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Specifications, descriptions and illustrative material contained herein were accurate as known at the time this publication was approved for printing.

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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.



Printed in the United States of America

# 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.

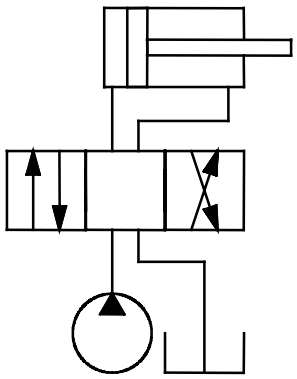
- Small diameter cylinder rods provide a larger oil supply due to the smaller cylinder ratio.

- 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) 4.25”
Rod Diameter 3.00”



With a 10 GPM flow from the pump

4.25” Bore Diameter = 14.2 $in^2$ area
3.00” Rod Diameter = 7.1 $in^2$ area

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

$$\text{Cylinder Ratio} = \frac{(14.2\ in^2)}{(14.2\ in^2 - 7.1\ in^2} = 2 = >2{:}1\ \text{Ratio}$$

### Cylinder Extend Speed *without* Regeneration

$$\text{Extend Speed} = \frac{(\text{Pump Flow GPM})(231)}{\text{Head End Area}} = \frac{(10\ \text{GPM})(231)}{14.2 in^2} = 163\ \text{in / min.}$$

$$\text{Retract Speed} = \frac{(\text{Pump Flow GPM})(231)}{(\text{Annular Area})} = \frac{(10\ \text{GPM})(231)}{7.1\ in^2} = 325\ \text{in / min.}$$

### Cylinder Extend Speed *with* Regeneration

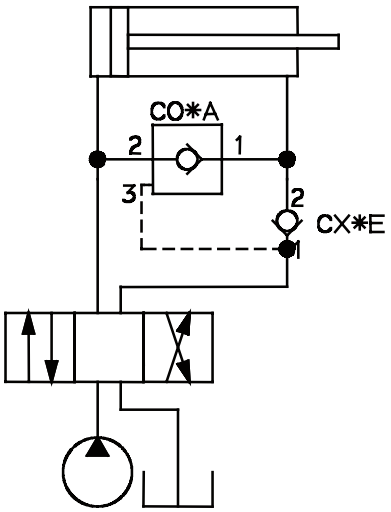
Rod side oil is redirected to the head end of the cylinder instead of the directional valve and adds to the flow going into the head end. The extend speed is due to the pump flow replacing the cylinder rod volume.

### Extend Speed in Regeneration Mode

$$= \frac{(\text{Pump Flow GPM})(231)}{(\text{Rod Area})}$$

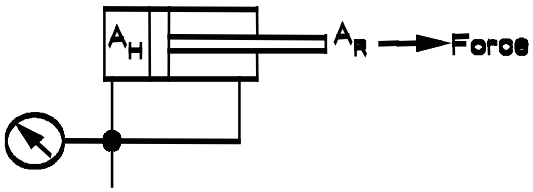
$$= \frac{(10)(231)}{(7.1)}$$

$$= 325 \text{ in / min.}$$




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




$P(A_H) - P(A_H - A_R) = \text{Force Output}$
$P(A_H) - P(A_H) + P(A_R) = \text{Force Output}$
$P(A_R) = \text{Force Output}$

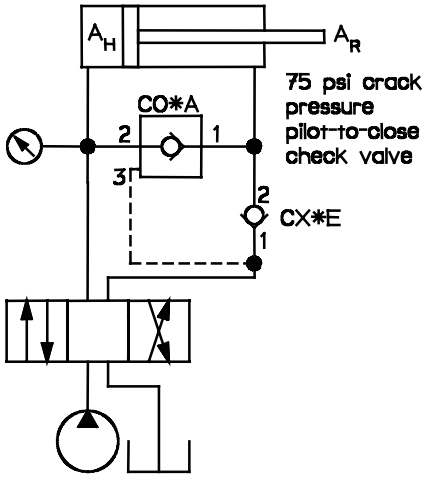
The output force available is the product of pressure in the cylinder and area of the rod.

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 75 psi crack pressure pilot-to-close check valve. See the following circuit.

Supply Pressure = P

$P(A_H) - (P + 75)(A_H - A_R) = 0$
$P(A_H) = (P + 75)(A_H - A_R)$
$P(A_H) = P(A_H) + 75\,A_H - P(A_R) - 75(A_R)$
$P(A_H) - P(A_H) = 75\,A_H - P(A_R) - 75(A_R)$
$0 = 75\,A_H - P(A_R) - 75(A_R)$
$P(A_R) = 75(A_H) - 75(A_R)$
$P = \frac{75(A_H - A_R)}{A_R} = \text{Extend Pressure}$




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

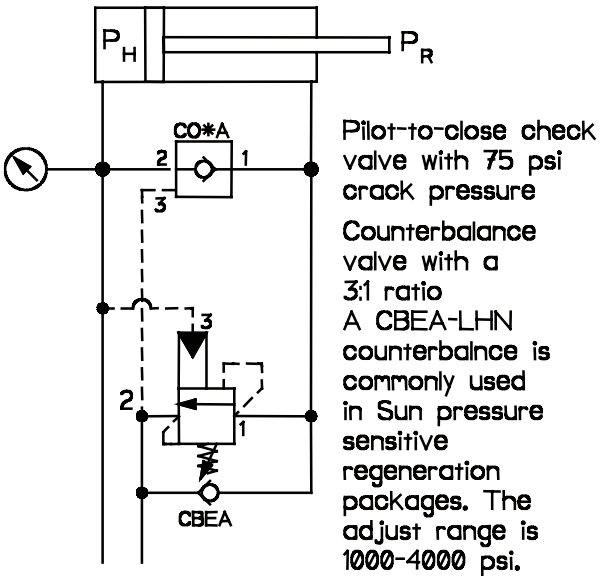
Pressure P is the minimum supply pressure required to extend the cylinder with a 75 psi crack pressure pilot-to-close check valve. This value does not include any system load on the cylinder or seal friction in the cylinder. The actual pressure required to extend the cylinder will be greater than this calculation.

Sun Hydraulics manufactures two types of regeneration assembles; (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.
$P_R = P_H + 75$ (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 starts to diminish:

$P_{CB} = P_R + (\text{Ratio})(P_H)$
$P_{CB} = (P_H + 75) + 3\ (P_H)$
$1000 = 4\ P_H + 75$
$P_H = 231$ psi

The maximum setting would be:

$4000 = 4\ P_H + 75$
$P_H = 981$ psi

*Note:* The adjust range for regeneration speed to start to diminish is 231-981 psi.

## Potential Problems for Consideration

Using the cylinder dimensions from the examples (4.25" Bore and 3.00" Rod) the extend pressure calculation:

$$P = \frac{75\ (A_H - A_R)}{A_R} = \frac{75\ (14.2 - 7.1)}{7.1} = 75 \text{ psi}$$

75 psi is required to extend the cylinder without any load and not including any seal friction.

## System Variations

**Larger Rod Diameter** (ie. Outrigger Cylinders)

4.25" Bore Diameter (14.2in$^2$ Head Area)
3.5" Rod Diameter (9.6$^2$ Rod Area)

- 10 GPM Pump Flow
- Extend Speed without Regeneration

$$\frac{(10 \text{ GPM})\ 231}{14.2 \text{ in}^2} = 163 \text{ in / min.}$$

- Extend Speed with Regeneration

$$\frac{(10 \text{ GPM})\ 231}{9.6 \text{ in}^2} = 241 \text{ in / min.}$$

- Retract Speed

$$\frac{(10 \text{ GPM})\ 231}{(14.2 - 9.6 \text{ in}^2)} = 502 \text{ in / min.}$$

- Extend pressure with a 75 psi crack pressure pilot-to close check valve.

$$P = \frac{75\ (A_H - A_R)}{A_R} = \frac{75\ (14.2 - 9.6)}{9.6} = 36 \text{ psi}$$

**Small Rod Diameter**

4.25" Bore Diameter (14.2in$^2$ Head Area)
2.00" Rod Diameter (3.1in$^2$ Rod Area)

- Extend Speed without Regeneration

$$\frac{(10 \text{ GPM})\ 231}{14.2 \text{ in}^2} = 163 \text{ in / min.}$$

- Extend Speed with Regeneration

$$\frac{(10 \text{ GPM})\ 231}{(3.1 \text{ in}^2)} = 745 \text{ in / min.}$$

- Retract Speed

$$\frac{(10 \text{ GPM})\ 231}{(14.2 - 3.1) \text{ in}^2} = 208 \text{ in / min.}$$

- Extend pressure with a 75 psi crack pressure pilot-to-close check valve.

$$P = \frac{75\ (A_H - A_R)}{A_R} = \frac{75\ (14.2 - 3.1) \text{ in}^2}{3.1 \text{ in}^2} = 269 \text{ psi}$$

## 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 75 psi crack pressure pilot-to-close check.

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

If: $A_H = 1.16$ $(A_H - A_R) = 1$

Then $A_H = 0.16$

$$\text{Pressure to Extend } P = \frac{75\,(A_H - A_R)}{A_R} = \frac{75\,(1)}{0.16} = 470 \text{ psi}$$

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.

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

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

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

$D_b$ = 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 increased flow going into the full bore side of the cylinder**.
2. The pilot-to-close check valve has a 75 psi 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 | |
|---|---|
| ***Line Mounted Assemblies*** | ***Sandwich Mounted Assemblies*** |
| **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<br>Dual Cartridges | YDFF-LHN-CA<br>Dual Cartridges |
| YDJC-LHN-AS<br>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 | |
|---|---|
| ***Line Mounted Assemblies*** | ***Sandwich Mounted Assemblies*** |
| | **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.

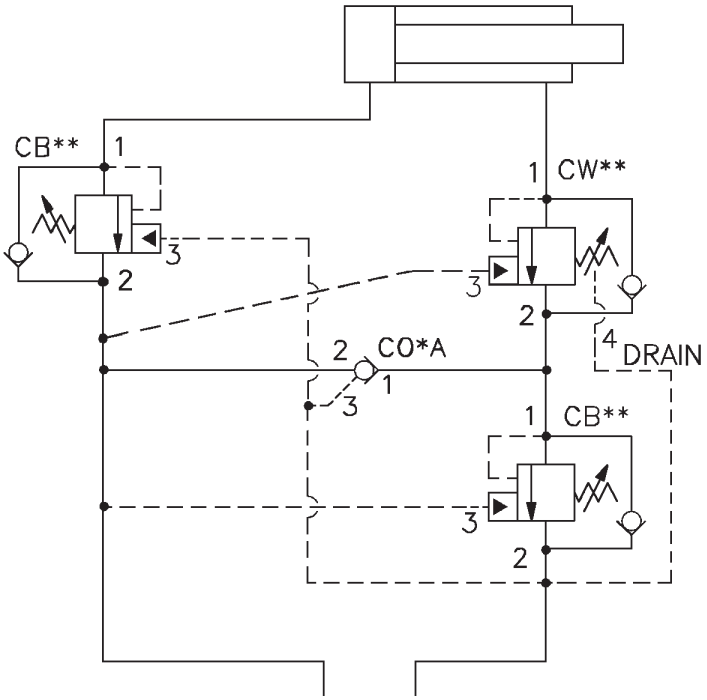
* Indicates optional port types available.

# 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 demonstates 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

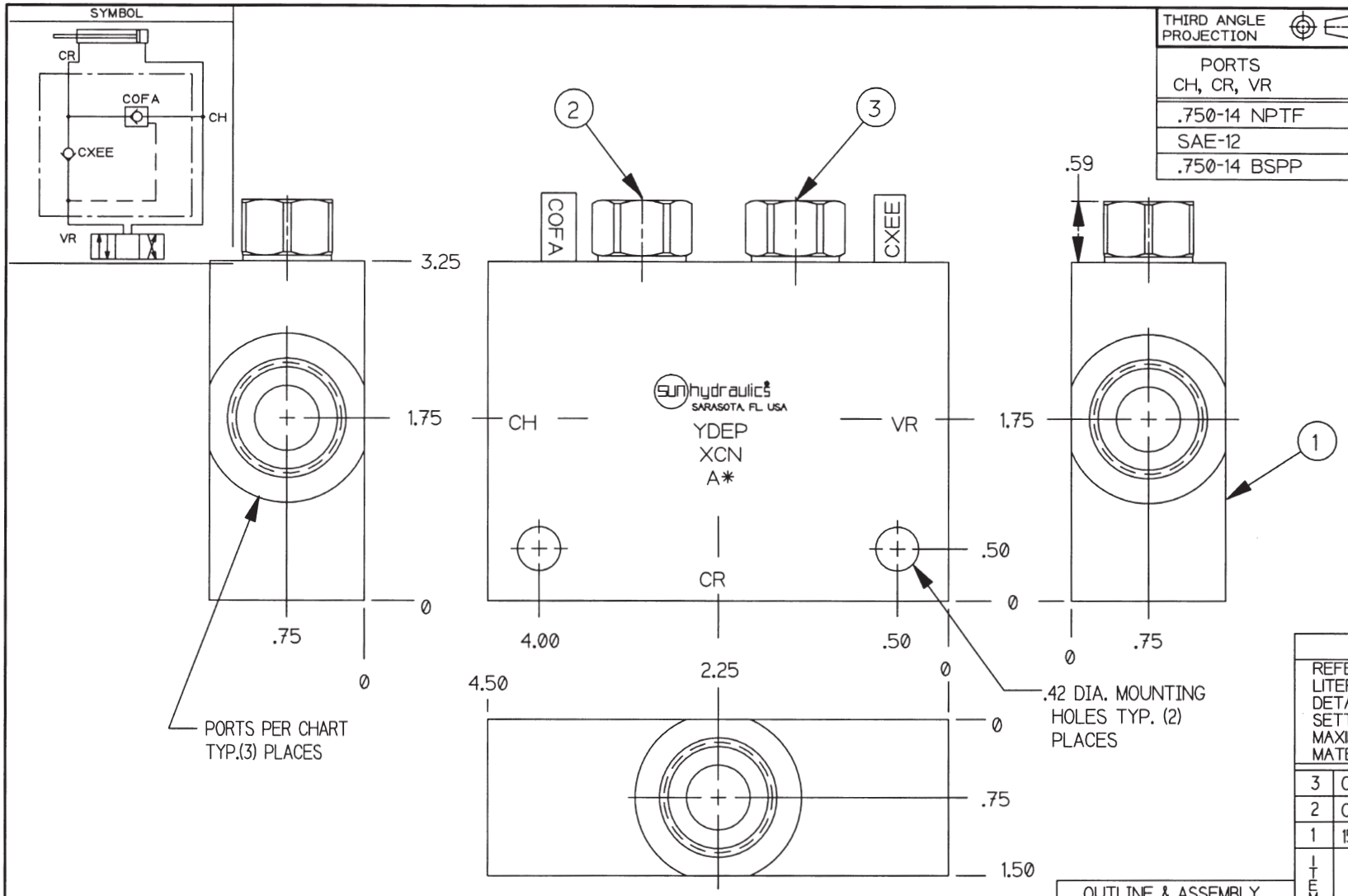
| *Pressure Sensitive Regeneration Assembly Model Code* | *Page Location* | *Sun Part Number for Body* | *Full Time Regeneration Assembly Model Code* | *Page Location* |
|---|---|---|---|---|
| YDCA-LHN-AA | 86 | 150-281 | YDCF-XCN-AA | 24 |
| YDEK-LHN-A* | 50 | 150-034 | YDEP-XCN-A* | 14 |
| YDES-LHN-BA | 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.

# NOTES

# NOTES

# NOTES




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | C | YDEP XCN 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.

| ITEM | PART NO. | PART NAME | QTY |
|---|---|---|---|
| 3 | CXEE XCN | CHECK VALVE | 1 |
| 2 | COFA XEN | CHECK VALVE | 1 |
| 1 | 150-034-*** | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| C | REDRAWN FOR REGEN. CATALOG | 22MAR00 | SMS | DSS | 9728 |
| - | ADDED ### TO PART # | 2MAPR98 | DSS | | |
| B | REDRAWN IN CADD SAES WERE SUN STD MOUNTING HOLES WERE .41 DIA. | 27MAR98 | DSS | DEB | 8498 |
| A | CXEE XCN WAS CXEE XAN | 27JUL88 | RC | | |

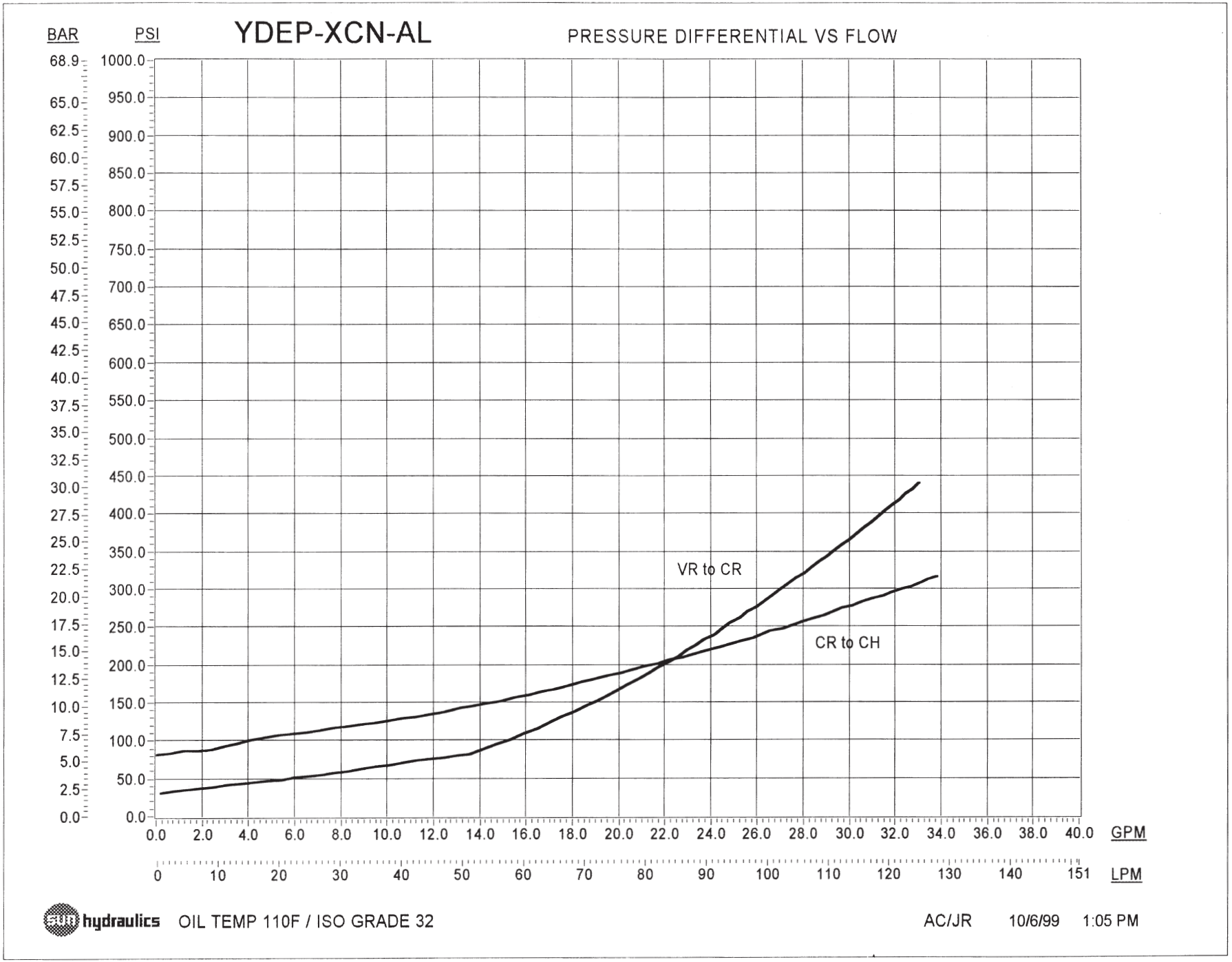
UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 64 V
REMOVE ALL BURRS

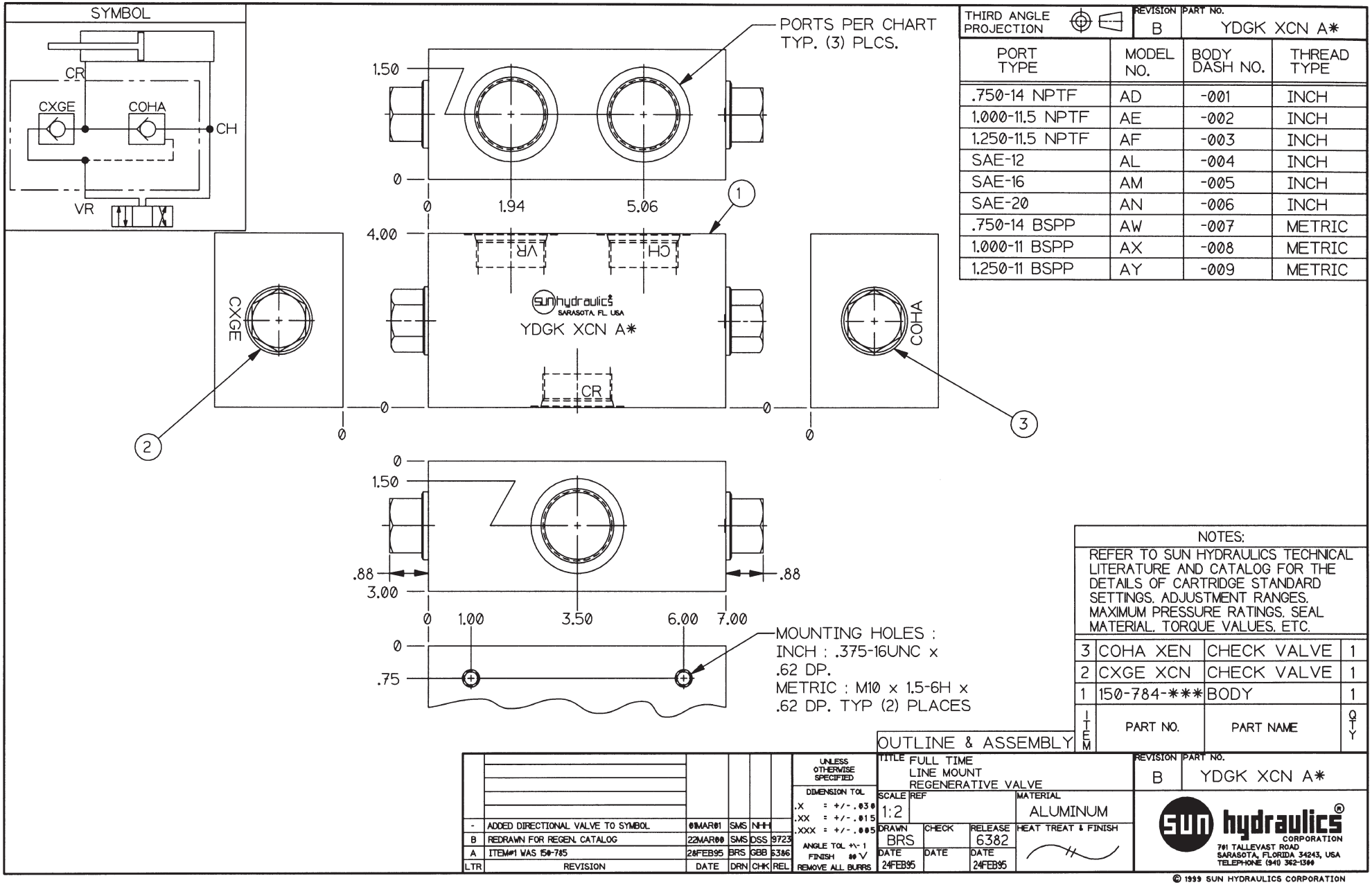
| TITLE | SCALE | REF | MATERIAL |
|---|---|---|---|
| FULL TIME REGENERATIVE VALVE LINE MOUNTED | 1 : 1 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | | | |
| DATE 18FEB88 | DATE | DATE | |

| REVISION | PART NO. |
|---|---|
| C | YDEP XCN A* |

sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDEP-XCN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9 65.0 62.5 60.0 57.5 55.0 52.5 50.0 47.5 45.0 42.5 40.0 37.5 35.0 32.5 30.0 27.5 25.0 22.5 20.0 17.5 15.0 12.5 10.0 7.5 5.0 2.5 0.0
1000.0 950.0 900.0 850.0 800.0 750.0 700.0 650.0 600.0 550.0 500.0 450.0 400.0 350.0 300.0 250.0 200.0 150.0 100.0 50.0 0.0
VR to CR
CR to CH
0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 151 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 10/6/99 1:05 PM




| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 01MAR01 | SMS | NHH | |
| B | REDRAWN FOR REGEN CATALOG | 22MAR00 | SMS | DSS | 9723 |
| A | ITEM#1 WAS 150-785 | 28FEB95 | BRS | GBB | 6386 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 V
REMOVE ALL BURRS

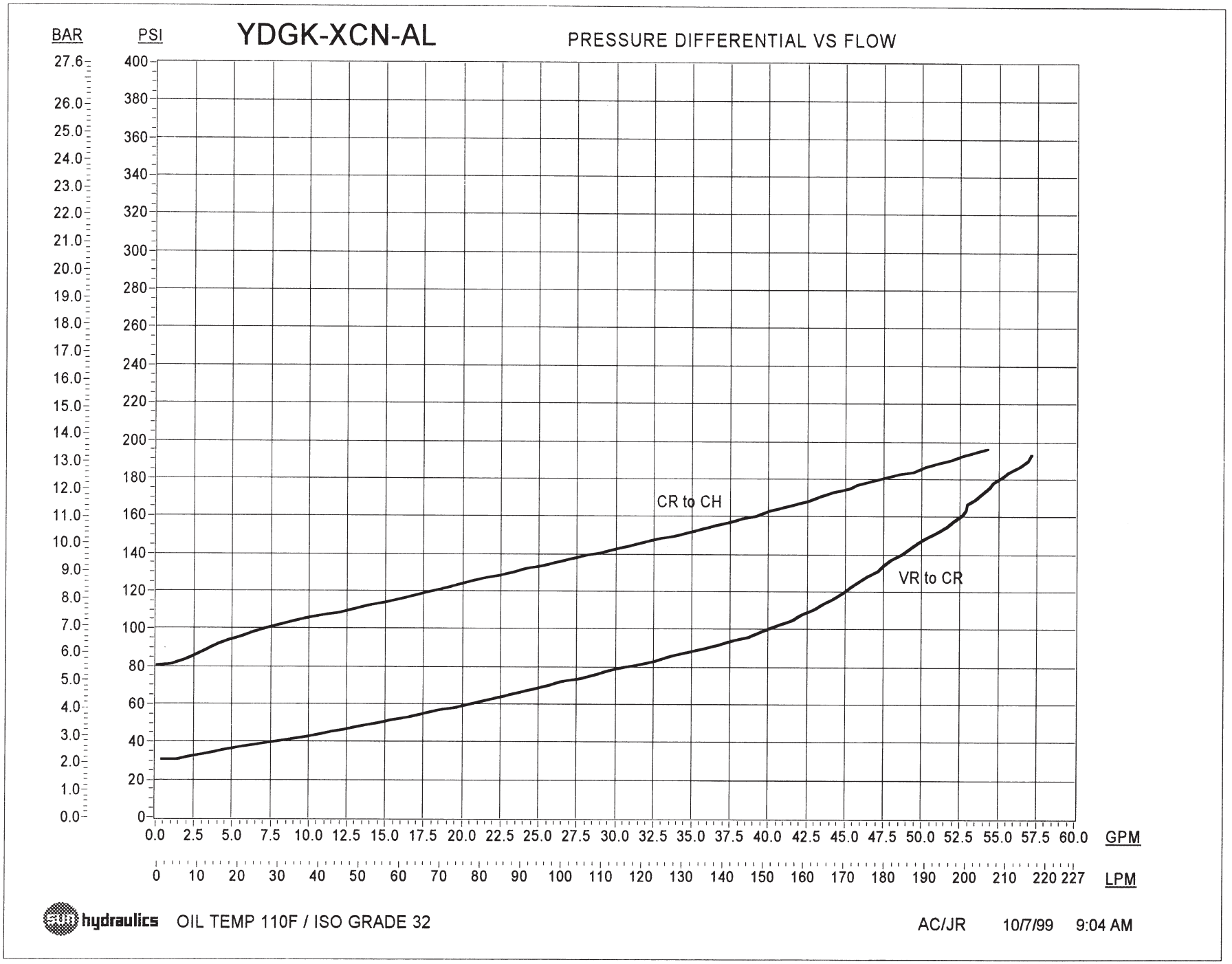
TITLE: FULL TIME LINE MOUNT REGENERATIVE VALVE

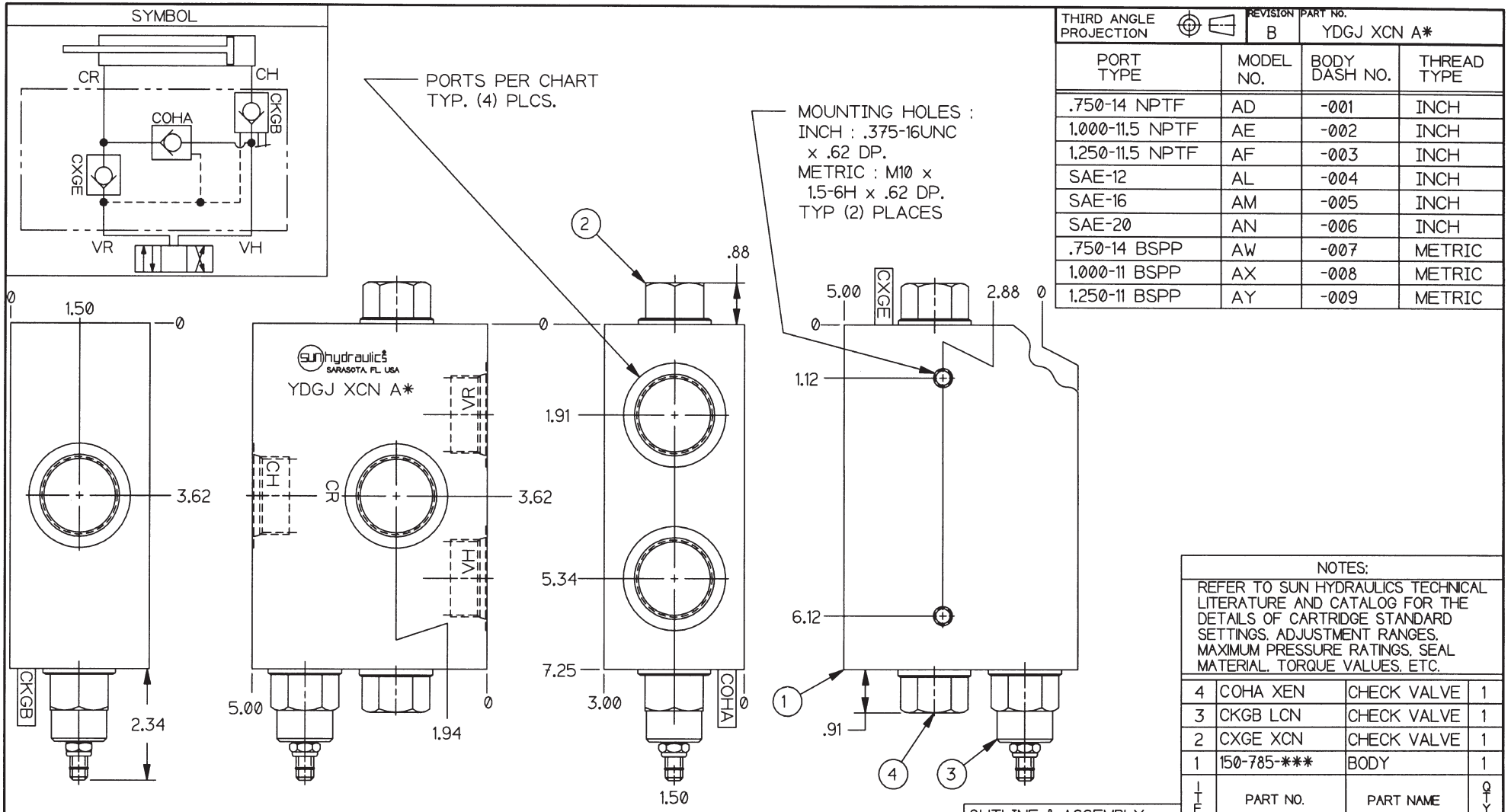
| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUMINUM |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | | 6382 | |
| DATE 24FEB95 | DATE | DATE 24FEB95 | |

REVISION B | PART NO. YDGK XCN A*

sun hydraulics® CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1360


YDGK-XCN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR
10/7/99
9:04 AM




| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| B | REDRAWN FOR REGEN. CATALOG REVISED SYM. | 22MAR00 | SMS | DSS | 9723 |
| A | DELETED CBGA NOTE | 24FEB95 | BRS | | 6382 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 √
REMOVE ALL BURRS

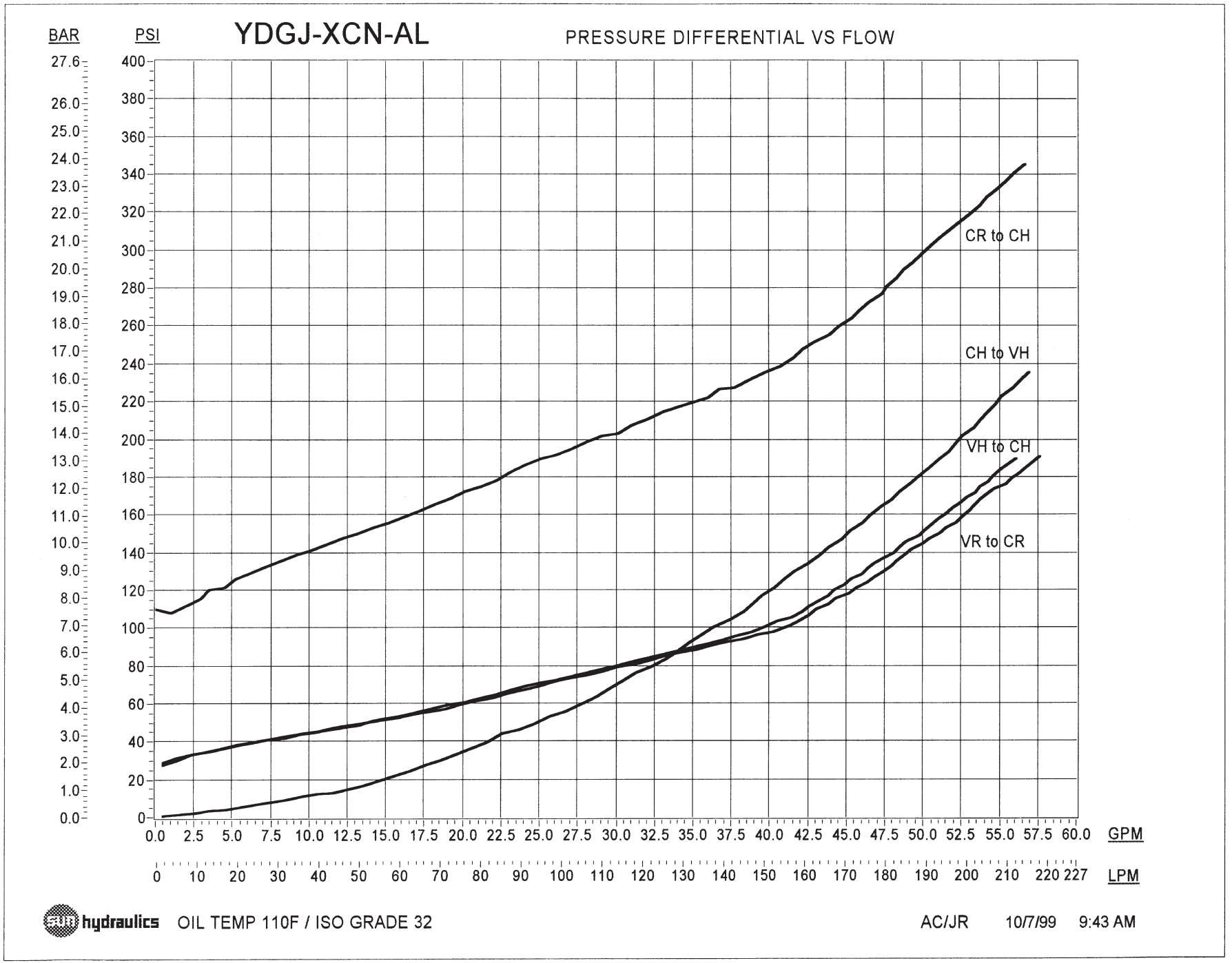
TITLE FULL TIME LINE MOUNT REGENERATIVE VALVE WITH CYL. LOCK

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | | 5649 | |
| DATE 12MAY94 | DATE | DATE 12MAY94 | |

| REVISION | PART NO. |
|---|---|
| B | YDGJ XCN A* |

sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1360


YDGJ-XCN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
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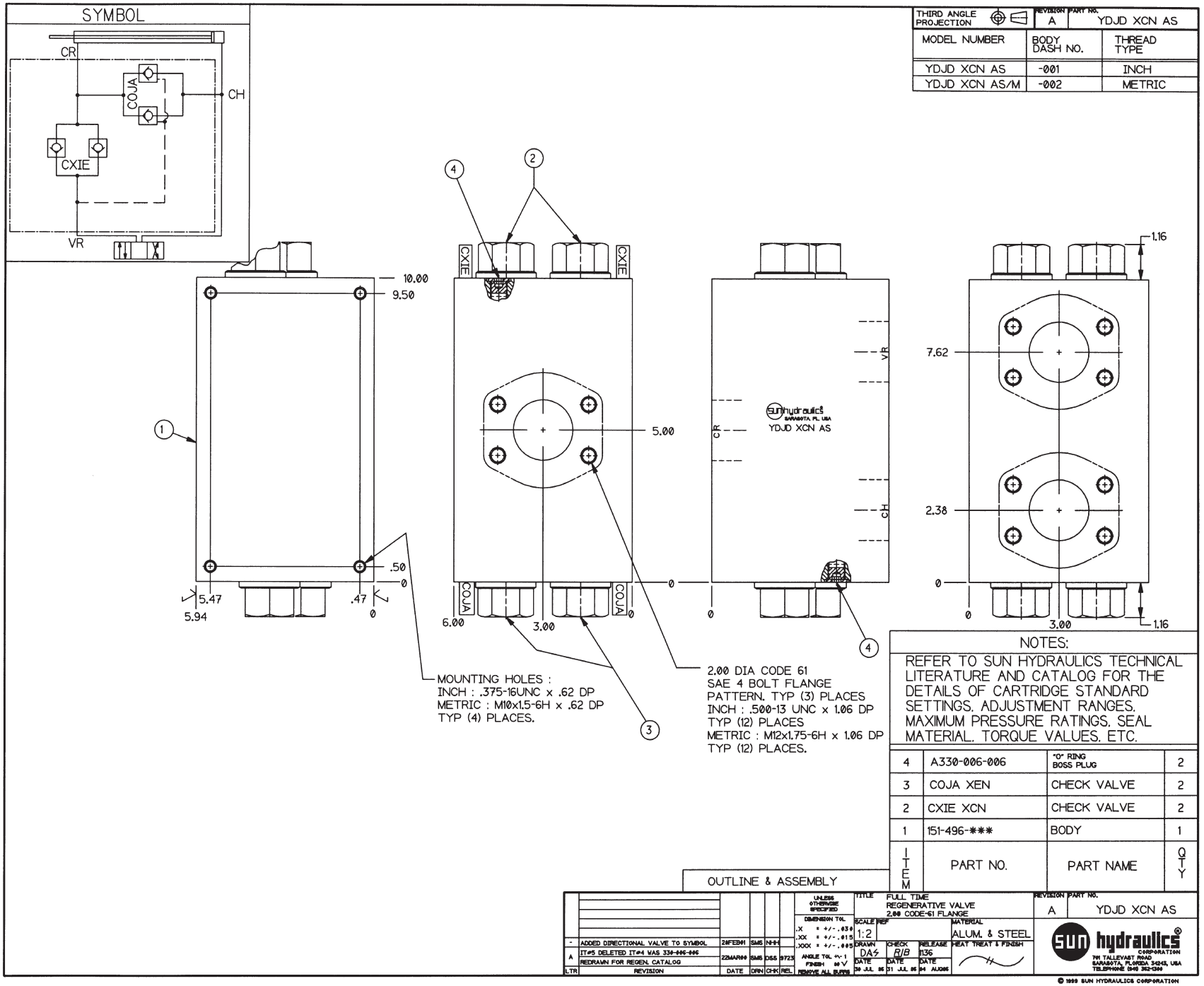
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
CH to VH
VH to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 10/7/99 9:43 AM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | A | YDJD XCN AS |

| MODEL NUMBER | BODY DASH NO. | THREAD TYPE |
|---|---|---|
| YDJD XCN AS | -001 | INCH |
| YDJD XCN AS/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 |
|---|---|---|---|
| 4 | A330-006-006 | "O" RING BOSS PLUG | 2 |
| 3 | COJA XEN | CHECK VALVE | 2 |
| 2 | CXIE XCN | CHECK VALVE | 2 |
| 1 | 151-496-*** | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB91 | SMS | NHH | |
| A | IT#5 DELETED IT#4 WAS 330-006-006 REDRAWN FOR REGEN. CATALOG | 22MAR94 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL. .X = +/-.030 .XX = +/-.015 .XXX = +/-.005
ANGLE TOL +/- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: FULL TIME REGENERATIVE VALVE 2.00 CODE-61 FLANGE

SCALE: 1:2 | WEIGHT: REF | MATERIAL: ALUM. & STEEL | HEAT TREAT & FINISH:

| DRAWN | CHECK | RELEASE |
|---|---|---|
| DAS | GB | 1136 |
| DATE 30 JUL 86 | DATE 31 JUL 86 | DATE 04 AUG86 |

REVISION A | PART NO. YDJD XCN AS

sun hydraulics CORPORATION
7911 TALLEVAST ROAD
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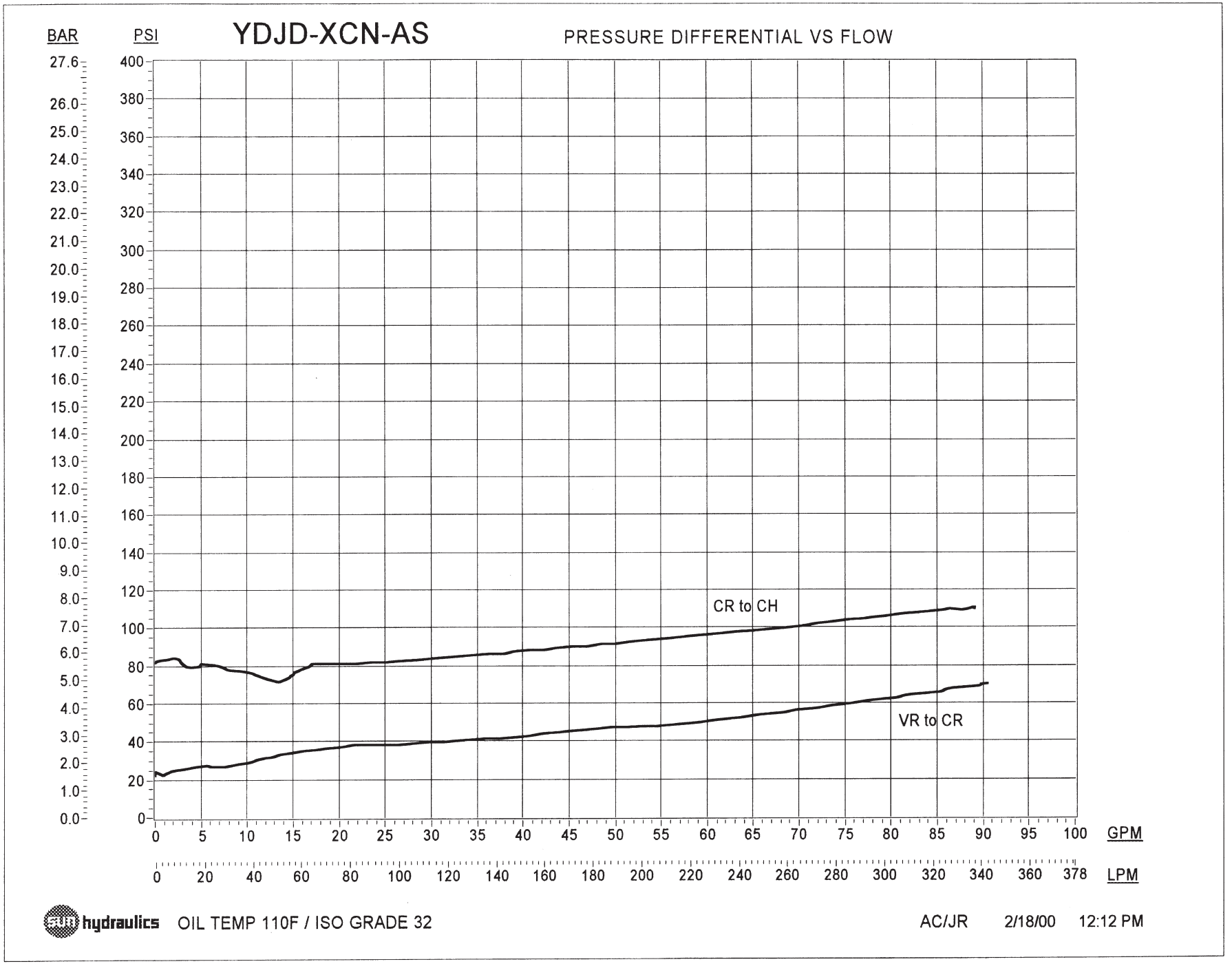
TELEPHONE (941) 362-1200


YDJD-XCN-AS
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
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280
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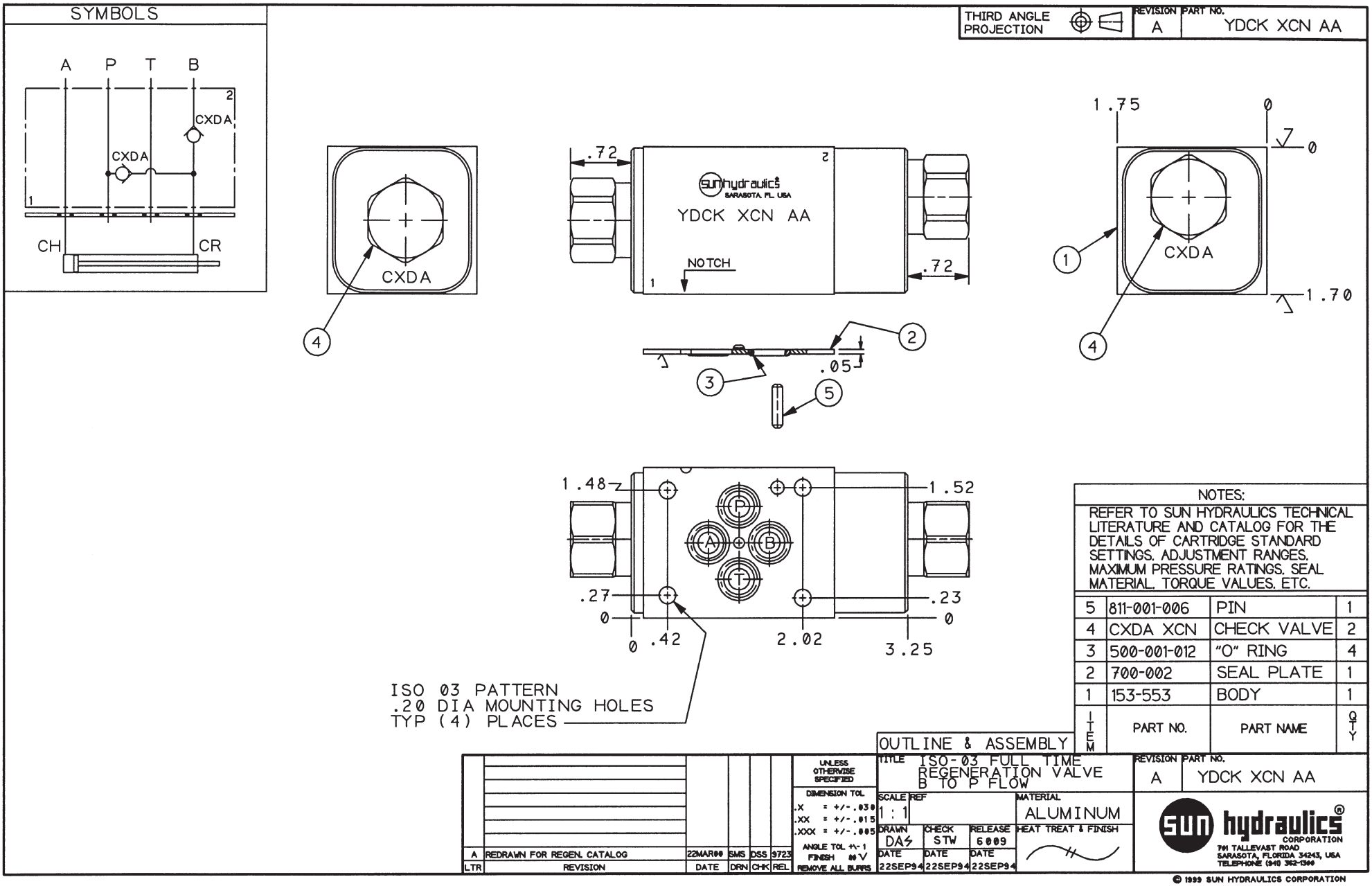
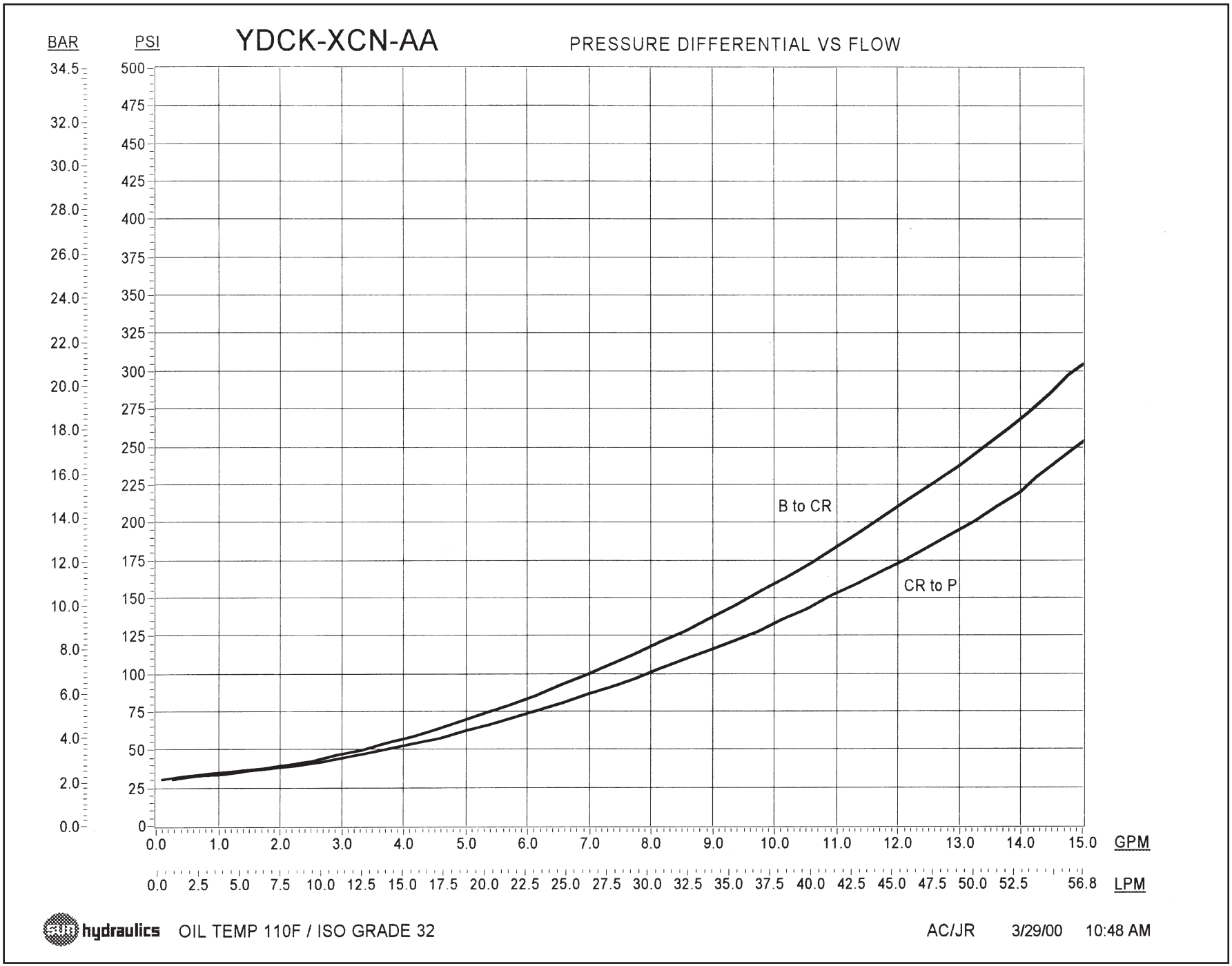
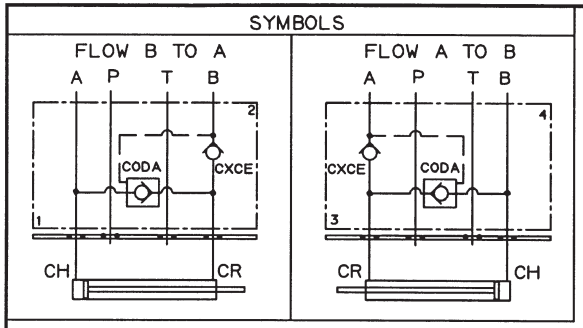
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 378 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 2/18/00 12:12 PM

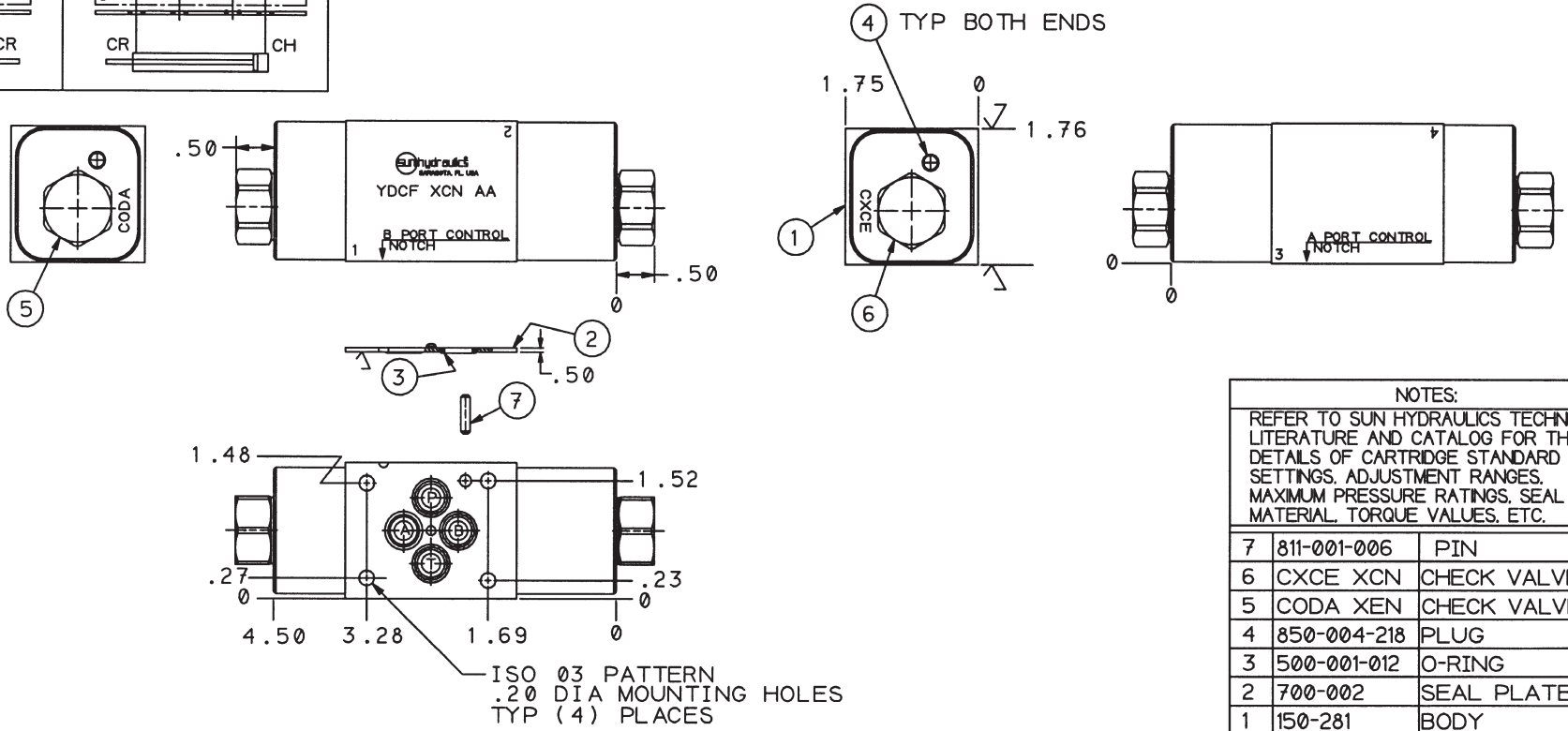



YDCK-XCN-AA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
B to CR
CR to P
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 GPM
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 56.8 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 10:48 AM




THIRD ANGLE PROJECTION

| REVISION | PART NO. |
|---|---|
| C | YDCF XCN AA |




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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| C | REDRAWN FOR REGEN. CATALOG | 22MAR00 | SMS | DSS | 9723 |
| B | REVISED STAMPING & ADDED IT#7 | 18NOV92 | BRS | | 4060 |
| A | CXCE WAS SHOWN AS A P.O. CHECK IN SYMBOL | 06APR92 | RJB | | 3615 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 64 V
REMOVE ALL BURRS

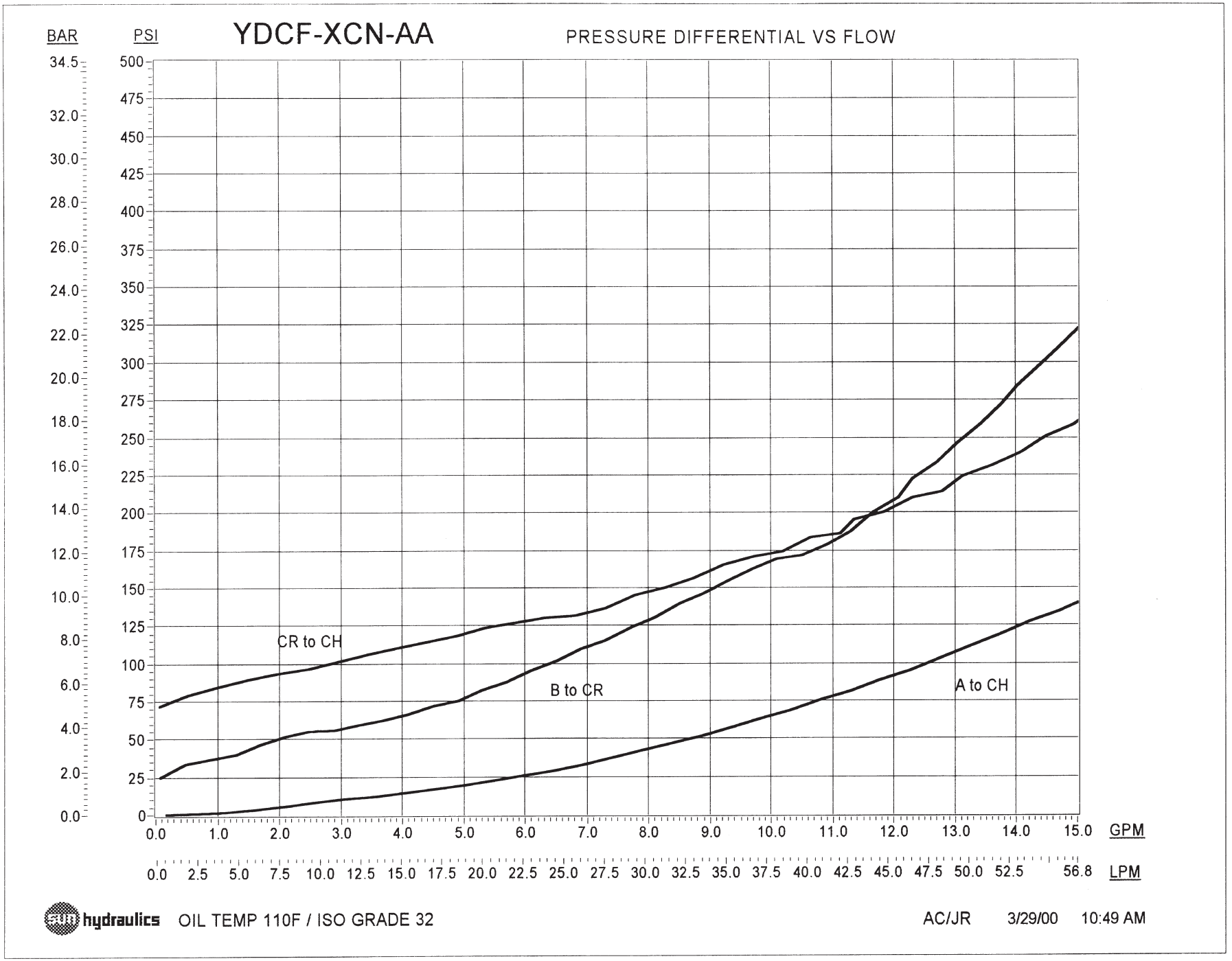
TITLE: FULL TIME ISO 03 REGENERATION VALVE FLOW B TO A OR A TO B

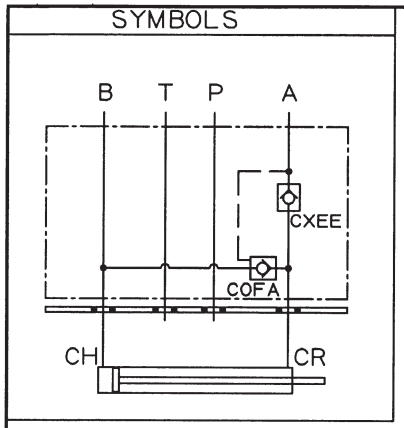
| SCALE | REF | MATERIAL |
|---|---|---|
| 1 : 1.5 | | 6061-T6 ALUM. |

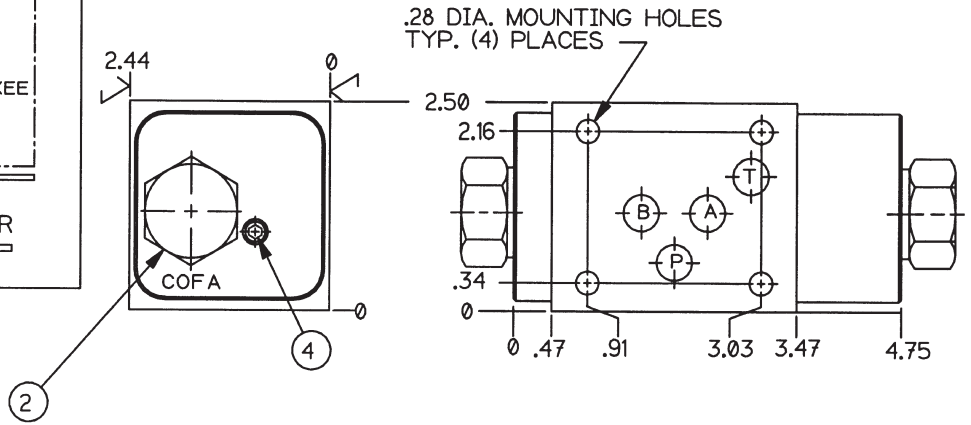
| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | RJB | 3115 | |
| DATE | DATE | DATE | |
| 05JUN91 | 06JUN91 | 06JUN91 | |

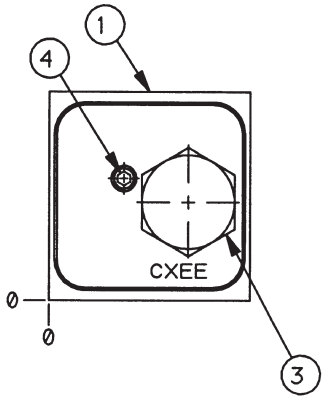
| REVISION | PART NO. |
|---|---|
| C | YDCF XCN AA |

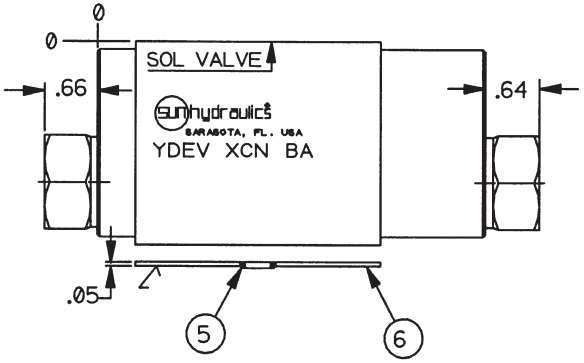
sun hydraulics CORPORATION
791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1369


YDCF-XCN-AA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
A to CH
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 GPM
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 56.8 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 10:49 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 | 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | REDRAWN FOR REGEN. CATALOG | 22MAR00 | SMS | DSS | 9723 |
| A | TITLE WAS B TO A | 20AUG92 | RJB | | 5997 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/-1
FINISH 63 √
REMOVE ALL BURRS

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

REVISION: B
PART NO.: YDEV XCN BA

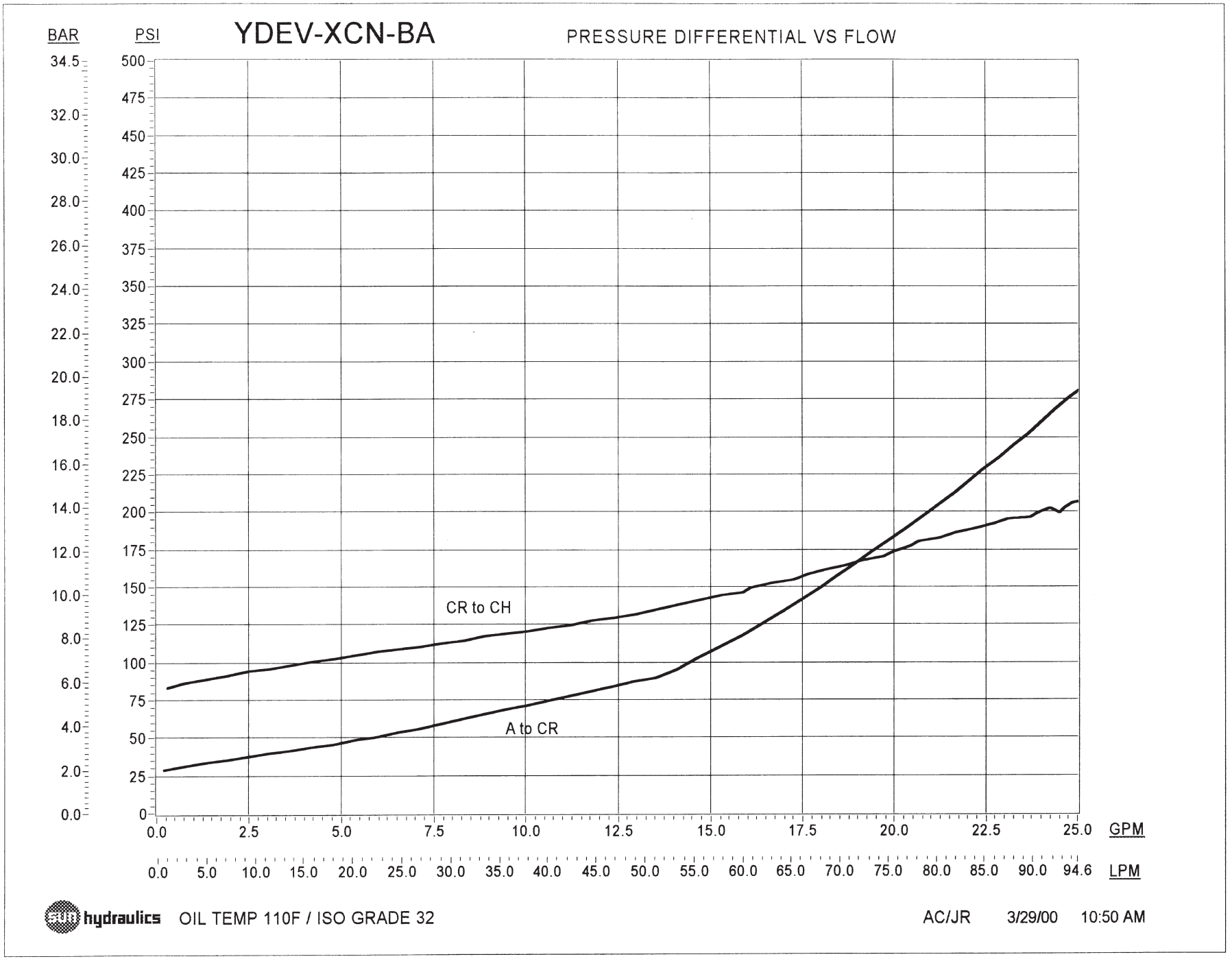
SCALE: 1 : 1.5
REF
MATERIAL: ALUMINUM

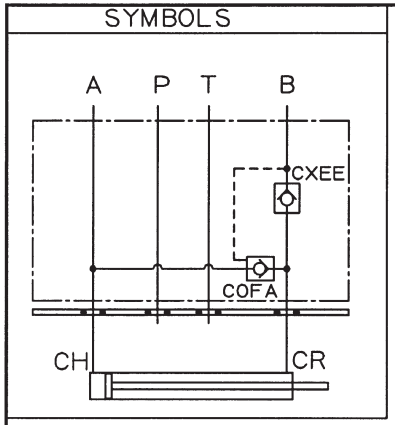
| DRAWN | CHECK | RELEASE |
|---|---|---|
| BRS | RJB | 3143 |
| DATE 13JUN91 | DATE 18JUN91 | DATE 21JUN91 |

HEAT TREAT & FINISH

THIRD ANGLE PROJECTION

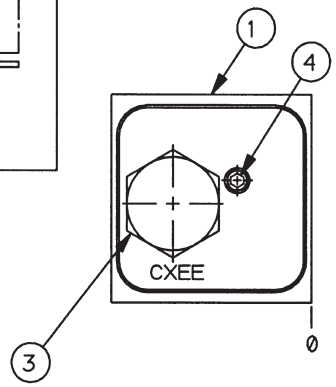
sun hydraulics® CORPORATION
791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200

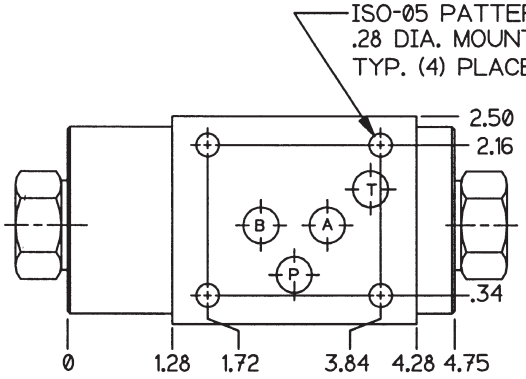

YDEV-XCN-BA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
A to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 94.6 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 10:50 AM

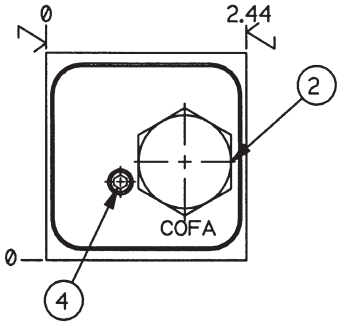


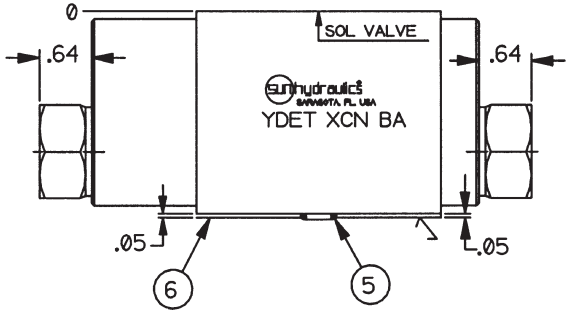

THIRD ANGLE PROJECTION

| 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| D | REDRAWN FOR REGEN. CATALOG | 22MAR00 | SMS | DSS | 9727 |
| C | ADDED SOL VALVE STAMPING | 19OCT93 | BRS | | 5048 |
| B | REVISED CARTRIDGE STAMPING | 18MAY93 | BRS | | 4654 |
| A | TITLE WAS A TO B | 28AUG92 | RJB | | 3997 |
| - | REVISED SYMBOL | 08JUL91 | BRS | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/- 1
FINISH 63 √
REMOVE ALL BURRS

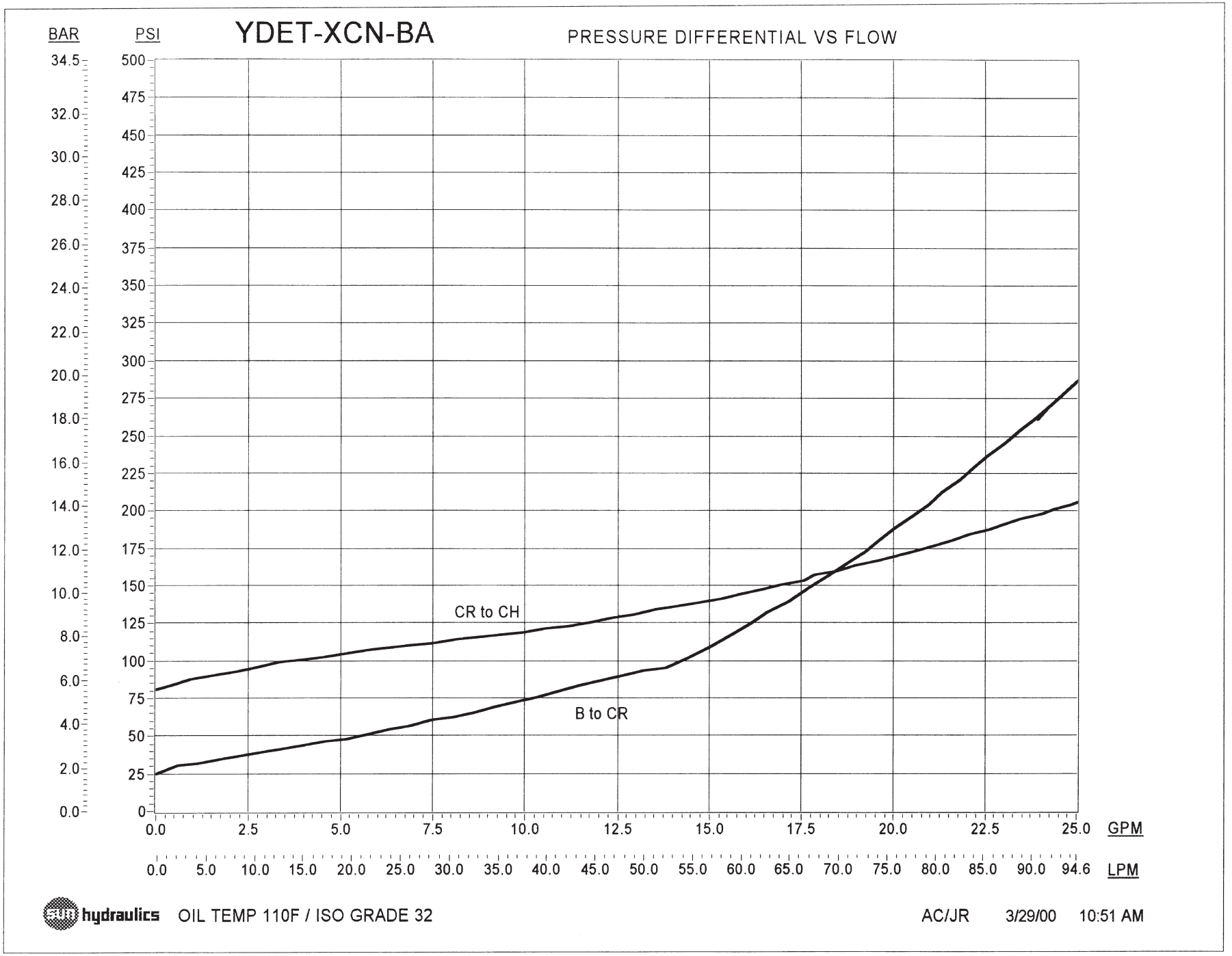
TITLE: ISO-05 FULL TIME REGENERATIVE VALVE FLOW B TO A

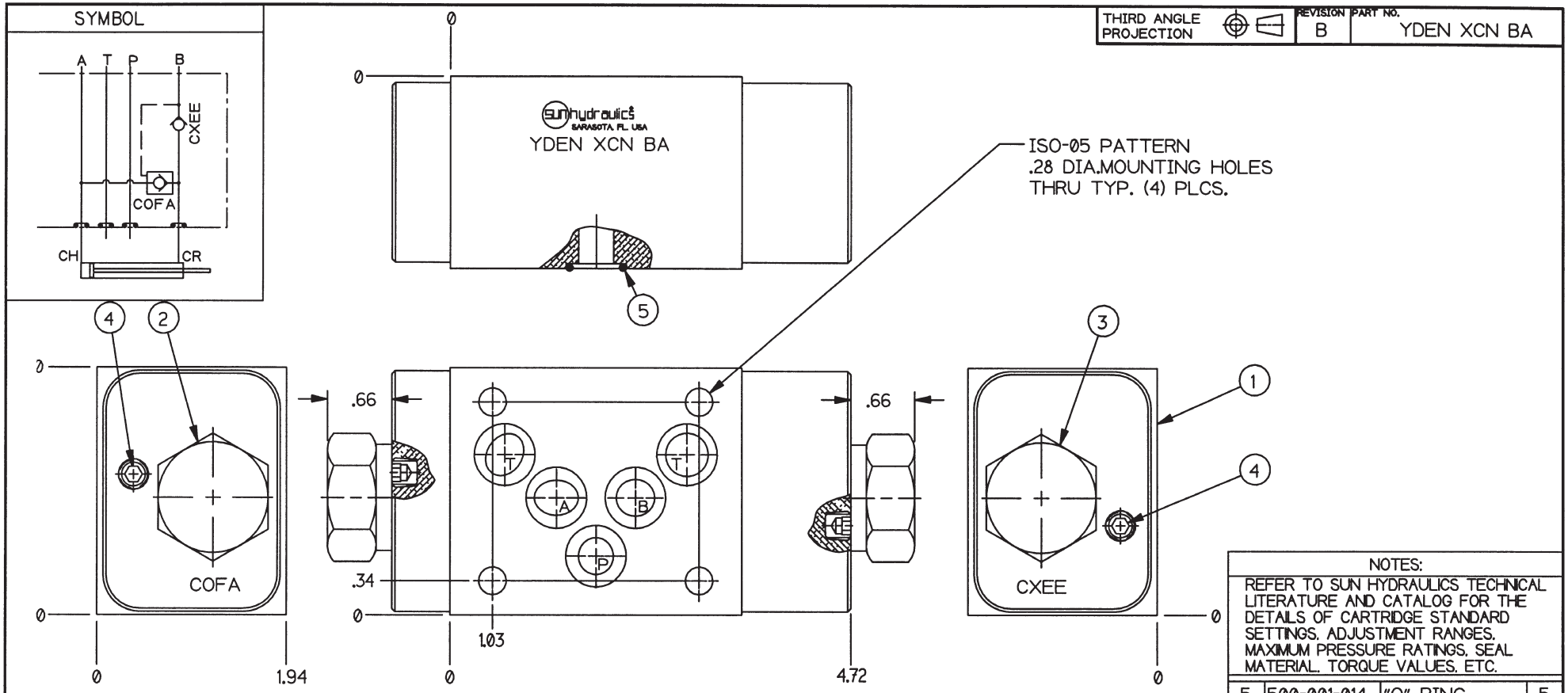
SCALE: 1:1.5 | REF | MATERIAL: ALUMINUM

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | RJB | 3143 | |
| DATE 13JUN91 | DATE 18JUN91 | DATE 18JUN91 | |

| REVISION | PART NO. |
|---|---|
| D | YDET XCN BA |

sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1360


YDET-XCN-BA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 94.6 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 10:51 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 |
|---|---|---|---|
| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | REDRAWN FOR REGEN. CATALOG | 22MAR00 | SMS | DSS | 9723 |
| A | 4.72 LENGTH WAS 4.62 | 25AUG98 | RJB | | 8795 |
| - | SEALS TO BUNA | 14AUG92 | RJB | | 2005 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL.
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/- 1
FINISH 63 √
REMOVE ALL BURRS

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

SCALE 1:1 | REF | MATERIAL ALUM. & STEEL

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | RJB | 1461 | |
| DATE 21SEP87 | DATE 21SEP87 | DATE 21SEP87 | |

REVISION B | PART NO. YDEN XCN BA

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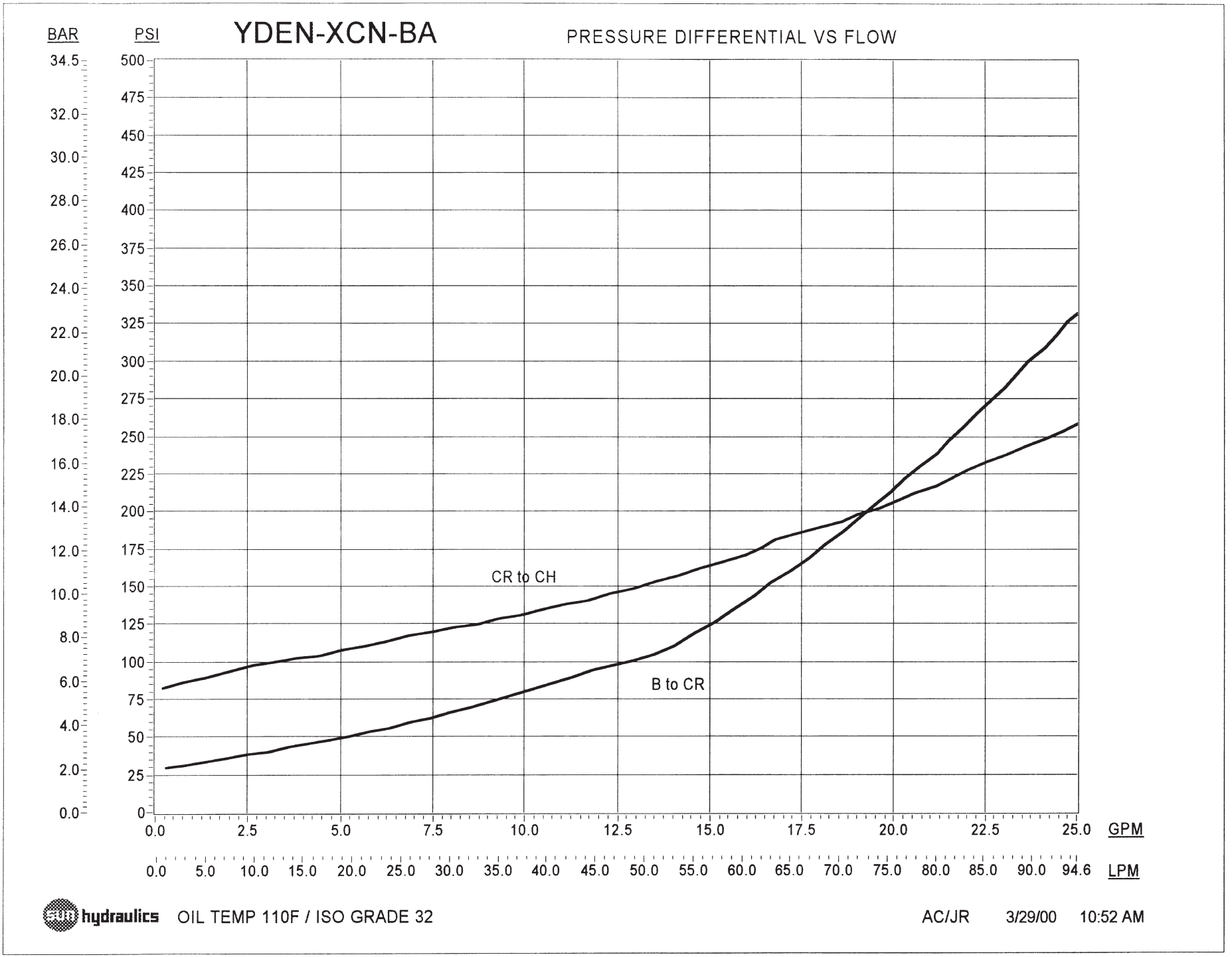
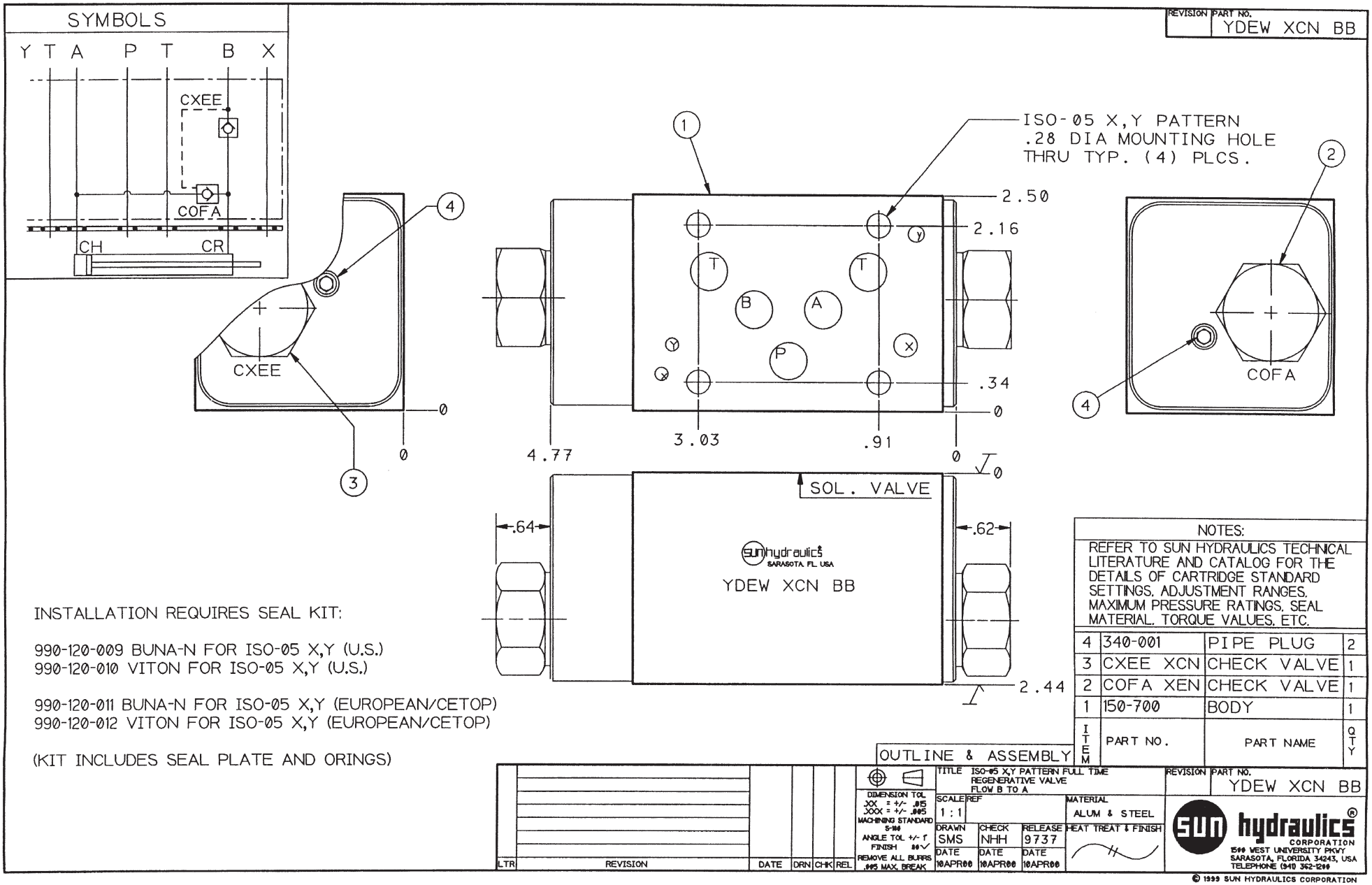
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


BAR
PSI
YDEN-XCN-BA
PRESSURE DIFFERENTIAL VS FLOW
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 94.6 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 10:52 AM




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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| | | | | | |

DIMENSION TOL .XX = +/- .015 .XXX = +/- .005
MACHINING STANDARD S-186
ANGLE TOL +/- 1°
FINISH 63
REMOVE ALL BURRS .005 MAX. BREAK

TITLE ISO-05 X,Y PATTERN FULL TIME REGENERATIVE VALVE FLOW B TO A

| SCALE | REF | MATERIAL |
|---|---|---|
| 1 : 1 | | ALUM & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| SMS | NHH | 9737 | |
| DATE | DATE | DATE | |
| 10APR00 | 10APR00 | 10APR00 | |

REVISION | PART NO.
YDEW XCN BB

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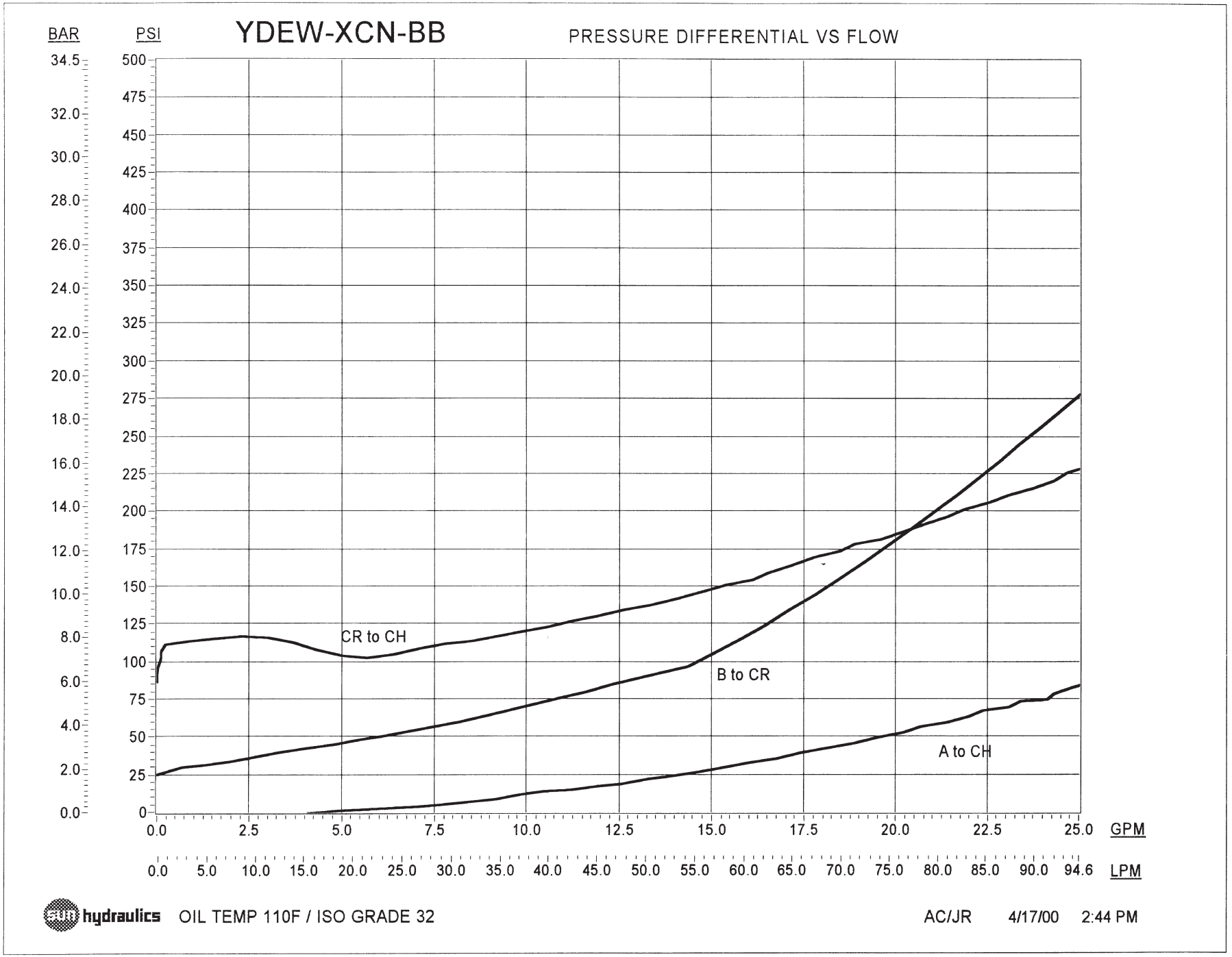
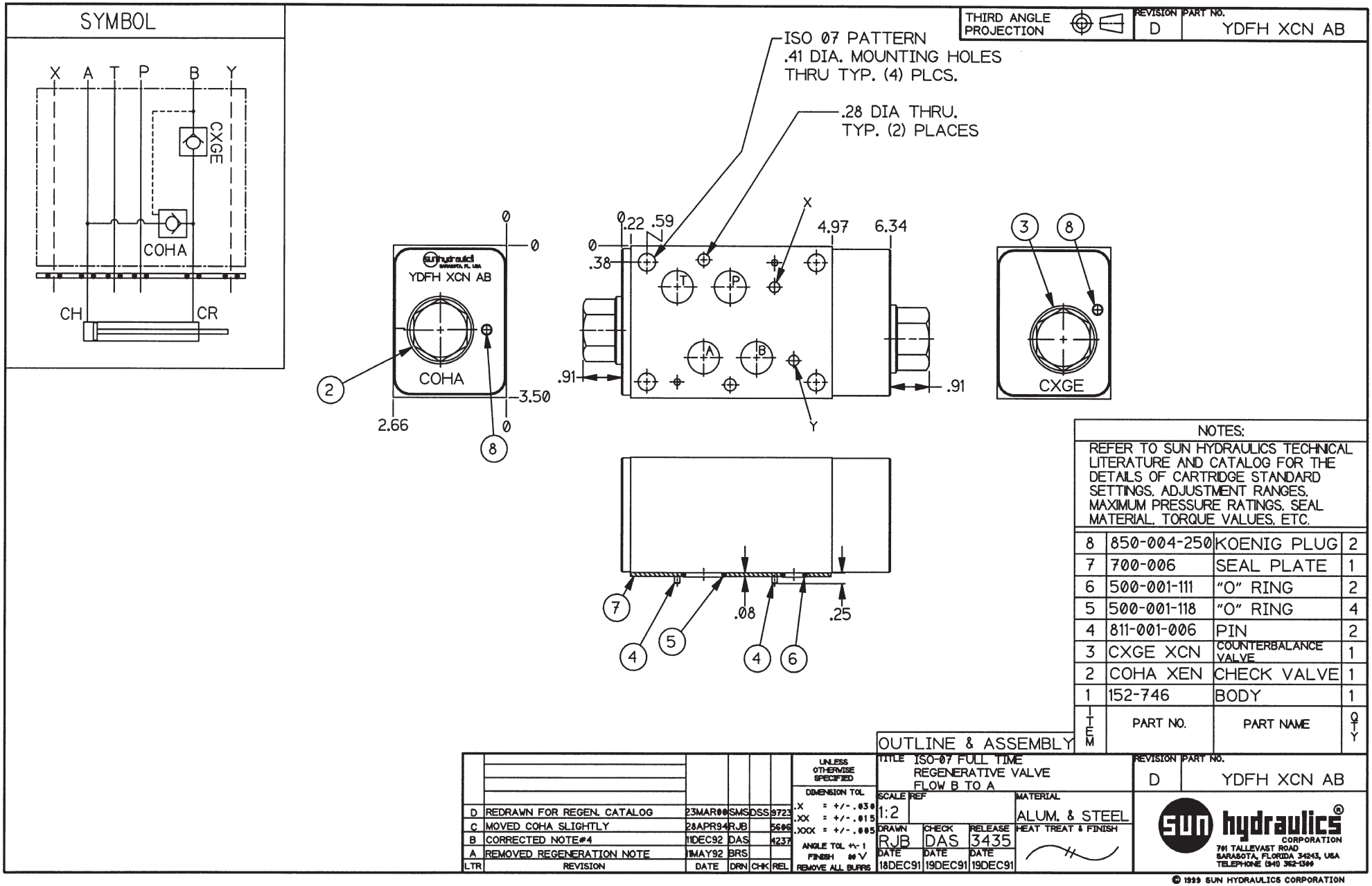
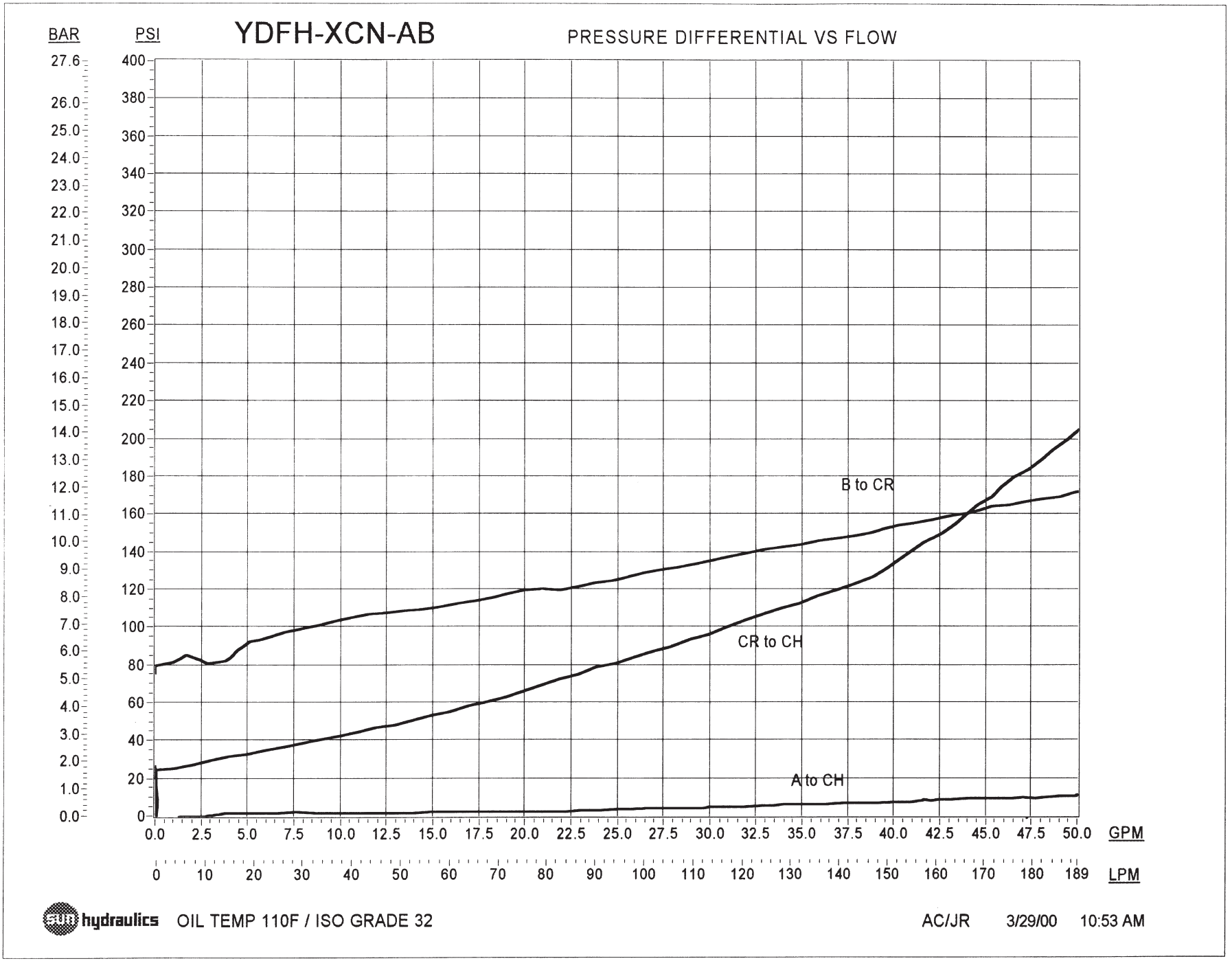
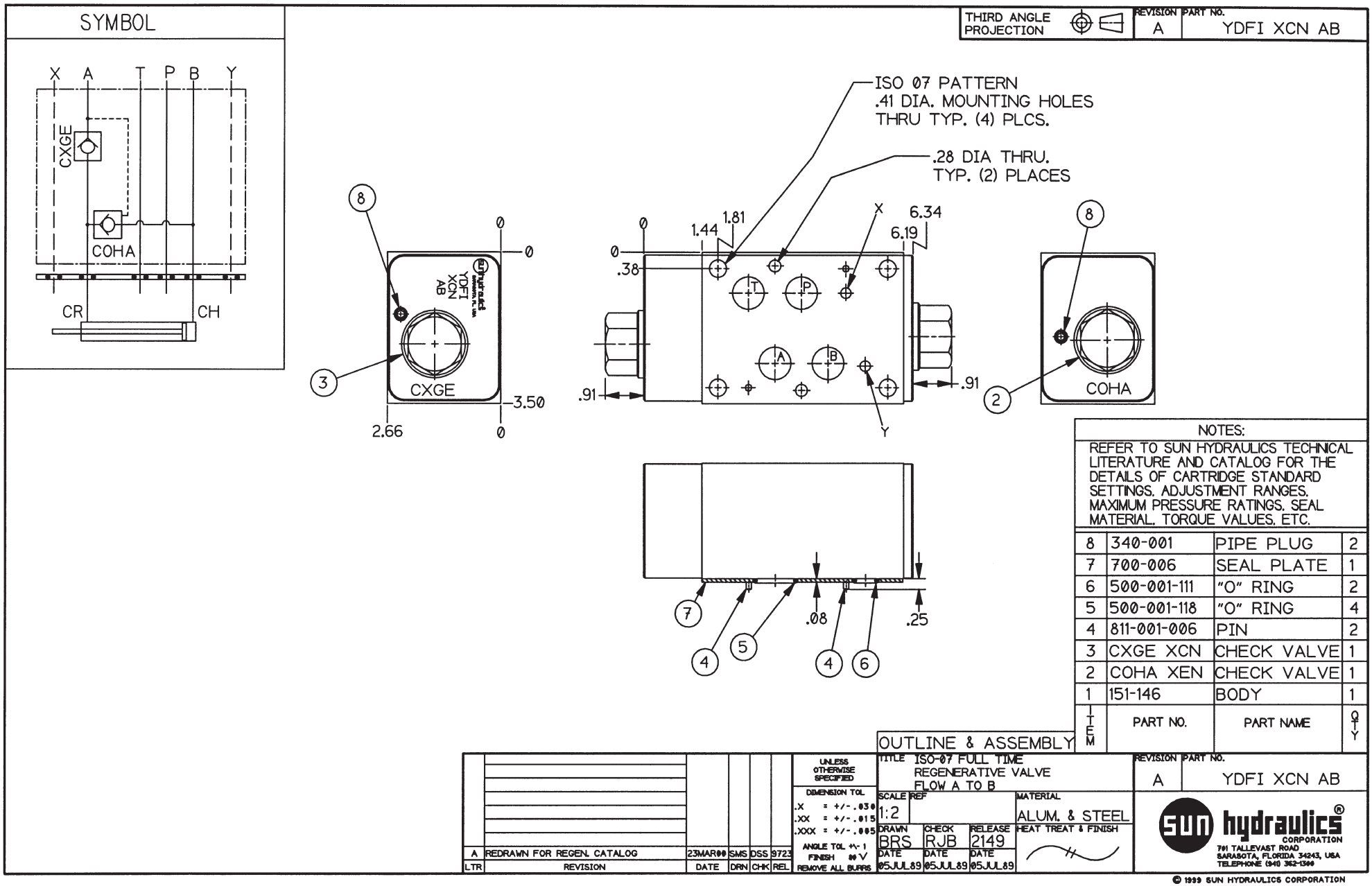
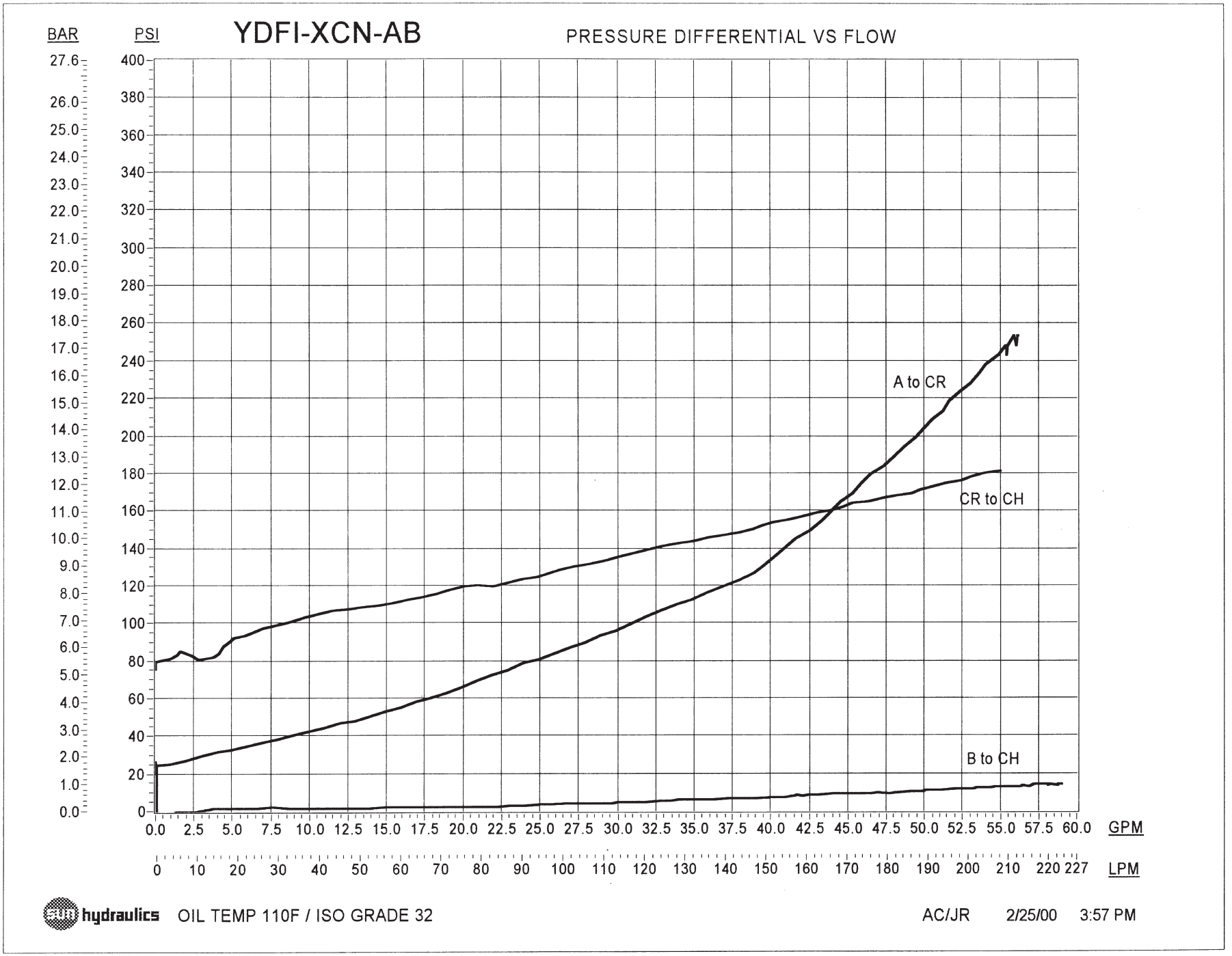
1500 WEST UNIVERSITY PKWY
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDEW-XCN-BB
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
A to CH
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
GPM
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
94.6
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR
4/17/00
2:44 PM

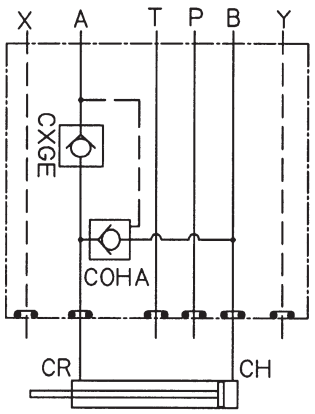

SYMBOL
X A T P B Y
CXGE
COHA
CH CR
THIRD ANGLE PROJECTION
REVISION D
PART NO. YDFH XCN AB
ISO 07 PATTERN
.41 DIA. MOUNTING HOLES
THRU TYP. (4) PLCS.
.28 DIA THRU.
TYP. (2) PLACES
YDFH XCN AB
COHA
3.50
2.66
.22 .59
.38
4.97
6.34
.91
.91
CXGE
.08
.25
NOTES:
REFER TO SUN HYDRAULICS TECHNICAL LITERATURE 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
TITLE ISO-07 FULL TIME REGENERATIVE VALVE FLOW B TO A
REVISION D
PART NO. YDFH XCN AB
UNLESS OTHERWISE SPECIFIED
DIMENSION TOL .X = +/-.030 .XX = +/-.015 .XXX = +/-.005
ANGLE TOL +/- 1
FINISH 63
REMOVE ALL BURRS
SCALE 1:2
REF
MATERIAL ALUM. & STEEL
HEAT TREAT & FINISH
DRAWN RJB DATE 18DEC91
CHECK DAS DATE 19DEC91
RELEASE 3435 DATE 19DEC91
D REDRAWN FOR REGEN. CATALOG 23MAR94 SMS DSS 9723
C MOVED COHA SLIGHTLY 28APR94 RJB 5696
B CORRECTED NOTE#4 11DEC92 DAS 4237
A REMOVED REGENERATION NOTE 11MAY92 BRS
LTR REVISION DATE DRN CHK REL
sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1399
© 1999 SUN HYDRAULICS CORPORATION


YDFH-XCN-AB
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
B to CR
CR to CH
A to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
sun hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 10:53 AM



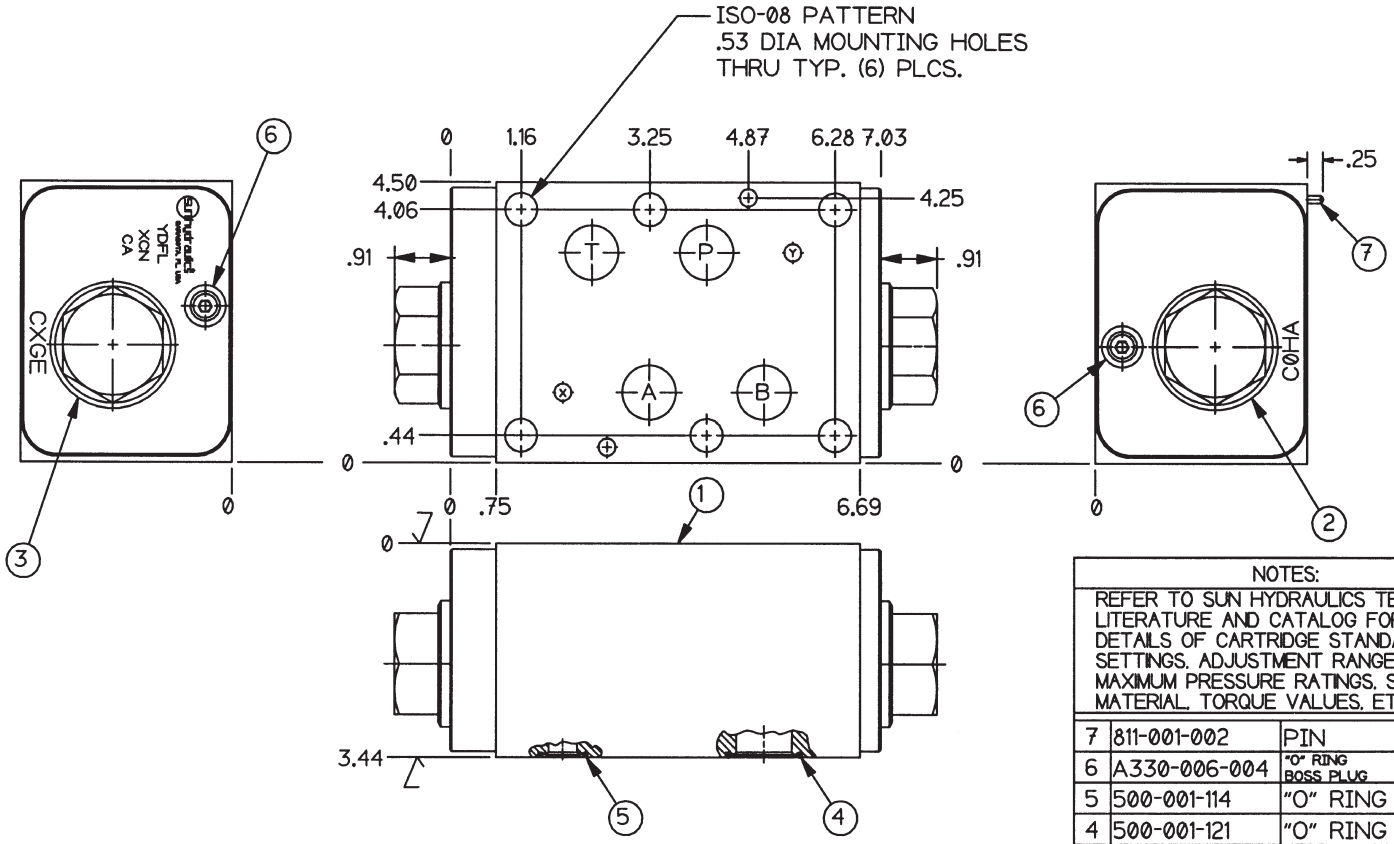

YDFI-XCN-AB
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
A to CR
CR to CH
B to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 2/25/00 3:57 PM

SYMBOL




THIRD ANGLE PROJECTION

| REVISION | PART NO. |
|---|---|
| A | YDFL 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.

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

OUTLINE & ASSEMBLY

| 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. | 23MAR00 | SMS | DSS | 9723 |
| | CATALOG | | | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: ISO-08 FULL TIME REGENERATIVE VALVE FLOW A TO B

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUMINUM |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | | 4245 | |
| DATE 1DEC92 | DATE | DATE 14DEC92 | |

| REVISION | PART NO. |
|---|---|
| A | YDFL XCN CA |

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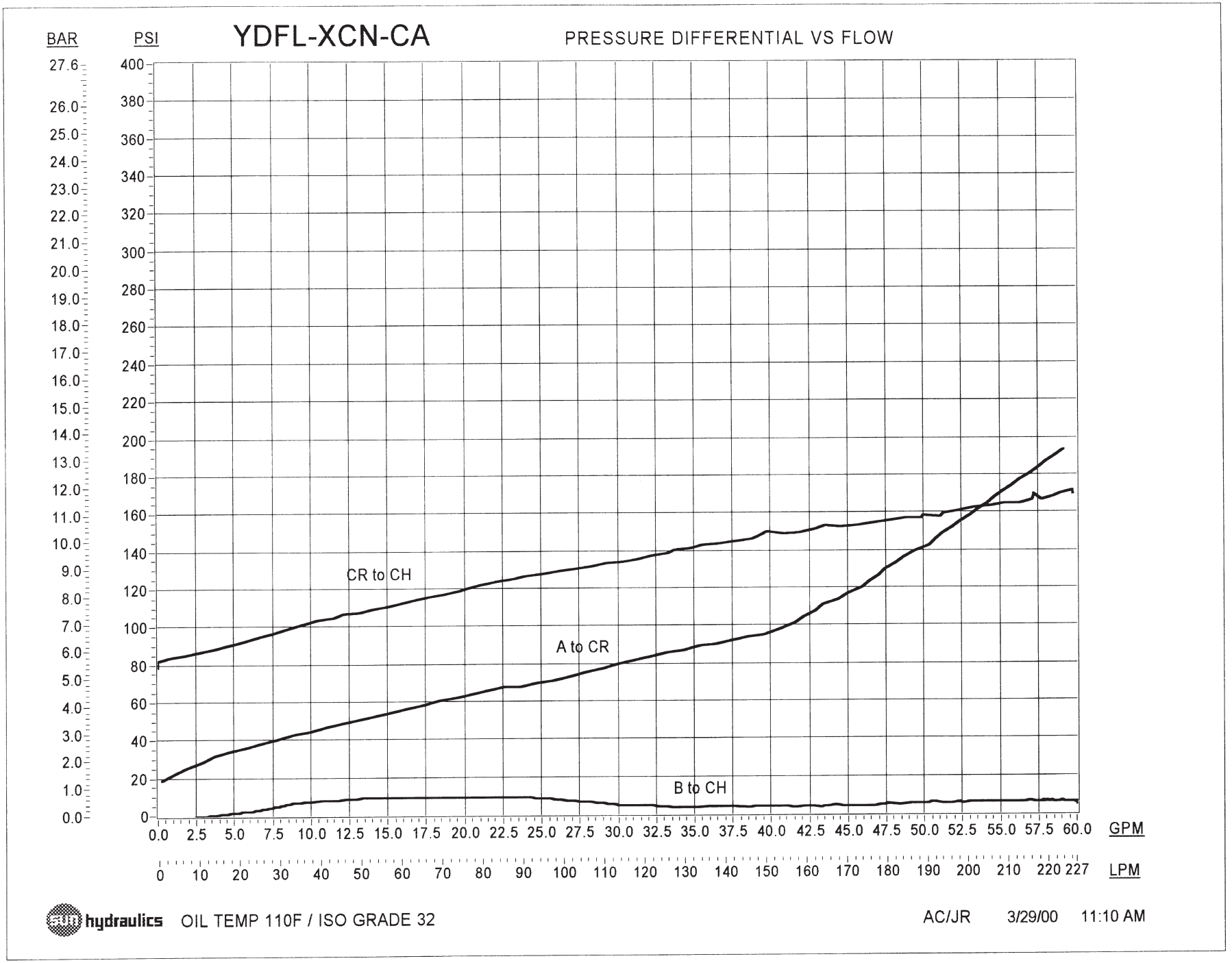
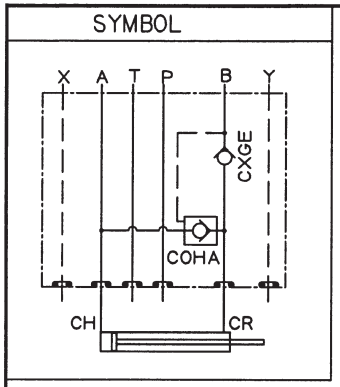
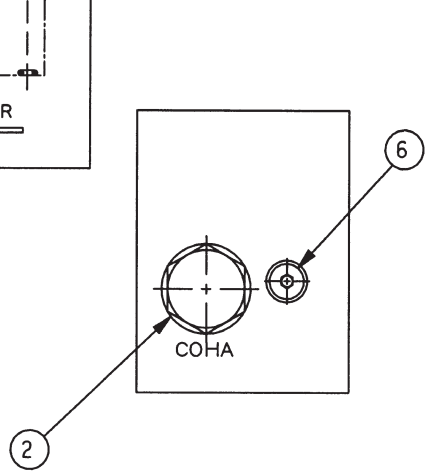
791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1369

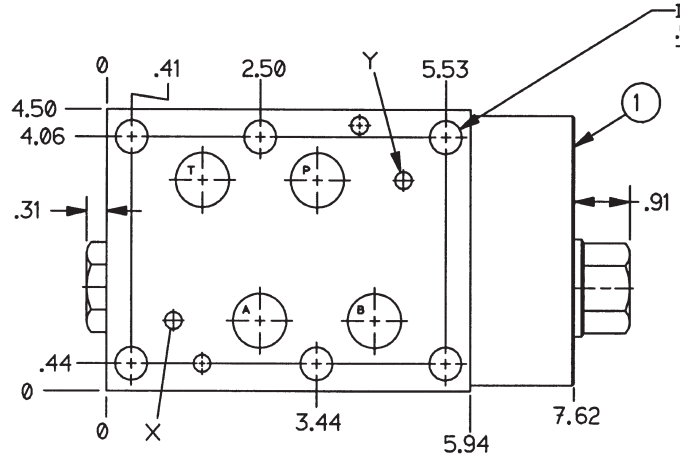

BAR
PSI
YDFL-XCN-CA
PRESSURE DIFFERENTIAL VS FLOW
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
A to CR
B to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:10 AM

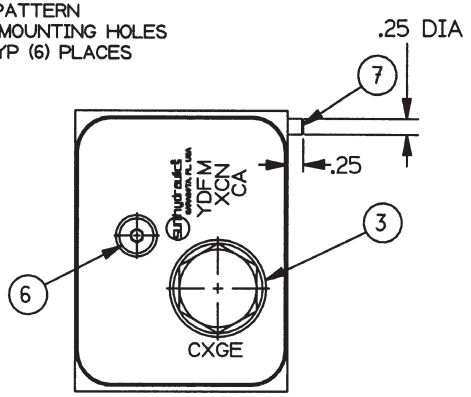


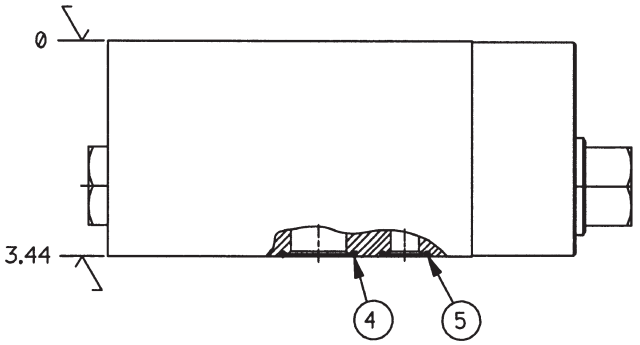

THIRD ANGLE PROJECTION

| 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.

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

OUTLINE & ASSEMBLY

| 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 | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: ISO-08 FULL TIME REGENERATIVE VALVE FLOW B TO A

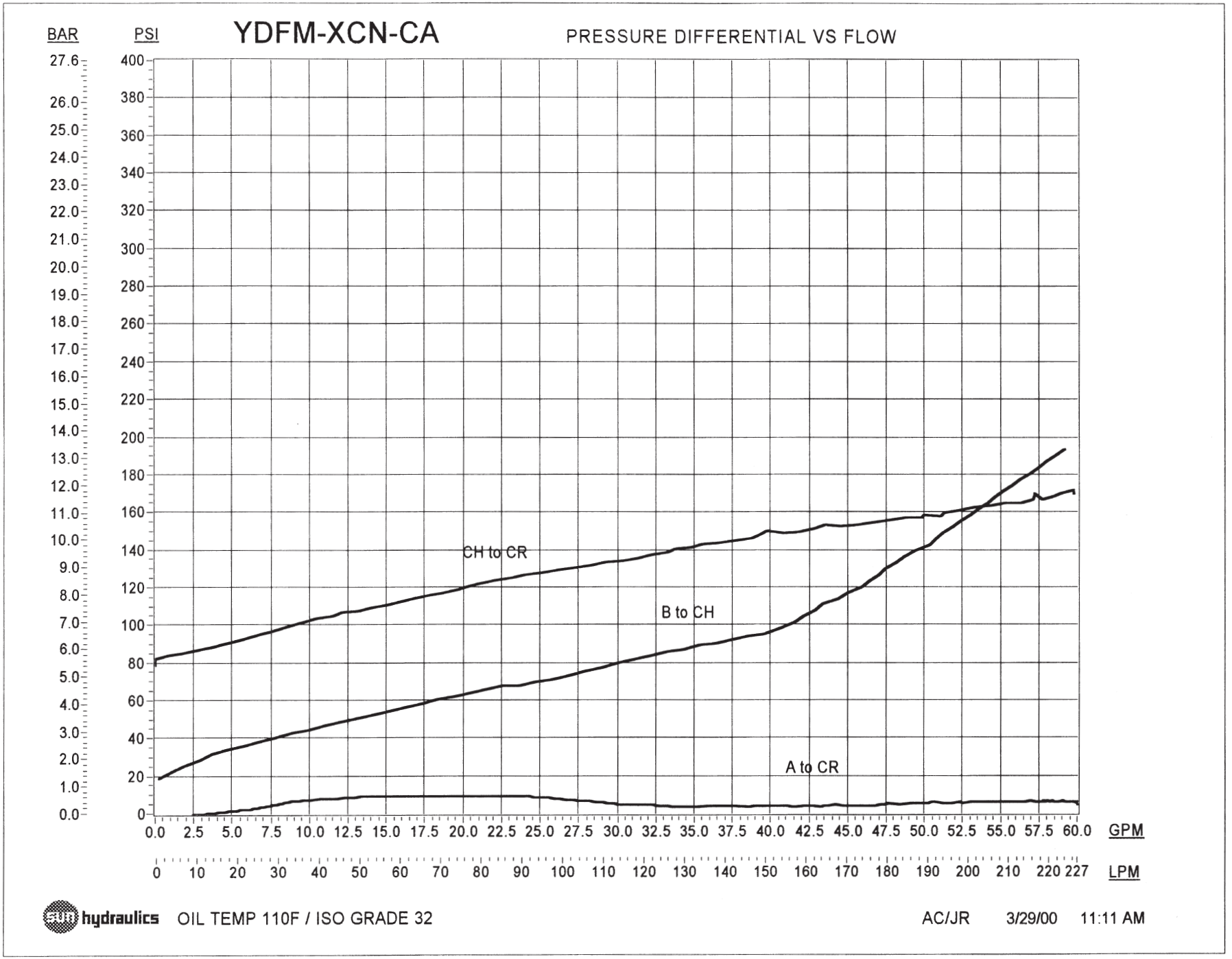
SCALE: 1:2 | REF | MATERIAL: ALUM. & STEEL

DRAWN: DAS | CHECK | RELEASE | HEAT TREAT & FINISH

DATE: 01DEC92 | DATE | DATE

| REVISION | PART NO. |
|---|---|
| A | YDFM XCN CA |

sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDFM-XCN-CA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
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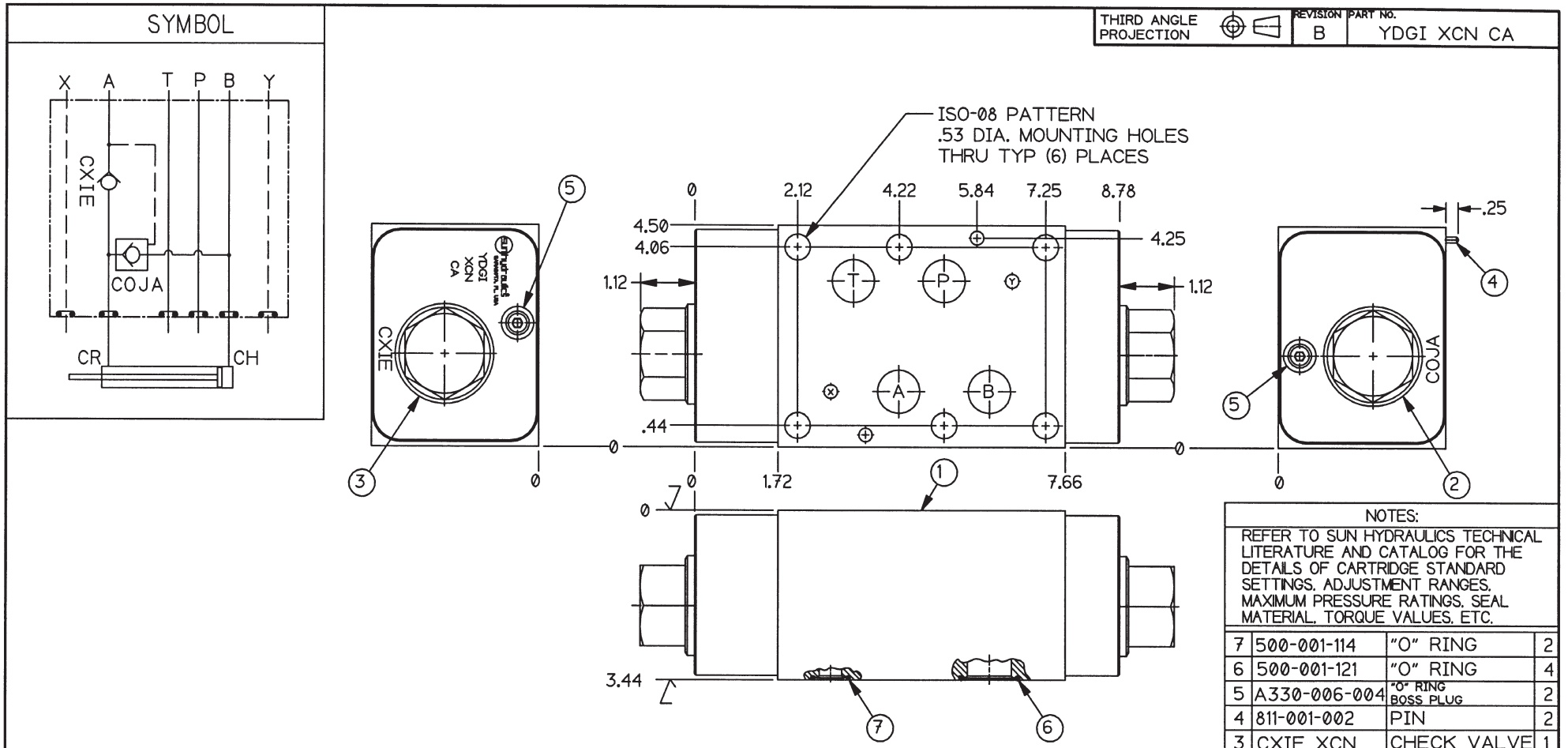
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CH to CR
B to CH
A to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:11 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 |
|---|---|---|---|
| 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 | CXIE XCN | CHECK VALVE | 1 |
| 2 | COJA XEN | CHECK VALVE | 1 |
| 1 | 151-196 | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | IT#7 WAS IT#8 IT#6 WAS IT#7 OLD IT#6 WAS DELETED IT#5 WAS 330-006-004 REDRAWN FOR REGEN CATALOG | 23MAR00 | SMS | DSS | 9723 |
| A | IN NOTE#5 75 PSI WAS 30 PSI | 29SEP93 | BRS | | 5038 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: ISO-08 FULL TIME REGENERATIVE VALVE FLOW A TO B

SCALE 1:2 REF

MATERIAL: ALUM. & STEEL

HEAT TREAT & FINISH

| DRAWN | CHECK | RELEASE |
|---|---|---|
| BRS | GB | 4930 |
| DATE 17AUG93 | DATE 18AUG93 | DATE 18AUG93 |

REVISION B PART NO. YDGI XCN CA

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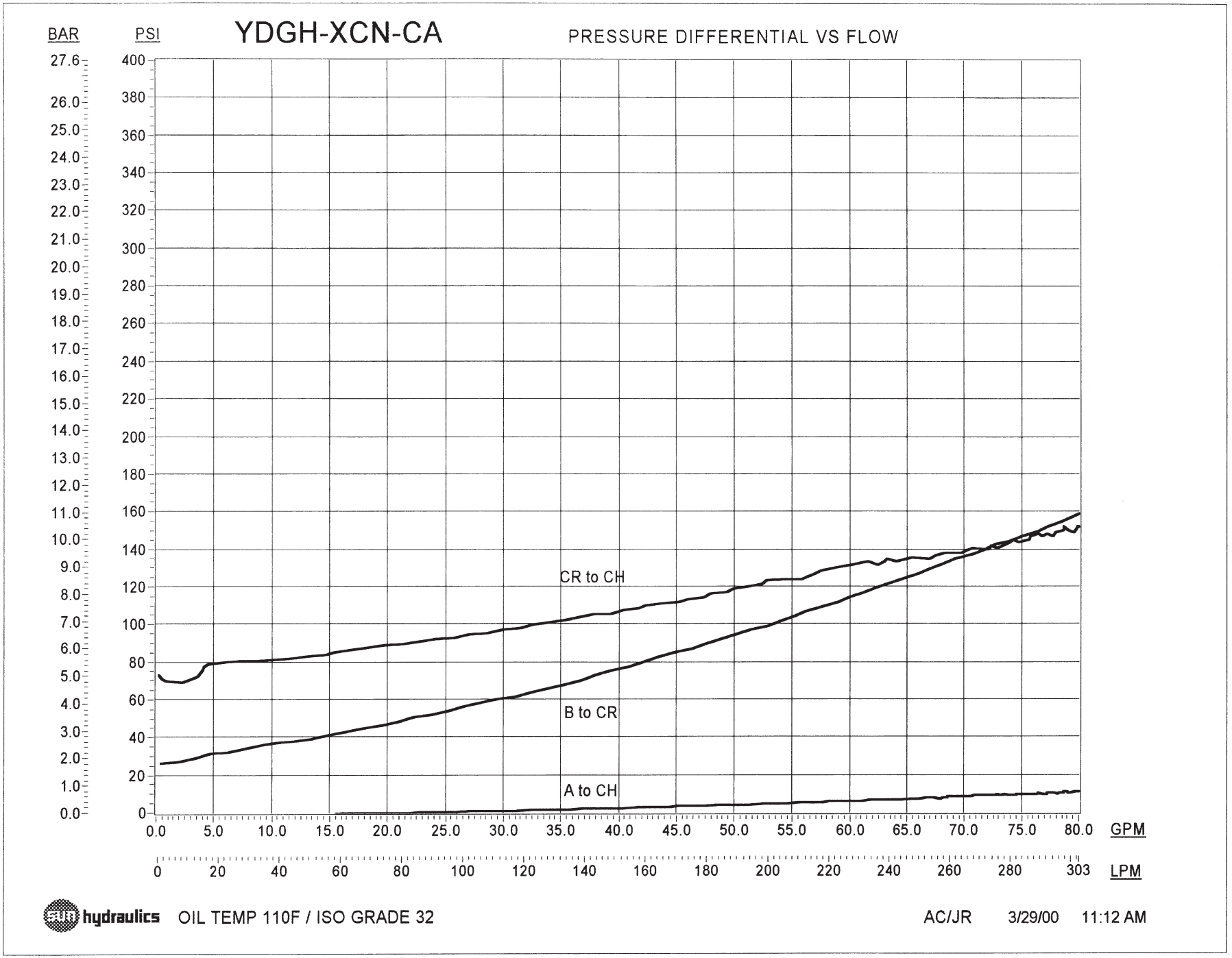
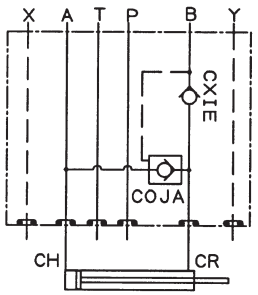
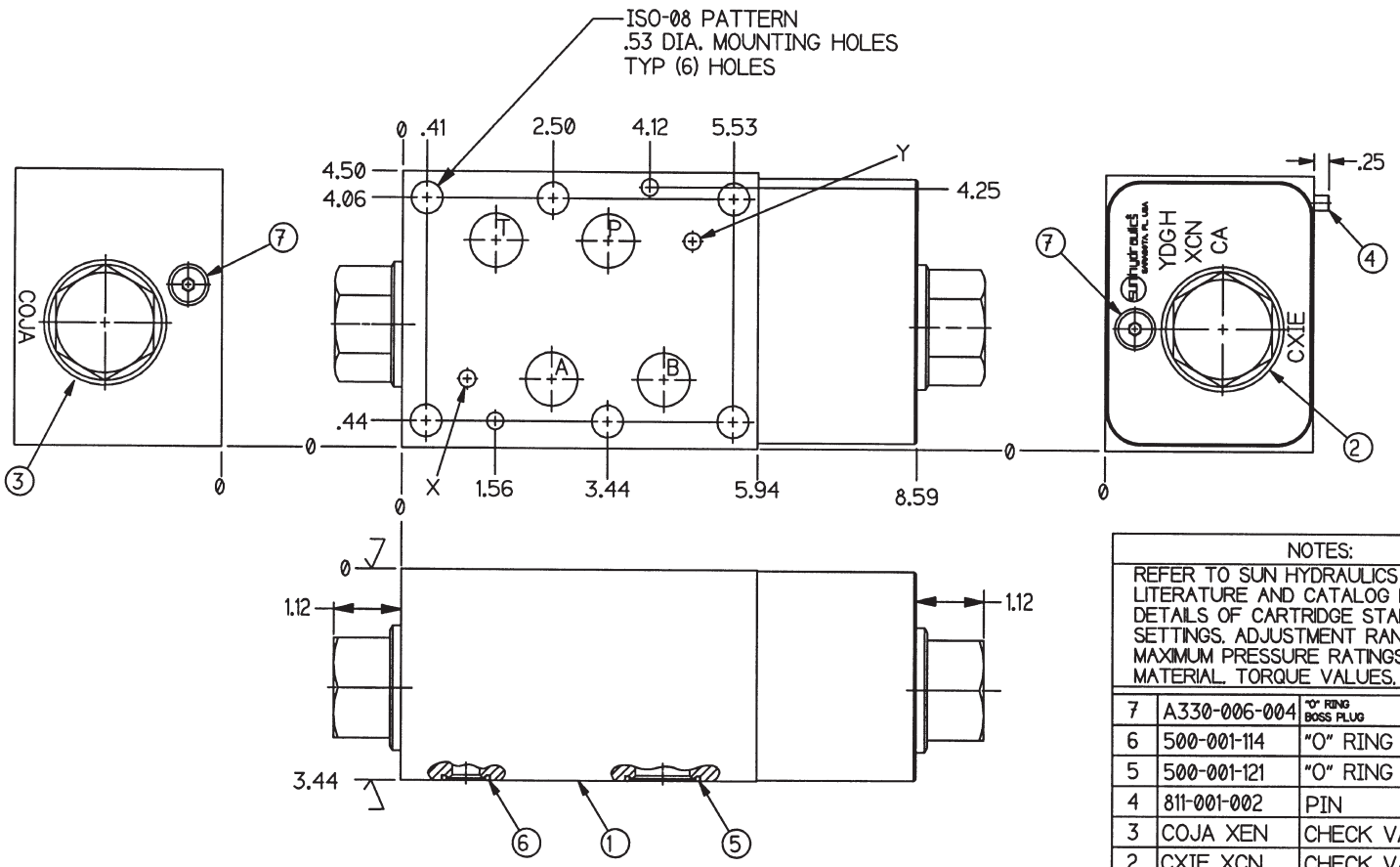

BAR
PSI
YDGH-XCN-CA
PRESSURE DIFFERENTIAL VS FLOW
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
B to CR
A to CH
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:12 AM

SYMBOL




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.

| ITEM | PART NO. | PART NAME | QTY |
|---|---|---|---|
| 7 | A330-006-004 | "O" 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| A | DELETED IT#8 IT#7 WAS 338-006-004<br>REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\-1
FINISH 63 √
REMOVE ALL BURRS

TITLE: ISO-08 FULL TIME REGENERATIVE VALVE FLOW B TO A

| SCALE | REF | MATERIAL |
|---|---|---|
| 1 : 2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | DAS | | |
| DATE 11MAY92 | DATE 11MAY92 | DATE | |

| REVISION | PART NO. |
|---|---|
| A | YDGH XCN CA |

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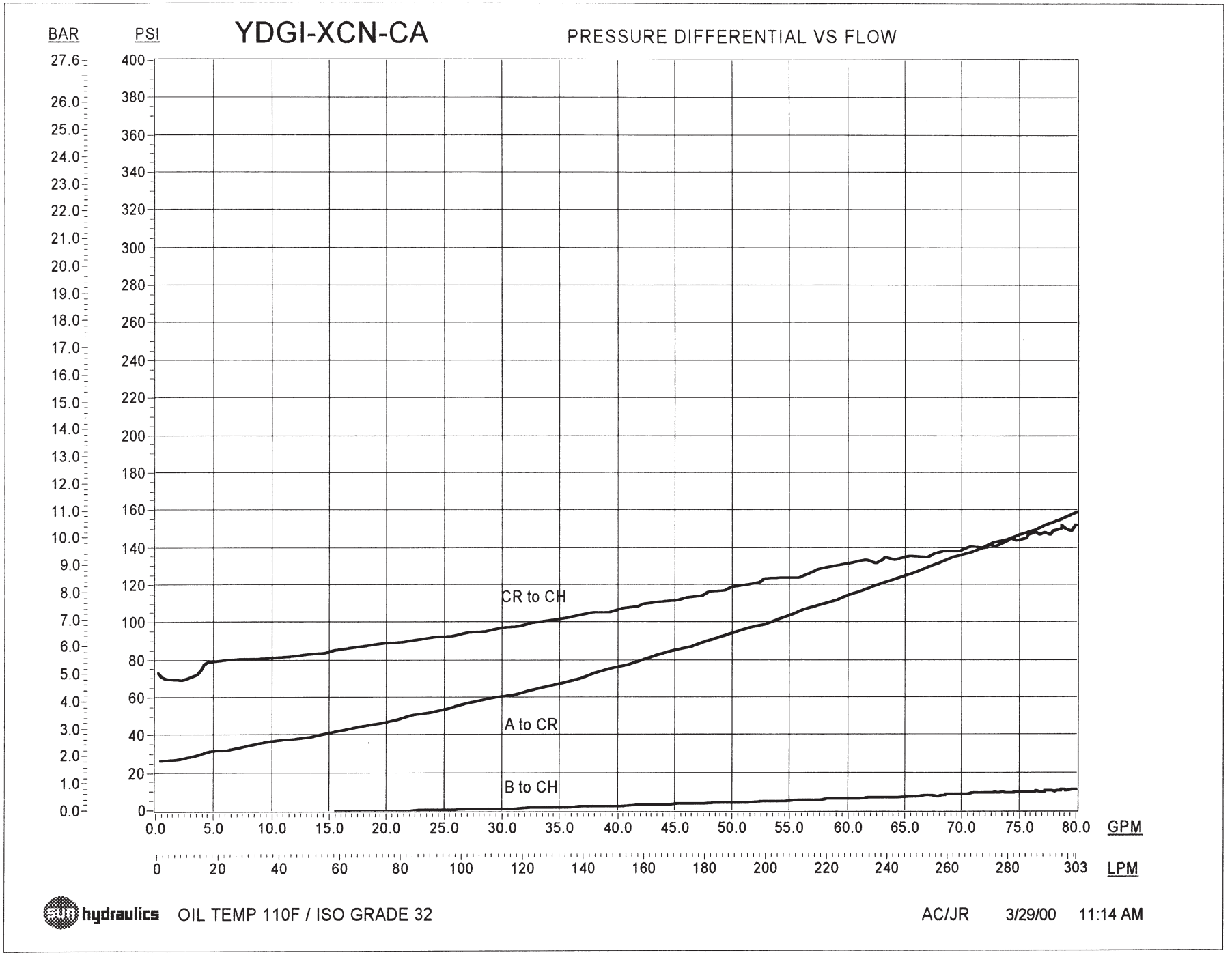
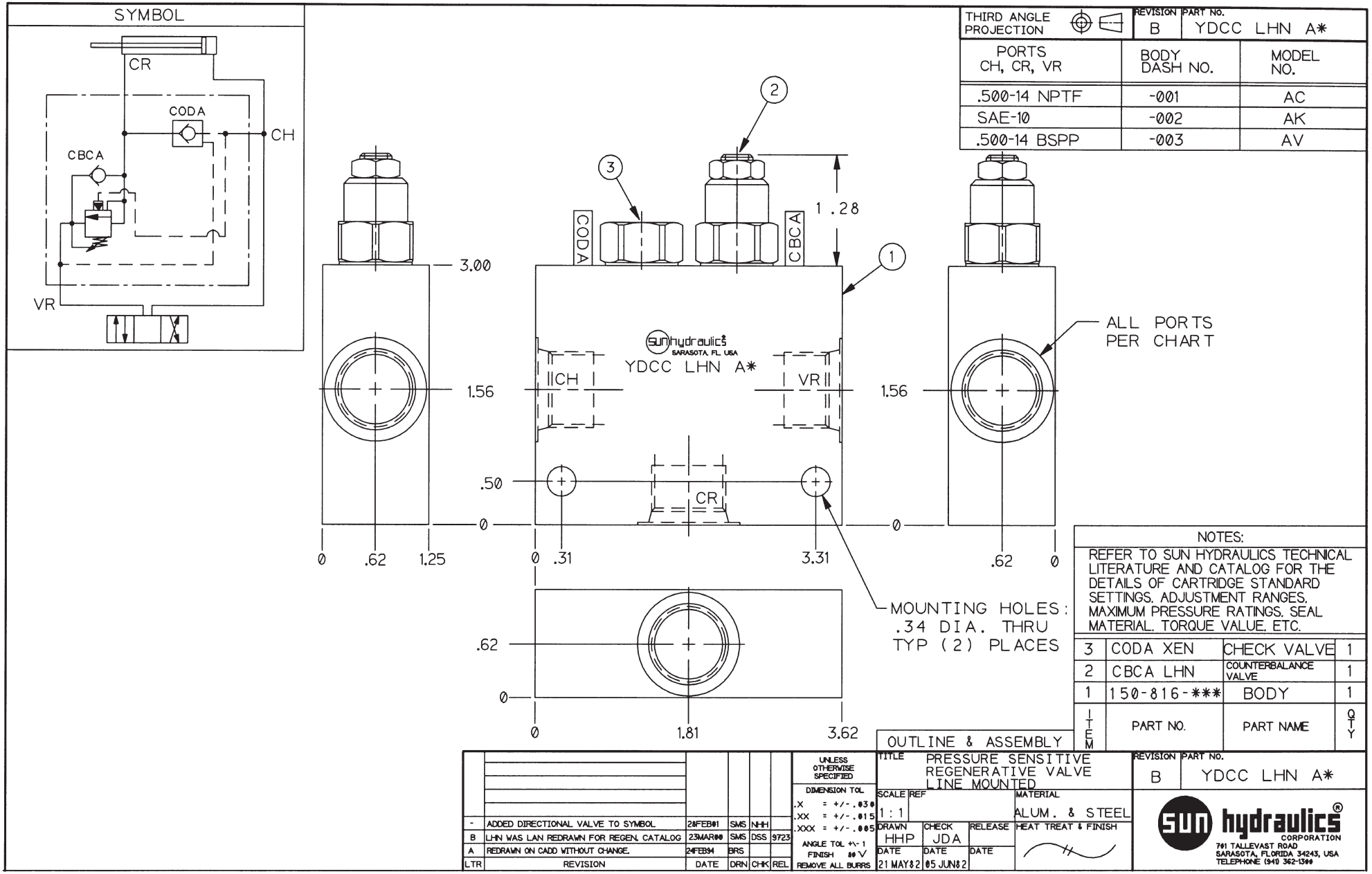
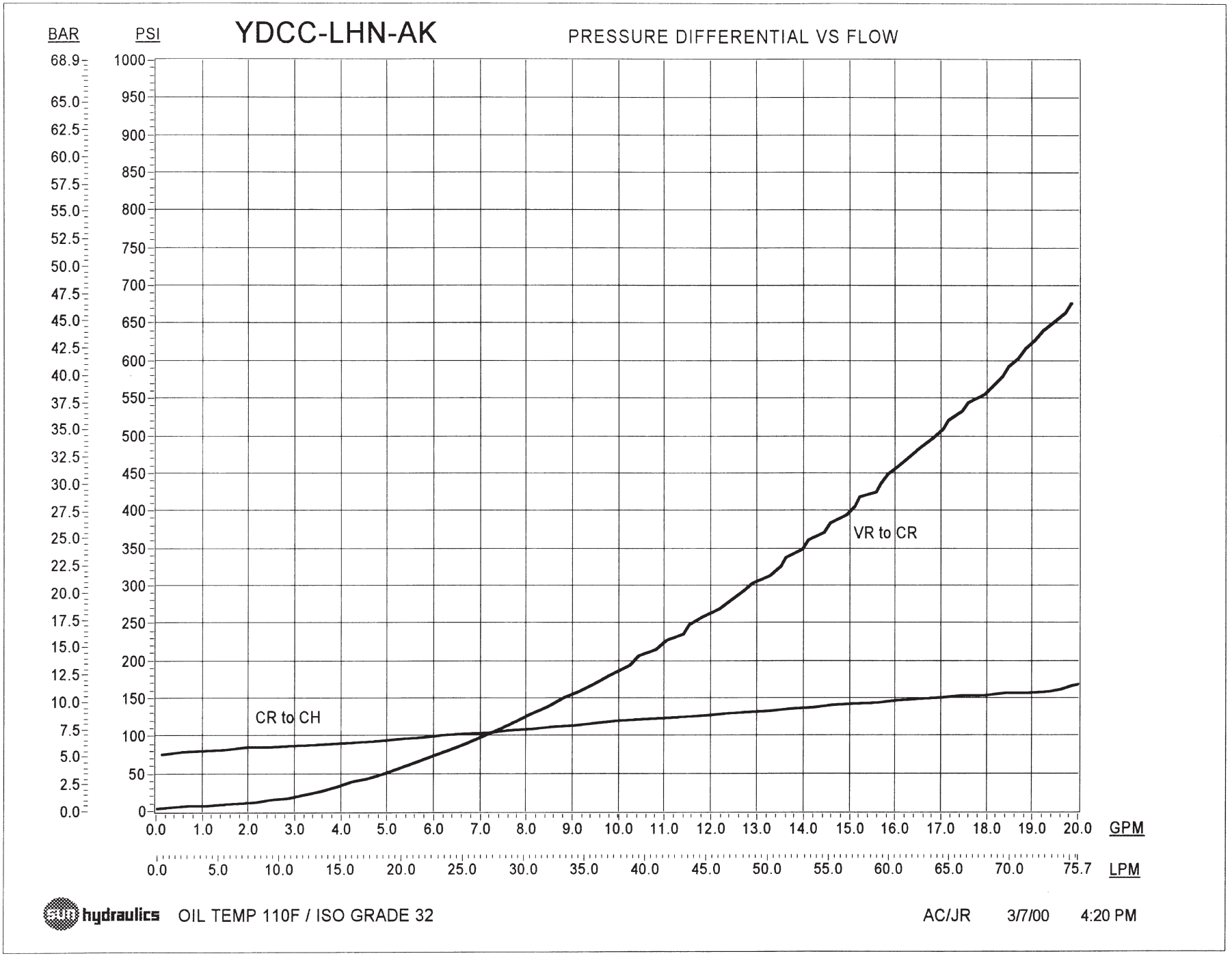
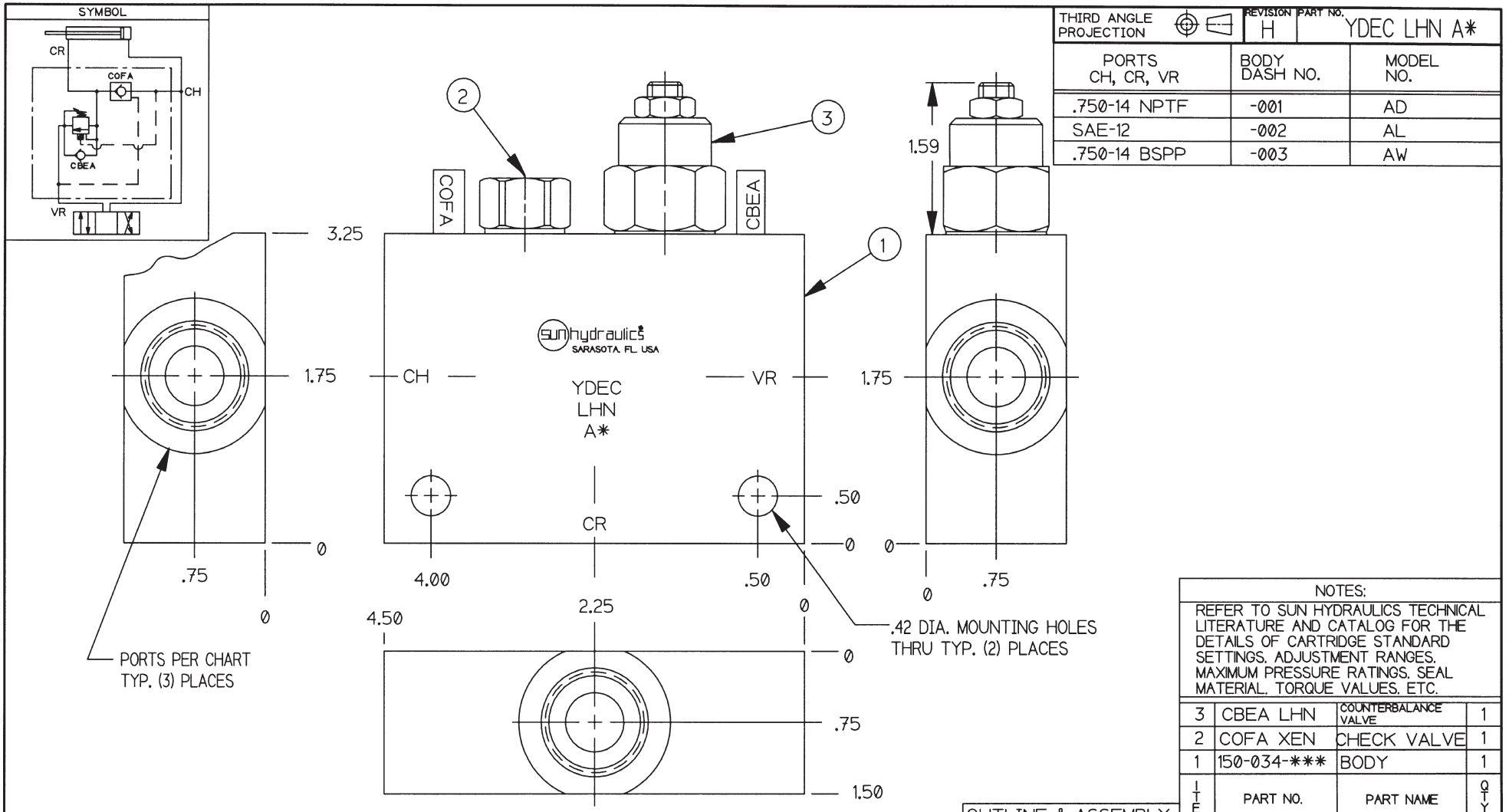
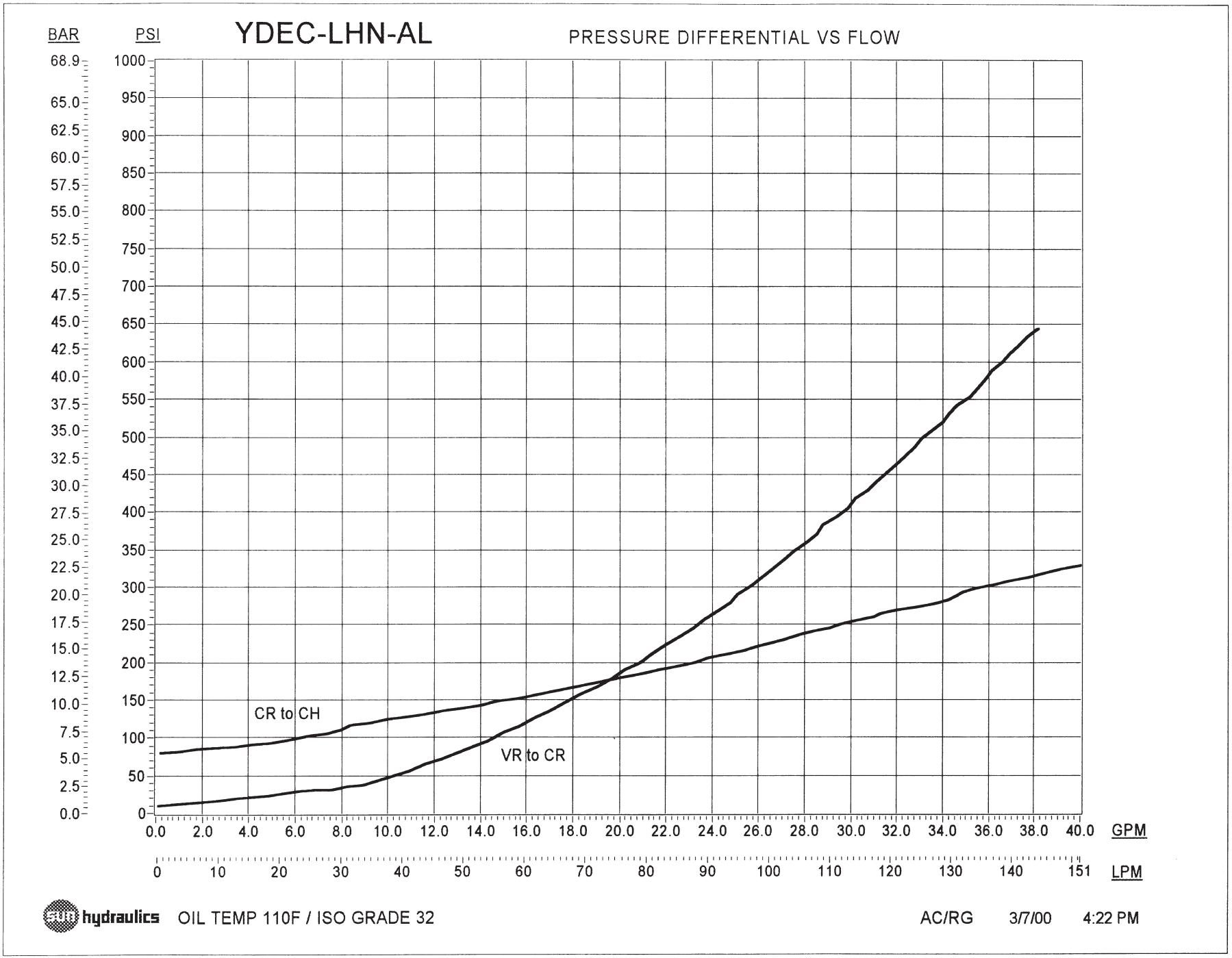
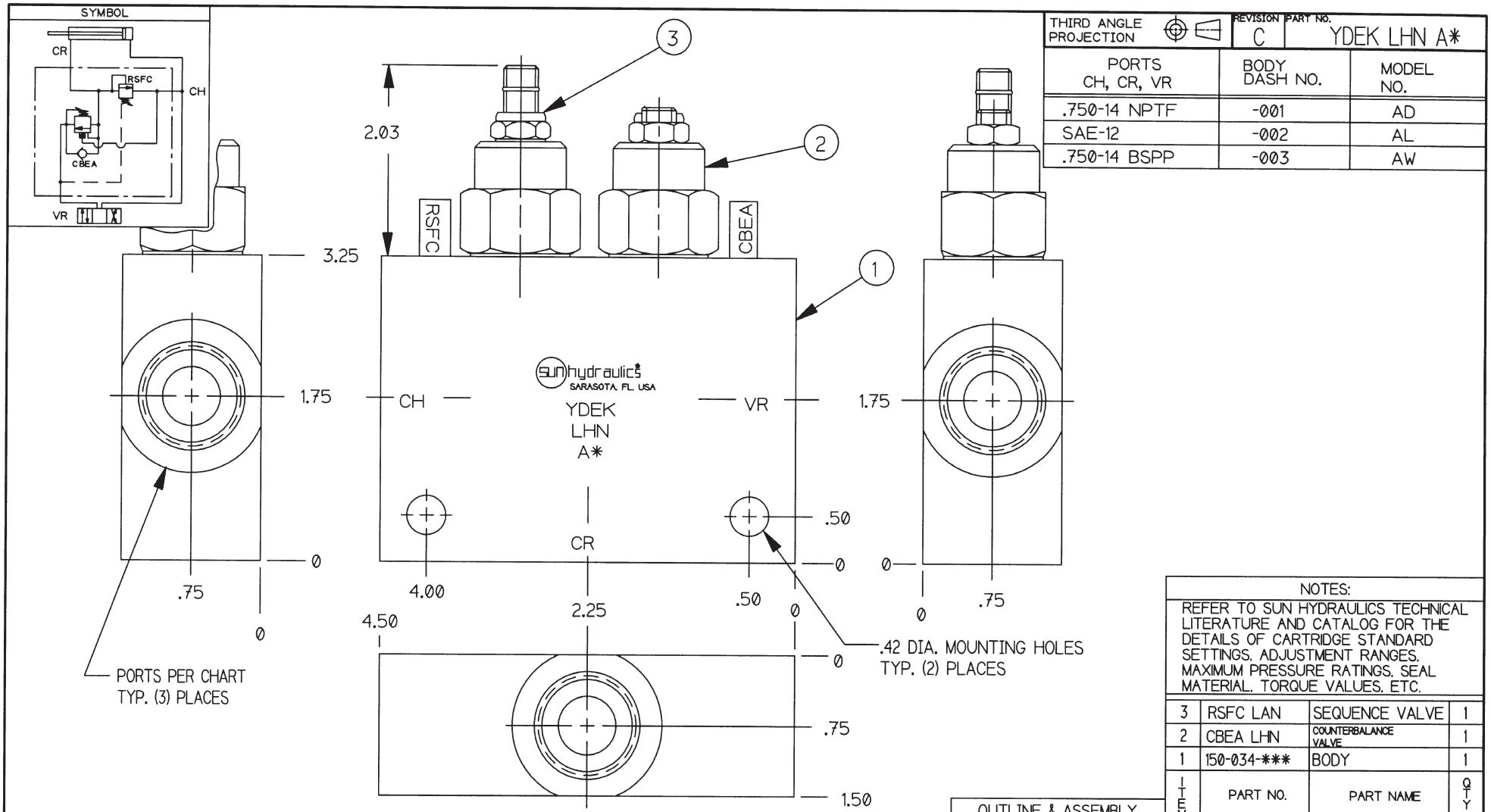

BAR
PSI
YDGI-XCN-CA
PRESSURE DIFFERENTIAL VS FLOW
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
A to CR
B to CH
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:14 AM




YDCC-LHN-AK
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.7 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:20 PM




YDEC-LHN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
CR to CH
VR to CR
0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 151 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/RG 3/7/00 4:22 PM




| 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.

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

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VAVLE 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 | 25JUN88 | RJC | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/- .030
.XX = +/- .015
.XXX = +/- .005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

| TITLE | SCALE | REF | MATERIAL |
|---|---|---|---|
| PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED | 1 : 1 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| HHP | JDA | | |
| DATE 24OCT79 | DATE 30OCT79 | DATE | |

| REVISION | PART NO. |
|---|---|
| C | YDEK LHN A* |

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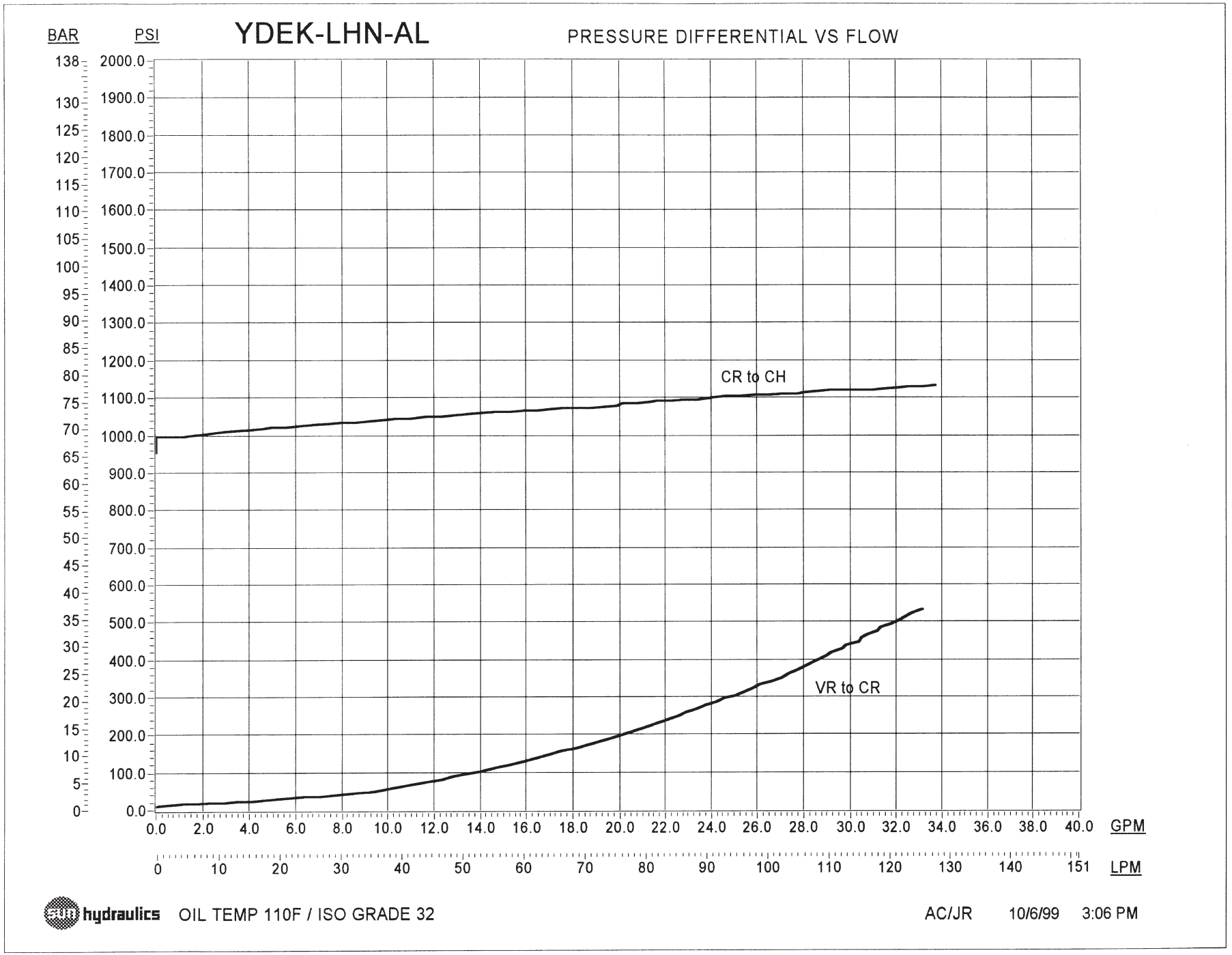
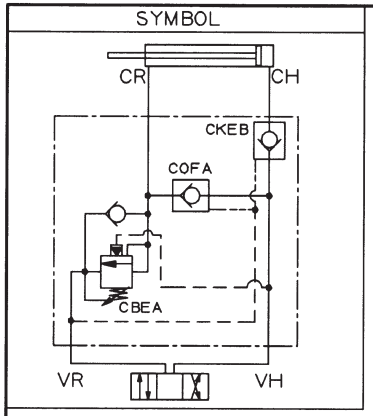
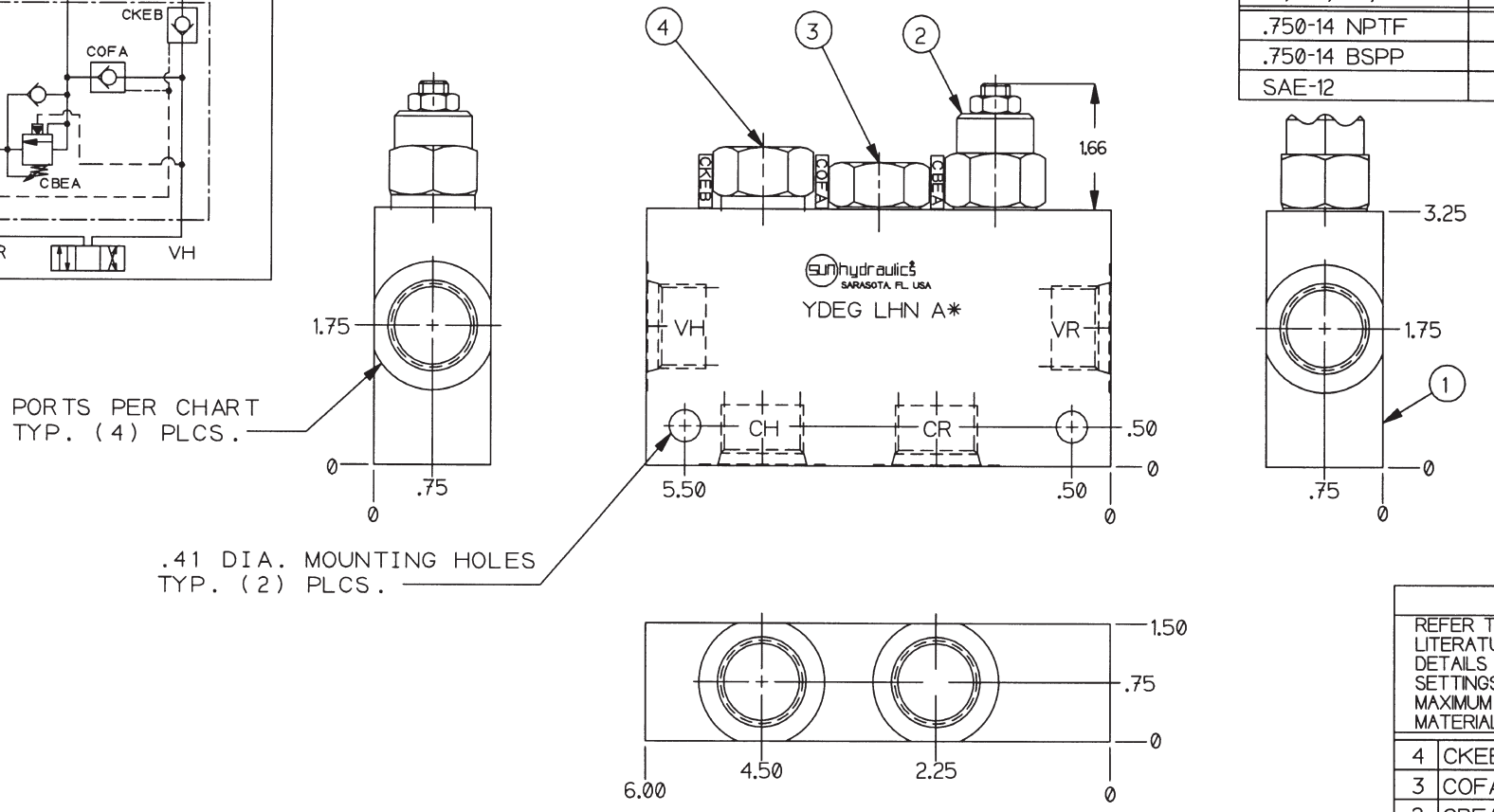

YDEK-LHN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
138 130 125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0
2000.0 1900.0 1800.0 1700.0 1600.0 1500.0 1400.0 1300.0 1200.0 1100.0 1000.0 900.0 800.0 700.0 600.0 500.0 400.0 300.0 200.0 100.0 0.0
CR to CH
VR to CR
0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 151 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 10/6/99 3:06 PM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | E | YDEG 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 XCN | CHECK VALVE | 1 |
| 3 | COFA XEN | CHECK VALVE | 1 |
| 2 | CBEA LHN | COUNTERBALANCE VALVE | 1 |
| 1 | 150-030-*** | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| E | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| D | CKEB XCN WAS CKEA XAN | 18JUL88 | RC | | |
| C | CKEA XAN WAS CPEA XAN | 20SEP82 | RJC | | |
| B | 3.25 WAS 3.00 REMOVED 340-001 | 03NOV80 | RJC | | |
| A | REDRAWN A SIZE OBSOLETED | 10AUG78 | JDA | HHP | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\-1
FINISH 80 √
REMOVE ALL BURRS

| TITLE | REVISION | PART NO. |
|---|---|---|
| PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED | E | YDEG LHN A* |

| SCALE | REF | MATERIAL |
|---|---|---|
| 1 : 1.5 | YDEA LAN A* YDEB LAN AD YDEC LAN AD | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| HHP | | | |
| DATE 10AUG78 | DATE | DATE | |

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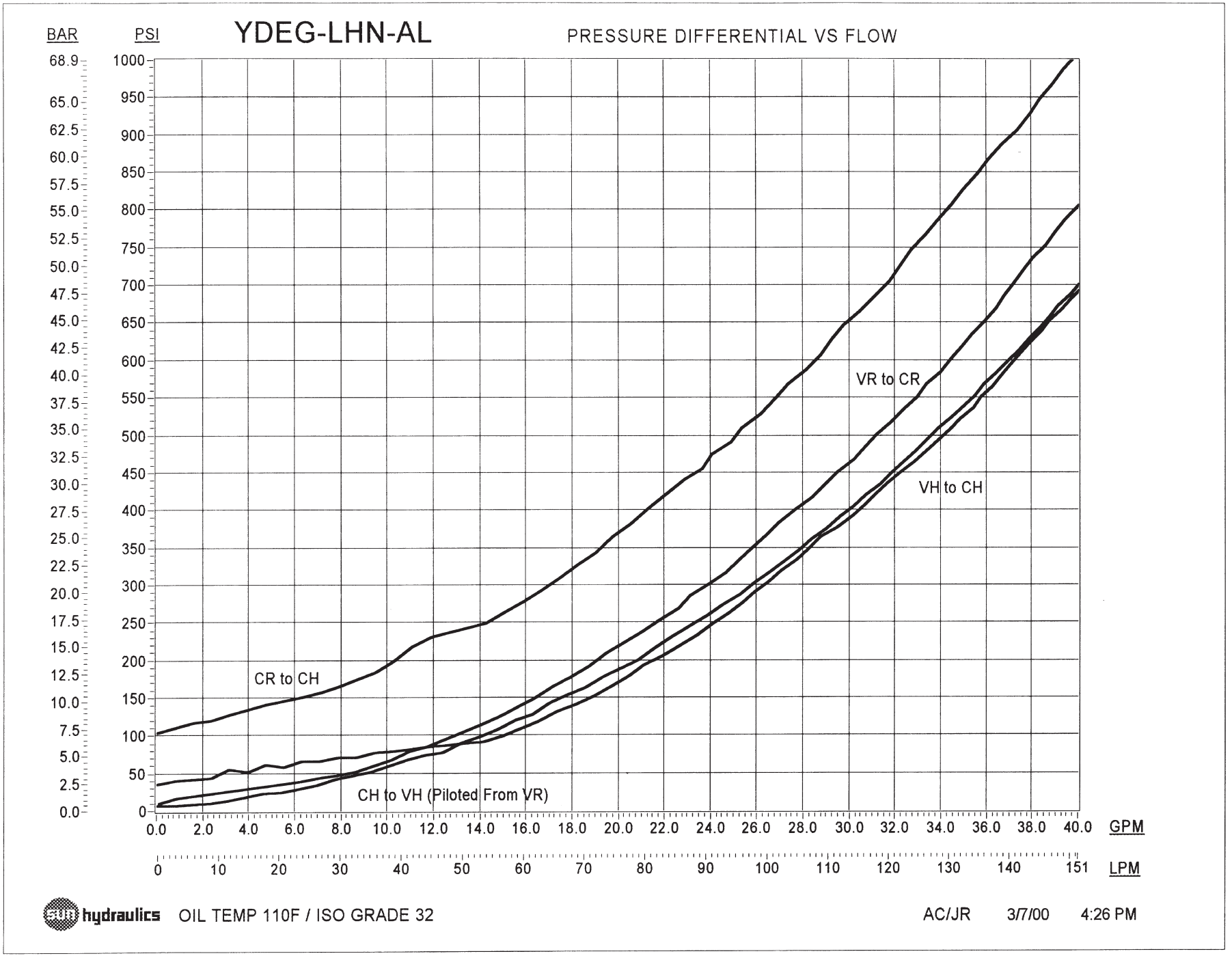
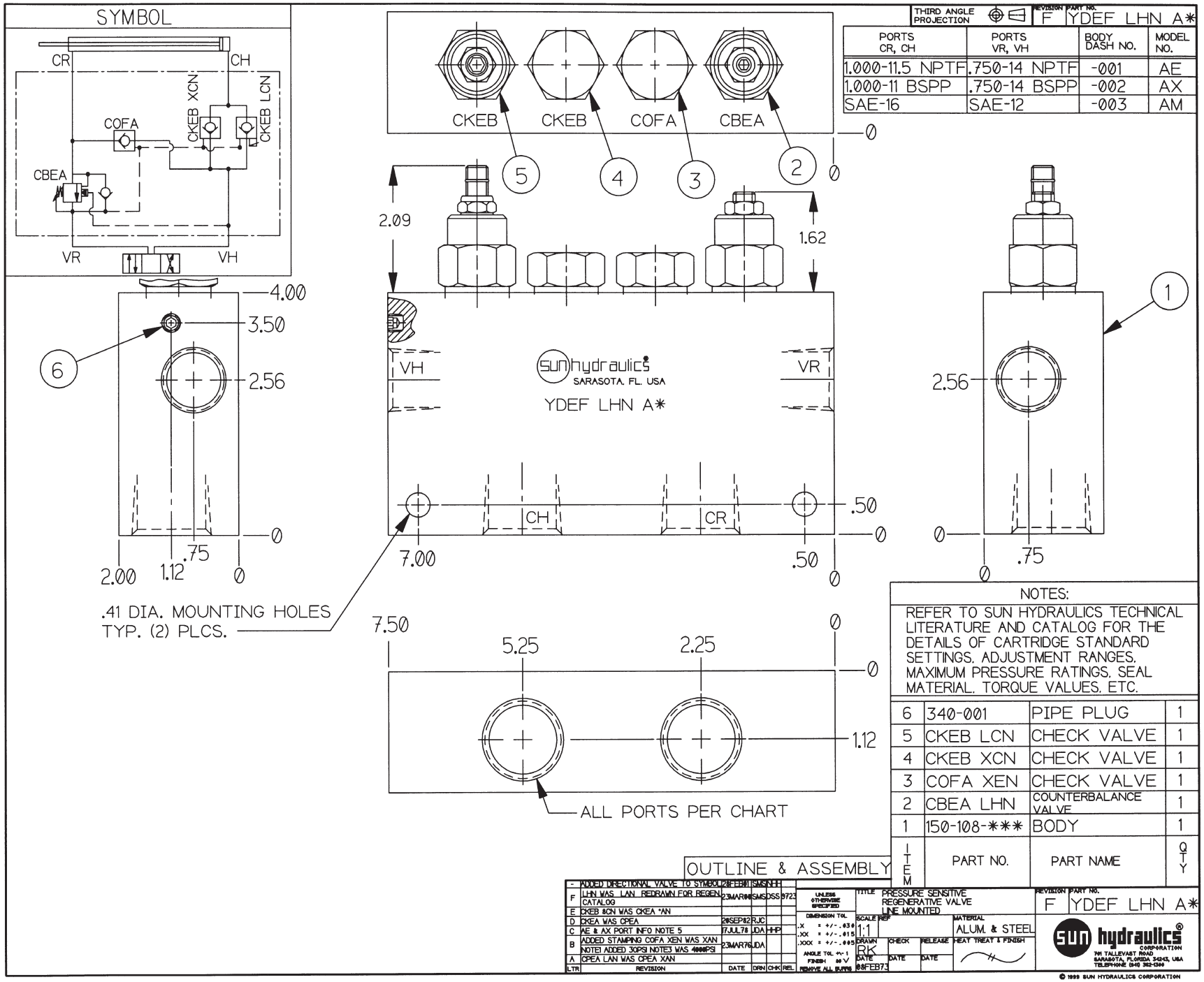

YDEG-LHN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
VH to CH
CR to CH
CH to VH (Piloted From VR)
0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 151 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:26 PM




THIRD ANGLE PROJECTION

REVISION F PART NO. YDEF LHN A*

| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB81 | SMS | NH | |
| F | LHN WAS LAN REDRAWN FOR REGEN CATALOG | 23MAR88 | SMS | DSS | 9723 |
| E | CKEB &CN WAS CKEA *AN | | | | |
| D | CKEA WAS CPEA | 28SEP82 | RJC | | |
| C | AE & AX PORT INFO NOTE 5 | 17JUL78 | JDA | HP | |
| B | ADDED STAMPING COFA XEN WAS XAN NOTE1 ADDED 30PSI NOTE3 WAS 4000PSI | 23MAR76 | JDA | | |
| A | CPEA LAN WAS CPEA XAN | | | | |

UNLESS OTHERWISE SPECIFIED: DIMENSION TOL .X ± +/-.030, .XX ± +/-.015, .XXX ± +/-.005; ANGLE TOL +/- 1; FINISH 63 √; REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED

REVISION F PART NO. YDEF LHN A*

SCALE REF 1:1 | MATERIAL ALUM. & STEEL | HEAT TREAT & FINISH

DRAWN RK 08FEB73 | CHECK | DATE | RELEASE | DATE

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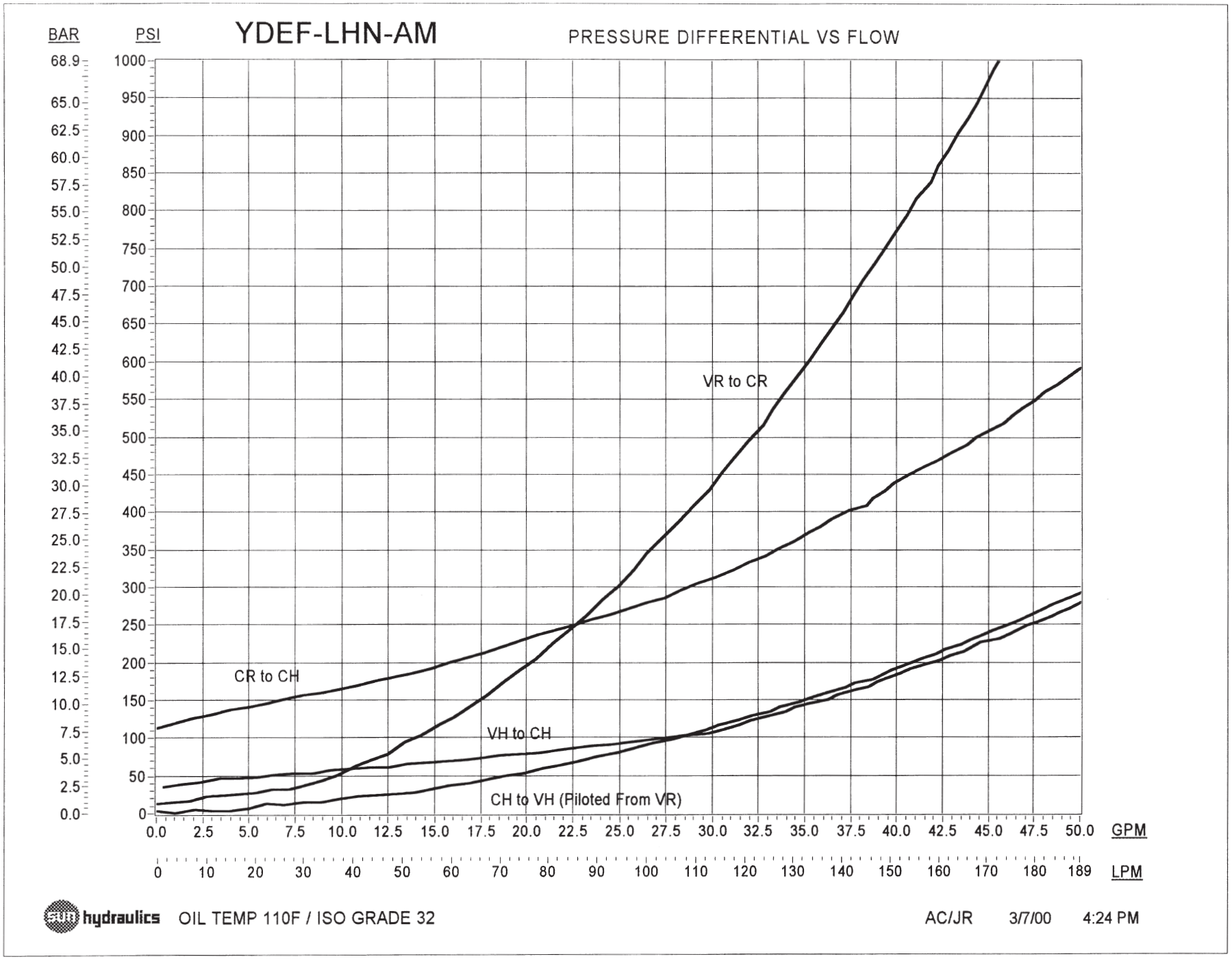
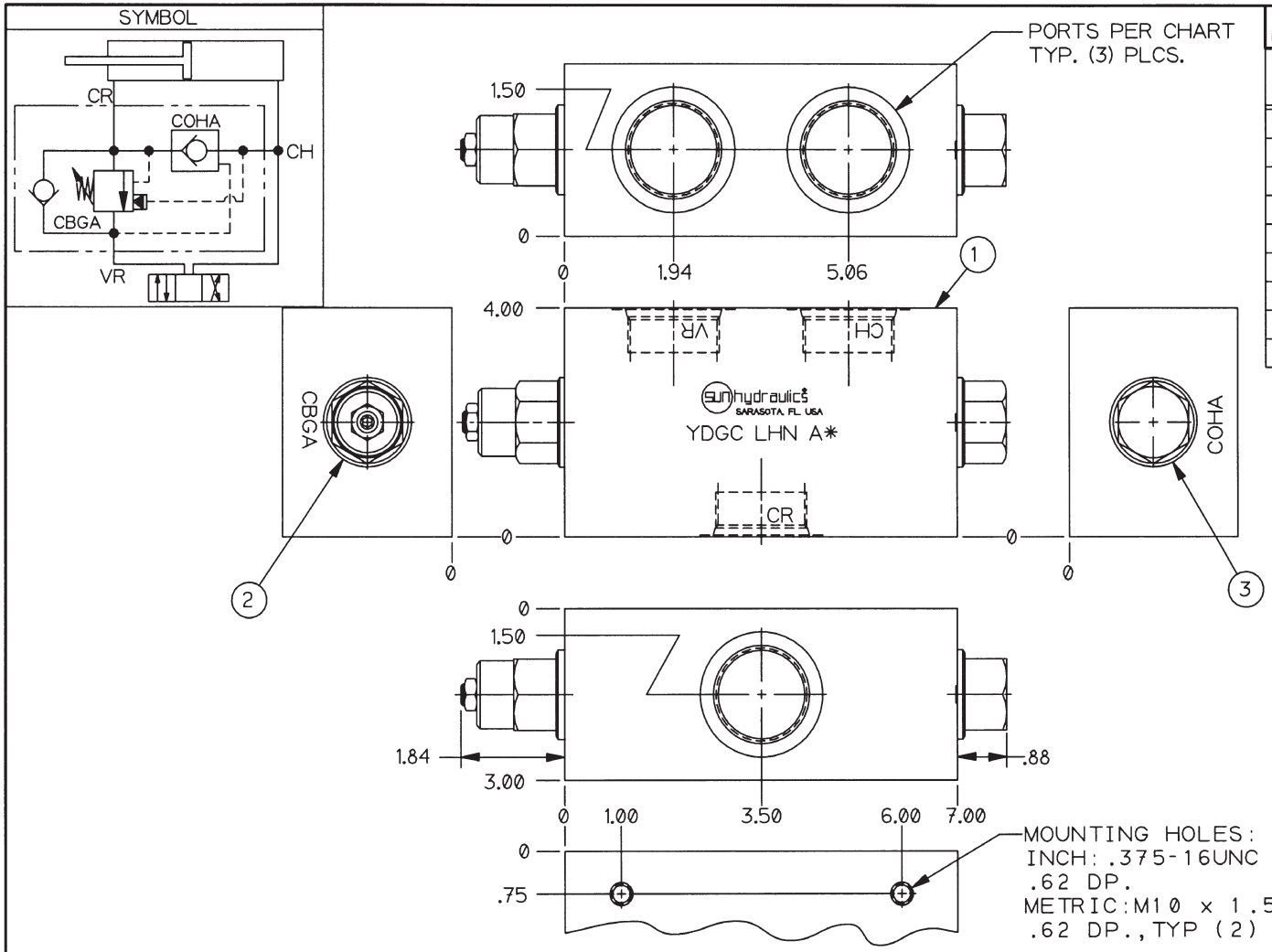
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDEF-LHN-AM
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
VH to CH
CH to VH (Piloted From VR)
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
sun hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:24 PM




THIRD ANGLE PROJECTION

REVISION: D

PART NO.: 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| D | REDRAWN FOR REGEN CATALOG LHN WAS LAN | 23MAR00 | SMS | DSS | 3723 |
| C | REDRAWN ON CADD, ADDED NOTES 2 & 6 | 29 JUL 93 | BRS | RJB | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE

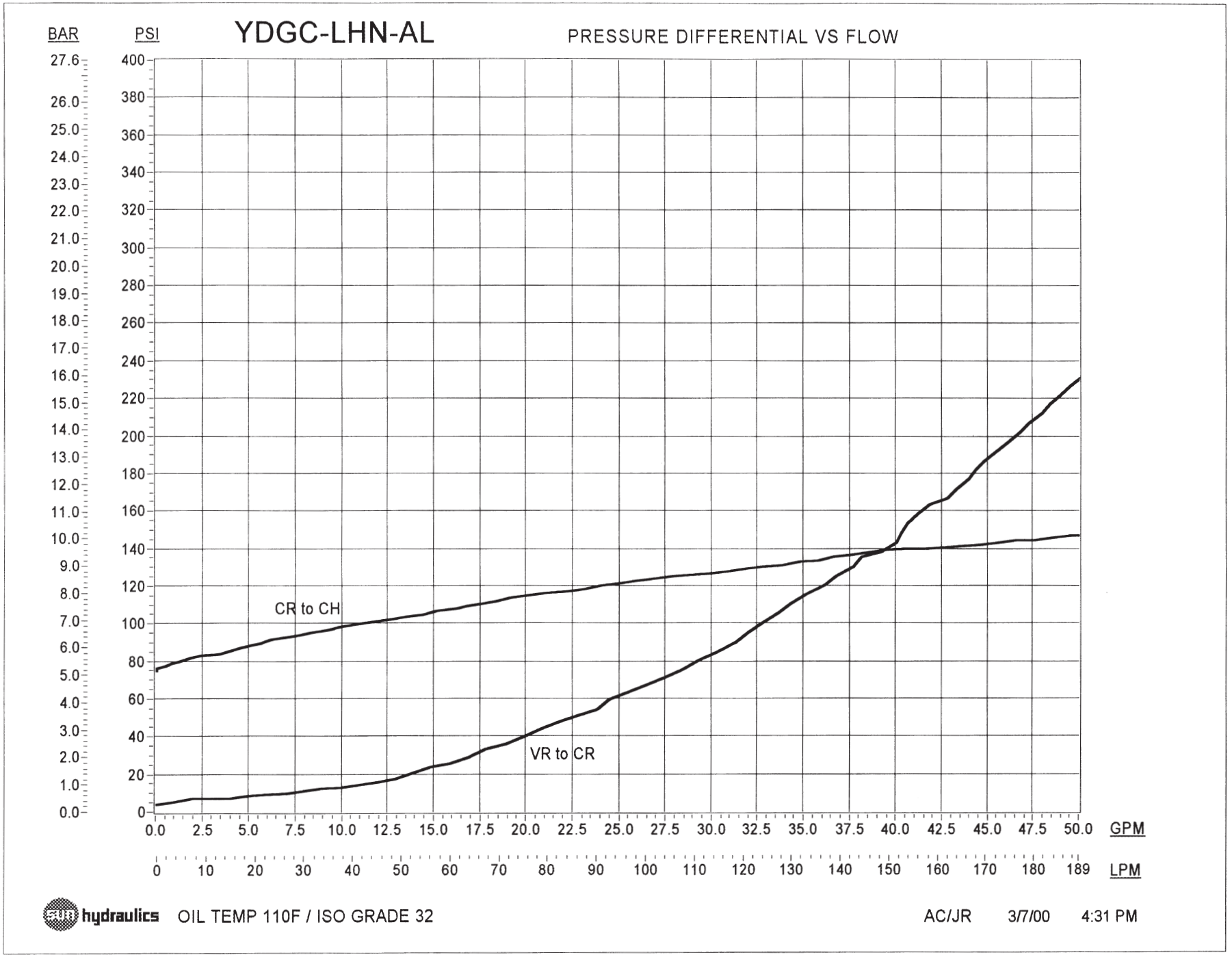
SCALE: 1:2 | REF | MATERIAL: ALUMINUM

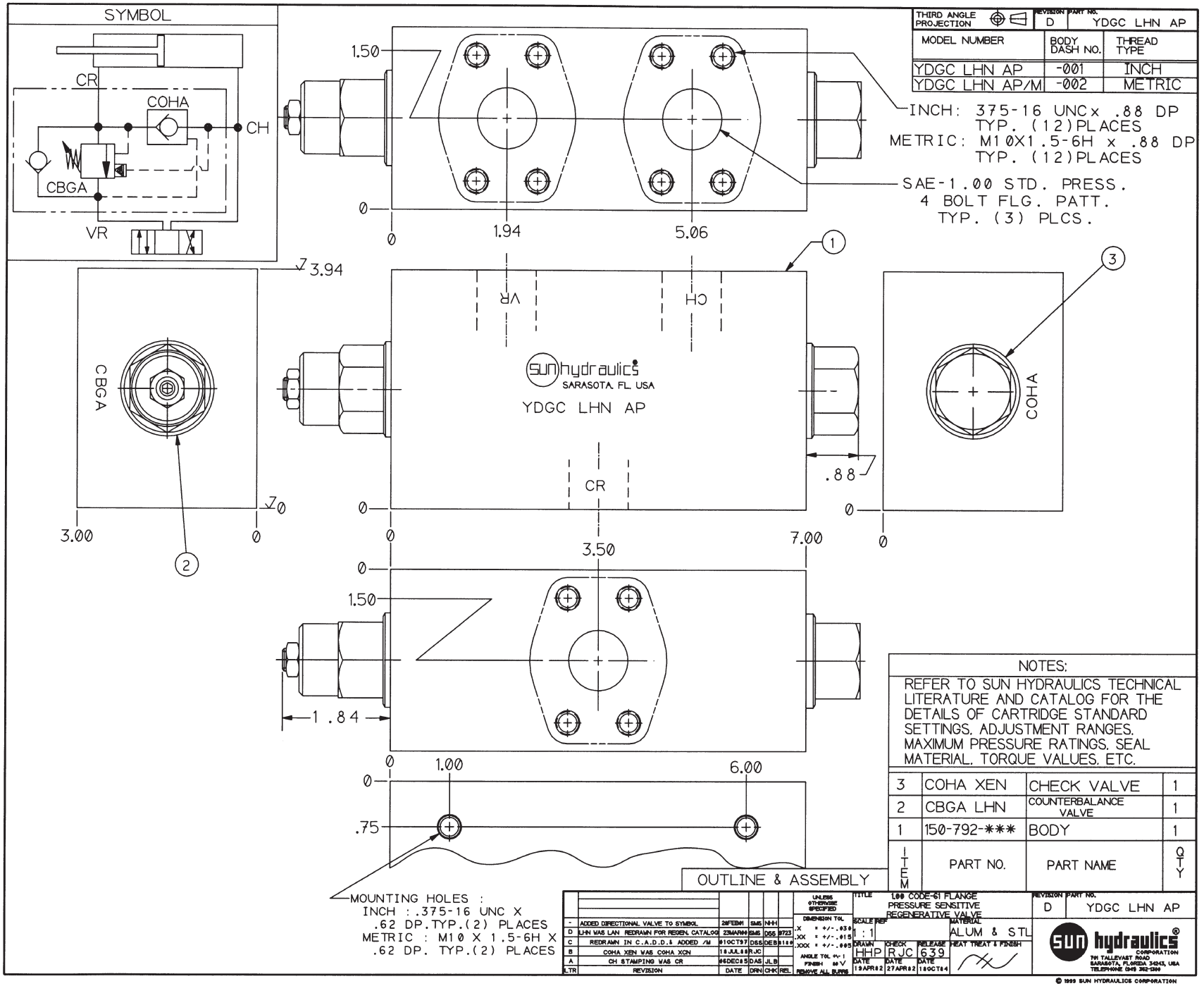
| DRAWN | CHECK | RELEASE |
|---|---|---|
| HHP | RJC | 639 |
| DATE 19APR82 | DATE 27APR82 | DATE 18OCT82 |

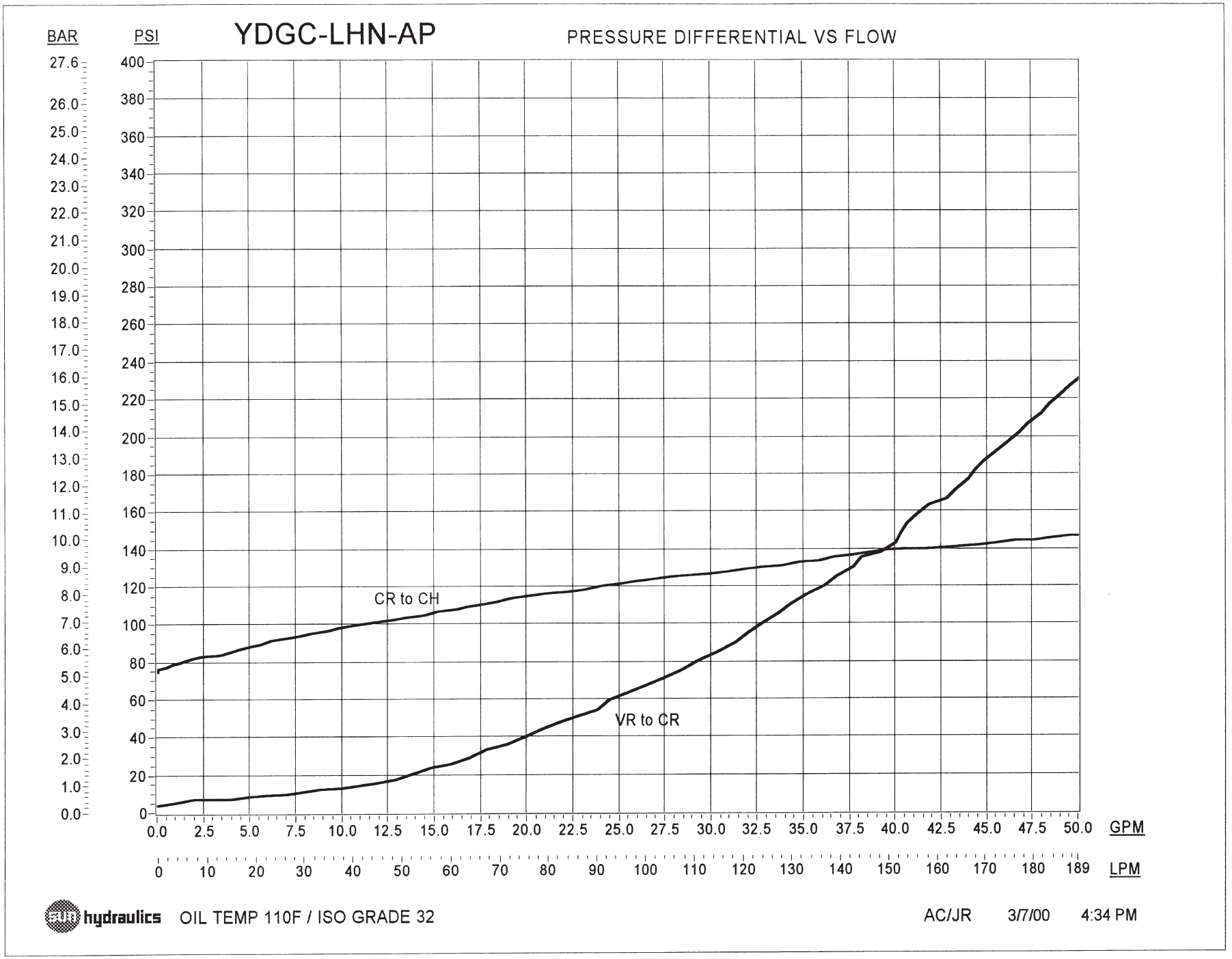
HEAT TREAT & FINISH

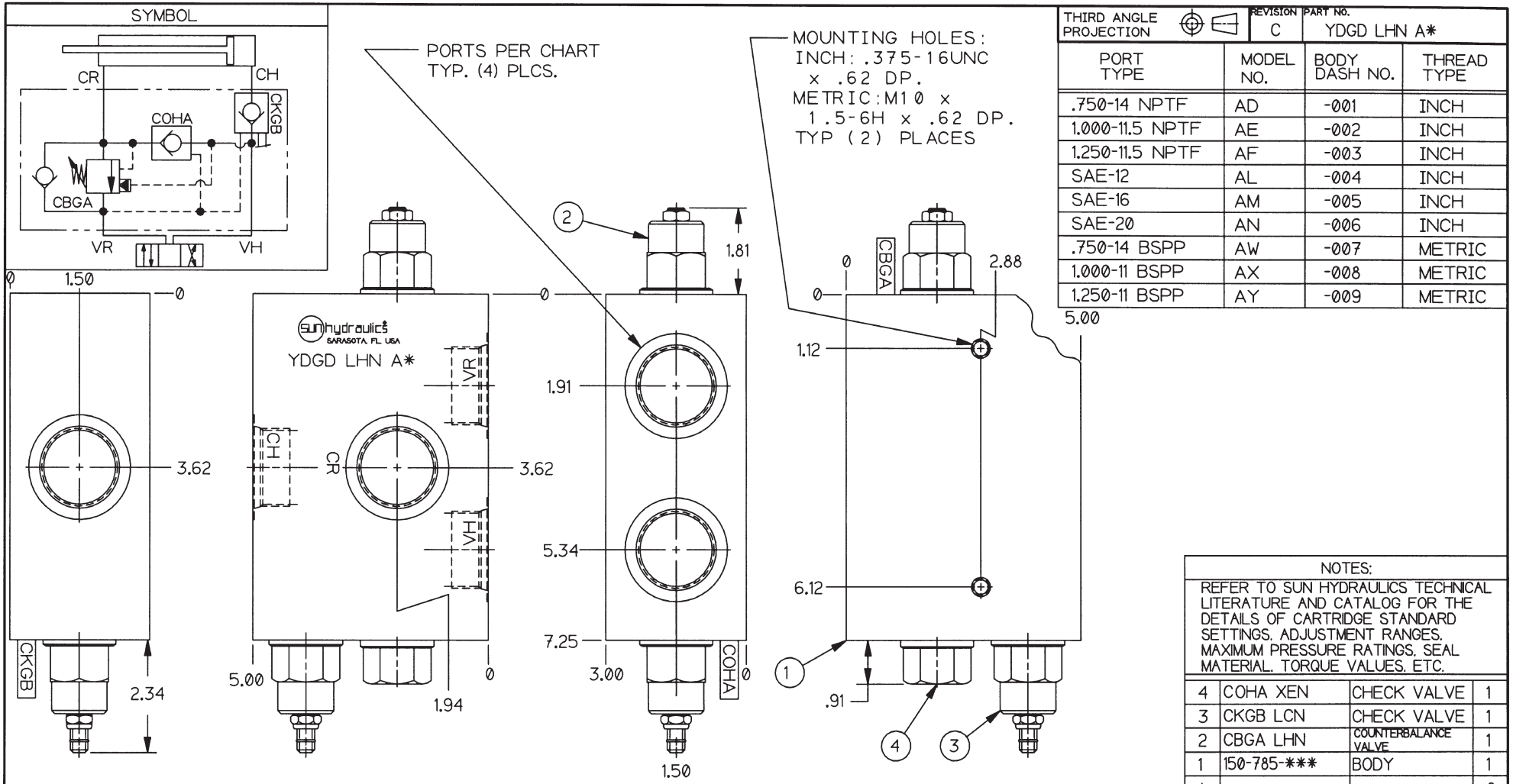
REVISION: D | PART NO.: YDGC LHN A*

sun hydraulics® CORPORATION
791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1399


BAR
PSI
YDGC-LHN-AL
PRESSURE DIFFERENTIAL VS FLOW
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:31 PM


SYMBOL
CR
COHA
CH
CBGA
VR
THIRD ANGLE PROJECTION
REVISION D
PART NO. 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.
1.50
0
1.94
5.06
3.94
sun hydraulics
SARASOTA, FL USA
YDGC LHN AP
.88
3.00
7.00
3.50
1.84
1.00
6.00
.75
MOUNTING HOLES : INCH : .375-16 UNC X .62 DP. TYP.(2) PLACES METRIC : M10 X 1.5-6H X .62 DP. TYP.(2) PLACES
OUTLINE & ASSEMBLY
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
LTR | REVISION | DATE | DRN | CHK | REL
D | ADDED DIRECTIONAL VALVE TO SYMBOL | 26FEB91 | SMS | N-H
C | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR94 | SMS | DSS | 9723
B | REDRAWN IN C.A.D.D.S ADDED /M | #10CT97 | DSS | DEB | 9118
A | COHA XEN WAS COHA XCN | 18JUL88 | RJC
- | CH STAMPING WAS CR | #6DEC88 | DAS | JLB
UNLESS OTHERWISE SPECIFIED
DIMENSION TOL .X ± +/-.030 .XX ± +/-.015 .XXX ± +/-.005
ANGLE TOL +/- 1
FINISH 80 V
REMOVE ALL BURRS
TITLE L88 CODE-61 FLANGE PRESSURE SENSITIVE REGENERATIVE VALVE
SCALE REF : 1
MATERIAL ALUM & STL
DRAWN HHP 19APR82
CHECK RJC DATE 27APR82
RELEASE 639 DATE 18OCT84
HEAT TREAT & FINISH
REVISION D PART NO. YDGC LHN AP
sun hydraulics CORPORATION
TM TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (813) 362-1399
© 1999 SUN HYDRAULICS CORPORATION


YDGC-LHN-AP
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:34 PM




| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| - | CORRECTED MTG. HOLE VIEW | 20DEC00 | SMS | DSS | |
| C | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| B | DRAWING PART NO. WAS YDGD LAN A*, ITEM 2 WAS CBGA LAN | 11 MAY94 | BRS | | |
| - | ITEM 3 WAS CKGA LBN, #2 WAS COHA XCN | 18 JUL88 | RJC | | |
| A | ADDED METRIC MOUNTING HOLE NOTE. | 14 NOV85 | DAS | RJB | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 √
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| HHP | RJC | 639 | |
| DATE 22APR82 | DATE 27APR82 | DATE 18OCT84 | |

| REVISION | PART NO. |
|---|---|
| C | YDGD LHN A* |

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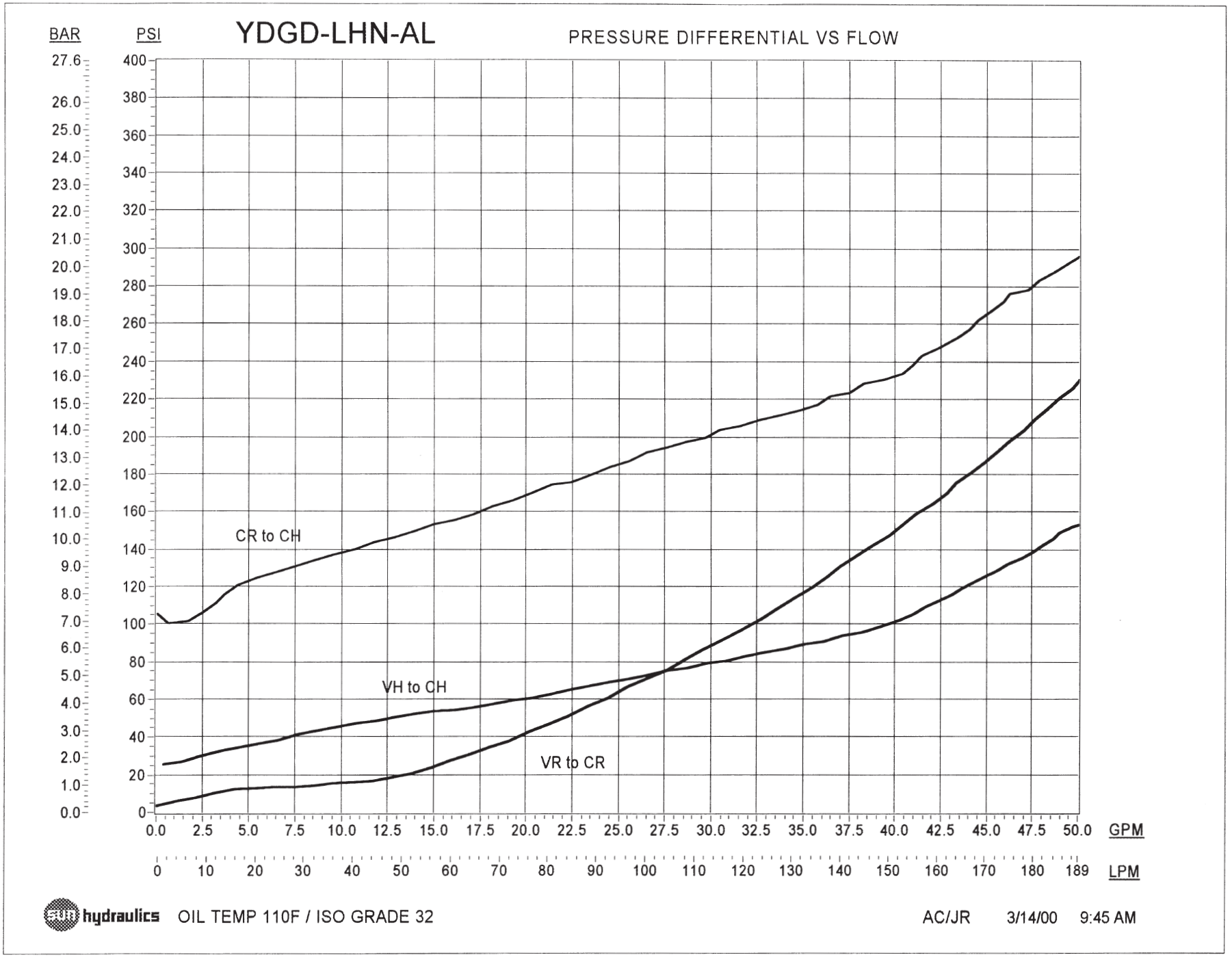
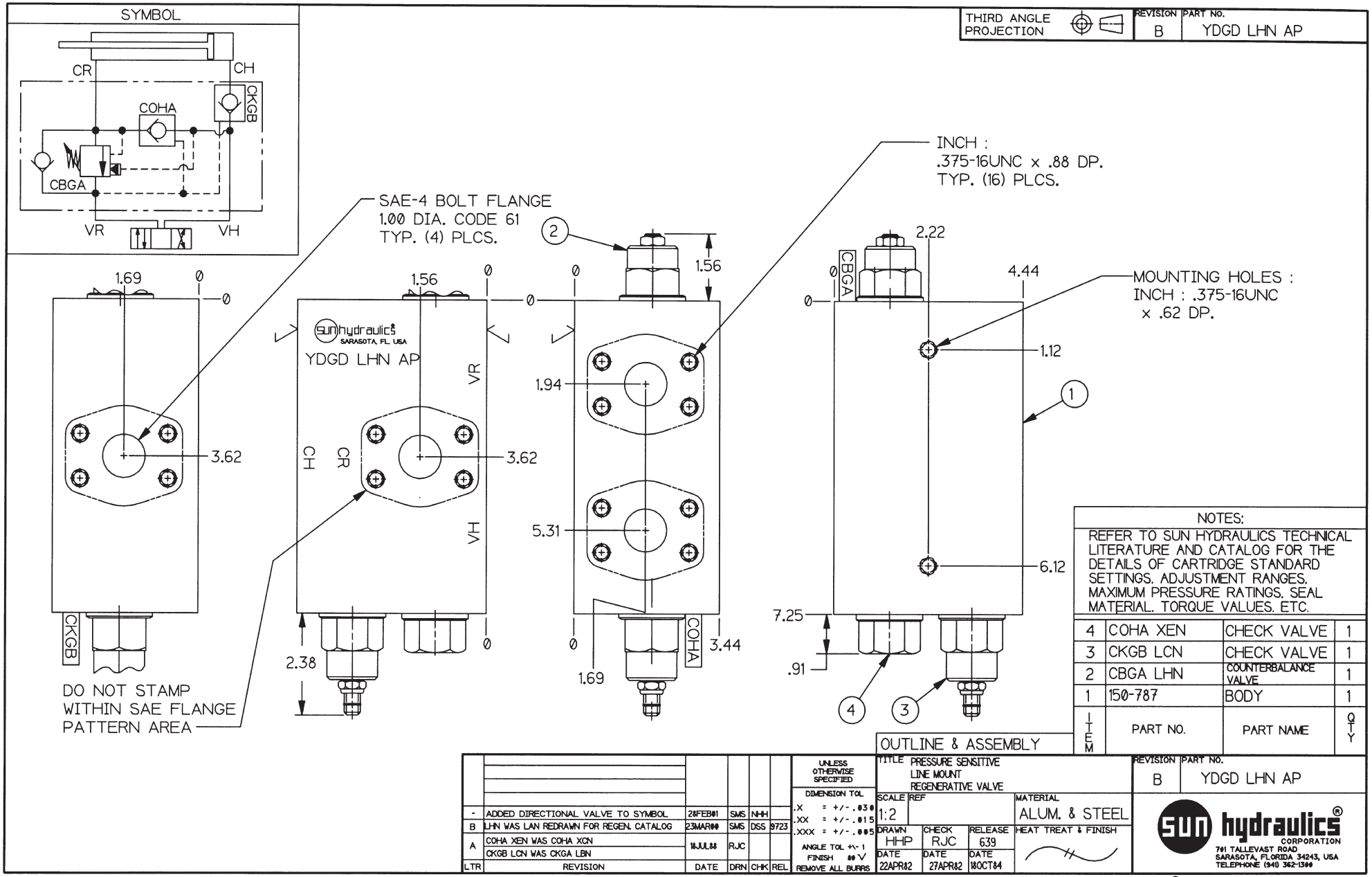
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDGD-LHN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VH to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/14/00 9:45 AM


SYMBOL
CR
CH
COHA
CKGB
CBGA
VR
VH
THIRD ANGLE PROJECTION
REVISION B
PART NO. YDGD LHN AP
SAE-4 BOLT FLANGE
1.00 DIA. CODE 61
TYP. (4) PLCS.
INCH :
.375-16UNC x .88 DP.
TYP. (16) PLCS.
MOUNTING HOLES :
INCH : .375-16UNC
x .62 DP.
sun hydraulics
SARASOTA, FL USA
YDGD LHN AP
1.69
1.56
2.22
4.44
1.12
1.94
3.62
5.31
6.12
7.25
.91
2.38
3.44
DO NOT STAMP
WITHIN SAE FLANGE
PATTERN AREA
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
OUTLINE & ASSEMBLY
LTR | REVISION | DATE | DRN | CHK | REL
- | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH
B | LHN WAS LAN REDRAWN FOR REGEN CATALOG | 23MAR00 | SMS | DSS | 9723
A | COHA XEN WAS COHA XCN<br>CKGB LCN WAS CKGA LBN | 18JUL88 | RJC
UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 88 V
REMOVE ALL BURRS
TITLE PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE
SCALE 1:2
REF
MATERIAL ALUM. & STEEL
HEAT TREAT & FINISH
DRAWN HHP DATE 22APR82
CHECK RJC DATE 27APR82
RELEASE 639 DATE 18OCT84
REVISION B
PART NO. YDGD LHN AP
sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200
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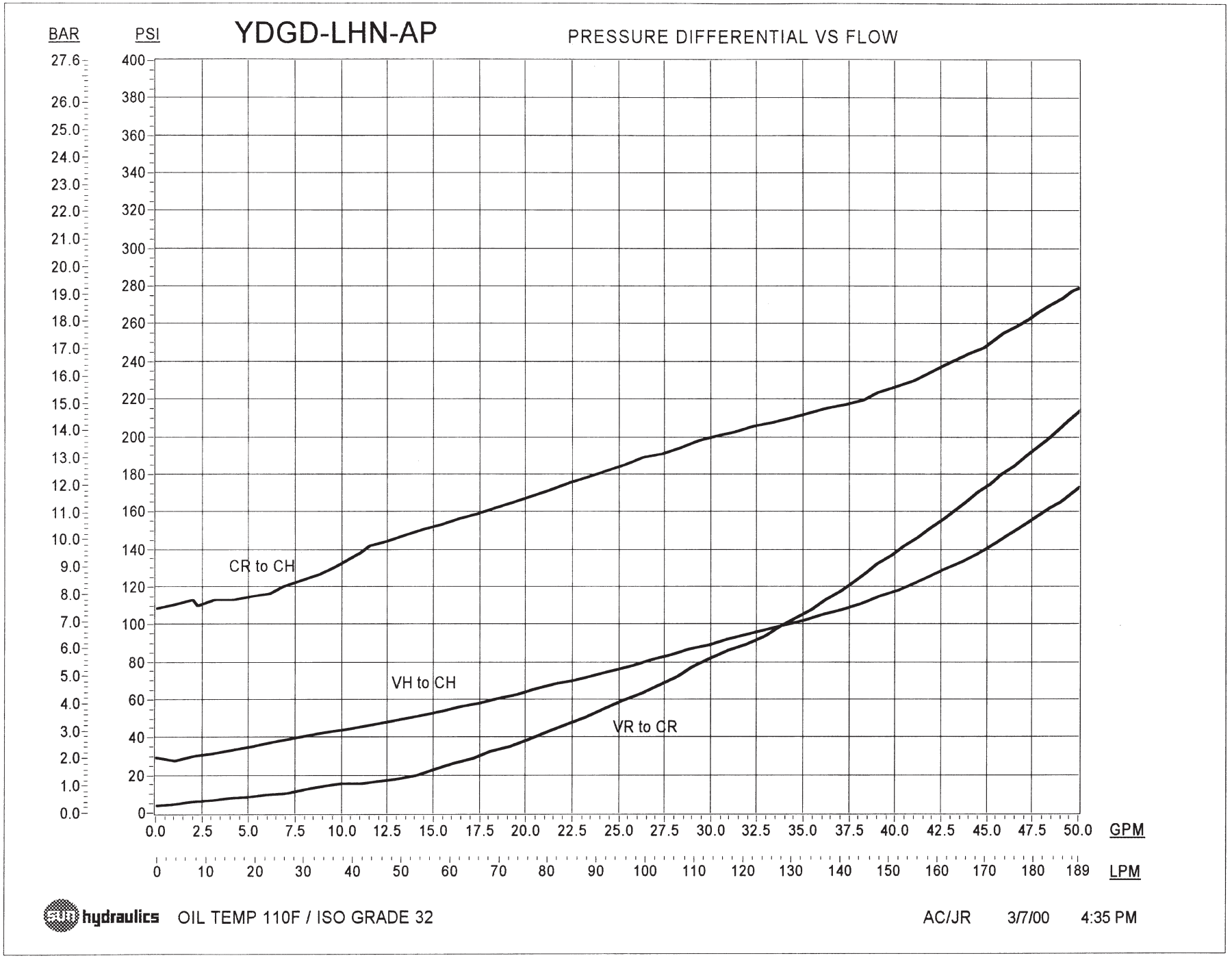
YDGD-LHN-AP
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
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400
380
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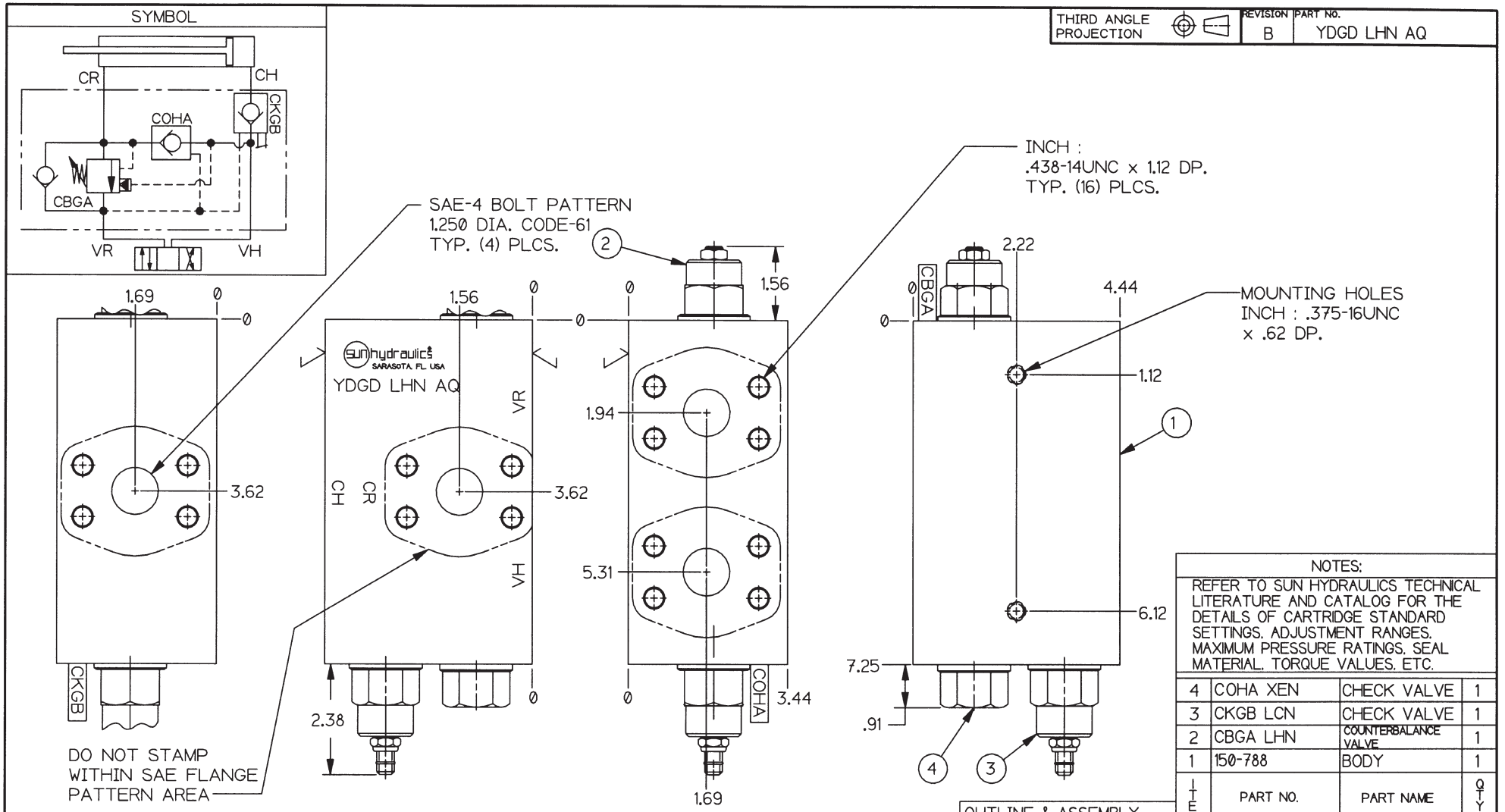
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VH to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO 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.

| 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 | 150-788 | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| B | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| A | COHA XEN WAS COHA XCN<br>CKGB LCN WAS CKGA LBN | 18JUL88 | RJC | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 √
REMOVE ALL BURRS

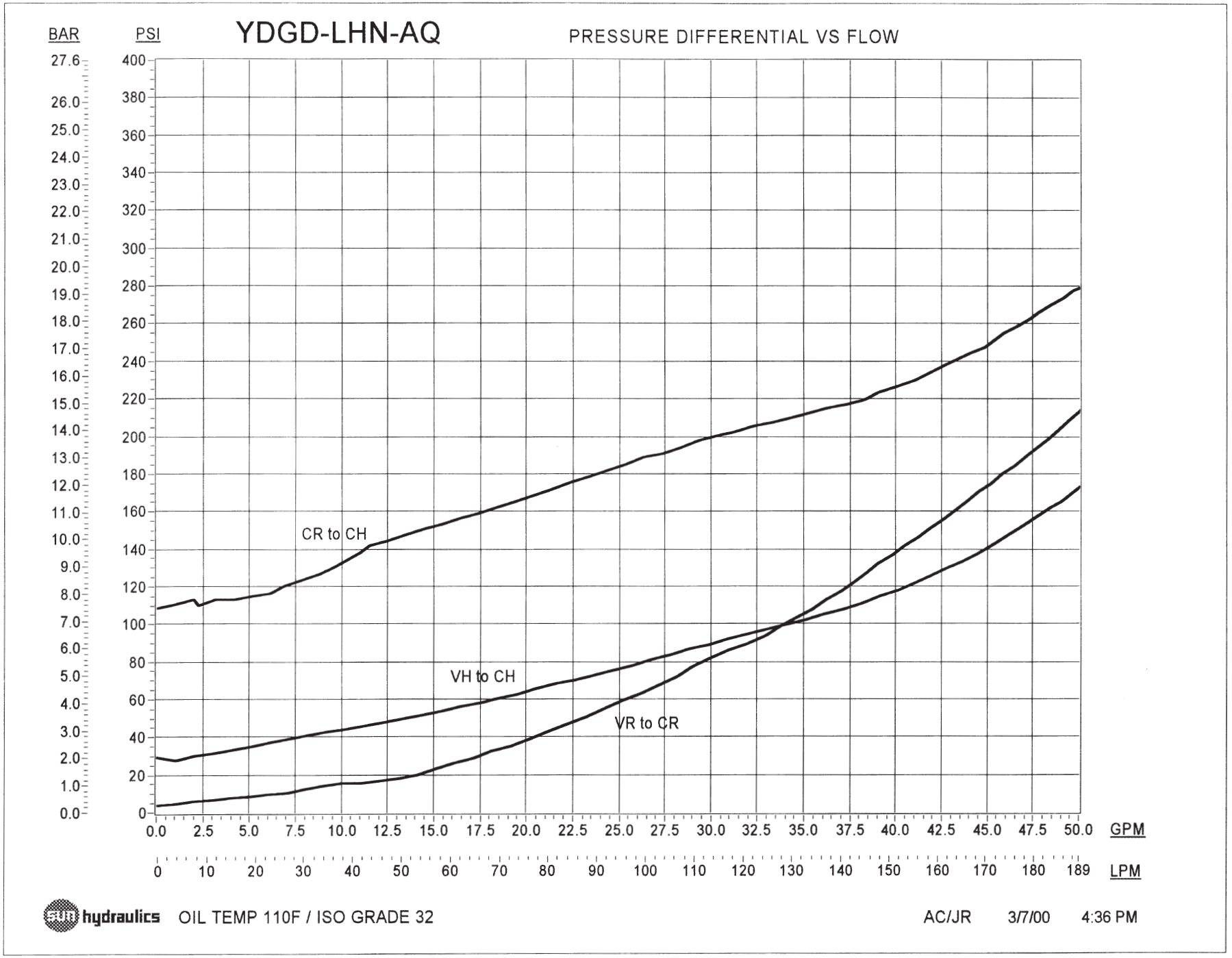
TITLE: PRESSURE SENSITIVE LINE MOUNT REGENERATIVE VALVE

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| HHP | RJC | 639 | |
| DATE 22APR82 | DATE 27APR82 | DATE 18OCT84 | |

| REVISION | PART NO. |
|---|---|
| B | YDGD LHN AQ |

sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1369


YDGD-LHN-AQ
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
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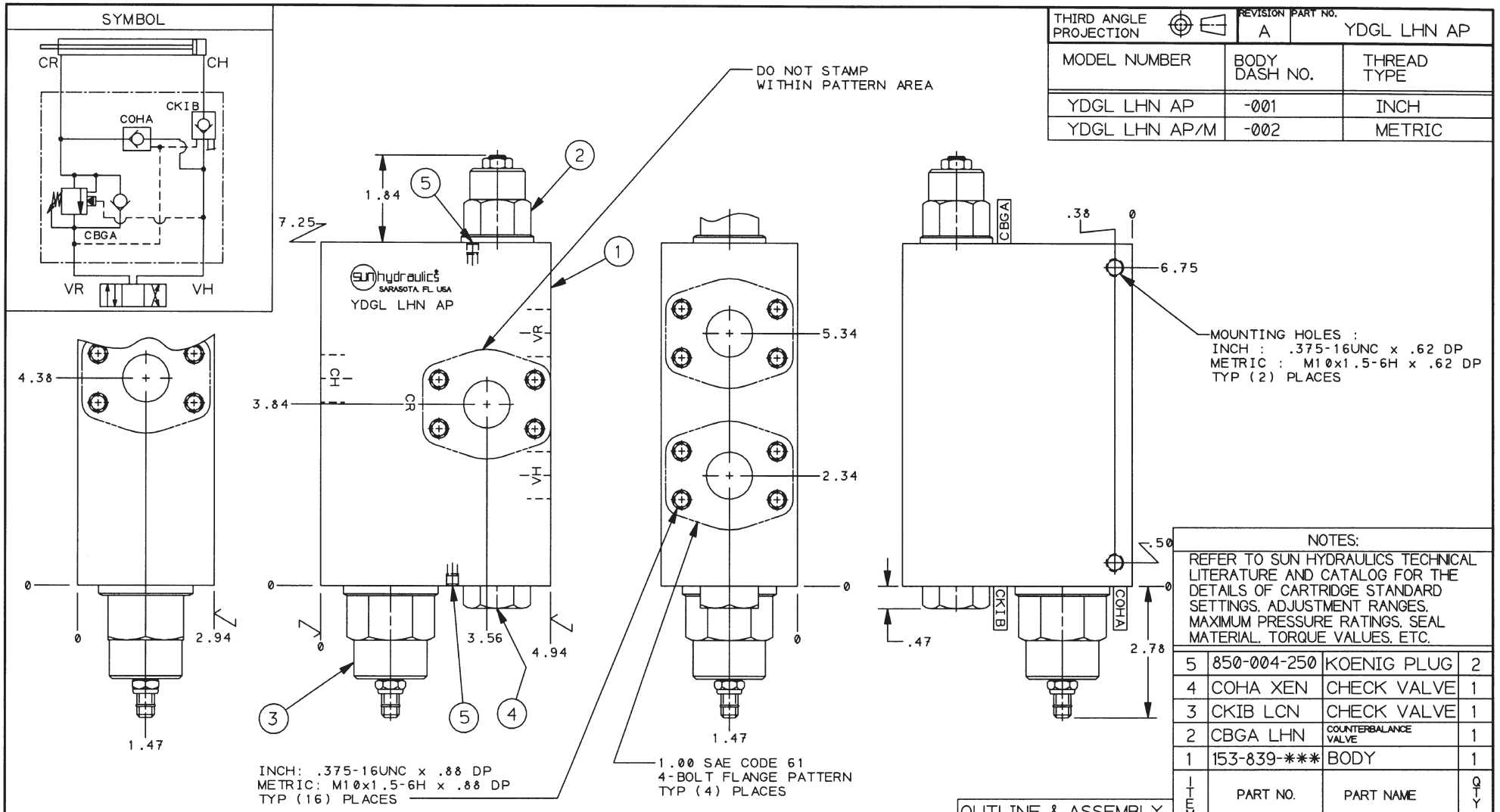
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VH to CH
VR to CR
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:36 PM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | A | 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.

| 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 | 153-839-*** | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| A | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\-1
FINISH 88 √
REMOVE ALL BURRS

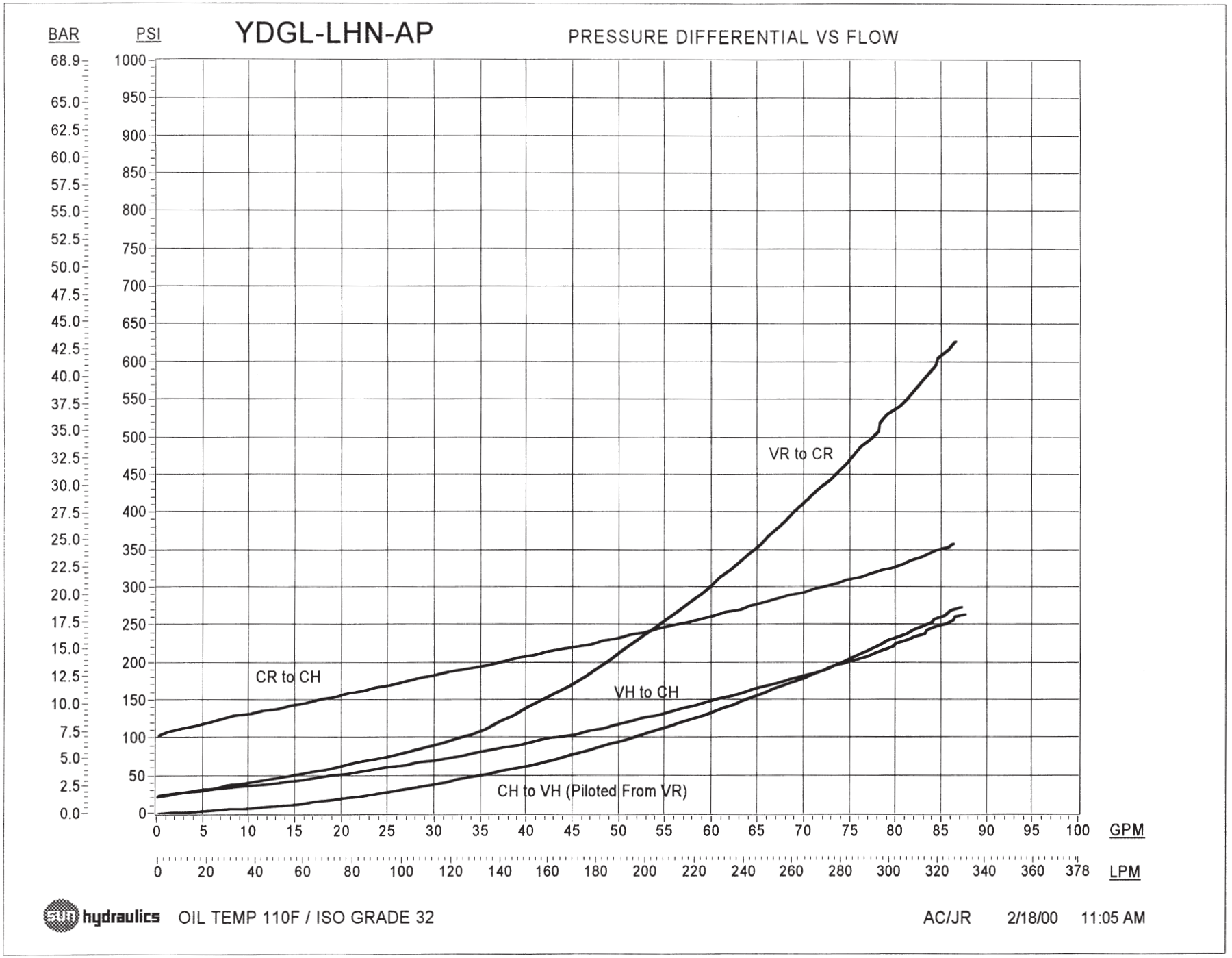
TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE 1.00 CODE-61 FLANGE

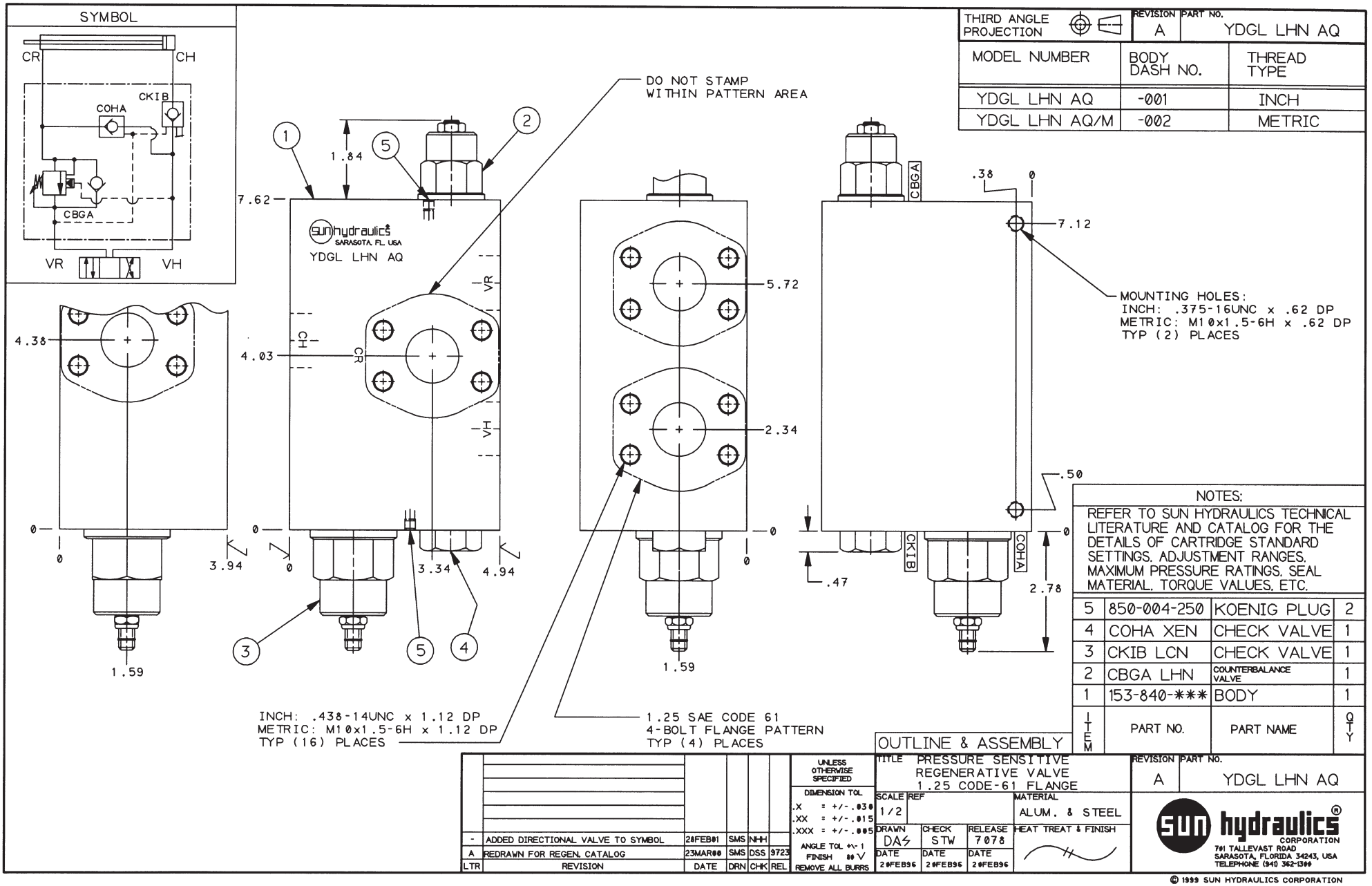
| SCALE | REF | MATERIAL |
|---|---|---|
| 1/2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | STW | 7078 | |
| DATE 28FEB96 | DATE 28FEB96 | DATE 28FEB96 | |

| REVISION | PART NO. |
|---|---|
| A | YDGL LHN AP |

sun hydraulics® CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1360


YDGL-LHN-AP
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
VH to CH
CH to VH (Piloted From VR)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 378 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 2/18/00 11:05 AM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | A | YDGL LHN AQ |

| MODEL NUMBER | BODY DASH NO. | THREAD TYPE |
|---|---|---|
| YDGL LHN AQ | -001 | INCH |
| YDGL LHN AQ/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 | 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| A | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\-1
FINISH 80 √
REMOVE ALL BURRS

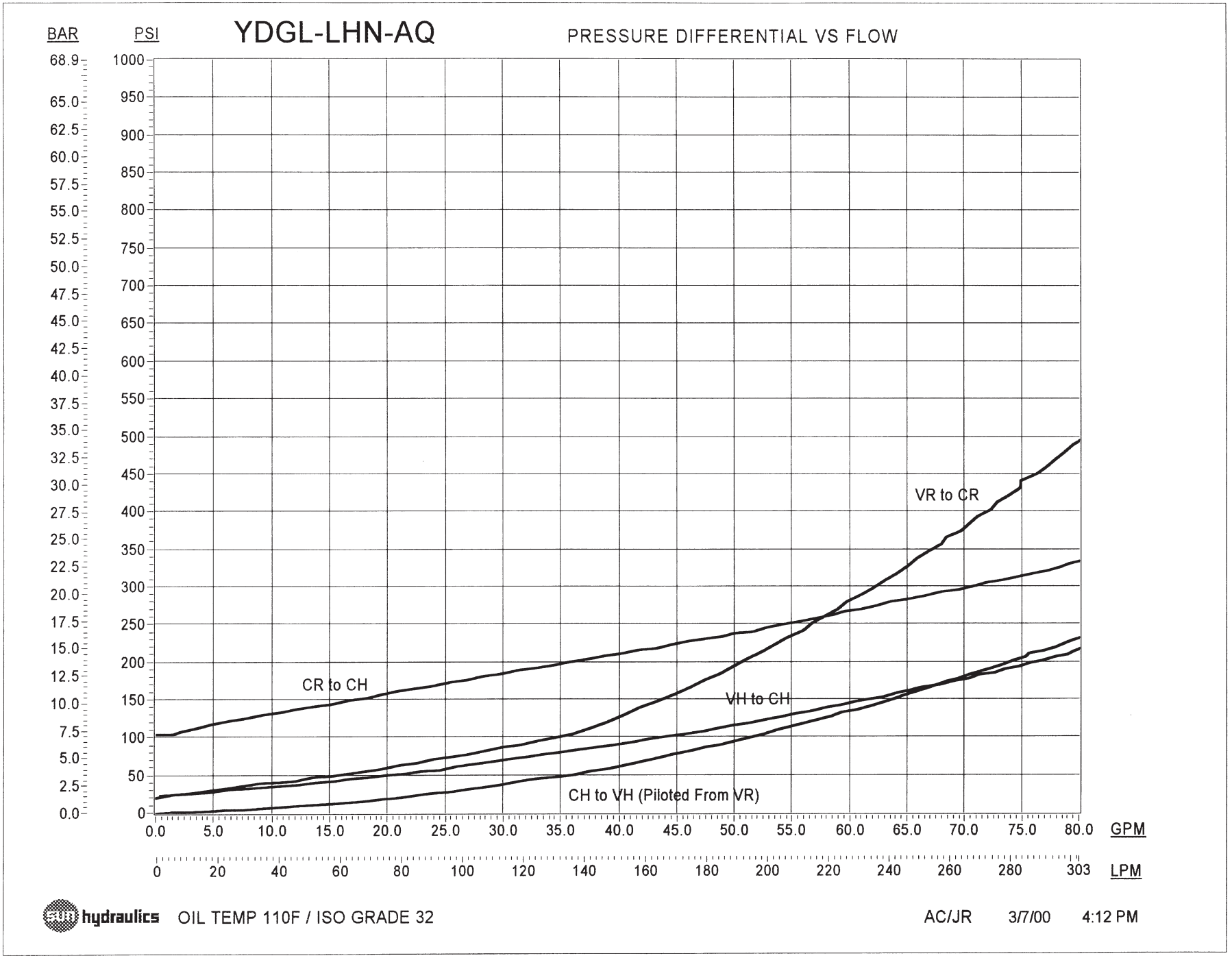
TITLE PRESSURE SENSITIVE REGENERATIVE VALVE 1.25 CODE-61 FLANGE

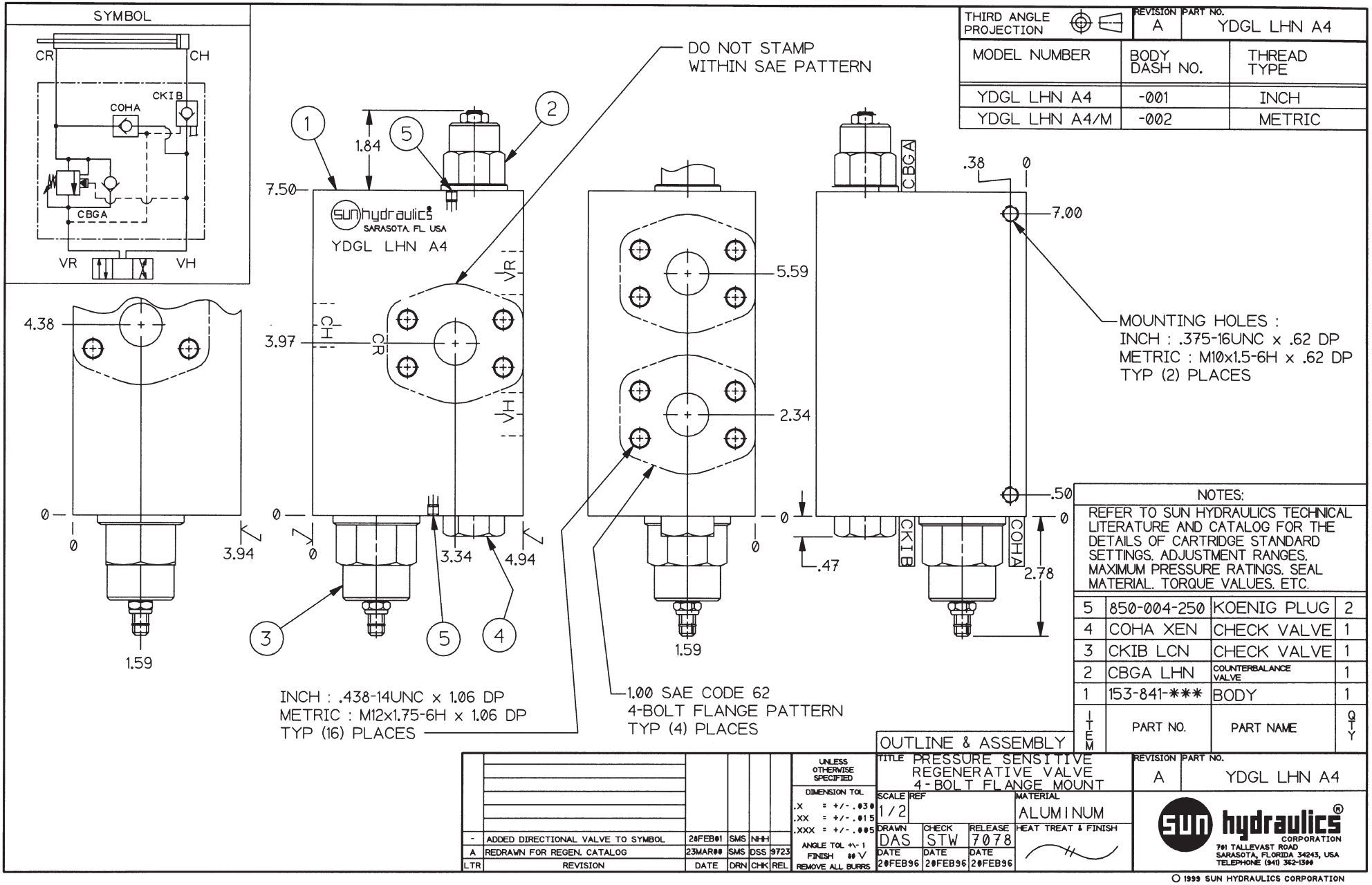
| SCALE | REF | MATERIAL |
|---|---|---|
| 1/2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | STW | 7078 | |
| DATE 28FEB96 | DATE 28FEB96 | DATE 28FEB96 | |

| REVISION | PART NO. |
|---|---|
| A | YDGL LHN AQ |

sun hydraulics® CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1399


YDGL-LHN-AQ
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
VH to CH
CH to VH (Piloted From VR)
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:12 PM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | A | YDGL LHN A4 |

| MODEL NUMBER | BODY DASH NO. | THREAD TYPE |
|---|---|---|
| YDGL LHN A4 | -001 | INCH |
| YDGL LHN A4/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 | 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| A | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 00 √
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE 4-BOLT FLANGE MOUNT

| SCALE | REF | MATERIAL |
|---|---|---|
| 1/2 | | ALUMINUM |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | STW | 7078 | |
| DATE 20FEB96 | DATE 20FEB96 | DATE 20FEB96 | |

| REVISION | PART NO. |
|---|---|
| A | YDGL LHN A4 |

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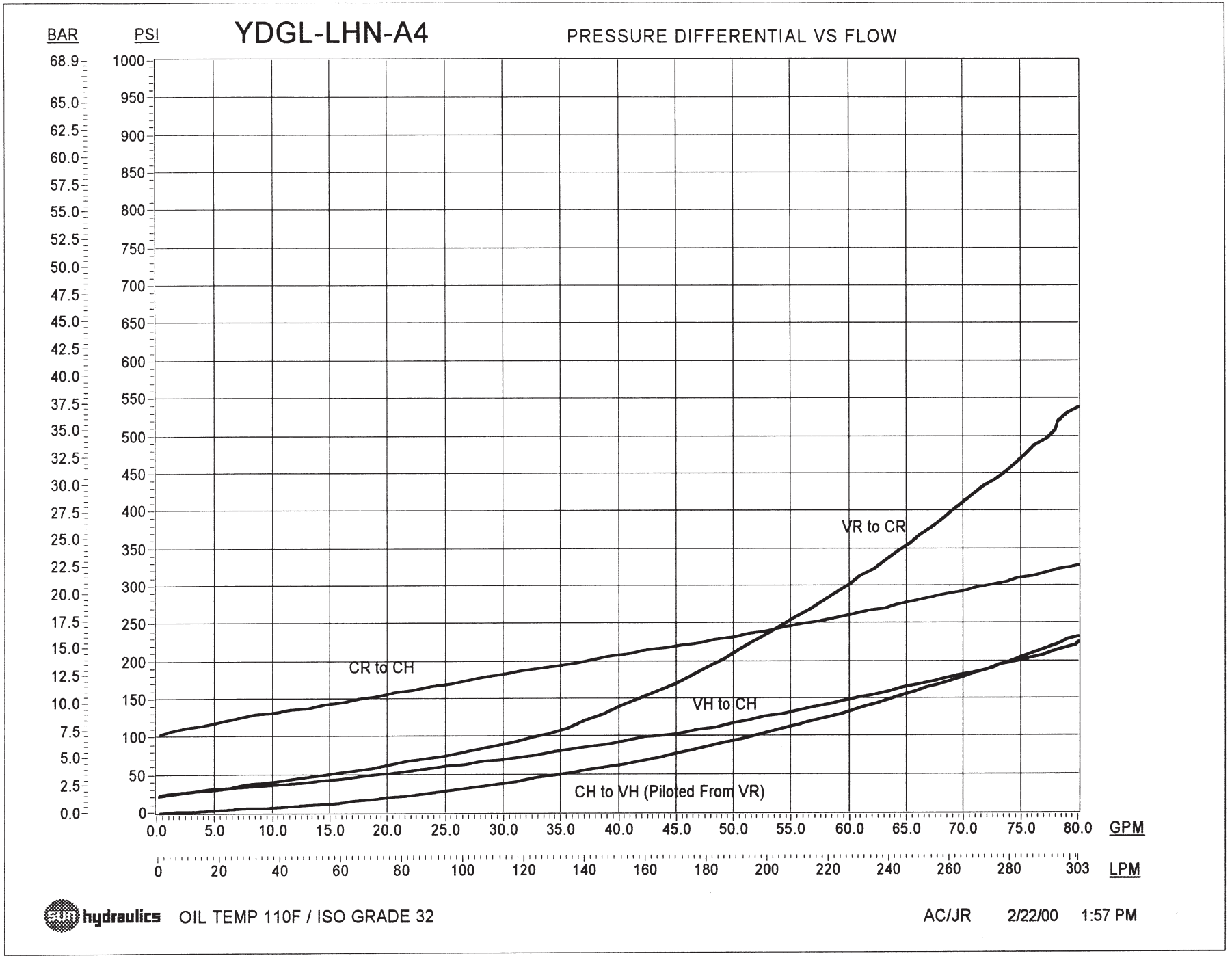
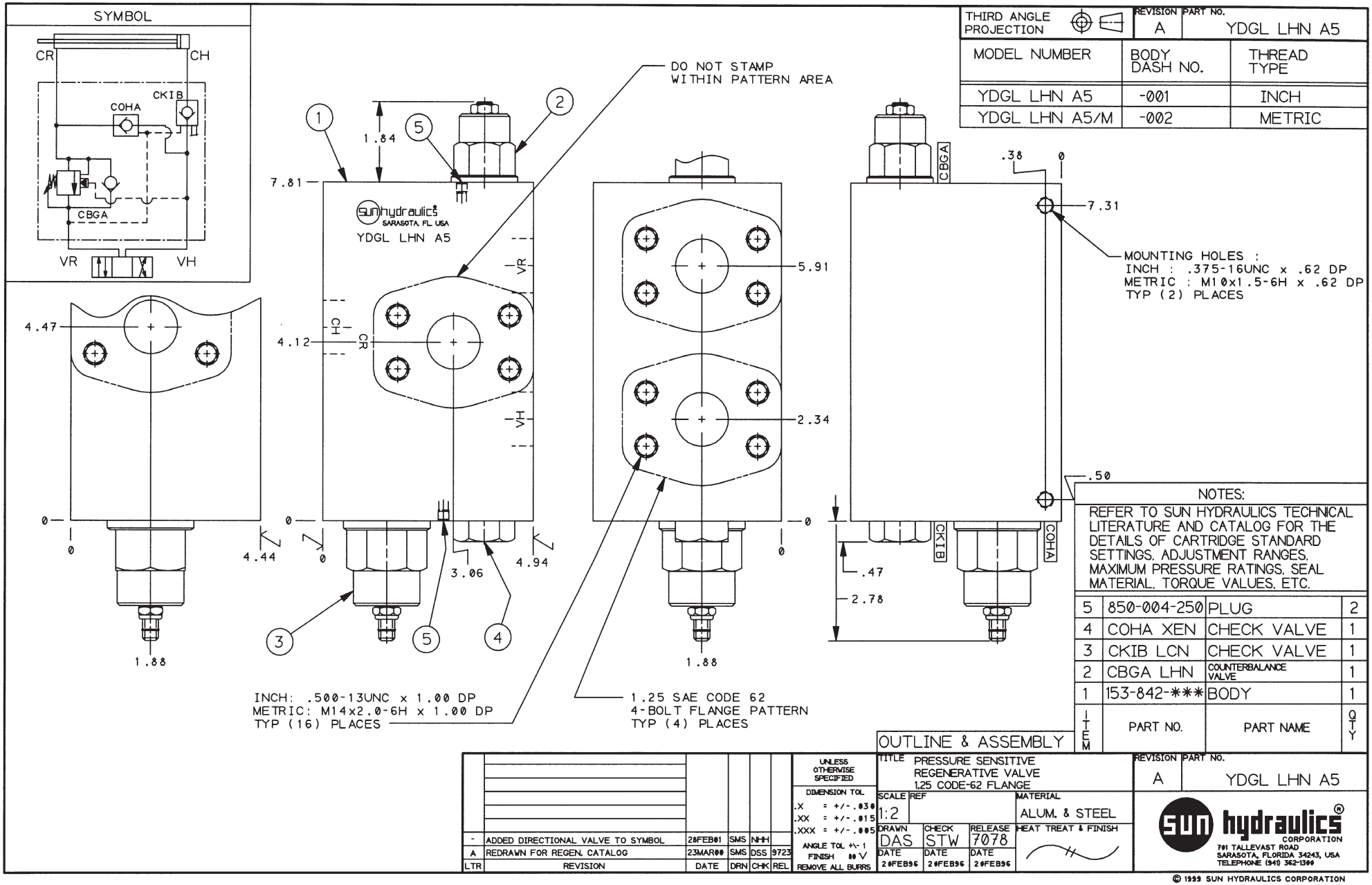
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDGL-LHN-A4
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
VH to CH
CH to VH (Piloted From VR)
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 2/22/00 1:57 PM




| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| A | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 √
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE 1.25 CODE-62 FLANGE

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | STW | 7078 | |
| DATE 28FEB96 | DATE 28FEB96 | DATE 28FEB96 | |

| REVISION | PART NO. |
|---|---|
| A | YDGL LHN A5 |

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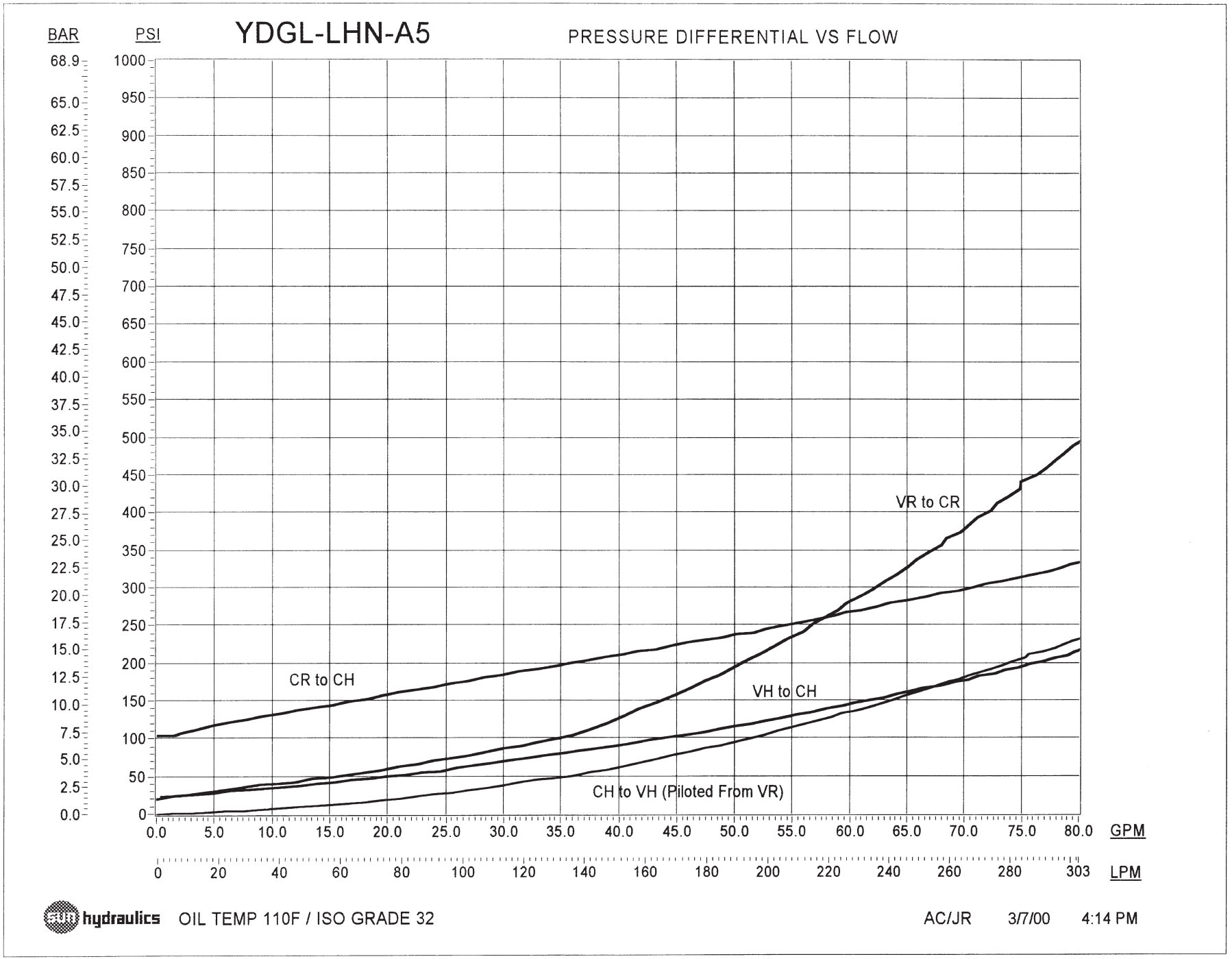
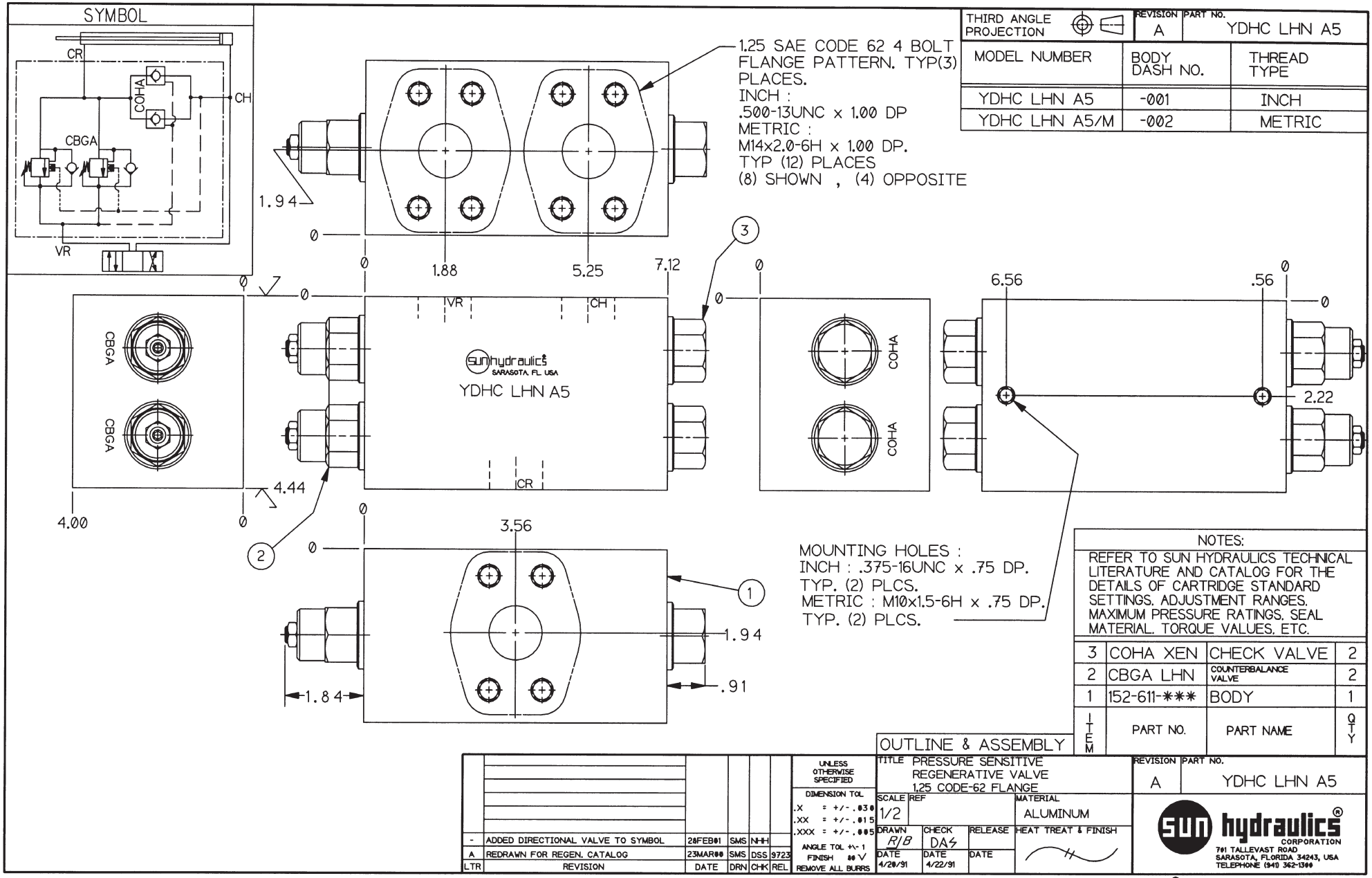

YDGL-LHN-A5
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
VH to CH
CH to VH (Piloted From VR)
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:14 PM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | A | YDHC LHN A5 |

| 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.

| ITEM | PART NO. | PART NAME | QTY |
|---|---|---|---|
| 3 | COHA XEN | CHECK VALVE | 2 |
| 2 | CBGA LHN | COUNTERBALANCE VALVE | 2 |
| 1 | 152-611-*** | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| A | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 V
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE 1.25 CODE-62 FLANGE

| SCALE | REF | MATERIAL |
|---|---|---|
| 1/2 | | ALUMINUM |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| R/B | DAS | | |
| DATE 4/20/91 | DATE 4/22/91 | DATE | |

| REVISION | PART NO. |
|---|---|
| A | YDHC LHN A5 |

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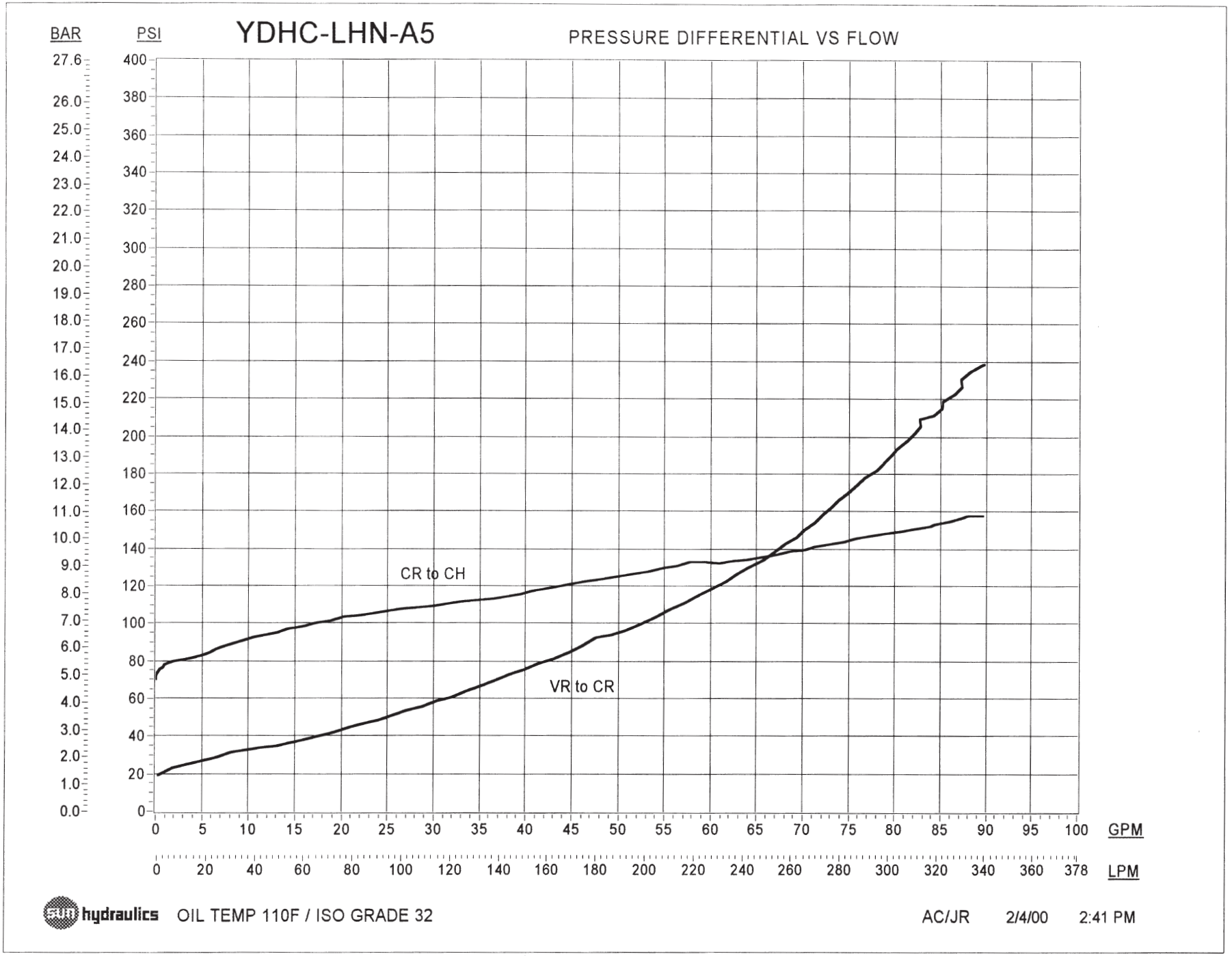
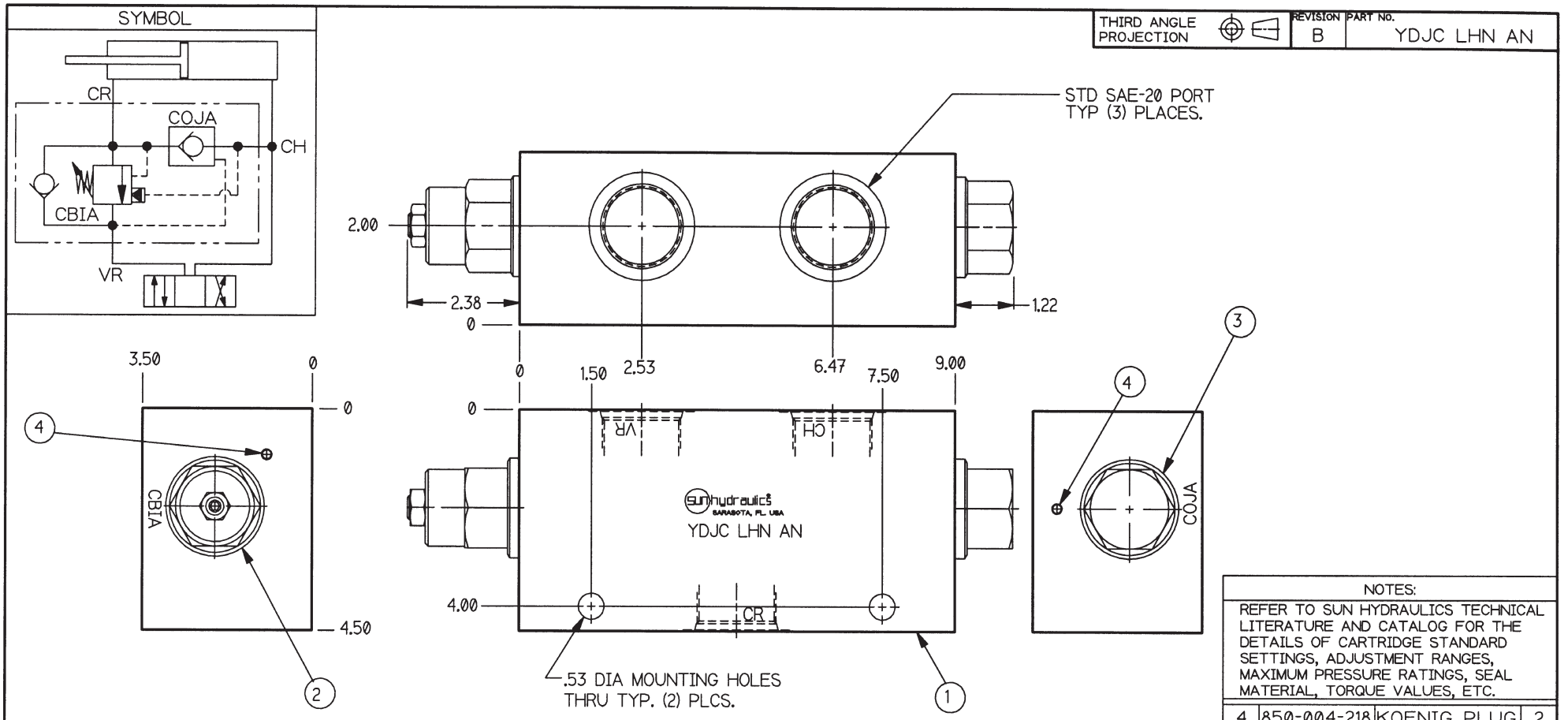

YDHC-LHN-A5
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 378 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 2/4/00 2:41 PM




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 | COUNTERBALNCE VALVE | 1 |
| 1 | 152-754-001 | BODY | 1 |

OUTLINE & ASSEMBLY

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

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNT

SCALE: 1:2 REF
MATERIAL: ALUM. & STEEL
DRAWN: DEB DATE: 26NOV91
CHECK DATE
RELEASE DATE
HEAT TREAT & FINISH

REVISION B PART NO. YDJC LHN AN

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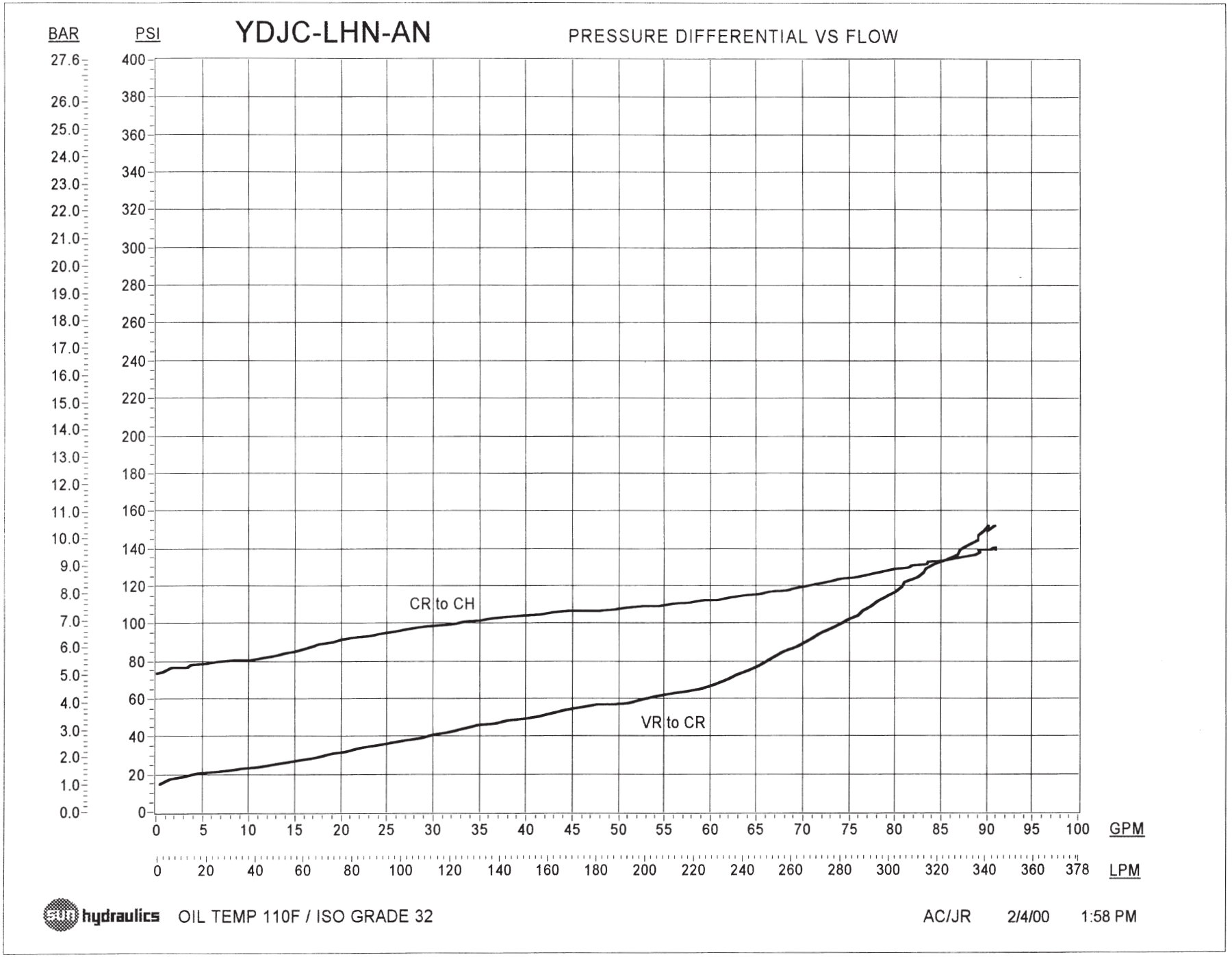
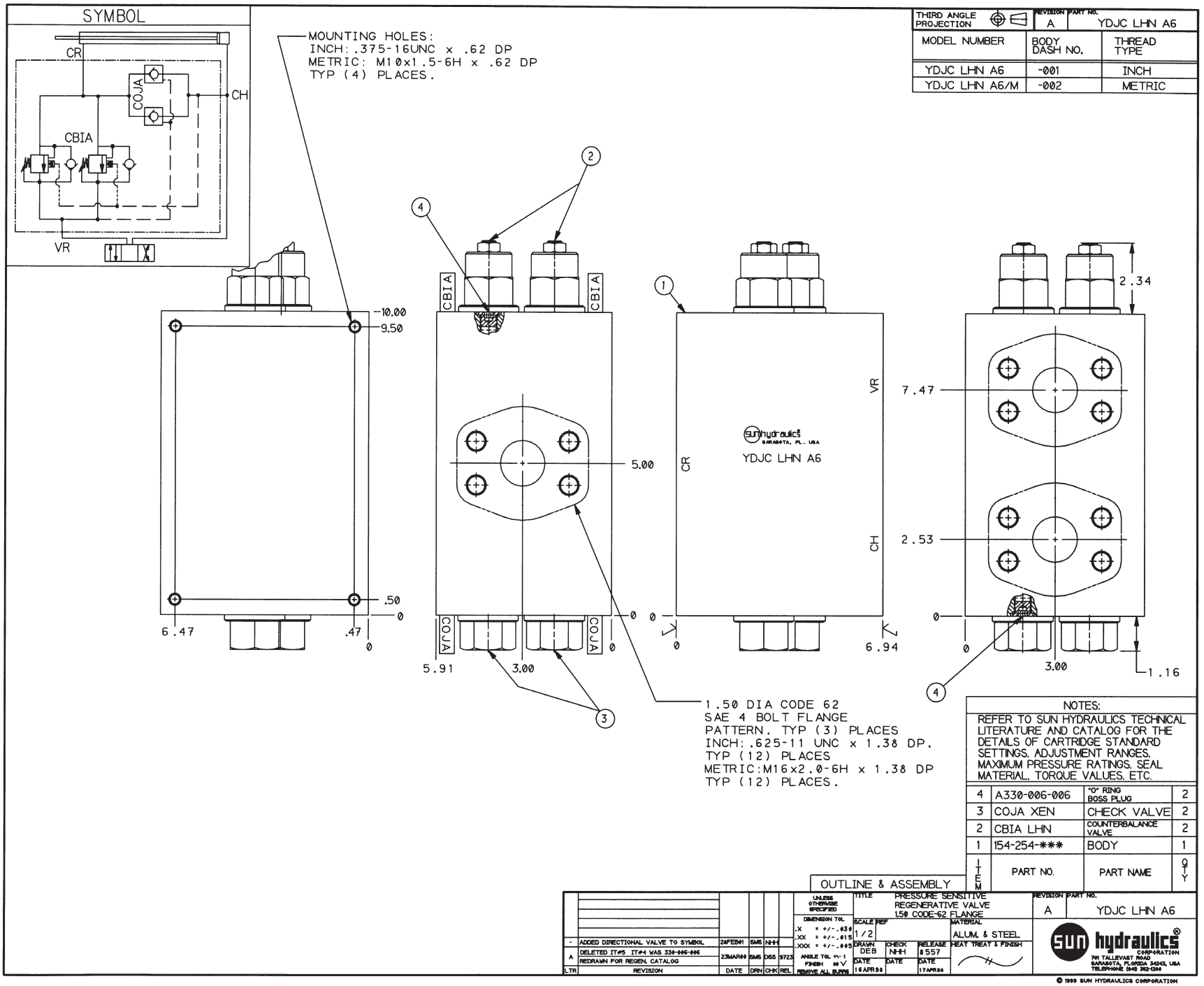
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDJC-LHN-AN
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 378 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR
2/4/00
1:58 PM


SYMBOL
CR
COJA
CH
CBIA
VR
MOUNTING HOLES:
INCH: .375-16UNC x .62 DP
METRIC: M10x1.5-6H x .62 DP
TYP (4) PLACES.
THIRD ANGLE PROJECTION
REVISION A
PART NO. YDJC LHN A6
MODEL NUMBER | BODY DASH NO. | THREAD TYPE
YDJC LHN A6 | -001 | INCH
YDJC LHN A6/M | -002 | METRIC
10.00
9.50
.50
0
6.47
.47
0
CBIA
CBIA
5.00
0
0
COJA
COJA
5.91
3.00
0
VR
CR
CH
YDJC LHN A6
6.94
2.34
7.47
2.53
0
0
3.00
1.16
1.50 DIA CODE 62
SAE 4 BOLT FLANGE
PATTERN. TYP (3) PLACES
INCH: .625-11 UNC x 1.38 DP.
TYP (12) PLACES
METRIC: M16x2.0-6H x 1.38 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.
4 | A330-006-006 | "O" RING BOSS PLUG | 2
3 | COJA XEN | CHECK VALVE | 2
2 | CBIA LHN | COUNTERBALANCE VALVE | 2
1 | 154-254-*** | BODY | 1
ITEM | PART NO. | PART NAME | QTY
OUTLINE & ASSEMBLY
- ADDED DIRECTIONAL VALVE TO SYMBOL 28FEB01 SMS NHH
A DELETED IT#5 IT#4 WAS 330-006-006; REDRAWN FOR REGEN. CATALOG 23MAR99 SMS DSS 9723
LTR REVISION DATE DRN CHK REL
UNLESS OTHERWISE SPECIFIED
DIMENSION TOL .X ± +/-.030 .XX ± +/-.015 .XXX ± +/-.005
ANGLE TOL +/- 1
FINISH 64 √
REMOVE ALL BURRS
TITLE PRESSURE SENSITIVE REGENERATIVE VALVE 1.50 CODE-62 FLANGE
SCALE REF 1/2
DRAWN DEB 16APR98
CHECK NHH
RELEASE # 557
DATE 17APR98
MATERIAL ALUM. & STEEL
HEAT TREAT & FINISH
REVISION A PART NO. YDJC LHN A6
sun hydraulics CORPORATION
7M TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200
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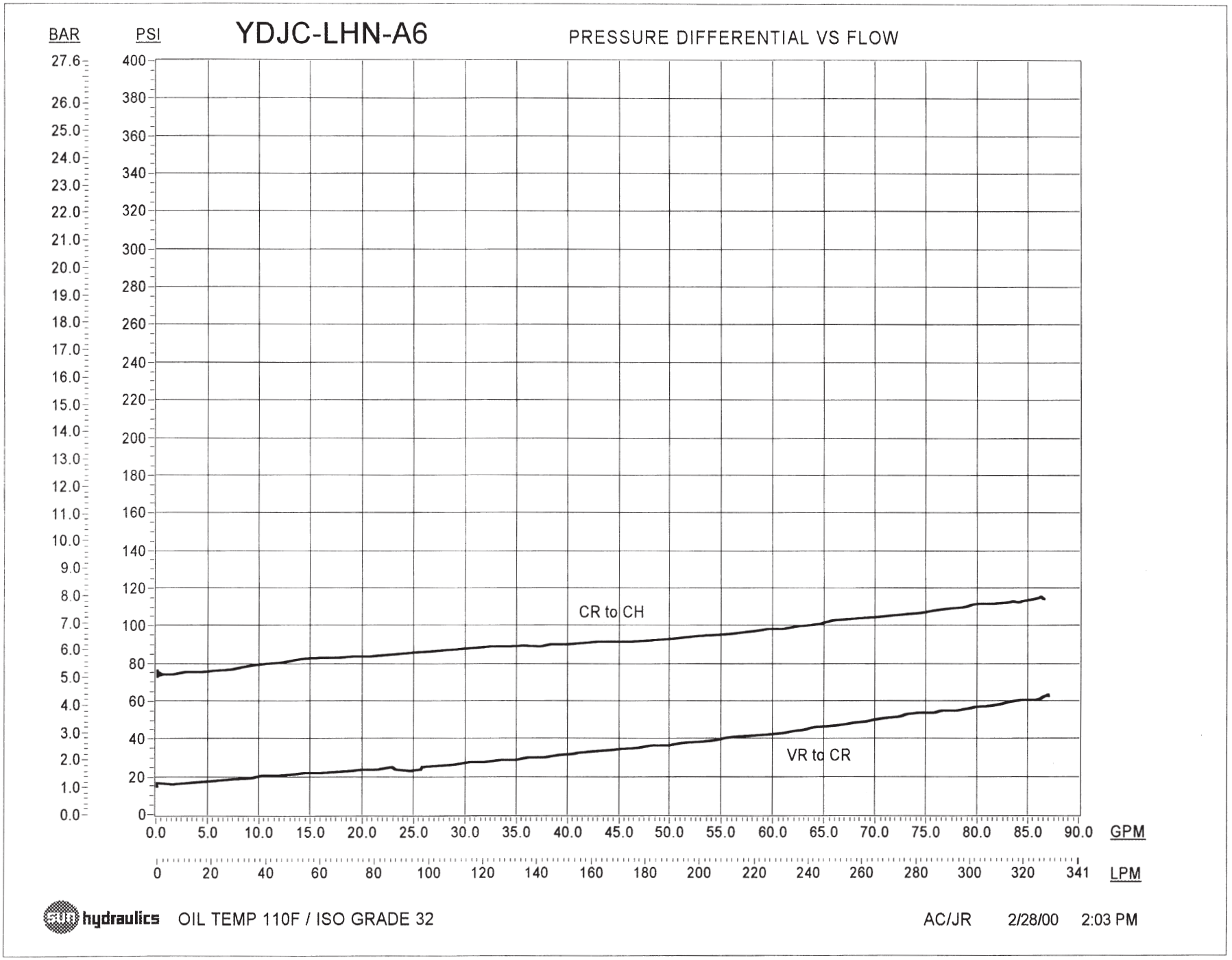
YDJC-LHN-A6
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
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3.0
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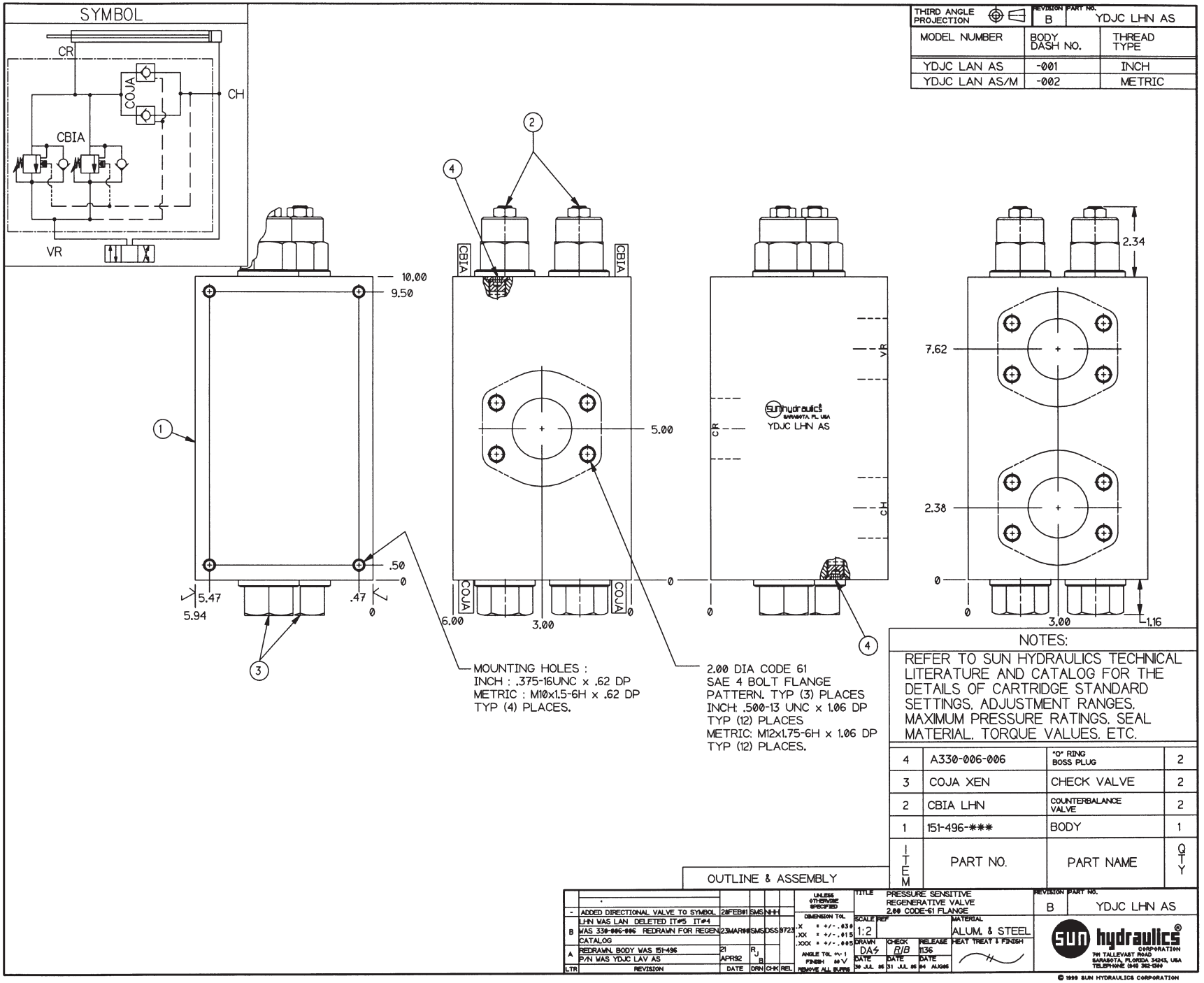
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 341 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 2/28/00 2:03 PM




| 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 |

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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| B | LHN WAS LAN DELETED IT#5 IT#4 WAS 330-006-006 REDRAWN FOR REGEN CATALOG | 23MAR98 | SMS | DSS | 9723 |
| A | REDRAWN BODY WAS 151-496 P/N WAS YDJC LAV AS | 21 APR92 | RJB | | |

UNLESS OTHERWISE SPECIFIED: DIMENSION TOL .X = +/-.030, .XX = +/-.015, .XXX = +/-.005; ANGLE TOL +/- 1; FINISH 63 V; REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE 2.00 CODE-61 FLANGE

SCALE 1:2 REF

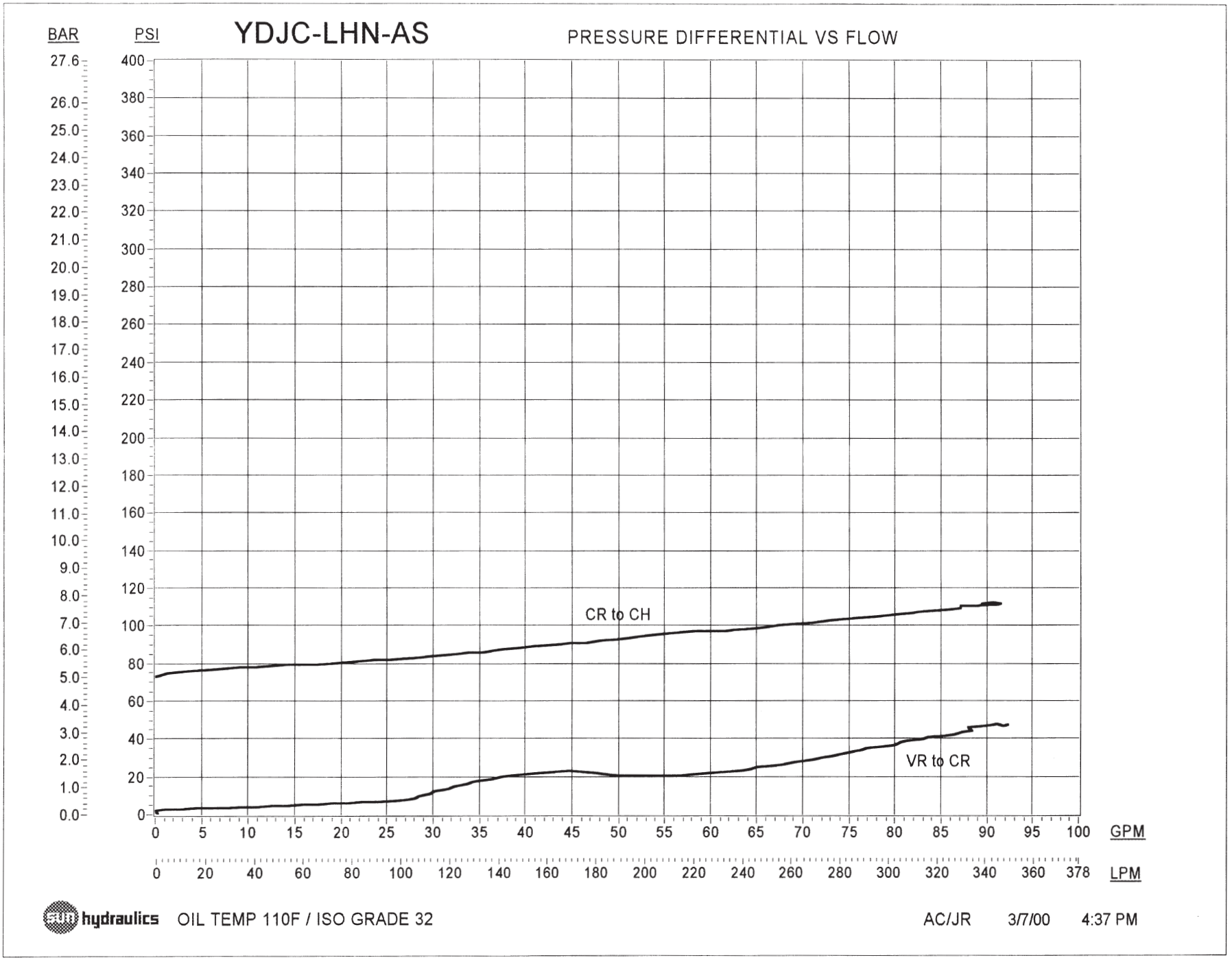
MATERIAL: ALUM. & STEEL

HEAT TREAT & FINISH

| DRAWN | CHECK | RELEASE |
|---|---|---|
| DAS | RJB | 1136 |
| DATE 29 JUL 85 | DATE 31 JUL 85 | DATE 04 AUG85 |

| REVISION | PART NO. |
|---|---|
| B | YDJC LHN AS |

sun hydraulics CORPORATION
7711 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDJC-LHN-AS
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
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12.0
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8.0
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3.0
2.0
1.0
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400
380
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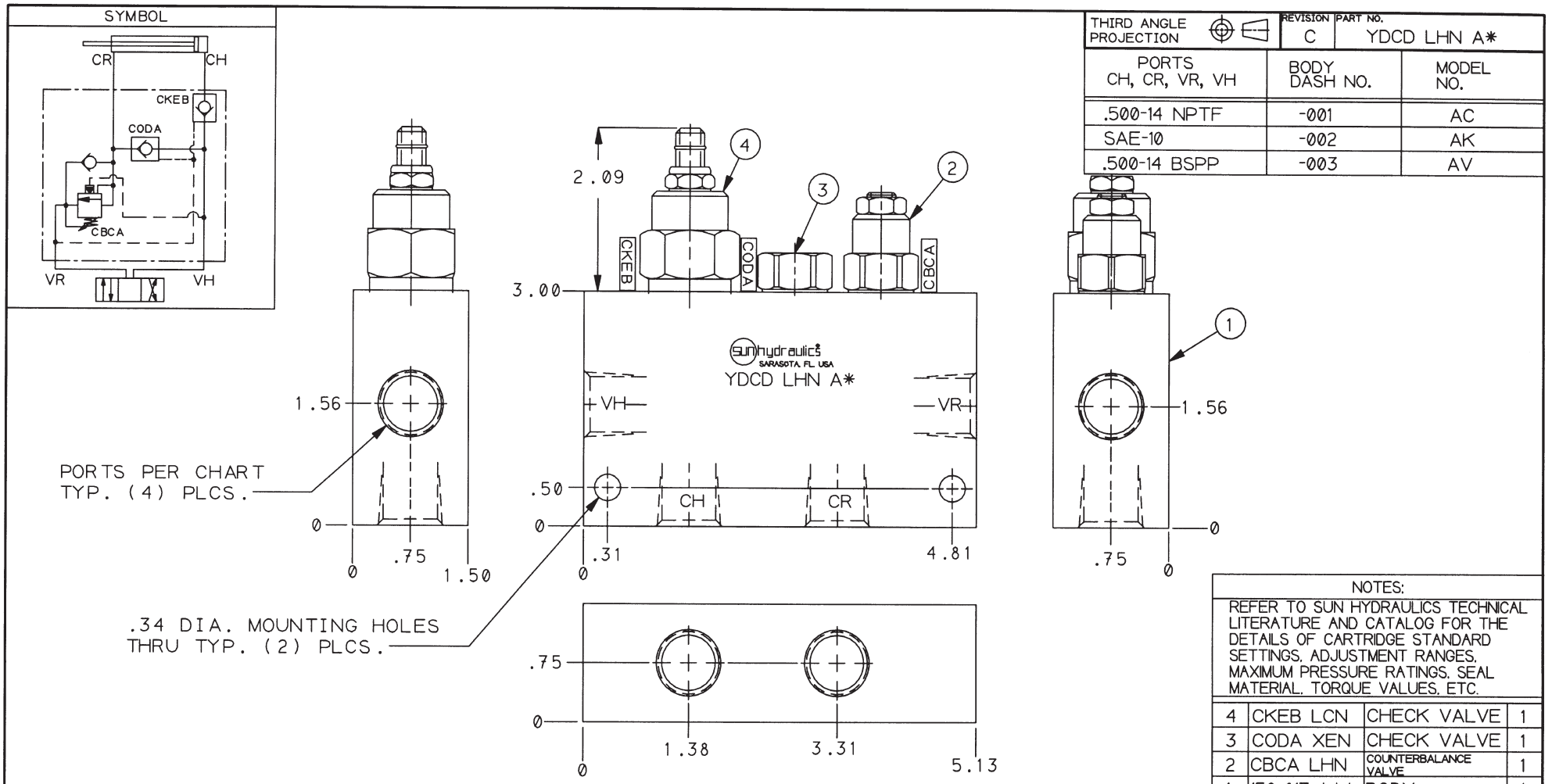
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
VR to CR
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 378 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:37 PM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | C | YDCD LHN A* |

| PORTS CH, CR, VR, VH | 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 VALUES, ETC.

| ITEM | PART NO. | PART NAME | QTY |
|---|---|---|---|
| 4 | CKEB LCN | CHECK VALVE | 1 |
| 3 | CODA XEN | CHECK VALVE | 1 |
| 2 | CBCA LHN | COUNTERBALANCE VALVE | 1 |
| 1 | 150-817-*** | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| C | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| B | CKEB LCN WAS CKEA LAN | 18JUL88 | RC | | |
| A | CKEA LAN WAS CPEA LAN | 20SEP82 | RJC | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 00 V
REMOVE ALL BURRS

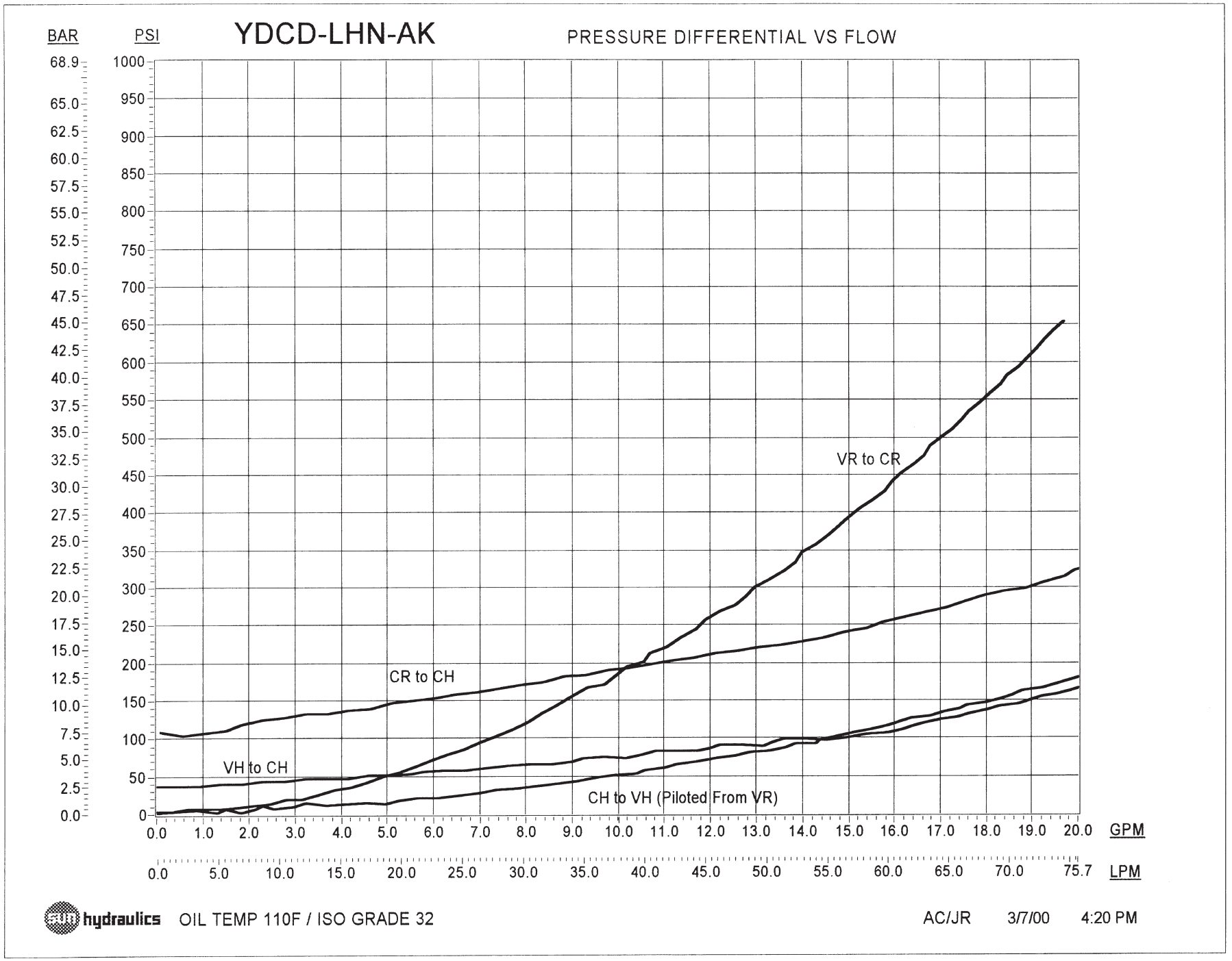
TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED

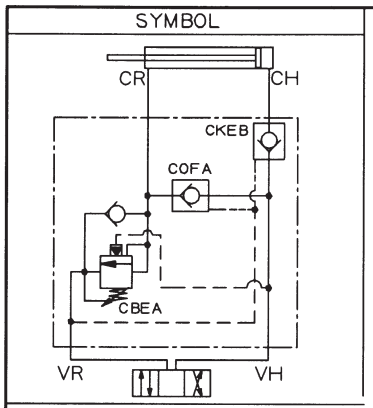
| SCALE | REF | MATERIAL |
|---|---|---|
| 1:1.25 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| HHP | JDA | | |
| DATE 21 MAY82 | DATE 05 JUN82 | DATE | |

REVISION C | PART NO. YDCD LHN A*

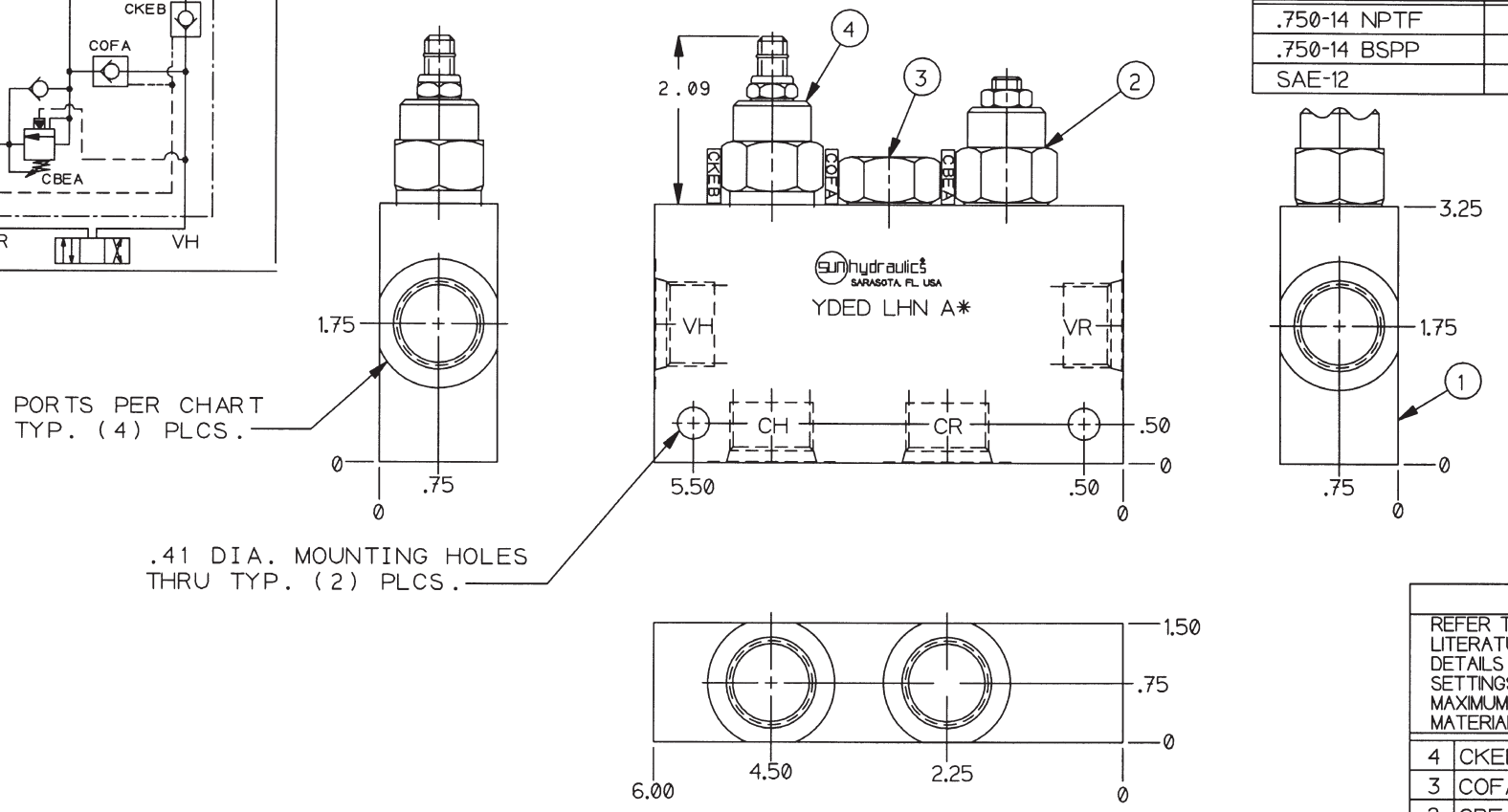
sun hydraulics CORPORATION
701 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDCD-LHN-AK
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
VR to CR
CR to CH
VH to CH
CH to VH (Piloted From VR)
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.7 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:20 PM




| THIRD ANGLE PROJECTION | REVISION | PART NO. |
|---|---|---|
| | H | 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| - | ADDED DIRECTIONAL VALVE TO SYMBOL | 28FEB01 | SMS | NHH | |
| H | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| G | CKEB LAN WAS CKEA LAN | 18JUL88 | RC | | |
| F | CKEA LAN WAS CPEA LAN | 28SEP82 | RJC | | |
| E | REMOVED 349-001 3.25 WAS 3.00 | 24SEP80 | RJC | | |
| D | REDRAWN A SIZE OBSOLETED | 10AUG78 | JDA | HHP | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/- .030
.XX = +/- .015
.XXX = +/- .005
ANGLE TOL +\- 1
FINISH 80 √
REMOVE ALL BURRS

TITLE: PRESSURE SENSITIVE REGENERATIVE VALVE LINE MOUNTED

SCALE: 1 : 1.5
REF: YDEA LAN A*, YDEB LAN AD, YDEC LAN AD
MATERIAL: ALUM. & STEEL
DRAWN: HHP
CHECK:
RELEASE:
HEAT TREAT & FINISH:
DATE: 10AUG78

REVISION: H
PART NO.: YDED LHN A*

sun hydraulics CORPORATION
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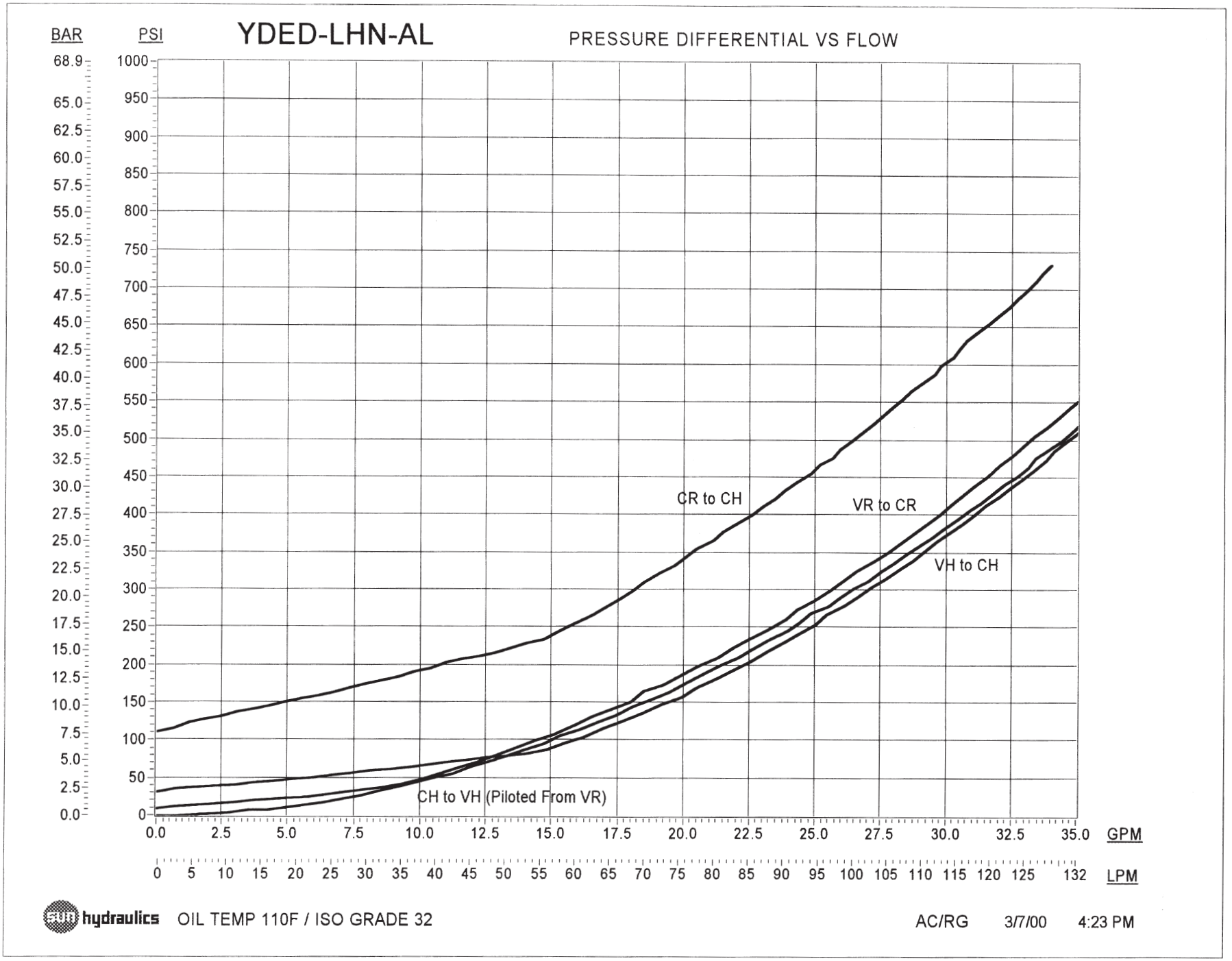
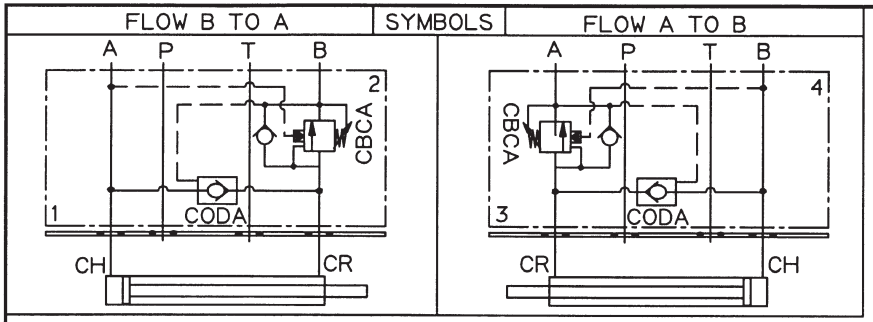
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDED-LHN-AL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
CR to CH
VR to CR
VH to CH
CH to VH (Piloted From VR)
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 GPM
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 132 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/RG 3/7/00 4:23 PM



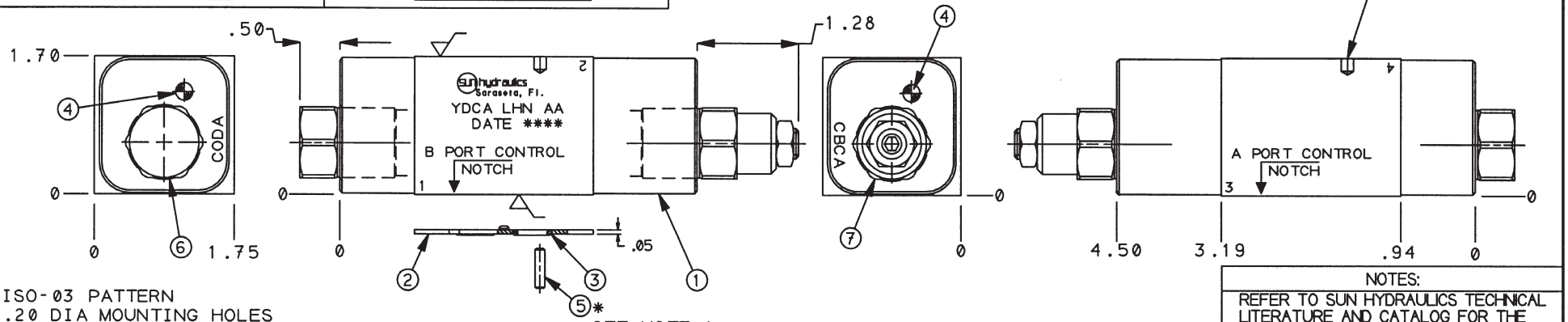

THIRD ANGLE PROJECTION

| REVISION | PART NO. |
|---|---|
| C | YDCA LHN AA |

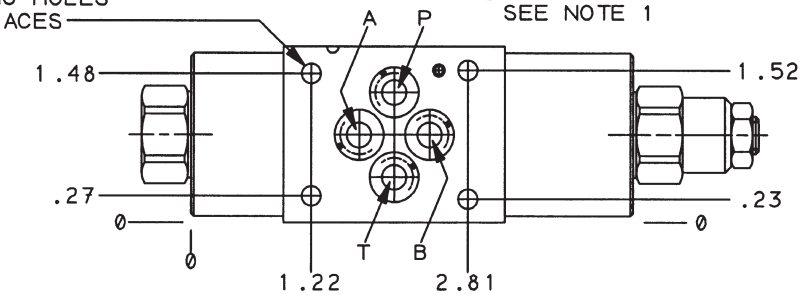
NOTES :

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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| C | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR99 | SMS | DSS | 9723 |
| B | REDRAWN IN CADD ADDED DATE & CODE STAMPING INSTRUCTIONS | 26AUG99 | GH | DRC | |
| A | REVISED STAMPING, ADDED ITEM 5 | 16NOV92 | BRS | | 4988 |
| - | ITEM 3 WAS 500-101-012 | 07APR93 | DAS | | 2985 |
| - | PLUG CHANGE PER REL 1823 | 19OCT88 | RC | | 1823 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/- 1
FINISH 80 √
REMOVE ALL BURRS

TITLE ISO-03 PRESS. SENSITIVE REGENERATIVE VALVE FLOW A TO B OR B TO A

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:1.25 | | ALUMINIUM |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| RJC | | | |
| DATE 26AUG88 | DATE | DATE | |

| REVISION | PART NO. |
|---|---|
| C | YDCA LHN AA |

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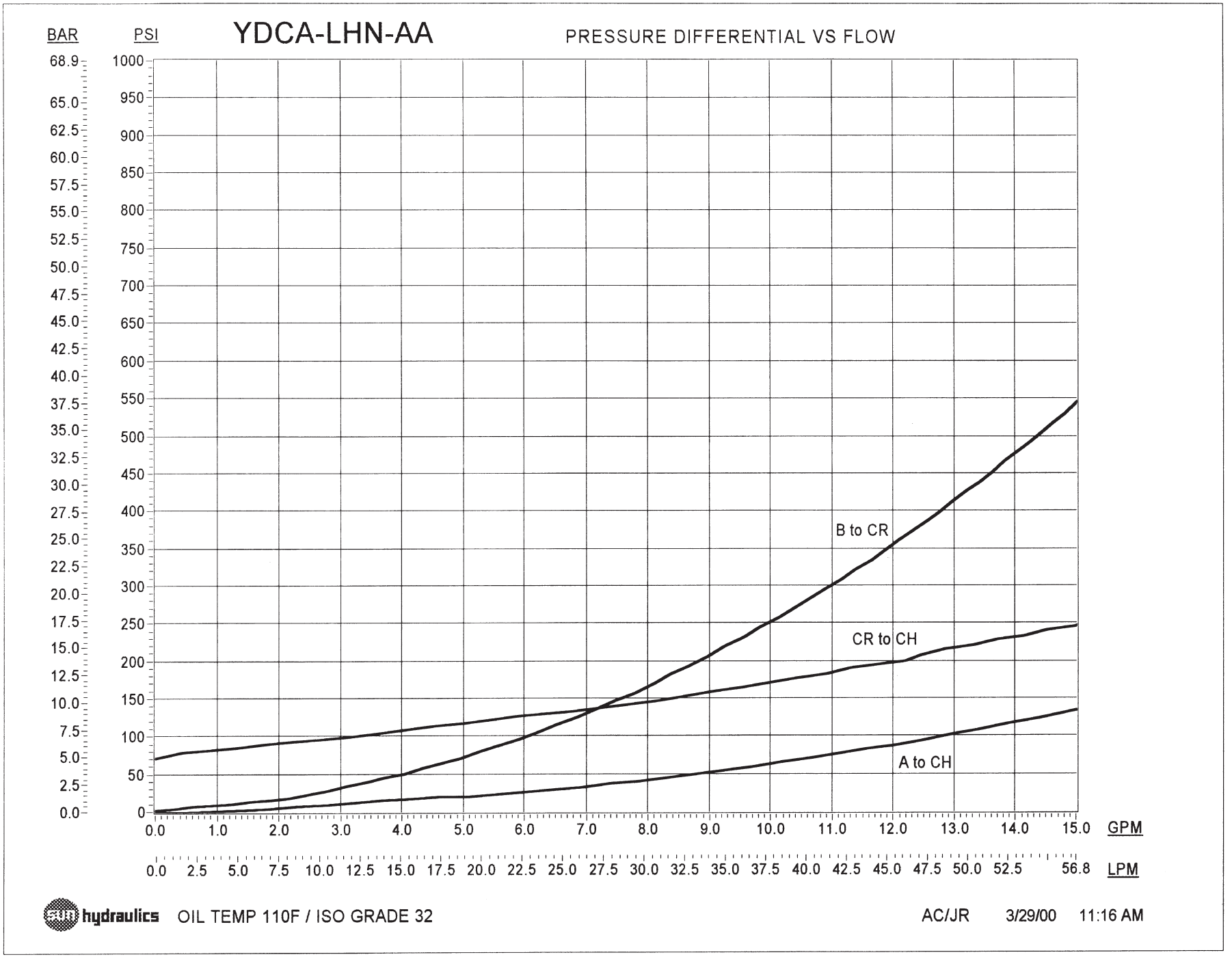
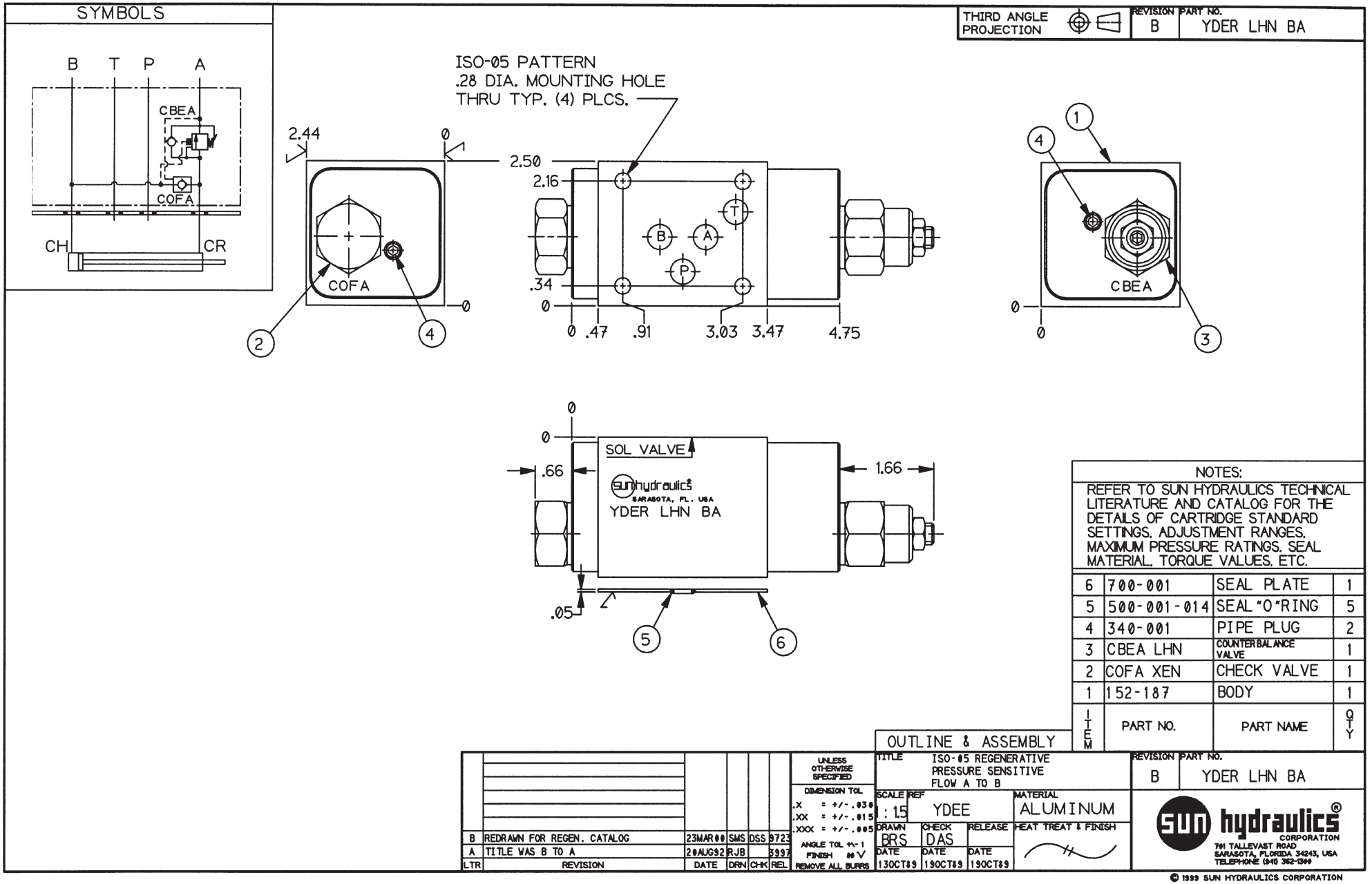
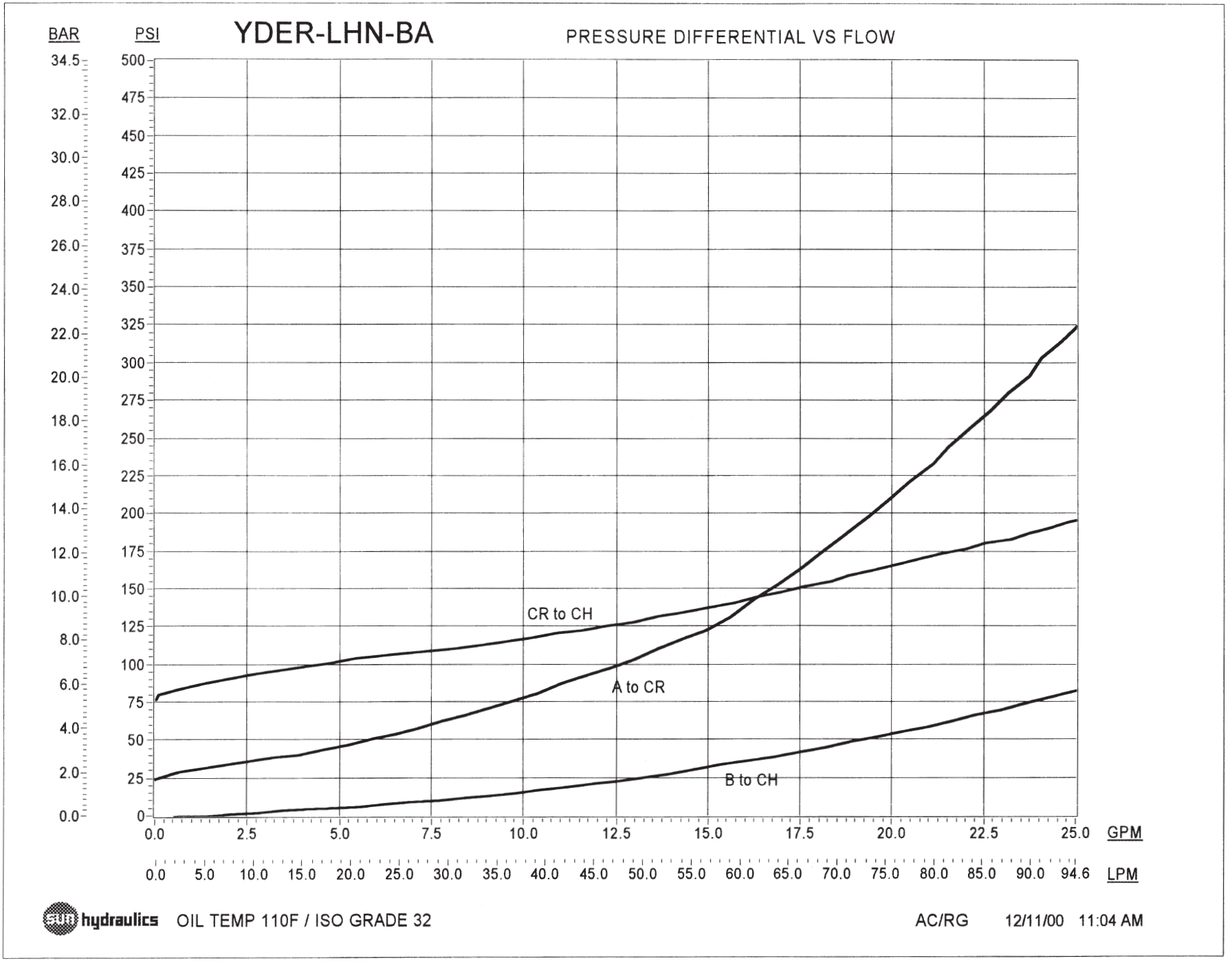
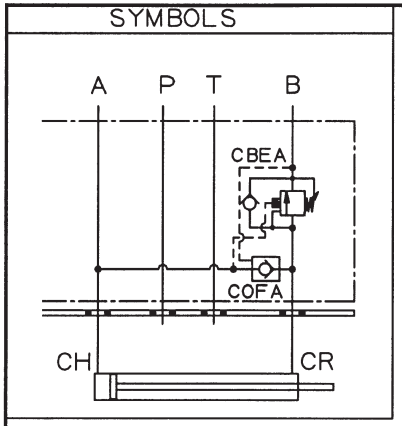
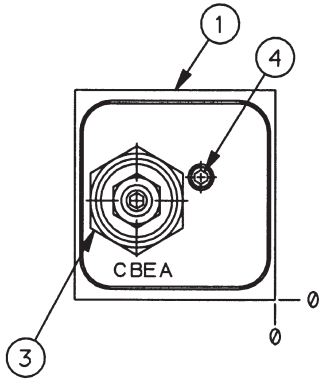
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200

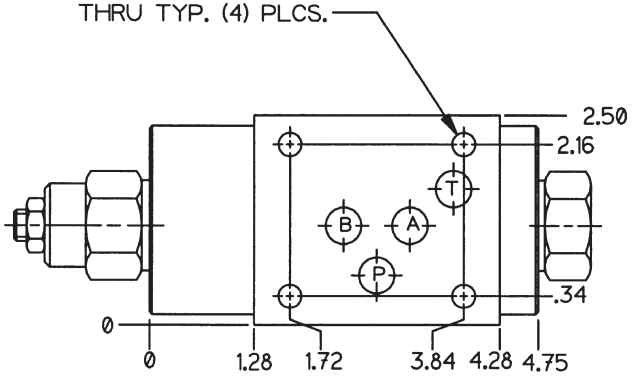

YDCA-LHN-AA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
B to CR
CR to CH
A to CH
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 GPM
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 56.8 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:16 AM

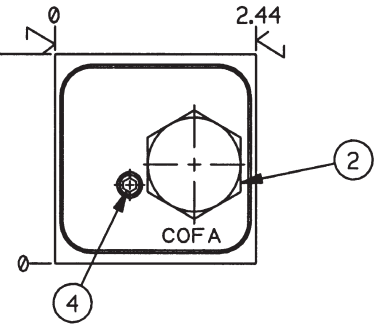


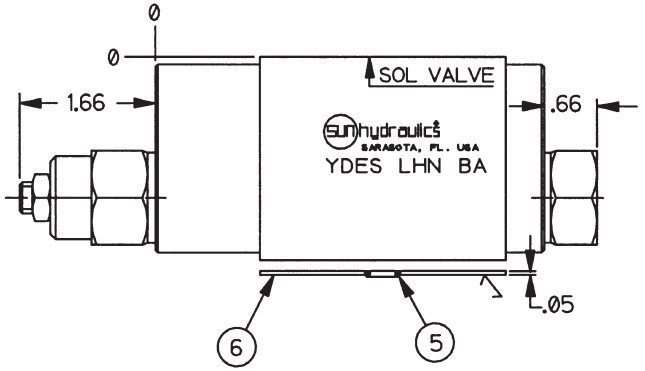

YDER-LHN-BA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
A to CR
B to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 94.6 LPM
sun hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/RG
12/11/00 11:04 AM




| 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.

| 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 | 152-188 | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| C | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| B | ADDED SOL. VALVE STAMPING | 29OCT93 | BRS | | |
| A | TITLE WAS A TO B | 20AUG92 | RJB | | 3997 |
| - | REVISED SYMBOL | 20MAY91 | BRS | | |
| - | ADDED .05 DIM. | 06DEC89 | BRS | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/- 1
FINISH 63 √
REMOVE ALL BURRS

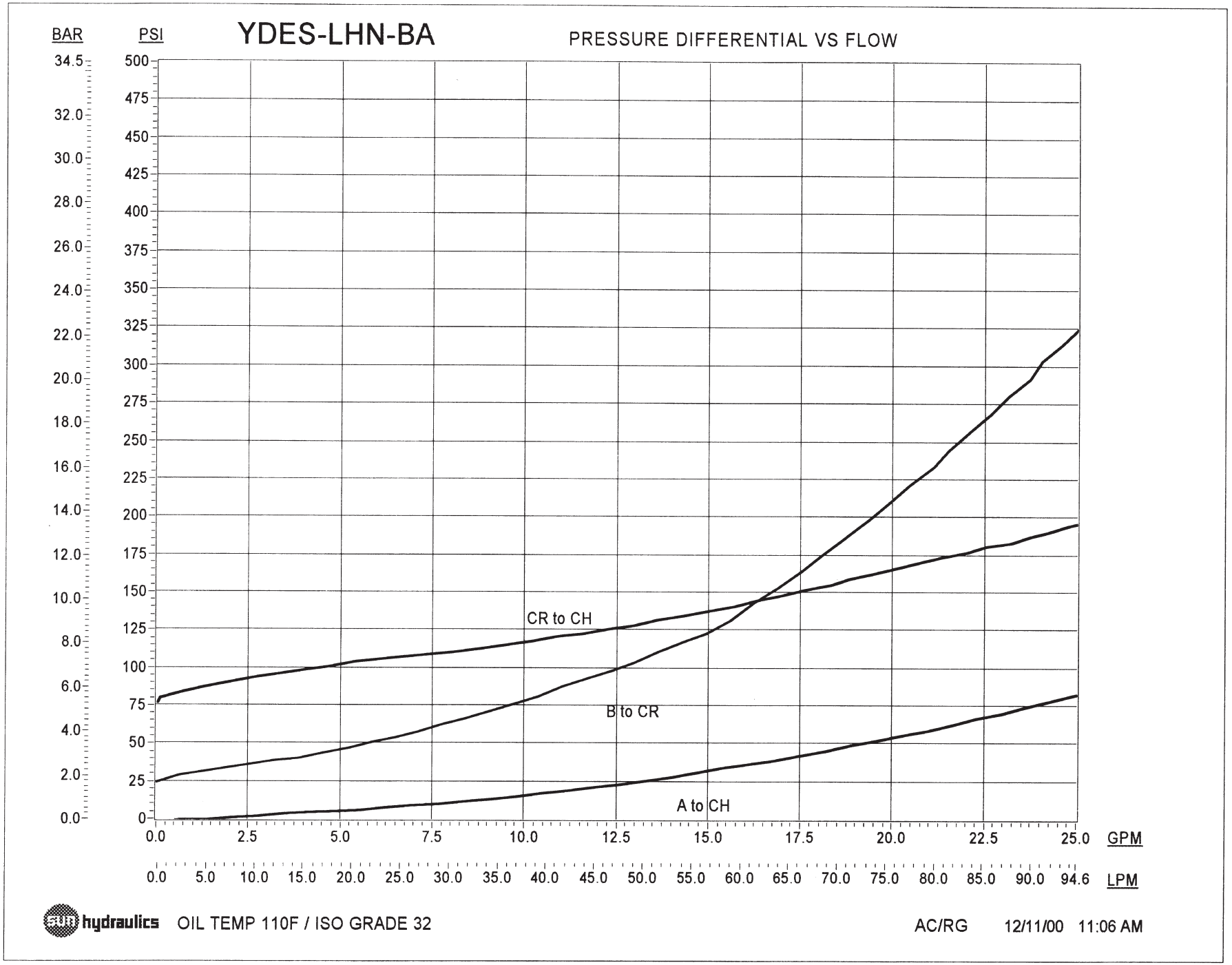
TITLE: ISO-05 REGENERATIVE PRESSURE SENSITIVE FLOW B TO A

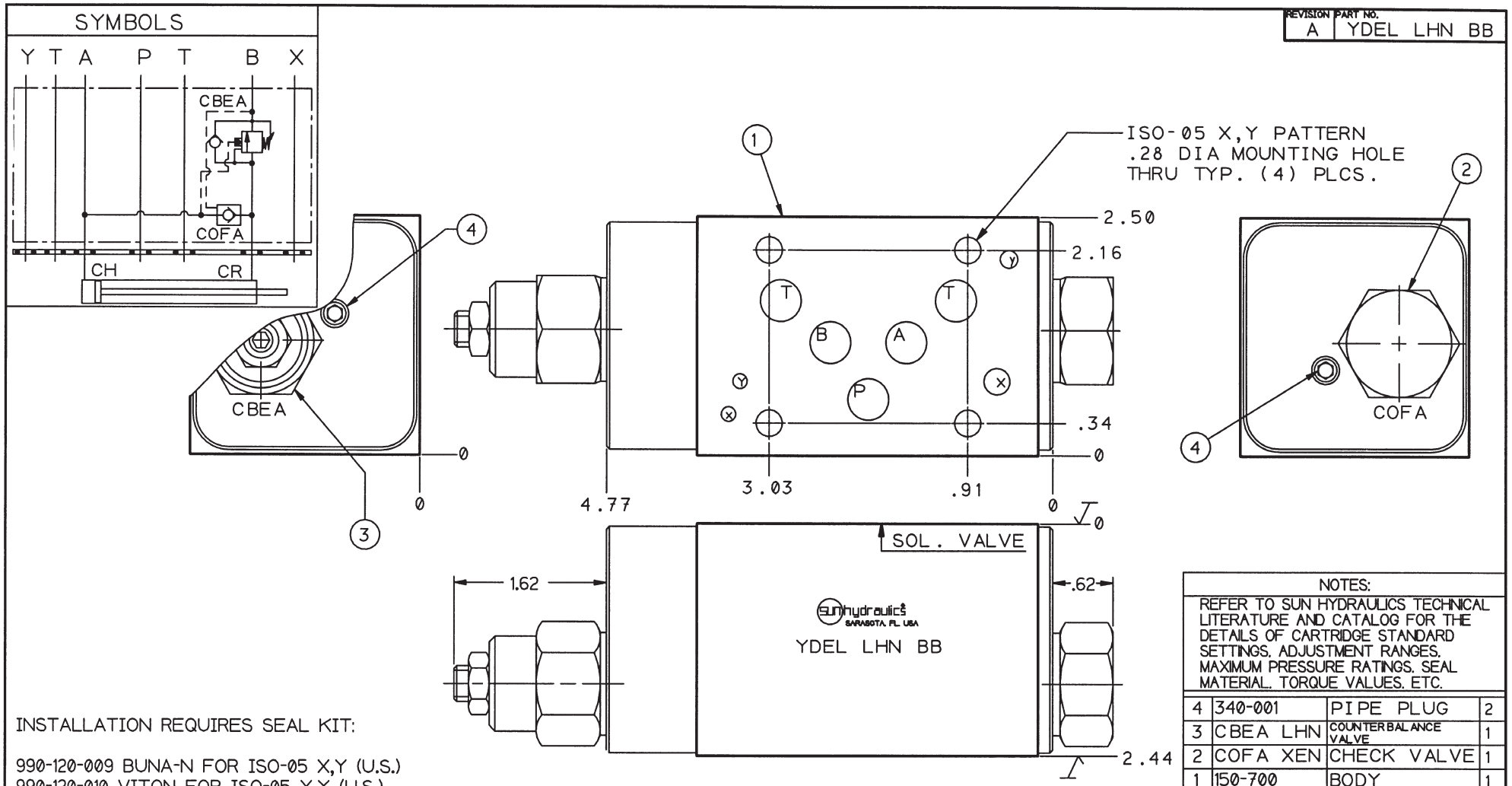
| SCALE | REF | MATERIAL |
|---|---|---|
| 1.5 | YDEE | ALUMINUM |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | DAS | 2273 | |
| DATE 110CT89 | DATE 190CT89 | DATE 190CT89 | |

| REVISION | PART NO. |
|---|---|
| C | YDES LHN BA |

sun hydraulics CORPORATION
791 TALLEVAST ROAD
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDES-LHN-BA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
A to CH
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
GPM
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
94.6
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/RG
12/11/00 11:06 AM




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)

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 | CBEA LHN | COUNTERBALANCE VALVE | 1 |
| 2 | COFA XEN | CHECK VALVE | 1 |
| 1 | 150-700 | BODY | 1 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| A | LHN WAS LAN REDRAWN FOR REGEN. | 23MAR88 | SMS | DSS | 9723 |
| | CATALOG | | | | |

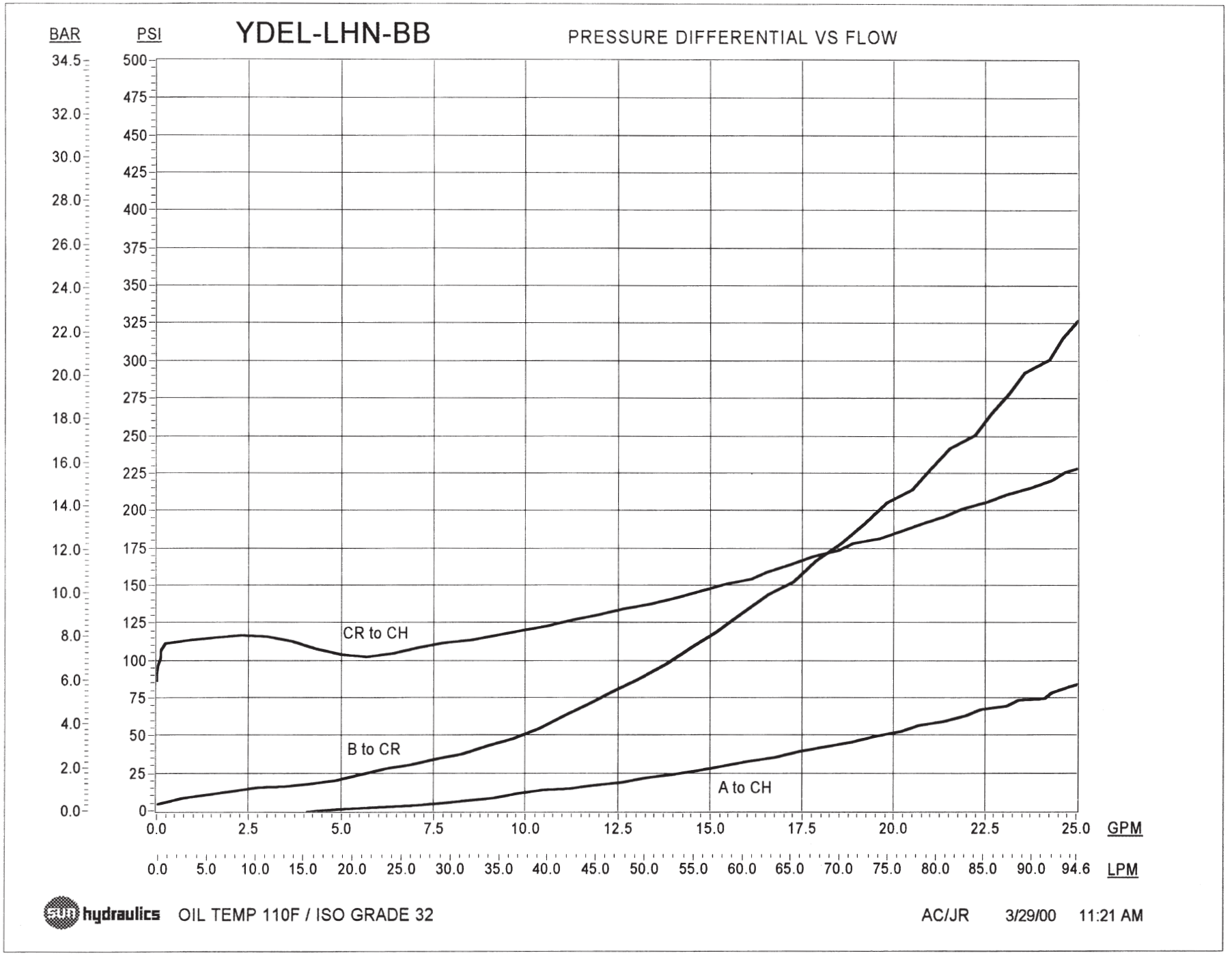
DIMENSION TOL .XX = +/- .015 .XXX = +/- .005
MACHINING STANDARD S-199
ANGLE TOL +/- 1°
FINISH 63√
REMOVE ALL BURRS .005 MAX. BREAK

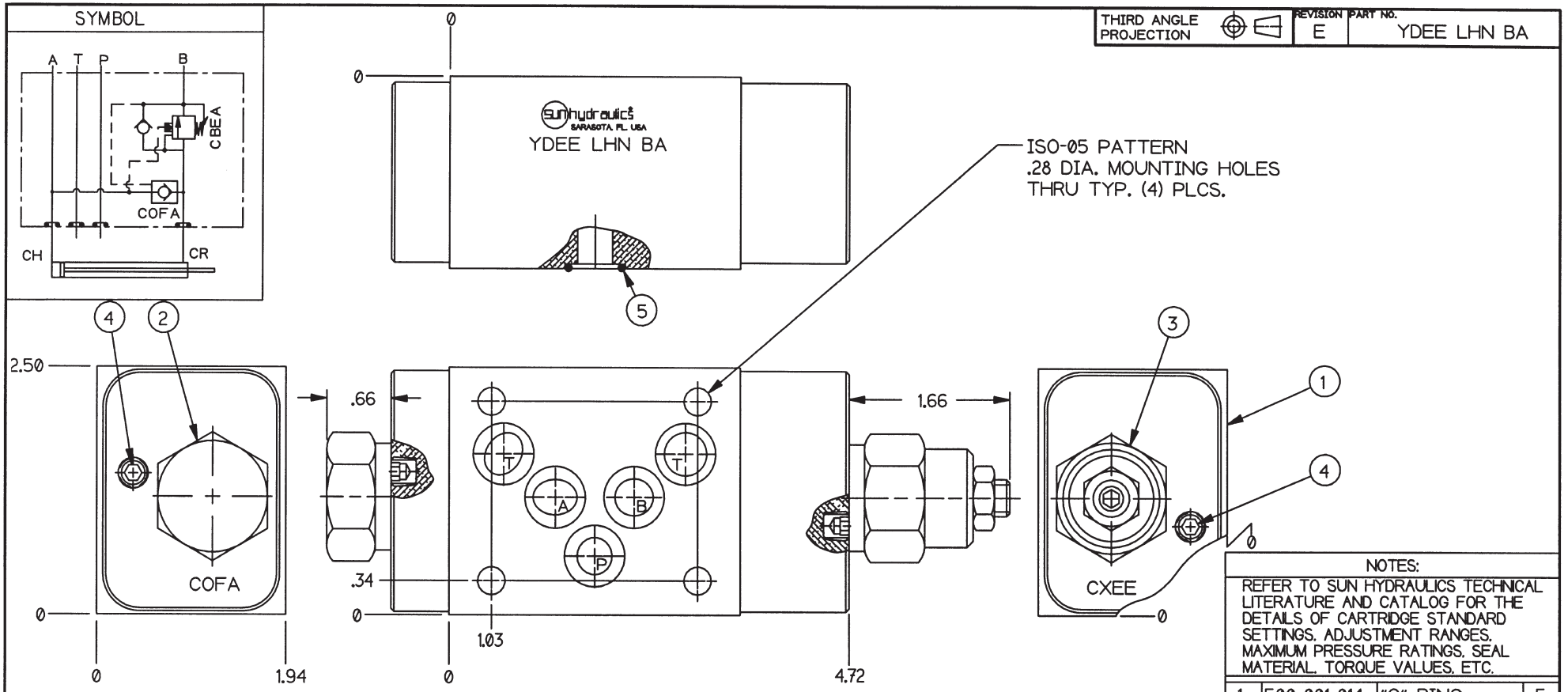
TITLE: ISO-05 X,Y PATTERN PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A
SCALE: 1:1
REF
MATERIAL: ALUM & STEEL
HEAT TREAT & FINISH

| | DRAWN | CHECK | RELEASE |
|---|---|---|---|
| | RJB | JLB | 668 |
| DATE | 25OCT84 | 06NOV84 | 19NOV84 |

REVISION: A
PART NO.: YDEL LHN BB

sun hydraulics CORPORATION
1500 WEST UNIVERSITY PKWY
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


YDEL-LHN-BB
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
A to CH
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
GPM
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
94.6
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR
3/29/00
11:21 AM




THIRD ANGLE PROJECTION

| REVISION | PART NO. |
|---|---|
| E | YDEE 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 |
|---|---|---|---|
| 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| E | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR99 | SMS | DSS | 9723 |
| D | 4.72 LENGTH WAS 4.62 | 25AUG98 | RJB | | 8795 |
| - | SEALS >-BUNA | 14AUG92 | RLB | | 2695 |
| C | REDRAWN | | RJB | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\-1
FINISH 63 √
REMOVE ALL BURRS

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

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:1 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| RJB | JLB | 715 | |
| DATE | DATE | DATE | |
| 26OCT84 | 06NOV84 | 04FEB85 | |

REVISION E PART NO. YDEE LHN BA

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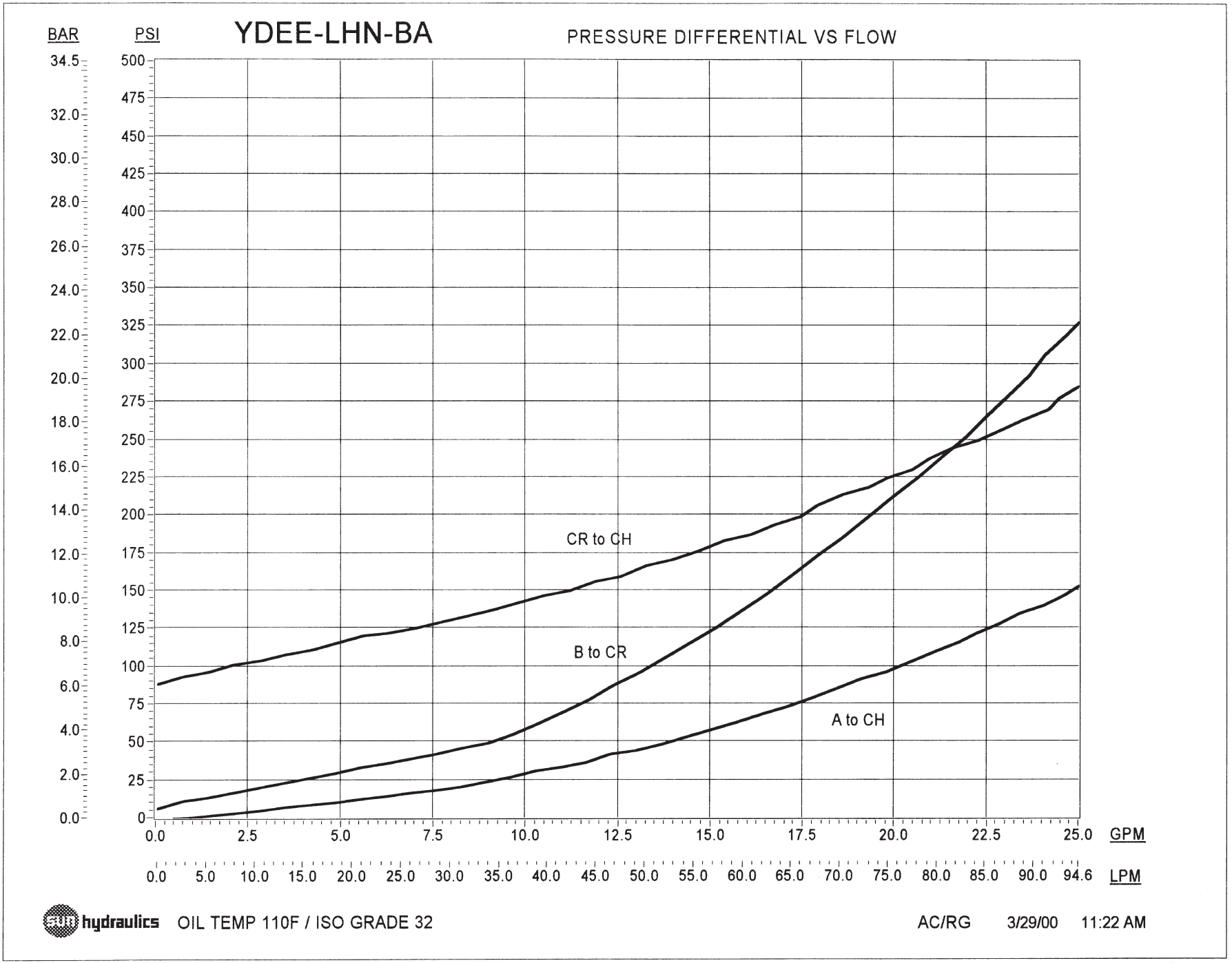
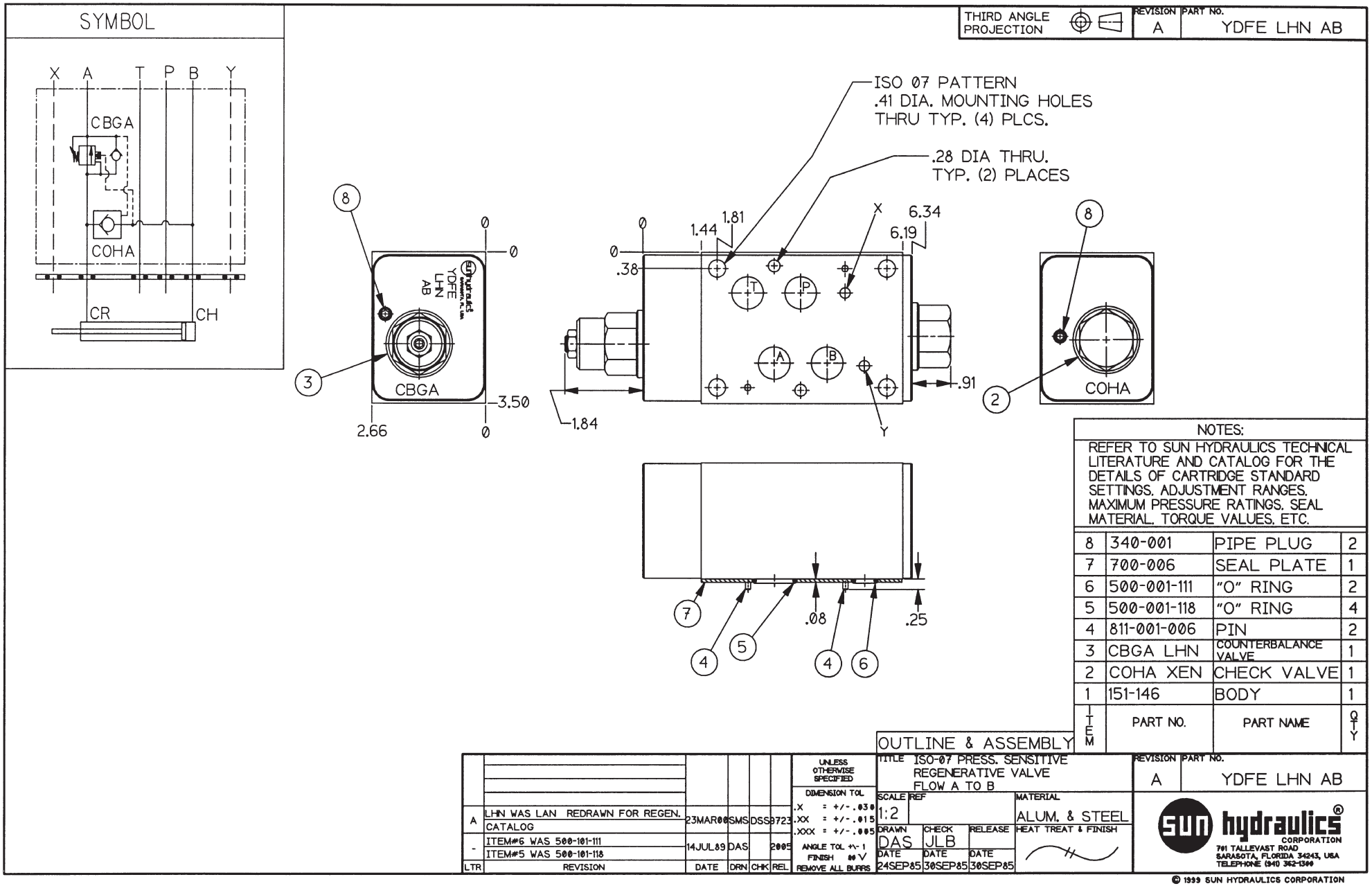
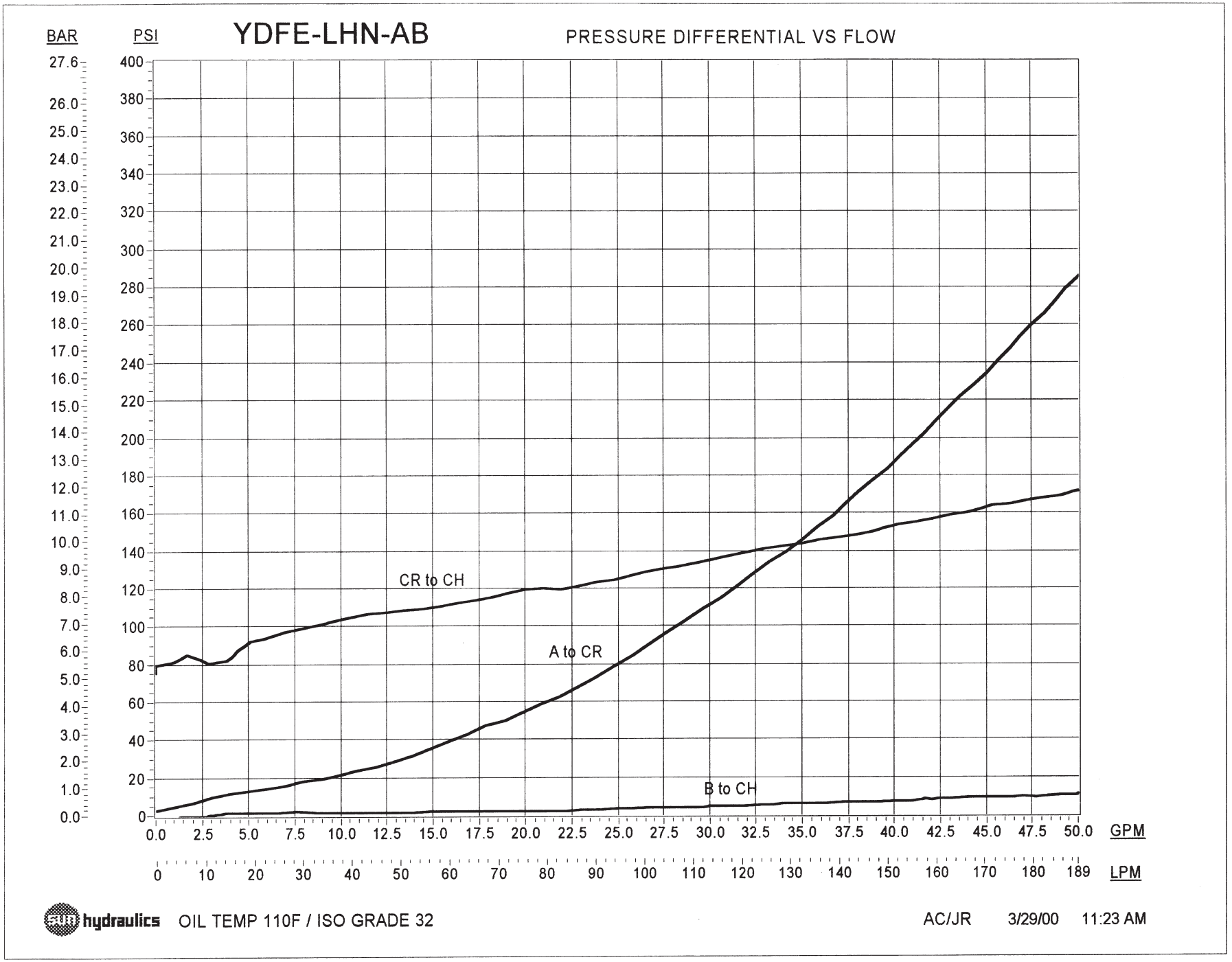
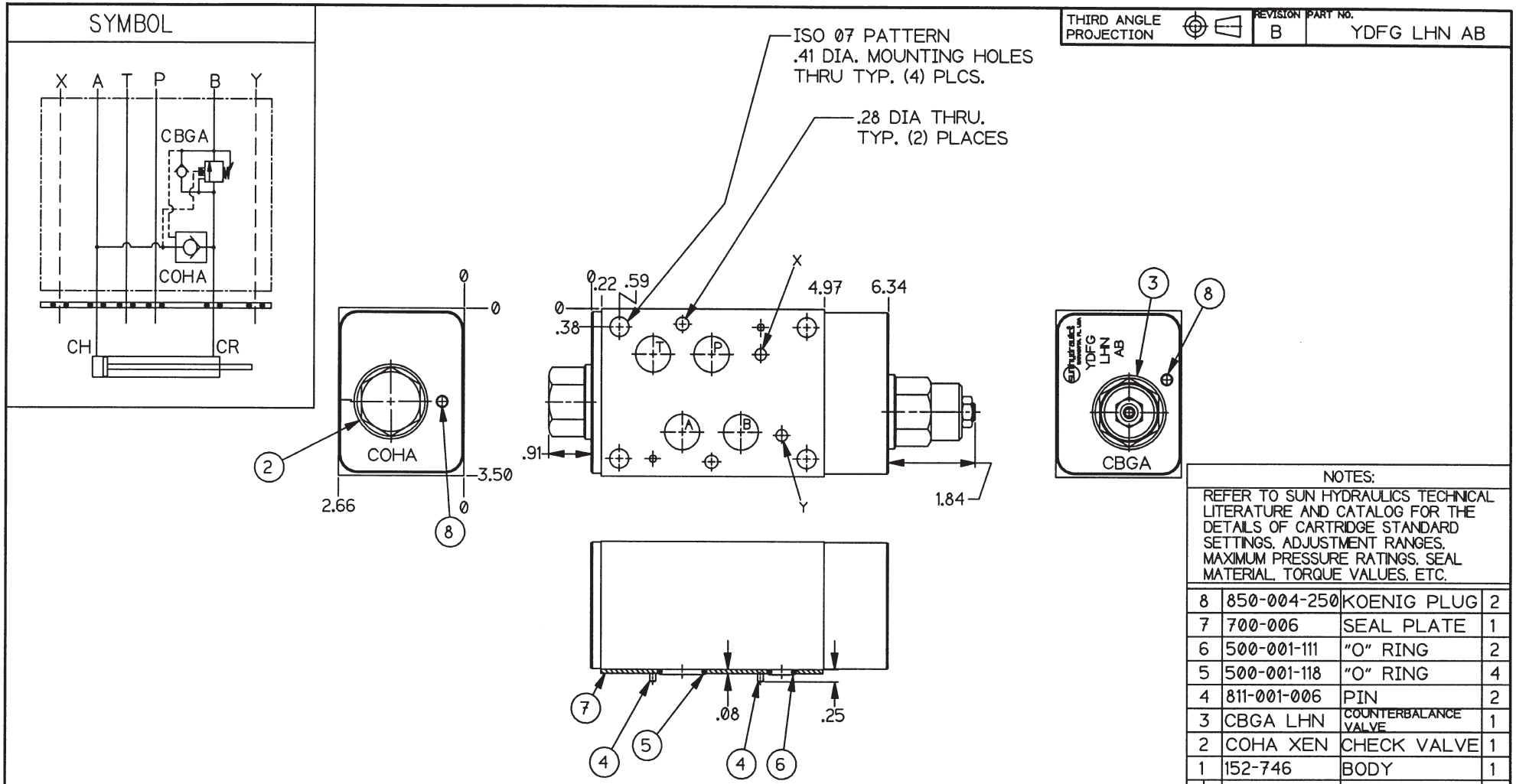

YDEE-LHN-BA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
A to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 GPM
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 94.6 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/RG
3/29/00
11:22 AM




YDFE-LHN-AB
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
A to CR
B to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:23 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 |
|---|---|---|---|
| 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |
| A | MOVED COHA SLIGHTLY | 28JUL94 | RJB | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE ISO-07 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| RJB | DAS | 3435 | |
| DATE 18DEC91 | DATE 19DEC91 | DATE 19DEC91 | |

REVISION B PART NO. YDFG LHN AB

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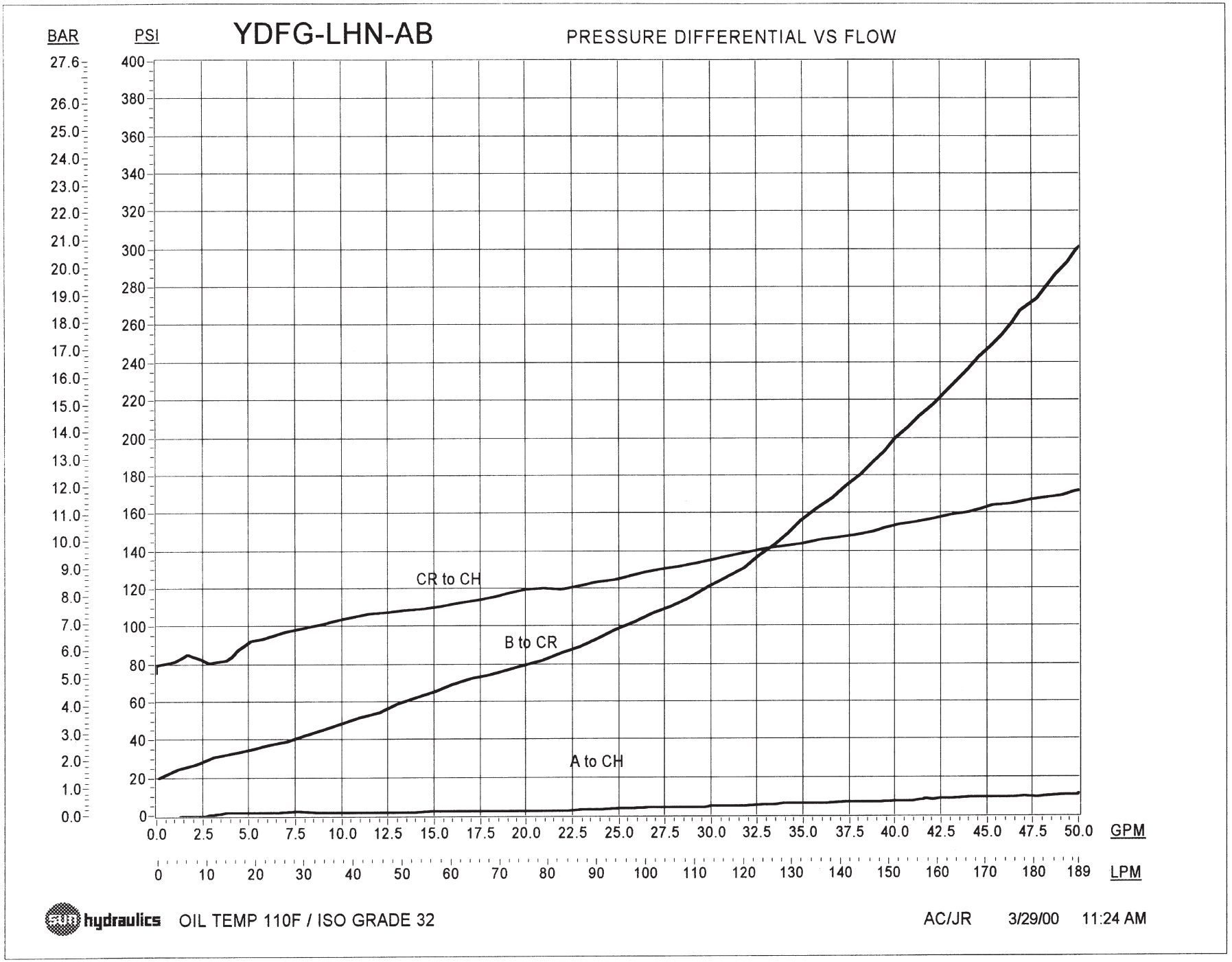
TELEPHONE (941) 362-1200


YDFG-LHN-AB
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
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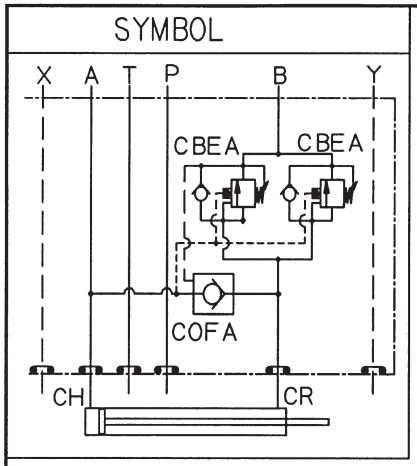
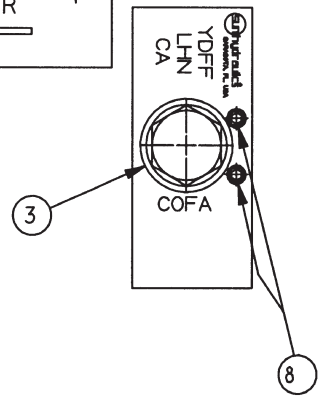
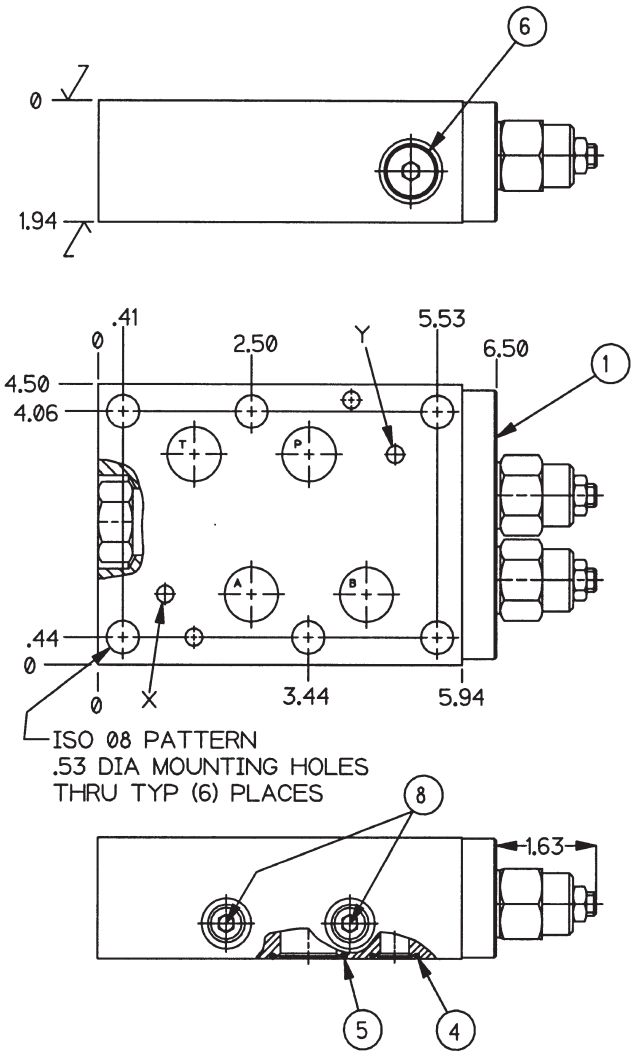
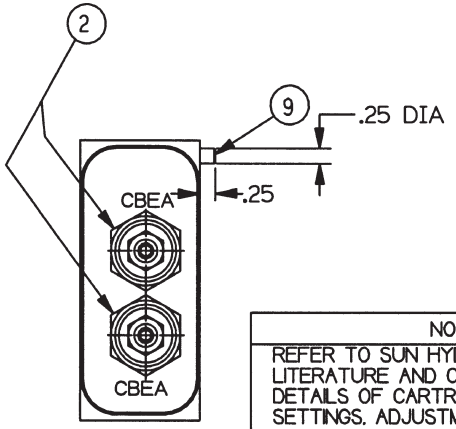
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
B to CR
A to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:24 AM




THIRD ANGLE PROJECTION

| REVISION | PART NO. |
|---|---|
| C | YDFF LHN 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.

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

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| C | LHN WAS LAN DELETED OLD IT#7 & 9 IT#9 WAS IT#11 IT#8 WAS IT#10 IT#6 & 7 WERE 330'S NOW A330'S REDRAWN FOR REGEN. CATALOG | 23MAR99 | SMS | DSS | 9723 |
| B | REDESIGNED & REDRAWN, CORRECTED DATUM | 08SEP93 | DAS | | |
| - | SEALS TO BUNA 8-14-92 | | RJB | | 2965 |
| - | PLUG CHANGE PER RELEASE 1624 | 10-21-88 | RJC | | 1624 |
| A | ITEM 4 QTY WAS 3, ADDED ITEM 10 | 3-10-87 | DAS | | 1362 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/- 1
FINISH 80 √
REMOVE ALL BURRS

TITLE: ISO-08 PRESS. SENSITVE REGENERATIVE VALVE FLOW B TO A

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | JLB | | |
| DATE 14JUN86 | DATE 16JUN86 | DATE | |

| REVISION | PART NO. |
|---|---|
| C | YDFF LHN CA |

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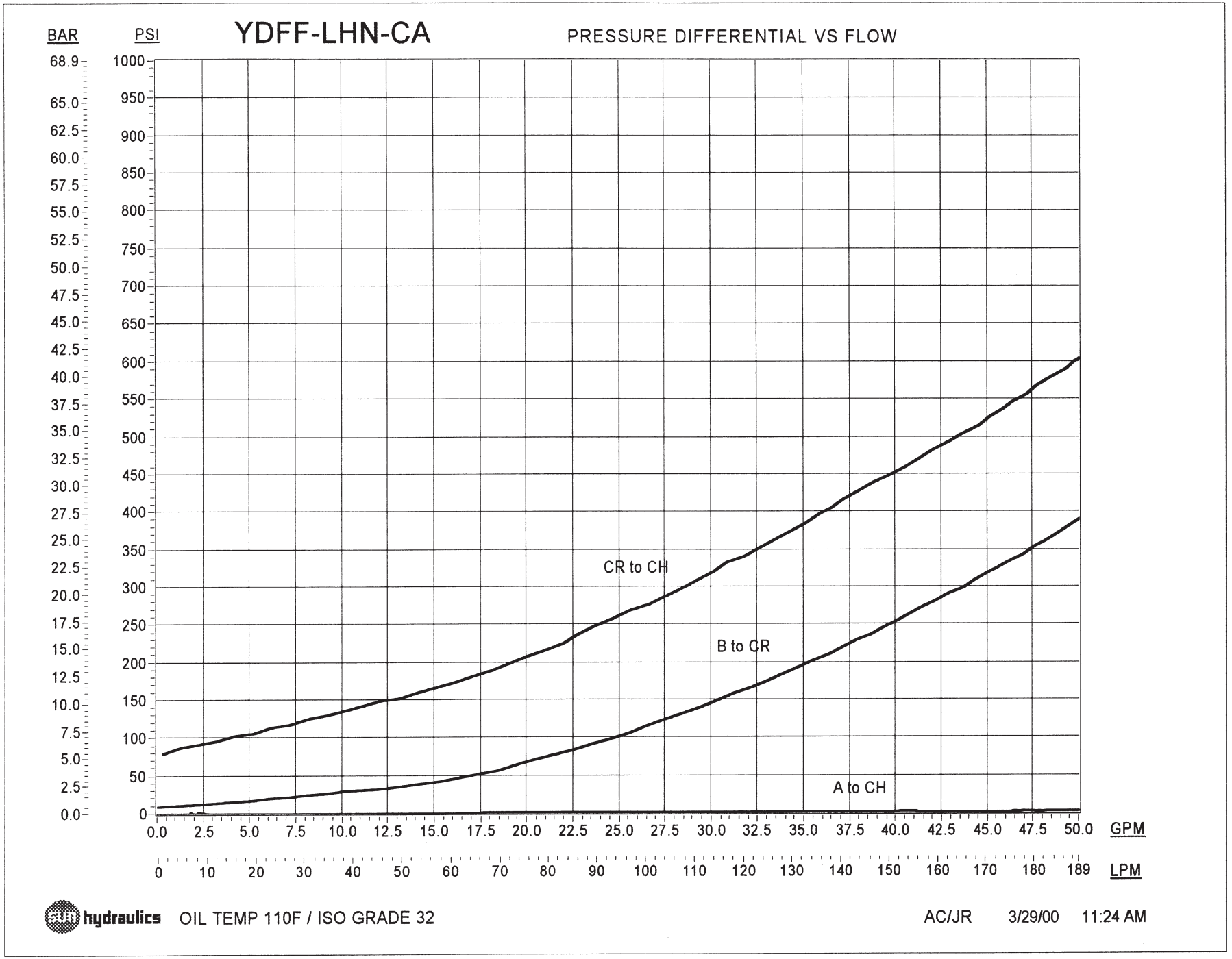
YDFF-LHN-CA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
68.9
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1000
950
900
850
800
750
700
650
600
550
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450
400
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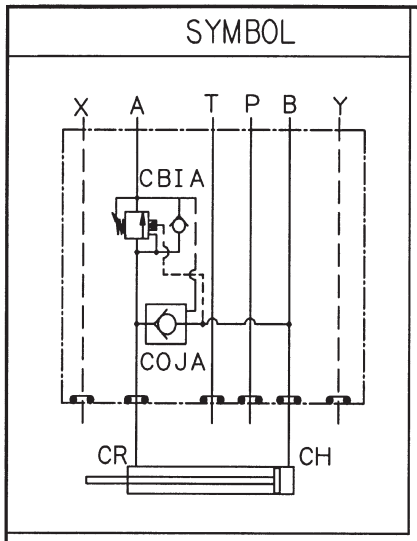
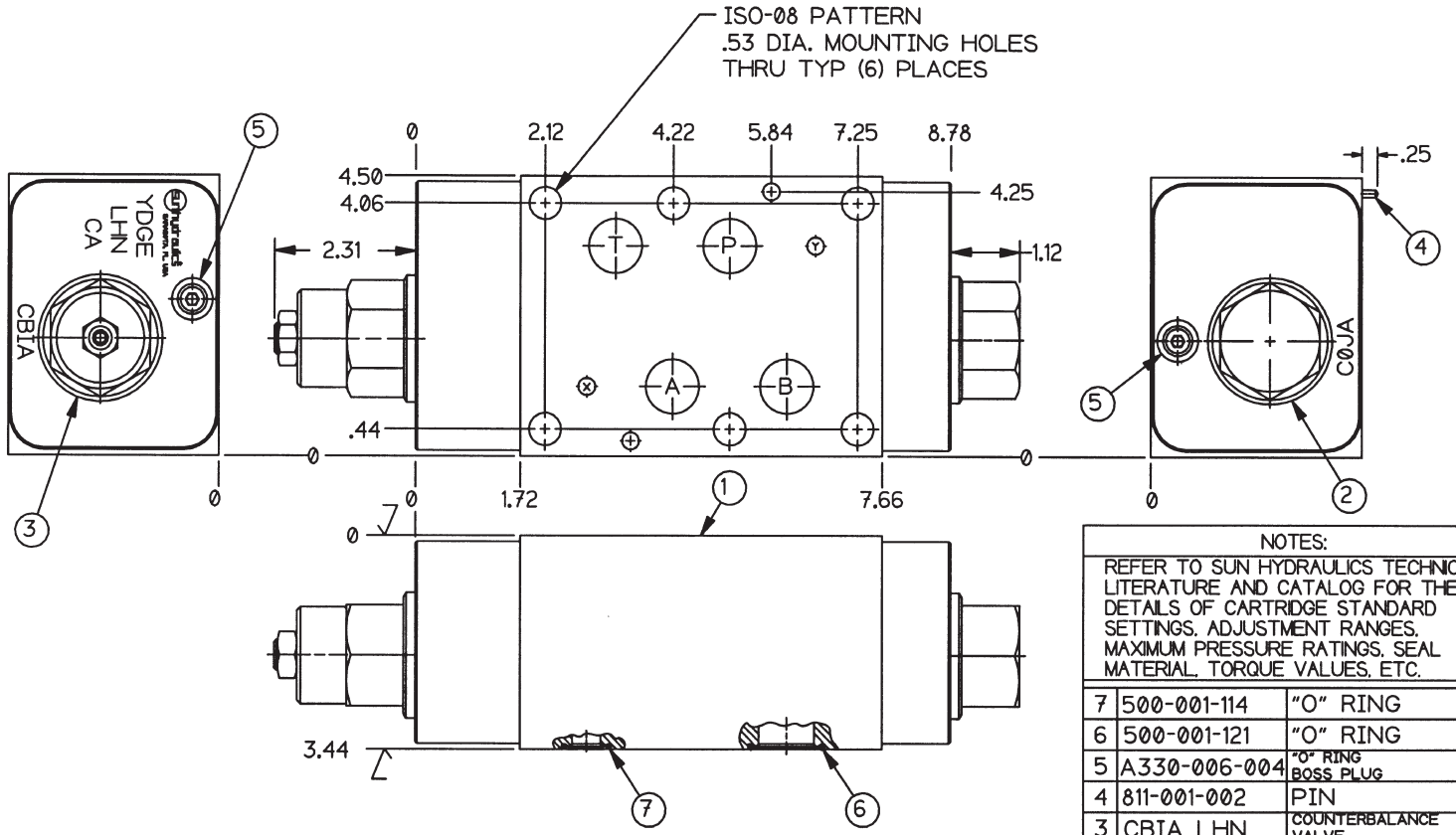
250
200
150
100
50
0
CR to CH
B to CR
A to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 189 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:24 AM




THIRD ANGLE PROJECTION

| REVISION | PART NO. |
|---|---|
| C | YDGE LHN 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.

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

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| C | LHN WAS LAN IT#7 WAS IT#8 IT#6 WAS IT#7 DELETED OLD IT#6 IT#5 WAS 330-006-004 REDRAWN FOR REGEN. CATALOG | 23MAR99 | SMS | DSS | 9723 |
| B | IN NOTE 5 , 75 PSI WAS 30 PSI. | 29 SEP 93 | BRS | | |
| A | REDRAWN ON CADD , SEALS WERE VITON | 17 AUG 93 | BRS | GB | 1930 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL .X = +/-.030 .XX = +/-.015 .XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE: ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW A TO B

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| R/B | JLB | 665 | |
| DATE 19NOV84 | DATE 19NOV84 | DATE 19NOV84 | |

REVISION C | PART NO. YDGE LHN CA

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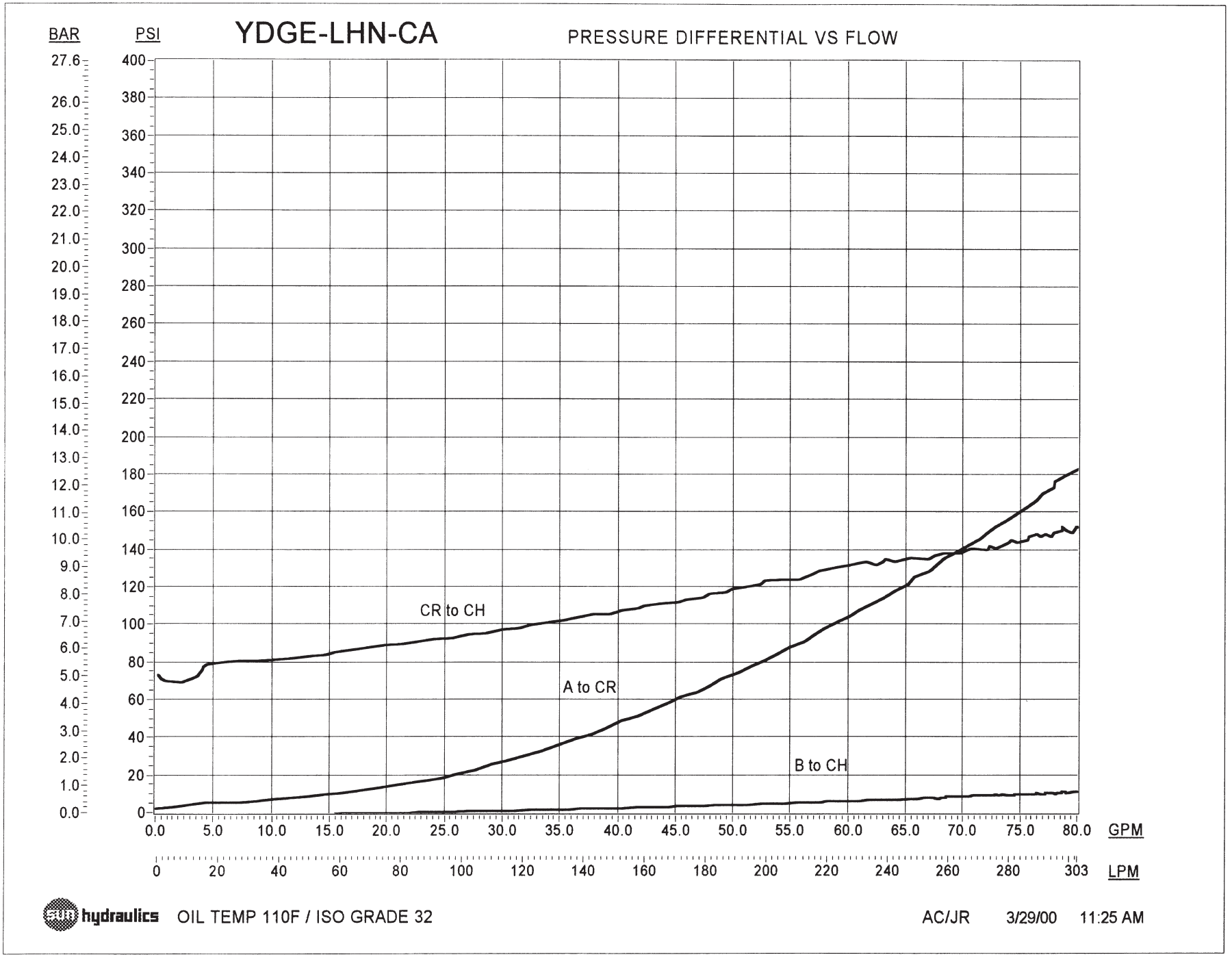
YDGE-LHN-CA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
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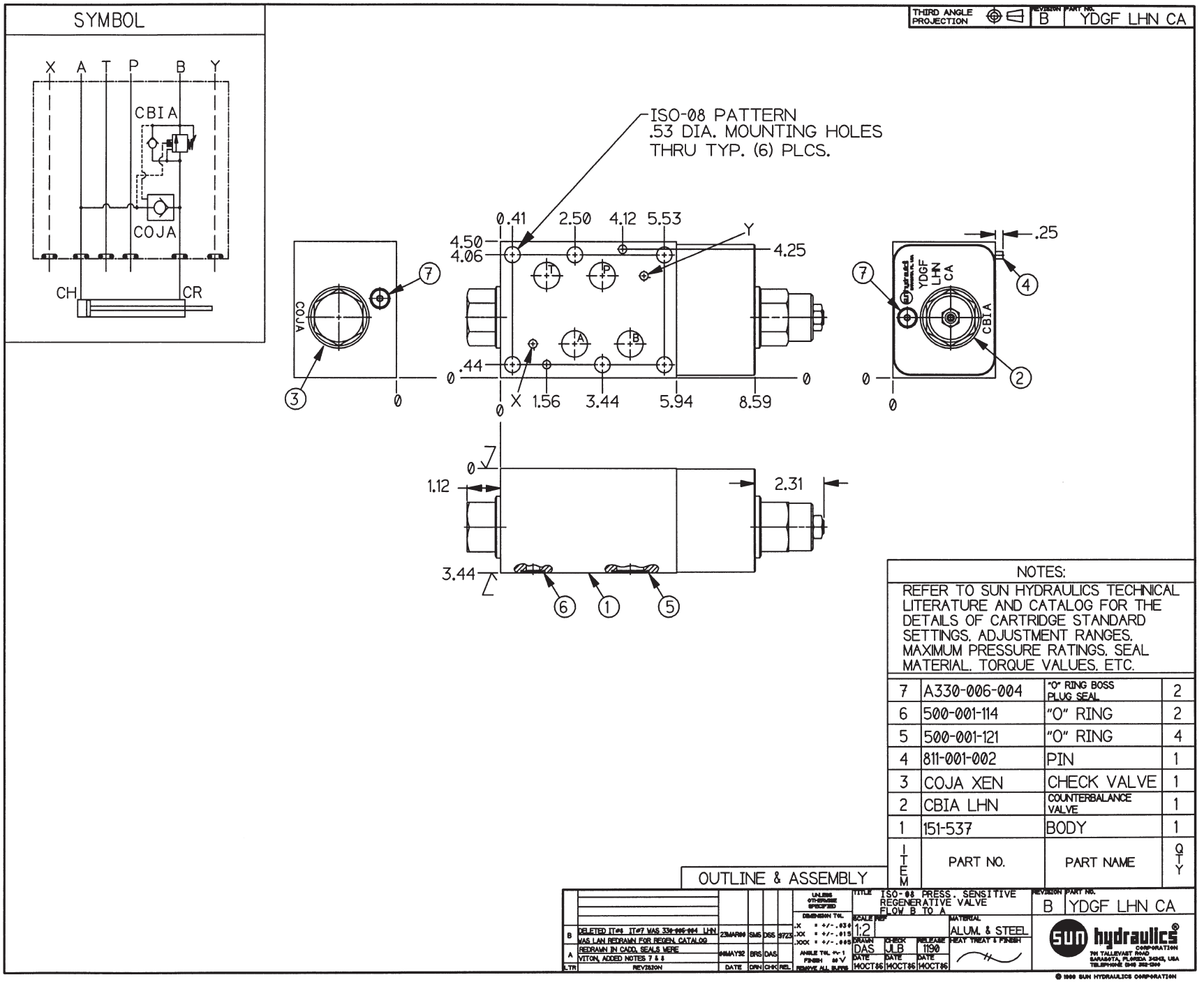
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
CR to CH
A to CR
B to CH
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:25 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 |
|---|---|---|---|
| 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

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | DELETED IT#4 IT#7 WAS 330-006-004 LHN WAS LAN REDRAWN FOR REGEN CATALOG | 23MAR99 | SMS | DSS | 97Z3 |
| A | REDRAWN IN CADD, SEALS WERE VITON, ADDED NOTES 7 & 8 | 04MAY92 | BRS | DAS | |

UNLESS OTHERWISE SPECIFIED: DIMENSION TOL. .X ± +/-.030, .XX ± +/-.015, .XXX ± +/-.005; ANGLE TOL. +/- 1; FINISH 63 √; REMOVE ALL BURRS

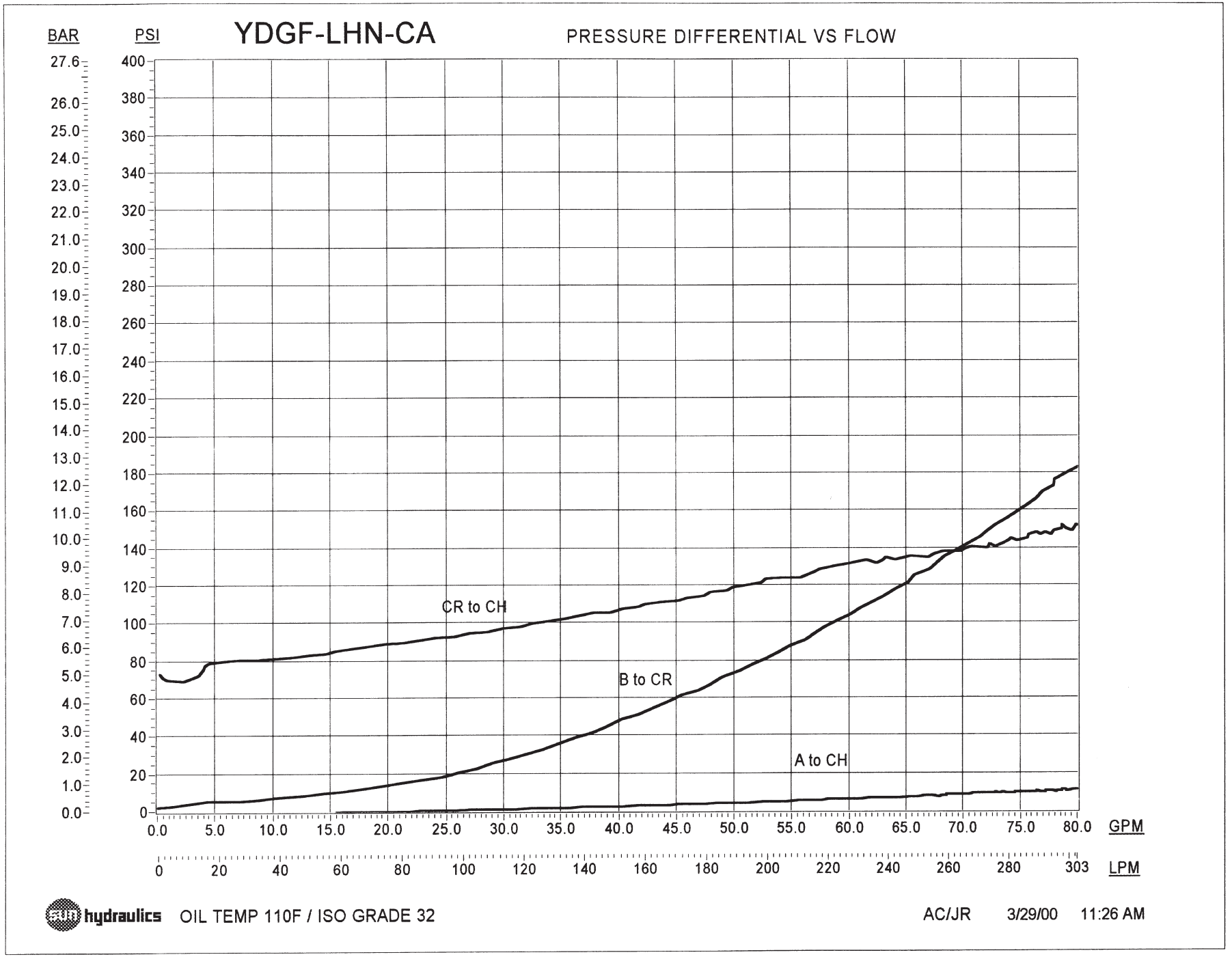
TITLE: ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A

REVISION B | PART NO. YDGF LHN CA

SCALE REF 1.2 | MATERIAL ALUM. & STEEL | HEAT TREAT & FINISH

| DRAWN | CHECK | RELEASE |
|---|---|---|
| DAS | JLB | 1190 |
| DATE 14OCT86 | DATE 14OCT86 | DATE 14OCT86 |

sun hydraulics CORPORATION
7111 TALLEVAST ROAD SARASOTA, FLORIDA 34243, USA TELEPHONE (941) 355-9300


BAR
PSI
YDGF-LHN-CA
PRESSURE DIFFERENTIAL VS FLOW
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
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320
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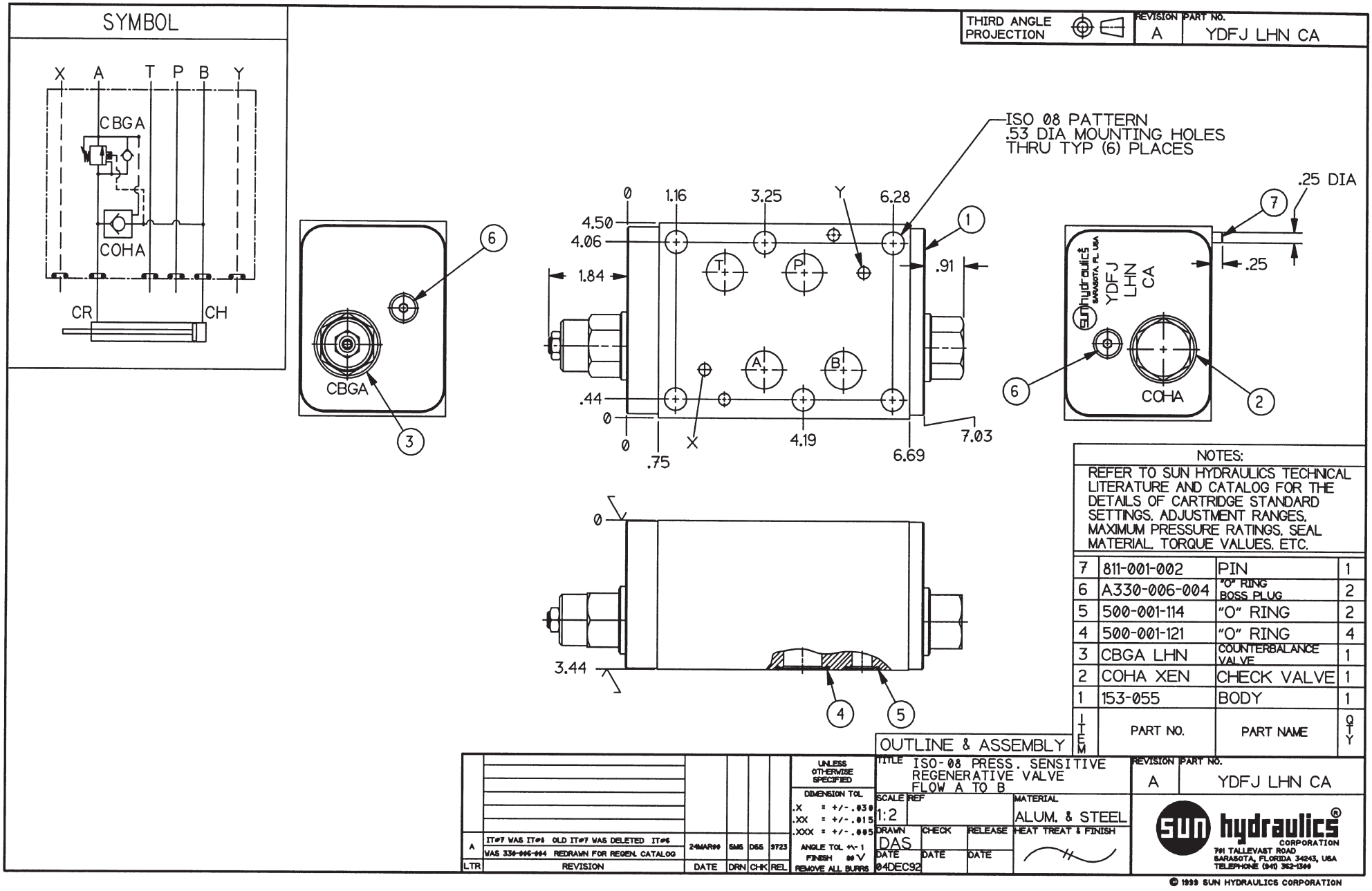
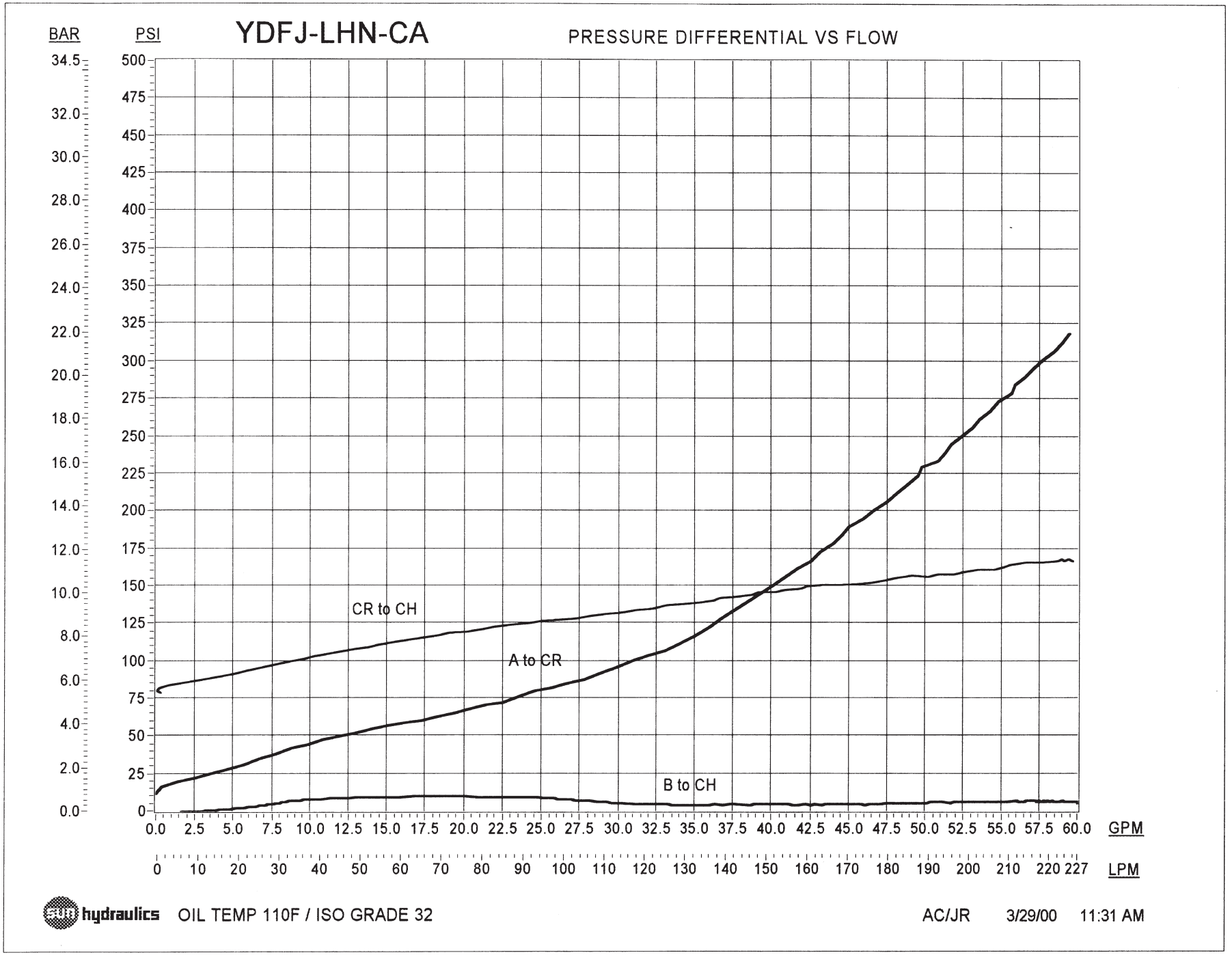
60
40
20
0
CR to CH
B to CR
A to CH
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 GPM
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 303 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:26 AM




YDFJ-LHN-CA
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
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6.0
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175
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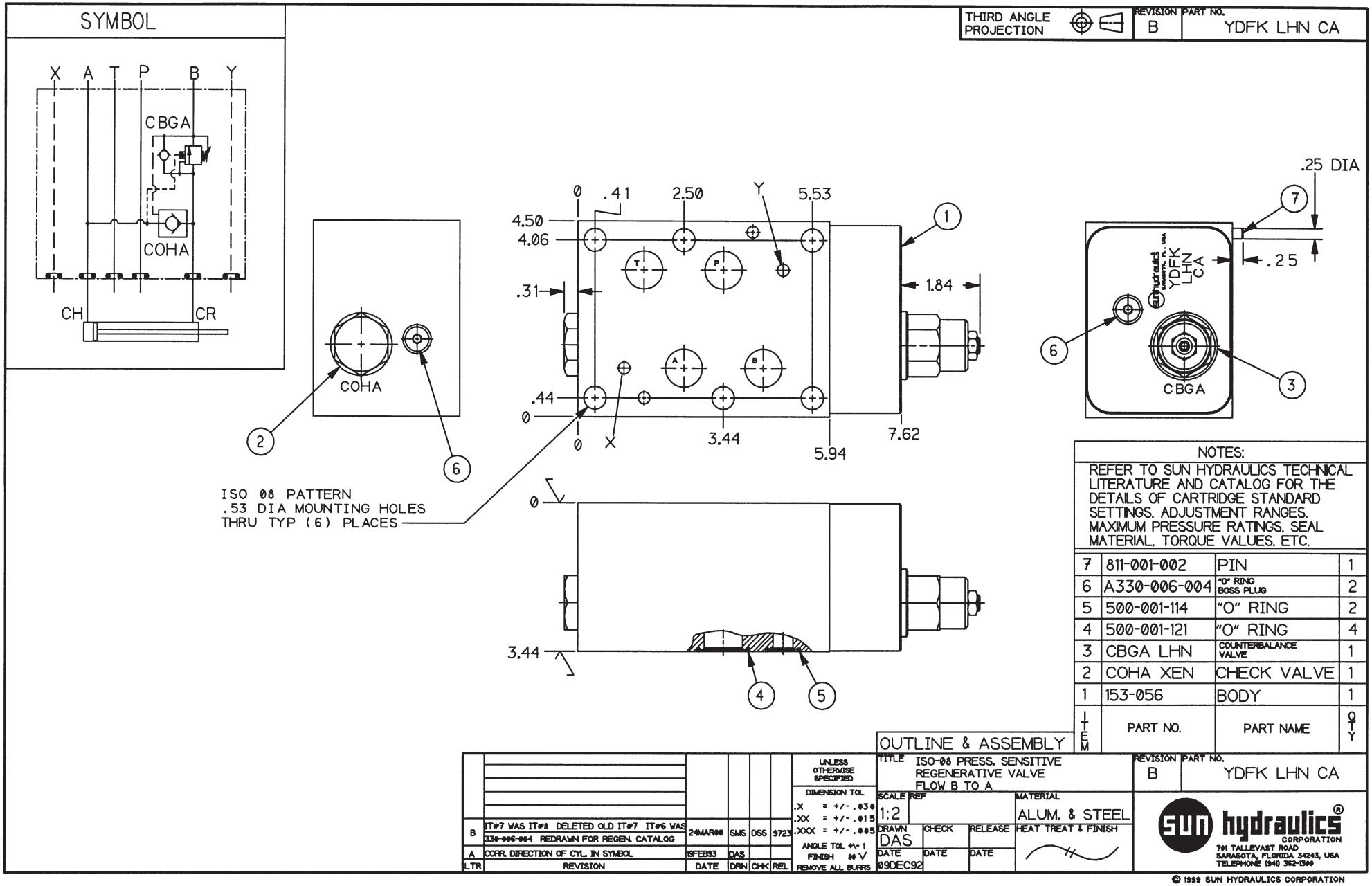
75
50
25
0
CR to CH
A to CR
B to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:31 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 |
|---|---|---|---|
| 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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | IT#7 WAS IT#8 DELETED OLD IT#7 IT#6 WAS 330-006-004 REDRAWN FOR REGEN CATALOG | 24MAR98 | SMS | DSS | 9723 |
| A | CORR. DIRECTION OF CYL. IN SYMBOL | 19FEB93 | DAS | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL .X = +/-.030 .XX = +/-.015 .XXX = +/-.005
ANGLE TOL +\- 1
FINISH 80 √
REMOVE ALL BURRS

TITLE ISO-08 PRESS. SENSITIVE REGENERATIVE VALVE FLOW B TO A
SCALE 1:2 REF
MATERIAL ALUM. & STEEL
DRAWN DAS DATE 09DEC92
CHECK DATE
RELEASE DATE
HEAT TREAT & FINISH

REVISION B PART NO. YDFK LHN CA

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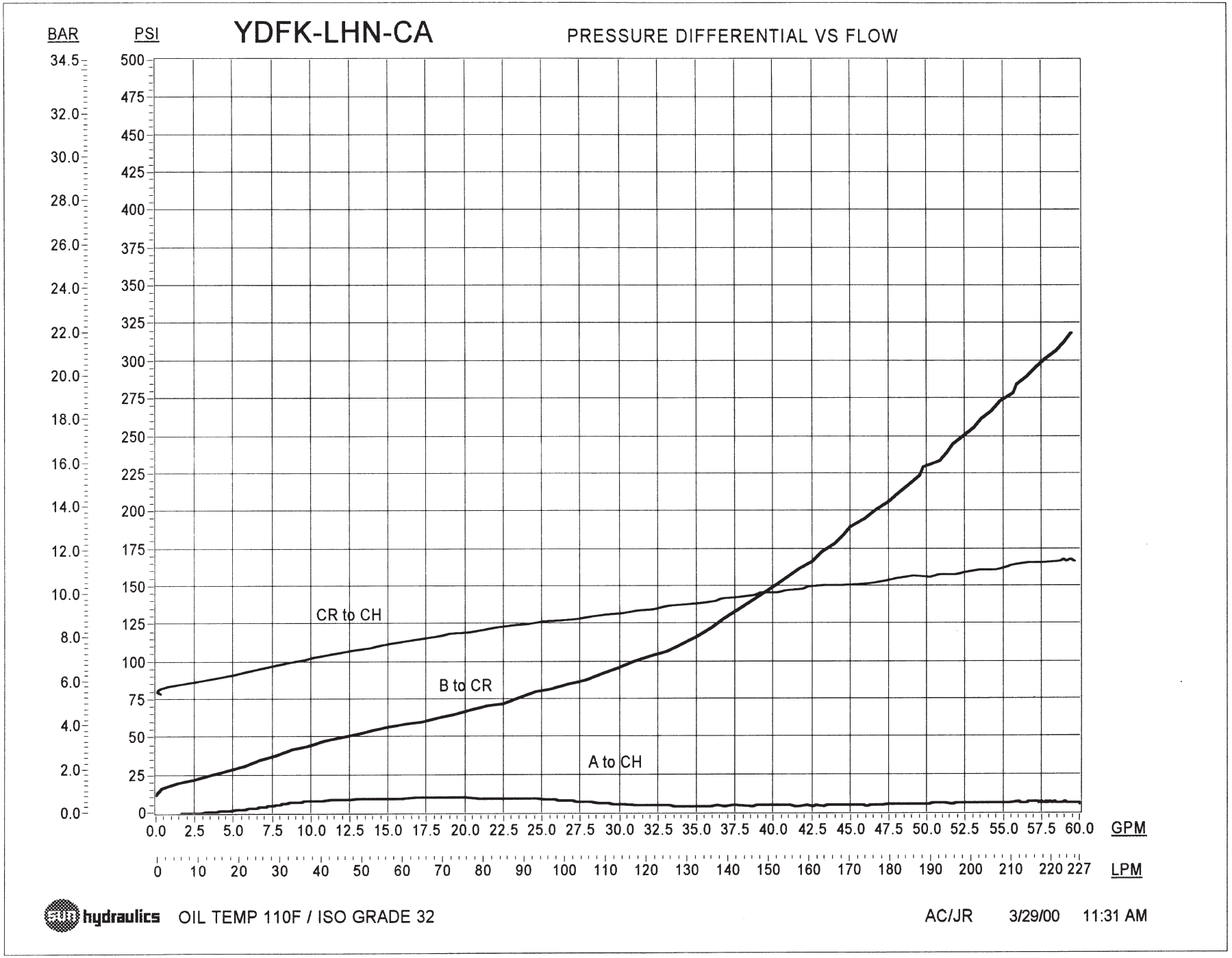
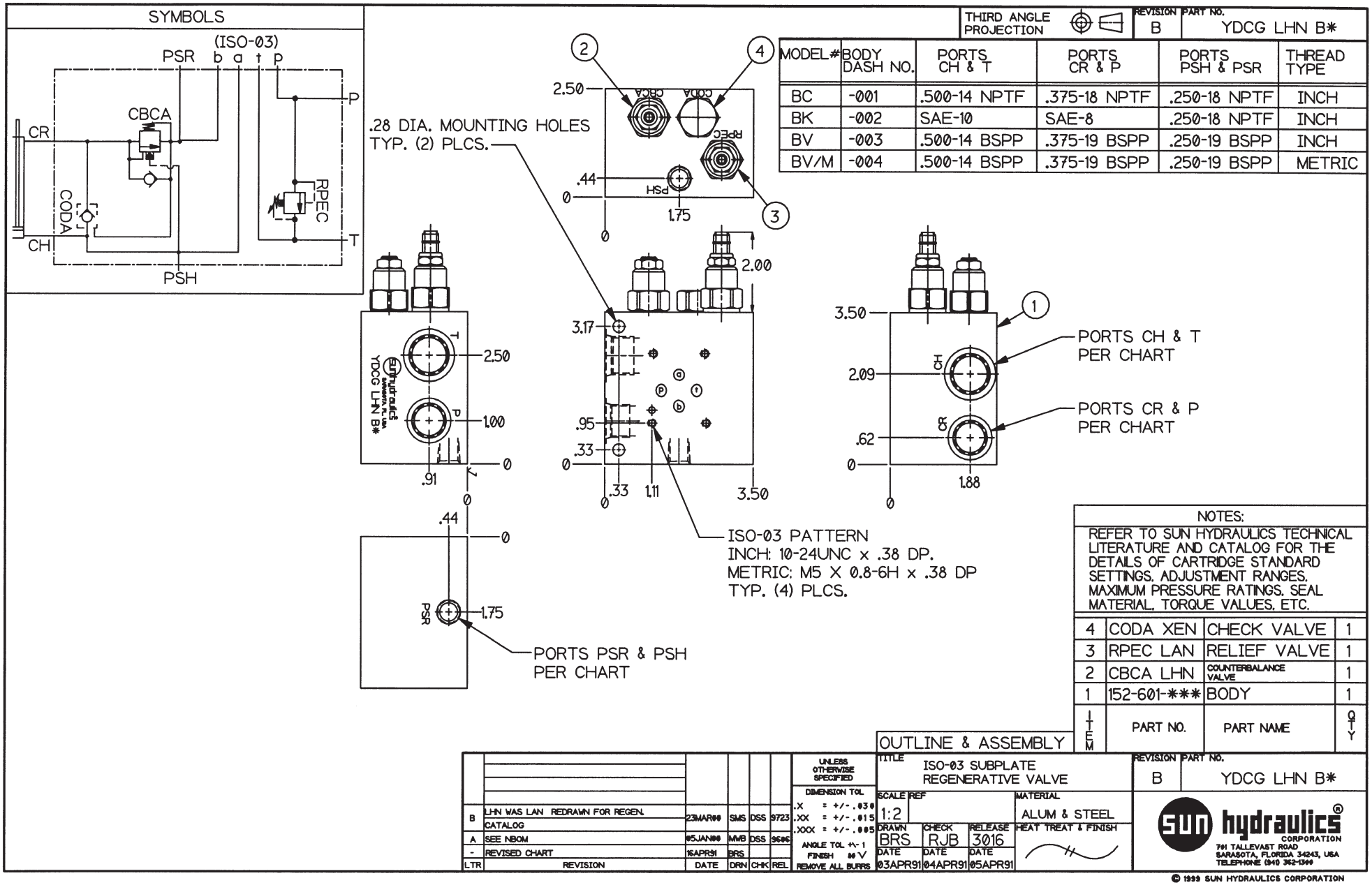
SARASOTA, FLORIDA 34243, USA
TELEPHONE (941) 362-1200


BAR
PSI
YDFK-LHN-CA
PRESSURE DIFFERENTIAL VS FLOW
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
CR to CH
B to CR
A to CH
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 55.0 57.5 60.0
GPM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 227
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/29/00 11:31 AM




THIRD ANGLE PROJECTION

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

| 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 |

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 |

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| B | LHN WAS LAN REDRAWN FOR REGEN. | 23MAR99 | SMS | DSS | 9723 |
| A | CATALOG | 05JAN99 | MWB | DSS | 9606 |
| - | SEE NBOM | 16APR91 | BRS | | |
| - | REVISED CHART | 16APR91 | BRS | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\-1
FINISH 80 V
REMOVE ALL BURRS

TITLE: ISO-03 SUBPLATE REGENERATIVE VALVE

| SCALE | REF | MATERIAL |
|---|---|---|
| 1:2 | | ALUM & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| BRS | RJB | 3016 | |
| DATE 03APR91 | DATE 04APR91 | DATE 05APR91 | |

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

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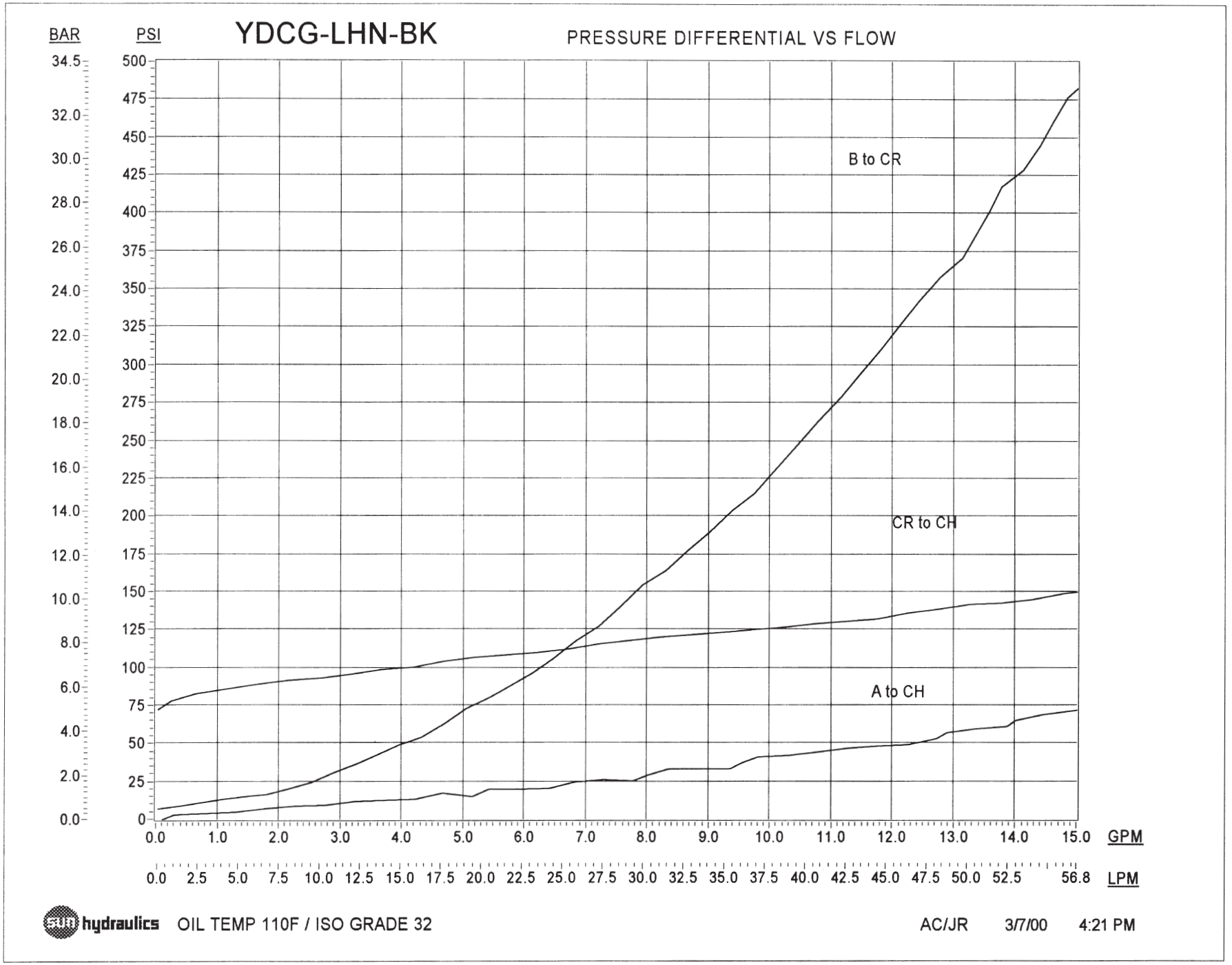
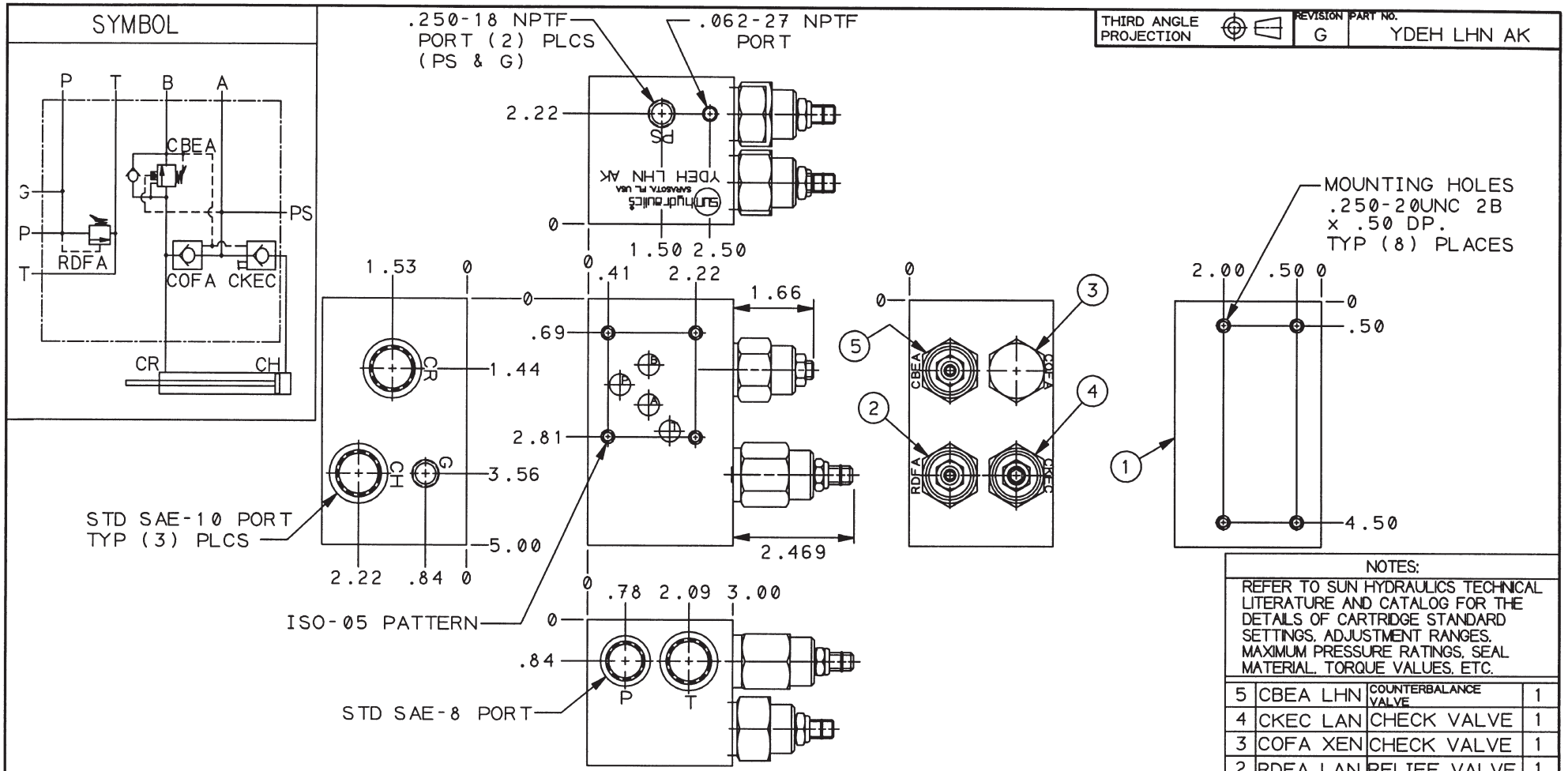

YDCG-LHN-BK
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
34.5
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
B to CR
CR to CH
A to CH
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 GPM
0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5 35.0 37.5 40.0 42.5 45.0 47.5 50.0 52.5 56.8 LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR 3/7/00 4:21 PM




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.

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

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| G | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 23MAR00 | SMS | DSS | 9723 |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +/-1
FINISH 63 √
REMOVE ALL BURRS

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

SCALE: REF | MATERIAL: ALUM. & STEEL

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| JDA | | | |
| DATE 18DEC73 | DATE | DATE | |

REVISION G | PART NO. YDEH LHN AK

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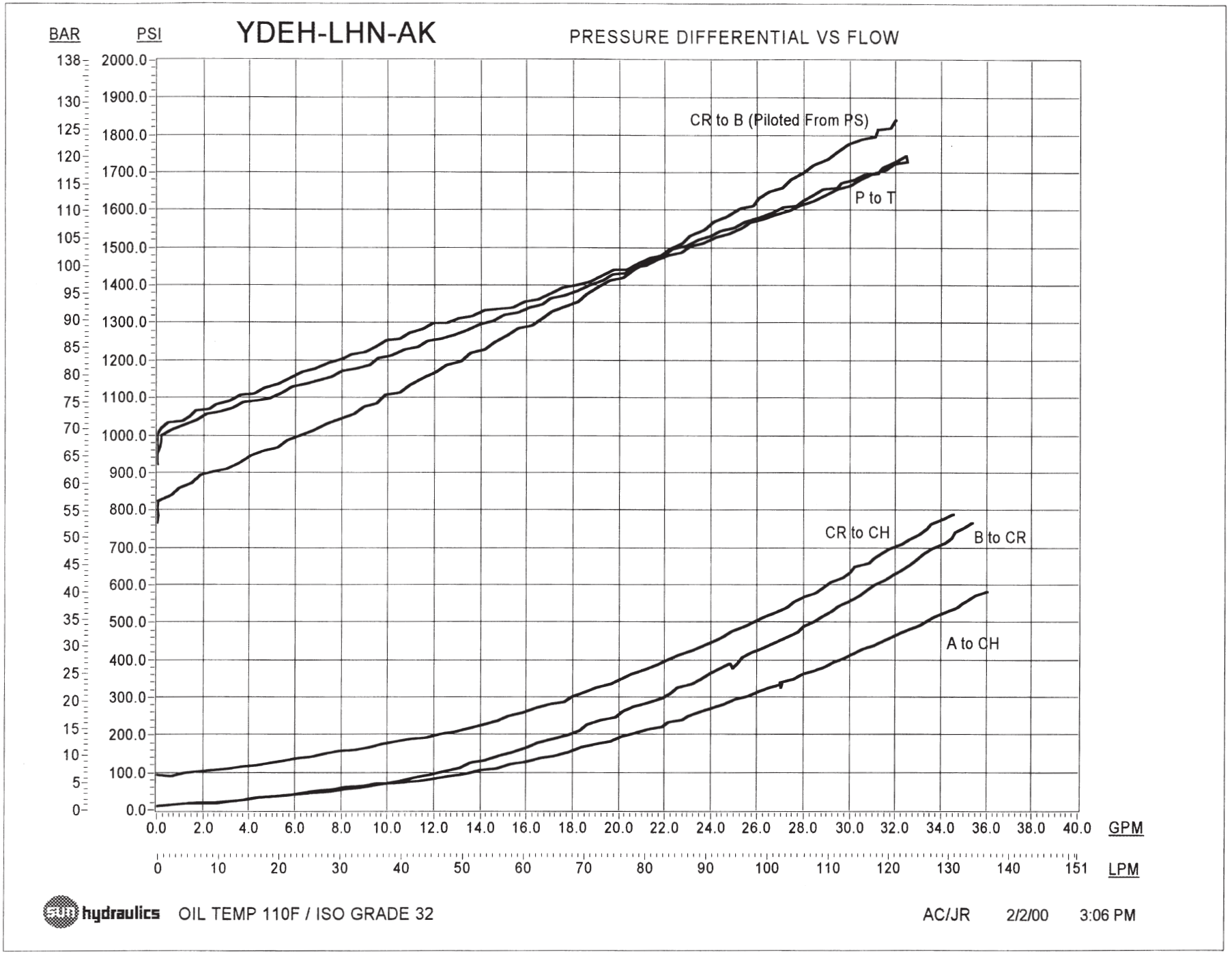
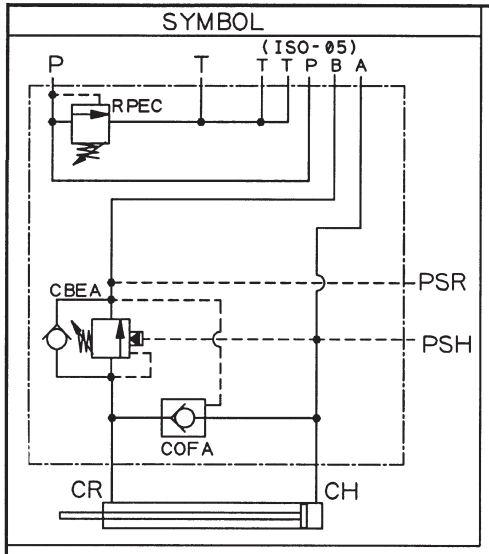

YDEH-LHN-AK
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
CR to B (Piloted From PS)
P to T
CR to CH
B to CR
A to CH
GPM
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR
2/2/00
3:06 PM

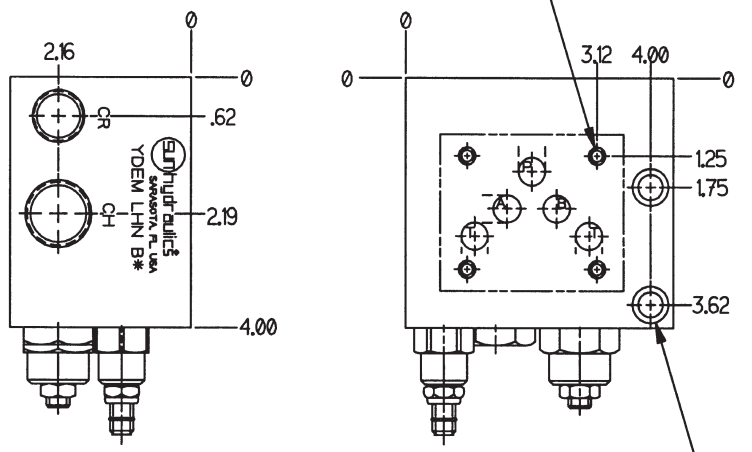



ISO-05 PATTERN
INCH: .250-20UNC x .50 DP.
METRIC: M6x1.0-6H x .50 DP.

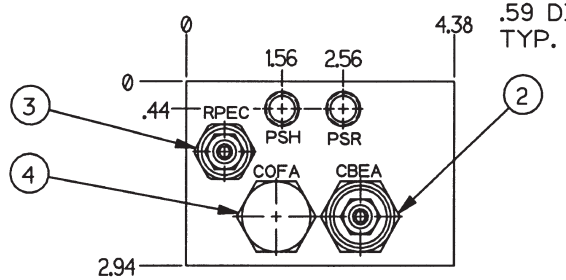
THIRD ANGLE PROJECTION

| 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.

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

OUTLINE & ASSEMBLY

| LTR | REVISION | DATE | DRN | CHK | REL |
|---|---|---|---|---|---|
| A | LHN WAS LAN REDRAWN FOR REGEN. CATALOG | 24MAR89 | SMS | DSS | 9723 |
| - | CHARTED BW MODEL PORTS T, CH, PSH & PSR WERE LABELED NPTF | 12DEC86 | RLB | | |

UNLESS OTHERWISE SPECIFIED
DIMENSION TOL
.X = +/-.030
.XX = +/-.015
.XXX = +/-.005
ANGLE TOL +\- 1
FINISH 63 √
REMOVE ALL BURRS

TITLE ISO-05 PATTERN
PRESSURE SENSITIVE
REGENERATIVE MANIFOLD

| SCALE | REF | MATERIAL |
|---|---|---|
| 1/2 | | ALUM. & STEEL |

| DRAWN | CHECK | RELEASE | HEAT TREAT & FINISH |
|---|---|---|---|
| DAS | RJB | | |
| DATE 15JUL86 | DATE 23JUL86 | DATE | |

| REVISION | PART NO. |
|---|---|
| | YDEM LHN B* |

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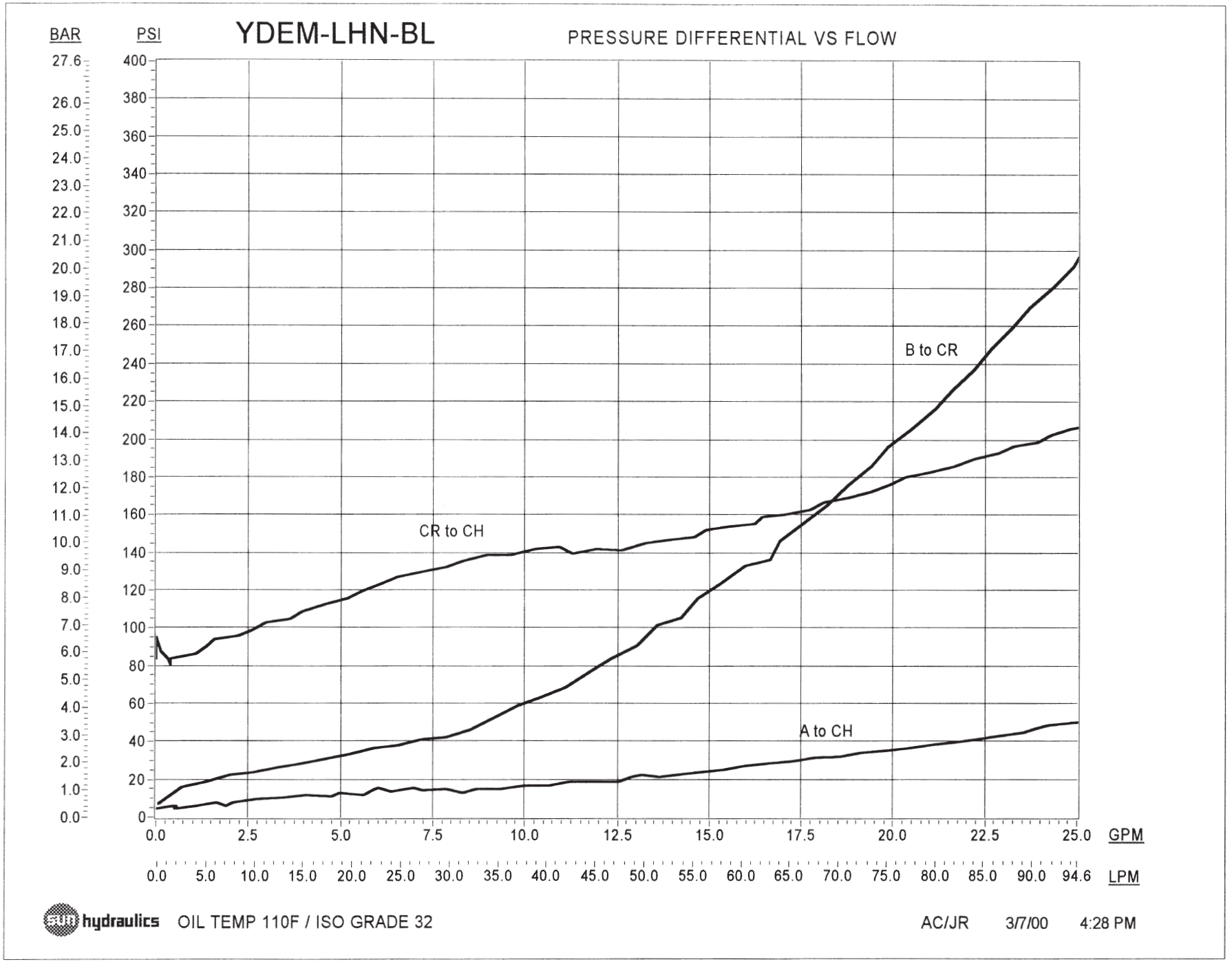
YDEM-LHN-BL
PRESSURE DIFFERENTIAL VS FLOW
BAR
PSI
27.6
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
B to CR
CR to CH
A to CH
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
GPM
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
94.6
LPM
hydraulics
OIL TEMP 110F / ISO GRADE 32
AC/JR
3/7/00
4:28 PM

# Assembly Model Code Index


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| YDCD-LHN-A* | 82 | YDES-LHN-BA | 90 | YDGE-LHN-CA | 102 |
| YDCF-XCN-AA | 24 | YDEV-XCN-BA | 26 | YDGF-LHN-CA | 104 |
| YDCG-LHN-B* | 110 | YDEW-XCN-BB | 32 | YDGH-XCN-CA | 44 |
| YDCK-XCN-AA | 22 | YDFE-LHN-AB | 96 | YDGI-XCN-CA | 42 |
| YDEC-LHN-A* | 48 | YDFF-LHN-CA | 100 | YDGJ-XCN-A* | 18 |
| YDED-LAN-A* | 84 | YDFG-LHN-AB | 98 | YDGK-XCN-A* | 16 |
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| YDEF-LHN-A* | 54 | YDFI-XCN-AB | 36 | YDGL-LHN-A5 | 72 |
| YDEG-LHN-A* | 52 | YDFJ-LHN-CA | 106 | YDGL-LHN-AP | 66 |
| YDEH-LHN-AK | 112 | YDFK-LHN-CA | 108 | YDGL-LHN-AQ | 78 |
| YDEK-LHN-A* | 50 | YDFL-XCN-CA | 38 | YDHC-LHN-A5 | 74 |
| YDEL-LHN-BB | 92 | YDFM-XCN-CA | 40 | YDJC-LHN-A6 | 78 |
| YDEM-LHN-B* | 114 | YDGC-LHN-A* | 56 | YDJC-LHN-AN | 76 |
| YDEN-XCN-BA | 30 | YDGC-LHN-AP | 58 | YDJC-LHN-AS | 80 |
| YDEP-XCN-A* | 14 | YDGD-LHN-A* | 60 | YDJD-XCN-AS | 20 |