

521E TIER III

Service Manual

Print No. 87728450 A - EU



521E

Loader

87728450 A - EU

Use for Repair Manual

521E Wheel Loader Repair Manual 87728450 A - EU

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Section 1001

GENERAL TORQUE SPECIFICATIONS

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TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

| Grade 5 Bolts, Nuts, and Studs | | |
|---|--------------|---------------|
|    | | |
| Size | Pound-Inches | Newton metres |
| 1/4 inch | 108 to 132 | 12 to 15 |
| 5/16 inch | 204 to 252 | 23 to 28 |
| 3/8 inch | 420 to 504 | 48 to 57 |
| | | |
| Size | Pound-Feet | Newton metres |
| 7/16 inch | 54 to 64 | 73 to 87 |
| 1/2 inch | 80 to 96 | 109 to 130 |
| 9/16 inch | 110 to 132 | 149 to 179 |
| 5/8 inch | 150 to 180 | 203 to 244 |
| 3/4 inch | 270 to 324 | 366 to 439 |
| 7/8 inch | 400 to 480 | 542 to 651 |
| 1.0 inch | 580 to 696 | 787 to 944 |
| 1-1/8 inch | 800 to 880 | 1085 to 1193 |
| 1-1/4 inch | 1120 to 1240 | 1519 to 1681 |
| 1-3/8 inch | 1460 to 1680 | 1980 to 2278 |
| 1-1/2 inch | 1940 to 2200 | 2631 to 2983 |

| Grade 8 Bolts, Nuts, and Studs | | |
|---|--------------|---------------|
|    | | |
| Size | Pound-Inches | Newton metres |
| 1/4 inch | 144 to 180 | 16 to 20 |
| 5/16 inch | 288 to 348 | 33 to 39 |
| 3/8 inch | 540 to 648 | 61 to 73 |
| | | |
| Size | Pound-Feet | Newton metres |
| 7/16 inch | 70 to 84 | 95 to 114 |
| 1/2 inch | 110 to 132 | 149 to 179 |
| 9/16 inch | 160 to 192 | 217 to 260 |
| 5/8 inch | 220 to 264 | 298 to 358 |
| 3/4 inch | 380 to 456 | 515 to 618 |
| 7/8 inch | 600 to 720 | 814 to 976 |
| 1.0 inch | 900 to 1080 | 1220 to 1465 |
| 1-1/8 inch | 1280 to 1440 | 1736 to 1953 |
| 1-1/4 inch | 1820 to 2000 | 2468 to 2712 |
| 1-3/8 inch | 2380 to 2720 | 3227 to 3688 |
| 1-1/2 inch | 3160 to 3560 | 4285 to 4827 |
| NOTE: Use thick nuts with Grade 8 bolts. | | |

TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

Grade 8.8 Bolts, Nuts, and Studs



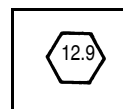
| Size | Pound-Inches | Newton metres |
|------|--------------|---------------|
| M4 | 24 to 36 | 3 to 4 |
| M5 | 60 to 72 | 7 to 8 |
| M6 | 96 to 108 | 11 to 12 |
| M8 | 228 to 276 | 26 to 31 |
| M10 | 456 to 540 | 52 to 61 |
| | | |
| Size | Pound-Feet | Newton metres |
| M12 | 66 to 79 | 90 to 107 |
| M14 | 106 to 127 | 144 to 172 |
| M16 | 160 to 200 | 217 to 271 |
| M20 | 320 to 380 | 434 to 515 |
| M24 | 500 to 600 | 675 to 815 |
| M30 | 920 to 1100 | 1250 to 1500 |
| M36 | 1600 to 1950 | 2175 to 2600 |

Grade 10.9 Bolts, Nuts, and Studs



| Size | Pound-Inches | Newton metres |
|------|--------------|---------------|
| M4 | 36 to 48 | 4 to 5 |
| M5 | 84 to 96 | 9 to 11 |
| M6 | 132 to 156 | 15 to 18 |
| M8 | 324 to 384 | 37 to 43 |
| | | |
| Size | Pound-Feet | Newton metres |
| M10 | 54 to 64 | 73 to 87 |
| M12 | 93 to 112 | 125 to 150 |
| M14 | 149 to 179 | 200 to 245 |
| M16 | 230 to 280 | 310 to 380 |
| M20 | 450 to 540 | 610 to 730 |
| M24 | 780 to 940 | 1050 to 1275 |
| M30 | 1470 to 1770 | 2000 to 2400 |
| M36 | 2580 to 3090 | 3500 to 4200 |

Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

| 37 Degree Flare Fitting | | | |
|-------------------------|----------------|------------------|------------------|
| Tube OD Hose ID | Thread Size | Pound- Inches | Newton metres |
| 1/4 inch 6.4 mm | 7/16-20 | 72 to 144 | 8 to 16 |
| 5/16 inch 7.9 mm | 1/2-20 | 96 to 192 | 11 to 22 |
| 3/8 inch 9.5 mm | 9/16-18 | 120 to 300 | 14 to 34 |
| 1/2 inch 12.7 mm | 3/4-16 | 180 to 504 | 20 to 57 |
| 5/8 inch 15.9 mm | 7/8-14 | 300 to 696 | 34 to 79 |
| | | | |
| Tube OD Hose ID | Thread Size | Pound- Feet | Newton metres |
| 3/4 inch 19.0 mm | 1-1/16-12 | 40 to 80 | 54 to 108 |
| 7/8 inch 22.2 mm | 1-3/16-12 | 60 to 100 | 81 to 135 |
| 1.0 inch 25.4 mm | 1-5/16-12 | 75 to 117 | 102 to 158 |
| 1-1/4 inch 31.8 mm | 1-5/8-12 | 125 to 165 | 169 to 223 |
| 1-1/2 inch 38.1 mm | 1-7/8-12 | 210 to 250 | 285 to 338 |

| Straight Threads with O-ring | | | |
|------------------------------|----------------|------------------|------------------|
| Tube OD Hose ID | Thread Size | Pound- Inches | Newton metres |
| 1/4 inch 6.4 mm | 7/16-20 | 144 to 228 | 16 to 26 |
| 5/16 inch 7.9 mm | 1/2-20 | 192 to 300 | 22 to 34 |
| 3/8 inch 9.5 mm | 9/16-18 | 300 to 480 | 34 to 54 |
| 1/2 inch 12.7 mm | 3/4-16 | 540 to 804 | 57 to 91 |
| | | | |
| Tube OD Hose ID | Thread Size | Pound- Feet | Newton metres |
| 5/8 inch 15.9 mm | 7/8-14 | 58 to 92 | 79 to 124 |
| 3/4 inch 19.0 mm | 1-1/16-12 | 80 to 128 | 108 to 174 |
| 7/8 inch 22.2 mm | 1-3/16-12 | 100 to 160 | 136 to 216 |
| 1.0 inch 25.4 mm | 1-5/16-12 | 117 to 187 | 159 to 253 |
| 1-1/4 inch 31.8 mm | 1-5/8-12 | 165 to 264 | 224 to 357 |
| 1-1/2 inch 38.1 mm | 1-7/8-12 | 250 to 400 | 339 to 542 |

| Split Flange Mounting Bolts | | |
|-----------------------------|------------------|------------------|
| Size | Pound- Inches | Newton metres |
| 5/16-18 | 180 to 240 | 20 to 27 |
| 3/8-16 | 240 to 300 | 27 to 34 |
| 7/16-14 | 420 to 540 | 47 to 61 |
| | | |
| Size | Pound- Feet | Newton metres |
| 1/2-13 | 55 to 65 | 74 to 88 |
| 5/8-11 | 140 to 150 | 190 to 203 |

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

| O-ring Face Seal End | | | | | O-ring Boss End Fitting or Lock Nut | | |
|-----------------------------|-----------------------|----------------|------------------|------------------|--|------------------|------------------|
| Nom. SAE Dash Size | Tube OD | Thread Size | Pound- Inches | Newton metres | Thread Size | Pound- Inches | Newton metres |
| -4 | 1/4 inch 6.4 mm | 9/16-18 | 120 to 144 | 14 to 16 | 7/16-20 | 204 to 240 | 23 to 27 |
| -6 | 3/8 inch 9.5 mm | 11/16-16 | 216 to 240 | 24 to 27 | 9/16-18 | 300 to 360 | 34 to 41 |
| -8 | 1/2 inch 12.7 mm | 13/16-16 | 384 to 480 | 43 to 54 | 3/4-16 | 540 to 600 | 61 to 68 |
| | | | | | | | |
| | | | | | Thread Size | Pound- Feet | Newton metres |
| -10 | 5/8 inch 15.9 mm | 1-14 | 552 to 672 | 62 to 76 | 7/8-14 | 60 to 65 | 81 to 88 |
| | | | | | | | |
| Nom. SAE Dash Size | Tube OD | Thread Size | Pound- Feet | Newton metres | 1-1/16-12 | 85 to 90 | 115 to 122 |
| | | | | | 1-3/16-12 | 95 to 100 | 129 to 136 |
| -12 | 3/4 inch 19.0 mm | 1-3/16-12 | 65 to 80 | 90 to 110 | 1-5/16-12 | 115 to 125 | 156 to 169 |
| -14 | 7/8 inch 22.2 mm | 1-3/16-12 | 65 to 80 | 90 to 110 | 1-5/8-12 | 150 to 160 | 203 to 217 |
| -16 | 1.0 inch 25.4 mm | 1-7/16-12 | 92 to 105 | 125 to 140 | 1-7/8-12 | 190 to 200 | 258 to 271 |
| -20 | 1-1/4 inch 31.8 mm | 1-11/16-12 | 125 to 140 | 170 to 190 | | | |
| -24 | 1-1/2 inch 38.1 mm | 2-12 | 150 to 180 | 200 to 254 | | | |

Section 1002

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FLUIDS AND LUBRICANTS

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 Model 521E 7

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 Model 521E 8

CAPACITIES AND LUBRICANTS

Engine Oil

| | |
|-----------------------------------|--------------------------------|
| Capacity | 10.9 liters (11.5 U.S. Quarts) |
| Capacity with Filter Change | 11.8 liters (12.5 U.S. Quarts) |
| Type of oil..... | Case AKCELA (SAE 15W-40) |

Engine Cooling System

| | |
|----------------------|-----------------------------------|
| Capacity | 22 liters (23.2 U.S. Quarts) |
| Type of Coolant..... | 50% water and 50% Ethylene Glycol |

Fuel Tank

| | |
|--------------------|--|
| Capacity | 189.3 liters (50 U.S. Gallons) |
| Type of Fuel | See Diesel fuel specifications on page 6 |

Hydraulic System

| | |
|---|----------------------------------|
| Hydraulic Reservoir Refill Capacity | 56.8 liters (15.0 U.S. Gallons) |
| Total System Capacity | 113.6 liters (30.0 U.S. Gallons) |
| Type of Oil | Case AKCELA Hy-Tran Ultra® |

Transmission

| | |
|--|------------------------------|
| Refill Capacity with Filter Change | 18.9 liters (20 U.S. Quarts) |
| Total System Capacity | 26 liters (27.5 U.S. Quarts) |
| Type of Oil | Case AKCELA (SAE 15W-40) |

Axles

| | |
|-------------------------|---|
| Capacity | |
| Front..... | 22.0 liters (23.2 U.S. Quarts) |
| Rear | 22.0 liters (23.2 U.S. Quarts) |
| Type of Lubricant | Case AKCELA Transaxle Fluid (SAE 80W-140) |

NOTE: *DO NOT use an alternate oil in the axles. The brake components in the axles could be damaged as a result of using an alternate oil. Machines are shipped from the factory with break-in oil.*

Brake System

| | |
|--|----------------------------|
| Type of Fluid (Same as Hydraulic System) | Case AKCELA Hy-Tran Ultra® |
|--|----------------------------|

Fittings

| | |
|--------------------------|---------------------------|
| Grease as required | Case AKCELA Molydisulfide |
|--------------------------|---------------------------|

ENGINE OIL RECOMMENDATIONS

Case AKCELA No. 1 Engine oil is recommended for use in your Case engine. Case AKCELA No. 1 Engine Oil will lubricate your engine correctly under all operating conditions.

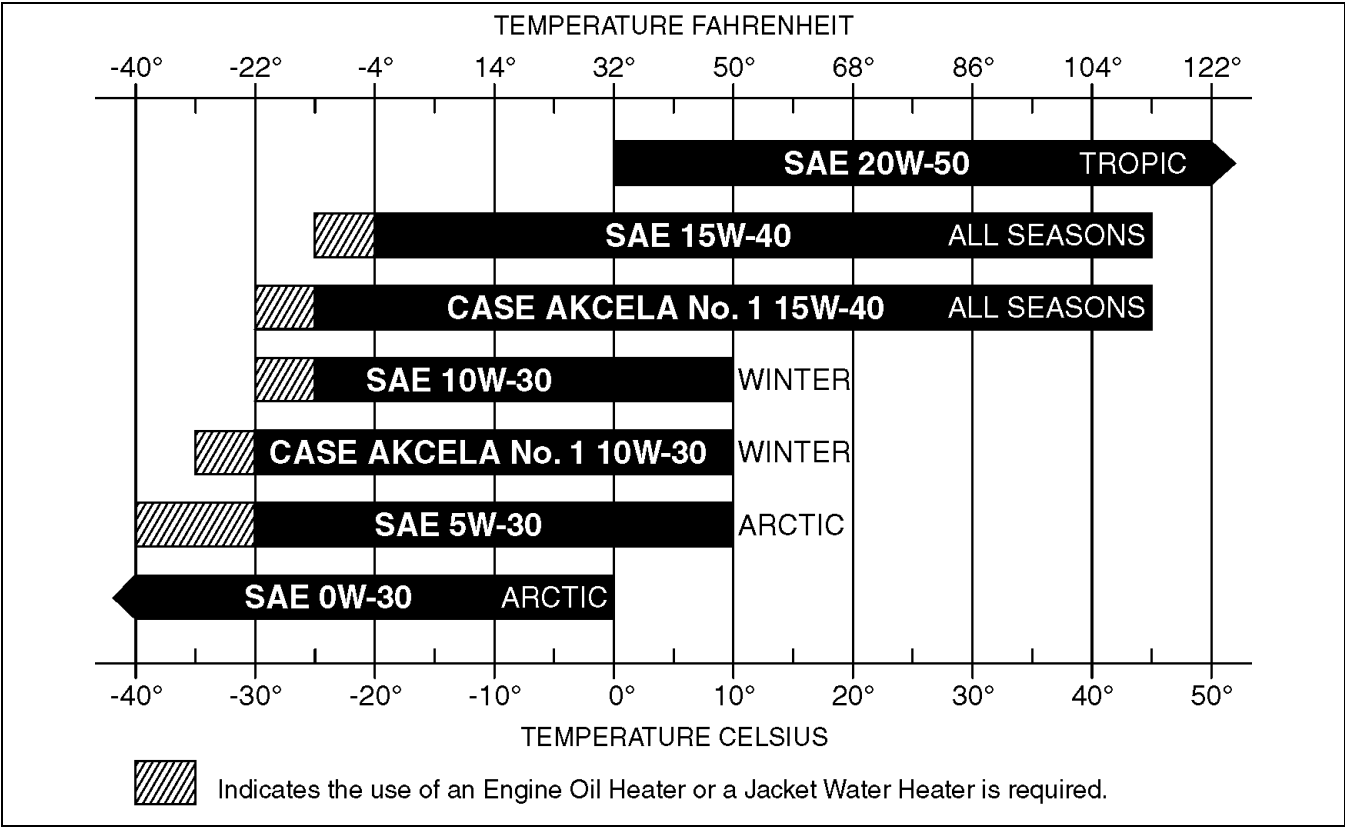
If Case AKCELA No. 1 Multi-Viscosity Oil is not available, use only oil meeting API engine oil service category CI-4.

See the chart below for recommended viscosity at ambient air temperature ranges.

NOTE: Do not put performance additives or other oil additive products in the engine crankcase. The oil change intervals given in this manual are according to tests with Case AKCELA lubricants.

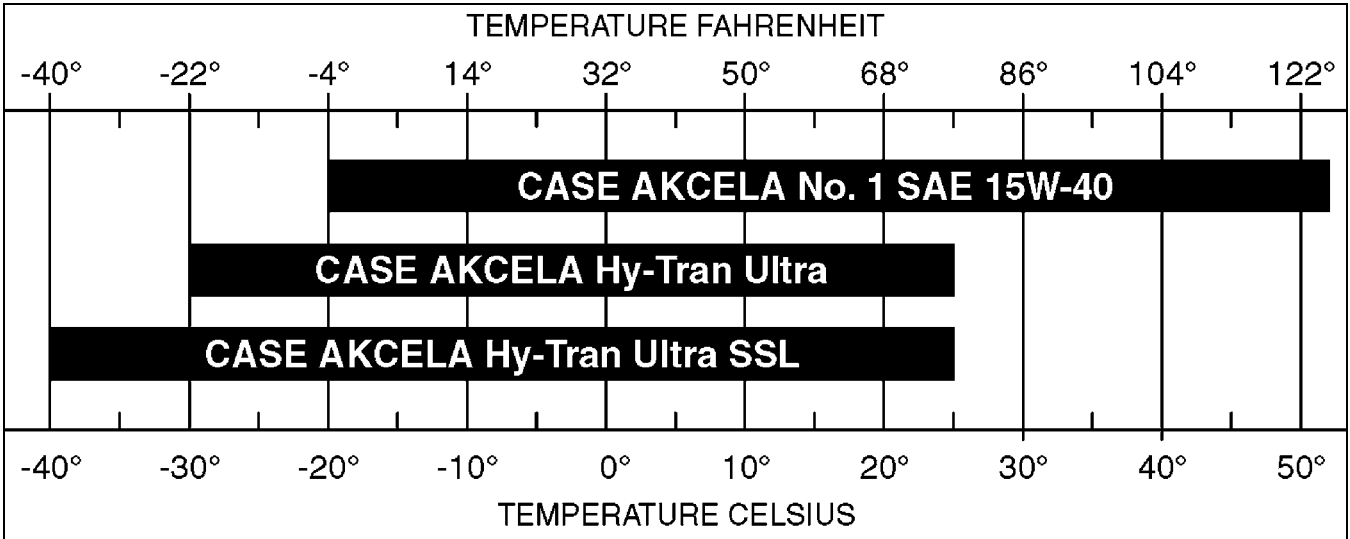


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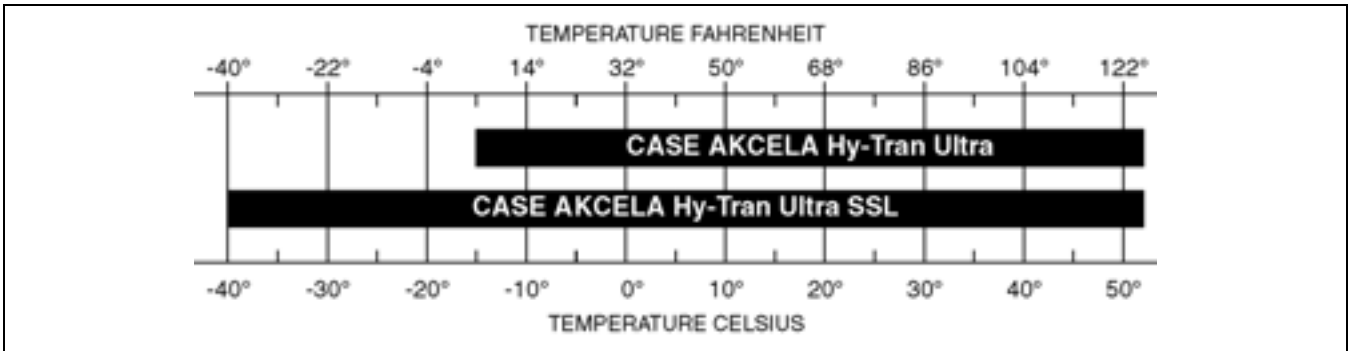
BC02N250

TRANMISSION TEMPERATURE CHART



BC04F193

HYDRAULIC/BRAKE SYSTEM TEMPERATURE CHART



BC04F192

DIESEL FUEL SYSTEM

Use No. 2 diesel fuel in the engine of this machine. The use of other fuels can cause the loss of engine power and high fuel consumption.

In very cold temperatures, a mixture of No. 1 and No. 2 diesel fuels is temporarily permitted. See the following Note.

NOTE: *See your fuel dealer for winter fuel requirements in your area. If the temperature of the fuel lowers below the cloud point (wax appearance point), wax crystals in the fuel will restrict the fuel filter and cause the engine to lose power or not start.*

The diesel fuel used in this machine must meet the specifications as shown below in, “Specifications for Acceptable No. 2 Diesel Fuel”, or Specification (ASTM-D-975) of the American Society for Testing and Materials.

Specifications for Acceptable No. 2 Diesel Fuel

| | |
|---|--|
| API gravity, minimum | 34 |
| Flash point, minimum | 60°C (140°F) |
| Cloud point (wax appearance point), maximum | -20°C (-5°F) See Note above |
| Pour point, maximum | -26°C (-15°F) See Note above |
| Distillation temperature, 90% point | 282 to 338°C (540 to 640°F) |
| Viscosity, at 38°C (100°F) | |
| Centistokes | 2.0 to 4.3 |
| Cetane number, minimum | 43 (45 to 55 for winter or high altitudes) |
| Water and sediment, by volume, maximum | 0.05% |

Fuel Storage

If you keep fuel in storage for a period of time, you can get foreign material or water in the fuel storage tank. Many engine problems are caused by water in the fuel.

Keep the fuel storage tank outside and keep the fuel as cool as possible. Remove water from the storage container at regular periods of time.

Fill the fuel tank at the end of the daily operating period to prevent condensation in the fuel tank.