



Technical Service Bulletin

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Belt Noise and Front Engine Accessory Drive Belt Re-routing: Tiffin Recreational Vehicles	

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Warranty Statement

The information in this document has no effect on present warranty coverage or repair practices, nor does it authorize TRP or Campaign actions.

Contents

Product Affected

Engine:

- ISV 5.0 CM3230 V104

Original Equipment Manufacturer (OEM):

- Tiffin (**only** recreational vehicles with high mount Freon™ compressor options)

Issue

Symptom:

- Belt noise/squeal or belt damage on the secondary belt plane which wraps around the air compressor and the high mount Freon™ compressor.

Root Cause:

- Insufficient belt wrap around the air compressor pulley.

Verification

- Listen for belt noise when air compressor is in a loaded state.
- Perform a visual check of the belt and pulleys on the secondary (air compressor) belt plane.

Resolution

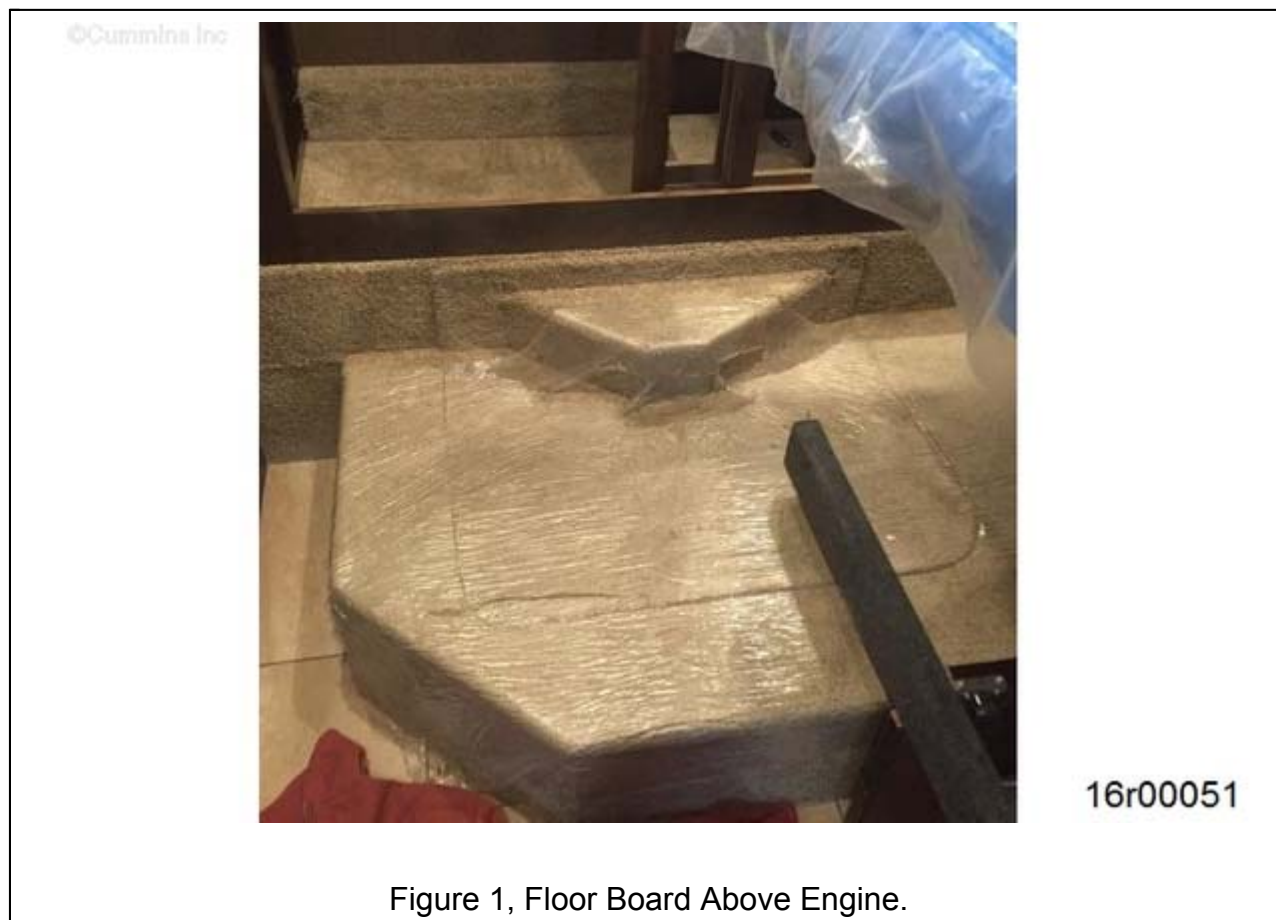
- Move Freon™ compressor from high mount to low mount. See Service Instructions section below.
- Modify fan shroud mounting brackets.
- Change belt options to CP80008 and WP80038 for increased belt wrap on plane two belt around the air compressor.

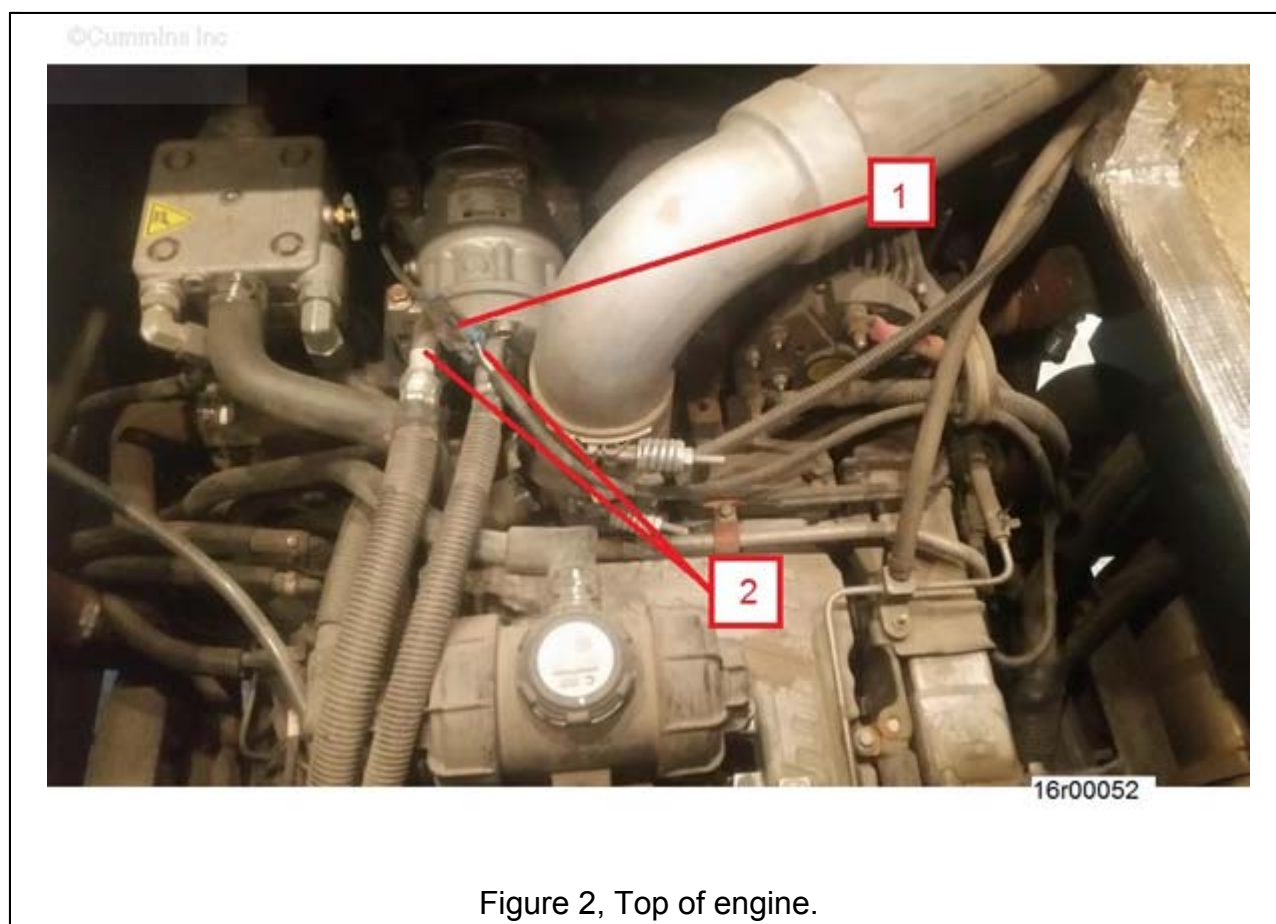
Service Instructions

Read instructions below in their entirety before completing any work.

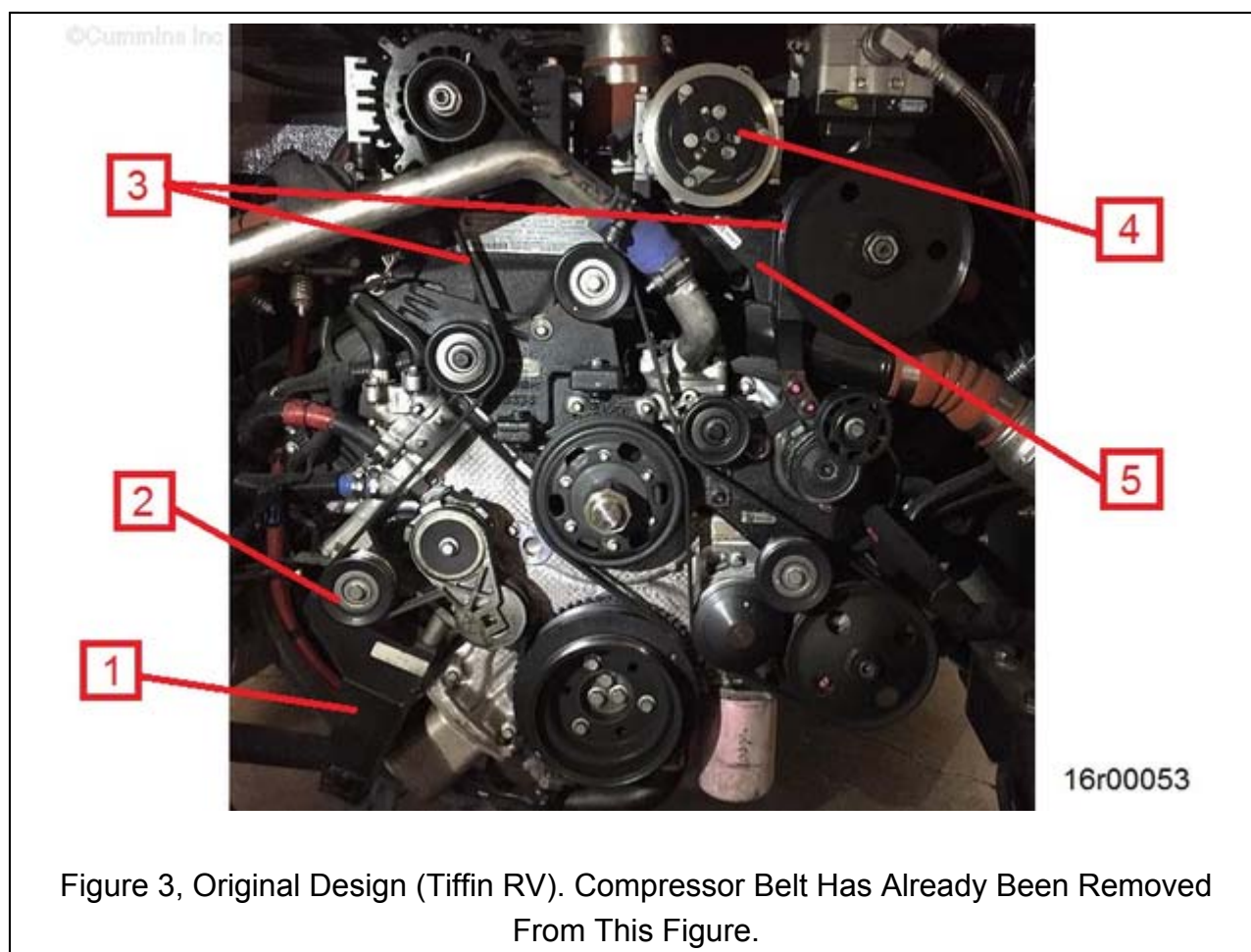
Engine Belt Upfit Procedure:

1. Remove floor board for access (Figure 1). See equipment manufacturer service information.
2. Evacuate refrigerant Freon™ system. See equipment manufacturer service information.
3. Disconnect refrigerant Freon™ pressure and return hoses (Figure 2). See equipment manufacturer service information. Secure hoses out of the way.





1. Freon™ compressor wiring connector.
2. Freon™ compressor supply/return lines.
4. Remove and discard belts, Part Number: 4335361 and 4335602 (Figure 3).
5. Remove and discard lower idler pulley assembly, Part Number 4390735 (Figure 3).
6. Remove refrigerant Freon™ compressor (Figure 3) from upper refrigerant compressor support.
 - a. Mounted on refrigerant compressor support bracket, Part Number 4360003 (Figure 3).
 - b. Two Sanden Freon™ compressor models have been identified as being used in Tiffin production.
 - i. Model Number U4520 can be reused.
 - ii. Model Number U4897 **must** be replaced due to interference fit in lower position.
 1. Acceptable replacements:
 - a. Model Number U4520
 - b. Model Number U6677
 - c. Model Number U4883



1. OEM Lower Fan Shroud Support Bracket.
2. Lower Idler Pulley.
3. Belts to be removed.
4. Refrigerant Freon™ Compressor.
5. Upper Freon™ Compressor Support.

7. Remove L-Bracket (Figure 4 - 7) and P-clamp (Figure 4 - 8) assembly from lower accessory support, Part Number 4390708 (Figure 4 - 9).

8. Remove OEM lower fan shroud support bracket (Figure 4 - 4) mounted to lower accessory support bracket, Part Number 4390708, (Figure 4 - 9) and OEM fan shroud.

- a. Discard OEM supplied cap screws which mounts the lower accessory support bracket to the engine. (Figure 4 - 5 and Figure 4 - 6).
- b. Install new OEM lower fan shroud support bracket (Figure 4 - 4) using new cap screws, washers, and nut at fan shroud position. (Figure 4)
- c. Reuse L-bracket (Figure 4 - 7) and P-Clamp assembly (Figure 4 - 8)
- d. Tighten all fasteners to proper specifications. See equipment manufacturer service information.

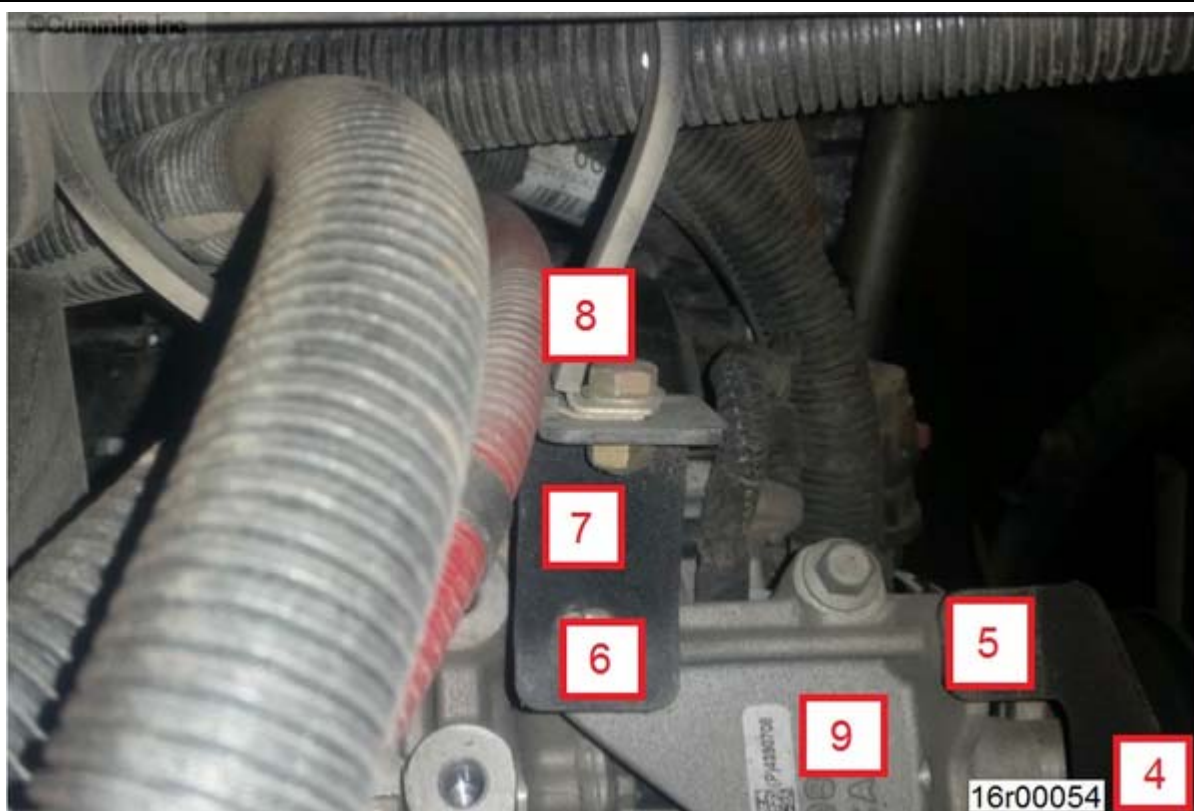


Figure 4, Lower Accessory Drive Mounting with L-Bracket and P-Clamp.

9. Install Sanden Freon™ compressor on lower accessory support, Part Number 4390708 (Figure 4 - 9).

- a. Do **not** tighten capscrews at this time.
- b. Reuse two of the OEM supplied freon compressor mounting bolts from upper mount configuration. (capscrews M8 x 80mm x 1.25)
- c. Install first capscrew in the lower mounting hole towards the rear of the engine.
- d. Install second capscrew (Figure 4 - 6) through the L-bracket and P-clamp assembly (Figure 4 - 8) in upper mounting hole towards the rear of the engine.

Note : Note: P-clamp may be on the inner side of frame rail in original configuration, but P-clamp will move to the outer side of frame rail when repositioned.

10. Install lower and upper OEM fan shroud support brackets or fabricate hardware as mentioned below to securely mount the fan shroud to the engine at all mounting locations.

Fabricate Fan Support brackets (if needed – if **not** needed, skip to Step 16).

Fabricate lower fan support bracket (if needed) (Figure 5 - 3).

11. Install 12.5 mm [½ in] spacers (Figure 5 - 1) between bracket and Freon™ compressor body with two new mounting capscrews (M8 x 120mm x 1.25) (Figure 5 - 2) in remaining holes. (12.5 mm [½ in] spacers allow for access to belt).

- a. Align refrigerant Freon™ compressor drive pulley and tighten refrigerant Freon compressor mounting capscrews to specifications.
- b. 12.5 mm [½ in] spacer can be manufactured or sourced. Fabricated with 9.5mm [3/8] ID x 12.5 mm [½ in] long in black pipe. Paint spacers black before installing.

12. Fan Shroud lower support bracket is offset the thickness of the Freon™ compressor from attaching to the fan shroud. A bracket will need to be fabricated to make up the offset.

- a. Fabricate 100 mm [4 in] long bracket from 38 mm [1 ½ in] x 3 mm [1/8 in] angle iron (Figure 8). Drill two holes as shown.

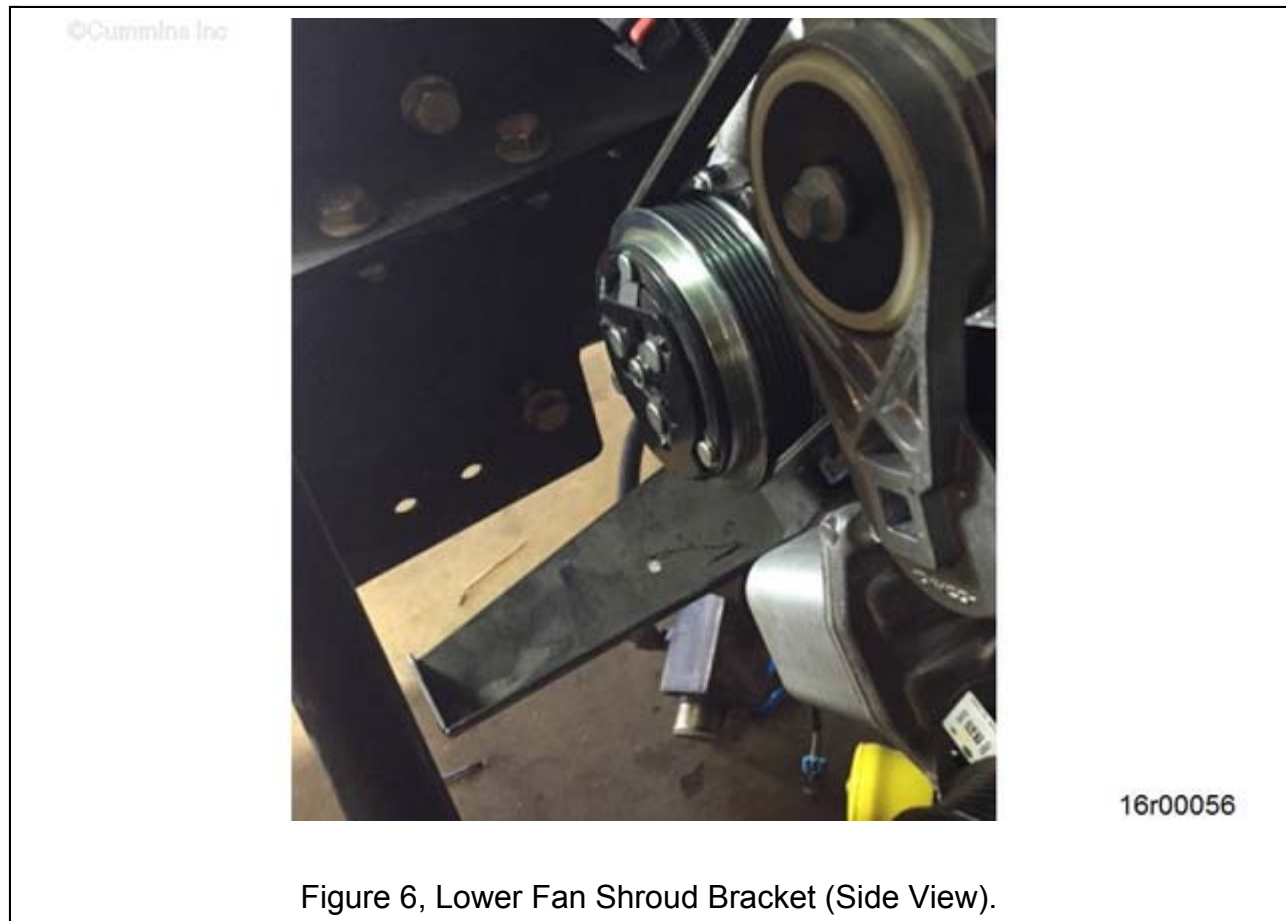
13. Paint bracket black after fabrication.

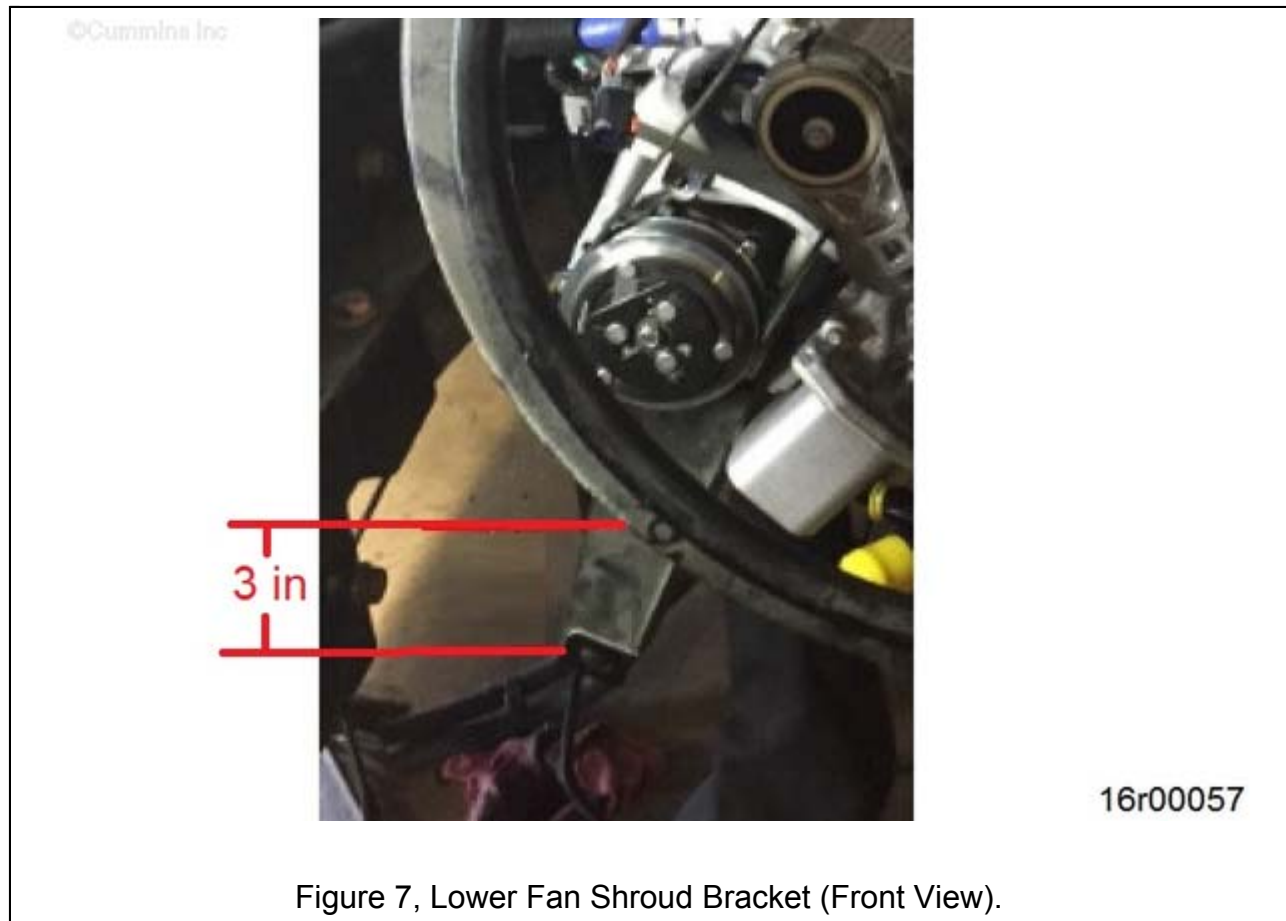
14. Install fabricated bracket to compensate for offset caused by thickness of Freon™ compressor.

- a. Reuse OEM hardware to secure fabricated bracket to fan shroud (Figure 9 -1).
- b. Secure fabricated angle bracket to the OEM fan support bracket (Figure 9 – 4) using a new capscrew, flat washer and locking nut. Install angle bracket on the outside of the OEM bracket as shown by arrow (Figure 9).
- c. Tighten fasteners to proper specifications.



Figure 5, Freon™ Compression Lower Mount Option With Spacers Installed on Fan Shroud Support Bracket.







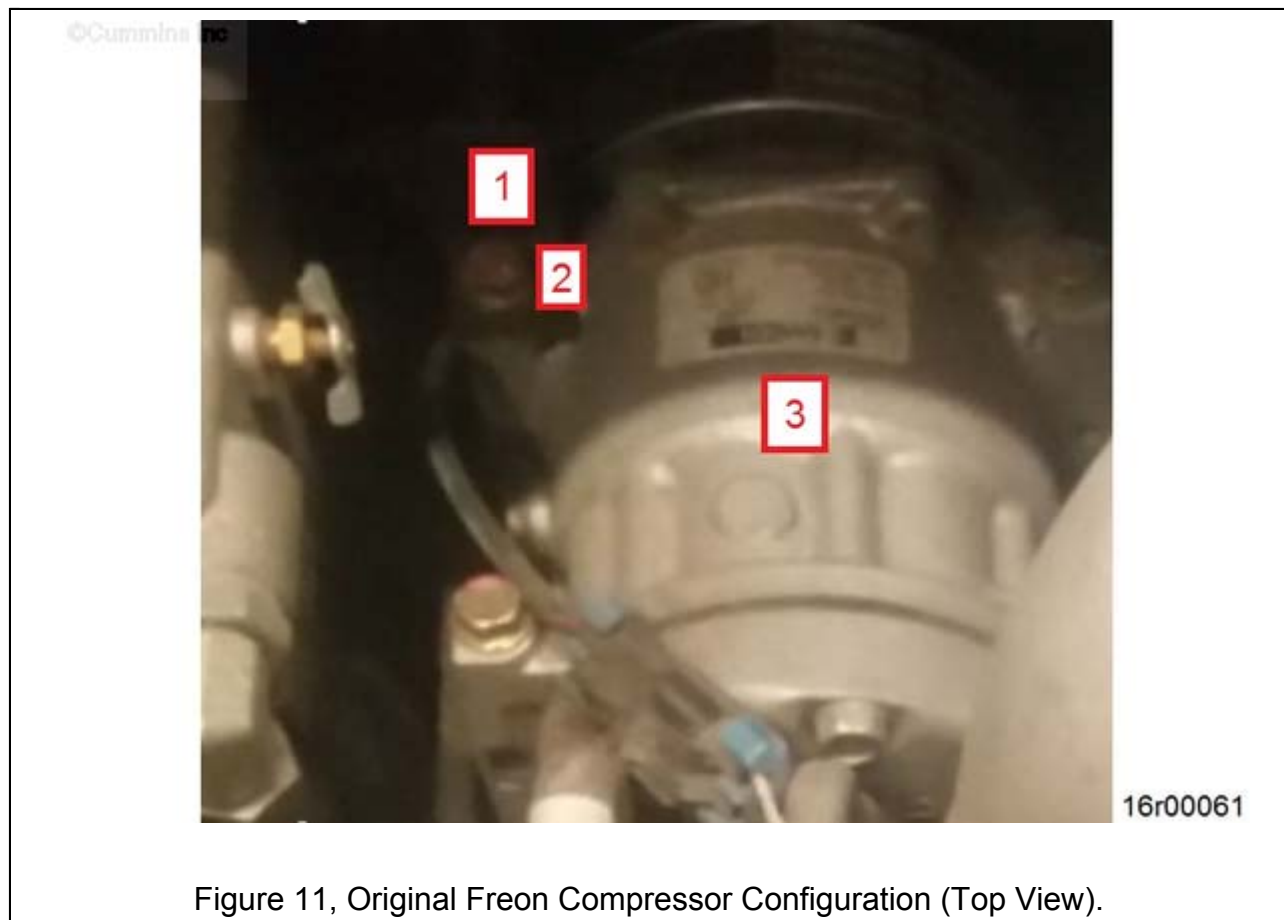


Fabricate upper fan support bracket (if needed).

15. Fan Shroud upper support bracket (Figure 10 – 1 & 11 – 1) originally mounted with refrigerant Freon™ compressor mounting capscrew (Figure 11 - 2). With refrigerant Freon™ compressor (Figure 11 - 3) no longer in the upper location, a spacer needs to be installed. Spacer can be sourced or fabricated.

- a. Fabricated with 9.5mm [3/8] ID x 75 mm [3 in] long black pipe.
- b. Install spacer (Figure 10 - 3) in place of Freon™ compressor in upper OEM fan shroud support. Reuse 1 of original Freon™ compressor mounting capscrews. M8 x 80mm x 1.25 (Figure 10 – 2).
- c. Paint spacer before installing
- d. Tighten all fasteners to proper specifications.





16. Install primary drive belt, Part Number 4335605, for fan, hydraulic pump, water pump, alternator, and lower refrigerant Freon™ compressor (Option WP80038).

17. Install secondary drive belt for air compressor, Part Number 4391015. (Option CP80008)

Wiring harness changes

18. Wiring harness is long enough to route to new position.

- a. Disconnect wiring connector at refrigerant Freon™ compressor.
- b. Remove wire from p-clamp secured to alternator.
- c. Route wiring harness down to new refrigerant Freon™ compressor location and connect to refrigerant Freon™ compressor clutch connector.
- d. Secure wiring harness with plastic ties away from heat sources. Bundle any extra length of harness.

Refrigerant compressor plumbing changes

19. With Freon™ fittings disconnected from the upper position refrigerant Freon™ compressor, cut plastic wire ties and remove p-clamps from original routing that are securing refrigerant Freon™ hoses.

20. Pull hoses from clips and wire bundles.

21. With refrigerant Freon™ hoses removed from original bundles, secure original bundles in p-clamps and replace plastic wire ties as needed.

22. Refrigerant Freon™ compressor pressure hose has a service loop in the hose close to the condenser coil. Rerouting to new Freon™ Compressor location, the length is sufficient to mate with new refrigerant Freon™ compressor without modification to hose.

23. Refrigerant Freon™ compressor suction hose needs to be lengthened approximately [610 mm] [24 in].

Note : Length varies based on model of Freon™ compressor and exact routing.

24. Options to lengthen hose:

- a. Option 1- Preferred method: Use union fitting or bulkhead fitting and a short total length approximately 24 in refrigerant Freon™ hose with 90 degree fitting on compressor end and straight fitting to union connected into original 90 degree fitting on original hose.
- b. Option 2- Hose cut and spliced to proper length approximately 610 mm [24 in] longer.
 - i. Contact your local air conditioning component supplier for necessary parts.

Note : Original hose is a reduced barrier hose which limits selection of fittings.

25. Route hoses to new refrigerant Freon™ compressor mount location. See Figures 12-13.

- a. Secure with wire ties and p-clamps as necessary.
- b. Secure away from heat sources.

26. Remove temporary caps and plugs.

27. Connect hose fittings to refrigerant Freon™ compressor. Tighten to specifications. See equipment manufacturer service information.









Finishing Steps

28. Leak check refrigerant Freon™ system. See equipment manufacturer service information.
29. Fill refrigerant Freon™ system with appropriate amount of oil. See equipment manufacturer service information.
30. Charge system with necessary amount of the proper Freon™ refrigerant. See equipment manufacturer service information.
31. Test operation of dash air conditioning system. See equipment manufacturer service information.
32. Verify belt noise is no longer present.
33. Install floor board which was removed for access. (Figure 1) See equipment manufacturer service information.
34. Return vehicle to service.

Service Parts Availability

Service parts are available. See Table 1 for part numbers.

Table 1, Service Parts				
Part Description	Existing Part Number	Obsolete	Superseded	New Part Number
Belt, V ribbed	4335361	No	No	4391015 (CP80008)
Belt, V ribbed	4335602	No	No	4335605 (WP80038)

Part Identification

See Tables 2 and 3.

Table 2, Parts To Be Removed			
Option	Part Number	Part description	Comment
WP80036	4390735	Pulley, Idler	Discard - Part not needed.
OEM	Model U4897	Compressor, Freon (Sanden)	Discard - Part not needed.
CP80007	4335361	Belt, V Ribbed	Discard - Part not needed.
WP80035	4335602	Belt, V Ribbed	Discard - Part not needed.

Table 3, Parts To Be Added			
Option	Part Number	Part description	Comment
OEM	Model U4883	Compressor, Freon (Sanden)	Install Sanden Model U4883 (will need new freon lines)
CP80008	4391015	Belt, V Ribbed	Use Cummins® belt, Part Number 4391015 for air compressor drive

WP80038	4335605	Belt, V Ribbed	Use Cummins® belt, Part Number 4335605 for primary belt drive
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Part Inventory Action

Existing parts are being removed and discarded for this procedure. New parts are being installed because of an option change on the Tiffin Recreational Vehicles. No parts are being obsoleted or superseded.

Document History

Date	Details
2018-5-15	Module Created

Last Modified: 04-Jun-2018
