BRAWN MIXER®

AN NBE COMPANY

OPERATION

AND

MAINTENANCE

MANUAL

BWG SERIES

SERIAL NUMBER

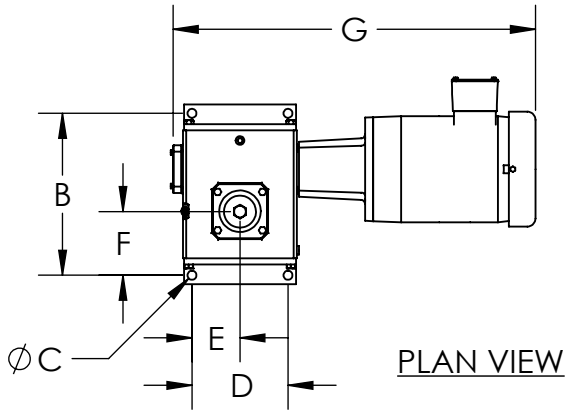
_____

CUSTOMER:_____

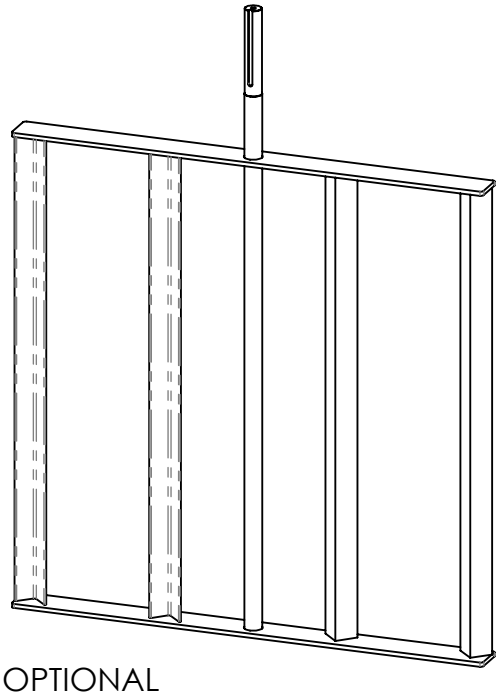
SALES REP.:_____

NOTES:

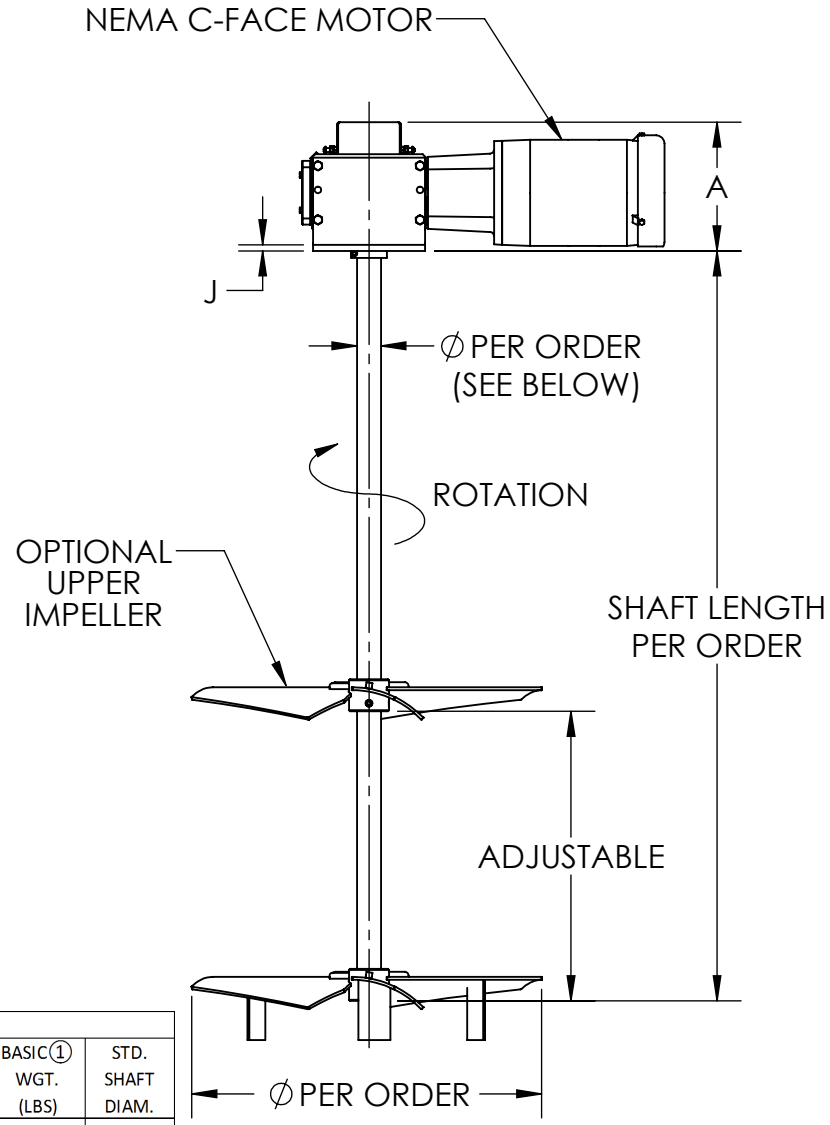
1. BASIC WEIGHT DOES NOT INCLUDE SHAFT, IMPELLER(S) OR MOTOR.
2. ALL DIMENSIONS ARE IN INCHES AND ARE FOR REFERENCE ONLY UNLESS CERTIFIED.
3. FLANGE MOUNTED UNITS ALSO AVAILABLE. CONSULT FACTORY FOR APPLICABLE DIMENSIONS.
4. AF3 HYDROFOIL TURBINE IMPELLERS SHOWN. OTHER IMPELLERS AVAILABLE UPON REQUEST OR PER APPLICATION.



PLAN VIEW



OPTIONAL
"PICKET FENCE"
IMPELLER



FOR REFERENCE ONLY

BWG DIMENSIONS											
CASE SIZE	A	B	ØC	D	E	F	G	H	J	BASIC① WGT. (LBS)	STD. SHAFT DIAM.
11	7.0	7.38	0.44	4.00	2.00	2.88	20.0	10.0	0.25	30	1.25
12	8.2	10.13	0.56	5.75	2.88	4.00	22.8	12.2	0.38	75	1.50
13	10.0	11.88	0.56	6.12	3.06	4.75	24.3	13.6	0.38	100	2.00
14	13.5	14.88	0.69	7.88	3.94	6.19	27.0	17.3	0.50	180	2.50
15	14.5	18.00	0.78	10.00	5.00	7.12	30.9	20.8	0.50	290	3.00

* ALL DIMENSIONS AND WEIGHTS ARE FOR REFERENCE ONLY UNLESS THE DRAWING IS CERTIFIED.

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APPROVED BY: | DATE:

BRAWN MIXER®
AN NBE COMPANY
12838 Stainless Drive
Holland, MI 49424
PH: 616-399-5600
FAX: 616-399-3084

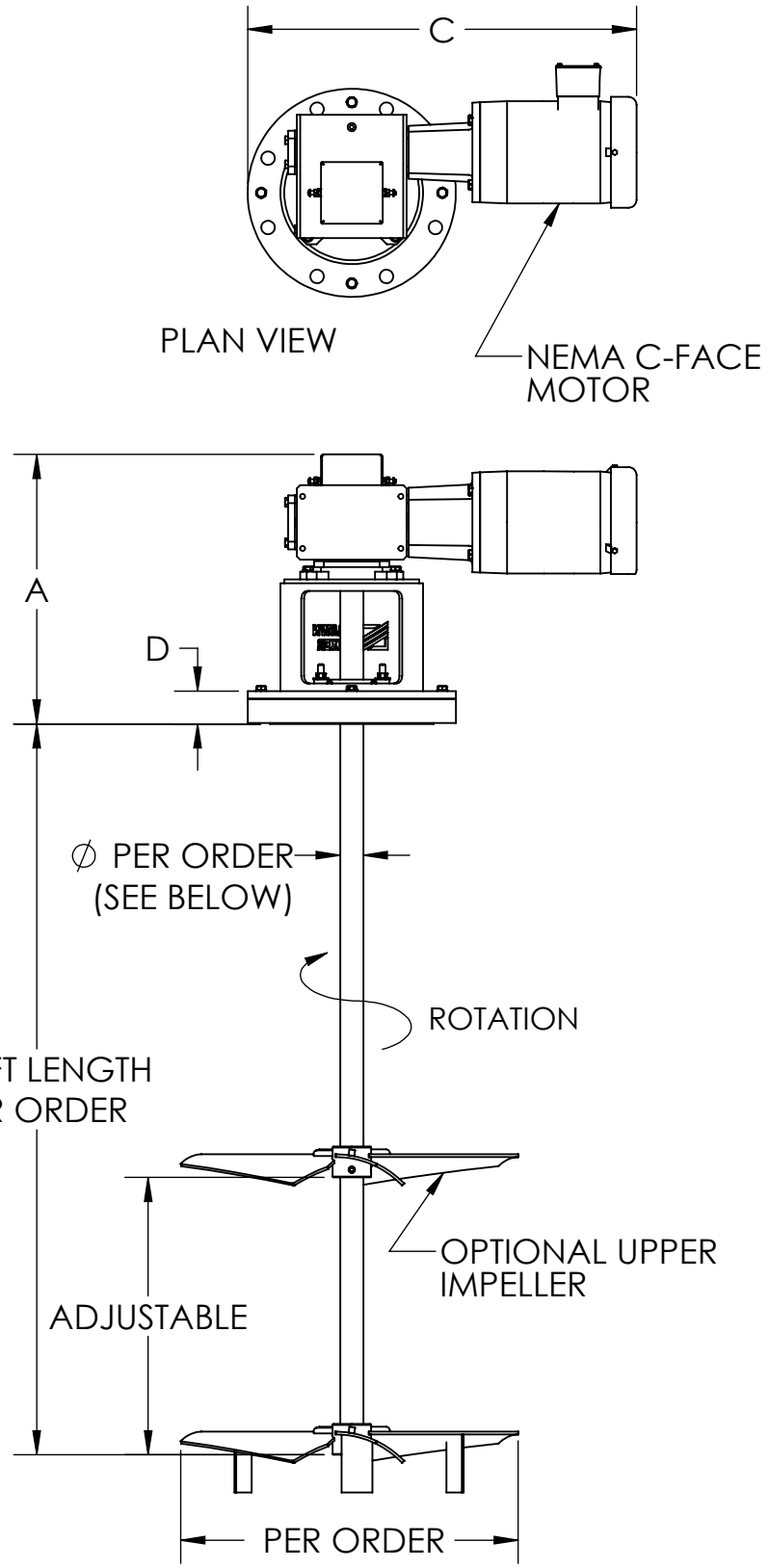
MIXER MODEL
BWG PLATE
OPEN TANK MOUNTED MIXER
DIMENSION AND ASSEMBLY DRAWING

DWG. NO. A- TK0038M

REV.

NOTES:

1. BASIC WEIGHT DOES NOT INCLUDE SHAFT, IMPELLERS OR MOTOR.
2. ALL DIMENSIONS ARE IN INCHES AND ARE FOR REFERENCE ONLY UNLESS CERTIFIED.
3. OVERALL HEIGHT DIMENSION (A) MAY VARY DEPENDING ON SEAL OPTION SELECTED.
4. AF3 3 BLADE HYDROFOIL IMPELLERS SHOWN. OTHER IMPELLERS AVAILABLE UPON REQUEST OR PER APPLICATION.
5. LOW PRESSURE STUFFING BOX SHOWN. SINGLE AND DOUBLE MECHANICAL SEAL ARE ALSO AVAILABLE.



BWG DIMENSIONS							
CASE SIZE	A	B	C	D	STD. ANSI FLANGE	BASIC WGT. (LBS)	STD. SHAFT DIAM.
11	20.5	16.7	23.5	1.50	6" - 150lbs.	120	1.25
12	21.7	18.3	26.3	1.50	8" - 150lbs.	240	1.50
13	23.5	19.1	27.1	1.50	8" - 150lbs.	270	2.00
14	25.0	20.5	28.5	1.50	10" - 150lbs.	360	2.50
15	27.0	22.0	30.0	1.50	10" - 150lbs.	470	3.00

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AN NBE COMPANY

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Holland, MI 49424

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MIXER MODEL

BWG PEDESTAL

SEALED TANK FLANGE MOUNT MIXER

DIMENSION AND ASSEMBLY DRAWING

DWG. NO. A- TK0039M

REV.

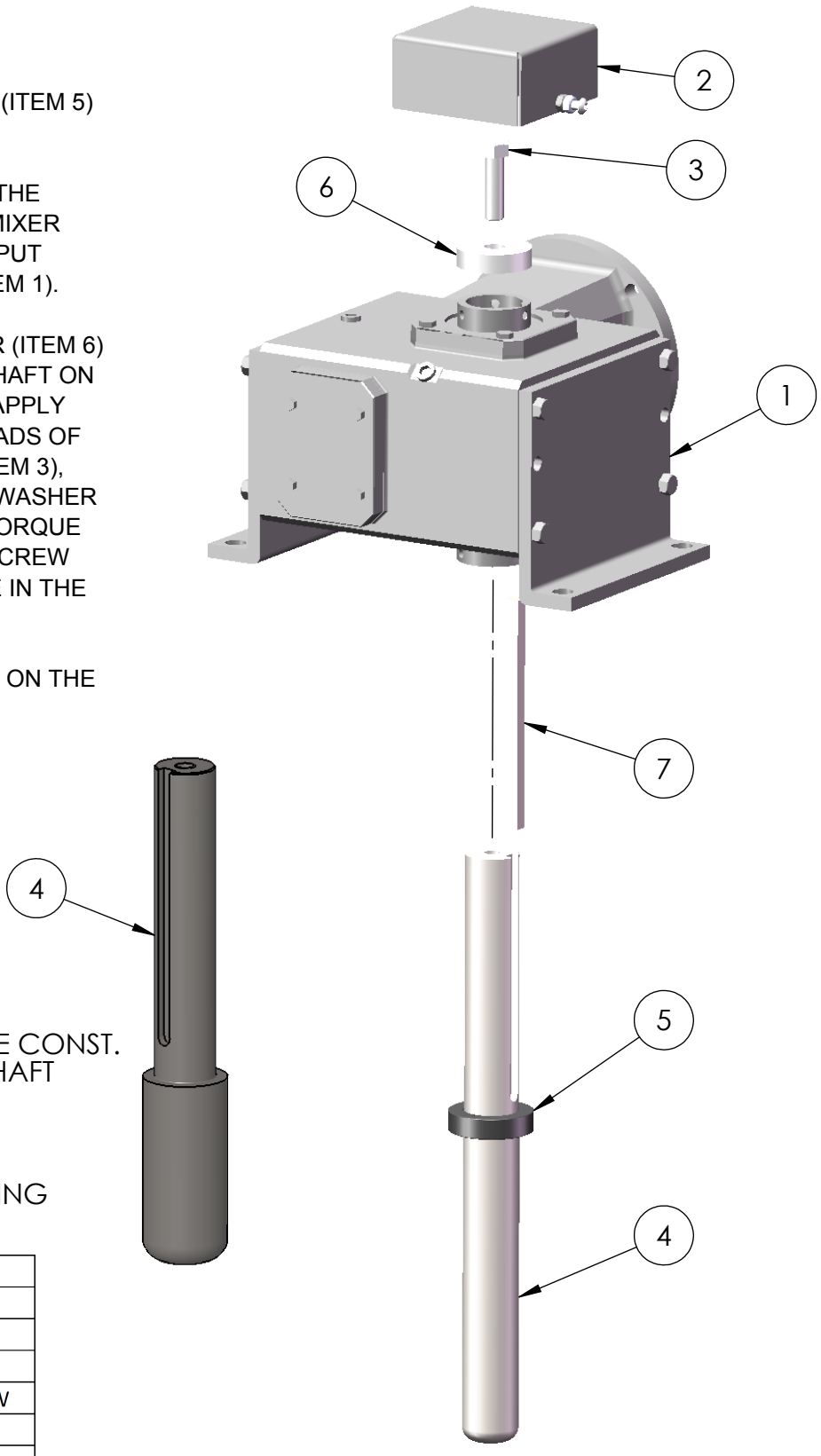
MIXER SHAFT ASSEMBLY

1. ATTACH THE SHAFT COLLAR (ITEM 5) TO THE MIXER SHAFT (ITEM 4).

2. PLACE THE KEY (ITEM 7) ON THE MIXER SHAFT AND SLIDE THE MIXER SHAFT INTO THE HOLLOW OUTPUT SHAFT ON THE GEARDRIVE (ITEM 1).

3. PLACE THE THRUST WASHER (ITEM 6) OVER THE HOLLOW OUTPUT SHAFT ON THE TOP OF THE GEARDRIVE. APPLY THREADLOCKER TO THE THREADS OF THE HEX HEAD CAP SCREW (ITEM 3), INSTALL IT THRU THE THRUST WASHER AND INTO THE MIXER SHAFT. TORQUE THE GRADE 5 HEX HEAD CAP SCREW TO THE RECOMMENDED VALUE IN THE O&M MANUAL.

4. ATTACH THE GUARD (ITEM 2) ON THE TOP OF THE GEARDRIVE.



ALTERNATE CONST. OF SHAFT

* QUANTITY VARIES DEPENDING ON SHAFT DESIGN.

ITEM NO.	QTY.	PART NAME
7	1	KEY
6	1	THRUST WASHER
5	1	SHAFT COLLAR
4	1	MIXER SHAFT
3	*	HEX HEAD CAP SCREW
2	1	GUARD
1	1	GEARDIVE

FOR REFERENCE ONLY

DRAWN BY: BSB | DATE: 10/29/2018 |

APPROVED BY: | DATE:

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MIXER MODEL
BWG SHAFT ASSEMBLY
DIMENSION AND ASSEMBLY DRAWING

DWG. NO. A- TK0090 | REV.

12838 Stainless Drive, Holland, MI 49424 **Phone: 616/399-5600 Fax 616/399-3084**

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SAFETY

The precautions mentioned in this manual are not intended to cover all hazards that may exist in a plant or on this equipment. Using safety mechanisms requires the constant attention of everyone in the vicinity of this (or any) equipment.

A plant and the related equipment are only as safe as the personnel are safety-minded. Proper equipment maintenance and the use of personal safety devices will contribute as much toward safety as will any number of mechanical safety devices.

WARNING

- To assure maximum safety, optimum performance, and to gain knowledge of the product, it is essential that you or any other operator of this equipment read and understand the contents of this manual before the mixer is operated.
- Installation, operation and maintenance must be performed only by qualified personnel.
- Do not operate this equipment unless all safety devices are installed and working properly. Check all devices prior to starting the equipment.
- Disconnect and lock out electrical power before installing or servicing the mixer.
- Do not touch rotating parts (keep all guards and safety devices installed while operating).
- Develop a safety checklist for this equipment and perform regular maintenance to ensure continued and proper operation. Develop a safety checklist for this equipment and perform regular maintenance to ensure continued and proper operation.
- Do not make any field changes or modifications without reviewing the change with your BRAWN sales representative or the BRAWN Customer Service Department.

CUSTOMER SERVICE

Mixer Model #..... **BWG-SERIES**
Mixer Serial # _____
Contact:

- Customer Service 616/399-5600
- E-Mail .....brawn@brawnmixer.com

You have received a quality engineered and manufactured BRAWN Mixer. We value your business, and we will strive to provide you with the proper service and equipment to meet your needs.

The information contained in this BRAWN Mixer Operator's Manual is designed to assist you in putting your BRAWN Mixer into operation without further delay. **Please read the entire manual before attempting to start your mixer.** If you have any further questions or if, by some chance, there are some missing components, contact your BRAWN Mixer Representative or the factory immediately.

We welcome your comments and suggestions concerning any BRAWN Mixer product. Please direct these comments in writing to the National Sales Manager at BRAWN Mixer, located in Holland, Michigan. To expedite troubleshooting service, please make your initial contact through your BRAWN Mixer Representative. If, for whatever reason, your representative cannot be reached and you have an emergency condition, please call us directly at 616/399-5600 and ask for the Customer Service Department.

Remember, you are backed by your BRAWN Mixer Technical representative and the factory support team. We are here to assist you; let us know how we can be of help.

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INITIAL INSPECTION

1. Upon receipt of your Brawn Mixer, check for possible shipping damage. Report any damage immediately to the carrier and to Brawn Mixer.

2. All Brawn Mixers are shipped with the shaft and impeller(s) disassembled from the drive assembly.

3. Storage: Mixers should not be stored near vibrating machinery to avoid damage to the bearings. Store mixers as packaged by the factory. For longer storage periods, consult factory. If electric motors have been subjected to humid conditions, check the insulation resistance between phase and mass and between the different phases. The resistance should not be less than 100 megohms. If the resistance is less, please consult the factory. If mixer is stored for more than a year, the condition of the gear lubricant should be checked before the mixer is put in operation (see lubrication instructions).

INSTALLATION

[REFER TO ASSEMBLY / DIMENSION DRAWING]

Refer to the mixer installation / assembly drawing for important mounting structure design, assembly, mounting and dimensional data.

1. Install the mixer drive on the mounting structure and secure with properly-sized, Grade 5 or better hardware. Torque the hardware as recommended in **TABLE 1**.

2. Install mixer shaft and impeller(s) (refer to shaft and impeller assembly section).

TABLE 1: RECOMMEND TORQUE VALUES

HARDWARE SIZE	*TORQUE VALUES (FOOT POUNDS)*	
	STANDARD GRADE 2 & 300 SERIES STAINLESS	*HIGH STRENGTH GRADES 5 & 8*
3/8-16	17	27
7/16-14	27	40
1/2-13	40	65
9/16-12	65	90
5/8-11	85	125
3/4-10	135	225
7/8-9	145	365
1-8	210	545

BOLT-TIGHTENING RECOMMENDATIONS:
Inadequately or improperly tightened hardware can loosen, due to vibration during mixer operation. This can result in reduced mixer life or damage to equipment. Recommended torque values for tightening all in-tank and mounting hardware are listed in **TABLE 1**. These average torque values should be considered only as a guide and not as absolute values.

SHAFT & IMPELLER ASSEMBLY

If an optional rigid shaft coupling is furnished, connect the mixer shaft and rigid driveshaft couplings by carefully engaging the shaft rabbeted faces and installing the mounting hardware. Be careful not to damage the coupling faces or rabbets, as this can cause excessive shaft run-out that will affect the life of the mixer

Proper hollow output shaft installation is shown in **FIGURE 1, PAGE 3**.

1. Inspect the shaft surface for evidence of damage and repair, if required, before installing the shaft into hollow output shaft or connecting to flanged coupling.

2. Attach the shaft collar (Item 5) to the mixer shaft (Item 4).

3. Place the key (Item 7) on the mixer shaft and slide the mixer shaft into the hollow output shaft on the gear drive (Item 1).

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SHAFT & IMPELLER ASSEMBLY, Continued

4. Place the thrust washer (Item 6) over the hollow output shaft on the top of the gear drive. Attach the hex head cap screw (Item 3) through the thrust washer (Item 6) and into the mixer shaft. Torque the Grade 5 hex head cap screw to the recommended value in **Table 1.**

5. Attach the guard (Item 2) on the top of the gear drive.

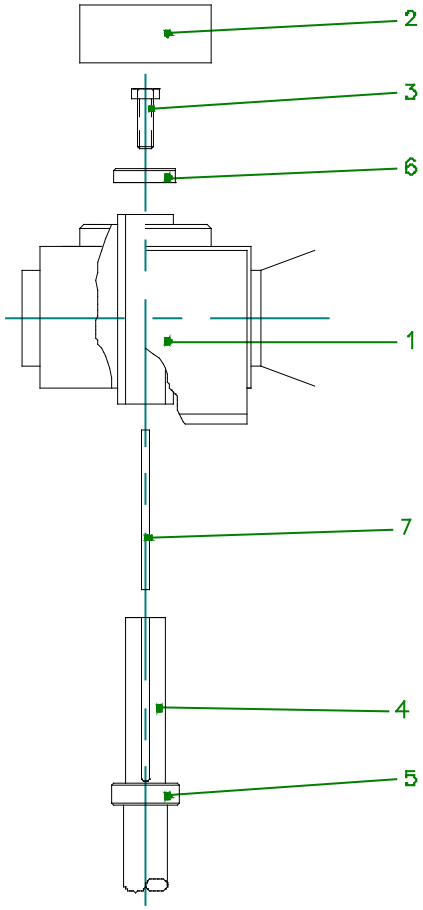

FIGURE 1: SHAFT INSTALLATION

For Installing Impellers without a Hook Key

Inspect the impeller bore and shaft surface for evidence of damage and repair, if required, before installing the impeller(s) on the shaft. Install the impeller(s) on the mixer shaft by carefully sliding the impeller hub over the shaft to its proper location and tighten the set screws. It is recommended that the shaft be spotted with a drill point at the setscrew locations to prevent loosening of the impeller(s).

For Installing Impellers with a Hook Key

To install the impeller on the shaft, slide the impeller hub over the mixer shaft, place the hook key in position, lower the hub over the hook key and tighten the set screw. The set screw must seat in the countersunk hole in the hook key. Proper impeller mounting is illustrated in **FIGURE 2**.

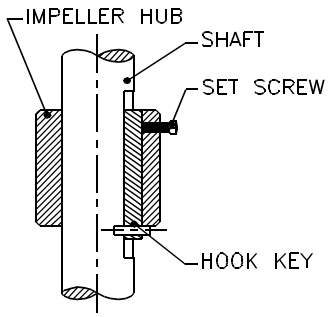

FIGURE 2: IMPELLER MOUNT WITH HOOK KEY

If an axial flow impeller of bolt together construction is used, blades should be bolted to the bottom of the impeller hub ears as shown in **FIGURE 3**.

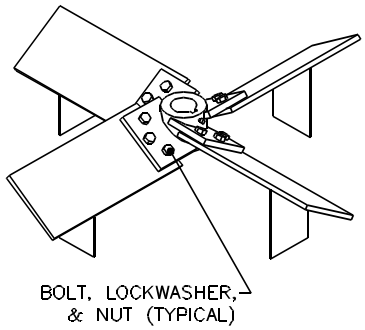

FIGURE 3: TYPICAL AXIAL FLOW IMPELLER ASSEMBLY (A45 SHOWN)

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START UP

1. All units are lubricated before shipment. The lubricant level should be checked with the unit mounted in its correct operating position. Lubricant should be added or removed to bring it to the correct level.

2. Connect the motor in accordance with the motor nameplate. The motor starter should incorporate overload protection. Before operating the mixer, jog the motor and observe mixer shaft rotation. Proper rotation is clockwise, as viewed from the top, unless otherwise noted.

3. Check all bolts and fasteners for tightness. It is good maintenance practice to recheck all bolts after two weeks of operation and periodically thereafter. Refer to **TABLE 1** for recommended torque values.

4. Do not attempt to start mixer with impellers buried in solids or solidified liquids.

CAUTION

Do not operate mixer with the tank empty or the lowest impeller submerged with less than ½ of the impeller diameter of liquid above it. Damage to the mixer and/or mounting structure may result.

ELECTRIC MOTORS

This equipment contains HAZARDOUS VOLTAGES, ROTATING PARTS AND HOT SURFACES. SEVERE PERSONAL INJURY OR PROPERTY DAMAGE CAN RESULT IF SAFETY INSTRUCTIONS ARE NOT FOLLOWED. Only qualified personnel should work on or around this equipment after becoming thoroughly familiar with all warnings, safety notices, and maintenance procedures contained herein. The successful and safe operation of this equipment is dependant upon proper handling, installation, operation and maintenance.

WARNING

Explosion-proof motors-these motors are constructed to comply with the U.L. Label Service Procedure Manual. When repairing and reassembling a motor that has an underwriter's label, it is imperative that the unit be reinspected and:

1. All original fits and tolerance be maintained.
2. All plugs and hardware be securely fastened.
3. Any parts replacements, including hardware, be accurate duplicates of the originals.

Repair work on explosion-proof motors can only be done by the original manufacturing or U.L. certified shops. Violations of any of the above items will invalidate the significance of the U.L. Label.

STORAGE

Motors must be stored in a clean, dry, well ventilated location free from vibration and rapid or wide temperature variations. If the unit is to be stored longer than three months, consult factory. Ball bearing motors are shipped from the factory properly lubricated and ready to operate. When in storage, the motor shaft must be turned several rotations every month and bearings relubricated every year. On non-explosion-proof TEFC motors, a removable plug in the bottom of the frame or housing permits removal of accumulated moisture. Drain regularly if storage atmosphere results in formation of condensation.

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ELECTRIC MOTORS, Cont.

INSTALLATION

Installation must be handled by qualified service or maintenance personal.

OPERATION

CAUTION

Repeated trial starts can overheat the motor and may result in motor burnout. If repeated trial starts are made, allow sufficient time between trials to permit heat to dissipate from windings and rotor to prevent overheating. Starting currents are several times running currents, and heating varies as the square of the current.

After installation is completed, but before motor is put in regular service, make an initial start as follows:

1. Check motor starting and control device connections against wiring diagrams.
2. Check voltage, phase, and frequency of line circuit (power supply) against motor nameplate.
3. If possible, remove external load (disconnect drive) and turn shaft by hand to ensure free rotation. This may have been done during installation procedure; if so, and conditions have not changed since, this check may not be necessary.
   a. If drive is disconnected, run motor at no load long enough to be certain that no unusual conditions develop. Listen and feel for excessive noise, vibration, clicking, or pounding. If present, stop motor immediately. Investigate the cause and correct before putting motor in service.
   b. If drive is not disconnected, interrupt the starting cycle after motor has accelerated to low speed. Carefully observe for unusual conditions as motor coasts to a stop.
4. When checks are satisfactory, operate at minimum load and look for unusual condition. Increase load slowly to maximum. Check unit for satisfactory operation.

CAUTION

Guard against overloading. Overloading causes overheating and overheating means shortened insulation life. A motor subjected to a 10°C temperature rise above the maximum limit for the insulation may cause the insulation life to be reduced by 50%. To avoid overloading, be sure motor current does not exceed nameplate current when nameplate voltage is applied.

Electric motors operating under normal conditions become quite warm. Although some places may feel hot to the touch, the unit may be operational within limits. Use a thermocouple to measure winding temperature.

The total temperature, not the temperature rise, is the measure of safe operation. Investigate the operating conditions if the total temperature measured by a thermocouple placed on the windings exceeds:

230°F (110°C) for class “B” insulation
275°F (135°C) for class “F” insulation
302°F (150°C) for class “H” insulation

VOLTAGE REGULATION

Motors will operate successfully under the following conditions of voltage and frequency variation, but not necessarily in accordance with the standard established for operation under rated conditions:

1. When the variation in voltage does not exceed 10% above or below normal, with all phases balanced.
2. When the variation in frequency does not exceed 5% above or below normal.
3. When the sum of the voltage and frequency of the voltage does not exceed 10% above or below normal (provided the frequency variation does not exceed 5%).

MAINTENANCE

Failure to properly maintain the equipment can result in severe personal injury and product failure. The instructions contained herein should be carefully reviewed, understood and followed. The following maintenance procedures should be performed regularly:

1. Bearing lubrication (When regreaseable bearings are supplied)
2. Insulation resistance check
3. Cleaning

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ELECTRIC MOTORS, Cont.

This checklist does not represent an exhaustive survey of maintenance steps necessary to ensure safe operation of the equipment. Particular applications may require further procedures

Dangerous voltages are present in the equipment which can cause severe personal injury and product failure. Always de-energize and ground the equipment before maintenance. Maintenance should be performed only by qualified personal.

The use of unauthorized parts in the repair of the equipment, tampering by unqualified personal, or removal or alteration of guards or conduit covers will result in dangerous conditions which can cause severe personal injury or equipment damage. Follow all safety instructions contained herein.

BEARING LUBRICATION

(When regreaseable bearings are supplied)

CAUTION

Do not lubricate motor while in operation, since excess grease will be forced through the bearings and into the motor before it will force its way out the drain plug. Excess grease accumulation on windings reduces insulation life.

Prior to shipment, motor bearings are lubricated with the proper amount and grade to provide six months of satisfactory service under normal operation and conditions.

For best results, grease should be compounded from a polyurea base and a good grade of petroleum oil. It should be of No. 2 consistency and stabilized against oxidation. Operating temperature ranges should be from -15°F to +250°F for class B insulation, and to +300°F for class F and H. Most leading oil companies have special bearing greases that are satisfactory.

Relubricate bearings every six months (more often if conditions require), as follows:

1. Stop the motor. Lock out the switch.
2. Thoroughly clean off pipe plugs and remove from housings.
3. Remove hardened grease from drains with stiff wire or rod.
4. Add grease to inlet with hand gun until small amount of new grease is forced out drain.
5. Remove excess grease from ports, replace inlet plugs, and run motor ½ hour before replacing drain plug.
6. Put motor back in operation.

INSULATION RESISTANCE

Check insulation resistance periodically. Any approved method of measuring insulation resistance may be used, provided the voltage across the insulation is at a safe value for the type and condition of the insulation. A hand crank megger of not over 500 volts is the most convenient and safest method. Standards of the Institute of Electrical and Electronics Engineers, Inc., recommend that the insulation resistance of the stator windings at 75° C, measured at 500 volts dc, after one minute should not be less than:

$$\frac{\text{Rated Voltage of Machine} + 1000}{1000} = \text{Insulation Resistance in Megohms}$$

This formula is satisfactory for most checks. For more information, see IEEE Standard No. 43 “Recommended Practice for Insulation Resistance Testing of AC Rotating Machinery.”

CLEANING

WARNING

Do not attempt to clean the motor while it is operating. Contact with rotating parts can cause severe personal injury or property damage. Stop the motor and lock out switch before cleaning.

The motor exterior must be kept free of oil, dust, water, and chemicals. For fan cooled motors, it is particularly important to keep the air intake openings free of foreign material. Do not block air outlet or inlet.

On non-explosion-proof TEFC motors, a removable plug in the bottom center of the motor frame or housing permits removal of accumulated moisture. Drain regularly.

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MAINTENANCE / LUBRICATION

Gear units should have the oil changed every 2,500 hours or six months. If synthetic lubricant is used, it should be changed every 6,000 hours or 2 years. For adverse operating conditions, the interval should be shorter. **DO NOT MIX SYNTHETIC AND MINERAL BASE OILS.** Units should be checked periodically for increased noise, surface temperature, vibration, shaft movement and amperage draw. Units with inspection covers should not be operated with the inspection cover removed.

CAUTION

Oil should be changed more often if reducer is used in a severe environment. (i.e. dusty, humid)

TABLES 2 and **3** offer suggestions on the viscosity and manufacturers of recommended lubricants. Some gear lubricants contain E.P. additives that can be corrosive to gear bronze. Avoid lubricants that are compounded with sulfur and/or chlorine.

Always check for proper oil level after filling. Capacities vary somewhat with model and mounting position. Oil should rise to bottom edge of level hole. Do Not Overfill.

TABLE 2: APPROXIMATE OIL CAPACITY FOR GEAR DRIVES

GEARBOX MODEL	*PINTS*
218	1
220	1.5
224	1.75
226	3
230	3.75
232	5
242	8
252	13.5

Reducers ordered from the factory will be filled to the proper level with lubricant. After the installation of the breather plug, the unit is ready for use. Before installing the breather plug, refer to the instruction tag and determine the proper position according to reducer mounting specifications.

CAUTION

In the Food and Drug Industry (including animal food), consult the lubrication supplier for recommendation of lubricants which are acceptable to the Food and Drug Administration and/or other authoritative bodies having jurisdiction. Factory supplied oil is not suitable for these applications or this industry.

To assist you in the proper selection of replacement lubricant, we recommend the following oils for the ambient temperatures specified.

TABLE 3: RECOMMENDED LUBRICANTS

MANUFACTURER	*30° TO 100° F AMBIENT TEMPERATURE AGMA COMPOUND NO. 7*	*50° TO 125° F AMBIENT TEMPERATURE AGMA COMPOUND NO. 8*
Amoco Oil Co.	Worm Gear Oil	Cylinder Oil #680
Chevron USA, Inc.	Cylinder Oil #460X	Cylinder Oil #680X
Exxon Co. USA	Cylesstic TK-460	Cylesstic TK-680
Gulf Oil Co.	Senate 460	Senate 680D
Mobil Oil Corp.	600W Super Cylinder	Extra Hecla Super
Shell Oil Co.	Valvata Oil J460	Valvata Oil J680
Sun Oil Co.	Gear Oil 7C	Gear Oil 8C
Texaco	Honor Cylinder Oil	650T Cylinder Oil
Union Oil Co.	Steaval A	Worm Gear Lube 140

Note: For Temperature ranges not shown and synthetic lubrication, contact factory.

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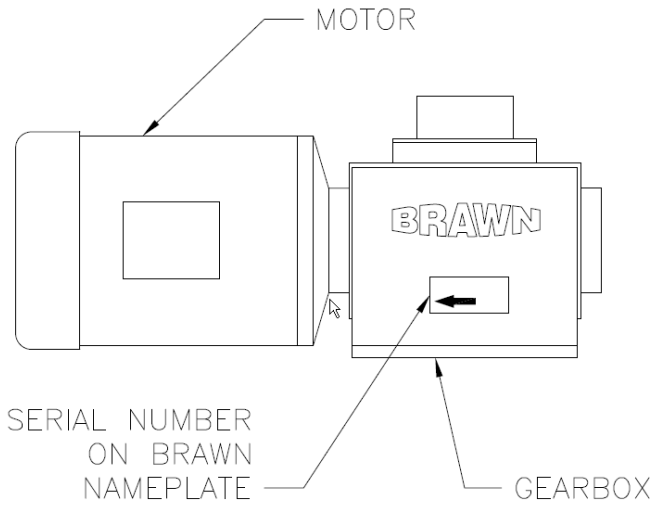
STORAGE

Units shipped from Brawn Mixer are intended to be used within 30 days after receipt and presumed to be stored indoors in a heated building. Store mixers as packaged by the factory. If you intend storing units under adverse conditions or for a long period of time, special storage precautions will be necessary.

1. Store in a sheltered area away from chemical vapors or steam.
2. Cover.
3. Do not store in sunlight or near high heat.
4. Spray oil on exposed shafts and seals. Remove oil on start-up.
5. Rotate output shaft 360º every 3-4 weeks.
6. Mixers should not be stored near vibrating machinery to avoid damage to the bearings.
7. If electric motors have been subjected to humid conditions, check the insulation resistance between phase and mass and between the different phases. The resistance should not be less than 100 megohms. If the resistance is less, please consult the factory



BWG SERIES MIXERS

BWG GEARBOX FEATURES

[SEE FIGURE ON PAGE 9]

1. **Rugged Cast Iron Housings** provide superior strength and rigidity.
   Generous Oil Capacity assures lower operating temperatures and maximum gear, bearing and seal life.

2. **Hardened and Precision-Ground Worms** are cut integral with the shaft. High helix angles provide the ultimate in efficiency and torque capacity.

3. **Cast Iron Bearing Covers** on the input shaft provide greater reliability when subjected to high start-up or reversing loads.

4. **Tapered Roller Bearings** provide greater overhung load and thrust capability, ensuring maximum life.

5. **Chill-Cast Bronze Gears** give you the long, trouble-free life and high quality you expect from Brawn Mixer drives.

6. **Output Oil Seal** keeps the lubricant in, contaminants out. Maintenance costs are reduced.

7. **Alloy Steel Output Shafts** provide extra strength for your rugged applications.

LUBRICATION

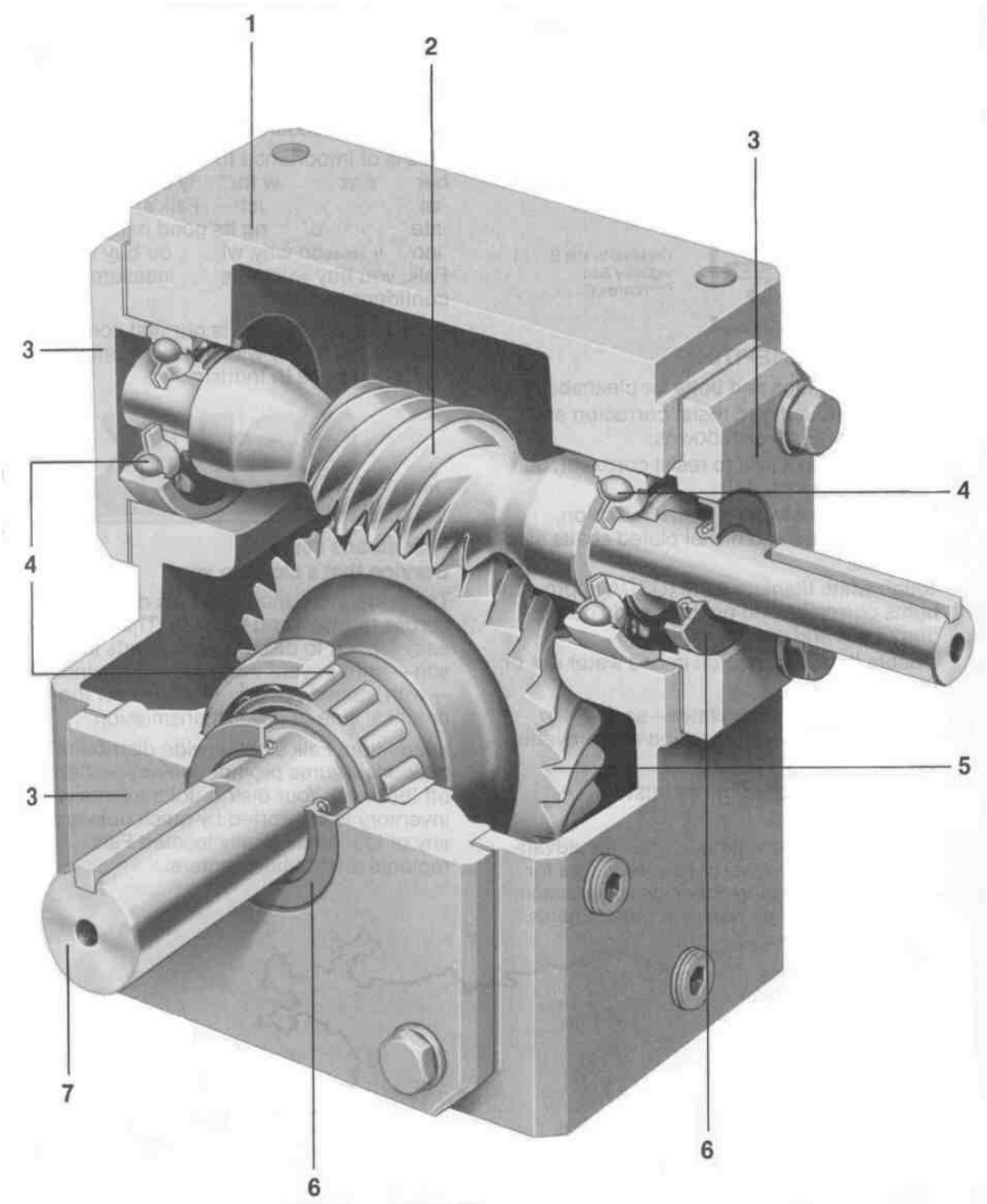
Splash Lubrication provides positive protection for gears and bearings.

Splash Guards are furnished to prevent oil from leaking through the vent.

MIXER NAMEPLATE

12838 Stainless Drive, Holland, MI 49424 **Phone: 616/399-5600 Fax 616/399-3084**

BWG GEARBOX FEATURES



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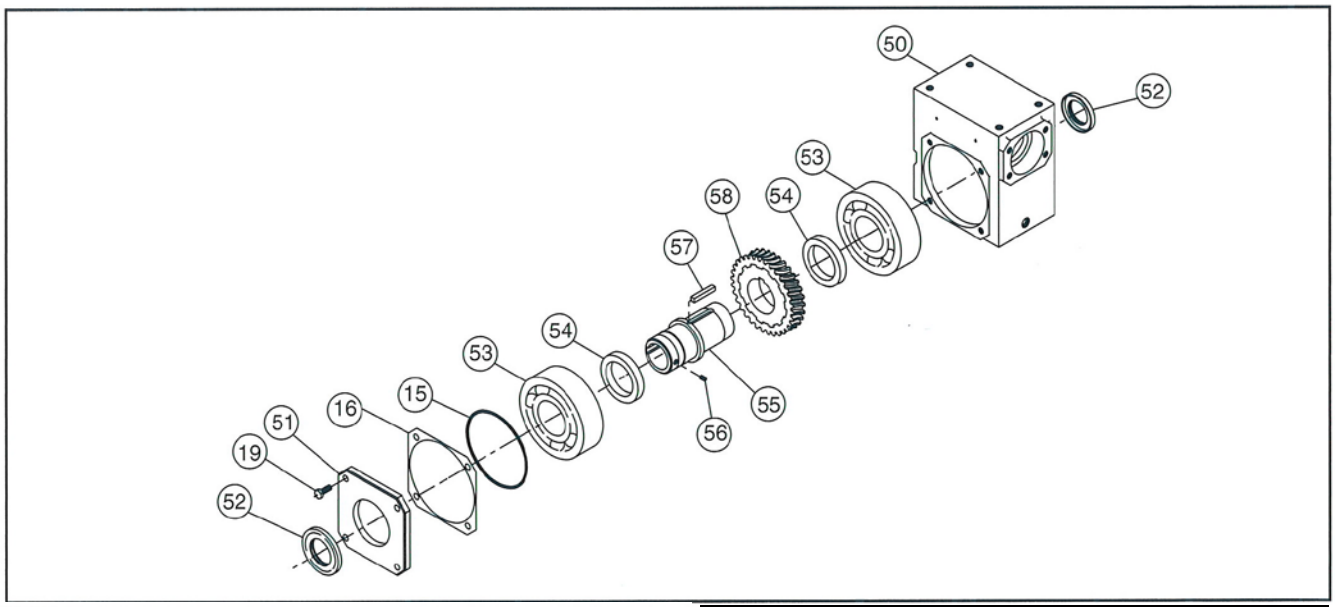
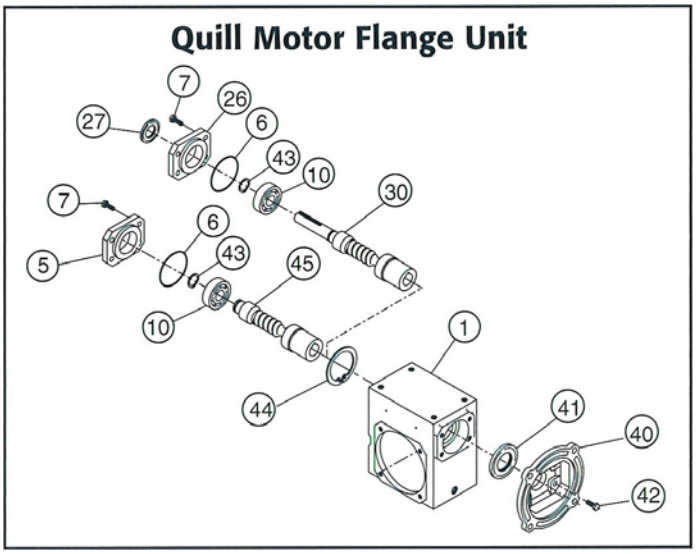
Hollow Output Shaft Unit



Quill Motor Flange Unit



ITEM #	DESCRIPTION
1	Gear Housing
5	Input Cover
6	*O-Ring
7	Hex Head Cap Screw
10	*Input Bearing
15	*O-Ring
16	*Output Cover Gasket (as required)
19	Hex Head Cap Screw
26	Input Cover
27	*Input Oil Seal
30	Double Input Shaft (or #45 per model)
40	Quill Motor Flange
41	*Input Oil Seal
42	Hex Head Cap Screw
43	Retaining Ring - Shaft
44	Retaining Ring - Housing
45	Quill Input Shaft (or #30 per model)
50	Gear Housing
51	*Output Cover Gasket (as required)
52	*Output Oil Seal
53	*Output Bearing
54	Gear Spacer
55	Output Shaft
56	Setscrew
57	Gear Key
58	Output Gear

* Recommended parts for gearbox rebuild

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WARRANTY

WARRANTY: All equipment or parts covered by this manual are guaranteed free from defective material and workmanship for a period of twelve (12) months from date of shipment, under normal use and service. This warranty does not cover failure of normal wear parts unless the failure of such part has resulted from defective material and workmanship. BRAWN Mixer will repair or replace, at its option, any equipment which has been found to be defective and is within the warranty period, provided that the equipment is shipped, with previous factory authorization, freight prepaid, to BRAWN's plant in Holland, Michigan, USA. All return shipments are made FOB BRAWN's factory. BRAWN is not responsible for removal, installation, or any other incidental expenses incurred in shipping the equipment to or from BRAWN. In the case of components purchased by BRAWN Mixer and incorporated in the equipment, the component manufacturer's guarantee shall apply. NOTE: Any modifications or corrective work done to the equipment which were not specifically authorized in writing by BRAWN Mixer shall void this limited warranty, and BRAWN Mixer shall accept no liability for any of the corrective work or expenditures which were conducted without their prior, written authorization. BRAWN Mixer shall not be held liable for any further cost, expense, or labor to replace equipment or replaceable parts, or indirect or consequential damages.

With the exceptions of the limited warranty set out above, there are no other understandings, agreements, representatives, or warranties implied (including any regarding the merchant-ability or fitness for a particular purpose), not specified herein, respecting this agreement or equipment, hereunder. This contract states the entire obligation of BRAWN Mixer in connection with this transaction.

SHOULD WE MAKE A MISTAKE...

BRAWN Mixer's Direct Returns Policy

To ensure proper handling of your return, please take a moment to read the following:

- **ALL** returns require a **RETURN GOODS AUTHORIZATION (RGA) NUMBER**. We are unable to process your return or issue proper credit without an approved **RGA** number.
- **ALL** returns must be **COMPLETE**, including all original warranties, manuals, documentation and packaging.
- **ALL** product must be received within 14 days of issuing an **RGA** number.

How to Return Product

You must have a **RETURN GOODS AUTHORIZATION (RGA)** number before you return any product to BRAWN Mixer. To obtain this number, call **616/399-5600** and ask for Customer Service. Be sure to have available the following information:

- ✓ your order number
- ✓ the BRAWN product serial number
- ✓ the part number and description of the product
- ✓ the reason for the return

♦ I M P O R T A N T ♦

The Return Goods Authorization number must be written clearly on all boxes being returned. C.O.D. shipments will not be accepted.

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AN NBE COMPANY