



**brookfield industries, inc.**  
99 West Hillside Ave  
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[www.bfimfg.com](http://www.bfimfg.com)

## **NB-4150 Sliding Door Operator**

### **Description:**

The **NB-4150** Sliding Door Operator (**Single Slide**) is designed and tested for lead shielding doors weighing in excess of 100,000 lbs that require a maximum operating force of up to **1800 lbs** at maximum speeds of 8.5 inches per second. The **NB-4150** can be modified for **Bi-Parting** applications, providing the operating force on each door does not exceed **900 lbs** (*supplemental drawings available upon request*). The **NB-4150** could also be used on lighter doors that are beyond the capabilities of other sliders in our product line. This is accomplished with a linear drive system comprised of a 3" wide XH polyurethane steel reinforced timing belt coupled to a 3hp AC, high torque, in-line helical gear motor.

The **NB-4150** is designed to be used in conjunction with an existing linear track system capable of supporting heavy doors with a low coefficient of friction. The open ended style timing belt clamps directly to the top of the door. Once the timing belt has been properly aligned and pre-loaded, in addition to the motor control parameters being correctly set, the **NB-4150** will provide many years of maintenance free service.

The PLC (Programmable Logic Control) is programmed by the manufacturer to accept input signals from an external (4) button station (including open, partial open, close and stop commands). Additional I/O (input/output) are featured with the **NB-4150** to accommodate inputs from infrared presence sensors and pressure sensitive tape switches that will either stop or reverse the door to the open position, when activated in the closing cycle. All input commands to the PLC are class 2 (low voltage). There are no limit or proximity switches to adjust or install. Simply adjust the door's positioning presets as required by interfacing with the PLC via a hand held Data Access Unit (purchased separately).

The **NB-4150 Commercial/Industrial Sliding Door** is compliant with **UL 325 Section 30.2 External Entrapment Protection (Fail Safe/Self-Monitoring)** providing all External Safety Devices are wired and installed per this manual.

### **Rating a Sliding Door Operator:**

The rating of a sliding door operator in any particular installation cannot be based solely on the weight of the door. Other factors such as linear bearing alignment, coefficient of friction, and acceleration/deceleration rates may have a substantial affect on the total axial force acting on the door operator components. We have factored these variables into the **Rated Maximum Operating Forces**. This assures the customer they are getting the most dependable product at a reasonable cost over the life expectancy of the operator.

Maximum Operating Force* =	<b>1800 lbs (8010 N)</b>
Maximum Rated Linear Speed =	<b>8.5 in/sec (21.6 cm/sec)</b>
Door Weight	<b>&gt;100,000 lbs (45,400 kg)**</b>
Minimum Rated Cycles =	<b>500,000 openings and closings</b>
Maximum Travel =	<b>Unlimited</b>

\*The maximum horizontal force acting on the timing belt assembly in order to accelerate the mass of the door to the maximum operating speed and to overcome friction and any misalignment.

\*\* Providing the Maximum Operating Force has not been exceeded.



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### Specification:

- 1) **Supply voltage:** 208/230 VAC 50/60 Hertz 3 phase. In-Line circuit breakers supplied with motor control and PLC. Surge protection, line filters, and EMI ferrites shall be included.
- 2) **Current Consumption:** maximum 12 amperes per phase
- 3) **PLC/Logic Control:**
  - a) Shall be a PLC with sufficient I/O and a CPU (Central Processing Unit) with adequate memory, response times, and scanning rates in order to properly control the motion and positioning of Linear Accelerator Sliding Doors.
  - b) Outputs commands shall be the internal type, integral with the PLC. No external limit or proximity switches shall be allowed for control of door positioning.
  - c) A means to interface with the PLC for adjusting preset values for the open, partial open, closed, latch check and back check positions.
  - d) Diagnostics and troubleshooting of the PLC shall be provided with LED and modular plug-in components.
  - e) The PLC shall be provided with an internal battery to store the door position presets in the CPU memory.
- 4) **Absolute position feedback control:** this assures the CPU always knows the door's position. During installation, a power interruption, or if electrical noise is encountered, the door is not required to be "homed", "reset" nor go through a "learn speed cycle" at any time. Also, limit or proximity switches are not required for controlling the door's position.
- 5) **Motor:** 3hp 208-230VAC 3 phase motor (50/60 Hz) 1800 RPM TEFC
- 6) **Motor Control:** adjustable frequency drive to provide variable speed control for standard 3 phase AC motors with the following functions:

FWD/REV maximum speed	FWD/REV current limit	motor overload protection
FWD/REV accel/decel	2.5% speed regulation	60:1 speed range.
- 7) **Speed Control:** a means of controlling independent forward and reverse speeds as well as controlling end of travel or latch check/back check speeds. This can be accomplished externally with speed/trim pots or internally with the PLC.
- 8) **Drive train:** shall be designed to assure each component (including motor, gear reducers, belt material and structural parts) from the motor to the door attachment point is properly "sized" in order to transfer all operating torques and forces as defined for Linear Accelerator Sliding Doors.
- 9) **Enclosure:** NEMA 1 vented enclosure of sufficient size (24" x 20 x 6-5/8") to house the PLC, motor control, speed pots, and terminal strip hookups. Enclosure shall have separate penetrations for supply voltage, safety sensors, push buttons, motor and positioning transducer hookups. All penetrations shall be drilled for 3/4" conduits or the equivalent metric size for European installations.
- 10) **Raw Materials:** ASTM A36, AISI 1018 cold rolled steel, Aluminum 6061-T6511, Structural tubing ASTM A- 500, grade 5 bolting or better.
- 11) **Mounting hardware:** the NB-4150 shall be mounted with grade 5 diameter bolts with compatible washers and lock washers. Hardware must also be properly tightened with adequate thread engagement.
- 12) **Finish:** all exposed metal surfaces shall be prime painted.
- 13) **Functionality test:** each NB-4150 is cycle tested in position for 24 hrs. prior to shipment. Each unit is checked for leaks and that all I/O are functioning properly.
- 14) **Installation:** Please refer to the **NB-4150 Door Operator Manual, Installation instructions** and Drawings: NB-4150-11, NB-4150-12, NB-4150-13, NB-4150-14, NB-4150-16 and NB-4150-21

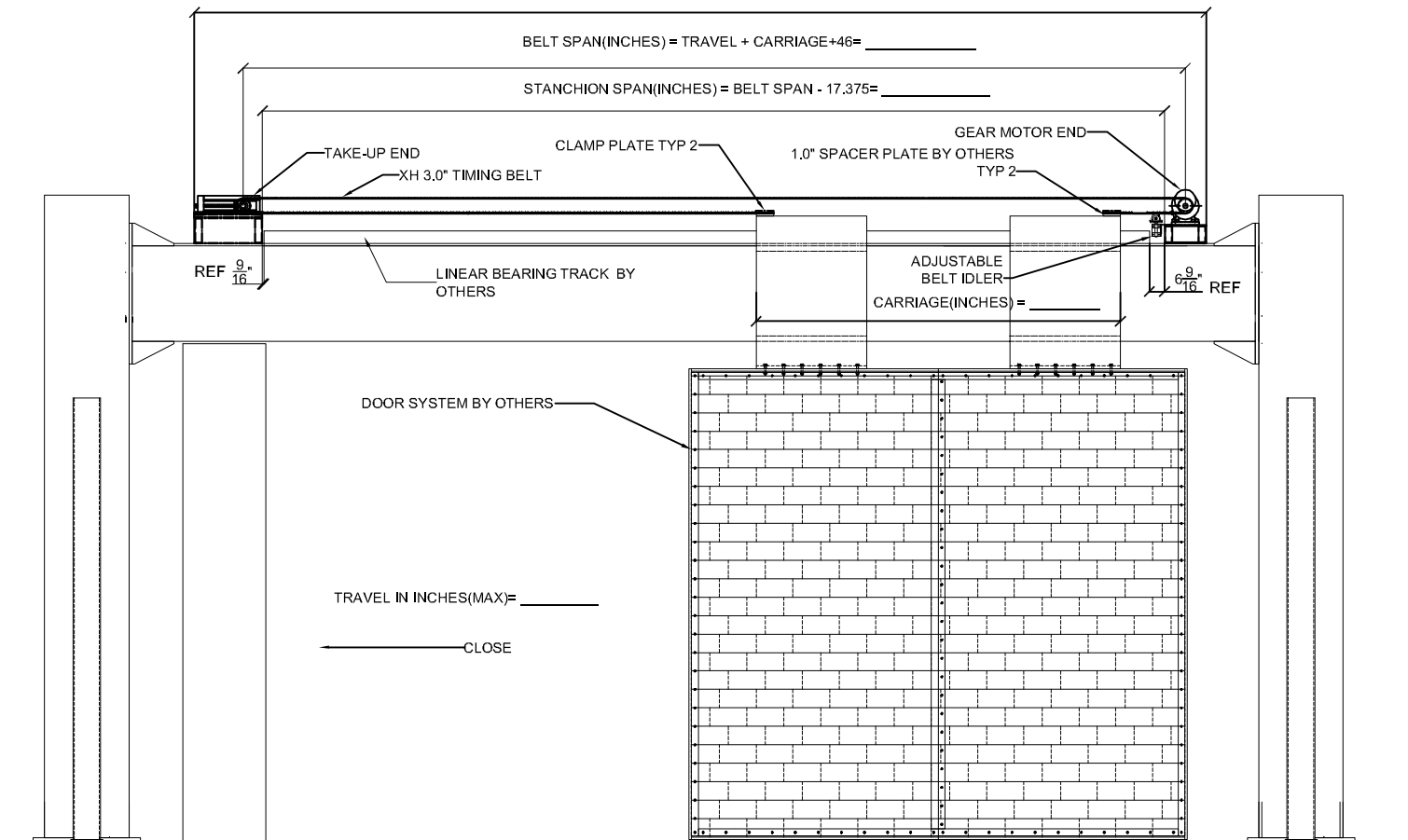
RevNo	Revision note	Date	Signature	Checked
1	ADD BELT IDLER & MAKE TRAVEL GENERIC	2/5/10	KPK	

NB-4150

OVERALL(INCHES)= BELT SPAN + 30.125 = \_\_\_\_\_

BELT SPAN(INCHES) = TRAVEL + CARRIAGE+46= \_\_\_\_\_

STANCHION SPAN(INCHES) = BELT SPAN - 17.375= \_\_\_\_\_



Drawing Notes:

Tolerances

Decimal + / - 1/16 UNO

Fractional + / - .xxx

Angular + / - .xxx

NB-4150 INSTALLATION DRAWING

Drawn by KPK  
Checked by XXX

FULL ELEVATION VIEW

Edition 0

Approved by - date  
XXX - 00/00/00

Filename

Date  
5/13/08

Scale  
1:1

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NB-4150-II

NB-4150 IN OPEN POSITION  
(GEAR MOTOR END)

XH x 3.0" CLAMP  
PLATE

1.0" SPACER  
BY OTHERS

BELT IDLER

LINEAR BEARING TRACK  
BY OTHERS

6  $\frac{9}{16}$ " REF.

SHIM BELT PARALLEL  
TO TRACK (+/-  $\frac{1}{16}$ )

DOOR SYSTEM  
BY OTHERS

1' - 4  $\frac{7}{16}$ "

Drawing Notes:

Tolerances	
Decimal	+ / - 1/16 UNO
Fractional	+ / - .xxx
Angular	+ / - .xxx

NB-4150 INSTALLATION DRAWING

Drawn by KPK  
Checked by XXX

ELEVATION AT GEAR MOTOR END

Edition 0

Approved by - date  
XXX - 00/00/00

Filename

Date  
5/13/08

Scale  
1:1

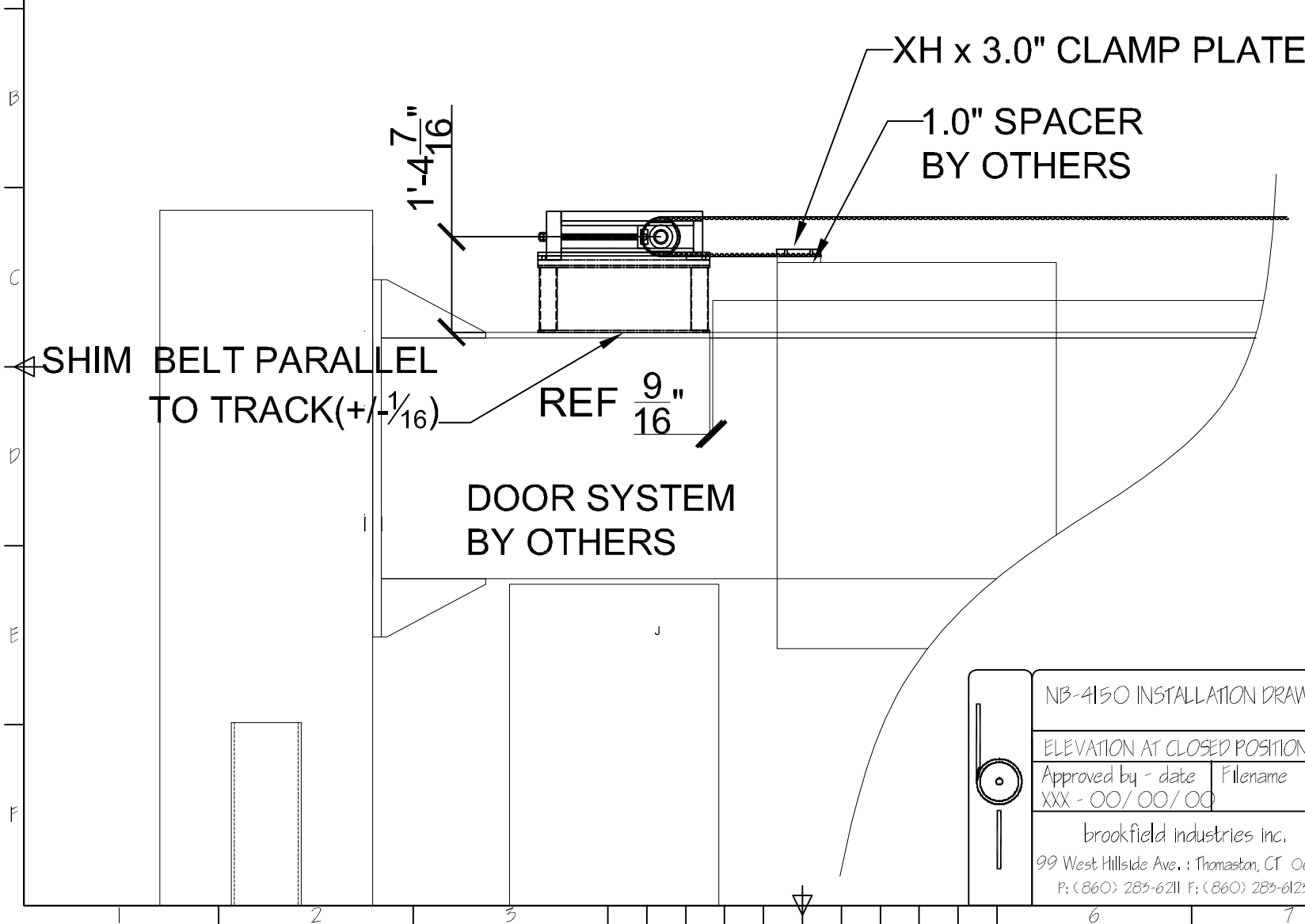
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NB-4150-12

RevNo	Revision note	Date	Signature	Checked

# NB-4150 IN CLOSED POSITION



Drawing Notes:

Tolerances	
Decimal	+ / - 1/16 UNO
Fractional	+ / - .xxx
Angular	+ / - .xxx

NB-4150 INSTALLATION DRAWING		Drawn by KPK	
ELEVATION AT CLOSED POSITION		Checked by XXX	
Approved by - date XXX - 00/00/00	Filename	Date 5/13/08	Scale 1:1
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		NB-4150-13	

TAKE-UP SHAFT  
CENTERLINE

MOUNT W/(4)  $\frac{5}{8}$  DIA GR.5 BOLTS  
W/COMPATIBLE WASHERS/  
LOCKWASHERS/  
NUTS AS REQUIRED  
(HARDWARE NOT INCLUDED)

LINEAR BEARING TRACK  
BY OTHERS

Drawing Notes:

- 1) TIMING BELT CENTERLINE  
SHALL BE PARALLEL TO  
RAIL CENTERLINE WITHIN  
+/- 1/16" OVER ENTIRE TRAVEL
- 2) TAKE UP SHAFT CENTERLINE  
SHALL BE PERPENDICULAR TO  
BELT CENTERLINE TO ALLOW  
FULL ENGAGEMENT OF BELT  
TEETH INTO PULLEY

Tolerances

Decimal +/- 1/32 UNO

Fractional +/- .xxx

Angular +/- .xxx

NB-4150  
TAKE-UP END

TIMING BELT  
CENTERLINE

NB-4150 INSTALLATION DRAWING

Drawn by KPK  
Checked by XXX

TAKE-UP END PLAN VIEW

Edition 0

Approved by - date  
XXX - 00/00/00

Filename

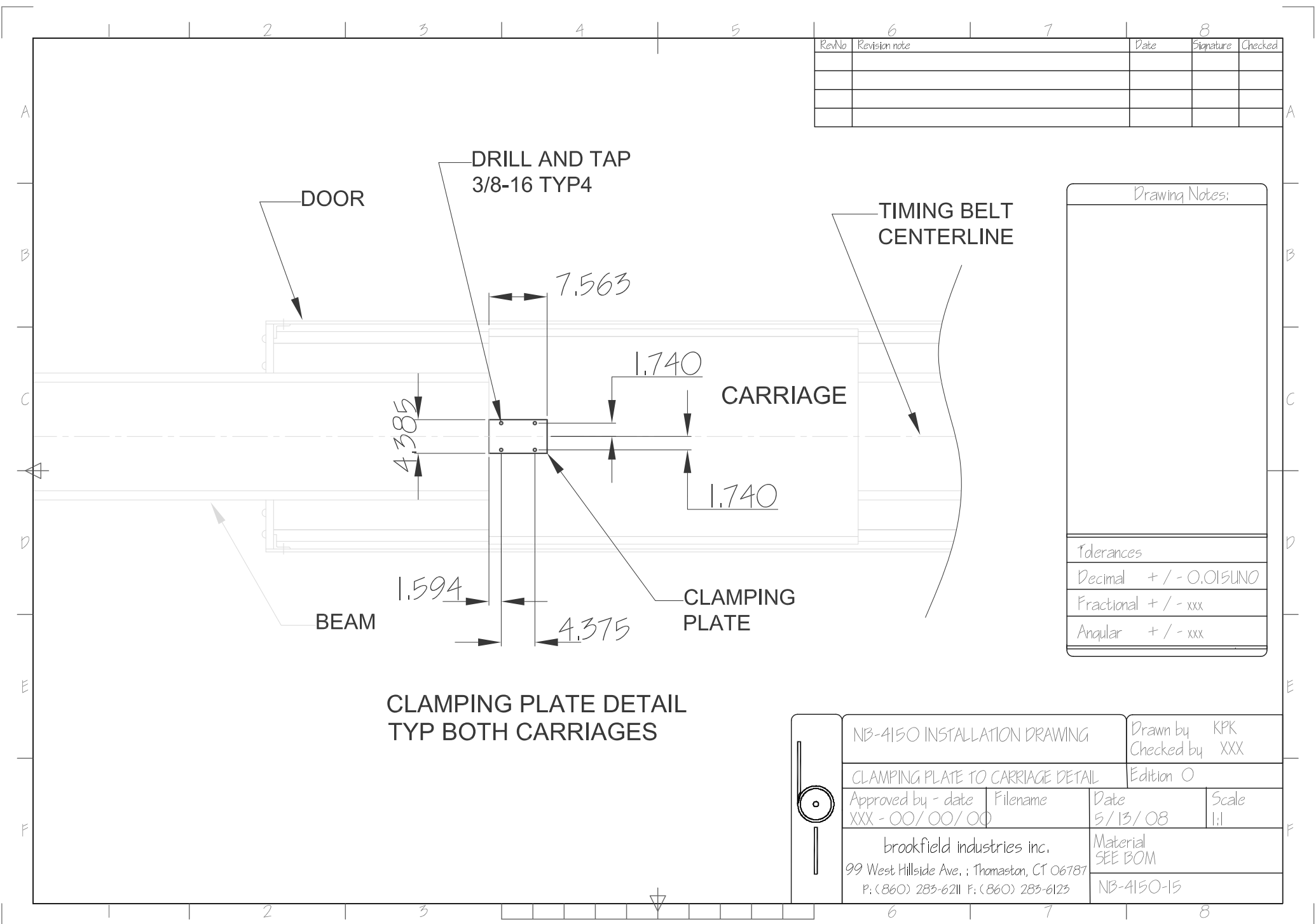
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Material  
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NB-4150-14



# NB-4150 GEAR MOTOR END

RevNo	Revision note	Date	Signature	Checked

## Drawing Notes:

- 1) TIMING BELT CENTERLINE SHALL BE PARALLEL TO RAIL CENTERLINE WITHIN  $\pm 1/16"$  OVER ENTIRE TRAVEL
- 2) OUTPUT SHAFT CENTERLINE SHALL BE PERPENDICULAR TO BELT CENTERLINE TO ALLOW FULL ENGAGEMENT OF BELT TEETH INTO PULLEY

## Tolerances

Decimal  $\pm 1/32$  UNO

Fractional  $\pm .xxx$

Angular  $\pm .xxx$

LINEAR BEARING  
TRACK BY OTHERS

TIMING BELT  
CENTERLINE

OUTPUT SHAFT  
CENTERLINE

MOUNT W/(4)  $\frac{5}{8}$  DIA. GR.5  
BOLTS W/COMPATIBLE  
WASHERS/LOCKWASHERS/  
NUTS AS REQUIRED  
(HARDWARE NOT INCLUDED)

NB-4150 INSTALLATION DRAWING

Drawn by KPK  
Checked by XXX

GEAR MOTOR END PLAN VIEW

Edition 0

Approved by - date  
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Filename

Date  
5/13/08

Scale  
1:1

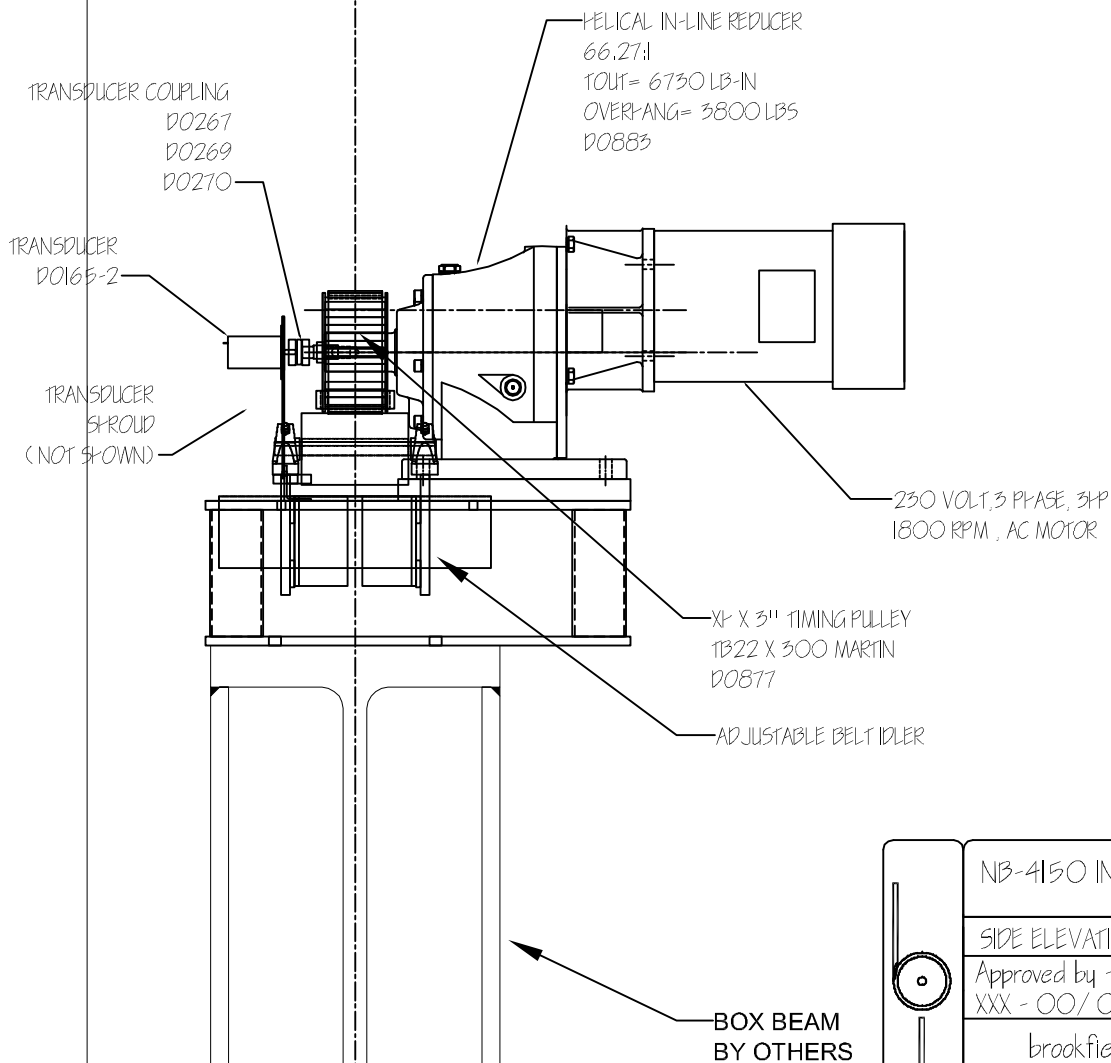
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NB-4150-16



# NB-4150 SIDE ELEVATION OF GEAR MOTOR



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## Drawing Notes:

### Tolerances

Decimal + / - 1/32 UNO

Fractional + / - .xxx

Angular + / - .xxx

NB-4150 INSTALLATION DRAWING

Drawn by KPK  
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SIDE ELEVATION OF GEAR MOTOREND

Edition 0

Approved by - date  
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Material  
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NB-4150-21

BOX BEAM  
BY OTHERS