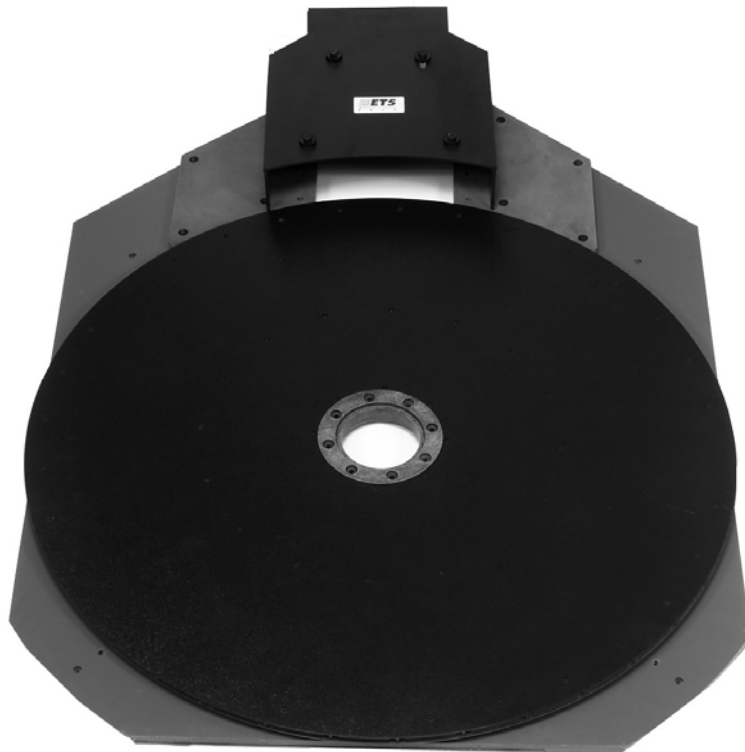


Model 2165
LoPro™ Turntable
1.2-Meter
User Manual



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Revision Record

MANUAL,INSTAL,MODEL 2165 LoPro TURNTABLE | Part #399791, Rev. C




Revision	Description	Date
A	Initial Release	January, 2007
B	<ul style="list-style-type: none">• Updated Turntable Encoder Calibration• Added Waste Electrical and Electronic Equipment (WEEE) Directive	February, 2007
C	Rebrand	July, 2008

Table of Contents

- Notes, Cautions, and Warnings v**
- 1.0 Introduction 7**
 - Standard Configuration..... 7
 - Turntable Assembly..... 7
 - Optional Items..... 8
 - Infrared Remote Controller 8
 - Shaft Kit 9
 - ETS-Lindgren Product Information Bulletin 9
- 2.0 Maintenance 11**
 - Recommended Maintenance Schedule 11
 - Monthly 11
 - 6-Month Service 12
 - 12-Month Service 12
 - Cleaning the Bearing Races..... 12
 - Replacement and Optional Parts..... 13
 - Service Procedures 13
- 3.0 Specifications..... 15**
 - Electrical Specifications..... 15
 - Physical Specifications 15
- 4.0 Turntable Installation Considerations..... 17**
 - Before You Begin—Precautions..... 17
- 5.0 Electrical Installation 19**
- 6.0 Assembly and Installation..... 21**
 - Required Tools 21
 - Assembly Instructions..... 21
- 7.0 Optional Shaft Kit Installation Instructions 23**
 - Components 23
 - Required Tools 24
 - Determine Shaft Length..... 24
 - Assemble Drive Shaft 24
 - Install Shaft Housing..... 25
 - Install Drive Shaft 25
 - Connect Shaft to Motor Drive 26

Cut Drive Shaft Assembly.....	27
Cut Shaft Housing	28
8.0 Operation.....	29
Appendix A: Warranty	31
Appendix B: Drawings.....	33
Appendix C: EC Declaration of Conformity	35

Notes, Cautions, and Warnings

	<p>Note: Denotes helpful information intended to provide tips for better use of the product.</p>
	<p>Caution: Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.</p>
	<p>Warning: Denotes a hazard. Failure to follow instructions could result in SEVERE personal injury and/or property damage. Included text gives proper procedures.</p>



See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

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1.0 Introduction

The **ETS-Lindgren Model 2165 LoPro™ Turntable** is an electric-powered, variable-speed turntable platform system designed for use with the Model 2090 Multi-Device Controller (or next generation ETS-Lindgren controller, if applicable) for EMI compliance testing. The Model 2165 is a low-profile design constructed of PVC plate with a textured ABS top and other non-metallic components. The 1.2-meter diameter turntable is an easily assembled system that can be disassembled for service or to be moved. The mechanical assembly, motor drive unit, and shaft kit (optional) comprise the three basic subassemblies of the turntable.

The mechanical assembly is shipped assembled with the top, base, gearbox, support bearings, and drive belt. The bearings on which the turntable rotates are integral to the top and bottom of the table. Three independent bearing races provide support for the inner and outer portions of the turntable top. These bearings are of a completely non-metallic construction. There are four keepers located on the outside of the turntable top that prohibit the bearings from shifting out of position during shipment. When the table is in place and ready to begin testing, the keepers should be removed.

The motor drive, encoder, and limit switch assemblies are located in a shielded enclosure with state-of-the-art I/O provided by a fiber optic interface. The motor drive is coupled to the drive shaft with a flexible hose coupling. The other end of the shaft connects to the turntable gearbox with a keyed coupling that clamps between the two shafts. The shaft assembly transmits torque from the motor drive to the gearbox at the table. The drive belt runs around the underside of the turntable at its perimeter, and is driven by a pulley in the gearbox.

Turntable rotation is limited by the soft, or electrical, limits that are set on the front panel of the controller.

There is a 1 cm (0.40 in) vertical x 2.54 cm (1.0 in) horizontal slot on the bottom side of the turntable base that can be used to run 3/8-in maximum diameter cable from the side and up through the center opening of the turntable.

Standard Configuration

TURNTABLE ASSEMBLY

Featuring continuous or non-continuous operation, the turntable assembly includes:

- Single-phase electric drive (208-230 VAC 50/60 Hz)
- Variable-speed drive

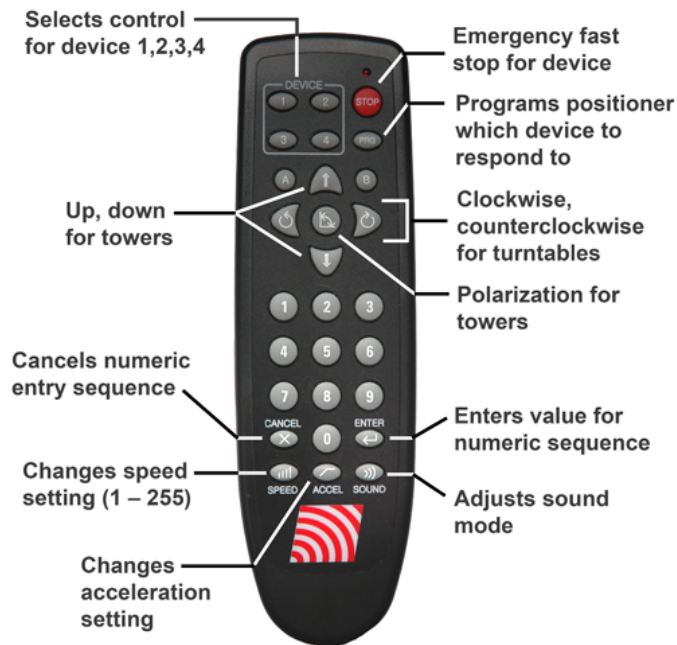
- Conductive top
- Continuous rotation
- 10-meter fiber optic control cable
- Fiber optic shield penetration kit

Additionally, the turntable is infrared compatible, and can be used with an optional ETS-Lindgren Infrared Remote Controller (IR remote). For more information on using an IR remote, see *Infrared Remote Controller* on page 8.

Optional Items

INFRARED REMOTE CONTROLLER

The Model 2165 is infrared compatible, and can be used with a universal remote control programmed to a specific protocol, such as the ETS-Lindgren Infrared Remote Controller (IR remote).



SHAFT KIT

This option allows the electric drive motor to be positioned farther from the turntable. The extension shaft separates the turntable and the drive motor by as much as 5 m (16.4 ft). Steps to cut it to a custom length are included in *Optional Shaft Kit Installation Instructions* on page 23.



The shaft kit option must be specified at the time the turntable order is placed.

ETS-Lindgren Product Information Bulletin

See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Warranty information
- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS Lindgren calibration service
- ETS Lindgren contact information

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2.0 Maintenance

WARNING

Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



Regularly inspect all equipment and conduct scheduled maintenance in accordance with the factory recommendations provided.



BEFORE SERVICING: CONTACT ETS-LINDGREN (+1.512.531.6400)—Servicing or modifying the unit without ETS-Lindgren authorization may void your warranty. If an attempt to service the unit must be made, disconnect all electrical power prior to beginning. Voltages exist at many points within the instrument that could, if contacted, cause personal injury. Only trained service personnel should perform adjustments and/or service procedures upon this instrument. Capacitors inside this instrument may still be charged even when the instrument is disconnected from the power source.

Recommended Maintenance Schedule

Regular maintenance will prolong the effective operation and reliability of your turntable. Follow the recommended schedule for monthly, 6-month, and 12-month service.

CAUTION

Do not perform maintenance while the turntable is operating.

MONTHLY

- Inspect the turntable assembly for loose fasteners, abnormal wear, and oil leaks.
- Verify the accuracy of the current position setting on the ETS-Lindgren controller in relation to the turntable. If the turntable always rotates in the same direction, over time the 0-degree position may drift. To reset the current position, see the controller manual.

6-MONTH SERVICE

- Check all parts for wear.
- The drive belt is furnished fully tensioned, but after usage the belt may need to be tightened. To remove slack in the belt, loosen the six bolts on the gearbox, move it outward, and then re-tighten. See *Drawing 5* and *Drawing 11* located in the back pocket of this manual.

12-MONTH SERVICE

- Thoroughly inspect the unit for wear.
- Grease the plastic miter gears with a silicone grease lubricant.
- Clean the bearing races to remove any dust or dirt that may have accumulated. For instructions, see the next section.

Cleaning the Bearing Races

To clean the bearing races, remove the turntable top as follows:

1. Remove the eight bolts at the center ring to remove the center plate/flange that holds down the turntable.
2. If keepers are installed at the four corners of the assembly, remove the bolts that hold the four keepers in place, and then remove the keepers.
3. Expose the bearing races by gently lifting the turntable top and placing it to the side.
4. Remove the bearings. Carefully place them in a secure location.
5. Use a clean rag moistened with water to clean the races. No lubrication is necessary in the tracks.
6. When complete, replace the bearings. Alternate the delrin bearings (white) and nylon bearings (tan tint) to improve wear characteristics. Gently replace the turntable surface. Insert the plate/flange in the center and tighten the eight bolts that secure it. If desired, reinstall the four keepers.

Replacement and Optional Parts

Following are the part numbers for ordering replacement or optional parts for the Model 2165 LoPro™ Turntable.

Part Description	Part Number
2165 turntable assembly	2165
Motor base assembly	109896
Tie bracket	105728
Standoff (2)	890508
1/2–13 x 3/4-in hex bolt	910551
1/4-in x 1 1/4-in hex bolt	910449
Hose clamp	890684
Hose coupling	860204
Fiber optic cable	705344-10
Shaft Kit	106555
IR Remote Controller	707030

Service Procedures

For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

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3.0 Specifications

Electrical Specifications

Nominal AC Voltage:	208–230 VAC
Input Frequency:	50/60 Hz
Current Rating:	3 A
RPM:	0.5 – 2.5
Phase:	Single
Motor Horsepower:	1/4 HP

Physical Specifications

Turntable Diameter:	1.2 m (3.94 ft)
Nominal Height:	5 cm (1.97 in)
Nominal Load Capacity:	273 kg (601.86 lb)
Nominal Max Diameter:	1.2 m (3.94 ft)
Top Construction:	One-piece PVC
Distributed Load Rating:	273 kg (600 lb)



Distributed Load Rating applies when:

- Load is evenly distributed on top;
- No point loads under 0.19 sq m (2.0 sq ft) should exceed 100 kg (220 lb);
- And not over 28.5 kg (62.8 lb) should be applied to a 45-degree segment at the table outer edge.

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4.0 Turntable Installation Considerations

WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

Before You Begin—Precautions



Read this manual completely before starting installation. This equipment should be installed and operated only by qualified personnel.

Do not attempt to service unless qualified to do so. As with any electrical equipment, make sure unit electrical power has been disconnected and secured when performing scheduled maintenance or adjustments.



Do not make any modifications to this unit without consulting the factory directly.

Regularly inspect all equipment for loose fasteners and wear. Conduct scheduled maintenance in accordance with the factory recommendations provided.

Only use replacement parts and fasteners ordered directly from the factory.



Stay clear of all moving components on this equipment.

Do not operate turntable while someone is physically on the turntable top.



Do not, at any time, place hands or feet in the vicinity of the drive pinion on the turntable.

CAUTION

The fiber optic cable must be looped through the P-clip installed on the front panel of the motor base. Failure to do so increases the chance of the accidentally pulling cable and breaking the fiber optic connectors.

The keepers on the outside edge of the turntable should be in place when the turntable is to be moved or relocated. This will prevent damage to the bearings on which the turntable top rotates.

5.0 Electrical Installation

WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.

CAUTION

Electrical installation must be performed by a qualified electrician, and in accordance with local and national electrical standards.



Make sure the power is off and secured before proceeding.

Determine the mains voltage to be applied to the motor base unit. The branch circuit supplying power to the motor base should be protected from excess current according to local electrical codes. Confirm that the conductor size is adequate for the motor load with respect to the distance from the mains source. Improperly-sized conductors will lead to a high voltage drop in the power conductors and cause reduced starting torque. This condition could lead to premature motor failure.

CAUTION

Keep all body parts away from the drive gears and drive belt when the turntable is energized. Do not operate the turntable with the protective guards removed.

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6.0 Assembly and Installation

WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



Prior to assembly and installation, review the drawings located in the back pocket of this manual.

The Model 2165 LoPro™ Turntable is shipped partially assembled, and additional assembly is estimated to take a maximum of one hour. Make sure a clear area is available to unpack, assemble, and install the turntable. Prior to assembly, open the shipping container and check all parts for any shipping damage.



Do not discard any packing material until the turntable is fully installed and operational.

Required Tools

- Level
- Adjustable wrench
- Phillips screwdriver and flat head screwdriver
- Shims, if the floor surface is not level

Assembly Instructions

CAUTION

Make sure power is off and secured before proceeding.

1. Position the turntable mechanical assembly on the floor. The turntable mechanical assembly has a 44-in (112-cm) base plate that must rest on a flat surface. For proper alignment of the drive shaft, the bottom surface of the turntable mechanical assembly, the drive shaft assembly, and the motor drive assembly must all be installed at the same level. If the floor is not flat, it may be necessary to place shims under the base. The turntable will stay in place due to its own weight, but the base plate provides four holes used to fasten the unit to the floor with 5/16-in diameter screws.

2. After the turntable is in position, remove the plastic gearbox cover plate by loosening the four plastic bolts holding it in place.



If you are installing the shaft kit, disregard the remainder of the instructions in this section and skip to *Optional Shaft Kit Installation Instructions* on page 23.

3. Install the aluminum shaft adapter onto the black shaft from the turntable gearbox. Use the 1/4-in phenolic (brown plastic) pin to key it to the black shaft. A spacer piece fits inside the shaft adapter and between the adapter and phenolic pin to secure the pin into place.
Two 8–32 set screws lock the adapter into place onto the shaft.
4. Slip the gray hose coupling with the two hose clamps onto the shaft adapter.
5. An aluminum bracket holds the motor drive to the turntable base. The bracket attaches to the 3/4-in base plate of the turntable using two 1/2–13 x 3/4-in bolts. Two standoffs attach the bracket to the motor base at the correct distance.
6. Position the motor drive so the shaft slips into the hose coupling. The bracket installed in step 5 should now be in place. Secure the bracket to the motor base using the provided 1/4-in x 1 1/4-in hex head cap screws. Tighten both hose clamps to secure the gray hose coupling around the shafts.
7. Place the gearbox cover on the gearbox, and then insert and tighten the four bolts.

7.0 Optional Shaft Kit Installation Instructions

WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



If you are not installing the shaft kit, disregard the instructions in this section and skip to *Operation* on page 29.

The shaft kit allows the motor base to be positioned up to 5 m (16.4 ft) from the turntable. The drive shaft assembly includes an inner shaft mounted in an outer housing supported in the center and at each end by plastic floor supports.

This section provides assembly information for the shaft and instructions to cut the shaft components if a shorter distance between the motor base and turntable is required. Following is an overview of steps:

1. Determine shaft length—see page 24.
 - Cut drive shaft assembly (may not be required)—see page 27.
 - Cut shaft housing (may not be required)—see page 28.
2. Assembly drive shaft—see page 22.
3. Install shaft housing—see page 25.
4. Install drive shaft—see page 25.
5. Connect shaft to motor drive—see page 26.

Components

Part	Quantity
Shaft sections	2
Shaft coupler	1
1/4–20 self-tapping screws	4
End floor supports, with a single clamp for a single item	2
Mid-floor support, with a double clamp for two items	1
Shaft housings, 4.5-in diameter	2
White bushings, one for each end of the shaft housing assembly and one for the center between the two shaft housing components	3

Required Tools

In addition to the tools for basic installation, these additional tools are required:

- Tape measure
- Drill
- Assorted bits, including 7/32
- Hand or reciprocating saw
- Marker
- File/sandpaper

Determine Shaft Length

To install the shaft kit, determine the **DIM1** dimensions as shown on *Drawing 4* located in the back pocket of this manual. This is the distance from the center of the turntable top to the end of the drive shaft floor support.

If **DIM1** needs to be shorter than the standard 5 m (16.4 ft), you must cut the drive shaft assembly to the proper length before attaching it to the turntable. See *Cut Drive Shaft Assembly* on page 27 for complete instructions.



No cutting is required if the standard length is acceptable for installation. However, the shaft must be the correct length before proceeding.

Assemble Drive Shaft



See *Drawing 8* located in the back pocket of this manual.

To assemble the two sections (section **A** and section **B**) of the drive shaft using the provided coupling: Insert the 6.0-cm (2.37-in) diameter plain ends of the shaft sections into the coupling all the way to the step. Match drill the shaft sections through the four pre-drilled holes in the coupling and install the four 1/4–20 self-tapping screws provided.

Install Shaft Housing

1. Assemble one of the two PVC outer shaft housings into one of the two end floor supports. The floor supports are split into a top and bottom half that clamp together. Loosen the top 1/2–13 hex nuts to separate these two split pieces. Insert one white bushing followed by the end of one housing into the floor support. Tighten the two top nuts to clamp the floor supports around the housing and bushing.
2. Install the housing assembly onto the base plate of the turntable mechanical assembly using two 1/2–13 x 1.5-in hex bolts inserted through the tie plate. Make sure the housing is square with the turntable base for proper shaft alignment.



If **DIM1** is 3035 mm (9.9 ft) or less, the mid-floor support is not required. Skip to *Install Drive Shaft* on page 25.

If **DIM1** is more than 3035 mm (9.9 ft), the mid-floor support is required.

3. If the mid-floor support is required, assemble the mid-floor support with a white bushing onto the end of the shaft housing. Make sure the housing is square with the turntable base for proper drive-shaft alignment after final assembly.

Install Drive Shaft

The drive shaft has two reduced ends. Make sure the 2.69-cm (1.06-in) diameter end with the groove goes toward the turntable. The knurled 2.54-cm (1.0-in) diameter end should point toward the motor drive.



The coupling on the drive shaft will not fit through the white bushing if a mid-floor support is used. The coupling should be on the motor drive side of the mid-floor support when the drive shaft is installed into the housing.

1. Insert the turntable end of the drive shaft through the housing assembly and into the clamp coupling on the gearbox. A 1/4-in diameter x 1-in long dowel pin is furnished to key the shaft to the coupling and prevent slipping.

2. Loosen the three 3/8–16 hex head screws on the gearbox coupling before insertion. Place the 1/4-in diameter x 1-in long dowel pin into the groove of the drive shaft, and line the shaft and pin up with the groove in the coupling. With everything aligned, push the shaft and pin into the coupling. Leave approximately a 1/4-in gap between the 6.01-cm (2.37-in) diameter shaft shoulder and the end of the coupling. Slowly tighten the three screws on the coupling.
3. If the mid-floor support was not required because **DIM1** was less than 3035 mm (9.9 ft), skip to step 5. Otherwise, continue to the next step.
4. If the second shaft housing is required, slip it around the shaft, into the mid-floor support, and then clamp it in place. Only the one bushing that was installed previously is needed in this support. There should be one remaining bushing, and that will be used in the next step.
5. Install the remaining bushing and mid-floor support onto the motor drive end of the shaft housing. Guide the 2.54-cm (1-in) diameter end of the shaft through the white bushing. The end of the shaft should stick out of the bushing approximately 5.08 cm (2.0 in). Make sure the housing extends out square with the base of the table for proper alignment.

Connect Shaft to Motor Drive

1. Install the hose coupling onto the steel shaft of the motor drive unit. The two hose clamps provided should rest loosely around the hose.
2. Position the motor drive on the floor and slide the unit into place with the hose coupling connecting both shafts. Bolt the aluminum tie bracket into place, and install one hose clamp onto the steel drive shaft and one onto the plastic shaft.
3. Fasten the floor supports and motor drive unit to the floor using 5/16-in diameter screws through the mounting holes in the bottom base of the shaft supports and motor drive.
4. Reinstall the gearbox cover using four 3/8-16 x 1-in hex screws. Be careful not to over-tighten the plastic bolts.
5. If desired, cables can be run along a slot under the base of the turntable, up and through the opening at the center of the table. The slot is 1 cm (0.40 in) deep and 2.54 cm (1 in) wide. It should accept a cable up to 3/8-in diameter.

Cut Drive Shaft Assembly

The inner drive shaft is shipped separate from the turntable and consists of the following:

- **Drive shaft section (A)**—2.37-in diameter x 82 in long, with a grooved 1.06-in diameter end for the turntable side
- **Drive shaft section (B)**—2.37-in diameter x 72 in long, with a knurled 1.0-in diameter end for the motor drive side
- **Shaft coupling**—with 1/4–20 self-tapping screws for joining the two shaft sections

Follow these steps to cut the shaft to the desired length. The material is PVC and can be cut with a hand or reciprocating saw with a 6-in blade length.

1. Determine the distance **DIM1** from the center of the turntable to the mounting holes in the floor support next to the motor drive unit. This **DIM1** dimension is critical in determining the length of the drive shaft and shaft housing. See *Determine Shaft Length* on page 24 for more information.
2. Determine the required total length of the drive shaft after section A and section B are connected with the coupling.
3. Subtract 978 mm (38.5 in) from **DIM1** in step 1 for the total overall length of the shaft.
4. Subtract 6.3 mm (0.25 in) for the total combined cut length of section A and section B. The coupling will add 6.3 mm (0.25 in) to the shaft length after the two sections are assembled.
5. Divide the total cut length in step 4 in half. Cut shaft B longer than shaft A as described:
 - Add three inches to the half length, and mark shaft A to this length. Measure from the 1.0-in diameter end.
 - Subtract three inches from the half length, and mark shaft B to this length. Measure from the 1.06-in diameter end.

This will offset the coupling three inches from the center after it is assembled.



Make sure to measure and mark each section from the small end, not the plain end. The length of section A (on the turntable side) should be at least 150 mm (6 in) longer than section B (on the motor side).

6. Place the shaft sections side by side to double check the length from small end to small end. Offset the cut marks 6.35 mm (0.25 in) for the coupling. If the length is accurate, cut the shaft pieces to length at the marks.
7. De-burr the cut ends before installing them in the coupling.
8. Install the plain end of each shaft into the coupling all the way to the step. The total overall length should be close to the length calculated in step 3.

Cut Shaft Housing

9. Cut the shaft housing(s) next:
 - If **DIM1** in step 1 on page 27 was 3035 mm (9.9 ft) or less, then the mid-floor support is not required. One housing is required. Continue to step 10.
 - If **DIM1** is more than 3035 mm (9.9 ft), then the mid-floor support is required. Two housings are required. Continue to step 11.
10. Determine the total length of the shaft housing. One housing is required. Subtract 4.75 inches from the overall length of the assembled shaft in step 3 on page 27. Cut one of the two housings to this length, $\pm 1/16$ inch. Discard the unused housing and mid-floor support, and skip to step 12.
11. Determine the total combined length of the two shaft housings. Two housings are required with the mid-floor support. Subtract 5.75 in from the overall length of the assembled shaft to get the combined length of the housings. Cut each housing to one-half this length, $\pm 1/16$ inch. After cutting the first housing, determine the required length for the second to equal the total combined length.
12. The shaft housing pieces should now be ready to assemble. See *Assemble Drive Shaft* on page 24.

8.0 Operation

WARNING

Before placing into operation, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

With the assembly of the turntable complete, the Model 2090 Multi-Device Controller (or next generation ETS Lindgren controller, if applicable) must be connected to the unit and power applied to both the motor base and controller. See the controller manual for complete information on connecting the fiber optic cable and operating the controller. A manual is included with each controller and is also available for download from www.ets-lindgren.com.

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Appendix A: Warranty



See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your ETS-Lindgren Model 2165 LoPro™ Turntable.

DURATION OF WARRANTIES FOR MODEL 2165

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to two years.

Product Warranted	Duration of Warranty Period
ETS-Lindgren Model 2165 LoPro™ Turntable	2 Years

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Appendix B: Drawings



Your Model 2165 LoPro™ Turntable may vary slightly from the following drawings.

See these drawings located in the back pocket of this manual:

- Drawing 1
- Drawing 2
- Drawing 3
- Drawing 4
- Drawing 5
- Drawing 6
- Drawing 7
- Drawing 8
- Drawing 9
- Drawing 10
- Drawing 11

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Appendix C: EC Declaration of Conformity

The EC Declaration of Conformity is the method by which ETS-Lindgren L.P. declares that the equipment listed on this document complies with the EMC Directive and Low Voltage Directive.

Factory

ETS-Lindgren, L.P.
P.O. Box 80589
Austin, Texas USA 78708-0589

Issued by

ETS-Lindgren, L.P.
P.O. Box 80589
Austin, Texas USA 78708-0589

The products listed below are eligible to bear the CE mark:

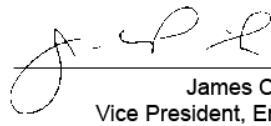
– Model 2165 Turntable with 2165-style motor base

APPLICABLE REQUIREMENTS

<u>Standard</u>	<u>Criteria</u>
EN 55011	Group 1, Class B
EN 61000-4-2:1995	Level 2/3 (4/8 kV)
EN 61000-4-3:1997	Level 2 (3 V/m)
EN 61000-4-4	Level 2 (1/0.5k V)
ENV 50204:1996	Level 2 (3 V/m)
EN 61000-4-5:1995	Level 3 (2/1 kV)
EN 61000-4-11:1994	2 kV
EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use

AUTHORIZED SIGNATORIES


Bryan Sayler,
General Manager

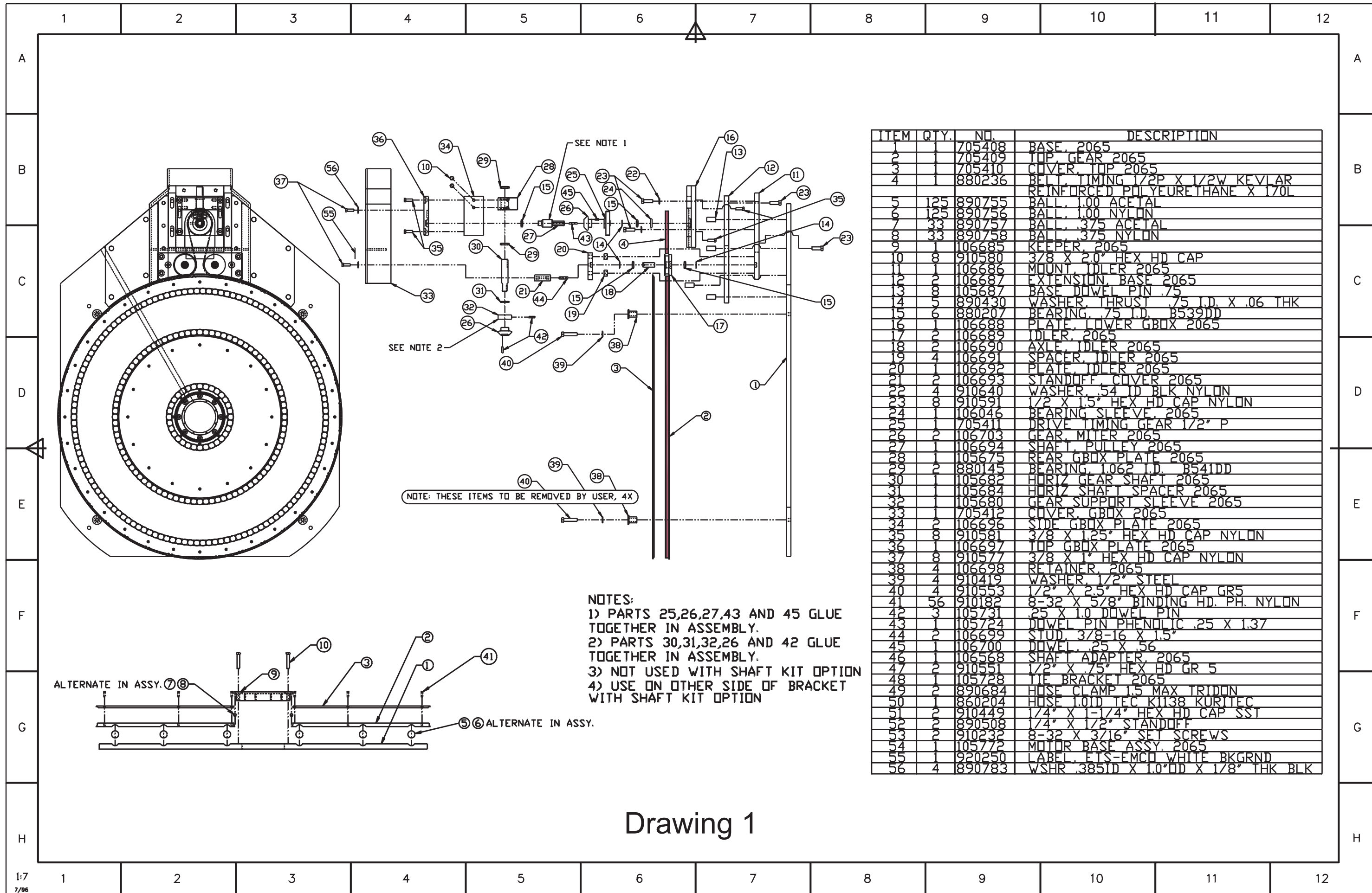

James C. Psencik,
Vice President, Engineering


Charles Garrison,
Quality Assurance

November 07, 2005

Date of Declaration

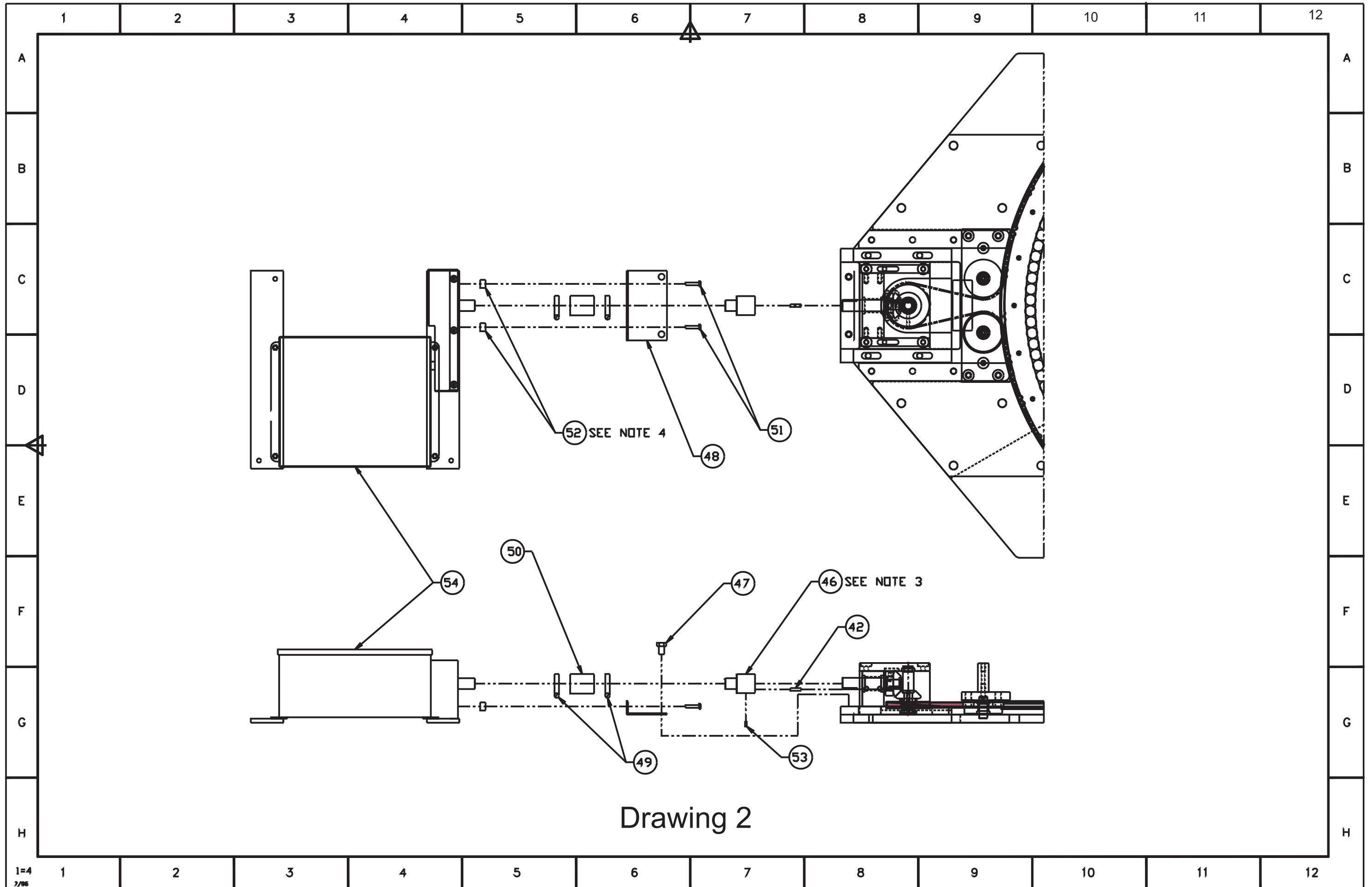
The authorizing signatures on the EC Declaration of Conformity document authorize ETS-Lindgren, L.P. to affix the CE mark to the indicated product. CE marks placed on these products will be distinct and visible. Other marks or inscriptions liable to be confused with the CE mark will not be affixed to these products. ETS-Lindgren, L.P. has ensured that appropriate documentation shall remain available on premises for inspection and validation purposes for a period of no less than 10 years.



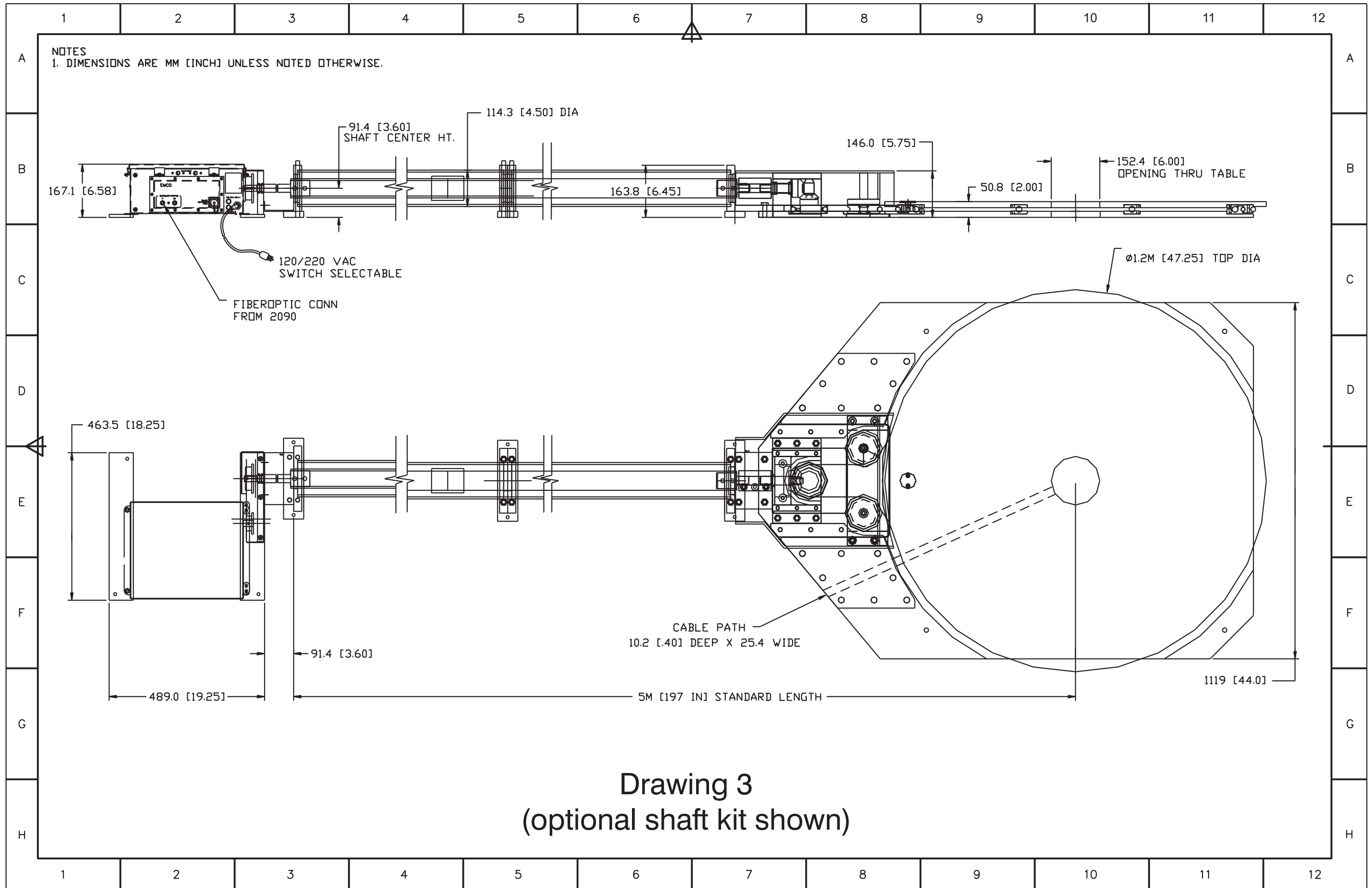
ITEM	QTY.	NO.	DESCRIPTION
1	1	705408	BASE, 2065
2	1	705409	TOP GEAR 2065
3	1	705410	COVER, TOP 2065
4	1	880236	BELT, TIMING 1/2" P X 1/2" W KEVLAR REINFORCED POLYURETHANE X 170L
5	125	890755	BALL, 1.00 ACETAL
6	125	890756	BALL, 1.00 NYLON
7	33	890757	BALL, .375 ACETAL
8	33	890758	BALL, .375 NYLON
9	1	106685	KEEPER, 2065
10	8	910580	3/8 X 2.0" HEX HD CAP
11	1	106686	MOUNT, IDLER 2065
12	2	106687	EXTENSION, BASE 2065
13	8	105687	BASE DOWEL PIN .75
14	5	890430	WASHER, THRUST .75 I.D. X .06 THK
15	6	880207	BEARING, .75 I.D. B539DD
16	1	106688	PLATE, LOWER GBOX 2065
17	2	106689	IDLER, 2065
18	2	106690	AXLE, IDLER 2065
19	4	106691	SPACER, IDLER 2065
20	1	106692	PLATE, IDLER 2065
21	2	106693	STANDOFF, COVER 2065
22	4	910640	WASHER, .54 ID BLK NYLON
23	8	910591	1/2 X 1.5" HEX HD CAP NYLON
24	1	106046	BEARING SLEEVE, 2065
25	1	705411	DRIVE TIMING GEAR 1/2" P
26	2	106703	GEAR, MITER 2065
27	1	106694	SHAFT, PULLEY 2065
28	1	105675	REAR GBOX PLATE 2065
29	2	880145	BEARING, 1.062 I.D. B541DD
30	1	105682	HORIZ GEAR SHAFT 2065
31	1	105684	HORIZ SHAFT SPACER 2065
32	1	105680	GEAR SUPPORT SLEEVE 2065
33	1	705412	COVER, GBOX 2065
34	2	106696	SIDE GBOX PLATE 2065
35	8	910581	3/8 X 1.25" HEX HD CAP NYLON
36	1	106697	TOP GBOX PLATE 2065
37	8	910577	3/8 X 1" HEX HD CAP NYLON
38	4	106698	RETAINER, 2065
39	4	910419	WASHER, 1/2" STEEL
40	4	910553	1/2" X 2.5" HEX HD CAP GR5
41	56	910182	8-32 X 5/8" BINDING HD. PH. NYLON
42	3	105731	.25 X 1.0 DOWEL PIN
43	1	105724	DOWEL PIN PHENOLIC .25 X 1.37
44	2	106699	STUD, 3/8-16 X 1.5"
45	1	106700	DOWEL, .25 X .56
46	1	106568	SHAFT ADAPTER, 2065
47	2	910551	1/2" X .75" HEX HD GR 5
48	1	105728	TIE BRACKET 2065
49	2	890684	HOSE CLAMP 1.5 MAX TRIDON
50	1	860204	HOSE 1.00" TEC K1138 KURITEC
51	2	910449	1/4" X 1-1/4" HEX HD CAP SST
52	2	890508	1/4" X 1/2" STANDOFF
53	2	910232	8-32 X 3/16" SET SCREWS
54	1	105772	MOTOR BASE ASSY. 2065
55	1	920250	LABEL, ETS-EMCO WHITE BKGRND
56	4	890783	WSHR .385ID X 1.0"OD X 1/8" THK BLK

NOTES:
 1) PARTS 25,26,27,43 AND 45 GLUE TOGETHER IN ASSEMBLY.
 2) PARTS 30,31,32,26 AND 42 GLUE TOGETHER IN ASSEMBLY.
 3) NOT USED WITH SHAFT KIT OPTION
 4) USE ON OTHER SIDE OF BRACKET WITH SHAFT KIT OPTION

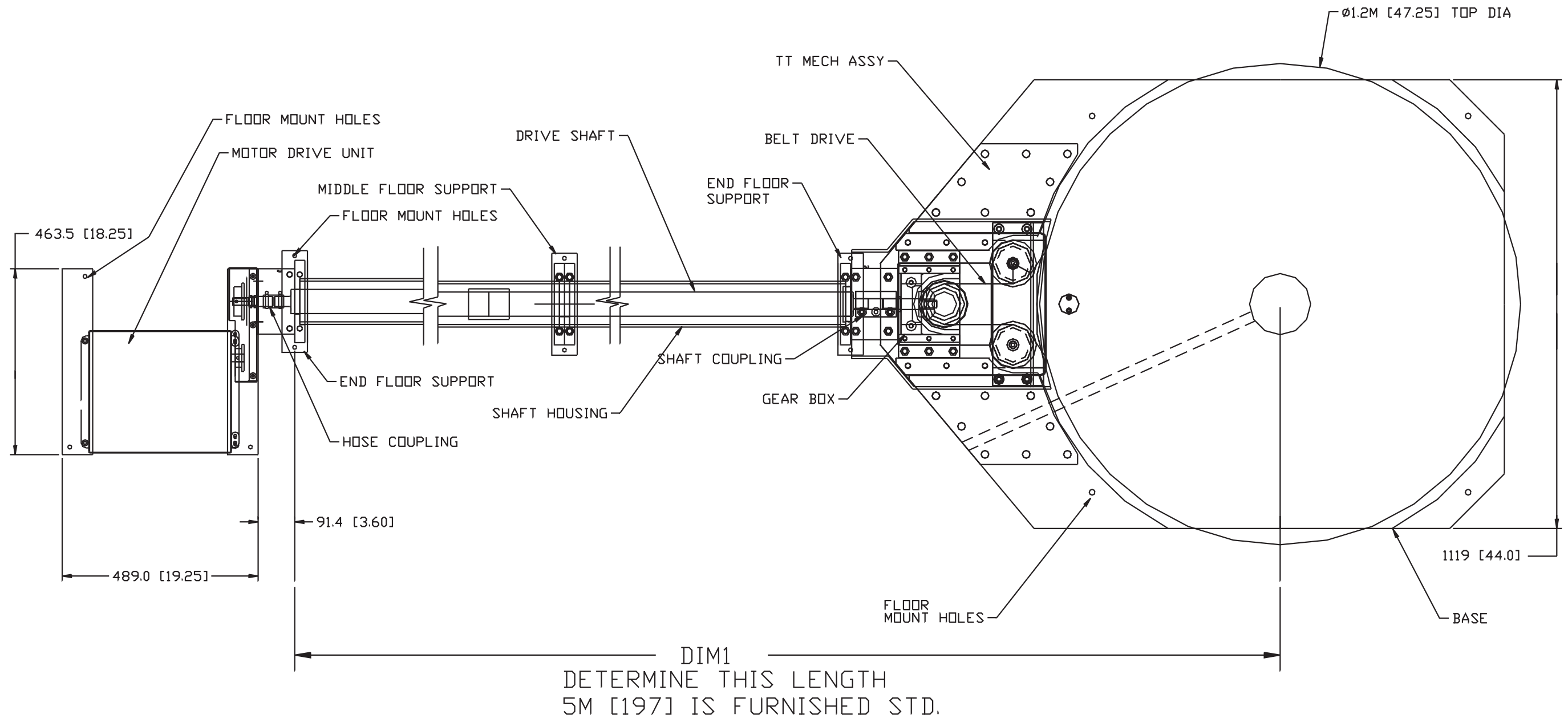
Drawing 1



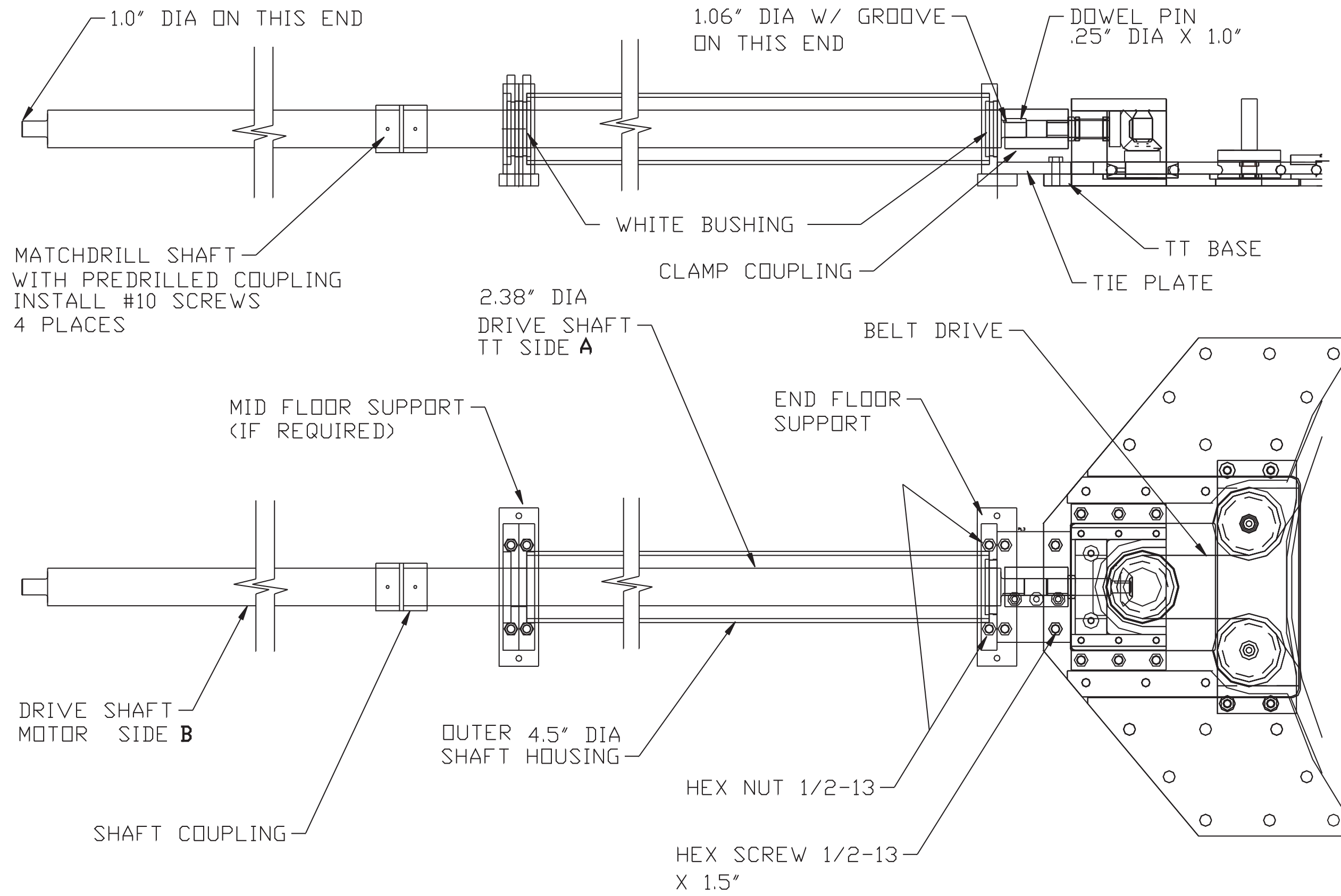
Drawing 2



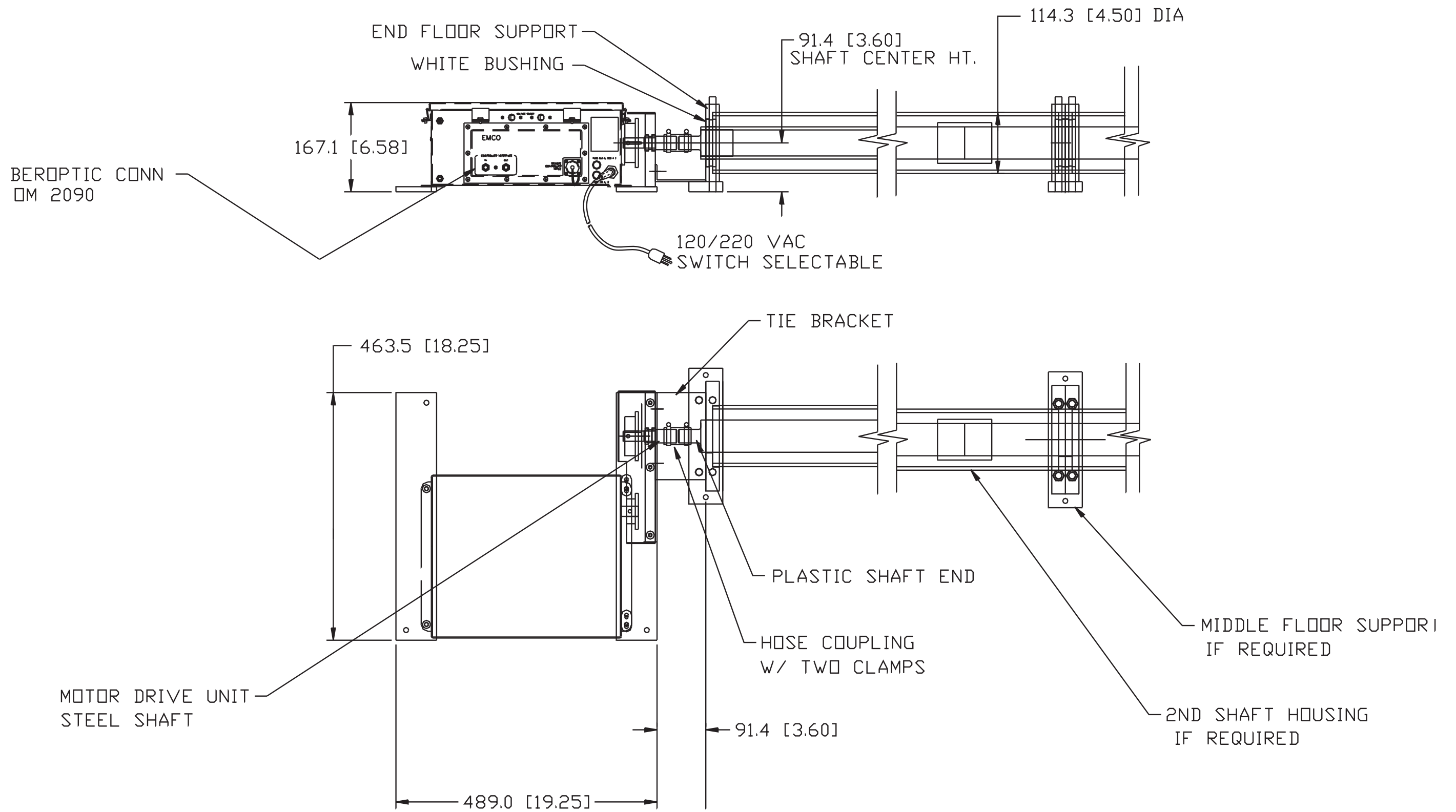
Drawing 3
(optional shaft kit shown)



Drawing 4
 (optional shaft kit shown)

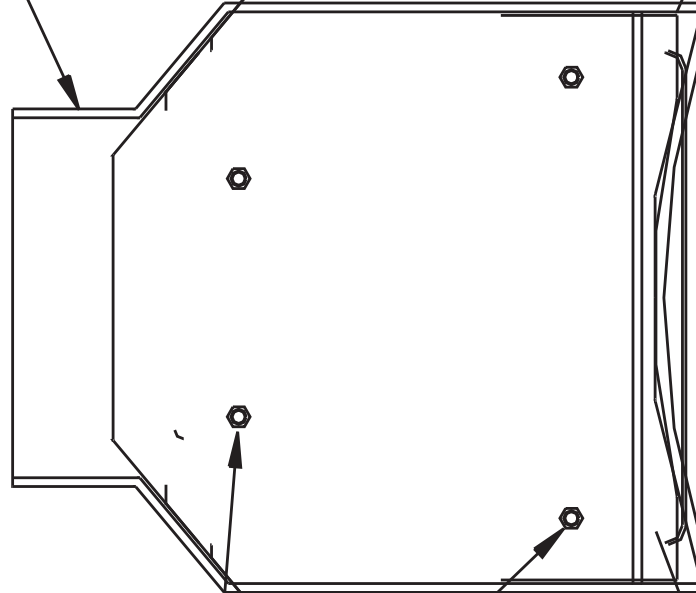


Drawing 5
(optional shaft kit shown)

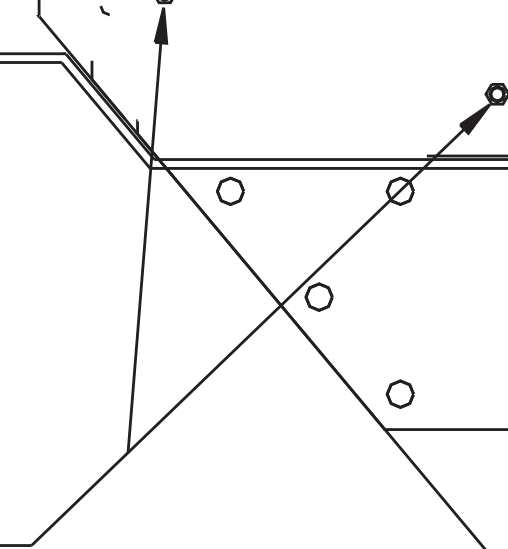


Drawing 6
 (optional shaft kit shown)

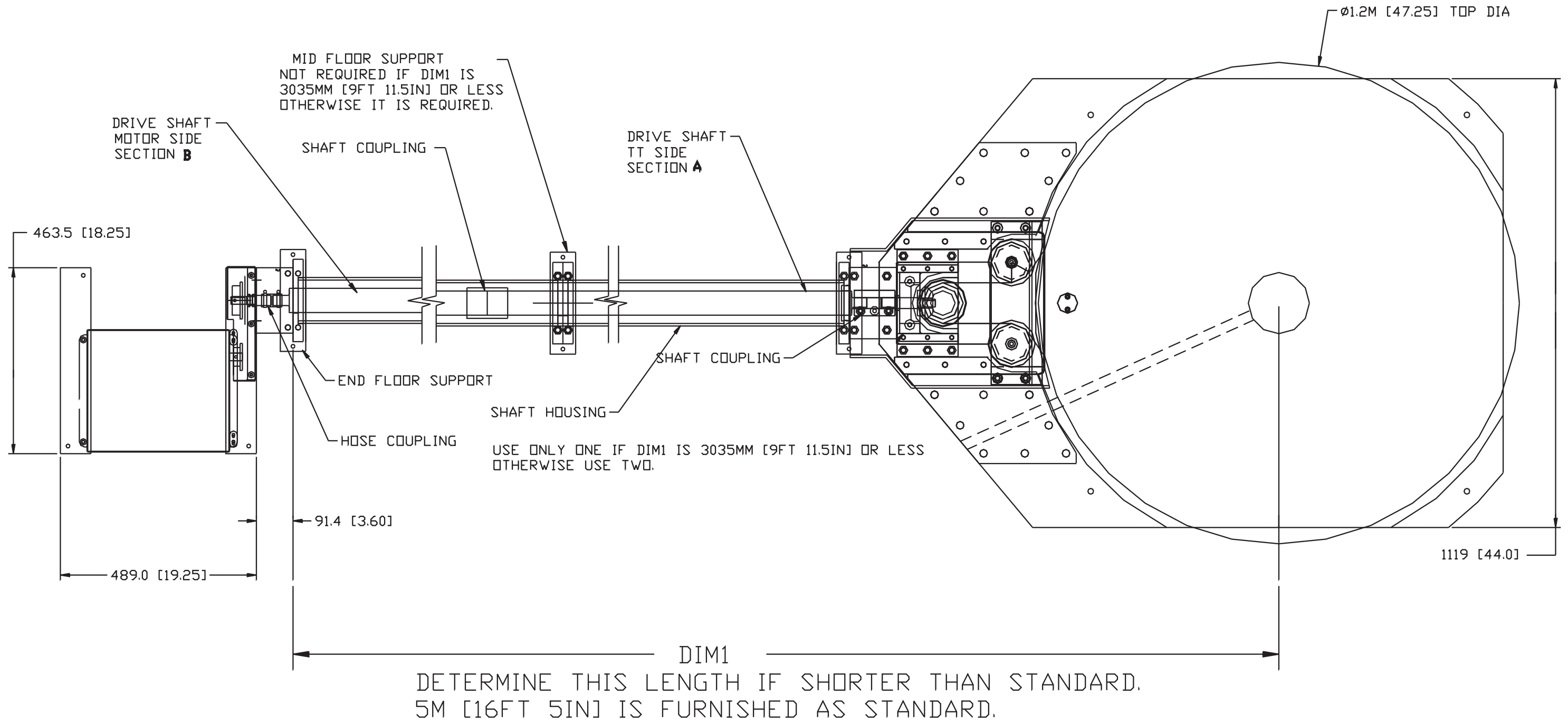
GEARBOX COVER



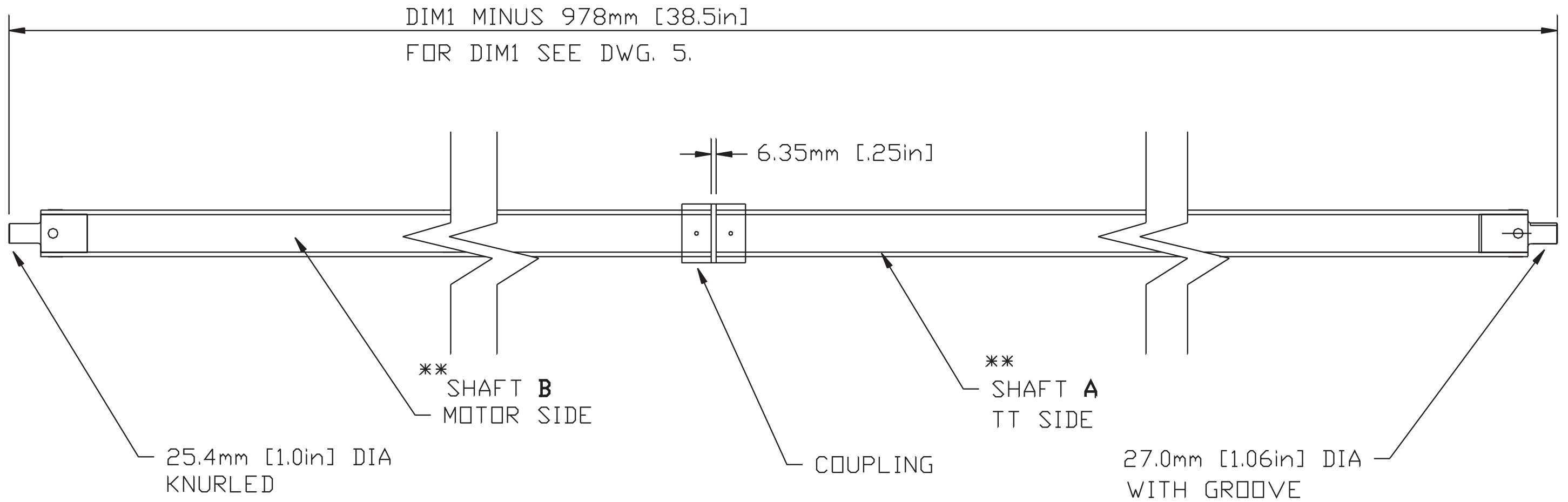
PLASTIC
3/8-16 X 1.0" HEX SCREW
4 PLACES



Drawing 7

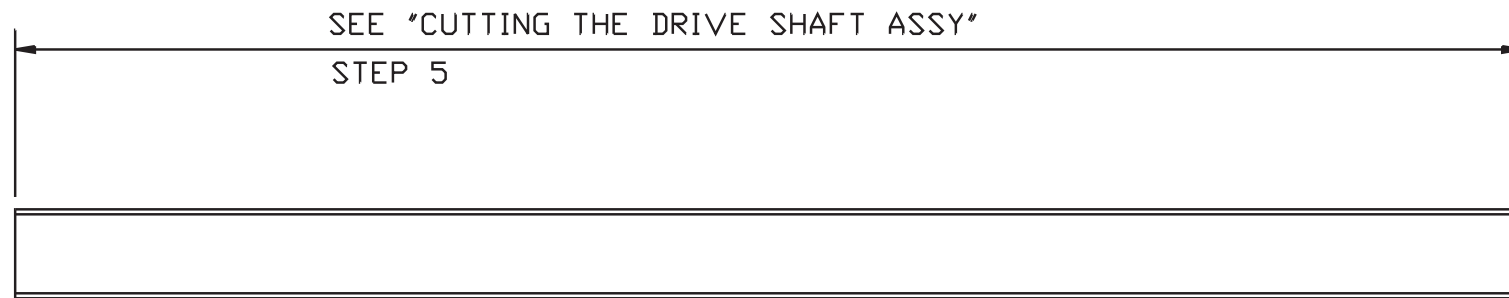


Drawing 8
 (optional shaft kit shown)

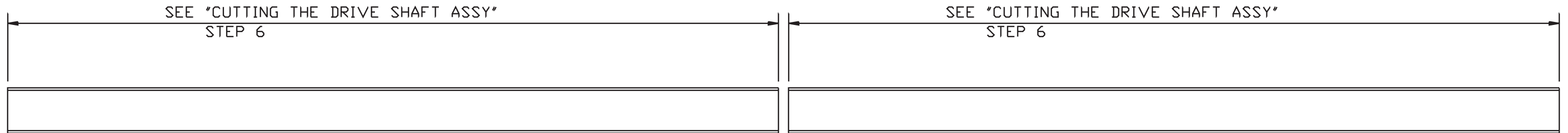


** CUT SHAFT A 150MM [6.0IN] LONGER THAN B

Drawing 9
 (optional shaft kit shown)

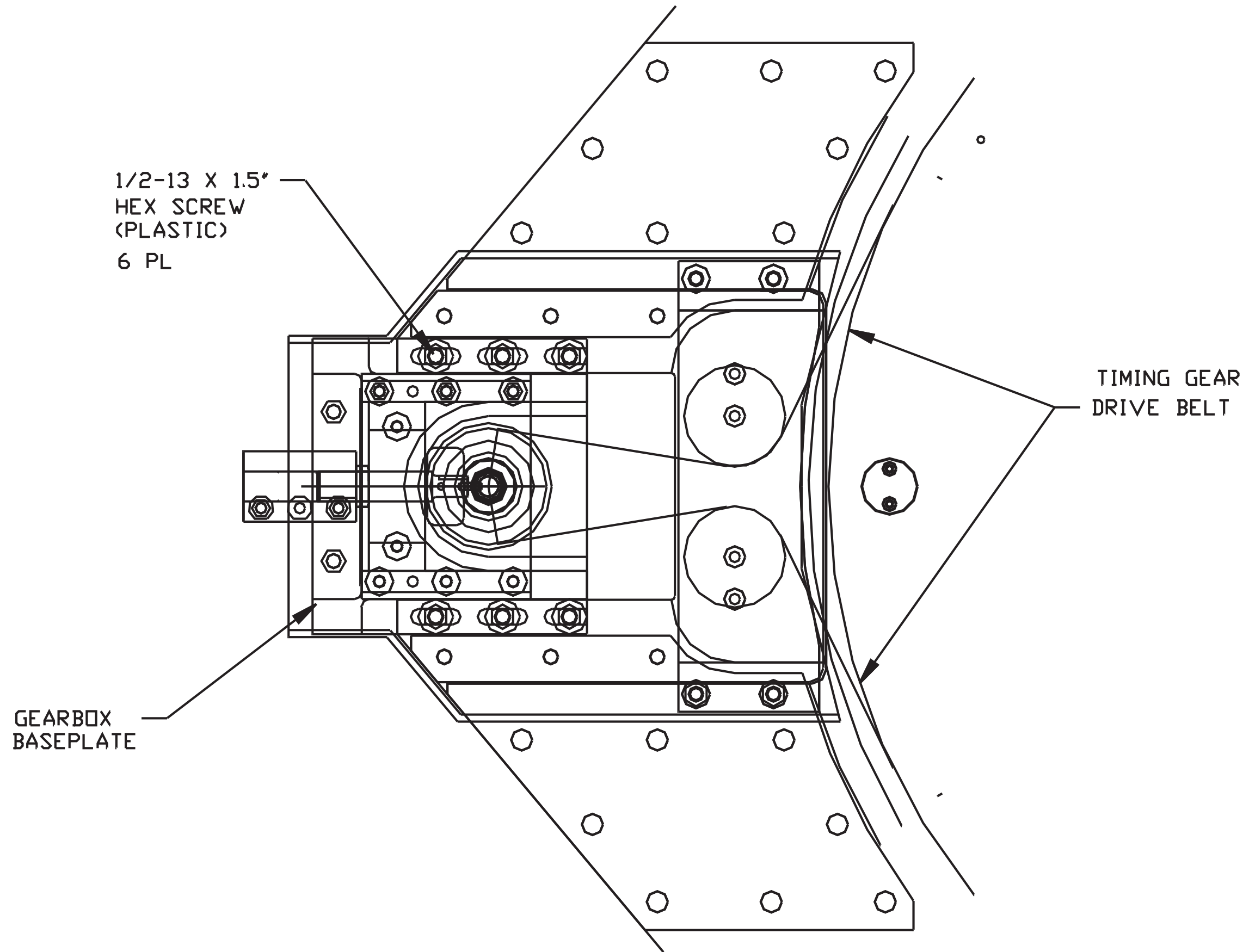


IF DIM1 ON DWG 5 IS 3035MM [9FT 11.5IN] OR LESS
USE ONE HOUSING ONLY



IF DIM1 ON DWG 5 IS MORE THAN 3035MM [9FT 11.5IN]
USE TWO HOUSINGS CUT EQUAL LENGTH ABOVE

Drawing 10
(optional shaft kit shown)



Drawing 11