

Demonstrate Inspecting and Servicing Various Bearing, Seal and Gasket Used in Heavy Equipment

Skill Number CO-OP15GN106

Full Name: Pritha Olvera Laura

No ID: 15

Validation Date: 21 / 02 / 2026

School: SMKW 1 Singapore

PERFORMANCE TASK:

Given assorted bearings, seals and gaskets, the student is requested to perform the following tasks on the components:

- Removing
- Inspection
- Installing

The student must be able to perform the following task:

- Demonstrate removing, inspection and installing Bearing, Seals and Gasket.

It is recommended that assessor put questions to student regarding the findings of their inspections and subsequent report. Literature and measuring tools will be made available but will not be provided directly to the student. Safety and Contamination Control must be always applied to this process.

Prerequisite	Yes	No	N/A	Hints
The student must complete the knowledge assessment. Minimum passing grade 80%.	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Preparation	✓			
Prepare related literature	✓			
Prepare required equipment	✓			
Prepare related tools	✓			
Prepare Safety & Contamination Control equipment	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform etiquette/manner when starting the job	✓			
Meet the customer / assessor	✓			
Perform etiquette/manner when opening the interraction.	✓			
Explain the purpose of Student's activity.	✓			
Ask permission to perform the job.	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Remove, inspect and install Bearings, Seals and Gaskets	✓			
1. Accessing Information	✓			
2. Bearing, Seals & Gasket Removal	✓			
3. Determine bearing reusability of bearings, seals, and gasket	✓			
4. Bearing, Seals & Gasket Installation	✓			
5. Equipment and tooling are used in the correct way	✓			
6. Equipment and tooling are cleaned and returned to its correct location	✓			
Documentation:				
Take picture if needed				

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform close the job by ensuring all systems or conditions is in the standard condition	✓			
Ensure all systems or conditions are in standard condition.	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Reporting All relevant documentation completed correctly and approved by customer (if required).	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Safety				
Using APD related to the job	✓			
Follows relevant Workplace Safety Guidelines (LOTO, Safety Equipment)	✓			
State and follow Safety Precautions	✓			
Service man completes job without accident due to incorrect procedure using hand tools.	✓			
Tasks completed without damage equipment and tools	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Contamination Control				
Environmental Practices & Housekeeping	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform etiquette/manner after completing the job	✓			
Perform etiquette/manner when closing the communication.	✓			

General Comments

RESULT: COMPETENT NOT YET COMPETENT (please check)

Student: Pritha Dharma Date: 27/02/20 Signature: [Signature]

Assessor: Setiawan IB Date: 27-2-2018 Signature: [Signature]

Supervisor: Name: _____ Date: _____ Signature: _____

Data Recorded: Name: _____ Date: _____ Signature: _____

Demonstrate Inspecting and Servicing Various Bearing, Seal and Gasket Used in Heavy Equipment

Skill Number CO-OP15GN106

Full Name: Patta Olivia Laura

No ID: 15

Validation Date: 27/02/2026

School: SMKN 1 Bangsari

PERFORMANCE TASK:

Given assorted bearings, seals and gaskets, the student is requested to perform the following tasks on the components:

- Removing
- Inspection
- Installing

The student must be able to perform the following task:

- Demonstrate removing, inspection and installing Bearing, Seals and Gasket.

It is recommended that assessor put questions to student regarding the findings of their inspections and subsequent report. Literature and measuring tools will be made available but will not be provided directly to the student. Safety and Contamination Control must be always applied to this process.

Prerequisite	Yes	No	N/A	Hints
The student must complete the knowledge assessment. Minimum passing grade 80%.	✓			Score seal, bearing, gasket course or subject.

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Preparation				
Prepare related literature	✓			Observe if the candidate is referring to the Manufacturer's Literature
Prepare required equipment	✓			Observe if the candidate is preparing bearings, seals, and gaskets
Prepare related tools	✓			Observe if the candidate is preparing related tools (e.g.: Hand tools, bearing puller, Bearing heater, Infrared Thermometer, etc.)
Prepare Safety & Contamination Control equipment	✓			Observe if the candidate is preparing related Safety & CC Equipment (e.g.: PPE, Blue Towel, Plastic Wrap, etc.)



Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform etiquette/manner when starting the job	✓			
Meet the customer / assessor	✓			
Perform etiquette/manner when opening the interaction.	✓			• Perform smile & greet • Introduce Student
Explain the purpose of Student's activity.	✓			
Ask permission to perform the job.	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Remove, Inspect and Install Bearings, Seals and Gaskets				
1. Accessing Information	✓			Observe if the candidate is accessing information relating task from manufacturer's literature
2. Bearing, Seals & Gasket Removal	✓			Observe if the candidate is removing seals and gasket following instructional manufacturer's literature
3. Determine bearing reusability of bearings, seals, and gasket	✓			Observe if the candidate is inspecting seals and gasket following instructional manufacturer's literature
4. Bearing, Seals & Gasket Installation	✓			Observe if the candidate is installing seals and gasket following instructional manufacturer's literature
5. Equipment and tooling are used in the correct way	✓			
6. Equipment and tooling are cleaned and returned to its correct location	✓			
Documentation:				
Take picture if needed				



Tasks	Completed	Yes	No	N/A	Observation / Hints
1. Accessing information					Observe if the candidate is accessing information relating task from manufacturer's literature
2. Bearing, Seals & Gasket Removal					Observe if the candidate is removing bearings, seals and gasket following instruction on manufacturer's literature
3. Determine bearing reusability of bearings, seals, and gasket					Observe if the candidate is inspecting bearings, seals and gasket following instruction on manufacturer's literature
4. Bearing, Seals & Gasket Installation					Observe if the candidate is installing bearings, seals and gasket following instruction on manufacturer's literature
5. Equipment and tooling are used in the correct way					Equipment and tooling are cleaned and returned to its correct location
6. Equipment and tooling are cleaned and returned to its correct location					Documentation:
Take picture if needed					

Tasks	Completed	Yes	No	N/A	Observation / Hints
Perform etiquette/manner when starting the job					
Meet the customer / assessor					
Perform etiquette/manner when opening the interaction.					<ul style="list-style-type: none"> Perform smile & greetings. Introduce Student's Identity.
Explain the purpose of Student's activity.					
Ask permission to perform the job.					

Preparation	Tasks	Completed	Yes	No	N/A	Observation / Hints
Prepare related literature						Observe if the candidate is referring to the Manufacturer's Literature
Prepare required equipment						Observe if the candidate is preparing bearings, seals, and gaskets
Prepare related tools						Observe if the candidate is preparing related tools (e.g.: Hand tools, Bearing puller, Bearing heater, Mirror, Thermometer, etc.)
Prepare Safety & Contamination Control equipment						Observe if the candidate is preparing related Safety & CC Equipment (e.g.: PPE, Blue Towel, Plastic Wrap, etc.)

Prerequisite	Tasks	Completed	Yes	No	N/A	Hints
The student must complete the knowledge assessment. Minimum passing grade 80%.						Score seal bearing, gasket course or subject.

PERFORMANCE TASK:

Given assorted bearings, seals and gaskets, the student is requested to perform the following tasks on the components:

- Removal
- Inspection
- Installation

The student must be able to perform the following task:

- Demonstrate removing, inspection and installing Bearing, Seals and Gasket.

It is recommended that assessor put questions to student regarding the findings of their inspections and subsequent report. Literature and measuring tools will be made available but will not be provided directly to the student.

Safety and Contamination Control must be always applied to the process.

Full Name: _____

No ID: _____

School: _____

Validation Date: _____

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform close the job by ensuring all systems or conditions is in the standard condition				
Ensure all systems or conditions are in standard condition.	✓			<ul style="list-style-type: none"> Find the improper condition. Communicate the finding to the customer/assessor.

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Reporting				
All relevant documentation completed correctly and approved by customer (if required).	✓			<ul style="list-style-type: none"> Completing the Task List Completing Measurement Form/Related Check Sheet, if required Create Service Report (SIMS), if required Create SPR, if required Documenting the failed or damaged parts, if required Provide Technical Analysis Report/Failure Analysis Report, if required.

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Safety				
Using APD related to the job	✓			
Follows relevant Workplace Safety Guidelines (LOTO, Safety Equipment)	✓			<ul style="list-style-type: none"> Comply with safety regulation that applied on the workplace
State and follow Safety Precautions	✓			<ul style="list-style-type: none"> Create Job Safety Analysis Student must follow safety procedure refer to service manual or SIS related to job
Service man completes job without accident due to incorrect procedure using hand tools.	✓			<ul style="list-style-type: none"> Correct working position Correct hand tool related to the job
Tasks completed without damage equipment and tools	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Contamination Control				
Environmental Practices & Housekeeping	✓			<ol style="list-style-type: none"> Waste is minimized, waste including sludge, solids and wastes are sorted and stor recycling or disposal Packaging of goods received and reused or disposed of Materials that can be reuse cleaned and stored Waste and scrap are removed following workplace procedure All fluids are disposed of in with enterprise policies and

Tasks	Completed			Observation
	Yes	No	N/A	
Perform etiquette/manner after completing the job				
Perform etiquette/manner when closing the communication.	✓			<ul style="list-style-type: none"> Perform smile & greet Ask permission to the interaction.

RESULT: COMPETENT NOT YET COMPETENT (please check (✓))

Student: Name _____ Date _____ Signature _____

Assessor: Name _____ Date _____ Signature _____

Supervisor: Name _____ Date _____ Signature _____

Data Recorded: Name _____ Date _____ Signature _____

General Comments

General Comments

RESULT: COMPETENT NOT YET COMPETENT (please check (N))

Student: Yveta Olivera Date: 27/02/2025

Name: _____ Signature: _____

Assessor: Sobhanwar TB Date: 27-2/2025

Name: _____ Signature: _____

Supervisor: _____ Date: _____

Name: _____ Signature: _____

Data Recorded: _____ Date: _____

Name: _____ Signature: _____

CC-OP15GN106 - Assessor Marking Guide
CO-OP15GN106 - Assessor Marking Guide

General Comments

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform close the job by ensuring all systems or conditions is in the standard condition				<ul style="list-style-type: none"> Find the improper condition. Communicate the finding to the customer/assessor.
Ensure all systems or conditions are in standard condition.				

Tasks	Completed			Observation / Hints	Date
	Yes	No	N/A		
Reporting					
All relevant documentation completed correctly and approved by customer (if required)	COMPETENT			<ul style="list-style-type: none"> Completing the Task List Completing Measurement Form Related Check Sheet (if required) Create Service Report (SIMS), if required Create SPR, if required Documenting the failed or damaged parts, if required Provide Technical Analysis Report/Failure Analysis Report required. 	
Student: _____					
Assessor: _____					

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Safety				
Having APD related to the job recorded:				<ul style="list-style-type: none"> Comply with safety regulation that applied on the workplace
Shows relevant Work Health & Safety Guidelines (LOTO, Safety Equipment)				
State and follow Safety Precautions				<ul style="list-style-type: none"> Create Job Safety Analysis Student must follow safety procedure refer to service manual or SIS related to job
Serviceman completes job without accident due to incorrect procedure using hand tools.				<ul style="list-style-type: none"> Correct working position Correct hand tool related to the job
Tasks completed without damage equipment and tools				

Data Recorded:

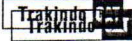
Name _____

Supervisor:

Name _____

Date _____

Signature _____



General Comments

TRAKINDO CO-OP

CC-OP15GN106 - Assessor Marking Guide
CO-OP15GN106 - Assessor Marking Guide

General Comments

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Contamination Control				
Environmental Practices & Housekeeping				<ol style="list-style-type: none"> Waste is minimized, waste material, including sludge, solids and other wastes are sorted and stored in bins for recycling or disposal Packaging of goods received is sorted and reused or disposed of by recycling Materials that can be reused are cleaned and stored Waste and scrap are removed following workplace procedures All fluids are disposed of in accordance with enterprise policies and procedures
Student: _____				
Assessor: _____				

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Perform etiquette/manner after completing the job				
Perform etiquette/manner when closing the communication.				<ul style="list-style-type: none"> Perform smile & greeting Ask permission to leave and end the interaction.
Student: _____				
Assessor: _____				

RESULT: **COMPETENT**

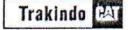
Student: _____

Assessor: _____

Name _____

Date _____

Signature _____

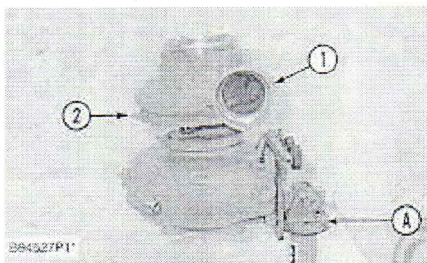


Disassemble Turbocharger (Marine Engine)

Tools Needed		A	B	C	D	E	F	G
9S6363	Turbocharger Fixture Group	1						
9S6343	Fixture Group		1					
5S9566	T-Wrench			1				
FT168	Fixture Adapter				1			
1P1861	Snap Ring Pliers					1		
1P74	Slide Hammer						1	
2P2312	Leg						3	
FT745	Modified Pliers							1

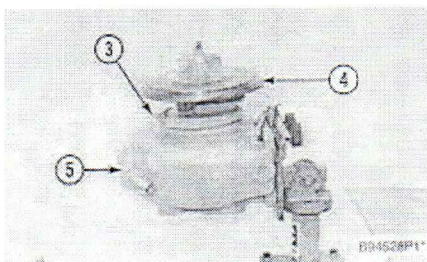
Start By:

a. remove turbocharger

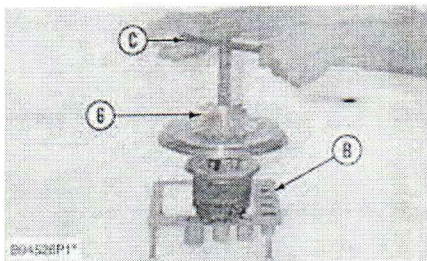


1. Install the turbocharger on Tooling (A). Put marks on the three housings of the turbocharger for correct installation and alignment at assembly.

2. Loosen "V" clamp (2), and remove compressor housing (1).



3. Loosen "V" clamp (3), and remove cartridge housing (4) from turbine housing (5).

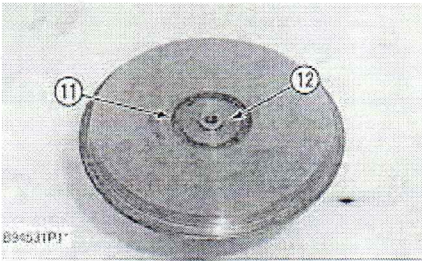


4. Put the cartridge assembly in Tool (B) as shown.

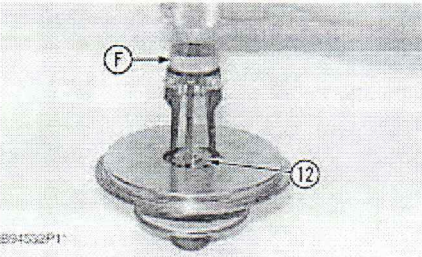
PCP-00022950
2026/02/26
08:26:59+07:00
SEN6526
2026 Caterpillar Inc.



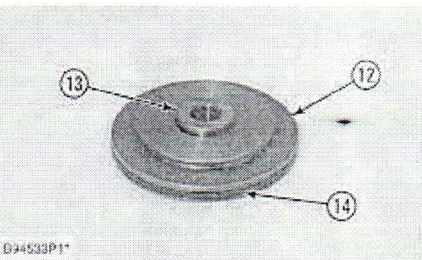




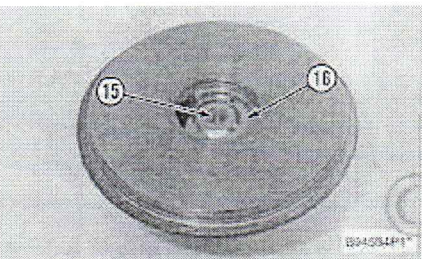
8. Use Tool (E), and remove ring (11) that holds insert (12) on the cartridge housing.



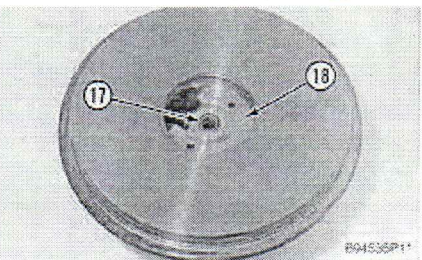
9. Remove insert (12) with Tooling (F).



10. Remove O-ring seal (14) and sleeve (13) from insert (12). Remove the seal ring from sleeve (13).

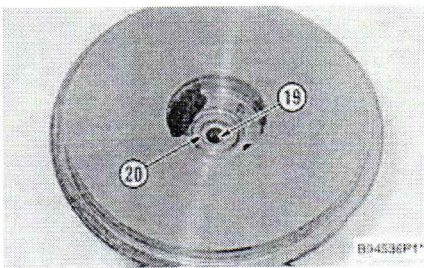


11. Remove deflector (16) and ring (15) from the cartridge housing.

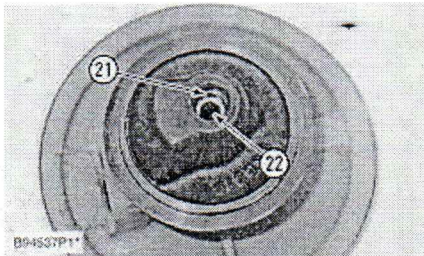


12. Remove bearing (18), sleeve (17) and the ring from the cartridge housing.

PCP-00022950
 2026/02/26
 08:26:59+07:00
 SENR6526
 © 2026 Caterpillar Inc.



13. Use Tool (G), and remove ring (20). Remove bearing (19), and put a long dye mark on the top of the bearing.



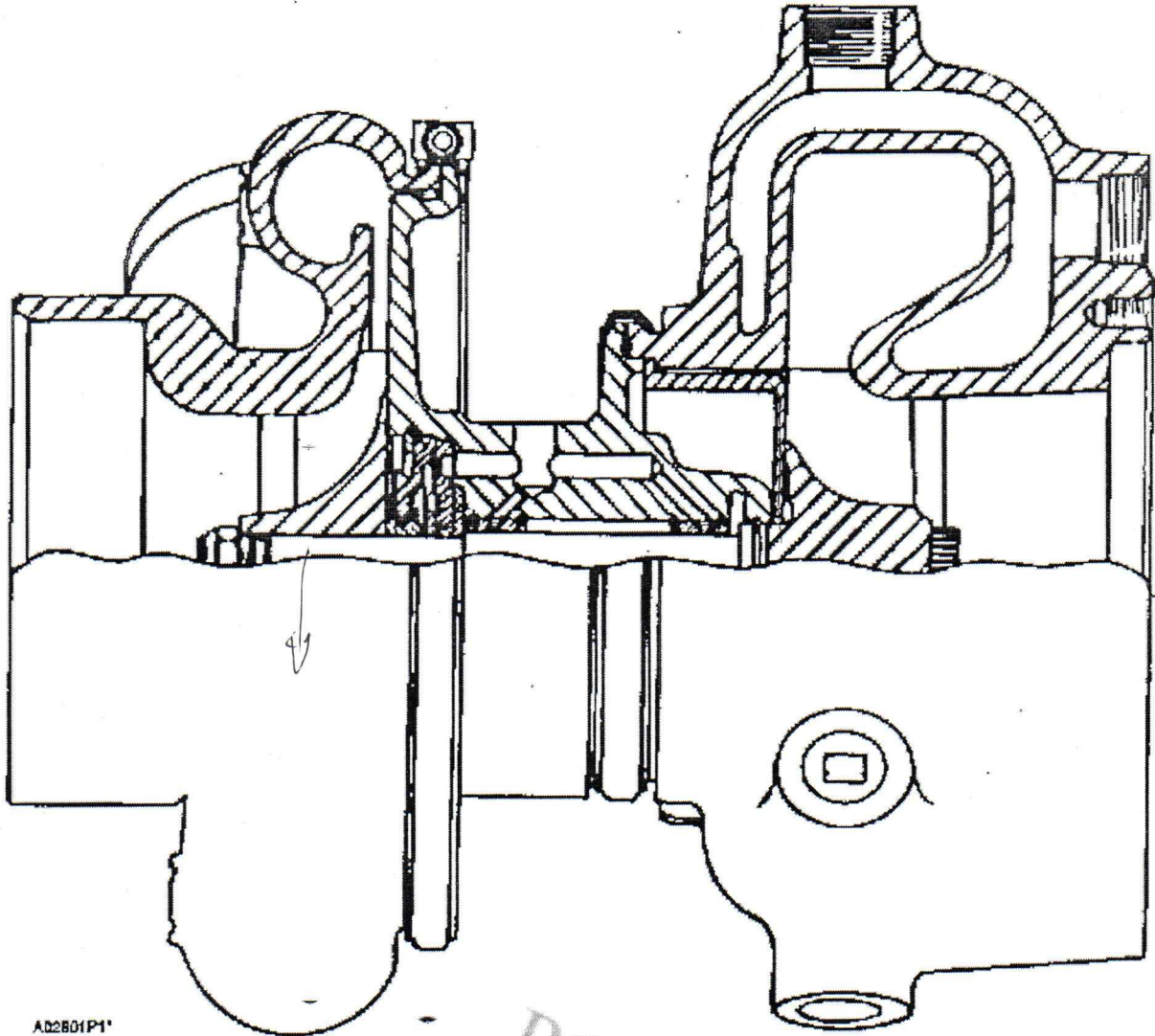
14. Turn the cartridge assembly over. Use Tool (G), and remove ring (21). Remove bearing (22) from the cartridge housing, and put a short dye mark on the top of the bearing.

NOTE: The dye marks are used for identification of the bearings when they are installed.

15. If necessary, remove the two rings that hold the bearings in position from the cartridge housing with Tool (F).

16. Check all the parts of the turbocharger for damage. If the parts have damage, use new parts for replacement. See Special Instruction, SMHS6854, for Turbocharger Reconditioning. Also see Guideline For Reusable Parts, SEBF8018, and Analyzing Turbocharger Failure, FEG45138.

2026/02/26
08:26:59+07:00
SEN6526
© 2026 Caterpillar Inc.



AD2801P1*

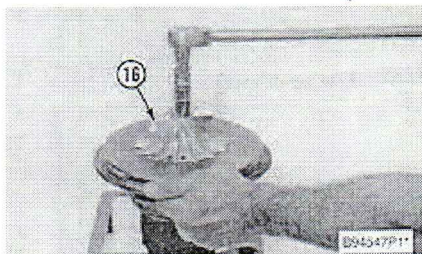
Assemble Turbocharger (Marine Engine)

Tools Needed		A	B	C	D	E
FT745	Modified Pliers	1				
1P1861	Pliers		1			
9S6363	Fixture Assembly			1		
8S2328	Dial Test Indicator Group				1	
9S6363	Turbocharger Fixture Group					1

1. Make sure 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.
3. Make a replacement of the two inside rings that hold the bearings in position in the cartridge housing if necessary.

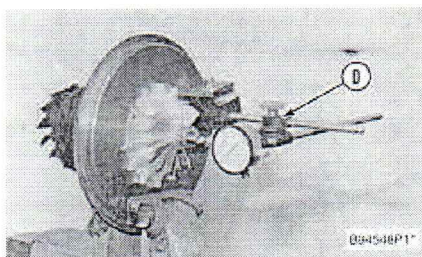
Do not put a side force on the shaft when the nut is tightened.

Compressor Inc.

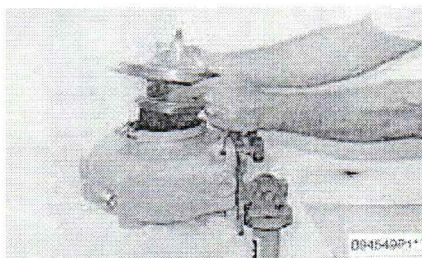


15. Install compressor wheel (16) on the turbine shaft. Put a small amount of **9S-3265 Retaining Compound** and the nut and the shaft. Install the nut that holds the compressor wheel on the turbine shaft. Use a torque wrench and a universal socket of the correct size, and tighten the bolt to a torque of **60 ± 3 N·m (44 ± 2 lb ft)**.

16. Make sure the compressor wheel is clean and dry.

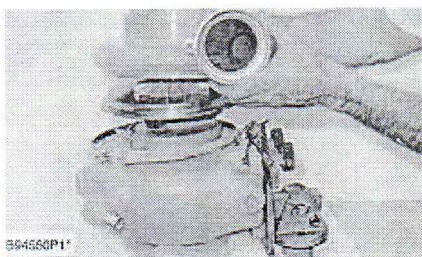


17. Put the cartridge housing in a vise as shown. Check the shaft end play with Tool (D). The end play must be **0.114 ± 0.038 mm (.0045 ± .0015 in)**(new) **0.20 mm (.008 in)** maximum permissible (worn). If the shaft end play is not the correct dimension, the inside parts of the cartridge housing must be checked for too much wear.



18. Install the turbine housing on Tooling (E). Put the cartridge assembly in position in the turbine housing. Make sure the marks on the housings are in alignment with each other. Put **5P-3931 Anti-Seize Compound** on the threads of the "V" clamp that holds the cartridge assembly to the turbine housing. Install the "V" clamp, and tighten the bolt to a torque of **13.6 ± 1.1 N·m (120 ± 10 lb in)**. Tap (hit) clamp lightly all around, and tighten again to a torque of **13.6 ± 1 N·m (120 ± 10 lb in)**.

PC 3026/02/26
08:26:59+07:00
SEN R6.52
© 20



19. Install the compressor housing to the cartridge assembly. Install the "V" clamp that holds the compressor housing to the cartridge housing, and tighten the bolt to a torque of $13.6 \pm 1.1 \text{ N}\cdot\text{m}$ ($120 \pm 10 \text{ lb in}$). Tap (hit) clamp lightly all around, and tighten again to a torque of $13.6 \pm 1.1 \text{ N}\cdot\text{m}$ ($120 \pm 10 \text{ lb in}$).

End by:

a. install turbocharger

PCP-00022950

2026/02/26

08:26:23+07:00

SENR65260046

© 2026 Caterpillar Inc.

2026 Caterpillar Inc.

