

TRUMBULL

Trumbull Manufacturing

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TRUMBULL MANUFACTURING MITER GEAR

Installation, Operation and Maintenance Manual

Installation:

The Trumbull Manufacturing Miter Gear must be mounted to a structure close to the valve using one of the mounting flanges provided with the miter gear. The miter gear may be mounted to either the input or output side. Once the miter gear is securely mounted the extension stems can be installed. During the installation of the stems, the installer must confirm that the extension stems do not put a bind on the gear box. There must not be any inward or outward force put on either of the input or output shafts. Failure to properly install the gear box can result in damage to the gear box or possibly the valve itself.

Operation:

A properly installed miter gear will operate freely in both clockwise and counter clockwise directions. There is no limit to the number of turns, so the miter gear can be used on anything from a quarter turn valve to a large diameter valve with hundreds of turns.

Maintenance:

The miter gear should be greased during the normal valve maintenance schedule thru the grease fitting provided on the elbow casting. This interval will vary based on usage and operating conditions, but at a minimum whenever the valve is serviced. The grease provided from the factory is an NSF approved lubricant, and the product data sheet is attached to this document. If another type of grease is used, it should be confirmed that the lubricant being used is compatible with the factory installed lubricant.

Storage before installation:

There are no special requirements for storage of the miter gears; their intended use can be more severe than the environmental conditions. However, miter gears should be handled with proper care and attention during shipment, handling and storage to prevent physical damage, especially from contact with material handling equipment.

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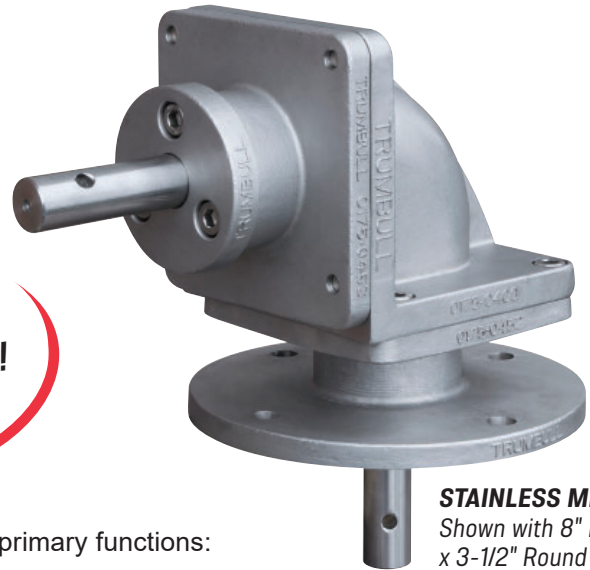
Miter Gears

Heavy-Duty, Enclosed Gear Assemblies
Available in Ductile Iron and Stainless Steel

3 STANDARD END ADAPTERS

- 8" Round End Adapter
- 4-1/4" Square End Adapter
- 3-1/2" Round End Adapter

**6 Possible
Combinations!**
(Shown below)



STAINLESS MITER GEAR
Shown with 8" Round
x 3-1/2" Round Adapters

Trumbull Miter Gears are designed to fulfill the following primary functions:

- To be used as an add-on component to Trumbull Floorstands or Pedestals.
- To be mounted directly to valves where a 90° change in the input shaft direction is required.
- For use as a stand-alone component in a valve operating assembly with rotating elements, such as extension stems, where the installed conditions require one or more 90° changes of direction.

Housings are cast 316 stainless steel or ductile iron 65-45-12 with a Tnemec N140-1211 two-part epoxy, NSF-61 certified exterior coating. The gears are case hardened steel; the gear shafts and fasteners are 316 stainless steel.

Trumbull Miter Gear Assemblies are provided standard with a recessed grease fitting for easy maintenance and Buna-N O-ring seals on each end adapter.

GEAR RATIO = 1:1, INPUT/OUTPUT SHAFT DIAMETER = 0.984".

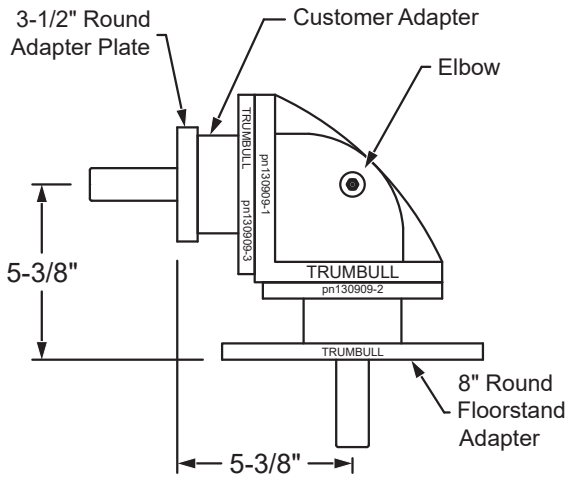
See reverse side for drawings of model end options.



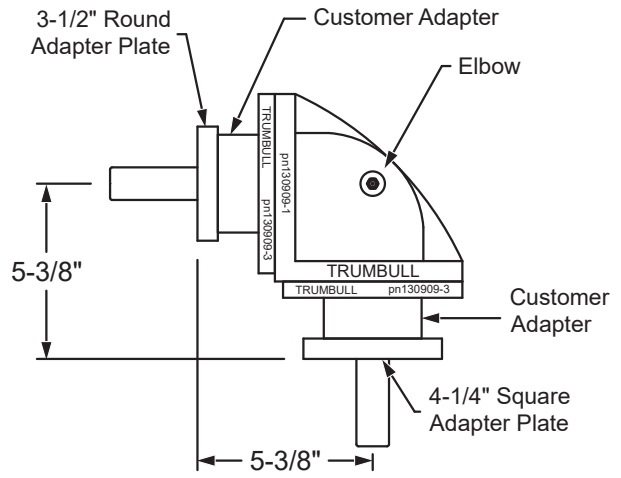
Trumbull Miter Gears have a recommended maximum working torque of 200 ft-lb (270 N-m). For applications with higher torque requirements, please consult Trumbull.

End Configurations	Model No	Weight	Typical Usage for Each End Adapter
8" Round x 3-1/2" Round	MG1A	39.00 lbs.	8" Round - mates to our Floorstands 3-1/2" Round - for use with handwheel or nut operators
8" Round x 4-1/4" Square	MG1B	42.00 lbs.	8" Round - mates to our Floorstands 4-1/4" Square - adapts for guide, bracket & motor mountings
8" Round x 8" Round	MG1C	46.00 lbs.	Both 8" Round ends mate to our Floorstands & other fabrications such as torque tubes
4-1/4" Square x 3-1/2" Round	MG2A	37.00 lbs.	4-1/4" Square - adapts for guide, bracket & motor mountings 3-1/2" Round - for use with handwheel or nut operators
4-1/4" Square x 4-1/4" Square	MG2B	35.00 lbs.	Both 4-1/4" Square ends easily adapt for guide, bracket & motor mountings
3-1/2" Round x 3-1/2" Round	MG3A	32.00 lbs.	Both 3-1/2" Round ends for use with either extension stem assemblies, handwheel, or nut operators

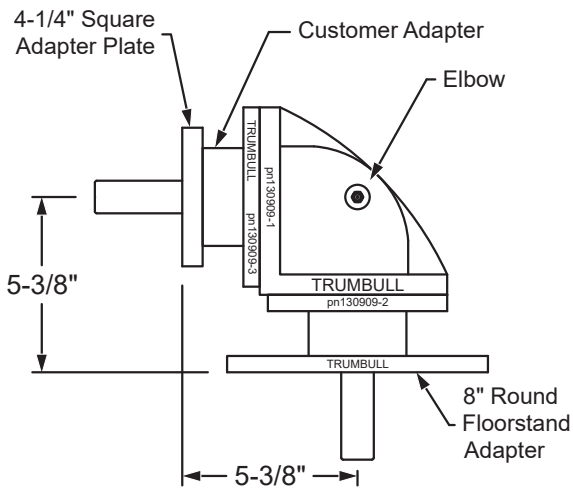
MG1A – 8" Round x 3-1/2" Round



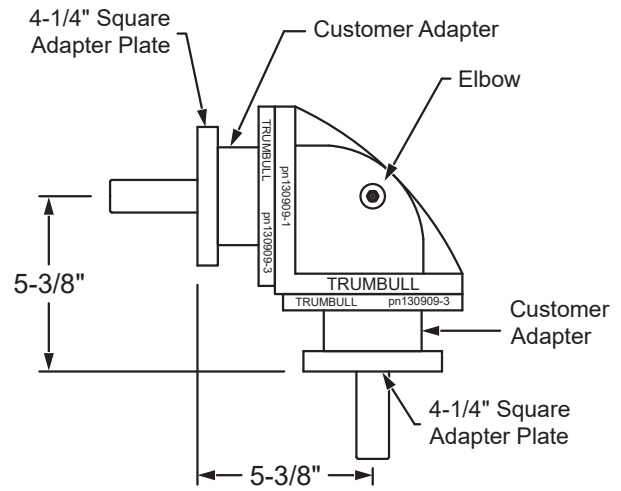
MG2A – 4-1/4" Square x 3-1/2" Round



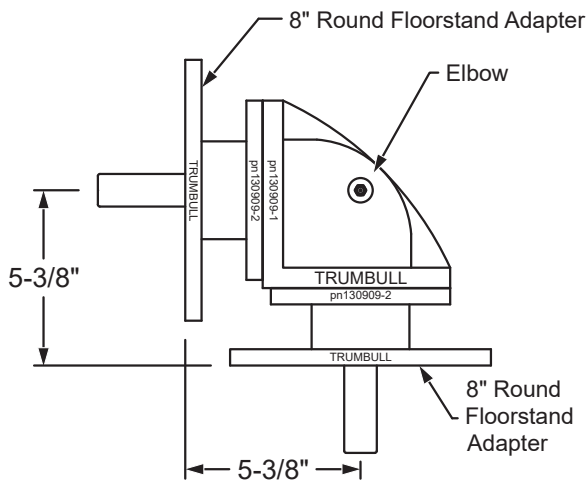
MG1B – 8" Round x 4-1/4" Square



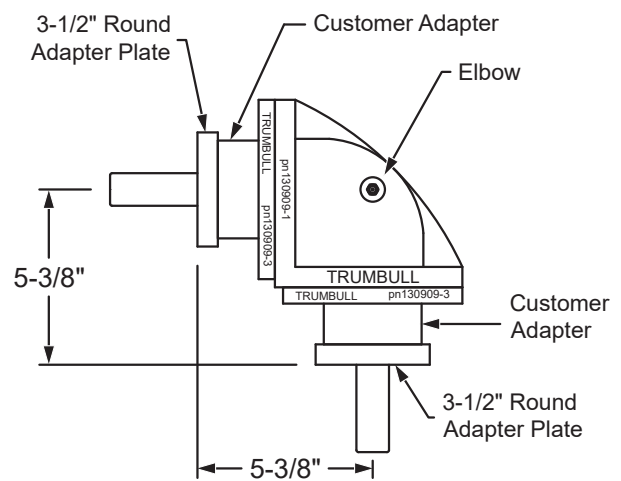
MG2B – 4-1/4" Square x 4-1/4" Square



MG1C – 8" Round x 8" Round



MG3A – 3-1/2" Round x 3-1/2" Round



MITER GEAR COMBINATIONS
Drawn to Scale

Drawn:
FCN
10/27/14

Revision:
FCN
© 09/18/19

Trumbull Manufacturing
Youngstown, Ohio
www.trumbull-mfg.com



Mobilgrease™ FM 101 and FM 222

Grease

Product Description

Mobilgrease™ FM 101 and FM 222 are high performance multi-purpose products designed specifically for the lubrication of food processing machinery. Mobilgrease FM 101 and FM 222 are formulated with components meeting the requirements of CFR 178.3570, Chapter 21, and are NSF registered as H1 classified lubricants. The Mobilgrease FM 101 and FM222 are manufactured at ISO 22000 certified facilities that also meet the requirements of ISO 21469 helping to ensure that the highest levels product integrity are maintained.

Food processing equipment often operates in a variety of environments, covering the extremes of temperatures from oven to freezer operations, as well as a high level of contamination from water, steam and **cleaning agents**. Mobilgrease FM 101 and FM 222 were developed as multipurpose grease lubricants capable of providing excellent lubrication in all of these environments. Mobilgrease FM 101 and FM 222 are engineered with excellent water resistance to withstand periodic washdown and cleaning operations frequent in the food processing industry. Rust inhibition is a critical property for the industry. Mobilgrease FM 101 and FM 222 are formulated with an excellent rust inhibition package which, working in concert with the water resistance properties, will provide protection against rust. The select base oils coupled with excellent thickener shear stability translates into an ability to provide lubrication over a wide range of speeds, loads and temperatures. Mobilgrease FM 101 and FM 222 are also formulated to handle a variety of loads, exhibiting good protection against wear and shock load conditions.

Mobilgrease FM 101 and FM 222 were designed to meet many global performance and cultural requirements, including:

- NSF H1 Registered
- DIN 51825 KPF1K -20 (for Mobilgrease FM 101)
- DIN 51825 KPF2K-20 (for Mobilgrease FM 222)
- Kosher/Parve
- Halal

Features and Benefits

Mobilgrease FM 101 and FM 222 belong to the Mobilgrease brand of products, which has gained a worldwide reputation for innovation and performance excellence. Mobilgrease FM 101 and FM 222 are designed by ExxonMobil formulation technologists and backed by its worldwide technical support staff.

Mobilgrease FM 101 and FM 222 greases have been designed specifically to meet the needs of the food processing industry that requires excellent water resistance, rust protection and a lubricant able to provide oil to the load zones reliably under high shear conditions. These greases offer the following features and potential benefits:

Features	Advantages and Potential Benefits
Excellent water resistance and rust protection	Helps provide superb equipment protection during frequent equipment cleaning operations
Excellent thickener shear stability	Product exhibits excellent stability for long periods of time, helping to provide oil more consistently between relubrication cycles
NSF H1 registered, DIN 51825 certified, Kosher/Parve, Halal	Engineered to meet global requirements, presenting a multi-purpose solution to the food processing industry around the world
Manufactured in facilities registered to ISO 21469	Product integrity assurance through independent verification

Applications

Mobilgrease FM 101 and FM 222 greases are recommended for multi-purpose lubrication of food processing equipment where NSF H1 registration is required. The food industry includes food processing, beverage, medical and packing industries for a wide range of cultures.

Applications include:

- General rotating equipment lubrication
- Conveyor bearings
- Equipment central lubrication systems (Mobilgrease FM 101)
- Anti-friction roller bearings under heavy or shock loading
- Linkages and slides
- Joints

Specifications and Approvals

Mobilgrease FM meets or exceeds the requirements of:	FM 101	FM 222
FDA 21 CFR 178.3570	X	X
DIN 51825 (2006:06)	KPF1K -20	KPF2K -20

Mobilgrease FM has the following builder approvals:	FM 101	FM 222
MAG IAS, LLC	P-72	P-64
Kosher/Parve	X	X
Halal	X	X

Mobilgrease FM is Registered to the requirement of:	FM 101	FM 222
NSF H1	X	X
NSF Registration Number	141881	136449

Typical Properties

	Mobilgrease FM 101	Mobilgrease FM 222
NLGI Grade	1	2
Thickener Type	Aluminum Complex	Aluminum Complex
Color, Visual	White	White
Penetration, Worked, 25° C, ASTM D 217, mm/10	325	280
Dropping Point, °C, ASTM D 2265	260	260
Viscosity of Oil, ASTM D 445		
cSt @ 40° C	100	220
Penetration Consistency Change, 100,000 Stroke, Change from Worked Pen, ASTM D 1831, mm/10	+20	+20
4-Ball Wear Test, ASTM D 2266, Scar, mm	0.50	0.50
Corrosion Prevention, ASTM D 1743, Rating	Pass	Pass
Copper Strip Corrosion, DIN 51811	1b	1b
4-Ball Weld Load, ASTM D 2596, Kg	315	315
FE-9 (DIN 51821, A-Unshielded), L50> 100 hours, Deg. C	120	120

Health and Safety

Based on available information, this product is not expected to produce adverse effects on health when used for the intended application and the recommendations provided in the Material Safety Data Sheet (MSDS) are followed. MSDS's are available upon request through your sales contract office, or via the Internet. This product should not be used for purposes other than its intended use. If disposing of used product, take care to protect the environment.

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10-2013

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Typical Properties are typical of those obtained with normal production tolerance and do not constitute a specification. Variations that do not affect product performance are to be expected during normal manufacture and at different blending locations. The information contained herein is subject to change without notice. All products may not be available locally. For more information, contact your local ExxonMobil contact or visit www.exxonmobil.com

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