

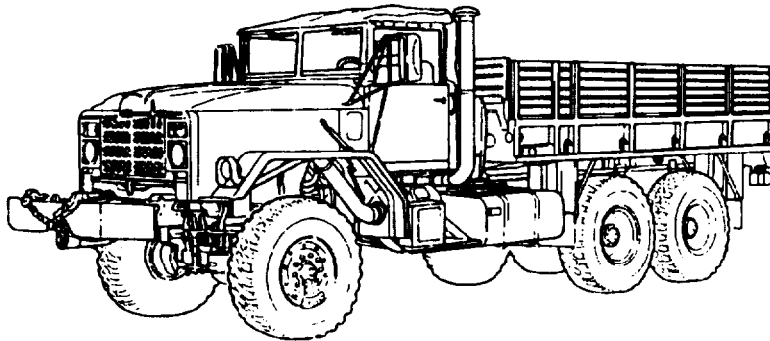
***ARMY TM 9-2320-272-24-3**
AIR FORCE TO 36A12-1C-1155-2-3

This publication supersedes TM 9-2320-272-20-1, October 1985, and changes 1 through 4; TM 9-2320-272-20-2, October 1985, and changes 1 through 3; TM 9-2320-272-34-1, June 1986, and changes 1 through 2; TM 9-2320-272-34-2, June 1986, and changes 1 and 2; and TM 9-2320-358-24&P, October 1992

TECHNICAL MANUAL
VOLUME 3 OF 4

DIRECT SUPPORT (DS) MAINTENANCE 4-271
(Contd)

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
MAINTENANCE MANUAL
FOR
TRUCK, 5-TON, 6X6, M939, M939A1, M939A2
SERIES TRUCKS (DIESEL)



TRUCK, CARGO: 5-TON, 6X6, DROPSIDE,
M923 (2320-01-050-2084) (EIC: BRY); M923A1 (2320-01-206-4087) (EIC: BSS); M923A2 (2320-01-230-0307) (EIC: BS7);
M925 (2320-01-047-8769) (EIC: BRT); M925A1 (2320-01-206-4088) (EIC: BST); M925A2 (2320-01-230-0308) (EIC: BS8);

TRUCK, CARGO: 5-TON, 6X6 XLWB,
M927 (2320-01-047-8771) (EIC: BRV); M927A1 (2320-01-206-4089) (EIC: BSW); M927A2 (2320-01-230-0309) (EIC: BS9);
M928 (2320-01-047-8770) (EIC: BRU); M928A1 (2320-01-206-4090) (EIC: BSX); M928A2 (2320-01-230-0310) (EIC: BTM);

TRUCK, DUMP: 5-TON, 6X6,
M929 (2320-01-047-8756) (EIC: BTH); M929A1 (2320-01-206-4079) (EIC: BSY); M929A2 (2320-01-230-0305) (EIC: BTN);
M930 (2320-01-047-8755) (EIC: BTG); M930A1 (2320-01-206-4080) (EIC: BSZ); M930A2 (2320-01-230-0306) (EIC: BTO);

TRUCK, TRACTOR: 5-TON, 6X6,
M931 (2320-01-047-8753) (EIC: BTE); M931A1 (2320-01-206-4077) (EIC: BS2); M931A2 (2320-01-230-0302) (EIC: BTP);
M932 (2320-01-047-8752) (EIC: BTD); M932A1 (2320-01-205-2684) (EIC: BS5); M932A2 (2320-01-230-0303) (EIC: BTQ);

TRUCK, VAN, EXPANSIBLE: 5-TON, 6X6,
M934 (2320-01-047-8750) (EIC: BTB); M934A1 (2320-01-205-2682) (EIC: BS4); M934A2 (2320-01-230-0300) (EIC: BTR);

TRUCK, MEDIUM WRECKER: 5-TON, 6X6,
M936 (2320-01-047-8754) (EIC: BTF); M936A1 (2320-01-206-4078) (EIC: BS6); M936A2 (2320-01-230-0304) (EIC: BTT).

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DEPARTMENTS OF THE ARMY AND THE AIR FORCE

JUNE 1998

TECHNICAL MANUAL
NO. 9-2320-272-24-3

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
Washington, D.C., 30 JUNE 1998

TECHNICAL ORDER
NO. 36A12-1C-1155-2-3

TECHNICAL MANUAL
VOLUME 3 OF 4
UNIT, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE MANUAL
FOR

TRUCK, 5-TON, 6X6, M939, M939A1, M939A2 SERIES TRUCKS (DIESEL)

TRUCK	MODEL	EIC	NSN WITHOUT WINCH	NSN WITH WINCH
Cargo, Dropside	M923	BRY	2320-01-050-2084	
Cargo, Dropside	M923A1	BSS	2320-01-206-4087	
Cargo, Dropside	M923A2	BS7	2320-01-230-0307	
Cargo, Dropside	M925	BRT		2320-01-047-8769
Cargo, Dropside	M925A1	BST		2320-01-206-4088
Cargo, Dropside	M925A2	BS8		2320-01-230-0308
Cargo	M927	BRV	2320-01-047-8771	
Cargo	M927A1	BSW	2320-01-206-4089	
Cargo	M927A2	BS9	2320-01-230-0309	
Cargo	M928	BRU		2320-01-047-8770
Cargo	M928A1	BSX		2320-01-206-4090
Cargo	M928A2	BTM		2320-01-230-0310
Dump	M929	BTH	2320-01-047-8756	
Dump	M929A1	BSY	2320-01-206-4079	
Dump	M929A2	BTN	2320-01-230-0305	
Dump	M930	BTG		2320-01-047-8755
Dump	M930A1	BSZ		2320-01-206-4080
Dump	M930A2	BTO		2320-01-230-0306
Tractor	M931	BTE	2320-01-047-8753	
Tractor	M931A1	BS2	2320-01-206-4077	
Tractor	M931A2	BTP	2320-01-230-0302	
Tractor	M932	BTD		2320-01-047-8752
Tractor	M932A1	BS5		2320-01-205-2684
Tractor	M932A2	BTQ		2320-01-230-0303
Van, Expansible	M934	BTB	2320-01-047-8750	
Van, Expansible	M934A1	BS4	2320-01-205-2682	
Van, Expansible	M934A2	BTR	2320-01-230-0300	
Medium Wrecker	M936	BTF		2320-01-047-8754
Medium Wrecker	M936A1	BS6		2320-01-206-4078
Medium Wrecker	M936A2	BTT		2320-01-230-0304

REPORTING OF 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 or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual, directly to: Director, Armament and Chemical Acquisition and Logistics Activity, 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 via datafax or e-mail:

- E-mail: amsta-ac-nml.@ria-emh2.army.mil
- Fax: DSN 783-0726 or commercial (309) 782-0726

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This publication is published in four volumes. TM 9-2320-272-24-1 contains chapters 1, 2, and 3 (through section IX). TM 9-2320-272-24-2 contains chapters 3 (sections X through XVI) and 4 (sections I through III). TM 9-2320-272-24-3 contains chapter 4 (sections IV through XVI). TM 9-2320-272-24-4 contains chapters 5 and 6 and appendices A through H. Volume 1 contains a table of contents for the entire manual. Volumes 1, 2, and 3 contain an alphabetical index covering tasks found in their respective volume. Volume 4 contains an alphabetical index covering all tasks found in the entire manual.

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Section IV. ENGINE (M939A2) MAINTENANCE

4-38. ENGINE MAINTENANCE INDEX

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4-39. ENGINE MOUNTING BRACKETS AND ISOLATORS REPLACEMENT

THIS TASK COVERS:

a. Removal

b. Installation

INITIAL SETUP:

APPLICABLE MODELS

M939A2

PERSONNEL REQUIRED

Two

TOOLS

General mechanic's tool kit (Appendix E, Item 1)
Torque wrench (Appendix E, Item 144)

REFERENCES (TM)

TM 9-2320-272-10
TM 9-2320-272-24P

MATERIALS/PARTS

Nine locknuts (Appendix D, Item 301)
Tiedown strap (Appendix D, Item 693)
Five locknuts (Appendix D, Item 302)

EQUIPMENT CONDITION

- Parking brake set (TM 9-2320-272-10).
- Surge tank removed (para. 3-62).
- Vibration damper removed (para. 4-42).
- Air cleaner hose removed (para. 3-13).

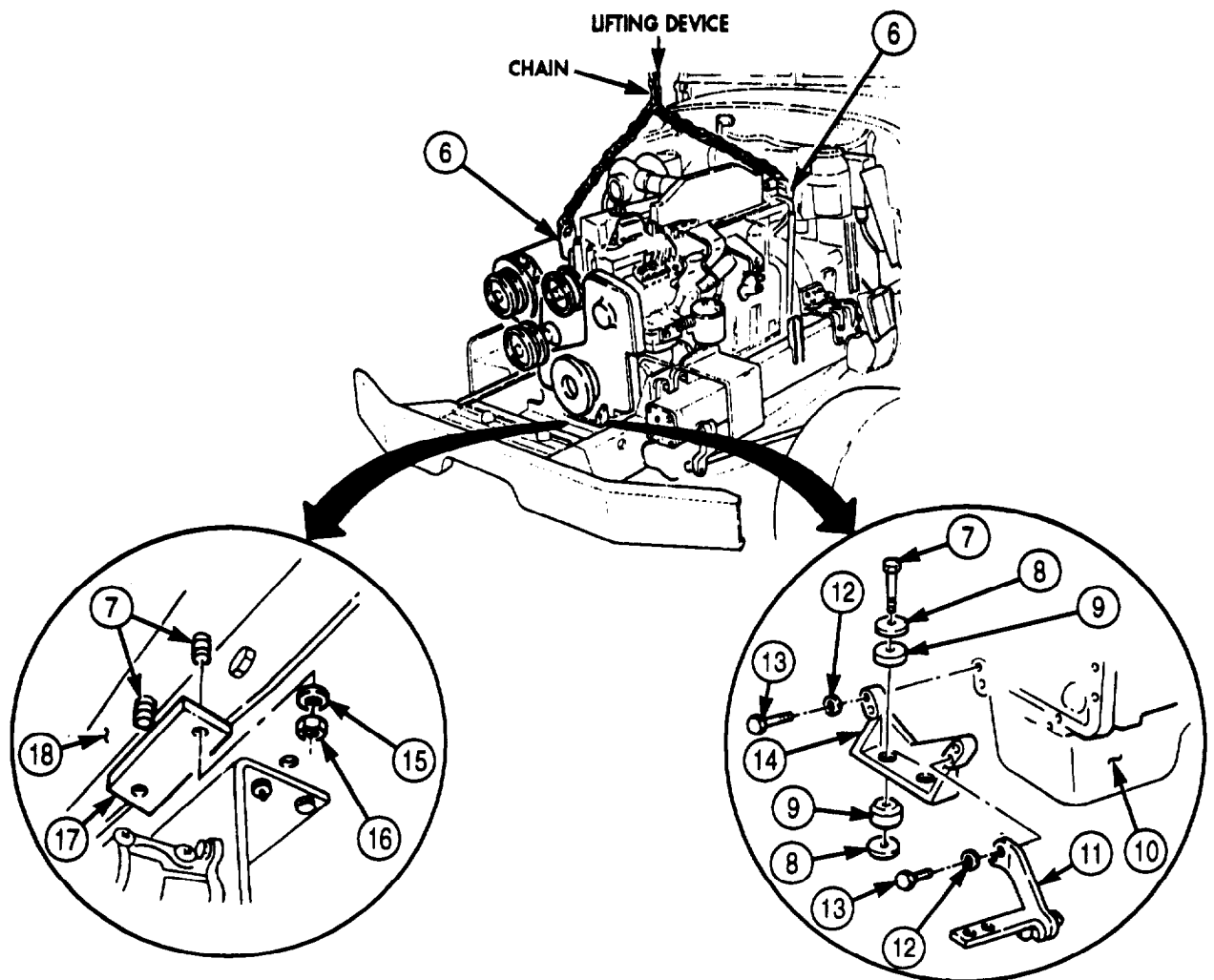
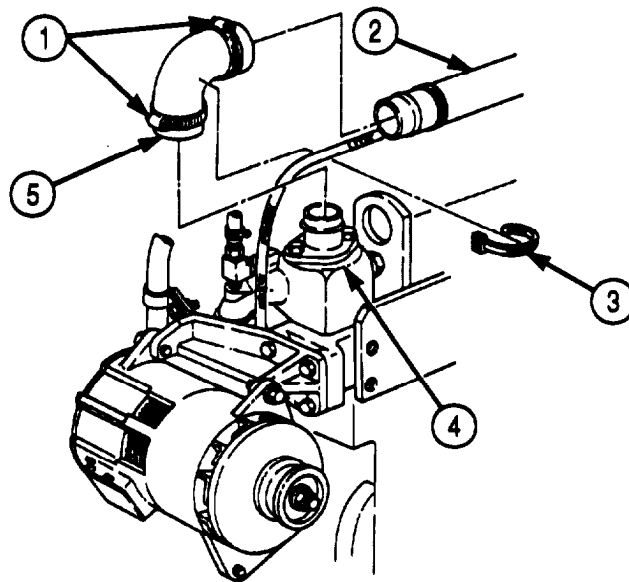
NOTE

Assistant will help with this procedure.

a. Removal

1. Remove tiedown strap (3) from hose (5). Discard tiedown strap (3).
2. Loosen two clamps (1) and remove hose (5) from thermostat housing connector (4) and radiator inlet tube (2).
3. Remove two locknuts (16), washers (15), and backing plate (17) from two screws (7) and cross-member (18). Discard locknuts (16).
4. Install chain and lifting device on two engine lifting brackets (6). Place tension on chain.
5. Remove two screws (7), washers (8), isolators (9), washers (8), and isolators (9) from front bracket (14).
6. Remove four screws (13), washers (12), and front bracket (14) from engine (10) and radiator bracket (11).

4-39. ENGINE MOUNTING BRACKETS AND ISOLATORS REPLACEMENT (Contd)



4-39. ENGINE MOUNTING BRACKETS AND ISOLATORS REPLACEMENT (Contd)

NOTE

- Tag mounting brackets for installation.
 - Perform steps 7 through 9 for removing right engine mounting brackets.
7. Remove two screws (1), washers (2), and four isolators (3) from upper mounting bracket (9) and lower mounting bracket (8).
 8. Remove four locknuts (7), washers (6), screws (4), and lower mounting bracket (8) from frame rail (5). Discard locknuts (7).
 9. Remove four screws (10), washers (11), and upper mounting bracket (9) from flywheel housing (12).

NOTE

Perform steps 10 through 13 for removing left engine mounting brackets.

10. Remove two locknuts (13), washers (14), isolators (15), screws (21), and isolators (15) from upper mounting bracket (30) and lower mounting bracket (18). Discard locknuts (13).
11. Remove locknut (24), washer (25), screw (26), washer (25), locknut (27), washer (17), screw (16), washer (17), shim (29), and engine support (28) from frame rail (22) and lower mounting bracket (18). Discard locknuts (24) and (27).
12. Remove four locknuts (20), washers (19), screws (23), and lower mounting bracket (18) from frame rail (22). Discard locknuts (20).
13. Remove four screws (32), washers (31), and upper mounting bracket (30) from flywheel housing (12).

b. Installation

NOTE

Perform steps 1 through 4 for installing left engine mounting brackets.

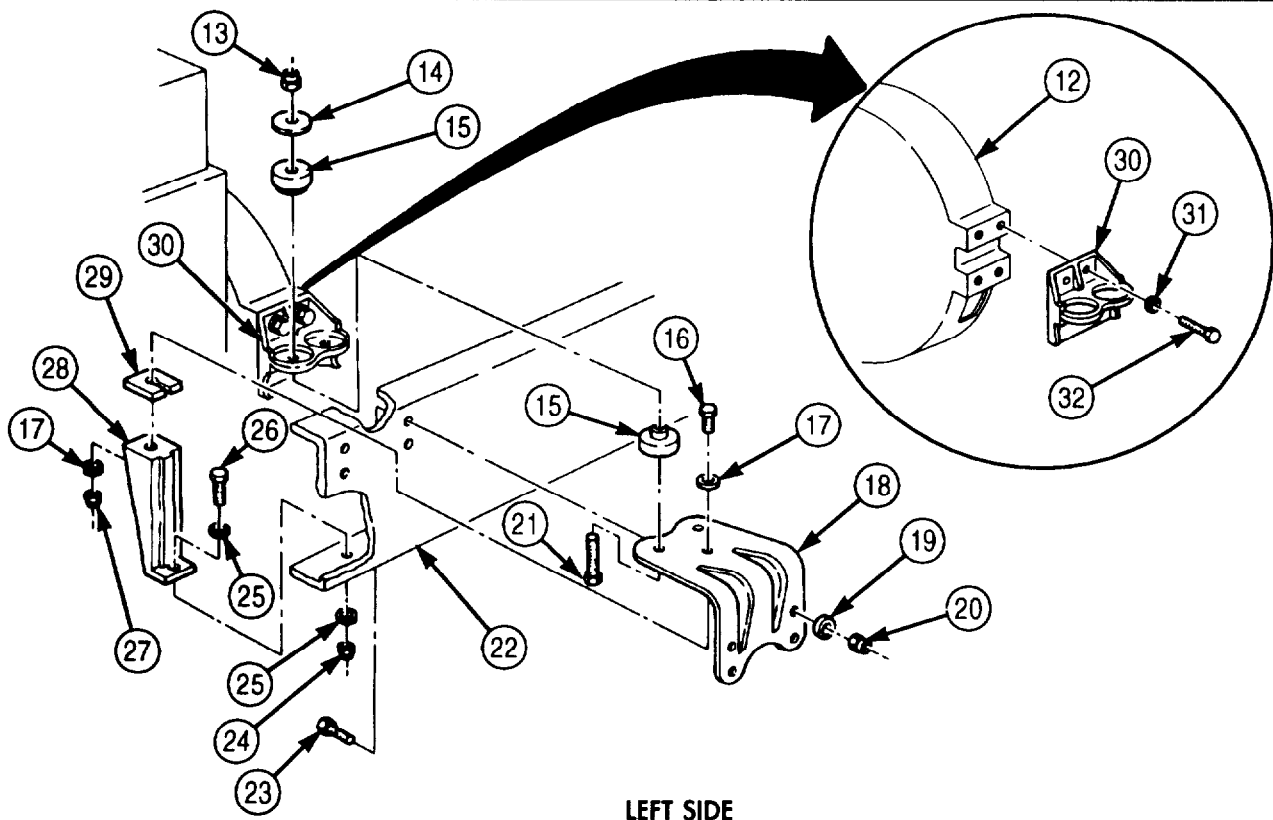
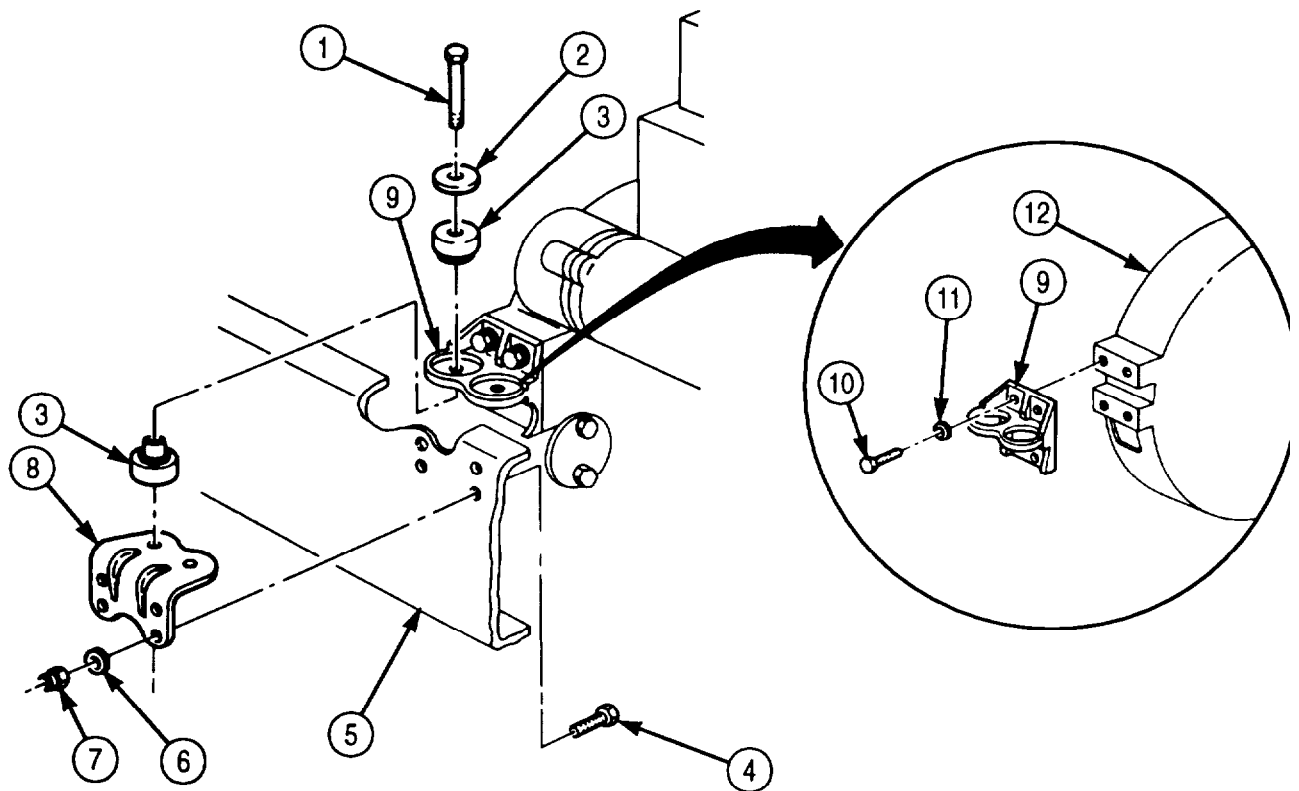
1. Install upper mounting bracket (30) on flywheel housing (12) with four washers (31) and screws (32). Tighten screws (32) 70-90-lb-ft (95-122 N·m).
2. Install lower mounting bracket (18) on frame rail (22) with four screws (23), washers (19), and new locknuts (20). Tighten top two locknuts (20) 80-95 lb-ft (109-129 N·m). Tighten bottom two locknuts (20) 55-70 lb-ft (75-95 N·m).
3. Install shim (29) and engine support (28) on frame rail (22) and lower mounting bracket (18) with washer (17), screw (16), washer (17), new locknut (27), washer (25), screw (26), washer (25), and new locknut (24). Tighten locknuts (24) and (27) 85 lb-ft (115 N·m).
4. Install four isolators (15) on upper (30) and lower (18) mounting brackets with two screws (21), washers (14) and new locknuts (13). Finger-tighten screws (21).

NOTE

Perform steps 5 through 7 for installing right engine mounting brackets.

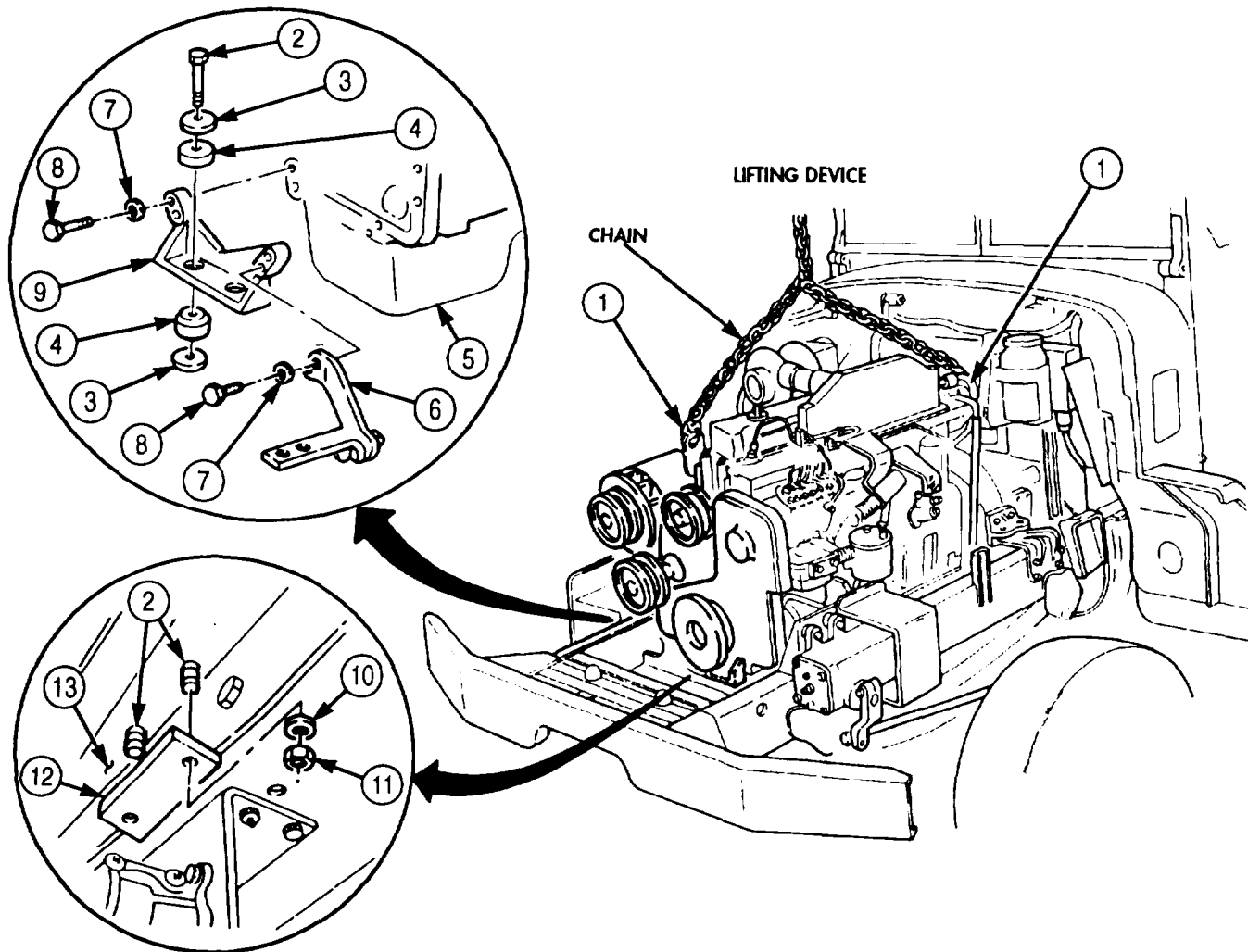
5. Install upper mounting brackets (9) on flywheel housing (12) with four washers (11) and screws (10). Tighten screws (10) 70-90 lb-ft (95-122 N·m).
6. Install lower mounting bracket (8) on frame rail (5) with four screws (4), washers (6), and new locknuts (7).
7. Install four isolators (3) on upper mounting bracket (9) and lower mounting bracket (8) with two washers (2) and screws (1). Finger-tighten screws (1).

4-39. ENGINE MOUNTING BRACKETS AND ISOLATORS REPLACEMENT (Contd)

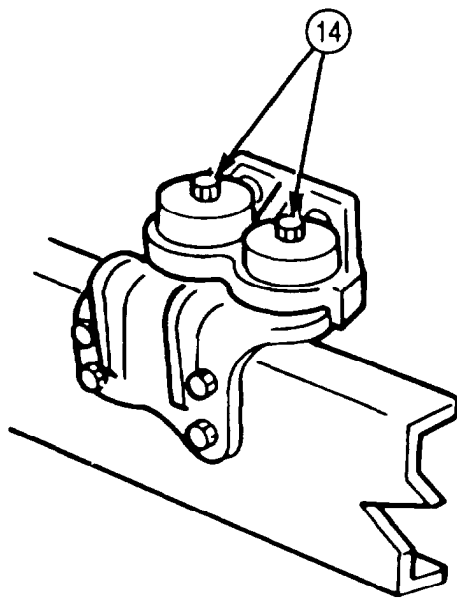


4-39. ENGINE MOUNTING BRACKETS AND ISOLATORS REPLACEMENT (Contd)

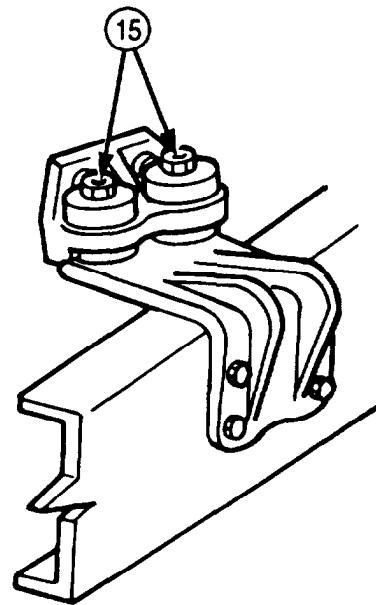
8. Position front bracket (9), four isolators (4), washers (3), and two screws (2) on crossmember (13) and install backing plate (12) with two washers (10) and new locknuts (11). Tighten locknuts (11) 75-85 lb-ft (102-115 N·m).
9. Slowly release tension on chain and lower engine (5) while aligning holes in front bracket (9) and radiator bracket (6) with holes in engine (5).
10. Install front bracket (9) and radiator bracket (6) on engine (5) with four washers (7) and screws (8). Tighten screws (8) 80 lb-ft (109 N·m).
11. Tighten two screws (14) and locknuts (15) 120-140 lb-ft (163-190 N·m).
12. Remove lifting device and chain from two engine lifting brackets (1).
13. Install hose (20) on radiator inlet tube (17) and thermostat housing connector (19) with two clamps (16) and new tiedown strap (18).



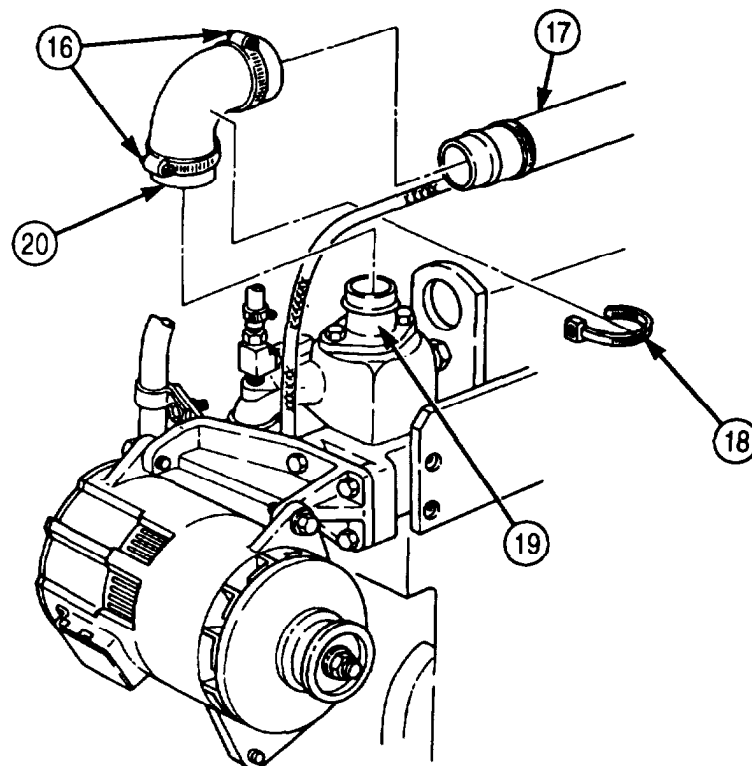
4-39. ENGINE MOUNTING BRACKETS AND ISOLATORS REPLACEMENT (Contd)



RIGHT SIDE



LEFT SIDE



FOLLOW-ON TASKS:

- Install air cleaner hose (para. 3-13).
- Install vibration damper (para. 4-42).
- Install surge tank (para. 3-62).

4-40. ENGINE LIFTING BRACKETS REPLACEMENT

THIS TASK COVERS:

a. Removal

b. Installation

INITIAL SETUP:

APPLICABLE MODELS

M939A2

TOOLS

General mechanic's tool kit (Appendix E, Item 1)

MATERIALS/PARTS

Tiedown strap (Appendix D, Item 690)

REFERENCES (TM)

TM 9-2320-272-10

TM 9-2320-272-24P

EQUIPMENT CONDITION

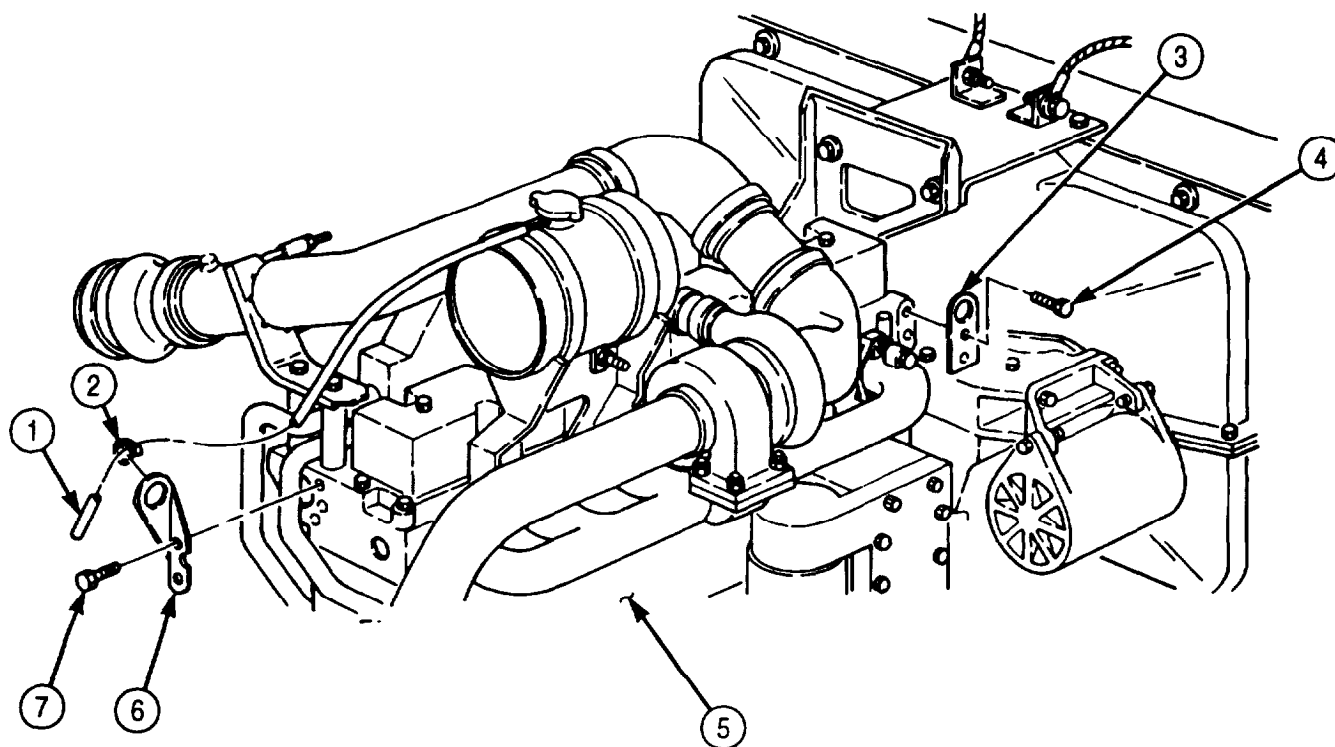
- Parking brake set (TM 9-2320-272-10).
- Hood raised and secured (TM 9-2320-272-10).
- Thermostat and thermostat housing removed (para. 3-66).

a. Removal

1. Remove tiedown strap (2) and overflow hose (1) from lifting bracket (6). Discard tiedown strap (2).
2. Remove two screws (7) and lifting bracket (6) from engine (5).
3. Remove two screws (4) and lifting bracket (3) from engine (5).

b. Installation

1. Install lifting bracket (3) on engine (5) with two screws (4).
2. Install lifting bracket (6) on engine (5) with two screws (7).
3. Install overflow hose (1) on lifting bracket (6) with new tiedown strap (2).

4-40. ENGINE LIFTING BRACKETS REPLACEMENT (Contd)

FOLLOW-ON TASK: Install thermostat and thermostat housing (para. 3-66).

4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT

THIS TASK COVERS:

- | | |
|--|---|
| a. Rocker Levers and Push Rods Removal | c. Cylinder Head Installation |
| b. Cylinder Head Removal | d. Rocker Levers and Push Rods Installation |

INITIAL SETUP:

APPLICABLE MODELS

M939A2

SPECIAL TOOLS

Torque angle gauge (Appendix E, Item 141)

TOOLS

General mechanic's tool kit (Appendix E, Item 1)
Torque wrench (Appendix E, Item 144)

MATERIALS/PARTS

Seal (Appendix D, Item 598)
Fuel filter (Appendix D, Item 135)
Lockwasher (Appendix D, Item 364)
Gasket (Appendix D, Item 188)
Two washers (Appendix D, Item 645)
Two washers (Appendix D, Item 644)
Two washers (Appendix D, Item 714)
Washer (Appendix D, Item 711)
Lubrication oil (Appendix C, Item 48)
Diesel fuel Appendix C, Item 42)

REFERENCES (TM)

TM 9-2320-272-24P

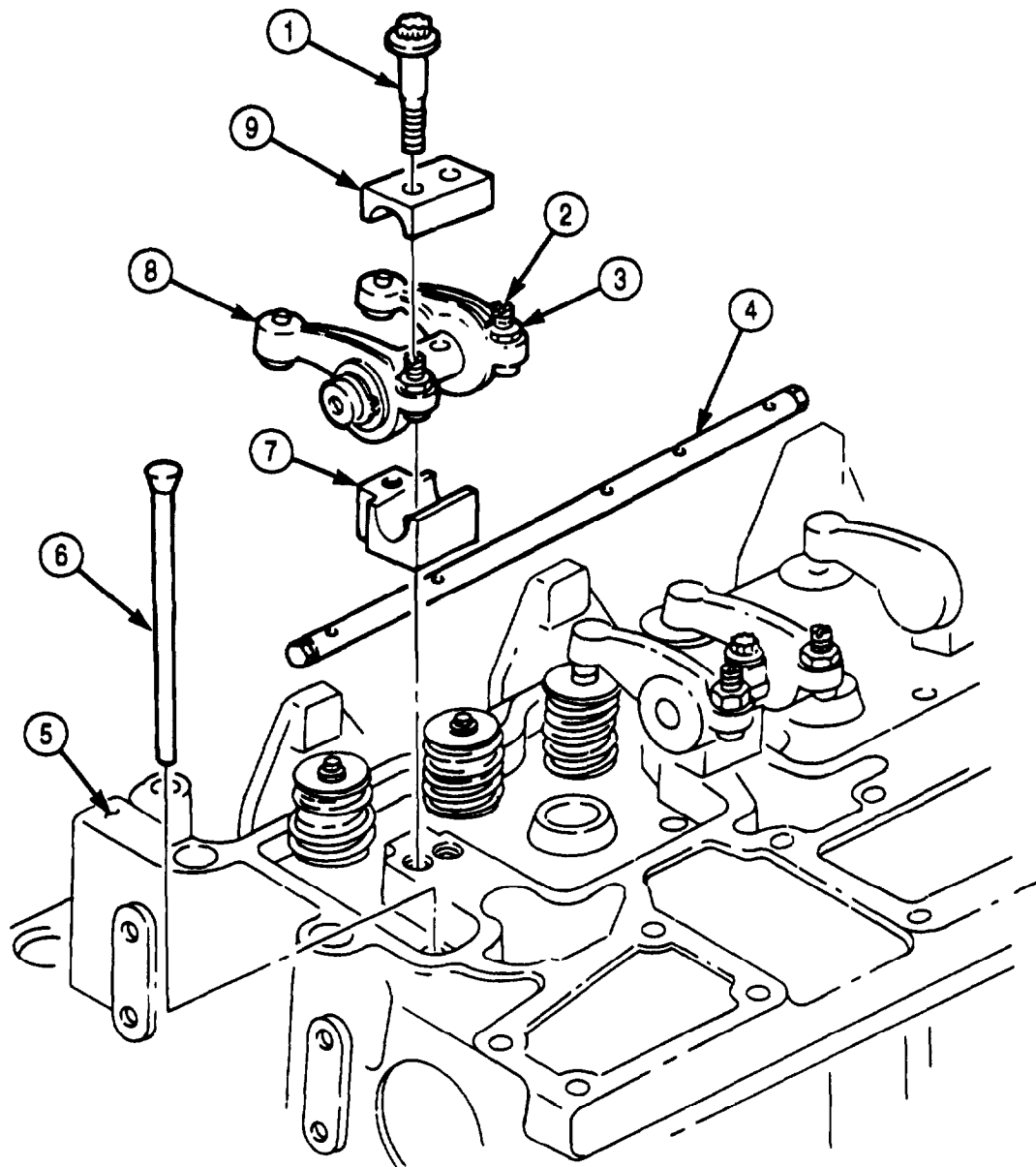
EQUIPMENT CONDITION

- Parking brake set (TM 9-2320-272-10).
- Aftercooler removed (para. 3-76).
- Exhaust manifold removed (para. 4-50).
- Fan clutch and hose removed (para. 3-74).
- Fuel injector tubes removed (para. 3-19).
- Valve covers removed (para. 3-6).

a. Rocker Levers and Push Rods Removal

1. Loosen twelve locknuts (3) and turn adjusting screws (2) two full turns counterclockwise.
2. Remove twelve screws (1), six retaining clamps (9), rocker lever assemblies (8), and rocker lever supports (7) from cylinder head (5).
3. Remove oil manifold (4) from cylinder head (5).
4. Remove twelve push rods (6) from cylinder head (5).

4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)



4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)

b. Cylinder Head Removal

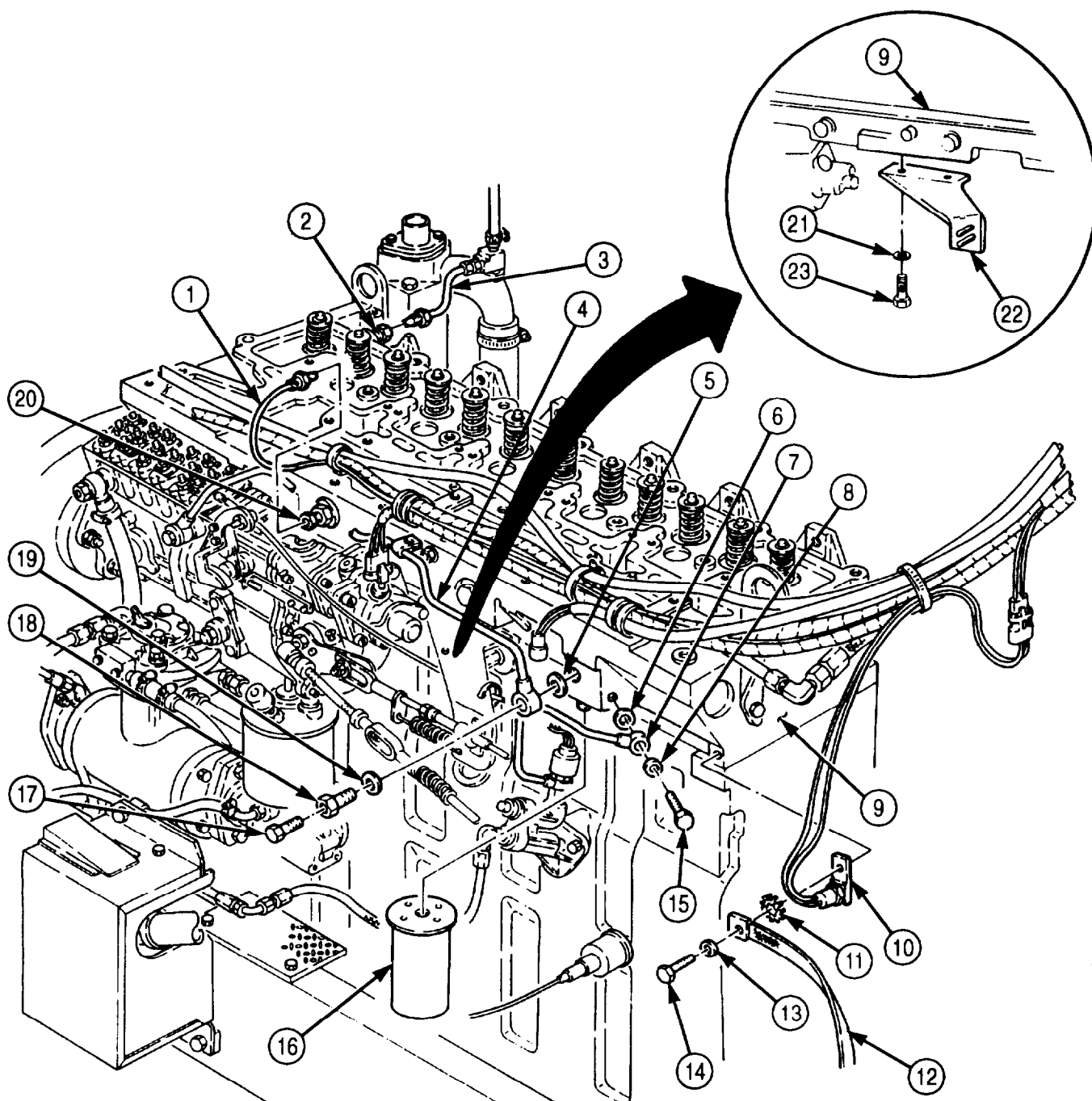
1. Disconnect ether supply tube (1) from atomizer nozzle (20).
2. Remove two screws (23), washers (21), and bracket (22) from cylinder head (9). Discard washers (21).
3. Remove screw (14), washer (13), ground strap (12), lockwasher (11), and temperature sensor (10) from cylinder head (9). Discard lockwasher (11).
4. Remove screw (15), washer (8), fuel supply tube (7), and washer (6) from cylinder head (9). Discard washers (6) and (8).
5. Remove screw (17), adapter (18), washer (19), fuel supply line (4), and washer (5) from cylinder head (9). Discard washers (5) and (19).
6. Remove fuel filter (16) from cylinder head (9). Discard fuel filter (16).

NOTE

Perform step 7 for engines equipped with external bypass system.

7. Disconnect tube (3) from adapter (2).

4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)



4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)

8. Remove water inlet tube (5) and seal (4) from elbow (3). Discard seal (4).
9. Remove screw (7) from air supply tube (6).
10. Loosen clamp (1) and remove air supply tube (6) from coupling (2).

NOTE

- Tag all screws for installation.
- Assistant will help with step 11.

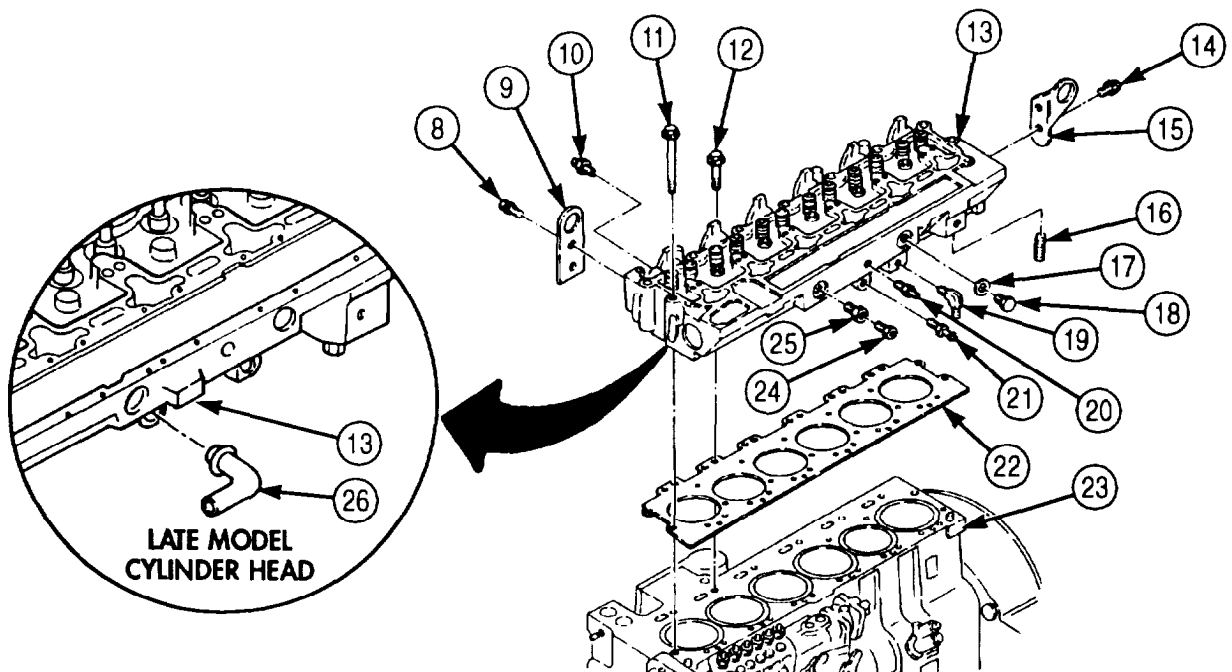
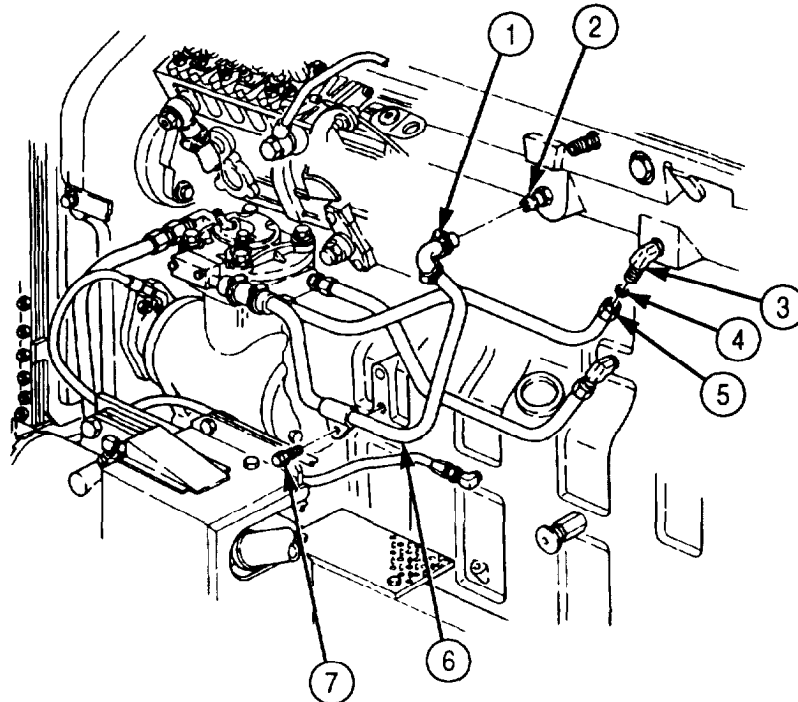
11. Remove fourteen screws (11) and twelve screws (12) from cylinder head (13).
12. Remove cylinder head (13) and gasket (22) from engine block (23). Discard gasket (22).
13. Remove adapter (24), atomizer (25), adapters (10), (20), and (21), elbow (19), plug (18), and washer (17) from cylinder head (13). Discard washer (17).
14. Remove nipple (16) from cylinder head (13).
15. Remove two screws (14) and (8) and lifting brackets (15) and (9) from cylinder head (13).

NOTE

Perform step 16 if coupling is damaged.

16. Remove coupling (26) from cylinder head (13).

4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)



4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)

c. Cylinder Head Installation

NOTE

- Cylinder head assemblies are interchangeable between early model engines, 44487830 and before, and late model engines, after 44487830. When interchanging cylinder head assemblies, 3913111, early model engines, and 3917767, late model engines, ensure the corresponding cylinder head screws are used and air compressor plumbing matches the applicable engine model configuration.
- Perform step 1 if installing new late model cylinder head.

1. Install coupling (19) on cylinder head (6).
2. Install lifting brackets (2) and (8) on cylinder head (6) with two screws (1) and (7).
3. Install new washer (10), plug (11), elbow (12), adapters (3), (13), and (14), atomizer (18), adapter (17), and nipple (9) on cylinder head (6).

NOTE

Assistant will help with step 4.

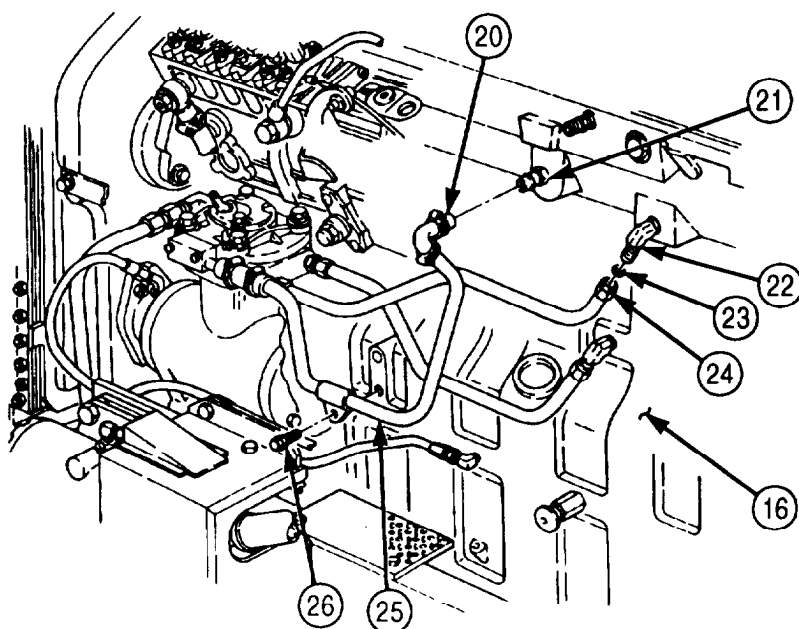
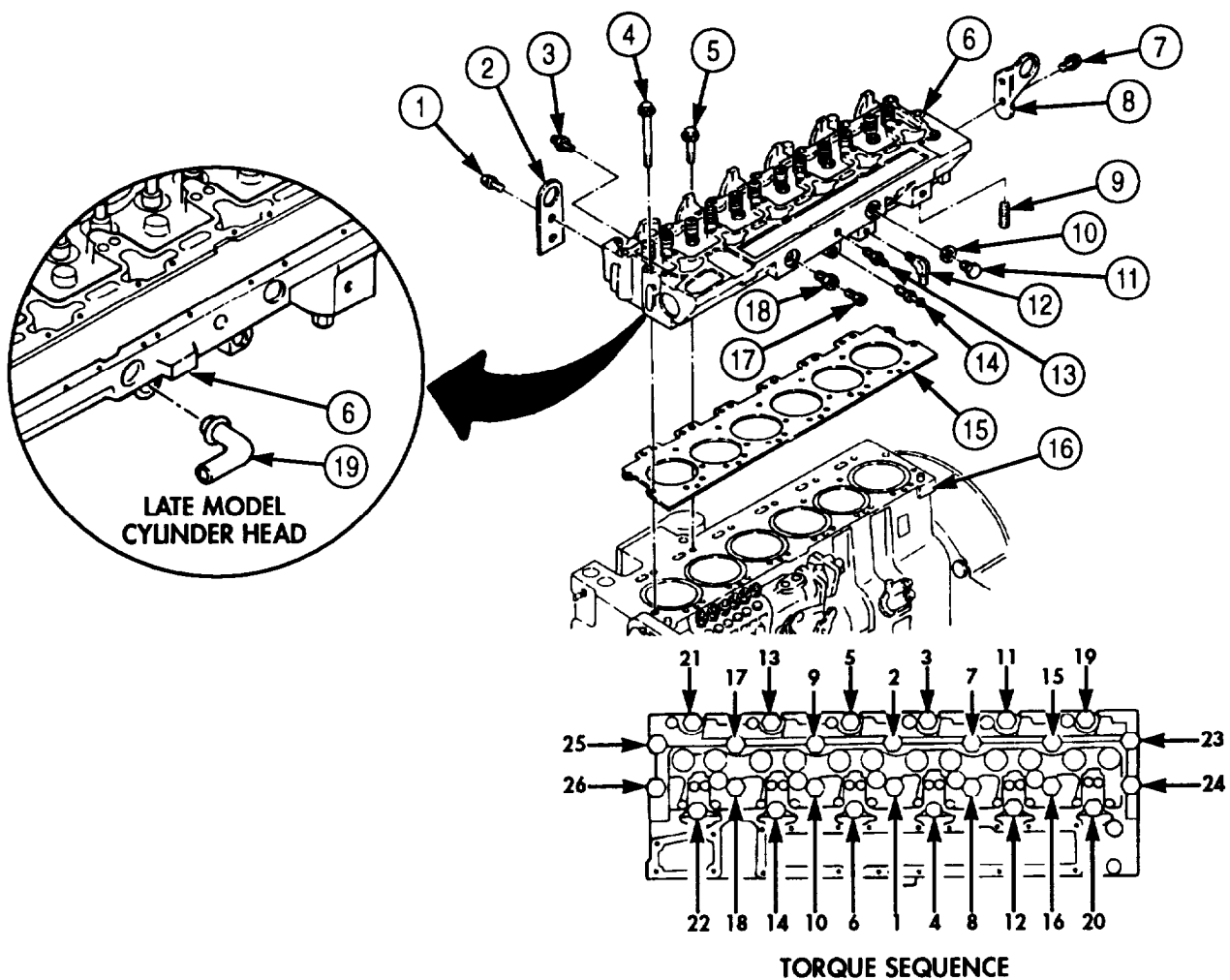
4. Position new gasket (15) and cylinder (6) on engine block (16) and install with fourteen screws (4) and twelve screws (5).

NOTE

- Perform step 5 for late model engines.
- Perform step 6 for early model engines.

5. Tighten screws (4) and (5) using the following steps:
 - a. Tighten screws (4) and (5) in sequence shown.
 - b. Loosen screws (4) and (5) in sequence shown.
 - c. Tighten screws (4) and (5) 50 lb-ft (68 N·m) in sequence shown.
 - d. Tighten long screws (4) 105 lb-ft (142 N·m) in sequence shown.
 - e. Using torque angle gauge, rotate screws (4) and (5) an additional 75-105 degrees in sequence shown.
6. Tighten screws (4) and (5) using the following steps:
 - a. Tighten screws (4) and (5) 30 lb-ft (41 N·m) in sequence shown.
 - b. Tighten screws (4) and (5) 110 lb-ft (149 N·m) in sequence shown.
 - c. Tighten screws (4) and (5) 160 lb-ft (217 N·m) in sequence shown.
7. Connect air supply tube (25) to coupling (21) with clamp (20).
8. Install air supply tube (25) on engine block (16) with screw (26).
9. Install new seal (23) and water inlet tube (24) on elbow (22).

4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)



4-41. ROCKER LEVERS, PUSH RODS, AND CYLINDER HEAD REPLACEMENT (Contd)

NOTE

Perform step 10 for engines equipped with external bypass system.

10. Connect tube (3) to adapter (2).
11. Install bracket (22) on cylinder head (8) with two new washers (24) and screws (23).

NOTE

Fill fuel filter and coat outer seal with diesel fuel before installation.

12. Install new fuel filter (17) on cylinder head (8) and engine block (16). Tighten until snug.
13. Install new lockwasher (11), temperature sensor (10), and ground strap (12) on cylinder head (8) with washer (13) and screw (14).

