

# TURBOCHARGER INSTALLATION INSTRUCTIONS

CAUTION: Failure to follow these instructions can result in premature turbocharger failure and warranty denial.

## I. GENERAL

- A. These instructions apply to all Garrett turbochargers except Models T14 and T30.
- B. When installing a replacement turbocharger, be certain there is no foreign material in the air cleaner and the ducting to the compressor inlet or in the exhaust manifold. Even small or soft objects will cause extensive damage to the turbocharger wheels.
- C. Take care to avoid getting dirt or debris into the turbocharger openings.
- D. New and replacement turbochargers may have bolts missing or deliberately left loose to facilitate installation. (A bolt kit, not supplied by Garrett, may be required. See Airframe and/or engine manufacturer's pertinent Overhaul Manual for specific instruction.) If the turbocharger bolts are all tight, all lock tabs bent up and compressor and turbine housing are correctly aligned, proceed to Step IV. Otherwise proceed to Step II.

## II. RELIGNMENT OF END HOUSING

- A. Loosen the compressor (aluminum) and turbine (cast iron) housing bolts and/or V-band nut(s) the minimum required to permit the housings to rotate on the center housing. Excessive loosening of the housings will allow contact and possible wheel damage. Bolts should not have to be loosened more than 1½ turns.
- B. Temporarily secure turbocharger to the engine exhaust manifold outlet flange with two bolts.
- C. Rotate the center housing so that the oil inlet and outlet pads will mate with the engine lines. The oil outlet (largest hole) must be at the bottom with the center line of the hole not more than 35° from vertical. Snugly tighten at least two bolts or the V-band, as applicable, to lock the center housing to the turbine housing.
- D. Rotate the compressor housing until it lines up with the intake manifold or intercooler ducting. Snugly tighten at least two bolts or V-band to lock the housing in place.
- E. Remove turbocharger from engine and tighten all bolts and/or V-band nuts. Tighten bolts alternately from side to side to prevent cocking of the housing. Tighten V-band nuts slowly as the torque setting is approached, (tapping the band slightly with a soft mallet), to allow for the band to fully seat. Refer to the torque values specified in the applicable Manual.

**NOTE:** For Aircraft Turbochargers, refer to the T.C. or S.T.C. information for torque information.

(OVER)

Reference values are not applicable to Aircraft. For aircraft Turbochargers refer to T.C., or S.T.C. information for torque information.

		<u>Torque</u>
V-band nut	All TV and TL models	120 in-lbs.
	GT 40-45 models tighten to	110-130 in-lbs
	All other models	50 in-lbs.
Bolts	TE06, TH08A, T12 and TV91 models	350 in-lbs.
	T3 automotive	165 in-lbs.
	Compressor (GT Series)	145-165 in-lbs.
	Turbine (GT Series)	185-215 in-lbs.
	Compressor and Turbine (Navistar)	185-215 in-lbs.
	All other models	140 in-lbs.

### III. BEND LOCKTABS

Bend lockplate tabs up against a flat on each bolt head (if not already bent) on bolted housing models. Bend in a direction which will tend to tighten, not loosen, the bolt V-band nuts are self-locking.

### IV. INSTALLATION AND PRE-OILING OF TURBOCHARGERS

- A. Remove old gasket from exhaust manifold mounting flange, inspect flange for erosion and flatness and install a new gasket, if used.
- B. Inspect oil drain and supply lines for kinking, clogging, restrictions and other signs of deterioration.
- C. Install turbocharger on engine using all new gaskets and "O" rings (when needed), but do not connect the compressor inlet and oil supply line. Tighten the nuts or bolts attaching the turbocharger to the exhaust manifold to the torque values given in the shop manual. Use of a high temperature lubricant on these threads is recommended.
- D. Fill the oil inlet hole with clean engine oil and spin the compressor wheel several times to coat the bearings with oil. Refill the oil inlet hole and connect the oil supply line.
- E. If the compressor wheel cannot be freely spun by hand or if there is any indication of rubbing or scraping, determine the reason before starting the engine. One cause of wheel rubbing is a cocked compressor or turbine housing. T04 and T04B turbochargers may have a slight drag before running-in, which is a normal condition. Connect the pipe or hose from the outlet of the air filter to the compressor inlet.
- F. Check lubricant level in engine crankcase.
- G. Prime the oil filter if it was charged.

### V. START ENGINE

- A. Before attempting to start the engine, crank the engine with the fuel shut off for 10 to 15 seconds or until the instruments show an oil pressure buildup.
- B. Start the engine and allow it to run at idle speed for 3 to 4 minutes before accelerating.
- C. CHECK FOR OIL LEAKS.