

Shop Manual

ARTICULATED
DUMP TRUCK

HM400-3MO

SERIAL NUMBERS 5001 and up

ecot3

KOMATSU

ARTICULATED DUMP TRUCK

HM400-3M0

Model Serial Number

HM400-3M0 5001 and up

00 Index and foreword

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Index

Index (ALL-0310-001-A-00-A)

00 Index and foreword	00-1
Index	00-2
Foreword, safety and general information	00-16
Important safety notice	00-16
How to read the shop manual	00-23
Explanation of terms for maintenance standard	00-25
Handling equipment of fuel system devices	00-27
Handling of intake system parts	00-28
Handling of hydraulic equipment	00-29
Method of disconnecting and connecting of push-pull type coupler	00-31
Handling of electrical equipment	00-34
How to read electric wire code	00-42
Precautions when performing operation	00-45
Practical use of KOMTRAX	00-50
Standard tightening torque table	00-51
List of abbreviation	00-57
Conversion table	00-62
01 Specification	01-1
Table of contents	01-2
Specifications	01-3
Specification drawing	01-3
Specifications	01-5
Weight table	01-11
Table of fuel, coolant, and lubricants	01-12
10 Structure and function	10-1
Table of contents	10-2
Engine and cooling system	10-4
Engine related parts	10-4
Output shaft	10-5
Turbocharger	10-6
EGR system layout drawing	10-8
EGR system circuit diagram	10-9
EGR valve	10-11
Bypass valve	10-13
Venturi system	10-15
EGR cooler	10-17
Muffler	10-19
Cooling system	10-20
Radiator fan pump	10-22
Aftercooler fan motor	10-30
Radiator fan motor	10-41
Oil cooler bypass valve	10-50
Power train	10-51
Power train system	10-51
Drive shaft	10-53
Torque converter and transmission hydraulic piping	10-54
Torque converter	10-55
Transmission	10-61
Transmission control valve	10-86
Forward and reverse clutch ECMV and gear speed clutch ECMV	10-89
Lockup clutch ECMV	10-96
Differential lock clutch ECMV	10-100
Main relief valve, torque converter relief valve, and main flow selector valve	10-104
Axle	10-110
Differential	10-113
Final drive	10-117
Steering system	10-120

Layout of steering devices	10-120
Steering column	10-121
Flow amplifier valve	10-122
Steering valve	10-126
Emergency steering pump	10-132
Emergency steering motor	10-133
Brake system	10-134
Layout of brake parts	10-134
Parking brake solenoid and accumulator charge valve	10-136
Accumulator	10-142
Shut off solenoid valve	10-143
Brake valve	10-144
Proportional pressure reducing valve	10-149
Slack adjuster	10-151
Brake	10-155
Brake system tank	10-158
Parking brake	10-159
Undercarriage and frame	10-162
Suspension	10-162
Suspension cylinder	10-166
Oscillation hitch	10-169
Hydraulic system	10-170
Hydraulic component layout	10-170
Dump body control	10-172
Hydraulic tank	10-173
Steering and hoist pump	10-174
Hoist valve	10-185
Steering pump selector solenoid valve	10-191
Dump EPC valve	10-192
Center brake cooling remote motor	10-194
Front brake cooling relief valve	10-203
Center brake cooling relief valve	10-204
Cab and its attachments	10-205
ROPS cab	10-205
Cab tilt	10-206
Electrical system	10-207
Electrical control system	10-207
Machine monitor system	10-236
Rear view monitor system	10-259
KOMTRAX system	10-263
System component parts	10-266
Sensor	10-292
20 Standard value tables	20-1
Table of contents	20-2
Standard service value table	20-3
Standard value table for engine	20-3
Standard value table for machine	20-5
30 Testing and adjusting	30-1
Table of contents	30-2
Related information on testing and adjusting	30-3
Tools for testing and adjusting	30-3
Sketch of tools for testing and adjusting	30-8
Engine and cooling system	30-9
Testing engine speed	30-9
Testing boost pressure	30-10
Testing exhaust gas temperature	30-12
Testing exhaust gas color	30-14
Adjusting valve clearance	30-16
Testing compression pressure	30-18

Testing blowby pressure	30-20
Testing engine oil pressure	30-21
Testing drive pressure of EGR valve and bypass valve	30-23
Testing fuel pressure	30-24
Handling cylinder cutout mode operation	30-25
Handling no-injection cranking operation	30-26
Testing fuel return rate and leakage	30-27
Bleeding air from fuel system	30-29
Testing fuel circuit for leakage	30-31
Testing radiator fan and aftercooler fan speed	30-32
Testing and adjusting alternator belt tension	30-33
Testing and adjusting air conditioner compressor belt tension	30-34
Power train	30-35
Testing torque converter stall speed	30-35
Testing power train oil pressure	30-37
Adjusting transmission speed sensor	30-48
Adjusting transmission controller	30-51
Retrieval of disabled machine that resulted from a trouble in electrical system	30-52
Retrieval of disabled machine due to traction control system (KTCS) failure	30-56
Steering system	30-58
Testing and adjusting steering circuit oil pressure	30-58
Brake system	30-60
Testing and adjusting brake oil pressure	30-60
Testing accumulator nitrogen gas pressure and charging procedure for accumulator nitrogen gas	30-64
Testing braking performance	30-68
Bleeding air from brake circuit	30-69
Testing wear of wheel brake disc	30-70
Parking brake emergency releasing procedure	30-71
Testing wear of parking brake pad and adjusting clearance	30-72
Hydraulic system	30-74
Testing and adjusting suspension cylinder	30-74
Testing and adjusting dump circuit oil pressure	30-79
Work equipment	30-82
Adjusting dump body positioner sensor	30-82
Cab and its attachments	30-83
Cab tilt up procedure	30-83
Electrical system	30-86
Setting and adjusting each equipment	30-86
Special functions of machine monitor	30-97
KOMTRAX terminal start-up procedure	30-168
Handling voltage circuit of engine controller	30-172
Handling battery disconnect switch	30-173
Pm clinic	30-174
Pm Clinic service	30-174
40 Troubleshooting	40-1
Table of contents	40-2
Related information on troubleshooting	40-10
Troubleshooting points	40-10
Sequence of events in troubleshooting	40-12
Check before troubleshooting	40-14
Inspection procedure before troubleshooting	40-16
Preparation for troubleshooting of electrical system	40-25
Classification and procedures for troubleshooting	40-31
Symptom and troubleshooting numbers	40-34
Information in troubleshooting table	40-36
Procedure for troubleshooting wiring harness of pressure sensor system for open circuit	40-38
Connector list and layout	40-40

Connector contact identification.....	40-56
T-branch box and T-branch adapter table	40-92
Fuse location table	40-97
Precautions on troubleshooting of machine monitor	40-101
Processing procedure of harness checker for troubleshooting of machine monitor LCD unit.....	40-103
Failure codes table.....	40-108
Troubleshooting by failure code (Display of code).....	40-121
Failure code [1500L0] Double Engagement of T/M Clutches	40-121
Failure code [15B0NX] Transmission Oil Filter Clogging	40-122
Failure code [15F0KM] Abuse 1 of Gear Shifting from R to F.....	40-123
Failure code [15F0MB] Abuse 2 of Gear Shifting from R to F.....	40-124
Failure code [15F7KM] Abuse of TM Forward Clutch Disk	40-125
Failure code [15G0MW] Failure of Clutch (Reverse).....	40-126
Failure code [15G7KM] Abuse of TM Reverse Clutch Disk.....	40-129
Failure code [15H0MW] Failure of Clutch (High)	40-130
Failure code [15J0MW] Failure of Clutch (Low)	40-133
Failure code [15K0MW] Failure of Clutch (1st).....	40-136
Failure code [15L0MW] Failure of Clutch (2nd)	40-139
Failure code [15M0MW] Failure of Clutch (3rd)	40-142
Failure code [15SBL1] Release Trouble of ECMV (Reverse).....	40-145
Failure code [15SBMA] Malfunction of ECMV (Reverse).....	40-148
Failure code [15SCL1] Release Trouble of ECMV (High)	40-149
Failure code [15SCMA] Malfunction of ECMV (High)	40-152
Failure code [15SDL1] Release Trouble of ECMV (Low).....	40-153
Failure code [15SDMA] Malfunction of ECMV (Low).....	40-156
Failure code [15SEL1] Release Trouble of ECMV (1st).....	40-157
Failure code [15SEMA] Malfunction of ECMV (1st).....	40-160
Failure code [15SFL1] Release Trouble of ECMV (2nd).....	40-161
Failure code [15SFMA] Malfunction of ECMV (2nd).....	40-164
Failure code [15SGL1] Release Trouble of ECMV (3rd).....	40-165
Failure code [15SGMA] Malfunction of ECMV (3rd).....	40-168
Failure code [15SJMA] Malfunction of ECMV (Lockup).....	40-169
Failure code [15SKMA] Malfunction of ECMV (Inter-Axle Diff.)	40-171
Failure code [2F00KM] Dragging of Parking Brake	40-173
Failure code [2G42ZG] Accumulator Oil Pressure Low (Front)	40-175
Failure code [2G43ZG] Accumulator Oil Pressure Low (Rear).....	40-176
Failure code [879AKA] A/C Inner Sensor Open Circuit	40-177
Failure code [879AKB] A/C Inner Sensor Short Circuit.....	40-178
Failure code [879BKA] A/C Outer Sensor Open Circuit.....	40-179
Failure code [879BKB] A/C Outer Sensor Short Circuit.....	40-180
Failure code [879CKA] Ventilating Sensor Open Circuit.....	40-181
Failure code [879CKB] Ventilating Sensor Short Circuit	40-182
Failure code [879EMC] Ventilation Damper Abnormality	40-183
Failure code [879FMC] Air Mix Damper Abnormality	40-184
Failure code [879GKX] Refrigerant Abnormality.....	40-185
Failure code [989D00] Tilt Caution.....	40-186
Failure code [989L00] Engine Controller Lock Caution1.....	40-187
Failure code [989M00] Engine Controller Lock Caution2.....	40-188
Failure code [989N00] Engine Controller Lock Caution3.....	40-189
Failure code [AA10NX] Air Cleaner Clogging.....	40-190
Failure code [AB00KE] Charge Voltage Low.....	40-192
Failure code [AB00KY] Hot Short of Alternator R Terminal	40-193
Failure code [B@BAZG] Eng Oil Press Low	40-194
Failure code [B@BAZK] Engine Oil Level Low	40-195
Failure code [B@BCNS] Eng Water Overheat	40-196
Failure code [B@BCZK] Eng Water Level Low	40-197
Failure code [B@C6NS] Retarder Oil Overheat (Front).....	40-199
Failure code [B@C8NS] Retarder Oil Overheat (Center)	40-200

Failure code [B@CENS] T/C Oil Temp. Overheat.....	40-201
Failure code [B@JANS] Steering Oil Overheat	40-202
Failure code [CA111] ECM Critical Internal Failure	40-203
Failure code [CA115] Eng Ne and Bkup Speed Sens Error	40-204
Failure code [CA122] Chg Air Press Sensor High Error	40-205
Failure code [CA123] Chg Air Press Sensor Low Error	40-207
Failure code [CA131] Throttle Sensor High Error.....	40-209
Failure code [CA132] Throttle Sensor Low Error	40-211
Failure code [CA135] Eng Oil Press Sensor High Error.....	40-213
Failure code [CA141] Eng Oil Press Sensor Low Error	40-215
Failure code [CA144] Coolant Temp Sens High Error	40-217
Failure code [CA145] Coolant Temp Sens Low Error	40-219
Failure code [CA153] Chg Air Temp Sensor High Error.....	40-221
Failure code [CA154] Chg Air Temp Sensor Low Error.....	40-223
Failure code [CA187] Sensor 2 Supply Volt Low Error	40-225
Failure code [CA221] Ambient Press Sensor High Error	40-227
Failure code [CA222] Ambient Press Sens Low Error	40-229
Failure code [CA227] Sensor 2 Supply Volt High Error.....	40-231
Failure code [CA234] Eng Overspeed	40-232
Failure code [CA238] Ne Speed Sensor Supply Volt Error	40-233
Failure code [CA263] Fuel Temp Sensor High Error	40-234
Failure code [CA265] Fuel Temp Sensor Low Error	40-236
Failure code [CA271] IMV/PCV1 Short Error	40-238
Failure code [CA272] IMV/PCV1 Open Error	40-239
Failure code [CA273] PCV2 Short Error	40-240
Failure code [CA274] PCV2 Open Error	40-241
Failure code [CA322] Inj #1(L#1) Open/Short Error	40-242
Failure code [CA323] Inj #5(L#5) Open/Short Error	40-244
Failure code [CA324] Inj #3(L#3) Open/Short Error	40-246
Failure code [CA325] Inj #6(L#6) Open/Short Error	40-248
Failure code [CA331] Inj #2(L#2) Open/Short Error	40-250
Failure code [CA332] Inj #4(L#4) Open/Short Error	40-252
Failure code [CA342] Calibration Code Incompatibility.....	40-254
Failure code [CA351] Injectors Drive Circuit Error	40-255
Failure code [CA352] Sensor 1 Supply Volt Low Error	40-256
Failure code [CA386] Sensor 1 Supply Volt High Error.....	40-258
Failure code [CA431] Idle Validation Sw Error.....	40-259
Failure code [CA432] Idle Validation Process Error	40-262
Failure code [CA441] Battery Voltage Low Error	40-265
Failure code [CA442] Battery Voltage High Error.....	40-267
Failure code [CA449] Rail Press Very High Error.....	40-268
Failure code [CA451] Rail Press Sensor High Error.....	40-269
Failure code [CA452] Rail Press Sensor Low Error	40-271
Failure code [CA553] Rail Press High Error	40-273
Failure code [CA554] Rail Press Sensor In Range Error	40-274
Failure code [CA559] Rail Press Low Error.....	40-275
Failure code [CA689] Eng Ne Speed Sensor Error	40-279
Failure code [CA731] Eng Bkup Speed Sens Phase Error	40-281
Failure code [CA757] All Continuous Data Lost Error	40-282
Failure code [CA778] Eng Bkup Speed Sensor Error.....	40-283
Failure code [CA1228] EGR valve servo error 1	40-285
Failure code [CA1625] EGR Valve Servo Error 2.....	40-286
Failure code [CA1626] Bypass Valve Solenoid Current High Error.....	40-287
Failure code [CA1627] Bypass Valve Solenoid Current Low Error.....	40-289
Failure code [CA1628] Bypass Valve Servo Error 1	40-291
Failure code [CA1629] Bypass Valve Servo Error 2.....	40-292
Failure code [CA1631] BP valve Lift Position Sensor High Error	40-293
Failure code [CA1632] BP valve Lift Position Sensor Low Error.....	40-295
Failure code [CA2185] Throt Sensor Sup Volt High Error	40-297

Failure code [CA2186] Throt Sensor Sup Volt Low Error.....	40-299
Failure code [CA2249] Rail Press Very Low Error	40-301
Failure code [CA2271] EGR Valve Pos Sens High Error	40-302
Failure code [CA2272] EGR Valve Pos Sens Low Error	40-304
Failure code [CA2351] EGR Valve Solenoid Short Error	40-306
Failure code [CA2352] EGR Valve Solenoid Open Error	40-308
Failure code [CA2555] Grid Htr Relay Volt Low Error	40-310
Failure code [CA2556] Grid Htr Relay Volt High Error	40-312
Failure code [D150KB] Ground Fault of Emerg. Steering Relay	40-314
Failure code [D150KZ] Failure of Emerg. Steering Relay	40-315
Failure code [D151KB] Ground Fault of Emerg. Steering Relay 2	40-316
Failure code [D151KZ] Failure of Emerg. Steering Relay 2	40-317
Failure code [D164KY] Hot Short of Head Light High Selector	40-318
Failure code [D19HKZ] Failure of Stop Lamp (R&L)	40-319
Failure code [D19JKZ] Personal Code Relay Abnormality.....	40-321
Failure code [D1EHKA] Disconnection of Engine Start Relay	40-322
Failure code [D1EHKB] Ground Fault of Engine Start Relay	40-323
Failure code [D1EHKY] Hot Short of Engine Start Relay	40-324
Failure code [D1EMKA] Disconnection of Parking Interlock Relay	40-325
Failure code [D1EMKB] Ground Fault of Parking Interlock Relay	40-326
Failure code [D1EMKY] Hot Short of Parking Interlock Relay	40-327
Failure code [D1FBKB] Ground Fault of Sol. Self-Holding Relay.....	40-328
Failure code [D5ZHL6] Disconnection of Key SW C	40-329
Failure code [D811MC] KOMTRAX Error.....	40-331
Failure code [D862KA] GPS Antenna Open Circuit	40-332
Failure code [D8ALKA] Operating Lamp Open Circuit (KOMTRAX)	40-333
Failure code [D8ALKB] Operating Lamp Short Circuit (KOMTRAX)	40-335
Failure code [D8AQK4] CAN2 Discon (KOMTRAX) 2	40-337
Failure code [D8AQKR] CAN2 Discon (KOMTRAX)	40-338
Failure code [DAF0KT] Abnormality of Non-volatile Memory (MON)	40-339
Failure code [DAF0MB] Monitor ROM Abnormality.....	40-340
Failure code [DAF0MC] Monitor Error	40-341
Failure code [DAF3KK] Controller Power Source Low (MON).....	40-342
Failure code [DAF8KB] Camera Power Supply Short Circuit	40-344
Failure code [DAFDKB] Monitor 12V Power Output Short Circuit	40-345
Failure code [DAFGMC] GPS Module Error.....	40-347
Failure code [DAFLKA] Operating Lamp Open Circuit (MON).....	40-348
Failure code [DAFLKB] Operating Lamp Short Circuit (MON).....	40-350
Failure code [DAFQKR] CAN2 Discon (Monitor)	40-352
Failure code [DAQ0KK] Controller Power Source Low (T/M).....	40-353
Failure code [DAQ0KT] Abnormality of Non-volatile Memory (T/M).....	40-355
Failure code [DAQ0MC] T/M Con Error	40-356
Failure code [DAQ1KA] Disconnection of Key SW ACC (T/M).....	40-357
Failure code [DAQ2KK] Solenoid Power Source Low (T/M)	40-359
Failure code [DAQ9KQ] Inconsistency of Model Selection (T/M)	40-361
Failure code [DAQLKA] Operating Lamp Open Circuit (T/M).....	40-362
Failure code [DAQLKB] Operating Lamp Short Circuit (T/M)	40-364
Failure code [DAQQKR] CAN2 Discon (Transmission Con)	40-366
Failure code [DAQRKR] CAN1 Discon (Transmission Con)	40-367
Failure code [DAQRMA] Inconsistency of Option Selection (T/M).....	40-371
Failure code [DAZ9KQ] A/C Model Selection Abnormality.....	40-372
Failure code [DAZQKR] CAN2 Discon (Aircon ECU).....	40-373
Failure code [DB10KT] Abnormality of Non-volatile Memory (RHC)	40-374
Failure code [DB10MC] RHC Error	40-375
Failure code [DB11KA] Disconnection of Key SW ACC (RHC)	40-376
Failure code [DB12KK] Solenoid Power Source Low (RHC).....	40-378
Failure code [DB13KK] Controller Power Source Low (RHC)	40-380
Failure code [DB19KQ] Inconsistency of Model Selection (RHC).....	40-382
Failure code [DB1LKA] Disconnection of System Ope. Lamp (RHC).....	40-383

Failure code [DB1LKB] Short Circuit of System Ope. Lamp (RHC)	40-385
Failure code [DB1QKR] CAN2 Discon (Retarder Hoist Con)	40-387
Failure code [DB1QMA] Inconsistency of Option Selection (RHC)	40-388
Failure code [DB1RKR] CAN1 Discon (Retarder Hoist Con)	40-389
Failure code [DB2QKR] CAN2 Discon (Engine Con)	40-390
Failure code [DBSQKR] CAN2 Discon (PLM)	40-395
Failure code [DBSQKQ] Inconsistency of Model Selection (PLM)	40-400
Failure code [DD1ML4] Failure of ARAC SW	40-401
Failure code [DDAAL6] Discon of Engine Shutdown Secondary Switch	40-403
Failure code [DDTHKA] Disconnection of Fill Switch (High)	40-405
Failure code [DDTJKA] Disconnection of Fill Switch (Low)	40-407
Failure code [DDTKKA] Disconnection of Fill Switch (1st)	40-409
Failure code [DDTLKA] Disconnection of Fill Switch (2nd)	40-411
Failure code [DDTMKA] Disconnection of Fill Switch (3rd)	40-413
Failure code [DDTNKA] Disconnection of Fill Switch (Reverse)	40-415
Failure code [DF10KA] Disconnection of Shift Lever Input	40-417
Failure code [DF10KB] Ground Fault of Shift Lever Input	40-420
Failure code [DGF1KX] Out of Range of T/M Oil Temp. Sensor	40-424
Failure code [DGR3KB] Ground Fault of Retarder Oil Temp. S.(C)	40-426
Failure code [DGR3L8] Failure of Retarder Oil Temp. Sensor (C)	40-427
Failure code [DGR4KB] Ground Fault of Retarder Oil Temp. S.(F)	40-428
Failure code [DGR4L8] Failure of Retarder Oil Temp. Sensor (F)	40-429
Failure code [DGR6KB] Ground Fault of Steering Oil Temp. S.	40-431
Failure code [DGR6L8] Failure of Steering Oil Temp. Sensor	40-432
Failure code [DGR7KX] Out of Range of Piston Pump Oil Temp. S.	40-434
Failure code [DGR8KX] Out of Range of CAC Output Temp. S.	40-436
Failure code [DGT1KX] Out of Range of T/C Oil Temp. Sensor	40-438
Failure code [DHP4KY] Hot Short of Suspension Press. S. (FR)	40-440
Failure code [DHP4KZ] Failure of Suspension Press. S. (FR)	40-442
Failure code [DHP5KY] Hot Short of Suspension Press. S. (FL)	40-444
Failure code [DHP5KZ] Failure of Suspension Press. S. (FL)	40-446
Failure code [DHP6KY] Hot Short of Suspension Press. S. (RR)	40-448
Failure code [DHP6KZ] Failure of Suspension Press. S. (RR)	40-450
Failure code [DHP7KY] Hot Short of Suspension Press. S. (RL)	40-452
Failure code [DHP7KZ] Failure of Suspension Press. S. (RL)	40-454
Failure code [DHQ2KX] Out of Range of Main Flow Sel. Valve S.	40-456
Failure code [DHT5KX] Out of Range of T/C Input Pressure Sensor	40-458
Failure code [DHT5L6] Failure of T/C Oil Press Sensor	40-460
Failure code [DHT8KX] Out of Range of Steering Oil Press. S.	40-462
Failure code [DHT8ZG] Steering Oil Pressure Low	40-464
Failure code [DHU2KX] Out of Range of Acc. Oil Press. S. (F)	40-465
Failure code [DHU3KX] Out of Range of Acc. Oil Press. S. (R)	40-467
Failure code [DHUAKX] Out of Range of Retarder Press. S. (CR)	40-469
Failure code [DHUBKX] Out of Range of Retarder Press. S. (FR)	40-471
Failure code [DHUCKX] Out of Range of Parking Brake Press. S.	40-473
Failure code [DHUDKX] Out of Range of Emerg. Steering Press. S.1	40-475
Failure code [DHUEKX] Out of Range of Emerg. Steering Press. S.2	40-477
Failure code [DHUQKX] Out of Range of Retarder Press. S. (FL)	40-479
Failure code [DHURKX] Out of Range of Retarder Press. S. (CL)	40-481
Failure code [DJF1KA] Disconnection of Fuel Level Sensor	40-483
Failure code [DK30KX] Out of Range of Steering Angle Pot.	40-485
Failure code [DK51L5] Failure of Retarder Lever Pot. and RVS	40-487
Failure code [DK52KX] Out of Range of Hoist Lever Potentio.	40-490
Failure code [DK53L8] Failure of Hoist Lever Potentio.	40-492
Failure code [DK54KX] Out of Range of Body Potentio.	40-493
Failure code [DK60KX] Out of Range of Acceleration Sensor	40-495
Failure code [DKH0KX] Out of Range of Inclination Angle Sensor	40-497
Failure code [DKH1KX] Out of Range of Long. Inclination Angle S.	40-499
Failure code [DLF1KA] Disconnection of T/M Input Speed Sensor	40-501

Failure code [DLF1LC] Failure of T/M Input Speed Sensor.....	40-503
Failure code [DLF2KA] Disconnection of T/M Inter. Speed Sensor.....	40-505
Failure code [DLF2LC] Failure of T/M Intermediate Speed Sensor.....	40-507
Failure code [DLF400] T/M Diff. Overrun Prevention Activated	40-509
Failure code [DLF4KA] Disconnection of T/M Diff. Speed Sensor	40-510
Failure code [DLF4LC] Failure of T/M Diff. Speed Sensor	40-512
Failure code [DLF6LC] Failure of Wheel Speed Sensor (FR).....	40-514
Failure code [DLF7LC] Failure of Wheel Speed Sensor (FL)	40-516
Failure code [DLFDLC] Failure of Wheel Speed Sensor (CR).....	40-518
Failure code [DLFELC] Failure of Wheel Speed Sensor (CL)	40-520
Failure code [DLFFLC] Failure of Wheel Speed Sensor (Front)	40-522
Failure code [DLFGLC] Failure of Wheel Speed Sensor (Center)	40-523
Failure code [DLM3KA] Disconnection of Radiator Fan Speed Sensor.....	40-524
Failure code [DLM3LC] Failure of Radiator Fan Speed Sensor.....	40-526
Failure code [DLM3MB] Radiator Fan Control Mismatch.....	40-528
Failure code [DLM4KA] Disconnection of CAC Fan Speed Sensor	40-529
Failure code [DLM4LC] Failure of CAC Fan Speed Sensor	40-531
Failure code [DLM4MB] CAC Fan Control Mismatch	40-533
Failure code [DLT3KA] Disconnection of Output Speed Sens. (Main).....	40-534
Failure code [DLT3LC] Failure of Output Speed Sensor (Main).....	40-536
Failure code [DPQ1KR] LIN Discon (Switch Panel)	40-538
Failure code [DPQ2KR] LIN Discon (LED Unit)	40-541
Failure code [DPQ3KR] LIN Discon (Rear View Monitor)	40-544
Failure code [DSJ0KR] CAN2 Discon (Meter Unit)	40-547
Failure code [DV00KB] Ground Fault of Buzzer Output.....	40-548
Failure code [DW2BKA] Disconnection of Main Flow Selector Sol.	40-550
Failure code [DW2BKB] Ground Fault of Main Flow Selector Sol.	40-551
Failure code [DW2BKY] Hot Short of Main Flow Selector Sol.	40-552
Failure code [DW2BL1] Release Trouble of Main Flow Sel. Valve	40-553
Failure code [DW2BLH] Malfunction of Main Flow Selector Valve	40-554
Failure code [DW4BK4] Release Trouble of Parking Brake Valve	40-555
Failure code [DW4BMA] Malfunction of Parking Brake Valve	40-557
Failure code [DW72KZ] Failure of Kick out Solenoid.....	40-558
Failure code [DW73KA] Disconnection of Hoist Selector Sol.	40-560
Failure code [DW73KB] Ground Fault of Hoist Selector Sol.	40-562
Failure code [DW73KY] Hot Short of Hoist Selector Sol.	40-564
Failure code [DW7BKB] Ground Fault of Radiator Fan Rev. Sol.	40-566
Failure code [DW7BKY] Hot Short of Radiator Fan Rev. Sol.	40-568
Failure code [DW7BKZ] Failure of Radiator Fan Rev. Sol.	40-569
Failure code [DW7LKB] Ground Fault of CAC Fan Rev. Sol.	40-571
Failure code [DW7LKY] Hot Short of CAC Fan Rev. Sol.	40-572
Failure code [DW7LKZ] Failure of CAC Fan Rev. Sol.	40-573
Failure code [DW7NKZ] Failure of Steering Pump Selector Sol.	40-574
Failure code [DWNJKZ] Failure of TCS Shut off Sol. (Front).....	40-576
Failure code [DWNKKZ] Failure of TCS Shut off Sol. (Center).....	40-578
Failure code [DX13KA] Disconnection of Hoist EPC Solenoid	40-580
Failure code [DX13KB] Ground Fault of Hoist EPC Solenoid.....	40-582
Failure code [DX13KY] Hot Short of Hoist EPC Solenoid	40-584
Failure code [DX16KA] Disconnection of Rad. Fan Pump EPC Sol.	40-586
Failure code [DX16KB] Ground Fault of Rad. Fan Pump EPC Sol.	40-587
Failure code [DX16KY] Hot Short of Radiator Fan Pump EPC Sol.	40-589
Failure code [DX29KA] Disconnection of CAC Fan Pump EPC Sol.	40-590
Failure code [DX29KB] Ground Fault of CAC Fan Pump EPC Sol.	40-591
Failure code [DX29KY] Hot Short of CAC Fan Pump EPC Sol.	40-592
Failure code [DX30K4] Release Trouble of Retarder EPC Valve (FL).....	40-593
Failure code [DX30KA] Disconnection of Retarder EPC Sol. (FL)	40-595
Failure code [DX30KB] Ground Fault of Retarder EPC Sol. (FL).....	40-597
Failure code [DX30KY] Hot Short of Retarder EPC Sol. (FL)	40-599
Failure code [DX30MA] Malfunction of Retarder EPC Valve (FL)	40-601

Failure code [DX31K4] Release Trouble of Retarder EPC Valve(CR).....	40-603
Failure code [DX31KA] Disconnection of Retarder EPC Sol. (CR).....	40-605
Failure code [DX31KB] Ground Fault of Retarder EPC Sol. (CR).....	40-607
Failure code [DX31KY] Hot Short of Retarder EPC Sol. (CR).....	40-609
Failure code [DX31MA] Malfunction of Retarder Valve (CR).....	40-611
Failure code [DX32K4] Release Trouble of Retarder EPC Valve(CL).....	40-613
Failure code [DX32KA] Disconnection of Retarder EPC Sol. (CL).....	40-615
Failure code [DX32KB] Ground Fault of Retarder EPC Sol. (CL).....	40-617
Failure code [DX32KY] Hot Short of Retarder EPC Sol. (CL).....	40-619
Failure code [DX32MA] Malfunction of Retarder EPC Valve (CL).....	40-621
Failure code [DX33K4] Release Trouble of Retarder EPC Valve (FR).....	40-623
Failure code [DX33KA] Disconnection of Retarder EPC Sol. (FR).....	40-625
Failure code [DX33KB] Ground Fault of Retarder EPC Sol. (FR).....	40-627
Failure code [DX33KY] Hot Short of Retarder EPC Sol. (FR).....	40-629
Failure code [DX33MA] Malfunction of Retarder EPC Valve (FR).....	40-631
Failure code [DX34KA] Disconnection of Remote Cooling EPC Sol.	40-633
Failure code [DX34KB] Ground Fault of Remote Cooling EPC Sol.	40-634
Failure code [DX34KY] Hot Short of Remote Cooling EPC Sol.	40-636
Failure code [DXH0KA] Disconnection of ECMV (Inter-Axle Diff.).....	40-637
Failure code [DXH0KB] Ground Fault of ECMV (Inter-Axle Diff.).....	40-639
Failure code [DXH0KY] Hot Short of ECMV (Inter-Axle Diff.).....	40-641
Failure code [DXH1KA] Disconnection of ECMV Solenoid (Lockup).....	40-643
Failure code [DXH1KB] Ground Fault of ECMV Solenoid (Lockup).....	40-645
Failure code [DXH1KY] Hot Short of ECMV Solenoid (Lockup).....	40-647
Failure code [DXH2KA] Disconnection of ECMV Solenoid (High).....	40-649
Failure code [DXH2KB] Ground Fault of ECMV Solenoid (High).....	40-651
Failure code [DXH2KY] Hot Short of ECMV Solenoid (High).....	40-653
Failure code [DXH3KA] Disconnection of ECMV Solenoid (Low).....	40-654
Failure code [DXH3KB] Ground Fault of ECMV Solenoid (Low).....	40-656
Failure code [DXH3KY] Hot Short of ECMV Solenoid (Low).....	40-658
Failure code [DXH4KA] Disconnection of ECMV Solenoid (1st).....	40-661
Failure code [DXH4KB] Ground Fault of ECMV Solenoid (1st).....	40-663
Failure code [DXH4KY] Hot Short of ECMV Solenoid (1st).....	40-665
Failure code [DXH5KA] Disconnection of ECMV Solenoid (2nd).....	40-668
Failure code [DXH5KB] Ground Fault of ECMV Solenoid (2nd).....	40-670
Failure code [DXH5KY] Hot Short of ECMV Solenoid (2nd).....	40-672
Failure code [DXH6KA] Disconnection of ECMV Solenoid (3rd).....	40-675
Failure code [DXH6KB] Ground Fault of ECMV Solenoid (3rd).....	40-677
Failure code [DXH6KY] Hot Short of ECMV Solenoid (3rd).....	40-679
Failure code [DXH7KA] Disconnection of ECMV Solenoid (Reverse).....	40-682
Failure code [DXH7KB] Ground Fault of ECMV Solenoid (Reverse).....	40-684
Failure code [DXH7KY] Hot Short of ECMV Solenoid (Reverse).....	40-686
Failure code [DY30MA] Malfunction 1 of Emerg. Steering Motor.....	40-689
Failure code [DY30MC] Malfunction 2 of Emerg. Steering Motor.....	40-692
Failure code [DY30ME] Emerg. Steering Long-Time Activated.....	40-695
Failure code [DY32MC] Malfunction 2 of Emerg. Steering Motor 2.....	40-697
Troubleshooting of electrical system (E-mode).....	40-700
E-1 Engine does not start (Engine does not crank).....	40-700
E-2 Manual preheating system does not work.....	40-705
E-3 Automatic preheating system does not work.....	40-708
E-4 While preheating is working, preheating monitor does not light up.....	40-710
E-5 All of LCD unit, LED unit and meter unit on machine monitor display nothing.....	40-712
E-6 LCD unit on machine monitor displays nothing.....	40-715
E-7 Backlight of LCD unit on machine monitor is abnormal (Backlight goes out or flickers).....	40-717
E-8 LCD on machine monitor does not display properly.....	40-719
E-9 Meter unit display on machine monitor is abnormal.....	40-721
E-10 Night lighting lamp of meter unit on machine monitor is abnormal.....	40-724
E-11 LED unit lamp on machine monitor is abnormal.....	40-727

E-12 Night lighting lamp of switch panel on machine monitor is abnormal or switches does not operate properly	40-729
E-13 2 switches operation of switch panel on machine monitor does not function.....	40-731
E-14 Switch panel buzzer of machine monitor is abnormal.....	40-733
E-15 Rear view monitor does not light up or backlight flickers.....	40-735
E-16 Rear view monitor images are not displayed clearly.....	40-737
E-17 Rear view monitor brightness cannot be adjusted.....	40-740
E-18 Night lighting lamp of rear view monitor is abnormal	40-743
E-19 Rearview monitor does not display images while reverse linked display function is enabled	40-745
E-20 Guide line on rear view monitor is not displayed while guide line is set	40-748
E-21 Some items of gauges and caution lamps on machine monitor are not displayed properly	40-750
E-22 Fuel level gauge does not indicate correct level	40-751
E-23 Seat belt caution lamp indication is abnormal.....	40-753
E-24 Machine monitor cannot be operated when starting switch is in OFF position	40-754
E-25 Alarm buzzer does not sound	40-755
E-26 Alarm buzzer does not stop sounding.....	40-757
E-27 Engine mode selector function does not operate properly	40-759
E-28 AISS function does not operate properly.....	40-760
E-29 Hoist lever does not operate properly	40-761
E-30 Turn signal lamp and winker lamp (hazard lamp) do not operate properly	40-763
E-31 None of headlamp, clearance lamp, and tail lamp lights	40-767
E-32 Clearance lamp does not light up.....	40-769
E-33 Tail lamp does not light up	40-771
E-34 Low beam of headlamp does not light up.....	40-773
E-35 High beam of headlamp does not light up	40-775
E-36 Neither Low beam nor High beam of headlamp lights up.....	40-777
E-37 High beams do not light up while passing switch is operated	40-779
E-38 KOMTRAX does not operate properly	40-781
Troubleshooting of hydraulic and mechanical system (H-mode).....	40-782
Information described in troubleshooting table (H-mode)	40-782
System chart of hydraulic and mechanical systems.....	40-783
Failure mode and cause table	40-785
H-1 Machine does not start	40-789
H-2 Machine does not travel smoothly (engine hunts).....	40-791
H-3 Lockup clutch is not disengaged.....	40-792
H-4 Abnormally large shocks result from starting of machine and gear shifting	40-793
H-5 Machine does not upshift.....	40-794
H-6 Machine lacks travel speed or power during travel in lockup drive mode through all gear speeds.....	40-796
H-7 Machine lacks travel speed or power during travel in torque converter drive mode	40-797
H-8 Machine lacks travel speed or power during travel in specific gear speed.....	40-798
H-9 Machine starts or gear speed shifts with long time lag	40-799
H-10 Torque converter oil temperature is high.....	40-801
H-11 Torque converter oil pressure is low	40-802
H-12 Front brake does not work sufficiently	40-803
H-13 Center brake does not work sufficiently	40-804
H-14 Steering wheel is heavy to turn.....	40-805
H-15 Steering wheel does not move	40-806
H-16 Steering wheel swings.....	40-807
H-17 Dump body raise speed or power is slow.....	40-808
H-18 Dump body does not move	40-810
H-19 Hydraulic drift of dump body is large	40-811
H-20 Radiator fan speed is abnormal (high, low, or stationary)	40-812
H-21 Aftercooler fan speed is abnormal (high, low, or stationary).....	40-813
H-22 Unusual noise is heard from around radiator fan	40-814
H-23 Unusual noise is heard from around aftercooler fan.....	40-815

Troubleshooting of engine (S-mode).....	40-816
Information mentioned in troubleshooting table (S mode).....	40-816
S-1 When starting switch is turned to START position, engine is not cranked.....	40-817
S-2 The engine cranks but exhaust smoke does not come out.....	40-818
S-3 Fuel is injected but engine does not start (incomplete combustion, engine seems to start but does not).....	40-819
S-4 Engine startability is poor.....	40-820
S-5 Engine does not pick up smoothly.....	40-822
S-6 Engine stops during operation.....	40-824
S-7 Engine runs rough or is unstable.....	40-826
S-8 Engine lacks power.....	40-827
S-9 Exhaust smoke is black.....	40-829
S-10 Engine oil consumption is excessive.....	40-831
S-11 Oil becomes contaminated quickly.....	40-832
S-12 Fuel consumption is excessive.....	40-833
S-13 Oil is in coolant (or coolant spurts or coolant level goes down).....	40-834
S-14 Oil pressure drops.....	40-835
S-15 Fuel mixes into engine oil.....	40-836
S-16 Water mixes into engine oil (milky).....	40-837
S-17 Coolant temperature rises too high (overheating).....	40-838
S-18 Unusual noise is heard.....	40-839
S-19 Vibration is excessive.....	40-840
S-20 Air cannot be bled from fuel circuit.....	40-841
50 Disassembly and assembly.....	50-1
Table of contents.....	50-2
Related information on disassembly and assembly.....	50-4
How to read this manual.....	50-4
Coating materials list.....	50-6
Special tools list.....	50-10
Sketches of special tools.....	50-19
Engine and cooling system.....	50-37
Removal and installation of supply pump assembly.....	50-37
Removal and installation of injector assembly.....	50-41
Removal and installation of cylinder head assembly.....	50-48
Removal and installation of radiator assembly.....	50-60
Removal and installation of radiator core assembly.....	50-65
Removal and installation of cooling fan and fan motor assembly for radiator.....	50-67
Removal and installation of aftercooler assembly.....	50-69
Removal and installation of cooling fan and fan motor assembly for aftercooler.....	50-73
Removal and installation of engine assembly.....	50-75
Removal and installation of engine front oil seal.....	50-84
Removal and installation of engine rear oil seal.....	50-88
Removal and installation of output shaft assembly.....	50-94
Disassembly and assembly of output shaft assembly.....	50-96
Removal and installation of air cleaner assembly.....	50-99
Removal and installation of EGR (Exhaust Gas Recirculation) valve assembly.....	50-101
Removal and installation of EGR (Exhaust Gas Recirculation) cooler assembly.....	50-103
Removal and installation of fire prevention cover on exhaust pipe.....	50-106
Power train.....	50-110
Removal and installation of transmission and front differential assembly.....	50-110
Disconnection and connection of front differential assembly and transmission assembly.....	50-122
Disassembly and assembly of front differential assembly.....	50-124
Disassembly and assembly of torque converter assembly.....	50-139
Disassembly and assembly of transmission assembly.....	50-146
Removal and installation of center differential assembly.....	50-186
Disassembly and assembly of center differential assembly.....	50-190
Removal and installation of rear differential assembly.....	50-204
Disassembly and assembly of rear differential assembly.....	50-206

Removal and installation of front final drive and brake assembly.....	50-216
Disassembly and assembly of front final drive and brake assembly	50-218
Removal and installation of center final drive and brake assembly	50-230
Disassembly and assembly of center final drive and brake assembly	50-232
Removal and installation of rear final drive assembly.....	50-242
Disassembly and assembly of rear final drive assembly.....	50-243
Removal and installation of center axle assembly	50-248
Removal and installation of rear axle assembly.....	50-252
Steering system.....	50-255
Disassembly and assembly of steering cylinder assembly	50-255
Undercarriage and frame.....	50-261
Removal and installation of front suspension cylinder assembly	50-261
Removal and installation of rear suspension cylinder assembly.....	50-263
Disassembly and assembly of suspension cylinder assembly	50-265
Removal and installation of equalizer bar assembly	50-267
Removal and installation of front wheel assembly	50-269
Removal and installation of rear (front side) wheel assembly.....	50-273
Removal and installation of rear (back side) wheel assembly	50-274
Removal and installation of hitch frame assembly	50-275
Disassembly and assembly of hitch frame assembly	50-282
Hydraulic system	50-287
Removal and installation of flow amplifier valve assembly.....	50-287
Removal and installation of hoist valve assembly	50-290
Disassembly and assembly of hoist valve assembly.....	50-294
Disassembly and assembly of hoist cylinder assembly	50-298
Body.....	50-304
Removal and installation of dump body assembly	50-304
Cab and its attachments	50-307
Removal and installation of operator's cab assembly.....	50-307
Removal and installation of operator's cab glass (adhered glass)	50-312
Removal and installation of operator's seat assembly.....	50-318
Removal and installation of seat belt.....	50-320
Electrical system	50-321
Removal and installation of machine monitor assembly	50-321
Removal and installation of engine controller assembly	50-323
Removal and installation of retarder and hoist controller assembly	50-325
Removal and installation of transmission controller assembly	50-326
Removal and installation of KOMTRAX terminal assembly	50-327
Air conditioner unit.....	50-328
Removal and installation of air conditioner unit assembly.....	50-328
Removal and installation of air conditioner compressor assembly.....	50-333
Removal and installation of air conditioner condenser	50-335
60 Maintenance standard.....	60-1
Table of contents	60-2
Engine and cooling system.....	60-3
Engine mount	60-3
Output shaft.....	60-4
Radiator fan pump.....	60-5
Radiator fan motor	60-7
Aftercooler fan motor	60-8
Power train.....	60-10
Drive shaft.....	60-10
Torque converter and transmission mount	60-12
Torque converter.....	60-13
Transmission	60-16
Transmission control valve.....	60-24
Forward and reverse clutch ECMV and gear speed clutch ECMV	60-25
Lockup clutch ECMV	60-26
Differential lock clutch ECMV	60-27

00 Index and foreword

Index


Main relief valve, torque converter relief valve, and main flow selector valve.....	60-28
Differential.....	60-30
Axle.....	60-33
Final drive.....	60-35
Steering system.....	60-40
Steering column.....	60-40
Steering cylinder.....	60-41
Emergency steering pump.....	60-42
Brake system.....	60-43
Slack adjuster.....	60-43
Brake.....	60-45
Parking brake.....	60-48
Undercarriage and frame.....	60-50
Suspension.....	60-50
Suspension cylinder.....	60-54
Oscillation hitch.....	60-56
Hydraulic system.....	60-58
Steering and hoist pump.....	60-58
Pump for driving torque converter, transmission, aftercooler fan, and center brake cooling motors.....	60-61
Center brake cooling pump.....	60-63
Brake charge pump.....	60-64
Center brake cooling remote pump.....	60-65
Center brake cooling remote motor.....	60-66
Hoist valve.....	60-68
Hoist cylinder.....	60-70
80 Appendix.....	80-1
Table of contents.....	80-2
Air conditioner components.....	80-3
Precautions for refrigerant.....	80-3
Air conditioner component.....	80-4
Configuration and function of refrigeration cycle.....	80-7
Outline of refrigeration cycle.....	80-8
Air conditioner unit.....	80-10
Dual pressure switch.....	80-15
Air conditioner controller.....	80-16
Compressor.....	80-17
Condenser.....	80-18
Receiver drier.....	80-19
Outer temperature sensor (outside air temperature sensor).....	80-20
Procedure for testing and troubleshooting.....	80-21
Circuit diagram and arrangement of connector pins.....	80-23
System diagram.....	80-25
Input and output signals of the air conditioner controller.....	80-26
Parts and connectors layout.....	80-28
Testing air leakage (duct).....	80-33
Testing with self-diagnosis function.....	80-36
How to open the electrical system abnormality record screen in service mode of the machine monitor.....	80-37
Testing vent (mode) changeover.....	80-39
Testing FRESH/RECIRC air changeover.....	80-40
Testing (dual) pressure switch for refrigerant.....	80-41
Testing relays.....	80-43
Troubleshooting chart 1.....	80-45
Troubleshooting chart 2.....	80-46
Information in troubleshooting table.....	80-49
Failure code list related to air conditioner.....	80-50
Failure code [879AKA] A/C Inner sensor Open Circuit.....	80-51
Failure code [879AKB] A/C Inner sensor Short Circuit.....	80-52

Failure code [879BKA] A/C Outer sensor Open Circuit	80-53
Failure code [879BKB] A/C Outer sensor Short Circuit	80-55
Failure code [879CKA] Ventilating sensor Open Circuit	80-57
Failure code [879CKB] Ventilating sensor Short Circuit	80-58
Failure code [879EMC] Ventilating Damper Abnormality	80-59
Failure code [879FMC] Air Mix Damper Abnormality	80-60
Failure code [879GKX] Refrigerant Abnormality	80-61
A-1 Troubleshooting for power supply system (Air conditioner does not operate)	80-63
A-2 Troubleshooting for compressor and refrigerant system (Air is not cooled)	80-65
A-3 Troubleshooting for blower motor system (No air comes out or air flow is abnormal)	80-68
A-4 Troubleshooting for FRESH/RECIRC air changeover	80-70
Troubleshooting with gauge pressure	80-72
Connection of service tool	80-75
Precautions for disconnecting and connecting air conditioner piping	80-77
Handling of compressor oil	80-79
90 Diagrams and drawings	90-1
Table of contents	90-2
Hydraulic circuit diagram	90-3
Symbols in hydraulic circuit diagram	90-3
Power train hydraulic circuit diagram	90-7
Hydraulic circuit diagram	90-9
Electric circuit diagram	90-13
Symbols in electric circuit diagram	90-13
Inside cab electrical circuit diagram	90-17
Outside cab electrical circuit diagram	90-33
Electrical circuit diagram of engine	90-45
Index	1


Foreword, safety and general information (ALL-0370-001-A-00-A)

Important safety notice (ALL-1120-012-A-01-A)

(Rev. 2012/10)

- Appropriate servicing and repair are extremely important to ensure safe operation of the machine. The shop manual describes the effective and safe servicing and repair methods recommended by Komatsu. Some of these methods require the use of the special tools designed by Komatsu for the specific purpose.
- The symbol mark  is used for such matters that require special cautions during the work. The work indicated by the caution mark should be performed according to the instructions with special attention to the cautions. Should hazardous situation occur or be anticipated during such work, be sure to keep safe first and take every necessary measure.

General precautions

 **Inappropriate handling causes an extreme danger. Read and understand what is described in the operation and maintenance manual before operating the machine. Read and understand what is described in this manual before starting the work.**

- Before performing any greasing or repairs, read all the safety labels stuck to the machine. For the locations of the safety labels and detailed explanation of precautions, see the operation and maintenance manual.
- Locate a place in the repair workshop to keep the tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dirt, water or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.
- When performing any work, always wear the safety shoes and helmet. Do not wear loose work cloths, or clothes with buttons missing.
 1. Always wear the protective eyeglasses when hitting parts with a hammer.
 2. Always wear the protective eyeglasses when grinding parts with a grinder, etc.
- When performing any work with 2 or more workers, always agree on the working procedure before starting. While working, always keep conversations of the work between your fellow workers and your self on any step of the work. During the work, hang the warning tag of "UNDER WORKING" in the operator's compartment.
- Only qualified workers must perform the work and operation which require license or qualification.
- Keep the tools in good condition. And learn the correct way to use the tools, and use the proper ones among them. Before starting the work, thoroughly check the tools, lift truck, service vehicle, etc.
- If welding repairs is required, always have a trained and experienced welder with good

knowledge of welding perform the work. When performing welding work, always wear welding gloves, apron, shielding goggles, cap, etc.

- Before starting work, warm up your body thoroughly to start work under good condition.
- Avoid continuing work for long hours and take rests with proper intervals to keep your body in good condition. Take a rest in a specified safe place.

Safety points

1	Good arrangement
2	Correct work clothes
3	Observance of work standard
4	Practice of making and checking signals
5	Prohibition of operation and handling by unlicensed workers
6	Safety check before starting work
7	Wearing protective goggles (for cleaning or grinding work)
8	Wearing shielding goggles and protectors (for welding work)
9	Good physical condition and preparation
10	Precautions against work which you are not used to or you are used to too much

Preparation

- Before adding oil or making any repairs, place the machine on a firm and level ground, and apply the parking brake and chock the wheels or tracks to prevent the machine from moving.
- Before starting work, lower the work equipment (blade, ripper, bucket, etc.) to the ground. If it is not possible to lower the equipment to the ground, insert the lock pin or use blocks to prevent the work equipment from falling. And be sure to lock all the work equipment control levers and hang a warning tag on them.
- When performing the disassembling or assembling work, support the machine securely with blocks, jacks, or stands before starting the work.
- Remove all of mud and oil from the steps or other places used to get on and off the machine completely. Always use the handrails, ladders of

steps when getting on or off the machine. Never jump on or off the machine. When the scaffold is not provided, use steps or stepladder to secure your footing.

Precautions during work

- For the machine equipped with the battery disconnect switch, check that the system operating lamp is turned off before starting the work. Then, turn the battery disconnect switch to OFF (○) position and remove the switch key. For the machine not equipped with the battery disconnect switch, remove the cable from the battery before starting the work. Be sure to remove the negative end (-) of the battery cable first.
- Release the remaining pressure in the circuits completely before the work when the parts in the circuits of oil, fuel, coolant and air are disconnected or removed. When the cap of the oil filter, drain plug or oil pressure pickup plug is removed, loose them slowly to prevent the oil from spurting out.
- When removing or installing the checking plug or the piping in the fuel circuit, wait 30 seconds or longer after the engine is shut down and start the work after the remaining pressure is released from the fuel circuit.
- Immediately after the engine is shut down, the coolant and oil in the circuits are hot. Be careful not to get scalded by the hot coolant and oil. Start the work after checking that the coolant and oil are cooled down sufficiently.
- Start the work after the engine is shut down. Be sure to shut down the engine when working on or around the rotating parts in particular. When checking the machine without shutting down the engine (measuring oil pressure, rotational speed, oil or coolant temperature), take extreme care not to get caught in the rotating parts or the working equipment.
- The hoist or crane must be used to sling the components weighing 25 kg or heavier. Check the slings (wire rope, nylon sling, chain and hook) for damage before the work. Use the slings with ample capacity and install them to the proper places. Operate the hoist or crane slowly to prevent the component from hitting any other part. Do not work with any part still raised by the hoist or crane.
- When removing the part which is under internal pressure or reaction force of the spring, always leave 2 bolts in diagonal positions. Loosen those 2 bolts gradually and alternately and release the pressure, then, remove the part.
- When removing the part, be careful not to break or damage the electrical wiring. The damaged wiring may cause electrical fires.
- When removing piping, prevent the fuel or oil from spilling out. If any fuel or oil drips onto the floor, wipe it off immediately. Fuel or oil on the floor can cause you to slip and can even cause fires.
- As a general rule, do not use gasoline to wash parts. Do not use gasoline to clean the electrical parts, in particular.
- Reinstall the parts removed to their original places. Replace the damaged parts and the parts which must not be used with new ones. When installing the hoses and wiring harnesses, be careful that they are not damaged by contacting with other parts when the machine is operated.
- When connecting the high pressure hoses and tubes, make sure that they are not twisted. The damaged high pressure hoses and tubes are very dangerous when they are installed. So, be extremely careful when connecting the high pressure pipings. In addition, check that their connections are correct.
- When assembling or installing the parts, be sure to tighten the bolts to the specified torque. When installing the protective parts such as guards, or the parts which vibrate violently or rotate at high speeds, be sure to check that they are installed correctly.
- When aligning 2 holes, never insert your fingers or hand into the holes. Align the holes with care so that your fingers are not caught in the hole.
- When measuring hydraulic pressure, check that the measuring tools are correctly installed.
- Pay attention to safety when removing and installing the tracks of the track type machines. When removing the track, it separates suddenly. The workers should not stand at either end of the track.
- If the engine is operated for a long time in a closed place which is not ventilated well, you may suffer from gas poisoning. Accordingly, open the windows and doors to ventilate the place well.

Precautions for slinging work and making signals

- Only one appointed worker must make signals and co-worker must communicate with each other frequently. The appointed signaler must make specified signals clearly at the place where the signaler is well seen from the operator's seat and where the signaler can see the working condition easily. The signaler must always stand in front of the load and guide the operator safely.
 1. Do not stand under the load.
 2. Do not step on the load.
- Check the slings before starting sling work.

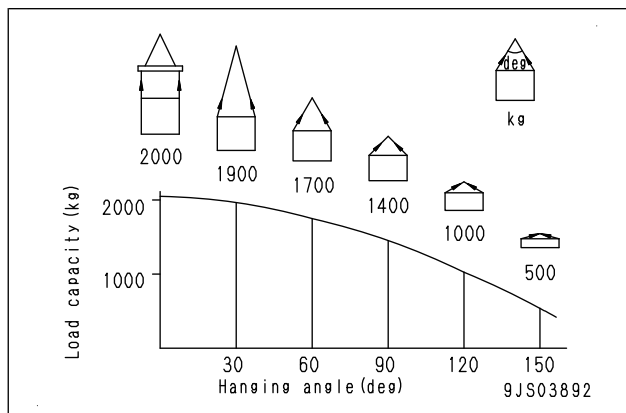
00 Index and foreword

Foreword, safety and general information

- Keep putting on the gloves during sling work. (Put on the leather gloves, if available.)
- Measure the weight of the load by the eye and check its center of gravity.
- Use the proper sling according to the weight of the load and method of slinging. If too thick wire ropes are used to sling a light load, the load may slip and fall.
- Do not sling a load with 1 wire rope only. If do so, the load may rotate or the sling gets loose and the sling may slip off. Install 2 or more wire ropes symmetrically.

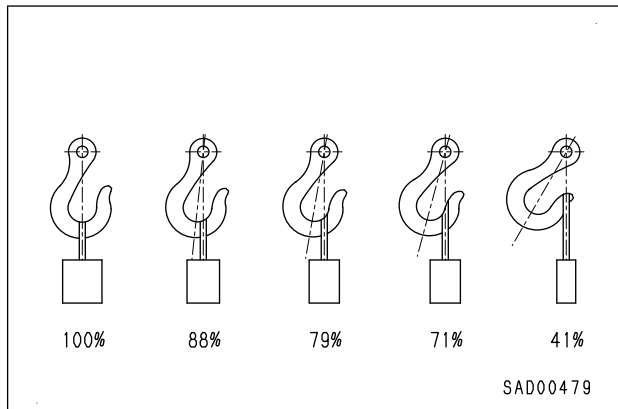
⚠ Slinging with one rope may cause turning of the load during hoisting, untwisting of the rope, or slipping of the rope from its original slinging position on the load, which can result in a dangerous accident.

- Hanging angle must be 60 deg. or smaller as a rule.
- When hanging a heavy load (25kg or heavier), the hanging angle of the rope must be narrower than that of the hook.
- ★ When slinging a load with 2 ropes or more, the larger the hanging angle is, the larger the tension of each rope. The figure bellow shows the variation of allowable load in kg when hoisting is made with 2 ropes, each of which is allowed to sling up to 9.8 kN {1,000kg} a load vertically, at various hanging angles. When the 2 ropes sling a load vertically, up to 2,000 kg of total weight can be suspended. This weight is reduced to 1,000 kg when the 2 ropes make a hanging angle of 120 deg.. If the 2 ropes sling a 2,000 kg load at a hanging angle of 150 deg., each rope is subjected to a force as large as 4,000 kg.



- When installing wire ropes to an angular load, apply pads to protect the wire ropes. If the load is slippery, apply proper material to prevent the wire rope from slipping.
- Use the specified eye bolts and fix wire ropes, chains, etc. to them with shackles, etc.

- Apply wire ropes to the middle part of the hook.
 - ★ Slinging near the tip of the hook may cause the rope to slip off the hook during hoisting. The strength of the hook is maximum at its central part.




- Do not use twisted or kinked wire ropes.
- When slinging up a load, observe the following.
 1. Wind up the rope slowly until the wire rope tensions. When putting your hands on the wire ropes, do not grasp them but press them down from above. If you grasp them, your fingers may be caught.
 2. After the wire ropes are stretched, stop the crane and check the condition of the slung load, wire ropes, and pads.
 3. If the load is unstable or the wire rope or chains are twisted, lower the load and lift it up again.
 4. Do not lift up the load at an angle.
- When lowering a load, pay attention to the following.
 1. When lifting down a load, stop it temporarily at 30 cm above the floor, and then lower it slowly.
 2. Check that the load is stable, and then remove the sling.
 3. Remove kinks and dirt from the wire ropes and chains used for the sling work, and put them in the specified place.

Precautions for using mobile crane

- ★ Read the Operation and Maintenance Manual of the crane carefully in advance and operate the crane safely.

Precautions for using overhead traveling crane

- ⚠ **The hoist or crane must be used to sling the components weighing 25 kg or heavier. A part weighing 25 kg or heavier in "disassembly and assembly" section is indicated with the symbol of .**