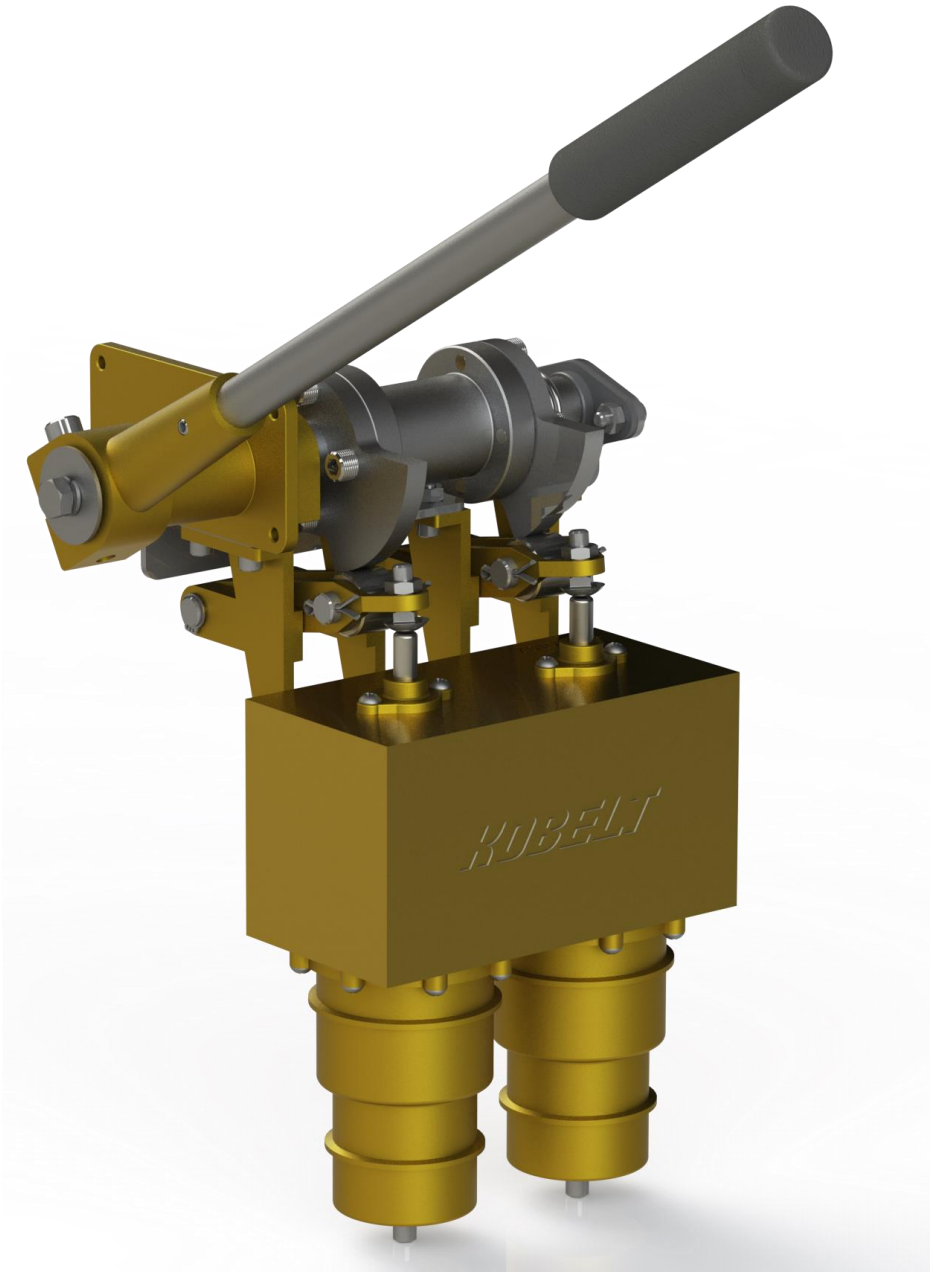
2588 Driller's Valve

Owner's Operation, Installation & Maintenance Manual



Kobelt Manufacturing Co. Ltd.

NOTES:

RECORD DATA BEFORE INSTALLATION FOR FUTURE REFERENCE	
Model #:	
Serial #:	
Date of Purchase:	
Date of Installation:	

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1 INTRODUCTION

1.1 CONTACT

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This document is intended to clearly present comprehensive product data and provide technical information to assist the end user in design applications. Kobelt reserves the right, without notice, to change the design, or construction, of any products and to discontinue or limit distribution of any products. Kobelt also reserves the right to change, or update, without notice, any technical information contained within this document.

Kobelt recommends that customers visit our website to check for updates to this Manual. Once a product has been selected for use, it should be tested by the user to ensure proper function in all possible applications. For further instructions, please contact our distributors or visit our website.

1.2 SAFETY

1.2.1 Safety Alerts

Throughout this manual, the following symbols, and their accompanying explanation, are used to alert the user to special instructions concerning a service or operation that may be hazardous if performed incorrectly or carelessly. The associated risk levels are stated below.

⚠ DANGER	This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	This symbol indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
NOTICE	This symbol informs the reader of events not related to personal injury but which there is a risk of damage to property or equipment.
SAFETY INSTRUCTIONS	This symbol informs the reader of safety-related instructions or procedures.

1.2.2 Notice to Installer

Disregarding the following safety measures can result in an accident causing severe injury to personnel and damage to material assets.

- Only use the product as directed in this manual.
- Never put the product into service if there is evidence of visible damage.
- Never put the product into service before fully completing installation and commissioning.
- Do not carry out any modifications to the product.

- Only use authentic Kobelt spare parts.
- Observe all local regulations, directives and laws during the installation of this product.
- All installation, commissioning, and maintenance work must only be conducted by qualified personnel. (For the purpose of this manual, qualified personnel are persons who are familiar with the assembly, installation, commissioning, and operation of the product and who have the qualifications necessary for their occupation.)
- Observe all specifications in this manual. If these guidelines are not followed and damage occurs, the warranty will be voided.

1.2.3 Product Hazards

⚠ DANGER	**Equipment Starts Automatically:** The connected brakes may activate suddenly while servicing this product, causing bodily harm. Ensure that all power sources are locked out prior to performing work.

⚠WARNING	**Pinch Points:** The 2588 driller's valve contains pinch points, which can cause bodily harm. Ensure that hands and fingers remain clear of the pinch points when performing work.

⚠WARNING	**High Pressure Fluids:** The 2588 driller's valve uses compressed air. Ensure all pressure is exhausted and the pressure source locked out prior to performing work.

2 PRODUCT DESCRIPTION

2.1 OVERVIEW

The Kobelt 2588 driller's valve permits proportional control of air applied brakes. The operator's handle turns a cam which depresses a spring-loaded valve stem. Pressure output is proportional to the handle movement with the maximum output achieved when the handle is fully depressed.

These units are available in single and dual channel configurations as well as several different pressure ranges. The dual channel option is to provide better control of two brake systems at light loads by only operating one brake for the first one third of handle movement.

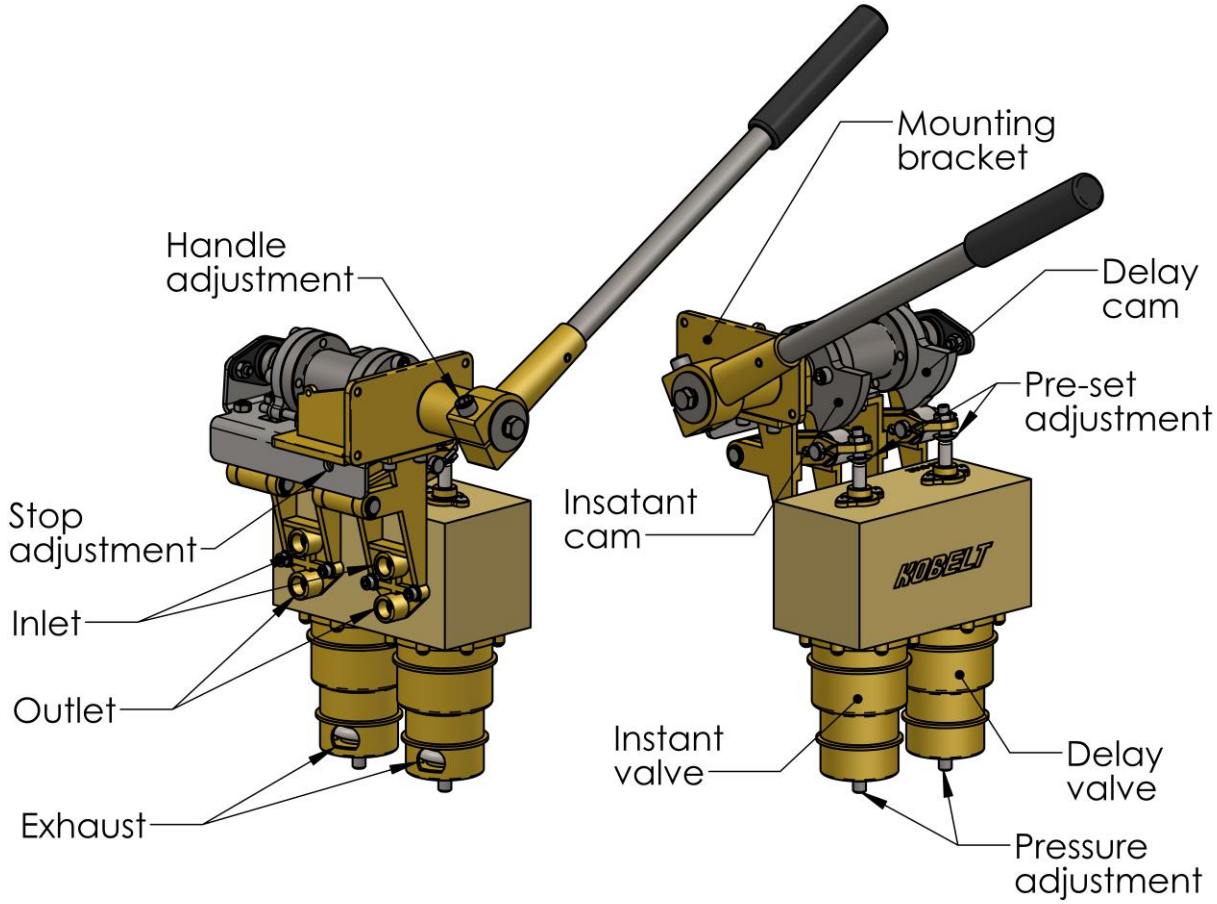


Figure 1: Valve Nomenclature

2.2 BASIC OPERATING PRINCIPLE

The purpose of the pressure compensating regulator is to provide an infinitely variable output pressure signal. There is a direct relation between the mechanical input **stem** position and the amount of accumulated air in the control system. The balance is obtained with air pressure against a **reactor spring**. The rolling diaphragm makes these valves very accurate due to the low friction.

The air pressure entering the "IN" port is held in check until the **stem** is depressed downward (see Fig. 1). This downward movement will create an opening between the **supply ball** and the seat thus allowing air to flow to the "OUT" port (see Fig. 2). Air pressure goes to the "OUT" port and via the **orifice** to the piston chamber, then compresses the **reactor spring** at the bottom of the valve until such a point that both **supply valve ball** and **exhaust valve ball** are seated into their respective seats. This will cause an equilibrium point whereby no air flow will take place. Allowing the **stem** to move upwards will cause the **exhaust ball** to lift itself from its respective seat and permit exhaust of air to atmosphere. This will allow the main reactor spring to push the seat upwards until the valve is in a balanced position again.

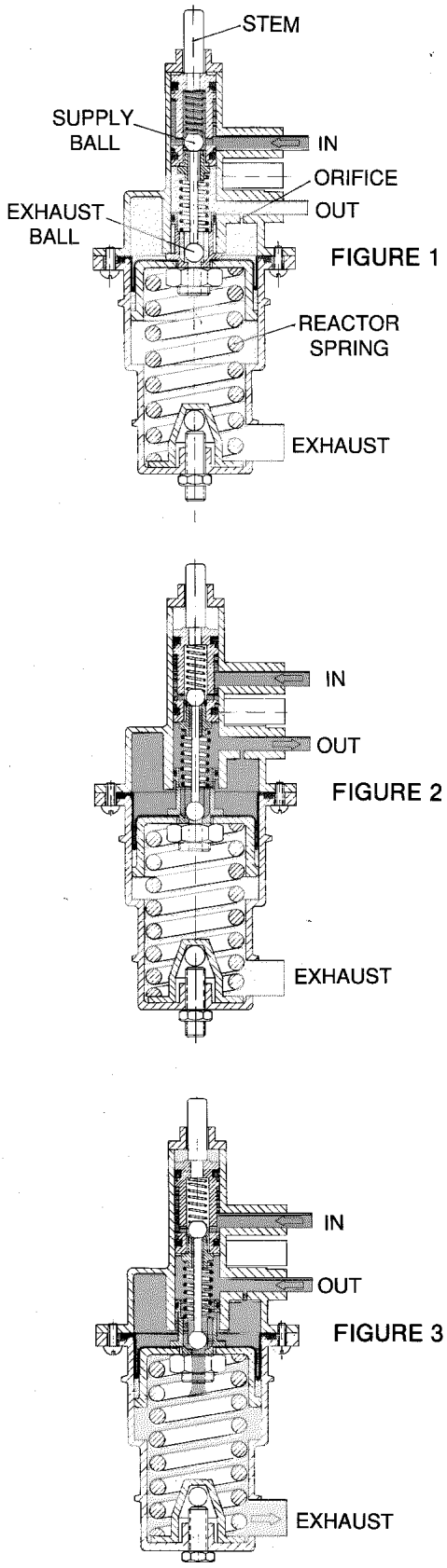


Figure 2: Principle of Operation

2.3 TECHNICAL DATA

Maximum supply pressure:	200 psi	[13.8 bar]
Pressure Output (R spring):	0-100 psi	[0-6.9 bar]
Hysteresis:	0.5 psi	[.03 bar]
Handle Travel:	60 degrees	
Port sizes:	1/4 NPT	
Ambient Temperature:	-40°F…+140°F	[-40 °C… + 60 °C]
Weight:	33 lbs	[15 kg]

2.4 MODEL CODE KEY

The 2588 driller's valve can be configured to have various pressure springs and one or two sperate outputs. Below is a key defining the letter code options:

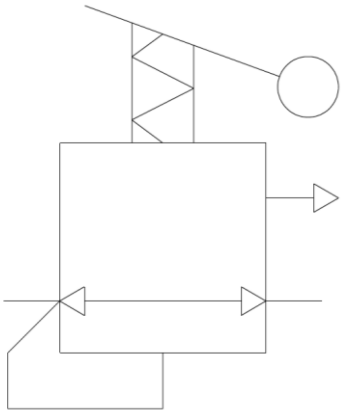
Model Code Key

2588-□□

Outputs
- (blank) = single output
- D = dual channel / two outputs

Pressure Range Options
- (blank) = 0–100 psi [0-6.9 bar]
- N = 0–60 psi [0-4.1 bar]
- P = 0–80 psi [0-5.5 bar]
- S = 0–120 psi [0-8.3 bar]
- T = 10–60 psi [0.7-4.1 bar]
- U = 10–80 psi [0.7-5.5 bar]
- W = 10–100 psi [0.7-6.9 bar]
- X = 10–120 psi [0.7-8.3 bar]

2.5 SCHEMATIC SYMBOL



3 INSTALLATION

3.1 MECHANICAL

The driller's valve must be mounted on a flat surface strong and stiff enough to withstand the operating forces without excessive flexing. Choose a location that has sufficient room for the handle to swing to both extreme positions.

Use the template in Appendix C to provide the correct cut-out on the control console.

The valve is equipped with (4) four threaded holes for ¼ UNC screws or bolts inserted from the front for direct mounting to the dash. Ensure the unit is securely fastened, preferably with an anaerobic thread locker such as Loctite 243.

3.2 VALVE CONNECTIONS

To make the proper piping connections at the control valve, refer to the diagram below.

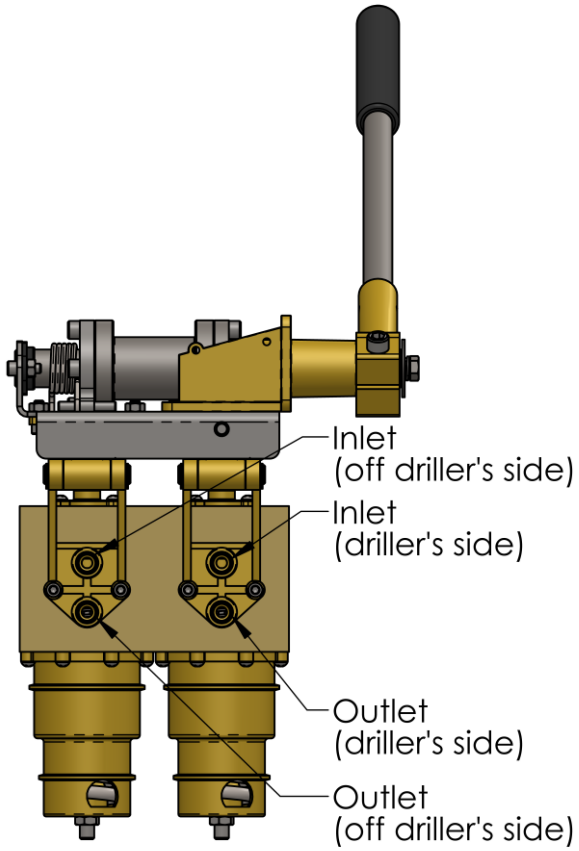


Figure 3: Piping Connections

The 2588-D control valve is equipped with four 1/4 NPT pressure ports. The exhaust ports do not need to be connected. Install the port fittings using thread sealant and tighten to 2 - 3 turns from finger tight. Use brass pipe fittings as steel fittings are too heavy and may split the port.

NOTICE	Do not over tighten the fittings as damage to the control head may occur.

3.3 PIPING

The piping to the relay valves must be adequately sized to ensure adequate response times. The piping must be selected to safely withstand the pressures required to operate the system. Secure the piping against vibration with pipe clamps per the schedule in the table below.

Table 1: Pipe Clamp Table

PIPE CLAMP TABLE				
PIPE SCHEDULE	3/8"-½" tube [DN6]	¼" – 1/2" pipe ½"-3/4" tube [DN8-DN15]	¾" pipe 1"-1.25" tube [DN20]	1" pipe 1.50" tube [DN25]
CLAMP SPACING	3 ft [914 mm]	4 ft [1219 mm]	5 ft [1524 mm]	6.5 ft [1981 mm]

All piping must be cleaned prior to connection to the actuators. Welded carbon steel piping must be pickled to remove the scale produced by welding.

Kobelt 2588 control valves are equipped with "U" cups and "O" rings and therefore require lubrication in order to provide long service life. Unlubricated seals will have excessive friction and wear. The oil that is required for the lubricator should be a hydraulic type with a viscosity grade of 10 to 32 centistokes. Heavy oils do not work well for lubricators.

The main supply line to the control head should be equipped with a filter, regulator and lubricator. The filter's function is to remove moisture and dirt in the system, and the regulator will provide a constant air pressure to the control system.

3.4 BRAKE SYSTEM PLAN

Below is a piping diagram depicting how to utilize the Kobelt 2588 Driller's valve in a hoist braking system. When implementing the two-channel 2588-D valve, it is recommended to plumb through a Barksdale 9001-M-G-D diverter valve to alternate the braking between the two discs at light loads. The diverter valve must have an open center position spool.

NOTICE	Failure to share the braking duty between the two discs may result in overheating a disc and causing permanent damage to it.

⚠ DANGER	**Loss of braking:** Failure to use an open center diverter valve may result in a sudden loss of braking during switching and result in an accident.

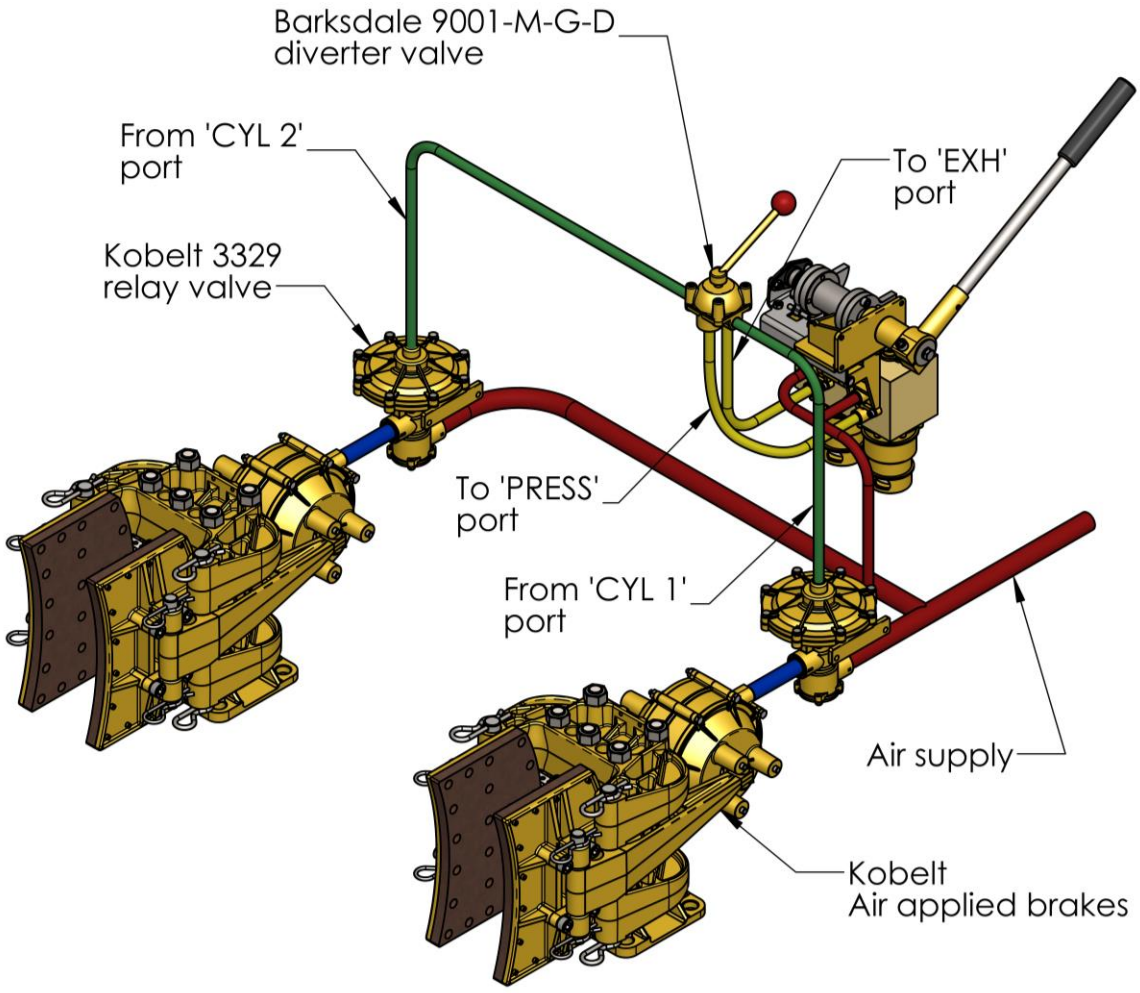


Figure 4: 2588-D Piping Diagram

4 COMMISSIONING

4.1 ADJUSTMENT

The control head is adjusted at the factory and, as such, will not require any further adjustment after installation.

4.2 FUNCTIONAL TEST

⚠CAUTION	Do not put the unit into service until it has been tested. The Functional Test should be carried out while the equipment is in a secure state.

After installation, test the control valve and verify that it operates the brakes over the full pressure range. Cycle the pressure to maximum and back to zero. Verify that the pressure to the brakes follows the handle command gradually without jumps or delays. With the dual channel version, test the diverter valve. Verify that the pressure is not blocked in the center position.

5 MAINTENANCE

5.1 PREVENTATIVE MAINTENANCE

- Quarterly (4 times per year)
  - Inspect unit for air leaks
- Every 2 years
  - Lubricate pins & rollers

5.2 ADJUSTMENT

After events such as repair kit installation or a major overhaul, it will be necessary to set all the adjustment points correctly.

1. Pressure screw adjustment:
   Tools: 5/32 in allen key + ½ in wrench
   Turn this screw CW to the desired initial pressure output setting. Note that the handle must be in the neutral position.

2. Plunger adjustment:
   Tools: 5/16 in wrench + 3/8 in wrench
   Turn the screw CCW until the slack has been removed from the valve plunger.

3. Handle end stop adjustment:
   Tools: 5/16 in wrench + 3/8 in wrench
   With the handle in the maximum down position, adjust the screw out until it contacts the cam.

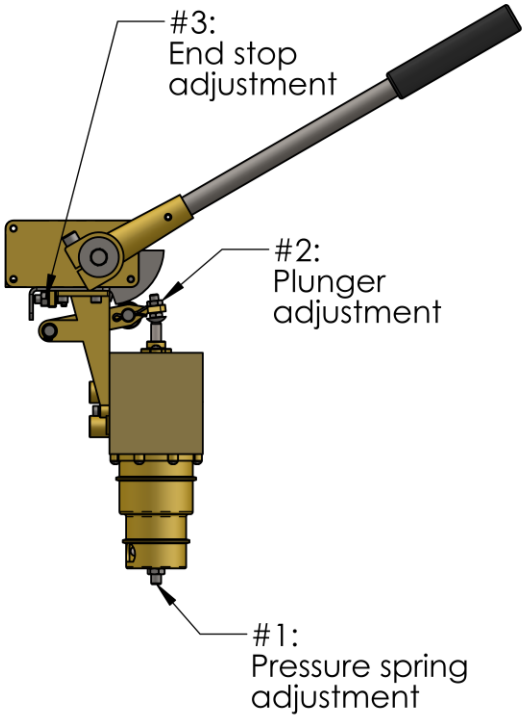


Figure 5: Valve adjustments

5.3 RECOMMENDED SPARE PARTS AND KITS

The spare parts kept on hand will depend on the severity of the service. The User should monitor the condition of their control head to predict necessary spare parts and ensure they are on hand when needed. As a minimum Kobelt recommends keeping the following parts for each unit in service:

1. Two **3230-RK** regulating valve repair kit

Refer to the parts list drawings in Appendix B for a complete list of parts. When purchasing spare parts refer to Appendix B: Parts List at the back of this manual for Kobelt component Part Numbers.

NOTICE	It is recommended that any required service work on a Kobelt unit be performed by a factory authorized service representative. Please contact the nearest Kobelt authorized distributor for assistance.

6 WARRANTY

Kobelt Manufacturing Co. Ltd. ("Kobelt") warrants the Products and Parts manufactured by Kobelt to be free from defects in workmanship or material and that said products are designed mechanically and functionally to perform to specifications.

This warranty is effective providing:

- The equipment is used within the intended operating conditions and in accordance with Kobelt recommendations
- The equipment is installed according to equipment diagrams, specifications and recommendations which Kobelt has provided

This warranty becomes invalid if the factory supplied serial number has been removed or altered on the product. This warranty does not cover cosmetic damage or damage caused by an act of God, accident, misuse, abuse, negligence or modification of any part of the product. This warranty does not cover damage due to improper operation or maintenance, connection to inappropriate equipment or attempted repair by anyone other than an authorized Kobelt representative.

Upon identification of a potential issue or defect with a Kobelt Product or Part, the Warranty Applicant ("Applicant") must immediately contact Kobelt and describe the issue in writing, by letter, fax, email or other electronic conveyance. Kobelt will then assess the cause of the defect and determine warranty applicability and appropriate remediation.

If any part is found to be defective, Kobelt will replace said part FOB the Kobelt factory provided that any such defective part is returned by the Buyer with freight and applicable forwarding charges prepaid by the Buyer. Kobelt's sole obligation to the Applicant will be to repair or replace the defective part with same or similar product, to a maximum value of the list price of the product or part. The Kobelt warranty does not cover labour charges, travel or any other associated expenses.

All Products and Parts manufactured by Kobelt, are subject to a warranty against manufacturer's defects in materials or workmanship for a period of two (2) years from the date of purchase.

Kobelt will be responsible for all Products or Parts sold by Kobelt but manufactured by 3rd party manufacturing companies. However, these products and parts are subject to applicable 3rd party warranties and may not be the same as the Kobelt warranty.

7 APPENDIX A: INSTALLATION DIMENSIONS

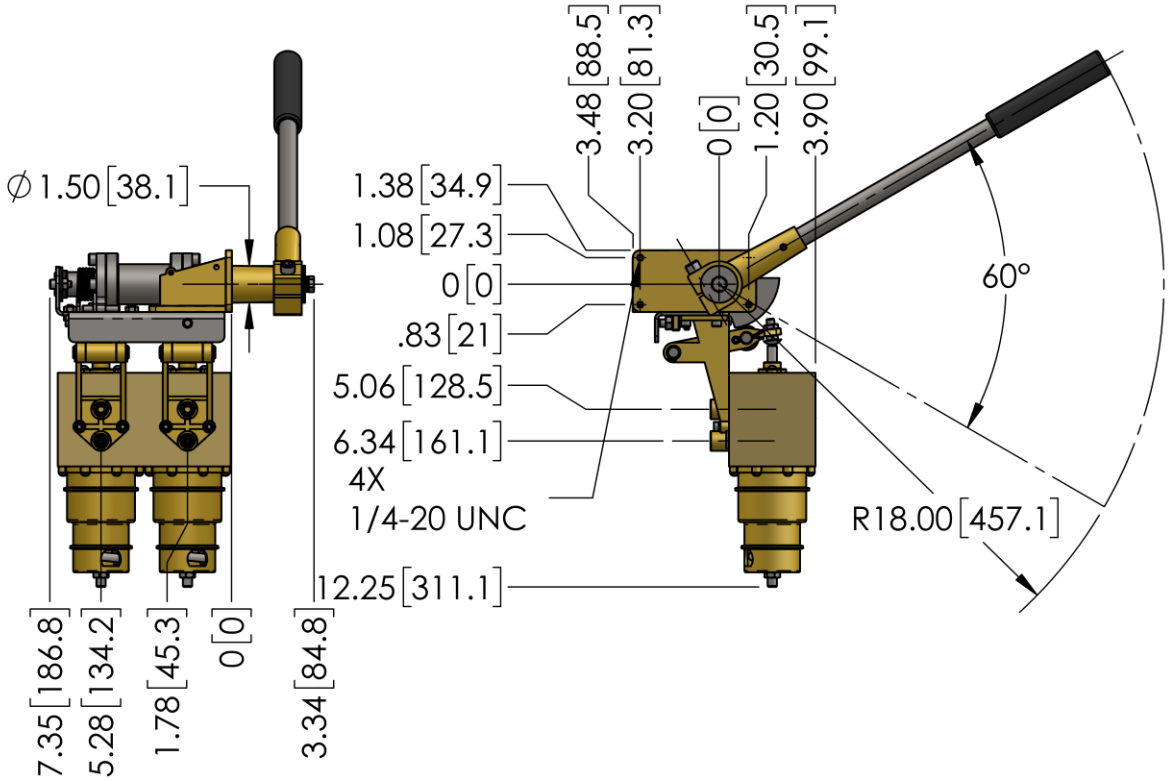
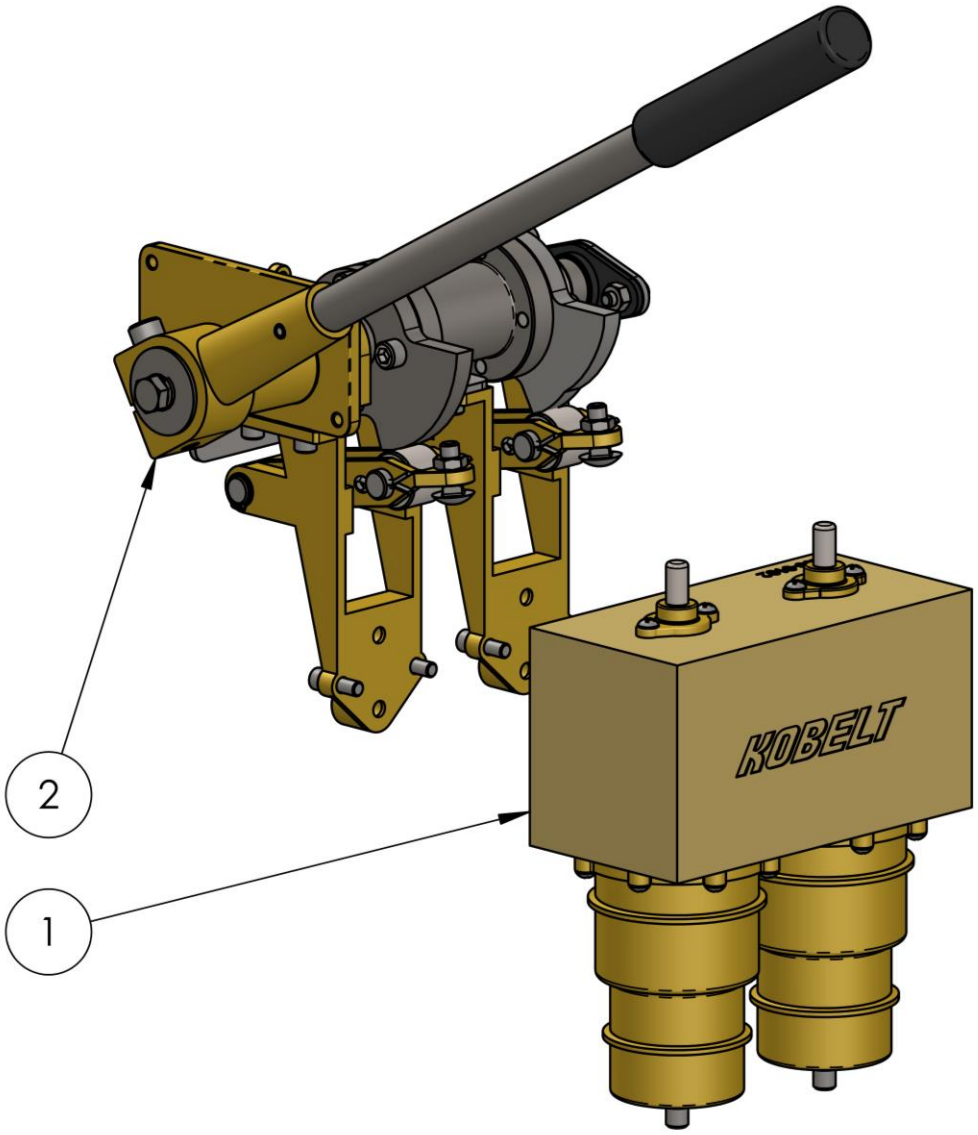


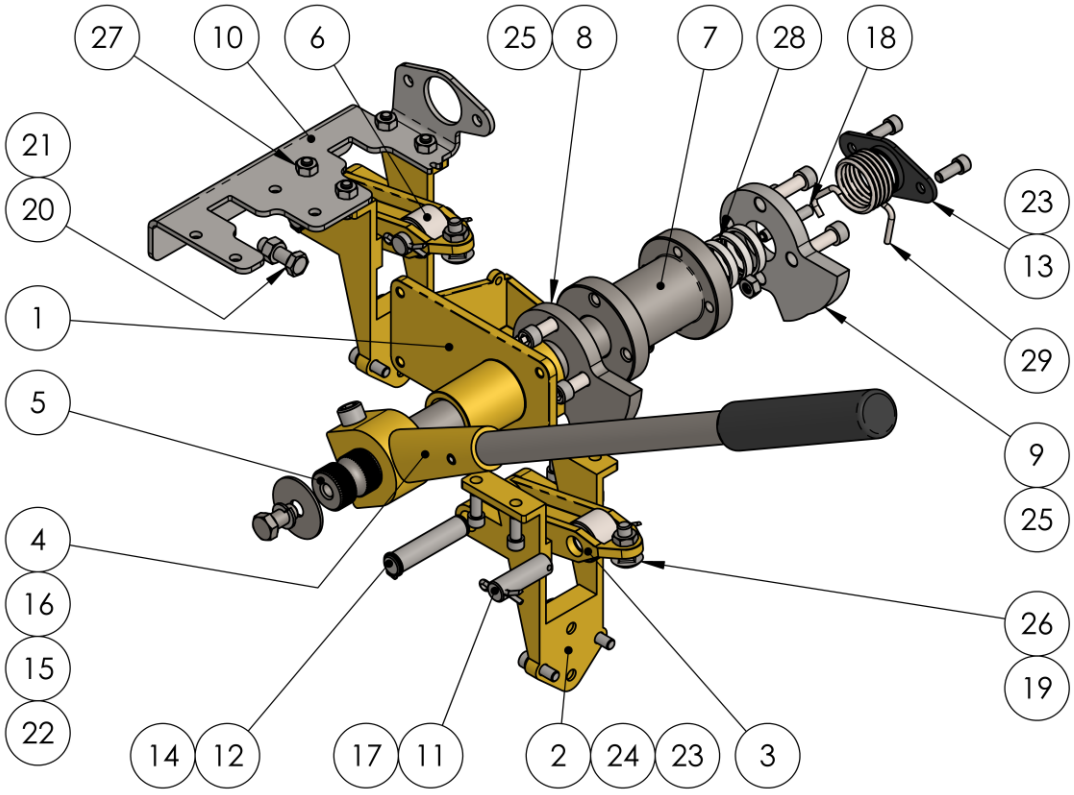
Figure 6: 2588 Installation Dimensions

8 APPENDIX B: PARTS LIST



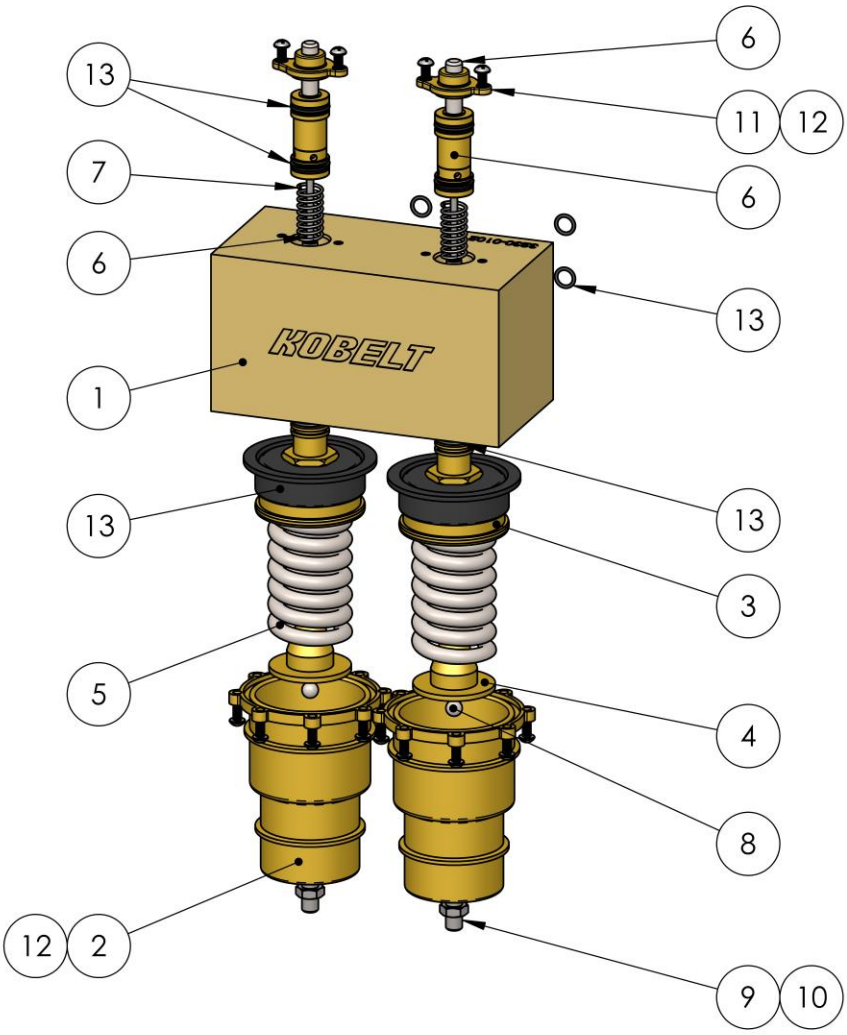
ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	3230-D	CONTROL VALVE SUBASSAMBLY
2	1	2588-1000	SUB-ASSEMBLY MOVEMENT DUAL DRILL VALVE

2588-1000 Sub Assembly



ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	2588-0101	BRACKET DRILLER VALVE; MODIFIED
2	2	2588-1002	MANIFOLD BRACKET DUAL DRILL VALVE
3	2	2588-0004	LEVER DRILLER VALVE
4	1	2588-0205	SUB-ASSEMBLY, HANDLE, DRILLERS VALVE
5	1	2588-1013	SHAFT DUAL DRILL VALVE
6	2	2588-0006	ROLLER DRILLER VALVE
7	1	2588-0015	HUB CAM DUAL DRILLER VALVE
8	1	2588-0103	CAM NON-DELAY DUAL CONTROL VALVE
9	1	2588-0203	DELAY CAM DUAL CONTROL VALVE
10	1	2588-0016	BRACKET DUAL CONTROL VALVE
11	2	2588-0010	PIN ROLLER DRILLER VALVE
12	2	2588-0009	PIN ROLLER LEVER DRILLER VALVE
13	1	1312-0025	BEARING PLASTIC FLANGE 25 MM
14	4	1029-1050	SNAP RING FOR 1/2
15	1	1023-0312	LOCK WASHER DIA 5/8 IN 18-8
16	1	1023-0245	WASHER, FENDER, 3/8 X 1-1/2, 18-8 SS
17	4	1026-0516	COTTER PIN; 1/8 DIA X 1 LG. 18-8
18	2	1024-1024	PIN SPRING 1/4 X 1 AISI 420
19	2	1022-0211	NUT, JAM, 5/16-18 UNC, SS
20	1	1001-1116	SCREW, HEX HD, 5/16-18 X 1, 18-8 SS
21	1	1022-0111	NUT, HEX, 5/16-18, 18-8 SS
22	1	1001-1212	SCREW, HX HD, 3/8-16 UNC X 3/4, 18-8
23	10	1002-1010	SCREW - SKT HD CAP; 1/4 UNC X 5/8 LG 18-8
24	4	1002-1012	SCREW CAP SKT HD 1/4UNC X3/4 GR 18-8
25	8	1002-1114	SCREW CAP SKT HD 5/16-18 X 7/8 18-8
26	2	1017-1114	BOLT, CARRIAGE, 5/16 UNC X 7/8, 18-8
27	10	1022-0110	NUT HEX 1/4-20 UNC 18-8
28	3	7601-0025	LOCKING RING 25 MM
29	1	1203-0014	SPRING, TORSION, 1 in SHAFT X .130 WIRE

3230-D Compensating Valve



ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	3230-0102	MANIFOLD DUAL DRILL VALVE
2	2	3230-0001	VALVE BODY
3	2	3230-1002	SUB ASSEMBLY; DIAPHRAGM
4	2	3230-0004	RETAINER
5	2	1201-0272	SPRING - COMPRESSION; 1.94OD X .343 WIRE
6	2	3230-1001	PLUNGER SUB ASSEMBLY
7	2	1201-0273	SPRING COMPRESSION .6OD X .06 WIRE
8	2	1301-0112	BALL 3/8 CR STEEL - GR 25 ASTM A295
9	2	1016-1224	SET SCREW -SCKT CP PT; 3/8-16 X 1-1/12, 18-8
10	2	1022-0212	JAM NUT; 3/8-16, 18-8
11	2	3230-0005	END CAP
12	20	1010-0808	SCREW RND HD PHIL #10-24 X 1/2 18-8
13	2	2588-RK	SEAL KIT; DRILLER VALVE

9 APPENDIX C: INSTALLATION CUT-OUT TEMPLATE

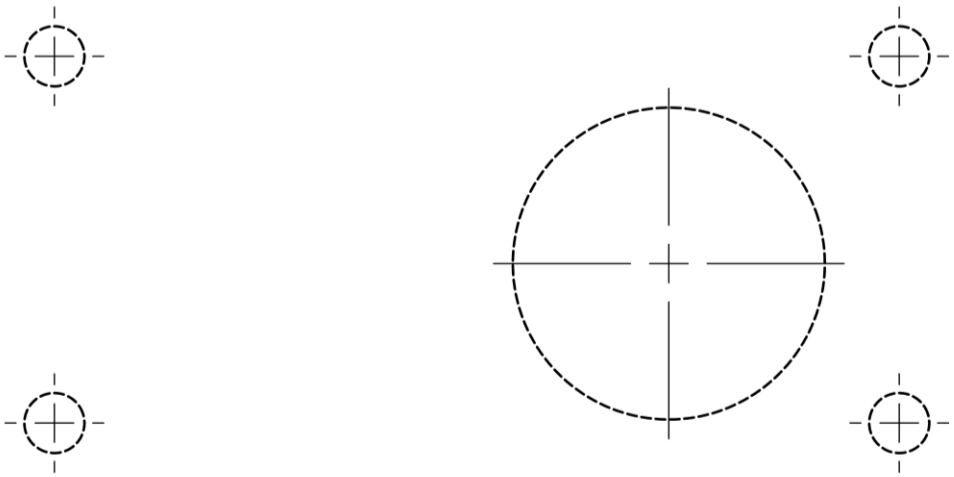


Figure 6: Installation Cut-out Template

NOTICE	Scale may not be exactly 1:1 due to PDF and printer scaling. Verify primary dimension with a ruler after printing and before using to cut.

Reference Appendix A: Installation Dimensions, for the cut-out dimensions.

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