

SERVICE REPAIR

Hyster E114 (E1.50XM, E1.75XM, E2.00XM, E2.00XMS Europe)
Forklift

MANUAL

HYSTER

HYDRAULIC SYSTEM

E1.50-3.20XM (E25-65XM, E25-65XM₂)
[D114, F108];

J2.00-3.20XM (J40-60XM, J40-60XM₂) [A216];

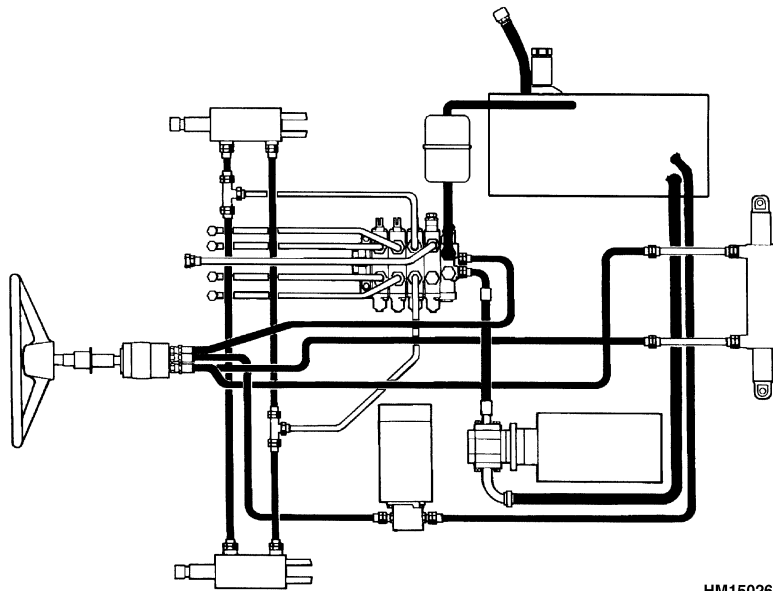
J2.00-3.20XM (J40-65Z) [A416];

N30XMH, N30XMH₂ [C210];

V30ZMD [D210];

E1.50-2.00XM (E25-35Z, 40ZS) [E114];

E2.00-3.20XM (E45-65Z) [G108]



HM150269

HYSTER

SAFETY PRECAUTIONS

MAINTENANCE AND REPAIR

- When lifting parts or assemblies, make sure all slings, chains, or cables are correctly fastened, and that the load being lifted is balanced. Make sure the crane, cables, and chains have the capacity to support the weight of the load.
- Do not lift heavy parts by hand, use a lifting mechanism.
- Wear safety glasses.
- **DISCONNECT THE BATTERY CONNECTOR** before doing any maintenance or repair on electric lift trucks. Disconnect the battery ground cable on internal combustion lift trucks.
- Always use correct blocks to prevent the unit from rolling or falling. See **HOW TO PUT THE LIFT TRUCK ON BLOCKS** in the **Operating Manual** or the **Periodic Maintenance** section.
- Keep the unit clean and the working area clean and orderly.
- Use the correct tools for the job.
- Keep the tools clean and in good condition.
- Always use **HYSTER APPROVED** parts when making repairs. Replacement parts must meet or exceed the specifications of the original equipment manufacturer.
- Make sure all nuts, bolts, snap rings, and other fastening devices are removed before using force to remove parts.
- Always fasten a **DO NOT OPERATE** tag to the controls of the unit when making repairs, or if the unit needs repairs.
- Be sure to follow the **WARNING** and **CAUTION** notes in the instructions.
- Gasoline, Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Diesel fuel are flammable. Be sure to follow the necessary safety precautions when handling these fuels and when working on these fuel systems.
- Batteries generate flammable gas when they are being charged. Keep fire and sparks away from the area. Make sure the area is well ventilated.

NOTE: The following symbols and words indicate safety information in this manual:



WARNING

Indicates a condition that can cause immediate death or injury!



CAUTION

Indicates a condition that can cause property damage!

TABLE OF CONTENTS

General 1

Description 1

 Hydraulic System 1

Operation 5

 Hydraulic System 5

 Hydraulic Gear Pump 5

 Rotator Actuator Valve 5

 Steering Pump 9

Hydraulic Tank Repair 16

 E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), E1.50-2.00XM (E25-35Z, 40ZS) (E114),
 E2.00-3.20XM (E45-65Z) (G108), N30XMH and N30XMH₂ (C210), V30ZMD (D210) Tank,
 Remove 16

 J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-60Z) (A416) Tank,
 Remove 17

 Inspect 18

 Small Leaks, Repair 18

 Large Leaks, Repair 18

 Clean 18

 Steam Method 18

 Chemical Solution Method 19

 Additional Methods for Tank Repair 19

 E1.50-3.20XM (E25-65XM, E25-65XM₂), (D114, F108), E1.50-2.00XM (E25-35Z, 40ZS) (E114),
 E2.00-3.20XM (E45-65Z) (G108), N30XMH, and N30XMH₂ (C210), V30ZMD (D210) Tank,
 Install 19

 J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-65Z) (A416) Tank, Install 20

Filter Replacement 20

Hydraulic Pump Repair 21

 E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), N30XMH, and N30XMH₂ (C210)
 Hydraulic Pump, Remove 21

 J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216), J2.00-3.20XM (J40-65Z) (A416), E1.50-2.00XM
 (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108) V30ZMD (D210), Hydraulic Pump,
 Remove 22

 Pump Seal, Replace and Pump Assemble 23

 Assemble Pump on Motor 23

 E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), N30XMH, and N30XMH₂ (C210),
 Hydraulic Pump and Motor Assembly, Install 26

 J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216), J2.00-3.20XM (J40-65Z) (A416), E1.50-2.00XM
 (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108), V30ZMD (D210) Hydraulic Pump
 and Motor Assembly, Install 27

Main Control Valve Repair 28

Steering Pump Repair 28

 E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), N30XMH, and N30XMH₂ (C210) Pump,
 Remove and Disassemble 28

 J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216), J2.00-3.20XM (J40-65Z) (A416), E1.50-2.00XM
 (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108), V30ZMD (D210) Pump, Remove
 and Disassemble 29

 Pump, Assemble and Install 30

Rotary Actuator Valve Repair 32

 Disassemble, Clean, and Inspect 32

 Assemble 32

Steering Control Unit Repair 33

TABLE OF CONTENTS (Continued)

Remove 33
 Install 33
 Steering Cylinder Repair 39
 Main Control Valve Check and Adjust 39
 Steering Relief Valve Check and Adjust 39
 Specifications 40
 Relief Valve Pressures* 40
 Hydraulic Tank Capacity (dipstick full mark) 40
 Hydraulic Pump Capacities 40
 Troubleshooting 41

This section is for the following models:

E1.50-3.20XM (E25-65XM, E25-65XM₂) [D114, F108];
 J2.00-3.20XM (J40-60XM, J40-60XM₂) [A216];
 J2.00-3.20XM (J40-65Z) [A416];
 N30XMH, N30XMH₂ [C210];
 V30ZMD [D210];
 E1.50-2.00XM (E25-35Z, 40ZS) [E114];
 E2.00-3.20XM (E45-65Z) [G108]

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**

**Have any questions please write to me:
admin@servicemanualperfect.com**

General

This section describes the hydraulic system and the steering system. The section includes repair, checks, adjustments, and troubleshooting. This section has repair procedures for the main hydraulic pump and the steering pump. Other repair procedures are in the following sections:

- **Main Control Valve** 2000 SRM 562 for models E1.50-2.00XM (E25-40XM, E25-40XM₂) (D114), E1.50-2.00XM (E25-35Z, 40ZS) (E114), E2.00-3.20XM (E45-65XM, E45-65XM₂) (F108), E2.00-3.20XM (E45-65Z) (G108), J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216), J2.00-3.20XM (J40-65Z) (A416), and **Main Control Valve** 2000 SRM 591 for N30XMH and N30XMH₂ (C210), V30ZMD (D210), lift truck models
- **Mast, Repairs** 4000 SRM 522
- **Four-Stage Mast** 4000 SRM 563
- **Mast, Repair** 4000 SRM 482 (N30XMH and N30XMH₂ (C210), V30ZMD (D210) Only)
- **Tilt Cylinders** 2100 SRM 103
- **Lift Cylinders** 4000 SRM 481 (N30XMH and N30XMH₂ (C210), V30ZMD (D210) Only)
- **Steering Housing and Control Unit** 1600 SRM 512 or **Steering Housing and Control Unit** 1600 SRM 720
- **Steering Axle** 1600 SRM 258 for E2.00-3.20XM (E45-65XM, E45-65XM₂) (F108), E2.00-3.20XM (E45-65Z) (G108), N30XMH, and N30XMH₂ (C210), V30ZMD (D210) lift trucks; **Steering Axle** 1600 SRM 316 for J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-65Z) (A416) lift trucks; and **Steering Axle** 1600 SRM 619 for E1.50-2.00XM (E25-40XM, E25-40XM₂) (D114) and E1.50-2.00XM (E25-35Z, 40ZS) (E114) model lift trucks
- **DC Motor Maintenance** 620 SRM 294 for E1.50-2.00XM (E25-40XM, E25-40XM₂) (D114), E1.50-2.00XM (E25-35Z, 40ZS) (E114), E2.00-3.20XM (E45-65XM, E45-65XM₂) (F108), E2.00-3.20XM (E45-65Z) (G108), N30XMH, N30XMH₂ (C210), V30ZMD (D210), J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-65Z) (A416) lift trucks
- **AC Motor Repair** 620 SRM 1053 for lift truck models J2.00-3.20XM (J40-65Z) (A416); **AC Motor Repair** 620 SRM 1098 for lift truck models V30ZMD (D210), E1.50-2.00XM (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108).

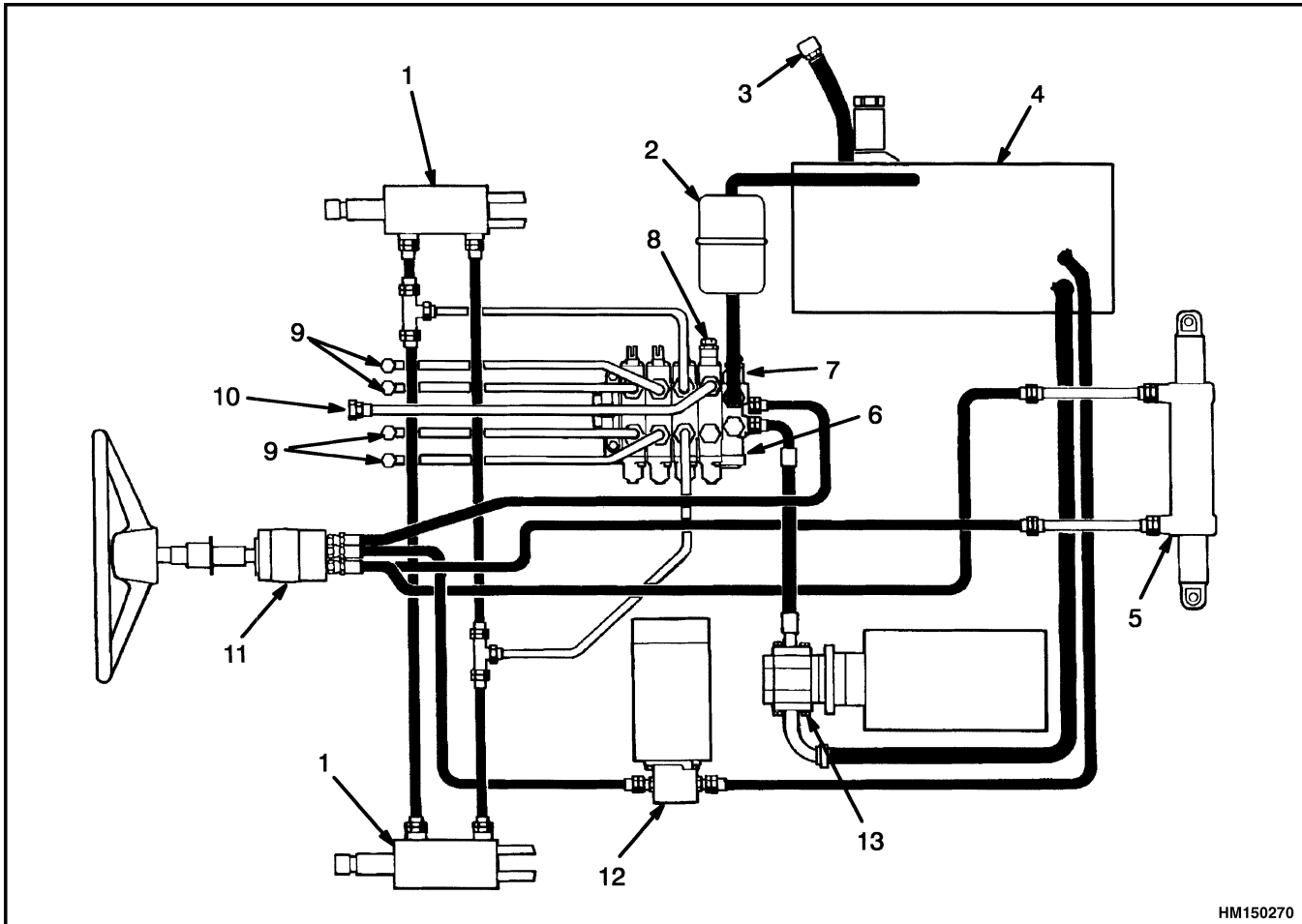
Description

HYDRAULIC SYSTEM

The parts of the hydraulic system for the E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), E1.50-2.00XM (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108), V30ZMD (D210) are shown in Figure 1. The parts of the hydraulic system for the J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-65Z) (A416) are shown in Figure 2. The parts of the hydraulic system for the N30XMH and N30XMH₂ (C210), are

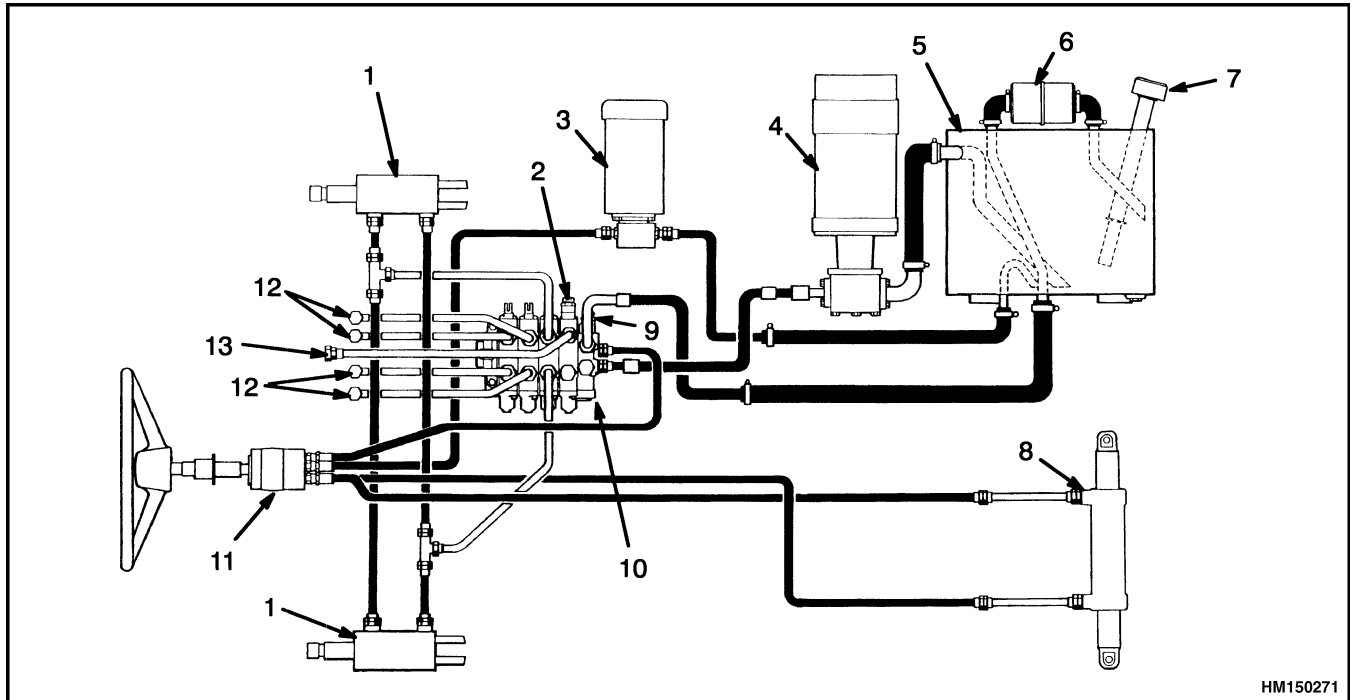
shown in Figure 3. The diagrams show components and interconnections that are typical of all models. It does not show all hydraulic systems. Not all units have a four-spool valve.

The hydraulic system includes the steering system and the lift system. One hydraulic tank supplies both systems. The steering system and the lift system have separate pumps. Both pumps are gear pumps.



- | | |
|---|-------------------------------------|
| 1. TILT CYLINDER (2) | 7. PRIMARY RELIEF VALVE |
| 2. FILTER | 8. SECONDARY RELIEF VALVE |
| 3. BREATHER | 9. TO AUXILIARY HYDRAULIC FUNCTIONS |
| 4. HYDRAULIC TANK (CAN BE DIFFERENT SHAPE) | 10. TO LIFT CYLINDERS |
| 5. STEERING CYLINDER | 11. STEERING CONTROL UNIT |
| 6. MAIN CONTROL VALVE (4-SPOOL VALVE SHOWN) | 12. STEERING PUMP |
| | 13. HYDRAULIC PUMP |

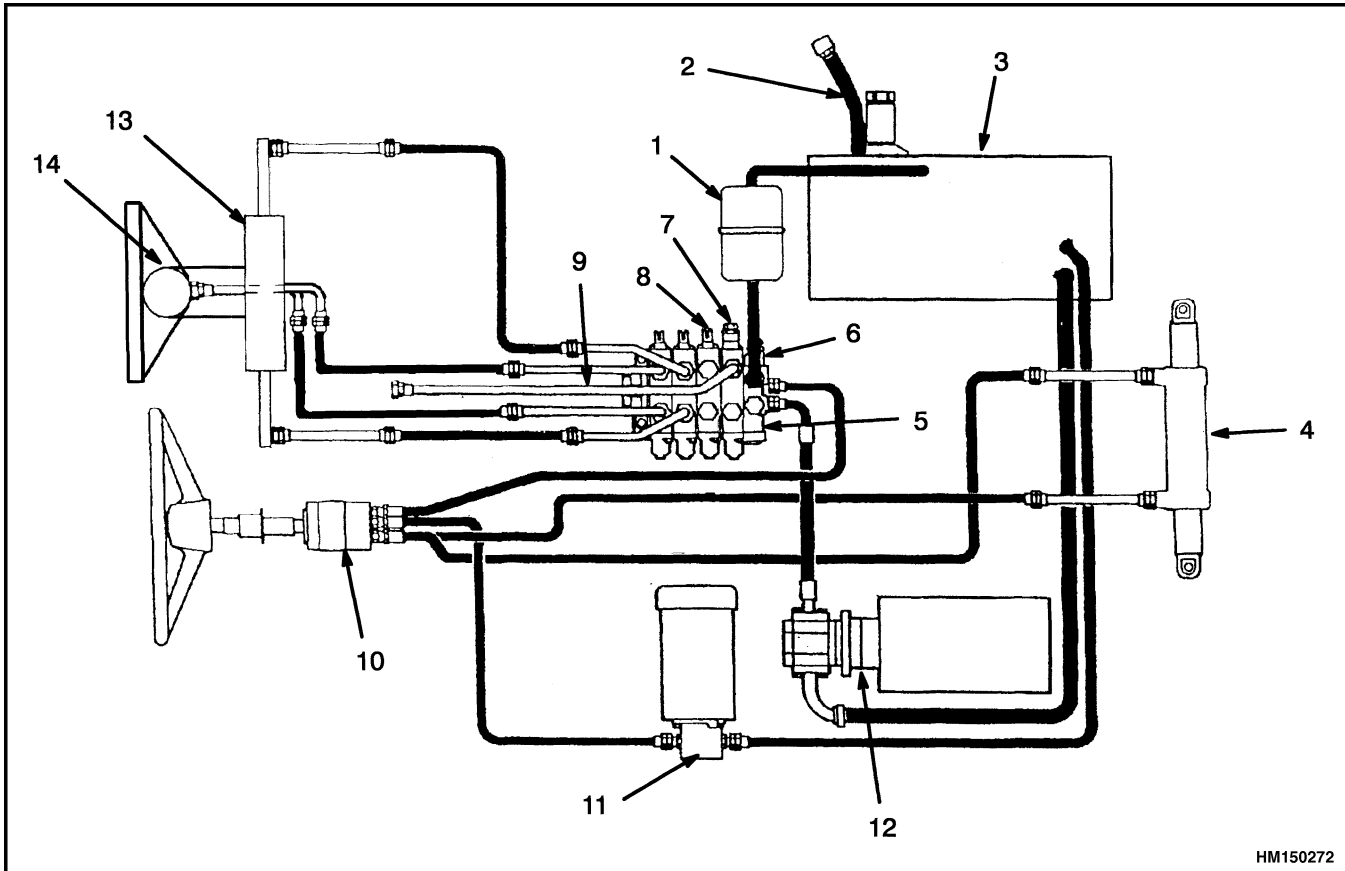
Figure 1. Hydraulic System E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), E1.50-2.00XM (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108)



HM150271

- | | |
|---------------------------------|--|
| 1. TILT CYLINDER (2) | 8. STEERING CYLINDER |
| 2. PRIMARY RELIEF VALVE | 9. SECONDARY RELIEF VALVE |
| 3. STEERING MOTOR AND PUMP | 10. MAIN CONTROL VALVE (4-SPOOL VALVE SHOWN) |
| 4. HYDRAULIC MOTOR AND PUMP | 11. STEERING CONTROL UNIT |
| 5. HYDRAULIC TANK | 12. TO AUXILIARY HYDRAULIC FUNCTIONS |
| 6. FILTER | 13. TO LIFT CYLINDERS |
| 7. BREATHER, FILL, AND DIPSTICK | |

Figure 2. Hydraulic System J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-65Z) (A416)



HM150272

- | | |
|---|-------------------------------------|
| 1. FILTER | 8. TO AUXILIARY HYDRAULIC FUNCTIONS |
| 2. BREATHER | 9. TO LIFT CYLINDERS |
| 3. HYDRAULIC TANK | 10. STEERING CONTROL UNIT |
| 4. STEERING CYLINDER | 11. HYDRAULIC PUMP - STEERING |
| 5. MAIN CONTROL VALVE (4-SPOOL VALVE SHOWN) | 12. HYDRAULIC PUMP - LIFT |
| 6. PRIMARY RELIEF VALVE | 13. TRAVERSE CYLINDER |
| 7. SECONDARY RELIEF VALVE | 14. ROTARY ACTUATOR |

Figure 3. Hydraulic System N30XMH and N30XMH₂ (C210), V30ZMD (D210)

Operation

HYDRAULIC SYSTEM

The hydraulic pump causes oil to flow from the tank to the main control valve. See Figure 4 or Figure 5. The main control valve controls the flow of oil to the lift cylinders, tilt cylinders, traverse cylinder, rotary actuator, and auxiliary functions when applicable. A relief valve on the main control valve keeps pressure within the design limits of the hydraulic system. A test port for checking the pressure when the relief valve opens is on the main control valve.

Some auxiliary functions require less pressure than the lift function. A secondary relief valve on the main control valve provides lower pressure for auxiliary functions.

The steering pump causes oil to flow from the tank to the steering control unit. The steering control unit is a metering pump actuated by the steering wheel. When the steering wheel is turned, oil flows to actuate the steering cylinder. Oil returns from the steering control unit to the main control valve. A relief valve in the pump keeps pressure within the design limits of the steering system.

The oil returns from the main control valve and flows through a filter in the hydraulic tank. The filter removes small particles from the oil. The filter has a bypass valve so that the oil can flow through the system if the filter becomes too dirty.

HYDRAULIC GEAR PUMP

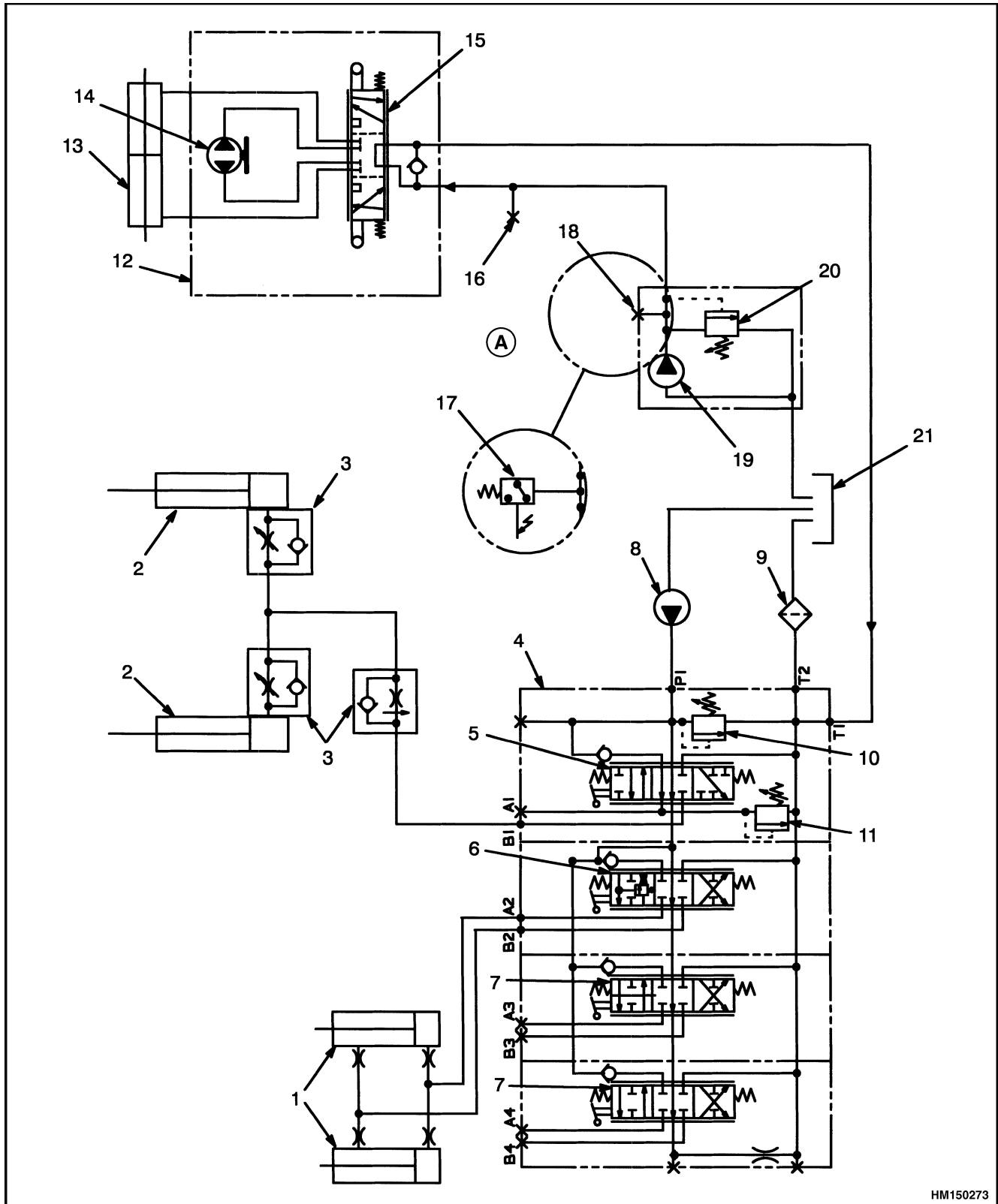
There can be two different sizes of hydraulic pumps used on these lift trucks: a 12 cc/revolution gear pump or a 19 cc/revolution gear pump. The larger pump is standard. See Figure 15. The smaller pump is used when there is a contactor motor control with a closed motor or for a slower speed requirement. These hydraulic pumps are all single-section gear

pumps that fasten to the end of the motor housing. A hose connects the pump inlet to the hydraulic tank. A hose connects the pump outlet to the main control valve. A flexible coupling connects the motor shaft to the pump shaft. Bushings at each side of each gear of the pump are the bearings for the gear shafts. The bushings also have passages for the oil flow to the pump outlet and for lubrication. Seals prevent leaks between sections of the pump housing.

ROTATOR ACTUATOR VALVE

On the N30XMH and N30XMH₂ (C210), V30ZMD (D210) only, the rotary actuator valve is connected between the rotary spool and the rotary actuator. The rotary actuator valve has two check valves, a shuttle, and two relief valves. The check valves prevent the rotary actuator from rotating when the lever on the main control valve is in the center position. The check valves prevent any oil flow from the rotary actuator until pressure from the main control valve pushes on the shuttle. The oil pressure opens the inlet check valve and at the same time the shuttle pushes against the return check valve. The shuttle moves the check valve from its seat and permits oil to flow to the hydraulic tank. A relief valve opens when the rotary actuator moves to the end of its stroke. One relief valve is installed for each direction of rotary actuator travel. These relief valves also protect the rotary actuator from damage if the forks hit an object. An adjustable bypass valve for the rotary actuator is connected in parallel to the rotary actuator valve. The bypass valve permits some of the oil from the main control valve to flow directly to the return line. The bypass valve decreases the speed of the rotary actuator.

For the location of the pressure check fitting for steering pressure, see Figure 6, Figure 7, Figure 8, or Figure 9.



HM150273

Figure 4. Hydraulic Schematic E1.50-3.20XM (E25-65XM, E25-65XM₂) (D114, F108), E1.50-2.00XM (E25-35Z, 40ZS) (E114), E2.00-3.20XM (E45-65Z) (G108), J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216), and J2.00-3.20XM (J40-65Z) (A416)

Legend for Figure 4

NOTE: THE PRESSURE SWITCH FOR ON-DEMAND STEERING IS NOT USED ON J2.00-3.20XM (J40-65Z) (A416), E1.50-2.00XM (E25-35Z, 40ZS) (E114), AND E2.00-3.20XM (E45-65Z) (G108), V30ZMD (D210) LIFT TRUCK MODELS.

A. INSTALL AT CHECK PORT

- | | |
|----------------------------|--|
| 1. TILT CYLINDERS | 12. STEERING CONTROL UNIT |
| 2. LIFT CYLINDERS | 13. STEERING CYLINDER |
| 3. LOWERING CONTROL VALVES | 14. HAND PUMP |
| 4. MAIN CONTROL VALVE | 15. STEERING VALVE |
| 5. LIFT SPOOL | 16. LINE PRESSURE TAP |
| 6. TILT SPOOL | 17. PRESSURE SWITCH FOR ON-DEMAND STEERING |
| 7. AUXILIARY SPOOL | 18. CHECK PORT |
| 8. HYDRAULIC PUMP | 19. STEERING PUMP |
| 9. FILTER | 20. STEERING RELIEF VALVE |
| 10. PRIMARY RELIEF VALVE | 21. HYDRAULIC TANK |
| 11. SECONDARY RELIEF VALVE | |

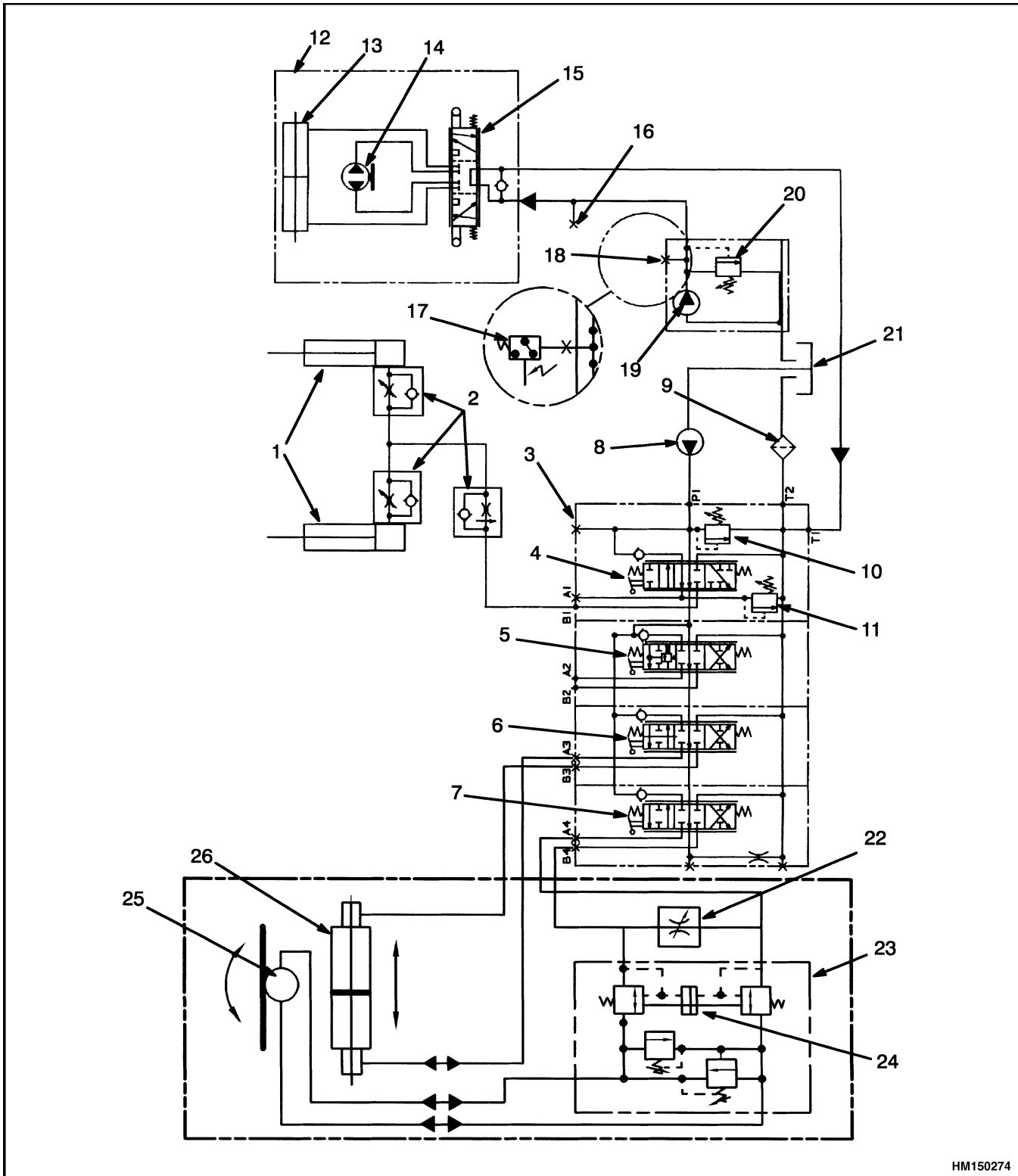


Figure 5. Hydraulic Schematic N30XMH and N30XMH₂ (C210), V30ZMD (D210)

Legend for Figure 5

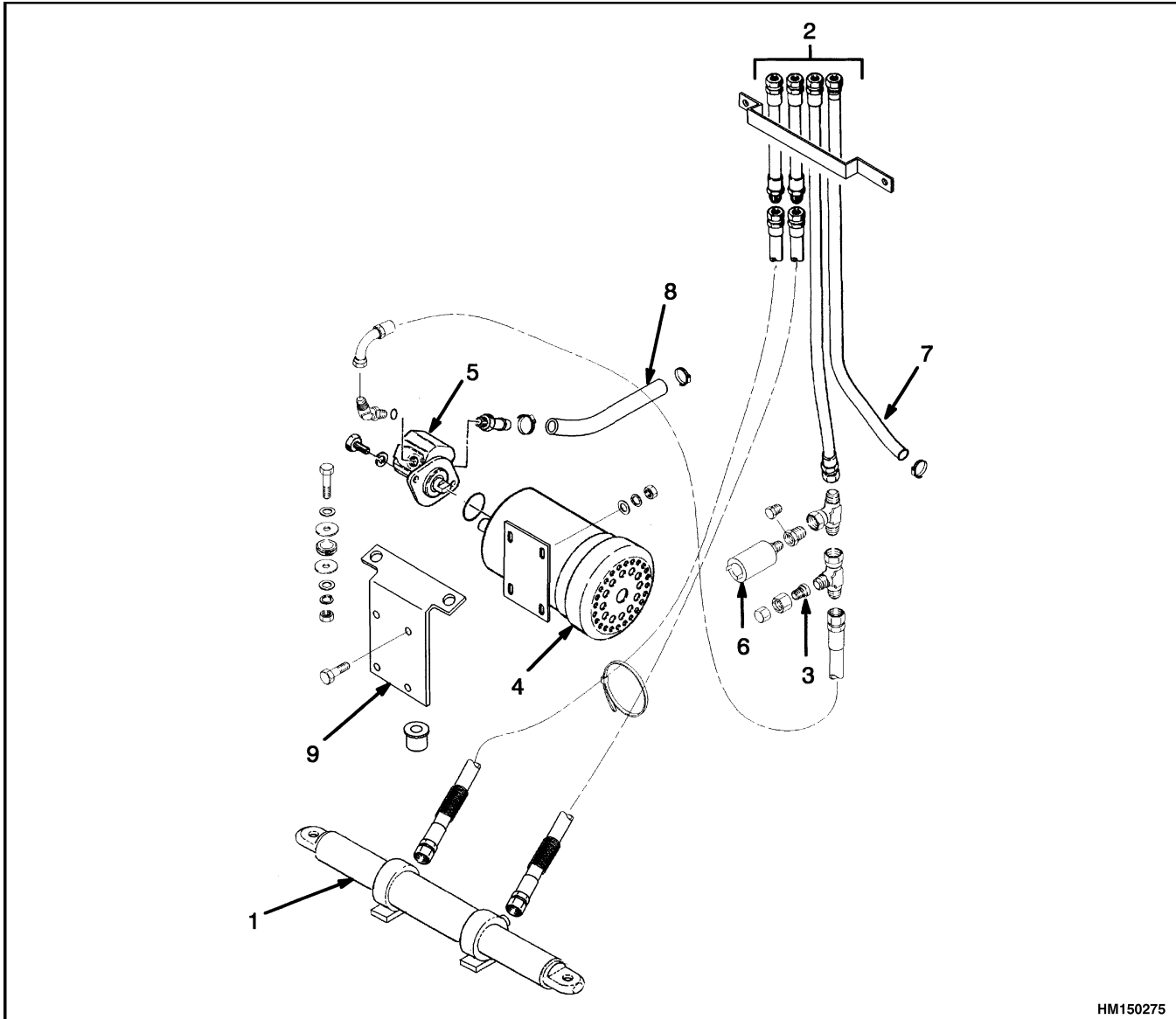
- | | |
|----------------------------|--|
| 1. LIFT CYLINDERS | 15. STEERING VALVE |
| 2. LOWERING CONTROL VALVES | 16. LINE PRESSURE TAP |
| 3. MAIN CONTROL VALVE | 17. PRESSURE SWITCH FOR ON-DEMAND STEERING (INSTALL AT CHECK PORT) |
| 4. LIFT SPOOL | 18. CHECK PORT |
| 5. AUXILIARY SPOOL | 19. STEERING PUMP |
| 6. TRAVERSE SPOOL | 20. STEERING RELIEF VALVE |
| 7. ROTARY SPOOL | 21. HYDRAULIC TANK |
| 8. HYDRAULIC PUMP | 22. BYPASS VALVE |
| 9. FILTER | 23. ROTARY ACTUATOR VALVE |
| 10. PRIMARY RELIEF VALVE | 24. SHUTTLE |
| 11. SECONDARY RELIEF VALVE | 25. ROTARY ACTUATOR |
| 12. STEERING CONTROL UNIT | 26. TRAVERSE CYLINDER |
| 13. STEERING CYLINDER | |
| 14. HAND PUMP | |

STEERING PUMP

NOTE: Lift truck models J2.00-3.20XM (J40-65Z) (A416), E1.50-2.00XM (E25-35Z, 40ZS) (E114), and E2.00-3.20XM (E45-65Z) (G108), V30ZMD (D210) do not contain a pressure switch on the steering pump for the On-Demand Steering system.

The steering pump is a small gear pump connected to a permanent-magnet DC motor. See Figure 6, Figure 7, Figure 8, or Figure 9. The steering pump and motor are in a horizontal mount under the battery compartment on the E1.50-2.00XM (E25-40XM, E25-40XM₂) (D114) and E1.50-2.00XM (E25-35Z, 40ZS) (E114) trucks. The steering pump and motor

are in a vertical mount under the floor plate on the E2.00-3.20XM (E45-65XM, E45-65XM₂) (F108), E2.00-3.20XM (E45-65Z) (G108), and N30XMH, N30XMH₂ (C210), V30ZMD (D210) trucks. The steering pump and motor are also in a vertical mount that is located behind the battery on the J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216) and J2.00-3.20XM (J40-65Z) (A416) trucks. Capscrews hold the motor mount to the frame mount bracket that has isolators. A relief valve and a pressure switch are mounted at ports in the pump housing. The pressure switch at the bottom of the pump is used with On-Demand Steering only.

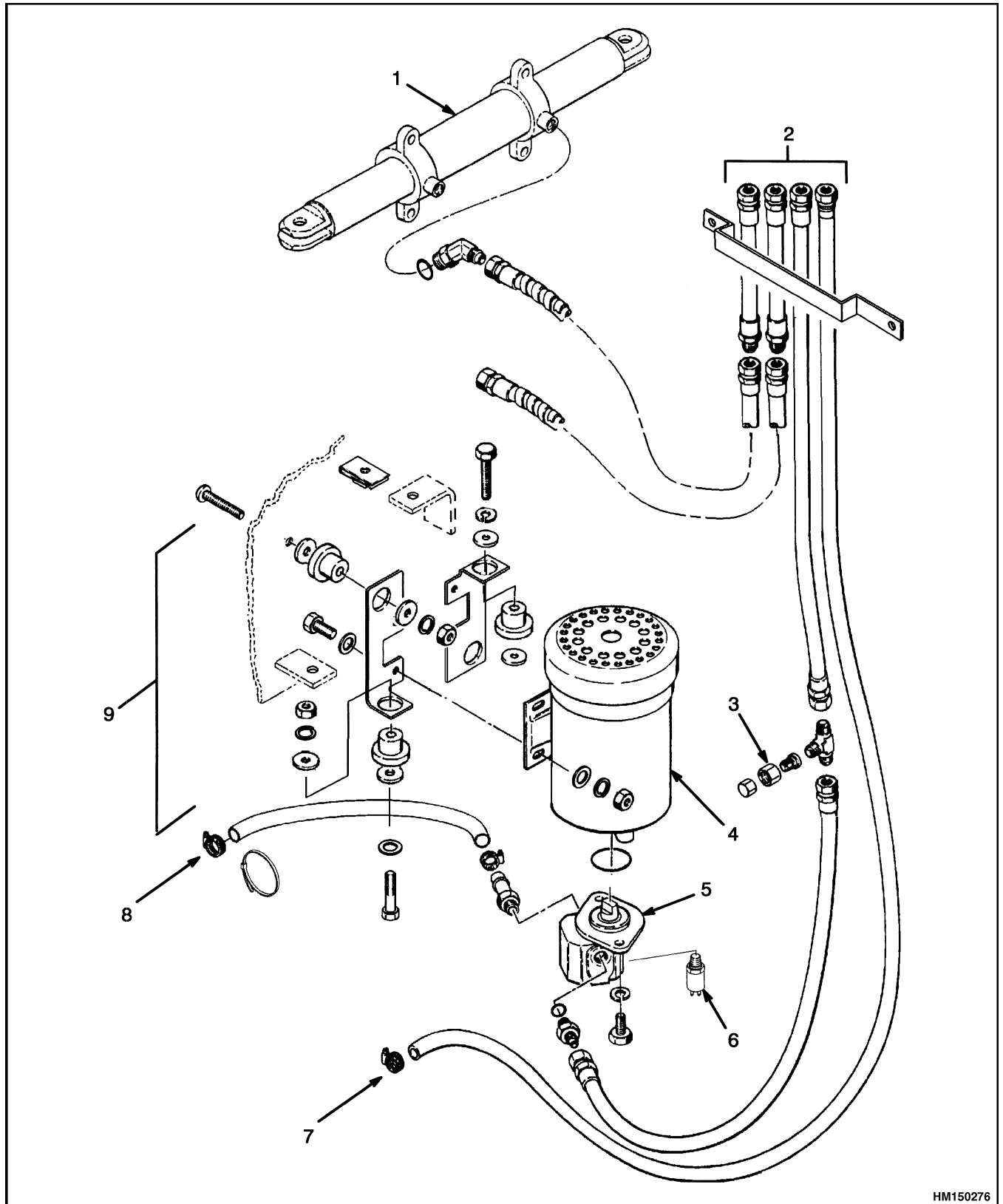


HM150275

NOTE: MOTOR CAN BE DIFFERENT THAN SHOWN.

- | | |
|-----------------------------|--|
| 1. STEERING CYLINDER | 6. PRESSURE SWITCH (ON-DEMAND STEERING ONLY) |
| 2. TO STEERING CONTROL UNIT | 7. RETURN TO HYDRAULIC TANK |
| 3. PRESSURE CHECK FITTING | 8. FROM HYDRAULIC TANK |
| 4. PUMP MOTOR | 9. MOUNT FOR STEERING MOTOR |
| 5. STEERING PUMP | |

Figure 6. Steering Pump and Hydraulic Circuit E1.50-2.00XM (E25-40XM, E25-40XM₂) (D114)



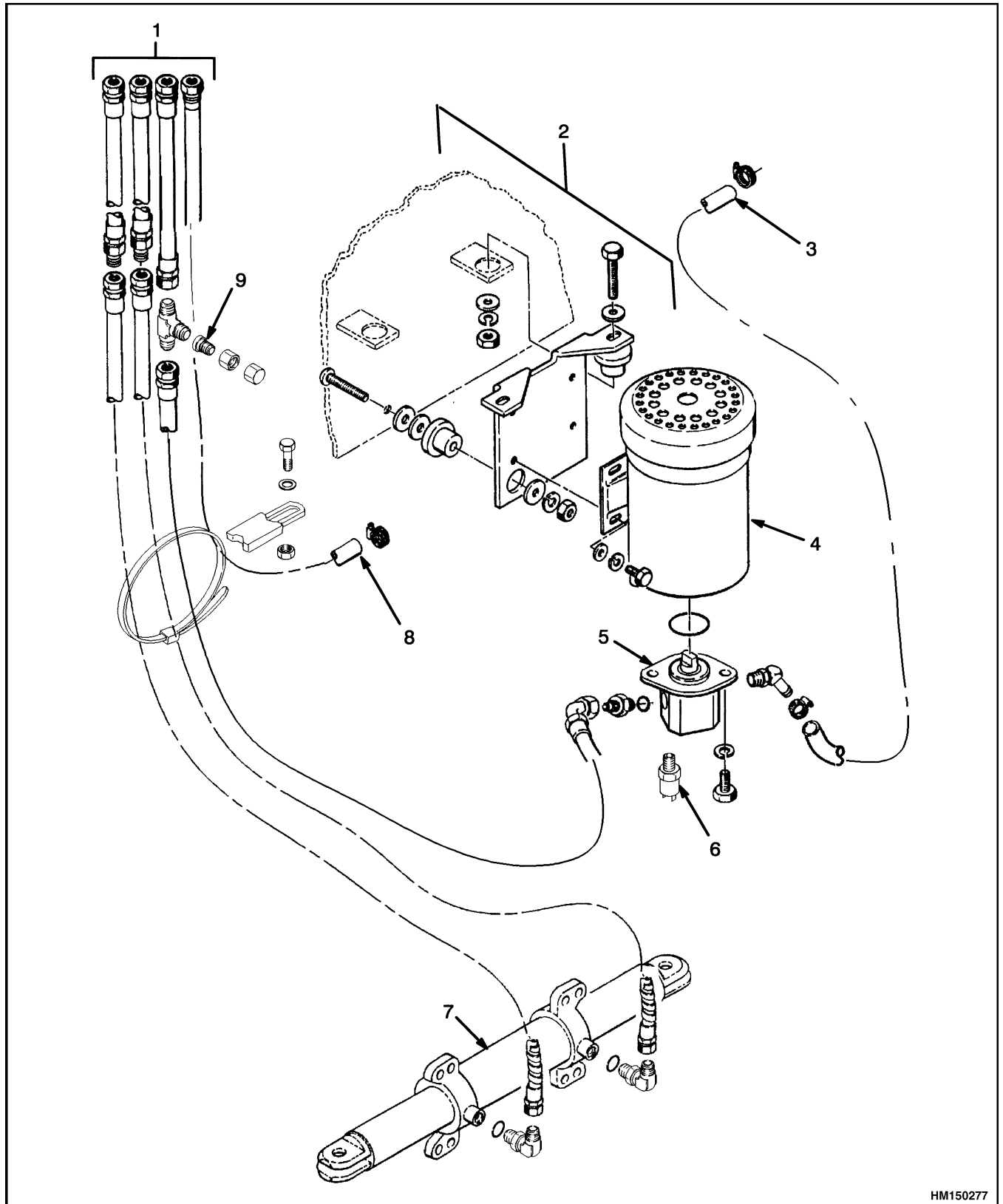
HM150276

Figure 7. Steering Pump and Hydraulic Circuit E2.00-3.20XM (E45-65XM, E45-65XM₂) (F108), N30XMH, and N30XMH₂ (C210)

Legend for Figure 7

NOTE: MOTOR CAN BE DIFFERENT THAN SHOWN.

- | | |
|-----------------------------|--|
| 1. STEERING CYLINDER | 6. PRESSURE SWITCH (ON-DEMAND STEERING ONLY) |
| 2. TO STEERING CONTROL UNIT | 7. RETURN TO HYDRAULIC TANK |
| 3. PRESSURE CHECK FITTING | 8. FROM HYDRAULIC TANK |
| 4. PUMP MOTOR | 9. MOUNT FOR STEERING MOTOR |
| 5. STEERING PUMP | |



HM150277

Figure 8. Steering Pump and Hydraulic Circuit J2.00-3.20XM (J40-60XM, J40-60XM₂) (A216)

Legend for Figure 8

NOTE: MOTOR CAN BE DIFFERENT THAN SHOWN.

- | | |
|-----------------------------|--|
| 1. TO STEERING CONTROL UNIT | 6. PRESSURE SWITCH (ON-DEMAND STEERING ONLY) |
| 2. MOUNT FOR STEERING MOTOR | 7. STEERING CYLINDER |
| 3. FROM HYDRAULIC TANK | 8. RETURN TO HYDRAULIC TANK |
| 4. PUMP MOTOR | 9. PRESSURE CHECK FITTING |
| 5. STEERING PUMP | |