

LIMIT SWITCH REPLACEMENT

ABERDEEN CHEMICAL PLANT

August 27, 1985

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Chief Process Engineer

LIMIT SWITCH REPLACEMENT

ABERDEEN CHEMICAL PLANT

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LIMIT SWITCH REPLACEMENT

ABERDEEN CHEMICAL PLANT

I. Purpose and Process Description

The purpose of this design is to provide the valves in VCM and chemical wash service with accurate indication in the control room of the valve position. The existing limit switches do not provide this accuracy, since they are operated by the position of the actuator and not the actual valve stem. This type of operation does not take into account the possibility of shearing between the valve stem and actuator, which has occurred here in the plant. This poses a potentially hazardous situation for a VCM release.

This design will provide each of the designated valves on the reactors and charge systems with a new limit switch that operates on the position of the valve stem. These new limit switches will provide accurate indication in the control room and eliminate the hazard of a valve being open when it's actuator position is showing closed.

A total of 102 valves will be equipped with this new type of limit switch. These limit switches will be mounted on the bracket between the valve and the actuator. Drawings of several different types of valves with the new limit switches are attached.

NEW MODULE

<u>General Location</u>	<u>Valve Number</u>	<u>Valve Location</u>
New Module Recovery System	1	Suction North Vacuum Pump
	2	Suction South Vacuum Pump
	3	Discharge North Vacuum Pump
	4	Discharge South Vacuum Pump
	5	Compressor Suction Manifold
	6	Compressor Suction Manifold
	7	Compressor Suction Manifold
	8	Suction North Compressor
	9	Suction Middle Compressor
	10	Suction South Compressor
	11	Discharge North Compressor
	12	Discharge Middle Compressor
	13	Discharge South Compressor
	14	Pressurization Equalization Valve
New Module Receivers	15	FVCM Supply
	16	RVCM to Blowdown Tank
	17	RVCM to Blowdown Tank

<u>General Location</u>	<u>Valve Number</u>	<u>Valve Location</u>
New Module Receivers	18	RVCM Supply To Reactors
New Module Blowdown Tank	19	Recirculation
	20	To Batch Water Strippers
Rx 745 thru 741	21-25	Chem Wash Supply
	26-30	Cleaning Rx
	31-35	Cleaning Condenser
Chem Wash Tank	41	TK Outlet
	42	Reactor
	43	TK Bypass
	44	TK Inlet

<u>Old Module</u>		
<u>General Location</u>	<u>Valve Number</u>	<u>Valve Location</u>
Old Module System	1	Suction West Compressor
	2	Suction East Compressor
	3	Discharge West Compressor
	4	Discharge East Compressor
	5	Suction West Vacuum Pump
	6	Suction East Vacuum Pump
	7	From Tank Farm
	8	Pressurization Equalization Valve
	9	To Batch Water Strippers
Old Module Receivers	10	Suction RVCM Pump
	11	RVCM Supply To FVCM Pumps
	12	To Batch Water Strippers
	13	To Batch Water Strippers
	14	FVCM Recovery Supply
Emission Recovery System	15	Recovery BWS Valve
	16	Recovery Tank Farm

Old Module(Continued)

<u>General Location</u>	<u>Valve Number</u>	<u>Valve Location</u>
Batch Water Stripper	17	South To Sewer
	18	North To Sewer
	19	S. To Centrate
	20	N. To Centrate
	21	North To ERS
	22	North To ERS
	23	North To ERS
	24	South To ERS
	25	South To ERS
	26	South To ERS
	27	North & South Relief Line from ERS
	28	South Steam Pressurization
	29	North Steam Pressurization
	30	South Fill Line
	31	South Fill Line
	32	North Fill Line
	33	North Fill Line
Rx 300 thru 700	34-38	Chem Wash Supply
	39-43	Chem Wash to Rx
	44-48	Chem Wash to Condenser
	49-53	Inert Vent
Chem Wash Tank	54	TK Outlet
	55	Reactor

Old Module (Continued)

<u>General Location</u>	<u>Valve Number</u>	<u>Valve Location</u>
Chem Wash Tank	56	TK Bypass
	57	Chem Wash From EA-357 to RA-776
	58	TK Inlet

LIMIT SWITCH REPLACEMENT

ABERDEEN CHEMICAL PLANT

III. Instrument Specification

<u>Item</u>	<u>Description</u>
PLS-101 through 207	Promimity Limit Switches



Conoco Inc.
Engineering Center
Ponca City, Oklahoma
SPECIFICATION SHEET

SPECIFICATION SHEET

PROJECT NO. _____

A F E NO. _____

DATE 7-31-85 INQ NO. _____

MADE BY EGJ REC NO. _____

APPD BY JFK P.D. NO. _____

PLANT Aberdeen Chemical PROJECT Reactor Valve Limit Switch Reprint.

ITEM NO
SERVICE

PLS-101 thru 207 Proximity Limit Switches

Service: Valve Indication

Location: On bracket between valve and actuator

Manufacturer: GO or company approved equal

Model: 713774

Description: 1/2 NPT conduit outlet with 18" potted, 3 wire leads, type 300 stainless steel housing with 5/8-18 NF x 2.813" threads.

VAB.0001098797

SHEET _____ OF _____ REV _____



CONTROL ACCESSORIES CO.

Subsidiary of J.F. GASKILL CO., INC.

Post Office Box 185
Pelham, Alabama 35124

August 5, 1985

Vista Polymers
P. O. Box 91
Aberdeen, MS 39730

Attention: Frank Jeanson

Frank:

I would like to thank you again for the opportunity to quote you the General Equipment 70 Series VIP Packages for your up coming project.

The Valve Indication Packages which consists of two 713774 GO Switches and mounting brackets are \$375.00 each. The switches are UL, CSA approved for Class I, Division I, Groups A, B, C, D or Class II, Groups E, F, and G.

At this current writing we are obtaining pricing on the NEMA Enclosure with a terminal strip that we discussed during our meeting on July 23. This will be forwarded to you as soon as we have the complete package price.

If you need my assistance on this project, please contact me at our Pelham, Alabama office.

Very truly yours,

Tom Meacham
Sales Representative

TM:sp

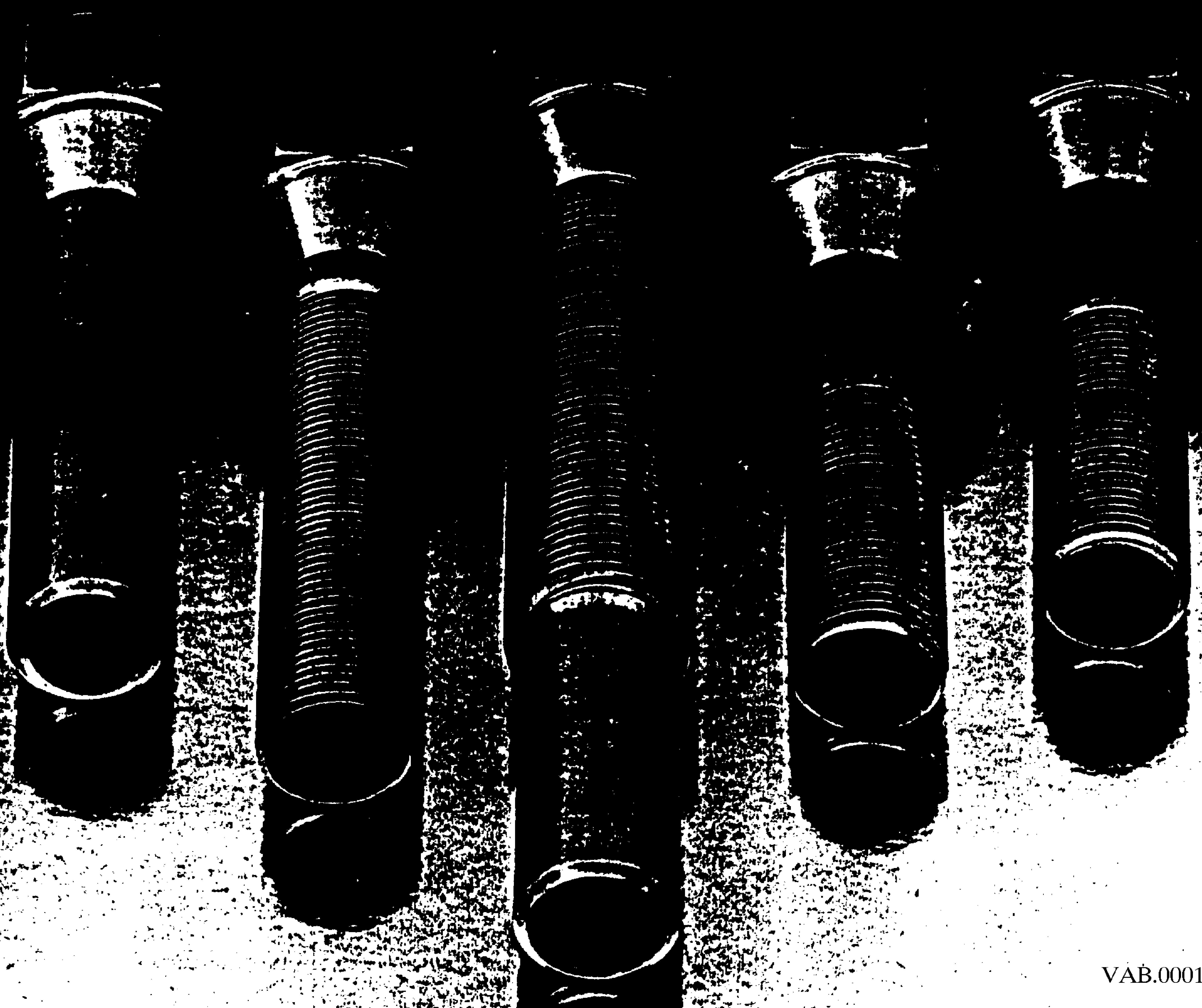
cc: Joe Gaskill, President
J. F. Gaskill Company

Don Toone, National Sales Director
General Equipment Mfg., Company

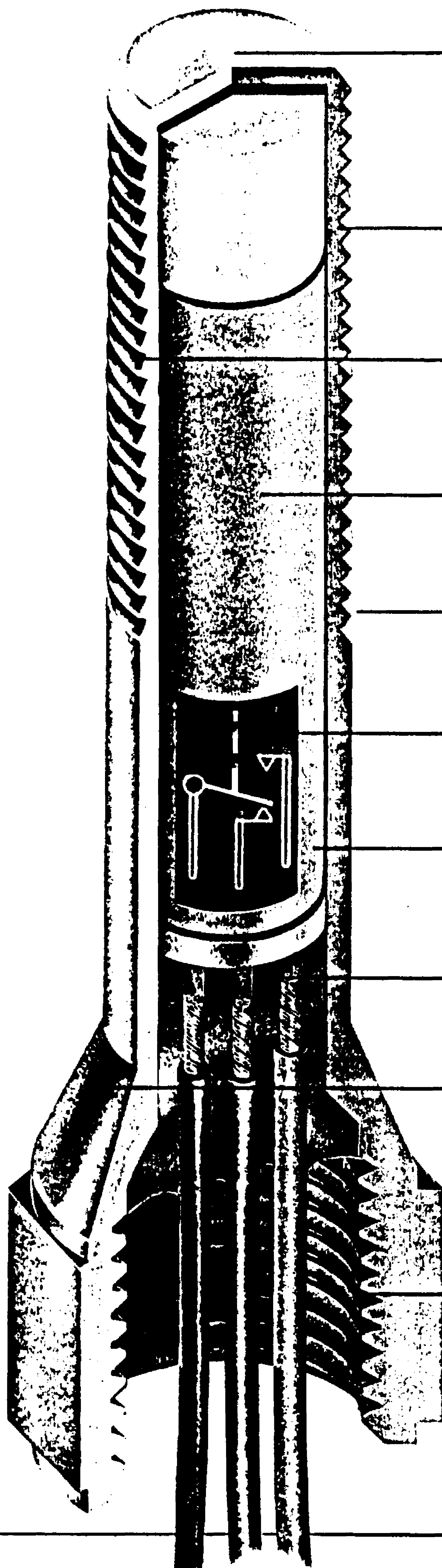
GO

Series 70 Switch

A Rugged and Dependable Line of Totally Enclosed Proximity Limit Switches
from General Equipment & Manufacturing Company, Inc.



VAB.0001098799



End Cap: .050" Stainless Steel (304) End Cap, available with thicker End Caps for higher pressure.

Pressure Options: Normally the standard 5/8" diameter will withstand 2000 PSI. Larger cases with thicker walls and front End Caps will allow the switch to function at much higher pressures (up to 10,000 PSI). Certification available as factory option.

Case: 300 Series Stainless Steel case, plain or threaded body (5/8-18 NF). Different body lengths available, SEE options on MODELS AVAILABLE.

Magnets: Made with a high energy product magnet. An excellent coercive force which converts into grams of Contact Pressure for reliable operation. Meets MMPA Specifications.

External Threads: Machines to meet SAE 5/8-18 UNF Specifications. Units available with or without threads.

Contacts: Type Silver, Cadmium Oxide, resists welding and is some of the most widely used Contact Material in the industry. Sized to withstand approved ratings. Hermetically Sealed Contact Chamber.

Bearing: Consists of a finely ground Stainless Steel Pin and durable plastic housing. Sized to withstand a wide temperature range. Resists seizing and gives millions of free operations.

Potting: Terminal cavity filled with epoxy resin compound for sealing and mechanical support of wire/cable connections.

Body Tube: Made of Free Mechanical Stainless Steel. Resists most all harsh environments and withstands high working pressures. Impervious to water, oils and gases.

Internal Threads: 1/2-14 NPT. complies with CSA requirements for Explosion Proof Applications. Wire or cable leads available to meet Customer's Specifications.

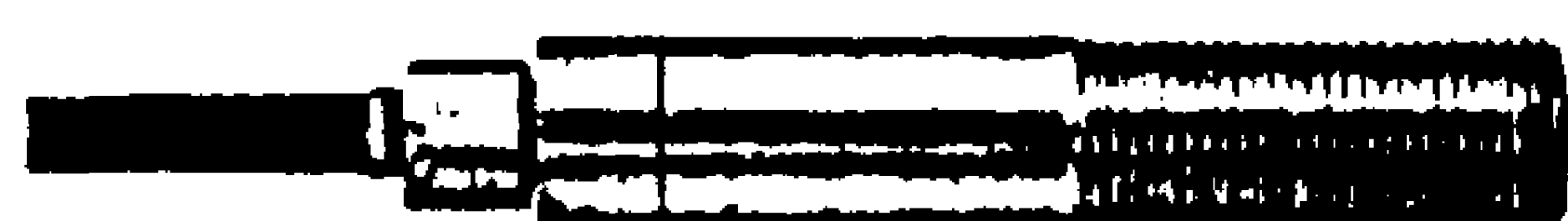
When time, accuracy, and dependability count . . . you can count on the 70 Series GO® Switch.
Maintenance free; engineered for precision, performance and reliability.

The standard 70 Series GO® Proximity Limit Switch has been designed and built to rugged specifications for use in most industrial and environmental applications. Each switch is totally enclosed, hermetically sealed and capable of operating in hostile environments.

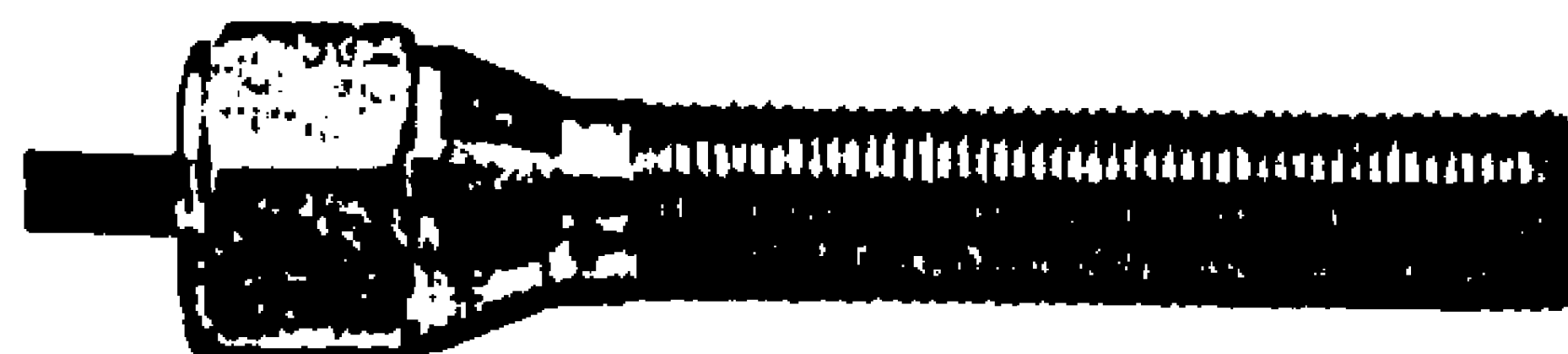
The standard stainless steel housing is impervious to oils, caustic acids, water laden areas and most

atmospheric conditions, with a broad operating temperature range. (See specification) Many different models of the switch are available for your design needs. (See ordering information for specifications, detail and options.)

Standard Models



Model 713360
 No conduit connection, 18" 3 conductor cable with water resistant squeeze connection, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.



Model 713570
 1/2 NPT conduit outlet, 18" 3 conductor cable, type 300 stainless steel housing with 1/2-18 NF x 2.813" threads with 2 lock nuts.



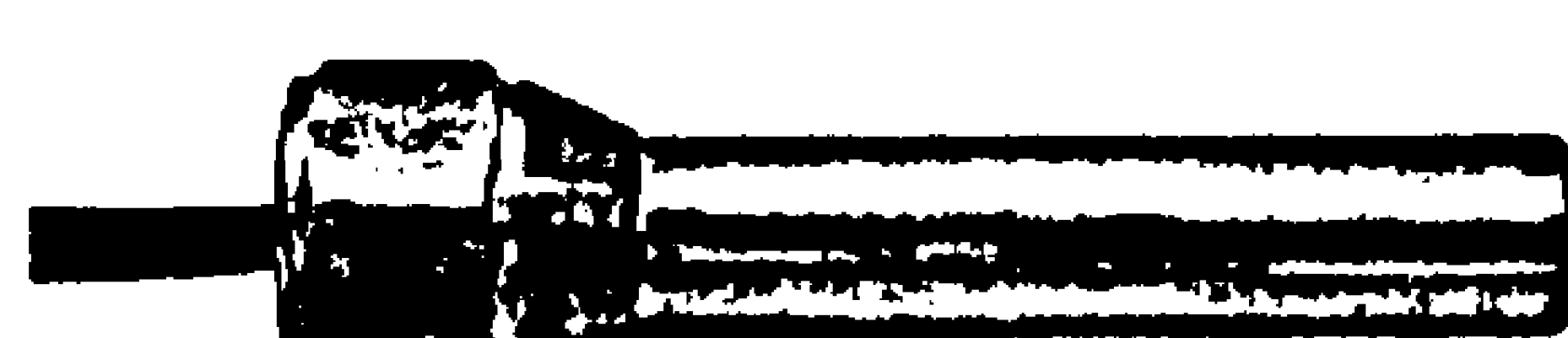
Model 713420
 No conduit outlet, 18" potted, 3 conductor cable, type 300 stainless steel housing; no threads.



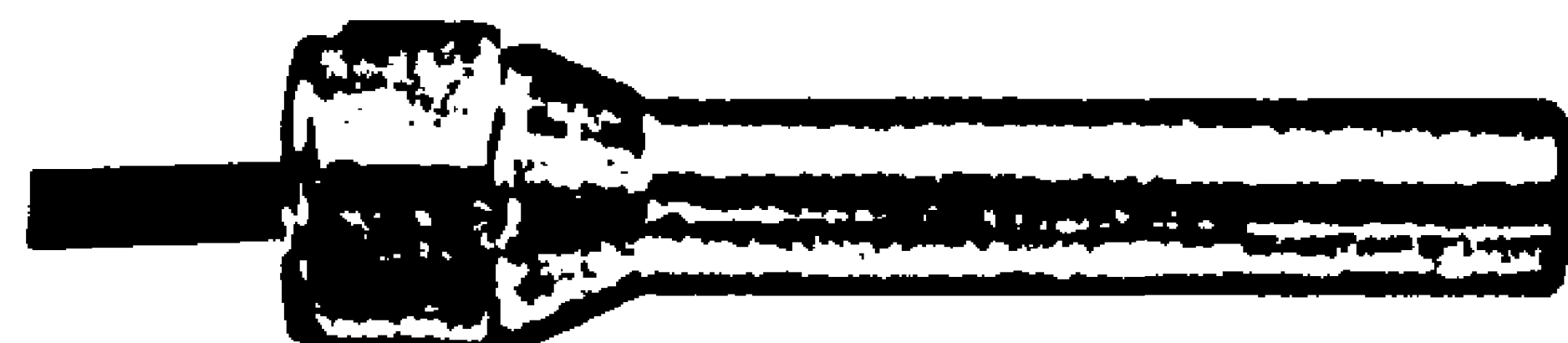
Model 713660
 No conduit outlet, 18" potted, 3 wire leads, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.



Model 713460
 No conduit outlet, 18" potted, 3 conductor cable, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.



Model 713720
 1/2 NPT conduit outlet with 18" potted, 3 wire leads, type 300 stainless steel housing, no threads.



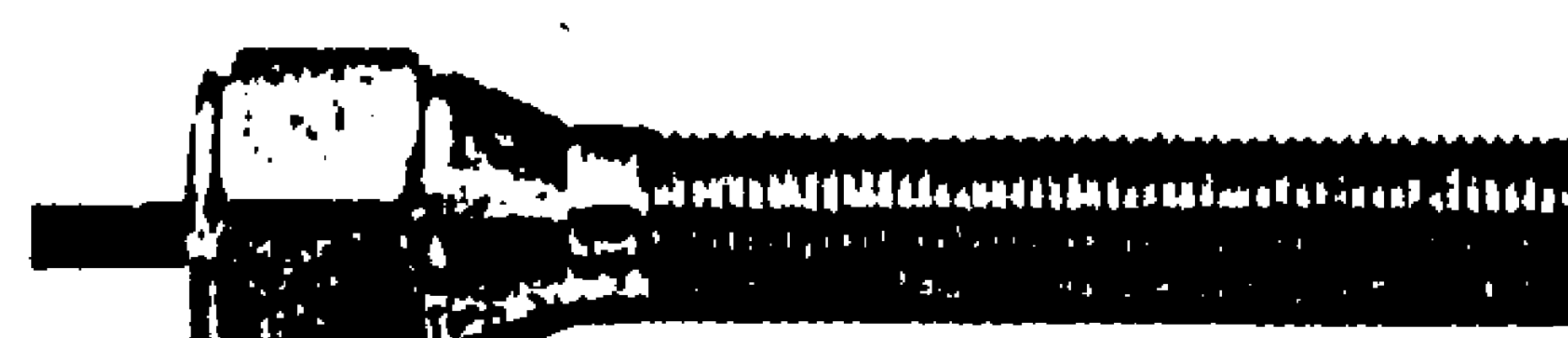
Model 713520
 1/2 NPT conduit outlet, 18" 3 conductor cable, type 300 stainless steel housing, no threads.



Model 713760
 1/2 NPT conduit outlet with 18" potted, 3 wire leads, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.

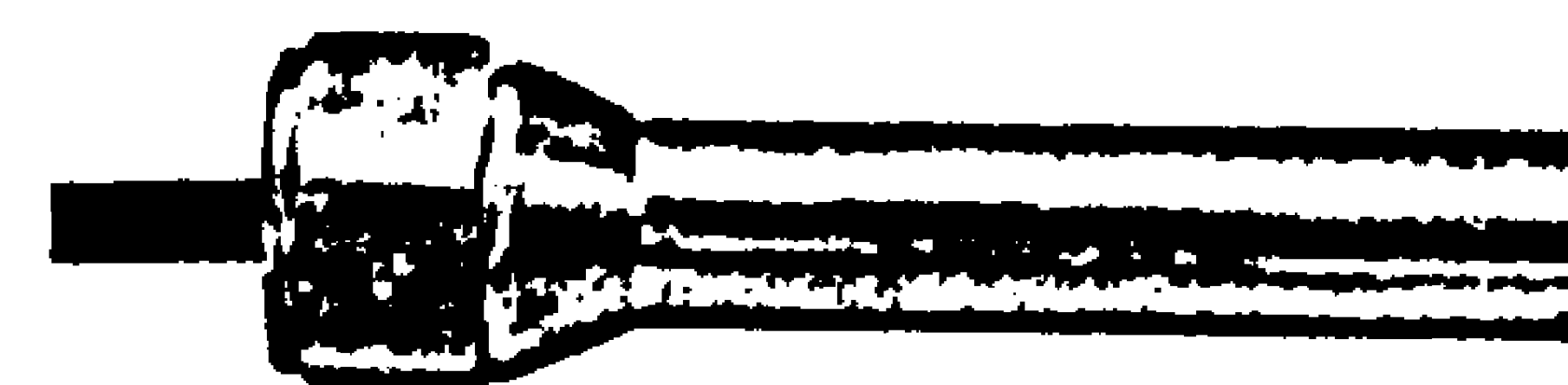


Model 713560
 1/2 NPT conduit outlet with 18" 3 conductor cable, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.



Model 713770
 1/2 NPT conduit outlet, 18" potted 3 wire leads, type 300 stainless steel housing with 1/2-18 NF x 2.813" threads with 2 lock nuts.

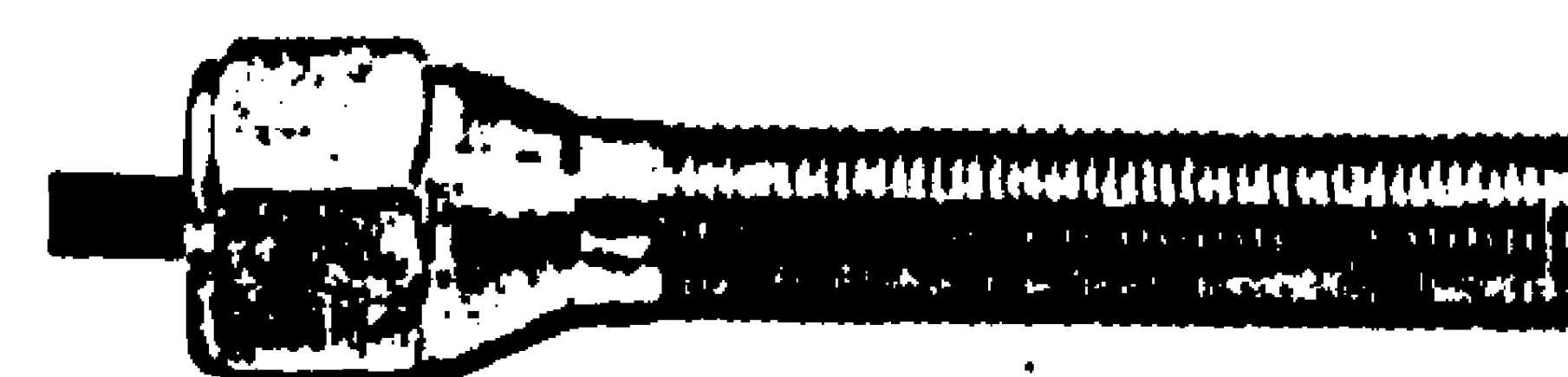
Hazardous Location approved models for Class I, Division 1, All Groups



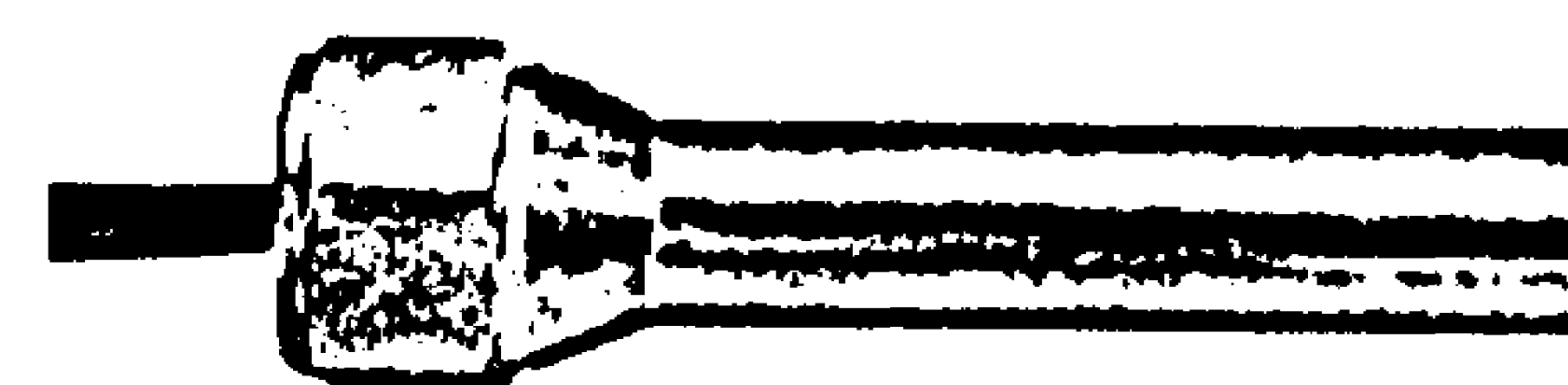
Model 713524
 1/2 NPT conduit outlet with 18" potted, 3 conductor cable, type 300 stainless steel housing, no threads.



Model 713564
 1/2 NPT conduit outlet with 18" potted, 3 conductor cable, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.



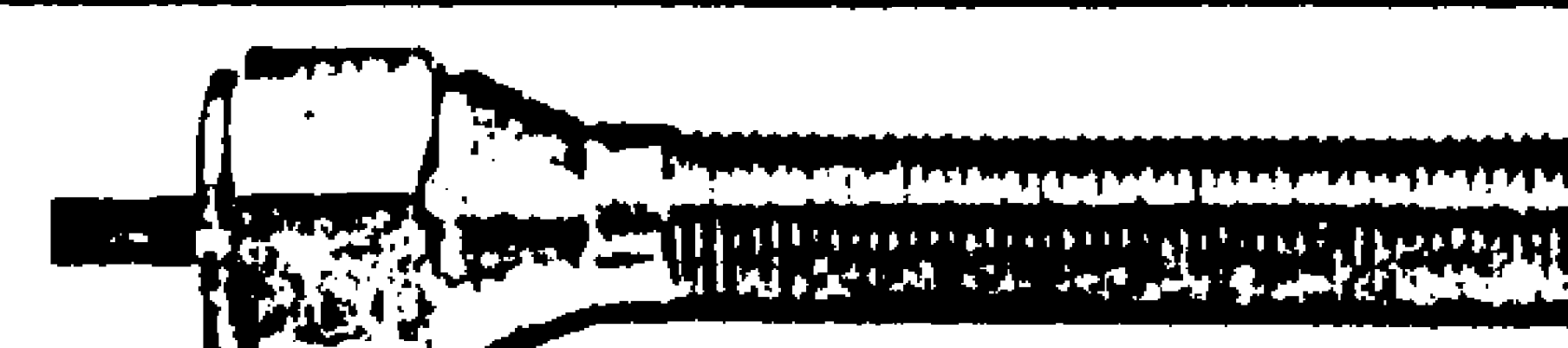
Model 713574
 1/2 NPT conduit outlet with 18" potted, 3 conductor cable, type 300 stainless steel housing with 1/2-18 NF x 2.813" threads with 2 lock nuts.



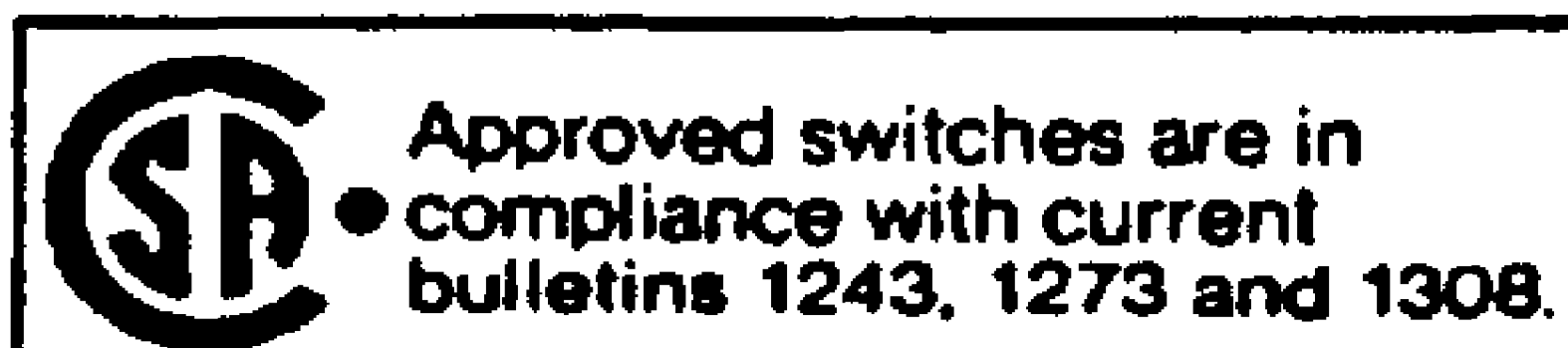
Model 713724
 1/2 NPT conduit outlet with 18" potted, 3 wire leads, type 300 stainless steel housing, no threads.



Model 713764
 1/2 NPT conduit outlet with 18" potted, 3 wire leads, type 300 stainless steel housing with 1/2-18 NF x 1.5" threads with 2 lock nuts.



Model 713774
 1/2 NPT conduit outlet with 18" potted, 3 wire leads, type 300 stainless steel housing with 1/2-18 NF x 2.813" threads.



These switches are U/L and CSA approved for industrial control, general purpose use. See hazardous location approved models in Column 3, this page.

VAB.0001098801

TOLERANCES Unless otherwise specified
 Angles: $\pm 1^\circ$, Fractions: $\pm 1/32"$, XX $\pm .01"$, XXX $\pm .005"$
 Surfaces must be Concentric, Parallel, Flat & Square
 (as applicable) to each other within T.I.R.

NO.	REVISION	DATE	BY	APPD.

MATERIAL LIST

Item	Qty.	Description	Dwg. No.
1	1	Switch Activator	V126411-1943
2	2	Mounting Bracket	V126411-1944
3	4	1/4-20 x 1/2 Hex Hd. Screw	
4	4	1/4 L.W.	
5	2	5/8 Shakeproof L.W.	
6	4	5/8 F.W. (1-5/16" O.D.)	

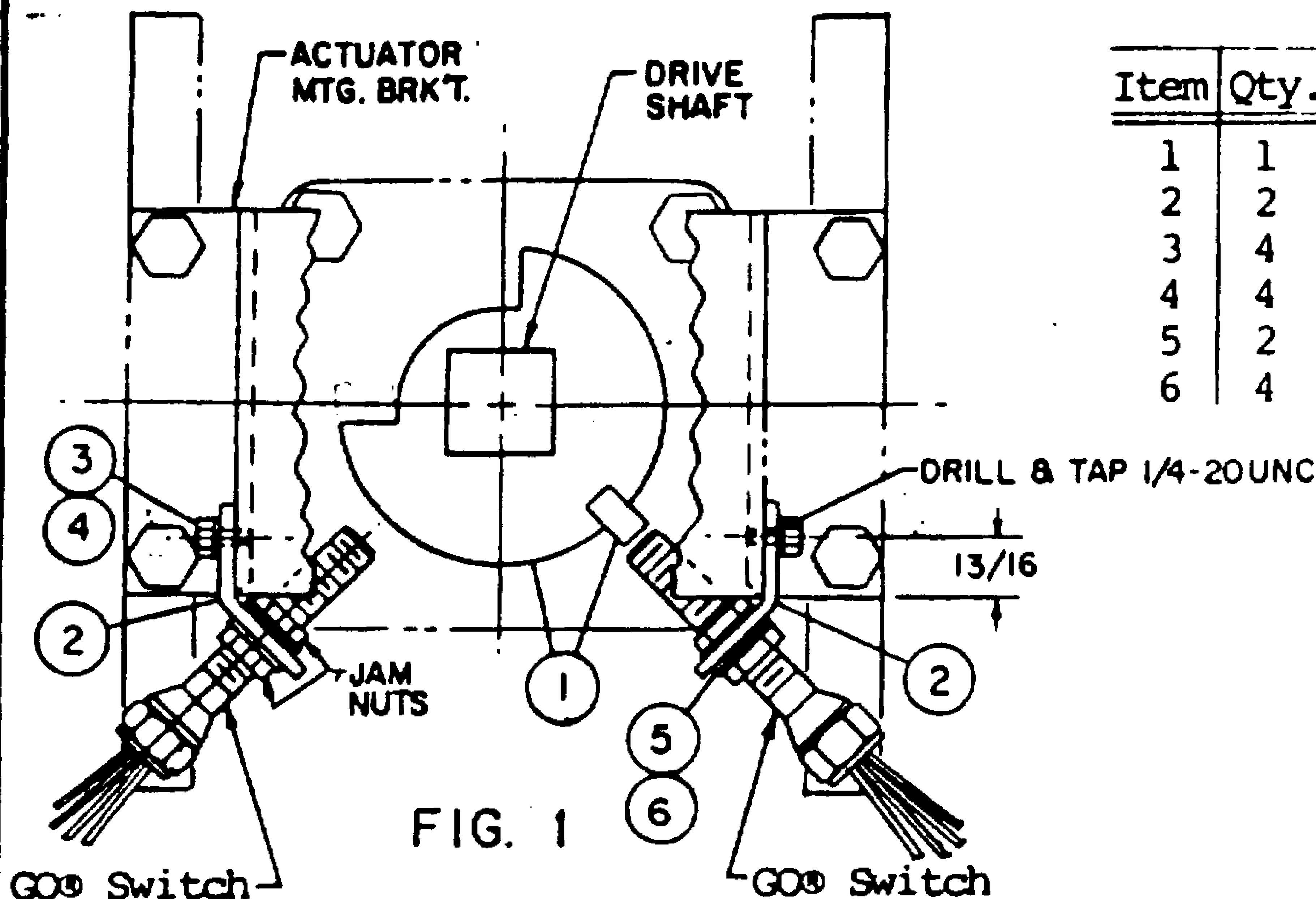


FIG. 1

INSTALLATION INSTRUCTIONS

1. Disassemble Actuator and Coupling from Valve and remove existing pointer.
2. Slide Switch Activator (item 1) onto drive shaft.
3. Drill and Tap Actuator Mtg. Brk't. for 1/4-20UNC screws and attach Mounting Bracket (item 2) with items 3 & 4.
4. Mount GOO Switches in Mounting Bracket (item 2) with two jam nuts supplied with switch and washers items 5 & 6.
5. Adjust Switches in slots on Mounting BRacket (item 2) to sense Switch Activator (item 1) in full open and full closed positions.

Note: 1. GOO Switches are not included in V.I.P. (Valve Indication Package) and should be ordered separately.
 2. Use Model 713774 GOO Switches.

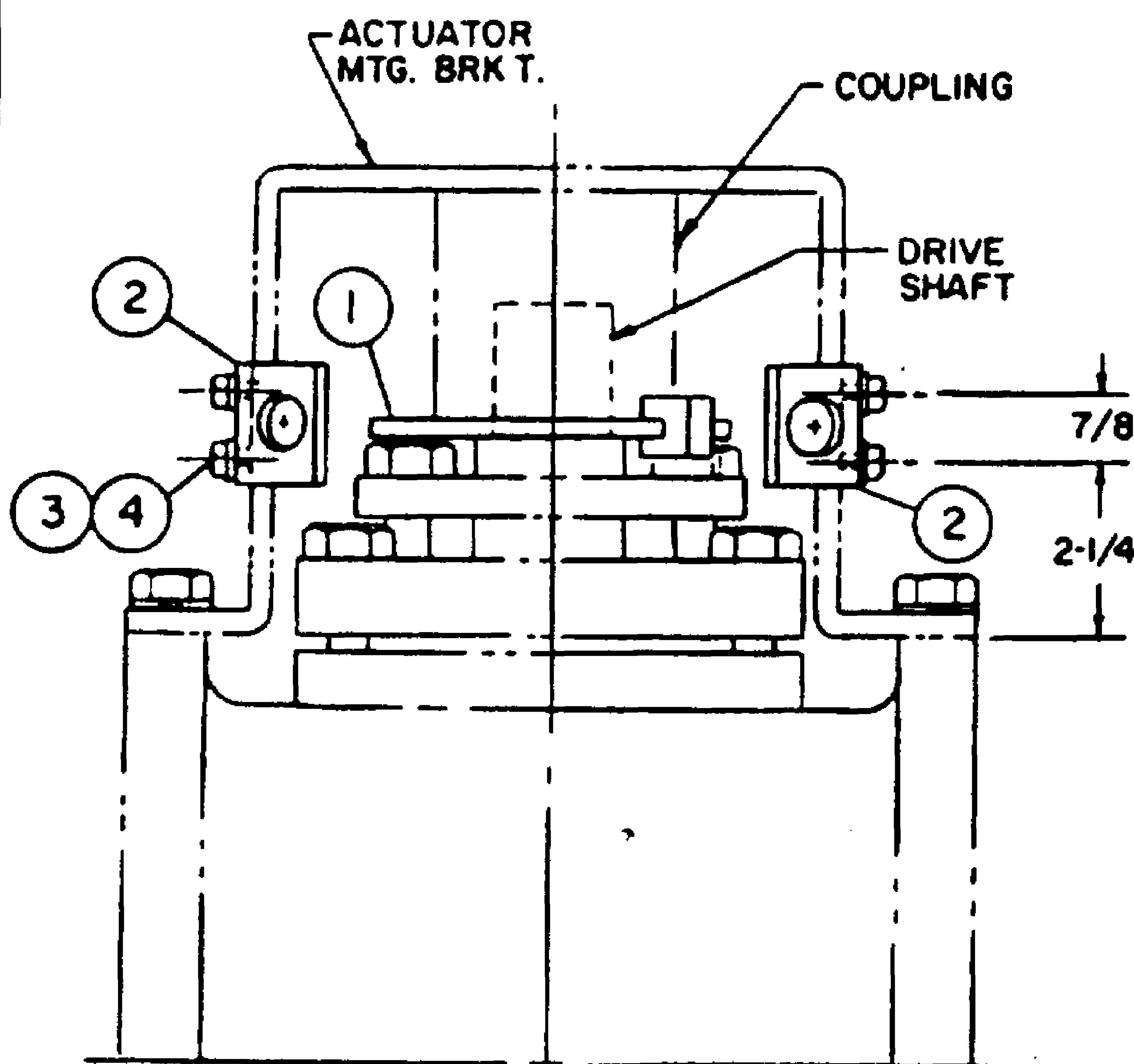


FIG. 2

Tag # 769 BVC

DWN. BY RON S.	DATE 9-28-83
CHK. BY	
APPD.	

70 SERIES GOO SWITCH V.I.P.
 ON DURCO 6" 150# G411 Valve
 WITH BETTIS ACTUATOR
 FOR CONOCO

GENERAL EQUIPMENT
 & MANUFACTURING CO., INC.
 3300 FERN VALLEY ROAD
 P.O. BOX 37280
 LOUISVILLE, KENTUCKY, USA, 40233
 (602) 888-2388, TWX 810-635-2786

GO.
SYSTEMS

DWG. NO.
 V126411-1942

REV.

NOTICE: Drawing contains confidential & proprietary material and is loaned upon condition that it will not be used in any way detrimental to the interest of

1098802

TOLERANCES Unless otherwise specified
 Angles: $\pm 1^\circ$, Fractions: $\pm 1/32"$, $.XX \pm .01"$, $.XXX \pm .005"$
 Surfaces must be Concentric, Parallel, Flat & Square
 (as applicable) to each other within T.I.R.

NO.	REVISION	DATE	BY	APPD.

MATERIAL LIST

Item	Qty.	Description	Dwg. No.
1	1	Switch Activator	V907310-1951
2	1	Mounting Bracket	V907310-1952
3	1	Set Screw #12-24 x 1/4	
4	4	1/4-20 x 1/2 Hex Hd. Screw	
5	4	1/4- L.W.	
6	2	5/8 Ext. Tooth L.W.	
7	2	5/8 F.W.	

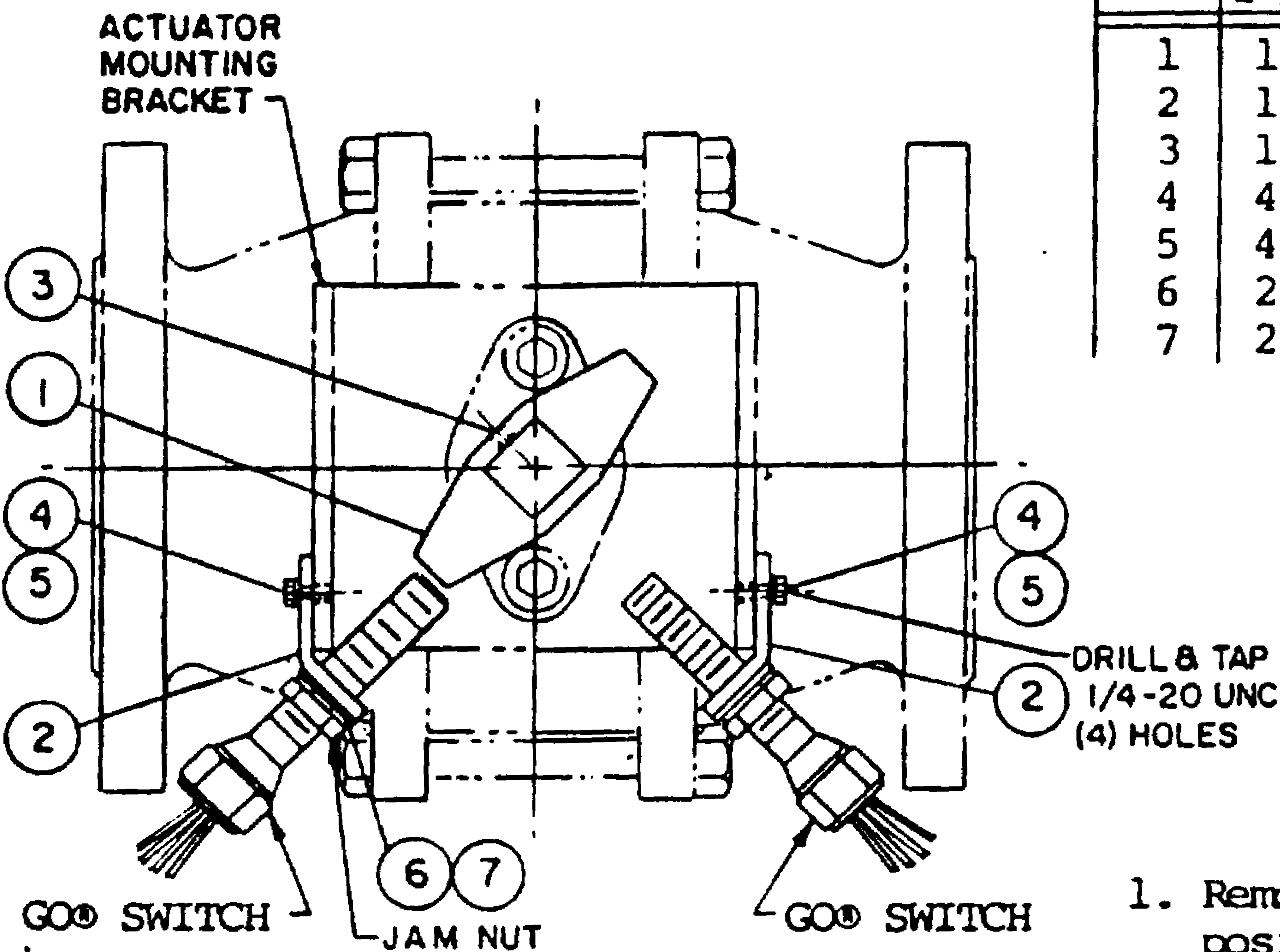


FIG. 1

INSTALLATION INSTRUCTIONS

1. Remove Actuator, Coupling and Existing position indication plate.
2. Slide Switch Activator (item 1) onto drive shaft and secure with set screw (item 3).
3. Assemble GOO Switches to Mounting Bracket (item 2) with Jam Nuts supplied with switches and washers items 6 & 7.
4. Place Switch mounted on bracket on sides of Actuator mounting bracket and align switch with Activator (item 1) then match drill Actuator mounting bracket with holes in Mounting Bracket (item 2). Secure with items 4 & 5.
5. Switches should sense Switch Activator when Valve is in full open and full closed positions.

NOTE: GOO Switches are not included in V.I.P. (Valve Indication Package) and should be ordered as a Separate item.

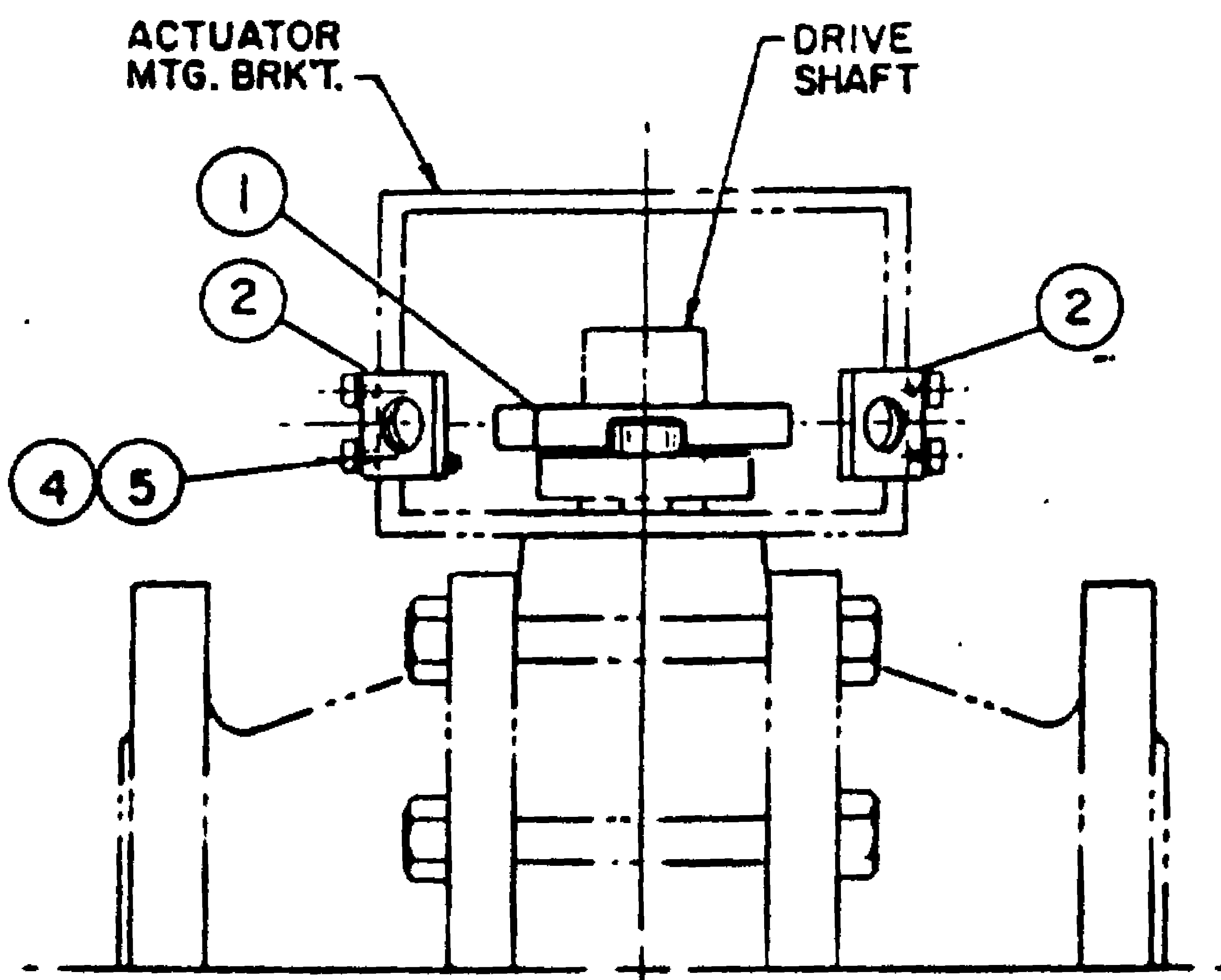


FIG. 2

DWN. BY RON S.	DATE 10-5-83
CHK. BY	
APPD.	

NOTICE: Drawing contains confidential & proprietary material and is furnished upon condition that it will not be used in any way detrimental to the interest of General Equipment & Mfg. Co., Inc.

70 SERIES GOO SWITCH V.I.P.
 ON
 W-K-M 310 BALL VALVE 4"
 FOR
 CONOCO

GENERAL EQUIPMENT
 & MANUFACTURING CO., INC.
 3300 FERN VALLEY ROAD
 P.O. BOX 37290
 LOUISVILLE, KENTUCKY, USA, 40233
 (502) 968-2388, TWX 810-638-2788

GO.
SYSTEMS

DWG. NO.
 V 907310-1950

REV.

1098803

Angles: $\pm 1^\circ$, Fractions: $\pm 1/32"$, $.XX \pm .01"$, $.XXX \pm .005"$
Surfaces must be Concentric, Parallel, Flat & Square
(as applicable) to each other within T.I.R.

NO	REVISION	DATE	BY	APPO.

MATERIAL LIST

Item	Qty.	Description	Dwg. No.
1	1	Switch Activator	V907310-1955
2	1	Mounting Bracket	V907310-1954
3	1	Set Screw #12-24 x 1/4	
4	4	1/4-20 x 1/2 Hex Hd. Screw	
5	4	1/4- L.W.	
6	2	5/8 Ext. Tooth L.W.	
7	2	5/8 F.W.	

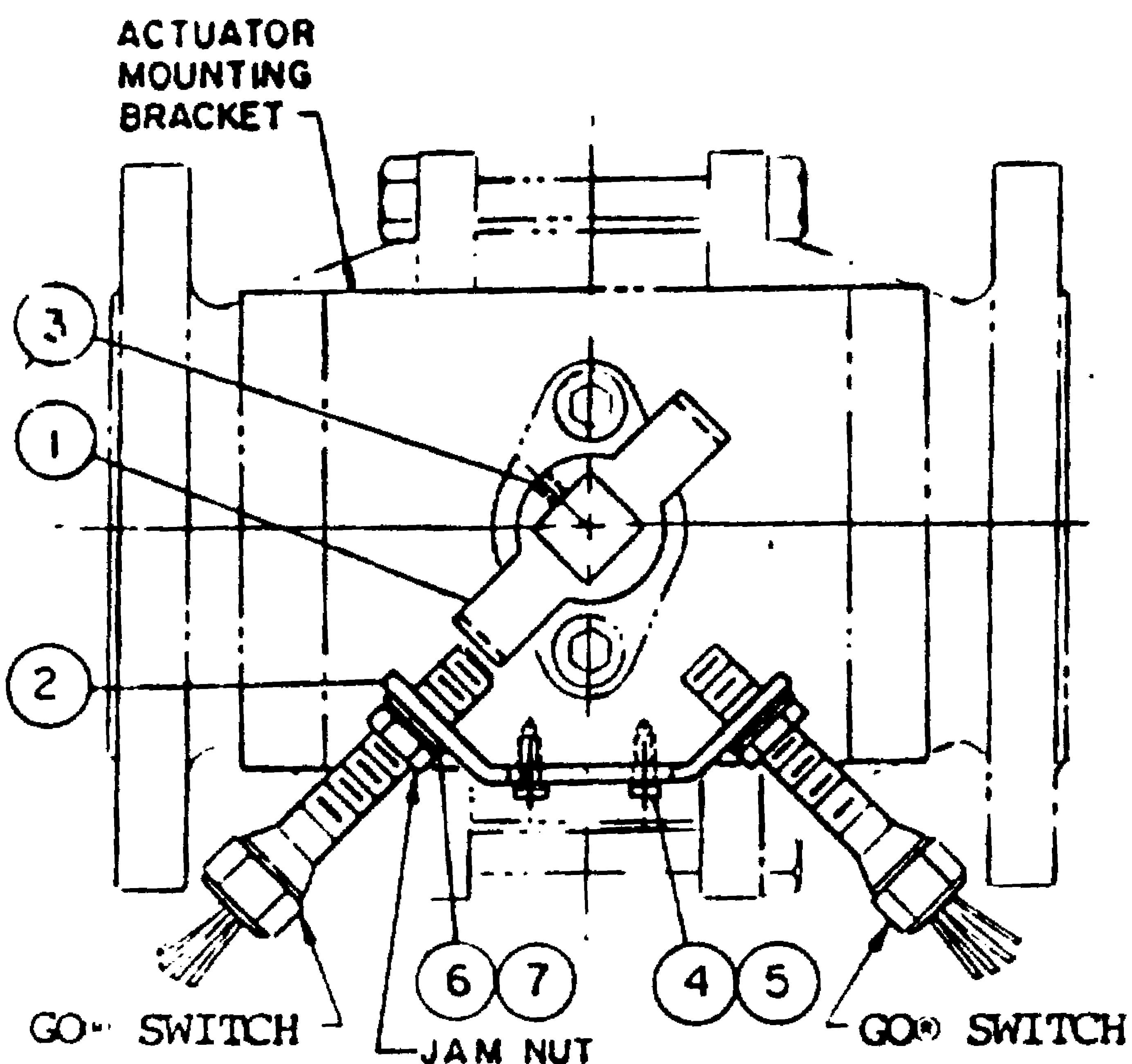


FIG. 1

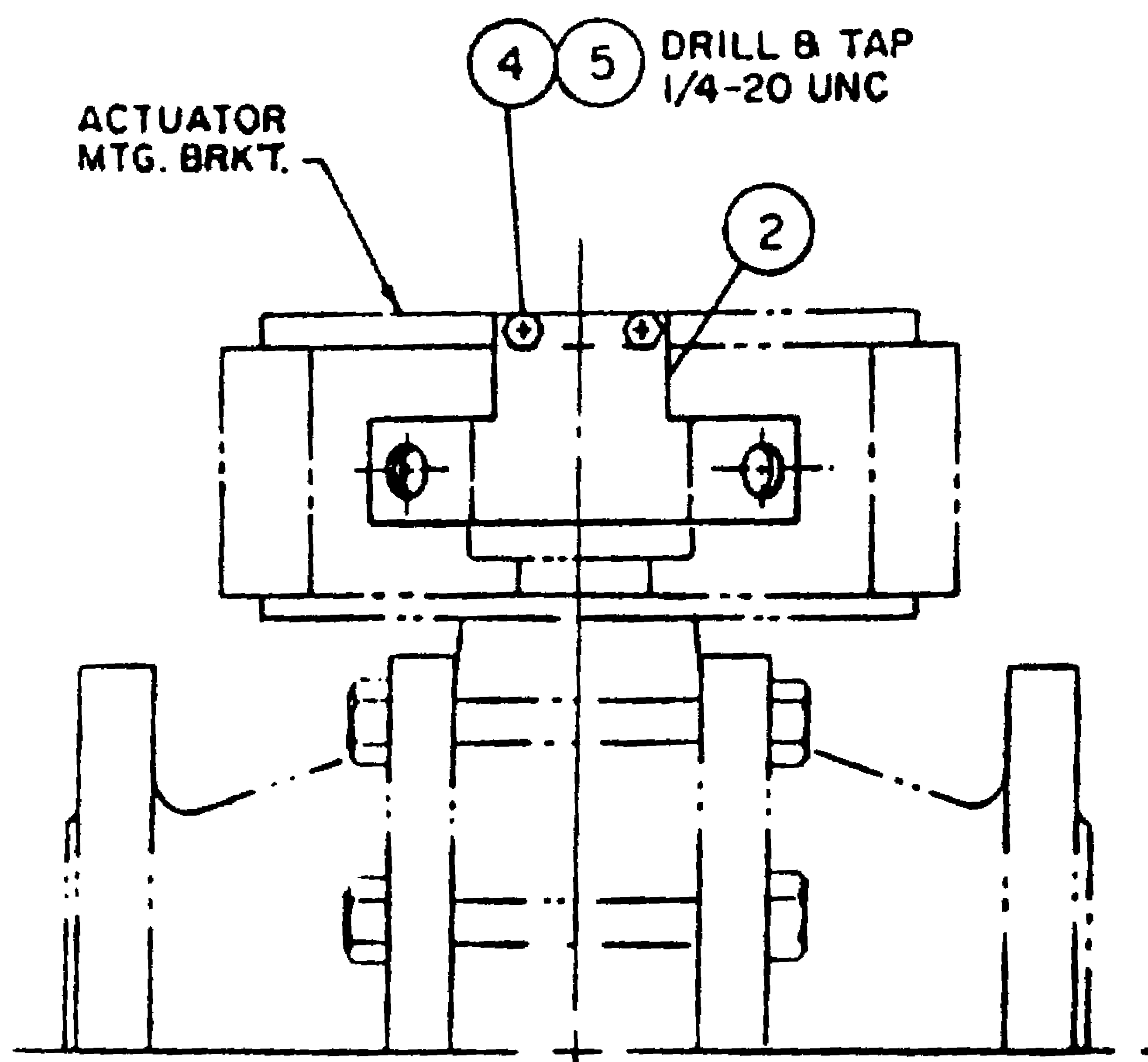


FIG. 2

INSTALLATION INSTRUCTIONS

1. Remove Actuator, Coupling and Existing position indication plate.
2. Slide Switch Activator (item 1) onto drive shaft and secure with set screw (item 3).
3. Place Mounting Bracket (item 2) onto Actuator Mtg. Brk't. and mark position of two holes. Drill and tap for 1/4-20 UNC holes. Secure Mounting Bracket (item 2) (item 2) with items 4 & 5.
4. Screw GO® Switches into Mounting Brk't. (item 2) till Gap between end of switch & Switch Activator (item 1) is approx. 1/16". Secure with Jam Nuts that are included with Switches and with washers (items 6 & 7).
5. Switches should sense Switch Activator when Valve is in full open and full closed positions.

NOTE: GO® Switches are not included in V.I.P. (Valve Indication Package) and should be ordered as a Separate item.

Tag # CV 754 & CV 760

OWN. BY RON S.	DATE 10-
CHK. BY	
APPO.	
NOTICE: Drawing contains confidential & proprietary material and is furnished upon condition that it will be used in any way detrimental to the interest of General Equipment & Mfg. Co., Inc.	

70 SERIES GO® SWITCH V.I.P.
ON
W-K-M 310 BALL VALVE 6"
FOR
CONOCO

GENERAL EQUIPMENT
& MANUFACTURING CO., INC.
3300 FERN VALLEY ROAD
P.O. BOX 37200
LOUISVILLE, KENTUCKY, USA, 40233
(502) 988-2386, TWX 810-636-2786

GO
SYSTEMS

DWG. NO.
V 907310-1953

REV.

VAB1001098804

TOLERANCES Unless otherwise specified
 Angles: $\pm 1^\circ$, Fractions: $\pm 1/32"$, XX $\pm .01"$, XXX $\pm .005"$
 Surfaces must be Concentric, Parallel, Flat & Square
 (as applicable) to each other within T.I.R.

NO.

REVISION

DATE

BY

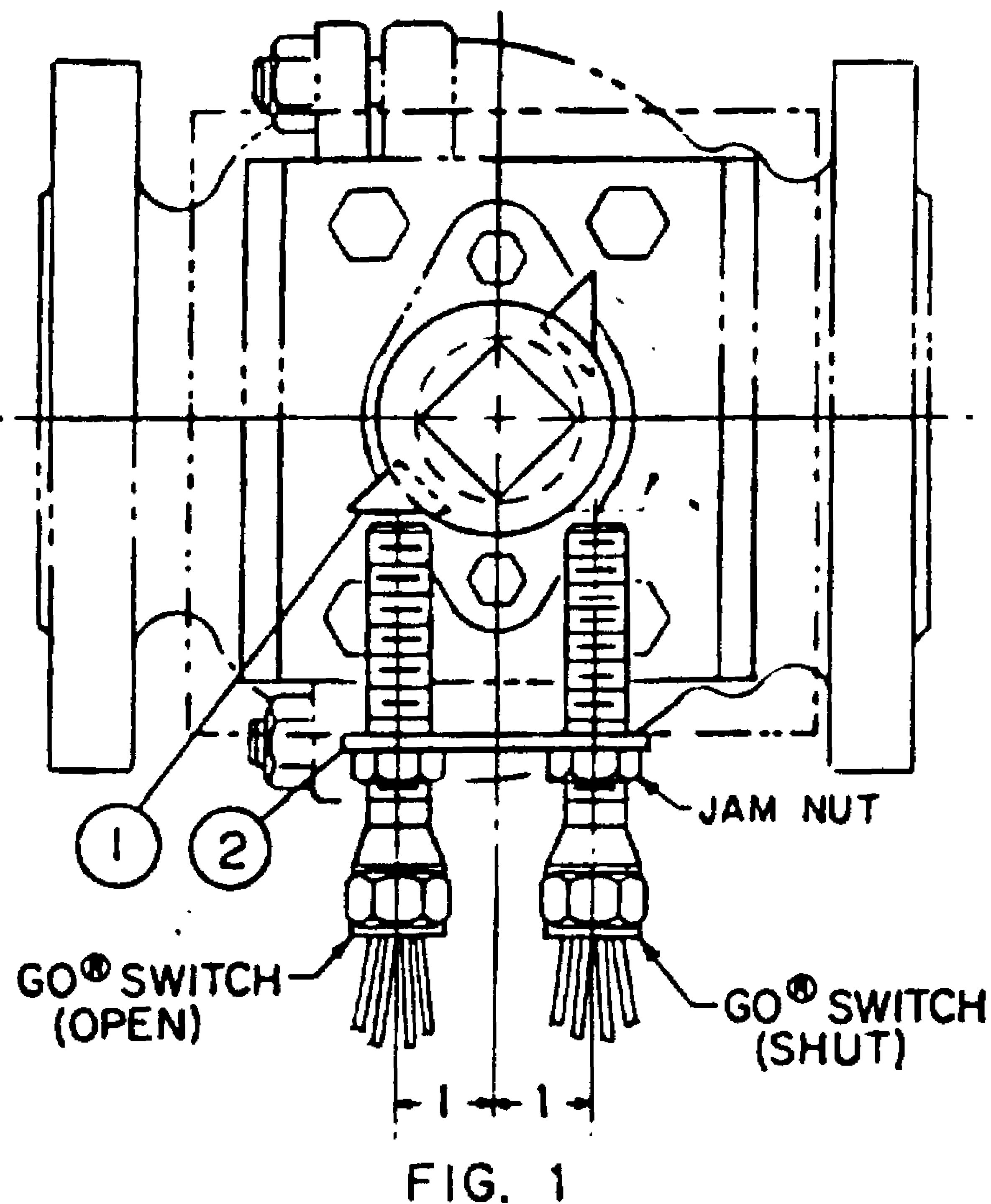
APPD.

MATERIAL LIST

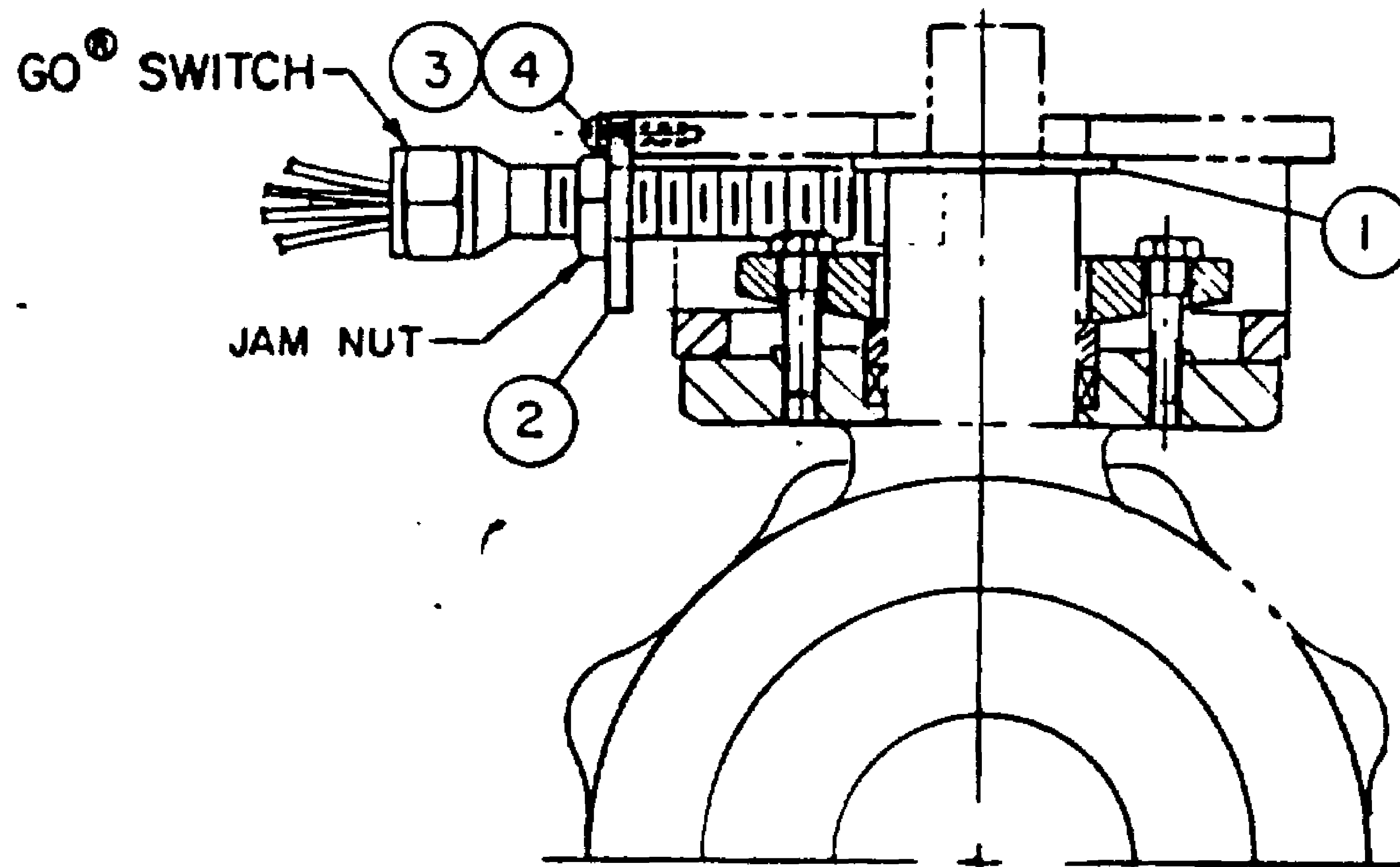
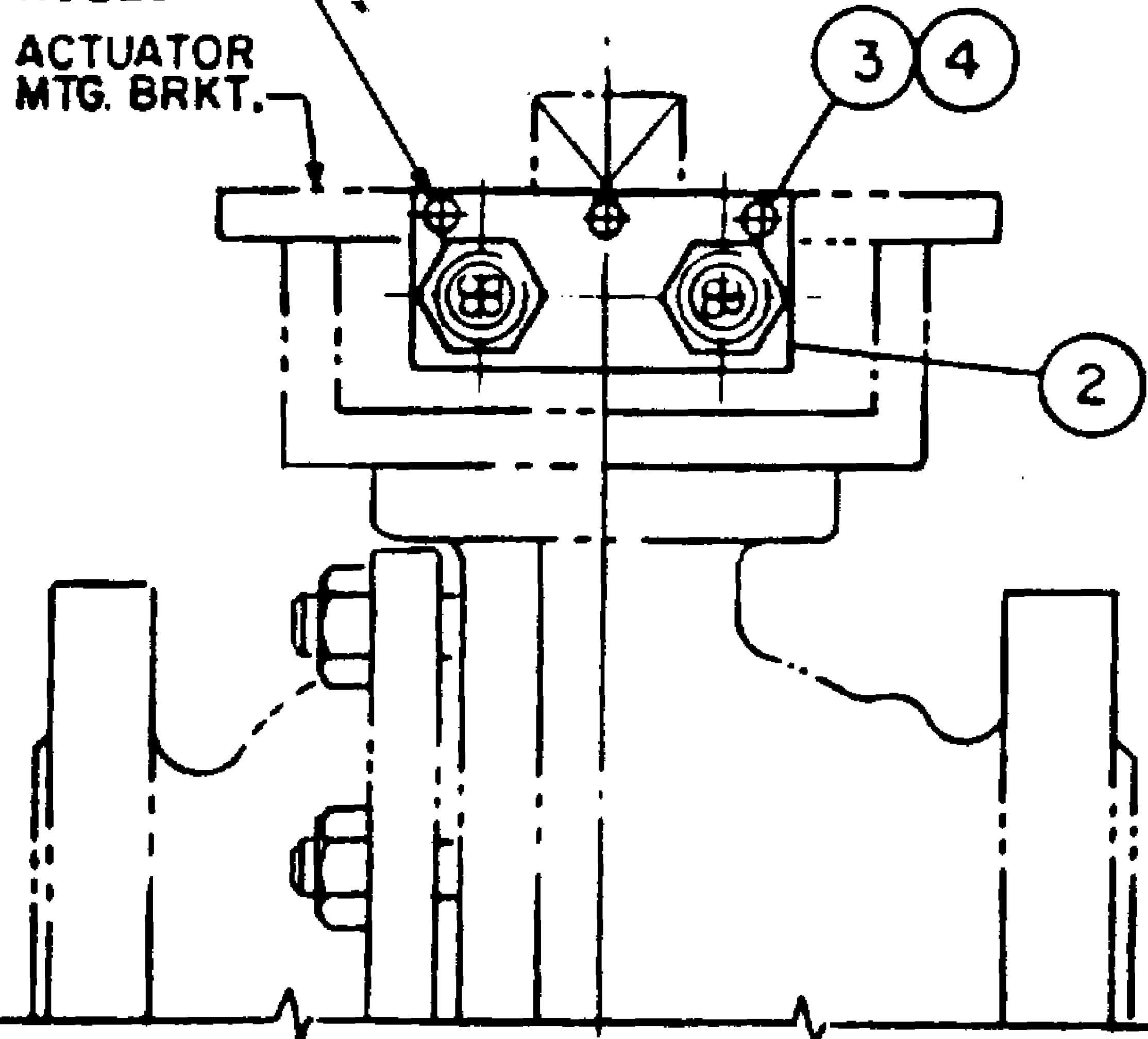
Item	Qty.	Description	Dwg. No.
1	1	Switch Activator	V402800-1948
2	1	Mounting plate	V402800-1949
3	3	#10-24 x 1/2 Rd. Hd. Screw	
4	3	#10 Ext. Tooth L.W.	

INSTALLATION INSTRUCTIONS

1. With Valve Actuator removed slide Switch Activator (item 1) onto drive shaft as shown in figure 1.
2. To Mount Mounting Bracket (item 2) match drill and tap for three #10-24 UNC screws and attach item 2 to Actuator mounting bracket with items 4 & 5.
3. Screw GO Switches into threaded holes on Mounting Bracket (item 2) and secure with jam nuts included with switches.
4. Adjust Switches to sense triangular bars on Switch Activator when Valve is in full open or full closed positions.



MATCH DRILL FOR THREE
 10-24 UNC-2B THREADED
 HOLES



DWN. BY
 RON S.

DATE
 10-3-83

CHK. BY

APPD.

NOTICE: Drawing contains
 confidential & proprietary material
 and is furnished upon condition
 that it will not be used in any way
 detrimental to the interest of
 General Equipment & Mfg. Co., Inc.

70 SERIES GO® SWITCH V.I.P.
 ON KTM 6" VALVE E0800
 WITH JAMESBURY ACTUATOR

FOR CONOCO

GENERAL EQUIPMENT
 & MANUFACTURING CO., INC.
 3300 FERN VALLEY ROAD
 P.O. BOX 37290
 LOUISVILLE, KENTUCKY, USA 40233
 (502) 968-2386, TWX 810-535-2786

GO.
SYSTEMS

DWG. NO.

V402800-1947

REV.

098805

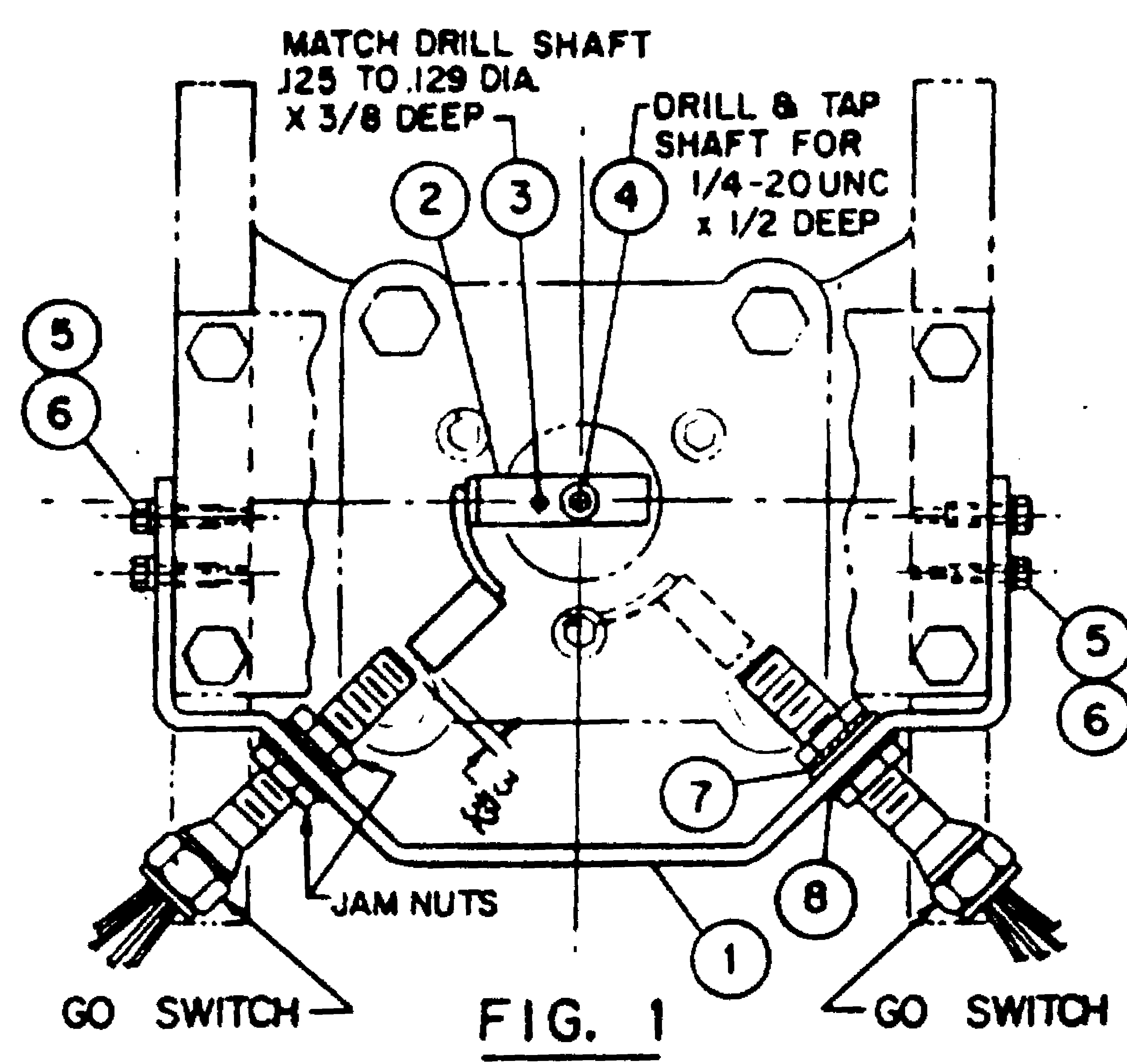
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TOLERANCES Unless otherwise specified
 Angles: $\pm 1^\circ$, Fractions: $\pm 1/32"$, .XX $\pm .01"$, .XXX $\pm .005"$
 Surfaces must be Concentric, Parallel, Flat & Square
 (as applicable) to each other within T.I.R.

NO.	REVISION	DATE	BY	APPD.

MATERIAL LIST

Item	Qty.	Description	Dwg. No.
1	1	Mounting Bracket	V782067-1935
2	1	Switch Activator	V782067-1936
3	1	Rollpin 1/8 x 1/2" long	
4	1	1/4-20 x 5/8 Flat Hd. Screw	
5	4	1/4-20 x 3/4 Hex Hd. Screw	
6	4	1/4 L.W.	
7	2	5/8 Ext. Tooth L.W.	
8	4	5/8 F.W. (1-5/16 O.D.)	



INSTALLATION INSTRUCTIONS

1. Remove Valve Actuator and Coupling from Valve.
2. Machine notch in coupling to 7/8" depth as indicated in view A-A.
3. Drill & tap top of shaft for 1/4-20UNC x 1/2" deep hole.
4. Place Switch Activator (item 2) on shaft and secure with flat head screw (item 4). Then orient Switch Activator as shown in figure 1. Match drill shaft with hole in Switch Activator and drive roll-pin (item 3) into hole to prevent rotation.
5. Fit Mounting Bracket (item 1) to sides of Actuator mounting plate support and mark location of four mounting holes, drill and tap four 1/4-20UNC x 9/16 dp. Then secure Mounting bracket (item 1) with items 5 & 6.
6. Insert GO Switches into slots on Mtg. Bracket (item 1) and secure with two jam nuts that come with switches and washers items 7 & 8.
7. Adjust Switches to sense Activator (item 2) in full open and full closed positions.

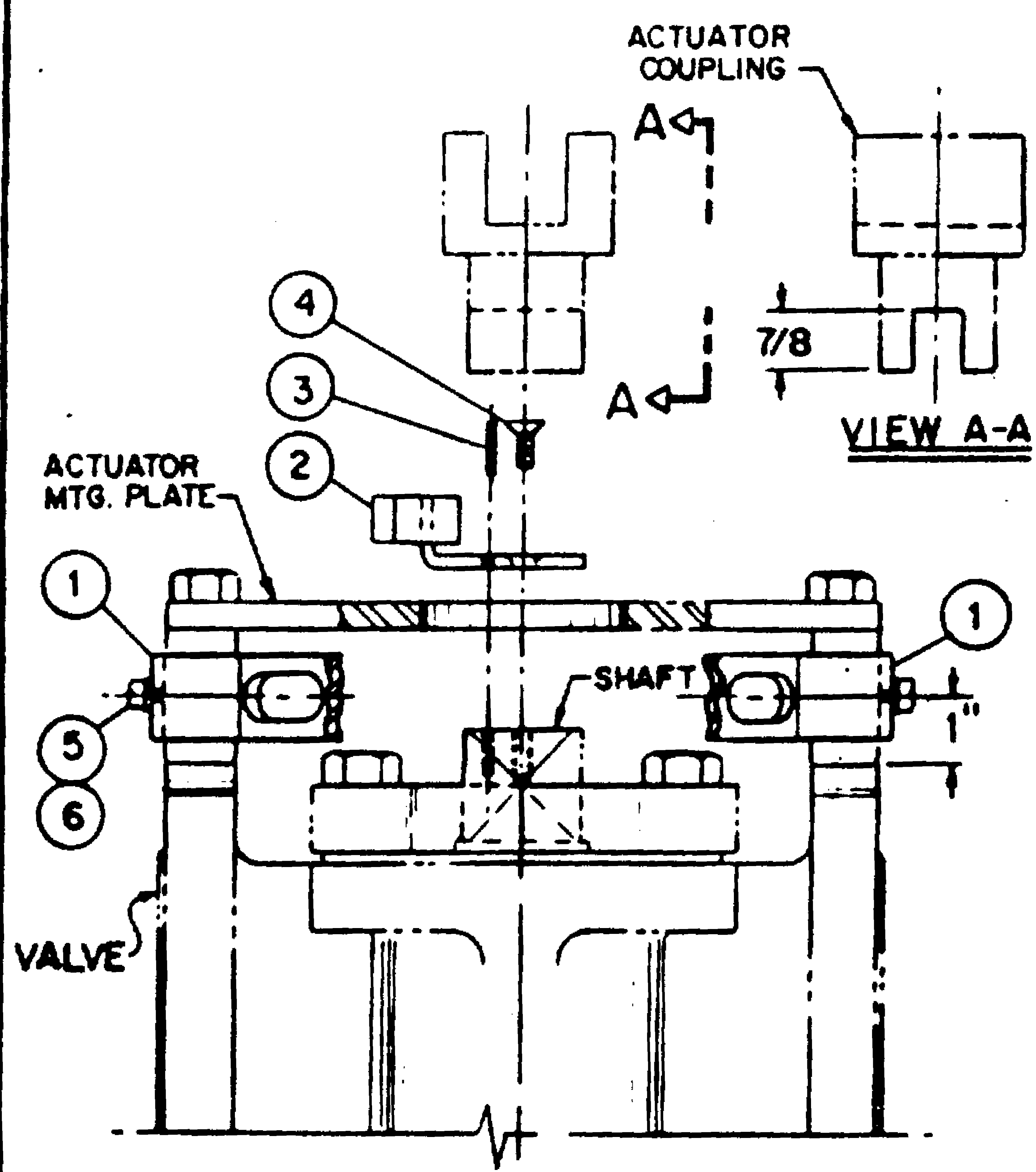


FIG. 2

DWN. BY RON S.	DATE 9-12-83
CHK. BY	
APPD.	

70 SERIES GO® SWITCH V.I.P.
 ON TUFLINE 067 6" PLUG VALVE
 VALVE SHAFT
 INDICATION

GENERAL EQUIPMENT
 & MANUFACTURING CO., INC.
 2800 FERN VALLEY ROAD
 P.O. BOX 37288
 LOUISVILLE, KENTUCKY, USA 40233
 (502) 585-6200, TWX 510-635-2700

GO
SYSTEMS

DWG. NO. V782067-1934	REV.
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