



SERVICE MANUAL
TMS900E CRANE
(SINGLE ECM ENGINE)

Updated: 08-16-06 Control # 025-01

7

Description Of Crane

7.1

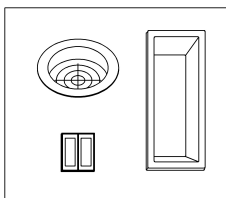
Overview of the operating and display instruments

This section only contains the operating and display elements for crane operation that are located on the outside of the truck crane or in the crane cab.

7.1.1

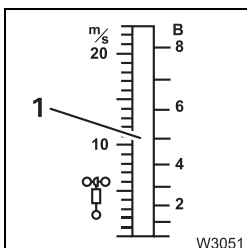
Overview of the crane section

The diagram on the following page illustrates the location of the operating and control instruments on the outside of the truck crane that are required for crane work.



Bubble Level Indicator

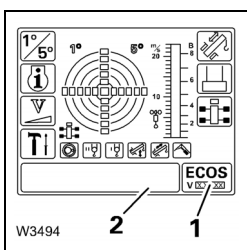
The bubble level indicator is located on the right-hand console on the out-rigger control panel above the engine speed control. This indicator provides the operator with a visual indication for determining the levelness of the machine.



Anemometer display

If crane is additionally equipped with an anemometer, it is possible to check the current wind speed in the *Anemometer* display.

The *Anemometer* display (1) shows a vertical bar with two scales on either side. The wind strength can be read in meters per second (m/sec) on the left-hand scale and in beauforts (B) on the right-hand scale; "Monitoring wind speed with an anemometer", see Section 3 - Superstructure Handbook.



Serial number display and crane control program version

The *Serial number* display (2) shows the same serial number as found on the *Superstructure* factory plate.

The *Crane control program version* display (1) show the current version number of the program which the crane control is working with. This version number must always be supplied in the case of a malfunction; see Section 6 - Superstructure Handbook.

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ANTIFREEZE/COOLANT

Heavy duty diesel engines require a balanced mixture of water and antifreeze/coolant. Fill the system with a 50/50 blended, fully formulated extended life antifreeze/coolant at all times. Refer to Lubrication section. Do not use more than 50 percent antifreeze/coolant in the mixture unless additional freeze protection is required. Never use more than 68 percent antifreeze/coolant under any condition. Antifreeze/coolant at 68 percent provides the maximum freeze protection; antifreeze/coolant protection decreases above 68 percent.

COOLANT FILTER

The engine has a coolant filter of the canister or spin-on type that requires periodic servicing. It is suggested that this be done when engine oil and filter are changed. Refer to "Cooling/SCA Maintenance Summary". There is a shut off valve located on the coolant filter head. Turn it to the OFF position before removing the filter. After changing filter, be sure the valve is positioned to the ON position Radiator assembly Removal AND Installation.

Operating Leaks and Checks Slightly depressurize the tank several times and check if air is exhausted through the drain valve exhaust port. If no air is exhausted, push up on the wire stem. If no air is exhausted, the filter is plugged. Remove the drain valve and clean the filter.



Excessive leaking of the air system could result in constant exhausting of the drain valve.

Replace the drain valve if the valve does not function as described above.

16.4.12

Pressure Protection Valve

Removal

1. Chock the wheels and completely depressurize both air systems.
2. Tag and disconnect the two air lines from the pressure protection valve and remove the two nuts and washers securing the valve to the mounting studs.



Step 3 is applicable to the pressure protection valve for the auxiliary air circuit.

3. Tag and disconnect the air lines from the valve. Unscrew the valve from the auxiliary air reservoir.

Installation

1. Install the valve on the mounting studs and secure with two nuts and washers or screw the valve into the auxiliary air reservoir.
2. Connect the air lines as per removal tags.

Operational Check



Replace any pressure protection valve that does not operate properly.

1. Install a pressure gauge and drain valve at both the supply and delivery sides of the pressure protection valve.

Operating Test



A CHANGE IN BRAKING CHARACTERISTICS OR LOW AIR PRESSURE MAY BE AN INDICATION OF A MALFUNCTION IN ONE OF THE BRAKE CIRCUITS. DO NOT OPERATE THE VEHICLE UNTIL REPAIRS HAVE BEEN MADE AND BOTH CIRCUITS ARE OPERATING PROPERLY. ALWAYS CHECK BRAKES AFTER SERVICING.

1. Check the delivery pressure of both #1 and #2 circuits with a test gauge. Depress the treadle to several positions between fully released and applied. Check the pressure on the gauges to see if it varies equally and proportionately with the movement of the brake pedal.
2. After the brakes are released, the reading on the test gauges should fall to zero. The delivery pressure in #1 circuit should be 30 kPa 4 psi greater than #2 circuit with both supply reservoirs at the same pressure.

Leakage Test

1. Make and hold a high pressure application 550 kPa (80 psi).
2. Coat the exhaust port and body of the brake valve with a soap solution. A leakage of a 25 mm (one-inch) bubble in three seconds is permitted.

Preventive Maintenance

Every 300 operating hours, 16,000 km (10,000 mi), or three months.

1. Clean dirt away from the heel of the treadle, plunger boot, and mounting plate.
2. Lubricate the treadle roller, hinge pin, and roller pin using a barium base lubricant.
3. Check the rubber plunger boot for deterioration and replace as necessary.
4. Lubricate the plunger with a barium base lubricant.

Every 3600 operating hours, 160,000 km, (100,000 mi), or yearly.

Replace inlet and exhaust valves, exhaust diaphragm, O-rings, and rubber graduating spring if worn or deteriorated.

Every 7200 operating hours, 320,000 km (200,000) mi or two years.

1. Disassemble the brake valve and clean and inspect all parts.

16.4.16

Park Brake Control Valve

Removal

1. Chock the wheels and completely depressurize both systems.
2. Remove the hardware securing the front console cover and remove the cover.

5. Remove the cotter pin and clevis pin securing the cylinder rod to the jack beam.
6. Slide the extension cylinder from the jack beam being careful not to damage the two hoses.
7. Tag and disconnect the hoses from the tubes in the top of the jack beam. Cap or plug all openings.
8. Remove the cylinder and lay it on suitable blocking.



The extension cylinder weighs approximately 66 kg (146 lb).

9. Remove the two clamps, nuts, washers, and lockwashers securing each tube assembly to the top inside of the jack beam. Remove the tube assemblies.
10. Tag and disconnect the stabilizer cylinder hoses from the tube assemblies in step. Cap or plug all openings.
11. Tag and disconnect the hoses from the tubes in the trays on the extension cylinder. Cap or plug all openings.
12. Tag and disconnect the tubes from the cylinder ports and remove the tubes from the trays. Cap or plug all openings.
13. Remove the bolts, washers, and lockwashers securing the trays to the extension cylinder and remove the trays.
14. Tag and disconnect the hoses from the stabilizer cylinder. Cap or plug all openings.
15. Remove the stabilizer cylinder from the jack beam. Refer to OUTRIGGER STABILIZER CYLINDER - REMOVAL in this Section.

Inspection

1. Inspect the hoses, couplings, and end fittings for cracks, chafing, cuts, or other damage.
2. Inspect the outrigger beams for bends, evidence of cracks, or other damage. Check the outrigger beam internally for hydraulic fluid, which may indicate a leaking cylinder or damaged hydraulic line.

Assembly



The mid beam and the jack beam are shimmed as a matched set and are identified by the stamped serial number ending in 'A' for the mid beam and 'B' for the jack beam. If one or the other is replaced, then the shims will have to be replaced and tolerances rechecked.

1. Install the stabilizer cylinder in the jack beam. Refer to OUTRIGGER STABILIZER CYLINDER - INSTALLATION in this Section.

Full Version Available

Grove TMS900E Truck Crane Service Manual

Grove TMS900E truck crane service manual with repair procedures, adjustments and troubleshooting for the main systems. Instant PDF download.

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