

SMCS - 1052

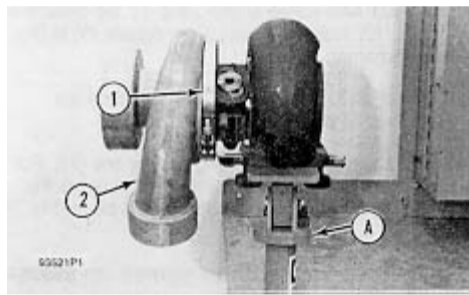
SENR74100011

Disassemble Turbocharger (T12)

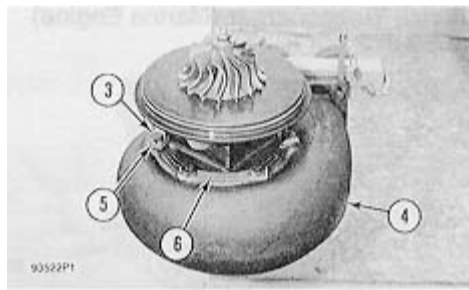
Tools Needed		A	B	C	D	E	F
9S6363	Fixture Group	1					
9S6343	Cartridge Fixture		1				
8S9944	Turbine Holder			1			
FT0808	Adapter				1		
FT0165	Fixture (Modified)					1	
FT0174	Driver Tool						1

Start By:

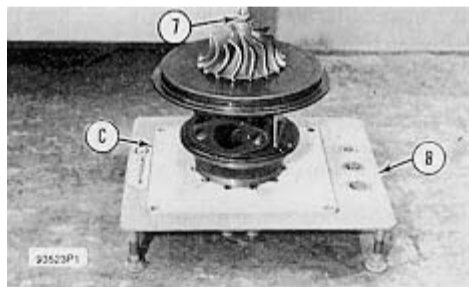
a. remove turbocharger



1. Install the turbocharger on Tool (A).
2. Put alignment marks on the housings for correct installation at assembly.
3. Loosen clamp (1).
4. Remove compressor housing (2). Remove clamp (1).



5. Remove bolts (3), locks (6) and plates (5).
6. Remove the center section from turbine housing (4).

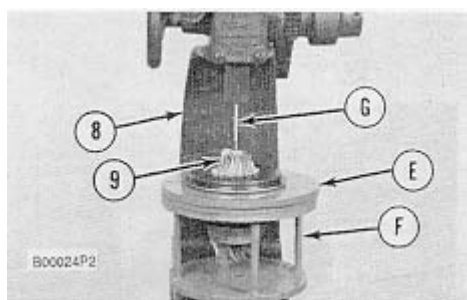


7. Install Tool (C) in Tool (B). Install the center section in Tool (C) as shown.

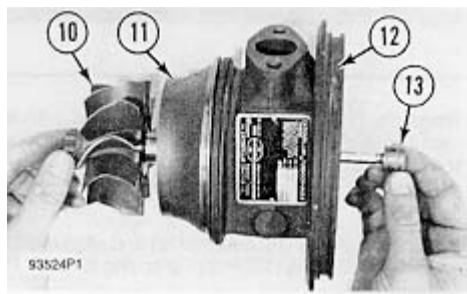
NOTICE

When nut (7) is loosened, do not put side force on the shaft. The shaft may bend.

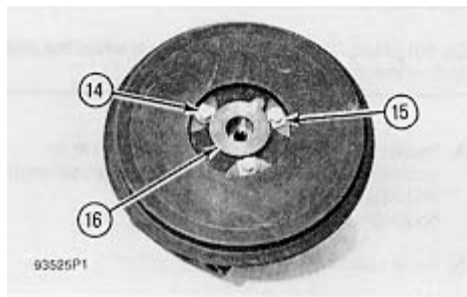
8. Remove nut (7).



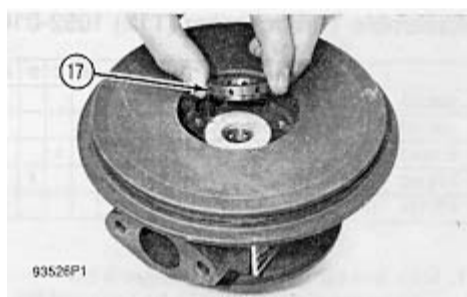
9. Install Tool (D) with the center section on Tool (E). Remove impeller (9) with an arbor press and Tool (F).



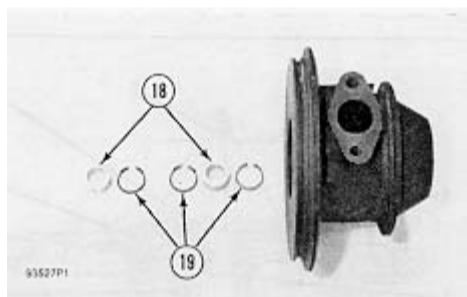
10. Remove shaft and wheel assembly (10), shroud (11) and spacer (13) from center housing (12).



11. Remove bolts (14), locks (15) and plate (16) from the center housing.



12. Remove collar (17) from the housing.



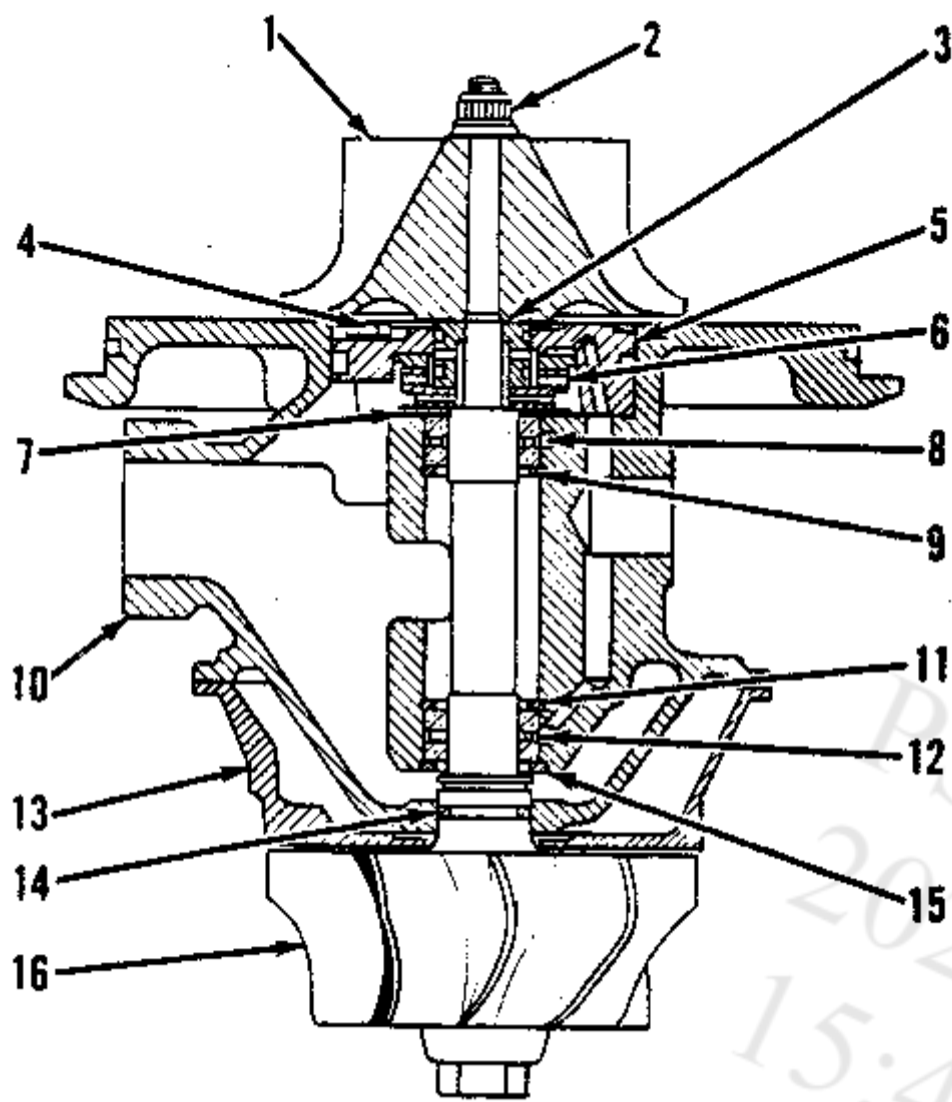
13. Remove two bearings (18) and three snap rings (19) from the center housing.

Assemble Turbocharger (T12)

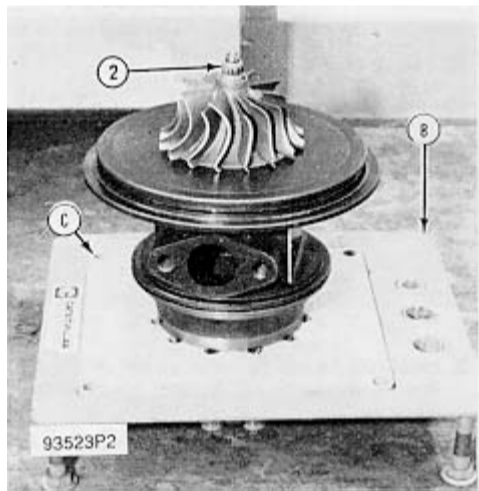
Tools Needed		A	B	C	D	E
9S6363	Fixture Group	1				
9S6343	Cartridge Fixture		1			
8S9944	Turbine Holder			1		
FT0165	Fixture (Modified)				1	
FT0174	Driver Tool					1

1. Make sure that all of the oil passages in the turbocharger cartridge housing are clean and free of dirt and foreign material.

2. Put clean engine oil on all parts of the cartridge assembly.



94749P1



NOTICE

Rings (9), (11) AND (15) must be installed with the round edge of the outside diameter of the rings toward the bearings.

3. Install snap ring (15) bearing (12) and snap ring (11) in center housing (10). Install snap ring (9) and bearing (8).

NOTE: Put **6V2055 High Vacuum Grease** in the groove for seal ring (14) assembly to one half or more of the depth of the groove all the way around.

NOTICE

Do not cause damage to seal ring (14) when the shaft and wheel assembly is installed.

4. Install shroud (13), and install seal ring (14) on turbine wheel and shaft assembly (16). Install shaft and wheel assembly (16) in the center housing.

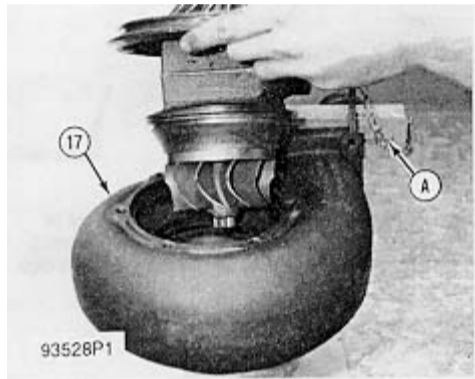
5. Install spacer (7) and collar (6).

6. Put plate (5) in position on the center housing. Install bolts (4). Tighten the bolts to a torque of **4.5 ± 0.6 N·m (40 ± 5 lb in)**.

NOTICE

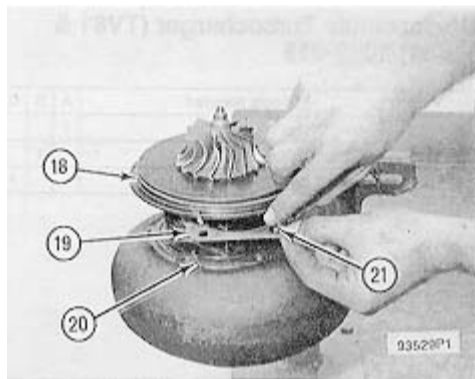
If spacer (3) is installed with its small inside diameter toward the center housing, it will cause a restriction in the flow of oil to the chambers and ring. This will cause a failure to the turbocharger.

7. Install spacer (3). Make sure the small inside diameter of the spacer is toward the impeller end of the shaft and wheel assembly.
8. Put a small amount of clean engine oil on the turbine shaft threads and compressor wheel face that makes with the nut. Install nut (2) and tighten it to a torque of **17 N·m (13 lb ft)** to push compressor wheel (1) on the shaft. Loosen the nut, and tighten it again to a torque of **3.5 N·m (30 lb ft)**. Tighten the nut an additional **120°** of a turn.
9. Remove the nut from the turbine shaft, and put **6V1541 Quick Care Primer** on the threads of the turbine shaft and nut.
10. Put **9S3265 Retaining Compound** on the threads of the shaft and nut. Install the nut, and tighten it to a torque of **3.5 N·m (30 lb in)**. Tighten the nut an additional **120°** of a turn.



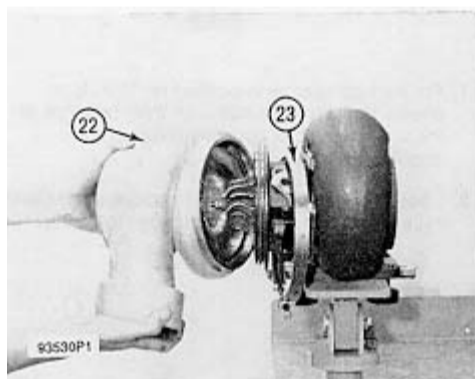
11. Install turbine housing (17) on tool (A). Install the center section in the turbine housing.

NOTE: Put the alignment marks that were made at disassembly in alignment to make sure the housings are in their original position.



12. Put **5P3931 Anti-Seize Compound** on the threads of bolts (21). Install plates (20), locks (19) and the bolts. Tighten the bolts to a torque of **20 ± 1 N·m (15 ± 1 lb ft)**.

13. Install a new O-ring seal (18) on the center housing.



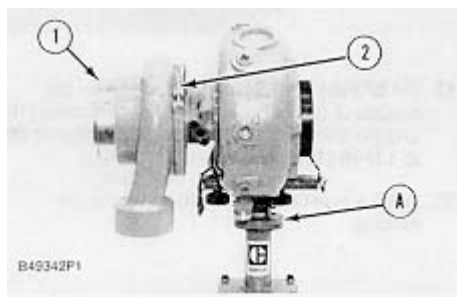
14. Put clamp (23) over the center section. Put compressor housing (22) in alignment with the marks made at disassembly. Put the clamp in position over the housing. Tighten the clamp to a torque of **14 ± 1 N·m (10 ± 1 lb ft)**.

Disassemble Turbocharger (TV81 & TW81)

Tools Needed		A	B	C
9S6363	Fixture Group	1		
9S6343	Cartridge Fixture		1	
1P1853	Retaining Ring Pliers			1

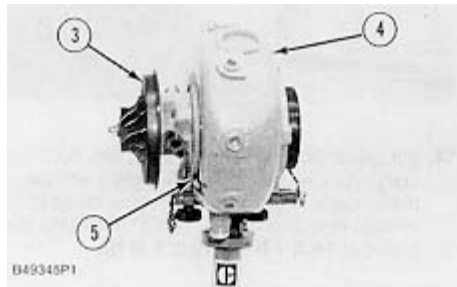
Start By:

- a. remove turbocharger (TV81 and TW81)



1. Put the turbocharger in position on Tool (A) as shown. Put alignment marks on three housings of the turbocharger for correct installation and alignment at assembly.

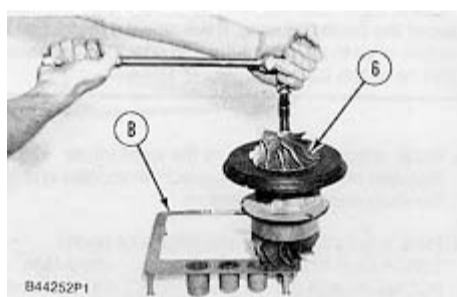
2. Loosen clamp (2) and remove compressor housing (1) and the clamp from the cartridge assembly.



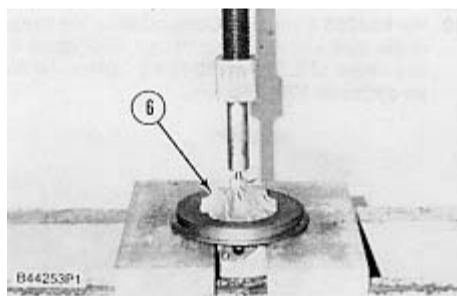
3. Loosen clamp (5) and remove cartridge assembly (3) from turbine housing (4).

NOTICE

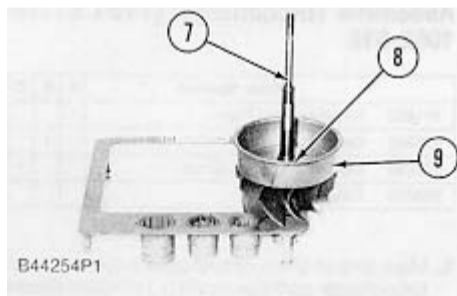
To prevent a bent shaft, do not put a side force on the turbine shaft when the compressor wheel nut is loosened.



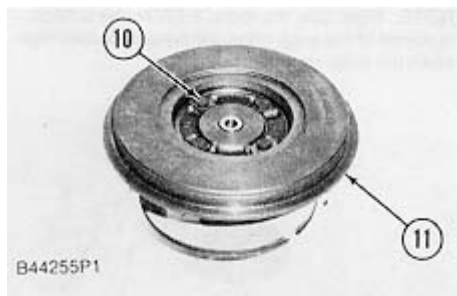
4. Put the end of the turbine shaft in tool (B). Use a universal joint and socket of the correct size to remove the nut that holds compressor wheel (6) on the turbine shaft.



5. Use a press, and push the turbine shaft out of compressor wheel (6) and the cartridge housing. Remove compressor wheel (6) from the cartridge housing.

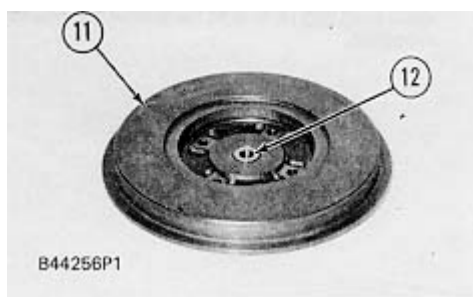


6. Remove seal ring (8) and shroud (9) from turbine shaft (7).

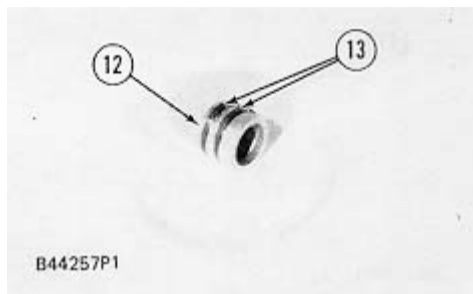


7. Bend the tabs of the locks from bolts (10), and remove the bolts.

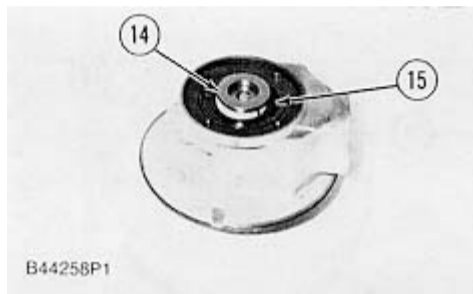
8. Remove backplate assembly (11) from the cartridge housing. Make a note of the position of the oil holes in the backplate assembly and cartridge housing for correct alignment at assembly.



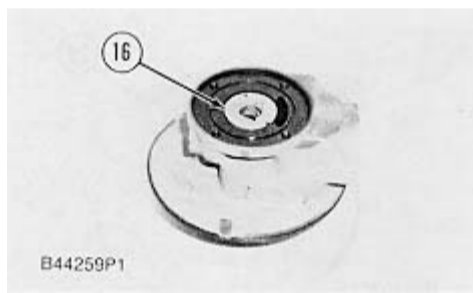
9. Remove spacer (12) from back plate assembly (11).



10. Remove seal rings (13) from spacer (12).

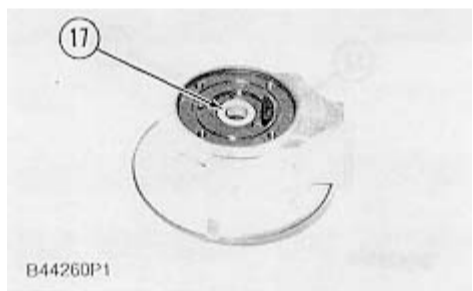


11. Remove thrust collar (14) and seal ring (15) from the cartridge housing.

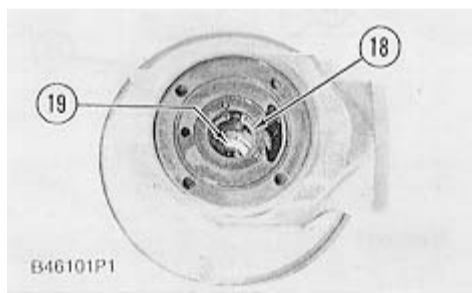


12. Remove thrust bearing (16) from the cartridge housing.

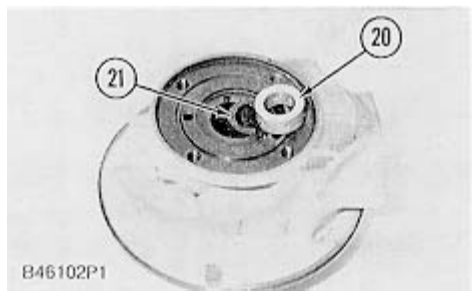
NOTE: If the bearings are to be used again, put identification marks on them as to their location for correct assembly.



13. Remove bearing (17) and the washer below the bearings from the cartridge housing.



14. Use tool (C), and remove snap rings (18) and (19) from the cartridge housing.



15. Remove bearing (20) and washer (21) from the cartridge housing.

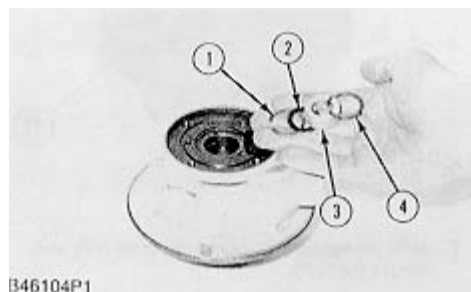
16. If necessary, use tool (C), and compress the end snap ring, and push it out of the bearing bore toward the compressor end of the cartridge housing to remove it.

Assemble Turbocharger (TV81 & TW81)

Tools Needed		A	B	C	D
1P1853	Retaining Ring Pliers	1			
9S6343	Cartridge Fixture		1		
8T5096	Dial Indicator Test Group			1	
9S6363	Fixture Group				1

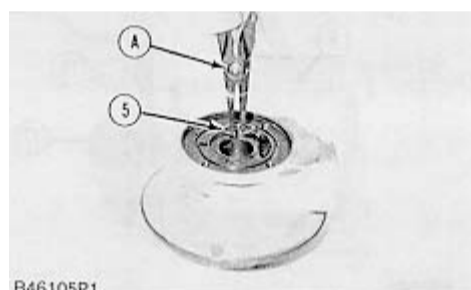
1. Make sure all of the oil passages in the turbocharger cartridge housing, backplate assembly and bearings are clean and free of dirt and foreign material.
2. Put clean engine oil on all parts of the cartridge at assembly.

NOTE: Make sure the round edge on the outside diameter of the snap rings are toward the bearings when the snap rings are installed.

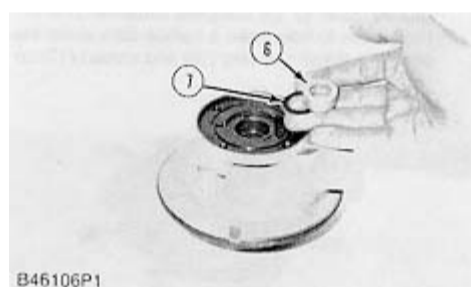


3. Use Tool (A), and install snap ring (1) in the turbine end of the cartridge housing.

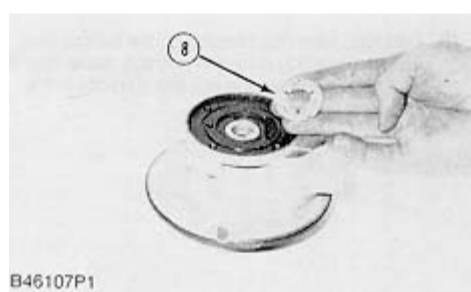
4. Install washer (2) and bearing (3). Use Tool (A) to install snap ring (4) to hold the washer and bearing in position.



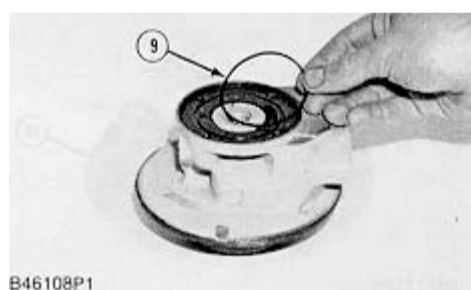
5. Use Tool (A), and install snap ring (5) in the cartridge housing.



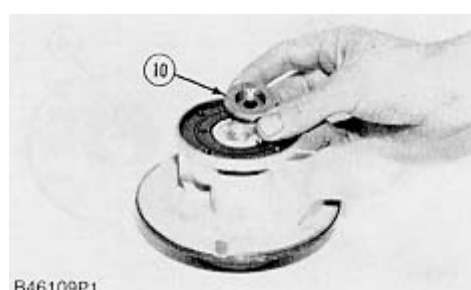
6. Install washer (7) and bearing (6) in the cartridge housing until washer (7) makes contact with snap ring (5).



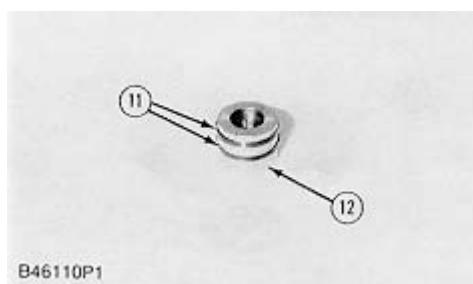
7. Install thrust bearing (8) over the dowels in the cartridge housing. Make sure the grooves in bearing (8) are toward the outside as shown.



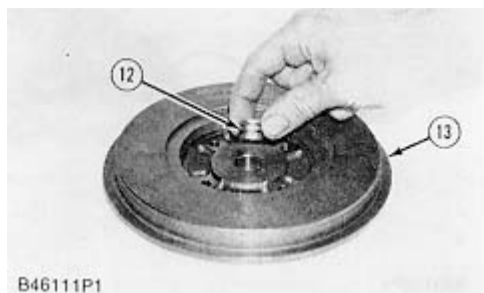
8. Install seal ring (9) in the groove of the cartridge housing.



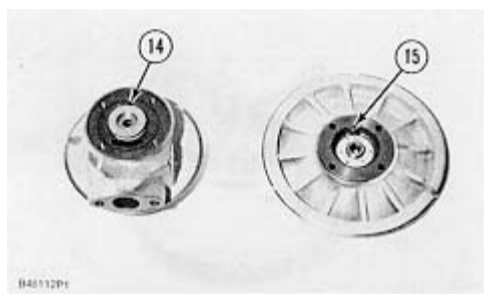
9. Put thrust collar (10) in position on the thrust bearing with the counterbore for the spacer up.



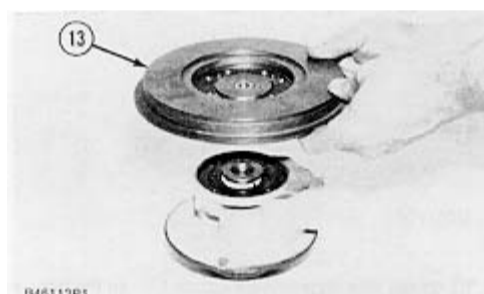
10. Install seal rings (11) on spacer (12) so the gaps in the rings are 180° apart.



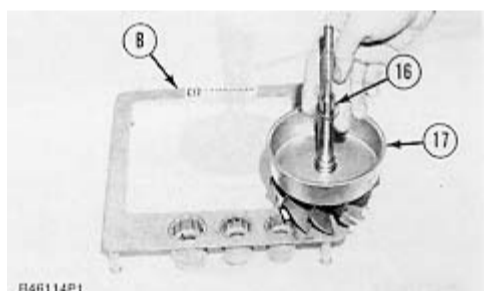
11. Install spacer (12) in backplate assembly (13).



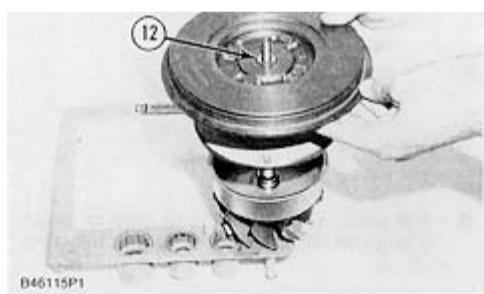
12. Make sure oil passage (14) in the cartridge housing and oil passage (15) in the backplate assembly are in alignment. Put backplate assembly (13) in position on the cartridge housing. Make sure the spacer fits correctly in the counterbore of the thrust collar.



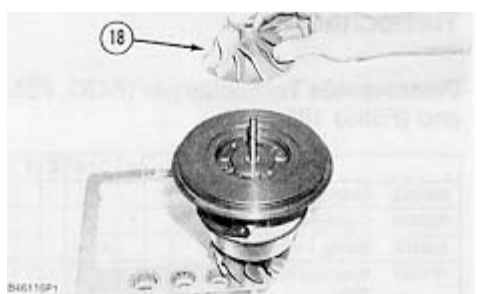
13. Install the locks and bolts to hold backplate assembly (13) to the cartridge housing. Tighten the bolts to a torque of $10 \pm 1 \text{ N}\cdot\text{m}$ ($7 \pm 1 \text{ lb ft}$) and bend the tabs of the locks on the bolts.



14. Put the turbine shaft in position in Tool (B). Put **6V2055 High Vacuum Grease** in the groove for seal ring (16). Make sure the grease fills the groove approximately one half or more of the groove depth for the complete circumference of the groove to help make a carbon dam under the seal ring. Install seal ring (16) and shroud (17) on the turbine shaft.



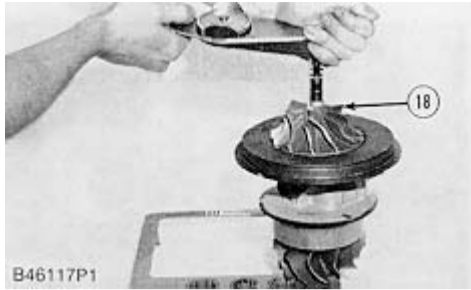
15. Install the cartridge housing on the turbine shaft while spacer (12) is held in position. Make sure the seal ring on the turbine is fitted correctly in the cartridge housing.



16. Put compressor wheel (18) in position on the turbine shaft.

NOTICE

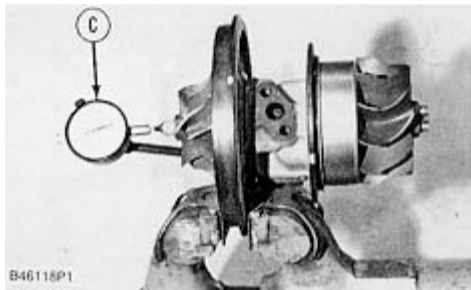
Do not put a side force on the turbine shaft when the nut is tightened, or a bent shaft will be the result.



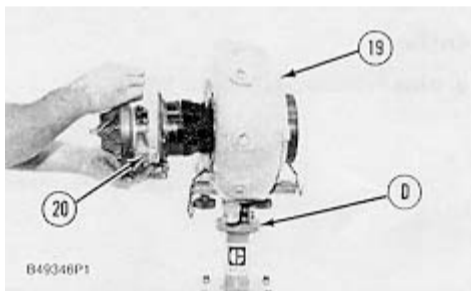
17. Put a small amount of oil on the turbine shaft threads and the compressor wheel face that will be under the nut. Install the nut, and tighten it to a torque of **17 N·m (150 lb in)** to push the compressor wheel (18) on the shaft. Loosen the nut and tighten it again to **3.5 N·m (31 lb in)**. Tighten the nut **120°** of a turn more.

18. Remove the nut from the turbine shaft and put **6V1541 Quick Cure Primer** on the threads of the turbine shaft and nut.

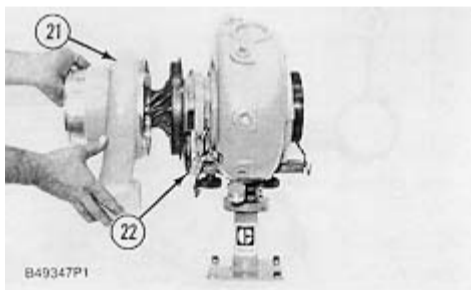
19. Put **9S3265 Retaining Compound** on the threads of the shaft and nut. Install the nut and tighten to a torque of **3.5 N·m (31 lb in)**. Tighten the nut an additional **120°** of a turn more.



20. Put the cartridge housing in a vise as shown. Check the shaft end play with Tool (C). The shaft end play must be **0.08 to 0.25 mm (.003 to .010 in)**.



21. Install turbine housing (19) on Tool (D) as shown. Put the cartridge and clamp (20) in position in turbine housing (19). Make sure the marks on the housing and cartridge in alignment, and tighten clamp (20) to a torque of **14.0 ± 1.5 N·m (124 ± 13 lb in)**. Lightly hit all around the clamp with a soft faced hammer. Tighten the clamp nut again to the same torque.



22. Install clamp (22) and compressor housing (21) on the cartridge in the correct position. Move clamp (22) into position, and tighten the nut to a torque of **14.0 ± 1.5 N·m (124 ± 13 lb in)**. Lightly hit all around the clamp with a soft faced hammer. Tighten the clamp nut again to the same torque.

End By:

a. install turbocharger (TV81 and TW81)

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2022/11/30

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