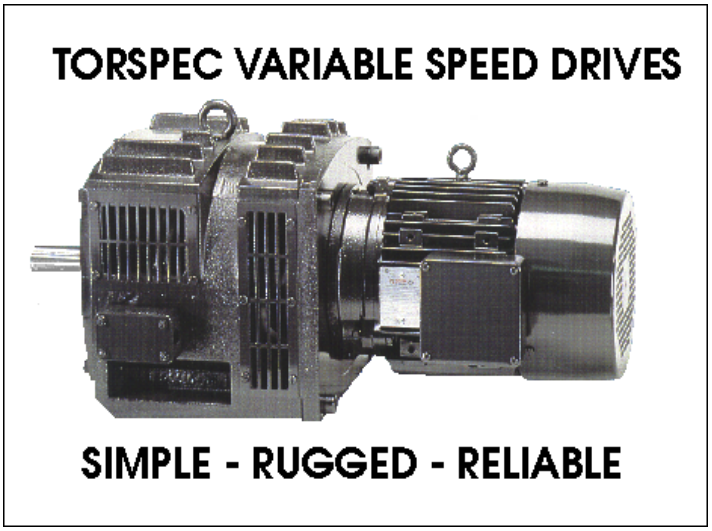
TORSPEC™ VARIABLE SPEED DRIVE

INSTALLATION AND MAINTENANCE INSTRUCTIONS

TORSPEC MODEL 305TCD-NEMA



WARNING

Disconnect all incoming power before working on this equipment.
Follow power lockout procedures.
Use extreme caution around electrical equipment.
Do not touch the circuit board while power is applied.

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Manufacturers & Suppliers of World Class Quality Variable Speed Drives & Controls

TORSPEC MODEL 305TCD-N.E.M.A. DISMANTLING INSTRUCTIONS

CAUTION - BE SURE TO DISCONNECT POWER AND FOLLOW LOCK-OUT PROCEDURES AS SPECIFIED BY LAW ***BEFORE*** OPENING ANY TERMINAL BOXES OR TOUCHING ANY WIRING.

D1: Open terminal box and disconnect clutch wires from terminal block. ***EXTREME CAUTION*** should be exercised with the small wires going to the tach generator, as they can be easily broken.
Hint: (Look for broken wires, or poor connections.)

D2: Remove motor from clutch assembly by removing 8-M16 hex head bolts and by supporting motor with the crane or forklift truck. Use 1-M16 hex. Head bolt in threaded hole to jack of motor adapter.

D3: Remove Torque Tube by unscrewing the grub screws in keystock and shaft positions. Remove 3 screws 3/8" hex head bolts and use 2 of the bolts to jack off the tube form the inner split bushing. Remove Motor Adapter from Motor by removing 8-5/8" hex head bolts.
Hint: (Look for pitting and/or lifting of the copper lining on the torque tube, this is what transmits the power and damage here will cause the drive to be short of power

D4: Stand the clutch with shaft pointing upwards. Remove 4-M24 hex head bolts and lift stator flange out of casing using 1-M24 eyebolt in the end of the output shaft. Remove output assembly while feeding wires through the hole, once the wires are free, the output assembly can be completely removed. Remove 1-M24 hex head bolt form the Polewheel and use M30 hex head bolt to jack the polewheel off the 4-M10 X50 slotted spring pins.
Hint: (Look for physical damage, remove any build up of foreign material on polewheel which could cause binding. Binding will cause the drive to run at full speed when the motor is started even if the clutch is turned off.)

D5: To separate the coil and tach wires, cut the waxed string and carefully slide the rubber tube off. If the tach is being replaced, a string or small wire tied to the old tach wires before removing can be used to assist in pulling in the new wires.
Hint: (Look for broken wires, tach should be 220 Ohms, a bad tach will cause the drive to run at full speed when the controller is energized.)

D6: Remove 3-M6 socket head screws from the 3 coil retainer blocks from the stator body. Carefully cut the silicon, which is holding the coil former to the stator flange and remove coil former. ***Care must be taken, not to damage the coil if it is not to be replaced. The coil former is breakable.*** *Hint: (Look for physical damage, signs of overheating, coil should be around 20 ohms depending on size. Low resistance will cause the control fuses to blow, too high will result in poor performance.)*

D7: Remove the grease inlet and outlet pipes then remove the output cover by removing the 4-M10 socket head bolts. Remove the 8-M6 hex head bolts securing the tachogenerator plate and front bearing plate, and lift up over the shaft.

D8: Remove rear bearing clamp plate by removing 8-M6 hex.hd bolts and draw the shaft out of the assembly from the polewheel side by pressing on the tach side of the shaft. Remove lock-washer, nut and tacho hub from the shaft. Be sure not to damage magnetic strip. Remove the front bearing inner race from the shaft.

D9: Remove the front bearing outer race from bearing housing.

D10: The two rear ball bearings can now be pressed off the shaft.

TORSPEC MODEL 305TCD-N.E.M.A. ASSEMBLY INSTRUCTIONS
USE A THREAD LOCKING COMPOUND ON ALL BOLTS

A1: Assemble Stator Flange to the Stator body using 6-M24x 140 socket head cap screws. Ensure that the top and bottom grease line holes are located properly.

A2: Mount the pre-greased outer race roller front bearing into the output assembly (stator flange).

A3: Mount front bearing inner grease spacer and front bearing inner race on the front end of the shaft. Press the front bearing inner onto the shaft.

A4: Place the rear grease spacer and press the pre-greased matched pair, ball bearings (rear bearings) onto the back end of the shaft. Make sure to press on the inner race only and ensure correct faces match (face to face or 'X').

A5: Insert the shaft assembly into the output assembly (stator body) from the polewheel side by pressing on the outer rear bearing. Secure rear bearing by bearing back plate using 8-M6x30 socket head cap screws.

A6: Place front bearing plate over shaft and locate over front bearing.

A7: Assemble 3 piece tacho-generator onto tacho-generator plate and secure using 4-M4x16 hex head bolts and 4-M4 flat washers.

A8: Place tacho assembly over shaft and locate on front bearing plate. Secure both to stator flange using 8-M6x35 hex head bolts and 6-M6 flat washers.

A9: Place tacho hub (magnet) assembly over shaft into tachogenerator assembly. Ensure that magnet is in line with poles on tacho-generator and secure it using 1-MB19 locking washer and 1-KM19 locking nut. Bend tag on lockwasher into slot on locknut.

A10: Fit oil seal to output cover and fit cover over shaft onto stator flange. Secure it using 4-M10x20 socket head cap screws.

A11: Fit grease inlet tube and grease nipple through hole in the top of output cover and screw it into threaded grease inlet port in stator flange. Fit grease drain tube through hole in the bottom of front face of output cover and screw it into threaded drain port on stator flange.

A12: Apply silicone to 4 areas on underside of stator flange. Place coil over stator body and press firmly onto stator flange. Secure it with 3 coil retainer blocks using 3-M6x50 socket head cap screws. Thread tacho-generator wires and coil wires through 2 rubber insulation tubes and tie off with waxed twine.

A13: Fit 4-M10x50 slotted spring pins in holes on the bottom of shaft. Place polewheel on stator body and locate on the 4 slotted spring pins and secure it using 1-M24x85 hex head bolt and 1-M24 flat washer. Torque the polewheel bolt to 360 foot pounds.

A14: Fit 2-M30 lifting eyebolts to casing. Place stator body assembly into casing using a M24 eyebolt in the end of shaft, thread the 2 rubber insulation tubes through the hole on the side of the casing (coil wires and tacho wires are at the top of stator flange and are wrapped around the coil). Secure output assembly using 4-M24x75 hex head bolts.

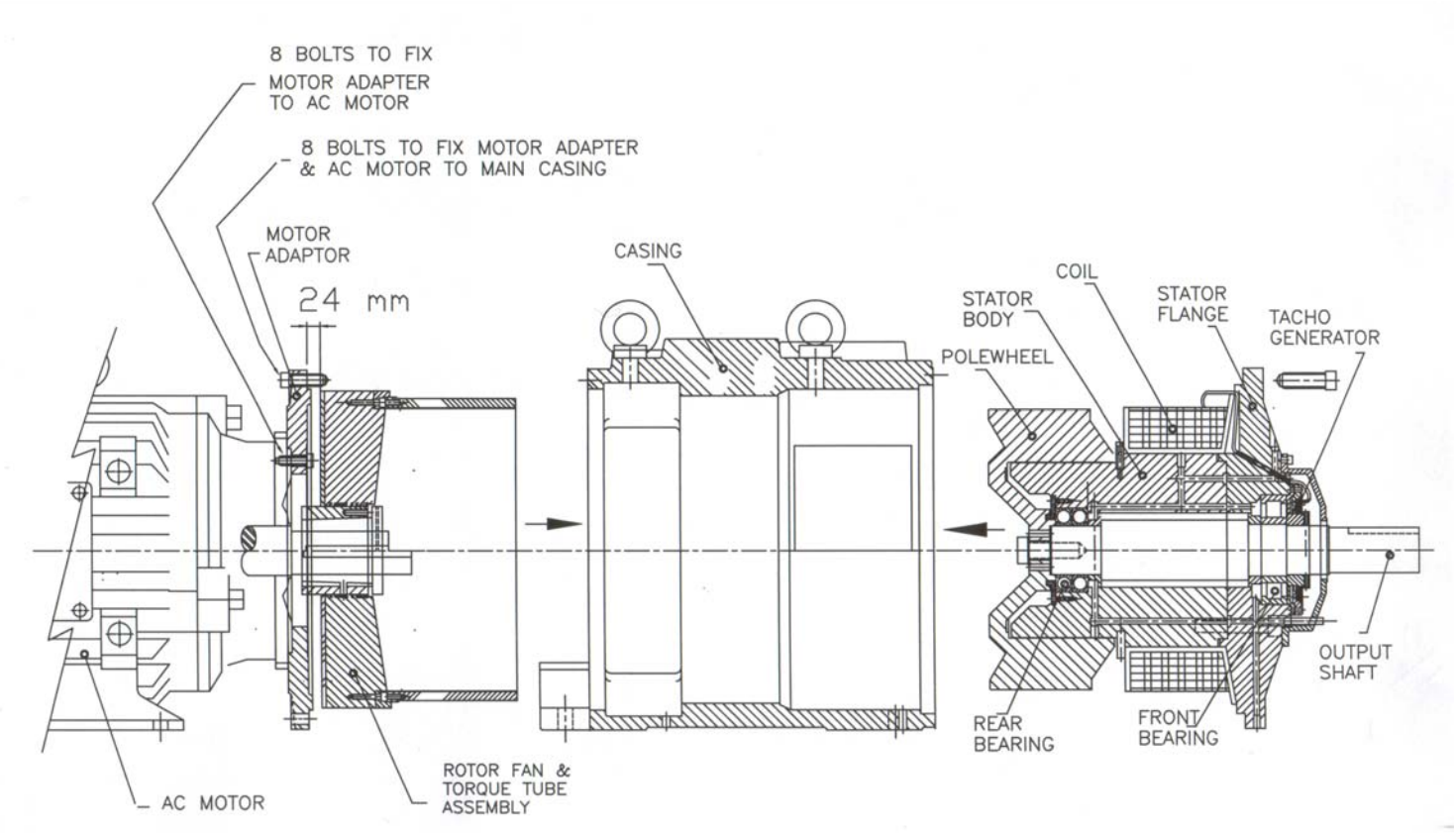
A15: Cut coil, tach and thermistor wires to desired length (approx. 5” is standard), and attach terminal connections. Fit terminal block using 1-M4x16 socket head screw and secure wires according to wiring instructions.

A16: Assemble front meshed inlet grills using 8-M6x10 pan head screws; assemble rear meshed outlet grills using 16-M6X10 pan head screws. Assemble terminal box using 4-M15x12 socket head screws, fit 1 terminal blanking plate to casing on the opposite sided of casing to terminal box, using 4M5x8 pan head screws.

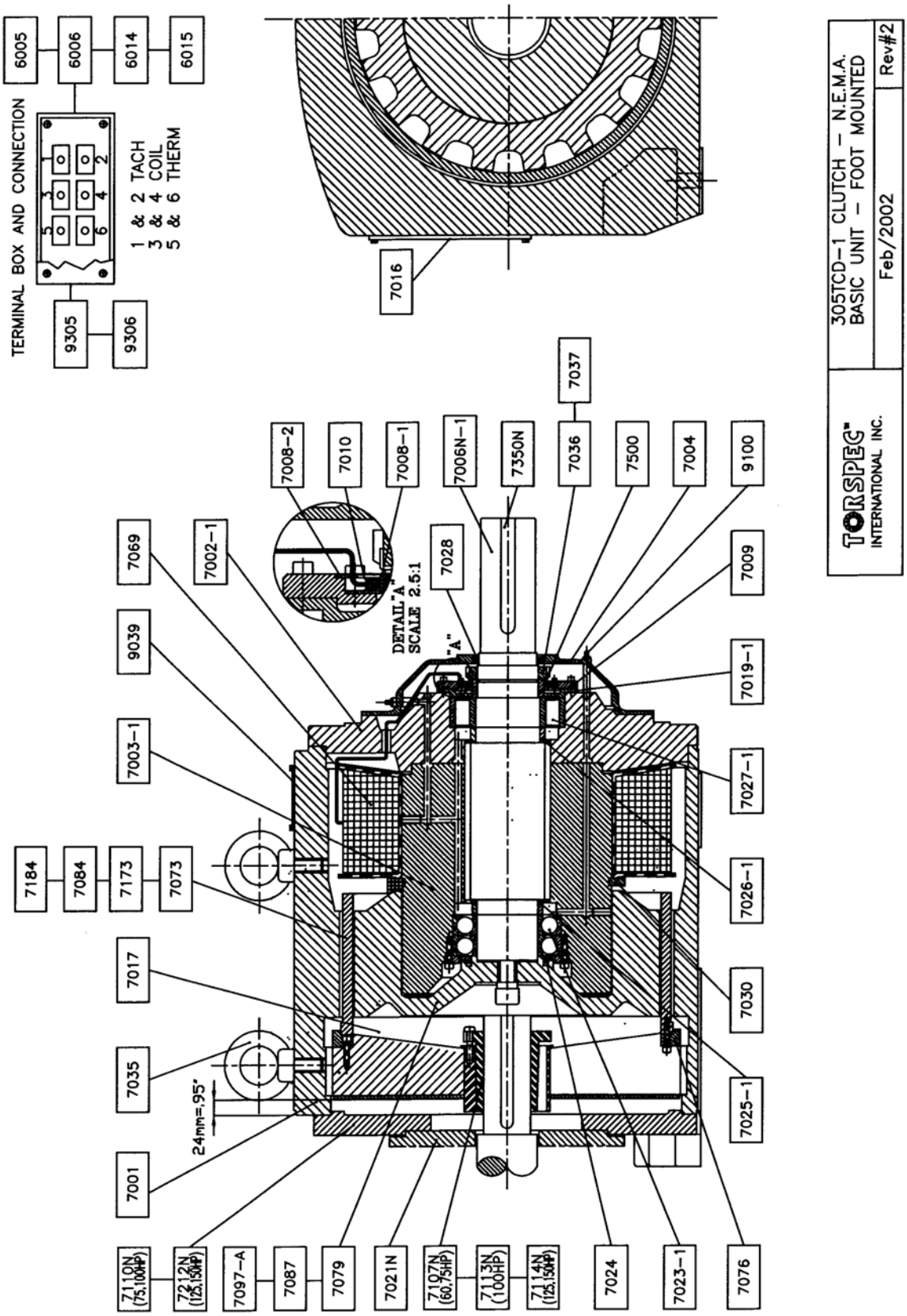
A17: Mount the motor adapter flange onto the motor with the flat on the bottom using 8-5/8”-18 UNCx1/2” lgnth hex head bolts.

A18: Mount the torque tube assembly (tube, rotor fan, split bushing) onto the motor shaft. Use 24 mm distance as reference while mounting torque tube assembly. This is distance from fitting face of Motor Adapter (edge) to back steel plate of Rotor Fan (shown on drawing). Lock bushing to rotor fan by 3-3/8” hex. bolts and 1 grub screw on keystock and one grub screw in shaft. ***This is critical for proper drive operation.***

A19: Fit Motor assembly to Clutch casing using 8-M16x60 hex head bolts.



TORSPEC MODEL 305TCD-N.E.M.A. DRIVE LAYOUT



TORSPEC MODEL 305TCD NEMA PARTS LIST

#	P/N	DESCRIPTION	FIXED TO
1	7001	CASING	
2	7002-1	STATOR FLANGE	CASING BY 4-M24 x 75 HEX HD BOLTS
3	7003-1	STATOR BODY	STATOR FLANGE BY 6-M24x140 SOCKET HD CAP SCREWS
4	7004	OUTPUT COVER	STATOR FLANGE BY 4 - M10 x 20 SOCKET HD CAP SCREWS
5	7006N	N.E.M.A. OUT.SHAFT 3-3/8"	POLEWHEEL BY 4 - M10 X 50 SLOTTED SPRING PINS; CODE S1
6	7350N	KEYSTOCK 7/8" SQUARE 7" Lngth	
7	7110N	MOTOR ADAPTER 365TC/405TC	CASING BY 8 - M16 x 75 HEX HEAD BOLTS; CODE D1
8	7009	TACHO PLATE	STAT. FLANGE BY 8 - M6 x 35 HEX HEAD BOLTS
9	7500	TACHO HUB (ARMATURE)	
10	7016	MESHED GRILL SMALL	CASING BY 4 - M6 x 10 PAN HEAD SLOTTED SCREWS
11	7017	MESHED GRILL LARGE	CASING BY 8 - M6 x 10 PAN HEAD SLOTTED SCREWS
12	7019-1	FRONT BEARING PLATE	STAT. FLANGE BY 8 - M6 x 35 HEX HEAD BOLTS
13	7024	BACK BEARING PLATE	STATOR BODY BY 8 - M6 X 25 SOCKET HEAD CAP SCREWS
14	7025-1	INNER SEAL SPACER - BACK BEARING	
15	7026-1	INNER SEAL SPACER - FRONT BEARING	
16	7030	COIL BLOCK	STAT. BODY BY 3 - M6 x 50 SOCKET HD CAP SCREWS
20	7173	TORQUE TUBE/ ROTOR ASSY- 4 POLE	NICKLE PLATED (FIXED SAME AS 7073)
21	7084	TOR. TUBE/ ROTOR ASSY- FAN DRIVE	SAME AS 8073
22	7184	TOR. TUBE/ ROTOR ASSY- FAN DRIVE	NICKLE PLATED (FIXED SAME AS 7073)
23	7079	POLEWHEEL STANDARD	SHAFT BY 1 - M24 x 75 HEX HEAD BOLT & 1 - M24 PLAIN WASHER
24	9101	OUTLET GREASE TUBE	
25	7008-1	TACHO CASING-1	TACHO PLATE BY 4-M4x6 SOCK. HD CAP SCR. & 4-M4 FLT WASH.
26	7008-2	TACHO CASING-2	TACHO PLATE BY 4-M4x6 SOCK. HD CAP SCR. & 4-M4 FLT WASH.
27	7010	TACHO COIL FORMER	
28	7023-1	ANG. SING. CONTACT BALL BEAR (x2)	7219 (2 X face to face)
29	7022-1	CYLINDRICAL ROLLER BEARING	NU2220
30	7028	OIL SEAL 90x110 x 12 TC	
31	9305	TERMINAL BLOCK 4 WAY	CASING BY 1 - M5 x 12 SOCKET HEAD CAP SCREWS
32	9306	TERMINAL BLOCK 6 WAY	CASING BY 1 - M5 x 12 SOCKET HEAD CAP SCREWS
33	6005	TERMINAL BOX	CASING BY 4 - M5 x 12 SOCKET HEAD CAP SCREWS
34	6006	TERMINAL BOX LID	CASING BY 4 - M5 x 12 PHILLIPS PAN HEAD SCREWS
35	6014	TERMINAL BOX LID GASKET	
36	6015	TERMINAL BOX GASKET	
37	7107N	SPLIT TAPER BUSH. R2TYP1 (2-3/8")	TO ROTOR FAN BY 3 -3/8-1.25 SCREWS & KEYED TO SHAFT
38	7113N	SPLT TAPER BUSH.R2-TYP1 (2-7/8")	TO ROTOR FAN BY 3 -3/8-1.25 SCREWS & KEYED TO SHAFT
39	9035	PLASTIC PLUG #12	CASING DRAIN HOLES BY 2 - #12 PLASTIC PLUGS
40	9039	NAME PLATE	CASING BY 4 - ST3.5 x 6.5 MM PAN HD TAPPING SCREWS
41	7034	M30 LIFTING EYEBOLT	TOP OF CASING
42	9501	ARMATURE STRIP EPOXIED TO HUB	TACHO HUB
43	7114N	SPLIT TAPER BUSH. R2TYP1 (3-3/8")	TO ROTOR FAN BY 3 -3/8-1.25 SCREWS & KEYED TO SHAFT
44	7087	POLEWHEEL REDUCED	SHAFT BY 1 - M24 x 85 HEX HEAD BOLT & 1 - M24 PLAIN WASHER
45	7097-A	POLEWHEEL RED. C/W AXIAL BLADES	SHAFT BY 1 - M24 x 85 HEX HEAD BOLT & 1 - M24 PLAIN WASHER
46	7212N	MOTOR ADAPTER 444TC/445TC	CASING BY 8-M16x75 HEX. HEAD BOLTS
47	9100	GREASE INLET	
48	7036	LOCK NUT KM19	
49	7037	LOCKING WASHER MB19	
47	9100	GREASE INLET	
48	7036	LOCK NUT KM19	
49	7037	LOCKING WASHER MB19	

DRIVE FEET MOUNTING PROCEDURE

F1: Push slotted Shims under the Coupling lowest mounting feet and moderately tighten the Bolts

F2: Align the unit. Insert Feeler Gauges under the remaining feet during the alignment process to level the unit.

F3: Replace feeler gauges with equal thickness of slotted Shims. Use a few thick shims rather than a large number of thin shims.

F4: Alternately tighten Bolts.

F5: Recheck alignment and change shims as required.

F6: Push slotted Shims under AC Motor mounting feet and moderately tighten the bolts.

Note:

-The decision to mount (bolt) the Motor feet should be based on the application dynamics. (I.e. vibration/support). It is not always necessary to mount the motor feet and is specifically motor size related.

-When Drives are purchased on base, base must also be leveled and secured.

Warning:

Failure to properly mount and level drive unit my result in distortion to the drive housing, torque tube, mechanical failure, misalignment, and premature bearing wear.