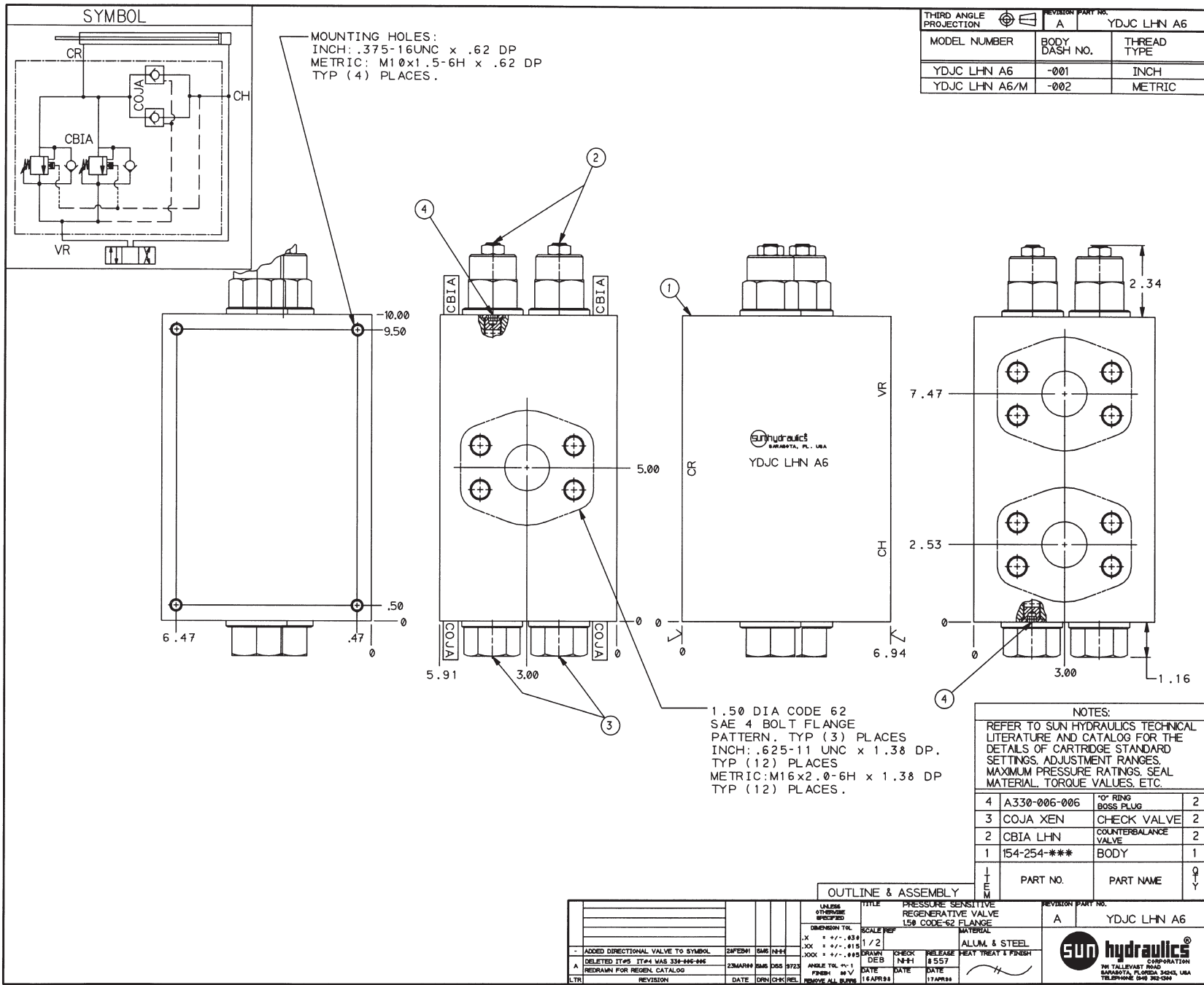
UNLESS OTHERWISE SPECIFIED			
DIMENSION TOL	SCALE REF	MATERIAL	
.X = +/- .030	1:2	ALUM. & STEEL	
.XX = +/- .015	DRAWN	CHECK	RELEASE
.XXX = +/- .005	DEB	HEAT TREAT & FINISH	
ANGLE TOL +/- 1	DATE	DATE	DATE
FINISH # V	26NOV91		
REMOVE ALL BURRS			

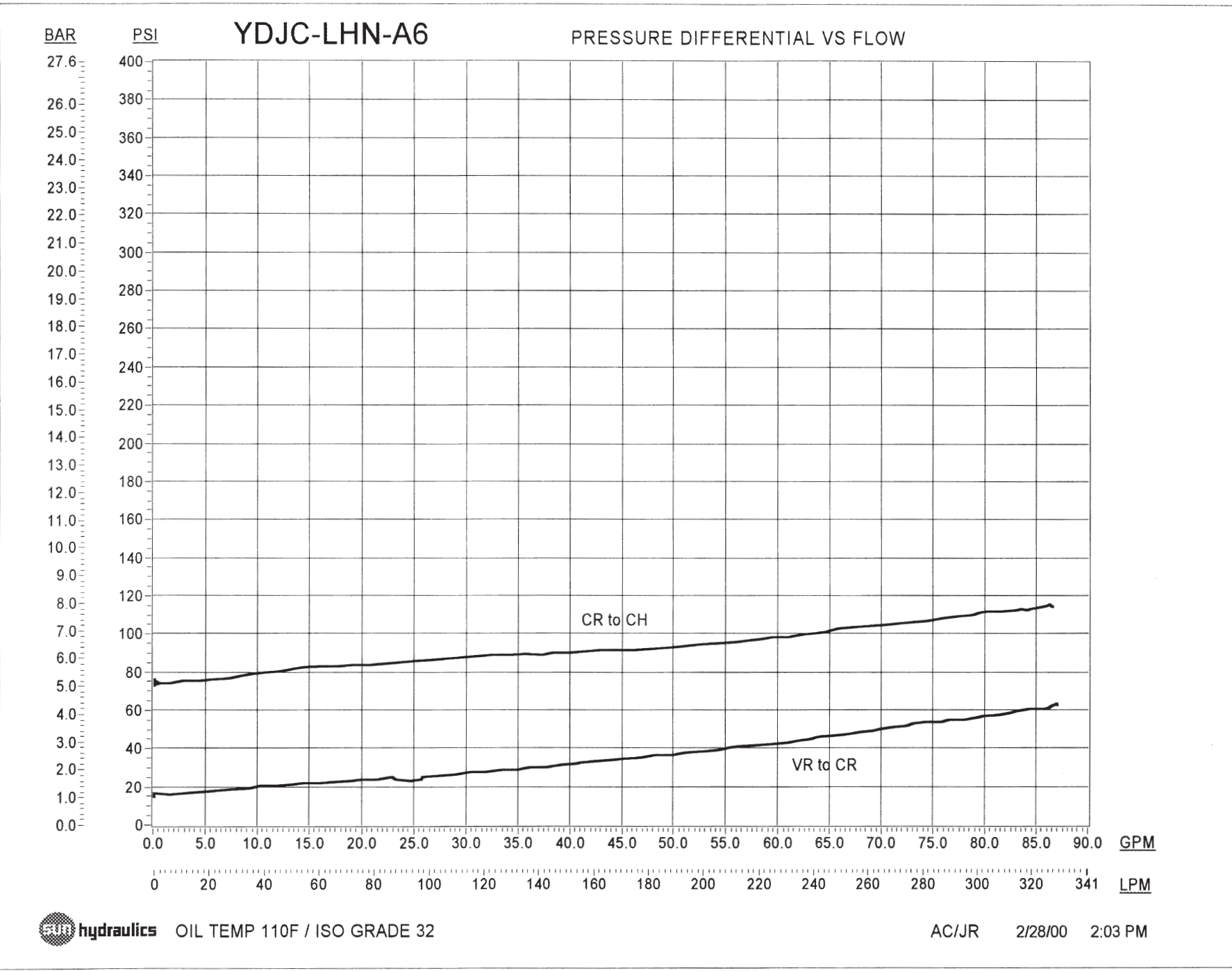
REVISION PART NO.	
B	YDJC LHN AN

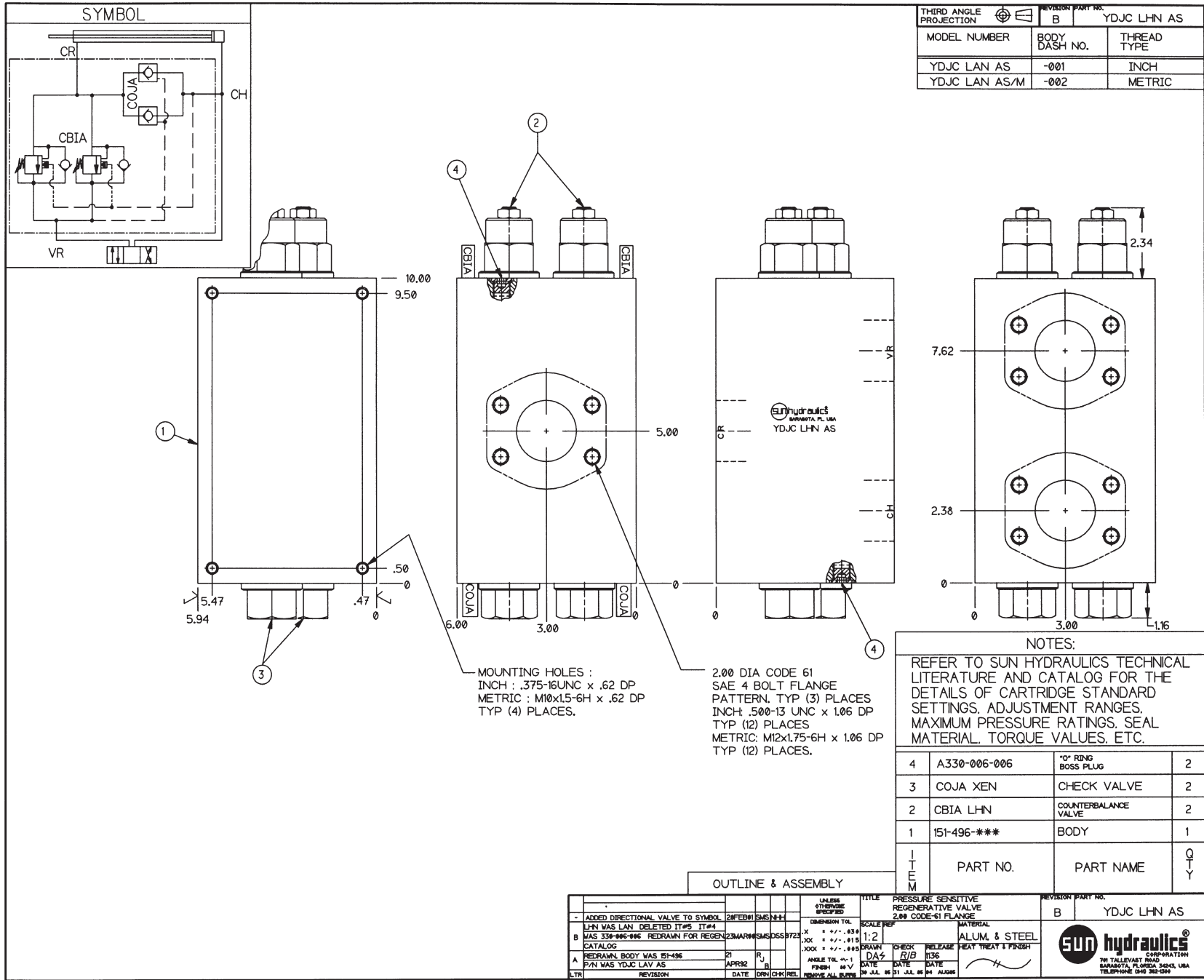


SUN hydraulic CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1300









THIRD ANGLE PROJECTION	REVISION PART NO. B	YDJC LHN AS
MODEL NUMBER	BODY DASH NO.	THREAD TYPE
YDJC LAN AS	-001	INCH
YDJC LAN AS/M	-002	METRIC

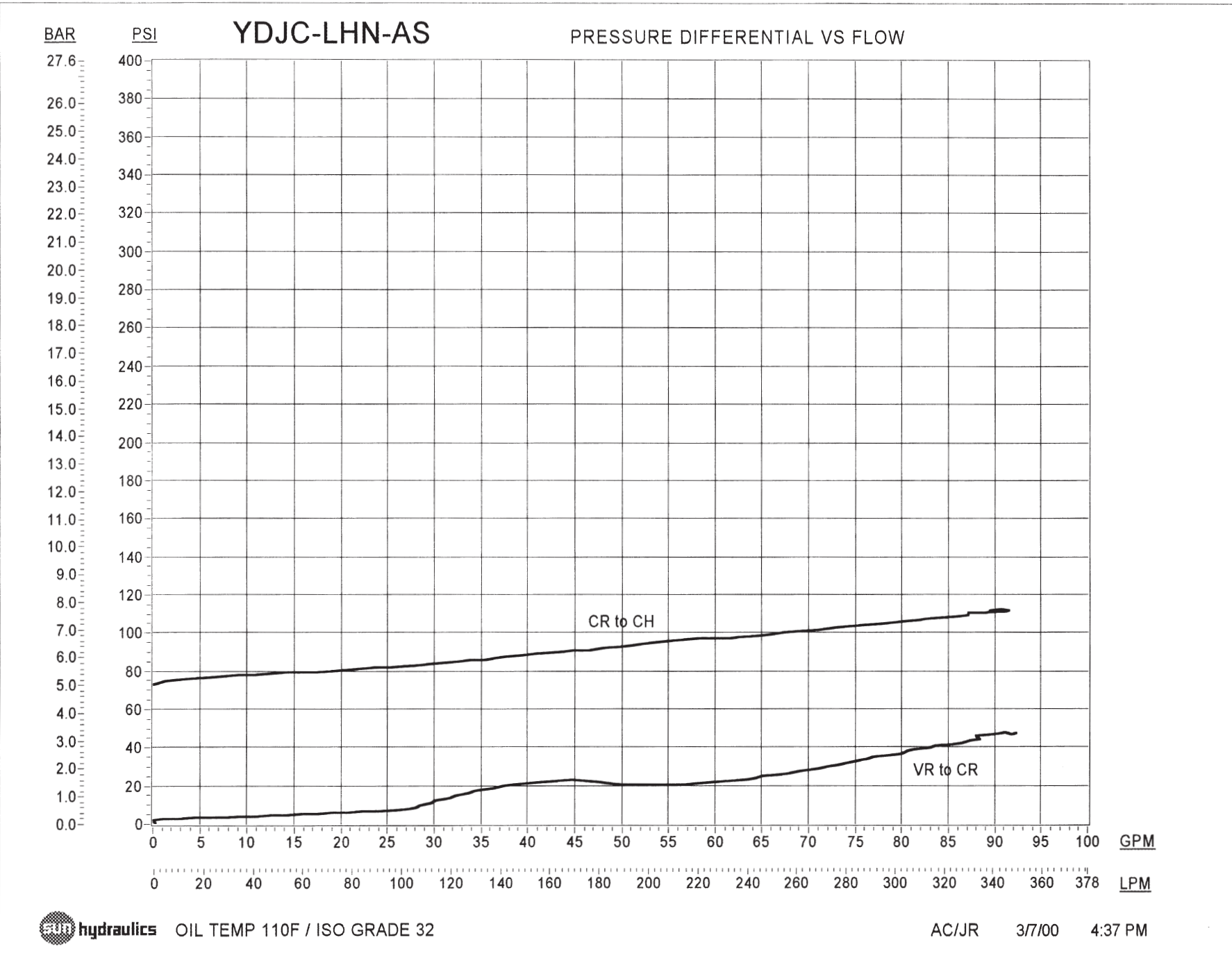
MOUNTING HOLES :
 INCH : .375-16UNC x .62 DP
 METRIC : M10x1.5-6H x .62 DP
 TYP (4) PLACES.

2.00 DIA CODE 61
 SAE 4 BOLT FLANGE
 PATTERN, TYP (3) PLACES
 INCH : .500-13 UNC x 1.06 DP
 TYP (12) PLACES
 METRIC : M12x1.75-6H x 1.06 DP
 TYP (12) PLACES.

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

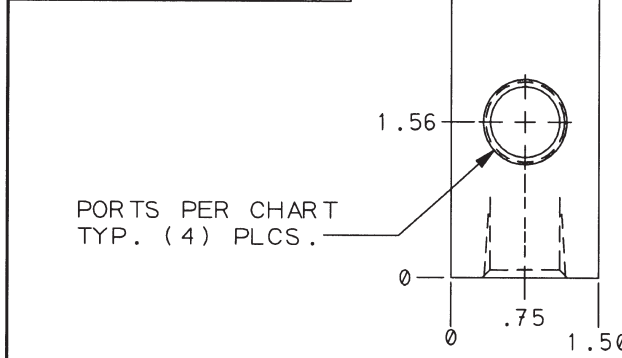
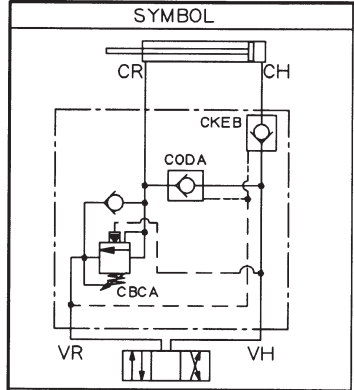
ITEM	PART NO.	PART NAME	QTY
4	A330-006-006	O' RING BOSS PLUG	2
3	COJA XEN	CHECK VALVE	2
2	CBIA LHN	COUNTERBALANCE VALVE	2
1	151-496-***	BODY	1

OUTLINE & ASSEMBLY				UNLESS OTHERWISE SPECIFIED		TITLE		PRESSURE SENSITIVE REGENERATIVE VALVE 2.00 CODE-61 FLANGE		REVISION PART NO.	
- ADDED DIRECTIONAL VALVE TO SYMBOL 28FEB81 SMS NHT				DIMENSION TOL		SCALE REF		MATERIAL		B YDJC LHN AS	
LHN WAS LAN DELETED IT#5 IT#4				X = +/- .039		1:2		ALUM. & STEEL		SUN hydraulics CORPORATION	
B WAS 330-006-006 REDRAWN FOR REGEN 23MAR88 SMS DSS B7Z				YOK = +/- .015		DRAWN		CHECK RELEASE HEAT TREAT & FINISH		79 TALLEYBAY ROAD	
CATALOG				.0002 = +/- .005		DATE		RIB		BANDWATER, FLORIDA 32845, USA	
A REDRAWN BODY WAS 151-496				ANGLE TOL +/-		DATE		DATE		TELEPHONE 904 362-1500	
P/N WAS YDJC LAV AS				FINISH		DATE		DATE		© 1999 SUN HYDRAULICS CORPORATION	
LTR REVISION				DATE DRN/CHK/REL		REMOVE ALL BUBBLES		DATE			



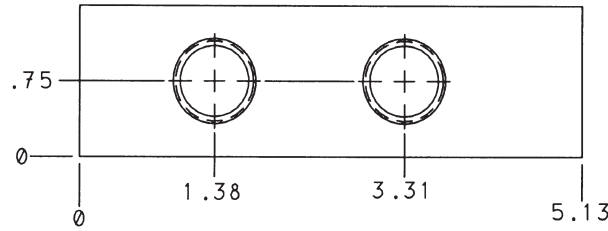
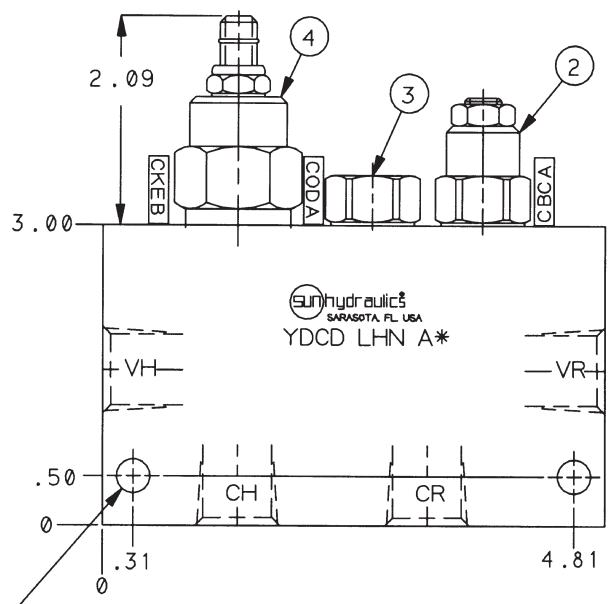
OIL TEMP 110F / ISO GRADE 32

AC/JR 3/7/00 4:37 PM

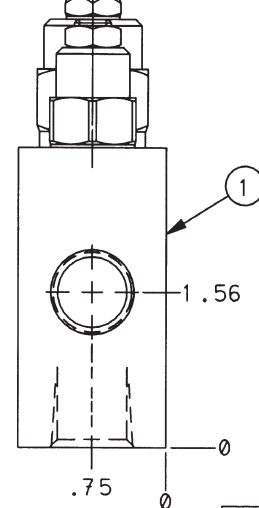


PORTS PER CHART
TYP. (4) PLCS.

.34 DIA. MOUNTING HOLES
THRU TYP. (2) PLCS.



THIRD ANGLE PROJECTION		REVISION C	PART NO. YDCD LHN A*
PORTS CH, CR, VR, VH		BODY DASH NO. -001	MODEL NO. AC
		SAE-10 -002	AK
		.500-14 BSPP -003	AV



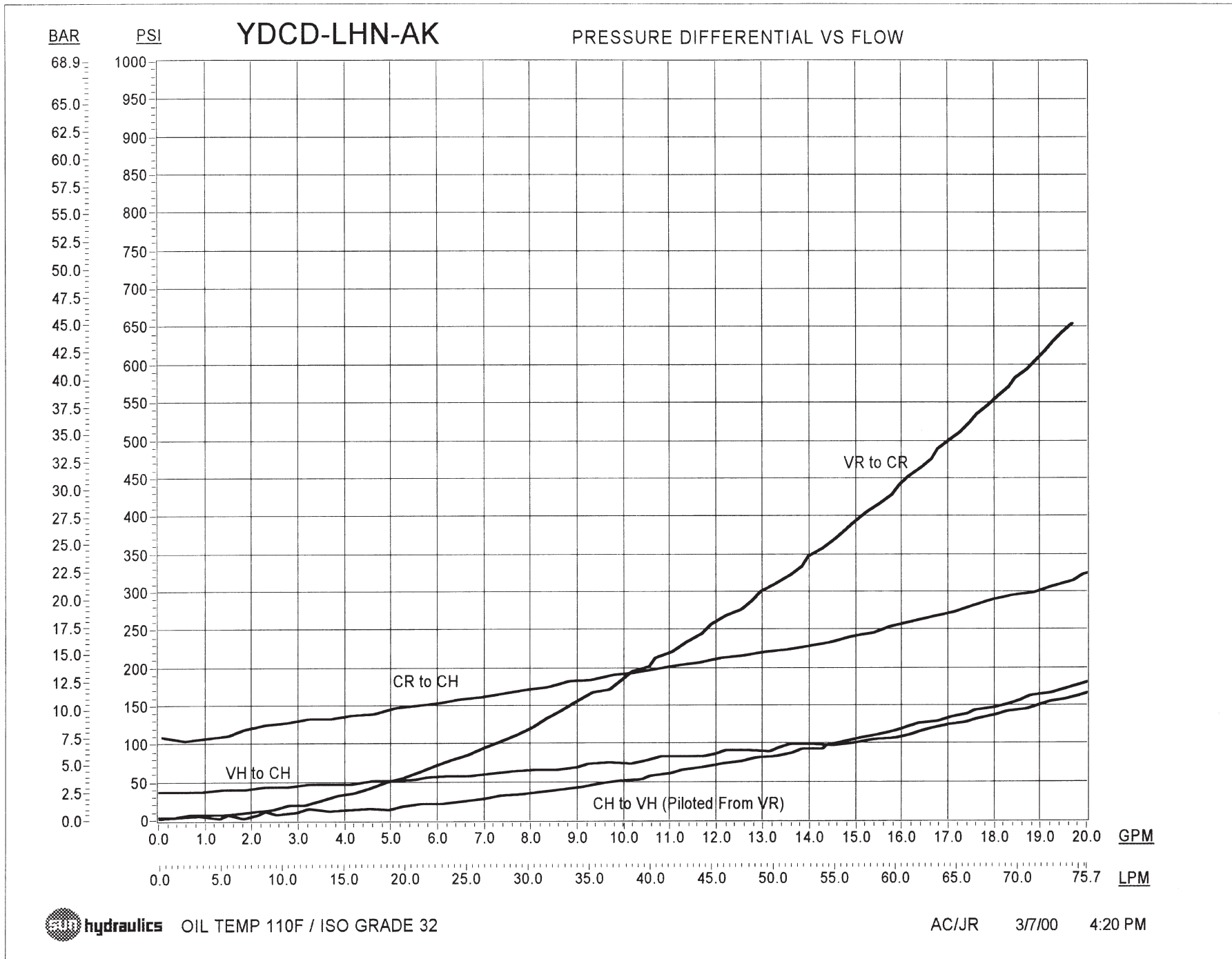
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

4	CKEB LCN	CHECK VALVE	1
3	CODA XEN	CHECK VALVE	1
2	CBCA LHN	COUNTERBALANCE VALVE	1
1	150-817-***	BODY	1

ITEM	PART NO.	PART NAME	QTY
------	----------	-----------	-----

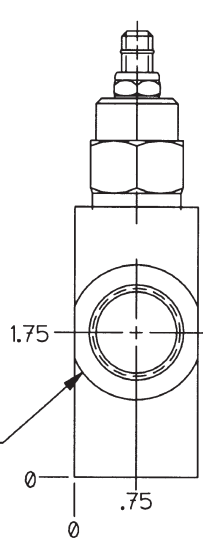
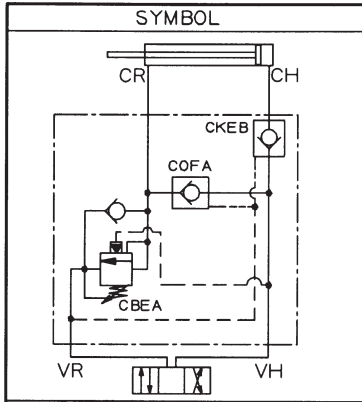
UNLESS OTHERWISE SPECIFIED	TITLE PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED			REVISION C	PART NO. YDCD LHN A*
DIMENSION TOL	SCALE REF	MATERIAL ALUM. & STEEL			
.X = +/- .030	1:125	HEAT TREAT & FINISH			
.XX = +/- .015	DRAWN HHP	CHECK JDA	RELEASE		
.XXX = +/- .005	DATE 21 MAY 82	DATE 05 JUN 82	DATE		
ANGLE TOL +/- 1					
FINISH #0 V					
REMOVE ALL BURRS					
LTR	REVISION	DATE	DRN	CHK	REL





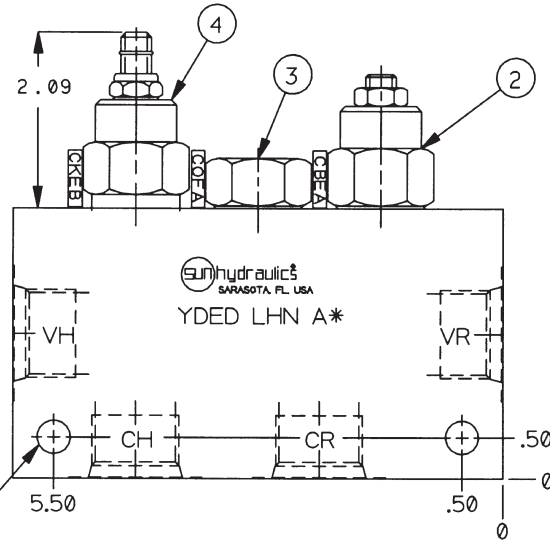
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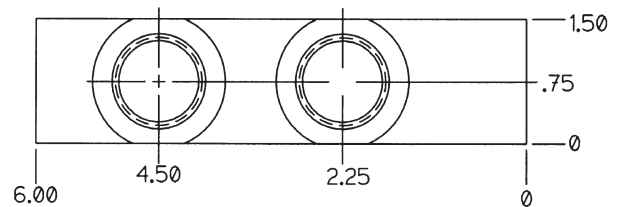
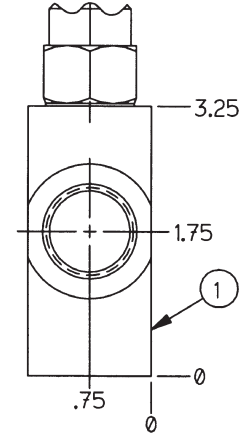


PORTS PER CHART
TYP. (4) PLCS.

.41 DIA. MOUNTING HOLES
THRU TYP. (2) PLCS.



THIRD ANGLE PROJECTION	REVISION H	PART NO. YDED LHN A*
PORTS CR, CH, VR, VH	BODY DASH NO.	THREAD TYPE
.750-14 NPTF	-001	AD
.750-14 BSPP	-002	AW
SAE-12	-003	AL



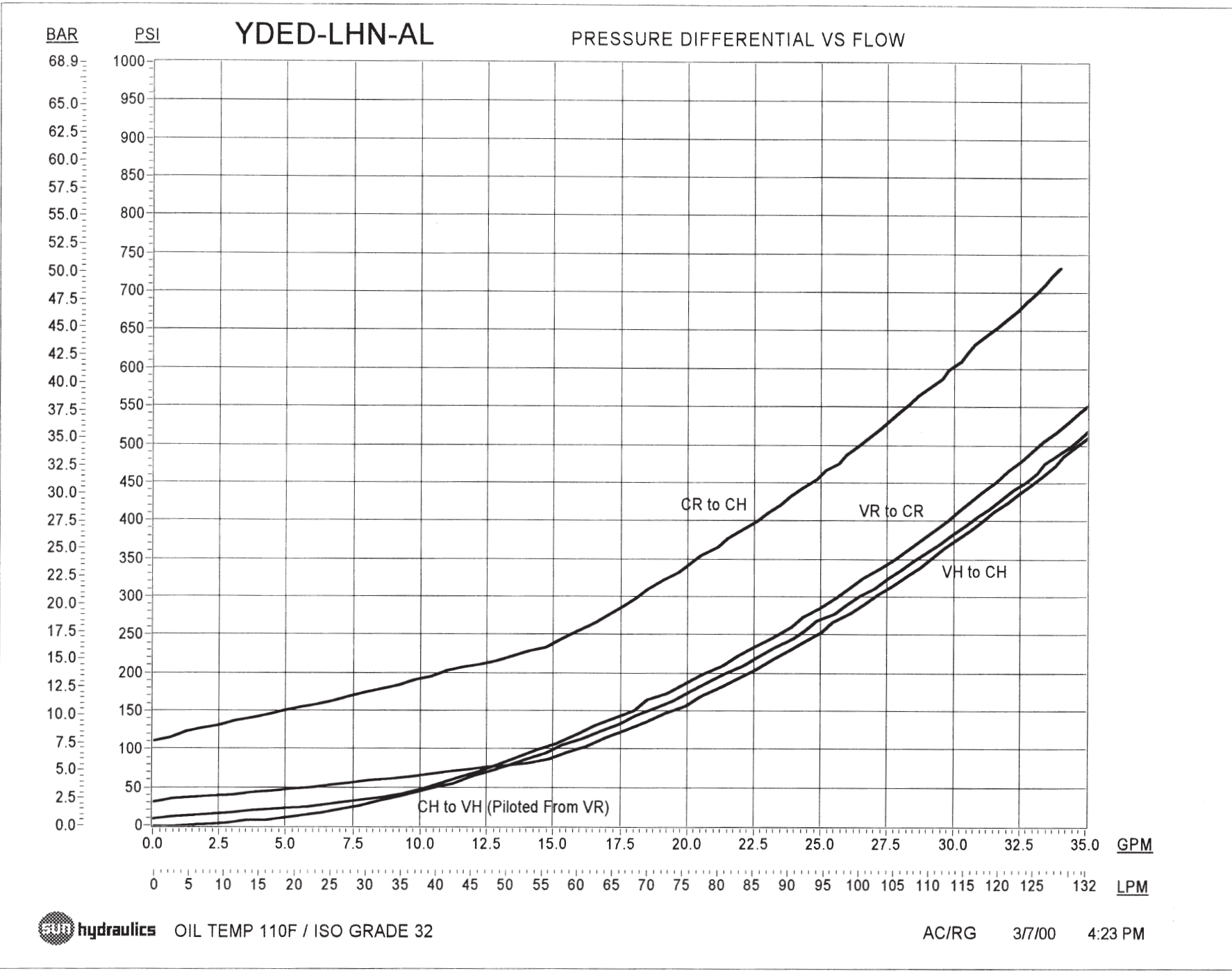
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
4	CKEB LCN	CHECK VALVE	1
3	COFA XEN	CHECK VALVE	1
2	CBEA LHN	COUNTERBALANCE VALVE	1
1	150-030-***	BODY	1

OUTLINE & ASSEMBLY

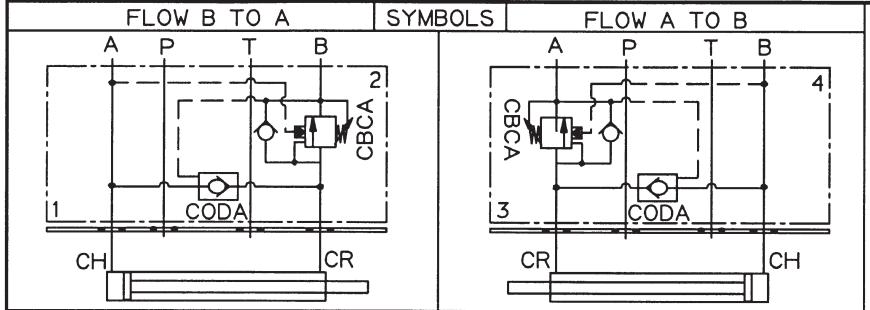
UNLESS OTHERWISE SPECIFIED				TITLE PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED				REVISION H				PART NO. YDED LHN A*			
DIMENSION TOL				SCALE REF YDEA LAN A*MATERIAL				DRAWN HHP				CHECK RELEASE HEAT TREAT & FINISH			
.X = +/- .03				1:1.5 YDEB LAN AD ALUM. & STEEL				DATE				DATE			
.XX = +/- .015				YDEC LAN AD				DATE				DATE			
.XXX = +/- .005				ANGLE TOL +/- 1				DATE				DATE			
FINISH #/V				REMOVE ALL BURRS				DATE				DATE			
LTR				REVISION				DATE				DRN CHK REL			





OIL TEMP 110F / ISO GRADE 32

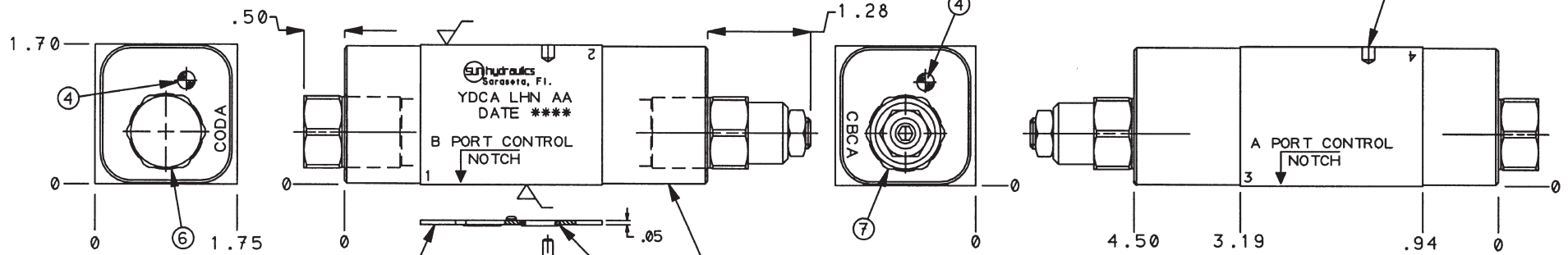
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THIRD ANGLE PROJECTION REVISION PART NO.
C YDCA LHN AA

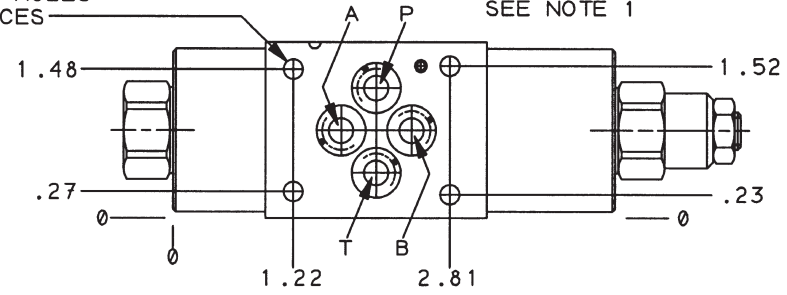
NOTES :
1) CUSTOMER TO INSTALL PIN FOR FUNCTIONAL ORIENTATION

LOCATION PIN CLEARANCE HOLE
.16 DIA x .16 DP.
TYP (2) PLACES.



ISO-03 PATTERN
.20 DIA MOUNTING HOLES
THRU TYP (4) PLACES

SEE NOTE 1



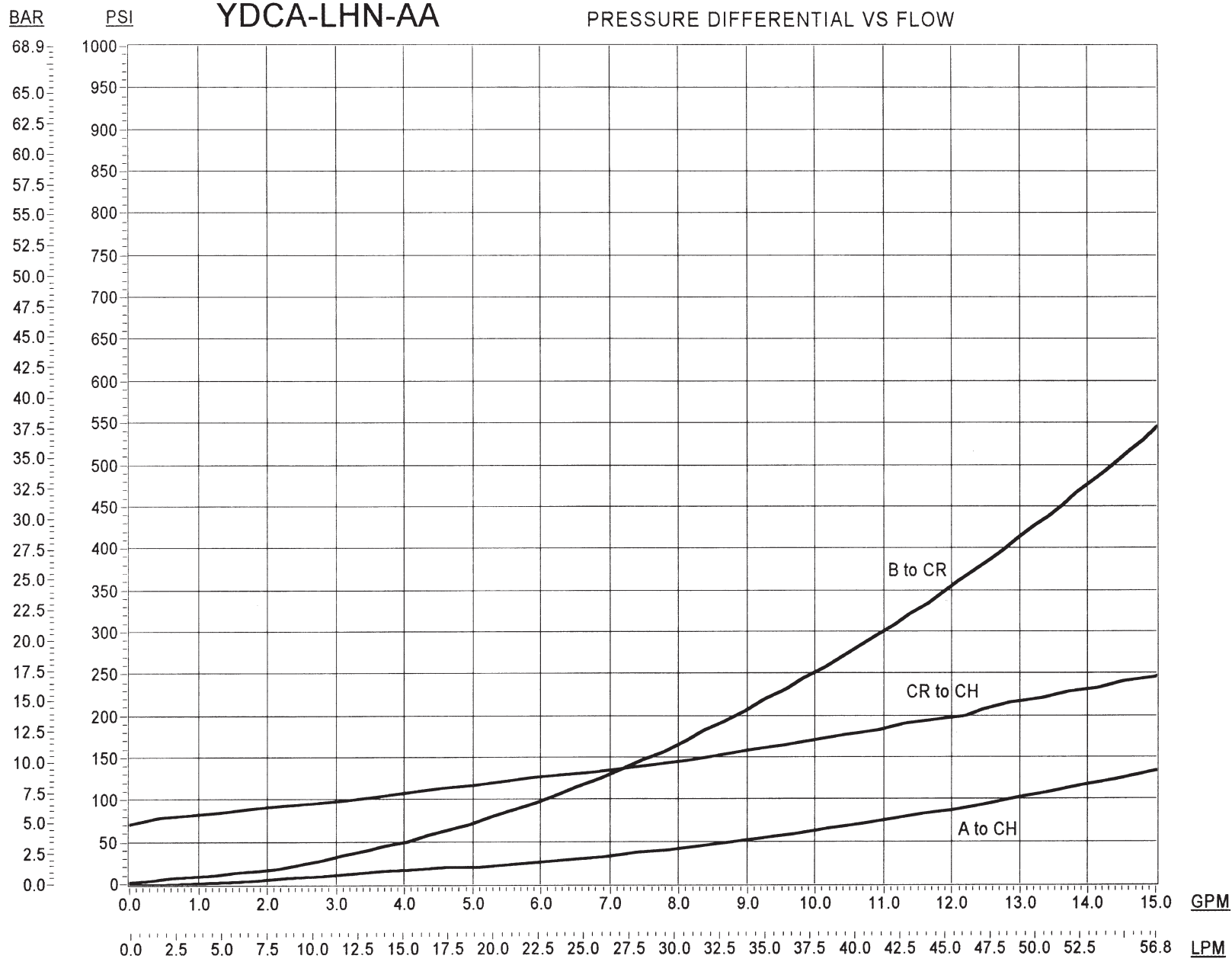
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES AND ETC.

ITEM	PART NO.	PART NAME	QTY
7	CBCA LHN	COUNTERBALANCE VALVE	1
6	CODA XEN	CHECK VALVE	1
5	811-001-006	PIN	1
4	850-004-218	KOENIG PLUG	2
3	500-001-012	"O" RING	4
2	700-002	SEAL PLATE	1
1	150-281	BODY	1

SEE NOTE 1 *

OUTLINE & ASSEMBLY

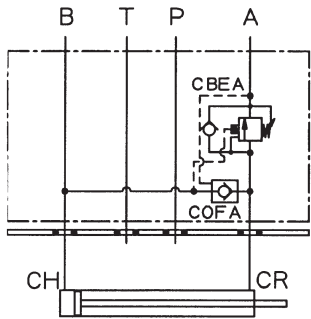
C LHN WAS LAN REDRAWN FOR REGEN. CATALOG 23MAR88 SMS DSS 9723				UNLESS OTHERWISE SPECIFIED DIMENSION TOL .X = +/- .03 # .XX = +/- .015 # .XXX = +/- .005 # ANGLE TOL +/- 1 # FINISH # # V REMOVE ALL BURRS				TITLE ISO-03 PRESS. SENSITIVE REGENERATIVE VALVE FLOW A TO B OR B TO A SCALE REF 1:1.25 DRAWN RJC CHECK RELEASE HEAT TREAT & FINISH DATE DATE DATE 26AUG88				REVISION PART NO. C YDCA LHN AA			
B REDRAWN IN CADD ADDED DATE & CODE STAMPING INSTRUCTIONS 28AUG89 GH DRC				MATERIAL ALUMINIUM				SUN HYDRAULICS CORPORATION 791 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300							
A REVISED STAMPING, ADDED ITEM 5 11NOV82 BRS 4888															
- ITEM 3 WAS 500-101-012 07APR83 DAS 2005															
- PLUG CHANGE PER REL 1023 19OCT88 RC 1023															
LTR REVISION DATE DRN CHK REL															



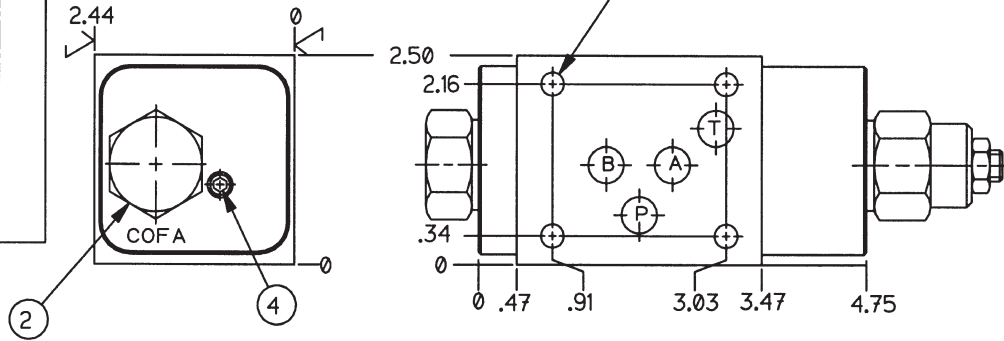
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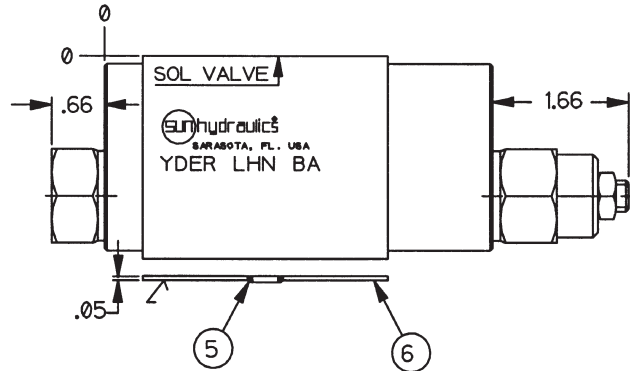
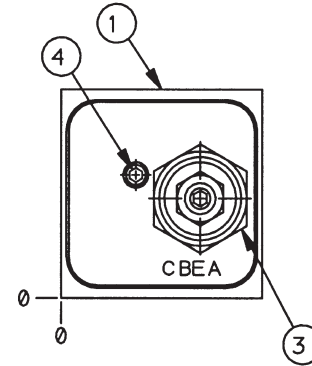
SYMBOLS



ISO-05 PATTERN
 .28 DIA. MOUNTING HOLE
 THRU TYP. (4) PLCS.



THIRD ANGLE PROJECTION REVISION PART NO. B YDER LHN BA

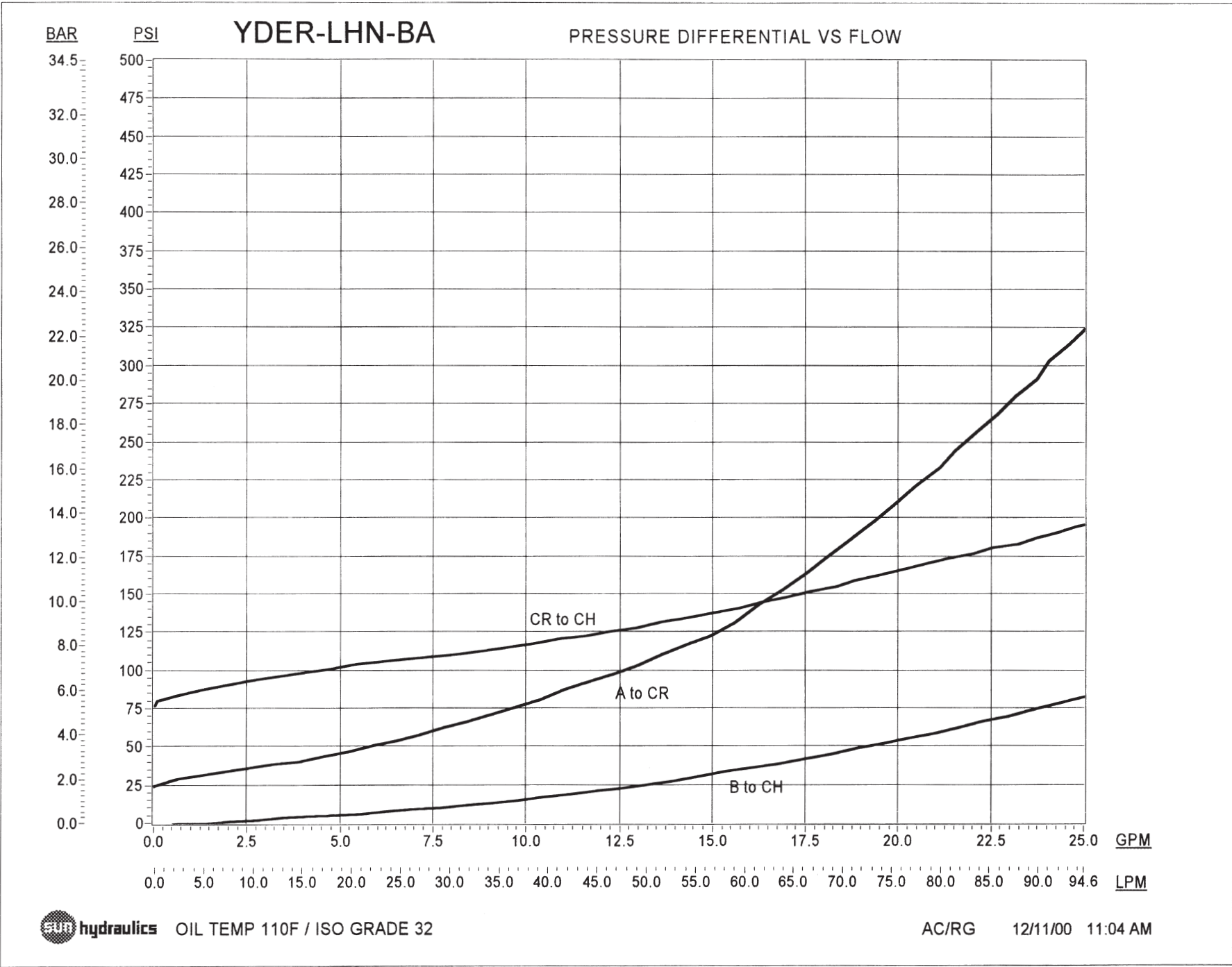


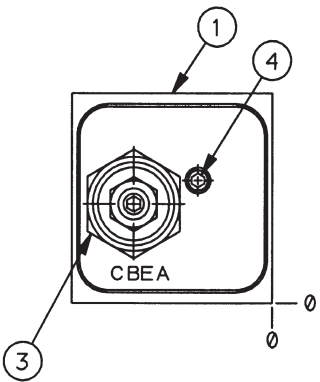
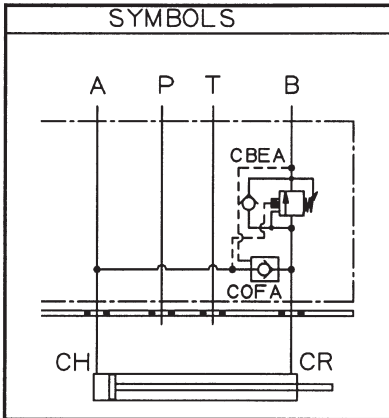
NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

ITEM	PART NO.	PART NAME	QTY
6	700-001	SEAL PLATE	1
5	500-001-014	SEAL O-RING	5
4	340-001	PIPE PLUG	2
3	CBEA LHN	COUNTERBALANCE VALVE	1
2	COFA XEN	CHECK VALVE	1
1	152-187	BODY	1

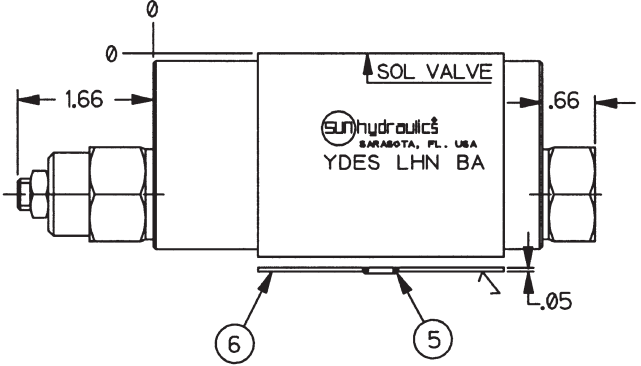
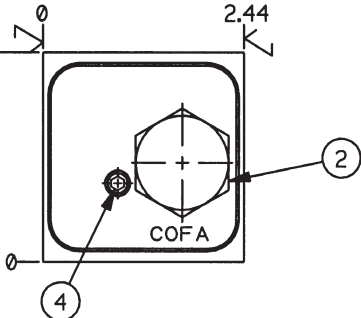
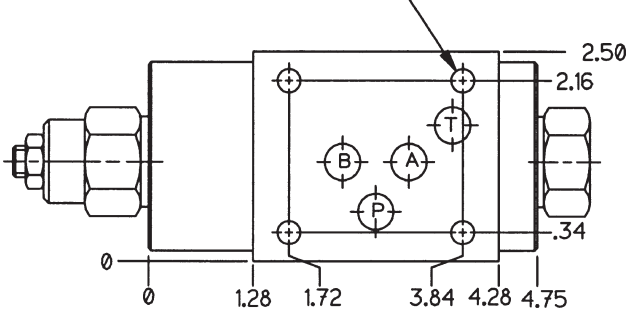
OUTLINE & ASSEMBLY

				UNLESS OTHERWISE SPECIFIED			TITLE ISO-05 REGENERATIVE PRESSURE SENSITIVE FLOW A TO B			REVISION PART NO. B YDER LHN BA		
				DIMENSION TOL			SCALE REF : 1.5 YDEE			MATERIAL ALUMINUM		
				.X = +/- .030			DRAWN BRS			HEAT TREAT & FINISH		
				.XX = +/- .015			CHECK DAS			CORPORATION		
				.XXX = +/- .005			RELEASE			701 TALLEYVAST ROAD		
B REDRAWN FOR REGEN. CATALOG				23MAR00 SMS DSS 8723			DATE DATE DATE			SARASOTA, FLORIDA 34243, USA		
A TITLE WAS B TO A				20AUG92 RJB 3397			13OCT89 19OCT89 19OCT89			TELEPHONE (941) 362-1399		
LTR REVISION				DATE DRN CHK REL			REMOVE ALL BURRS			© 1999 SUN HYDRAULICS CORPORATION		





ISO-05 PATTERN
.28 DIA. MOUNTING HOLES
THRU TYP. (4) PLCS.

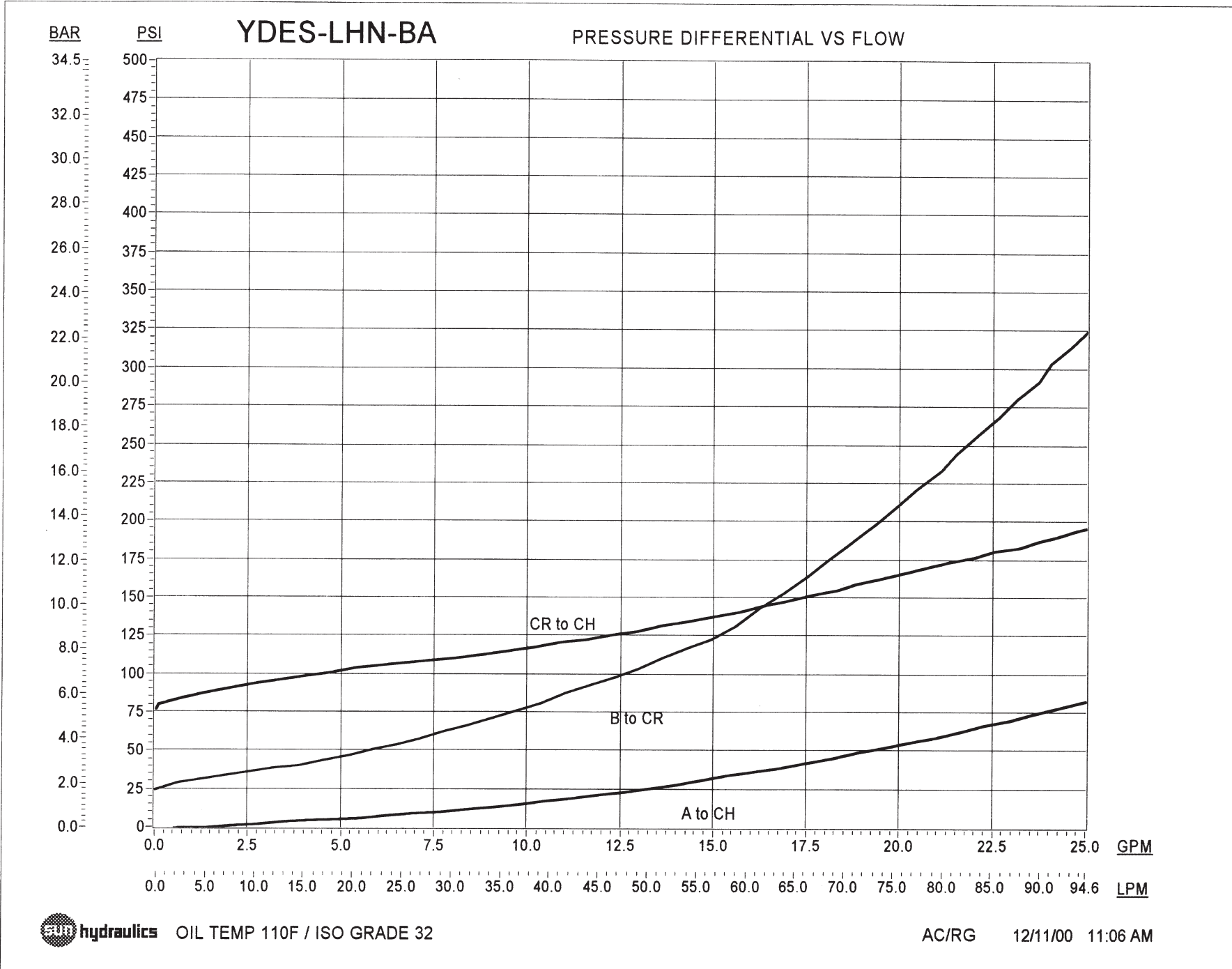


THIRD ANGLE PROJECTION REVISION PART NO. C YDES LHN BA

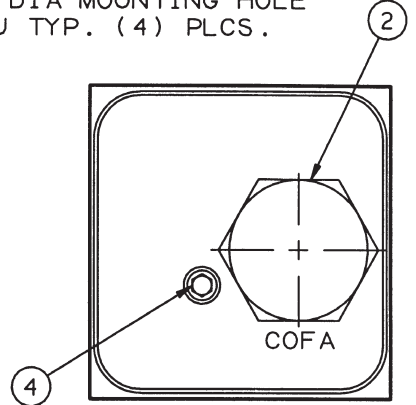
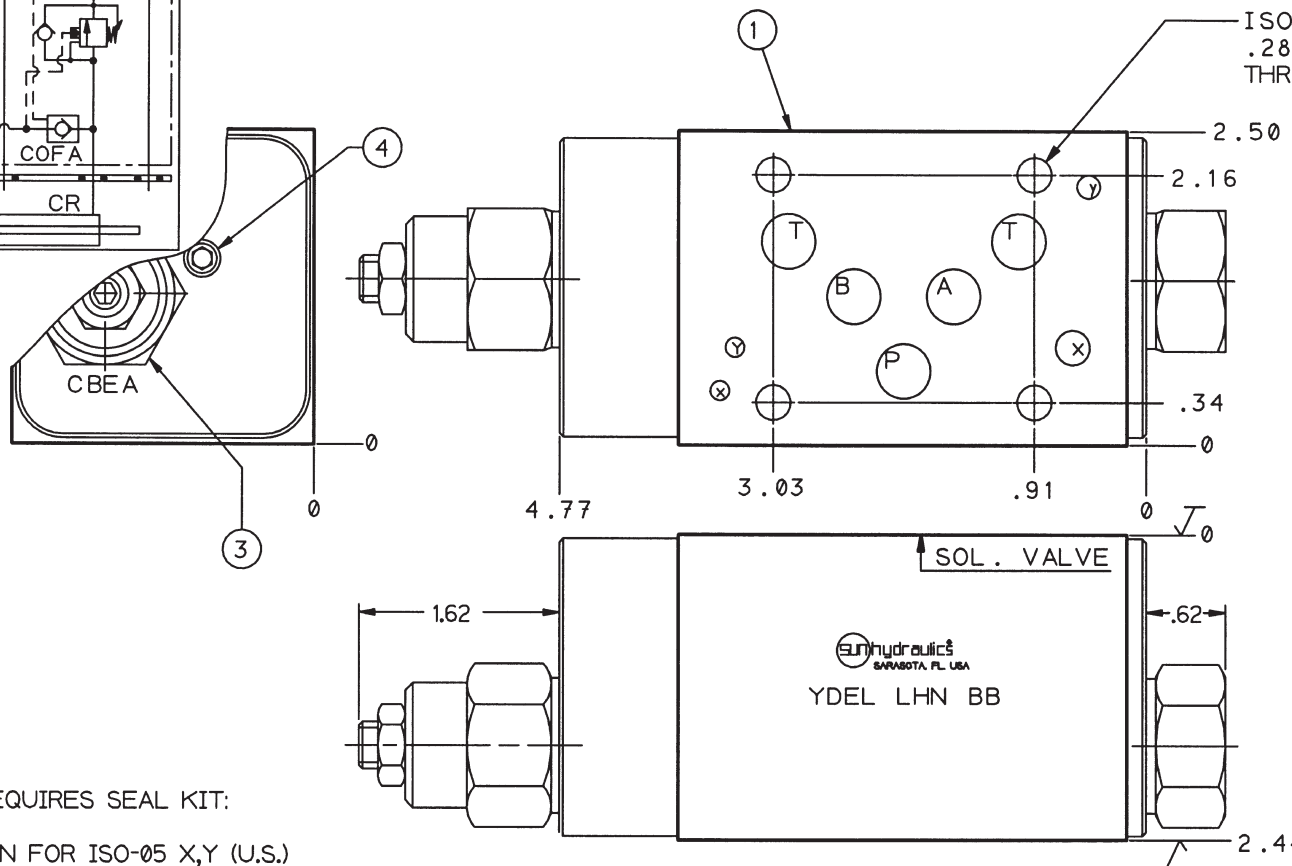
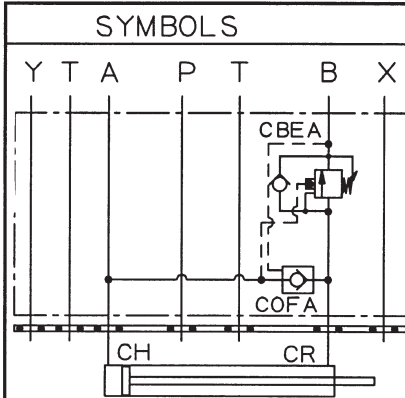
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

6	700-001	SEAL PLATE	1
5	500-001-014	SEAL "O"RING	5
4	340-001	PIPE PLUG	2
3	CBEA LHN	COUNTERBALANCE VALVE	1
2	COFA XEN	CHECK VALVE	1
1	152-188	BODY	1
ITEM	PART NO.	PART NAME	QTY

<p>OUTLINE & ASSEMBLY</p> <p>TITLE ISO-05 REGENERATIVE PRESSURE SENSITIVE FLOW B TO A</p> <p>REVISION PART NO. C YDES LHN BA</p>				<p>UNLESS OTHERWISE SPECIFIED</p> <p>DIMENSION TOL</p> <p>SCALE REF : 1:15</p> <p>MATERIAL ALUMINUM</p> <p>HEAT TREAT & FINISH</p>						
C	REDRAWN FOR REGEN. CATALOG	23MAR00	SMS	DSS	9723	.X = +/- .030	DRAWN BRS	CHECK DAS	RELEASE 2273	<p>SUN hydraulic CORPORATION 791 TALLEYVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (813) 362-1599</p>
B	ADDED SOL. VALVE STAMPING	29OCT93	BRS			.XX = +/- .015	DATE 11OCT89	DATE 19OCT89	DATE 19OCT89	
A	TITLE WAS A TO B	20AUG92	RJB	3997		.XXX = +/- .005				
-	REVISED SYMBOL	20MAY91	BRS			ANGLE TOL +/- 1				
-	ADDED .05 DIM.	06DEC89	BRS			FINISH 80 V				
LTR	REVISION	DATE	DRN	CHK	REL	REMOVE ALL BURRS				



REVISION PART NO.
A YDEL LHN BB



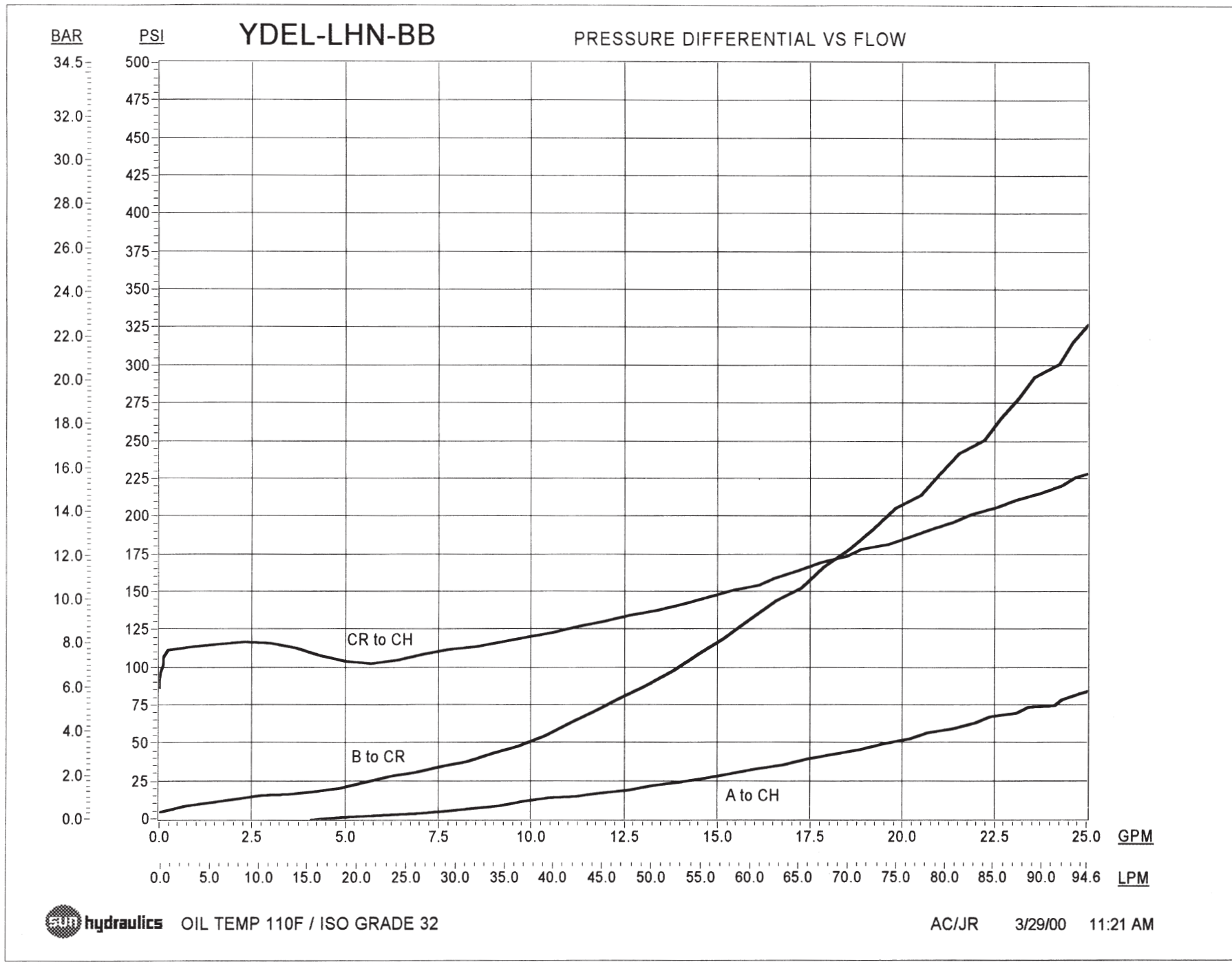
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

4	340-001	PIPE PLUG	2
3	CBEA LHN	COUNTERBALANCE VALVE	1
2	COFA XEN	CHECK VALVE	1
1	150-700	BODY	1

ITEM	PART NO.	PART NAME	QTY
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INSTALLATION REQUIRES SEAL KIT:
 990-120-009 BUNA-N FOR ISO-05 X,Y (U.S.)
 990-120-010 VITON FOR ISO-05 X,Y (U.S.)
 990-120-011 BUNA-N FOR ISO-05 X,Y (EUROPEAN)
 990-120-012 VITON FOR ISO-05 X,Y (EUROPEAN)
 (KIT INCLUDES SEAL PLATE AND ORINGS)

<p>OUTLINE & ASSEMBLY</p>				<p>TITLE ISO-05 XY PATTERN PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A</p>		<p>REVISION PART NO. A YDEL LHN BB</p>	
<p>DIMENSION TOL XX = +/- .015 XXX = +/- .005 MACHINING STANDARD G-28</p>				<p>SCALE REF 1:1</p>		<p>MATERIAL ALUM & STEEL</p>	
<p>ANGLE TOL +/- 1° FINISH .00 ✓ REMOVE ALL BURRS .025 MAX. BREAK</p>				<p>HEAT TREAT & FINISH</p>			
<p>A LHN WAS LAN REDRAWN FOR REGEN. CATALOG</p>		<p>23MAR00 SMS DSS 9723</p>		<p>DRAWN RJB DATE 25OCT84</p>		<p>CHECK JLJ DATE 06NOV84</p>	
<p>LTR REVISION</p>		<p>DATE DRN CHK REL</p>		<p>RELEASE 668 DATE 19NOV84</p>		<p>1540 WEST UNIVERSITY PKWY SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1200</p>	



SYMBOL

THIRD ANGLE PROJECTION

REVISION PART NO.
E YDEE LHN BA

ISO-05 PATTERN
.28 DIA. MOUNTING HOLES
THRU TYP. (4) PLCS.

NOTES:

REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

1	500-001-014	"O" RING	5
1	340-001	PIPE PLUG	2
1	CBEA LHN	COUNTERBALANCE VALVE	1
1	COFA XEN	CHECK VALVE	1
1	150-015	BODY	1

ITEM	PART NO.	PART NAME	QTY
1	500-001-014	"O" RING	5
1	340-001	PIPE PLUG	2
1	CBEA LHN	COUNTERBALANCE VALVE	1
1	COFA XEN	CHECK VALVE	1
1	150-015	BODY	1

UNLESS OTHERWISE SPECIFIED

DIMENSION TOL

E	LHN WAS LAN REDRAWN FOR REGEN. CATALOG	23MAR88	SMS	DSS	9723
D	4.72 LENGTH WAS 4.62	25AUG98	RJB		8795
-	SEALS >BUNA	14AUG92	RJB		2885
C	REDRAWN		RJB		
LTR	REVISION	DATE	DRN	CHK	REL

OUTLINE & ASSEMBLY

TITLE ISO-05 SANDWICH PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A

SCALE REF 1:1

MATERIAL ALUM. & STEEL

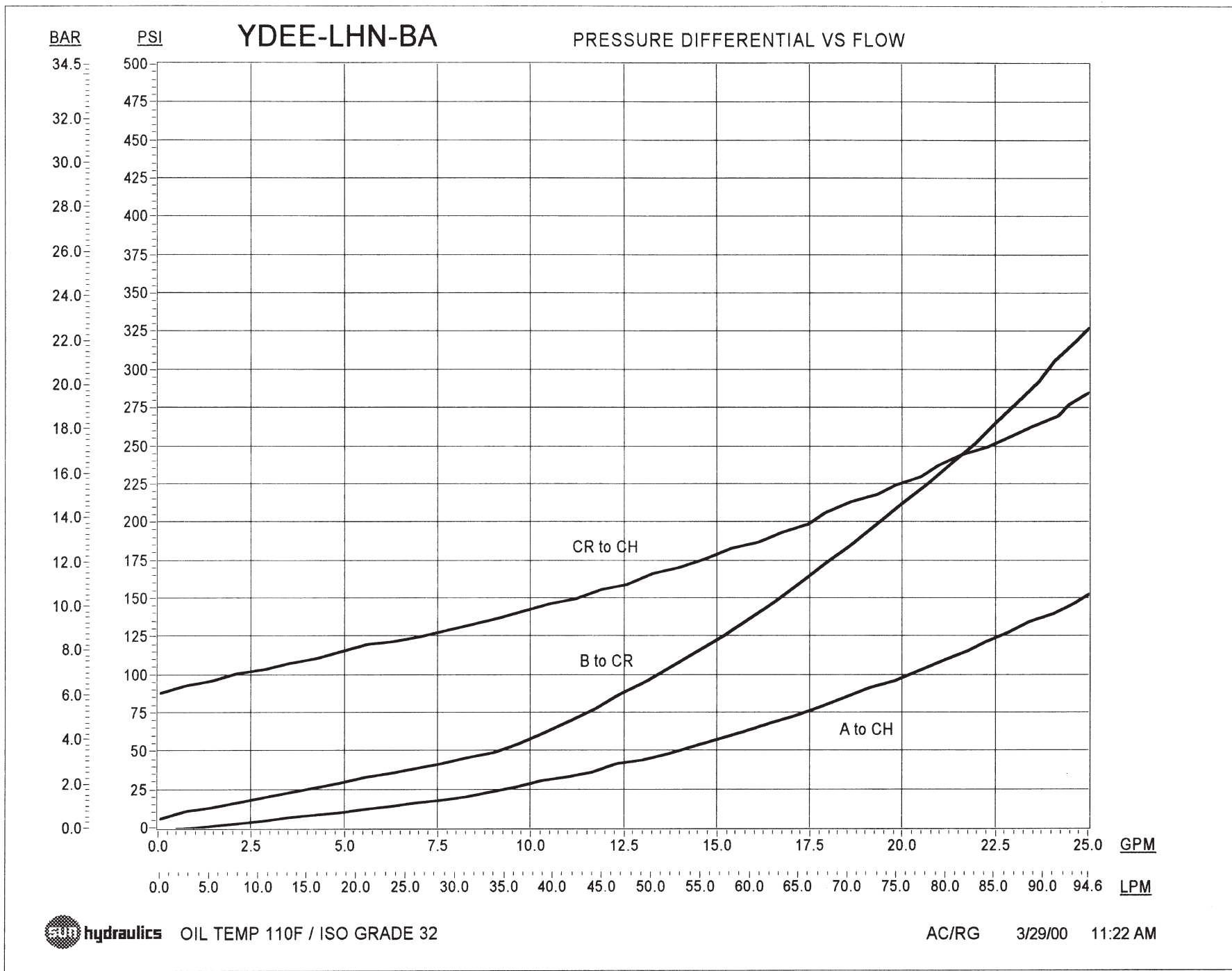
HEAT TREAT & FINISH

DRAWN RJB	CHECK JLB	RELEASE 715
DATE	DATE	DATE

26OCT84 06NOV84 04FEB85


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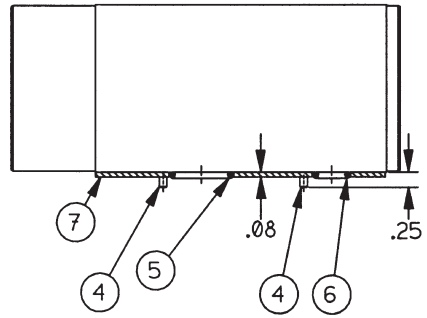
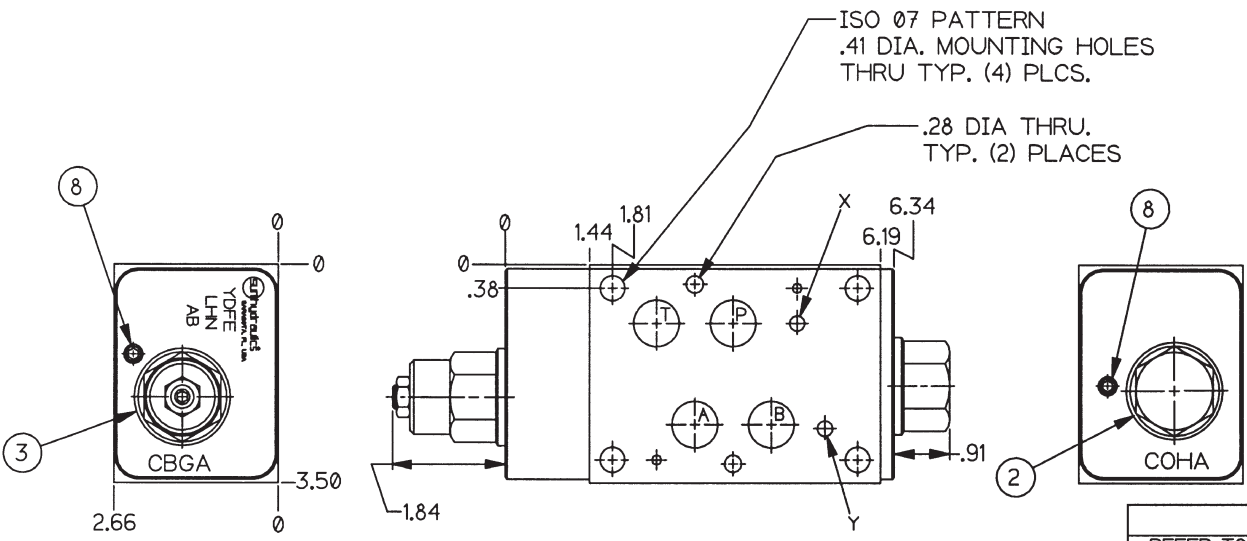
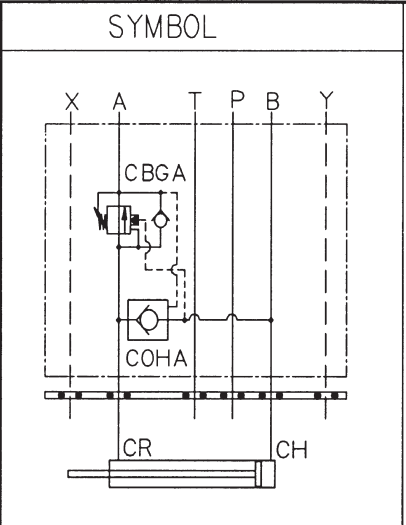
791 TALLEYVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (810) 362-1300



OIL TEMP 110F / ISO GRADE 32

AC/RG 3/29/00 11:22 AM



THIRD ANGLE PROJECTION  REVISION PART NO.
A YDFE LHN AB

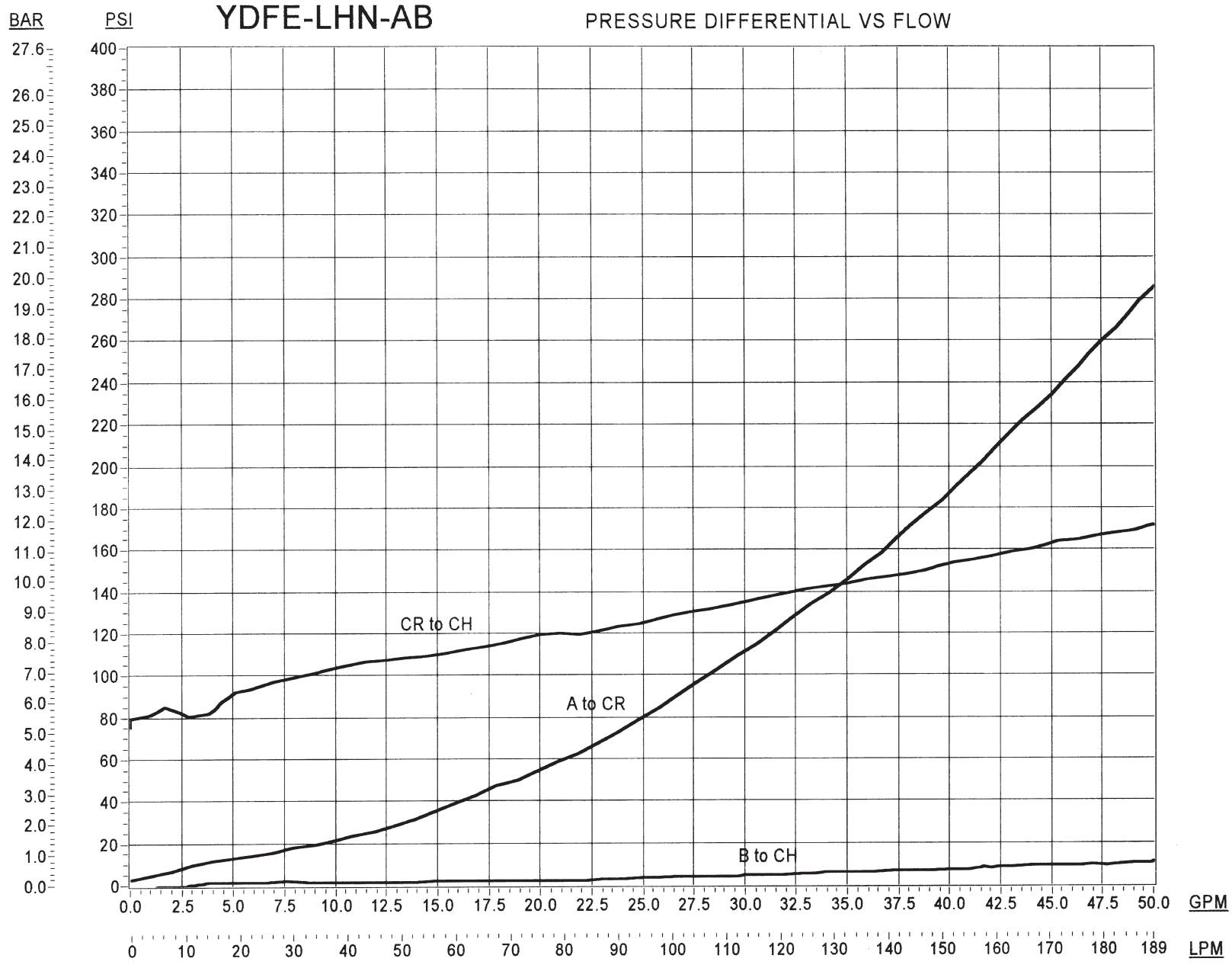


NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

8	340-001	PIPE PLUG	2
7	700-006	SEAL PLATE	1
6	500-001-111	"O" RING	2
5	500-001-118	"O" RING	4
4	811-001-006	PIN	2
3	CBGA LHN	COUNTERBALANCE VALVE	1
2	COHA XEN	CHECK VALVE	1
1	151-146	BODY	1
ITEM	PART NO.	PART NAME	QTY

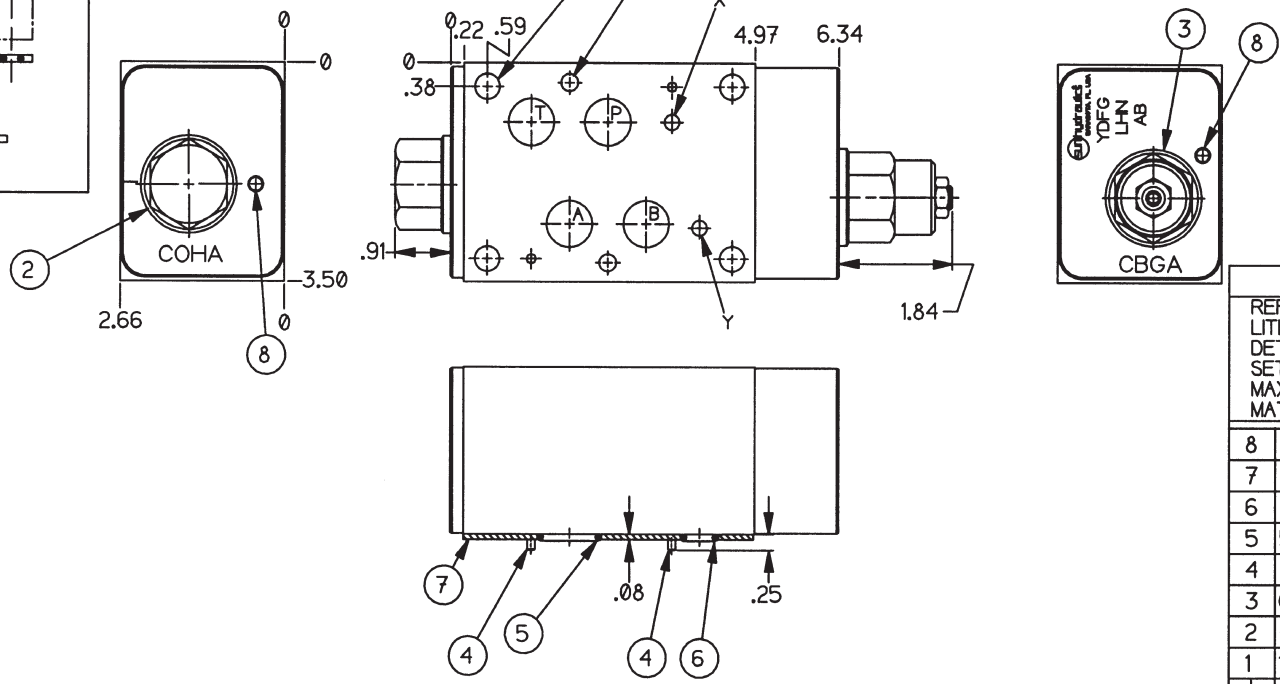
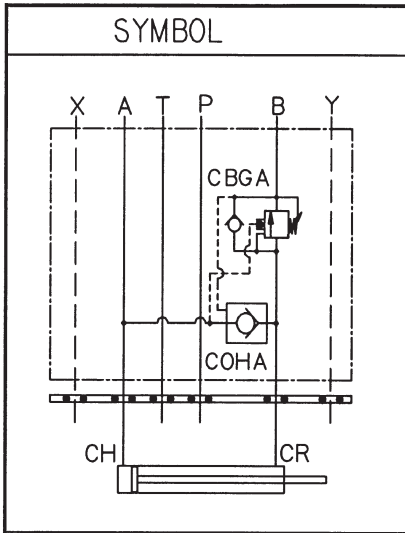
OUTLINE & ASSEMBLY

					UNLESS OTHERWISE SPECIFIED			TITLE ISO-07 PRESS. SENSITIVE REGENERATIVE VALVE FLOW A TO B			REVISION PART NO. A YDFE LHN AB		
					DIMENSION TOL			SCALE REF			MATERIAL		
					.X = +/- .03			1:2			ALUM. & STEEL		
					.XX = +/- .015			DRAWN CHECK RELEASE			HEAT TREAT & FINISH		
					.XXX = +/- .005			DAS JLB					
					ANGLE TOL +/- 1			DATE DATE DATE					
					FINISH # V			24SEP85 30SEP85 30SEP85			 <p>SUN hydraulics CORPORATION 791 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300</p>		
					REMOVE ALL BURRS								
A	LHN WAS LAN REDRAWN FOR REGEN. CATALOG				23MAR89	SMS	DSS	9723					
-	ITEM#6 WAS 500-101-111				14JUL89	DAS		2005					
-	ITEM#5 WAS 500-101-118												
LTR	REVISION				DATE	DRN	CHK	REL					



OIL TEMP 110F / ISO GRADE 32

AC/JR 3/29/00 11:23 AM



THIRD ANGLE PROJECTION REVISION B PART NO. YDFG LHN AB

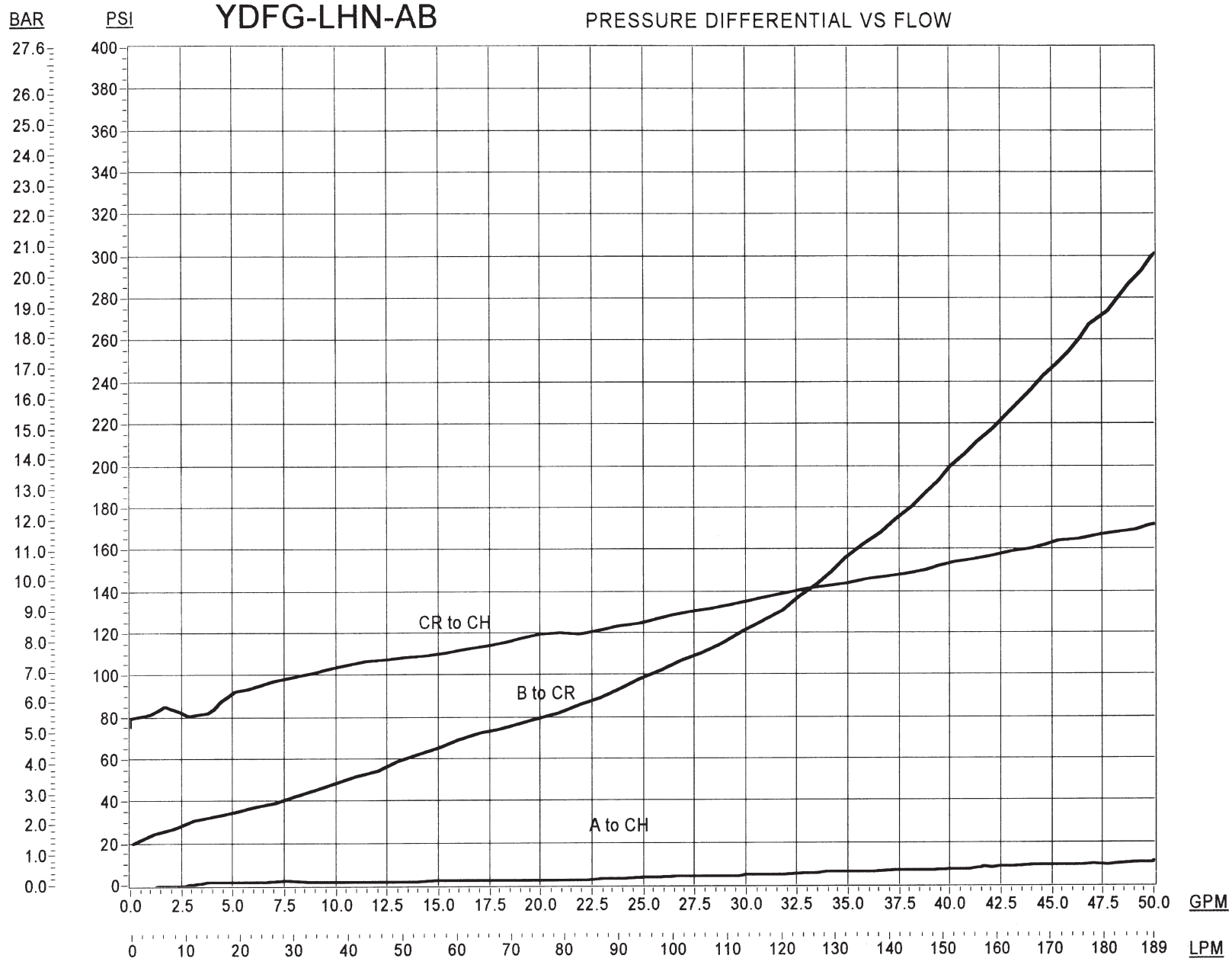
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

8	850-004-250	KOENIG PLUG	2
7	700-006	SEAL PLATE	1
6	500-001-111	"O" RING	2
5	500-001-118	"O" RING	4
4	811-001-006	PIN	2
3	CBGA LHN	COUNTERBALANCE VALVE	1
2	COHA XEN	CHECK VALVE	1
1	152-746	BODY	1
ITEM	PART NO.	PART NAME	QTY

OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED				TITLE ISO-07 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A			REVISION B PART NO. YDFG LHN AB	
DIMENSION TOL				SCALE REF	MATERIAL			<p>SUN hydraulics CORPORATION 791 TALLEYVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 362-1300</p>
.X = +/- .030				1:2	ALUM. & STEEL			
.XX = +/- .015				DRAWN RJB	CHECK DAS	RELEASE 3435	HEAT TREAT & FINISH	
.XXX = +/- .005				DATE 18DEC91	DATE 19DEC91	DATE 19DEC91		
ANGLE TOL +/- 1				FINISH #0V				
LTR REVISION				REMOVE ALL BURRS				

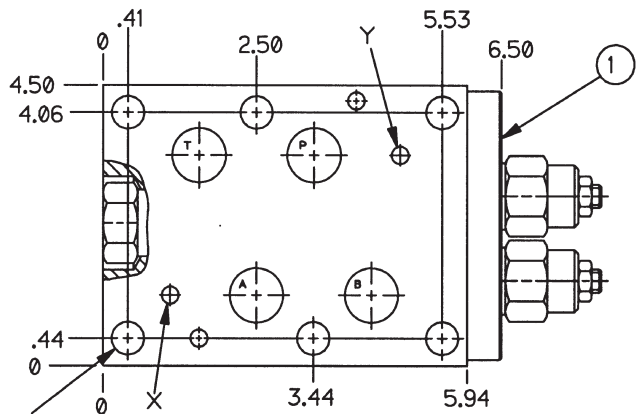
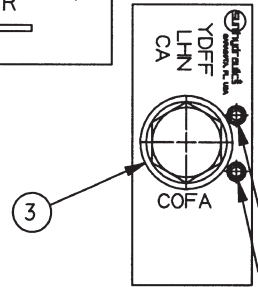
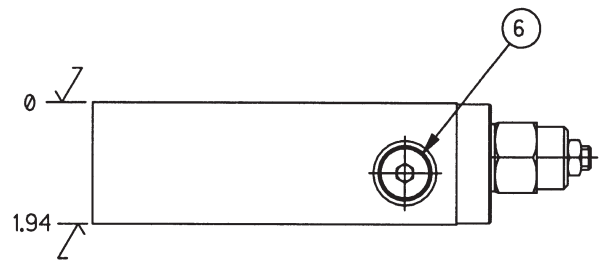
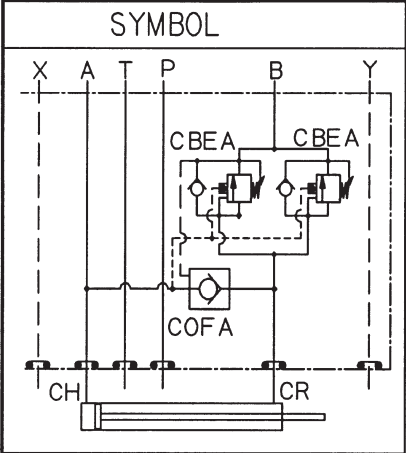
B	REDRAWN FOR REGEN. CATALOG	23MAR90	SMS	DSS	B723
A	MOVED COHA SLIGHTLY	28JUL94	RJB		
LTR	REVISION	DATE	DRN	CHK	REL



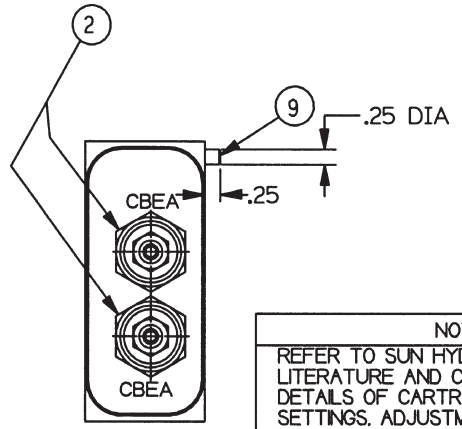
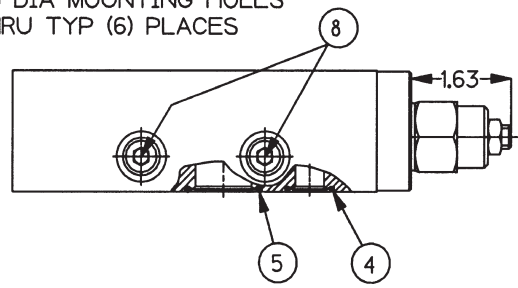
OIL TEMP 110F / ISO GRADE 32

AC/JR 3/29/00 11:24 AM

THIRD ANGLE PROJECTION  REVISION PART NO.
 C YDF LHN CA



ISO-08 PATTERN
 .53 DIA MOUNTING HOLES
 THRU TYP (6) PLACES



NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

9	811-001-002	PIN	1
8	340-001	PIPE PLUG	2
7	A330-006-006	"O" RING BOSS PLUG	2
6	A330-006-008	"O" RING BOSS PLUG	1
5	500-001-121	"O" RING	4
4	500-001-114	"O" RING	2
3	COFA XEN	CHECK VALVE	1
2	CBEA LHN	COUNTERBALANCE VALVE	2
1	151-470	BODY	1

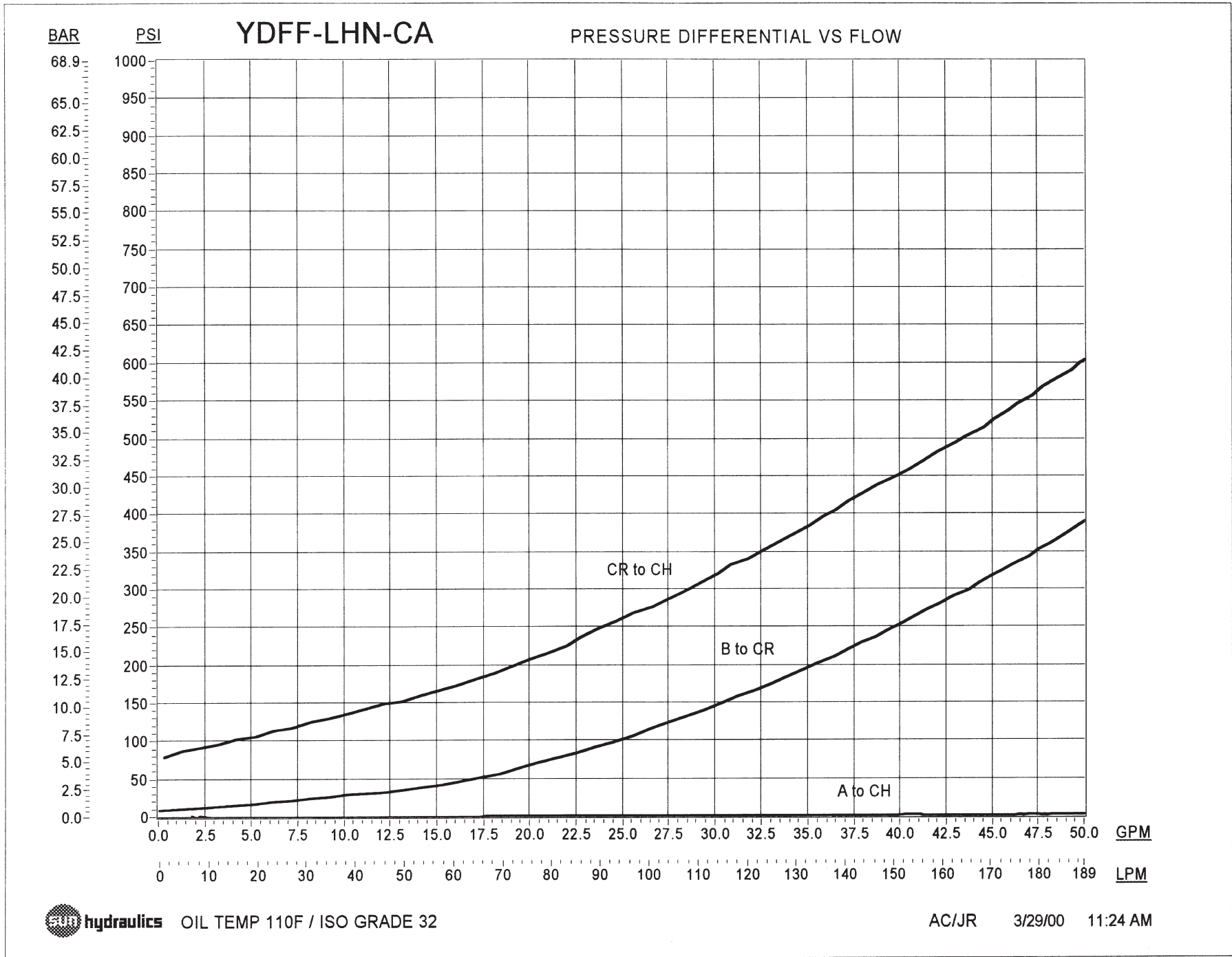
ITEM	PART NO.	PART NAME	QTY
	C	YDF LHN CA	


OUTLINE & ASSEMBLY

C	LHN WAS LAN DELETED OLD IT#7 & 9 IT#9 WAS IT#11 IT#8 WAS IT#10 IT#6 & 7 WERE 33#S NOW A33#S REDRAWN FOR REGEN CATALOG	23MAR80	SMS	DSS	9723				UNLESS OTHERWISE SPECIFIED
B	REDESIGNED & REDRAWN, CORRECTED DATUM	08SEP83	DAS						DIMENSION TOL
-	SEALS TO BUNA	0-14-82	RJB		2895				.X = +/- .030
-	PLUG CHANGE PER RELEASE 1024	10-21-88	RJC		1024				.XX = +/- .015
A	ITEM 4 QTY WAS 3, ADDED ITEM 10	3-10-87	DAS		1342				.XXX = +/- .005
LTR	REVISION	DATE	DRN	CHK	REL				ANGLE TOL +/- 1
									FINISH #0 V
									REMOVE ALL BURRS

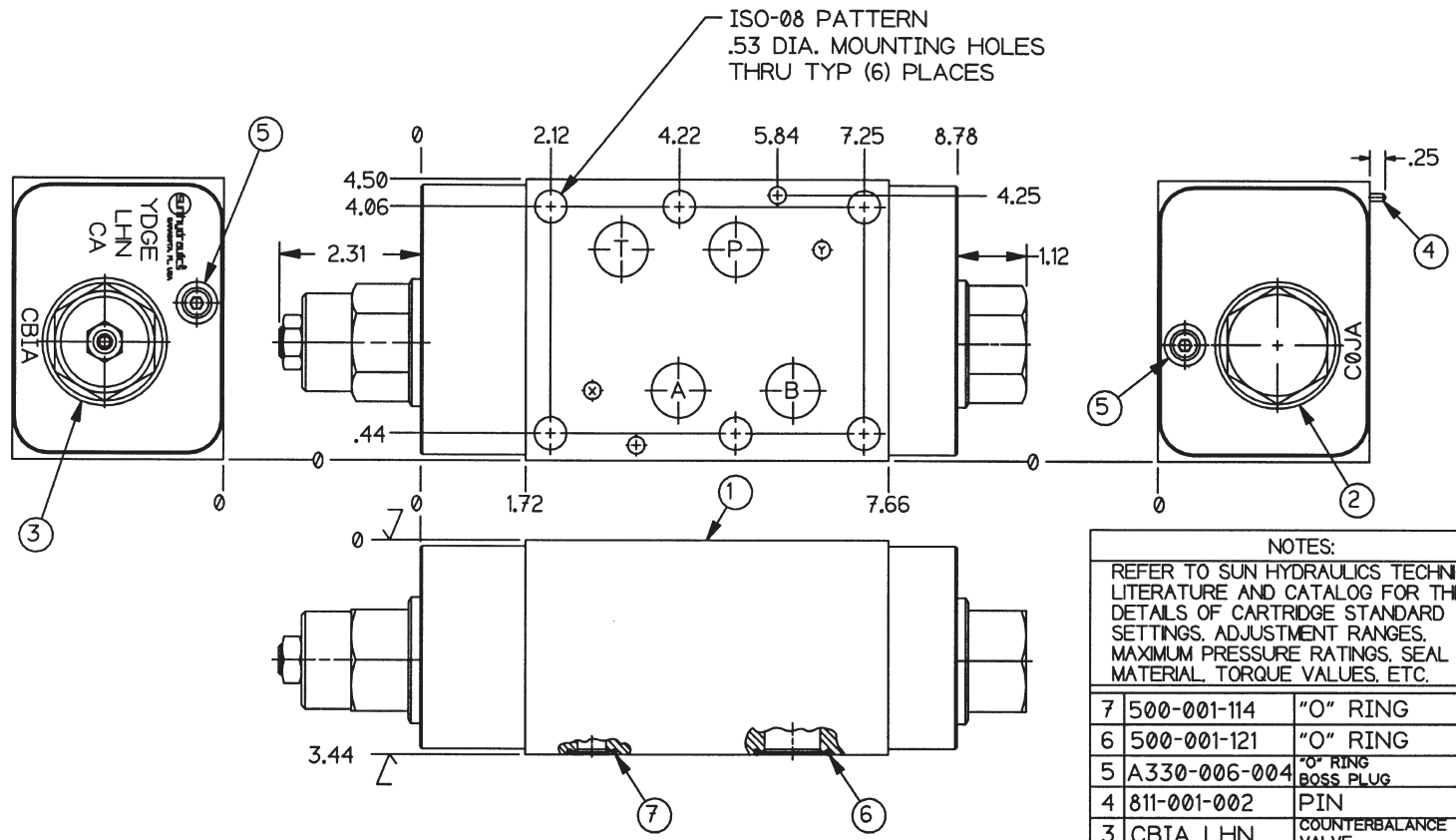
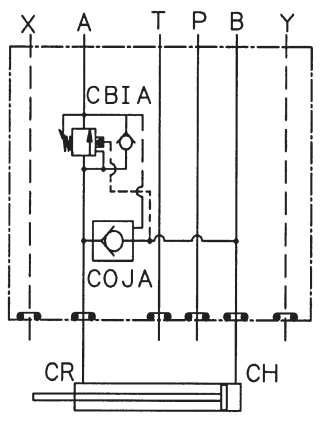
TITLE ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A			REVISION PART NO. C YDF LHN CA		
SCALE REF 1:2		MATERIAL ALUM. & STEEL			
DRAWN DAS	CHECK JLB	RELEASE	HEAT TREAT & FINISH		
DATE 14JUN86	DATE 16JUN86	DATE			





THIRD ANGLE PROJECTION  REVISION PART NO.
C YDGE LHN CA

SYMBOL



NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

7	500-001-114	"O" RING	2
6	500-001-121	"O" RING	4
5	A330-006-004	"O" RING BOSS PLUG	2
4	811-001-002	PIN	2
3	CBIA LHN	COUNTERBALANCE VALVE	1
2	COJA XEN	CHECK VALVE	1
1	151-196	BODY	1

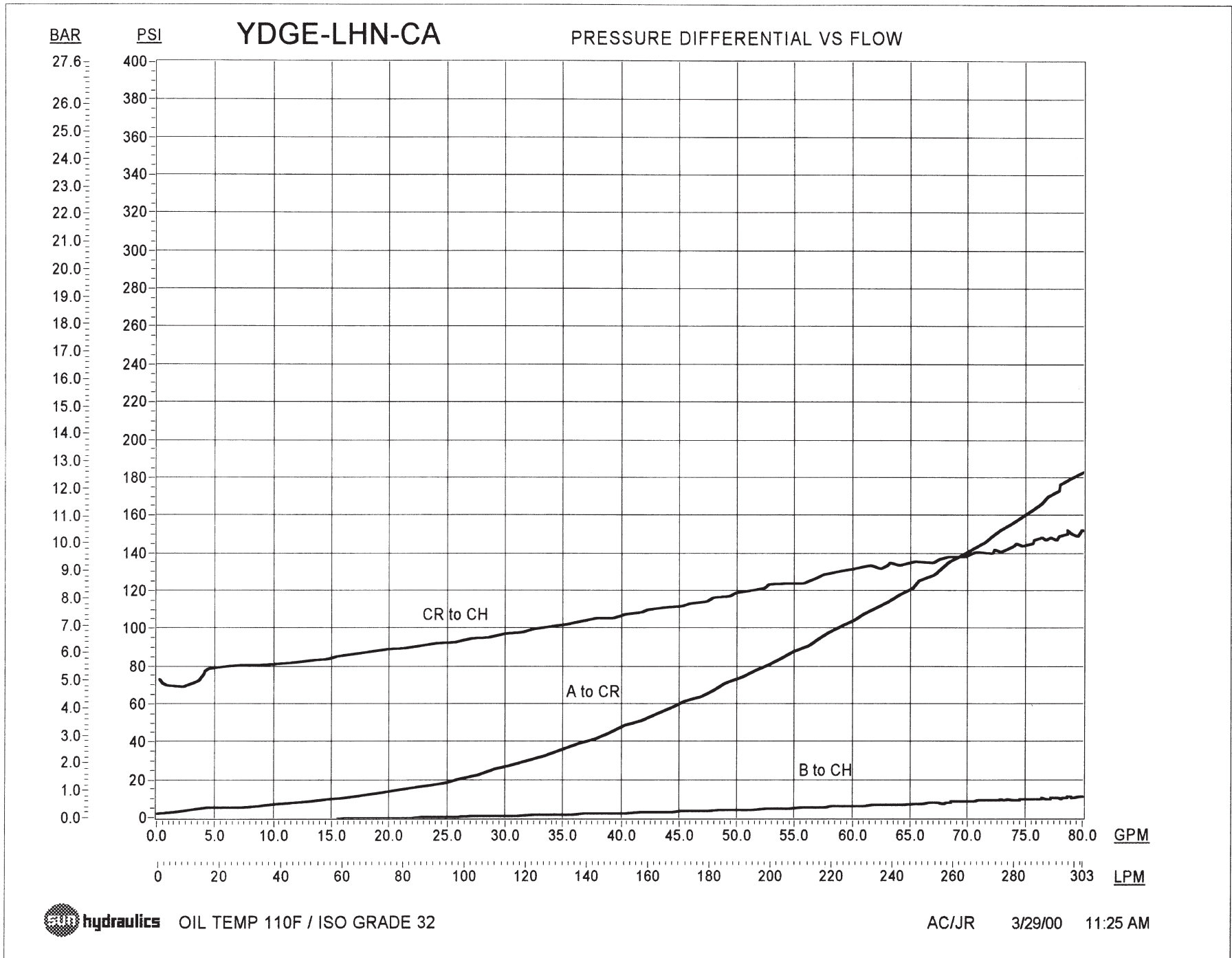
ITEM	PART NO.	PART NAME	QTY
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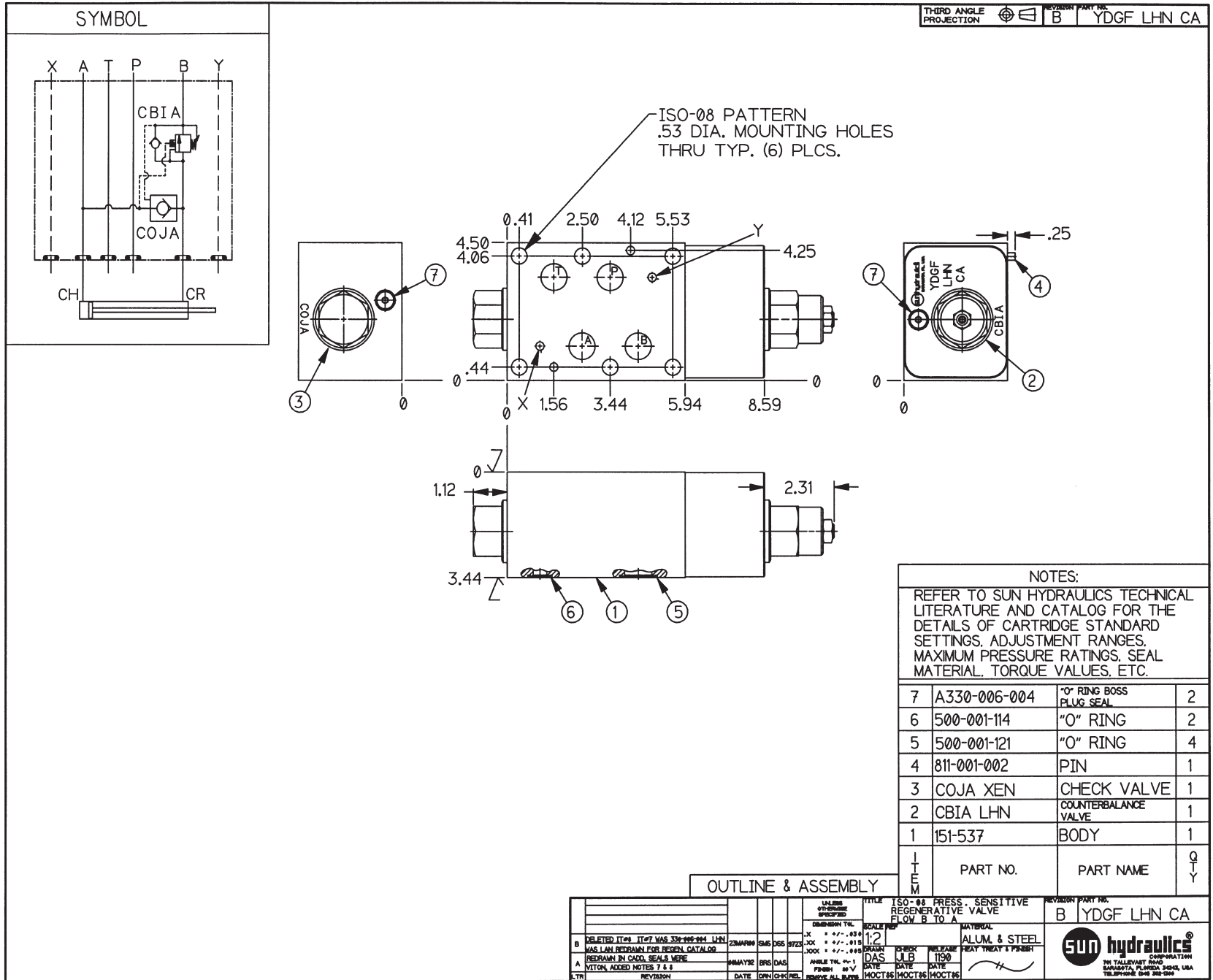
OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED				TITLE ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW A TO B			REVISION PART NO. C YDGE LHN CA		
DIMENSION TOL.				SCALE REF			MATERIAL		
.X = +/- .030				1:2			ALUM. & STEEL		
.XX = +/- .015				DRAWN RIB			HEAT TREAT & FINISH		
.XXX = +/- .005				CHECK JLB			665		
ANGLE TOL +/- 1				DATE 18NOV84			DATE 18NOV84		
FINISH #0				DATE 18NOV84			DATE 18NOV84		
REMOVE ALL BURRS									

LHN WAS LAN IT#7 WAS IT#8 IT#6 WAS IT#7					
DELETED OLD IT#6 IT#5 WAS 330-006-004	23MAR80	SMS	DSS	9723	
REDRAWN FOR REGEN. CATALOG					
B IN NOTE 5, 75 PSI WAS 30 PSI	29 SEP 83	BRS			
A REDRAWN ON CADD, SEALS WERE VITON	17 AUG 83	BRS	GB	8339	
LTR	REVISION	DATE	DRN	CHK	REL





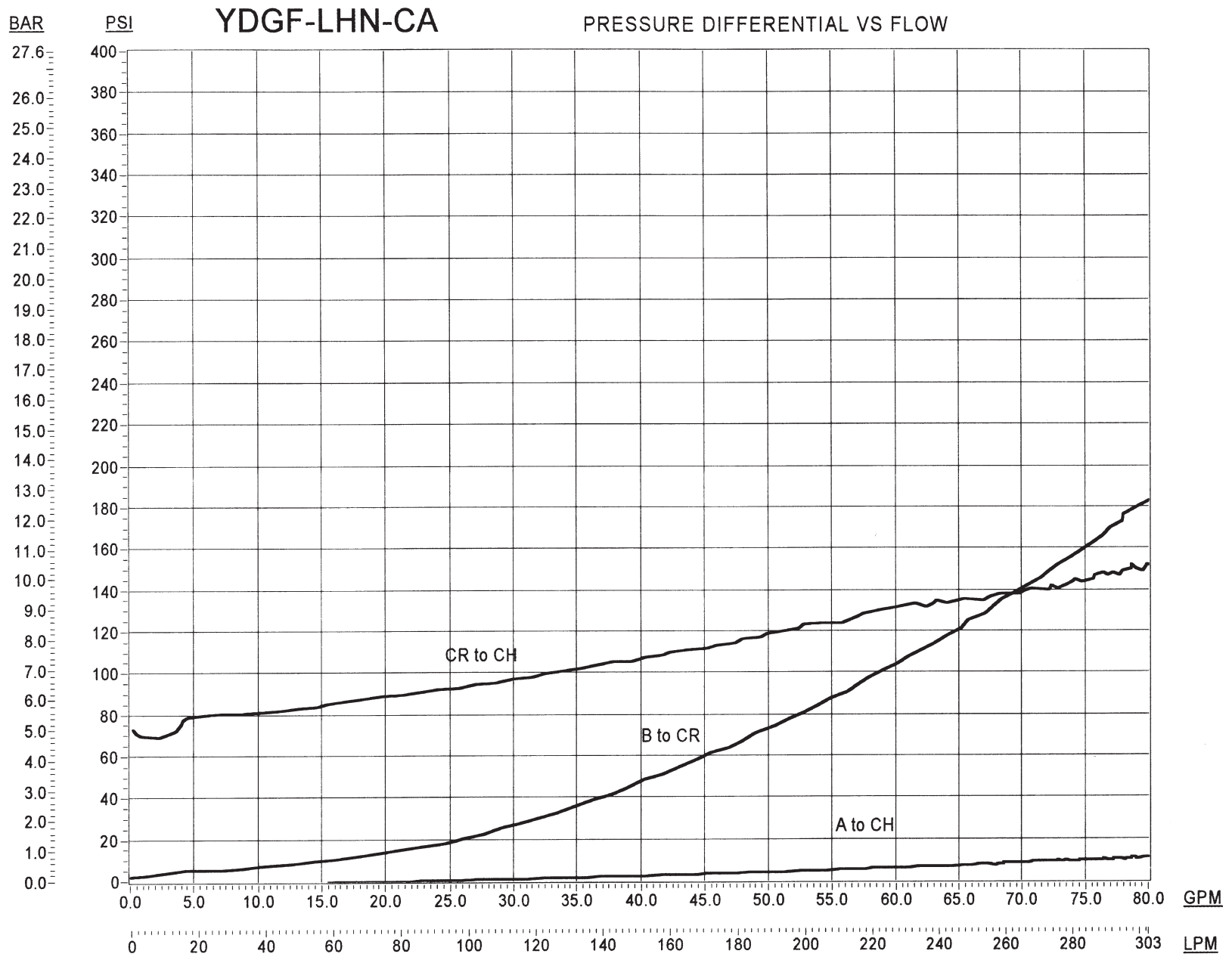


NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

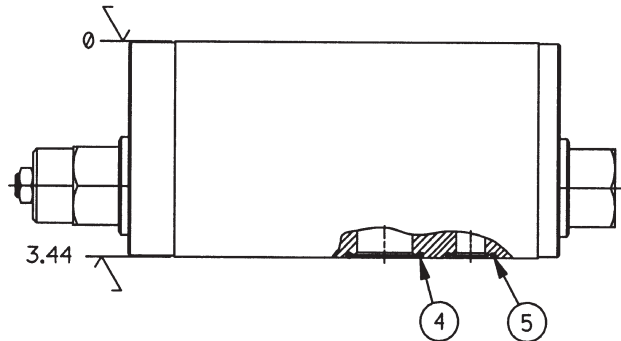
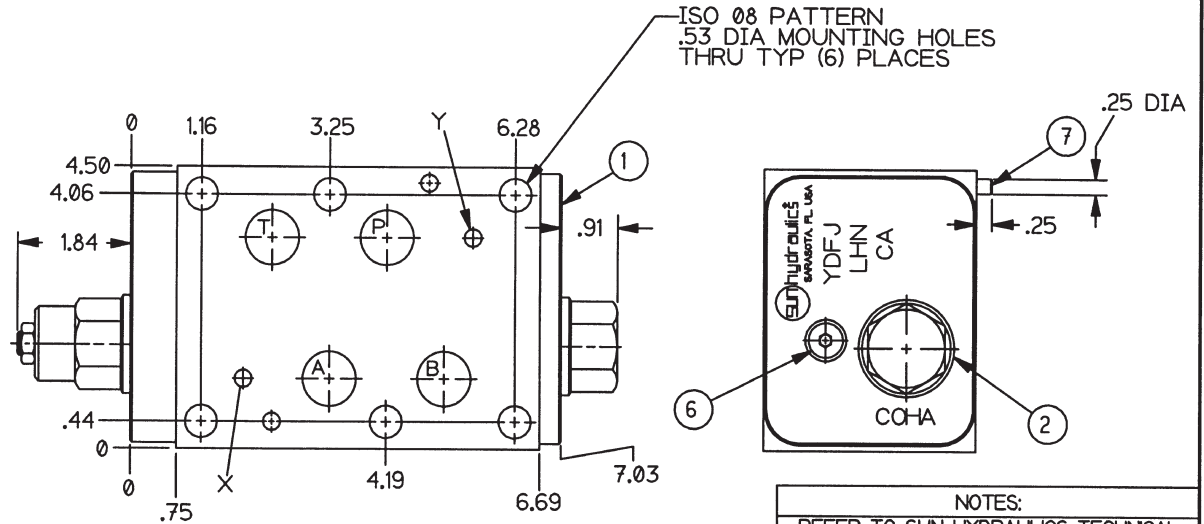
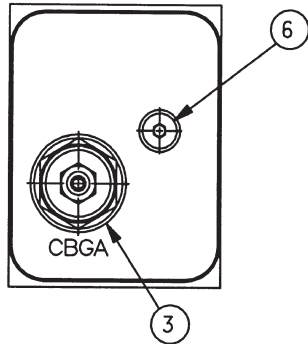
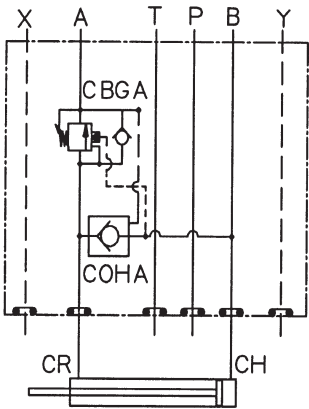
ITEM	PART NO.	PART NAME	QTY
7	A330-006-004	"O" RING BOSS PLUG SEAL	2
6	500-001-114	"O" RING	2
5	500-001-121	"O" RING	4
4	811-001-002	PIN	1
3	COJA XEN	CHECK VALVE	1
2	CBIA LHN	COUNTERBALANCE VALVE	1
1	151-537	BODY	1

OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED		TITLE		ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A		REVISION PART NO.	
DIMENSION TOL.		SCALE		MATERIAL		B YDGF LHN CA	
.X = +/- .030		1:2		ALUM. & STEEL		SUN HYDRAULICS CORPORATION 39 TALLEYHAYT ROAD BAKERSFIELD, FLORIDA 34943, USA TEL: 813/936-0148 FAX: 813/936-0149	
B DELETED ITEM IT#27 WAS 330-006-004 LHN WAS LHN REBRN FOR REGEN CATALOG		ZMANN		JOK			
A REBRN IN CADD, SEALS WERE		MAY92		DAS		DATE DATE DATE	
VITON, ADDED NOTES 7 & 8		BRS DAS		JLB		DATE DATE DATE	
ETH		REVISON		DATE		MOCT85 MOCT85 MOCT85	



SYMBOL



THIRD ANGLE PROJECTION REVISION PART NO. A YDFJ LHN CA

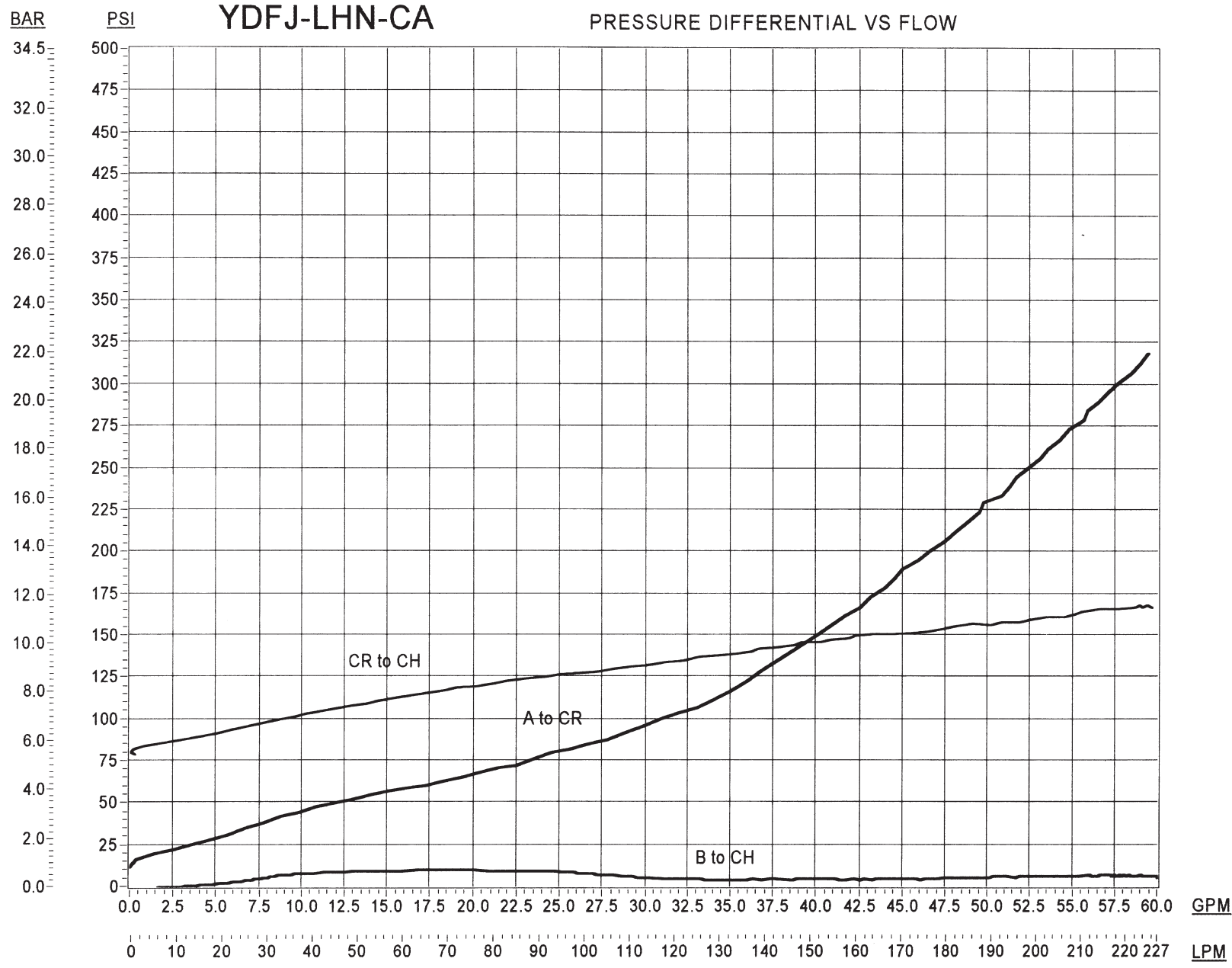
ISO 08 PATTERN
.53 DIA MOUNTING HOLES
THRU TYP (6) PLACES

NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

7	811-001-002	PIN	1
6	A330-006-004	"O" RING BOSS PLUG	2
5	500-001-114	"O" RING	2
4	500-001-121	"O" RING	4
3	CBGA LHN	COUNTERBALANCE VALVE	1
2	COHA XEN	CHECK VALVE	1
1	153-055	BODY	1
ITEM	PART NO.	PART NAME	QTY

OUTLINE & ASSEMBLY

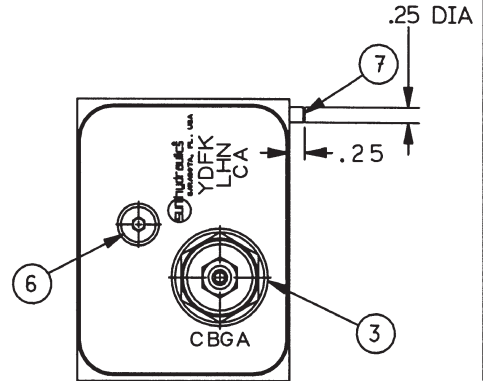
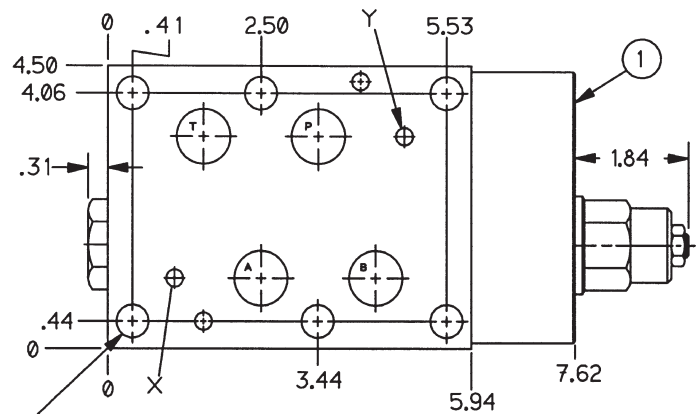
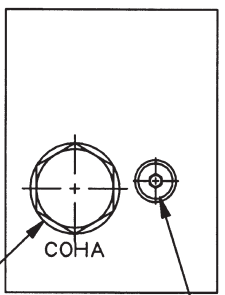
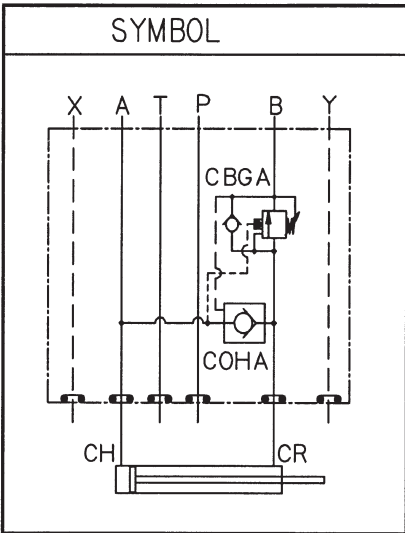
				UNLESS OTHERWISE SPECIFIED			TITLE ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW A TO B			REVISION PART NO. A YDFJ LHN CA				
				DIMENSION TOL			SCALE REF 1:2			MATERIAL ALUM. & STEEL				
				.X = +/- .030			DRAWN CHECK RELEASE HEAT TREAT & FINISH			<p>SUN hydraulic CORPORATION 791 TALLEYBAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (813) 352-1349</p>				
				.XX = +/- .015			DATE DATE DATE							
				.XXX = +/- .005			DATE DATE DATE							
A	IT#7 WAS IT#8 OLD IT#7 WAS DELETED IT#6 WAS 330-006-004 REDRAWN FOR REGEN. CATALOG			2-MAR-90	GMS	DGS	3723	ANGLE TOL +/- 1	DATE DATE DATE					
LTR	REVISION			DATE	DRN	CHK	REL	FINISH 80 V	DATE DATE DATE					
				REMOVE ALL BURRS			04DEC92							



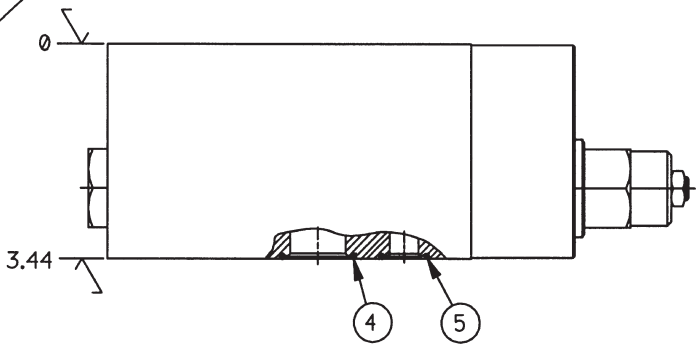
OIL TEMP 110F / ISO GRADE 32

AC/JR 3/29/00 11:31 AM

THIRD ANGLE PROJECTION  REVISION PART NO. B YDFK LHN CA



ISO #8 PATTERN
.53 DIA MOUNTING HOLES
THRU TYP (6) PLACES



NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.


7	811-001-002	PIN	1
6	A330-006-004	"O" RING BOSS PLUG	2
5	500-001-114	"O" RING	2
4	500-001-121	"O" RING	4
3	CBGA LHN	COUNTERBALANCE VALVE	1
2	COHA XEN	CHECK VALVE	1
1	153-056	BODY	1
ITEM	PART NO.	PART NAME	QTY

OUTLINE & ASSEMBLY

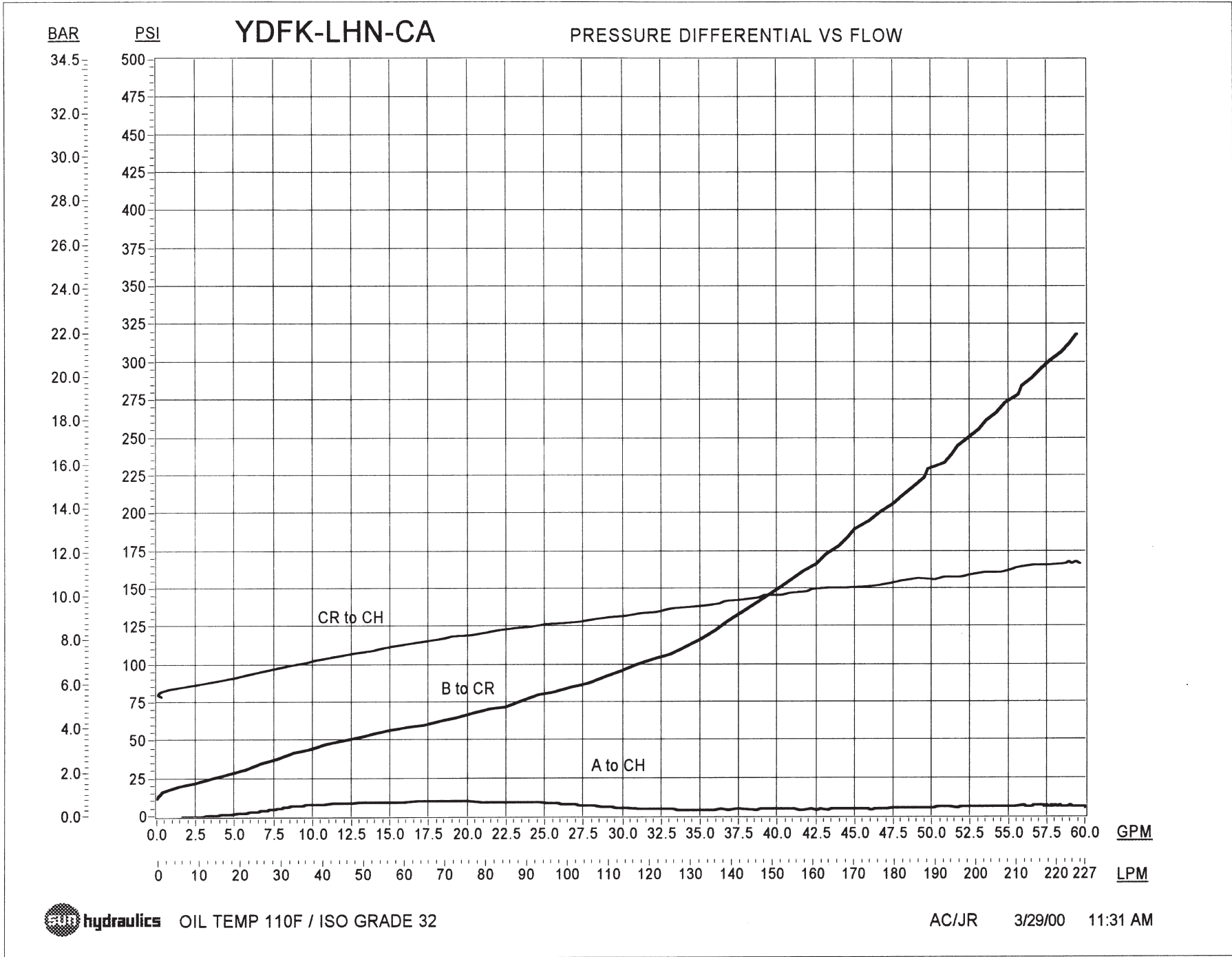
UNLESS OTHERWISE SPECIFIED					
DIMENSION TOL					
.X = +/- .030					
.XX = +/- .015					
.XXX = +/- .005					
ANGLE TOL +/- 1					
FINISH # V					
REMOVE ALL BURRS					
B	IT#7 WAS IT#8 DELETED OLD IT#7 IT#6 WAS 334-006-004 REDRAWN FOR REGEN. CATALOG	24MAR80	SMS	DSS	9723
A	CORR. DIRECTION OF CYL. IN SYMBOL	18FEB83	DAS		
LTR	REVISION	DATE	DRN	CHK	REL

TITLE ISO-#8 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A			
SCALE REF	MATERIAL	HEAT TREAT & FINISH	
1:2	ALUM. & STEEL		
DRAWN	CHECK	RELEASE	
DAS			
DATE	DATE	DATE	
09DEC92			

REVISION PART NO. B YDFK LHN CA

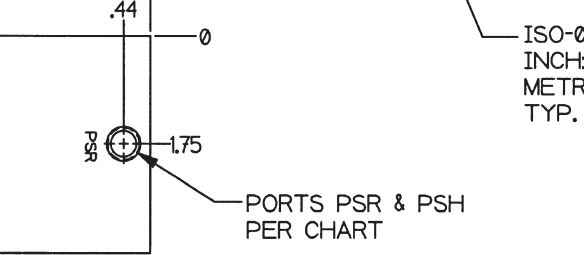
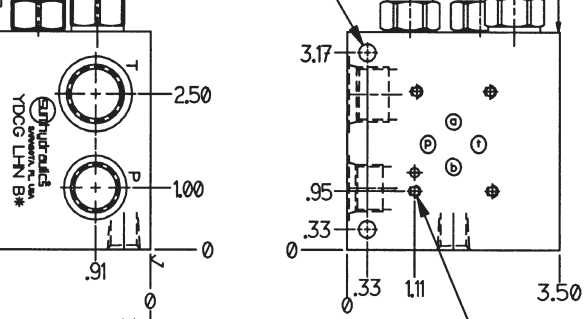
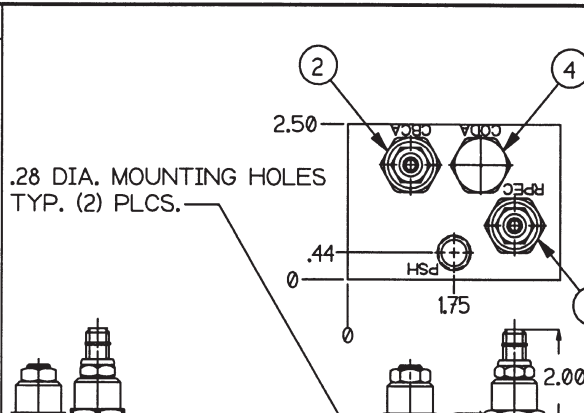
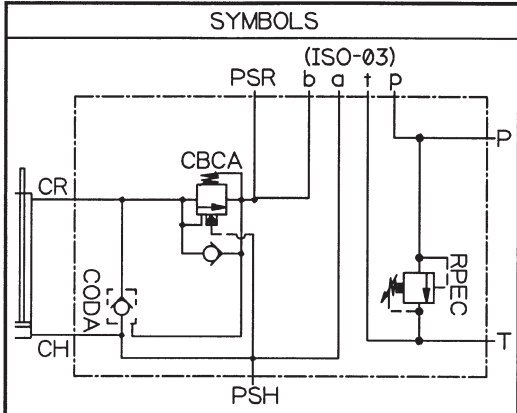


SUN hydraulic CORPORATION
791 TALLEYVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (813) 362-1300

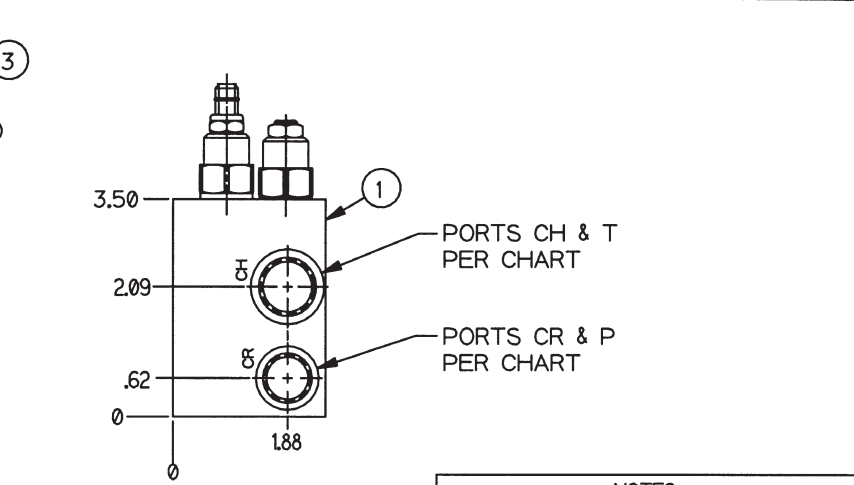


OIL TEMP 110F / ISO GRADE 32

AC/JR 3/29/00 11:31 AM



MODEL #	BODY DASH NO.	PORTS CH & T	PORTS CR & P	PORTS PSH & PSR	THREAD TYPE
BC	-001	.500-14 NPTF	.375-18 NPTF	.250-18 NPTF	INCH
BK	-002	SAE-10	SAE-8	.250-18 NPTF	INCH
BV	-003	.500-14 BSPP	.375-19 BSPP	.250-19 BSPP	INCH
BV/M	-004	.500-14 BSPP	.375-19 BSPP	.250-19 BSPP	METRIC



ISO-03 PATTERN
 INCH: 10-24UNC x .38 DP.
 METRIC: M5 X 0.8-6H x .38 DP
 TYP. (4) PLCS.

NOTES:
 REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

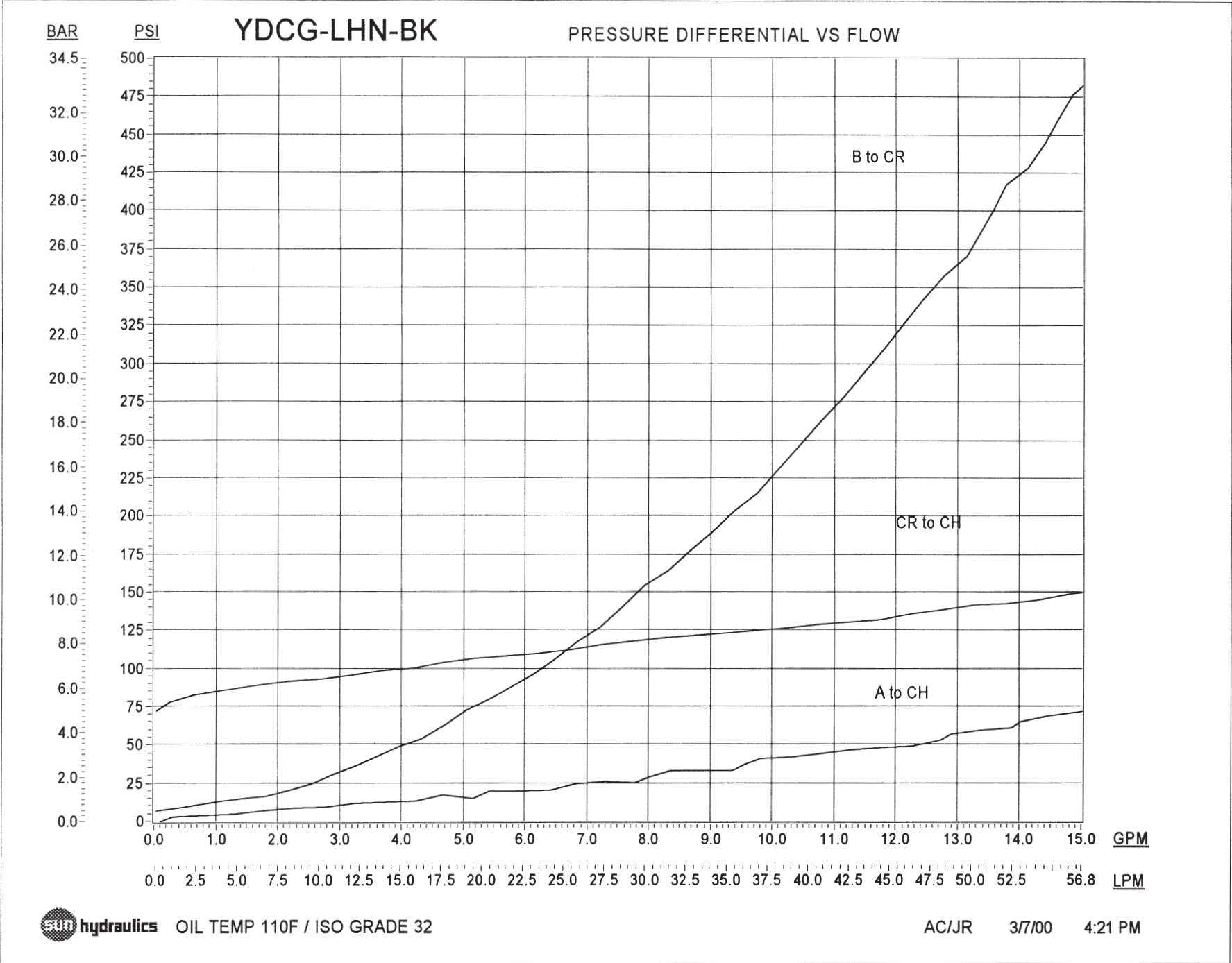
ITEM	PART NO.	PART NAME	QTY
4	CODA XEN	CHECK VALVE	1
3	RPEC LAN	RELIEF VALVE	1
2	CBCA LHN	COUNTERBALANCE VALVE	1
1	152-601-***	BODY	1

REVISION	DATE	DRN	CHK	REL
B	23MAR99	SMS	DSS	9723
A	05JAN00	MWB	DSS	9696
-	16APR91	BRS		
LTR				

OUTLINE & ASSEMBLY

TITLE ISO-03 SUBPLATE REGENERATIVE VALVE	SCALE REF 1:2	MATERIAL ALUM & STEEL HEAT TREAT & FINISH
UNLESS OTHERWISE SPECIFIED DIMENSION TOL .X = +/- .030 .XX = +/- .015 .XXX = +/- .005 ANGLE TOL +/- 1 FINISH #0 ✓ REMOVE ALL BURRS	DRAWN BRS	CHECK RJB
	RELEASE 3016	DATE 03APR91
		DATE 04APR91
		DATE 05APR91

REVISION B	PART NO. YDCG LHN B*
---------------	-------------------------



SYMBOL

ISO-05 PATTERN

ISO-05 PATTERN

STD SAE-8 PORT

STD SAE-10 PORT TYP (3) PLCS

THIRD ANGLE PROJECTION

REVISION PART NO.
G YDEH LHN AK

NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

5	CBEA LHN	COUNTERBALANCE VALVE	1
4	CKEC LAN	CHECK VALVE	1
3	COFA XEN	CHECK VALVE	1
2	RDFA LAN	RELIEF VALVE	1
1	150-023	BODY	1

ITEM PART NO. PART NAME QTY

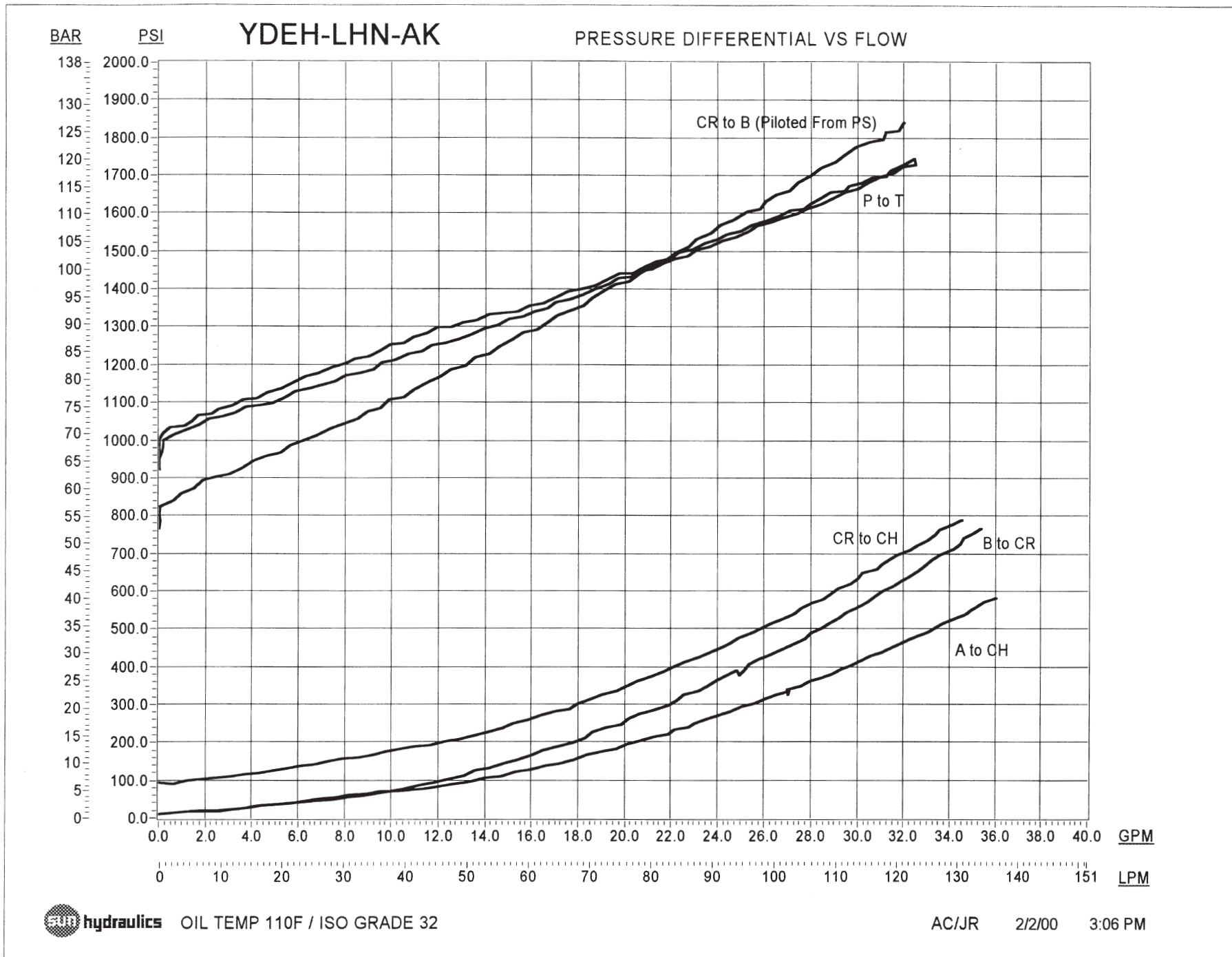
OUTLINE & ASSEMBLY

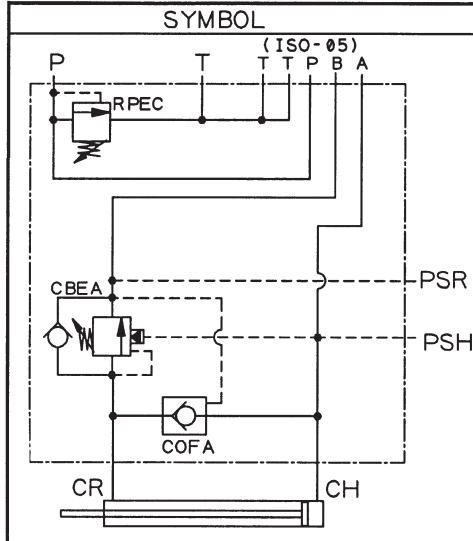
UNLESS OTHERWISE SPECIFIED				TITLE ISO-05 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A		REVISION PART NO. G YDEH LHN AK	
DIMENSION TOL				SCALE REF		MATERIAL	
.X = +/- .030				DRAWN JDA		ALUM. & STEEL	
.XX = +/- .015				CHECK		HEAT TREAT & FINISH	
.XXX = +/- .005				RELEASE		/	
ANGLE TOL +/- 1				DATE			
FINISH #0 ✓				DATE			
REMOVE ALL BURRS				18DEC73			

LHN WAS LAN REDRAWN FOR REGEN.	23MAR70	SMS	DSS	9723
CATALOG				
LTR	REVISION	DATE	DRN	CHK REL

791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (813) 362-1349

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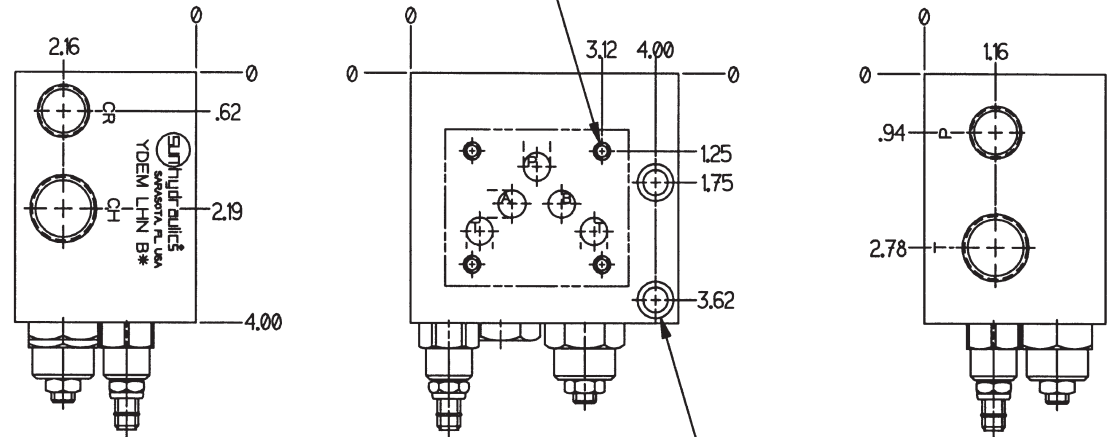




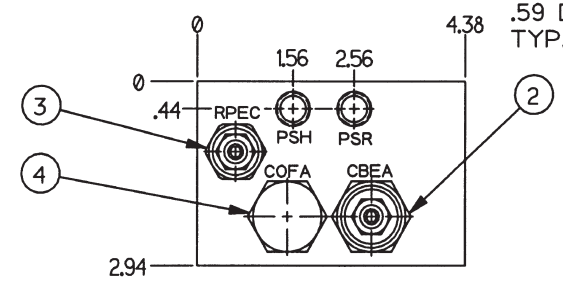
ISO-05 PATTERN
INCH: .250-20UNC x .50 DP.
METRIC: M6x1.0-6H x .50 DP.

THIRD ANGLE PROJECTION REVISION PART NO. YDEM LHN B*

MTG. THREAD	PORTS PSH & PSR	PORTS T & CH	PORTS P & CR	BODY DASH NO.	MODEL NO.
INCH	.250-18 NPTF	.750-14 NPTF	.500-14 NPTF	-001	BD
INCH	.250-18 NPTF	SAE-12	SAE-10	-002	BL
METRIC	.250-19 BSPP	.750-14 BSPP	.500-14 BSPP	-003	BW



.41 DIA. MOUNTING HOLES THRU TYP. (2) PLCS.
.59 DIA. C-BORE x .56 DP. TYP. (2) PLCS.

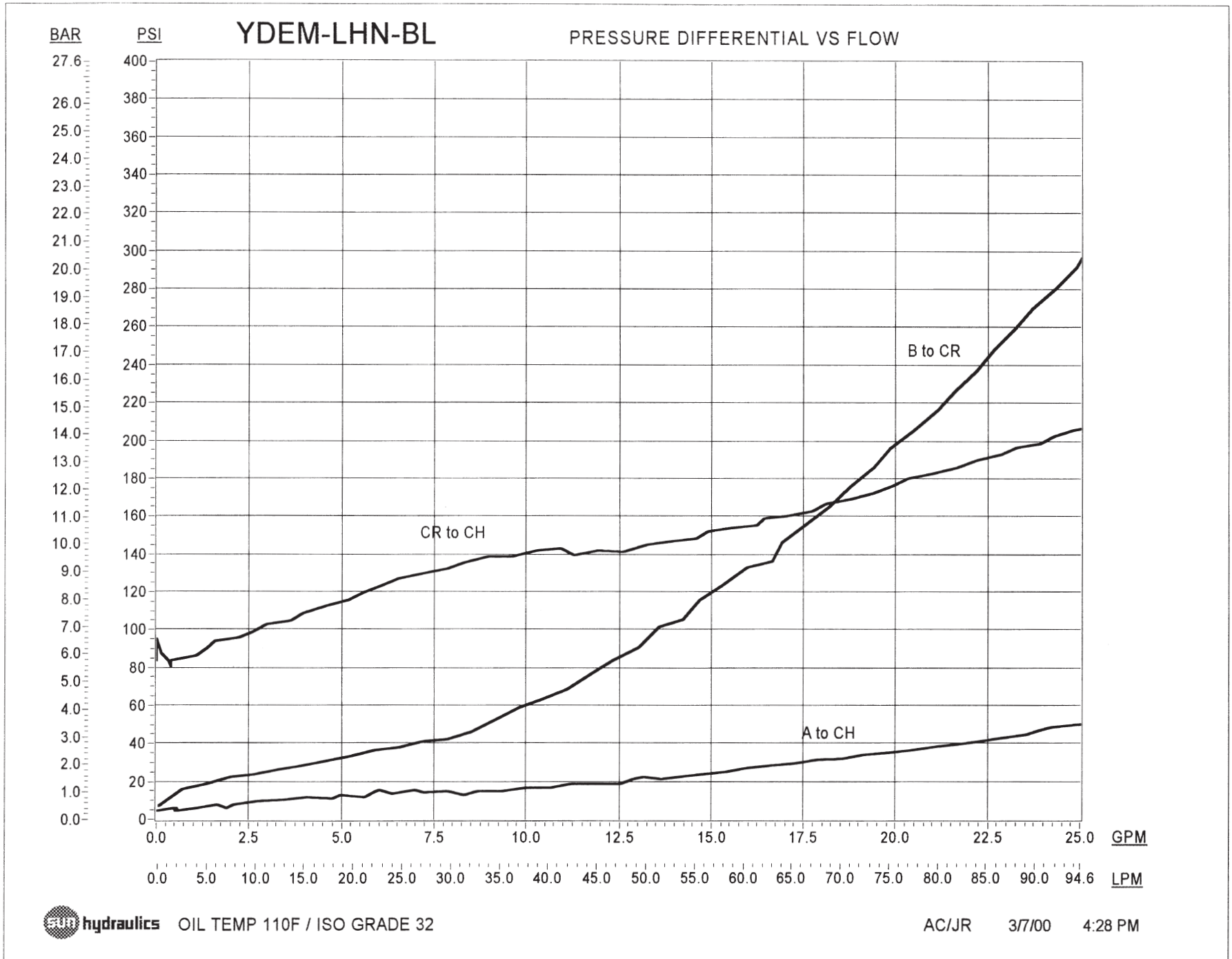


NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE AND CATALOG FOR THE DETAILS OF CARTRIDGE STANDARD SETTINGS, ADJUSTMENT RANGES, MAXIMUM PRESSURE RATINGS, SEAL MATERIAL, TORQUE VALUES, ETC.

QTY	PART NO.	PART NAME	QTY
4	COFA XEN	CHECK VALVE	1
3	RPEC LAN	RELIEF VALVE	1
2	CBEA LHN	COUNTERBALANCE VALVE	1
1	151-208-***	BODY	1

OUTLINE & ASSEMBLY

UNLESS OTHERWISE SPECIFIED				TITLE ISO-05 PATTERN PRESSURE SENSITIVE REGENERATIVE MANIFOLD				REVISION PART NO. YDEM LHN B*			
DIMENSION TOL				SCALE REF				MATERIAL			
.X = +/- .030				1/2				ALUM. & STEEL			
.XX = +/- .015				DRAWN CHECK RELEASE HEAT TREAT & FINISH				 SUN HYDRAULICS CORPORATION 761 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (813) 352-1599			
.XXX = +/- .005				DATE DATE DATE							
ANGLE TOL +/- 1				DATE DATE DATE							
FINISH #/V				DATE DATE DATE							
REMOVE ALL BURRS				15JUL86 23JUL86							
LTR				REVISION				DATE DRN CHK REL			



OIL TEMP 110F / ISO GRADE 32

AC/JR 3/7/00 4:28 PM

