



*Direct Reading
Tank Level Indicator*

**Installation and
Adjustment Manual**

General

All Models consist basically of two main components, the Indicator Head and the Tank Assembly with float and float arm. The mechanical direct reading gauge to which these instructions apply are suitable for installation on tanks containing light oils and other liquids where such tanks are vented to atmosphere or under pressure not exceeding 15 pounds per square inch.

This Direct Reading Gauge was manufactured and calibrated at the factory for a specific tank diameter and stand pipe dimension furnished by the customer and therefore should not require additional adjustment. However, due to variations in tanks and installation factors, minor adjustments may be necessary to fine tune the indicator.

Two adjustments are provided at the gauge head for this purpose. One, the stroke lever adjustment controls the amount of pointer travel. Two, the push rod adjustment controls the pointer position.

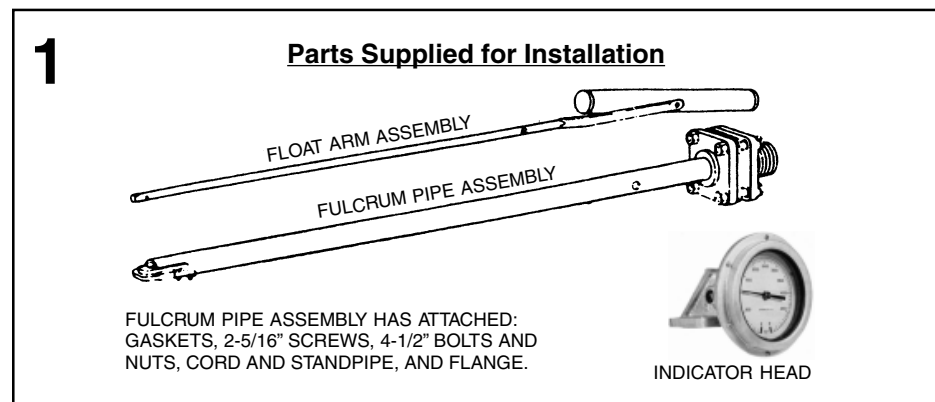
CAUTION: Both of these adjustments are extremely sensitive. As little as 1/4 turn results in considerable pointer position change. When making adjustments, be sure to tighten adjustment block locking nuts before moving the float to check the results of your adjustment.

DO NOT DISTURB THE POSITION OF BACK LOCKNUTS ON THE STROKE LEVER AS THIS IS YOUR PRESET CALIBRATION.

The gauge is mechanically simple. The float rides on the liquid supporting the free end of the float arm the opposite end of which is connected to the fulcrum pipe and push rod. The float arm pivot point should be located at the horizontal center line of the tank. The push rod is moved up and down by the float action. At the gauge end of the fulcrum pipe, the push rod is coupled to a stroke lever which is an integral part of a bellows seal/sector gear assembly that transmits this up and down push rod movement through the sector gear to the pinion shaft and pointer.

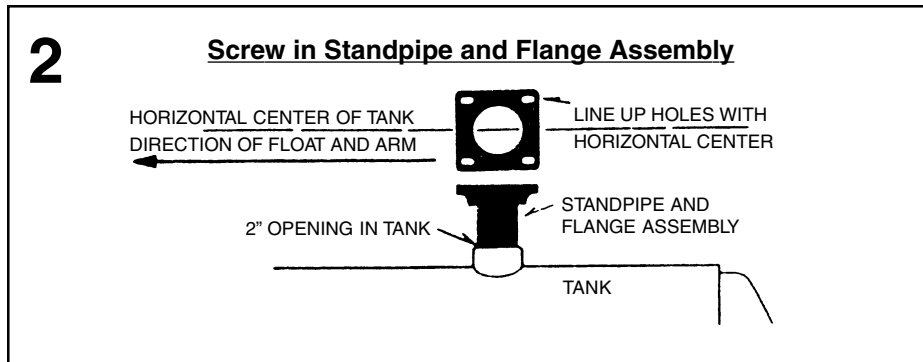
Installation & Adjustment

1. The *standpipe*, *fulcrum pipe* and *float arm* assemblies are made to suit dimensions furnished by the customer. Do not change their length or install on a tank of different depth than for which the gauge was ordered.

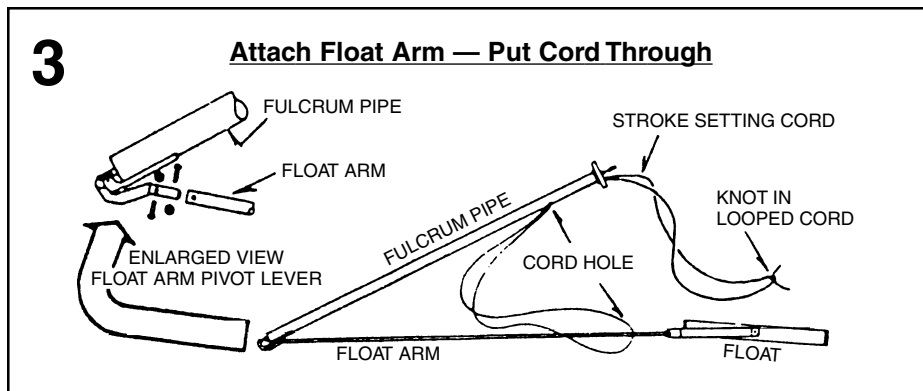


Direct Reading Tank Level Indicator

2. Niagara Direct Reading Gauges require a two inch tank opening. When attaching the standpipe and flange assembly to the tank, be sure to locate the flanges as shown. Flange position governs the float and float arm position in the tank. Use a sealing compound on the threads.



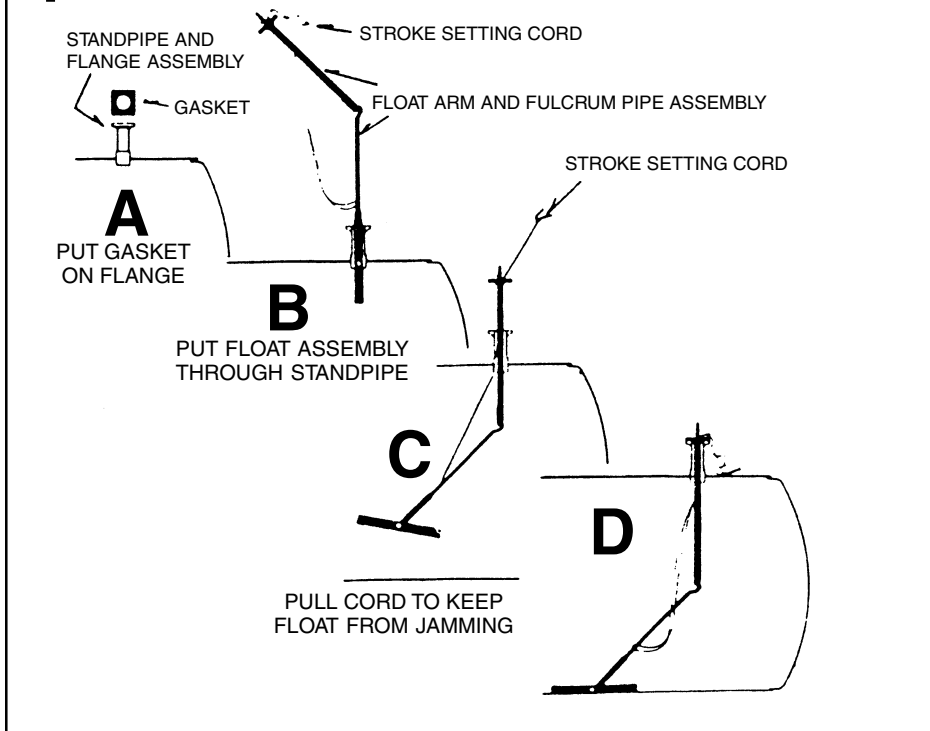
3. Attach the float arm to the pivot lever with the two bolts supplied. Insert the stroke setting cord through the hole in the fulcrum pipe. Pull the string up through housing and knot both ends.



4. Install the tank unit assembly as shown in steps A, B, C, and D. Check the float and float arm clearance being careful not to bend the float arm.

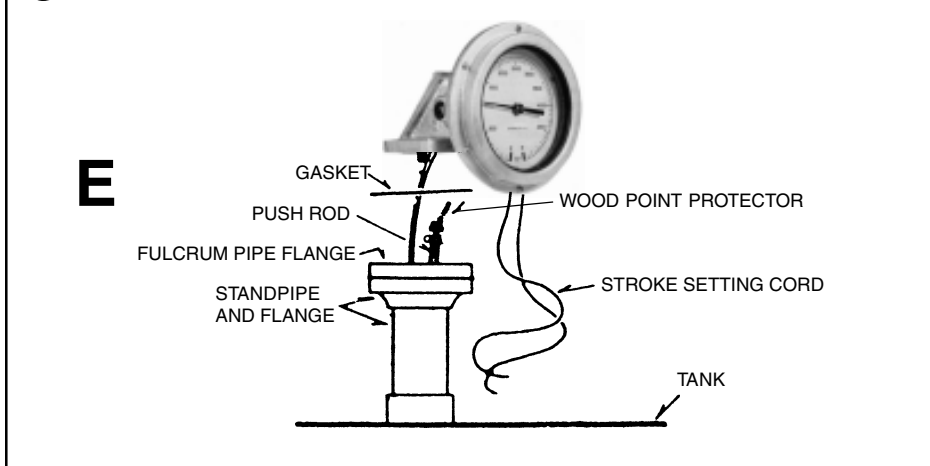
Place gasket on the flange using a suitable sealing compound on both sides. Make certain that the float and float arm have clearance to move from the bottom to the top of the tank without any interference. Move the float arm assembly by means of the stroke setting cord.

4 Put Float and Fulcrum Pipe Assembly Through Standpipe



5. To attach indicating head see Drawing E and proceed as follows. Remove cover and gasket from adjustment opening. Cover fulcrum pipe flange gasket with sealing compound. Pass the stroke setting cord through the center and place the gasket on the fulcrum pipe flange properly aligned with holes. Put the stroke setting cord through the indicator head and out through the adjustment opening as shown. Put the indicator head down in place with adjustment opening facing away from the direction of the float, and attach the fulcrum flange with the two 5/16 inch screws. Then bolt the indicator head, fulcrum and standpipe flanges together with the four 1/2 inch bolts, nuts on top. The position of the indicator head may be rotated 180° from the position shown if necessary.

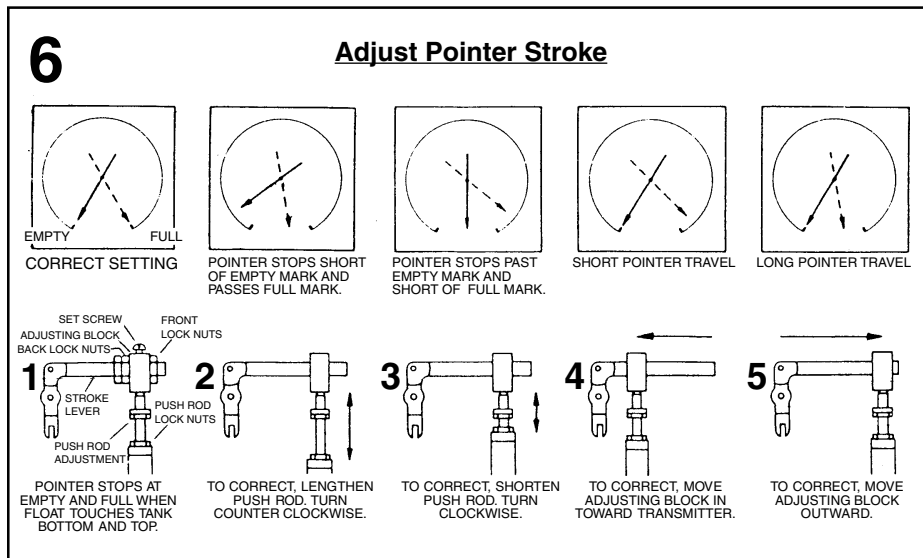
5 Attach Indicator Head



Direct Reading Tank Level Indicator

6. The schematic drawings of indicators below represent the different approximate pointer positions that may be encountered if the gauge is not properly adjusted to the tank when it is first connected. The drawings and notations explain the adjustments required to correct the various pointer conditions that may be encountered.

CAUTION: VERY MINOR ADJUSTMENTS ARE ALL THAT ARE NECESSARY.



7. All Mechanical Direct Readers are adjusted at the factory according to standpipe length and tank dimensions furnished by the customer. However, due to variations in tanks and other factors, minor adjustments may be necessary to make the indicator pointer stop at the empty and full marks on the dial when the float is moved from the bottom to the top of the tank.

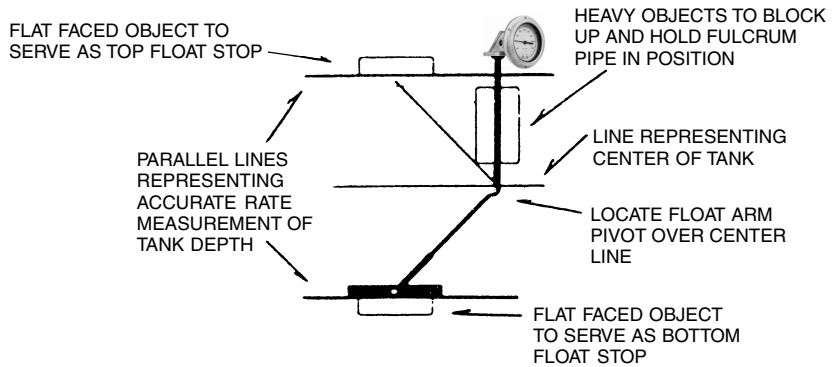
Two adjustments are provided to fine tune the indicator. As shown in the drawing above, the push rod adjustment controls the pointer position, and stroke adjustment block controls the amount of pointer travel.

UNDER NO CIRCUMSTANCES SHOULD THE INDICATOR POINTER BE PULLED OFF AND RELOCATED.

8. Mark two parallel lines on the floor to coincide accurately with the tank top and bottom. Assemble the tank unit and the indicator as shown on the next page. Place the tank assembly at right angles to the top line with the fulcrum and float arm, resting on the center line of the imaginary tank. By moving the float between the two lines representing the top and bottom of your tank, you can now check and adjust the pointer stroke as described in Paragraph 7. After completing the adjustments on the floor make sure the adjustment block lock screw is tight before disassembling the indicator head from the tank assembly in order to install it in the tank.

8

Adjusting Gauge Outside of Tank



Automatic Contact Switch Adjustment

Automatic Contact Switch used on 6" Direct Reading Gauges

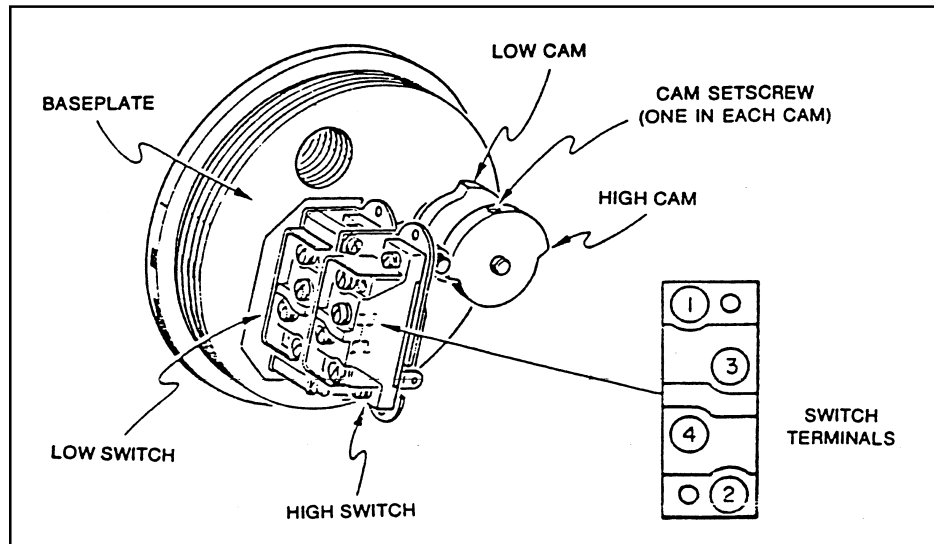
This switch assembly, as part of a direct reading gauge installation, is designed to control pumps or to signal the LOW or HIGH level warnings. The switches are enclosed in an explosion-proof housing, and the assembly is listed by Underwriters Laboratories for CLASS 1 GROUP D hazardous areas.

Switch adjustments are set at the factory in accordance with customer's requirements, but readjustments can be made in the field to suit different conditions.

The figure below illustrates a combination LOW and HIGH switch assembly. The switch located nearest the baseplate is wired for the LOW level actuation while the outside switch is wired for the HIGH level actuation.

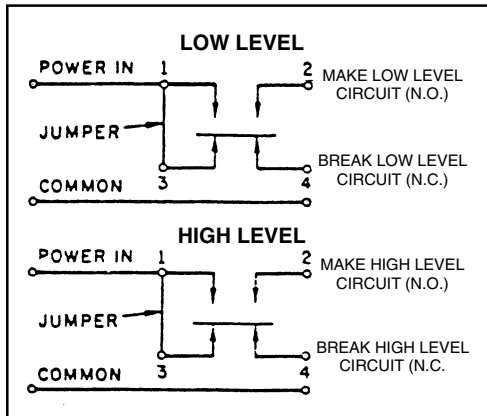
Switch assemblies are also supplied with a single switch, in which case it can be used for either LOW or HIGH level contact operation.

Readjustments on the cams can be made as indicated in the table on the next page and by referring to the figure below. The wiring diagram on the next page shows terminals for normally open and normally closed circuits.

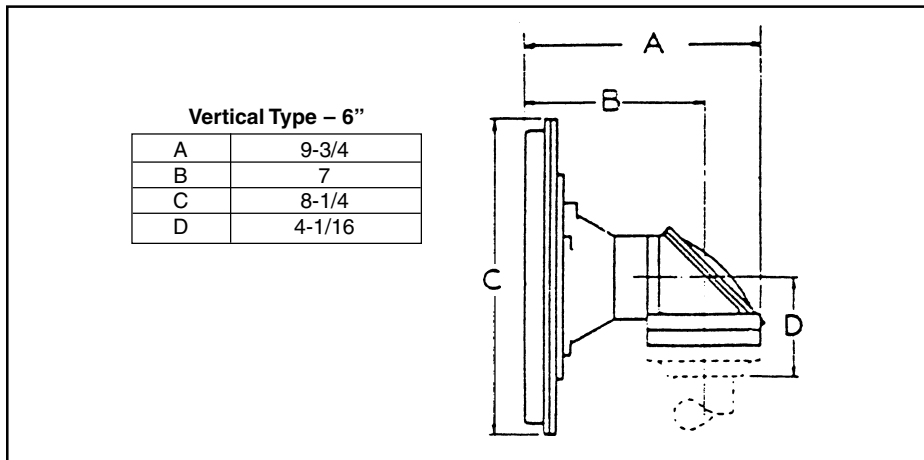


Direct Reading Tank Level Indicator

SINGLE SWITCH ADJUSTMENTS				
	Float Movement	Switch Terminals	Switch Function	Cam Adjustment
For LOW level adjustment	Fall of float	Common and 4 (for a normally closed circuit) Common and 2 (for a normally open circuit)	Off (Break) On (Make)	Loosen cam setscrew. Turn cam clockwise for earlier contact, or counterclockwise for later contact.
For HIGH level adjustment	Rise of float	Common and 4 (for a normally closed circuit) Common and 2 (for a normally open circuit)	Off (Break) On (Make)	Turn cam counterclockwise for earlier contact, or clockwise for later contact.
COMBINATION LOW AND HIGH SWITCH ADJUSTMENTS				
For LOW level adjustment	Fall of float	Common and 4 of LOW switch (for a normally closed circuit) Common and 2 of LOW switch (for a normally open circuit)	Off (Break) On (Make)	Turn cam clockwise for earlier contact, or counterclockwise for later contact.
For HIGH level adjustment	Rise of float	Common and 4 of HIGH switch (for a normally closed circuit) Common and 2 of HIGH switch (for a normally open circuit)	Off (Break) On (Make)	Turn cam counterclockwise for earlier contact, or clockwise for later contact.



CONTRACTOR RATING				
Load	Non-Inductive Amps		Pilot Rating AC	
	AC	DC	Steady	Inrush
115	15	0.8	6.0	60.
230	15	0.4	3.0	30.
480	15		1.5	15.
600	15		1.2	12.
1/2 HP 120 VAC				
1 HP 240 VAC				



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