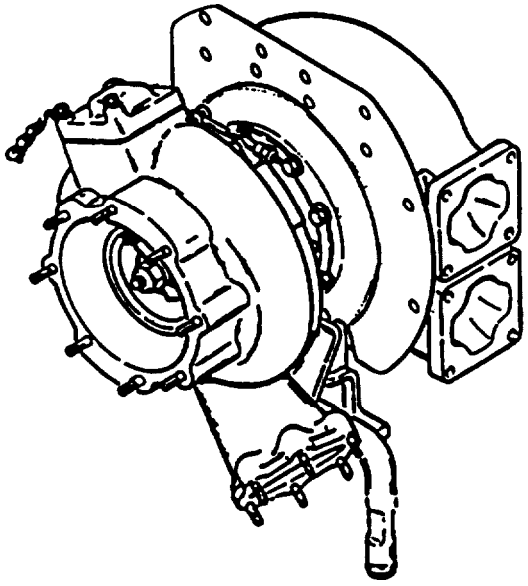
TECHNICAL MANUAL
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL

(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)



TURBOSUPERCHARGER

SCHWITZER MODEL 5HDR

NSN 2950-01-432-0369 [12366708-1]
NSN 2950-01-434-3229 [12366708-2]
NSN 2950-00-397-3384 [11668377-1]
AND 2950-01-167-1700 [187727]

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21 JUNE 1984

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NO. 3
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 11 July 1998

Direct Support and General Support Maintenance Manual
(Including Repair Parts and Special Tools List)

for

TURBOSUPERCHARGER

SCHWITZER MODEL 5HDR

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3-1 and 3-2	3-1 and 3-2
3-39 and 3-40	3-39 and 3-40
A-1 and A-2	A-1 and A-2
B-1 and B-2	B-1 and B-2
B-7 through B-16	B-7 through B-16
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Direct Support and General Support Maintenance Manual
(including Repair Parts and Special Tools List)
for
TURBOSUPERCHARGER

SCHWITZER: MODEL 5HDR
NSN 2950-01-432-0369 (12366708-1)
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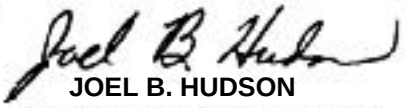

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Direct Support and General Support Maintenance Manual
(Including Repair Parts and Special Tools List)

for

TURBOSUPERCHARGER

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WARNING

Cleaning solvent is flammable! Use only in well ventilated areas. Keep away from flame, sparks, or heat. Avoid contact with eyes, mouth, or skin. Wear rubber gloves to prevent skin irritation.

WARNING

Line pressure for compressed air used for cleaning shall not exceed 30 psi. Wear appropriate eye protection and gloves. Never direct the compressed air stream at another person.

Refer to FM21-11 for first aid instructions.

END ITEM APPLICATION
Turbosuperchargers 12366708-1, 12366708-2, 11668377-1 and 187727
used on
Engines AVDS-1790-2C, AVDS-1790-2CA, AVDS-1790-2D, AVDS-1790-2DA, and AVDS-1790-2DR, and AVDS-1790-8CR

Vehicles	TM No. Series
Tank, Combat, Full Tracked: 105-MM Gun, MM Gun, M48A5	9-2350-258
Tank, Combat, Full Tracked 1 05-MM Gun, M60 and M60A1	9-2350-215
Tank, Combat, Full Tracked 105-MM Gun, M60A1 (RISE)	9-2350-257
Tank, Combat, Full Tracked 1 05-MM Gun, M60A3	9-2350-253
Armored Vehicle Launched Bridge: M48A2 AVLB	5-5420-200
Armored Vehicle Launched Bridge: M60A1 AVLB	5-5420-202
Armored Vehicle Launched Bridge: M48A5 AVLB	5-5420-226
Vehicle, Combat Engineer, Full Tracked: M728	9-2350-222
Recovery Vehicle, Full Tracked: Medium, M88A1	9-2350-256
Recovery Vehicle, Full Tracked: Heavy, M88A2	9-2350-292

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TM 9-2990-205-34&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 21 June 1984

Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for TURBOSUPERCHARGER SCHWITZER MODEL 5HDR NSN 2950-00-397-3384 (11668377-1), 2950-01-167-1700 (187727), 2950-01-432-0369 (12366708-1), AND 2950-01-434-3229 (12366708-2)

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630.

You may also provide DA Form 2028-2 information to TACOM via datafax or e-mail:

- TACOM's fax number is DSN 793-0726 or Commercial (309) 782-0726
- TACOM's e-mail address is amsta-ac-nml@ria-emh2.army.mil
- Soldier Support Network: http://www-ssn.ria.army.mil/ssn/larn.html

Marine Corps users submit NAVMC Form 10772 directly to: Commanding General, Marine Corps Logistics Base (Code 850), Albany GA 31704-5000.

A reply will be furnished directly to you.

CONTENTS ..... **Page**

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HOW TO USE THIS MANUAL

This technical manual describes the Direct Support (DS) and General Support (GS) maintenance and repair requirements for the Schwitzer Model 5HDR Turbosupercharger. To use the maintenance procedures in this manual properly, you must familiarize yourself with the entire procedure before beginning the maintenance task. Information in this manual is divided into three chapters, three appendixes, and an index. Sections, paragraphs and tables are numbered sequentially within each chapter. Use the front cover locators to quickly find the parts of the manual used most often.

Chapter 1 contains general introductory information and a description of the characteristics, capabilities, and major components of the turbosuperchargers. A nomenclature cross-reference list is provided in Chapter 1 which compares common nomenclature used in the manual with official nomenclature when a difference exists. This should help you locate repair parts in the Repair Parts and Special Tools List by official nomenclature.

Chapter 2 lists and illustrates common and special tools required to repair the turbosupercharger. This chapter also contains instructions for inspecting and troubleshooting the turbosupercharger.

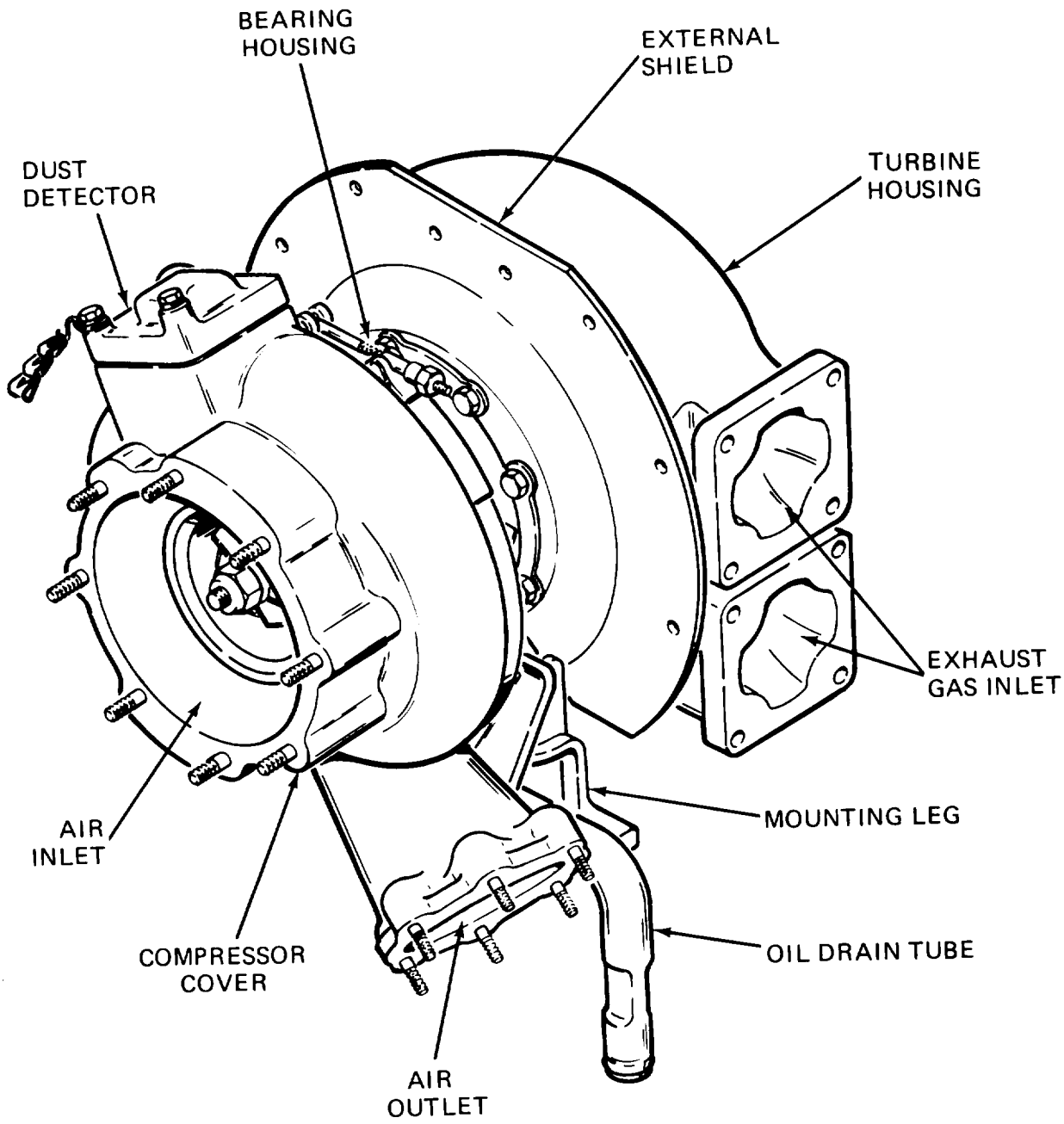
Chapter 3 contains procedures for disassembly, cleaning, inspection, repair and assembly of the turbosupercharger. Lubrication instructions and testing, as well as packaging and preservation procedures, are also contained in Chapter 4. Throughout the disassembly portion of the chapter, you are instructed to remove and discard certain items such as gaskets, seals, and bearings. These disposable parts are furnished in a turbosupercharger parts kit (refer to the Repair Parts and Special Tools List in Appendix B). All kit parts listed must be used during assembly.

Appendix A, References, provides a listing of U.S. Army publications which apply to this manual.

Appendix B is the Repair Parts and Special Tools List.

Appendix C, Expendable Supplies and Materials, is a list of consumable material required to maintain the turbosupercharger at DS/GS level.

An alphabetical index is also provided at the end of this manual, and a metric conversion table is included on the inside back cover.



Turbosupercharger - typical left hand mounting.

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION.

1-1. SCOPE.

a. Type of Manual. This technical manual contains instructions for the maintenance and repair of the Schwitzer Model 5HDR Turbosupercharger at the Direct and General Support level.

b.. Equipment Identification. There are four configurations of Model 5HDR turbosupercharger covered In this manual. Part numbers 11668377-1 (standard, no longer available) and 187727 (clean air) can be mounted on either the right or left bank of various AVDS-1790 series engines. Part numbers 12366708-1 (right bank) and 12366708-2 (left bank) are used on AVDS-1790-8CR engines.

c. Purpose of the Equipment. Turbosuperchargers are basically centrifugal blowers driven by engine exhaust gases which deliver high volumes of compressed air to the engine intake manifold. Engines with turbosuperchargers are able to develop more power per unit of fuel consumed.

1-2. MAINTENANCE FORMS AND RECORDS.

Department of the Army forms and records used for equipment maintenance will be those prescribed by DA PAM 738-750, the Army Maintenance Management System (TAMMS).

1-3. PREPARATION FOR STORAGE OF EQUIPMENT.

Instructions for preservation administrative storage of your Schwitzer turbosupercharger are contained in paragraph 3-13.

1-4. NOMENCLATURE CROSS REFERENCE LIST.

This list includes nomenclature cross-references used in this manual.

COMMON NAME	OFFICIAL NOMENCLATURE
Turbo, Turbocharger	Turbosupercharger, Schwitzer Model 5HDR
Cap screws	Screws, Cap, Hexagon Head
Oil drain tube	Tube Assembly, Metal
Nut	Nut, Self-locking, Hexagon
Compressor wheel	Impeller, Fan, Axial
Compressor wheel shims	Shim, Endplay Adjusting
Thrust ring	Ring, Turbosupercharger
Locking plate	Locking Plate, Nut and Bolt
Shield	Shield, Turbosupercharger
Backplate	Backplate, Turbine
Cap screws	Screws, Externally Relieved Body
Filter	Filter, Air, Electrostatic
Compressor cover adapter	Adapter, Straight, Tube to Boss
Turbine wheel and shaft assembly	Turbine Wheel Assembly

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your turbosupercharger needs improvement, let us know. You, the user, are the only one who can tell us what you don't like about your equipment. Let US know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at U.S. Army Tank Automotive and Armament Command, Warren, MI 48397-5000, ATTN: AMSTA - MB. We'll send you a reply.

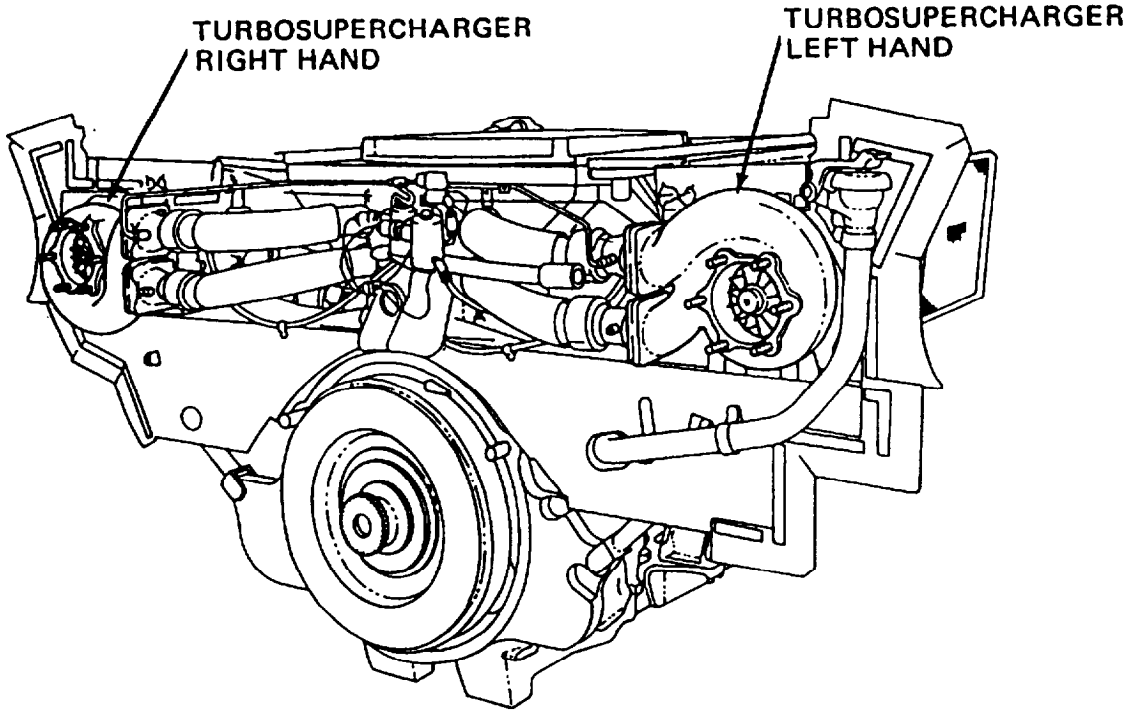
Section II. EQUIPMENT DESCRIPTION AND DATA.

1-6. DESCRIPTION

NOTE

Throughout the remainder of this technical manual, turbosuperchargers will be referred to also as turbo's or turbochargers.

a. General. Turbochargers are mounted on the rear right and left sides of all series AVDS-1790 engines. They use engine exhaust gases to drive a turbine and generate compressed air which is blown at high velocity into the engine air intake manifold. This turbocharging action maintains air intake pressure at a high level and results in an increase in engine output power.



Turbosuperchargers In mounted locations.

b. How Your Turbo Works.

(1) Exhaust gases from the engine exhaust manifold enter the turbo through ports in the turbine housing.

(2) Pressure and heat from the exhaust gases turn the turbine wheel. The gases then leave the turbine housing through the exhaust outlet and are expelled through the vehicle exhaust system.

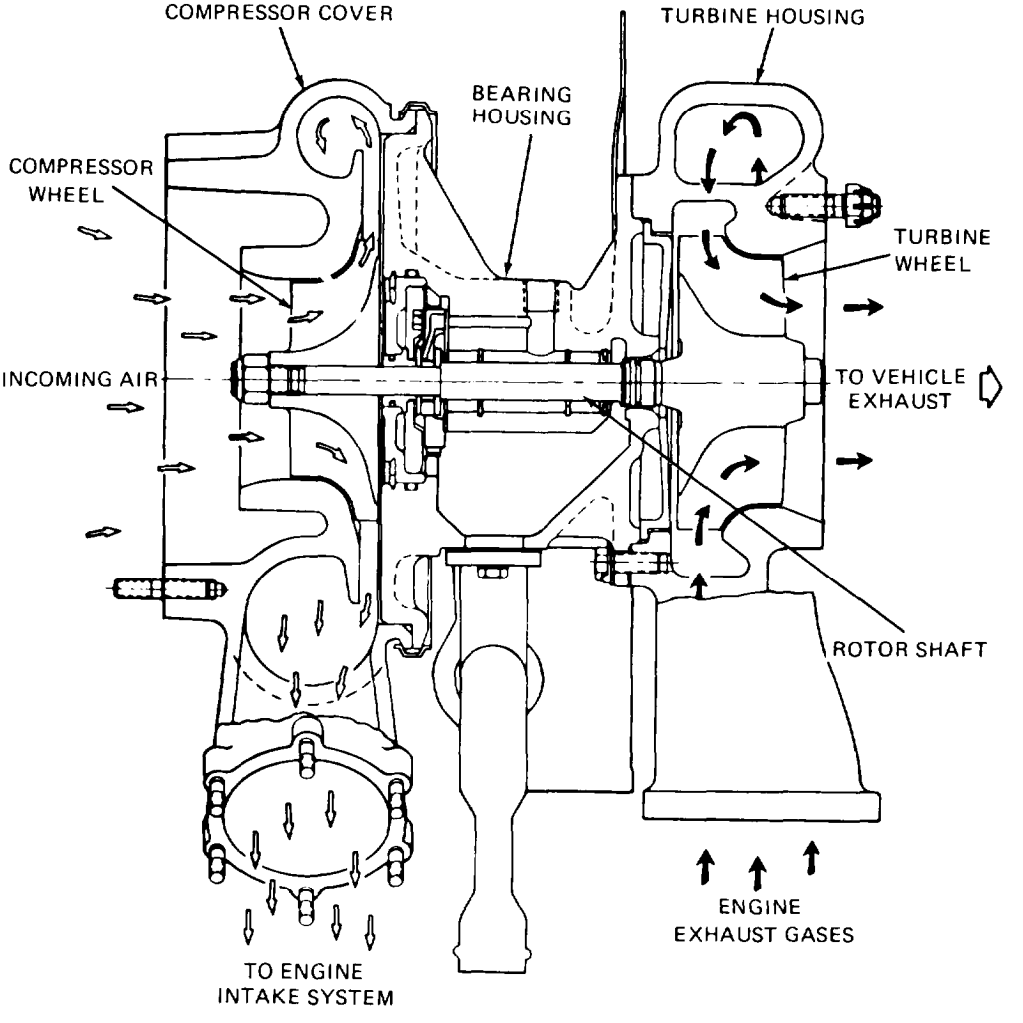
(3) The turbine wheel and the compressor wheel are mounted on a common rotor shaft. When the turbine wheel spins, so does the compressor wheel.

(4) The spinning compressor wheel draws air from the vehicle air filter into the compressor cover.

(5) The air is compressed and blown out of the compressor cover through the outlet port, where it enters the vehicle air induction system.

(6) The increased volume and density of air that is delivered to the engine cylinders causes a corresponding increase in engine output power.

(7) The bearing housing supports the rotor shaft and its sleeve bearings. Lubrication of bearings and other turbocharger moving parts takes place in the bearing housing.



Air flow system.

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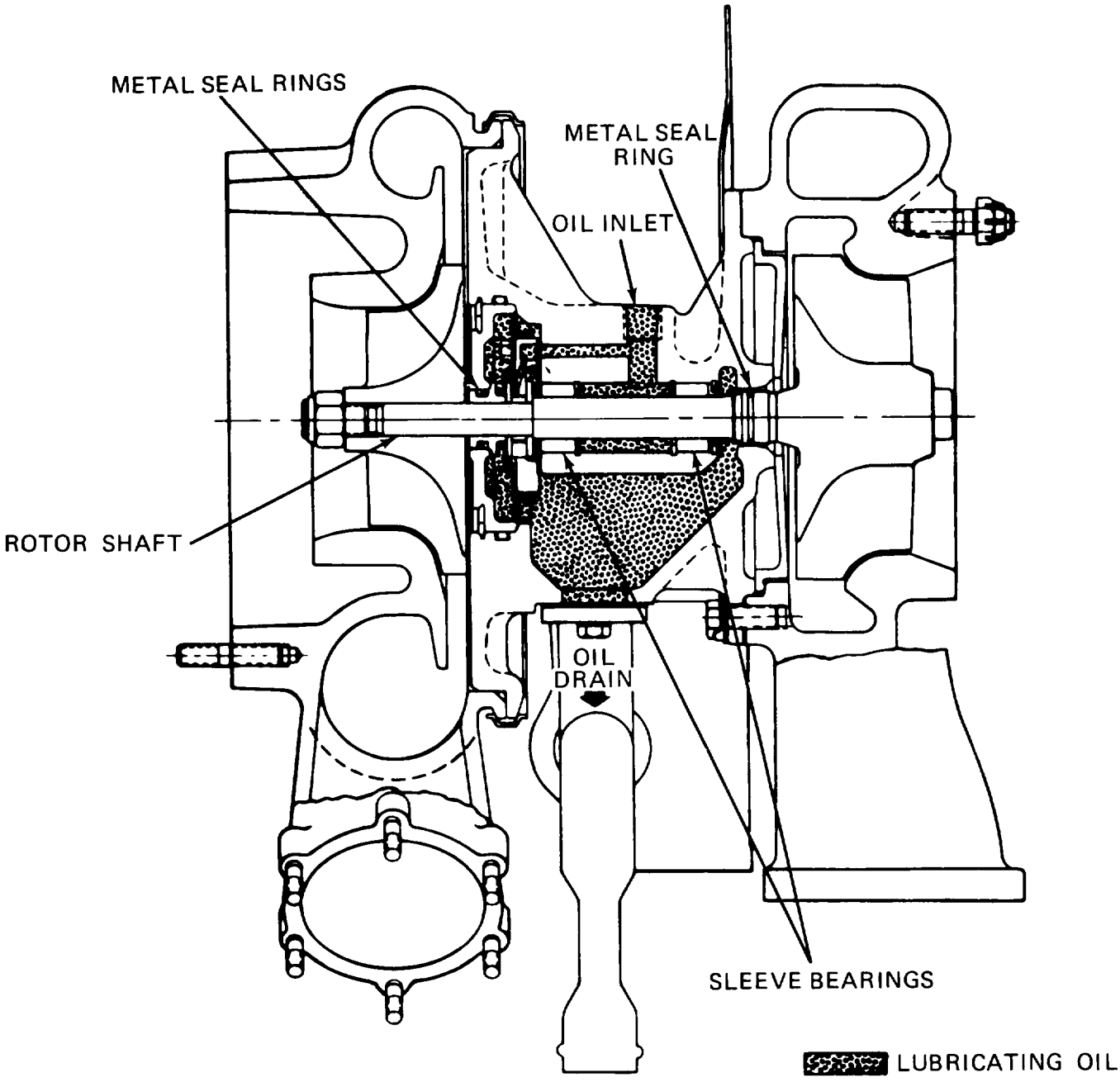
c. Lubrication. Your turbocharger is pressure lubricated by the engine lubricating system through an external hose connected from the bearing housing to the engine oil filter. Oil flows through the bearing housing, around the sleeve bearings, and returns to the engine oil pan via bearing clearances and the oil drain tube. Metal seal rings prevent oil from entering the turbine housing and compressor cover.



Lubrication system.

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d. Difference Between Models

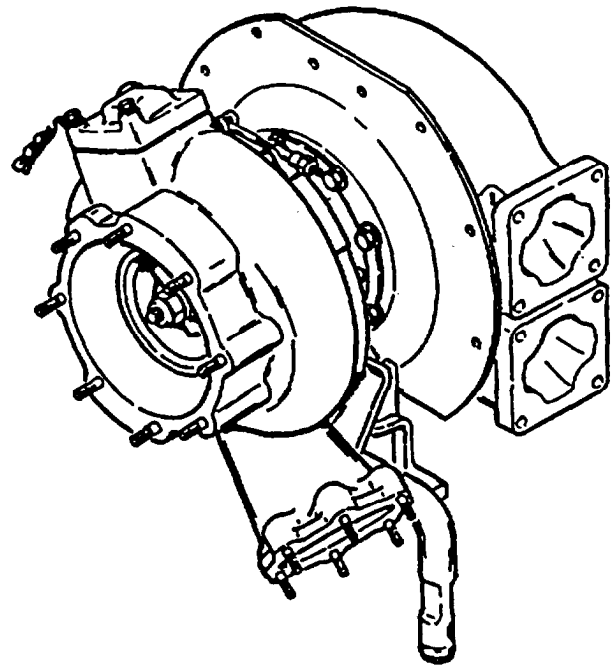
Turbosupercharger part number 11668377-1 used on engine models AVDS-1790-2C, AVDS-1790-2D, and AVDS-1790-2DR (no longer available).

Turbosupercharger part number 187727 (clean air) used on engine models AVDS-1790-2CA, AVDS-1790-2DA, and as a replacement for part number 11668377.

With the exception of the dust detector assembly incorporated into the compressor housing of turbosupercharger part number 187727, these two models are identical and can be used for either left or right bank applications (proper orientation as required). When replacing 11668377-1 turbosupercharger, use part number 187727 and cap off clean air fittings with MS51532B-B5S (NSN: 4730-00-948-9682) and MS51532B-B4S (NSN: 4730-01-127-3942) caps.

Turbosupercharger part numbers 12366708-1 (right bank) and 12366708-2 (left bank) are used on engine model AVDS-1790-8CR. The only difference between the -1 and -2 models are orientation and heat shields. For replacement, order 12366708-1. Use as is for right bank, replace heat shield and re-orient for left bank.

Assembly/Disassembly/Inspection procedures are identical for all three models. Difference in parts/part numbers are identified in Appendix B.

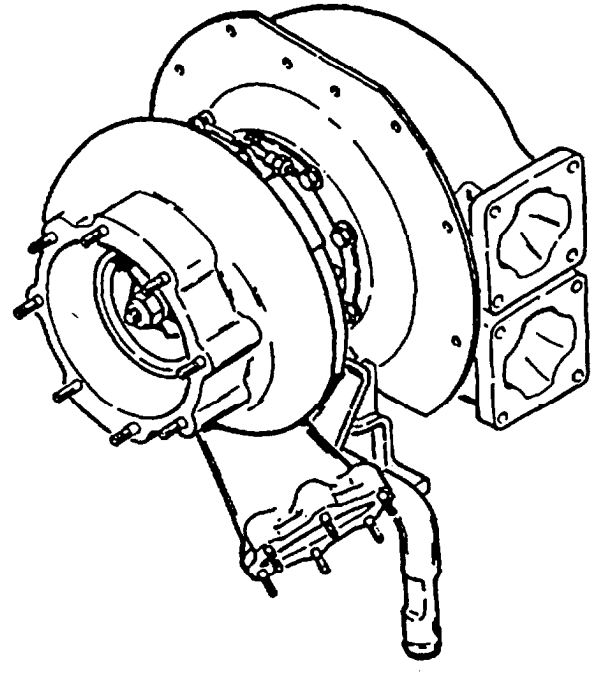


"Clean air" turbosupercharger.

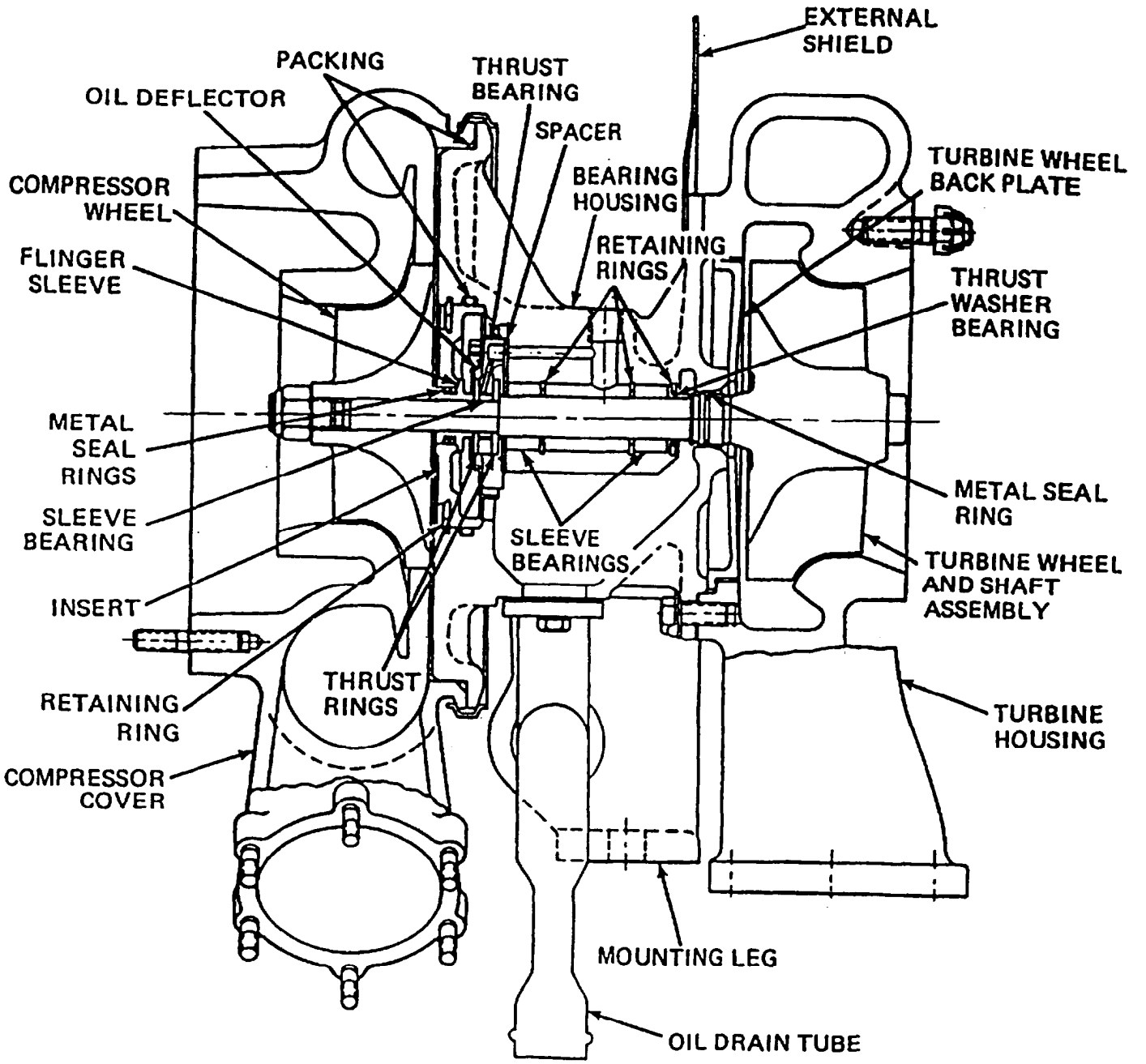
NOTE

For a complete description of the Dust Detector system for "clean air" engine models AVDS-1790-2CA, AVDS-1790-2DA, and AVDS-1790-8CR refer to TM 9-2815-247-34.

e. Difference Between Right and Left Hand Mounting. All configurations of the turbo discussed in this manual can be either right or left hand mounted by indexing the turbine housing and compressor cover according to the mounting location and engine model. Also, the position of the oil drain tube is reversed for right or left hand use. For engine model AVDS-1790-2DR the turbosupercharger heat shields are removed and discarded before the turbos are mounted. Part number 12366708-1 and 12366708-2 turbosuperchargers have different heat shields. Ensure proper shield is used for left or right bank application.



Standard turbosupercharger.



Turbosupercharger – sectional view.

1-7. EQUIPMENT DATA.

a. General.

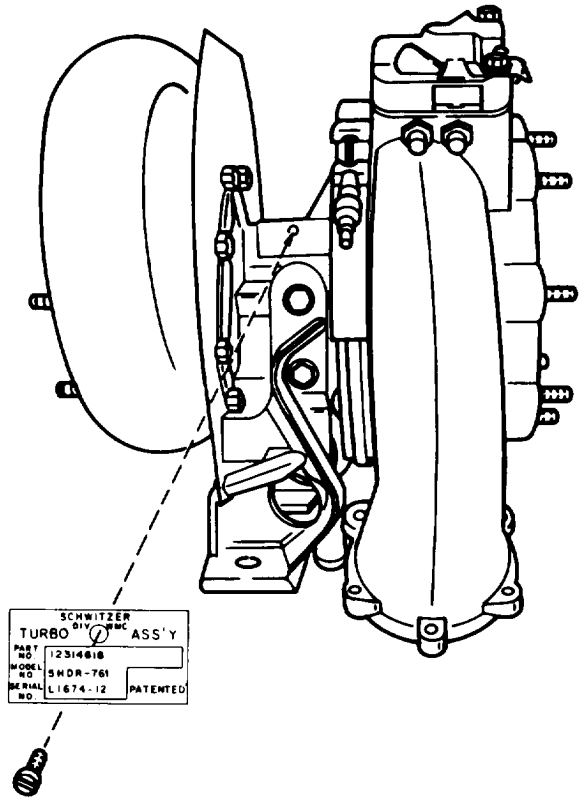
Manufacturer . . . . . Schwitzer Corporation
Model 5HDR
Mounting . . . . . Universal

b. Specifications.

Maximum revolutions per minute 65,000
Diameter of compressor air inlet opening . . . . . 6.50 in.
Diameter of compressor air outlet opening . . . . . 3.62 in.
Diameter of each turbine exhaust inlet opening . . . . . 3.00 in.
Diameter of turbine exhaust outlet opening . . . . . 4.26 in.
Oil inlet pressure to bearing housing . . . . . 40 to 70 psi
Oil outlet pressure from bearing housing . . . . Crankcase pressure

1-8. IDENTIFICATION PLATE.

The turbosupercharger identification plate is located on the bearing housing above the mounting leg.



Location of turbosupercharger identification plate.

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CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section 1. REPAIR PARTS, SPECIAL TOOLS AND SUPPORT EQUIPMENT.

2-1. REPAIR PARTS.

Repair parts are listed and illustrated in Appendix B of this manual.

2-2. SPECIAL TOOLS.

Appendix B contains a listing and illustrations of the special tools required to maintain and repair turbosuperchargers at the DS/GS level.

2-3. IMPROVISED TOOLS.

An improvised support block may be fabricated locally for use in disassembling the turbosupercharger. It should be a hardwood block 3 x 3 x 1-1/8 inches.

2-4. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

Section II. TROUBLESHOOTING.

2-5. GENERAL.

The instructions and information in this section apply to defective turbosuperchargers once they have been removed from the engine.

a. When the malfunction is known, use the inspection procedures to make sure the diagnosis is correct and to determine if there are further problems with the turbo not indicated on the repair tag.

b. When the malfunction is not known, use the inspection procedures to detect and identify the problem. The inspection is particularly important in this case because it is often the only available way of finding out what is wrong without completely disassembling the turbo.

c. When you have identified all the problems with a defective turbosupercharger, then use the Troubleshooting Guide, Table 2-1, to find out the probable causes and corrective actions.

2-6. INSPECTION.

Upon receipt, you should thoroughly inspect and check the defective turbosupercharger according to the following procedures.

a. Visual Checks. Visually inspect the turbo for:

(1) Stripped, damaged or missing studs.

(2) Cracked or broken mounting legs; cracked, bent or restricted oil drain tube.

(3) Cracked or damaged compressor cover, turbine housing, or bearing housing.

(4) Damaged or eroded (worn) compressor wheel blades.

NOTE

If compressor wheel blades are worn, look for dust or sand in the compressor housing inlet or outlet openings.

(5) Peened or feathered edges on compressor wheel or turbine wheel blade tips.

(6) Compressor wheel or turbine wheel which does not turn freely when spun by hand.

(7) Excess oil in the compressor cover or turbine housing.

NOTE

A trace of oil in these areas is normal. During long periods of idling or under certain peak acceleration conditions, some oil may pass through the seals. However, this normal leakage is small, and will not affect the oil consumption rate. Also heavy oily soot deposits in the turbine housing or on the turbine wheel are usually caused by improper engine operation or engine malfunction.

b. Check Radial Movement. Radial movement is the motion of the rotor shaft laterally in the bore of the bearing housing. Too much radial movement can cause the compressor wheel and turbine wheel to rub against their respective housings. Check radial movement by performing the following steps.

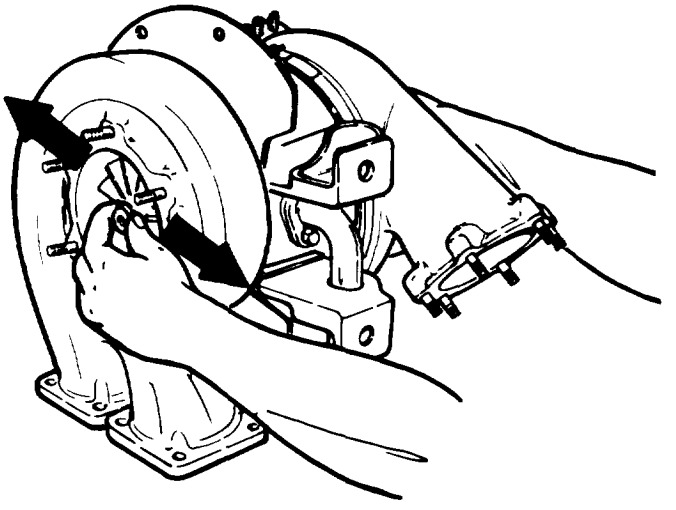
(1) Visually check the compressor cover outlet for excessive lubricating oil.

(2) Push both wheels laterally in opposite directions, and visually check to ensure that there is clearance between the compressor wheel and the compressor cover at the extreme radial movement.

(3) Check to ensure that there is clearance between the turbine wheel and the turbine housing at the extreme radial movement.

(4) Repeat steps (2) and (3) at 90° intervals around the shaft.

(5) If there is no significant evidence of lubricating oil at the compressor cover outlet, and there is visual clearance between the compressor and turbine wheels and their respective housing, and the wheels turn freely when spun by hand, the turbo is approved for service with regard to radial movement.



Checking radial movement.

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Check End Play. End play is the distance the rotor shaft travels in and out of the bore in the bearing housing. Check the end play by performing the following steps.

(1) Clean the turbine wheel hub.

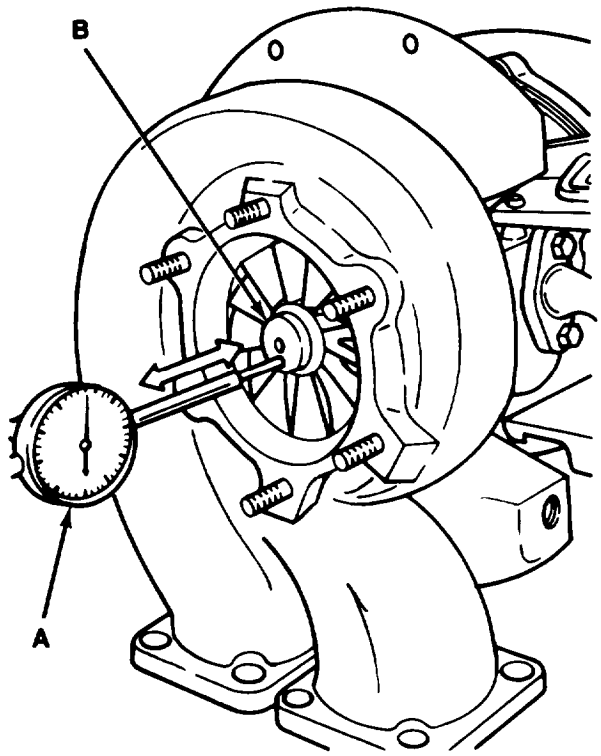
(2) Secure the turbocharger and attach a dial indicator (A) to the turbine housing (or other flat surface) with a clamp or magnetic base holder. Position the indicator plunger on the turbine wheel hub (B).

(3) Move the turbine wheel in and out as far as possible and check the distance traveled on the indicator.

NOTE

If there is lubricating oil in the bearing housing, the initial end play reading could be inaccurate. To ensure that an accurate reading is obtained, you should move the turbine wheel in and out several times to displace the oil before taking the end play reading.

(4) Total end play must be greater than 0.004 inch and less than 0.006 inch.



Checking end play.

2-7. CORRECTIVE ACTION. I

Any broken or damaged components discovered during the visual checks should be marked for repair. If no additional problems are found during inspection or are indicated on the repair tag, you should thoroughly clean the turbo (para. 3-6), replace the broken or damaged components, and return the unit to service. For all other problems, refer to Table 2-1, Troubleshooting Guide.

Table 2-1. Troubleshooting Guide

PROBLEM PROBABLE CAUSE	CORRECTIVE ACTION
1. Compressor wheel or turbine wheel does not turn freely when spun by hand.	
Dirt build up behind compressor wheel. Dirt or carbon build up behind turbine wheel.	Disassemble and clean turbo. Refer to para. 3-7.
Foreign object damage. Worn bearings or thrust surfaces. Damaged compressor wheel or turbine wheel.	Disassemble turbo and replace worn or damaged parts. Refer to para. 3-7.
2. Evidence of compressor wheel rubbing.	
Worn or damaged bearings or thrust rings. Worn bore in bearing housing; worn or bent shaft. Bent or damaged compressor wheel.	Disassemble the turbo and replace worn or damaged parts. Refer to para. 3-7.
3. Evidence of turbine wheel rubbing.	
Worn sleeve bearing. Bent or. damaged turbine wheel. Worn bore in bearing housing; worn or bent shaft.	Disassemble the turbo and replace worn or damaged parts. Refer to para. 3-7.
4. Excessive radial movement. Refer to para. 2-6b.	
Worn sleeve bearings. Worn shaft and turbine wheel assembly. Worn bore in bearing housing.	Disassemble turbo and replace worn or damaged parts. Refer to para 3-7.

Table 2-1. Troubleshooting Guide (Continued).

PROBLEM PROBABLE CAUSE	CORRECTIVE ACTION
5. Excessive oil leaking into compressor housing from bearing housing.	
Flinger sleeve metal seal ring worn or broken.	Disassemble turbo and replace flinger sleeve metal seal ring. Refer to para. 3-7.
6. Excessive oil leaking into the turbine from the bearing housing.	
Turbine wheel and shaft assembly metal seal ring worn or broken.	Disassemble turbo and replace metal seal ring. Refer to para. 3-7.
7. End play greater than 0.006 inch.	
Worn thrust surfaces on thrust bearing and thrust rings.	Disassemble turbo and replace worn or damaged parts. Refer to para 3-7.
8. End play less than 0.004 inch.	
Dirt build-up behind turbine wheel. Dirt build-up behind compressor wheel.	Disassemble and clean turbo. Refer to para. 3-7.
9. Turbo makes excessive noise.	
Dirt build-up between bearings and housing.	Disassemble and clean turbo. Replace worn or damaged bearings. Refer to para. 3-7.

CHAPTER 3

MAINTENANCE PROCEDURES

Section I. GENERAL.

3-1. PURPOSE.

This chapter contains instructions for cleaning before disassembly; disassembly; cleaning, inspection, and repair of component parts; assembly; operational testing; and storage of turbosuperchargers after they have been removed from the engine.

3-2. APPLICATION.

Procedures in this chapter, except those involving components of the dust detector system, apply to all turbo configurations covered by this manual. Maintenance operations for dust detector components apply to the “clean air" turbo’s (part no. 187727, 12366708-1, and 12366708-2) only.

3-3. ORGANIZATION.

Each maintenance task described in this chapter will be organized in the following manner:

a. General Description. Provides general Information and a description of the scope of the task.

b. Initial Setup. Lists the information you will need before starting the procedure, such as:

(1) Tool requirements.

(2) Material and supplies requirements.

(3) Personnel requirements.

(4) Equipment condition.

c. Procedure. Outlines the process for performing the task in step-by-step sequence.

3-4. ILLUSTRATIONS.

Illustrations in this chapter are derived from a “clean air” turbo assembled for typical left hand mounting. Each illustration used to describe a procedural step will be located immediately adjacent to that step and will be keyed to the instructions.

3-5. CONVERSIONS.

At the time of publication of this manual, a program is underway for converting all standard Schwitzer Model 5HDR Turbosuperchargers to the “‘clean air” configuration. Instructions for performing this conversion are contained in Maintenance Work Order (MWO) 9-2815-220-50-1.

Section II. DISASSEMBLY.

Before beginning the disassembly of the turbo, thoroughly clean and degrease exterior surfaces using the procedure outlined below.

3-6. CLEANING THE TURBO BEFORE DISASSEMBLY.

INITIAL SETUP

Material/Parts
Hard bristle brush
Plastic scraper Goggles Rubber gloves

Supplies
Solvent (Item 3, Appendix C)
Clean cloth (Item 1, Appendix C)

Equipment Condition
Turbo on workbench. Bearing housing drained of lubricant.

Personnel
One mechanic, MOS 63H30

CLEANING:

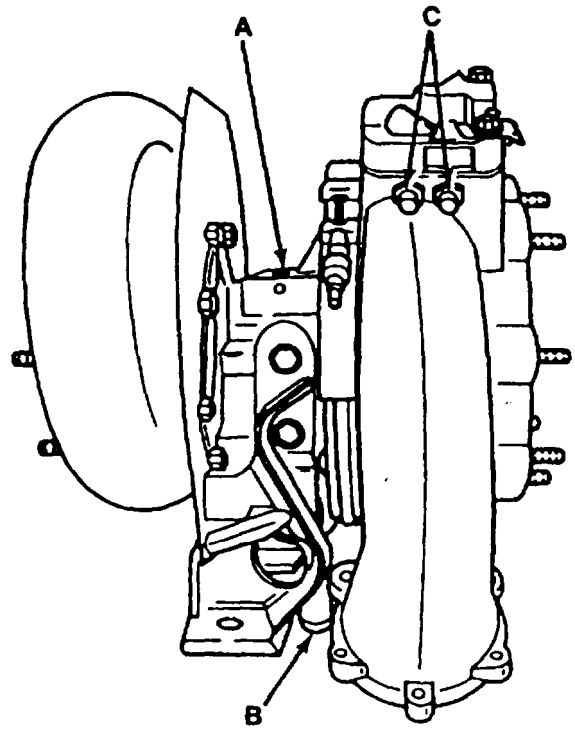
1. Tape oil inlet port (A), oil drain tube opening (B), and threaded hose adapters (C).

WARNING

Cleaning solvent is flammable! Use only in well ventilated areas. Keep away from flame, sparks, or heat. Avoid contact with eyes, mouth, or skin. Wear rubber gloves to prevent skin irritation.

CAUTION

Never use a wire brush or steel blade scraper.



2. Using bristle brush, plastic scraper, and solvent, remove dirt, oil, and other contaminants from all exterior surfaces.

3. Use cloth moistened with solvent to clean hard to reach areas.

> WARNING
>
> Line pressure for compressed air used for cleaning shall not exceed 30 psi. Wear appropriate eye protection and gloves. Never direct the compressed air stream at another person.

4. Blow turbo dry with compressed air.

37. DISASSEMBLY OF THE TURBO INTO COMPONENT PARTS.

Disassemble the turbo according to the following procedure. During disassembly you will be instructed to "remove and discard" certain disposable parts. These items will be replaced during assembly of the turbo with new parts from the turbosupercharger parts kit, part no. 5705073. Refer to Appendix B.

INITIAL SETUP

Tools:

General mechanic's tool kit:
Automotive - NSN 5180-00-177-7033
Retaining ring pliers (special tool) -
Appendix B, Section 111
Wood support block (improvised
tool)
Metal scriber

Supplies:

None

Personnel:

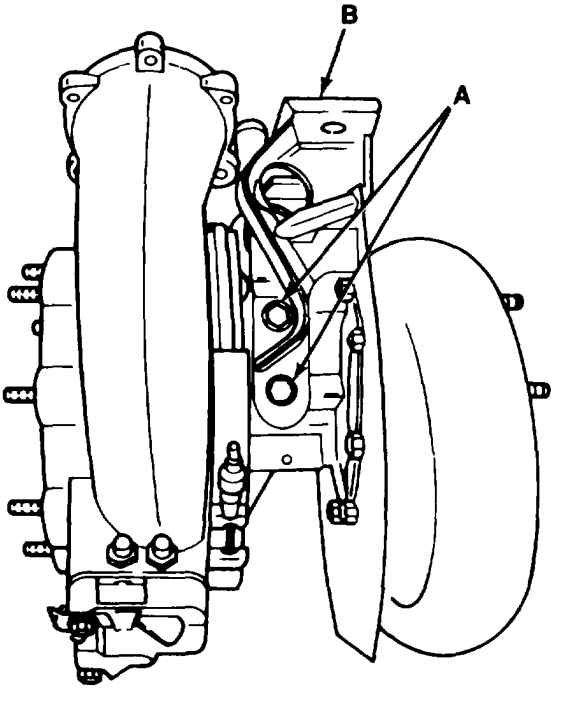
One mechanic, MOS 63H30

Equipment Condition:

Turbo on workbench, exterior cleaned, oil drained from bearing housing.

REMOVAL OF MOUNTING LEGS AND OIL DRAIN TUBE:

1. Remove two cap screws and lockwashers (A).
2. Remove outer mounting leg (B).

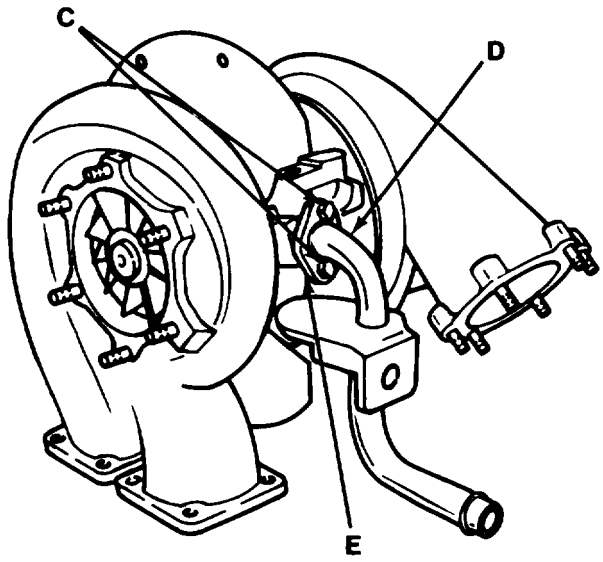


TA293493

DISASSEMBLY - Continued.

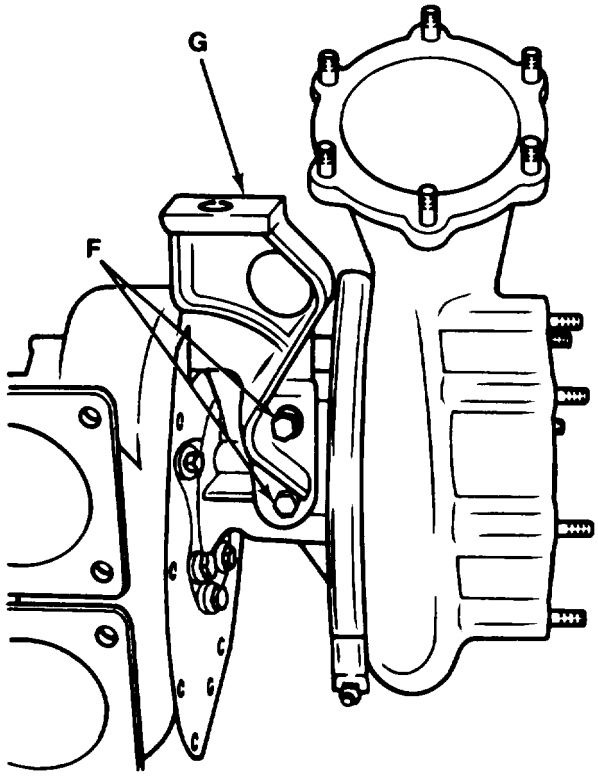
3. Remove two cap screws and lockwashers (c).

4. Remove oil drain tube (D). Remove and discard oil drain tube gasket (E).



5. Remove two cap screws and lockwashers (F).

6. Remove inner mounting leg (G).



TA293494

DISASSEMBLY - Continued.

REMOVAL OF THE COMPRESSOR COVER AND CLAMP:

1. Using metal scriber, scribe alinement marks on compressor cover (A) and bearing housing (B).

NOTE

If your turbo is a newer model, alinement marks will be cast into the housings, and the above step will not be necessary. Take careful note of the matched alinement marks to ensure proper reassembly.

2. Remove nut.(C) from clamp (D). Loosen clamp and slide it down on bearing housing.

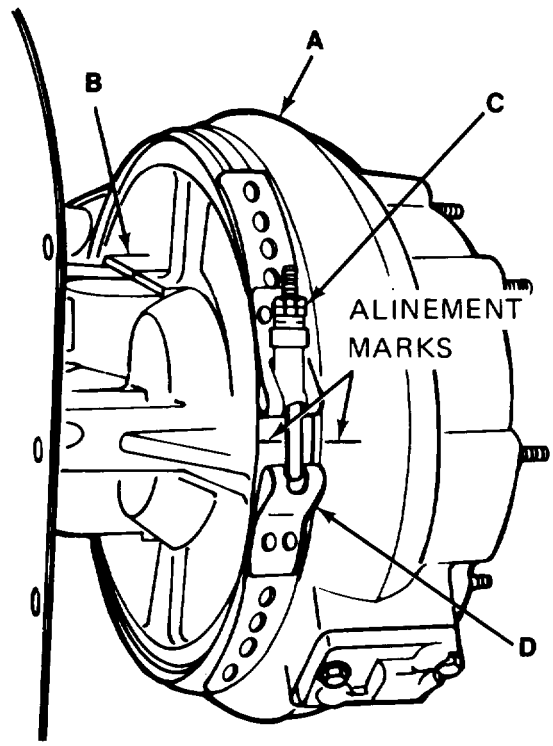
CAUTION

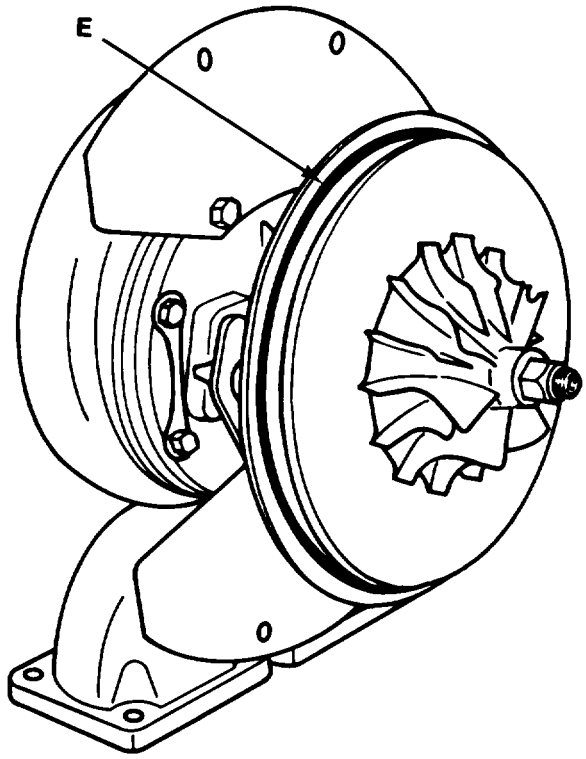
Use care when lifting compressor cover to prevent damage to compressor wheel.

3. Remove compressor cover.

4. Remove clamp.

5. Remove and discard preformed packing (E) from bearing housing.





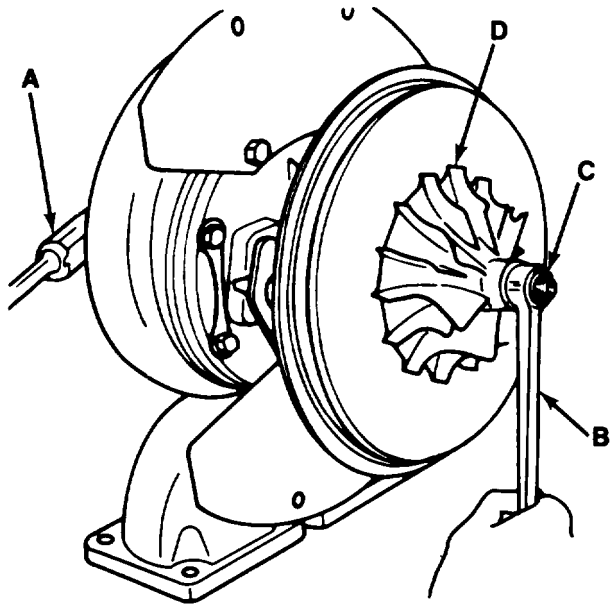
TA293495

DISASSEMBLY - Continued.

REMOVAL OF THE COMPRESSOR WHEEL:

1. Place a 1-1/8 inch 12 point socket and bar (A) on the turbine wheel hub and hold in position.

2. Using 3/4 inch box end wrench (B), remove and discard compressor wheel lock nut (C).



CAUTION

Use care when removing the compressor wheel to prevent damage to the wheel blades. DO NOT attempt to pry the compressor wheel off the shaft. If the wheel is difficult to remove, work it gently back and forth with your fingers until loose.

3. Remove compressor wheel (D).

TA293496

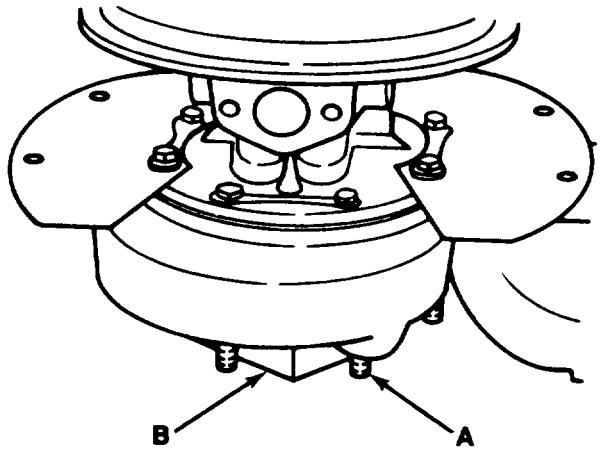
DISASSEMBLY - Continued.

REMOVAL OF COMPRESSOR WHEEL SHIMS, RETAINING RING, AND FLINGER SLEEVE INSERT:

1. Place turbo on turbine housing studs (A) with improvised support block (B) under the turbine wheel. See paragraph 2-3.

NOTE

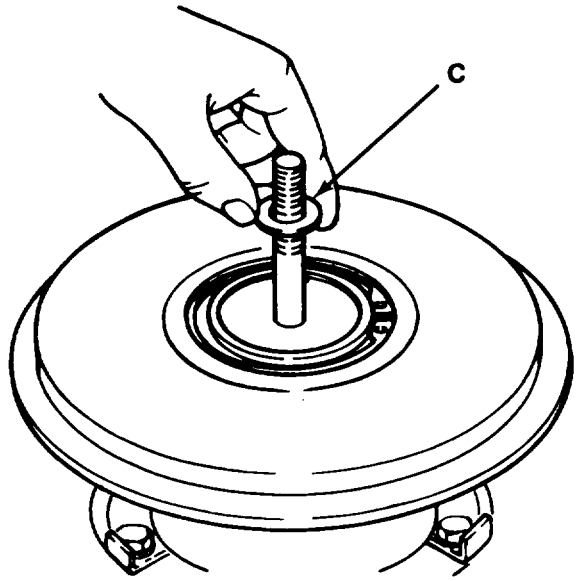
The support block prevents the turbine wheel and shaft assembly from dropping into the turbine housing during disassembly and possibly damaging the wheel blades.



2. Remove and discard compressor wheel shims (C).

NOTE

Compressor wheel shims may stick to the back of the compressor wheel.



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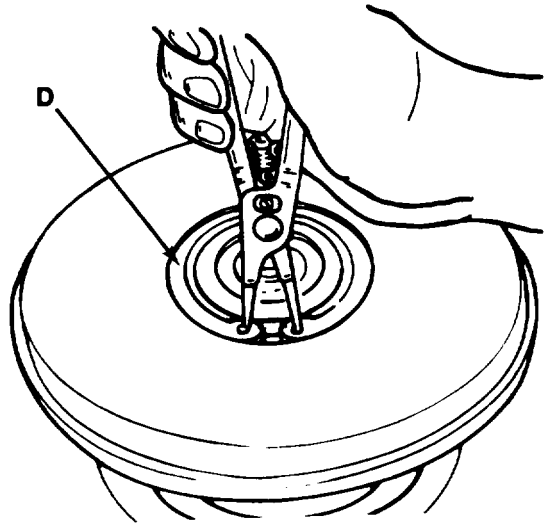
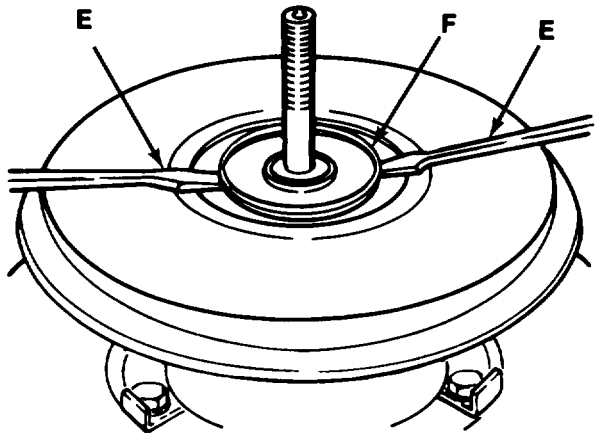
DISASSEMBLY - Continued.

3. Remove retaining ring (D).



4. Using two flat head screwdrivers (E), GENTLY pry flinger sleeve insert (F) away from bearing housing until it can be removed by hand. Discard insert.



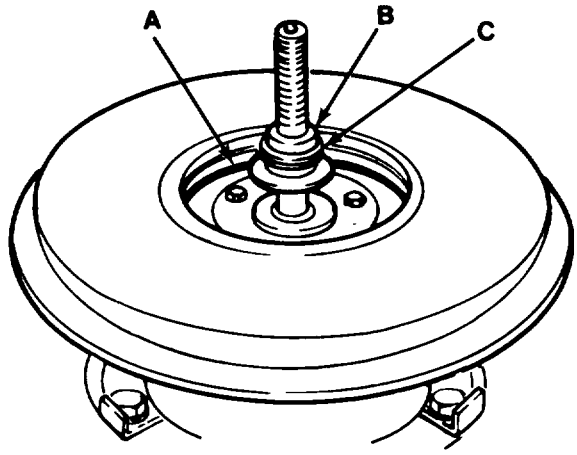
TA293498

DISASSEMBLY - Continued.

REMOVAL OF PREFORMED PACKING, METAL SEAL RINGS, FLINGER SLEEVE, AND OIL DEFLECTOR:

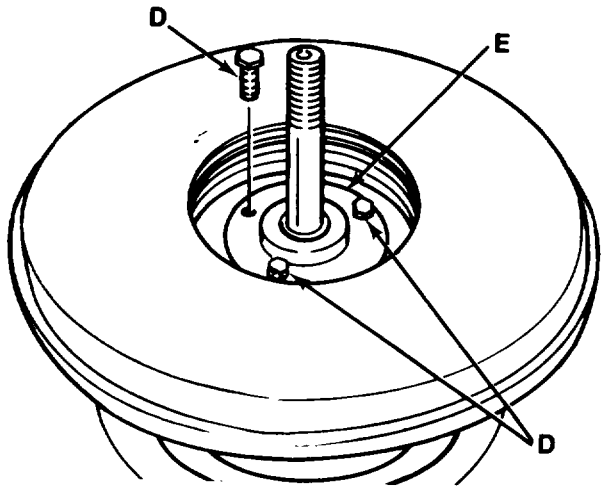
1. Remove and discard" preformed packing (A).

2. Remove and discard flinger sleeve (B) and two metal seal rings (C).



3. Remove and discard three oil deflector screws (0).

4. Remove oil deflector (E).

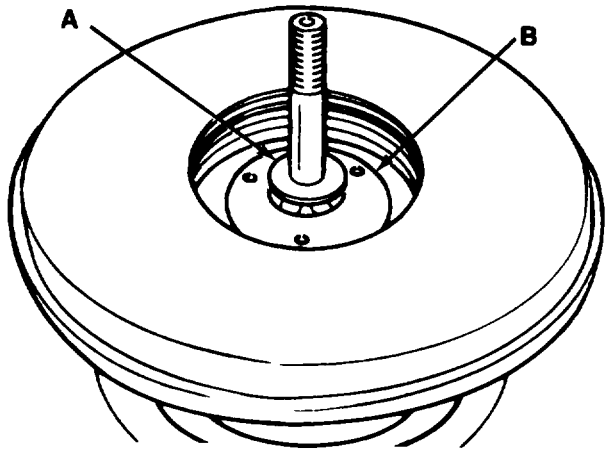


TA293499

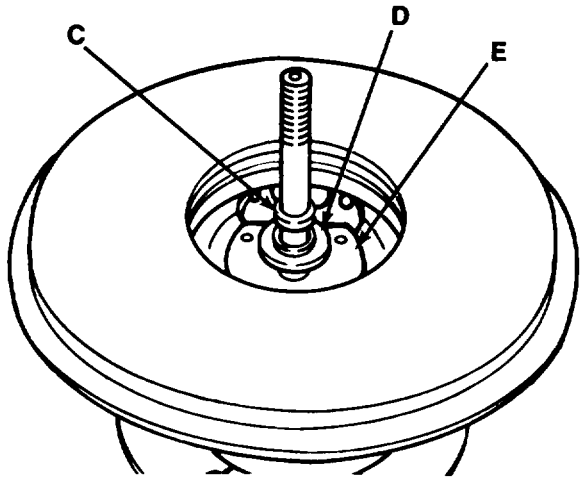
DISASSEMBLY - Continued.

REMOVAL OF UPPER THRUST RING, THRUST BEARING, THRUST SLEEVE BEARING, LOWER THRUST RING, AND SPACER:

1. Remove and discard upper thrust ring (A).
2. Remove and discard thrust bearing (B).



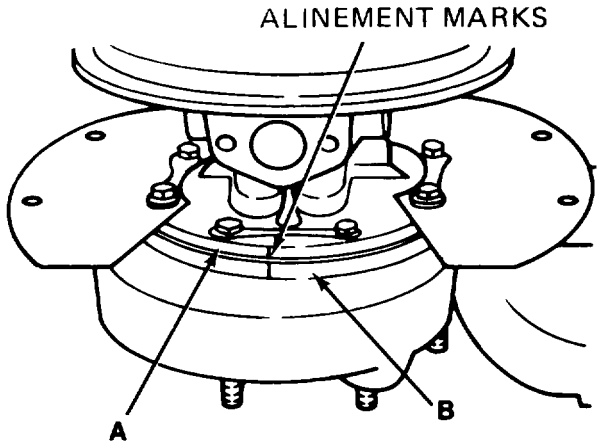
3. Remove and discard thrust sleeve bearing (C).
4. Remove and discard lower thrust ring (D).
5. Remove and discard spacer (E).



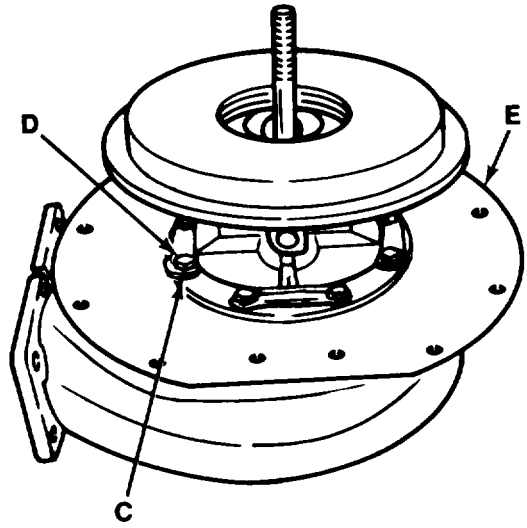
DISASSEMBLY - Continued.

REMOVAL OF THE SHIELD, BEARING HOUSING, TURBINE WHEEL AND SHAFT ASSEMBLY AND BACK-PLATE:

1. Scribe alinement marks on flanges of bearing housing (A) and turbine housing (B).

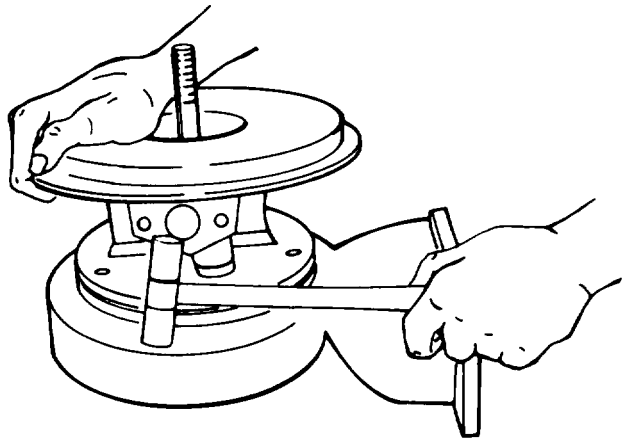


2. Straighten tabs on locking plates (c).
3. Remove eight cap screws (D).
4. Remove and discard four locking plates.
5. Remove shield (E).



NOTE

You may have difficulty separating the bearing housing from the turbine housing. If so, tap the turbine housing lightly with a soft mallet while lifting the bearing housing.



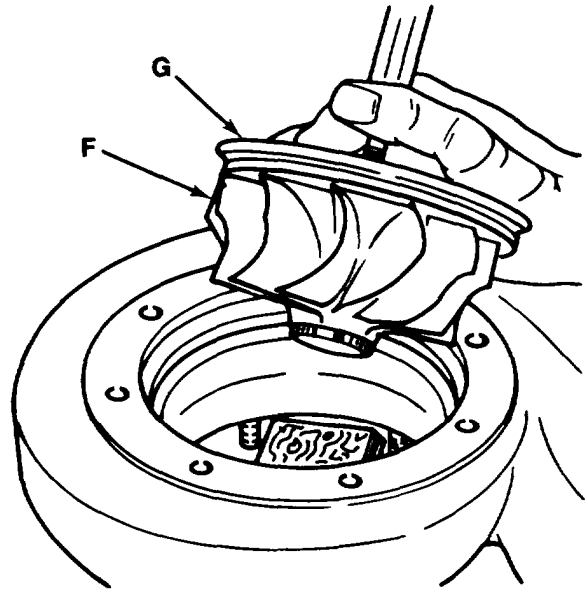
TA293501

DISASSEMBLY - Continued.

6. Remove the bearing housing by lifting it straight up. The turbine wheel and shaft assembly should remain in the turbine housing.

7. Remove turbine wheel and shaft assembly (F) with backplate (G) from turbine housing.

8. Remove backplate from turbine wheel and shaft assembly.



TA293502

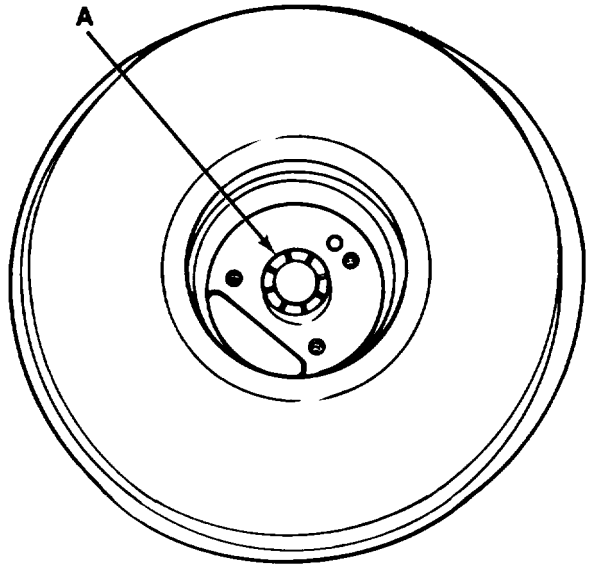
DISASSEMBLY - Continued.

REMOVAL OF UPPER SLEEVE BEARING, RETAINING RINGS, LOWER SLEEVE BEARING, THRUST WASHER BEARING, AND METAL SEAL RING:

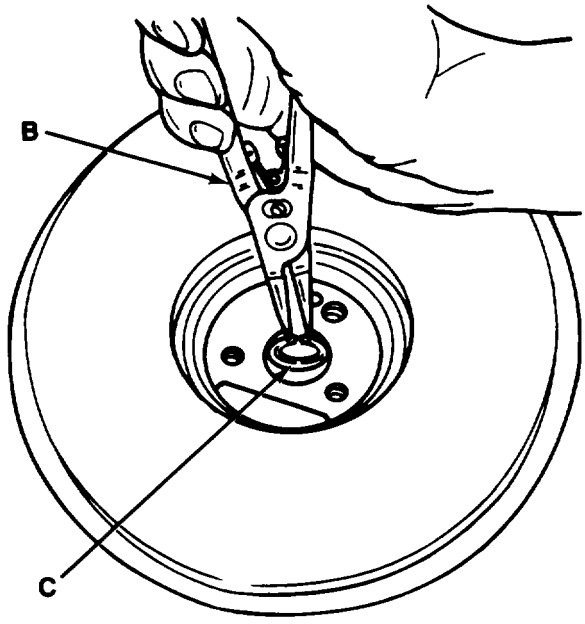
1. Remove and discard upper sleeve bearing (A) from bearing housing.

CAUTION

When removing retaining rings, use care that they do not scratch the bore of the bearing housing.



2. Using retaining ring pliers, part no. 10935598 (B), remove two retaining rings (C).



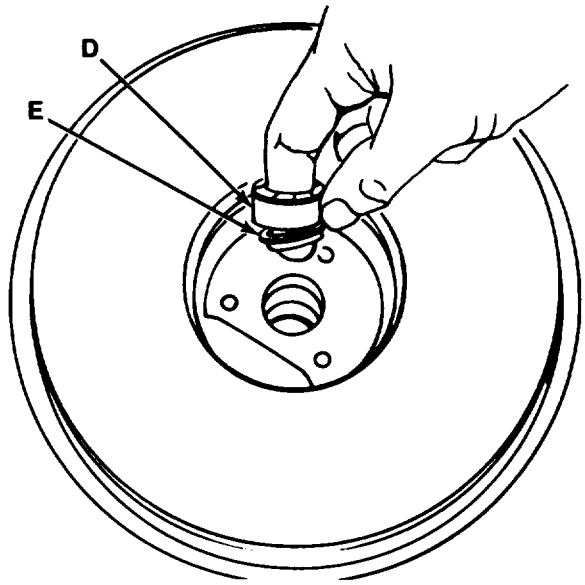
TA293503

DISASSEMBLY - Continued.

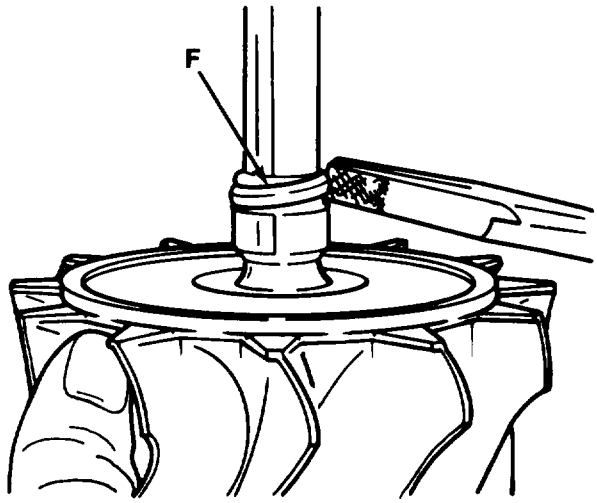
3. Remove and discard lower sleeve bearing (D) and thrust washer bearing (E).

NOTE

It is not necessary to remove the third retaining ring from the bearing housing unless it is worn or damaged. If removal is necessary, use retaining ring pliers.



4. Remove metal seal ring (F) from turbine wheel and shaft assembly. Discard metal seal ring.



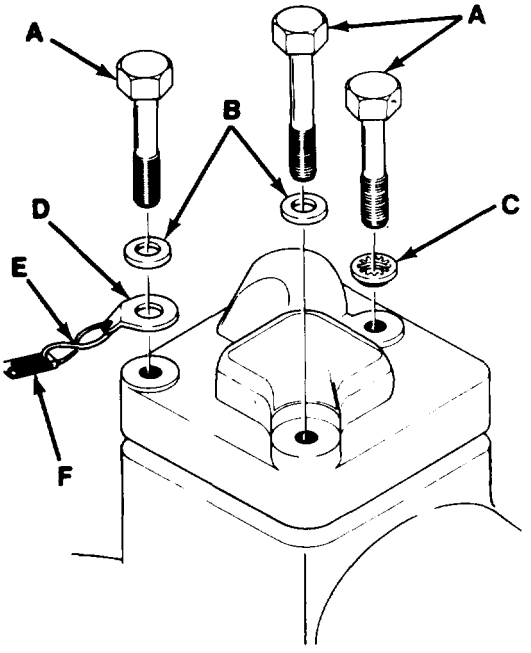
DISASSEMBLY - Continued.

REMOVAL OF DUST DETECTOR COVER, PACKING WITH RETAINER, CHAIN FASTENER, CHAIN "S" HOOK, AND CHAIN:

NOTE

This procedure applies to "clean air" turbo only.

1. Remove three cap screws (A), two flat washers (B), and packing with retainer (C).



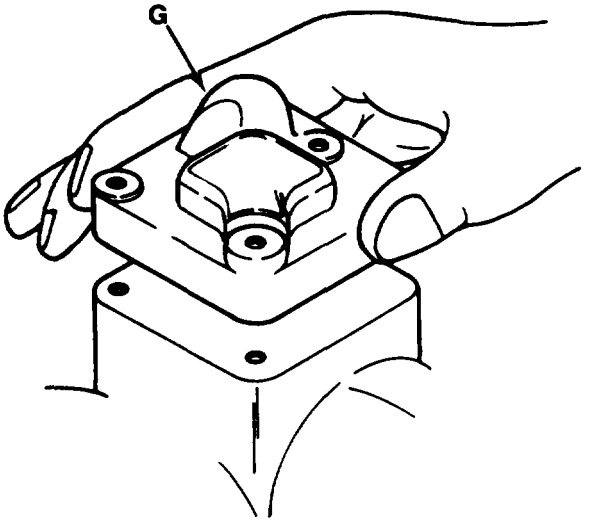
2. Discard packing with retainer.

3. Remove chain fastener (D), chain "S" hook (E), and chain (F) as an assembly.

NOTE

It will not be necessary for you to disassemble the chain fastener, chain "s" hook, and chain unless one or more of these parts show signs of damage or wear.

4. Remove dust detector cover (G).



TA293505

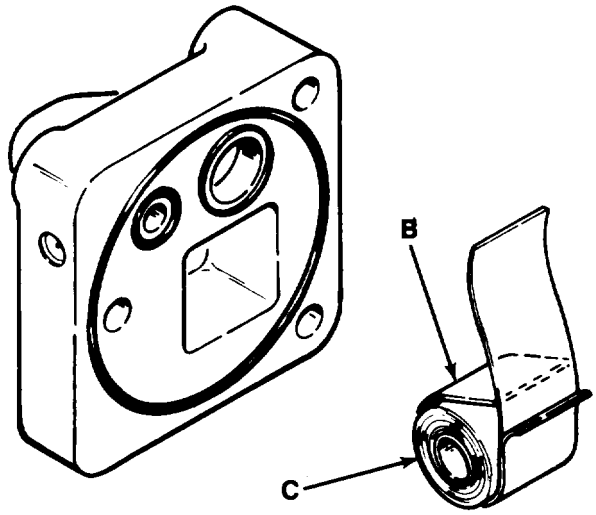
DISASSEMBLY – Continued.

REMOVAL OF PREFORMED PACKINGS, FILTER RETAINING STRAP, AND FILTER FROM DUST DETECTOR COVER :

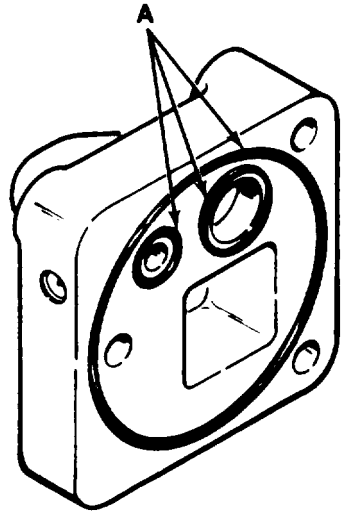
NOTE

This procedure applies to “clean air” turbo only.

1. Remove filter retaining strap (B) and filter (C).



2. Remove and discard three preformed packings (A) from underside of dust detector cover.



TA293506

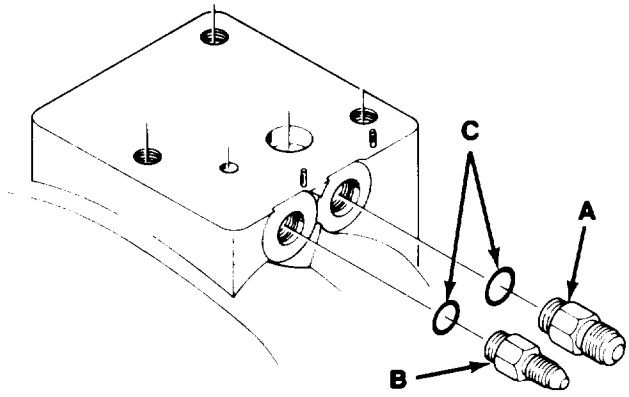
DISASSEMBLY - Continued.

REMOVAL OF COMPRESSOR COVER INLET AND OUTLET ADAPTERS AND PREFORMED PACKINGS:

NOTE

This procedure applies to "clean air" turbo only.

1. Remove compressor cover inlet adapter (A) and outlet adapter (B).
2. Remove and discard two preformed packings (C).



TA293507

Section III. CLEANING, INSPECTION, AND REPAIR.

3-8. CLEANING OF COMPONENT PARTS.

After disassembly and before inspection, all component parts must be thoroughly cleaned according to the following procedure.

INITIAL SETUP

Tools:

Hard bristle brush
Plastic scraper
Wire probe
Goggles
Rubber gloves

Supplies:

Solvent (Item 3, Appendix C)
Clean cloth (Item 1, Appendix C)

Personnel:

One mechanic, MOS 63H30

Equipment Condition:

Turbo components on workbench.

CLEANING:

WARNING

Cleaning solvent is flammable! Use only in well ventilated areas. Keep away from flame, sparks, or heat. Avoid contact with eyes, and wear rubber gloves to prevent skin irritation.

1. Immerse metal parts in solvent and clean with bristle brush and plastic scraper. Use clean cloth moistened with solvent to clean hard to reach areas.

WARNING

Line pressure for compressed air used for cleaning shall not exceed 30 psi. Wear appropriate eye protection and gloves. Never direct the compressed air at another person.

CAUTION

Never use caustic solution, wire brush, or steel blade scraper.

2. Clean all drilled passages with wire probe and compressed air.
3. Make certain all housing surfaces surrounding the turbine-and compressor-wheels are clean and smooth.
4. Blow all parts dry with compressed air.

3-9. INSPECTION OF COMPONENT PARTS.

All components not discarded during disassembly must be thoroughly inspected according to the following procedures to determine if they can be reused in rebuilding the turbo.

Some defects you may discover during inspection can be repaired (para. 3-10); however, parts that are worn or damaged beyond repair must be replaced with new parts.

Wear standards for turbo components are provided within the applicable "inspection procedures. Use appropriate precision measuring instruments when checking for wear. When measuring inside or outside diameters, always take two measurements approximately 90° apart to allow for possible out-of-round condition.

INITIAL SETUP

Tools:

General mechanics's tool kit:
Automotive - NSN 5180-00-177-7033
Gage, turbocharger (special tool) -
Appendix B, Section III
Magnifying glass
Micrometer, outside - NSN 5210-00-540-2973
Micrometer, outside - NSN 5210-00-221-1934
Micrometer, outside - NSN 5210-00-243-2933
Telescope gages, set - NSN 5210-00-473-9350

Supplies:

None

Personnel:

One mechanic, MOS 63H30

Equipment Condition:

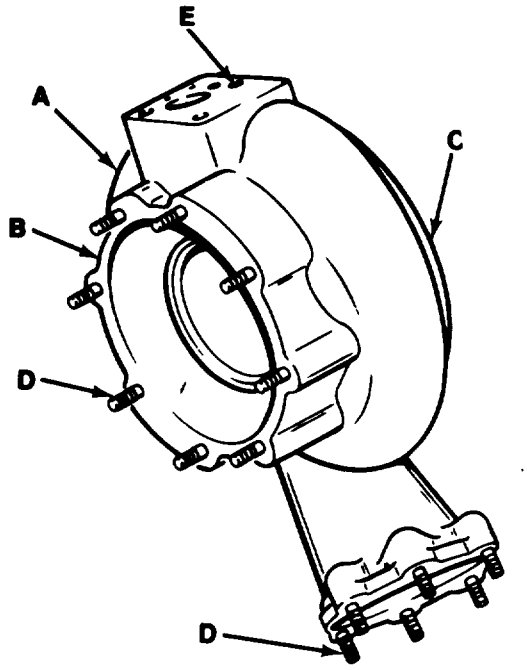
Turbo components on workbench; cleaned and dried.

NOTE

When inspecting for cracks, use a strong light and magnifying glass.

INSPECTION - Continued.

INSPECTION OF THE COMPRESSOR COVER:

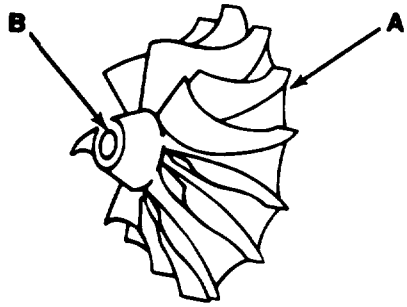


1. Inspect compressor cover (A) for cracks.
2. Inspect mounting flanges (B) and (C) for distortion or warping.
3. Check for loose, missing, broken or damaged studs (D). Inspect threaded inserts (E) for damaged threads.
4. Inspect mating surfaces for nicks, raised metal, or other damage.
5. Replace compressor cover if cracked. or if mounting flanges are distorted.

INSPECTION OF THE COMPRESSOR WHEEL:

CAUTION

It is important to use extra care when checking for cracked blades. If undetected, they could break during operation and cause severe damage.



1. Inspect compressor wheel (A) for bent, cracked, broken or missing blades. Check back of wheel for evidence of rubbing against bearing housing.
2. Check inside diameter of compressor wheel bore (B) using telescope gage and micrometer. The bore measurement must be greater than 0.500 inch but less than 0.5003 inch.
3. Replace a damaged compressor wheel, or if the bore measures greater than 0.5003 inch.

TA293508

INSPECTION - Continued.

INSPECTION OF TURBINE WHEEL AND SHAFT ASSEMBLY:

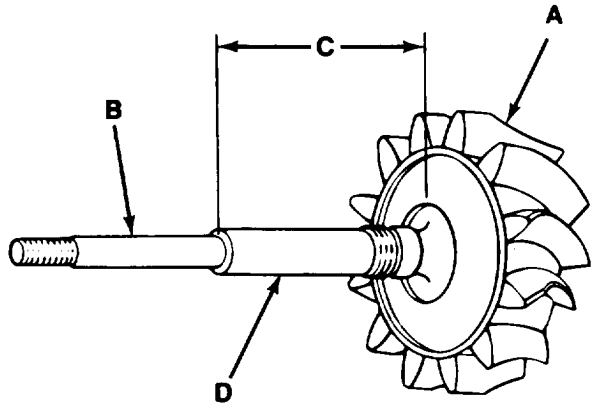
> CAUTION
>
> It is important to use extra care when checking for cracked blades. If undetected, they could break during operation and cause severe damage.

1. Inspect turbine wheel and shaft assembly (A) for bent, cracked, broken, or missing blades, or a bent shaft.

2. Using micrometer, check the diameter of the thrust area (B) of the shaft. The measurement must be from 0.5000 inch to 0.4997 inch.

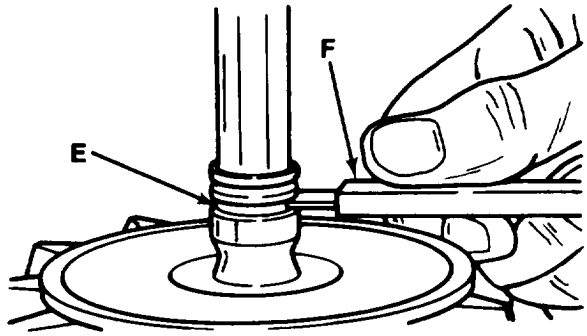
3. Using micrometer, check the length of the shaft (C) from thrust surface shoulder to inner face of turbine wheel. This measurement must be from 3.9860 inches to 3.9820 inches.

4. Using micrometer, check the diameter of the bearing area of the shaft (D). This measurement must be from 0.6865 inch to 0.6862 inch.



5. Inspect metal seal ring groove (E) for wear using gage (F). If "NO-GO" end of gage enters the ring groove, replace the turbine wheel end shaft assembly.

6. Replace the turbine wheel and shaft assembly if damaged or if it does not meet the wear standards specified in the preceding steps.



TA293509

INSPECTION - Continued.

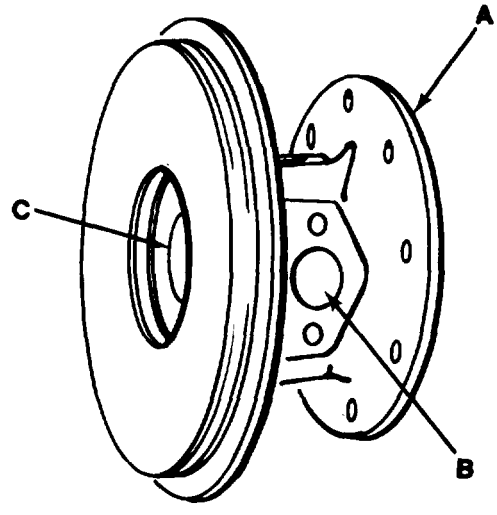
INSPECTION OF THE BEARING HOUSING:

1. Inspect the bearing housing (A) for cracks, damage, or scoring of the bore. Ensure the oil drain port (B) is clear and all residue build-up has been completely removed.

2. Check for warping or distortion of the mounting flanges and mating surfaces.

3. Using telescope gage and micrometer, check inside diameter of bore (C). This measurement must be from 1.0628 inches to 1.0633 inches.

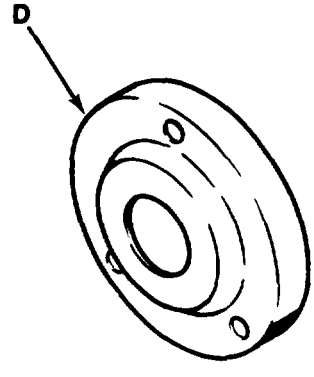
4. Replace the bearing housing if it is cracked or otherwise damaged, if the bore is badly scored, if there are any bronze deposits in the bore, or if it does not meet the wear standards.



INSPECTION OF THE OIL DEFLECTOR:

1. Inspect the oil deflector (D) for cracks, distortion, or other damage, especially in the thrust ring area.

2. Replace a damaged oil deflector.



TA293510

INSPECTION - Continued.

INSPECTION OF THE TURBINE HOUSING:

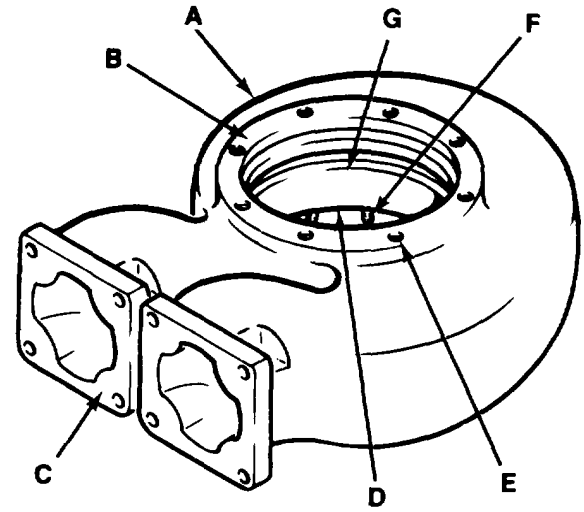
1. Inspect the turbine housing (A) for cracks or distorted mounting flanges (B), (C) and (D). Inspect the condition of threaded holes (E) and studs (F).

NOTE

Minor cracks in the exhaust outlet flange (C) is not cause for discarding the part.

2. Check the inside surface of the housing (G) for evidence of contact with turbine wheel.

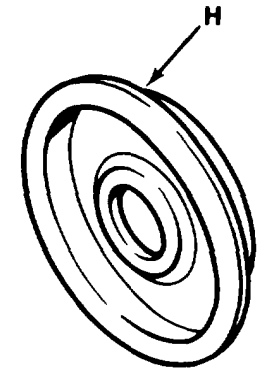
3. Replace the turbine housing if cracked, or if mounting flanges are distorted .



INSPECTION OF THE TURBINE BACKPLATE:

1. Inspect turbine backplate (H) for cracks, distortion, warpage, or other damage.

2. Replace a damaged turbine backplate.

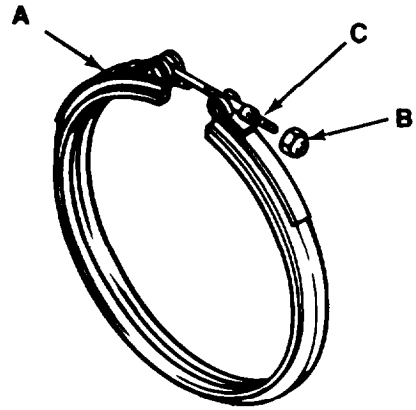


TA293511

INSPECTION - Continued.

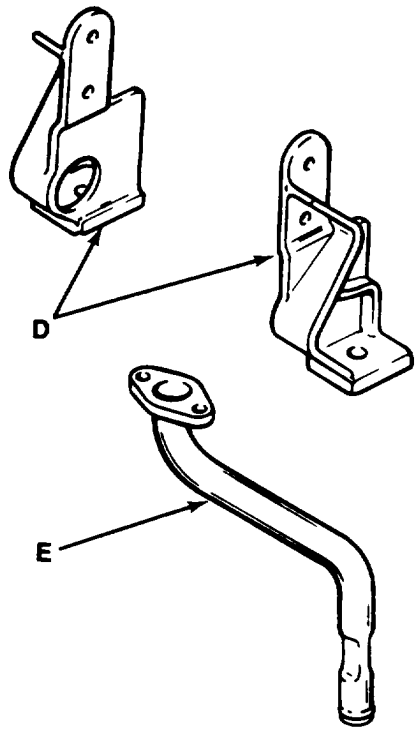
INSPECTION OF THE CLAMP:

1. Inspect clamp (A) for cracks or separated welds.
2. Inspect nut (B) and stud (C) for thread damage.
3. Replace damaged clamp or nut.



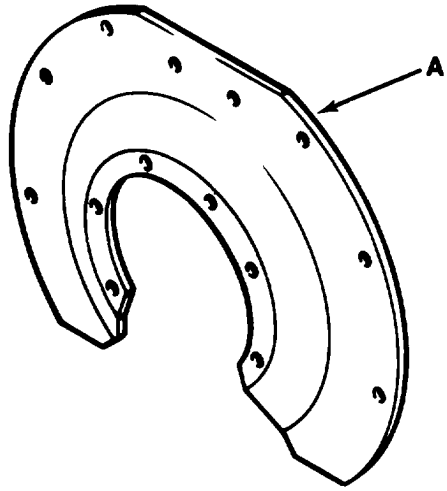
INSPECTION OF THE MOUNTING LEGS AND OIL DRAIN TUBE:

1. Inspect mounting legs (D) for cracks.
2. Inspect oil drain tube (E) for cracks, bends, or crushed condition.
3. Replace damaged mounting legs or oil drain tube.



TA293512

INSPECTION - Continued.



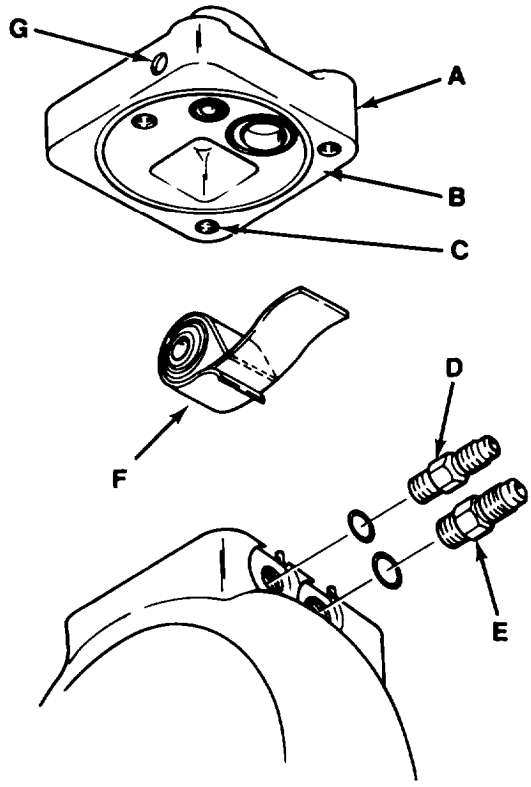
INSPECTION OF THE SHIELD:

1. Inspect shield (A) for cracks or deformation.
2. Replace cracked shield.

INSPECTION OF DUST DETECTOR COVER, INLET AND OUTLET ADAPTERS, AND FILTER RETAINING STRAP :

NOTE

This procedure applies to "clean air" turbo only.



1. Inspect dust detector cover (A) for cracks, scoring of mating surface (B), and thread damage in tapped holes (C).
2. Check adapters (D) and (E) for cracks, distortion, or thread damage. Ensure both are clear of obstruction.
3. Inspect filter retaining straps (F) for cracks, bends, and general serviceability.
4. Verify presence of pipe plug (G).
5. Replace any of these components if damaged.

TA293513

3-10. REPAIR OF COMPONENT PARTS.

Repair of turbo components is, for the most part, limited to stud replacement and repair of tapped holes in the compressor cover and turbine housing. Slight nicks or raised metal on mating surfaces can be smoothed using a fine hand file. In all cases, if a component cannot be restored to its original condition, it must be replaced.

Use the procedures provided below for repair of turbo components.

INITIAL SET-UP

Tools:

General mechanic's tool kit:
Automotive - NSN 5180-00-177-7033
Hand File
1/4 to 3/4 inch diameter, 1/2 inch drive, stud remover and setter
Screw thread inserter (special tool) - Appendix B, Section III
Thread taps (special tool)- Appendix B, Section 111

Supplies:

Screw thread inserts - Part no. MS21208C5-20
Studs - Part no. C157631

Personnel:

One Mechanic, MOS 63H30

Equipment condition:

Turbo components on workbench; cleaned and inspected.

REPAIR - Continued.

REPAIR OF THE COMPRESSOR COVER:

1. Smooth small nicks or raised metal using a fine hand file.

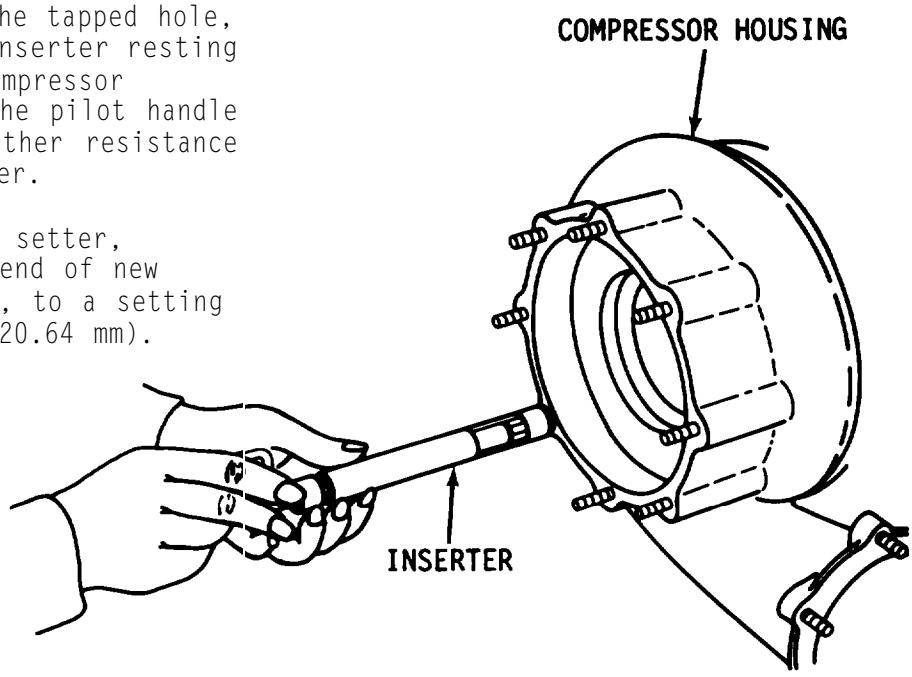
2. Remove and discard loose or damaged studs using stud remover and setter.

3. Drill a 21/64 inch (8.33mm) hole to a depth of 7/8 inch (22.2mm).

4. Tap a 5/16-18 thread using special heli-coil thread tap.

5. Install screw thread insert, Part No. MS21208C5-20, into threaded guide of screw thread inserter by slowly turning the pilot counterclockwise until the insert is flush with the end of the inserter. Insert the pilot of the inserter into the tapped hole, with the face of the inserter resting solidly against the compressor housing. Slowly turn the pilot handle clockwise until no further resistance is felt. Remove inserter.

6. Using stud remover and setter, install coarse thread end of new stud, Part No. C157631, to a setting height of 13/16 inch (20.64 mm).



REPAIR - Continued.

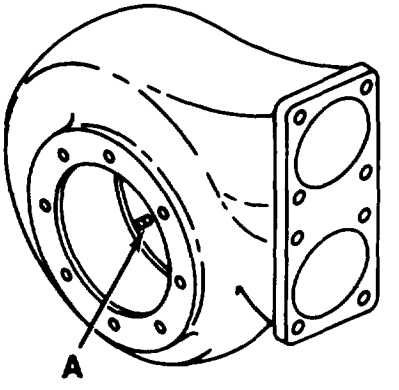
REPAIR OF THE TURBINE HOUSING:

1. Smooth small nicks ior.raised metal using a fine hand file.

2. Remove and discard loose or damaged studs (A) using stud remover and setter.

3. Using stud remover and setter, install coarse thread end of new stud, Part No. 400602-1, to a setting height of 1.00 inch (25.4 mm).

4. Repair damaged threads using a used 3/8-16NC thread tap.



REPAIR OF THE OIL DRAIN TUBE AND SHIELD:

Minor bends in the oil drain tube and shield can be straightened as long as the integrity of the part remains intact.

REPAIR OF THE BEARING HOUSING, MOUNTING LEGS, AND TURBINE BACKPLATE:

Slight nicks on the mating surfaces of these components can be smoothed using a hand file. Re-tap threaded holes, if damaged.

Section IV. ASSEMBLY AND OPERATIONAL TESTING.

3-11. ASSEMBLY OF THE TURBO.

Assemble the turbo according to the following procedures. Use special care to ensure the cleanliness of each part. Coat each part with a light film of engine oil (OE/HDO) immediately before installation.

All parts discarded during disassembly are replaced with new parts during assembly. You must requisition turbosupercharger parts kit, part no. 5705073. Refer to Appendix B. All kit parts listed in the Repair Parts and Special Tools List for your configuration of turbo ("clean air" or standard) must be used during assembly.

INITIAL SETUP

Tools:

General mechanic's tool kit:
Automotive - NSN 5180-00-177-7033
Installing sleeve (special tool) -
Appendix B, Section III
Retaining ring pliers (special tool) -
Appendix B, Section III
Box end wrench (special tool) -
Appendix B, Section III
5/8 inch, 1/2 inch drive deep well socket -
NSN 5120-00-235-5898
9/16 inch, 1/2 inch drive deep well socket -
NSN 5120-00-243-7348
Feeler gages - NSN 5120-00-267-3095
3/8 inch crowfoot attachment

Supplies:

Turbosupercharger parts kit
Oil drain tube gasket-
NSN 5330-01-059-0096
Lockwashers

Personnel:

One mechanic, MOS 63H30

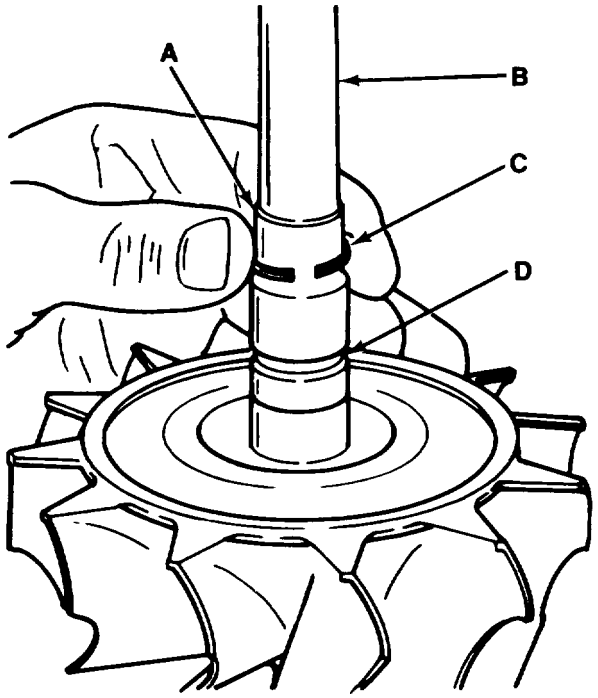
Equipment Condition:

Turbo components on work bench; cleaned, inspected and repaired.

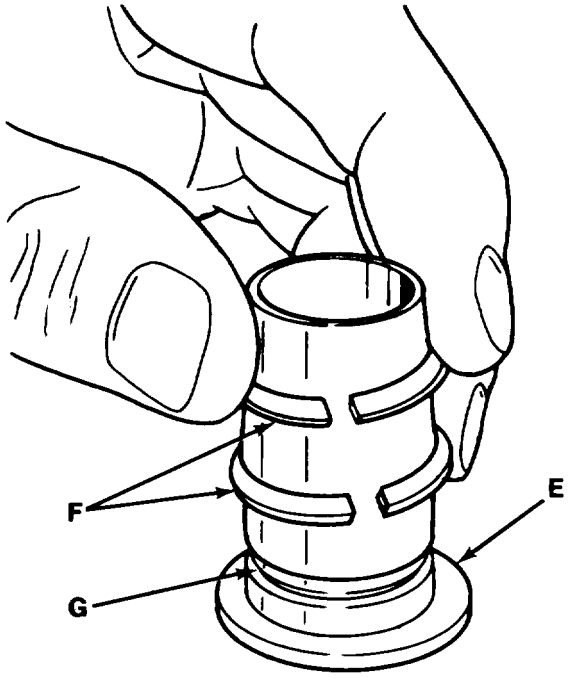
ASSEMBLY - Continued.

INSTALLATION OF METAL SEAL RINGS ON TURBINE WHEEL AND SHAFT ASSEMBLY AND FLINGER SLEEVE:

1. Place installing sleeve (A) over turbine wheel and shaft assembly (B).
2. Install new metal seal ring (C) by sliding over installing sleeve into ring groove (D).
3. Remove ring installing sleeve.



4. Place installing sleeve over new flinger sleeve (E).
5. Install two new metal seal rings (F) by sliding over installing sleeve into ring groove (G).
6. Remove installing sleeve.

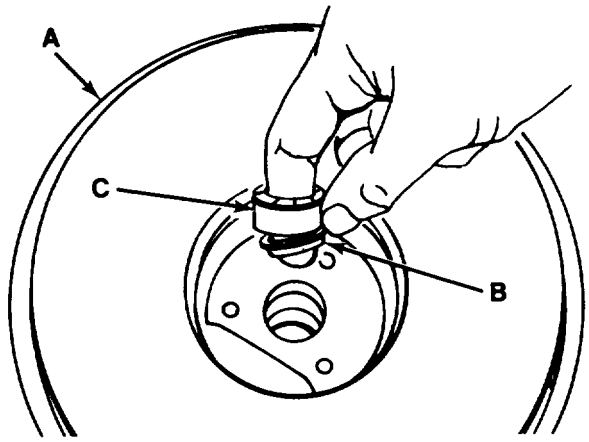


TA293514

ASSEMBLY - Continued.

INSTALLATION OF THRUST WASHER BEARING, LOWER SLEEVE BEARING, RETAINING RINGS, AND UPPER SLEEVE BEARING:

1. Place bearing housing (A) on work bench with larger flange up.



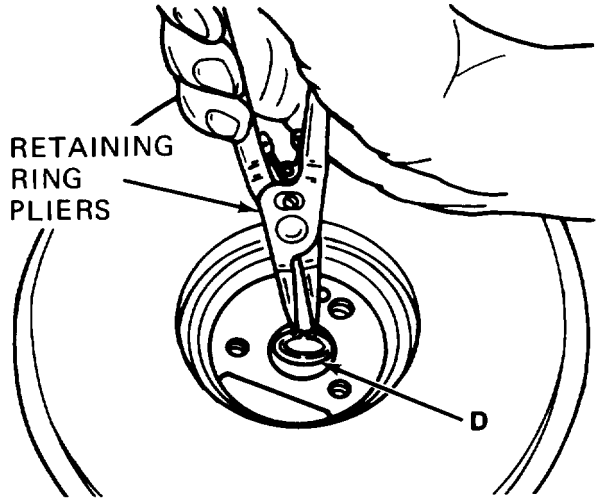
NOTE

If the third (bottom) retaining ring was removed from the bore of bearing housing during disassembly, it must be installed using retaining ring pliers before the following steps can be performed.

2. Install new thrust washer bearing (B) and new lower sleeve bearing (C).

CAUTION

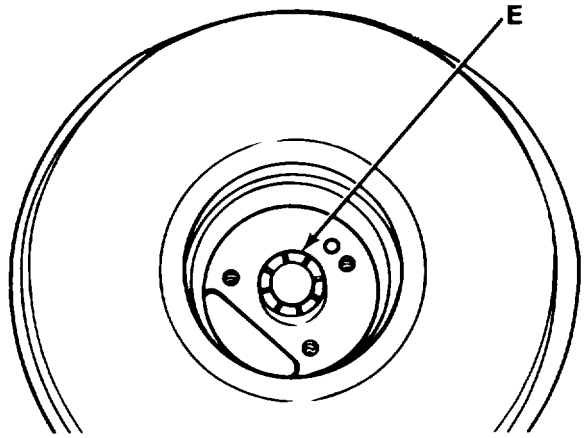
Use care when installing retaining rings that they do not scratch the bore of the bearing housing.



NOTE

Retaining rings have one rounded side and one flat side. Install retaining rings with rounded sides toward sleeve bearings.

3. Using retaining ring pliers install two retaining rings (D), in grooves in bearing housing bore.



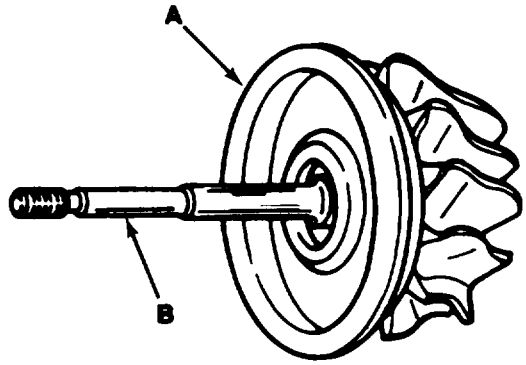
4. Install upper sleeve bearing (E).

TA293515

ASSEMBLY - Continued.

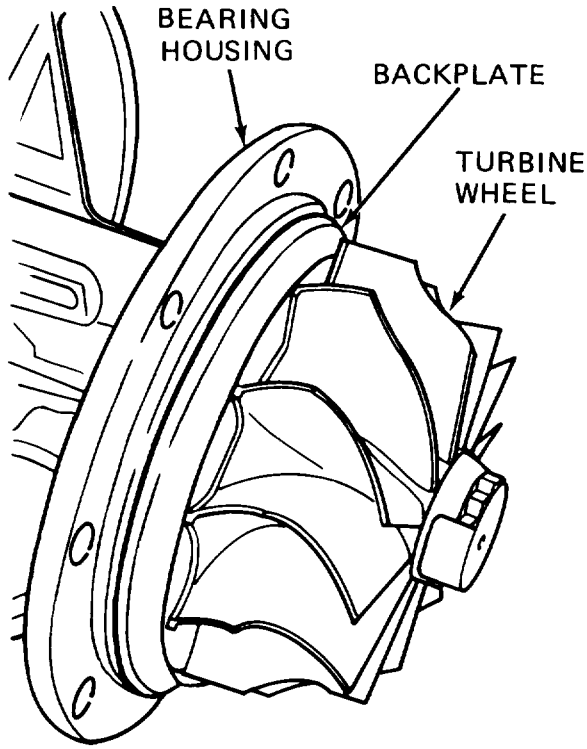
INSTALLATION OF TURBINE BACKPLATE AND TURBINE WHEEL AND SHAFT ASSEMBLY:

1. Position turbine backplate (A) on turbine wheel and shaft assembly (B).



> CAUTION
>
> Use steady pressure but do not force the shaft into the bore of the bearing housing. The new metal seal ring may be fractured.

2. Install turbine wheel and shaft assembly into backplate in bearing housing by inserting the shaft into the bore and, using a rocking motion, working the metal seal ring into the bore as far as possible.

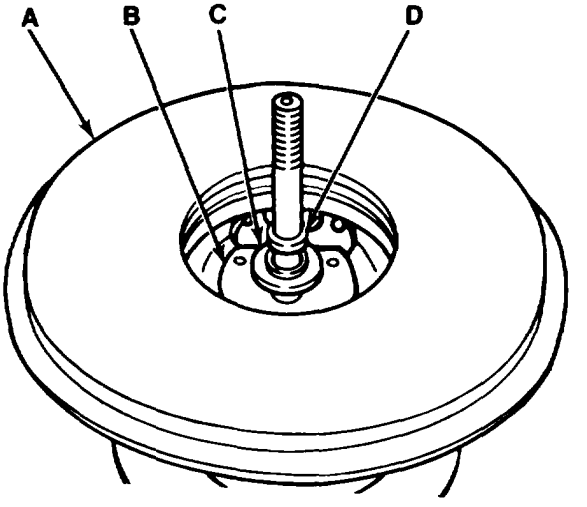


TA293517

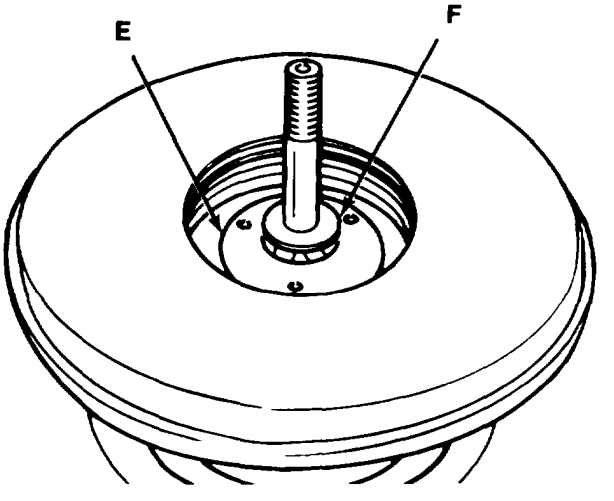
ASSEMBLY - Continued.

INSTALLATION OF SPACER, LOWER THRUST RING, THRUST SLEEVE BEARING, THRUST BEARING, AND UPPER THRUST RING:

1. Hold assembled turbine wheel and shaft assembly, turbine backplate, and bearing housing (A) in upright position (large flange up).
2. Install new spacer (B). Ensure screw holes are properly alined.
3. Install new *lower* thrust ring (C).
4. Install new thrust sleeve bearing (D).



5. Install new thrust bearing (E). Ensure screw holes are alined properly.
6. Install new upper thrust ring (F).



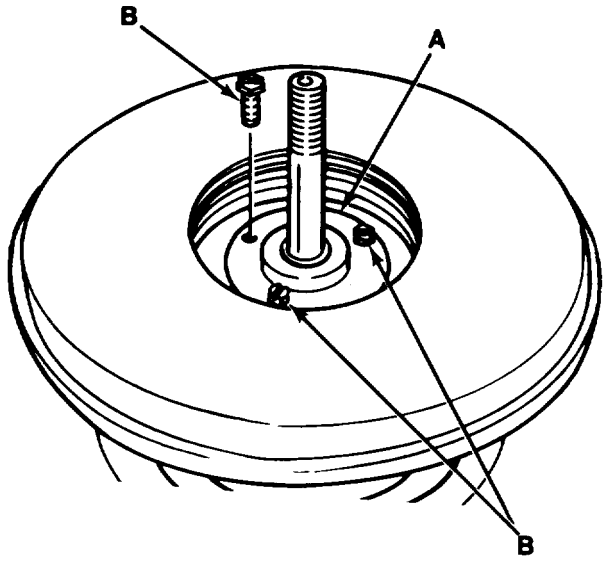
TA293518

ASSEMBLY – Continued.

INSTALLATION OF OIL DEFLECTOR, FL INGER SLEEVE WITH METAL SEAL RINGS, AND PREFORMED PACKING:

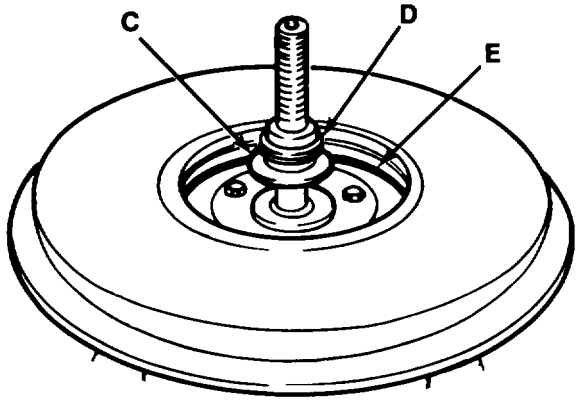
1. Install oil deflector (A) and aline screw holes.

2. Install three new oil deflector screws (B). Torque screws to 55-65 pound-inches (6.8 N.m).



3. Install new flinger sleeve (C) with two new metal seal rings (D).

4. Install new preformed packing (E) in bearing housing groove.



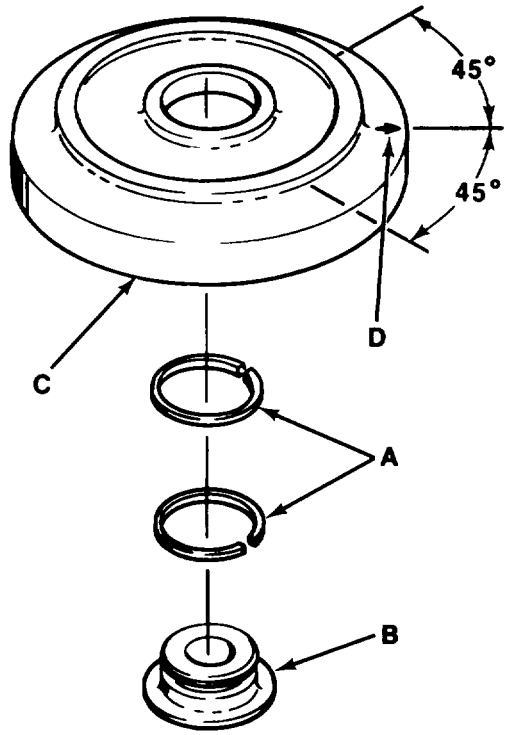
TA293519

ASSEMBLY - Continued.

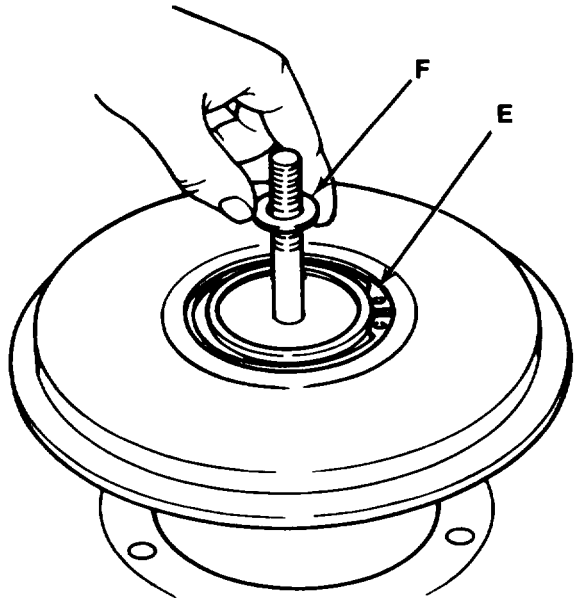
INSTALLATION OF FL INGER SLEEVE INSERT, RETAINING RING, COMPRESSOR WHEEL SHIMS, AND COMPRESSOR WHEEL:

> CAUTION
>
> Use steady pressure but do not force flinger sleeve insert into bearing housing; metal seal rings or flinger sleeve may fracture.

1. Center metal seal rings (A) on flinger sleeve (B) with gaps in rings 90° apart.
2. Install flinger sleeve insert (C) in bearing housing below retaining ring groove. The arrow (D) stamped on the top of the insert should be in line with the oil inlet port of the bearing housing.



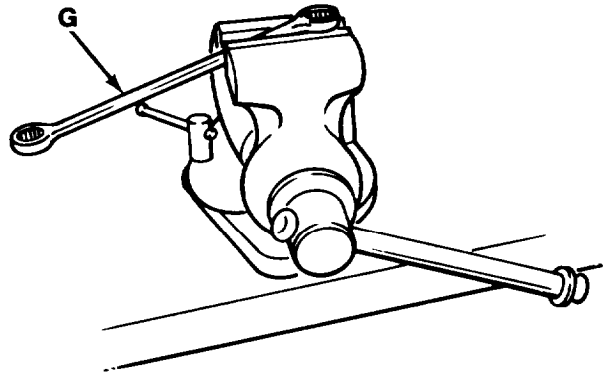
3. Install retaining ring (E).
4. Install compressor wheel shims (F).



TA293520

ASSEMBLY - Continued.

5. Place a 1-1/8 inch angular 12 point box wrench (G) in a vise. Position wrench to hold turbine,wheel hub.

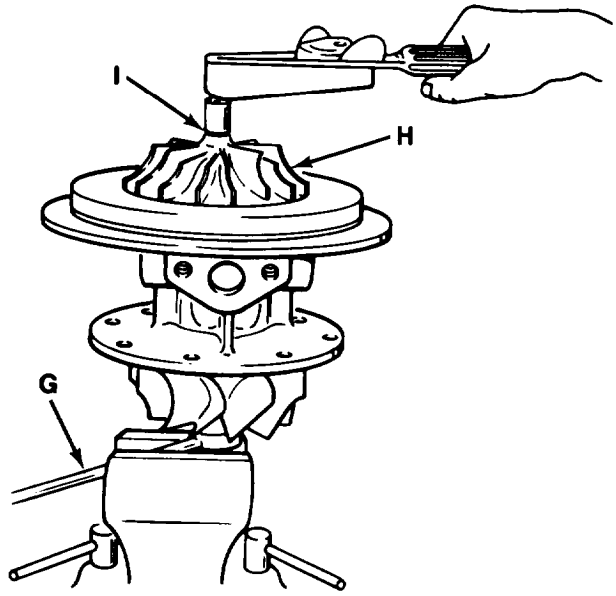


6. While supporting turbine wheel and shaft assembly in the bearing housing, place turbine wheel hub in box wrench. Hold in position.

7. Install compressor wheel (H) on shaft.

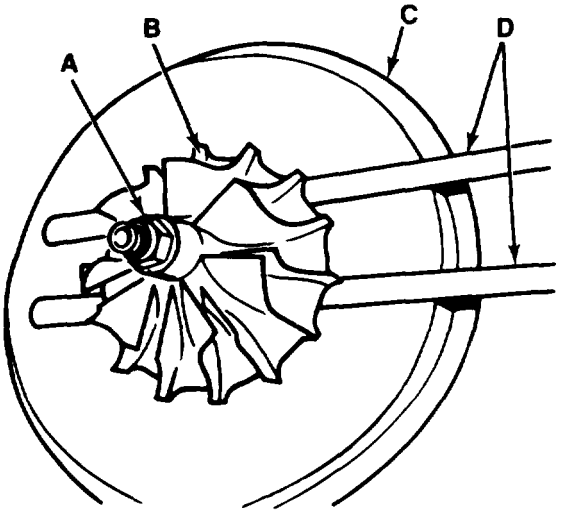
8. Install new compressor wheel lock nut (I). Torque tighten lock nut to 50 - 55 pound-feet (67.8 to 74.6 N.m).

9. Remove unit from vise.



TA293521

ASSEMBLY - Continued.



CHECK COMPRESSOR WHEEL BACK CLEARANCE:

1. With compressor wheel lock nut (A) tightened to 50-55 pound- feet, check the clearance between compressor wheel (B) and bearing housing (C) using feeler gages (0).

2. Clearance must be from 0.019 to 0.022 inch. Add or remove compressor wheel shims as required to obtain proper clearance.

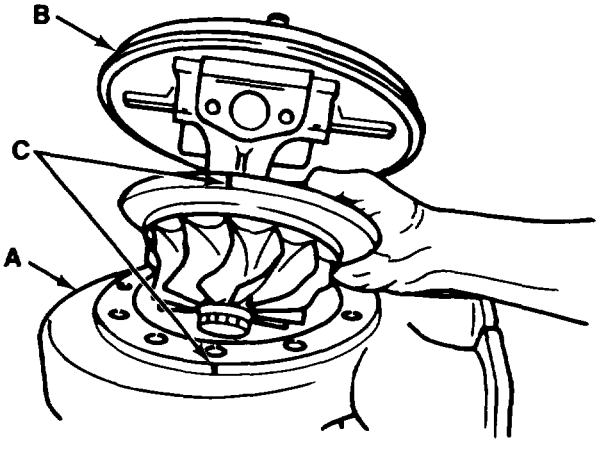
NOTE

Compressor wheel shims are available in 0.003, 0.005, and 0.010 inch thicknesses.

INSTALLATION OF TURBINE HOUSING, SHIELD, PREFORMED PACKING, AND COMPRESSOR COVER:

NOTE

Table 3-1 provides information for proper indexing of the turbine housing and compressor *cover* according to engine model and mounting location. Table 3-1 applies to both "clean air" and standard turbosuperchargers.



1. Place turbine housing (A) on studs.

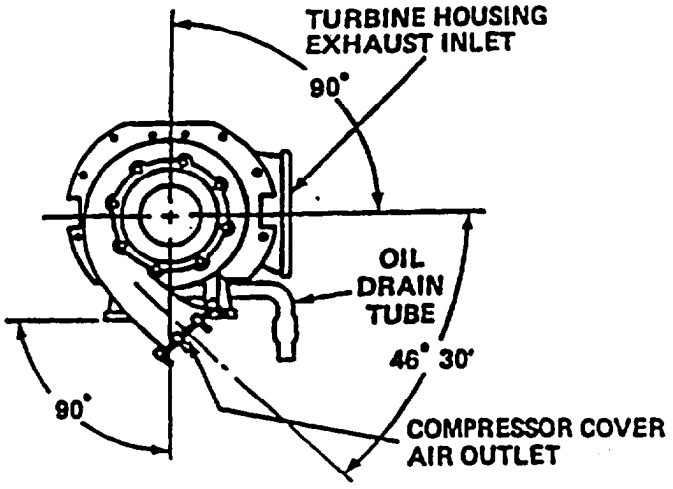
2. Install bearing housing with compressor and turbine wheels (B) in turbine housing.

3. Aline marks (C) scribed in housing flanges during disassembly. If alinement marks cannot be located, or if either housing has been replaced, refer to Table 3-1 to determine proper housing positions.

TA293522

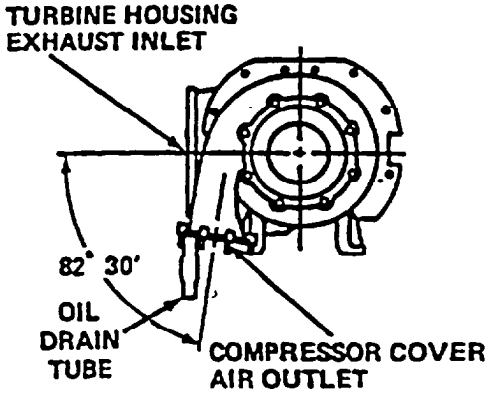
Table 3-1. Housing alignment.

Engine Models AVDS–1790–2A, AVDS–1790–2C, AVDS–1790–2CA, AVDS–1790–2D, AVDS–1790–2DA and AVDS–1790–8CR.



Alignment marks: Compressor Cover – D, Bearing housing – A

LEFT BANK

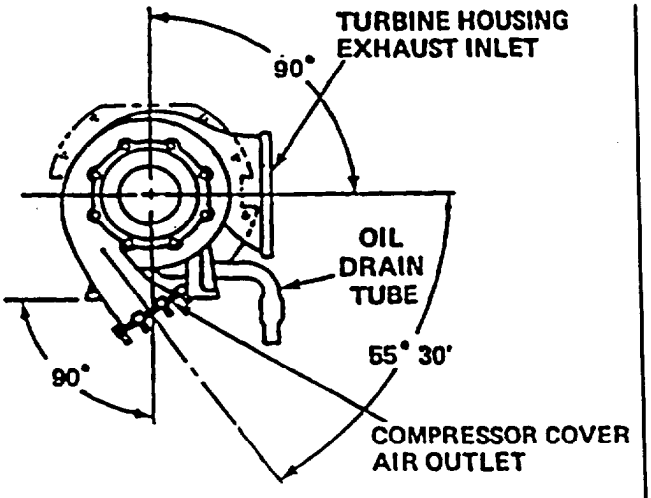


Alignment marks: Compressor cover – A, Bearing housing – A

RIGHT BANK

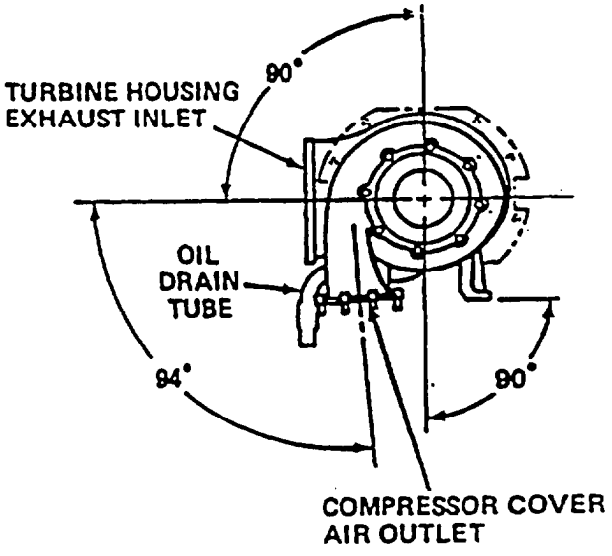
Engine model AVDS–1790–2DR.

NOTE: External Shield not used.



Alignment marks: Compressor Cover – C, Bearing housing – A

LEFT BANK



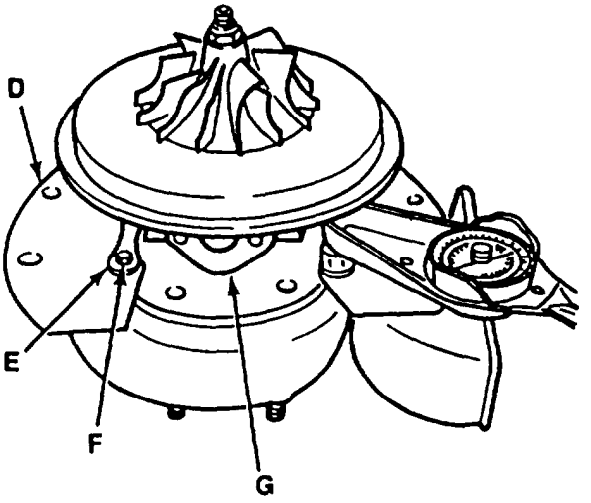
Alignment marks: Compressor cover – B, Bearing housing – A

RIGHT BANK

ASSEMBLY-Continued.

INSTALLATION OF TURBINE HOUSING. SHIELD. PREFORMED PACKING. AND COMPRESSOR COVER (CONTINUED)

4. Install shield (D).



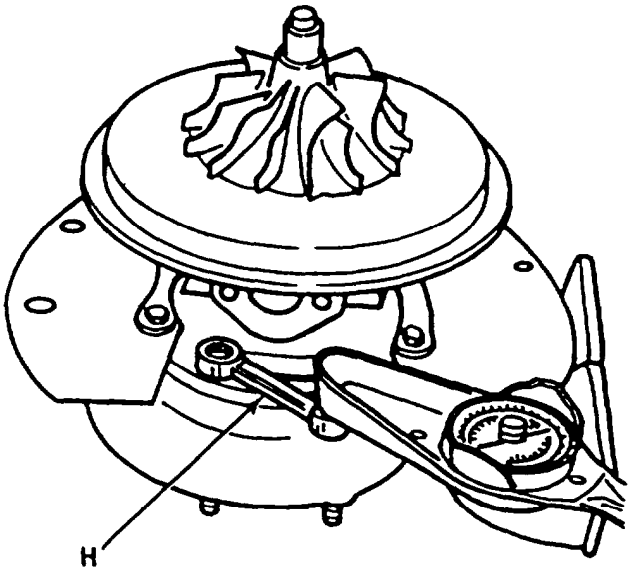
NOTE

If your turbo is to be used on engine models AVDS-1790-2DR the shield is not used.

5. Install three new locking plates (E) and six cap screws (F). Do not install locking plate and two capscrews under oil drain tube boss (G).

6. Torque cap screws to 230-250 pound-inches (27 N•m).

7. Install new locking plate and two cap screws under drain tube boss. Torque cap screws to 200-220 pound-inches (23.7 N•m) using box wrench (8).



NOTE

The added length of the box wrench decreases the 240 pound-inches value by approximately 30 pound-inches.

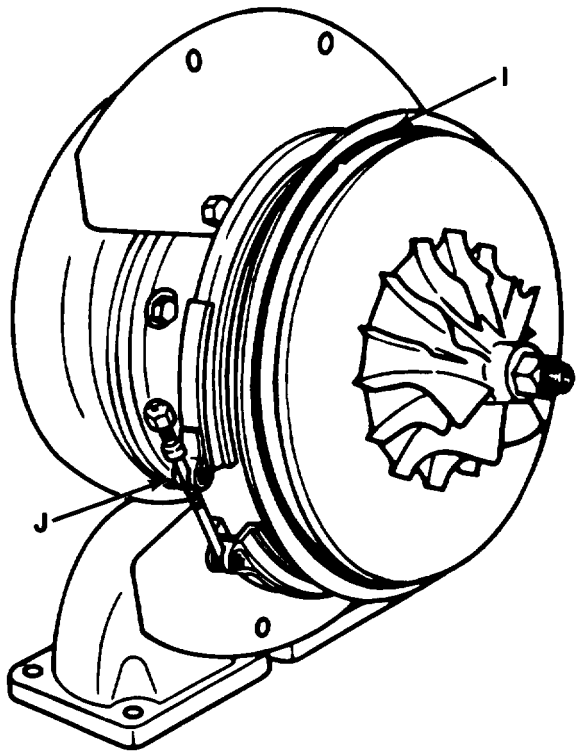
8. Bend locking plate tabs against flats on cap screws.

9. Check end play (para. 2-6c). Total end play must be greater than 0.004 inch and less than 0.006 inch. If end play is not within these limits; disassemble turbo and recheck for worn parts. Reassemble turbo and recheck end play.

ASSEMBLY - Continued.

10. Install new preformed packing (I) on bearing housing.

11. Install clamp (J) and slide it down on bearing housing.



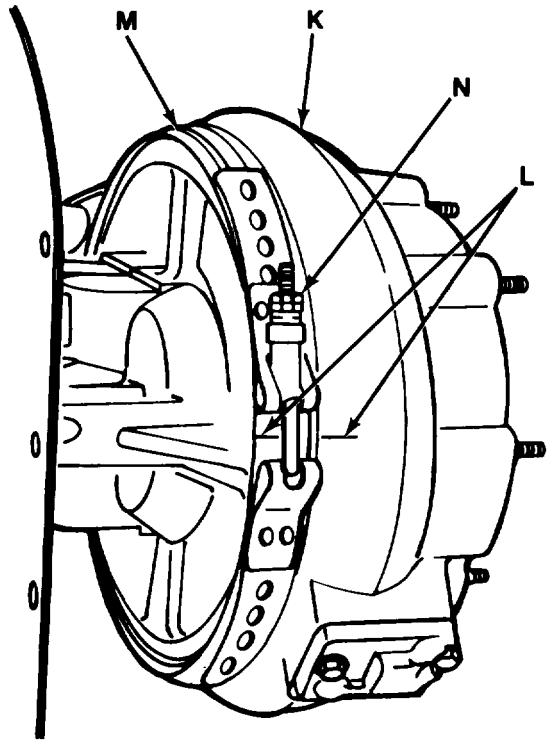
12. Install compressor cover (K). Aline marks (L) scribed in housing flanges during disassembly. If your turbo is a newer model, alinement marks will be cast into the flanges of the compressor cover and housing, and the marks you noted during disassembly should be matched.

NOTE

If you cannot locate the alinement marks, or if you are otherwise unsure of the indexing of the housings for your turbo, consult Table 3-1.

13. Place clamp (M) over compressor cover and bearing housing flanges, and install clamp nut (N).

14. Torque clamp nut to 110-130 pound-inches (13.6 N.m).



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ASSEMBLY - Continual.

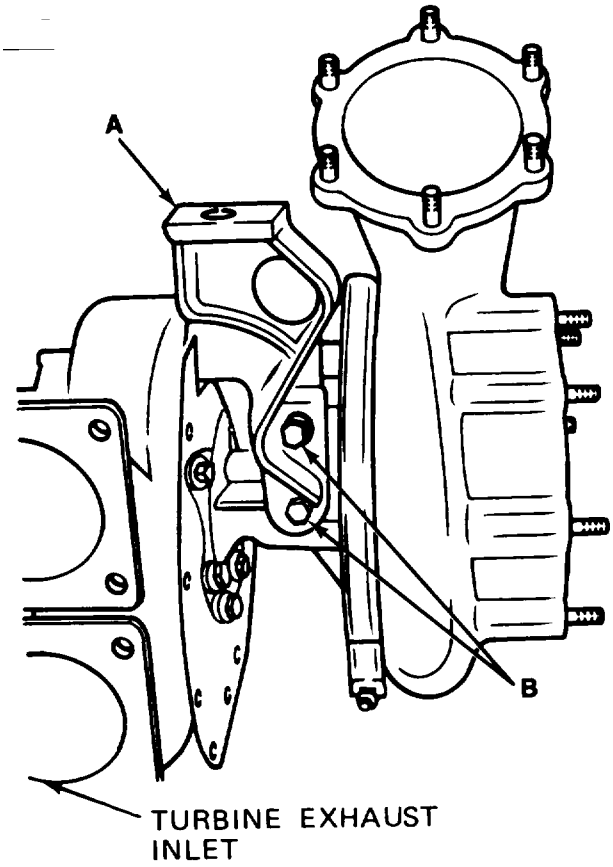
INSTALLATION OF MOUNTING LEGS AND OIL DRAIN TUBE:

NOTE

The mounting leg on the same side as the turbine housing exhaust inlet is referred to as the "inner" mounting leg and must be installed first.

1. Install inner mounting leg (A) and secure with two cap screws and new lockwashers (B).

2. Torque cap screws to 230-250 pound-inches (27 N.m).



3. Install new gasket (C) and oil drain tube (D). Secure with two cap screws and new lockwashers (E).

NOTE

The oil drain tube must pass through the opening in the INNER leg. The oil drain tube must always be on the same side as the turbine housing exhaust inlet.

4. Torque cap screws to 230-250 pound-inches (27 N.m) using crowfoot attachment (F).

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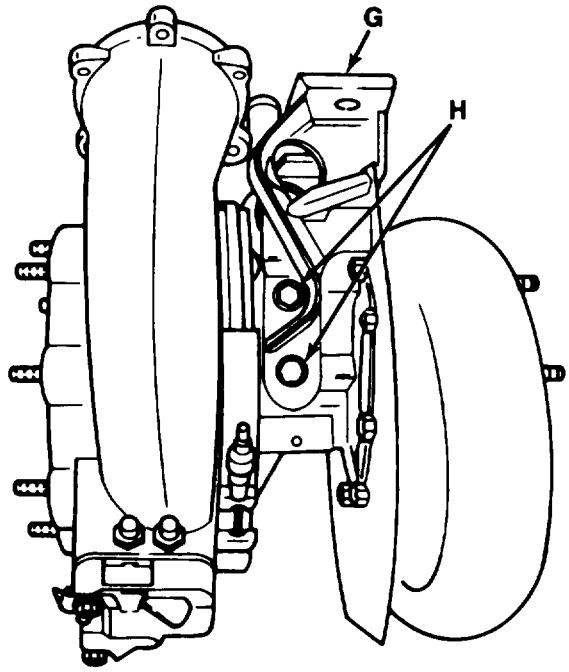
ASSEMBLY - Continued.

5. Install outer mounting leg (G) and secure with two cap screws and new lockwashers (H).

6. Torque lockwashers to 230-250 pound-inches (27 N.m).



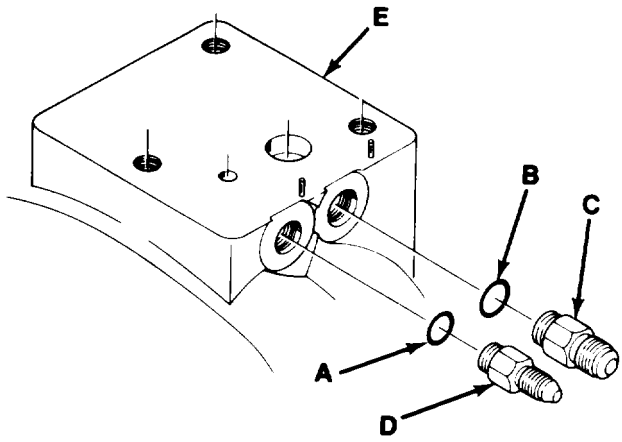
INSTALLATION OF COMPRESSOR COVER INLET AND OUTLET ADAPTERS AND PREFORMED PACKINGS:

NOTE

This procedure applies to "clean air" turbo only.

.

1. Install new preformed packings (A) and (B) on compressor cover inlet adapter (C)' and outlet adapter (D).



The inlet adapter is slightly larger than the outlet adapter and requires the larger preformed packing.

2. Install adapters with preformed packings in compressor cover (E).

3. Using deep well sockets, torque adapters to 55-65 pound-inches (6.8 N.m). '

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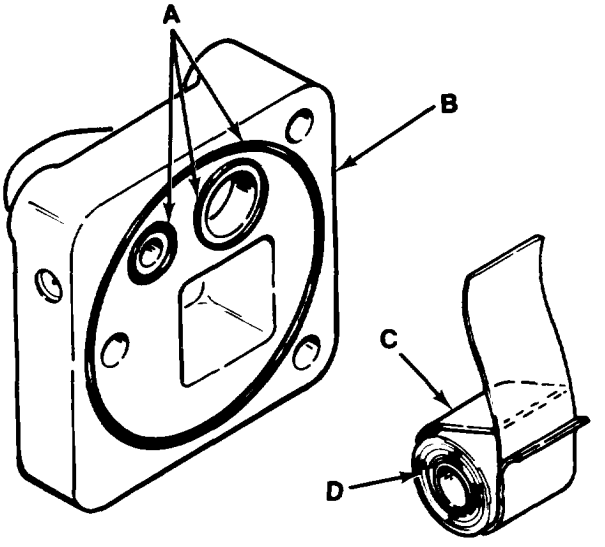
ASSEMBLY - Continued.

INSTALLATION OF PREFORMED PACKINGS, FILTER RETAINING STRAP, AND FILTER IN DUST DETECTOR COVER:

NOTE

This procedure applies to "clean air" turbo only.

1. Install three new preformed packings (A) in grooves in underside of dust detector cover (B).
2. Assemble filter retaining strap (C) and filter (D), and install in recess in underside of dust detector cover.



INSTALLATION OF DUST DETECTOR COVER, PACKING WITH RETAINER, CHAIN FASTENER, CHAIN "S" HOOK, AND CHAIN:

NOTE

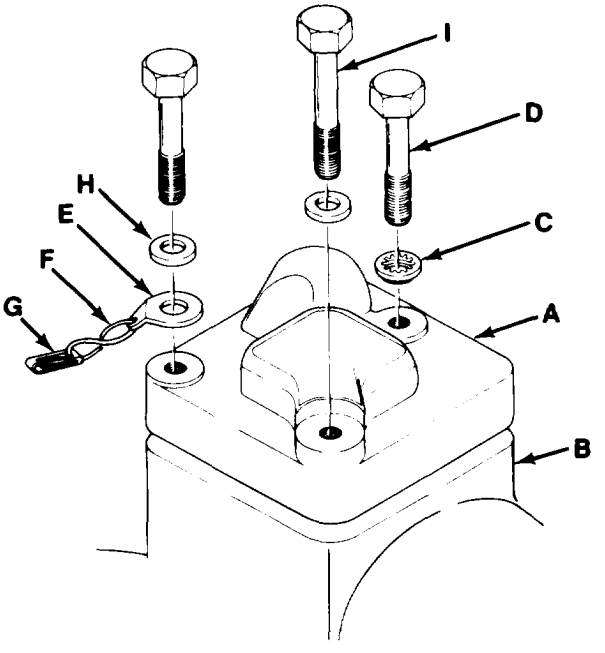
This procedure applies to "clean air" turbo only.

1. Position dust detector cover (A) on compressor cover (B). Ensure mounting holes are properly alined.
2. Install new packing with retainer (C) on cap screw (D).
3. Install assembled chain fastener (E), "S" hook (F), and chain (G) on cap screw and lockwasher (H).
4. Secure dust detector cover to compressor cover with attaching hardware.

NOTE

Ensure the longer cap screw (I) is installed in the position shown.

5. Torque tighten cap screws to 110-130 pound-inches (13.6 N.m).



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3-12. OPERATIONAL TESTING OF THE TURBO.

Since turbosupercharger performance depends on engine performance, the turbosupercharger cannot be tested unless it is installed on an engine. Therefore, testing a turbo not mounted on an engine consists only of ensuring free rotation of the turbine wheel and shaft assembly and checking radial movement (para. 2-6b) and end play (para. 2-6c). If the turbo passes these tests, it is approved for installation on an engine.

Section V. PRESERVATION AND STORAGE.

3-13. PRESERVATION AND STORAGE. I

Procedures for both short and long term administrative storage of turbosuperchargers are provided below.

INITIAL SETUP

Tools:

None

Supplies:

Lubricant (Item 2, Appendix C)
Tape (Item 4, Appendix C)
Packaging materials as specified below.

Personnel:

One mechanic, MOS 63H30

Equipment Condition:

Completely assembled turbo on workbench.

SHORT TERM STORAGE :

1. Fill turbosupercharger bearing housing with Preservative General Purpose Lubrication Oil (VV-L-800). Apply a light coat of the same oil to the exterior surface. Remove excess oil.

2. Wrap turbosupercharger with Waterproof, Greaseproof Barrier Material (MIL-B-121, Type II, Grade A, Class 2).

3* Wrap turbosupercharger in Wrapping and Cushioning Paperboard, (Federal Specification PPP-P-291, Style I, Type III).

4. Tape securely with Paper Packing/Masking Tape (Federal Specification PPP-T-42).

5. Place package in a carton made from Fiberboard Shipping Box Material (Federal Specification PPP-B-636, Style RSC, Type CF, Grade 125, Class DOM).

6. Tape carton securely with Waterproof Packaging Tape (Federal Specification PPP-T-60).

LONG TERM STORAGE:

1. Preserve and package turbosupercharger as outlined above.

2. Place carton in Interior Packaging Sleeve and Tubing Bag (Federal Specification MIL-B-117, Style I, Type I, Class E). Seal bag using standard heat sealing equipment.

3. Place sealed bag in a carton made from Fiberboard Shipping Box Material (Federal Specification PPP-B-636, Style RSC, Type CF, Grade 125, Weather Resistant).

4. Tape carton securely with Waterproof Packaging Tape (Federal Specification PPP-T-60).

APPENDIX A

REFERENCES

Section I. GENERAL INFORMATION.

A-1. PURPOSE.

This appendix is a reference list of army publications which pertain to the operation and maintenance of the vehicle/weapons systems incorporating Schwitzer Model 5HDR Turbosuperchargers.

A-2. ARRANGEMENT OF LISTINGS.

The document listings in each portion of this appendix are arranged in numerical order by publication number.

A-3. REQUISITIONING OF PUBLICATIONS.

Copies of the publications referenced in this appendix, which are required in the performance of your mission, may be requisitioned from Commander, U.S. Army AG Publications Center, 1655 Woodson Road, St. Louis, MO 63144.

Section II. TECHNICAL AND REFERENCE DOCUMENTS.

A-4. STANDARD FORMS.

SF368	Quality Deficiency Report
DA Form 2028-2	Recommended Changes to Equipment Technical Manuals

A-6. MILITARY STANDARD DRAWINGS.

MS33537	Insert, Screw Thread, Helical Coil, Coarse and Fine Thread, Standard Dimensions For

A-6. TECHNICAL MANUALS.

TM9-247	Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel.
TM 9-2350-215	Operator's Manual, Tank Combat, Fuel Tracked: 105 MM Gun, M60A1 and MGOA1/AOS
TM 9-2350-215-20-1-4.	Organizational Maintenance, Tank Combat, Full-Tracked: 105 MM Gun, M60A1 and M60A1/A0S (Hull)
TM 9-2815-220-34	Direct Support and General Support Maintenance Manual for Engine with Container: Turbosupercharged, Diesel, Fuel Injection, 90° "V" Type, Air-Cooled, 12 Cylinder, Assembly; Model AVDS-1790-2C, AVDS-1790-2CA, AVDS-1790-2D, AVDS-1790-2DA
TM 9-2815-247-34	Direct Support and General Support Maintenance Manual for Engine with Container: Turbosupercharged, Diesel, Fuel Injection, 90° "V" Type, Air-Cooled, 12 Cylinder, Assembly; Model AVDS-1790-2DR and AVDS-1790-8CR

A-6. TECHNICAL MANUALS-Continued.

TM 9-2815-220-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) Engine with Container: Turbosupercharged, Diesel, Fuel Injection, 90° "V" Type, Air-Cooled, 12 Cylinder, Assembly; Model AVDS-1790-2C, AVDS-1790-2CA, AVDS-1790-2D, AVDS-1790-2DA, AVDS-1790-2DR and
TM 9-2815-247-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) Engine with Container: Turbosupercharged, Diesel, Fuel Injection, 90° "V" Type, Air-Cooled, 12 Cylinder, Assembly; Model AVDS-1796-8CR.

A-7. SUPPLY CATALOGS.

SC 5180-90-CL-N26	Tool Kit, General Mechanic's: Automotive
SC 4910-95-CL-A63	Shop Equipment, Maintenance and Repair: Automotive
SC 4910-95-CL-A31	Shop Equipment, Maintenance and Repair: Automotive

A-8. PUBLICATION INDEXES.

The following indexes should be consulted frequently for the latest changes or revisions to references given in the appendix and for new publications relating to the material covered in this Technical Manual.

DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	The Army Maintenance Management System (TAMMS)

A-8. PUBLICATION INDEXES.

The following indexes should be consulted frequently for the latest changes or revisions to references given in the appendix and for new publications relating to the material covered in this Technical Manual.

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms
DA Pam 310-7	US Army Equipment Index of Modification Work Orders
DA Pam 738-750	The Army Maintenance Management System (TAMMS)

APPENDIX B

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION.

B-1. SCOPE.

This appendix lists repair parts and special tools required for the direct and general support maintenance of the Schwitzer Model 5HDR Turbosupercharger. It authorizes the requisitioning and issue of repair parts as indicated by the source and maintenance codes.

Part Numbers	Engine Applications
11668377-1 and 187727	AVDS-1790-2A AVDS-1790-2CA AVDS-1790-2D AVDS-1790-2DA AVDS-1790-2DR
12366708-1 (RB)	AVDS-1790-8CR
12366708-2(LB)	AVDS-1790-8CR

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence.

b. Section Ill. Special Tools List. A list of special tools authorized for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) (fast nine numerals) sequence, of all national stock numbers (NSN) appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

B-3. EXPLANATION OF COLUMNS.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration on which the item is shown.

(2) Item Number The number used to identify items called out in the illustration.

b. Source Maintenance, and Recoverability (SMR) Codes.

(1) Source Code. Source codes indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second Positions of the Uniform SMR code format as follows:

REPAIR PARTS AND SPECIAL TOOLS LIST -Continued

CODE	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked or initial issue or outfitting to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.
KD	An item of a depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul/ repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at the direct support level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
MD	Item to be manufactured or fabricated at the depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at direct support maintenance level.
AH	Item to be assembled at general support maintenance level.
AD	Item to be assembled at depot maintenance level.
XA	Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.
XB	Item is not procured or stocked.. If not available through salvage, requisition.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA.

REPAIR PARTS AND SPECIAL TOOLS LIST - Continued.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support item. The maintenance codes are entered in the third and fourth positions of the uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance.

Code	Application/Explanation
c	Crew or operator maintenance performed within organizational maintenance.
o	Support item is removed, replaced, used at the organizational level.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed, replaced, used at depot, mobile depot, or specialized repair activity only.

(b) The maintenance code entered in the fourth position indicates whether the item is to be required and identifies the lowest maintenance level with the capability to perform the complete repair (i.e., all" authorized maintenance functions). This position will contain one of the following maintenance codes:

Code	Application/Explanation
0	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
D	The lowest maintenance level capable of complete repair of the support item is the depot level.
L	Repair restricted to (enter applicable designated specialized repair activity), Specialized Repair Activity.
z	Nonreparable. No repair is authorized.
B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for the maintenance of this item.

(3) Recoverability Code. Recoverability codes are assigned to support items to indicate the-disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability Codes	Definition
z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
o	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.

REPAIR PARTS AND SPECIAL TOOLS LIST - Continued.

Recoverability Codes	Definition
F	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/ directives for specific instructions.

c. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-diqit numeric code listed in S8 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. Items that are included in kits and sets are listed below the name of the kit or set with the quantity of each item in the kit or set indicated in the quantity incorporated in unit column. When the part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description. In the Special Tools List, the initial basis of issue (BOI) appears as the last line in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased accordingly.

g. unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in 'performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown-on the illustration figure, which is prepared for a functional group, a subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc.).

REPAIR PARTS AND SPECIAL TOOLS LIST Continued.

54. SPECIAL INFORMATION.

Repair Parts Kits. Repair parts kits appear as the last entries in the repair parts listing for the figure in which its parts are listed as repair parts.

b. Special Tool Sets. Special tool sets are stocked for initial issue. Tool set components are requisitioned as individual items. Stockage of tools that are duplicated in tool sets for other vehicles assigned or supported are not required beyond actual need.

B5. HOW TO LOCATE PARTS.

a. When National Stock Number or Part Number is Unknown:

(1) First. Find the illustration for the configuration of turbosupercharger, standard or “clean air”, being repaired.

(2) Second. Identify the part on the illustration and note the illustration number and item number for the part.

(3) Third. Using the repair parts listing the illustration, find the item number.

b. When National Stock Number or Part Number is Known:

(1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index is in NIIN sequence followed by a list of part numbers in alphanumeric sequence, cross referenced to the illustration figure number and item number.

(2) Second. After finding the fiqure and item number, locate the figure and item number-in the repair parts list.

Section Il. REPAIR PARTS LIST.

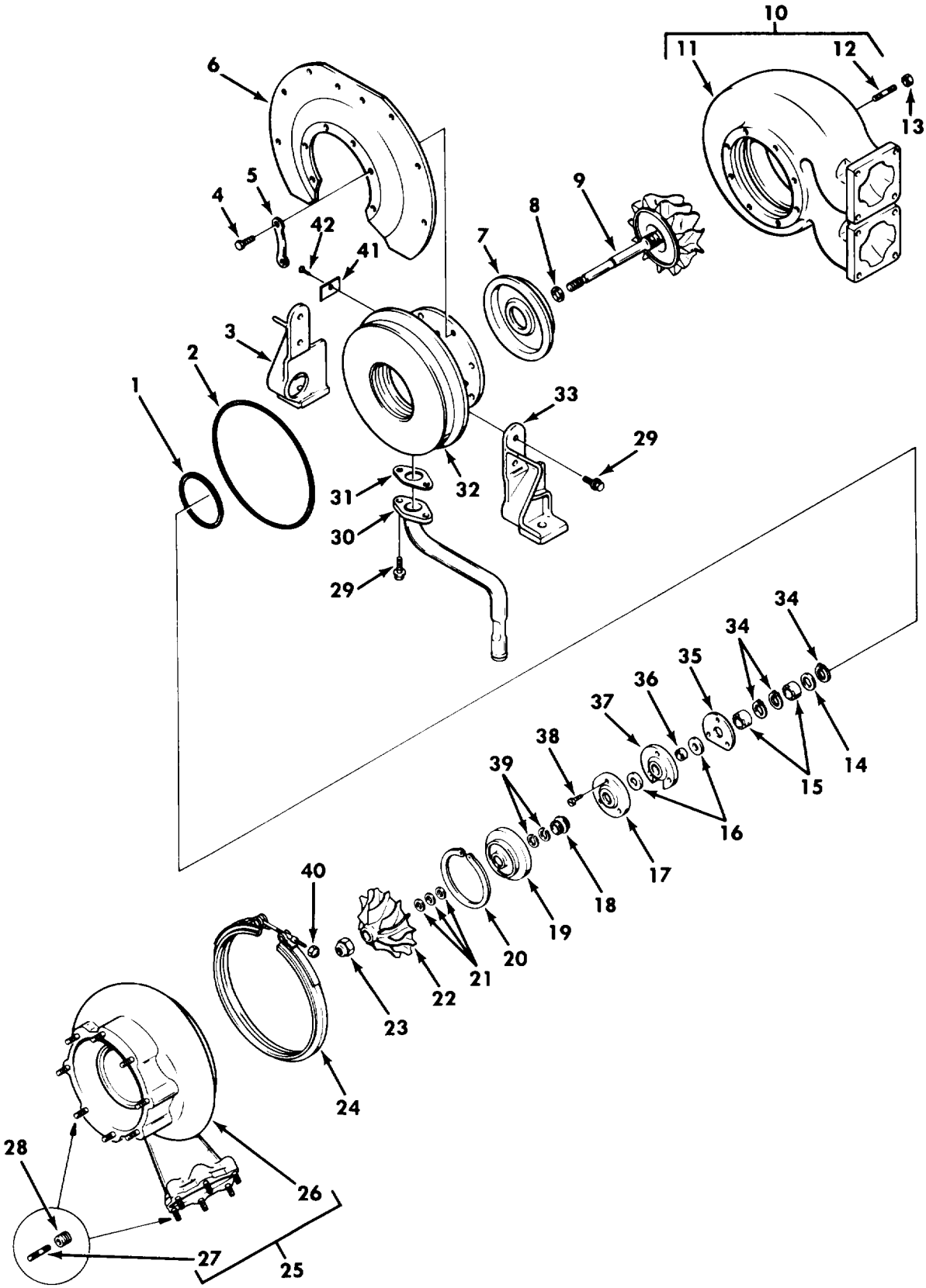

Figure B-1. Turbosupercharger assembly.

(1) ITEM NO	(2) SMR	(3) NSN	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0305 TURBOSUPBRCHARGBR SCHWITZER MODEL 5HDR, PART NO. 11668377-1	
					FIGURE B-1 TURBOSUPERCHARGER	
1	KFHZZ		53591	C183234	PACKING,PREFORMED PART OF KIT P/N 5705073	1
2	PAHZZ	5330-00-486-0417	53591	A138201	PACKING,PREFORMED PART OF KIT P/N 5705073	1
3	PBHZZ	2990-01-292-8579	53591	A157571	MOUNTING LEG, TURBOS	1
4	XAHZZ	5305-00-576-5417	53591	C140319	SCREW, CAP, HEXAGON H	8
5	KFHZZ		53591	B157617	LOCKING PLATE PART OF KIT P/N 5705073	4
6	PAHZZ	2950-01-053-7200	53591	A157615	SHIELD, TURBOCHARGBR	1
7	XAHZZ		53591	B158568	BACKPLATE, TURBINE	1
8	KFHZZ		53591	C142114	SEAL, RING, METAL PART OF KIT P/N 5705073	1
9	PFHZZ	2950-00-397-3363	53591	152258	TURBINE WHEEL ASSEM	1
10	XAHHH		53591	158581	HOUSING, TURBINE ASS	1
11	XAHZZ		53591	157809	HOUSING, TURBINE	1
12	PAHZZ	5307-00-492-3217	53591	C157415	STUD, PLAIN	6
13	PAOZZ	5310-01-151-2732	19207	12275894	NUT, SELF-LOCKING, HB	6
14	PAHZZ	3120-00-413-9604	53591	B140029	BEARING, WASHER, THRU PART OF KIT P/N 5705073	1
15	KFHZZ		53591	B135619	BEARING, SLEEVE PART OF KIT P/N 5705073	2
16	PAHZZ	2950-00-118-8535	53591	2S1185	RING, TURBOCHARGER PART OF KIT P/N 5705073	1
17	XAHZZ		53591	B137856	DEFLECTOR, OIL	1
18	PAHZZ	2990-00-970-7553	53591	B135796	SLEEVE, FLINGER PART OF KIT P/N 5705073	1
19	KFHZZ		53591	A189814	INSERT, FLINGER SLEEVE PART OF KIT P/N 5705073	1
20	PAHZZ	5365-00-115-1475	53591	C139052	RING, RETAINING	1
21	PAHZZ	5365-00-103-9189	89619	375SB16P1	SHIM (0.003 THICK) PART OF KIT P/N 5705073	1
21	PAHZZ	5365-00-104-2124	89616	375SB16P2	SHIM (0.005 THICK) PART OF KIT P/N 5705073	1
21	PAHZZ	5365-00-103-9191	64104	701569B	SHIM (0.010 THICK) PART OF KIT P/N 5705073	1
22	PAHZZ	4310-00-423-3892	53591	191634	IMPELLER, FAN, AXIAL	1
23	KFHZZ		53591	C146164	NUT, LOCK PART OF KIT P/N 5705073	1
24	PFHZZ	2990-00-235-1709	53591	140153	CLAMP	1
25	XAHHH		53591	B157229	COVER, COMPRESSOR ASSE	1
26	XAHZZ		53591	L157148	COVER, COMPRESSOR	1
27	PFHZZ	5307-01-008-6182	53591	C157631	STUD, PLAIN	14
28	PAHZZ	5340-00-290-4520	96906	MS21208C5-20	INSERT, SCREW THREAD	V
29	PAHZZ	5305-00-500-0435	53591	132575	SCREW, CAP, HEXAGON, H	6
30	PAFZZ	4710-00-432-0055	53591	A157599	TUBE ASSEMBLY, METAL	1
31	PAFZZ	5330-01-059-0096	53591	C184054	GASKET	1
32	XAHZZ		53591	L157542	HOUSING, BEARING	1
33	XAHZZ		53591	A157572	LEG, MOUNTING	1
34	PAHZZ	5365-00-655-8113	96906	MS16627-1106	RING, RETAINING	3
35	KFHZZ		53591	C137945	SPACER PART OF KIT P/N 5705073	1
36	PAHZZ	3120-00-087-2704	53591	C137016	BEARING, SLEEVE PART OF KIT P/N 5705073	1

(1) ITEM NO	(2) SMR	(3) NSN	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
37	KFHZZ		53591	B146827	BEARING, THRUST PART OF KIT P/N 5705073	1
38	KFHZZ		53591	C158567	SCREW, OIL DEFLECTOR PART OF KIT P/N 5705073	3
39	PAHZZ	2990-00-858-6206	19207	7383439	SEAL RING, METAL PART OF KIT P/N 5705073	2
40	PAHZZ	5310-00-298-2747	96906	MS20500-428	NUT, SELF-LOCKING, HB	1
41	XAHZZ		53591	B157482	PLATE, IDENTIFICATIO	1
42	XAHZZ		53591	C129309	SCREW, DRIVE	1
	PAHZZ	2990-01-152-2373	19207	5705073	PARTS KIT, TURBOCHAR	
					PACKING, PREFORMED (1)	
					PACKING, PREFORMED (1)	
					LOCKING, PLATE (4)	
					SEAL, RING, METAL (1)	
					BEARING, WASHER, THRU (1)	
					BEARING, SLEEVE (2)	
					RING, TURBOCHARGER (2)	
					SLEEVE, FLINGER (1)	
					INSERT, FLINGER SLEE (1)	
					SHIM (3)	
					SHIM (3)	
					SHIM (3)	
					NUT, LOCK (1)	
					SPACER (1)	
					BEARING, SLEEVE (1)	
					BEARING, THRUST (1)	
					SCREW, OIL DEFLECTOR (3)	
					SEAL, RING, METAL (2)	

END OF FIGURE

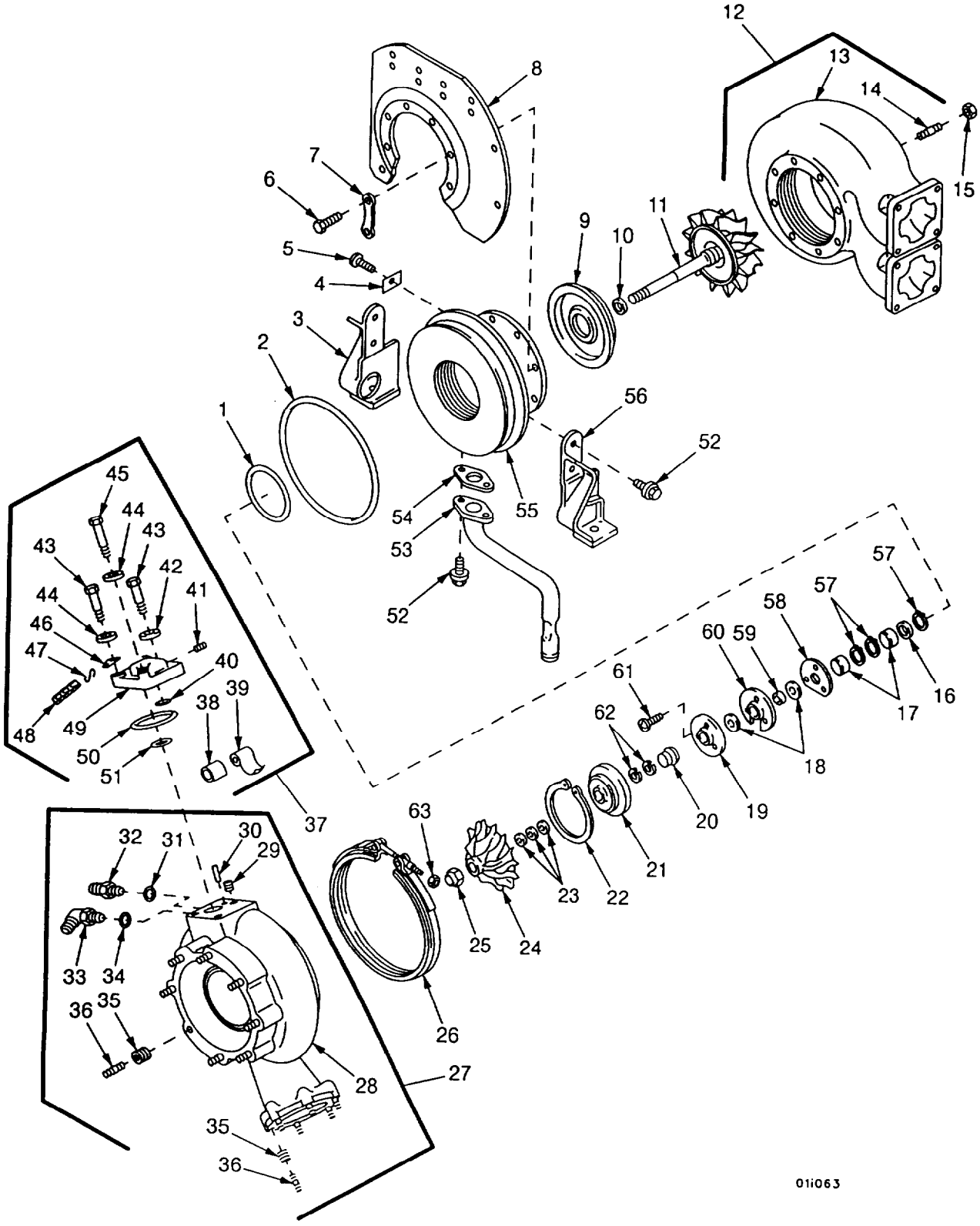

Figure B-2. Turbosupercharger assembly 187727.

(1) ITEM NO	(2) SMR	(3) NSN	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0305 TURBOSUPERCHARGER SCRWITZER MODEL 5HDR, PART NO. 187727	
					FIGURE B-2 TURBOSUPERCHARGER	
1	PAHZZ	5330-00-806-4171	96906	MS29561-238	PACKING,PREFORMED PART OF KIT P/N 5705073	1
2	PAHZZ	5330-00-486-0417	53591	A138201	PACKING, PREFORMED PART OF KIT P/N 5705073	1
3	PBHZZ	2990-01-292-8579	53591	A157571	MOUNTING LEG, TURBOS	1
4	XAHZZ		53591	C193898	PLATE, IDENTIFICATIO	1
5	XAHZZ		53591	C186752	RIVET	1
6	PAHZZ	5305-00-576-5417	96906	MS35307-360	SCREW, CAP, HEXAGON H	8
7	KFHZZ		53591	B157617	LOCKING, PLATE, NUT A PART OF KIT P/N 5705073	4
8	PAHZZ	2950-01-053-7200	53591	A157615	SHIELD	1
9	XAHZZ		53591	B158568	BACKPLATE, TURBINE	1
10	PAHZZ		53591	C142114	PISTON RING PART OF KIT P/N 5705073	1
11	PFHZZ	2950-00-397-3363	53591	A152258	TURBINE WHEEL ASSEM	1
12	XAHHH		53591	158581	HOUSING ASSEMBLY, TU	1
13	XAHZZ		53591	157809	HOUSING, TURBINE	1
14	PAHZZ	5307-00-492-3217	53591	C157415	STUD, PLAIN	6
15	PAOZZ	5310-01-151-2732	15653	SPL51712-6	NUT, SELF-LOCKING, H	6
16	PAHZZ	3120-00-413-9604	53591	B140029	BEARING, WASHER, THRU PART OF KIT P/N 5705073	1
17	KFHZZ		53591	B135619	BEARING, SLEEVE PART OF KIT P/N 5705073	2
18	PAHZZ	3120-00-118-8535	11083	2S11B5	BEARING, WASHER, THRU PART OF KIT P/N 5705073	1
19	XAHZZ		53591	B137856	DEFLECTOR, OIL	1
20	PAHZZ	2990-00-970-7553	53591	B135796	SLEEVE, FLINGER PART OF KIT P/N 5705073	1
21	KFHZZ		53591	A189814	INSERT, FLINGER SLEE PART OF KIT P/N 5705073	1
22	PAHZZ	5365-00-226-9996	96906	MS16631-1350	RING, RETAINING	1
23	PAHZZ	5365-00-103-9191	64104	701569B	SHIM 0.010 THICK PART OF KIT P/N 5705073	1
23	PAHZZ	5365-00-103-9189	89619	375SB16P1	SHIM 0.003 THICK PART OF KIT P/N 5705073	1
23	PAHZZ	5365-00-104-2124	89619	375SB16P2	SHIM 0.005 THICK PART OF KIT P/N 5705073	1
24	PAHZZ	4310-00-432-3892	53591	L157149	WHEEL, COMPRESSOR	1
25	PAHZZ		53591	C146164	NUT, LOCK	1
26	PAHZZ	2990-00-235-1709	53591	140153		1
27	XAHHH		53591	B184910	COVER, COMPRESSOR	1
28	XAHZZ		53591	184907	COVER, COMPRESSOR	1
29	PAHZZ	5340-00-582-7256	96906	MS21209F5-20	INSERT, SCREW THREAD	3
30	PAHZZ	5340-00-815-3250	96906	MS39086-101	PIN, SPRING	2
31	PAOZZ	5330-00-033-7491	96906	MS28778-5	PACKING, PREFORMED PART OF KIT P/N 5705073	1
32	PAOZZ	4730-01-007-5232	96906	MS51525A4	ADAPTER, STRAIGHT, TU	1
33	PAOZZ	4730-00-431-9307	96906	MS51525A5	ADAPTER, STRAIGHT, TU	1
34	PAOZZ	5330-00-805-2966	96906	MS28778-4	PACKING, PREFORMED PART OF KIT PIN 5705073	1
35	PAHZZ	5340-00-290-4520	96906	MS122162	INSERT, SCREW THREAD	1
36	PAHZZ	5307-01-008-6182	53591	C157631	STUD, PLAIN	14

(1) ITEM NO	(2) SMR	(3) NSN	(4) (5) CAGE	PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
37	AFFFF		19207	12275864	COVER ASSEMBLY	1
38	PAFZZ	5340-01-145-8291	19207	12275868	STRAP, RETAINING	1
39	PAFZZ	4460-01-145-8299	19207	12275040	FILTER, AIR, ELECTROS	1
40	PAFZZ	5330-00-724-7902	96906	MS9068-013	PACKING, PREFORMED PART OF KIT P/N 5705073	1
41	PAFZZ	4730-00-277-6352	96906	MS27769-1	PLUG, PIPE	1
42	PAFZZ	5330-00-297-6468	83259	600-001-5-16	PACKING WITH RETAIN PART OF KIT P/N 5705073	1
43	PAFZZ	5305-01-145-8286	19207	12275866-1	SCREW, EXTERNALLY RE	2
44	PAFZZ	5310-00-194-0636	96906	MS9320-11	WASHER, PLAT	2
45	PAFZZ	5305-01-145-8287	19207	12275866-2	SCREW, EXTERNALLY RE	1
46	PAFZZ	4030-01-145-8293	19207	12275867	CHAIN FASTENER, ANGL	2
47	PAFZZ	4030-00-270-5436	96906	MS87006-3	HOOK, CHAIN, S	2
40	PAFZZ	4010-01-157-1343	19207	12275841	CHAIN, WELDLESS	1
49	PBFZZ	5340-01-145-8310	19207	12275869	COVER, ACCESS	1
50	PAFZZ	5330-00-180-9951	96906	MS9068-038	PACKING, PREFORMED PART OF KIT P/N 5705073	1
51	PAFZZ	5330-00-724-5541	96906	MS90687-018	PACKING, PREFORMED PART OF KIT PIN 5705073	1
52	PAHZZ	5305-00-500-0435	53591	132575	SCREW, CAP, HEXAGON H	6
53	PAHZZ	4710-00-432-0055	53591	A157599	TUBE ASSEMBLY, METAL	1
54	PAHZZ	5330-01-059-0096	53591	C184054	GASKET	1
55	XAHZZ		51591	L157542	HOUSING, BEARING	1
56	PBHZZ	5340-01-300-0409	53591	A157572	BRACKET, MOUNTING	1
57	PAHZZ	5365-00-655-8113	96906	MS16627-1106	RING, RETAINING	1
58	KFHZZ		53591	C137945	SPACER PART OF KIT P/N 5705073	3
59	PAHZZ	3120-00-087-2704	53591	C137016	BEARING, SLEEVE PART OF KIT P/N 5705073	1
60	KFHZZ		53591	B146827	BEARING, THRUST PART OF KIT P/N 5705073	1
61	KFHZZ		53591	C158567	SCREW, MACHINE PART OF KIT P/N 5705073	3
62	PAHZZ	2990-00-858-6206	19207	7383439	SEAL RING, METAL PART OF KIT P/N 5705073	2
63	PAHZZ	5310-00-298-2747	96906	MS20500-428	NUT, SELF-LOCKING, HE	1
	PAHZZ	2990-01-152-2373	19207	5705073	PARTS KIT, TURBOCHAR	
					PACKING, PREFORMED (1)	
					PACKING, PREFORMED (1)	
					LOCKING. PLATE (4)	
					SEAL, RING, METAL (1)	
					BEARING, WASHER, THRU (1)	
					BEARING, SLEEVE (2)	
					RING, TURBOCHARGER (2)	
					SLEEVE, FLINGER (1)	
					INSERT, FLINGER SLEE (1)	
					SHIM (3)	
					SHIM (3)	
					SHIM (3)	
					NUT, LOCK (1)	
					SPACER (1)	
					BEARING, SLEEVE (1)	
					BEARING, THRUST (1)	
					SCREW, OIL DEFLECTOR (3)	
					SEAL, RING, METAL (2)	

END OF FIGURE

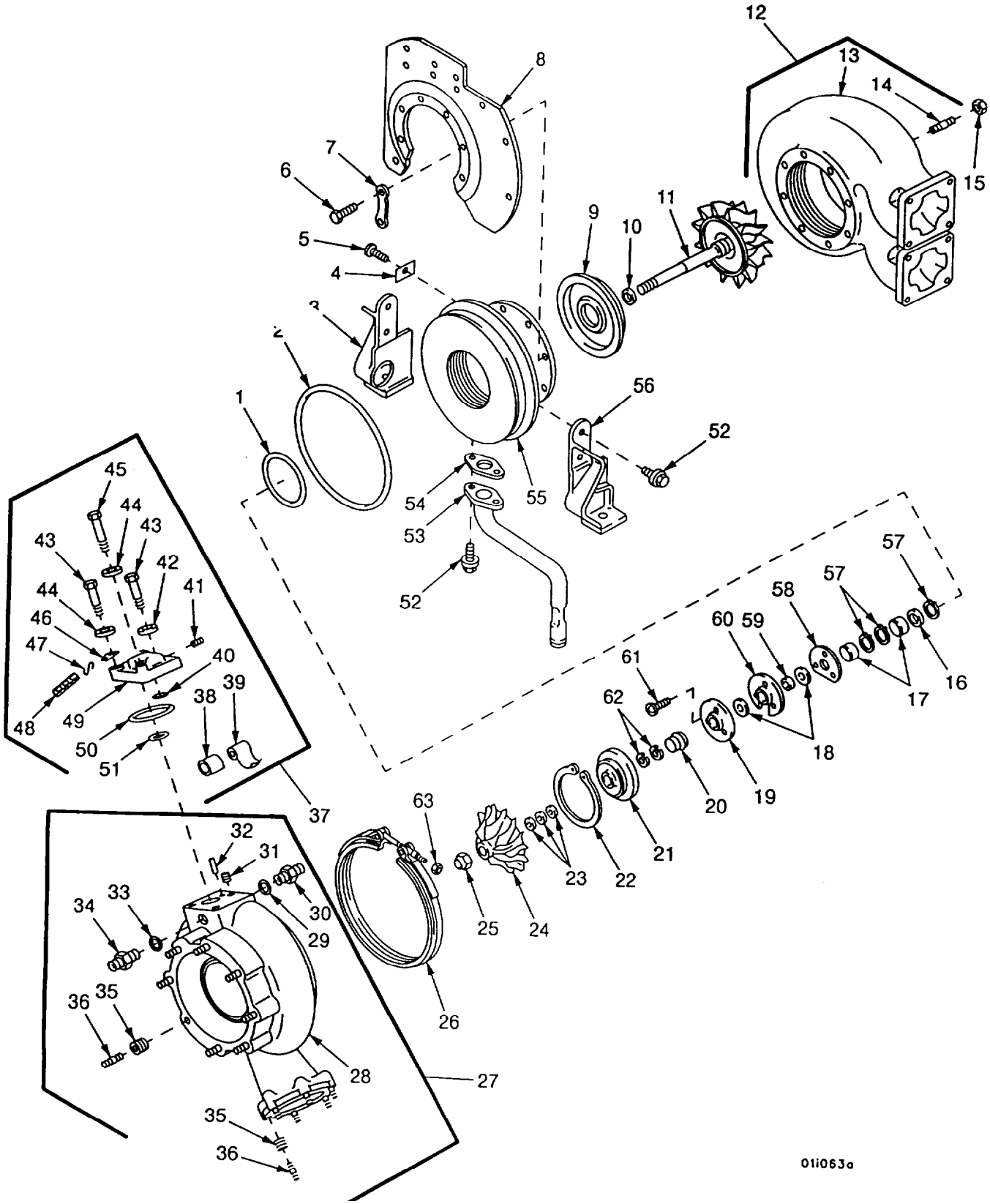

Figure B-3. Turbosupercharger assembly 12366708-1 and 12366708-2.

(1) ITEM NO	(2) SMR	(3) NSN	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0305 TURBOSUPERCHARGER PART NO. 12366708-1 RIGHT BANK PART NO. 12366708-2 LEFT RANK	
					FIGURE B-3 TURBOSUPERCHARGER	
1	PAHZZ	5330-00-806-4171	96906	MS29561-238	PACKING, PREFORMED PART OF KIT P/N 5705073	1
2	PAHZZ	5330-00-486-0417	53591	A136201	PACKING, PREFORMED PART OF KIT P/N 5705073	1
3	PBHZZ	2990-01-292-8579	53591	A157571	MOUNTING LEG, TURBOS	1
4	XAHZZ		53591	C193898	PLATE, IDENTIFICATIO	1
5	XAHZZ		53591	C186752	RIVET	1
6	PAHZZ	5305-00-576-5417	96906	MS35307-360	SCREW, CAP, HEXAGON H	8
7	KFHZZ		53591	8157617	LOCKING PLATE, NUT A PART OF KIT P/N 5705073	4
8	PAHZZ	2990-01-437-8266	53591	A193801	SHIELD USED ON RIGHT RANK	1
8	PAHZZ	2990-01-437-1570	53591	A182349	SHIELD USED ON LEFT BANK	
9	XAHZZ		53591	8158568	BACKPLATE, TURBINE	1
10	PAHZZ	2815-01-434-5208	53591	C142114	PISTON RING PART OF KIT P/N 5705073	1
11	PFHZZ		53591	B191804	WHEEL ASSEMBLY PART OF KIT P/N 5705073	1
12	XAHHH		53591	194671	HOUSING ASSEMBLY, TU	1
13	XAHZZ		53591	L192766	HOUSING, TURBINE	1
14	PAHZZ	5307-00-492-3217	53591	C157415	STUD, PLAIN	6
15	PAOZZ	5310-01-151-2732	15653	SPL51712-6	NUT, SELF-LOCKING, H	6
16	PAHZZ	3120-00-413-9604	53591	B140029	BEARING, WASHER, THRU PART OF KIT P/N 5705073	1
17	KFHZZ		53591	B168983	BEARING, SLEEVE PART OF KIT P/N 5705073	2
18	PAHZZ	3120-00-118-8535	11083	2S1185	BEARING, WASHER, THRU PART OF KIT P/N 5705073	1
19	XAHZZ		53591	B137856	DEFLECTOR, OIL	1
20	PAHZZ	2990-00-970-7553	53591	B135796	SLEEVE, FINGER PART OF KIT P/N 5705073	1
21	KFHZZ		53591	A189814	INSERT, FINGER SLEEVE PART OF KIT P/N 5705073	1
22	PAHZZ	5365-00-226-9996	96906	MS16631-1350	RING, RETAINING	1
23	PAHZZ	5365-00-103-9191	64104	701569B	SHIM 0.010 THICK PART OF KIT P/N 5705073	1
23	PAHZZ	5365-00-103-9189	89619	375SB16P1	SHIM 0.003 THICK PART OF KIT P/N 5705073	1
23	PAHZZ	5365-00-104-2124	89619	375SB16P2	SHIM 0.005 THICK PART OF KIT P/N 5705073	1
24	PAHZZ	2930-01-434-5503	53591	191634	WHEEL, COMPRESSOR	1
25	PAHZZ	5310-01-433-8977	53591	194118	NUT, LOCK	1
26	PAHZZ	2990-00-235-1709	53591	140153	CLAMP	1
27	XAHHH		53591	B191695	COVER, COMPRESSOR	1
28	XAHZZ		53591	191635	COVER, COMPRESSOR	1
29	PAOZZ	5330-00-833-7491	96906	MS29778-5	PACKING, PREFORMED PART OF KIT P/N 5705073	1
30	PAOZZ	5340-00-815-3250	96906	MS51525A4	ADAPTER, STRAIGHT	1
31	PAHZZ	5340-00-582-7256	96906	MS21209F5-20	INSERT, SCREW THREAD	V
32	PAHZZ	5315-00-815-3250	96906	MS39086-101	PIN, SPRING	2
33	PAOZZ	5330-00-805-2966	96906	MS26770-4	PACKING, PREFORMED PART OF KIT P/N 5705073	1
34	PAOZZ	4730-00-431-9307	81343	5-5 070120CA	ADAPTER, STRAIGHT, TU	1
35	PAHZZ	5340-00-290-4520	96906	MS122162	INSERT, SCREW THREAD	V
36	PAHZZ	5307-01-008-6182	53591	C157631	STUD, PLAIN	14

(1) ITEM NO	(2) SMR	(3) NSN	(4) (5) PART CAGE NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
37	AFFFF		19207 12275864	COVER ASSEMBLY	1
38	PAFZZ	5340-01-145-8291	19207 12275868	STRAP, RETAINER	1
39	PAFZZ	4460-01-145-8299	19207 12275840	FILTER, AIR, ELECTROS	1
40	PAFZZ	5330-00-724-7902	96906 MS9068-013	PACKING, PREFORMED PART OF KIT P/N 5705073	1
41	PAFZZ	4730-00-277-6352	96906 MS27769-1	PLUG, PIPE	1
42	PAFZZ	5330-00-297-6468	83259 600-001-5-16	PACKING WITH RETAIN PART OF KIT P/N 5705073	1
43	PAFZZ	5305-01-145-8286	19207 12275866-1	SCREW, EXTERNALLY RE	2
44	PAFZZ	5310-00-194-0636	96906 MS9320-11	WASHER, FLAT	2
45	PAFZZ	5305-01-145-8287	19207 12275866-2	SCREW, EXTERNALLY RE	1
46	PAFZZ	4030-01-145-8293	19207 12275867	CHAIN FASTENER, ANGL	2
47	PAFZZ	4030-00-270-5436	96906 NS87006-3	HOOK, CHAIN, S	2
48	PAFZZ	4010-01-157-1343	19207 12275841	CHAIN, WELDLESS	1
49	PBFZZ	5340-01-145-8310	19207 12275869	COVER, ACCESS	1
50	PAFZZ	5330-00-180-9951	96906 MS9068-038	PACKING, PREFORMED PART OF KIT P/N 5705073	1
51	PAFZZ	5330-00-724-5541	96906 MS90687-018	PACKING, PREFORMED PART OF KIT P/N 5705073	1
52	PAHZZ	5305-00-500-0435	53591 132575	SCREW, CAP, HEXAGON H	6
53	PAHZZ	4710-00-432-0055	53591 A157599	TUBE ASSEMBLY, METAL	1
54	PAHZZ	5330-01-059-0096	53591 C184054	GASKET	1
55	XAHZZ		51591 L168982	HOUSING, BEARING	1
56	PBHZZ	5340-01-300-0409	53591 A157572	BRACKET, MOUNTING	1
57	PAHZZ	5365-00-655-6113	96906 MS16627-1106	RING, RETAINING	1
58	KFHZZ		53591 C137945	SPACER PART OF KIT P/N 5705073	3
59	PAHZZ	3120-00-087-2704	53591 C137016	BEARING, SLEEVE PART OF KIT P/N 5705073	1
60	PAHZZ		53591 C18809	BEARING, THRUST	1
61	KPHZZ		53591 C158567	SCREW, MACHINE PART OF KIT P/N 5705073	3
62	PAHZZ	2990-00-858-6206	19207 7383439	SEAL RING, METAL PART OF KIT P/N 5705073	2

(1) ITEM NO	(2) SMR	(3) NSN	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)		(7) QTY
63	PAHZZ	5310-00-298-2747	96906	MS20500-428	NUT, SELF-LOCKING, HE		1
	PAHZZ	2990-01-152-2373	19207	5705073	PARTS KIT, TURBOCHAR		
					PACKING, PREFORMED	(1)	
					PACKING, PREFORMED	(1)	
					LOCKING, PLATE	(4)	
					SEAL, RING, METAL	(1)	
					BEARING, WASHER, THRU	(1)	
					BEARING, SLEEVE	(2)	
					RING, TURBOCHARGER	(2)	
					SLEEVE, FLINGER	(1)	
					INSERT, FLINGER SLEE	(1)	
					SHIN	(3)	
					SHIM	(3)	
					SHIM	(3)	
					NUT, LOCK	(1)	
					SPACER	(1)	
					BEARING, SLEEVE	(1)	
					BEARING, THRUST	(1)	
					SCREW, OIL DEFLECTOR	(3)	
					SEAL, RING, METAL	(2)	

END OF FIGURE

Section III. SPECIAL TOOLS LIST

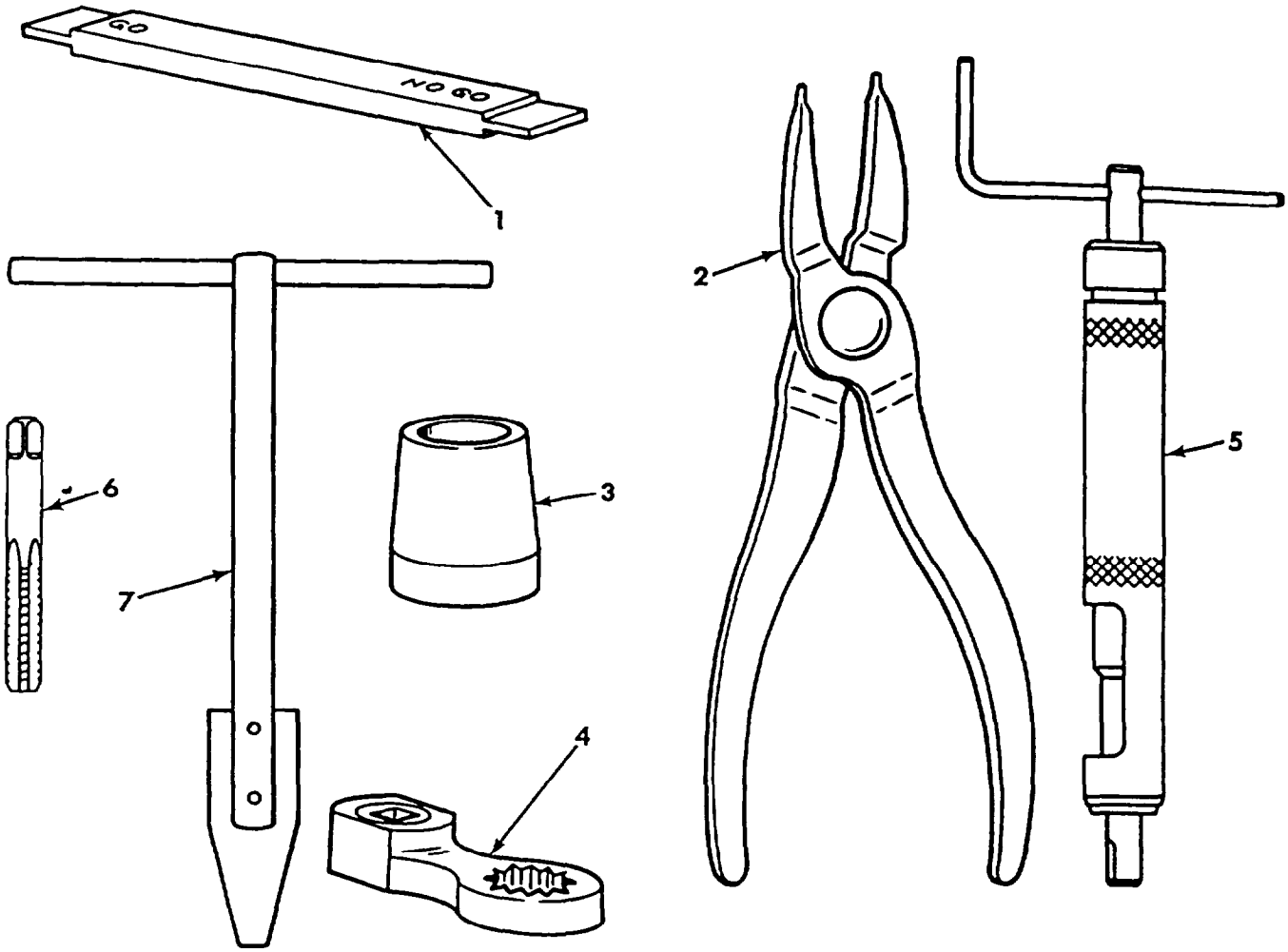

Figure B-3. Special Tools.

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY INC IN UNIT
						GROUP - 2604		
B-3	1	PEHZZ	4910-00-793-5030	10882675	19207	GAGE, TURBOCHARGER	EA	1
B-3	2	PEHZZ	5120-00-792-8624	10935598	19207	PLIERS, RETAINING RING	EA	1
B-3	3	PEHZZ	4910-00-870-2122	10899149	19207	SLEEVE, INSTALLING: FLINGER SLEEVE AND SHAFT SEAL RING EXPANDER	EA	1
B-3	4	PEHZZ	5120-00-323-4875	8708189	19207	WRENCH, BOX: BEARING HOUSING	EA	1
B-3	5	PEHZZ	5120-00-804-6055	3551-5	01556	INSERTER, SCREW THREAD: 5/16-18	EA	1
B-3	6	PEHZZ	5136-00-276-1031	5CBB	26344	TAP, THREAD: 5/16-18 (SPECIAL)	EA	1
B-3	7	PEHZZ	5120-00-723-6833	1227-6	01556	EXTRACTOR, SCREW THREAD INSERT: NO. 10-3/8	EA	1

Section IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX.

National Stock Number Cross Reference to Figure and Item Number

National stock number	Fig. no.	Item no.	National stock number	Fig. no.	Item no.
3120-00-087-2704	B-1	36	5305-00-500-0435	B-2	50
3120-00-087-2704	B-2	57	5305-00-576-5417	B-1	4
5465-00-103-9189	B-1	21	5305-00-576-5417	B-2	4
5465-00-103-9189	B-2	21	5340-00-582-7256	B-2	28
5365-00-103-9191	B-1	21	5365-00-655-8113	B-1	34
5365-00-103-9191	B-2	21	5365-00-655-8113	B-2	55
5365-00-104-2124	B-1	21	5120-00-723-6833	B-3	7
5365-00-104-2124	B-2	21	5330-00-724-5541	B-2	49
5365-00-115-1475	B-1	20	5330-00-724-7902	B-2	47
5365-00-115-1475	B-2	20	5120-00-792-8624	B-3	2
2950-00-118-8535	B-1	16	4910-00-793-5030	B-3	1
2950-00-118-8535	B-2	16	5120-00-804-6055	B-3	5
5330-00-180-9951	B-2	48	5330-00-805-2966	B-2	31
5310-00-194-0636	B-2	41	5315-00-815-3250	B-2	29
2990-00-235-1709	B-1	24	5330-00-833-7491	B-2	34
4030-00-270-5436	B-2	39	2990-00-858-6206	B-1	39
4730-00-277-6352	B-2	45	2990-00-858-6206	B-2	60
5340-00-290-4520	B-1	28	4910-00-870-2122	B-3	3
5340-00-290-4520	B-2	30	2990-00-970-7553	B-1	18
5330-00-297-6468	B-2	44	2990-00-970-7553	B-2	18
5310-00-298-2747	B-1	40	4730-01-007-5232	B-2	32
5310-00-298-2747	B-2	61	5307-01-008-6182	B-1	27
5120-00-323-4875	B-3	4	5307-01-008-6182	B-2	27
2950-00-397-3363	B-1	9	2950-01-053-7200	B-1	6
2950-00-397-3363	B-2	9	2950-01-053-7200	B-2	3
3120-00-413-9604	B-1	14	5330-01-059-0096	B-1	31
3120-00-413-9604	B-2	14	5330-01-059-0096	B-2	52
4310-00-423-3982	B-1	22	5305-01-145-8286	B-2	42
4310-00-423-3982	B-2	22	5305-01-145-8287	B-2	43
4730-00-431-9307	B-2	33	5340-01-145-8291	B-2	36
4710-00-432-0055	B-1	30	4030-01-145-8293	B-2	38
4710-00-432-0055	B-2	51	4460-01-145-8299	B-2	37
5330-00-486-0417	B-1	2	5340-01-145-8310	B-2	46
5330-00-486-0417	B-2	2	5310-01-151-2732	B-1	13
5307-00-492-3217	B-1	12	5310-01-151-2732	B-2	13
5307-00-492-3217	B-2	12	2990-01-152-2373	B-1	KIT
5305-00-500-0435	B-1	29	2990-01-152-2373	B-2	KIT

Part Number Cross Reference to Figure and Item Number

Part number	FSCM	Fig. No.	Item No.
A138201	53591	B-1	2
A138201	53591	B-2	2
A152258	53591	B-1	9
A152258	53591	B-2	9
A157571	53591	B-1	3
A157571	53591	B-2	3
A157572	53591	B-2	33
A157572	53591	B-2	54
A157599	53591	B-1	30
A157599	53591	B-2	51
A157615	53591	B-1	6
A157615	53591	B-2	6
A189814	53591	B-1	19
A189814	53591	B-2	19
B135619	53591	B-1	15
B135619	53591	B-2	15
B135796	53591	B-1	18
B135796	53591	B-2	18
B137856	53591	B-1	17
B137856	53591	B-2	17
B1400.29	53591	B-1	14
B140029	53591	B-2	14
B146827	53591	B-1	37
B146827	53591	B-2	58
B157229	53591	B-1	25
B157617	53591	B-1	5
B57617	53591	B-2	5
B158568	53591	B-1	7
B158568	53591	B-2	7
B184910	53591	B-2	25
C125648	53591	B-1	21
C125648	53591	B-2	21
C125649	53591	B-1	21
C125649	53591	B-2	21
C125650	53591	B-1	21
C125650	53591	B-2	21
C137016	53591	B-1	36
C137016	53591	B-2	57
C137945	53591	B-1	35
C137945	53591	B-2	56
C139052	53591	B-1	20
C139052	53591	B-2	20
C140319	53591	B-1	4
C140319	53591	B-2	4
C140963	53591	B-1	16
C140963	53591	B-2	16
C142114	53591	B-1	8
C142114	53591	B-2	8
C146164	53591	B-1	23
C146164	53591	B-2	23
C157415	53591	B-1	12
C157415	53591	B-2	12
C157631	53591	B-1	27
C157631	53591	B-2	27
C158567	53591	B-1	38
C158567	53591	B-2	59
C183234	53591	B-1	1
C183234	53591	B-2	1
C184054	53591	B-1	31
C184054	53591	B-2	52
L157148	53591	B-1	26
L157149	53591	B-1	22
L157149	53591	B-2	22
L157542	53591	B-1	32
L157542	53591	B-2	53
MS16627-1106	96906	B-1	34
MS16627-1106	96906	B-2	55
MS20500-428	96906	B-1	40
MS20500-428	96906	B-2	61
MS21208C5-20	96906	B-1	28
MS21208C5-20	96906	B-2	30
MS21209F5-20	96906	B-2	28
MS27769-1	96906	B-2	45
MS28778-4	96906	B-2	31
MS28778-5	96906	B-2	34
MS39086-101	96906	B-2	29
MS51525A4	96906	B-2	32
MS51525A5	96906	B-2	33
MS87006-3	96906	B-2	39
MS9068-013	96906	B-2	47
MS9068-018	96906	B-2	49
MS9068-038	96906	B-2	48
MS9320-11	19207	B-2	41
SPL51712-6	15653	B-1	13
SPL51712-6	15653	B-2	13
10882675	19207	B-3	1
10899149	19207	B-3	3
10935598	19207	B-3	2
12275840	19207	B-2	37
12275841	19207	B-2	40
12275864	19207	B-2	35
12275866-1	19207	B-2	42
12275866-2	19207	B-2	43
12275867	19207	B-2	38
12275868	19207	B-2	36
12275869	19207	B-2	46

* U.S. GOVERNMENT PRINTING OFFICE: 1997-646-039/60135

PART NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER

PART NUMBER	FSCM	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
132575	53591	B-1	29	184907	53591	B-2	26
132575	53591	B-2	50	42C16887	21450	B-2	BULK
140153	53591	B-1	24	5705073	19207	B-1	KIT
140153	53591	B-2	24	5705073	19207	B-2	KIT
157809	53591	B-1	11	600-001-5-16	83259	B-2	44
157809	53591	B-2	11	7383439	19207	B-1	39
158581	53591	B-1	10	7383439	19207	B-2	60
158581	53591	B-2	10	8708189	19207	B-3	4

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

INTRODUCTION.

This appendix lists the expendable supplies and materials you will need to repair the turbosupercharger. These items are authorized to you by CTA50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

Item Number	National Stock Number	Description'	U/M
1	7920-00-205-1711	RAG, WIPING, COTTON, WHITE: 50 lb. bale: 000-R-30 (81348)	lb.
2	9150-00-231-6689	PL SPECIAL LUBE OIL: 1 qt. can, VV-L-800 (81348)	qt.
3	6850-00-281-1985	SD DRYCLEANING SOLVENT: 1 gallon can, P-O-680, Type II (81348)	gal.
4	7510-00-852-8179	TAPE, ADHESIVE: Type II, 36 yd. roll, 1 in. wide, MIL-T-22085 (81349)	

ALPHABETICAL INDEX

Subject, Page Number

ALPHABETICAL INDEX - Continued

ALPHABETICAL INDEX - Continued

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Direct and General Support Maintenance requirements for Recovery Vehicles, Medium, M88A1; Tanks, Combat, Full Tracked, 105mm, M60; Miscellaneous Combat Vehicles, Combat Engineer, Full Track, M728; Tank, Bridge Launcher, AVLB; Tank, Combat, Full Tracked: 105mm Gun, M60A1(RISE); Tank, Combat, Full Tracked: 105mm Gun, M48A5 and M60A3 Tank Turret.

* U.S. GOVERNMENT PRINTING OFFICE: 1984.654-116:4065

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

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DATE: Date you fill out this form.

PUBLICATION NUMBER	DATE	TITLE
TM 9-XXXX-XXX-XX	Date of TM	Title of TM

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
3		2		Item 10. Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.
109		51		Item 3. The NSN and P/N are not listed on the AMDF nor the MCRL. Request correct NSN and P/N be furnished.
2-8			2-1	Preventive Maintenance Checks and Services. Item 7 under "Items to be inspected" should be changed to read as follows: Firing linkage and firing mechanism pawl.
12	1-6a			Since there are both 20- and 30- round magazines for this rifle, data on both should be listed.

SAMPLE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER: Albert Rand SP5-226-5644

SIGN HERE: Albert Rand

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

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DATE

PUBLICATION NUMBER	DATE	TITLE
TM 9-2990-205-34&P	JUNE 1984	DS and GS Maintenance Manual, Including RPSTL, For Schwitzer Turbosupercharger, Model 5HDR

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

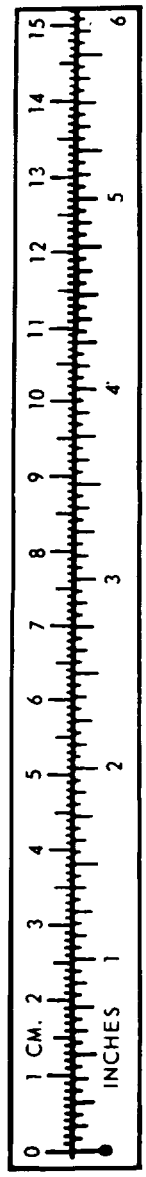
TEMPERATURE

$5/9\ (^0F - 32) = {}^0C$
212^0 Fahrenheit is equivalent to 100^0 Celsius
90^0 Fahrenheit is equivalent to 32.2^0 Celsius
32^0 Fahrenheit is equivalent to 0^0 Celsius
$9/5\ C^0 + 32 = F^0$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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