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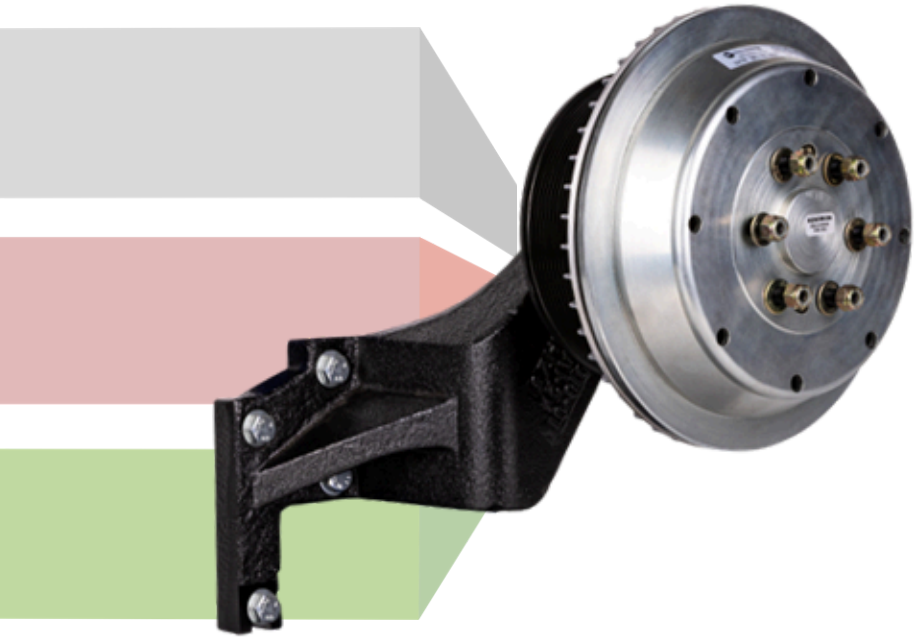
TERMINATOR



Pulley Bearing Replacement

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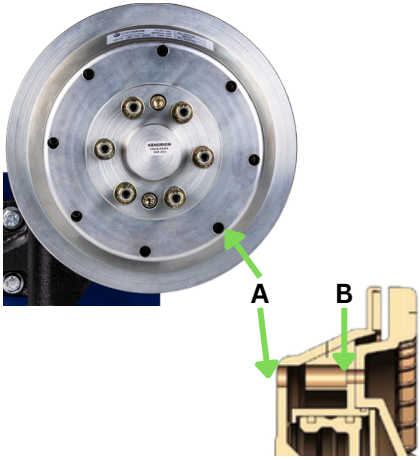
Maintenance Procedure

TERMINATOR

Safety guidelines and procedures outlined by your company must be followed, which should adhere to or exceed Federal or State approved shop safety practices and procedures

Tools Required

- 5mm Allen Key
- Torque Wrench 0 - 40 Nm
- Torque Wrench 50 - 250 Nm
- Small Circlip Pliers
- Soft Rubber Mallet
- 13mm Spanner
- 9/16” Socket
- Loctite 243 (or equivalent)
- Light Lubricating Oil
- Workshop press - 1 - 2 ton
- 3/4" DR. Axial Lock nut Socket-KING TONY-64K9M
- Large Circlip pliers



Removal of the fan clutch assembly from the vehicle.

1. Remove fan from the fan clutch mounting studs by removing the 6 x M8 Nyloc nuts.
2. Release fan drive belt tension.
3. Remove the 4 Journal bracket engine mounting bolts and remove the complete assembly, be sure to use best lifting practices when removing unit from engine bay.
4. Mount the clutch assembly to a secure work surface.

Remove the clutch from the pulley.

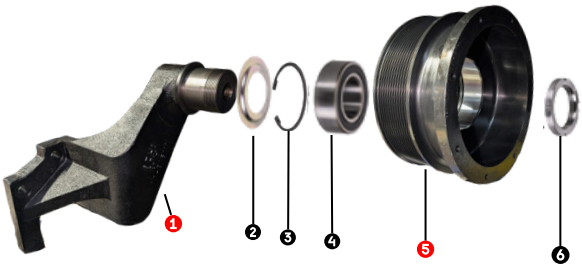
1. To remove the clutch, the holes in the outer clutch face **(A)** and cooling ring **(B)** must align to gain access to the 8 mounting screws inside the clutch.
2. To align holes, connect workshop air supply (100 psi) to the air fitting on the clutch bracket, rotate the outer clutch face (A) to align.
3. **Disconnect air supply once aligned, do not attempt to remove the clutch mounting bolts with air pressure applied.**
4. **Using a 5mm Allen Key – remove the 8 x M6 bolts.**
5. **Remove the clutch from the pulley and place face down on the bench.**

NOTE: In the unlikely event the outer face cannot be rotated to align the holes, DO NOT REMOVE THE 2 X M8 BOLTS ON THE FRONT FACE OF THE CLUTCH. Call InnoTherm for support.

Remove the air cartridge.

1. With the air cartridge now exposed – remove the circlip retaining the air cartridge.
2. Using a pair of wide nose pliers – grasp the cartridge by the plunger and remove it from the bracket. the used air cartridge and circlip can be discarded.

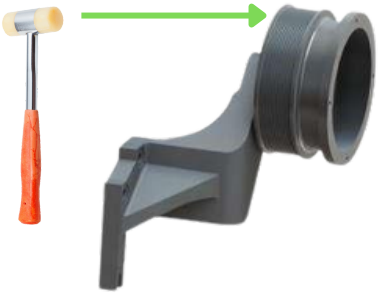
NOTE: Take care during this process not to damage the surfaces of the bore that houses the air cartridge.



Pulley Bearing Replacement

Its recommended to be replaced when replacing complete fan clutch.

1. Remove the axle nut (6) using special socket. 3/4" DR. Axial Lock nut Socket-KING TONY-64K9M and **breaker bar.**



1. Remove the pulley (5) from the mounting bracket (1), The bearing is a not a press fit on to the bracket journal, meaning a soft hammer can be used on the pulley as per illustration

Pulley Bearing Replacement

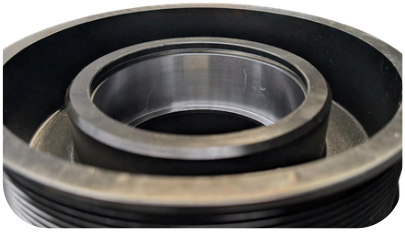
Recommended to be replaced when replacing complete fan clutch.

Bearing Removal

1. Remove old bearing from pulley, press bearing out from fan clutch mounting side as shown, using a hydraulic or arbor press with spacer or socket on inner bearing ring.

Bearing Housing

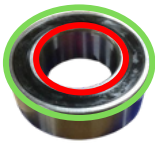
- Ensure bore is clean and blemish, pitting & rust free. Clean with brake clean and rag.
- Pulley should be replaced if blemishes, pitting & rust is present.

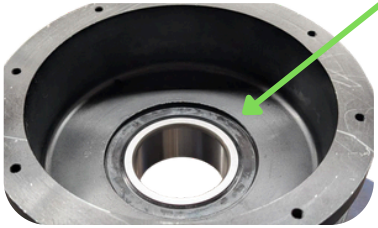


Bracket Bearing Journal & Thread

- Check that the thread is clean and not damaged.
- Check that the base is smooth and free of any damage or ridges.
- Make sure that machined shaft section has no damage and is smooth and clean.
- Ensure the bearing seating area is blemish, pitting & rust free, replace if present.
- The bearing is a not a press fit on to the mounting bracket, meaning when the new bearing is installed, NO pressing or excessive force is required. If the new bearing (once fitted into the pulley) seems loose on the bracket, replacement of complete unit required.

Pulley Bearing Replacement





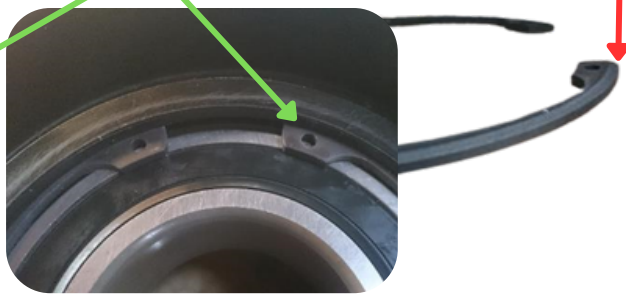
New Bearing Installation

Only press the new bearing in on the outer bearing shell, bearing installation adapters available from Innotherm

Press size recommended. 2 Ton hydraulic or Arbor press.

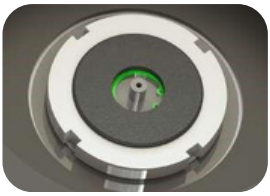
1. Lightly lubricate the outside of the bearing with WD40.
2. Make sure there are no contaminants on the outside face of the bearing.
3. Sit the bearing inside the bearing opening making sure it is sitting flat.
4. Rest adapter on top of the bearing making sure it sits flush on the bearing outer race.
5. Use press to drive bearing into the pulley.
6. To start off, press the bearing approximately 10mm in, stop, inspect, then press the bearing home if the bearing is sitting correctly.
7. **DO NOT OVERLOAD ONCE BEARING PRESSED INTO PLACE, DAMAGE CAN OCCUR IF OVERLOADED.**
8. Remove the pulley from the press and check that bearing is resting flush against the lip in the pulley.
9. The beveled edge of the circlip must face away from the bearing.
10. Make sure circlip is installed all the way into the groove between the pulley and the bearing.

NOTE: The beveled edge should be hidden under the groove once the circlip is properly fitted.



Prepare the bracket and pulley for the new air cartridge

1. Thoroughly clean all surfaces.
2. Inspect the bore to ensure it is in a serviceable condition.
3. Check condition of bearings for signs of wear/play and replace if required.
4. **Ensure any dried thread sealant has been cleaned away from journal bracket air supply line. Ensure no debris is inside the air supply line or bore.**
5. The top surface of the plunger is a sealing face, ensure it is clean and free of damage.
6. Carefully insert the cartridge into to bore, up to the first o-ring seal. Ensure the cartridge in pressed into the bore with care.
7. Ensure the circlip groove is visible once the cartridge is seated. If it is not visible, using a 13mm deep socket on the air cartridge outer surface and with a soft hammer, tap cartridge until circlip groove visible.
8. If the air cartridge is unable to be seated remove and inspect the bore for any abnormalities.
9. Install the circlip with the beveled edge against the air cartridge and ensure the circlip installed as per below example.



Replace the face seal nut on rear of clutch

1. Use a 13mm spanner to remove and discard the used nut.
2. Clean the surface and thread on the rear of the clutch and fit the new face seal nut - tighten to 10 Nm.

ENSURE FACE SEAL SURFACE IS CLEAN AND FREE OF ANY MARKS/SCRATCHES - AVOID TOUCHING FACE

Install the clutch assembly to the pulley.

1. Mount the clutch on the pulley.
2. Apply Loctite 243 (or equivalent) to the 8 x M6 bolts.
3. Tension bolts to 10Nm.

Pre-Installation Check

1. With the clutch still mounted on a secure work surface apply air pressure (90-100 PSI) to the inlet nipple and visually confirm the clutch is engaging/disengaging
2. When working correctly the front face of the clutch can rotate independently to the pulley when pressurised.
3. While pressurised listen for any audible signs of air leaks. In the event of leaks partially repeat the assembly process from point 6.

Installation & Maintenance

Troubleshooting Guide

TERMINATOR

Issue: Air leaking from clutch Cause:	Solution:
1. Air-line connection to clutch is faulty. 2. Leaking Air cartridge.	1. Confirm wiring is as per OEM wiring. 2. Clutch engagement occurs at +10ºF above full open thermostat. 3. Ensure airside of cooling system is clean.
Issue: Clutch not engaging /disengaging. Cause:	**Solution:**
1. Faulty electrical wiring. 2. Faulty thermal switch. 3. Faulty solenoid valve. 4. Clutch at end-of-life.	1. Inspect and fittings on hose ends – for air leaks and rectify as required. 2. Remove clutch from the pulley (refer to installation manual) and inspect the seal between the pulley and clutch and inspect the air cartridge. Replace any worn components.
Issue: Clutch cycles too frequently Cause	**Solution:**
1. Electrical circuit short or incorrectly wired. 2. Temperature control setting is incorrect. 3. Obstruction to air flow through the radiator. 4. Low coolant level. 5. Faulty thermal switch.	1. Confirm wiring is as per OEM specification. 2. Fault check thermal switch, replace as required. 3. Clean solenoid exhaust or replace valve if faulty.
Issue: Clutch slipping on engagement. Cause:	**Solution:**
1. Low air pressure. 2. Solenoid incompatible. 3. Restrictor still fitted in airline.	1. Check air-line pressure – 90-100 PSI is required. 2. Some solenoids have a ‘slow’ release function, which is not recommended for a Terminator clutch. Replace with ‘quick’ release solenoid.
Issue: Clutch face appears scorched /blistered. :	**Solution:**
1. Low air pressure (clutch slipping). 2. Solenoid not suitable (clutch slipping).	1. Check air-line pressure – 90-100 PSI is required. 2. Some solenoids have a ‘slow’ release function, which is not recommended for a Terminator clutch. Replace with ‘quick’ release solenoid.
Issue: Clutch engaged, engine running hot	**Solution:**
1. Obstruction to airflow through the radiator. 2. Fan capacity not sufficient. 3. Cooling system problem	1. Ensure airside of cooling system is clean. 2. Confirm OEM fan is installed. 3. Refer to OEM vehicle manual.