

TECHNICAL MANUAL

**UNIT MAINTENANCE MANUAL
FOR**

**TRUCK, TRACTOR, LINE HAUL
52,000 GVWR, 6 X 4, M915A2
(NSN 2320-01-272-5029)**

**TRUCK, TRACTOR, LIGHT EQUIPMENT
TRANSPORTER (LET)
68,000 GVWR, 6 X 6, W/WINCH, M916AI
(NSN 2320-01-272-5028)**

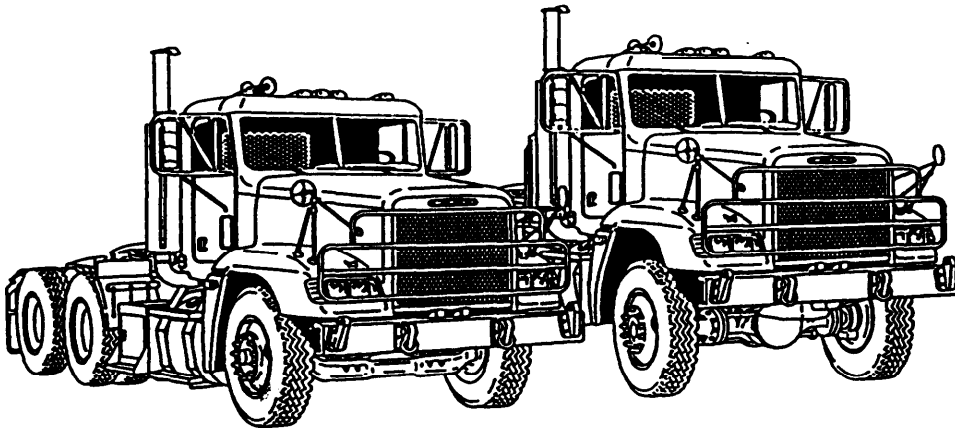


TABLE OF CONTENTS

VEHICLE MAINTENANCE 4-1
INSTRUCTIONS

REFERENCES

A-1

MAINTENANCE
ALLOCATION CHART

B-1

INDEX

Index-I

Approved for public release, distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY JUNE 1992

UNIT MAINTENANCE MANUAL

FOR

TRUCK, TRACTOR, LINE HAUL: 52,000 GVWR, 6 X 4, M915A2
(NSN 2320-01-272-5029)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET)
68,000 GVWR, 6 X 6, W/WINCH, M916A1
(NSN 2320-01-272-5028)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET)
68,000 GVWR, 6 X 6, W/WINCH, M916A2
(NSN 2320-01-431-1163)

TRUCK, DUMP, HEAVY, CHASSIS
68,000 GVWR, 6 X 6, 14 CU YD, ON-OFF HIGHWAY
M917A1 (NSN 3805-01-431-1165)
M917A1 W/MCS (NSN 3805-01-432-8249)

VOLUME 2 OF 2

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any 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 at the back of this manual direct to: Commander, US Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630. A reply will be furnished to you. You may also provide DA Form 2028-2 information to TACOM via datafax or e-mail. TACOM's datafax number for AMSTA-AC-NML is DSN 793-0726 or Commercial (309) 782-0726 and the e-mail address is: amsta-ac-nml@riaemh2.army.mil.

TABLE OF CONTENTS

VOLUME 2		Page
CHAPTER	4	VEHICLE MAINTENANCE INSTRUCTIONS
Section	I	Power Package Maintenance 4-1
Section	II	Fuel System Maintenance 4-38
Section	III	Exhaust System Maintenance 4-88
Section	IV	Cooling System Maintenance 4-98
Section	V	Electrical System Maintenance 4-146
Section	VI	Transmission Maintenance 4-334
Section	VII	Transfer Case Maintenance 4-367
Section	VIII	Driveline Maintenance 4-385
Section	IX	Front and Rear Axles Maintenance 4-395

Approved for public release; distribution is unlimited.

TABLE OF CONTENTS (Cont)

			Page
Section	X	Brake Maintenance	4-401
Section	XI	Wheel Maintenance	4-582
Section	XII	Steering Maintenance	4-605
Section	XIII	Frame And Towing Attachments Maintenance	4-618
Section	XIV	Body, Cab, And Hood Maintenance.....	4-652
Section	XV	Winch And Power Take-Off (PTO) Maintenance	4-757
Section	XVI	Body And Chassis Accessory Items Maintenance	4-774
Section	XVII	Gages (Non-Electrical) Maintenance.....	4-852
Section	XVIII	Chemical, Biological, Radiological (CBR) Equipment Maintenance.....	4-870
Section	XIX	Air Conditioning System Maintenance	4-876
APPENDIX	A	REFERENCES	A-1
APPENDIX	B	MAINTENANCE ALLOCATION CHART	B-1
APPENDIX	C	EXPENDABLE SUPPLIES AND MATERIALS LIST	C-1
APPENDIX	D	ILLUSTRATED LIST OF MANUFACTURED ITEMS	D-1
APPENDIX	E	TORQUE LIMITS	E-1
		INDEX	Index-1

CHAPTER 4 VEHICLE MAINTENANCE INSTRUCTIONS

Section I. POWER PACKAGE MAINTENANCE

OVERVIEW

This section illustrates and describes procedures for maintenance of the power package and related components. A list of tasks contained in this section is shown below.

	Page
Oil Filter Element Replacement	4-2
Oil Bypass Filter Adapter and Tube Replacement (M915A2 and M916A1)	4-4
Oil Cooler, Core, and Oil Filter Adapter Replacement (M915A2 and M916A1)	4-6
Oil Cooler, Core, and Oil Filter Adapter Replacement (All Except M915A2 and M916A1)	4-15.0
Oil Fill Tube Replacement	4-16
Oil Level Dipstick, Tube, and Adapter Replacement	4-18
Air Intake Tubes, Hoses, and Clamps Replacement	4-20
Air Compressor Replacement (M915A2 and M916A1)	4-22
Air Compressor Replacement (All Except M915A2 and M916A1)	4-27.0
Tachometer Drive Replacement	4-28
Oil Sample Valve Replacement	4-32
Air Compressor Governor Replacement and Adjustment	4-34
Air Compressor Discharge Hose Replacement	4-36

OIL FILTER ELEMENT REPLACEMENT

This task covers: a. Removal b. Cleaning c. Inspection d. Installation

INITIAL SETUP**Tools and Special Equipment:**

Shop Equipment, SC 4910-95-CL-A72

General Safety Instructions:**WARNING****Materials/Parts:**

Element, Bypass Filter	P/N 25011188
Element, Full Flow Filter (2)	P/N 25010495
Oil, Lubricating	Appendix C, Item 18

- **Hot oil can cause serious burns. Allow engine to cool down before changing oil filter elements.**
- **Spilled engine oil is very slippery. Wipe up any spilled oil immediately. Failure to do so could result in serious injury to personnel.**

References:

TM 9-2320-363-20-1

REMOVAL**WARNING**

- **Hot oil can cause serious burns. Allow engine to cool down before changing oil filter elements.**
- **Spilled engine oil is very slippery. Wipe up any spilled oil immediately. Failure to do so could result in serious injury to personnel.**

NOTE

Oil filter element replacement should be performed on warm engine.

1. PLACE SUITABLE DRAIN PAN UNDER OIL FILTER ELEMENT TO BE REMOVED, TO CATCH OIL.
2. USING STRAP WRENCH, REMOVE AND DISCARD OIL FILTER ELEMENT (1) WITH GASKET (2).

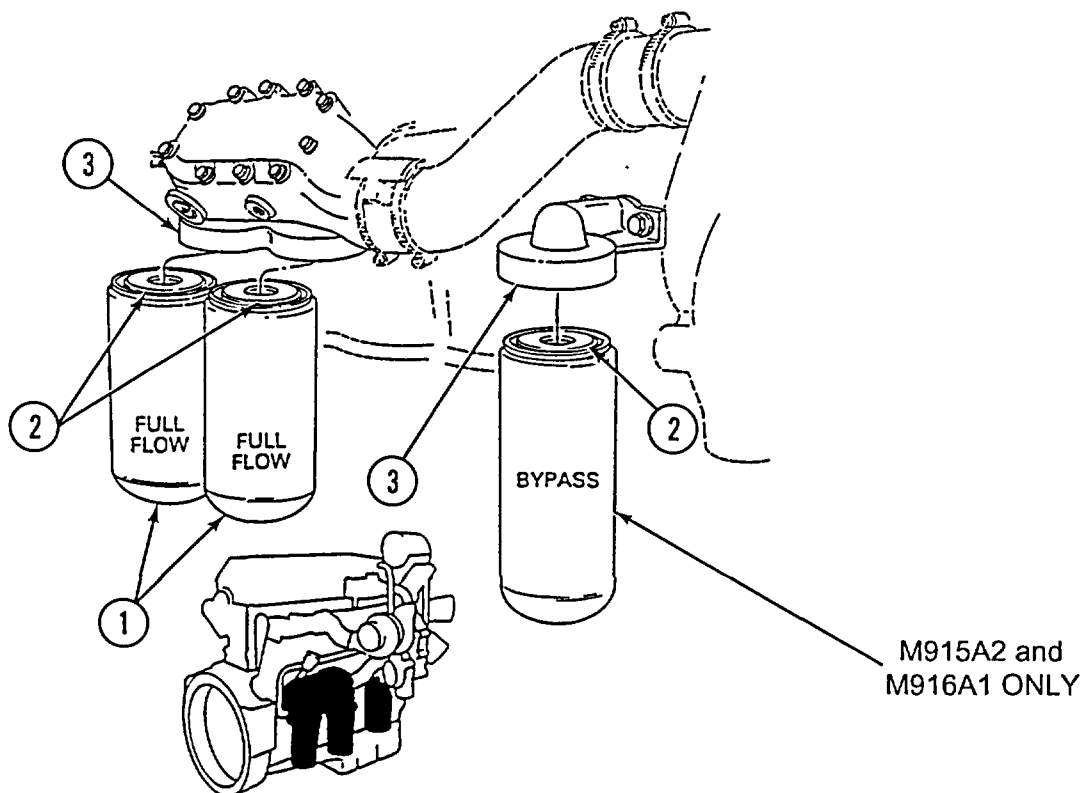
NOTE

M916A1 serial numbers 465379 through 465446 and 662068 through 662079, M916A2, M917A1, and M917A1 w/MCS have no bypass oil filter.

3. REPEAT STEPS 1 AND 2 FOR REMAINING OIL FILTER ELEMENTS.

CLEANING

Clean oil filter adapter where oil filter gasket makes contact.



INSPECTION

Inspect oil filter adapter for cracks, nicks, or damaged threads.

INSTALLATION

1. COAT NEW GASKET (2) WITH THIN FILM OF ENGINE LUBRICATING OIL.
2. FILL NEW OIL FILTER ELEMENT (1) APPROXIMATELY 2/3 FULL WITH ENGINE LUBRICATING OIL
3. THREAD NEW OIL FILTER ELEMENT (1) ON ADAPTER (3) BY HAND UNTIL NO FILTER ELEMENT SIDE MOVEMENT IS EVIDENT.

CAUTION

To prevent damage to filter element, do not use filter wrench for installation.

4. TIGHTEN OIL FILTER ELEMENT (1) ADDITIONAL 2/3 TURN.

NOTE

M916A1 serial numbers 465379 through 465446 and 662068 through 662079, M916A2, M917A1, and M917A1 w/MCS have no oil bypass filter.

5. REPEAT STEPS 1 THRU 4 FOR REMAINING OIL FILTER ELEMENTS.

NOTE

Follow-on Maintenance:
Top-off engine oil (Unit PMCS, TM 9-2320-363-20-1).

OIL BYPASS FILTER ADAPTER AND TUBE REPLACEMENT

This task covers: a. Removal b. Cleaning/Inspection c. Installation

INITIAL SETUP

Applicable Configuration:		Materials/Parts:	
M915A2 and M916A1		Packing, Preformed P/N 23508392	
Tools and Special Equipment:		Equipment Condition:	
Shop Equipment, SC 4910-95-CL-A72		Reference	Condition Description
Tool Kit, SC 5180-90-CL-N26		Page 4-2	Oil Filter Element Removed

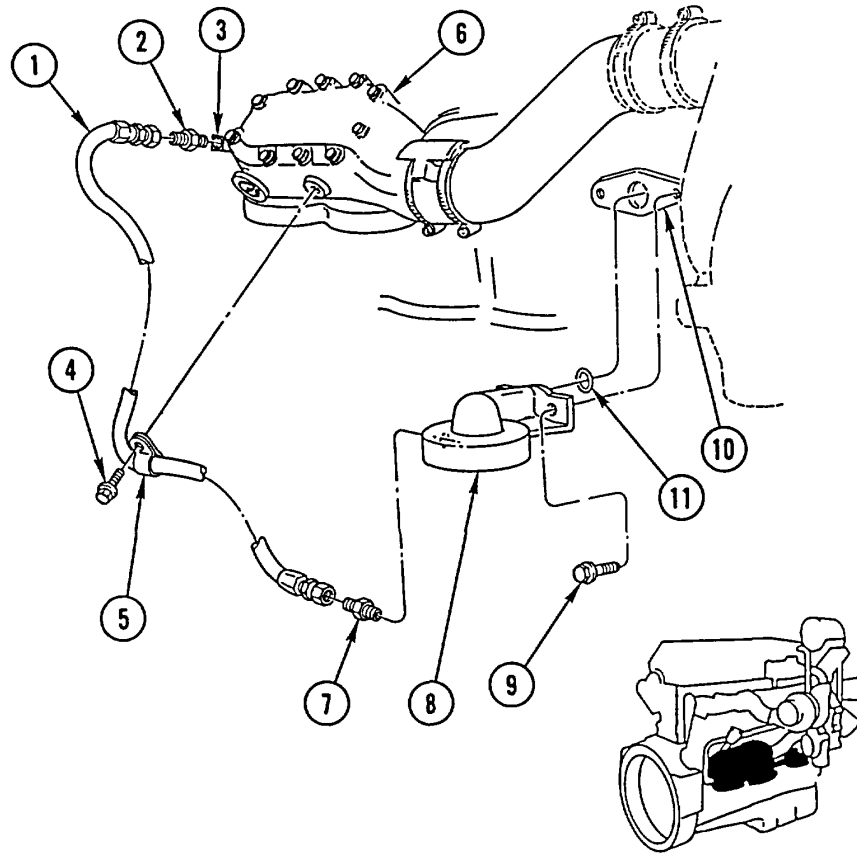
REMOVAL

NOTE
M916A1 serial numbers 465379 through 465446 and 662068 through 662079 have no oil bypass filter.

1. DISCONNECT BYPASS TUBE (1) FROM CONNECTOR (2) AT REAR OF OIL FILTER ADAPTER (3).
2. REMOVE BOLT (4) AND CLAMP (5) FROM OIL COOLER (6).
3. DISCONNECT BYPASS TUBE (1) FROM CONNECTOR (7) ON OIL BYPASS FILTER ADAPTER (8).
4. REMOVE CLAMP (5) FROM BYPASS TUBE (1).
5. REMOVE TWO CONNECTORS (2 AND 7) FROM OIL FILTER ADAPTER (3) AND OIL BYPASS FILTER ADAPTER (8).
6. REMOVE TWO BOLTS (9) AND OIL BYPASS FILTER ADAPTER (8) FROM ENGINE BLOCK (10).
7. REMOVE AND DISCARD PREFORMED PACKING (11) FROM OIL BYPASS FILTER ADAPTER (8).

CLEANING/INSPECTION

Clean and inspect all parts in accordance with Chapter 2.



INSTALLATION

NOTE

M916A1 serial numbers 465379 through 465446 and 662068 through 662079 have no oil bypass filter.

1. INSTALL NEW PREFORMED PACKING (11) IN OIL BYPASS FILTER ADAPTER (8).
2. INSTALL OIL BYPASS FILTER ADAPTER (8) AND TWO BOLTS (9) ON ENGINE BLOCK (10). TIGHTEN BOLTS TO 15-19 LB-FT (20-26 N.m).
3. INSTALL TWO CONNECTORS (7 AND 2) ON OIL BYPASS FILTER ADAPTER (8) AND OIL FILTER ADAPTER (3).
4. INSTALL CLAMP (5) ON BYPASS TUBE (1).
5. CONNECT BYPASS TUBE (1) TO CONNECTOR (7) ON OIL BYPASS FILTER ADAPTER (8).
6. INSTALL CLAMP (5) AND BOLT (4) ON OIL COOLER (6).
7. CONNECT BYPASS TUBE (1) TO CONNECTOR (2) AT REAR OF OIL FILTER ADAPTER (3).

NOTE

Follow-on Maintenance:

Install oil filter element (page 4-2).

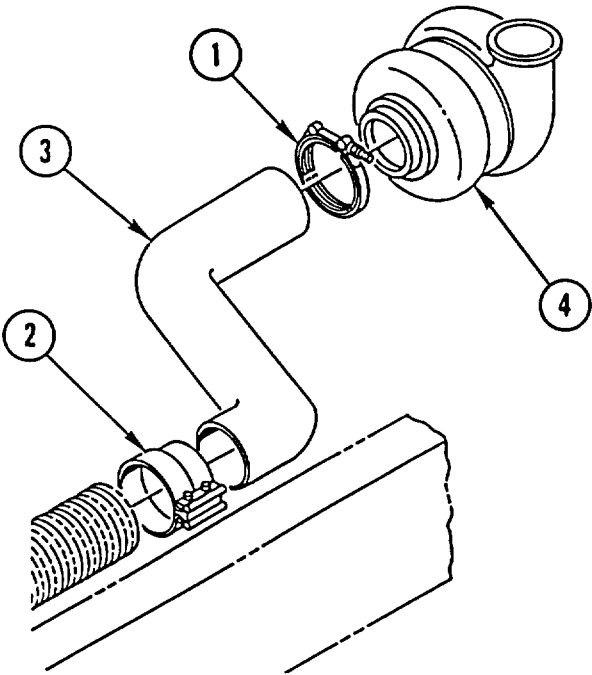
OIL COOLER, CORE, AND OIL FILTER ADAPTER REPLACEMENT

This task covers: a. Removal b. Cleaning/Inspection c. Installation

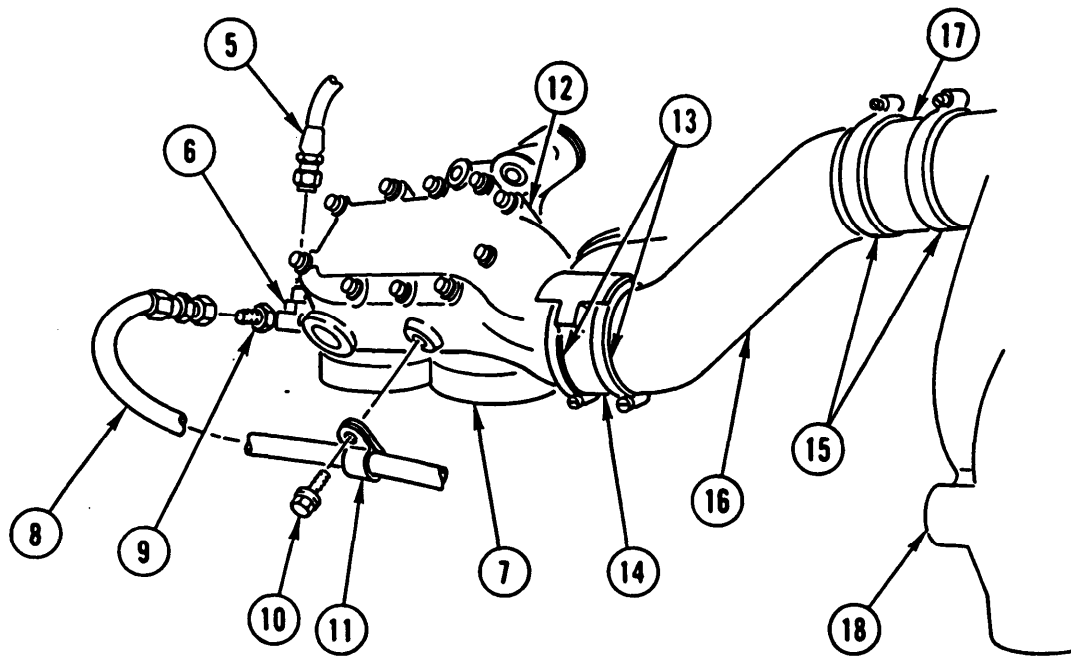
INITIAL SETUP

Applicable Configuration: M915A2 and M916A1		References: TM 9-2320-363-20-1	
Tools and Special Equipment: Tool Kit, SC 5180-90-CL-N26		Equipment Conditions:	
Materials/Parts:		Reference	Condition Description
Ring, Seal	P/N 8929289	Page 4-2	Oil Filter Elements Removed
Ring, Seal	P/N 23505902	Page 4-141	Radiator Drained
Gasket	P/N 23506247		
Ring, Seal (4)	P/N 23508392		
Clamp, Seal	P/N KYX00-5833		
Compound, Pipe Sealing	Appendix C, Item 8		
Oil, Lubricating	Appendix C, Item 16		

REMOVAL

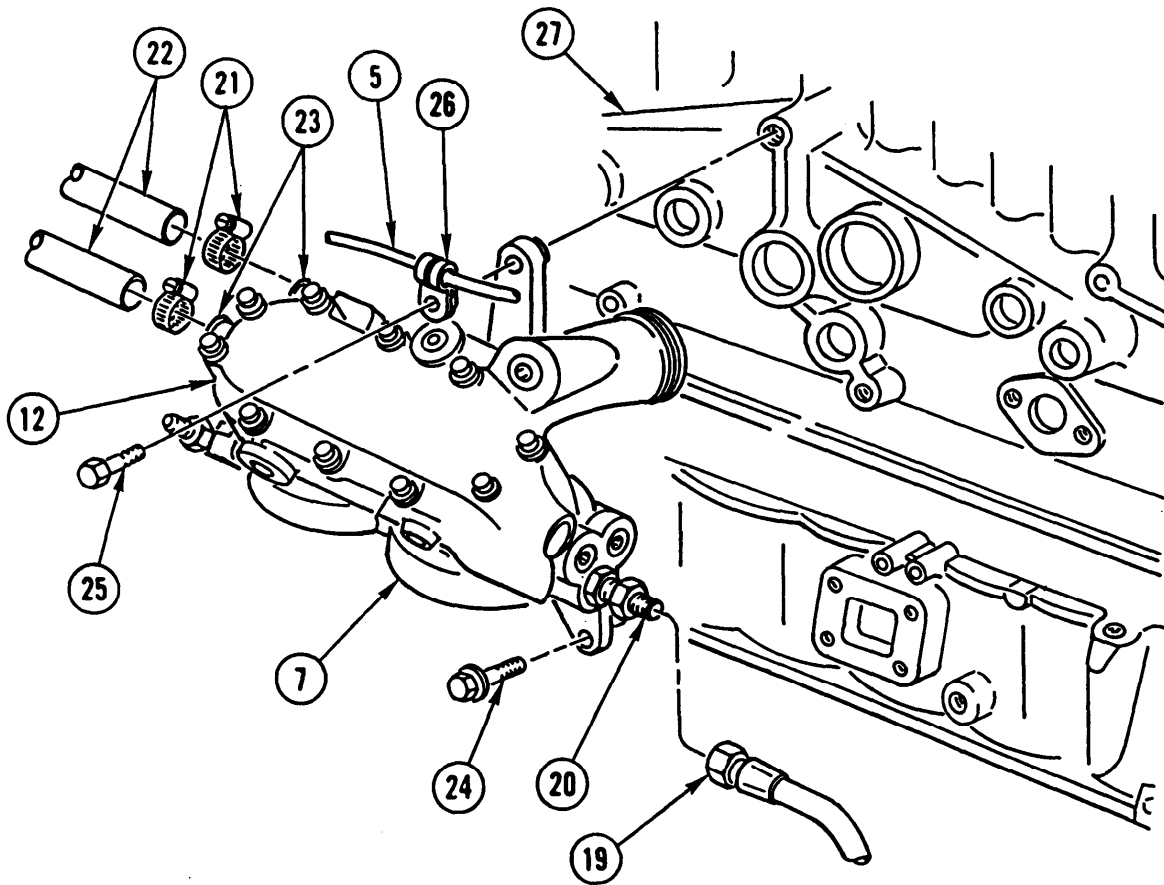


- 1. REMOVE VEE CLAMP (1).
- 2. LOOSEN SEAL CLAMP (2) AND REMOVE EXHAUST INLET PIPE (3) FROM TURBOCHARGER (4). REMOVE AND DISCARD SEAL CLAMP (2).

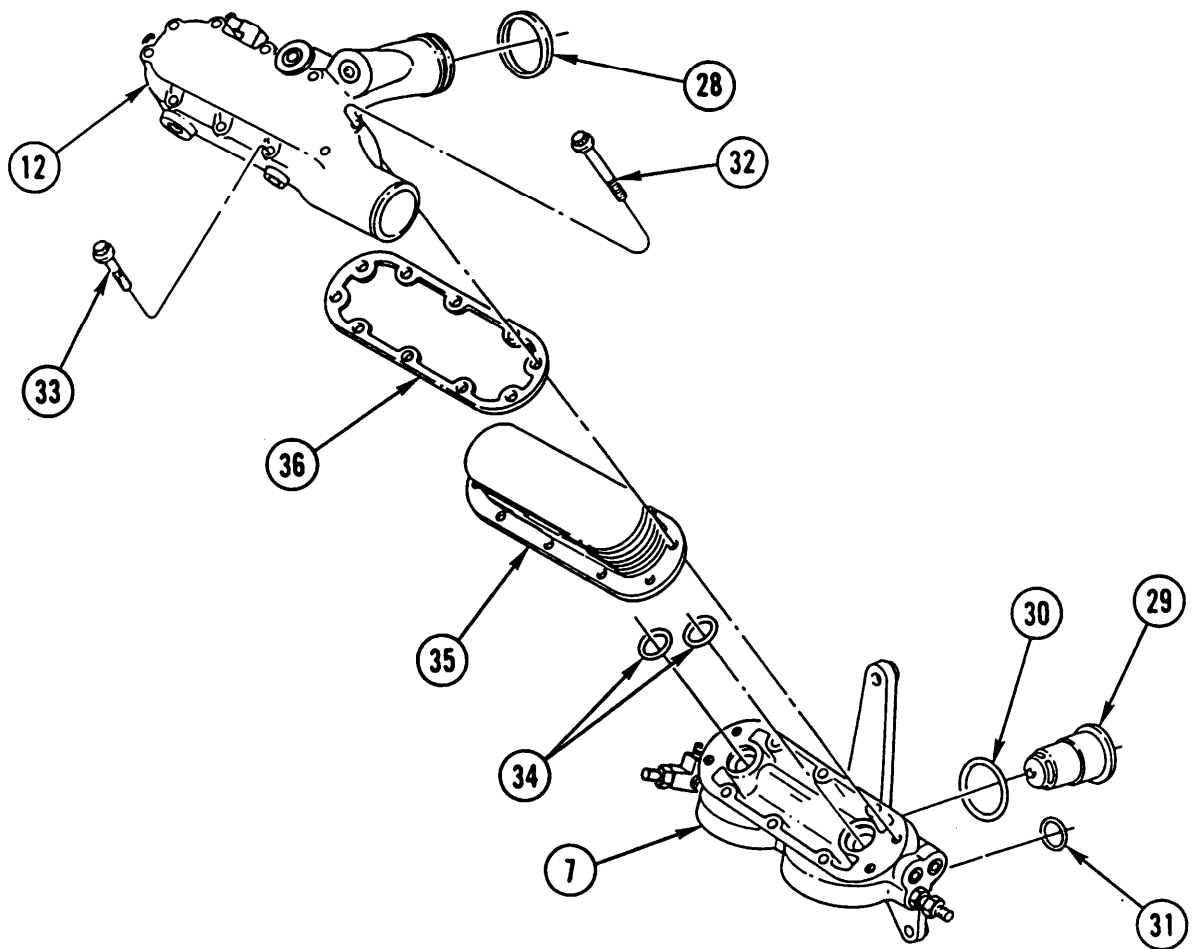


3. DISCONNECT TURBOCHARGER OIL SUPPLY TUBE (5) FROM FITTING (6) AT REAR OF OIL FILTER ADAPTER (7).
4. DISCONNECT BYPASS FILTER OIL SUPPLY TUBE (8) FROM CONNECTOR (9).
5. REMOVE BOLT (10) AND CLAMP (11) FROM OIL COOLER (12).
6. POSITION BYPASS FILTER OIL SUPPLY TUBE (8) AWAY FROM OIL COOLER (12).
7. LOOSEN TWO HOSE CLAMPS (13) AND REMOVE INLET HOSE (14) FROM OIL COOLER (12). REMOVE TWO HOSE CIAMPS (13).
- & LOOSEN TWO HOSE CLAMPS (15) AND REMOVE COOLANT PIPE (16) AND HOSE (17) FROM WATER PUMP (18). REMOVE IWO HOSE CIAMPS (15).

OIL COOLER, CORE, AND OIL FILTER ADAPTER REPLACEMENT (CONT)

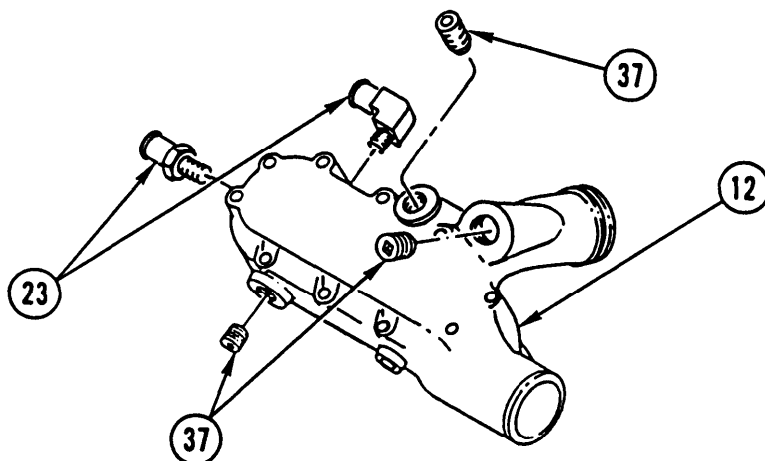


9. DISCONNECT OIL SAMPLE VALVE HOSE (19) FROM CONNECTOR (20).
10. LOOSEN TWO CLAMPS (21) AND DISCONNECT TWO HOSES (22) FROM TWO WATER FITTINGS (23).
11. REMOVE THREE MOUNTING BOLTS (24) FROM OIL FILTER ADAPTER (7).
12. REMOVE BOLT (25) AND SUPPLY HOSE CLAMP (26) FROM OIL FILTER ADAPTER (7).
13. POSITION OIL SUPPLY TUBE (5) AWAY FROM OIL COOLER (12).
14. REMOVE OIL COOLER (12) AND OIL FILTER ADAPTER (7) AS AN ASSEMBLY FROM ENGINE BLOCK (27).

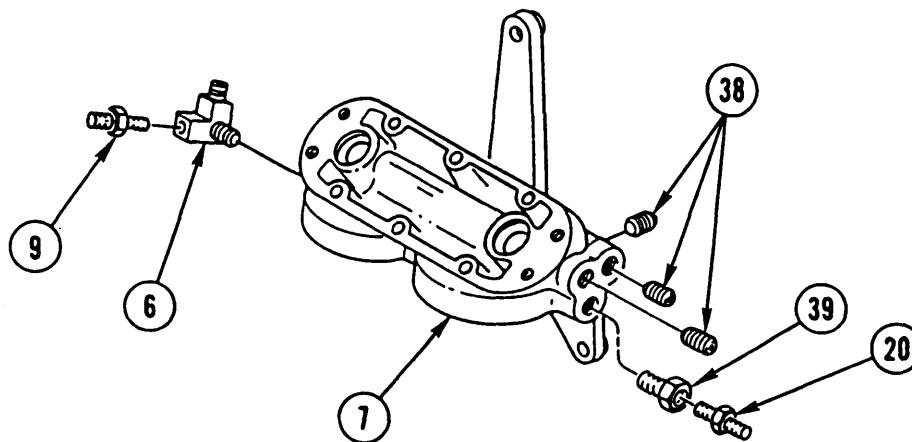


15. REMOVE AND DISCARD SEAL RING (28) FROM OIL COOLER (12).
16. REMOVE THERMOSTAT (29) AND SEAL RING (30) FROM OIL FILTER ADAPTER (7). DISCARD SEAL RING.
17. REMOVE AND DISCARD TWO SEAL RINGS (31) FROM OIL FILTER ADAPTER (7).
18. REMOVE SEVEN LONG BOLTS (32) AND THREE SHORT BOLTS (33) FROM OIL COOLER (12).
19. REMOVE OIL COOLER (12) FROM OIL FILTER ADAPTER (7).
20. REMOVE AND DISCARD TWO SEAL RINGS (34) FROM OIL FILTER ADAPTER (7).
21. REMOVE CORE (35) FROM OIL COOLER (12).
22. REMOVE AND DISCARD GASKET (36).

OIL COOLER, CORE, AND OIL FILTER ADAPTER REPLACEMENT (CONT)



23. REMOVE THREE PIPE PLUGS (37) FROM OIL COOLER (12).
24. REMOVE TWO WATER FITTINGS (23) FROM OIL COOLER (12).

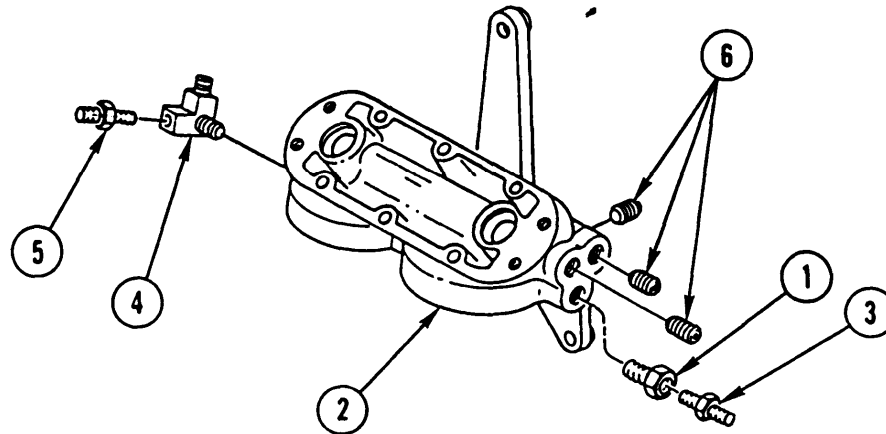


25. REMOVE THREE PIPE PLUGS (38) FROM OIL FILTER ADAPTER (7).
26. REMOVE CONNECTOR (9) FROM FITTING (6).
27. REMOVE FITTING (6) FROM OIL FILTER ADAPTER (7).
28. REMOVE CONNECTOR (20) FROM BUSHING (39).
29. REMOVE BUSHING (39) FROM OIL FILTER ADAPTER (7).

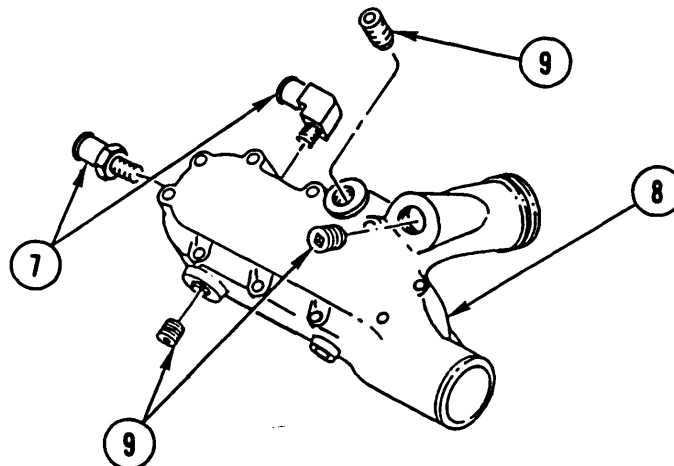
CLEANING/INSPECTION

Clean and inspect all parts in accordance with Chapter 2.

INSTALLATION

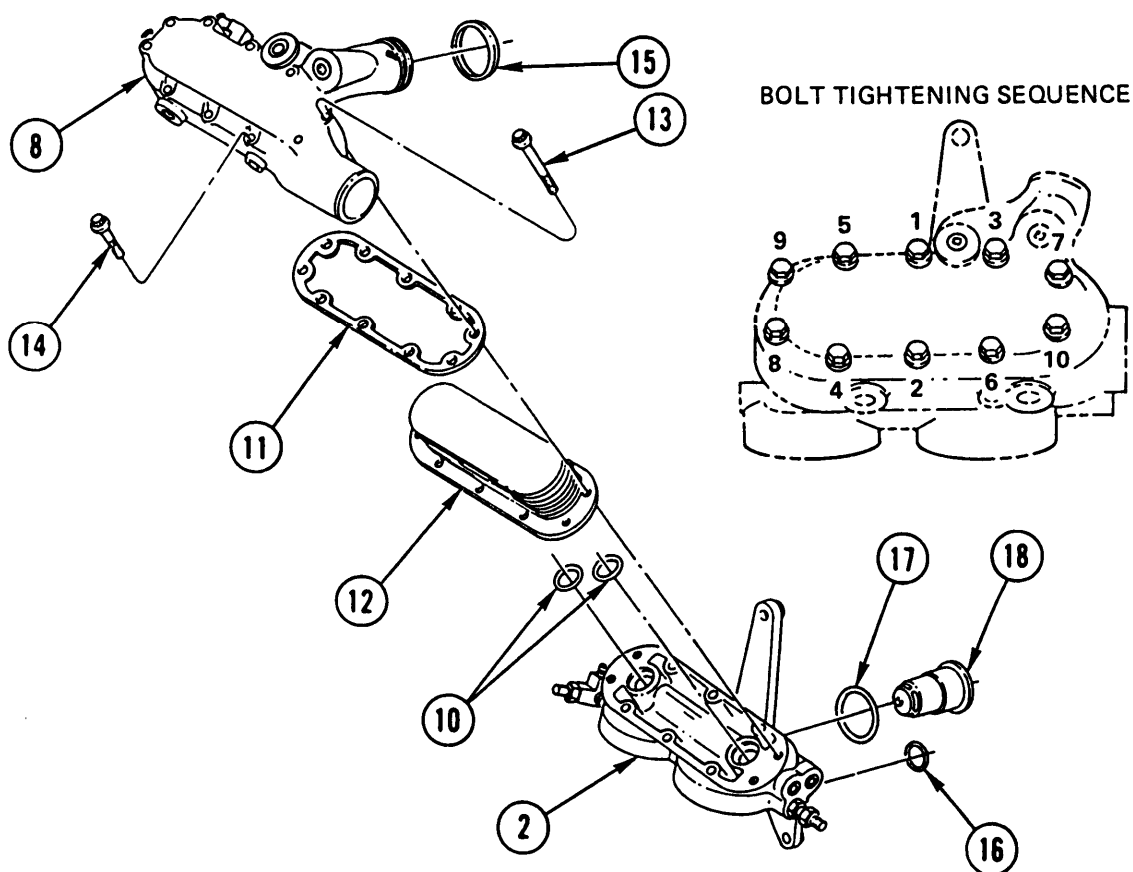


1. INSTALL BUSHING (1) IN OIL FILTER ADAPTER (2).
2. INSTALL CONNECTOR (3) IN BUSHING (1).
3. INSTALL FITTING (4) IN OIL FILTER ADAPTER (2).
4. INSTALL CONNECTOR (5) IN FITTING (4).
5. APPLY PIPE SEALING COMPOUND TO THREADS AND INSTALL THREE PIPE PLUGS (6) IN OIL FILTER ADAPTER (2).



6. INSTALL TWO WATER FITTINGS (7) IN OIL COOLER (8).
7. INSTALL THREE PIPE PLUGS (9) IN OIL COOLER (8).

OIL COOLER, CORE, AND OIL FILTER ADAPTER REPLACEMENT (CONT)



8. INSTALL TWO NEW SEAL RINGS (1 O) IN OIL FILTER ADAPTER (2).

CAUTION

Make sure all old gasket material is removed from core and oil cooler mating surfaces. Failure to do so could cause damage to engine.

9. INSTALL NEW GASKET (11) ON CORE (12).

10. INSTALL CORE (12) IN OIL COOLER (8).

CAUTION

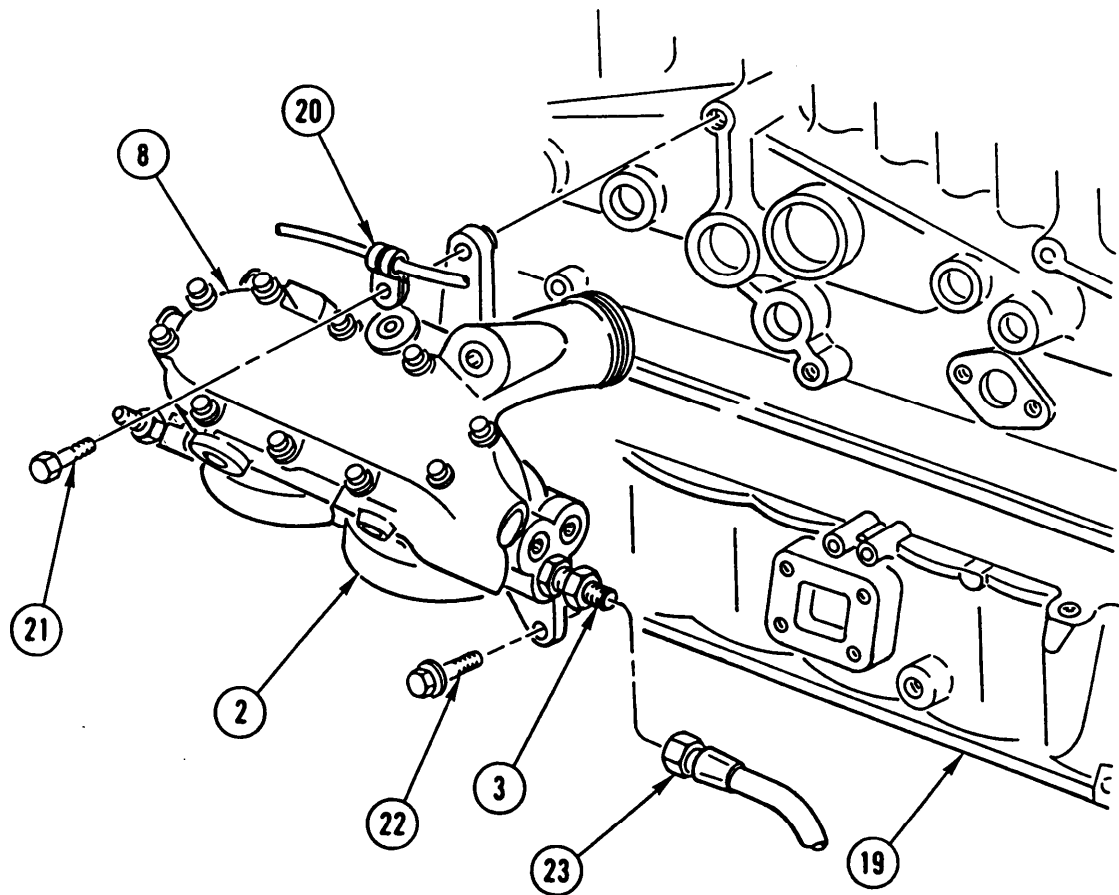
Make sure seal rings are not dislodged when installing oil cooler on oil filter adapter. Failure to do so could cause damage to engine.

11. INSTALL OIL COOLER (8) ON OIL FILTER ADAPTER (2).

12. INSTALL SEVEN LONG BOLTS (13) AND THREE SHORT BOLTS (14) ON OIL COOLER (8).

13. TIGHTEN 10 BOLTS (13 AND 14) TO 22-28 LB-FT (30-38 N.m) IN SEQUENCE SHOWN.

14. COAT NEW SEAL RING (15) WITH CLEAN ENGINE OIL AND INSTALL SEAL RING (15) ON OIL COOLER (8).
15. INSTALL TWO NEW SEAL RINGS (16) IN OIL FILTER ADAPTER (2).
16. INSTALL NEW SEAL RING (17) AND THERMOSTAT (18) IN OIL FILTER ADAPTER (2).

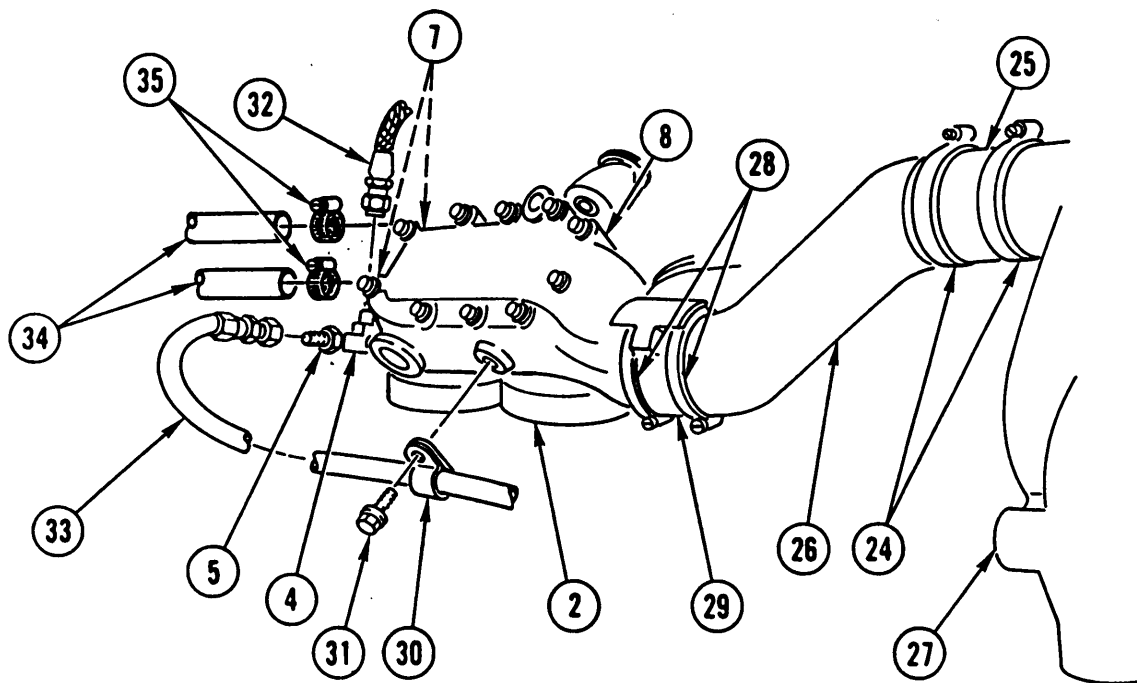


NOTE

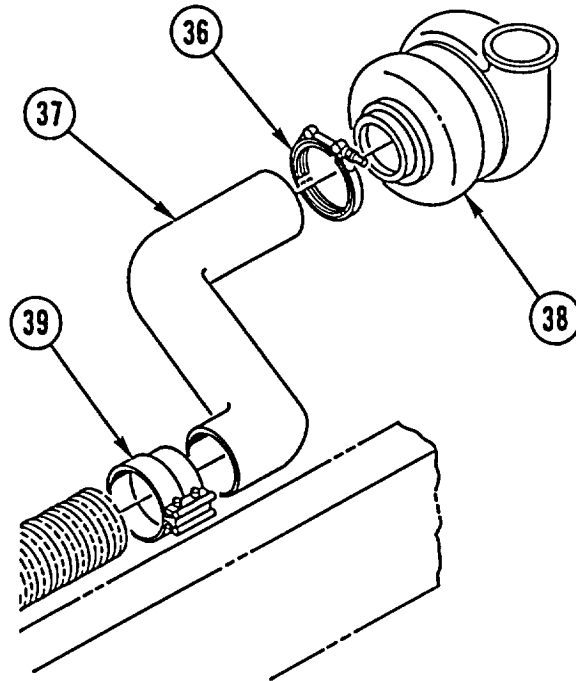
If necessary, tap neck of oil cooler housing with plastic or fiber mallet to force seal ring into engine block opening.

17. INSTALL OIL COOLER (8) ON ENGINE BLOCK (19).
18. INSTALL SUPPLY HOSE CLAMP (20) AND BOLT (21) HAND-TIGHT ON OIL FILTER ADAPTER (2).
19. INSTALL THREE MOUNTING BOLTS (22) HAND-TIGHT.
20. TIGHTEN THREE MOUNTING BOLTS (22) AND BOLT (21) TO 43-54 LB-FT (58-73 N.m).
21. CONNECT OIL SAMPLE VALVE HOSE (23) TO CONNECTOR (3).

OIL COOLER, CORE, AND OIL FILTER ADAPTER REPLACEMENT (CONT)



22. INSTALL TWO HOSE CLAMPS (24), HOSE (25), AND COOLANT PIPE (26) ON WATER PUMP (27). TIGHTEN TWO HOSE CLAMPS (24).
23. INSTALL TWO HOSE CLAMPS (28) AND INLET HOSE (29) ON OIL COOLER (8). TIGHTEN TWO HOSE CLAMPS (28).
24. INSTALL CLAMP (30) AND BOLT (31) ON OIL COOLER (8). TIGHTEN BOLT TO 43-54 LB-FT (58-73 N.m).
25. CONNECT TURBOCHARGER OIL SUPPLY TUBE (32) TO FITTING (4) AT REAR OF OIL FILTER ADAPTER (2).
26. CONNECT BYPASS FILTER OIL SUPPLY TUBE (33) TO CONNECTOR (5).
27. CONNECT TWO HOSES (34) AND TIGHTEN TWO CLAMPS (35) ON TWO WATER FITTINGS (7).



28. INSTALL VEE CLAMP (36) AND EXHAUST INLET PIPE (37) ON TURBOCHARGER (38). TIGHTEN VEE CLAMP (36).
29. INSTALL NEW SEAL CLAMP (39) ON EXHAUST INLET PIPE (37). TIGHTEN SEAL CLAMP (39).

NOTE

Follow-on Maintenance:

Install oil filter elements (page 4-2).
Fill radiator (Unit PMCS, TM 9-2320-363-20-1).

OIL COOLER, CORE, AND OIL FILTER ADAPTER REPLACEMENT

This task covers: a. Removal b. Cleaning/Inspection c. Installation

INITIAL SETUP

Applicable Configuration:

All except M915A2 and M916A1

References:

TM 9-2320-363-20-1

Tools and Special Equipment:

Tool Kit, SC 5180-90-CL-N26

Equipment Conditions:

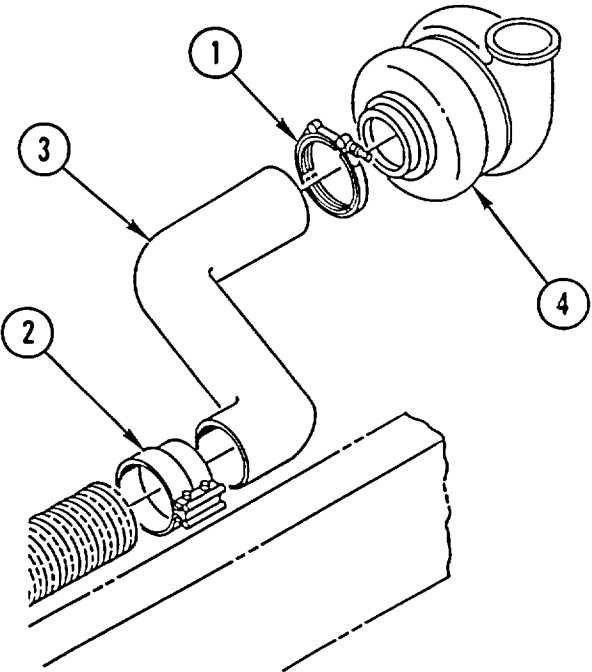
ReferenceCondition Description

Materials/Parts:

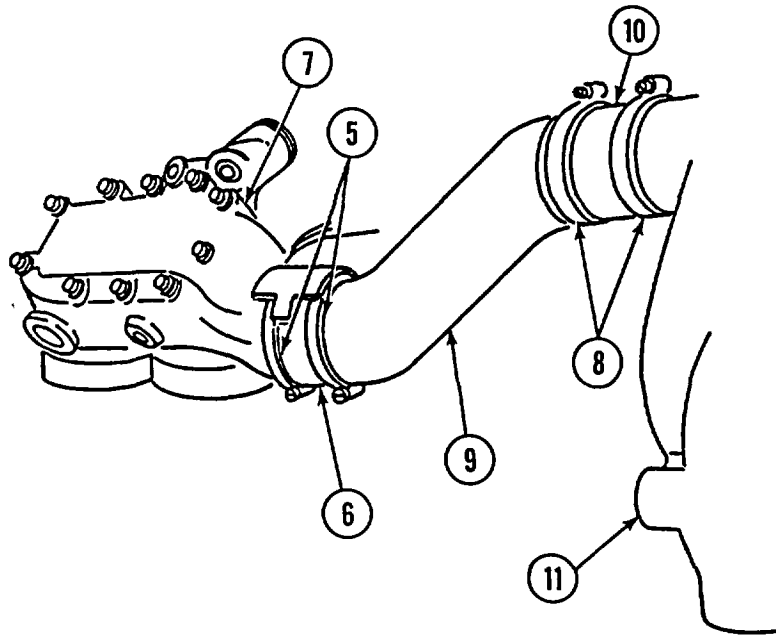
Ring, Seal	P/N 8929289
Ring, Seal	P/N 23505902
Gasket	P/N 23506247
Ring, Seal (4)	P/N 23508392
Clamp, Seal	P/N KYX00-5833
Compound, Pipe Sealing	Appendix C, Item 8
Oil, Lubricating	Appendix C, Item 16

Page 4-2	Oil Filter Elements Removed
Page 4-141	Radiator Drained

REMOVAL



1. REMOVE VEE CLAMP (1).
2. LOOSEN SEAL CLAMP (2) AND REMOVE EXHAUST INLET PIPE (3) FROM TURBOCHARGER (4). REMOVE AND DISCARD SEAL CLAMP (2).



3. LOOSEN TWO HOSE CLAMPS (5) AND REMOVE INLET HOSE (6) FROM OIL COOLER (7). REMOVE HOSE CLAMPS (5).
4. LOOSEN TWO HOSE CLAMPS (8) AND REMOVE COOLANT PIPE (9) AND HOSE (10) FROM WATER PUMP (11). REMOVE TWO HOSE CLAMPS (8).