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Title: Vibration Troubleshooting

Applies To: All International Trucks

Change Log

Dealers: Please refer to the change log text box below for recent changes to this article:

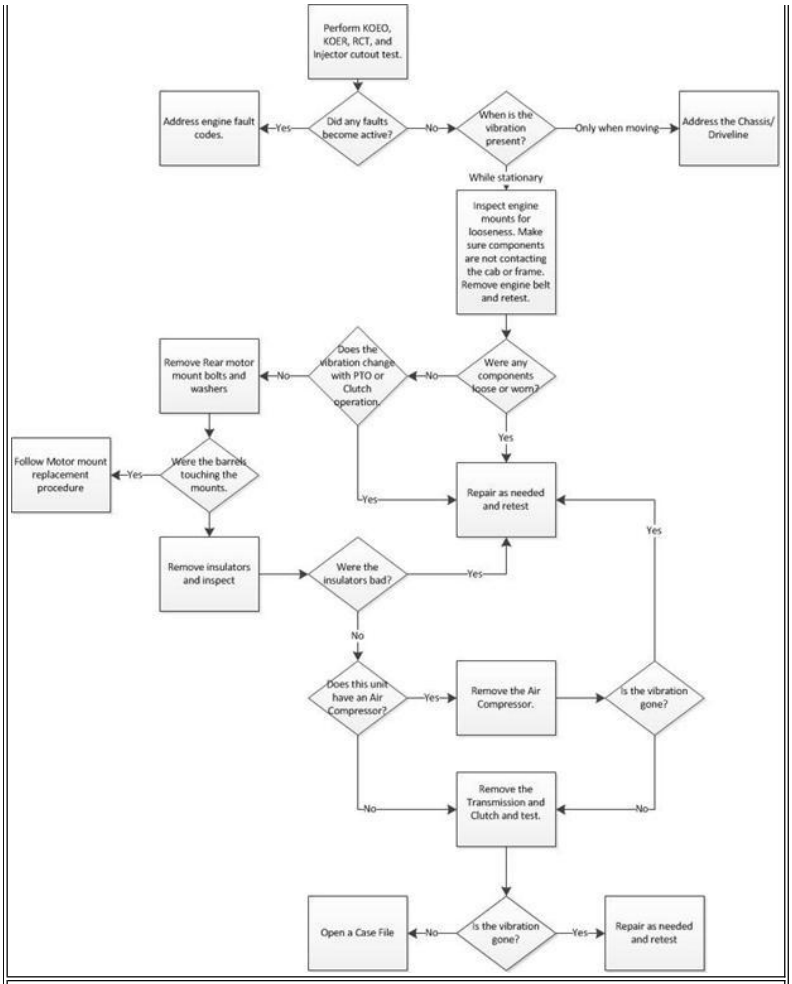
11/18/2015 - Repaired hyperlink to Mekra Lang manuals. Re-formatted article layout.
11/02/2015 - Added info from IK0100013 & IK1200666
10/16/2015 - Removed content about discontinued tool - ZTSE 4580 and updated Author for feedback purposes
04/01/2015 - Added Frequency Graph
08/28/2014 - Deleted the yellow highlighted links that were not really links.
08/05/2014 - Author updated for feedback purposes

Description

- This article will cover the following information on vibrations:
  - Vibration troubleshooting flowchart.
  - Vibrations caused by engine mounts.
  - Vibrations caused by cab mounts.
  - Correcting mirror shake not caused by engine or cab mount issues.
- For vibrations caused by driveline issues please refer to IK1400005 - Driveline Information Center and Troubleshooting Procedures

Troubleshooting Flowchart

Figure 1 - Vibration Troubleshooting Flowchart



For a printable version of this chart - Click Here

Engine Vibration Information

Table 1 - Engine Mount Troubleshooting and Repair

Description

Engine Vibration on all Engine and Chassis Types

- For MaxxForce 11/13 and N13 front engine mount information refer to Table 2 below.

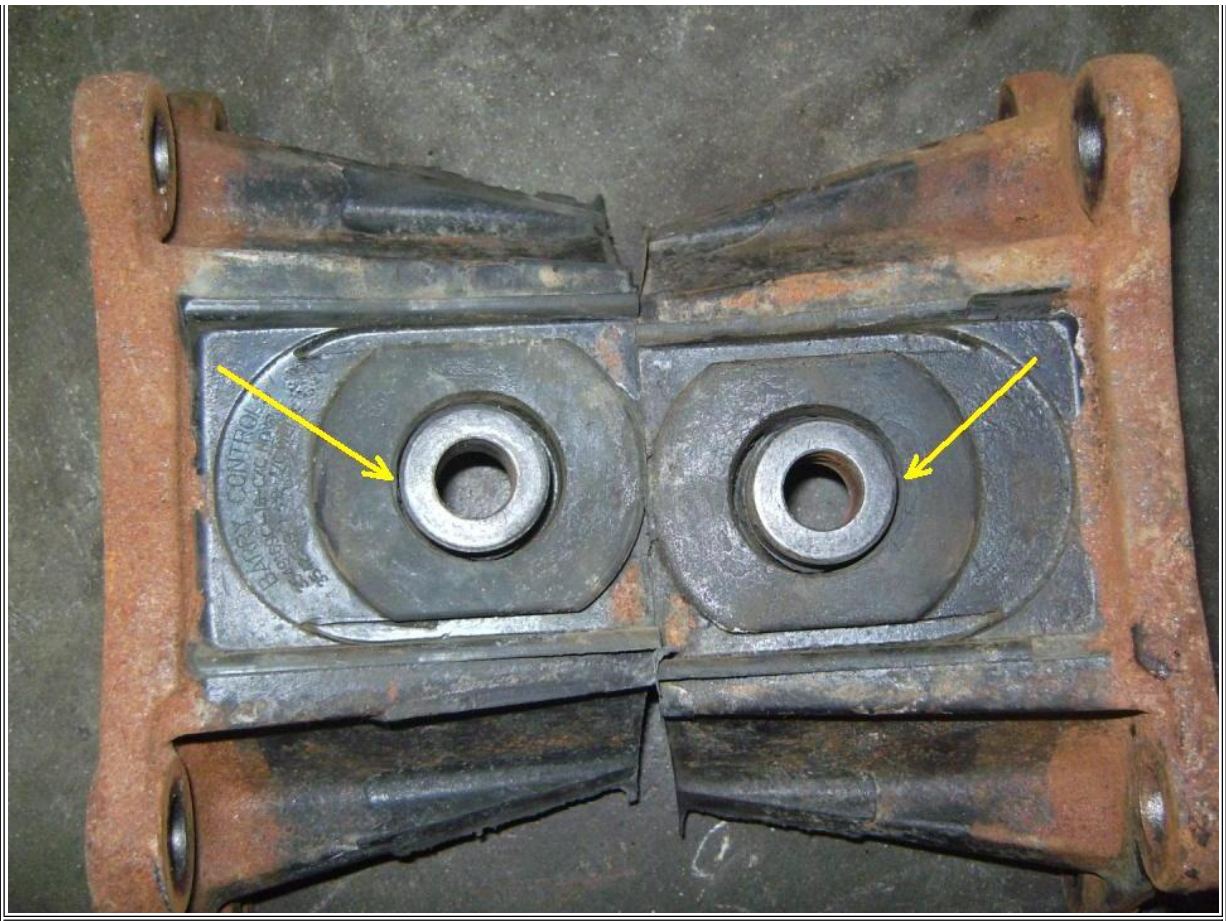
Symptoms

- Driver may feel a vibration while steering the chassis in one direction or the other.
- Driver may feel this in the floor or steering wheel while driving in certain conditions and speed ranges.
- Driver may hear as well as feel this vibration.

Troubleshooting

1. Remove the lower snubber washers on the rear engine mounts and look to see if the "spool" is centered in the mount bracket.
2. Jack the rear of the engine up to remove pressure from mount to see if the "spool" or the outer portion of the rubber on the mount is torn loose or damaged.
3. Remove and inspect the front engine mounts to inspect the inner radius of the isolator for damage.

Figure 2 - Rear Engine Mount Damage



Isolator is damaged. Notice how the barrels are contacting the mount.

Figure 3 - Front Engine Mount Damage

Isolator is damaged.

Resolution

- Replace any compromised mount - there are no part number changes just get what parts catalog calls for.
- With new mounts installed, carefully let the weight of the engine down on the mounts-pay close attention to note whether the weight of the engine cocks the spool to an angle and then note whether the spool is perfectly centered.
- Loosen the bolts that assemble the rear of cab crossmember and push out the frame if it is too narrow or pull frame together if too wide to allow centering of the rear engine mount bolts and retorque the crossmember bolts.
- If the frame is still too wide at the rear engine mount area then you will need to add grade eight washers between the mount and the frame to space it inward until perfectly centered.
- If the frame is still too narrow at the rear engine mount area then you will need to measure the frame width at the front engine crossmember, again at the rear engine mount area, and lastly at the first crossmember (rear cab mount) behind the engine and document these numbers.

Table 2 - MaxxForce 11/13 and N13 Specific Information

Description

Engine Vibration on MaxxForce® 11/13 or N13

Symptoms

- Vibrations felt in the engine at idle and highway speeds.
- Driver may complain they cannot see out the side mirrors due to the vibration, particularly at idle speed in reverse.

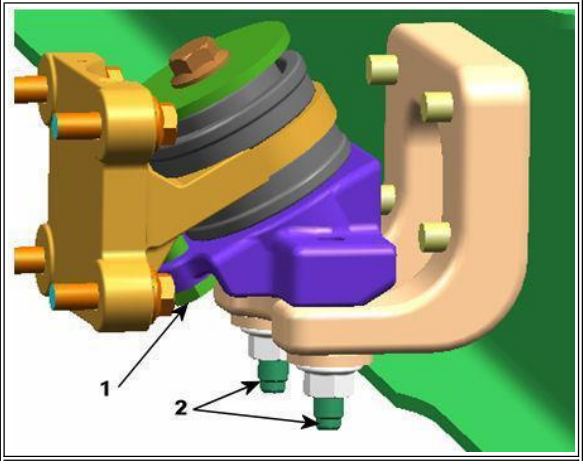
Resolution

- When installing a MaxxForce 11/13 or N13 engine a shoulder bolt (PN 3822703C1 or 3596321C2) must be used to align both the left and right front engine mounts.
- This will ensure correct alignment of front engine mount bushings.
- Install the shoulder bolts (as shown in Figure 5) prior to lowering the engine into the chassis.
- After the engine has been positioned and the front and rear engine mount bolts have been tightened to the appropriate torque, remove the alignment bolt from each of the front engine mounts.

NOTE:

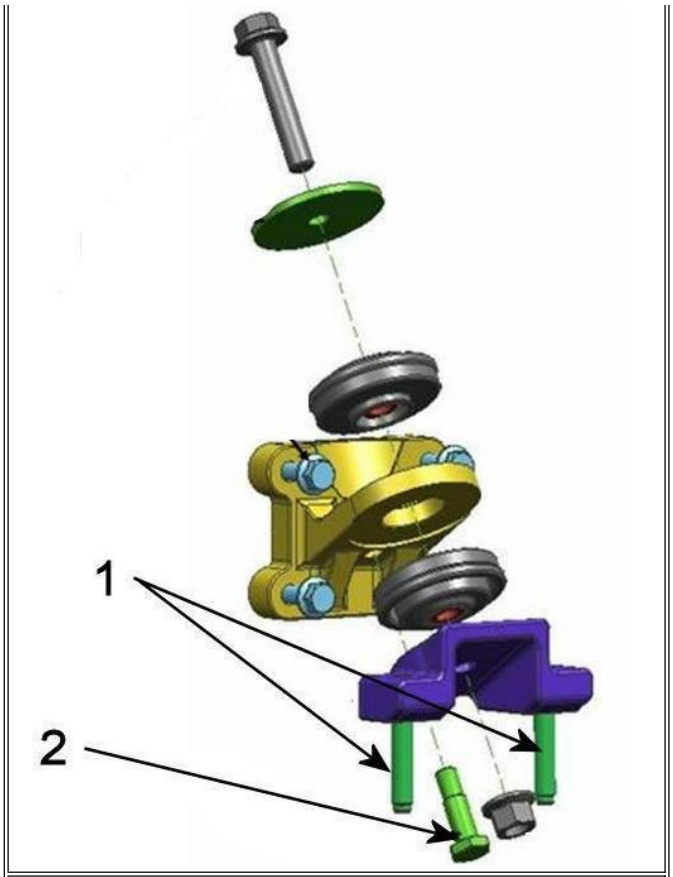
If the alignment bolts are left in, it will cause an engine vibration.

Figure 4



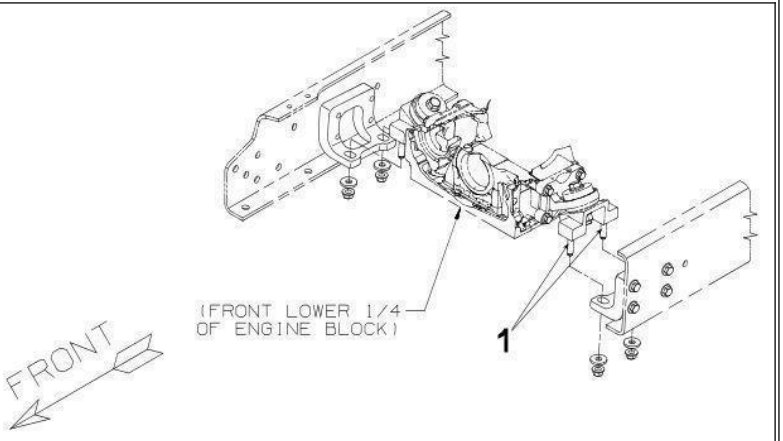
1. Temporary Alignment Bolt
2. Engine Mount Bolts

Figure 5



1. Front Engine Mount Bolts (Torque: 215-237 Nm) (160-175 Lbf-ft)
2. Temporary Alignment Bolt

Figure 6



1. Front Engine Mount Bolts (Torque: 215-237 Nm) (160-175 Lbf-ft)

Cab Vibration Information

Description

Cab mount vibration. Applies to any vehicle model.

Symptoms

- Vibrations felt in the engine or cab at idle and/or highway speeds.
- Driver may complain they cannot see out the side mirrors due to the vibration.

Resolution

- Check the air bag height on the rear cab mounts.
- Check the torque and condition of the front cab mounts.

Mirror Shake - Engine and Cab Vibration Diagnostics Complete

Description

Mirror shakes and vibrates at any engine speed. Applies to any vehicle model.

Symptoms

- Mirror shake at any engine speed.
- Shake may be worse while in reverse.

Service Parts Information

Self-adhering weights

Supplier Service Information

Lang Mekra Mirror Service Information

- http://www.lang-mekra.com/servicemanuals.html

Resolution

- Inspect to make sure upper flip out arm has good rubber grommet.
  - These have been known to wear out.
- Remove the mirrors and add weight using self-adhering weights to the back side of the mirror.
  - It may take up to 16oz of weight on each mirror.

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