



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 refrigerant 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 refrigerant 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 refrigerant compressor from high mount to low mount. See Service Instructions section below.
- Install new Tiffin fan shroud mounting brackets.

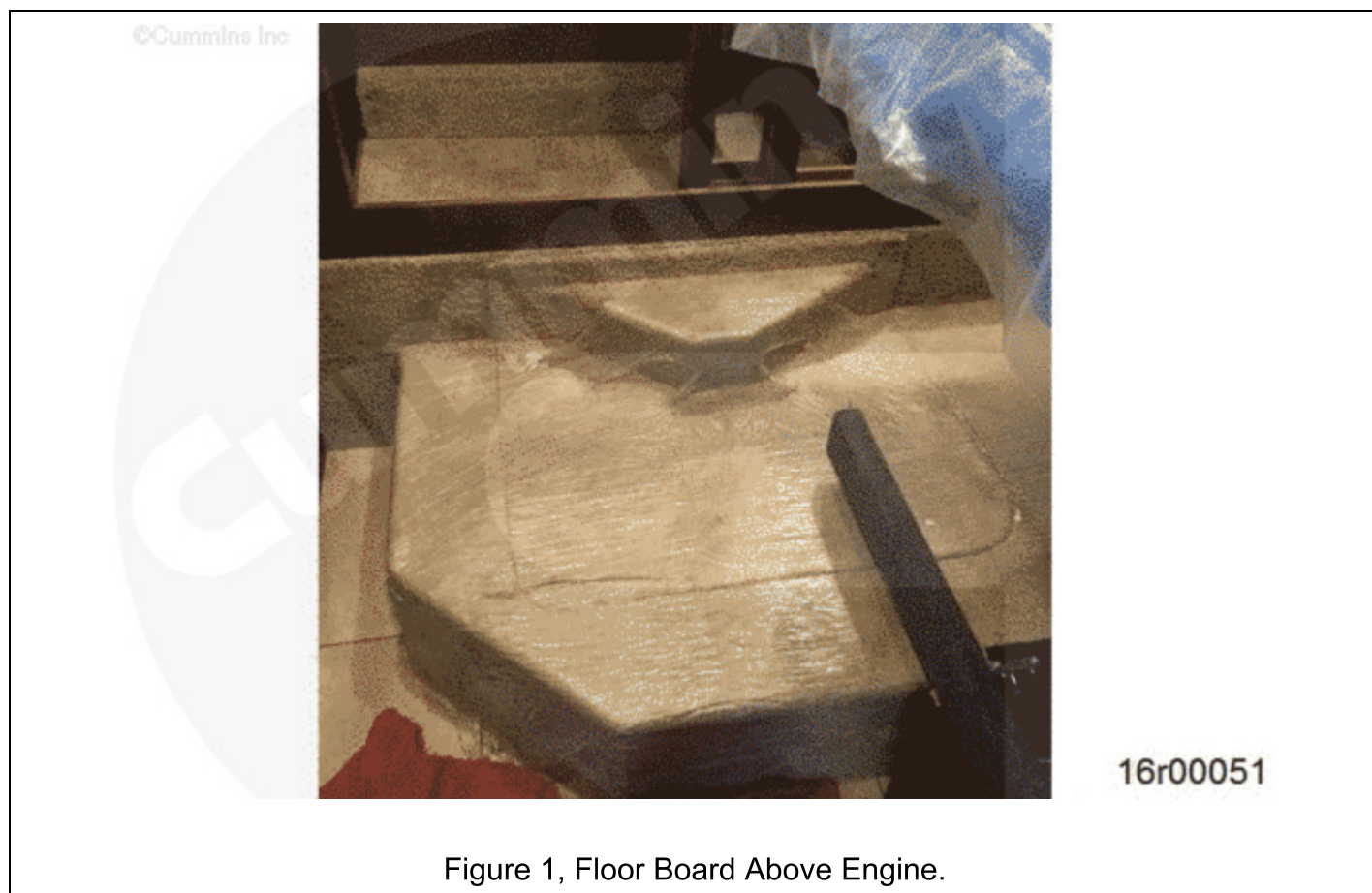
- Change belt options to CP80008 and WP80038 for increased belt wrap on second belt plane around the air compressor.

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 system. See equipment manufacturer service information.
3. Disconnect refrigerant pressure and return hoses (Figure 2). See equipment manufacturer service information. Secure hoses out of the way.



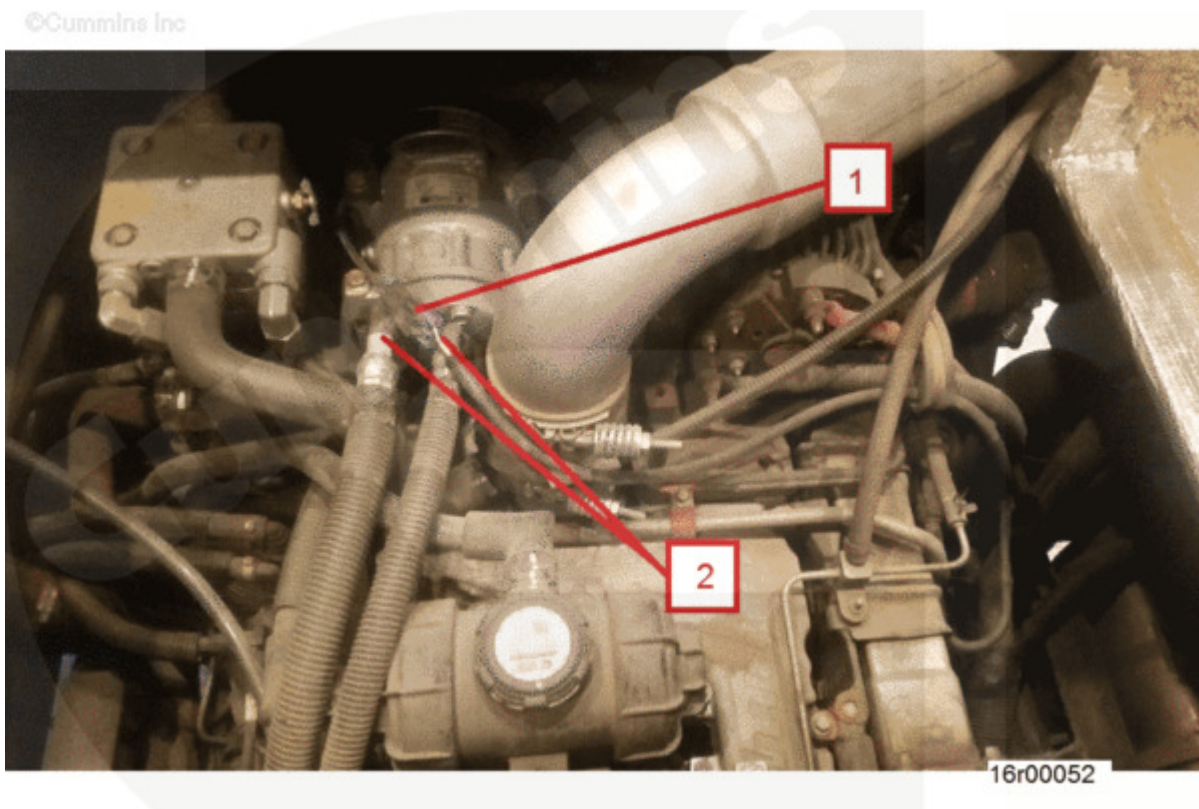


Figure 2, Top of engine.

1. Refrigerant compressor wiring connector.
 2. Refrigerant compressor supply and 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 compressor (Figure 3) from upper refrigerant compressor support.
 - a. Mounted on refrigerant compressor support bracket, Part Number 4360003 (Figure 3).
 - b. Two Sanden refrigerant compressor models have been identified as being used in Tiffin production.
 - i. Model number U4520 - Reuse compressor.
 - Move from high mount location to low mount location.
 - ii. Model number U4897 - Replace compressor with U4520
 - Use in low mount location

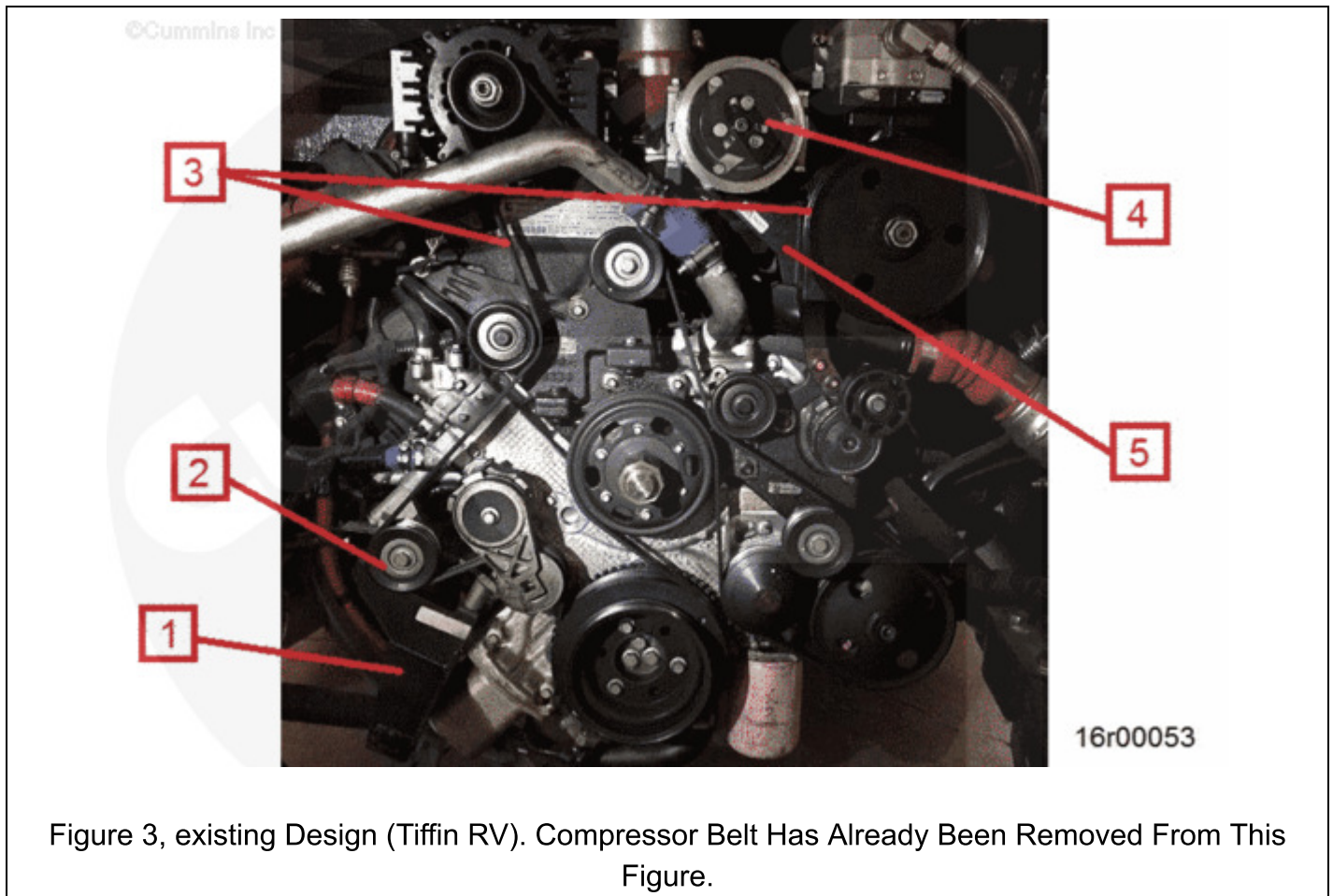


Figure 3, existing Design (Tiffin RV). Compressor Belt Has Already Been Removed From This Figure.

1. OEM Lower Fan Shroud Support Bracket.
 2. Lower Idler Pulley.
 3. Belts to be removed.
 4. Refrigerant compressor.
 5. Upper refrigerant 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).
 - Disconnecting P-clamp from bracket is **not** necessary.
 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. Reuse p-clip mounting bracket (Figure 4 - 7), capscrews, washers, and nut at fan shroud position. (Figure 4) Tighten all fasteners to proper specifications.

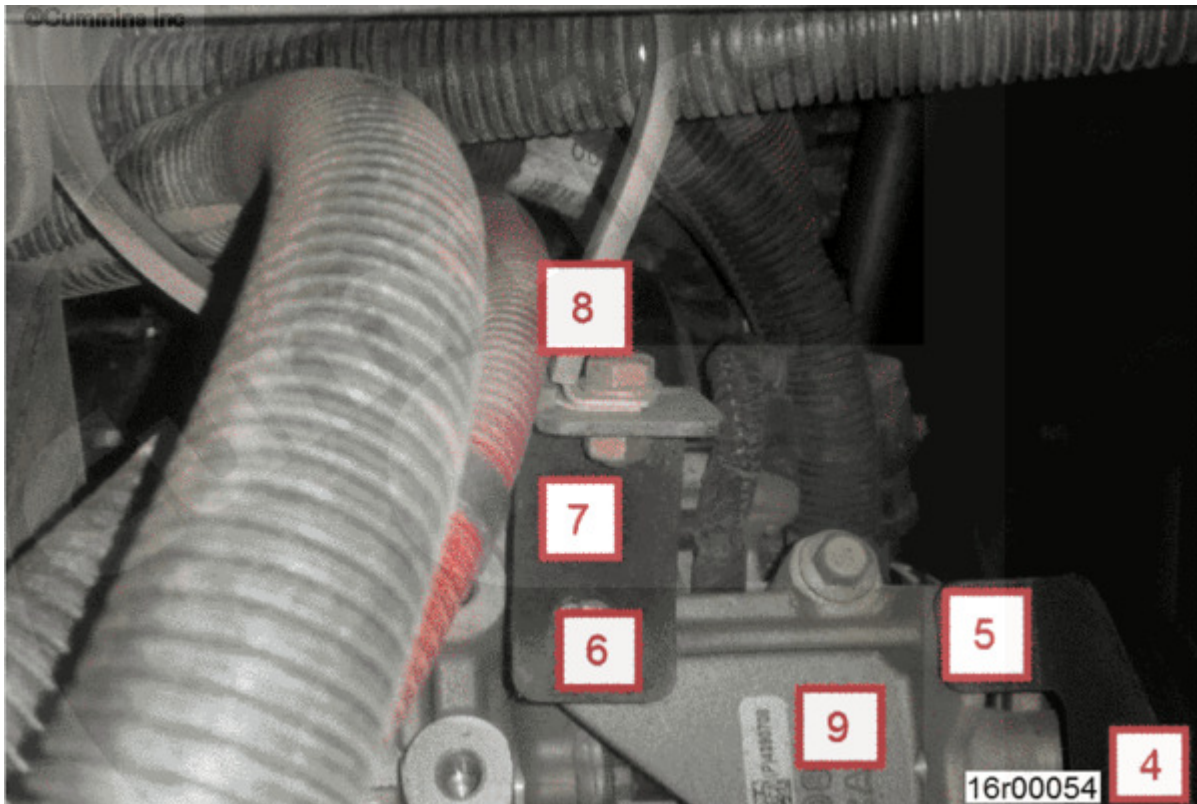


Figure 4, Lower Accessory Drive Mounting with L-Bracket and P-Clamp.

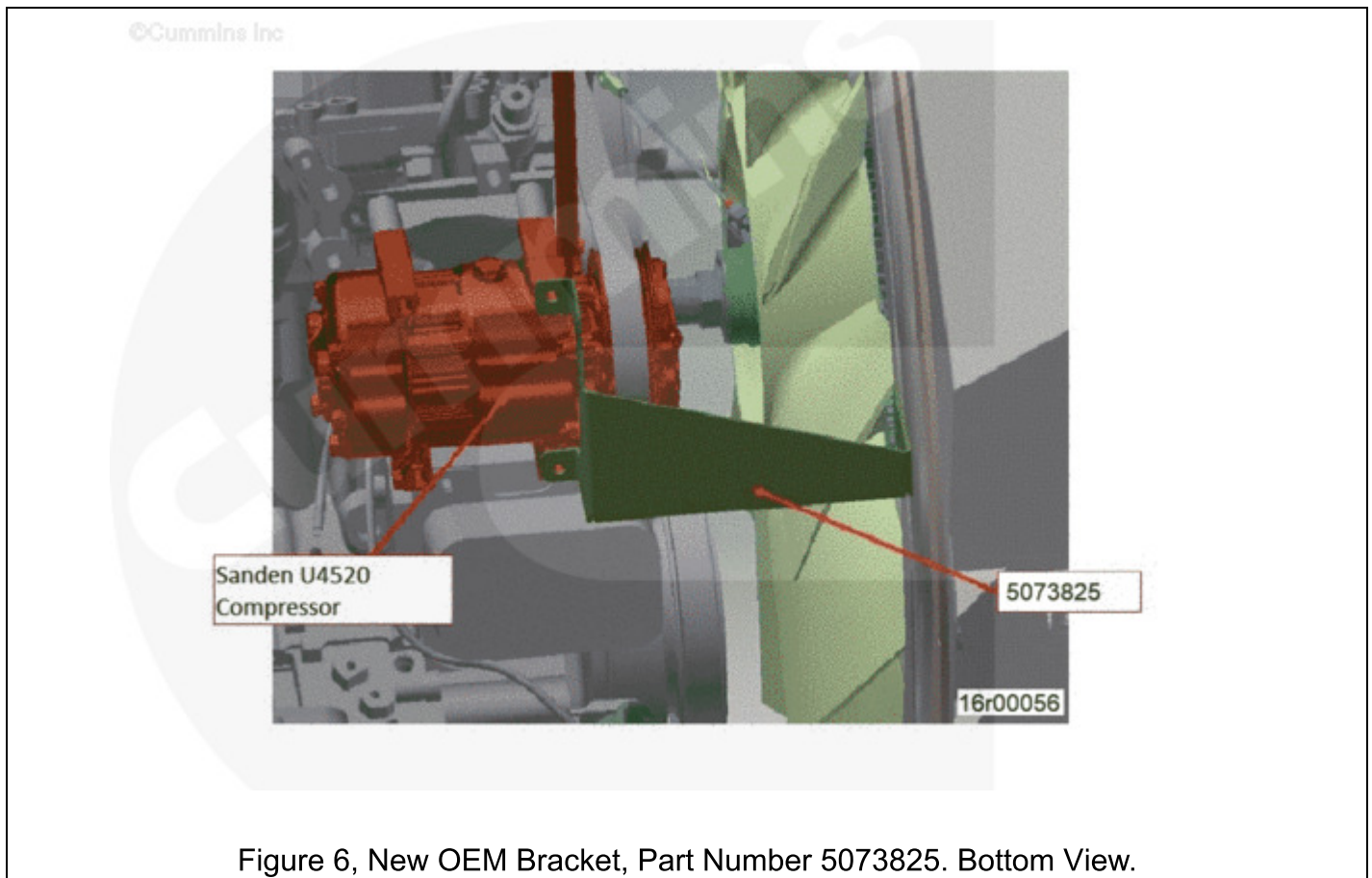
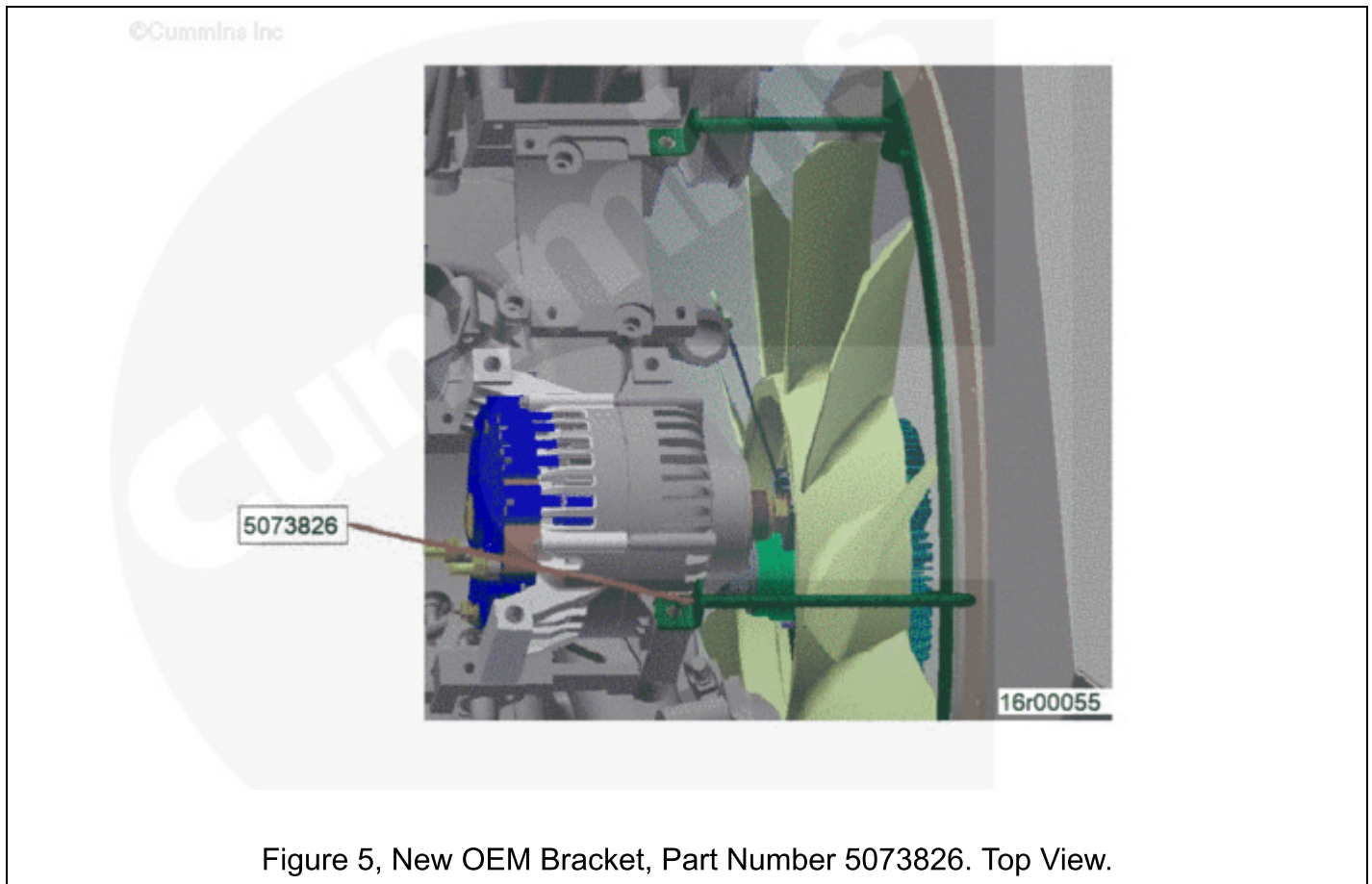
9. Install Sanden refrigerant compressor on lower accessory support, Part Number 4390708 (Figure 4 - 9).

- a. Do **not** tighten capscrews at this time.
- b. Reuse two of the OEM supplied refrigerant 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 existing 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 as mentioned

below (Table 3) to securely mount the fan shroud to the engine at all mounting locations.



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

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

Wiring harness changes

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

- a. Disconnect wiring connector at refrigerant compressor. Figure 7
- b. Remove wire from p-clamp secured to alternator. Figure 8
- c. Route wiring harness down to new refrigerant compressor location and connect to refrigerant compressor clutch connector.
- d. Secure wiring harness with plastic ties away from heat sources. Bundle any extra length of harness.

Refrigerant compressor plumbing changes

14. With refrigerant fittings disconnected from the upper position refrigerant compressor, cut plastic wire ties and remove p-clamps from existing routing.

15. Pull hoses from clips and wire bundles.

16. With refrigerant hoses removed from existing bundles, secure existing bundles in p-clamps and replace plastic wire ties as needed.

17. Route hoses to new low mount refrigerant compressor location. See Figures 8, 9, 10, and 11.

1. Use OEM Hose kit, Part Number 5083043, to attach existing hoses to new refrigerant compressor.
2. Low pressure return hose (smaller diameter of two hoses) **must** be extended.
 - o Cut existing low pressure hose and crimp new connector onto existing low pressure hose.
 - o Do **not** stretch the existing low pressure hose.
3. Loosely connect the new low pressure hose extension to the refrigerant compressor.
4. Route the new low pressure hose extension back to the existing hose under the engine.
 - o Route the new hose in a similar path as the existing hose.
5. Cut the new low pressure hose to correct length to mate with the old hose. Leave some slack in order to properly make the connections.
 - o A proper hose cutting tool **must** be used to ensure a clean, perpendicular cut of the hose.
6. Crimp connection using Mastercool® Crimping Tool, Part Number 71500A (supplied along with AC hose in the Tiffin Campaign Parts Kit, Part Number 5083043).
 - o A number 12 crimping insert will be provided with the Tiffin Campaign Parts Kit, Part Number 5083043.
7. Tighten connection between the new hose and the refrigerant compressor.
8. Secure with wire ties and p-clamps as necessary.
9. Secure away from heat sources.

18. Remove temporary caps and plugs.

19. Connect hose fittings to refrigerant compressor. Tighten to specifications. See equipment manufacturer service information.

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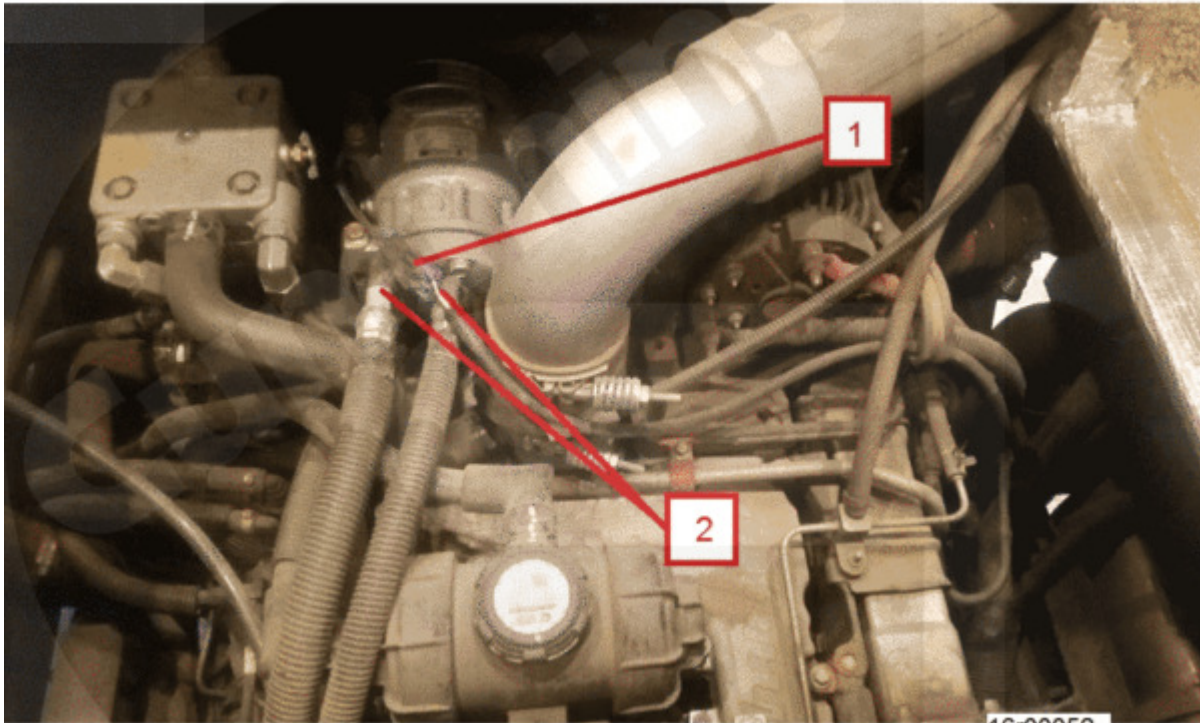


Figure 7, OEM as built wiring harness routing to refrigerant compressor.

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Figure 8, Existing Refrigerant Hose Mounting.

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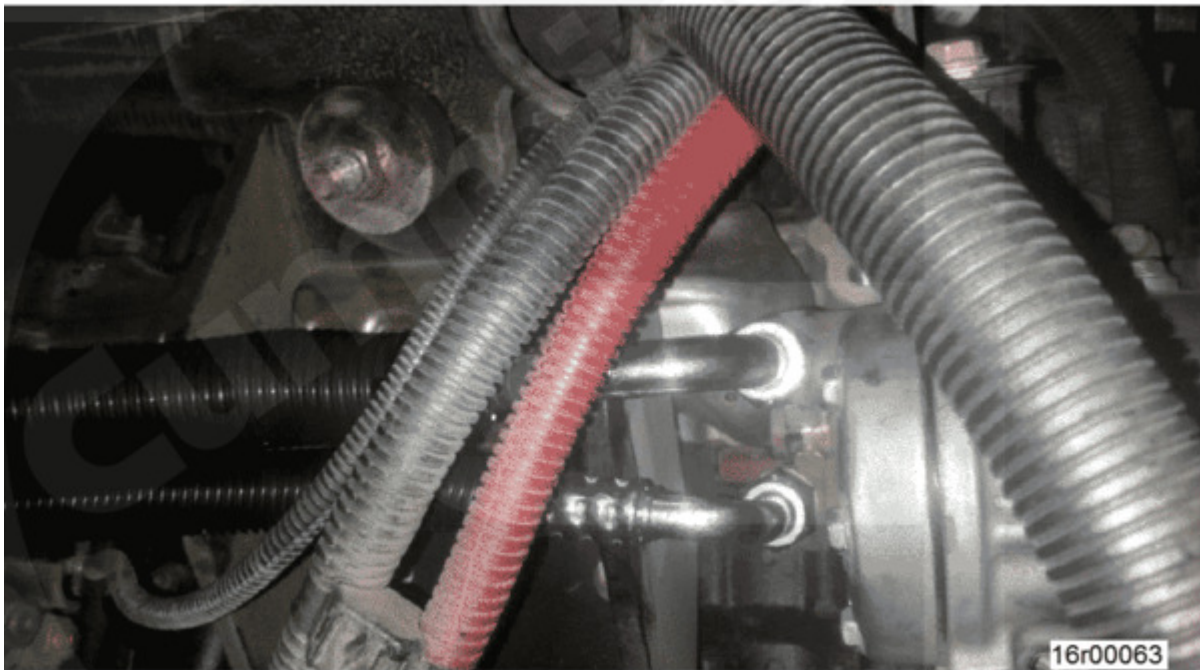


Figure 9, New Refrigerant Hose Mounting.

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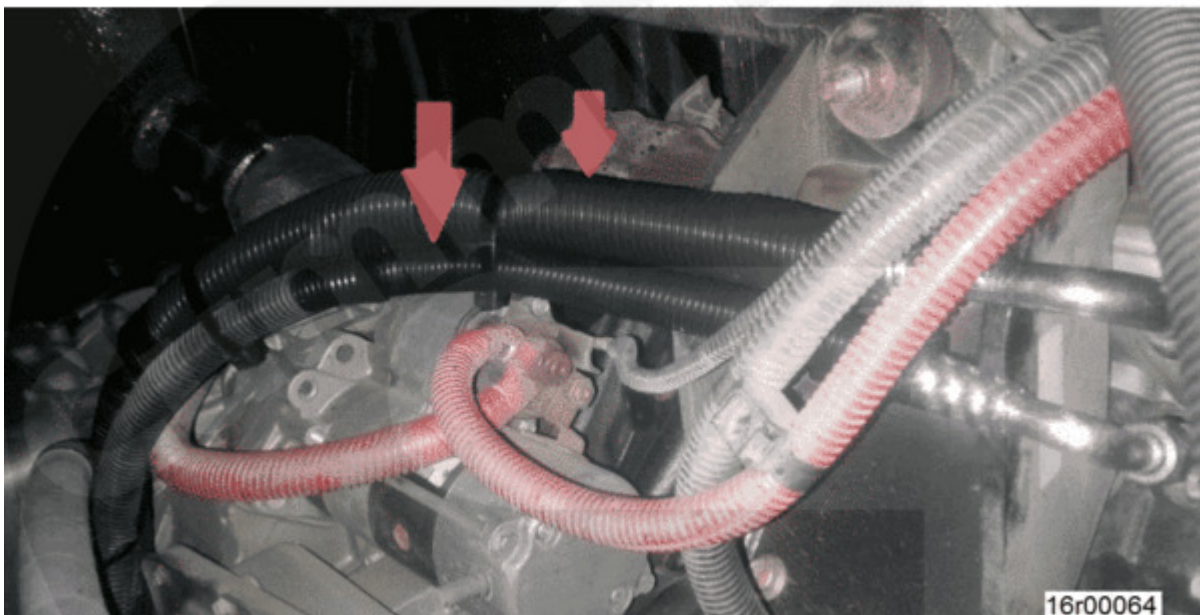


Figure 10, New refrigerant Hose Routing.



Figure 11, New Refrigerant Hose Routing.

Finishing Steps

20. Leak check refrigerant system. See equipment manufacturer service information.
21. Fill refrigerant system with appropriate amount of oil. See equipment manufacturer service information.
22. Charge system with necessary amount of the proper refrigerant. See equipment manufacturer service information.
23. Test operation of dash air conditioning system. See equipment manufacturer service information.
24. Verify belt noise is no longer present.
25. Install floor board which was removed for access. (Figure 1) See equipment manufacturer service information.
26. Return vehicle to service.

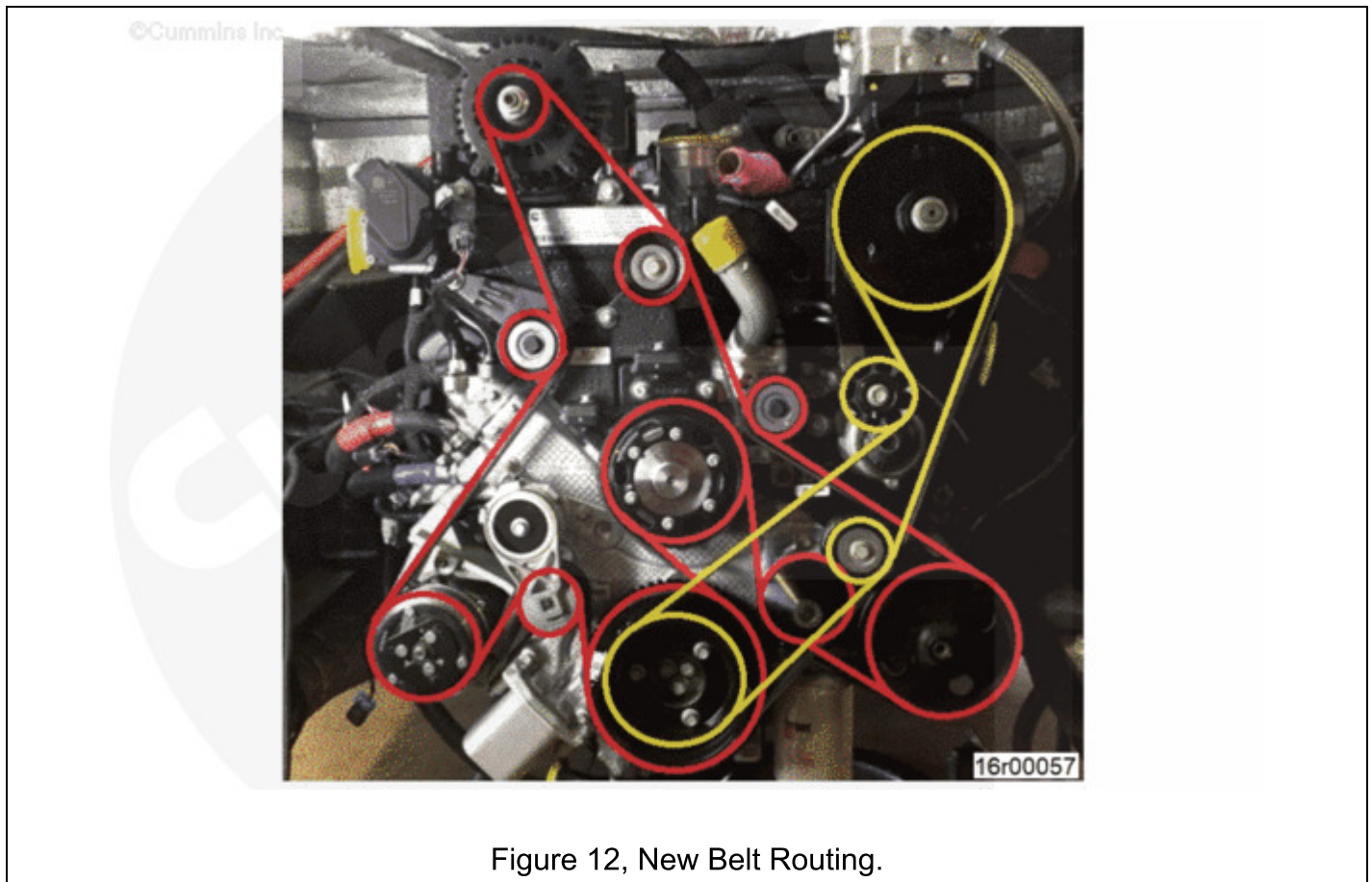


Figure 12, New Belt Routing.

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, Refrigerant (Sanden)	Discard - Part not needed.

Table 2, Parts To Be Removed			
Option	Part Number	Part description	Comment
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	5083043	Hose Kit	Full Replacement Kit
OEM	5073826	Bracket	Upper Bracket
OEM	5073825	Bracket	Lower Bracket
OEM	5058518	Compressor, Refrigerant (Sanden)	Sanden Model U4520 (will need to extend refrigerant line)
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
OEM	5058520	Manifold - Refrigerant Compressor	Install with U4520 refrigerant compressor

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
2019-2-27	Updated for safety campaign

Date	Details
2019-4-3	Non-Product Problem Solving (PPS)
2019-4-15	Updated sanden part numbers

Last Modified: 29-Apr-2019
