



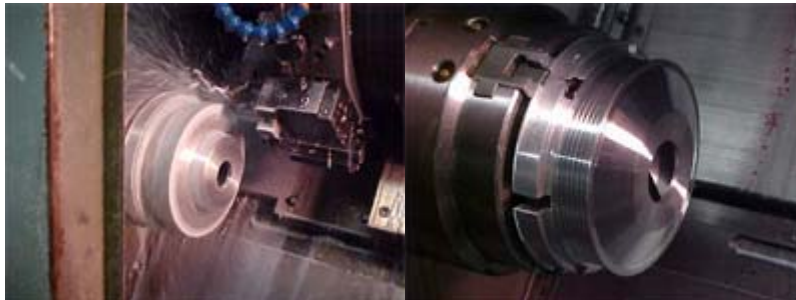
RACE-DEVELOPED COMPONENT

Turner Motorsport Inc, 16 Hunt Road South, Amesbury, MA 01913
978-388-7769 / www.turnermotorsport.com

Turner Motorsport Power Pulley Kit Detail

Technical Specifications:

- We use a 10-20% increase in pulley diameter to lower the RPM's that the accessories spin at. This reduces the load that the accessories put on the engine in a couple ways.
 - The water pump and power steering pumps are actually turning fluid inside of them. The faster fluid is moved, the more power it takes.
 - The alternator has "frictional" drag when in operation, so reducing the speed results in less load.
- BMW, as other cars manufactures do, builds high safety factors into these parts. By slightly lowering these safety factors, performance is gained while not compromising any mechanical integrity. Each accessory pulley is made in various ratios to not in any way harm your car's engine components as each component operates differently.
- Moment of Inertia also applies in this area. When a part rotates, it takes power to simply turn it. The moment of inertia is based on mass and shape $I=(md^2)/8$. While the bigger a part is, the bigger the moment, the less weight there is, the more it lowers the moment. Lowering the moment, a small increase in throttle response it achieved.
- Manufacturing is done with full CNC machining. Each pulley is made of 6061-T6 aluminum and MIL-A-8615F Type III HARDCOATED. Type II anodize is used on some pulleys and basically provides corrosion protection. Type III actually penetrates the aluminum, bonds to it and has a protective outer layer. It acts as a "ceramic" coating which has very good abrasion and wear resistance resulting in long life.





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TMS Power Pulleys

E46M3, E46M3 CSL, MZ3 S54

Parts list for kit: (TEN 46 10 001) 1 Valeo Alternator Pulley
(TEN 99 22 509) 1 E46M3 Valeo Alternator Stereo Pulley
(TEN 46 10 002) 1 Water Pump Pulley
(TEN 46 10 003) 1 Power Steering Pump Pulley
6 Grove 1538mm long belt for S54

6cyl E36, E46, E39, Z3, MZ3 S52

Parts list for kit: (TEN 36 10 001) 1 Valeo Alternator Pulley
(TEN 99 22 501) 1 E36/E46 Valeo Alternator Stereo Pulley
(TEN 36 10 002) 1 Bosch Alternator Pulley 1.605" or 40.77mm
(TEN 99 22 004) 1 Bosch Alternator Pulley 1.477" or 37.50mm
(TEN 99 22 505) 1 E36/E46 Bosch Alternator Stereo Pulley

(TEN 36 10 003) 1 Water Pump Pulley

(TEN 46 10 004) 1 Flat Shape Power Steering Pump Pulley
(TEN 36 10 004) 1 Bell Shape Power Steering Pump Pulley

6 Grove 1590mm long belt for M52 TU, M54, M56
6 Grove 1597mm long belt for M50, S50, M52, S52

TMS Power Pulley kits are designed to replace the alternator, water pump, and power steering pulleys with an OE look. The crankshaft pulley can't be changed because the harmonic balancer is built into the stock pulley, and can cause crankshaft vibrational problems or failure.

Power is not actually *made* from these pulleys, power is *released* from the engine by reducing drag from the accessories. In addition, there is a decrease in overall rotational inertia, allowing the engine to rev up and down in a shorter time period. All pulleys are based on a percentage of size increase from stock (or a size ratio) to allow them to be used safely and effectively on the street and racetrack. Our pulleys are professionally CNC machined, from high grade 6061-T6 aluminum and hardcoat anodized for long lasting protection. Accurate performance dyno charts for *real/proven* horsepower numbers, and documentation of other characteristics done exclusively by TMS R&D are available on the Turner Motorsport website.

Install time: 2 hours

Directions on next page

Note: Due to the multiple applications of these parts, specific instructions are not possible.

Note: Professional installation is strongly recommended.

Note: Before taking apart your car, make sure and compare the pulleys you received to the pulleys that are on your car. BMW varied what pulleys were used during certain years.

1. Remove air intake and air box
 - a. Disconnect any wiring
 - b. Remove Xenon box (if equipped) to access an air box bolt, and move aside.



2. Remove radiator fan and shields (process varies for electric or clutch fans)

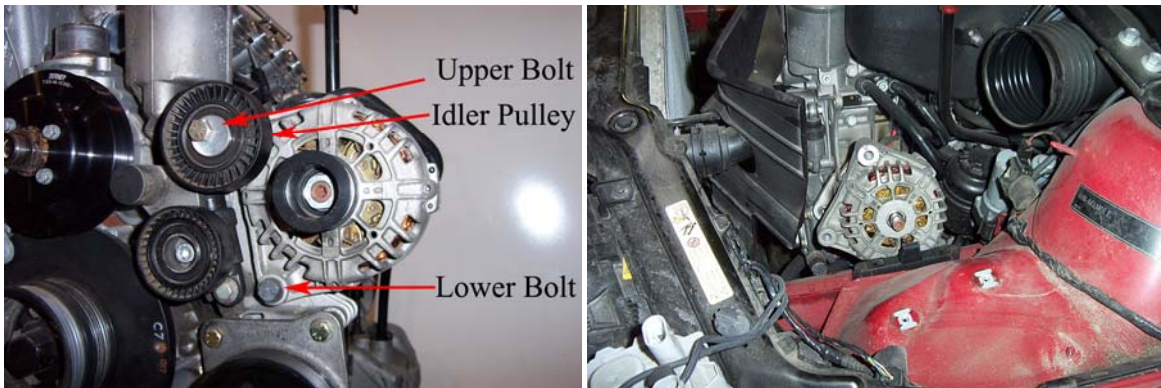
Notes: Steps **b.** & **d.** do not apply for cars with coolant tank on fan shroud.

- a. Remove plastic under tray for access underneath the car.
- b. Loosen the radiator shroud (4 torx bolts, one in each corner).
- c. Undo fan (fan wrenches may be needed).
 - o **Note:** the threads are reverse.
- d. Remove fan and shroud assembly from the top of the car.



3. Remove air-conditioning belt.
 - Loosen the tensioner and remove the belt.
 - o The procedure may vary on different models to loosen belt tensioner.
 - o Some models will have a 16mm lug on the side to loosen the tensioner.
 - o Other models require removal of the plastic cap on the tensioner pulley. Under the cap there will be either a hex, allen, or torx bolt. Use this to loosen the tensioner.
4. Remove main drive belt
 - Before removing belt loosen the bolts on the water and power steering pump pulleys.
 - Remove cover over belt tensioner
 - Note the belt routing for re-installation.
 - Loosen the tensioner and remove the belt.

5. Remove alternator pulley
 - Remove Alternator
 - Remove the two bolts that secure it to the engine block (be careful, the wiring does not need to be removed). Note: if you are going to remove the alternator from the car disconnect the battery first.
 - Use an impact gun to break the pulley loose, and remove



6. Remove Power Steering Pulley
 - The bolts should already be loose, so remove bolts and remove pulley.
7. Remove the Water Pump Pulley
 - The bolts should already be loose, so remove bolts and remove pulley.
8. Install Water Pump Pulley.
 - Tighten bolts. Bolts can be fully tightened after belt is put on.
 - Corrosion may need to be removed from the shaft.
 - Turner logo faces out.
9. Install Power Steering Pulley.
 - Tighten bolts. Bolts can be fully tightened after belt is put on.
 - Turner logo faces out.
10. Install alternator pulley.
 - Slide pulley over shaft.
 - Turner logo faces out.
 - Torque nut to: 60 N*m (44 ft*lb) (locktite is optional)
 - Re-install alternator

Tip: If the lower section of the alternator does not want to slide on the oil filter housing, try screwing the bolt in to the alternator in the stock orientation. Tap on the head of the bolt to move the steel sleeve back just a hair. However, it should not take excessive force. Be careful to not damage the alternator



11. Reinstall main drive belt.
 - Properly route the belt according to original routing.



12. Check belt for proper tension, that it is seated correctly on each pulley, and routed correctly.
 - Tighten all bolts on the Pulleys.
 - Torque water pump to 10 N*m (89 in*lb)
 - Torque power steering to 22 N*m (16 ft*lb)
 - Check for proper fitment again.
13. Stand clear and start the car
 - If anything is out of normal shut down immediately and re-check fitments, seating, tightness, and routing.
 - If all seems normal, look to see if belt or pulleys are running true or rubbing anything.
 - Shut car off and re-check for interferences or signs of non-fitment.
14. Re-install air-conditioning belt, and check fitments and seating on that belt.
15. Re-install all other parts and trim pieces.

After installation, please use the prepaid postage envelope to return the alternator pulley not used in the kit. This creates less confusion during installation and allows us to keep cost down.