

- h. Withdraw the rack by manually rotating the crane to the left until the rack is ejected. Mark the position of the column in relation to the base at the point where the rack comes free.
- i. Remove the guide block and grease tube if necessary.

**145. *Cleaning and Inspection.*** To clean and inspect the slew mechanism, proceed as follows:

- a. Clean all components thoroughly.
- b. Strip the seals from the pistons and discard.
- c. Check the condition of the cylinder tubes. Replace worn or damaged parts as necessary.
- d. Check the condition of the rack and its pinion gear. Repair or replace worn or damaged parts as necessary.
- e. Check the condition of the guide block and replace as necessary.
- f. Clean and check the condition of the bearing bushings in the slew housing. Replace as necessary.
- g. Clean the base of the crane body thoroughly and check the condition of the bearing journal surfaces.

**146. *Assembly.*** To assemble the slew mechanism, proceed as follows:

- a. Install the guide block and grease tube.
- b. Ensure the column lines up with the mark on the base or is fully to the left, then engage the first tooth of the rack onto the gear of the column.
- c. Manually rotate the column to the right (anti-clockwise) to pull the rack into the housing.
- d. Rotate the crane until the boom is central to the truck and measure each end of the rack to ensure it is centred. Remove and reposition the rack if required.
- e. Fit new piston seals and install on the rack. Ensure that the 'O' rings are fitted between the piston and the rack.
- f. Ensure the rack is central within the cylinder opening to prevent cross threading of the cylinder tubes.
- g. Liberally coat the piston, seals and internal walls of the cylinder tubes with hydraulic fluid and apply anti-seize to the threads of the cylinder tubes.

- h. Slide the cylinder tubes over the rack and screw them fully home into the slew housing.
- i. Reconnect the two pipe connections to the slew cylinders.
- j. Start the engine, engage the crane PTO and operate the crane to bleed the air from the system (refer to EMEI Vehicle D 324-1). Check that the crane operates smoothly and correctly, rectify any leaks as necessary.
- k. Check the level of fluid in the oil reservoir. If necessary, top up with OM-68.

## VALVES

**WARNING**

**CRANE SERIAL NUMBER MUST BE SUPPLIED WHEN ORDERING ANY CRANE COMPONENTS TO ENSURE COMPATIBILITY AND SAFE CRANE OPERATION.**

### Main Control Valve

**147. *Removal and Installation.*** Removal and installation of the main control valve is to be conducted in accordance with EMEI Vehicle D 324-1.

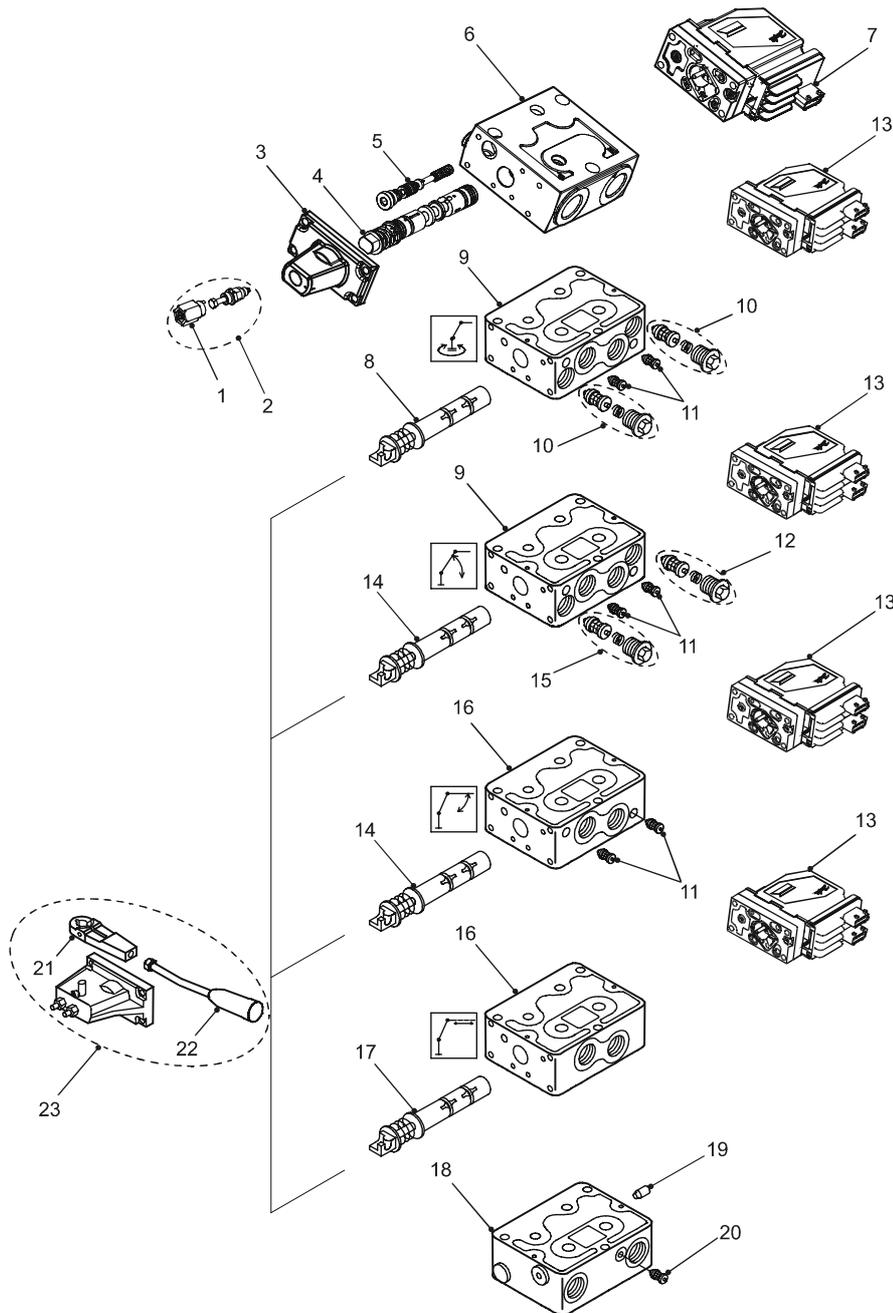
**148. *Disassembly.*** To disassemble the main control valve, proceed as follows (refer to Figure 92):

- a. Drain excess oil from the control valve then place it on a clean tray to catch any oil during disassembly.
- b. Mark and record the position of each valve module, then remove the tie rods and separate each module.
- c. Remove the control modules, lever assemblies and spools from the spool blocks if necessary. Ensure all components kept are together and laid out in order.

**149. *Cleaning and Inspection.*** To clean and inspect the main control valve, proceed as follows:

- a. Clean the control module by wiping with a cloth.
- b. Wash the spool valve components and control lever housing in clean solvent and dry thoroughly.
- c. Inspect all machined and mating surfaces for corrosion, pitting, nicks, burrs, scratches and excessive wear. Replace worn or damaged components as necessary.

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Item	Description	Item	Description	Item	Description
1.	Tamper proof cap	9.	Valve body (slew/main boom)	17.	Spool (extension boom)
2.	Emergency override screw	10.	Pressure relief valve 240 bar	18.	End section
3.	Emergency override housing	11.	Pressure relief valve	19.	Plug
4.	Spool	12.	Pressure relief valve 345 bar	20.	Main relief valve
5.	Pilot oil supply valve	13.	Proportional control module	21.	Lever base
6.	Inlet valve block	14.	Spool (main and outer booms)	22.	Lever
7.	On/off control module	15.	Pressure relief valve 150 bar	23.	Lever housing
8.	Spool (slew)	16.	Valve body (outer/extension booms)		

Figure 92 – Main Control Valve Breakdown

**150. Assembly.** To assemble the main control valve, proceed as follows (refer to Figure 92):

- a. Lubricate all the new seals, 'O' rings and spools with hydraulic oil (OM-68).
- b. Reassemble the spool valves in reverse order to disassembly on a flat surface, then refit the control module and control lever assemblies.
- c. Fit new 'O' rings between each valve block and assemble onto the tie rods in the correct order.
- d. Tighten the tie rods evenly to 22 N.m.

**Stabiliser Control Valve**

**151. Removal and Installation.** Removal and installation of the stabiliser control valve is to be conducted in accordance with EMEI Vehicle D 324-1.

**152. Disassembly.** Disassemble the valve in accordance with Figure 94 laying all components out in order.

**153. Cleaning and Inspection.** To clean and inspect the stabiliser control valve, proceed as follows:

- a. Thoroughly wash all components in clean solvent.
- b. Inspect machined surfaces for corrosion, pitting, nicks, burrs, scratches and excessive wear.
- c. Inspect all other components for damage and wear. Replace unserviceable components as necessary.

**154. Assembly.** To assemble the stabiliser control valve, proceed as follows (refer to Figure 94):

- a. Lubricate all seals and internal valve components with hydraulic oil (OM-68).
- b. Reassemble in reverse order to disassembly.

**CRANE ASSEMBLY**

**155. Removal.** To remove the crane assembly from the vehicle, proceed as follows:

- a. To facilitate removal, the crane is best positioned in the stowed position.
- b. Prepare a suitable stand to accommodate the crane when it has been removed from the vehicle.
- c. Remove stabiliser legs if necessary.
- d. Tag, crack loose and disconnect the supply hose connection at the pressure filter inlet. Use a suitable container to contain any oil spillage.

- e. Tag and crack loose the return hose at the 'T' piece on top of the valve bank, then disconnect the fitting. Use a suitable container to contain any oil spillage.
- f. Cap all ports lines and fittings to prevent the ingress of dirt.

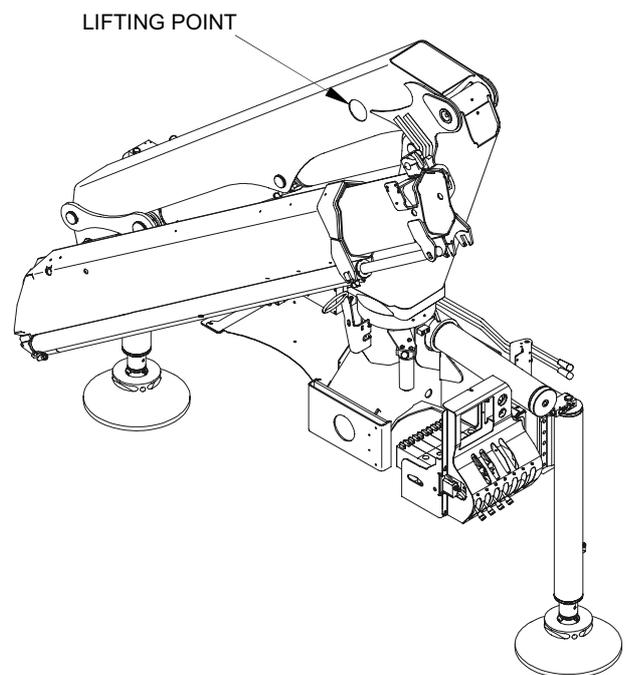
**NOTE**

**Disconnect the air line from the crane PTO to prevent inadvertent operation while the crane is removed.**

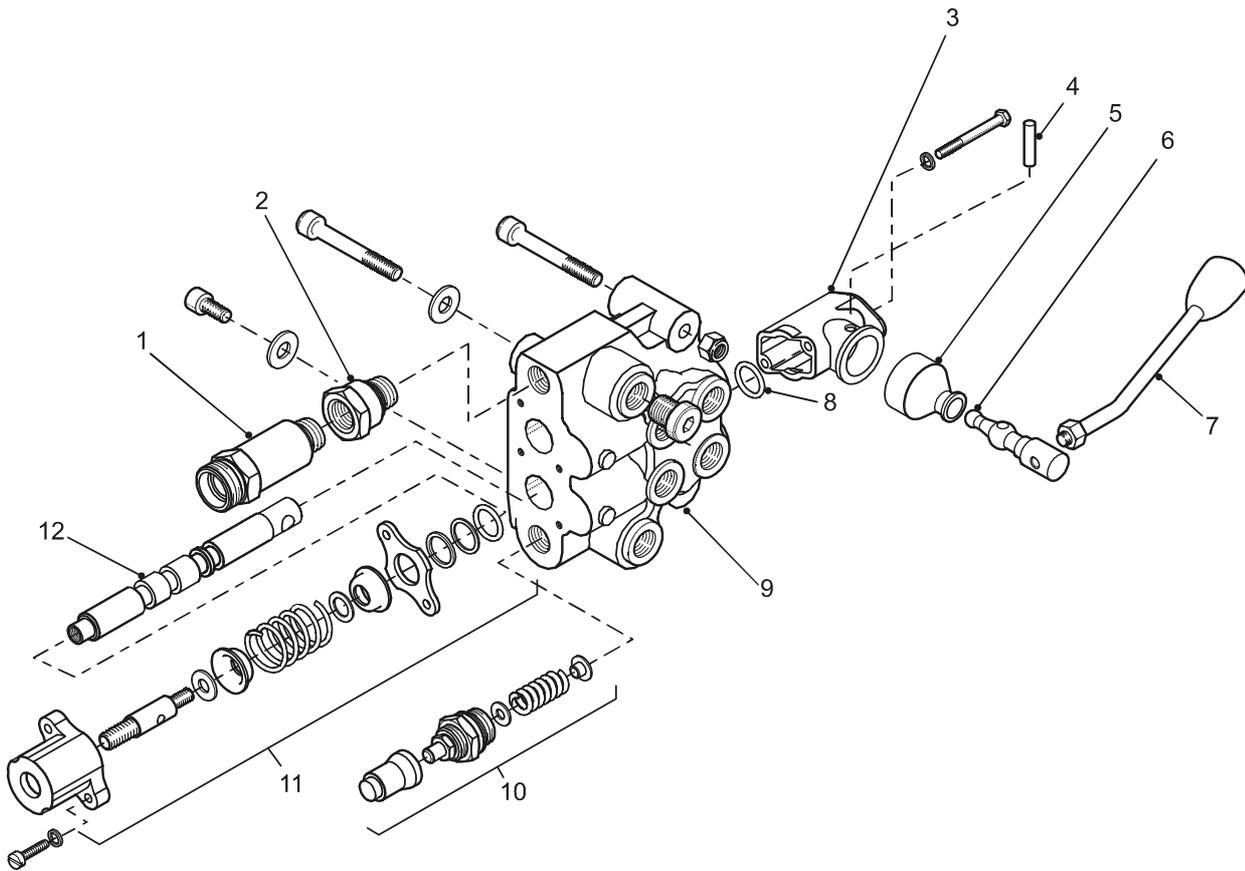
- g. Disconnect the crane power connection, pull the wiring back to the crane and stow securely.
- h. Fit the travel latch at the travel rest bracket for the inner boom. This will prevent movement in the crane boom system caused by hydraulic creep.
- i. Insert the lifting hook of an overhead crane into the lifting point on the crane boom (refer to Figure 93).
- j. Remove mounting bolts, then carefully lift the crane clear of the vehicle. Lower the crane onto suitable safety stands.

**WARNING**

**THE CRANE WILL TOPPLE IF IT IS NOT SECURED TO THE STAND.**



**Figure 93 – Crane Lifting Point**



Item	Description	Item	Description	Item	Description
1.	Non-return valve	5.	Rubber boot	9.	Valve body
2.	Bush	6.	Actuator	10.	Main relief valve
3.	Support housing	7.	Lever	11.	Spring housing assembly
4.	Pin	8.	'O' ring	12.	Spool valve

Figure 94 – Stabiliser Control Valve Exploded View

156. **Cleaning and Inspection.** To clean and inspect the crane assembly, proceed as follows:

- a. Check the condition of the crane mounting sub-frame.
- b. Replace worn or damaged parts as necessary.

157. **Installation.** To install the crane assembly, proceed as follows:

**WARNING**

**DO NOT RE-USE OLD TIE DOWN BOLTS OR NUTS WHEN RE-FITTING THE CRANE. PAINT NEW BOLTS PRIOR FITTING TO PREVENT CORROSION.**

- a. Using appropriate lifting equipment, lift the crane from the safety stand and guide it into position over the truck chassis.

- b. Guide the crane down into its position on the chassis ensuring all mounting holes are correctly aligned. Install and nip up all tie down bolts, then check that the crane is sitting flat on all mounting points of the sub-frame. Tighten the tie down bolts to 600 N.m.

- c. Reconnect the supply and return hoses to their respective fittings as tagged.
- d. Reconnect the power supply to the truck.
- e. Remove travel lock and reconnect the PTO air line.
- f. Bleed and test the crane hydraulic systems.
- g. Check the level of fluid in the oil reservoir. If necessary, top up with OM-68.

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### Crane Column

**WARNING**

**CRANE SERIAL NUMBER MUST BE SUPPLIED WHEN ORDERING ANY CRANE COMPONENTS TO ENSURE COMPATIBILITY AND SAFE CRANE OPERATION.**

**NOTE**

**The crane column can be removed from the base without disassembly of the inner and outer booms.**

**158. Removal.** To remove the crane column, proceed as follows (refer to Figure 91):

- a. Tag and disconnect all hoses and wiring connecting the column and booms to the crane base.

**NOTE**

**The hoses and wiring can be left connected if the column is only being lifted for bush inspection.**

- b. Mark the column and base to ensure the column is engaged into the slew rack in the correct position.
- c. Attach appropriate lifting apparatus to the crane column.
- d. Remove the circlip from the base of the crane column then carefully lift the column out of the base, guiding it vertically as it rises. Do not operate the slew mechanism while the column is removed.

**159. Cleaning and Inspection.** To clean and inspect the crane column, proceed as follows:

- a. Clean the crane column thoroughly.
- b. Check the condition of all hydraulic cylinder mounting pins and bushes. Replace as necessary.

**WARNING**

**ANY BENT OR TWISTED COMPONENTS MUST BE REPLACED.**

- c. Check the column for twist, bend or damage. Check for elongation of any of the mounting points. Check the condition of the mounting hardware. Rectify as necessary.
- d. Clean and check the condition of the bearing bushings in the slew housing. Replace as necessary.

- e. Clean the base of the crane column thoroughly, check the condition of the bearing journal surfaces and the pinion gear. Rectify as necessary.
- f. Check the condition of all associated hoses and pipework. Rectify as necessary.

**160. Installation.** To install the crane column, proceed as follows:

- a. Thoroughly grease the bearing surfaces, the pinion gear at the base of the crane column and the rack and bearings inside the crane base with XG 291.
- b. Guiding the column vertically, slowly lower it into the base, ensuring that the match marks line up and that the pinion gear engages with the rack in the correct position.
- c. Refit the circlip to base of the column.
- d. Ensure the crane slews through its range after fitment and that all hoses move with the column without snagging.
- e. Pump grease into the base bushes and rear of the rack while slowly rotating the crane until grease is forced out passed the circlip at the base of the column and the top junction of the column and base, wipe off excess grease.

### CRANE ELECTRONICS

**WARNING**

**THE CRANE SERIAL NUMBER MUST BE SUPPLIED WHEN ORDERING REPAIR PARTS FOR THE CRANE TO ENSURE COMPATIBILITY AND SAFE CRANE OPERATION.**

**161.** Figure 101 to Figure 104 illustrate the crane's electrical circuits.

**162.** All circuit boards used within the cranes electronic system are non-repairable and must be replaced with factory pre-programmed units upon failure. Exceptions are the remote control receiver and antenna boxes which must be replaced as complete assemblies.

**163. Replacement of Circuit Boards.** All circuit boards within the Paltronic system are screwed onto the covers and can be removed by completely removing the cover and disconnecting all plugs.

**164.** Refer to EMEI Vehicle D 323 for fault finding information.

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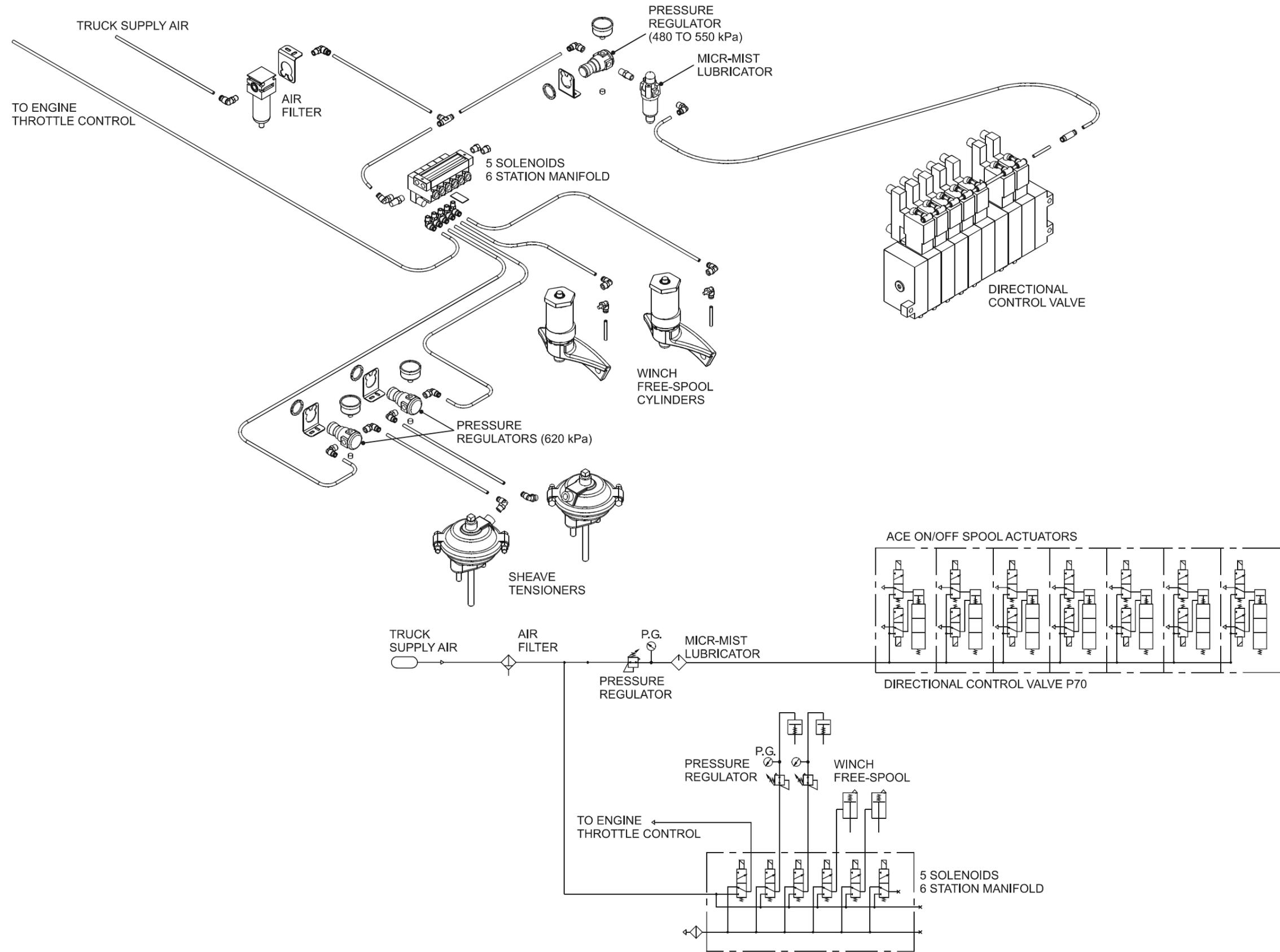


Figure 95 – Recovery System Pneumatic Diagram

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