



Bulletin 840 Float Switch and Operator Assembly Instructions



ATTENTION: Disconnect all power before wiring float switch and motor. Secure cover before reconnecting power. Test float switch operator assembly manually before leaving the equipment unattended.

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Description - Bulletin 840 Float Switches provide automatic control for motors that pump liquids from a sump or tank. The contacts are rated for both motor and pilot duty. See Page 2 for contact ratings and wiring diagrams for each style of switch.

Tank Operation -When the liquid in a tank reaches a preset low level the float switch will start a pump to begin filling the tank. When the liquid level reaches a preset high level the float switch will stop the pump. The contacts will be open when the operating lever is in the up position. As the liquid level decreases, the operating lever will move downward causing the contacts to close. As the liquid level rises, the operating lever moves upward causing the contacts to open.

Sump Operation - Liquid is being collected in a sump. When full, the float switch starts a pump to empty the sump. When the liquid in the sump reaches a predetermined low level the float switch will turn the pump off.

Float Switches - Bulletin 840 Style A, B and C switches are supplied for tank operation, but can be easily converted to sump operation (see illustrations on this page). Style D switches are for tank operation only and Style DS switches are for sump operation only.

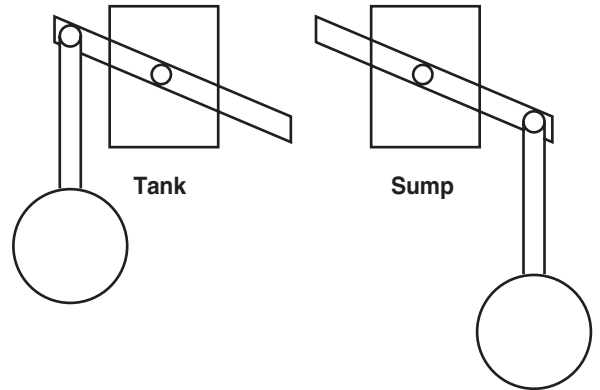
Installing the Switch for "Tank" Operation - When facing the lever, install the switch so that the float is positioned on the left side of the switch.

Tank to Sump Conversion - Style A switches can be changed from tank to sump operation by moving the float rod to the opposite end of the double arm lever.

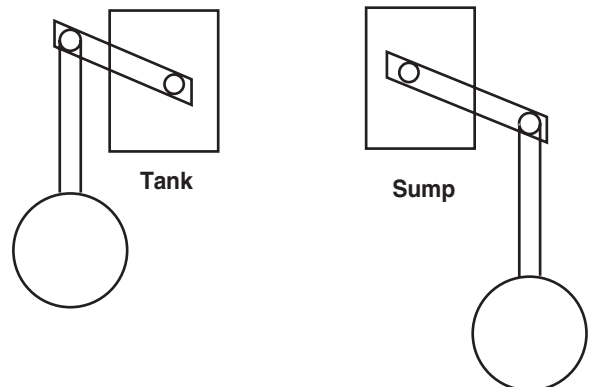
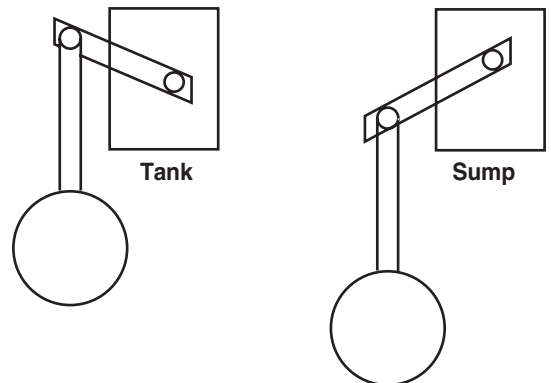
Style B and C switches can be converted in either of two ways:

- Remove the lever, turn the shaft 90 degrees counterclockwise and replace the lever in its original position; or
- Remove the lever and replace 180 degrees from the original position.

Style A Conversion



Style B and C Conversion





ATTENTION: Suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical amperes, 600 VAC maximum. Use fuses only!

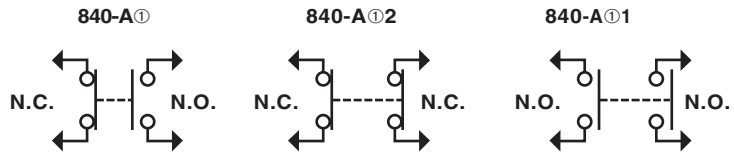
Style A

USE COPPER WIRE ONLY - Select a wire size that corresponds to the ampacity rating for either 60°C or 75°C wire.

Max. Pilot Ratings	
NEMA A600	600VAC
NEMA N300	250VDC

Max. HP Ratings		
Phase	Volts	HP
Single Phase	115	1
	230	1
DC	32	1/4
	115	1/4
	230	1/8

CONTACT ARRANGEMENTS FOR TWO WIRE DEVICE



① Catalog Number as listed does not include enclosure. To order switch with enclosure, add one of the following numbers "1" for NEMA Type 1, "4" for NEMA Type 4, "7" for NEMA Type 7 & 9.

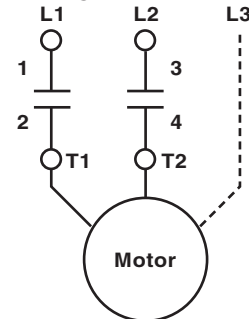
Style B

USE COPPER WIRE ONLY - Select a wire size that corresponds to the ampacity rating for either 60°C or 75°C wire.

Max. Pilot Ratings	
NEMA A600	600VAC
NEMA N300	250VDC

Max. HP Ratings		
Phase	Volts	HP
Single Phase	115	1 - 1/2
	230	3
2 or 3 Phase	230	2
	460 - 575	2
DC	115	1
	230	1

Single Phase Lines



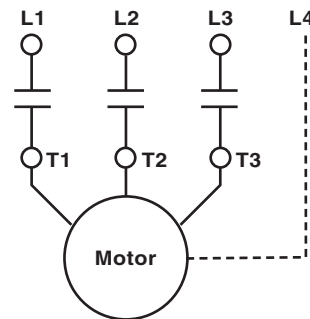
For 2 or 3 phase connect L3 direct.

Style C

USE COPPER WIRE ONLY - Select a wire size that corresponds to the ampacity rating for either 60°C or 75°C wire.

Max. HP Ratings		
Phase	Volts	HP
Single Phase	115	1 - 1/2
	230	3
2 or 3 Phase	115	3
	230 - 575	5
DC	115	2
	230	2

3 Phase Lines



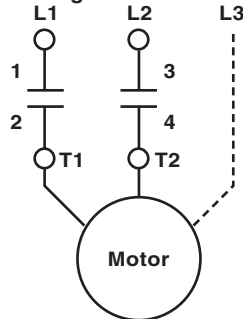
For single phase. L3 and T3 are not used.
For 2 phase 4 wire connect line 4 directly to motor.

Style D & DS

USE COPPER WIRE ONLY - Select a wire size that corresponds to the ampacity rating for either 60°C or 75°C wire.

Max. HP Ratings		
Phase	Volts	HP
Single Phase	115	1 - 1/2
	230	2
2 or 3 Phase	115	2
	230 - 575	3
DC	32	1/4
	115	1/2
	230	1/2

Single Phase Lines



For 2 or 3 phase connect L3 direct.



ATTENTION: For recommended torque values, refer to the table below.

Fastener Thread Size	Torque (lb-in ±25%)
#6-32	11
#8-32	20
#10-32	32
1/4-20	70

Automatic Float Switch Assemblies

Single Arm Lever Operator Assemblies

Table 1. Materials

Quantity	Material
2	3 foot Section of Rod
1	Roll Pin
1	Float
2	Adjustable Stop Collars
2	1/4-20 x 1/2 inch Set Screws
1	Pedestal (Floor Mounted Units Only)
1	Fixed Stop Collar (For Assembly Drawing "B" Only)
1	6-32 x 1 inch Screw (For Assembly Drawing "B" Only)
2	6-32 Brass Nut (For Assembly Drawing "B" Only)

Refer to Table 2 for the appropriate drawing of the operator assembly to be installed.

Table 2. Single Arm Lever Operator Assemblies

Mounting Style	Operator Assembly Catalog Number	For Use with Switch Style(s) Catalog Number(s)	Assembly Drawing (Page 7)
Base Mount	840-1AD	840-A1, 840-A4, 840-A7, 840-D1, 840-DS1	A
	840-1BCE	840-B1, 840-B4, 840-B7, 840-C1, 840-C4, 840-C7	B
Floor Mount	840-2A1	840-A1	A
	840-2A47	840-A4, 840-A7	A
	840-2BC1	840-B1, 840-C1	B
	840-2B47	840-B4, 840-B7	B
	840-2C47	840-C4, 840-C7	B

Mounting the Switch

1. Mount the switch in the desired area. Hardware for mounting the switch is not provided. For floor mount devices see instructions on this page.

Assembling the Rod (If more than 3 feet of rod is required.)

1. Mate the (2) 3-foot sections of rod together.
2. Align the holes in each end, insert roll pin using a pliers.

Attaching the Float to the Rod

(For operator assemblies similar to Drawing A.)

1. Turn the threaded end of the operating rod into the float until secure.

(For operator assemblies similar to Drawing B.)

1. Slide one adjustable stop collar onto the rod.
2. Attach the stop collars to the rod using the set screws.

Note: The positioning of the adjustable stop collars is dependent upon the level of the liquid to be monitored. The rod may need additional guides to stabilize vertical float movement. These guides are to be supplied by the user.

Floor Mount Operator Assemblies -

Mounting the Floor Pedestal

1. Mount the pedestal in the desired area. Hardware for mounting the pedestal is not provided.

Note: Recommended mounting hardware diameter is 3/8 inch. The length of the hardware depends upon the thickness of the mounting surface.

Mounting the Switch to the Pedestal -

Note: If using switch (Catalog Number 840-A1), remove the bracket from the switch enclosure before mounting the switch to the pedestal.

1. Remove the hardware from the top flange/bracket of the mounting pedestal.
2. Align the mounting holes of the switch enclosure with the holed slots in the top flange bracket of the pedestal.
3. Secure in place using the hardware provided.

Single Arm Lever , Separate Pulleys Operator Assemblies

Table 3. Materials

Quantity	Material
1	Float
2	Pulley Bracket Assemblies
1	Chain / Cable Assembly

Refer to Table 4 for the appropriate drawing of the operator assembly to be installed.

Table 4. Single Arm Lever, Separate Pulley Operator Assemblies

Mounting Style	Operator Assembly Catalog Number	For Use with Switch Style(s) Catalog Number(s)	Assembly Drawing (Page 7)
Base Mount	840-3AD	840-A1, 840-A4, 840-A7, 840-D1, 840-DS1	D
	840-3BCE	840-B1, 840-B4, 840-B7, 840-C1, 840-C4, 840-C7	D

Mounting the Switch

1. Mount the switch in the desired area. Mounting hardware is not provided.

Mounting the Pulley Brackets

1. Mount the bracket on the float side of the chain directly above the operating lever of the switch.
2. Mount the second pulley bracket away from the switch so the counterweight does not interfere with the operating lever on the switch.

Installing the Chain/Cable

Chain operated assemblies are provided with an eyebolt at one end of the chain which must be threaded into the float after final assembly. On cable operated assemblies, the eyebolt is welded to the float.

1. Remove the hardware and two stop collars from the float/eyebolt end of the chain/cable.

For Recommended Torque Values, Refer to Page 2.

Automatic Float Switch Assemblies

Single Arm Lever Operator Assemblies

2. Thread the chain/cable through the pulley brackets. Make sure the chain/cable rides smoothly over the pulleys.
3. Slide one stop collar onto the chain/cable through the operating lever.
4. Slide the second adjustable stop collar onto the chain/cable and secure in place. Note: The positioning of the adjustable stop collar is dependent upon the level of the liquid to be monitored.

Installing the Float

1. Thread the chain/cable through the eyebolt on the float.
2. Install hardware to attach the eyebolt to the chain/cable.

Double Arm Lever, Single Pulley Operator Assemblies

Table 5. Materials

Quantity	Material
1	Float
1	Pulley Assembly
1	Chain/Cable Assembly
1	Pedestal (Floor Mounted Units Only)

Refer to Table 6 for the appropriate drawing of the operator assembly to be installed.

Table 6. Double Arm Lever, Single Pulley Operator Assemblies

Mounting Style	Operator Assembly Catalog Number	For Use with Switch Style(s) Catalog Number(s)	Assembly Drawing (Page 7)
Base Mount	840-4A1	840-A1	E
	840-4A4	840-A4	G
Floor Mount	840-5A1	840-A1	E
	840-5A4	840-A4	G

Mounting the Pulley

For operator assemblies used with switch (Catalog Number 840-A1).

1. Remove and discard the filler screws, nut and lockwasher located on the back of the enclosure.
2. Remove the nut and lockwasher from the pulley pivot pin and insert the pivot pin through the enclosure.
3. Attach the pivot pin to the enclosure using the nut and lockwasher. When the pivot pin is in place spread the cotter pin to hold the pulley in position (see Drawing E).

For operator assemblies used with switch (Catalog Number 840-A4).

1. Remove the nut and lockwasher that holds the pulley to the mounting bracket.
2. Mount the bracket to the back of the enclosure using the hardware provided.
3. Reattach the pulley to the mounting bracket using the nut and lockwasher. When the pulley is in place spread the cotter pin to hold it in position (see Drawing G).

Mounting the Switch

1. Mount the switch in the desired area. Hardware for mounting the switch is not provided.

Installing the Chain/Cable Assembly

Chain operated assemblies are provided with an eyebolt at one end which must be threaded into the float after final assembly. On cable operated assemblies, the eyebolt is welded to the float.

1. Remove the hardware and one stop collar from the float/eyebolt end of the chain/cable.
2. Thread the chain/cable over the pulley. Make sure the chain/cable rides smoothly over the pulley.
3. Thread the chain/cable through "both" ends of the operating lever.
4. Slide the adjustable stop collar onto the chain/cable and secure in place.

Note: The positioning of the stop collar is dependent upon the level of the liquid to be monitored.

Installing the Float

1. Thread the chain/cable through the eyebolt on the float.
2. Install hardware to attach the eyebolt to the chain/cable.

Floor Mount Operator Assemblies

Refer to "Floor Mount Operator Assemblies" information on Page 3.

Double Arm Lever, Double Pulley Operator Assemblies

Table 7. Materials

Quantity	Material
1	Float
1	Double Pulley Assembly
1	Chain/Cable Assembly
1	Pedestal (Floor Mounted Units Only)

Refer to Table 8 for the appropriate drawing of the operator assembly to be installed.

Table 8. Double Arm Lever, Double Pulley Operator Assemblies

Mounting Style	Operator Assembly Catalog Number	For Use with Switch Style(s) Catalog Number(s)	Assembly Drawing (Page 8)
Base Mount	840-4A47	840-A7	I
	840-4BC1	840-B1, 840-C1	J
	840-4B4	840-B4	K
	840-4C4	840-C4	I
Floor Mount	840-4BC47	840-B7, 840-C7	I
	840-5A47	840-A7	I
	840-5BC1	840-B1, 840-C1	J
	840-5B4	840-B4	K
Floor Mount	840-5B47	840-B7	I
	840-5C47	840-C4, 840-C7	I

For Recommended Torque Values, Refer to Page 2.

Automatic Float Switch Assemblies

Mounting the Double Pulley Assembly

1. Remove the filler screws or plugs from the back or top of the enclosure.
2. Mount the double pulley assembly bracket to the enclosure using the hardware provided

Mounting the Half-Lever Extension

(Operator assemblies used with switches that have Catalog Numbers **840-B1**, **840-B4** and **840-C1** are provided with a half-lever extension.)

- 1 Remove the screws that hold the operator lever to the switch enclosure.
- 2 Align the holes of the extension lever with the holes of the switch enclosure.
3. Fasten the levers to the enclosure using the hardware provided.

Mounting the Switch

1. Mount the switch in the desired area. Hardware for mounting the switch is not provided.

Installing the Chain/Cable

Chain operated assemblies have an eyebolt on one end of the chain which must be threaded into the float after final assembly. On cable operated assemblies the eyebolt is welded to the float.

1. Remove the hardware and one stop collar from the float/eyebolt end of the chain/cable.
2. Thread the chain/cable through "both" ends of the operating lever. Make sure the cable rides smoothly over the two pulleys.

Note: For operator assemblies with the half-lever extension the chain cable is threaded through one side of the operating lever.

Installing the Float

1. Slide the adjustable stop collar onto the chain/cable.

Note: The positioning of the adjustable stop collar is dependent upon the level of the liquid to be monitored.

2. Thread the chain/cable through the eyebolt on the float.
- 3 Install the hardware to secure the float to the chain/cable.

Floor Mount Operator Assemblies

Refer to "Floor Mount Operator Assemblies" information on Page 3.

For Recommended Torque Values, Refer to Page 2.

Double Arm Lever Operator Assemblies -

Table 9. Materials

Quantity	Material
2	3 foot Section of Rod
1	Roll Pin
1	Float
3	Adjustable Stop Collars
3	1/4-20 x 1/2 inch Set Screw
1	Fixed Stop Collar
1	6-32 x 1 inch Screw
2	6-32 Brass Nut
1	Counterweight ①
1	Counterweight Rod Assembly
1	Pedestal (Floor Mounted Units Only)

① Operator assemblies with rod lengths of greater than 6 feet may require additional counterweights

Refer to Table 10 for the appropriate drawing of the operator assembly to be installed

Table 10. Double Arm Lever Operator Assemblies

Mounting Style	Operator Assembly Catalog Number	For Use with Switch Style(s) Catalog Number(s)	Assembly Drawing (Page 8)
Base Mount	840-6A1	840-A1, 840-A4	M
	840-6A4	840-A7	N
	840-6BCE	840-B1, 840-B4, 840-C1	O
	840-6BCE47	840-B1, 840-B4, 840-C7	N
Floor Mount	840-7A1	840-A1, 840-A4	M
	840-7A47	840-A7	N
	840-7BC1	840-B1, 840-B4, 840-C1	O
	840-7B47	840-B7	N
	840-7C47	840-C4, 840-C7	N

Mounting the Operator Assembly to the Switch

Operator assemblies (Catalog Numbers **840-6BCE** and **840-7BC1**) are provided with an operating extension attached to the counterweight assembly (see Drawing O).

1. Remove and discard the screws that hold the operating lever to the back of the switch.
2. Align the holes of the operating lever extension with the holes of the switch lever.
3. Secure to the switch enclosure using the hardware provided.

For all other operator assemblies.

1. Remove the mounting hardware from the end of the counterweight assembly.
2. Insert the counterweight rod through the operating lever of the switch.
3. Secure in place using the hardware provided.

Mounting the Switch

1. Mount the switch in the desired area. Hardware for mounting the switch is not provided.

Automatic Float Switch Assemblies

Assembling the Rod and Float

1. If more than 3-feet of rod is required, mate two sections of rod together.
2. Align the holes in each end of the rod and insert the roll pin using a pliers.
3. Slide the adjustable stop collar onto the rod.

Note: Positioning of the adjustable stop collar is dependent upon the level of liquid to be monitored

4. Slide the rod through the float and install the fixed stop collar to the end of the rod using hardware provided

Installing the Rod and Float Assembly

1. Attach the rod to the operating lever using two adjustable stop collars - one for each side of the lever.
2. Use the set screws to attach the stop collars to the rod.

Note: The positioning of the adjustable stop collars is dependent upon the level of the liquid to be monitored. The rod may need additional guides to stabilize vertical float movement. These guides are to be supplied by the user.

Floor Mount Operator Assemblies Refer to "Floor Mount Operator Assemblies" information on Page 3.

Double Parallel Arm Operator Assemblies -

Table 11. Materials

Quantity	Material
2	3 foot Section of Rod
1	Roll Pin
1	Float
1	Adjustable Stop Collars
1	1/4-20 x 1/2 inch Set Screw
1	Fixed Stop Collar
1	6-32 x 1 inch Screw
2	6-32 Brass Nut
1	Counterweight ①
1	Double Arm Lever / Counterweight Assembly
1	Pedestal (Floor Mounted Units Only)

① Operator assemblies with rod lengths of greater than 6-feet may require additional counterweights.

Refer to Table 12 for the appropriate drawing of the operator assembly to be installed.

Table 12. Double Parallel Arm Operator Assemblies

Mounting Style	Operator Assembly Catalog Number	For Use with Switch Style(s) Catalog Number(s)	Assembly Drawing (Page 8)
Base Mount	840-8A1	840-A1	P
	840-8A4	840-A4	Q
	840-8A47	840-A7	R
	840-8B1	840-B1	S
	840-8B4	840-B4	S
	840-8B47	840-B7	R
	840-8C1	840-C1	T
	840-8C47	840-C4, 840-C7	R
Floor Mount	840-9A1	840-A1	P
	840-9A4	840-A4	Q
	840-9A47	840-A7	R
	840-9B1	840-B1	S
	840-9B4	840-B4	S
	840-9B47	840-B7	R
	840-9C1	840-C1	T
	840-9C47	840-C4, 840-C7	R

For operator assemblies supplied with TWO parallel arm levers.

1. Remove the switch lever from the switch enclosure.
2. Mount the upper arm lever of the operator assembly to the enclosure.

Note: The upper arm lever will either mount directly to the back of the enclosure or a bracket will be provided. Filler screws or plugs may have to be removed from the back or top of the enclosure before the top lever bracket can be mounted into position. Mounting hardware is supplied with the assembly.

3. Mount the lower arm lever to the enclosure in the same position the original switch lever was mounted.

For operator assemblies supplied with ONE arm lever, use the operating lever on the switch enclosure as the lower arm lever.

1. Remove the filler screws from the top of the enclosure.
2. Mount the upper lever bracket to the switch enclosure using the hardware provided.
3. Secure the guide rod to the lower lever using the hardware provided on the guide rod.

Mounting the Switch

1. Mount the switch in the desired area. Mounting hardware is not provided. Instructions for "Floor Mount Operator Assemblies" are listed on Page 3.

Automatic Float Switch Assemblies

Assembling the Rod and Float

1. If more than 3-feet of rod is required mate the two 3-foot sections of operating rod together.
2. Align the holes in each end of the rod and insert the roll pin using a pliers.
3. Slide the adjustable stop collar onto the rod.

Note. Positioning of the adjustable stop collar is dependent upon the level of liquid to be monitored.

4. Slide the rod through the float and install the fixed stop collar to the end of the rod using the hardware provided.

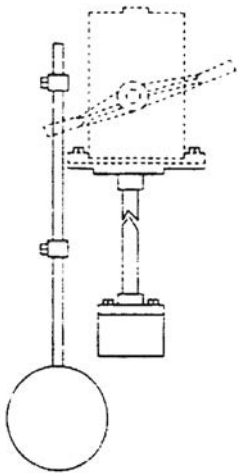
Installing the Rod and Float Assembly

1. Insert the operating rod through the ring clamps on the guide rod.
2. Secure the rod in place using the ring clamp set screws.

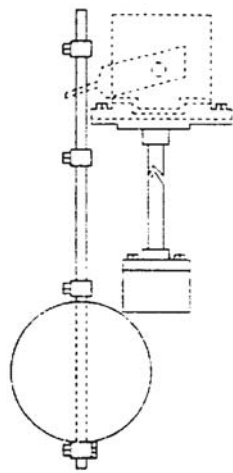
Floor Mount Operator Assemblies

Refer to "Floor Mount Operator Assemblies" information on Page 3.

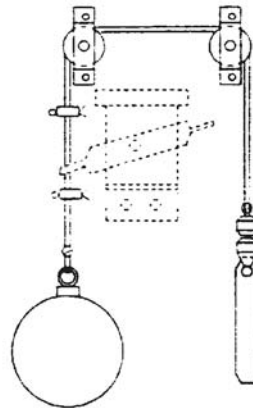
Assembly Drawings



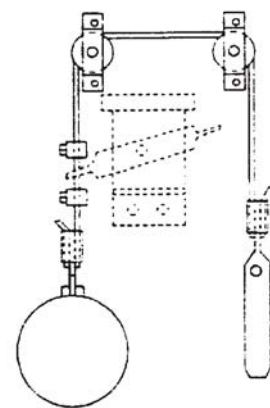
Drawing A



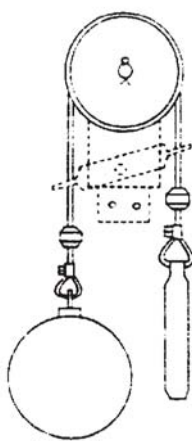
Drawing B



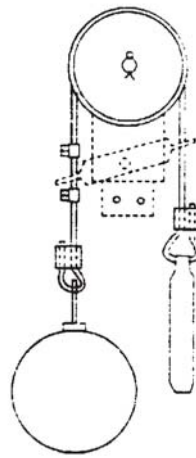
Drawing C



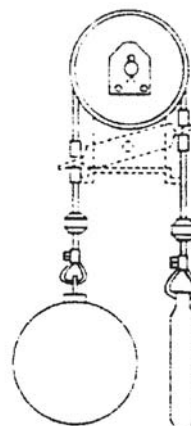
Drawing D



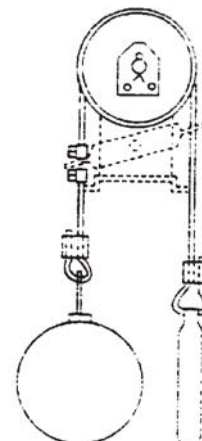
Drawing E



Drawing F



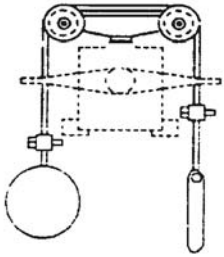
Drawing G



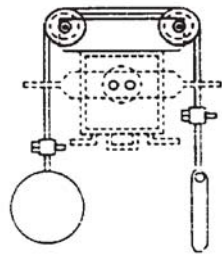
Drawing H

For Recommended Torque Values, Refer to Page 2.

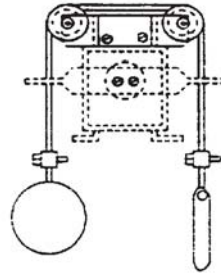
Assembly Drawings



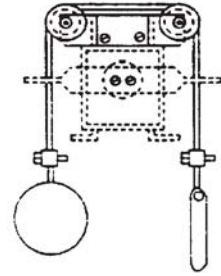
Drawing I



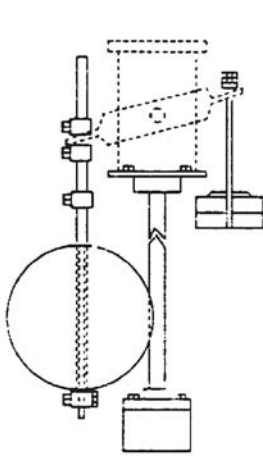
Drawing J



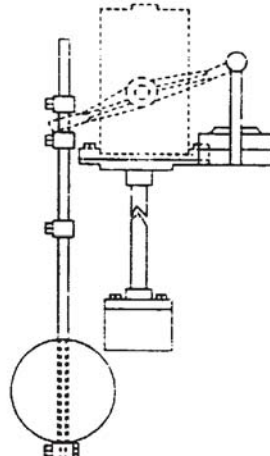
Drawing K



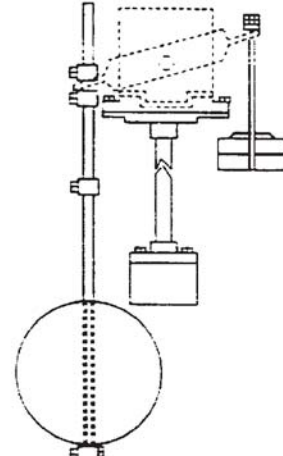
Drawing L



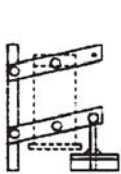
Drawing M



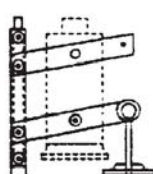
Drawing N



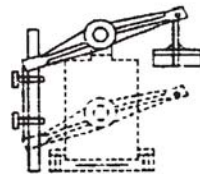
Drawing O



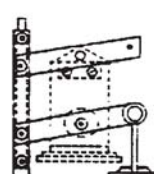
Drawing P



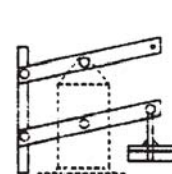
Drawing Q



Drawing R



Drawing S



Drawing T