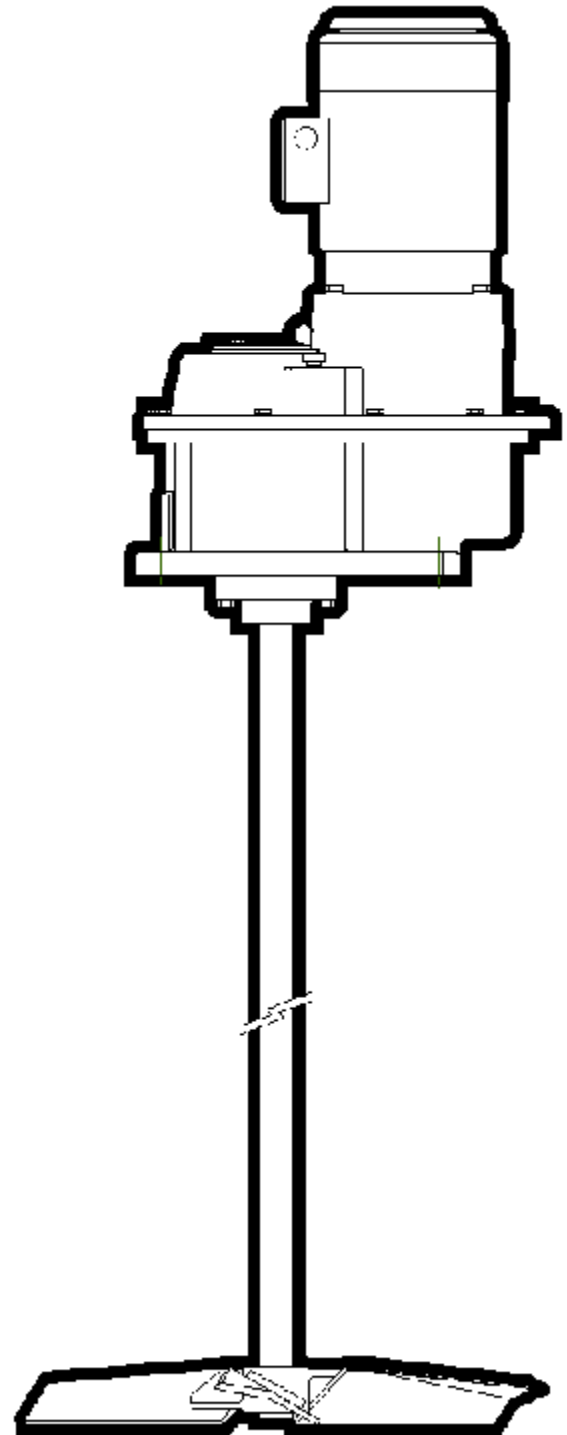


# GTD/GTP Turbine Agitators Angle Mount Supplement



Reference IOM Manual 415

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***Chemineer, Inc.***  
A Unit of Robbins & Myers, Inc.

## OPTIONAL ANGLE MOUNTED DRIVE

Case 1 and 2 GT agitator drives are available with a 10E angle mounting option.

Angle mounting requires a specific mounting orientation and a special dip stick [258] to indicate the correct oil level. The angle of the gear drive **must** be oriented such that the motor end of the gear drive is low. See *Figures 1, 2 and 4, pages 1, 3, and 5.*

The special dip stick is identified by the marking, *Angle Mount-10 DEG.* on the wand. The approximate oil capacity for case size 1 or 2 GT gear drive mounted at 10E is 1.08 Gallon (4.1L.). Always fill to the full mark on the dip stick.

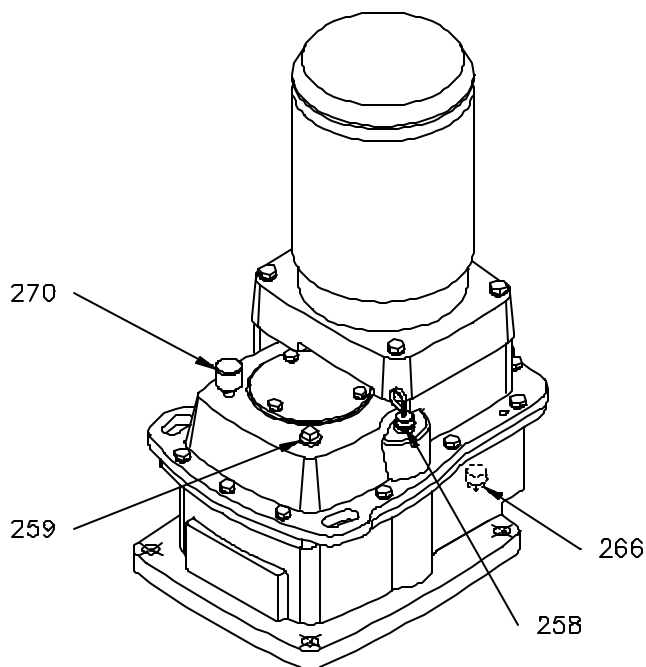


Figure 1: Gear Drive Oil Level Dip Stick

## AGITATOR MOUNTING

GTD and GTP (open tank) style units usually mount separately from the tank on either a steel structure or a concrete slab over the tank. The steel structure for open tank mounting is typically constructed of two main support beams, with lateral and diagonal bracing, spanning the tank. See *Figure 3, page 4 (GTD)* or *Figure 5, page 6 (GTP)*.

Case size 1 and 2 GT drives are available with a 10E angle mounting option. Angle mounting requires a specific mounting orientation. The angle must be 10E and the gear drive must be orientated such that the motor end of the gear drive is low. See *Figures 2 and 4, pages 3 and 5*.

During operation of the agitator, the fluid motion in the vessel produced by the rotation of the turbine impeller can exert significant forces and moments on the agitator extension shaft. The forces and moments produced by the turbine rotating in a fluid are; torque, turbine thrust and turbine hydraulic (side) force. Torque implies an unchanging load, but the actual operating torque will show plus or minus 10 to 20 percent variability due to the turbulent conditions within the agitated fluid. Start up of the agitator with the turbine impacted in solids is beyond the scope of these recommendations. Hydraulic forces acting on the turbine generate moments, which act on the shaft and are transmitted to the agitator drive. Because of the random nature of the forces and the rotation of the shaft, the direction of these forces is constantly changing. A pitched blade or axial flow turbine normally pumps downward and generates an upward thrust. The thrust force is generally less than the weight of the unit. Upward pumping turbine thrust force will add to the unit weight. The net effect of the turbine thrust force is to offset or add to the unit weight, contributing to the variability of the support structure loading. The agitator has been designed to accommodate these forces, and as a result, the forces are transmitted directly to the mounting support. The support structure must be rigid enough to support the agitator weight and the live agitator reactions as a result of torque and bending moment. The structure should be sufficiently rigid that the agitator extension shaft will not move more than 1/32 inch per foot (2.6 mm per meter) of length due to deflection of the structure. Refer to the agitator assembly drawing for the support structure design loads.

*Table 3, page 7, Recommended Beam Sizes* is keyed to model, a case size and tank diameter. Select the appropriate beam size for your application. Beams of equivalent section modulus and moment of inertia and/or modulus of elasticity can be used. See *Figure 3, page 4 (GTD)* or *Figure 5, page 6 (GTP)* for positioning the gear drive relative to the flange on the beams. Refer to *Table 2, page 7* for mounting dimensions.

This information is intended as a guide and does not relieve the user of completely analyzing the entire mounting system.

Optional 10E angle risers are available for Case 1 and 2 GTD agitator drives. Mount the angle risers such that the motor end of the gear drive is low.

Assemble angle risers [801 & 802] to gear drive [200]. Install mounting bolts [803] with flatwashers, lockwashers and hex nuts [804, 805 & 806]. Torque bolts to 120 ft-lb (163Nm) lubricated.

Install the agitator drive to support structure using a 3/4" (20mm) customer supplied fastener set [1119]. Torque bolts to 120 ft-lb (163Nm) lubricated.

The structural arrangement is shown in *Figure 3, page 4*. See *Table 3, page 7* for recommended beam size.

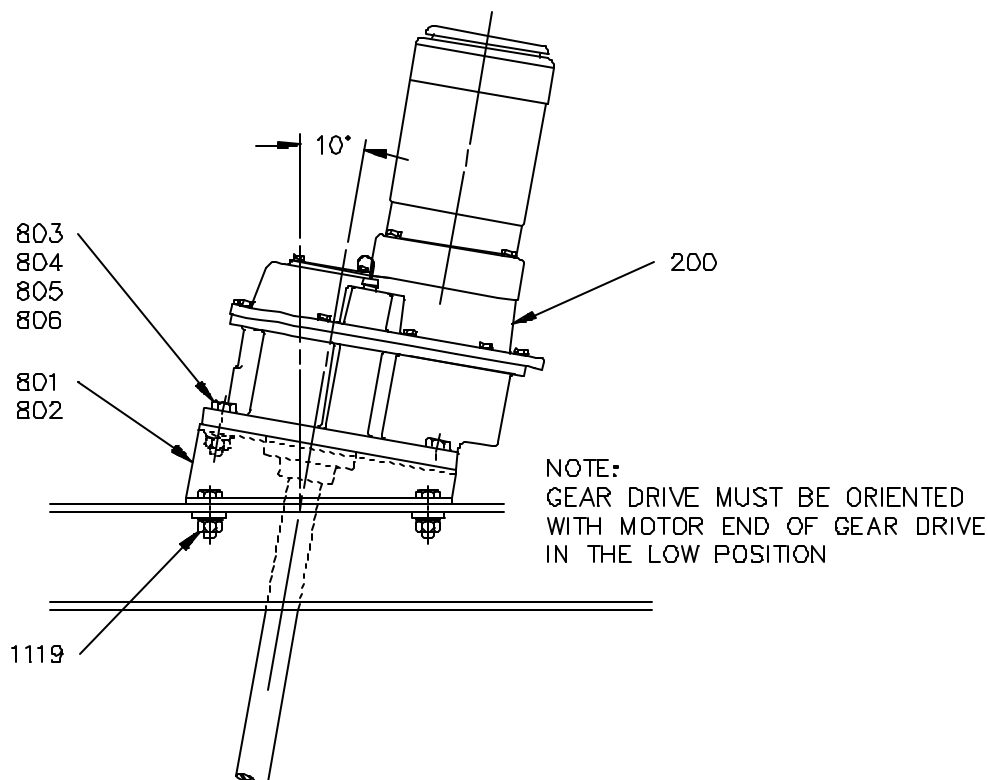


Figure 2: Angle Riser Mounting -GTD

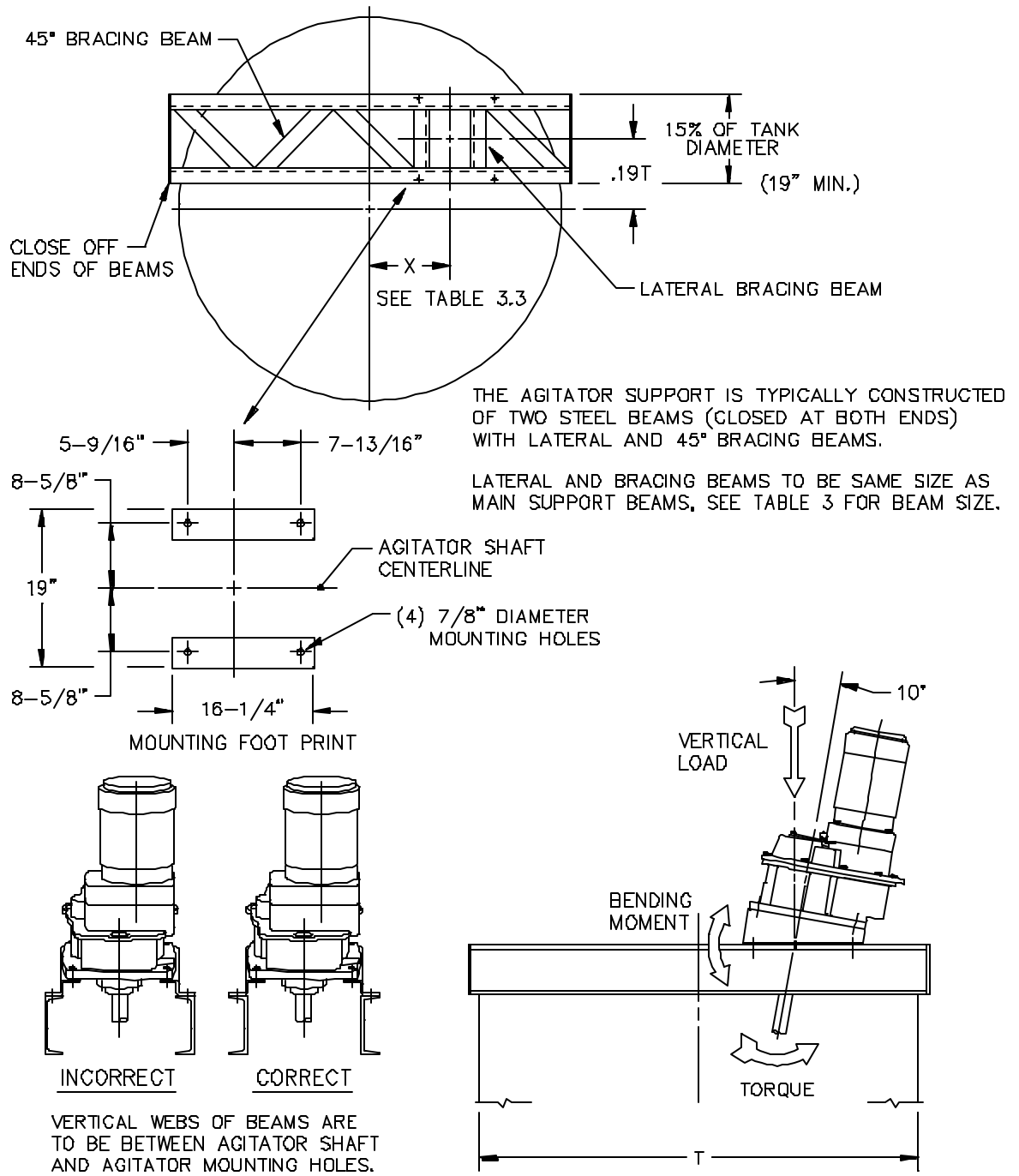


Figure 3: Angle Riser Mounting - GTD  
Open Tank Beam Mounting

### ANGLE MOUNTED DRIVE, MODEL GTP

Case size 1 and 2 GTP agitator drives, furnished with 10E angle mounting option, may be angle mounted. The structural arrangement is shown *Figure 5, page 6*. See *Table 3, page 7* for recommended beam size.

**Note:** Angle mounted units must have the extension shaft assembled in a vertical position, prior to installation on the vessel. The standard assembly and disassembly instructions in *Manual #415* cannot be used.

Install the assembled agitator drive onto the support structure using 3/4" (20mm) fastener set [1119], furnished by customer. Torque bolts to 120 ft-lb (613Nm) lubricated.

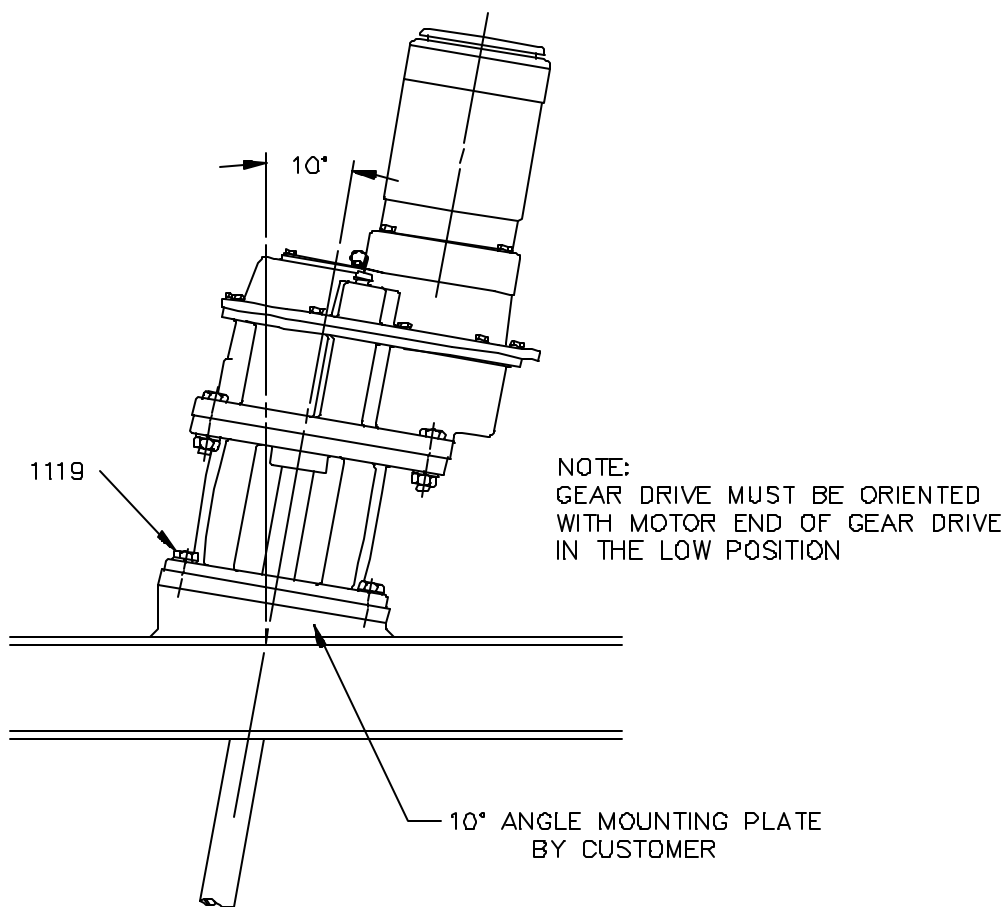


Figure 4: Angle Mounting - GTP

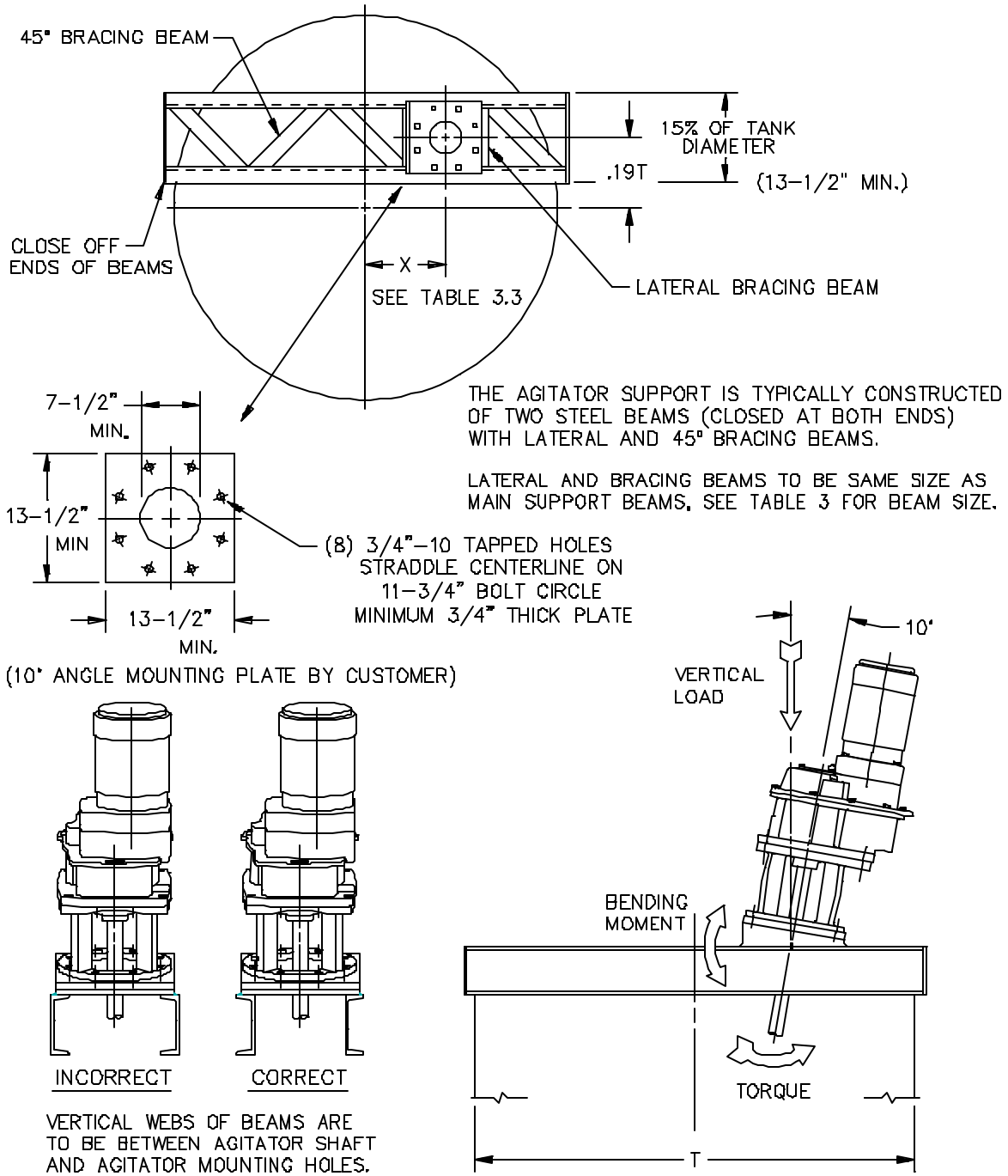


Figure 5: Angle Mounting - GTP  
Open Tank Beam Mounting



**TABLE 2: MOUNTING DIMENSIONS**

CASE SIZE	MODEL GTD					
	A	B	C	D	E	F
1GT	27/32" (21.4mm)	13-1/2" (343 mm)	15-3/4" (400mm)	5-9/16" (141.3mm)	5-9/16" (141.3mm)	7-13/16" (198.4mm)
2GT	27/32" (21.4mm)	13-1/2" (343 mm)	15-3/4" (400mm)	5-9/16" (141.3mm)	5-9/16" (141.3mm)	7-13/16" (198.4mm)

**TABLE 3: RECOMMENDED BEAM SIZES**

TANK DIAMETER Ft (m)	CASE SIZE	
	1GTD/1GTP	2GTD/2GTP
4 (1.22)	C4 x 5.4	C5 x 6.7
6 (1.83)	C5 x 6.7	C6 x 8.2
8 (2.44)	C6 x 8.2	C7 x 9.8
10 (3.05)	C7 x 9.8	C8 x 11.5
15 (4.57)	C12 x 20.7	C12 x 20.7
20 (6.10)	C12 x 20.7	C15 x 33.9
25 (7.62)	C15 x 50	C15 x 50

☒ Consult Factory

C = American Standard Channel

MC = American Standard  
Miscellaneous Channel

**TABLE 3.3: OFF CENTER MOUNTING**

Shaft Extension Range In. (mm)	CASE SIZE 1 AND 2	
	"X" Dimension In. (mm)	Minimum Tank Diameter In. (mm)
38"-53" (965-1346)	7.5" (191)	22" (559)
54"-76" (1372-1930)	10.75" (273)	32" (813)
77"-110" (1956-2794)	15.5" (394)	46" (1168)
111"-158" (2819-4013)	22.5" (572)	66" (1676)
159"-227" (4039-5766)	32" (813)	96" (2438)

**GT AGITATOR PART NUMBERS**

Part	Description	Qty.
<b>Angle Risers</b>		
800	angle riser assembly	1
801	right hand angle riser	1
802	left hand angle riser	1
803	bolt	4
804	flatwasher	4
805	lockwasher	4
806	hex nut	4