

KOBELT

PNEUMATIC CONTROLS
HYDRAULIC STEERING & ACCESSORIES
ELECTRONIC CONTROLS
PUSH-PULL CONTROLS
DISC BRAKES



CONTROL YOUR SHIP WITH COMPLETE SYSTEMS AND COMPONENTS FROM KOBELT MANUFACTURING

- 1 Steering components up to 320 tonmeter for hydraulic steering of single and multi rudder vessels.
- 2 In the aftdeck control station, complete control over all propulsion and deck machinery.
- 3 Hydraulic cylinders and control devices for lowering and raising masts, davits for lifeboats, loading ramps etc.
- 4 Weatherproof controls for outside stations to control propulsion and deck machinery.
- 5 Control components for propulsion and deck machinery, plus electronic alarm systems and electronic telegraphs.
- 6 Control for all deck machinery such as anchor and towing winches.
- 7 Controls for bow thrusters.
- 8 Control components for any propulsion package, fixed pitch CP propellers, load share and load control.
- 9 Propeller shaft disc brakes, from small engines up to 50,000 HP.
- 10 Control components to control stern thrusters.



Why are Kobelt Controls the Best?

All components are made from die cast brass with stainless steel hardware.

- Solid brass frame for watertight installation.
- Stainless steel shaft supported in two bearings.
- Spring or non-spring return handle.
- Adjustable detents and nylon holding frictions.
- All standard "O"-Rings and "U" Cups.
- Illuminated Sidescales.
- Most stylish, easy removable solid brass dome.
- Compensating self-relieving regulating valve.
- Light sockets for illumination.
- Dimmer switches if required.
- Mounting screws under the dome.
- Easy installation and maintenance.
- Throttle movement proportional to handle travel.
- Also made for twin engine application.
- All parts interchangeable.
- Available in many configurations and sizes.
- Five year warranty on all metal parts and two year warranty on synthetic rubber parts.
- Sales and service around the world.

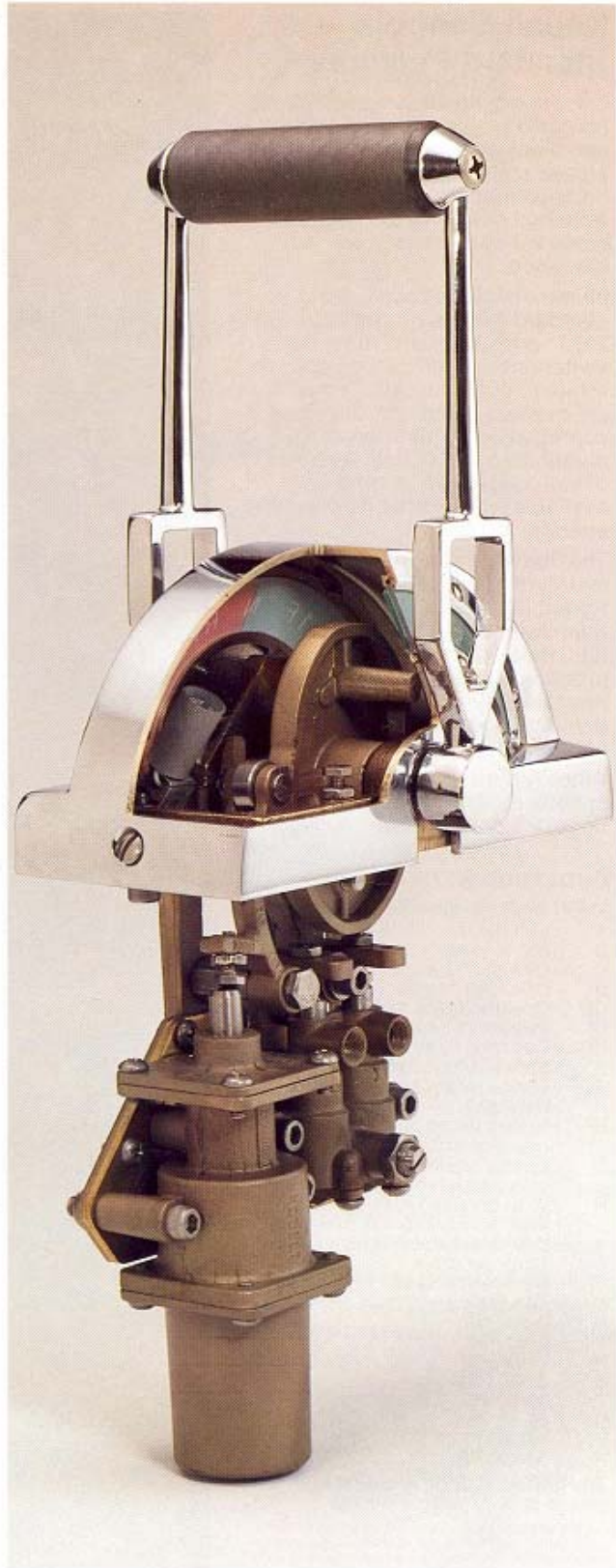
Kobelt pneumatic controls are manufactured under one or more of the following Patent Numbers. Further patents pending.

U.S. Patent Numbers	Canadian Patent Numbers
3455186	828507
3724970	922594
3766835	923767
3783742	928607
3795110	932600
3820438	936055
3826490	939202
3838630	947619
3900090	946138
4522111	964555

FOR MORE INFORMATION CONTACT:

Dealer

BROCHURES ON MANY OF OUR OTHER PRODUCTS ARE AVAILABLE.



A-2554 Single Lever Clutch & Throttle Pneumatic Control

No other control can offer all the above and match the Kobelt price.

Kobelt Controls — Standard Features

Our control heads are available in polished brass, polished chrome and black epoxy. When ordering please state finish required. The components are manufactured from non-corrosive die-cast silicon brass with stainless steel hardware.

Illuminated side scales are a standard feature on our 2550 and 2570 series. Optional dimmer switches to regulate the light effect to suit your requirements are available. Only the 2570 series comes with the addition of illuminated top scales. A choice of various handle lengths are available; when ordering please specify.

The dome is removable for easy installation and adjustments. Kobelt has a vast variety of interchangeable components and it is, therefore, very easy for us to produce **custom-made** control heads, all simply assembled from standard components in various configurations.

When ordering control heads specify model number and letter code designation.

ORDERING INFORMATION:

Letter code designations*

- A - Left hand.
- B - Right hand.
- C - One short handle.
- D - One long handle.
- CD - One short/one long handle.
- CC - Two short handles.
- DD - Two long handles.
- E - Spring return handle.
- F - Spring return handle on one regulator.
- FF - Spring return handle on two regulators.
- G - Spring return handle with full pressure latching.
- H - With chrome finish dome.
- J - With polished brass finish dome.
- K - With black epoxy finish dome.
- L - Sprocket drive.
- LL - Double sprocket.
- M - Top scale.
- N - 0-60 PSI.
- P - 0-80 PSI.
- R - 0-100 PSI.
- S - 0-120 PSI.
- T - 10-60 PSI.
- U - 10-80 PSI.
- W - 10-100 PSI.
- X - 10-120 PSI.

Any pressure range is available — please specify when ordering.

***VERY IMPORTANT:** Due to the changes in the letter code designation for control heads, when ordering from this brochure, Model numbers **MUST** be prefixed "A". e.g. A-2545.



Basic Information on Pneumatic Controls

Kobelt Pneumatic Control components are the most reliable means of control for marine propulsion packages and deck machinery. Our engineering department has done an excellent job in simplifying designs, by eliminating many moving parts and yet retaining all the essential safeguards for propulsion package timing. The simplicity in design, in conjunction with our selection of material, makes Kobelt the number one choice for Pneumatic Marine Controls.

Pneumatic Marine Controls lend themselves extremely well for multi-station remote control, interlocks and time delays, automatic load share and automatic load control.

Kobelt can also provide all necessary alarms, control-consoles and console-tops for your complete turn-key package.

Kobelt Controls – Best Today and Still Better Tomorrow!

Kobelt products have an enviable reputation for durability and performance. Our success is based on the simple fact that we are the only control manufacturer in the world providing a non-corrosive marine environment control. The absence of plastic, zinc, aluminum and steel, with our rugged design, puts us into an exclusive class in terms of materials and workmanship.

We also manufacture the most complete line of components and systems, with distribution and sales all over the world. If you are not already a Kobelt user please contact your nearest distributor for the whole story.

Dual Function Control Head 1/8" NPT

MODELS A-2544 and A-2554

These two control heads are designed to provide single lever control over ship direction (ahead and astern) and engine speed. The pneumatic signal for ahead and astern can control either a hydraulic reduction gear or a pneumatic actuating gear. These controls can also be used for the control of direct reversing engines. The pipe connections are all 1/8" NPT. The control is intended for vessels ranging from 40 to 175 feet (12 m to 55 m) in length. It can be provided for big vessels on short tubing runs from the wheelhouse or in the engine room.

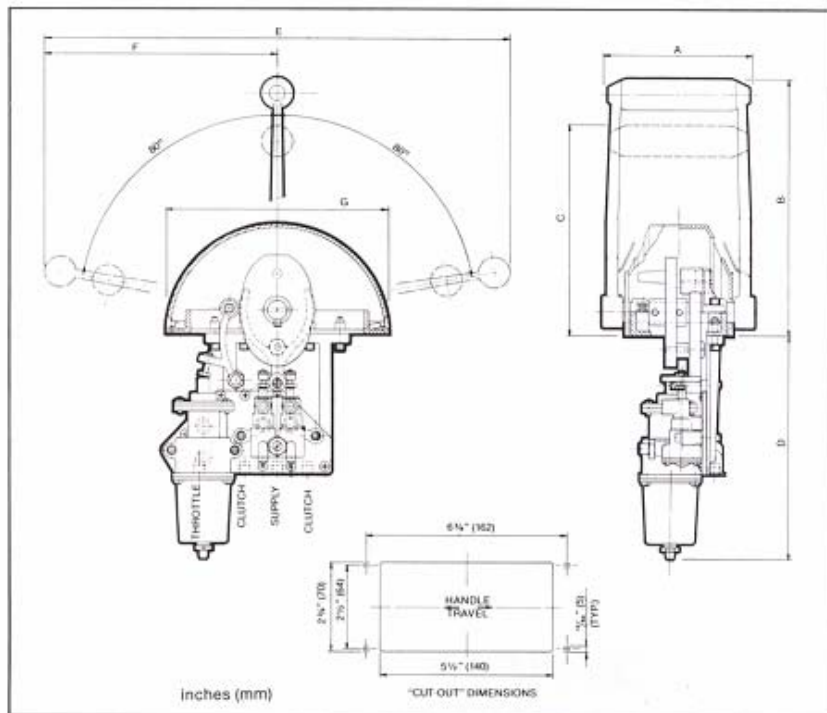
The Model A-2544 has a standard dome and handle (no illumination). Model A-2554 is equipped with side scales and internal light sockets for illumination. Except for the dome and handle all parts are interchangeable. Dimensionally, the control heads are the same.



MODEL A-2554



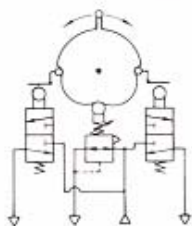
MODEL A-2544



	A	B	C	D	E	F	G
MODEL 2544	4 1/4 (105)	8 1/4 (222)	7 1/4 (190)	7 1/4 (200)	15 1/4 (405)	7 1/4 (200)	7 1/4 (184)
MODEL 2554	4 1/4 (124)	8 1/4 (210)	6 1/4 (171)	7 1/4 (200)	14 1/4 (374)	7 1/4 (187)	7 (178)

NOTE: Right-hand model standard.
If left-hand model for A-2544 is required,
reverse indicator label.

SCHEMATIC SYMBOL



OUTPUT PRESSURE VS LEVER TRAVEL



* Letter code designations:
C, D, E, H, J, K, N, P, R, S, T, U, W, X.
* See page 2.

Weight: 9 lbs (4 kg)
Maximum Supply Pressure: 150 PSI (10.3 BAR)
Operating Temperature Range: -40°C to +90°C
Pipe Port Size: 1/8" NPT

Short handle standard for model A-2544 and long handle standard for model A-2554.

Twin Dual-Function Control Head 1/8" NPT

MODELS A-2545 and A-2555

The control heads illustrated are Models A-2545 and A-2555, designed for twin engine, single lever clutch and throttle control. These controls have been used by hundreds of boat owners, around the world, who are totally satisfied with our control systems.

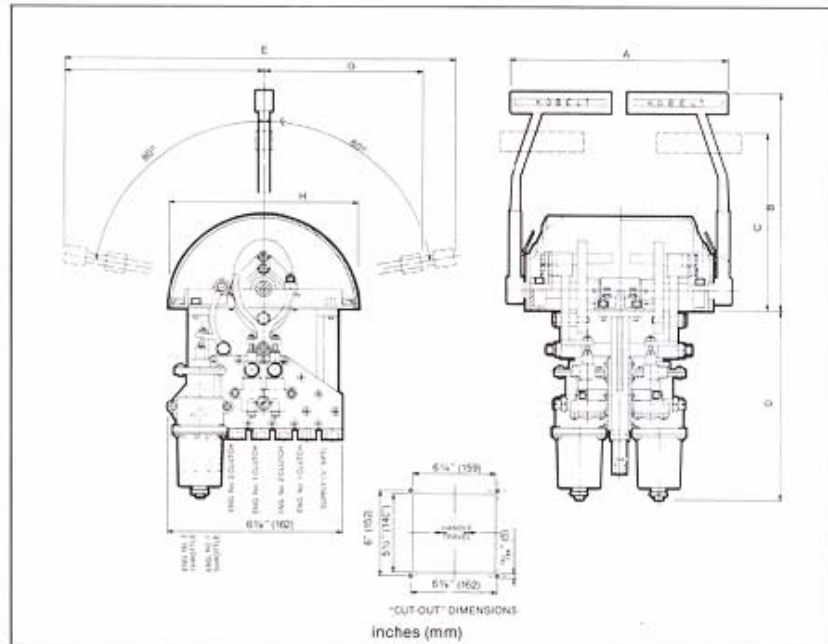
Model 2555, which is a recent development, is the most stylish looking control head. It is made of all-brass and stainless steel construction with side scales for illumination. This product in fact has been so well accepted by the bigger pleasure craft industry that most cruisers now being constructed are equipped with Model 2555 because of its good looks and dependability. The valve used for controlling the clutch is Model 3803 and the valve controlling the throttle is Model 3217. These valves are standard on all our 1/8" NPT series heads.



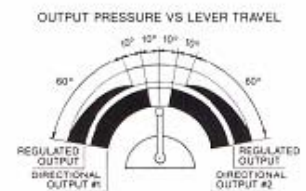
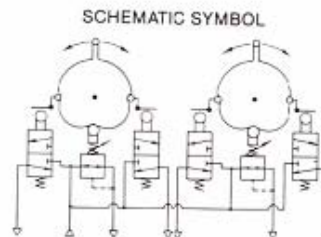
MODEL A-2555



MODEL A-2545



	A	B	C	D	E	F	G	H
MODEL 2545	8 1/4 (219)	8 1/4 (225)	7 1/4 (187)	7 1/4 (184)	15 1/4 (400)	7 1/2 (200)	8 1/4 (219)	7 1/4 (187)
MODEL 2555	8 1/4 (219)	7 1/4 (187)	6 1/4 (172)	7 1/4 (184)	14 1/4 (360)	7 1/4 (194)	6 (152)	7 (178)



*Letter code designations:
CC, DD, E, H, J, K, N, P, R, S, T, U, W, X.
*See page 2

Weight: 20 lbs (9kg)
Maximum Supply Pressure: 150 PSI (10.3 BAR)
Operating Temperature Range: -40°C to +90°C
Pipe Port Sizes: Input: 1/4" NPT
Output: 1/8" NPT

Short handle standard for Model A-2545 and long handle standard for Model A-2555.

For performance and reliability you can count on Kobelt.

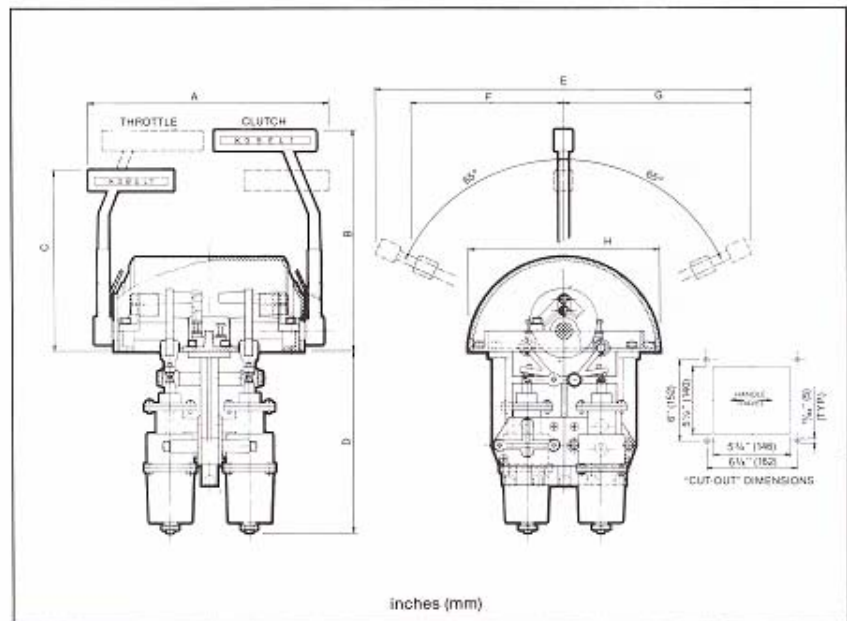
Pressure Control Head, 2 Lever – Triple Output 1/8" NPT

MODELS A-2546 and A-2556

These control heads were designed to provide control for controllable pitch propeller and engine speed. The long handle (pitch) actuates two pressure regulating valves which provide "O" pressure for "O" pitch. In case of air pressure failure the C.P. propeller actuator will return to "O" pitch position. The engine speed control (short handle) will provide accurate control over the engine speed. Loss of air pressure again will cause the engine to return to idle.

Model A-2546 is equipped with a standard dome. Model A-2556 is equipped with side scales for illumination. Both control heads can also be used for the control of the Omega twin disc gear.

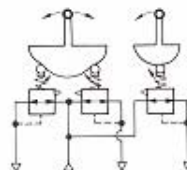
Control packages are available to fit the twin Disc Omega gear, and standard C.P. control actuators can be adapted to any C.P. propeller.



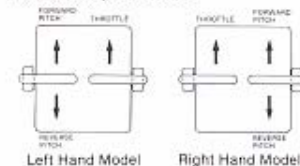
	A	B	C	D	E	F	G	H
MODEL 2546	8 1/4" (212)	8 1/4" (212)	7 1/4" (187)	6 1/4" (163)	14 1/2" (368)	7 1/4" (184)	5 1/4" (140)	7 1/2" (191)
MODEL 2554	8 1/2" (215)	8 1/2" (215)	6 1/4" (163)	6 1/4" (163)	14" (355)	7" (178)	5 1/4" (143)	7" (178)



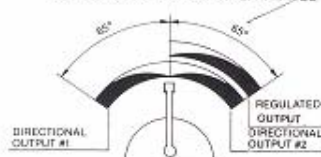
SCHEMATIC SYMBOL



Movement of Handle in Direction of Arrow Increases Output Pressure



OUTPUT PRESSURE vs LEVER TRAVEL



*Letter code designations:
A, B, CC, DD, CD, E, F, FF, H, J,
K, N, P, R, S, T, U, W, X.

*See page 2.

Weight: 13.5 lbs (6 kg)
Maximum Supply Pressure: 150 PSI (10.3 BAR)
Operating Temperature Range: -40°C to +90°C
Pipe Port Size: 1/8" NPT

Pressure Control Head, 2 Lever – 4 Outputs 1/8" NPT

MODELS A-2547 and A-2557

These control heads are equipped with four compensating regulating valves to provide infinite pressure-increase in either direction for both handles. It therefore lends itself ideally for the control of two C.P. propellers. This control head can also be used for twin engine, single lever control for C.P. propeller and engine speed. Special actuators will be required to accomplish this task. Please consult Kobelt or your nearest distributor. These units are manufactured in all brass and stainless steel, just like all other Kobelt control heads and provide years of trouble-free service.

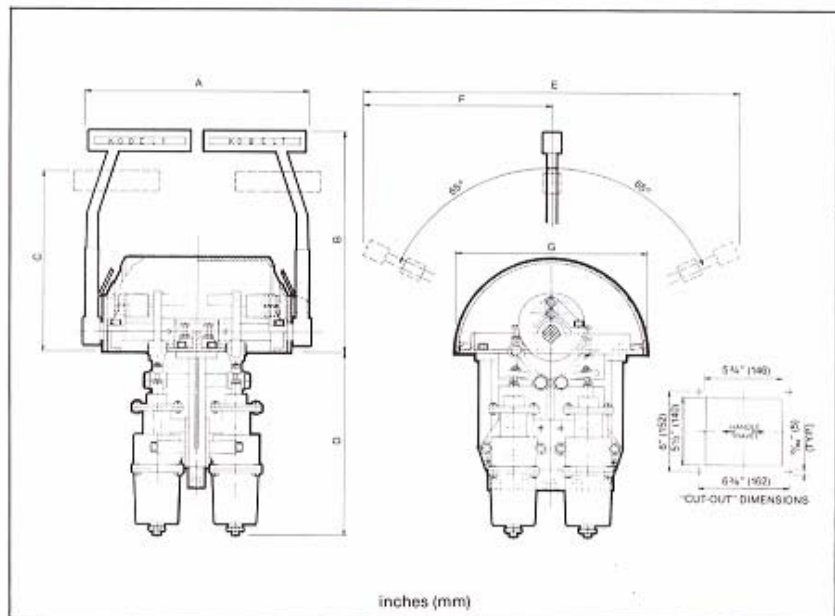
The Model A-2547 has a standard dome and Model A-2557 has side scales for illumination. Both controls have the same physical dimensions and use the same parts, except for dome and handle.



MODEL A-2547

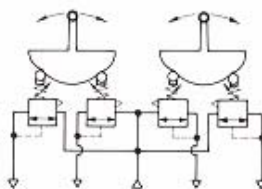


MODEL A-2557

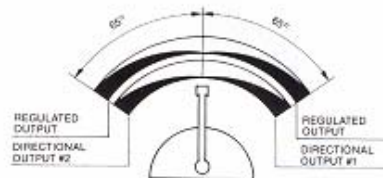


	A	B	C	D	E	F	G
MODEL 2547	8 1/4 (210)	8 3/4 (222)	7 1/4 (187)	6 1/4 (175)	7 1/4 (184)	14 1/4 (362)	7 1/4 (184)
MODEL 2554	8 3/4 (213)	8 1/4 (210)	6 1/4 (172)	6 1/4 (175)	6 1/4 (175)	13 1/4 (352)	7 (178)

SCHEMATIC SYMBOL



OUTPUT PRESSURE vs LEVER TRAVEL



***Letter code designations:**

CC, DD, CD, E, H, J, K,
N, P, R, S, T, U, W, X.

*See page 2

Weight: 15 lbs (7 kg)

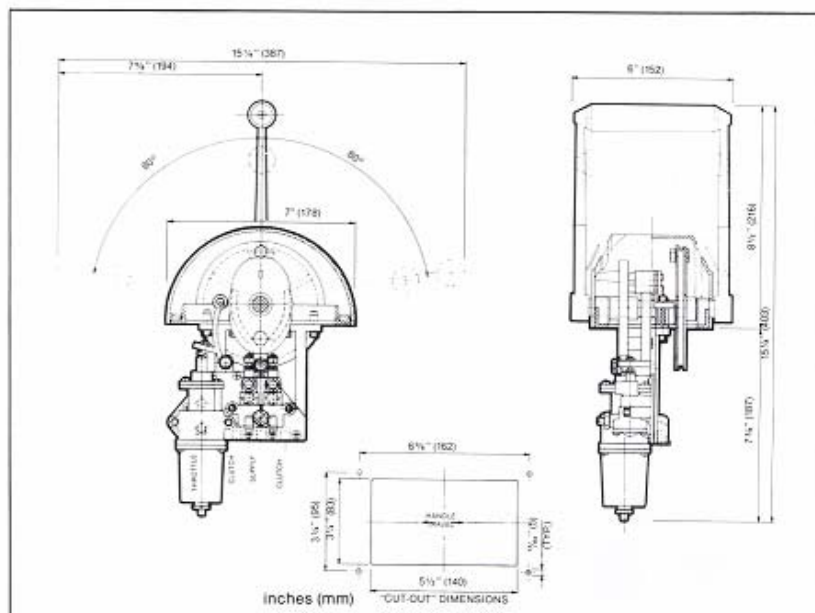
Maximum Supply Pressure: 150 PSI (10.3 BAR)

Operating Temperature Range: - 40°C to + 90°C

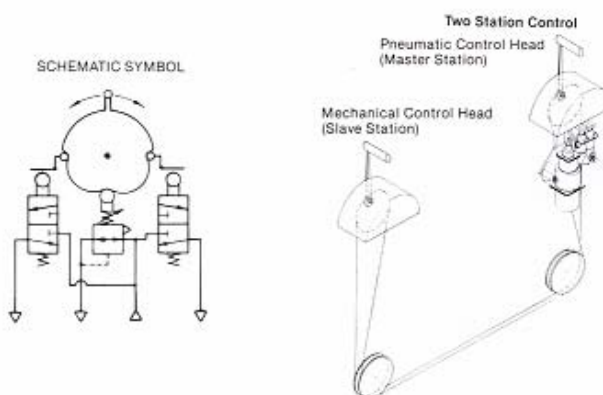
Pipe Port Size: 1/8" NPT

Dual Function Control Head 1/8" NPT**MODELS A-2534 and A-2535**

Both controls are designed to be interconnected mechanically with Kobelt Wire-Over-Pulley Controls and, therefore, eliminate the necessity of station transfer. All handles connected in such a system will move together. This has proven extremely successful in very cold weather conditions whereby the outside stations are mechanically interconnected to the wheelhouse pneumatic station, therefore eliminating freezing in airlines to bridge wings.

**MODEL A-2535**

NOTE: Right-hand model standard.
If left-hand model for A-2534 is required,
reverse indicator label.

**MODEL A-2534**

*Letter code designations:

C, D, H, J, K, N, P, R, S, T, U, W, X.

*See page 2.

Weight: 11.5 lbs (5kg)

Maximum Supply Pressure: 150 PSI (10.3 BAR)

Operating Temperature Range: - 40°C to + 90°C

Pipe Port Size: 1/8" NPT

Mechanical and Electrical Remote Control Heads

Single Handle – MODEL A-2570-1

Twin Handle – MODEL A-2570-2



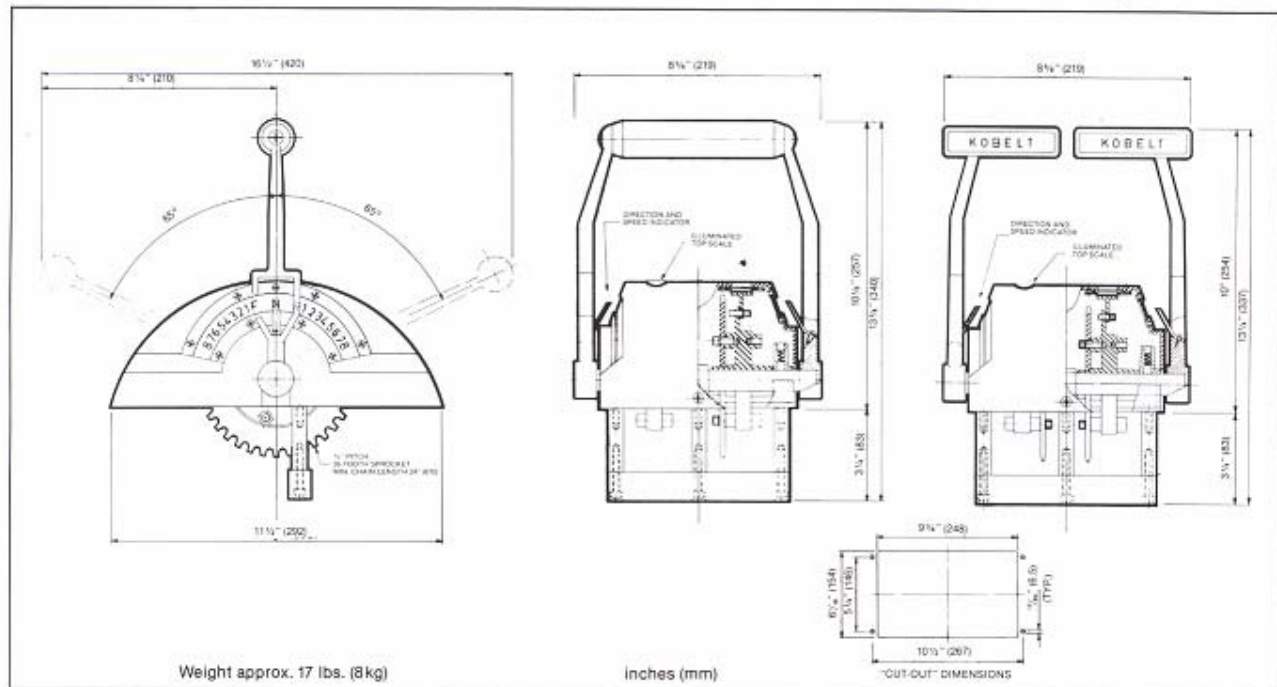
MODEL A-2570-1



MODEL A-2570-2

These control heads were designed with the big ship owner in mind. They incorporate the many Kobelt design innovations making them durable, non-corrosive and attractive. Many control requirements can be accomplished with these units. They are available for purely mechanical drive or electric applications with potentiometers and micro switches. A mixture of mechanical, electric and pneumatic applications are available. Please consult us for your specific requirements.

Model A-2570-1 is intended for the control of one engine. Model A-2570-2 can be used for a twin engine control.



*Letter code designations: Model A-2570-1 H, J, K, L, LL, M.

Model A-2570-2 CC, DD, CD, H, J, K, L, M. *See page 2

Universal Propulsion Control Heads ¼" NPT 2570 SERIES



MODEL A-2575



MODEL A-2577

An enormous variety of standard 2570 series pneumatic control heads are available to accomplish any control function desired. The most advanced production technology (die cast brass), as well as the latest design concepts, combined with the rugged, yet stylish appearance makes the 2570 series control heads the finest of their kind. A variety of standard mechanical adjustable cams are available. As mentioned on the foregoing page, custom made control heads are available and we have provided enumerable customer specified products. All pneumatic 2570 series control heads are equipped with a combination of 3804 four-way valves and 3230 pressure compensating valves. The table below indicates the standard pneumatic control heads available.

Application	Model	Description
Fixed Wheel	A-2571	Single Lever, Single Engine Control Head <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2572	Single Lever, Twin Engine Control Head <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2573	One Handle, Dual Compensator Control Head <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2574	Single Lever, Single Engine Control Head <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2575	Single Lever, Twin Engine Control Head <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
Controllable Pitch	A-2576	Single Lever, Single Engine Control Head (Mid-pressure for 'O' pitch) <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2577	Single Lever, Single Engine Control Head ('O' pressure for 'O' pitch) <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2578	Two Handle, Single Engine Control Head <i>Letter Code: A, B, H, J, K, L, M, N, P, R, S, T, U, W, X.</i>
	A-2579	Single Lever, Twin Engine Control Head <i>Letter Code: H, J, K, L, M, N, P, R, S, T, U, W, X.</i>

Note: If sprockets are required, top scales are not available for Models 2572, 2573, 2575, 2576, 2577, 2578 and 2579.

Double Acting Clutch Control Devices

Illustrations on this page show four basic units (available from stock) to actuate hydraulically and mechanically actuated reverse reduction gear boxes. Models 4204 and 4207 are spring centered requiring only two control lines for engaging either forward or reverse clutch.

Models 1528 and 4004 are air centered for the neutral position. Model 4004 is intended for use on medium sized mechanically actuated gears. Please contact Kobelt regarding your requirements since we have a large range of sand cast cylinders available for your requirements.

Our range of cylinders can also be supplied for direct reversing engines for the operations of your cam shaft, fuel interlock, air start and engine speed.

Double Acting, Self-Centering Actuators



MODEL 4204

Letter code designations:

- A - Two-Direction Position Actuator
10-80 PSI
- C - Three-Position Self-Centering Cylinder
35-65 PSI



MODEL 4207

Letter code designations:

- A - Two-Direction Positioner Actuator
10-80 PSI
- C - Three-Position Self-Centering Cylinder
25-55 PSI

Double Acting Air Centered Cylinders



MODEL 1528



MODEL 4004

Model	4204	4207	1528	4004
Max. Input Pressure	200 PSI (13.8 BAR)			
Operating Temp. Range	- 40°C to + 90°C			
Port Size	1/4" NPT			
Max. Total Stroke (Approx.) (mm)	2" (50)	4 3/4" (120)	2 1/2" (64)	8" (200)

Throttle Actuators and Positioners (Single Direction)

Illustrated are three of the most popular throttle actuators, available from stock. All of them are equipped with rolling diaphragms to provide the ultimate in accuracy. All units are made in brass and stainless steel with carbon steel spring. Model 4106 is intended for light duty use and is equipped with a maximum speed stop and idling stop. The Model 4107 is a medium duty unit and has a manual over-riding control allowing engine speed setting without air pressure. The output rod is infinitely adjustable with the double lock nuts. The Model 4108 is intended for heavy duty use. The large bore actuator produces enough force to control even the most difficult throttle and governor levers. Its rugged design makes it an outstanding performer where accuracy is required. The output rod is again adjustable, by moving it up or down, to obtain the precise stroke required. We also have several sand cast actuators available for special purpose applications.



MODEL 4106

Letter code designations:

U - 10- 80 PSI input pressure range
R - 0-100 PSI input pressure range
Other ranges available on request.

MODEL 4107

Letter code designations:

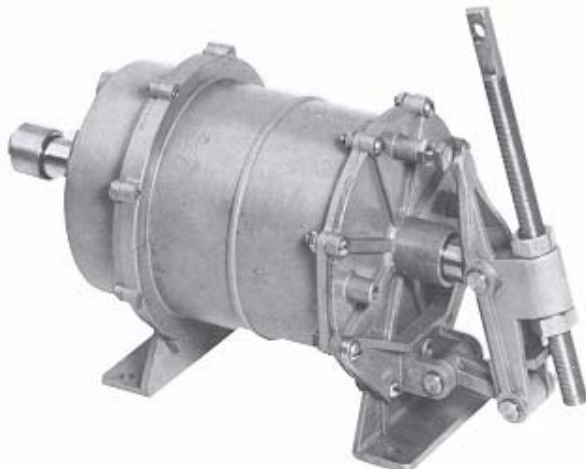
U - 10- 80 PSI input pressure range
R - 0-100 PSI input pressure range
Other ranges available on request.



MODEL 4108

Letter code designations:

U - 10- 80 PSI input pressure range
R - 0-100 PSI input pressure range
Other ranges available upon request.

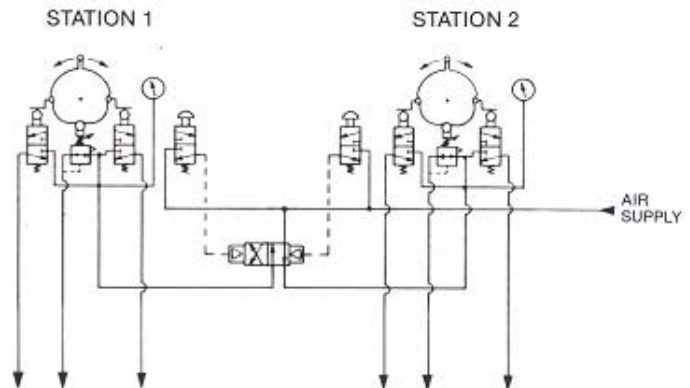


Model	4106	4107	4108
Max. Input Pressure	200 PSI (13.8 BAR)		
Operating Temp. Range	- 40°C to + 90°C		
Pipe Port Size	¼" NPT		
Max. Stroke (Approx.) (mm)	2¾" (60)	3½" (89)	4¾" (106)
Stroke as Linear Actuator	⅝" (16)	1" (25)	—

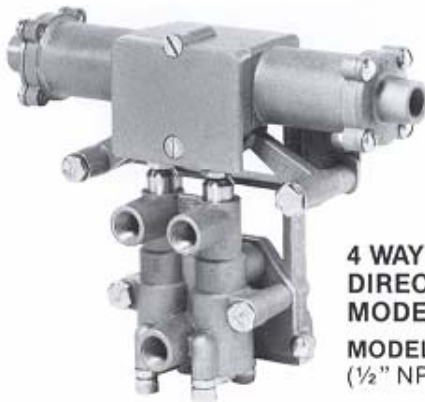
Station Transfer

On multi-station remote controls it is necessary to transfer the command from one station to another. Kobelt provides all components required to accomplish this task. The inspection authorities have different view points regarding the transfer of pneumatic stations. Kobelt however, can comply with all of these requests. Illustrated on this page are a few of the items required in the transfer of stations.

TYPICAL APPLICATION



TO CLUTCH & THROTTLE CONTROL ACTUATORS AND POSITIONERS



4 WAY AIR PILOT DIRECTIONAL CONTROL VALVE
MODEL 3403 (1/4" NPT)
MODEL 3405, not shown (1/2" NPT)

2-POSITION, 3-WAY CONTROL VALVE (1/8" NPT)
MODEL 3514
MODEL 3515, not shown (1/4" NPT)



SINGLE HANDLE 4-WAY DIRECTIONAL CONTROL HEAD
MODEL 3609 (1/4" NPT)
MODEL 3604, not shown (1/8" NPT)

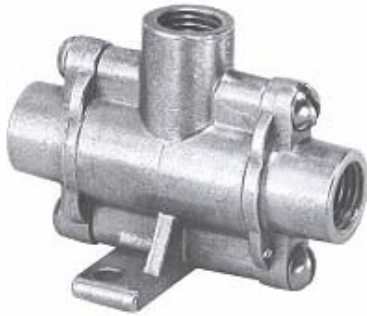
PALM VALVE
MODEL 3517 (1/8" NPT)



Pneumatic Accessories

Kobel is capable of providing all components necessary for a complete control system including all brass and stainless steel quick release valves, shuttle valves, one way check and choke valves and accumulators. Illustrations on this page are only a few of the standard components available from stock.

SHUTTLE VALVE MODEL 3009



NOTE: Under no circumstances must a shuttle valve be installed with one of the incoming lines plugged.

Weight: 0.4 lbs (192g)
Material: Die cast silicon brass and stainless steel
Operating Temperature Range: - 40°C to + 90°C
Pipe Port Size: ¼" NPT
Flow Capacity: ¼" Orifice Equivalent
Maximum Operating Pressure: 200 PSI (13.8 BAR)

QUICK RELEASE VALVE MODELS 3903 and 3905



Weight: 3903 - 0.9 lbs (428g);
 3905 - 1.1 lbs (500g)
Materials: Die cast silicon brass and stainless steel hardware
Operating Temperature Range: - 40°C to + 90°C
Maximum Operating Pressure: 200 PSI (13.8 BAR)

Pipe Port Size:	3903	3905
In and Out Ports	¼" NPT	½" NPT
Exhaust Port	⅜" NPT	½" NPT

Relay Valves

- *normally open*, MODELS 3325 and 3328
- *normally closed*, MODELS 3326 and 3327

Kobel makes a vast variety of relay valves in Normally Open and Normally Closed and in a single and dual pilot configuration, as well as compensating relays. The purpose of these relays is to interlock control functions and allow for time delays in "ship reversal" without damaging the propulsion machinery. Relays can also be used in the automation of deck machinery to interlock clutches and brakes, etc. Kobelt offers an engineering service to our customers providing system drawings and piping arrangements as well as specifications for installation. We also assist the ship yard in the installation of our products. This ensures a smooth performance and very few start up problems.



MODEL 3326 N/C

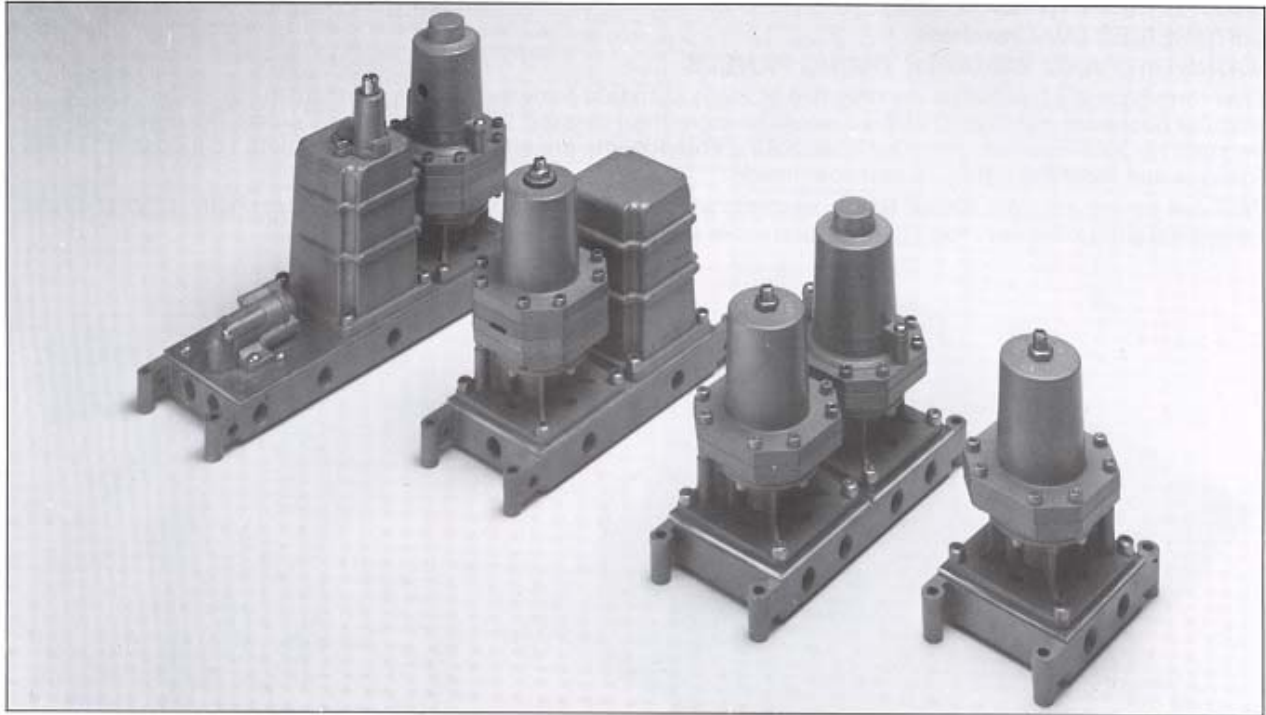
MODEL 3328 N/O

ORDERING INFORMATION:

Model Designation		
A	- Standard inlet cap	
B	- With flow control inlet cap	
C	- Heavy spring	40-110 PSI
CC	- Extra heavy spring	100-160 PSI
D	- Light spring	25-60 PSI
DD	- Extra light spring	10-20 PSI
E	- Left hand model	
F	- Right hand model	
H	- Piston Operated for oil pilot	

Operating Temperature Range: - 40°C to + 90°C
Maximum Supply Pressure: 200 PSI (13.8 BAR)
Pipe Port Size: ¼" NPT

Time Delay and Interlock Systems



Our engineering department over the last few years has developed the most versatile, robust and non-corrosive timing units (patented). This allows the assembly of an interlocking control system to suit your requirements in very little time. All components are made from brass and stainless steel and carry a five-year warranty. The standard flow capacity is 1/4" diameter and booster relays are available which allows for full flow of 1/2" diameter. Please note that all components on the timing panels are made by Kobelt. Diaphragms, poppets and seats are totally interchangeable from one unit to the next.

Illustrated on this page are four basic timing units. Timing systems are available to provide the following functions:

- Constant Timing (Clutch delay)
- Variable Timing (Clutch delay)
- Throttle Delay
- Throttle Boost
- Shaftbrake Timing
- Minimum Timing
- Two Stage Charge
- Pneumatic Slipclutch
- Over-riding Interlocking Throttle
- PTO Interlock
- PTO Speed Limiting

A combination of any of the above functions is available, on pre-assembled timing panels, to suit your requirements.

The following is a short description of the Basic Control Functions:

Constant Timing Constant Timing provides a constant neutral time delay.

Variable Timing The Variable Timing provides a variable neutral time delay which is dependent on engine speed and duration of engine speed.

Minimum Timing The Minimum Timing is used in conjunction with variable timing and provides primary constant neutral time delay.

Throttle Delay The purpose of the Throttle Delay is to delay engine acceleration until after the clutches are engaged.

Throttle Boost The purpose of the Throttle Boost is to raise the engine RPM slightly before and during clutch engagement. This is to prevent engine stallout. It is highly recommended on light engines with reduction ratios of 3.5:1 and up.

Propeller Shaft Disc Brakes The Propeller Shaft Disc Brakes should be employed on all reduction gear ratios of 5:1 and over. An enormous amount of wear and tear on the engine and gearbox can be eliminated with the application of the Propeller Shaft Brake Timing. The speed of maneuverability is greatly improved. On ships with large reduction gear ratios Throttle Boost and Shaft Brake Timing are employed to prevent engine stallouts.

Time Delay and Interlock Systems (Patents Pending)

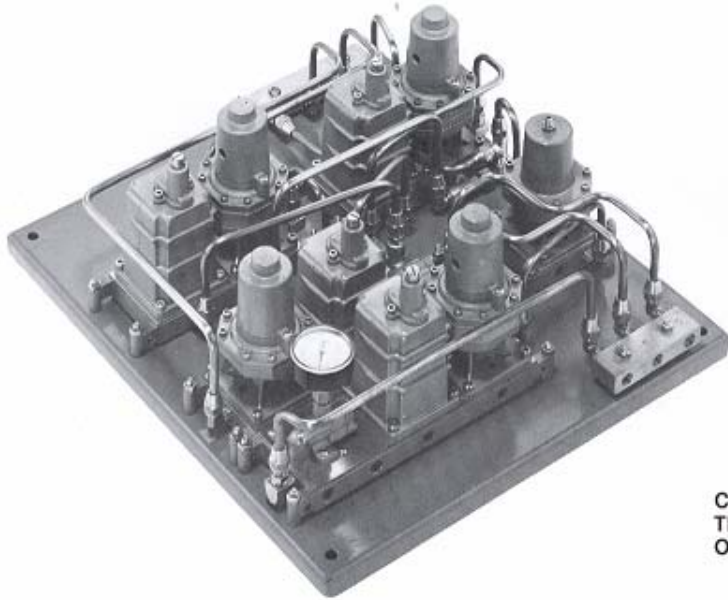
2850 SERIES (Hydraulic Gear)

2870 SERIES (Air Clutches)

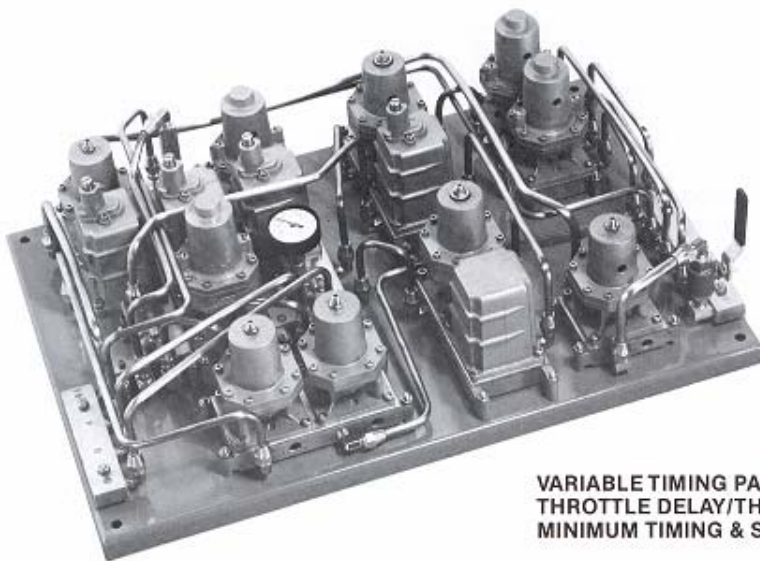
CONSTANT AND VARIABLE TIMING PANELS

The timing panels illustrated are only two of many standard panels available. Custom made systems are a regular occurrence at Kobelt and we would be more than pleased to assist you in selecting the right timing system for your requirements. Our interlocking components are also available in cabinets with door-mounted gauges and indicator lights, to suit your needs.

You can be assured that Kobelt timing systems will give you the utmost in performance, engine protection and maneuverability. We are proud to be a forerunner in this area.



CONSTANT TIMING PANEL
THROTTLE DELAY/THROTTLE BOOST
Order No. 2850-1120



VARIABLE TIMING PANEL
THROTTLE DELAY/THROTTLE BOOST/
MINIMUM TIMING & SHAFT BRAKE

Remote Control for Controllable Pitch Propellers

Kobel control heads are available to serve any function required in controllable pitch propeller application. For single and multi-station installations, and from the smallest to the largest propeller, our automatic load control will accurately maintain the desirable fuel consumption throughout the whole engine speed range with a high degree of dependability. For further information on our control heads please consult pages 6, 7 and 10.



MODEL A-2556
SINGLE ENGINE, TWO LEVER
PITCH & THROTTLE CONTROL



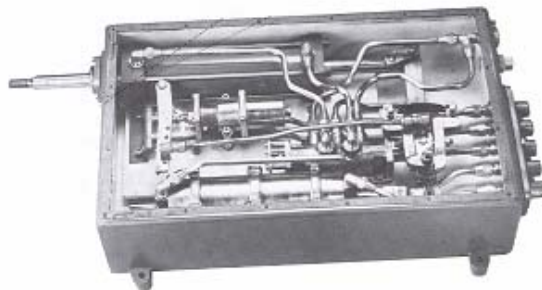
MODEL 2579
TWIN ENGINE, SINGLE LEVER
PITCH & THROTTLE CONTROL

Pitch Actuators for Smaller C.P. Propellers

A direct pneumatic actuator can be installed on C.P. pitch positioning mechanism requiring little force to operate. Cylinders Models 4221 and 4224 are most suitable for these applications. Our air-over hydraulic pitch positioning unit, Model 4630, is intended for C.P. pitch control requiring a considerable amount of force. A hydraulic pressure source is required to make this unit operative. Shuttle valves must also be installed in order to provide a pre-load of 3 p.s.i. on both pneumatic positioning diaphragms, at all times.

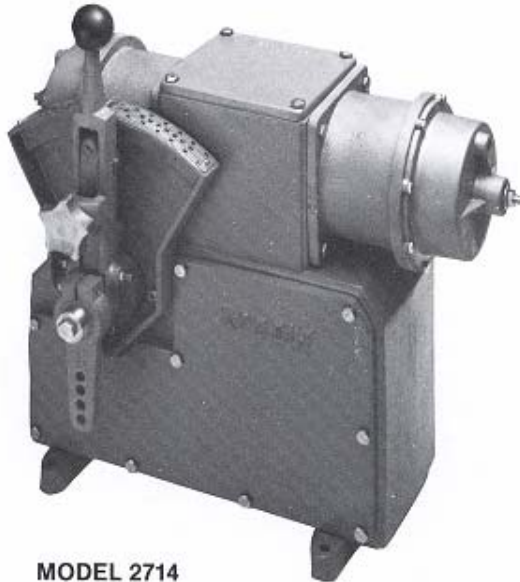


MODEL 4221 (Shown)
DOUBLE ACTING
SELF-CENTERING POSITIONING ACTUATOR



MODEL 4630 (Cover removed)
AIR OVER HYDRAULIC
TWO-DIRECTION POSITIONING UNIT

Pitch Servo Positioner with Load Control



MODEL 2714

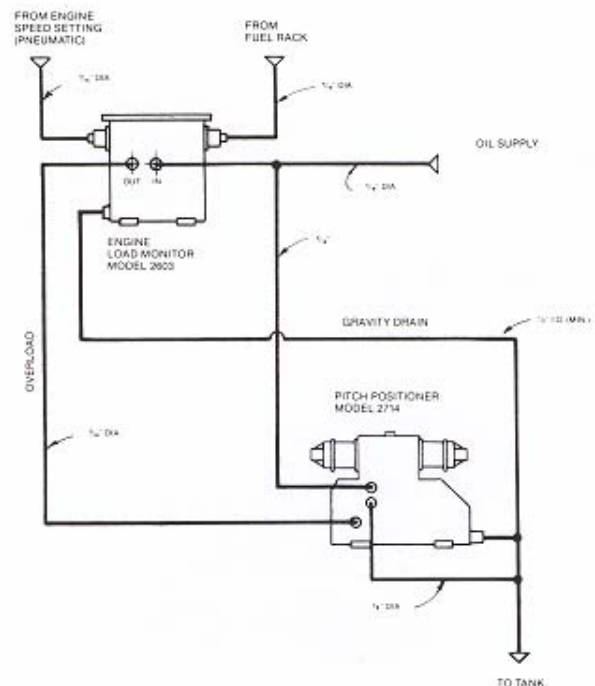


MODEL 2603

MODEL 2714 (Patent Pending)

This unit is available in two different versions. Model 2712 will provide "O" pitch in the mid-control range (Single Actuator). Model 2714 provides "O" pitch at "O" control pressure (Dual Actuator). Both units will ensure very accurate positioning throughout a whole range of the pitch setting unit.

Our Model 2603, Engine Load Monitor, has the ability to receive the engine speed setting signal and the fuel rack signal via a rack transmitter. The outgoing hydraulic signal from Model 2603 is fed into the pitch positioner Model 2712 or 2714 and causes a proportional pitch increase or decrease to suit engine fuel consumption specifications throughout the whole speed range. These signals can be maintained within 1% accuracy without much difficulty. The components are all vibration resistant and will therefore provide years of trouble-free operation because of the simplicity of design.



C.P. Accessories

The vast assortment of Kobelt components, which are available, enable us to select from standard products off the shelf, in order to give you the following options for C.P. propeller installation:

- Propulsion mode selector, two handle or single lever.
- Master station transfer in engine room.
- Master station selector in wheelhouse.
- Control take over system at individual remote stations.
- Control acknowledgement at master remote station.
- Manual engine room throttle trim.
- Manual engine room pitch trim.
- Clutch and throttle interlock system.
- Pneumatic pitch indicator system.
- Electric station-in-command indicator system.
- Power take off control.
- Power take off engage and speed interlock.
- Engine speed limiting for power take off drive.
- Separate overriding throttle.
- Interlocked overriding throttle.
- Multi engine load share automatic.
- Automatic pitch limiting.
- Automatic pitch compensation.
- Propeller shaft holding brake (automatic).



Give us your specifications which will enable us to provide you with the control system best suited for your vessel. Our engineering department will be pleased to prepare a proposal for you.

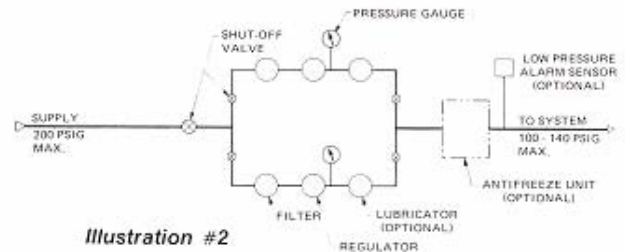
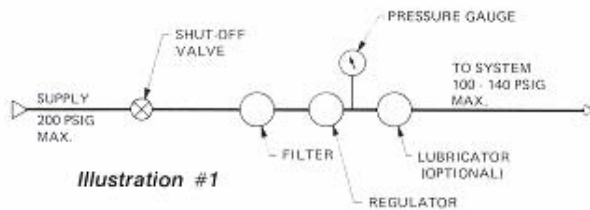
Air Preparation

Air Treatment Units

In order to provide a satisfactory control system it is of utmost importance to have a reliable source of clean compressed air and storage facilities. Before the air enters the control system an air filter must be provided to remove minor impurities from the air. The filter also removes most of the moisture from the air supply. After the filter, an air pressure regulating valve is required to

maintain a specified and constant air pressure. We recommend the installation of a lubricator in the air system which provides an oil fog for the lubrication of all moving parts within the system. See illustration #1.

For a more elaborate air treatment unit, dual installations with isolator valves can be installed. See illustration #2.



A low pressure alarm switch is optionally available to provide a means of warning in the event of loss of air pressure.

Air dryers and antifreeze units are also available upon customer request. These systems are totally flexible and any combination of air preparation units are available to meet specific requirements.

High Pressure Regulating Valves

MODEL 3264



Kobelt does not, at the present time, manufacture low pressure filters, regulators and lubricators. We can, however, supply from stock or your choice of manufacturer any item of this nature.

We manufacture 1" N.P.T. high pressure reducing valves (600 p.s.i. input) which has been very well accepted in the field.

The valve has full flow capacity and is made from bronze and stainless steel.

Basic Instructions

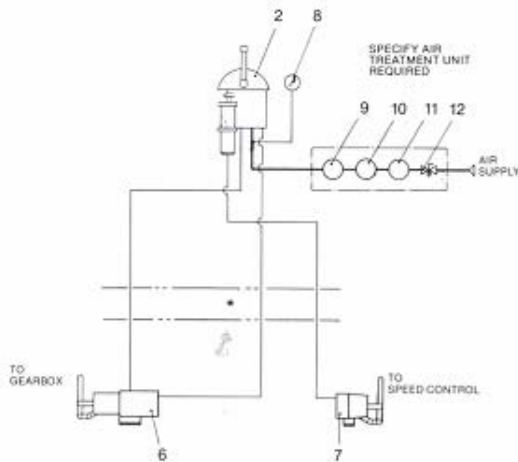
Assisting your marine technicians and engineers in installing and maintaining our controls properly has always been a Number 1 priority at Kobelt. We offer detailed instructions as to how the pneumatic control system works, how best to install a system of this kind and how to best maintain a pneumatic control system. On this page we can only point out some very basic standards. Should you require any further information please do not hesitate to contact us.

Systems drawings provided by Kobelt will indicate tubing size for various systems. We recommend that these tubing sizes be adhered to as closely as possible since a large tube and long tube acts as a reservoir and could cause a delay in charging and dumping. On the other hand, too small a tube attached to a valve would cause a restriction in flow volume. One of the most important things to remember during the installation of pneumatic control systems is to keep the tubing and piping system free from foreign matter.

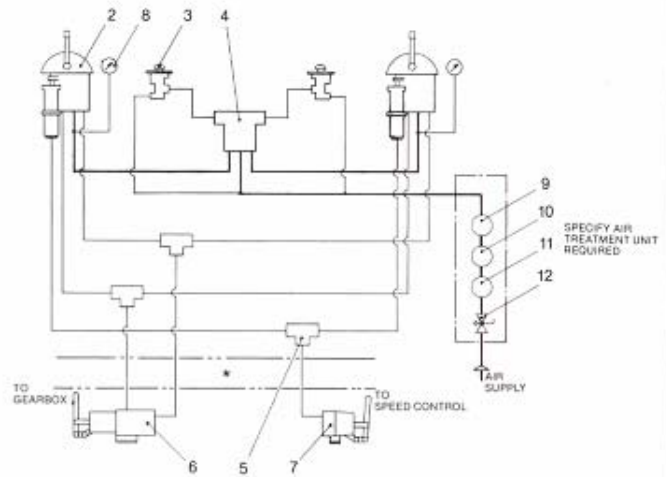
If brackets must be furnished to install our actuators to the engine or gear box, the actuator must be bolted down — do not weld.

Pipe fittings should be installed using a liquid sealant. Teflon tape is not recommended. Fittings must not be over tightened since the tapered thread could in fact cause castings to split.

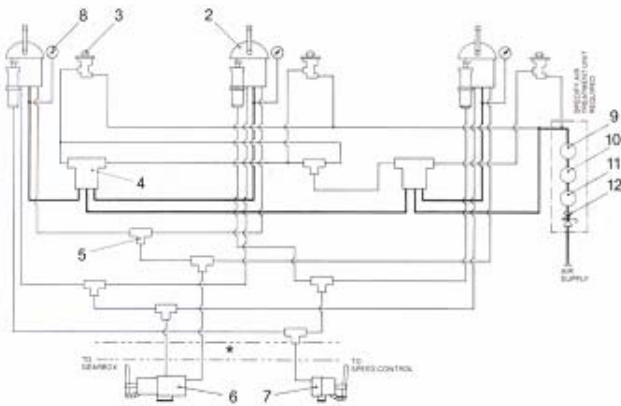
**1 STATION, SINGLE ENGINE
CLUTCH & THROTTLE CONTROL**



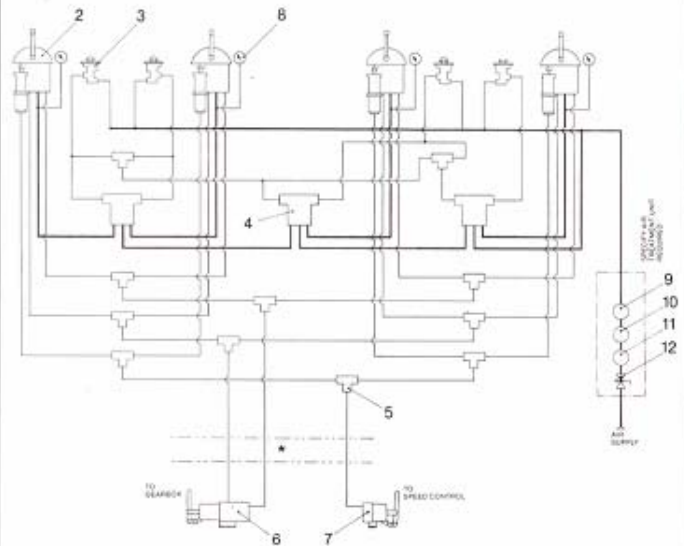
**2 STATION, SINGLE ENGINE
CLUTCH & THROTTLE CONTROL**



**3 STATION, SINGLE ENGINE
CLUTCH & THROTTLE CONTROL**



**4 STATION, SINGLE ENGINE
CLUTCH & THROTTLE CONTROL**



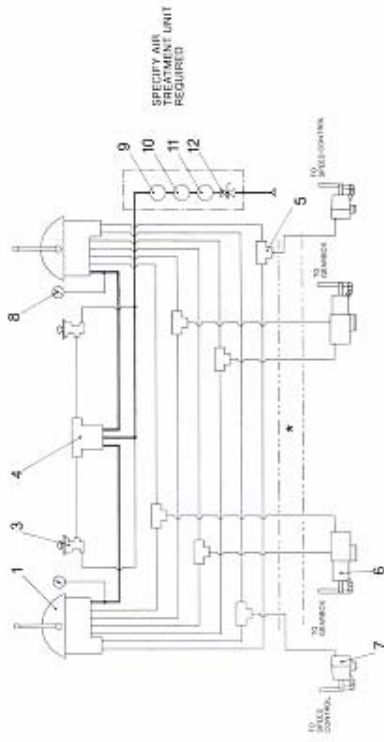
PARTS LIST

ITEM	PART NUMBER	DESCRIPTION
1	2545/55	Twin Dual Function Control Head
2	2544/54	Dual Function Control Head
3	3517	2-Pos, 3-Way Palm Valve
4	3403	2-Pos, 4-Way Air Piloted Valve
5	3009	2-Way Check Valve
6	4204-C 4207-C	Clutch Actuator
7	4106-U 4107-U 4108-U	Throttle Actuator
8	82408	Pressure Gauge
9	606-2	Lubricator
10	119-2	Regulator
11	602-2	Filter
12	3150-1050	Vented Ball Valve

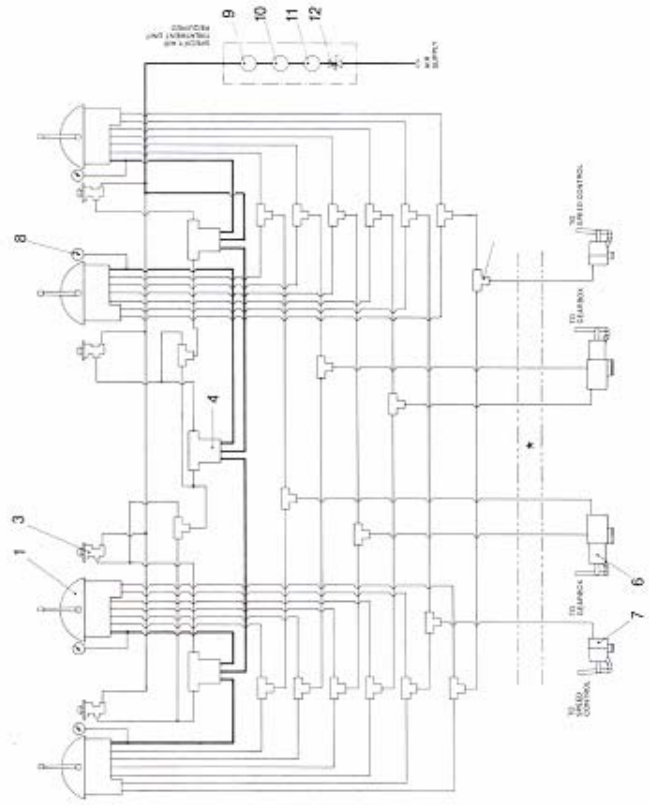
*** NOTE:**

Control systems requiring delays and interlocks must be installed at this point.
For Pneumatic Actuated Reverse Gears, interlocks are essential.

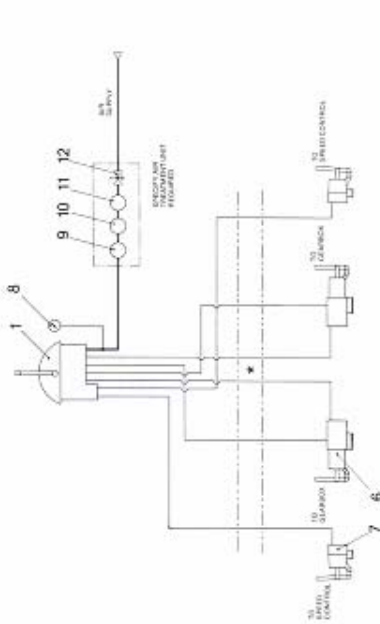
2 STATION, TWIN ENGINE CLUTCH & THROTTLE CONTROL



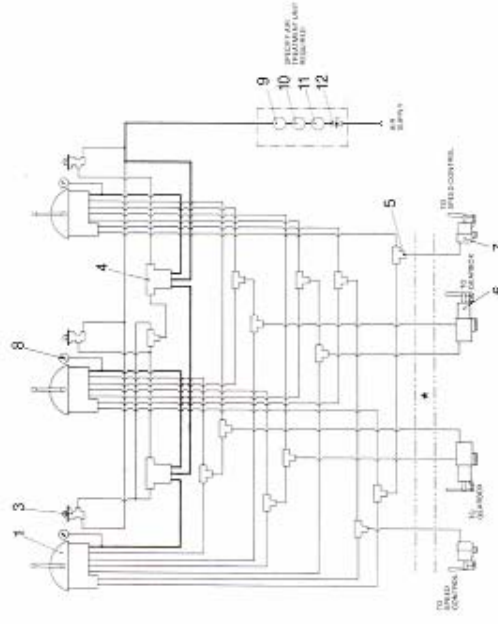
4 STATION, TWIN ENGINE CLUTCH & THROTTLE CONTROL



1 STATION, TWIN ENGINE CLUTCH & THROTTLE CONTROL



3 STATION, TWIN ENGINE CLUTCH & THROTTLE CONTROL



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	254355	Twin Dual Function Control Head	7	4106-U	4107-U
2	254454	Dual Function Control Head	8	4108-U	Throttle Actuator
3	3517	2-Pos, 3-Way Palm Valve	9	82405	Pressure Gauge
4	3403	2-Pos, 4-Way A/T Potted Valve	10	506-2	Lubricator
5	3009	2-Way Check Valve	11	119-2	Regulator
6	4204-C	4207-C Clutch Actuator	12	6022-F101	F101
				3150-1050	Verred Ball Valve

* NOTE: Control systems requiring delays and interlocks must be installed at this point. For Pneumatic Actuated Reverse Gears, interlocks are essential.



Winch Control

Kobel provides all necessary control components required for the control of winches and general deck machinery. Operators working with such equipment, exposed to salt water, really appreciate Kobelt quality. Like all Kobelt products, they provide years of trouble-free service in a salt water environment. We make several types of 3-Way and 4-Way valves, single compensator and dual compensator control valves plus a large variety of cylinders to accomplish all the tasks for shipboard winch control.

Our controls can be used for the following winch control applications:

- Hydrostatic pumps and motors
- Hydraulic valves
- Brakes
- Clutches
- Engine speed
- Transmissions
- Single or multi stations
- Cement systems

We can also provide interlocks and delays to automate your winch control system.

Disc Brakes

Kobel Disc Brakes are used in all corners of the world. The applications that we serve are limitless. For example, propeller shaft brakes from 40 – 50,000 H.P., supply vessels, and drill ship anchor handling, pipe laying barges, draw work disc brakes both on land and off-shore, conveyor belt systems, chair lifts, cable spooling reels, sugar and paper industry, wind generators, industrial equipment as well as mining and aerospace.

We offer many patented features which are a direct result of our innovative design and research program. Most of our brake calipers are made from bronze and stainless steel and can be used in almost any kind of environment. The rugged design will offer years of trouble free service. We can also offer several types of brake linings to conform with your environmental controls.

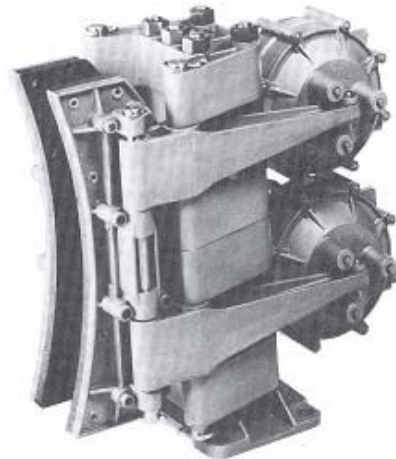
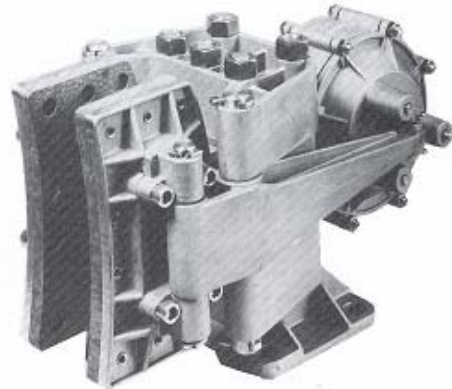
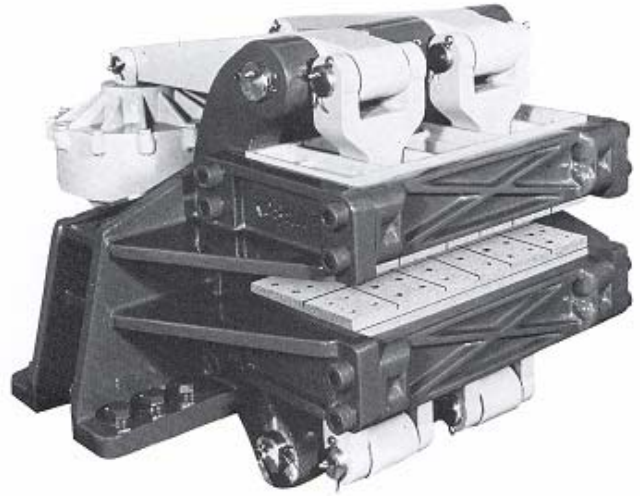
The most recent addition to our ever growing product line is the die-cast series brake calipers. These calipers represent the latest in technology and the absolute utmost in engineering. Its compact design and versatility are unmatched. All castings are made from die-cast silicone bronze with stainless steel hardware. This assures years of trouble free service.

Brake discs are available in many different versions. We can offer solid steel discs, medium duty cast ventilated discs, high energy cast ventilated discs, and supreme duty ventilated and segmented discs as well as internal water-cooled discs.

Kobel Disc Brakes are manufactured under one or more of the following patents:

U.S. Patents	Canadian Patents
3722636	895693
3815471	922603
4013148	1069066
4060153	1072025
4108285	1158181
4121697	1176187
4164993	
4236608	
4393962	
4572335	

Further patents pending.



Wire-Over-Pulley Controls



Of all the various types of mechanical marine propulsion controls available, our experience has shown that the endless wire-over-pulley system gives accuracy and best response. The push-pull control, even with the finest components, will reach a point where it cannot meet certain requirements, i.e. long cable runs with many bends and several stations. At this point, if mechanical controls are required, we recommend the endless wire-over-pulley control system. Although this type of control requires a little more planning and installation time than the push-pull system, its operation is extremely sensitive and light.

It is important to remember that the wire-over-pulley controls can be partially incorporated into push-pull

systems as well as pneumatic systems. In fact, we manufacture all control components required for push-pull, wire-over-pulley and pneumatic systems.

Wire-over-pulley components are available for either two lever or single lever installations. For complete details on the Kobelt wire-over-pulley system contact your local Kobelt dealer.

Kobelt's wire-over-pulley controls are manufactured under one or more of the following patent numbers:

Canadian Patent Numbers	U.S. Patent Numbers
643930	320211
737682	3330390
767393	3363881
787168	3496833
952345	3818771

Push-Pull Control

The Push-Pull Control for small craft has proven to be the easiest control installation. The flexible cables require little planning for installation and no intermediate supports. Kobelt, today, is the only manufacturer in the world providing brass and stainless steel control components. Our quality and price make it almost impossible for a boat owner to choose any other product. The durability and performance of our products have an

international reputation which is envied by our competitors.

Kobelt's push-pull controls are manufactured under one or more of the following patent numbers. Further patents pending.

Canadian Patent Numbers
1153673
1158136

U.S. Patent Numbers
4280371
4326612
4453428
4470492



Kobelt Manufacturing, Surrey, British Columbia, Canada

Ever since our humble beginnings in 1962, Kobelt Manufacturing Limited has been committed to manufacturing the finest marine controls in the world. We stress the importance of quality, precision, competitive pricing and prompt delivery. Our team of dedicated production staff is uncompromising in ensuring that we meet the needs of all our valued customers. Our growing reputation in world markets is proof of our commitment to highest possible standards. From our very first line of pneumatic controls we've believed in the simple things—rugged construction, quality materials and prompt delivery to customers. Today, the technology has changed, but our commitment remains the same. From our innovations in electronic controls to our craftsmanship with bronze and stainless steel, our products span the oceans of the world to further our reputation as an international leader in maritime technology.



Kobel equipment comes with a 5-year **conditional** warranty that is the best in the industry. Strict quality control manufacturing and sturdy corrosion-resistant materials ensure trouble-free service above and beyond this generous warranty period.

KOBELT

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