

# TST's Dowel Pin Fix Kit for Cummins "B" Engines

**The TST Dowel Pin Fix Kit contains:** Written instructions with color photos, a front crank seal kit, a special offset washer, a longer capscrew, tube of RTV gasket maker, a small capsule of red threadlocker.

**This kit does NOT include a new cover gasket, rather a tube of gasket maker like Cummins used on later B engines in place of a gasket. If you want to use a gasket, Cummins part number is 3918673.**

**Note: During this procedure you will be removing the engine drive belt, there is not a new belt in this kit but, it is advised that you look at the belt on your truck to see if it needs to be replaced and purchase one before you start tearing the truck apart.**

## Tool list and required parts:

10mm 1/4" or 3/8" drive socket.	8mm 1/4" or 3/8" drive socket.
16mm 3/8" drive socket.	13mm 3/8" drive socket.
15mm 1/2" drive socket.	3" 3/8 drive extension.
1/4 " drive ratchet.	3/8" drive ratchet long handled, or cheater bar.
1/2" drive breaker bar.	3/8"drive torque wrench at least 0-25 ft. lbs.
Inch Pound torque wrench to cover 50 inch lbs.	Foot Pound torque wrench to cover 92 ft. lbs.
Feeler gauge set to cover 0.049-0.051 inches.	A hammer med size.
A 3 or 4 inch long punch small diameter.	A pair of large adj. pliers
10mm box end open end wrench combo.	A large flat blade screw driver (12 inch).
A gasket scraper or putty knife.	Shop light or flash light.
Shop towels or rags.	A roll of tape.
A container for emptying washer fluid tank.	1 piece of card board 24"x 24"
Brake Parts Cleaner (Mopar 04897150AB)	Fender covers to protect the paint.

**A Cummins "B" engine that has not had the dowel pin fixed.**

**A friend to help remove and install the fan and shroud.**

## Procedure for work.

- 1) Disconnect both batteries and wrap both positive (+) ends with shop towels or tape to protect from making contact with the battery positive (+) this will help prevent any shorts to ground.
- 2) Remove the coolant over flow tank by inserting a large flat screw driver between the tank and the fan shroud just above the circular notch in the tank. Then remove the hose from the coolant tank to the radiator at the radiator. Next carefully lift the tank out of the truck making sure not to spill the coolant, and place the tank in an upright place out of the way.
- 3) It is best to have as little fluid in the windshield washer tank as possible before removing it from the fan shroud, you can remove the line from the bottom of the tank and catch the fluid or you can just remove the tank as is if you drain the tank catch the fluid in a container for reuse later. It is not easy to remove the tank from the truck, and it is not required. You do have to get it out of the way to remove the fan shroud. To do this you need to insert a long flat screwdriver just above the two notches in the tank, between the tank and shroud then lift the tank out of the slots and set back as far to the fire wall as possible.
- 4) Next you need to remove the four 10mm head bolts from the fan shroud there are two on each side. Then remove the two clips from the top of the shroud, holding it to radiator.
- 5) Remove the engine acc. drive belt using a long handled 3/8 drive ratchet, if you don't have a long handled ratchet then find a 2 ft. long piece of pipe that fits the ratchet good enough to loosen the belt tensioner. Rotate the belt tensioner arm counter-clock wise and remove the accessory drive belt making sure not to smash your fingers between the belt and pulley.
- 6) Insert the 2ft. by 2ft. piece of card board between the fan and fan shroud, and center it on the radiator then tape it in place. This will **help** protect the radiator but **will not prevent damage from sharp or sudden blows as the card board is not strong enough**, but it will help prevent cooling fin damage and minor bumps. **So work slowly and be EXTREMELY CAREFUL!**

7) Next locate the four 10mm bolts for the fan support bracket (see Figure 1), three of the bolts have to be removed first the last bolt can only be removed with an open end wrench (If this bolt cannot be loosened with the open end wrench; you can shave a 10mm box end wrench down to fit between the fan pulley and bolt head. Tap on the wrench with a hammer to help with an impact type motion.) . Support the fan assembly with one hand and loosen the bolt with the other making sure not to damage the radiator fins.

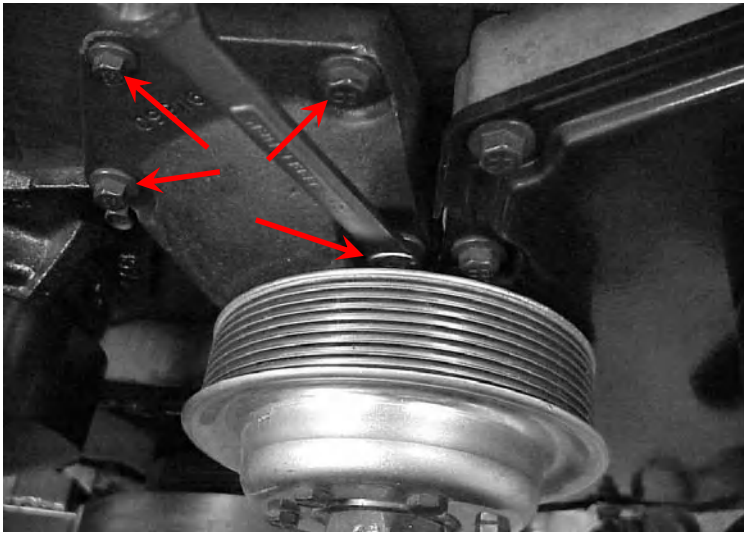


Figure 1

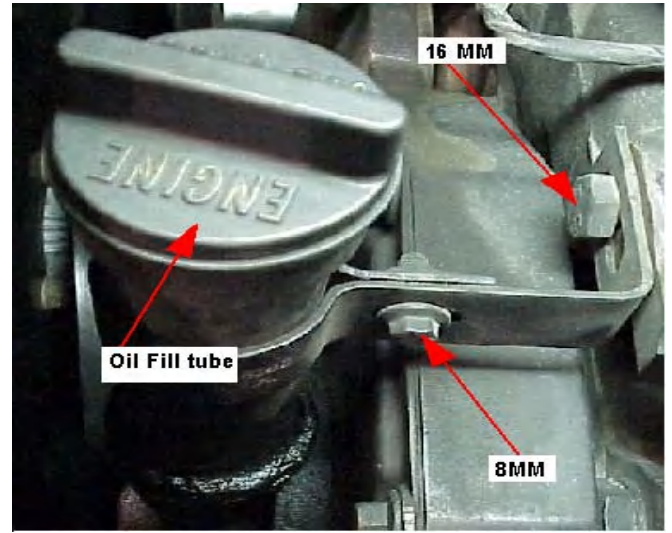


Figure 2

8) **CAREFULLY** work the fan and the fan shroud out together, this takes time so go slow and (working with a friend helps) just make sure not to **DAMAGE** the radiator cooling fins or any hoses that may be in the way, this is a very tight area so be careful.

9) Now remove the engine oil fill tube located at the front upper side of the gear case (See Figure 2). To do this remove the one 16mm bolt from the bracket to the cylinder head, and loosen the 8mm bolt that clamps the bracket to the oil fill tube. Now rotate the oil fill tube counter-clock wise and remove it from the pump nut cover, this can be done with the use of a large pair of pliers. **Note: 24 valve engines do not have this fill tube.**

10) Now remove the two 13mm nuts from the engine speed sensor (RPM pick up, See Figure 3). Make sure to make note the orientation of the bracket and the placement of the wire hold down bracket. Place the sensor off to the side making sure not to damage the sensor or the wires to the sensor. **Note: The 24 valve engines do not have this RPM sensor.**

11) Next remove the engine vibration damper using a 15mm socket and ½ inch drive breaker bar. On manual transmission trucks place truck in gear and set parking brake to keep engine from rotating while loosening the damper bolts, on automatics you will need an engine barring tool to keep the engine from rotating while loosening the bolts or use an impact wrench. On automatics you can remove an inspection plate b the flex plate/starter ring gear and keep the engine from rotating by placing large pry bar or screw driver against ring gear teeth.

12) Using a 10mm socket remove all the gear housing bolts, two of these bolts are 8mm (and it is best to use a wrench) these bolts are for the engine speed sensor. Keep the bolts in a safe place making sure not to loose them.

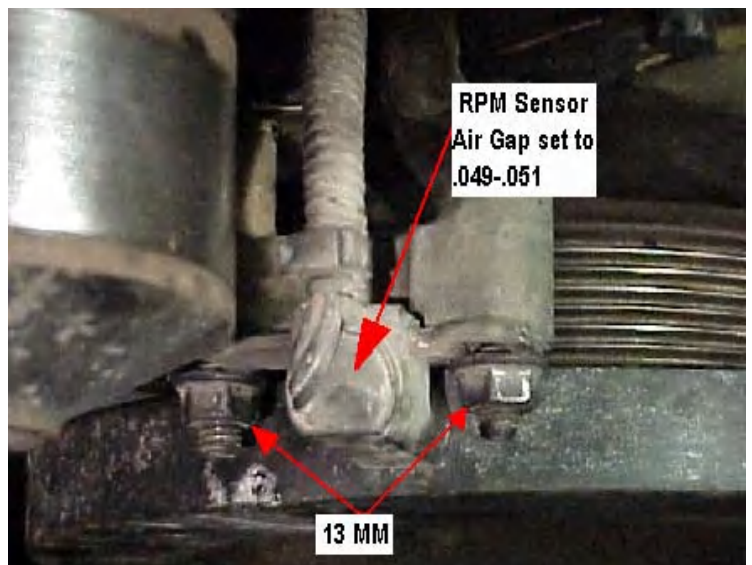


Figure 3

**Note1: There are long and short bolts they will need to be put in the proper location when reinstalled.**  
**Note 2: These two studs are not on the 24 valve engines.**

13) Now locate the dowel pin and look to see if it is fully seated, most of the pins will be flush with the gear housing or just below flush if they have not backed out. If the pin seems to be backed out (See Figure 4) find a small punch (or a small socket with a 3 inch extension) that is smaller than the head of the dowel pin. With a hammer and punch (or socket with extension) tap on the head of the dowel pin and drive it into the block as far as possible (See Figure 5).

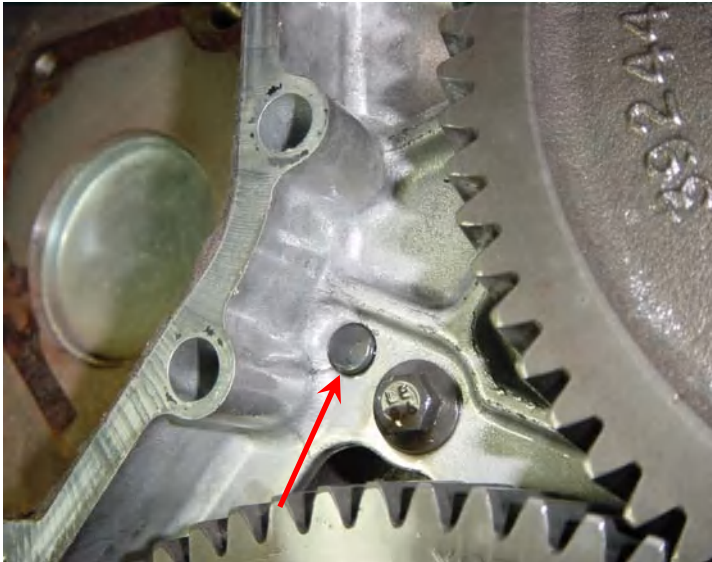


Figure 4



Figure 5

14) Locate the 10mm bolt next to the dowel pin and remove it (See Figure 5). Clean threaded hole with the parts cleaner and let dry. Place a drop of the red threadlocker on the new longer bolt, then using the special washer supplied in the kit, install the bolt with washer in the hole next to the dowel pin (See Figure 6). This washer prevents the dowel pin from backing out. Torque the bolt to 18 lb-ft torque. You may also wish to



Figure 6

check five other capscrews holding the gear cover housing to the engine as shown in Figure 7. Three are easy to access but two are hidden behind the cam gear and may require barring engine to access. Remove these five screws one at a time, clean and dry each threaded hole and capscrew separately and reinstall the with red threadlocker and torque to 18 lb-ft before removing the next capscrew.

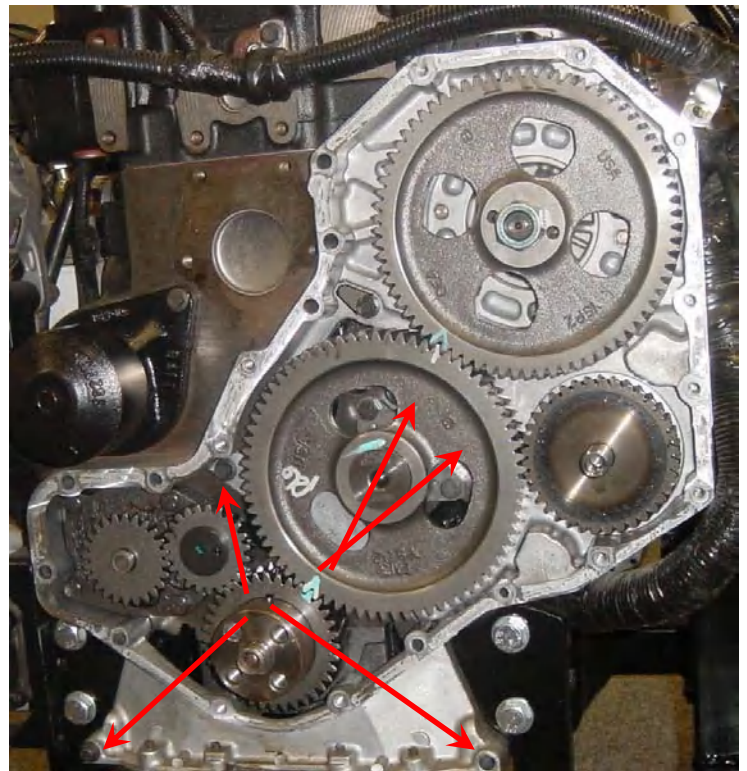


Figure 7

15) Using a gasket scraper clean the gear housing gasket surface and the gear housing cover, of all old gasket material. With brake parts cleaner clean all gasket surfaces to remove all oil residues.

16) Remove the crank shaft oil seal from the gear housing using a punch or seal driver. Located in the kit there is a box with a new crankshaft seal, seal driver, crankshaft seal starter and a dust shield. **See page 5 for more details of the seal installation.** Install the new crankshaft seal in the gear housing cover applying Threadlocker Red to the outside of the seal. Using the seal driver install the new seal in the gear housing cover making sure it is square in the opening. Clean all oil residues from the gear housing cover and gear housing gasket surface and any old gasket material. Apply a continuous 1/8 inch bead of RTV to the gasket surface area, around the bolt holes of the gear housing cover. Clean all oil off the front of the crankshaft as the new Teflon seal must be installed on a clean dry surface. Using the crankshaft seal starter in the new seal place the gear housing on to the front of the engine, push the gear housing cover over the crankshaft nose with the aid of the seal starter in the kit, and remove the seal starter from the crankshaft once a couple of bolts are started and holding the cover in place.

17) Install all of the gear cover bolts making sure to apply a small amount RTV to the threads of each bolt. There are two different lengths of bolts (longs and shorts) and two studs for the engine speed pick up. Make sure to get all the bolts back in the right location. Once the bolts are installed and hand tight, torque to 18 lb-ft.

**Note: The engine speed sensor and the two studs are not on the 24 valve engines.**

18) Reinstall the 4 (15mm) engine damper bolts and torque bolts to 92 lb-ft. torque.

19) Reinstall the engine speed sensor (RPM sensor) and set the sensor-to-vibration damper air gap to 0.049 minimum to 0.051 inches maximum. Make sure that the two notches in the damper aren't under the sensor when setting the air gap (See Figure 8), tighten and torque the mounting nuts to 18 lb-ft. and remove the feeler gauge.

**Note: This step will not be done on the 24 valve engines.**

20) Lower the fan shroud into the engine compartment placing the driver side shroud mounting brackets under the radiator hose, leave the passenger side up in the air and, ***CAREFULLY*** work the fan and mount down with the fan shroud into place, making sure not to damage the radiator cooling fins or upper radiator hose. It is best to have a helper with this part although one person can do it. Once the fan and shroud are in place, start the four 10 mm bolts, it is best to

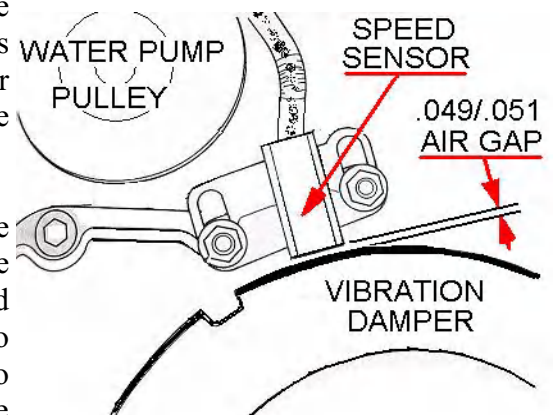


Figure 8

start the one left in the mounting bracket first then start the other 3 bolts. Once all of the bolts are installed and hand tight, then torque bolts to 18 lb-ft. Remove the piece of card board from the radiator at this time.

21) Align the two tabs on the bottom of the fan shroud with the two slots on the bottom of the radiator, align the bolt holes on the sides of the fan shroud and install the four 10mm bolts hand tight and once all four bolts are installed, torque the bolts to 50 lb-in. Then reinstall the two clips on the top of the radiator to fan shroud.

22) Reinstall the windshield washer tank to the fan shroud by inserting the tab at the bottom of the tank into the slot in the arm towards the bottom of the fan shroud, and then insert the two tabs at the top of washer tank into the openings on the top of the fan shroud and push the tank down to lock in place. Now reinstall the coolant tank by aligning the two tabs on the tank with the two slots in the fan shroud and push down to lock in place. Reconnect the hose from the coolant tank.

23) Reinstall the oil fill tube using a pair of large pliers, make sure not to over tighten and break the tube, it is only plastic so just past hand tight will be enough. Reinstall the 16mm bolt and torque to 32 lb-ft. Tighten the 8mm tube clamp bold to 18 lb-ft. **Note: This step will not be done on the 24 valve engines.**

24) Reinstall the engine accessory drive belt according to the diagram on the front hood support of your truck. There are two different diagrams, one for no A/C and one for A/C. After the belt is on, recheck to make sure the belt is on properly and not hanging part of the way off any of the pulleys. (Refill the windshield washer tank if drained during removal.)

25) Reconnect both batteries making sure the terminals are clean and the clamps are tight. Check around the engine compartment and make sure all tools and equipment are clear of any moving parts and test start the engine, check for any oil leaks and to make sure the engine drive belt is running straight. Fix any oil leaks or drive belt problems before driving the truck.

## TST's Front Crank Seal Installation Instructions for Cummins "B" Engines

These instructions replace the Cummins supplied instructions in the 3804899 kit which were written for seal replacement with the front cover still on the engine. Use these instructions to aid in the seal installation mentioned in step 16 of our Dowel Pin Fix Kit, or anytime the seal is replaced with the gear cover removed from the engine.

### **Tool list and required parts:**

A hammer med size.

A large flat blade screw driver (12 inch).

Red Threadlocker

A long punch small diameter or

Brake Parts Cleaner (Mopar 04897150AB)

Cummins Front Crank Seal Kit 3804899

### **A Cummins "B" engine needing a new front seal**

#### **Procedure for work.**

1) With the front gear cover removed from engine, place gear cover front down on a work surface and drive the old seal out hitting the metal case of the seal from the back side of the cover with a punch or screwdriver and hammer as shown in Figure 1. **Caution: Do not damage the cover bore .**



Figure 1



Figure 2



Figure 3

2) Clean the bore with parts cleaner, dry the bore, then place the seal driver furnished with the seal kit in the front side of the cover bore as shown in Figure 2. Flip the cover over, front side down with the seal driver against the work surface such that the driver tool will control the depth of the seal when it is installed from the back side of the cover.

3) Remove the semi-transparent plastic seal starter guide from the inside diameter of the seal. Coat the outside diameter of the seal metal case with a light coating of red threadlocker. These seal have two sealing lips, one is the black oil seal lip and the other is a yellow dust lip. Since we are installing the seal from the back side of the cover, the side with the yellow dust lip would go in first or down when laid on the work surface. Start installation of the seal into the back side of the gear cover as shown in Figure 3 by taping lightly with a hammer. **Caution: Do not let the seal go in the bore tilted,**

**keep it flat.** Use a wide bladed screwdriver or punch as shown in Figure 4 to drive the seal into the bore until it is against the supplied seal driver that was placed on the front side of the gear cover bore on the work surface. Re-install the semi transparent plastic guide into the seal from the back side of the cover.

4) Proceed with reinstalling gear cover on the engine using instructions elsewhere. **Before you re-install the damper,** install the black rubber dust shield that was include in the 3804899 kit. This shield fits snug on the crank with the large diameter side of the shield touching the metal face of the crank seal as shown in Figure 5. Proceed with damper installation.



Figure 4



Figure 5