Operation & Maintenance Manual

DG714



210M

DUMP TRUCK

SERIAL SUFFIX BFA40DA THRU DN
24501 THRU 24567

KOMATSU®

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NOTE: Tables such as Table II, IIA, VIII, and IX may be used as in the following example:

Example: Convert 975 psi to kilopascals (kPa).

1. Select Table VIII.
2. Go to **PSI** row **90**, column **7**; read 668.8
   97 psi = 668.8 kPa.
3. Multiply by 10:
   970 psi = 6688 kPa.
4. Go to **PSI** row **0**, column **5**; read 34.47
   5 psi = 34.47 kPa. Add to step 3.
5. 970 + 5 psi = 6688 + 34 = 6722 kPa.
   975 psi = 6722 kPa.

TABLE VIII PRESSURE CONVERSIONS
Pounds/sq. in. [psi] To kilopascals (kPa)
Formula: psi x 6.895 = kPa

PSI	0	1	2	3	4	5	6	7	8	9
0	(kPa)	6.895	13.79	20.68	27.58	34.47	41.37	48.26	55.16	62.05
10	68.95	75.84	82.74	89.63	96.53	103.42	110.32	117.21	124.1	131.0
20	137.9	144.8	151.7	158.6	165.5	172.4	179.3	186.2	193.1	200.0
30	206.8	213.7	220.6	227.5	234.4	241.3	248.2	255.1	262.0	268.9
40	275.8	282.7	289.6	296.5	303.4	310.3	317.2	324.1	331.0	337.9
50	344.7	351.6	358.5	365.4	372.3	379.2	386.1	393.0	399.9	406.8
60	413.7	420.6	427.5	434.4	441.3	448.2	455.1	462.0	468.9	475.8
70	482.6	489.5	496.4	503.3	510.2	517.1	524.0	530.9	537.8	544.7
80	551.6	558.5	565.4	572.3	579.2	586.1	593.0	599.9	606.8	613.7
90	620.5	627.4	634.3	641.2	648.1	655.0	661.9	668.8	675.7	682.6

TABLE IX PRESSURE CONVERSIONS
Pounds/sq. in. [psi] To Megapascals (MPa)
Formula: psi x 0.0069 = MPa

PSI	0	10	20	30	40	50	60	70	80	90
0	(MPa)	0.069	0.14	0.21	0.28	0.34	0.41	0.48	0.55	0.62
100	0.69	0.76	0.83	0.90	0.97	1.03	1.10	1.17	1.24	1.31
200	1.38	1.45	1.52	1.59	1.65	1.72	1.79	1.86	1.93	2.00
300	2.07	2.14	2.21	2.28	2.34	2.41	2.48	2.55	2.62	2.69
400	2.76	2.83	2.90	2.96	3.03	3.10	3.17	3.24	3.31	3.38
500	3.45	3.52	3.59	3.65	3.72	3.79	3.86	3.93	4.00	4.07
600	4.14	4.21	4.27	4.34	4.41	4.48	4.55	4.62	4.69	4.76
700	4.83	4.90	4.96	5.03	5.10	5.17	5.24	5.31	5.38	5.45
800	5.52	5.58	5.65	5.72	5.79	5.86	5.93	6.00	6.07	6.14
900	6.21	6.27	6.34	6.41	6.48	6.55	6.62	6.69	6.76	6.83

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SUGGESTED* SOURCES FOR RUST PREVENTIVE GREASE:

- AMERICAN ANTI-RUST GREASE # 3-X from Standard Oil Company.
  also American Oil Company.
- GULF NORUST # 3 from Gulf Oil Company.
- MOBILARMA 355, Product No. 66705 from Mobil Oil Corporation.
- RUST BAN 326 from Humble Oil Company.
- RUSTOLENE B GREASE from Sinclair Oil Company.
- RUST PREVENTIVE GREASE - CODE 312 from the Southwest Grease and Oil Company.

** NOTE: This list represents the current Engineering approved sources for use in Haulpak manufacture. It is not exclusive. Other products may meet the same specifications of this list.*

TABLE X – COMMON CONVERSION MULTIPLIERS

TO CONVERT FROM	TO	MULTIPLY BY
inch – in.	millimeter (mm)	25.40
inch – in.	centimeter (cm)	2.54
foot – ft.	meter (m)	0.3048
yard – yd.	meter (m)	0.914
mile – mi.	kilometer (km)	1.61
sq. in. – $in.^2$	sq. centimeters (cm^2)	6.45
sq. ft. – $ft.^2$	sq. centimeters (cm^2)	929
cu. in. – $in.^3$	cu. centimeters (cm^3)	16.39
cu. in. – $in.^3$	liters (l)	0.016
cu. ft. – $ft.^3$	cu. meters (m^3)	0.028
cu. ft. – $ft.^3$	liters (l)	28.3
ounce – oz.	kilogram (kg)	0.028
fluid ounce – fl. oz.	milliliter (ml)	29.573
pound (mass)	kilogram (kg)	0.454
pound (force) – lbs.	Newton (N)	4.448
in. lbs. (force)	Newton.meters (N.m)	0.113
ft. lbs. (force)	Newton.meters (N.m)	1.356
ft. lbs. (force)	kilogram.meters (kg.m)	0.138
kilogram.meters (kg.m)	Newton.meters (N.m)	9.807
psi (pressure)	kilopascals (kPa)	6.895
psi (pressure)	megapascals (MPa)	0.007
psi (pressure)	kilograms/cm^2 (kg/cm^2)	0.0704
ton (short)	kilogram (kg)	907.2
ton (short)	metric ton	0.907
quart – qt.	liters (l)	0.946
gallon – gal.	liters (l)	3.785
HP (horsepower)	Watts	745.7
HP (horsepower)	kilowatts (kW)	0.745

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INSTRUMENTS AND CONTROLS

INSTRUMENT PANEL (FIGURE 3-5)

The operator must understand the function and operation of each instrument and control. This knowledge is essential for proper and safe operation of the machine. Items that are marked **(OPTIONAL)** may not apply to this truck.

(1) Fog Lights (Optional)



The fog lights are an optional piece of equipment, useful in heavy rain and foggy conditions. When present, the switch has two positions, "On" and "Off".

(2) Lights- All



The instrument panel lights and the head lights are controlled by a three position switch. Moving the switch from the "Off" position to the second position completes the circuit from battery to the instrument panel lights and taillights. Moving the switch to the third position completes the circuit to the head lights in addition to the panel and tail lights.

(3) Lights - Instrument Panel



The panel light dimmer control is a rheostat which allows the operator to vary the brightness of the instrument panel lights.

(4) Windshield Washer



The windshield washer switch, when held in the "On" position, directs water from the reservoir (located in the cab to the left of the passenger seatbox) to the windshield for cleaning purposes. Wipers (5) should be operating when washer is activated. This switch is spring loaded to the "Off" position. The windshield washer has a 2 qt. (2 l) plastic container.

(5) Windshield Wiper



The windshield wiper control switch is a three position rocker switch. Moving the switch from "Off" to the second position places the wiper in the low or slow cycle. Pushing the switch to the third position places the wiper motor in high or fast cycle.

(6) Engine Starting Aid



The ether starting aid is used for cold weather starting and is controlled by a switch, spring-loaded to the "Off" position. When the switch is held in the "On" position, the ether is injected into the engine intake manifold to aid in cold weather starting. In cold weather, below 50°F (10°C), turn the keyswitch (7) to the "Start" position. Push the cold weather starting switch to the "On" position for **three seconds while cranking**, then release. If engine does not start, wait thirty seconds before repeating the procedure.

(7) Keyswitch

The key switch is a three position ("Off", "Run", "Start") switch. When it is moved to the "Run" position, the switch activates the accessory circuits. When moved to the "Start" position, the engine's starting system is activated. After engine start, allow the switch to return to the spring-loaded "Run" position.

(8) Engine Shut Down (Not Used)



This position is not used on the 210M equipped with the Cummins Quantum QSK-19 engine.

(9) Windshield Wiper Fuse Holder



This is a 15 amp.- dual element, time delay (slow blow) type fuse. Replacement with any other type is not recommended.

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250 HOUR LUBRICATION AND MAINTENANCE CHECKS

NOTE: 10 Hour and 100 Hour service should be included with the following:

Truck Serial Number _____
Site Unit Number _____
Date:_____Hour Meter_____
Serviceperson Name_____

ENGINE

a. **Crankcase Oil** – Change engine oil (use Lube Key "A" on Lubrication and Specification chart) and corrosion filters.

b. **Lube Oil Filters** – Change.

c. **By- Pass Filter** – Change.

d. **Other EngineChecks –**

- Remove primary air filters if indicator shows RED. Clean or replace as required.
- Change safety filter when green dot disappears from wing nut on safety element. If safety element is disturbed, replace O-ring seal.
- Check air filter cover gasket, replace as required.
- Check radiator, water pump, hoses and pipes for leaks, replace or repair as required.
- Check cooling system for correct coolant mixture. Add mixture as required.
- Check exhaust manifolds, gaskets, pipes & exhaust box for leaks, repair as required.
- Check lubrication hoses and pipes for leaks, replace or repair as required.

FUEL FILTER AND STRAINER -

Change filter and strainer element.

HYDRAULIC FILTERS -

Change two (2) filter elements.

OTHER CHECKS AND ADJUSTMENTS -

Check hydraulic tank, lines, valves and cylinders for leaks and/or wear, repair as required.

Check orbitrol steering control unit for binding, steering column for excess play, hoses and tubes for wear or leaks, steering cylinders for excessive play or leaks, repair as required.

Check parking brake actuator, hoses and tubes for leaks or wear, repair as required.

Check parking brake adjustments (lining and linkage), adjust/repair as required.

COMMENTS	√'d	INITIALS

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The SPECIFICATIONS listed on these pages cover standard production. When optional equipment is selected, some of these specifications and/or capacities may change.

ENGINE

Cummins	QSK–19C
Number of Cylinders	6
Operating Cycle	4-Stroke
Rated Brake HP (SAE)	675 HP (504kW) @ 2100 RPM
Flywheel HP (SAE)	641 HP (478kW) @ 2100 RPM
Maximum Torque:	
	2275 ft. lbs. (3085 N.m) @ 1300 RPM

TRANSMISSION — ALLISON CLT-6063 w/ATEC

Torque Converter	TC683
6 Speeds FORWARD	2 REVERSE

SUSPENSION — HYDRAIR® II

Stroke (Front & Rear)	10.88 in. (276 mm)

FINAL DRIVE

Ratios:	
Bevel Set (differential)	3.85:1
Planetary	5.70:1
Total Reduction	21.93:1
Maximum Speed	35 MPH (56.7 km/h)

TIRES (Standard) — 24.00-35, 36 PR(E-3)

Rating Ton-MPH (m/ton-km/h)	180 (262.8)

24 VDC ELECTRIC SYSTEM

Batteries	Two 12 Volt Batteries in Series
Capacity	200 Ampere-Hour
Alternator	24 Volt, 75 Amperes Output
Starter	DELCO-REMY
Lighting	24 Volt-DC

SERVICE CAPACITIES

	U.S. Gallons	Liters
Engine Lube Oil:		
Cummins (incl. lube oil filters)	14.2	53.8
Cooling System	48	181.7
Fuel Tank	154	583.7
Hydraulic System (incl. tank)	144	545.0
Hydraulic Tank	95	359.6
Transmission	20	75.6
Final Drive	56	212.2
Front Spindle	1	3.8

HOIST SYSTEM

Tandem Pump Capacity:	
Shaft End	94 gpm (355 l/min.) @ 2100 RPM
Cover End	80 gpm (303 l/min.) @ 2100 RPM
Relief Valve Pressure Setting	2750 psi (18.9 MPa)
Hoist Cylinders	2 - Stage Hydraulic Cylinders
Filtration	Full-Flow, Remote-Mounted Filter
Return	Full Flow, 12 Micron - Absolute

SERVICE BRAKES

Actuation	All Hydraulic
Type:	
(Front)	Single Dry Disc with 2 Caliper Assy./Wheel
Total Braking Surface	408 $in.^2$ (2 632 cm^2)
(Rear)	Dual Wet Disc Brake Assemblies
Total Braking Surface	9020 $in.^2$ (58 193 cm^2)

STEERING

Turning Circle	69 ft. (21.0 m)
Pump Capacity	22.7 gpm (85.9 lpm)
System Pressure	2750 psi (19.0 MPa)

DUMP BODY CAPACITIES

PAYLOAD (Rated)	55 Ton	(49.9 mt)
Capacitiy:		
Struck	31.1 cu. yds.	(23.8 m^3)
Heaped @ 2:1 (SAE)	44.0 cu. yds.	(33.7 m^3)

BODY

Material [Yield Strength]	Thickness
Floor [125,000 psi (862 MPa)Steel]	0.75 in. (19 mm)
Front [90,000 psi (620 MPa)Steel]	0.50 in. (13 mm)
Sides [90,000 psi (620 MPa)Steel]	0.38 in. (10 mm)

WEIGHT DISTRIBUTION

EMPTY - STANDARD	Pounds	Kilograms
Front Axle	44,390	20 135
Rear Axle	45,910	20 824
Total	90,300	40 959
LOADED	**Pounds**	**Kilograms**
Front Axle	66,700	30 255
Rear Axle	133,600	60 600
Total	200,300	90 855

MAXIMUM ALLOWABLE **GVW** **210,000** **95 340**

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