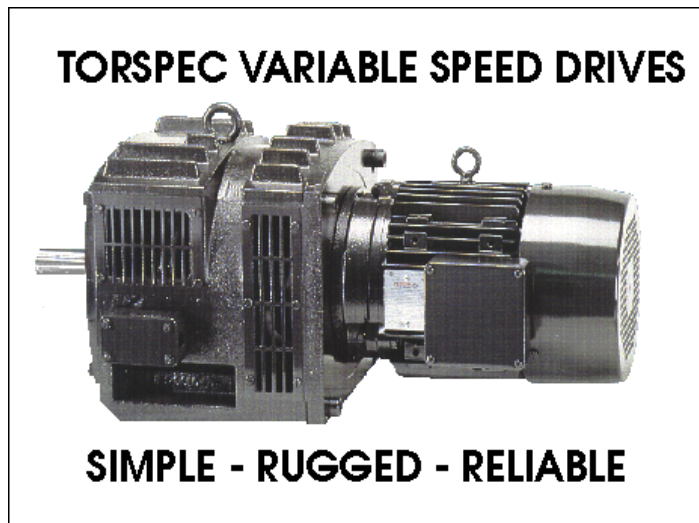


# **TORSPEC™** VARIABLE SPEED DRIVE

## INSTALLATION AND MAINTENANCE INSTRUCTIONS

### TORSPEC MODEL 160TCD-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 160TCD-NEMA 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 drive wires. **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 four bolts holding output assembly to main casing. Remove output assembly while feeding wires through the hole, once the wires are free, the output assembly can be completely removed.

*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.)*

D3: The polewheel is removed by removing the bolt in the center that is attaching it to the output shaft and inserting a larger 16mm bolt to push it off.

D4: The coil is held in place by a circlip at the back and silicone sealant at the front. After removing the circlip it is necessary to use a thin blade to break the sealant between the coil form and the front of the output assembly. **Care must be used, the former is breakable.**

*Hint: (Look for physical damage, signs of overheating, coil should be 20 to 40 ohms depending on size. Low resistance will cause the control fuses to blow, too high will result in poor performance.)*

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 the tach cover plate and tach stator mounting plate with tach stator. The tach armature is held in place by a setscrew and can be pulled off. **Be sure not to damage the magnetic strip.**

*Hint: (Look for broken magnetic strip, this will give the same symptoms as a bad tach.)*

D7: Remove the shaft out of the assembly from the input shaft side by pressing on the output side of the shaft.

D8: The rear bearing and front bearing race that is still on the shaft can now be removed. The front outer bearing race can also be removed from the stator body.

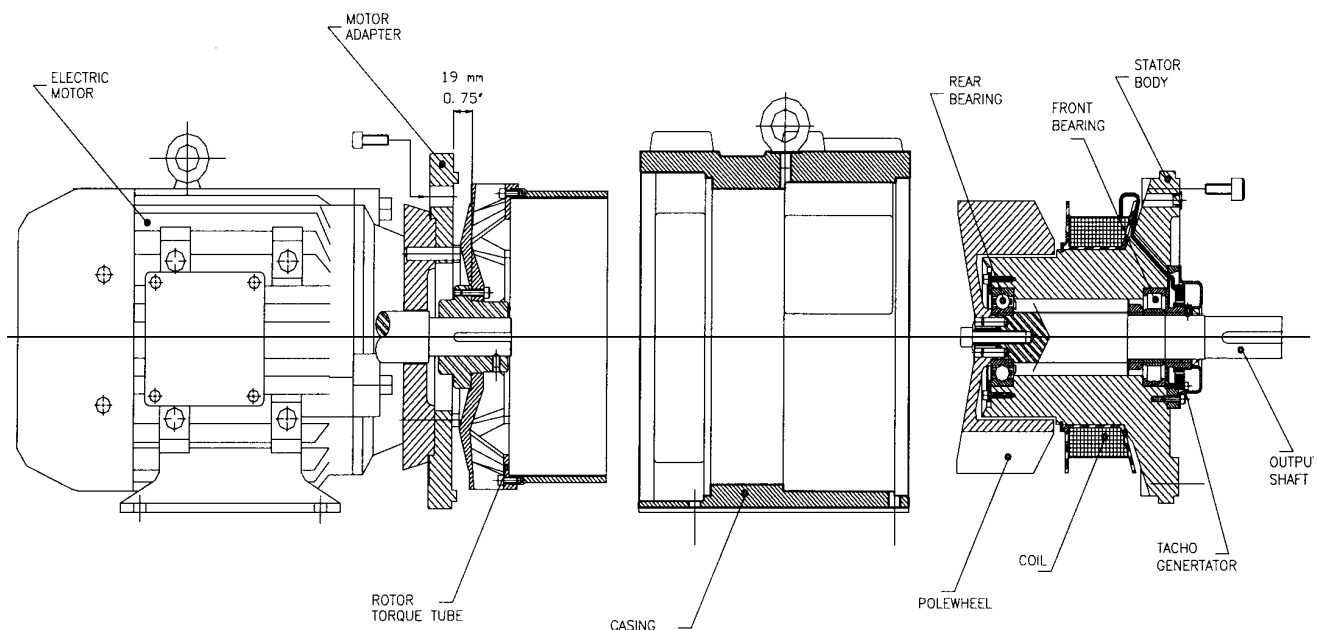
D9: Remove the motor adapter flange from the main casing. Remove the 6 cap head screws holding the torque tube assembly to the hub on the motor shaft. Two grub screws hold the hub on the shaft, be sure to remove these grub screws completely as one is counter sunk into the shaft.

*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)*

# TORSPEC MODEL 160TCD-NEMA ASSEMBLY INSTRUCTIONS

## USE A THREAD LOCKING COMPOUND ON ALL BOLTS

- A1: If the motor is being replaced it will be necessary to dimple the shaft in the same location as the original motor. ***This location is critical for proper alignment.*** Use an anti-seize compound on the shaft. Mount the torque tube hub with one of the grub screws in the dimple
- A2: Mount the motor adapter flange onto the motor flange with the flat on the bottom. Mount the torque tube on the hub. Bolt the motor assembly onto the main casing.
- A3: Mount the pre-greased rear bearing onto the shaft by pressing on the outer and inner race with a press, ***do not hammer.*** Press the front outer bearing into the stator body and the inner race on to the shaft with the press. Insert the shaft assembly into the output assembly from the rear side by pressing on the inner and outer rear bearings. Install rear bearing retaining plate onto stator body.
- A4: Mount the armature onto the shaft. Feed the tach wires through the hole in the output assembly and slide the tach stator plate over the shaft and bolt to the output assembly. ***Be sure not to pinch the tach wires.***
- A5: Apply silicone rubber to the front of the main coil and push the coil onto the output assembly. Install the coil circlip. Push the tach wires, then the coil wires into the rubber sleeving. Tie off with a piece of waxed string.
- A6: Bolt the polewheel onto the shaft ensuring the spring pins are in place and the polewheel completely seats.
- A7: Insert the output assembly into the casing while feeding the wires through the hole. Bolt into place on main casing.



## TORSPEC 160TCD-N PARTS LIST

PART NO.	DESCRIPTION
<b>4007N</b>	OUTPUT SHAFT NEMA 213/215T 1-3/8" CODE S2
<b>4050N</b>	KEYSTOCK NEMA 215T 5/16" SQ.X2 3/8" CODES S2, F2
<b>4106N</b>	MOTOR ADAPTER 213/215/254/256TC FIXED BY 4-M16X40 HEX HEAD BOLT CODE D2
<b>4107N</b>	ROTOR HUB 213/215TC 1 3/8" FIXED BY 1-M8X10 CUP POINT GRUB SCREW, 1-M8X10 CONE POINT GRUB SCREW CODE D2
<b>4113N</b>	ROTOR HUB 254/256TC 1 5/8" FIXED BY 1-M8X10 CUP POINT GRUB SCREW, 1-M8X10 CONE POINT GRUB SCREW CODE D2
<b>4115N</b>	OUTPUT FLANGE 213/215TC FIXED BY 4-M12X50 SOCKET HD CAP CODE F2
<b>4120N</b>	NEMA MOTOR SEE MOTOR NAMEPLATE FOR DETAILS FIXED BY 4-1/2"X 1 3/8" SOCKET HD. CAP
<b>4324N</b>	INPUT ASSY. NEMA CODE K2
<b>4001</b>	CASING
<b>4002</b>	STATOR BODY ASSY. FIXED BY 4-M12X40 SOCKET HD. CAP
<b>4004</b>	TACH COVER 4-M5X35 SOCKET HD. CAP AND 4 FLAT WASHERS
<b>4009</b>	TACH GENERATOR MOUNTING PLATE
<b>4016</b>	GRILLES SMALL INLET FIXED BY 4-M6X10 PAN HD. SLOTTED
<b>4017</b>	GRILLES LARGE OUTLET FIXED BY 6-M6X10 PAN HD. SLOTTED
<b>4018</b>	GREASE BAFFLE
<b>4019</b>	BEARING SPACER
<b>4020</b>	NILOS RING 6308JV
<b>4022</b>	BEARING FRONT NU308
<b>4024</b>	BEARING REAR RETAINING PLATE FIXED BY 4-M5X16 SOCKET HD. CAP
<b>4028</b>	OIL SEAL 40X52X8 STD. & CODE F1
<b>4030</b>	COIL RETAINING RING
<b>4038</b>	OIL SEAL 40X55X8 CODE F2
<b>4060</b>	STD. COIL FOR 4/15HP, 2/25HP FIXED BY PART NO. 4030
<b>4063</b>	STD. COIL FOR 4/7.5HP, 4/10HP, 2/15HP, 2/20 FIXED BY PART NO 4030
<b>4066</b>	HP COIL FOR 4/15HP, 2/25HP FIXED BY PART NO. 4030 CODES H10, H20, N1, N2
<b>4069</b>	HP COIL FOR 4/7.5HP, 4/10HP, 2/15HP, 2/20HP FIXED BY PART NO. 4030 CODES H10, H20, N1, N2
<b>4073</b>	TORQUE TUBE/ROTOR ASSY. 4 POLE FIXED BY 6-M6X30 SOCKET HD. CAP
<b>4079</b>	POLEWHEEL STD. FIXED BY 1-M12X40 HEX. HD. CAP, 1-M12 FLAT WASHER, 2-M8X24 SLOTTED SPRING PINS
<b>4084</b>	TORQUE TUBE /ROTOR ASSY. FAN DRIVE FIXED BY 6-M6X30 SOCKET HD. CAP SAME AS 4073
<b>4087</b>	POLEWHEEL REDUCED FIXED BY 1-M12X40 HEX. HD. CAP, 1-M12 FLAT WASHER, 2-M8X24 SLOTTED SPRING PINS CODE R
<b>4089</b>	TORQUE TUBE/ROTOR ASSY. 2 POLE FIXED BY 6-M6X30 SOCKET HD. CAP
<b>4097K</b>	POLEWHEEL REDUCED C/W AXIAL BLADES FIXED BY 1-M12X40 HEX. HD. CAP, 1-M12 FLAT WASHER, 2-M8X24 SLOTTED SPRING PINS CODE R
<b>4173</b>	TORQUE TUBE NICKEL PLATED/ROTOR ASSY. 4 POLE FIXED BY 6-M6X30 SOCKET HD. CAP SAME AS 4073
<b>4184</b>	TORQUE TUBE NICKEL PLATED/ROTOR ASSY. FAN DRIVE FIXED BY 6-M6X30 SOCKET HD. CAP SAME AS 4073
<b>4189</b>	TORQUE TUBE NICKEL PLATED/ROTOR ASSY. 2 POLE FIXED BY 6-M6X30 SOCKET HD. CAP SAME AS 4089
<b>4302</b>	TOTALLY ENCLOSED COVERS LEFT HAND FIXED BY 5-M6X16 SOCKET HD. CAP CODES T1, T2
<b>4303</b>	TOTALLY ENCLOSED COVERS RIGHT HAND FIXED BY 5-M6X16 SOCKET HD. CAP CODES T1, T2
<b>4500</b>	TACH ARMATURE FIXED BY 1-M5X8 CUP POINT GRUB SCREW
<b>4501</b>	HOSEPROOF COVERS SMALL INLET FIXED BY 4-M6X40 SOCKET HD. CAP CODES N1, N2
<b>4502</b>	BAFFLES FOR PART NO. 4501 CODES N1, N2
<b>4503</b>	HOSEPROOF COVERS LARGE OUTLET FIXED BY 4-M6X40 SOCKET HD. CAP CODES N1, N2
<b>4504</b>	BAFFLES FOR PART NO. 4503 CODES N1, N2
<b>9005</b>	TERMINAL BOX FIXED BY 4-M5X60 STUD, 4-M5 RUBBER WASHERS, 4-M5 FLAT WASHERS, 4-M5 LOCKNUT
<b>9006</b>	TERMINAL BOX LID
<b>9008</b>	TACH GENERATOR ASSY. FIXED BY 4-M4X16 SOCKET HD. CAP, 4-M4 FLAT WASHERS
<b>9014</b>	TERMINAL BOX GASKET X3 FOR CODES H10, H20, N1, N2, T1, T2
<b>9021</b>	BEARING REAR 6308Z
<b>9034</b>	EYEBOLT M12
<b>9035</b>	PLASTIC PLUG 1-#12 CODES T1, H10, N1
<b>9035</b>	PLASTIC PLUG 2- #12 CODES T1, T2
<b>9039</b>	NAMEPLATE FIXED BY 4-6X1/4 TAPPING SCREWS
<b>9305</b>	TERMIANAL BLOCK 4 WAY FIXED BY 1-M5X12 SOCKET HD. CAP
<b>9306</b>	TERMINAL BLOCK 6 WAY FIXED BY 1-M5X12 SOCKET HD. CAP CODES B? Y?



- 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 may result in distortion to the drive housing, torque tube, mechanical failure, misalignment, and premature bearing wear.***