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Title: Turbocharger Oil Supply Tube Retrofit

Applies To: ProStar® 122, ProStar® 113, WorkStar®, CAT®, TranStar®, PayStar®, LoneStar® models equipped with 2010 MaxxForce® 11 & 13, N13 Engines

CHANGE LOG

12/1/14 - Modified the description to state "The old oil supply tube CANNOT be reused once removed from either turbo". This iKNow article was launched to replace TSI 14-12-03 that launched to the service portal in April 2014. This is NOT a new procedure, it has been out since April and the Engine Service Manuals reflect the same information.
 11/21/14 - Modified format and parts table. Added a few statements to the description.
 11/13/2014 - Changed oil supply tube part number to a C92. Added PL3000036 for return stock of old oil supply tube. Added SRT information. Added link to turbo center section procedure.
 11/07/2014 - Initial Article Release

DESCRIPTION

A new turbocharger oil supply tube has been developed to resolve oiling concerns and replaces the factory oil supply tube on EPA 10 MaxxForce 11/13L and N13 Engines up to break date of 12/18/13 (ESN **4305742** - EPA 10 MaxxForce 11/13L Engines / **4181336** - N13 Engines). The factory oil supply tube cannot be reused when removed from either turbocharger. The new tube has routing and clipping that may interfere with other coolant hoses, so the following document provides installation instructions for both the oil supply tube and T-fitting. Each chassis will differ, as well, so a user needs to ensure they are using the appropriate section of the document.

This procedure replaces TSI 14-12-03 that was launched in April 2014 and should be used in conjunction with any turbocharger repair or anytime the old turbocharger oil supply tube is removed from either turbocharger.

Both the old and new oil supply tubes are one-time use only items. The T-fitting and hardware can be re-used once installed onto the engine.

SERVICE PARTS INFORMATION

Table 1. Engine Parts

Kit Description	Part Number	Quantity Required
Tube, Assy Turbo Oil Supply	3018397C92	1
Fitting, Oil Tube	2512772C91	1
Spacer (If required)	62917010831	1
Stud Bolt (If required)	1819245C1	1

Table 2. ProStar® 122 Routing & Clipping Kit

Kit Description	Part Number	Quantity Required
ProStar® 122, Heater Hose Routing Kit	2513145C91	1
Bolt, Carriage	495967R1 (Obtain Locally)	1

Table 3. ProStar® 122 Routing & Clipping Kit (2513145C91) Contents

Kit Description	Part Number	Quantity Required
Saddle	3821016C1	4
Nut	31082R1	2
Bolt	31054R1	2
Clamp, Cushioned	299615C1	2
Tie Strap	306132C1	8
Swivel Saddle	3666881C1	1
Bolt	31046R1	1
Nut	31081R1	1
Clamp	3919779C1	1
Nut	120377	1
Hose (1900 mm)	L2643486	1
Conduit (1900 mm)	584067C1	1
Spin Huck Saddle	3948245C1	2
Clamp	3535872C1	2

Table 4. ProStar® 113, CAT®, TranStar®, and PayStar® Routing & Clipping Parts

Kit Description	Part Number	Quantity Required
Swivel Saddle	3666881C1 (Obtain Locally)	1
Tie Straps	306132C1 (Obtain Locally)	2

Table 5. TranStar®, WorkStar®, and PayStar® (SCR Equipped Vehicles with Manual Transmission) Routing & Clipping

Kit Description	Part Number	Quantity Required
Spacer, DEF Coolant Supply	4037501C1	1

Table 6. TranStar® (SCR Equipped Vehicles with Automatic Transmission) Routing & Clipping Parts

Kit Description	Part Number	Quantity Required

Hose, Rubber	3996883C3	1
Hose, Silicone (Do Not Order Unless Vehicle Is Equipped with Silicone Hoses)	3996910C3	1

REPAIR STEPS

WARNING: To prevent property damage, personal injury, and / or death, park vehicle on hard flat surface, turn the engine off, set the parking brake, and install wheel chocks to prevent the vehicle from moving in both directions.

WARNING: To prevent property damage, personal injury, and / or death, do not work under the vehicle supported only by jacks if the vehicle must be raised. Jacks can slip or fall over.

WARNING: To prevent property damage, personal injury, and / or death, always wear safe eye protection when performing vehicle maintenance.

WARNING: To prevent property damage, personal injury, and / or death, keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases.

WARNING: To prevent property damage, personal injury, and / or death, remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last.

TURBOCHARGER OIL SUPPLY TUBE PROCEDURE:

NOTE: It is recommended the technician read these instructions thoroughly prior to performing this procedure.

NOTE: The oil supply tube is a ONE TIME USE ONLY item and must be replaced if damaged or removed. The T-fitting and adapter fitting are reusable and only need to be installed per these instructions the first time.

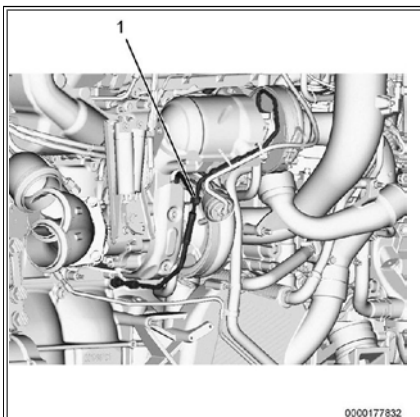


Figure 1: Old Style (Factory Installed) Turbocharger Oil Supply Tube.

Item 1: Turbocharger oil supply tube

CAUTION:

To prevent property damage, the factory installed oil supply tube must not be reused or damage to equipment will occur. If oil supply tube will not come out of the high-pressure turbocharger due to seizure, cut the oil supply tube into two pieces and leave the line in the high-pressure turbocharger for ease of removal, then discard oil supply tube.

1. Bring vehicle into shop and park on flat surface.
2. Shift transmission to Park or Neutral, set parking brake, and install wheel chocks.
3. Unlatch and open hood.
4. Remove right side inner fender.
5. Remove air intake and pipe.

6. Remove CAC pipe from high-pressure charge air cooler and high-pressure turbo outlet elbow.
7. Remove high pressure turbo outlet elbow from high-pressure turbocharger.
8. Remove air inlet duct from low-pressure turbocharger.

NOTE: Save two M6 X 16 bolts for reuse.

9. Remove and discard turbocharger oil supply tube (Figure 1, Item 1).

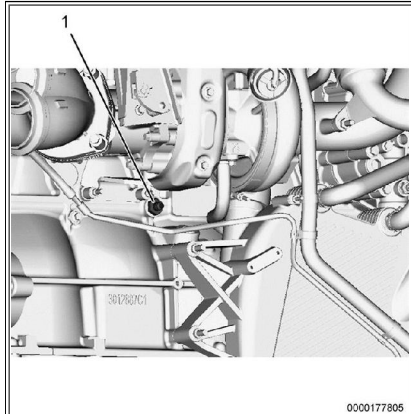


Figure 2: Turbocharger Oil Supply Tube Male Stud Fitting.

Item 1: Turbocharger oil supply tube male stud fitting

10. Remove and discard turbocharger oil supply tube male stud fitting (Figure 2, Item 1).

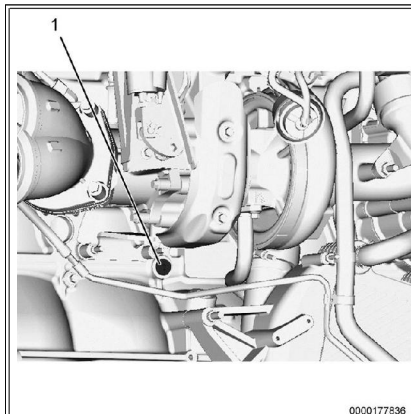


Figure 3: Oil Supply Tube Hex Socket Plug.

Item 1: Oil supply tube hex socket plug

11. Install oil supply tube hex socket plug (Figure 3, Item 1) into oil supply inlet port in block. Using torque wrench, tighten socket plug to 52 lb-ft (70 N•m).

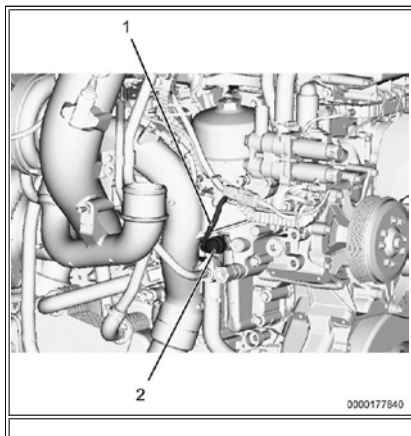


Figure 4: Engine Oil Pressure (EOP) Sensor.

Item 1: EOP sensor connector
Item 2: EOP sensor

12. Disconnect connector (Figure 4, Item 1) from EOP sensor (Figure 4, Item 2).

13. Remove EOP sensor and gasket, and **save for reuse**.

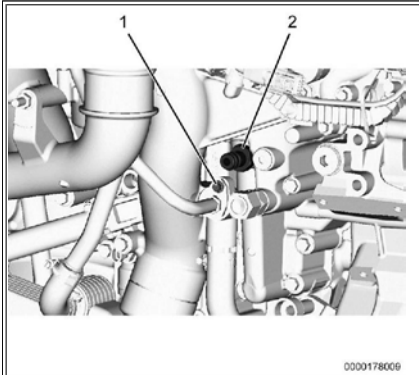


Figure 5: Adapter Assembly Fitting.

Item 1: M6 bolt
Item 2: Adapter assembly fitting

14. Remove M6 bolt (Figure 5, Item 1) from heater return tube and discard.

NOTE: Install adapter fitting with the two O-rings facing out towards the operator.

15. Install adapter assembly fitting (Figure 5, Item 2). Using torque wrench, tighten fitting to 52 lb-ft (70 N•m).

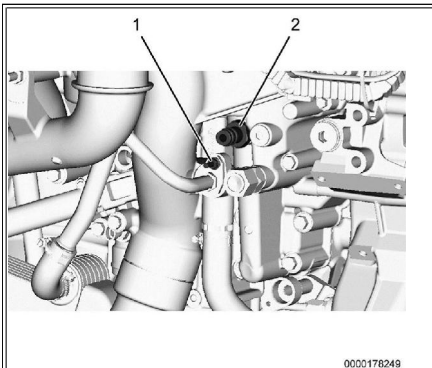


Figure 6: M6 Stud Bolt.

Item 1: M6 stud bolt
Item 2: Adapter assembly fitting

16. Install M6 stud bolt (Figure 6, Item 1). Using torque wrench, tighten stud bolt to 10 lb-ft (13 N•m).

17. Using P-80[®], lubricate adapter fitting (Figure 6, Item 2).

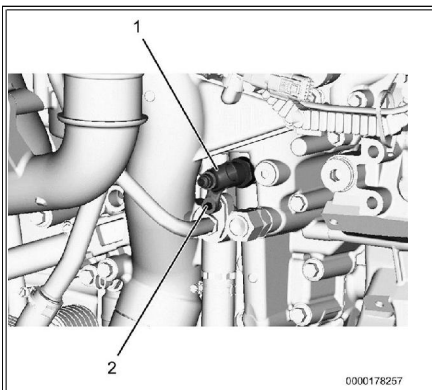
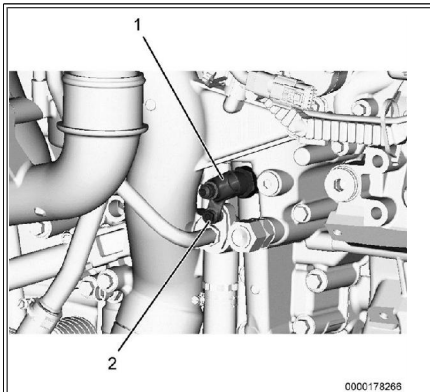


Figure 7: Oil Supply T-fitting.

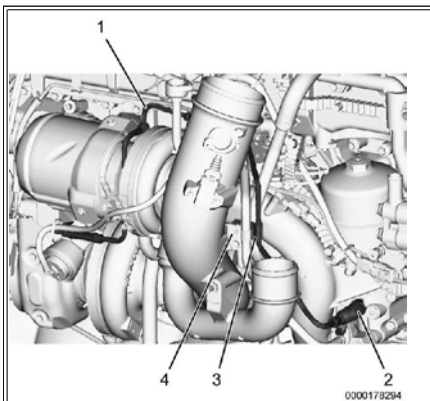
Item 1: Oil supply T-fitting
Item 2: M6 stud bolt

18. Slide oil supply T-fitting (Figure 7, Item 1) over adapter assembly fitting and M6 stud bolt (Figure 7, Item 2).

**Figure 8: Install Oil Supply T-fitting.**

Item 1: Oil supply T-fitting
Item 2: M6 nut

19. Install M6 nut (Figure 8, Item 2) to oil supply T-fitting (Figure 8, Item 1). Using torque wrench, tighten nut to 10 lb-ft (13 N·m).

**Figure 9: Turbo Oil Supply Tube Position.**

Item 1: Turbo oil supply tube
Item 2: Oil supply T-fitting
Item 3: Turbo oil supply tube bracket
Item 4: Heater and cooler line bracket (2)

20. Remove M8 bolt from heater and cooler line brackets (Figure 9, Item 4) and discard.

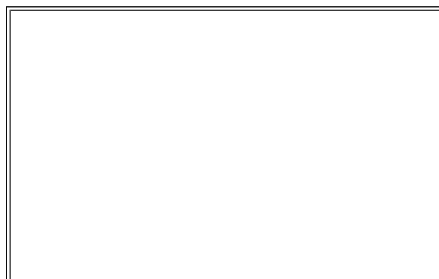
NOTE: Do not tighten any bolts or flare nuts at this time.

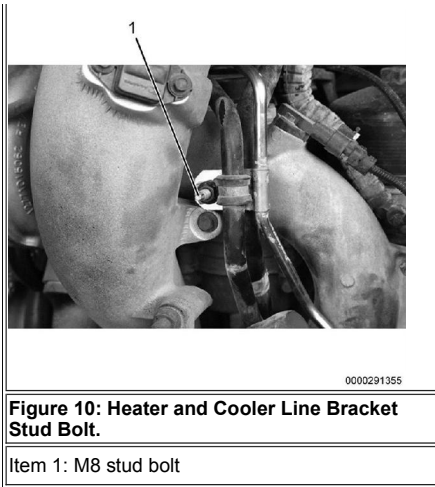
NOTE: If repairing a ProStar® 122, disconnect sleeper heater return hose from lower radiator hose and maneuver out of chassis before continuing.

21. Align turbo oil supply tube (Figure 9, Item 1) with oil supply T-fitting (Figure 9, Item 2) and turbocharger oil supply openings.

22. Loosely install turbo oil supply tube flare nut end onto oil supply T-fitting.

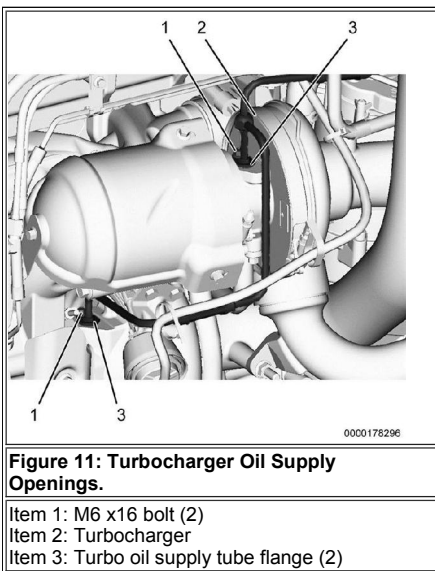
23. Position turbo oil supply tube bracket (Figure 9, Item 3) BETWEEN heater and cooler line brackets (Figure 9, Item 4).





NOTE: Do not exceed torque.

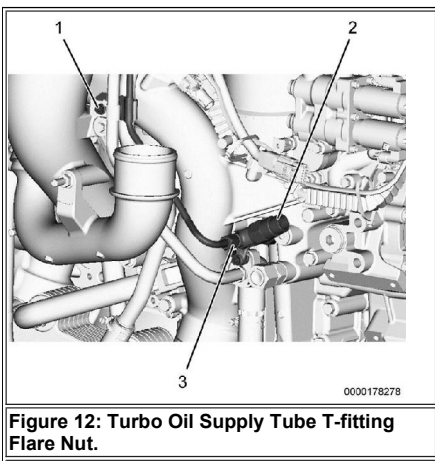
24. Install M8 stud bolt (Figure 10, Item 1) through turbo supply line bracket, heater and cooler line brackets, and into high-pressure turbocharger air inlet duct. Using torque wrench, tighten stud bolt to 23 lb-ft (31 N•m).



25. Using P-80[®], lubricate turbocharger oil supply tube O-rings.

26. Press turbo oil supply tube fittings into openings on turbocharger (Figure 11, Item 2).

27. Align turbo oil supply tube flanges (Figure 11, Item 3) and loosely install the two previously removed M6 X 16 bolts (Figure 11, Item 1). Using torque wrench, tighten bolts to 10 lb-ft (13 N•m).



- | |
|---|
| Item 1: M8 nut |
| Item 2: EOP sensor |
| Item 3: Turbo oil supply tube T-fitting flare nut |

28. Install M8 nut (Figure 12, Item 1) over turbo supply line bracket, heater and cooler line brackets and stud bolt in high-pressure turbocharger air inlet duct.
Using torque wrench, tighten nut to 23 lb-ft (31 N•m).
29. Install turbo oil supply tube flare nut (Figure 12, Item 3) to T-fitting. Using torque wrench, tighten nut to 19 lb-ft (26 N•m).
30. Install EOP sensor (Figure 12, Item 2) to T-fitting. Using torque wrench, tighten sensor to 33 lb-ft (45 N•m).



NOTE: The EOP connector may contact the engine harness on early MaxxForce® 11 & 13 (EPA 10) Engines.

31. If EOP sensor connector contacts engine harness:
 - Remove rear coolant control valve (CCV) stud bolt, and install spacer with longer stud bolt (Figure 13, Items 1 and 2).
 - Install EOP sensor connector.
 - Secure engine harness to longer stud with original nut. Tighten nut to standard torque.
32. Install low-pressure air inlet duct to low-pressure turbocharger.
33. Install high-pressure turbo outlet elbow to high-pressure turbocharger.
34. Install CAC pipe.
35. Install air intake and pipe.
36. Install inner fender.
37. Verify routing and clipping for various coolant hoses has been performed before repairs are complete.

HOSE ROUTING AND CLIPPING:

NOTE: Refer to the manufacturer sticker located in the operator-side door jamb for identifying what truck model you are repairing. Select the appropriate routing and clipping section for that vehicle.

NOTE: Refer to the table below for a link to the instructions of the specific model you are working on..

Table 7. Vehicle Model Hose Routing

Vehicle Model	Description
ProStar® 122	Sleeper heater hose rerouting
ProStar® 113 and TranStar®	Deaeration tank hose routing

CAT®	Deaeration tank hose routing
PayStar® and TranStar®	Water bypass hose routing
PayStar®, Workstar® and TranStar® Models Equipped With SCR And Manual Transmission	DEF coolant supply hose routing
TranStar® Models Equipped with SCR and Automatic Transmission	Water bypass hose routing

PROSTAR® 122 MODELS – SLEEPER HEATER HOSE ROUTING:

Some ProStar® 122 vehicles experience the sleeper heater hose routed in the way of the new turbocharger oil supply tube. Use the following procedure to reroute the sleeper heater return hose away from the oil supply tube.

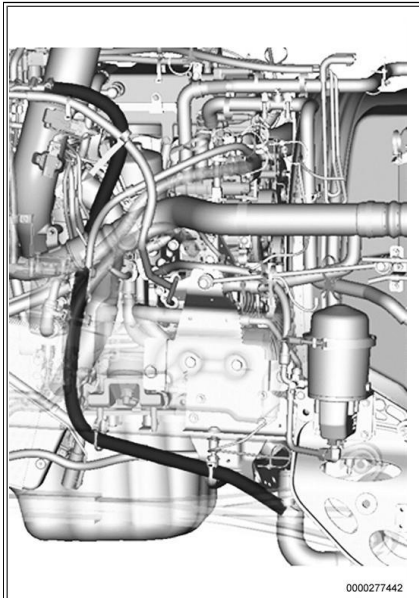


Figure 14: Sleeper Heater Hose Existing Routing.

1. Drain cooling system.
2. Remove sleeper heater hose from bottom radiator hose (Figure 14) .
3. Maneuver heater hose out of chassis.
4. Install 584067C1 conduit over heater hose.

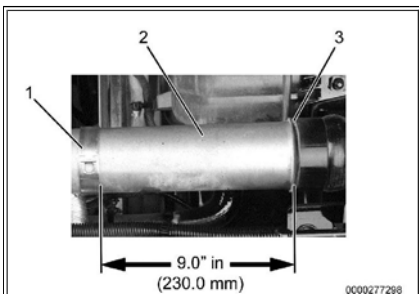
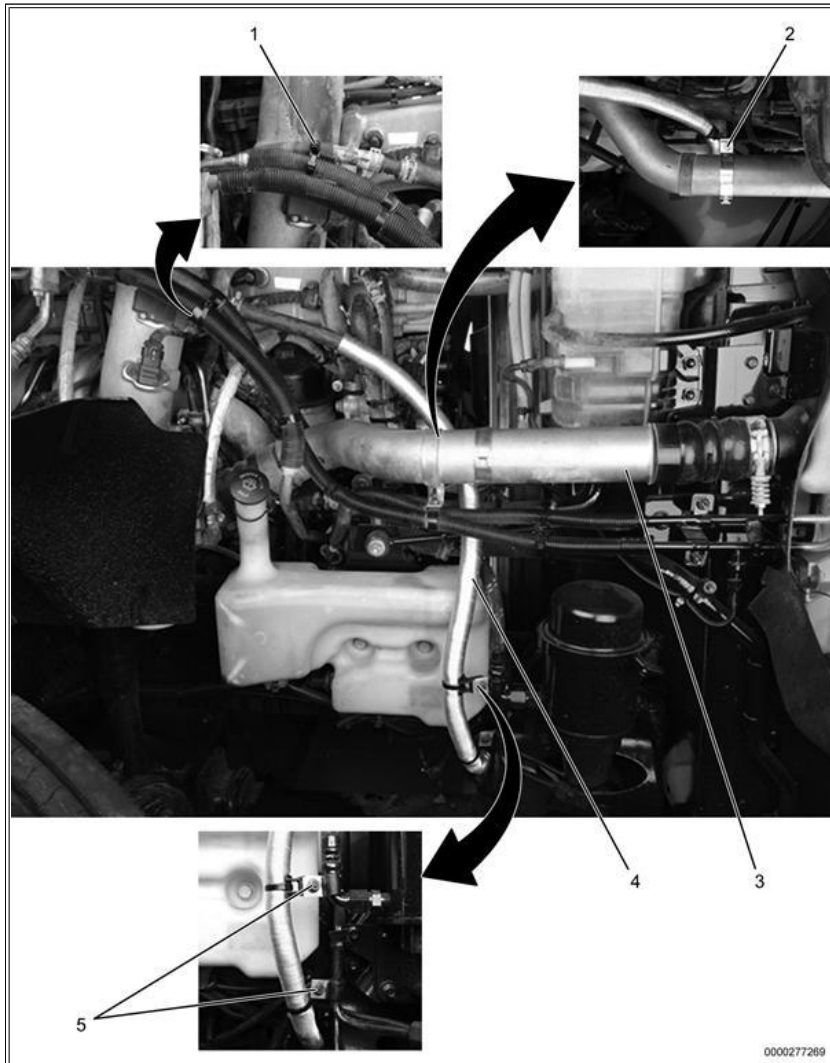


Figure 15: Clamp Measurement.

- Item 1: 3535872C1 Clamp
- Item 2: CAC pipe
- Item 3: CAC rubber boot

NOTE: Orientate CAC clamp saddle parallel with CAC pipe.

5. Measure approximately 9.0 in (230 mm) on CAC pipe (Figure 15, Item 2) from end of CAC rubber boot (Figure 15, Item 3) towards rear of vehicle for clamp (Figure 15, Item 1) installation.

PROSTAR® 122 MODELS – SLEEPER HEATER HOSE ROUTING:**VEHICLES EQUIPPED WITH CHASSIS MOUNTED OIL CENTRIFUGE****Figure 16: ProStar® 122 Heater Hose Route Overview.**

- Item 1: Tie strap
- Item 2: 3535872C1 Clamp
- Item 3: CAC pipe
- Item 4: Heater hose
- Item 5: Swivel clamp (2)

NOTE: Vehicles equipped with chassis mounted oil centrifuge.

NOTE: Use one swivel clamp for each oil centrifuge line.

6. Install clamp (Figure 16, Item 2), carriage bolt, and nut onto CAC pipe (Figure 16, Item 3). Using torque wrench, tighten nut to standard torque value.
7. Secure heater hose (Figure 16, Item 4) to CAC pipe clamp using sideways saddle, bolt nut, and one tie strap.
8. Using tie strap (Figure 16, Item 1), secure heater hose (Figure 16, Item 4) to A/C hose.
9. Using two sideways swivel clamps (Figure 16, Item 5), two tie straps, two M8 bolts, and two M8 nuts, secure heater hose to oil centrifuge supply and return lines.
10. Attach heater hose (Figure 16, Item 4) to lower radiator hose. Using torque wrench, tighten clamp to standard torque value.



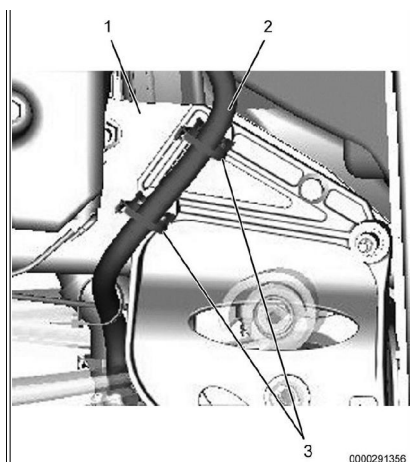


Figure 17: Frame Mounted Heater Hose Routing.

Item 1: Frame
 Item 2: Heater hose
 Item 3: Tie strap (4) (2 not shown)

NOTE: Following steps are unique to vehicles not equipped with chassis mounted oil centrifuge.

11. Using two 3948245C1 spin huck saddles and four tie straps (Figure 17, Item 3), secure heater hose (Figure 17, Item 2) to frame (Figure 17, Item 1).
12. Attach heater hose to lower radiator hose. Using torque wrench, tighten clamp to standard torque value.
13. Fill cooling system.

PROSTAR® 113 AND TRANSTAR® MODELS – DEAERATION TANK HOSE ROUTING:

Some ProStar® 113 and TranStar® vehicles may experience the coolant deaeration tank hose or an in-transit heat hose rubbing on the turbocharger oil supply tube. Use the following procedure to secure either hose away from the oil supply tube.

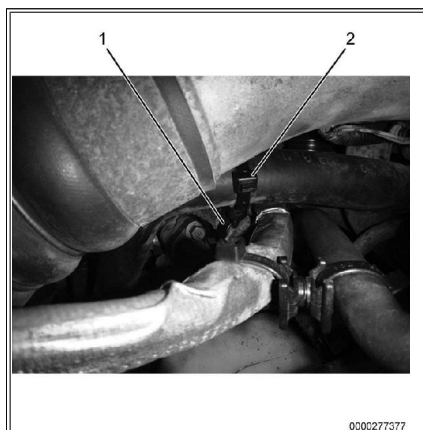


Figure 18: Deaeration Tank Hose.

Item 1: Deaeration tank hose
 Item 2: Tie strap (2) (1 not shown)

NOTE: This routing procedure does not require draining the cooling system.

1. Pull deaeration tank hose (Figure 18, Item 1) towards deaeration tank until it clears turbocharger oil supply tube.
2. Using two tie straps (Figure 18, Item 2), and a swivel saddle, secure deaeration tank hose to oil centrifuge supply line.
3. Verify deaeration tank hose or in-transit heat hose is not rubbing on turbocharger oil supply tube or CAC pipe.
4. Close hood.
5. Remove wheel chocks.

CAT® MODELS – DEAERATION TANK HOSE ROUTING:

Some CAT® vehicles equipped with MaxxForce® 11 & 13 (EPA 10) engines could experience coolant deaeration tank hose rubbing on turbocharger oil supply tube.

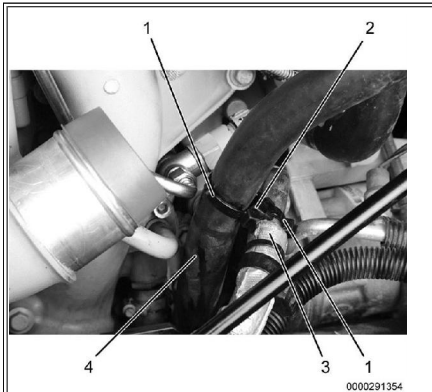


Figure 19: Surge Tank Hose.

Item 1: Tie strap (2)
 Item 2: Swivel saddle
 Item 3: A/C suction line
 Item 4: Deaeration tank hose

NOTE: This routing procedure does not require draining cooling system.

NOTE: CAC pipe removed from graphic for clarity.

1. Pull deaeration tank hose (Figure 19, Item 4) back to its original location towards deaeration tank until it clears turbocharger oil supply tube.
2. Using two tie straps (Figure 19, Item 1), and a swivel saddle (Figure 19, Item 2) secure deaeration tank hose to A/C suction line (Figure 19, Item 3).
3. Verify deaeration tank hose is not rubbing on turbocharger oil supply line or CAC pipe.
4. Close hood.
5. Remove wheel chocks.

PAYSTAR® AND TRANSTAR® MODELS – WATER BYPASS HOSE ROUTING:

NOTE: Some PayStar® and TranStar® vehicles may experience water bypass hose rubbing on turbocharger oil supply tube. Use following procedure to secure bypass hose away from turbocharger oil supply tube.

NOTE: This routing procedure does not require draining cooling system.

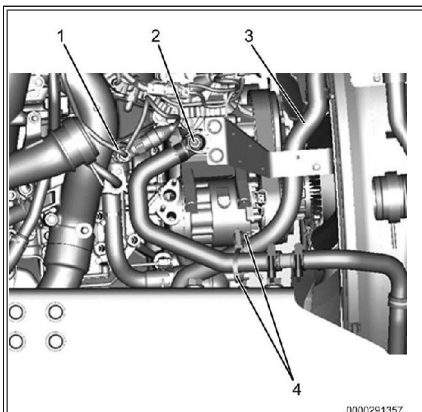


Figure 20: Water Bypass Hose.

Item 1: Turbo oil supply tube
 Item 2: 90-degree elbow fitting
 Item 3: Deaeration tank hose
 Item 4: Tie strap (2)

NOTE: CAC pipe was removed from graphic for clarity.

1. Rotate 90-degree elbow fitting (Figure 20, Item 2) down until bypass hose clears turbo oil supply tube (Figure 20, Item 1).
2. Using two tie straps (Figure 20, Item 4), and a swivel saddle, secure water bypass hose to deaeration tank hose (Figure 20, Item 3).
3. Verify no other hoses are rubbing on turbocharger oil supply line or CAC pipe.
4. Close hood.
5. Remove wheel chocks.

PAYSTAR®, WORKSTAR® AND TRANSTAR® MODELS EQUIPPED WITH SCR AND MANUAL TRANSMISSION – DEF COOLANT SUPPLY HOSE ROUTING:

NOTE: Some PayStar®, WorkStar®, and TranStar® vehicles equipped with SCR and manual transmissions may experience DEF coolant supply hose rubbing on turbocharger oil supply tube. Use the following procedure to install a spacer for manual transmission equipped chassis.

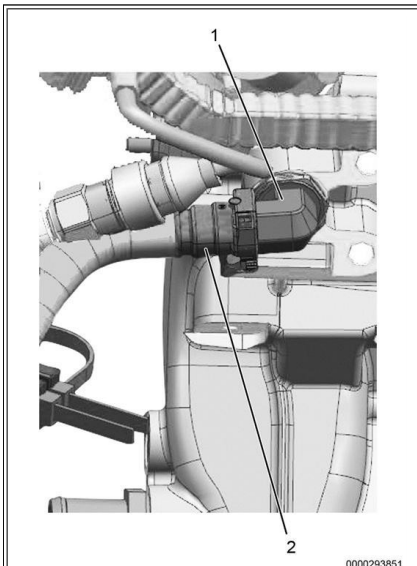


Figure 21: Coolant Deaeration Tank Supply Hose.

Item 1: 90-degree elbow fitting
Item 2: DEF coolant supply hose

1. Drain cooling system.
2. Remove DEF coolant supply hose (Figure 21, Item 2).
3. Remove 90-degree elbow fitting (Figure 21, Item 1).

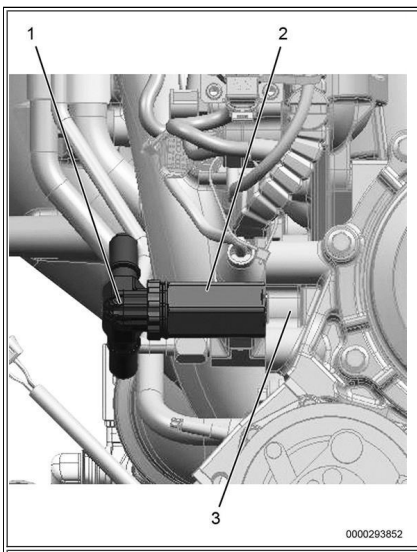


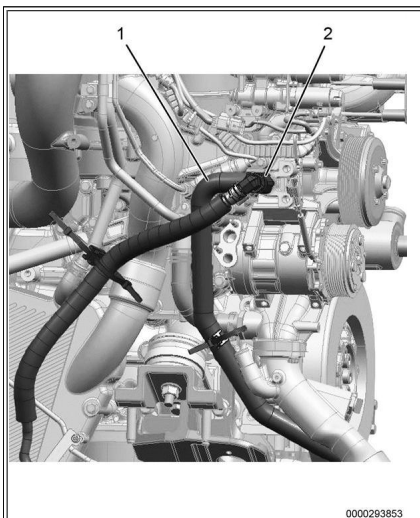
Figure 22: Coolant Deaeration Tank Supply Hose Spacer.

Item 1: 90-degree elbow fitting
 Item 2: 4037501C1 Spacer
 Item 3: Coolant distribution housing

4. Install spacer (Figure 22, Item 2) into coolant distribution housing (Figure 22, Item 3).
5. Install 90-degree elbow fitting (Figure 22, Item 1) and DEF coolant supply hose.
6. Fill cooling system.
7. Close hood.
8. Remove wheel chocks.

TRANSTAR® MODELS EQUIPPED WITH SCR AND AUTOMATIC TRANSMISSION – WATER BYPASS HOSE ROUTING:

NOTE: Some TranStar® vehicles equipped with SCR and automatic transmissions may experience DEF coolant supply hose rubbing on turbocharger oil supply tube. Use the following procedure to install a spacer for manual transmission equipped chassis.

**Figure 23: SCR Equipped Water Bypass Hose.**

Item 1: 90-degree elbow fitting
 Item 2: Water bypass hose

1. Drain cooling system.
2. Remove water bypass hose (Figure 23, Item 2) from 90-degree elbow fitting (Figure 23, Item 1).
3. Remove water bypass hose from deaeration tank and discard.

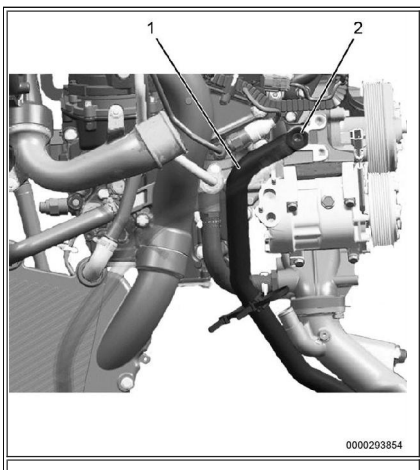


Figure 24: SCR Equipped Water Bypass Hose Replacement.
Item 1: Water bypass hose
Item 2: 90-degree elbow fitting

4. Rotate 90-degree elbow fitting (Figure 24, Item 2) down 1/8 turn.
5. Install new water bypass hose (Figure 24, Item 1) to deaeration tank and 90-degree elbow fitting.
6. Clip new bypass hose in original location.
7. Fill cooling system.
8. Close hood.
9. Remove wheel chocks.

WARRANTY INFORMATION

Standard Repair Times:

If performing Turbocharger repairs such as a HP turbo center section or complete turbo replacement, the time for installing the updated turbo oil supply tube is part of those SRTs. Use the "Add-Ons" section below for additional routing and clipping time depending on the chassis you are working on.

If only removing and replacing the turbocharger oil supply tube only, use the SRTs listed below.

12 - Turbocharger Oil Supply Tube, Replace

Chassis	Engine	SRT	Hours
Prostar	MaxxForce 11/13 2010 Emissions	R12-6869U	1.1
5000	MaxxForce 11/13 2010 Emissions	T12-6869U	1.1
8600	MaxxForce 11/13 2010 Emissions	Q12-6869U	1.1
7600	MaxxForce 11/13 2010 Emissions	N12-6869U	1.1
CT610	MaxxForce 11/13 2010 Emissions	AR12-6869U	1.1

12 - Add-On if Required

Description	Chassis	Engine	SRT	Hours
With updated retrofit oil supply tube	Prostar 122	MaxxForce 11/13 2010 Emissions	R12-6869U-2	0.3
With updated retrofit oil supply tube	Prostar 113	MaxxForce 11/13 2010 Emissions	R12-6869U-1	0.1
With updated retrofit oil supply tube	8600 W/Premium Interior	MaxxForce 11/13 2010 Emissions	Q12-6869U-1	0.2
With updated retrofit oil supply tube	Transtar	MaxxForce 11/13 2010 Emissions	Q12-6869U-2	0.1
With updated retrofit oil supply tube	Workstar	MaxxForce 11/13 2010 Emissions	N12-6869U-1	0.1
With updated retrofit oil supply tube	5000	MaxxForce 11/13 2010 Emissions	T12-6869U-1	0.1

[SRT Manual](#)

OTHER RESOURCES

[Master Service Information Site](#)

Title: Turbo Oil Supply Tube Assembly Return - [PL3000036](#)

Title: 2010 MaxxForce® 11L Turbo Cartridge Replacement - [IK1201073](#)

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