KEBM661702

Shop Manual

KOMATSU®

D51EX-24

D51PX-24

CRAWLER DOZER

SERIAL NUMBERS **D51EX-24 B20001 and up**
D51PX-24 B20001 and up

ENGINE **4D107E-3**

This material is proprietary to Komatsu America Corp. and is not to be reproduced, used, or disclosed except in accordance with written authorization from Komatsu America Corp.

It is our policy to improve our products whenever it is possible and practical to do so. We reserve the right to make changes or improvements at any time without incurring any obligation to install such changes on products sold previously.

Due to this continuous program of research and development, revisions may be made to this publication. It is recommended that customers contact their distributor for information on the latest revision.

Copyright 2017 Komatsu
Printed in U.S.A.
Komatsu America Corp.

June 2017

MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer Service Manual | Publication KEBM661702 Order the manual at mid-west-tech.com >

INDEX

00 INDEX AND FOREWORD 00-1
ABBREVIATION LIST 00-18
FOREWORD, SAFETY, BASIC INFORMATION 00-24
HOW TO READ THE SHOP MANUAL 00-24
SAFETY NOTICE FOR OPERATION 00-26
PRECAUTIONS TO PREVENT FIRE 00-34
ACTIONS IF FIRE OCCURS 00-36
PRECAUTIONS FOR DISPOSING OF WASTE MATERIALS 00-37
ACTIONS TAKEN TO MEET EXHAUST GAS REGULATIONS 00-38
PRECAUTIONS FOR DEF 00-39
STORE AdBlue/DEF 00-40
PRECAUTIONS FOR HANDLING HYDRAULIC EQUIPMENT 00-41
PRECAUTIONS FOR DISCONNECTION AND CONNECTION OF PIPINGS 00-44
PRECAUTIONS FOR HANDLING ELECTRICAL EQUIPMENT 00-50
PRECAUTIONS FOR HANDLING FUEL SYSTEM EQUIPMENT 00-52
PRECAUTIONS FOR HANDLING INTAKE SYSTEM EQUIPMENT 00-53
PRACTICAL USE OF KOMTRAX 00-54
DISCONNECT AND CONNECT PUSH-PULL TYPE COUPLER 00-55
PRECAUTIONS FOR DISCONNECTION AND CONNECTION OF CONNECTORS 00-59
METHOD FOR DISCONNECTING AND CONNECTING DEUTSCH CONNECTOR 00-63
METHOD FOR DISCONNECTING AND CONNECTING SLIDE LOCK TYPE CONNECTOR 00-64
METHOD FOR DISCONNECTING AND CONNECTING CONNECTOR WITH LOCK TO PULL ... 00-66
METHOD FOR DISCONNECTING AND CONNECTING CONNECTOR WITH LOCK TO PUSH .. 00-67
METHOD FOR DISCONNECTING AND CONNECTING CONNECTOR WITH HOUSING TO ROTATE 00-69
HOW TO READ ELECTRICAL WIRE CODE 00-70
EXPLANATION OF TERMS FOR MAINTENANCE STANDARD 00-74
STANDARD TIGHTENING TORQUE TABLE 00-77
CONVERSION TABLE 00-84
01 SPECIFICATIONS 01-1
CONTENTS 01-2
ABBREVIATION LIST 01-3
SPECIFICATIONS 01-9
SPECIFICATION DRAWING 01-9
SPECIFICATIONS 01-13
WEIGHT TABLE 01-23
FUEL, COOLANT, LUBRICANTS (FOR NORTH AMERICA) 01-27
FUEL, COOLANT, LUBRICANTS (FOR EUROPEAN UNION) 01-29
10 STRUCTURE AND FUNCTION 10-1
CONTENTS 10-2
ABBREVIATION LIST 10-5
UREA SCR SYSTEM 10-11
LAYOUT DRAWING OF UREA SCR SYSTEM 10-11
UREA SCR SYSTEM DIAGRAM 10-13
FUNCTION OF UREA SCR SYSTEM 10-14
COMPONENT PARTS OF UREA SCR SYSTEM 10-32
BOOT-UP SYSTEM 10-41
LAYOUT DRAWING OF BOOT-UP SYSTEM 10-41
SYSTEM OPERATING LAMP SYSTEM 10-42
BATTERY DISCONNECT SWITCH 10-44
ENGINE SYSTEM 10-45
LAYOUT DRAWING OF ENGINE SYSTEM 10-45
ENGINE CONTROL SYSTEM 10-47
AUTOMATIC IDLE STOP SYSTEM 10-53
COMPONENT PARTS OF ENGINE SYSTEM 10-56
COOLING SYSTEM 10-73

MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

LAYOUT DRAWING OF COOLING SYSTEM 10-73
COOLING FAN CONTROL SYSTEM 10-75
COMPONENT PARTS OF COOLING SYSTEM 10-78
CONTROL SYSTEM 10-87
LAYOUT DRAWING OF CONTROL SYSTEM 10-87
MACHINE MONITOR SYSTEM 10-88
KOMTRAX SYSTEM 10-89
COMPONENT PARTS OF CONTROL SYSTEM 10-90
HYDRAULIC SYSTEM 10-122
LAYOUT DRAWING OF HYDRAULIC SYSTEM 10-122
CLSS 10-123
COMPONENT PARTS OF HYDRAULIC SYSTEM 10-126
POWER TRAIN SYSTEM 10-158
LAYOUT DRAWING OF HST SYSTEM 10-158
OPERATION OF HST SYSTEM 10-159
STEERING AND BRAKE CONTROL SYSTEM 10-161
HST CONTROL SYSTEM 10-163
PARKING BRAKE CONTROL SYSTEM 10-174
COMPONENT PARTS OF POWER TRAIN SYSTEM 10-177
WORK EQUIPMENT SYSTEM 10-213
WORK EQUIPMENT CONTROL 10-213
LAYOUT DRAWING OF FRONT WORK EQUIPMENT 10-215
LAYOUT OF FIXED MULTI-SHANK RIPPER 10-216
COMPONENT PARTS OF WORK EQUIPMENT SYSTEM 10-217
UNDERCARRIAGE AND FRAME 10-233
MAIN FRAME 10-233
SUSPENSION 10-234
TRACK FRAME AND IDLER CUSHION 10-237
WORK EQUIPMENT 10-239
STRUCTURE OF FRONT WORK EQUIPMENT 10-239
STRUCTURE OF FIXED MULTI-SHANK RIPPER 10-240
CAB AND ITS ATTACHMENTS 10-241
ROPS CAB 10-241
CAB MOUNT 10-243
20 STANDARD VALUE TABLE 20-1
CONTENTS 20-2
ABBREVIATION LIST 20-3
STANDARD VALUE TABLE FOR ENGINE 20-9
STANDARD VALUE TABLE FOR ENGINE: D51EX-24 20-9
STANDARD VALUE TABLE FOR ENGINE: D51PX-24 20-13
STANDARD VALUE TABLE FOR MACHINE 20-17
STANDARD VALUE TABLE FOR MACHINE: D51EX-24 20-17
STANDARD VALUE TABLE FOR MACHINE: D51PX-24 20-33
MACHINE POSTURE AND PROCEDURE FOR MEASURING PERFORMANCE 20-47
30 TESTING AND ADJUSTING 30-1
CONTENTS 30-2
ABBREVIATION LIST 30-5
RELATED INFORMATION ON TESTING AND ADJUSTING 30-11
TOOLS FOR TESTING AND ADJUSTING 30-11
SKETCH OF TOOLS FOR TESTING AND ADJUSTING 30-18
ENGINE AND COOLING SYSTEM 30-19
TEST ENGINE SPEED 30-19
TEST BOOST PRESSURE 30-21
TEST EXHAUST GAS COLOR 30-23
TEST AND ADJUST VALVE CLEARANCE 30-25
TEST COMPRESSION PRESSURE 30-27
TEST BLOWBY PRESSURE 30-32
TEST ENGINE OIL PRESSURE 30-34

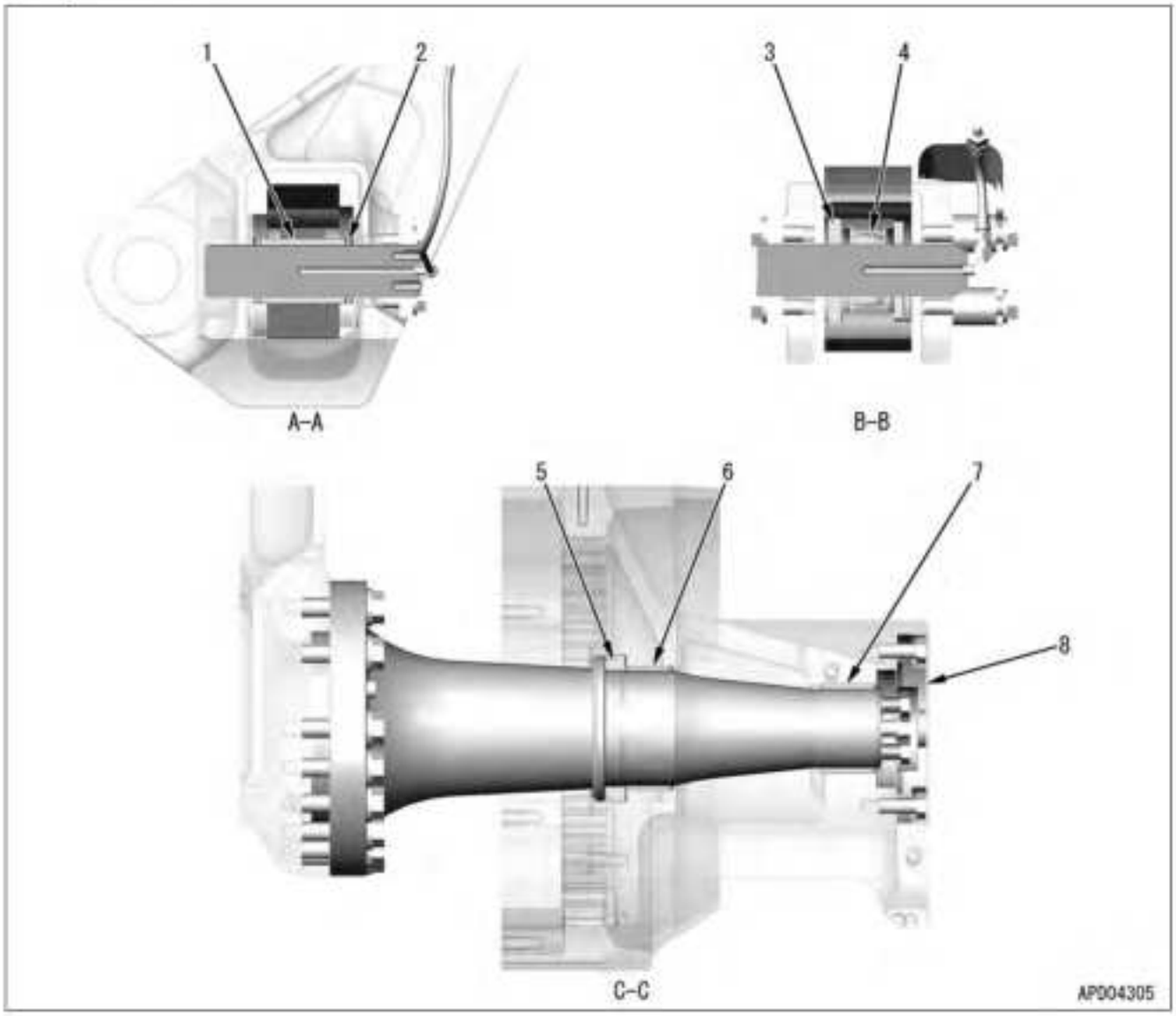
MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

TEST FUEL PRESSURE 30-35
TEST FUEL DISCHARGE, RETURN AND LEAKAGE 30-40
BLEED AIR FROM FUEL SYSTEM 30-46
TEST FUEL CIRCUIT FOR LEAKAGE 30-47
HANDLE CYLINDER CUT-OUT MODE OPERATION 30-49
HANDLE NO-INJECTION CRANKING OPERATION 30-50
TEST KDOC, SCR AND MUFFLER STACK FOR LOOSENESS AND DAMAGE 30-51
TEST INSTALLED CONDITION OF CYLINDER HEADS AND MANIFOLDS 30-52
TEST ENGINE PIPING FOR DAMAGE AND LOOSENESS 30-53
WRITE ASH IN SOOT ACCUMULATION CORRECTION TO ENGINE CONTROLLER 30-54
TEST SCR RELATED FUNCTIONS 30-55
CLEAN AdBlue/DEF TANK 30-83
CLEAN AdBlue/DEF TANK MOUNTING PORTION 30-87
POWER TRAIN 30-88
TEST AND ADJUST HST OIL PRESSURE 30-88
BLEED AIR FROM HST PUMP 30-93
TEST OUTLET PRESSURE OF SOLENOID VALVE 30-95
TEST TRAVEL DEVIATION 30-99
TEST BRAKE PERFORMANCE SIMPLY 30-101
TEST AND ADJUST DECELERATION/BRAKE PEDAL 30-102
ADJUST PARKING BRAKE LEVER 30-106
MOVE MACHINE WHEN IT CANNOT TRAVEL 30-108
UNDERCARRIAGE AND FRAME 30-111
CHECK AND ADJUST IDLER CLEARANCE 30-111
TESTING SPROCKET WEAR 30-113
TEST AND ADJUST TRACK TENSION 30-114
HYDRAULIC SYSTEM 30-116
RELEASE REMAINING PRESSURE FROM HYDRAULIC SYSTEM 30-116
TEST AND ADJUST WORK EQUIPMENT OIL PRESSURES 30-117
TEST AND ADJUST OIL PRESSURE OF CONTROL CIRCUIT 30-120
TEST OUTLET PRESSURE OF EPC SOLENOID VALVE 30-122
BLEED AIR FROM WORK EQUIPMENT AND COOLING FAN PUMP 30-124
TEST COOLING FAN SPEED 30-125
TEST COOLING FAN CIRCUIT OIL PRESSURE 30-126
TEST THE PARTS CAUSING HYDRAULIC DRIFT IN WORK EQUIPMENT 30-128
TEST INTERNAL OIL LEAKAGE OF WORK EQUIPMENT CYLINDER 30-130
BLEED AIR FROM WORK EQUIPMENT CYLINDERS 30-133
WORK EQUIPMENT 30-134
ADJUST WORK EQUIPMENT LOCK LEVER 30-134
ELECTRICAL SYSTEM 30-136
SET AND OPERATE MACHINE MONITOR 30-136
METHOD FOR STARTING UP KOMTRAX TERMINAL 30-264
ADJUSTMENT WHEN HST CONTROLLER HAS BEEN REPLACED 30-269
ADJUSTMENT WHEN ELECTRIC OR HYDRAULIC DEVICE HAS BEEN REPLACED 30-275
ADJUST REARVIEW CAMERA ANGLE 30-277
HANDLE VOLTAGE CIRCUIT OF ENGINE CONTROLLER 30-278
HANDLE BATTERY DISCONNECT SWITCH 30-279
TEST DIODES 30-280
Pm CLINIC 30-281
Pm CLINIC SERVICE 30-281
40 TROUBLESHOOTING 40-1
CONTENTS 40-2
ABBREVIATION LIST 40-12
RELATED INFORMATION ON TROUBLESHOOTING 40-18
GENERAL TROUBLESHOOTING POINTS 40-18
TROUBLESHOOTING POINTS FOR UREA SCR SYSTEM 40-19
SEQUENCE OF EVENTS IN TROUBLESHOOTING 40-31
CHECKS BEFORE TROUBLESHOOTING 40-33

MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

Sectional view

The figure shows D51PX-24.



1: Bushing
2: Seal
3: Seal
4: Bushing
5: Seal
6: Bushing (large)
7: Bushing (small)
8: Cover

SPECIFICATIONS OF SUSPENSION

D51EX-24

Displacement at center of equalizer bar side pin

Upward: 46.1 mm

Downward: 46.1 mm

D51PX-24

Displacement at center of equalizer bar side pin

Upward: 49.4 mm

Downward: 49.4 mm

MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

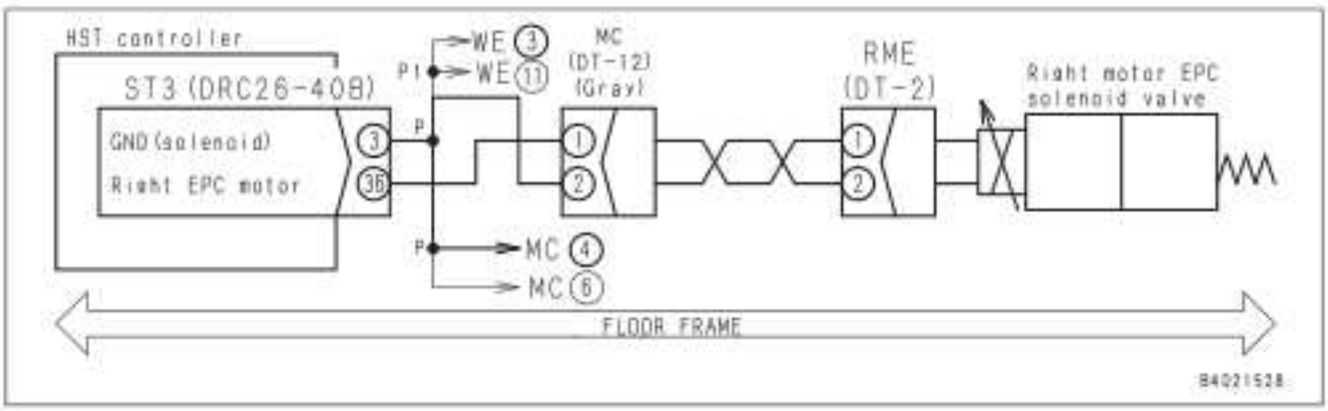
FAILURE CODE [CA4277]

Action level	Failure code	Failure	AdBlue/DEF quality sensor liquid distinction impossible error (Engine controller system)
L01	CA4277		
Detail of failure	AdBlue/DEF sensor cannot measure the quality and that state continues.		
Action of controller	None in particular		
Phenomenon on machine	AdBlue/DEF quality cannot be measured.		
Related information	• AdBlue/DEF quality sensor is one of AdBlue/DEF tank sensors which are integrated in one unit with AdBlue/DEF level sensor and AdBlue/DEF temperature sensor. It communicates with engine controller through CAN communication. • If AdBlue/DEF quality sensor is Liquid Distinction Impossible state, the last time memory value of AdBlue/DEF concentration is displayed on the monitor. • When AdBlue/DEF temperature in tank is 0 °C or lower, the engine controller does not troubleshoot this failure code. (Failure code is not cleared even after performing "Loaded Diagnostics Operation to Clear Failure Code".) • Check that AdBlue/DEF temperature in tank is 0 °C or higher on "Pre-defined Monitoring" screen, and then troubleshoot this failure code. • When AdBlue/DEF level in tank is 0 %, the engine controller does not troubleshoot this failure code. (Failure code is not cleared even after performing "Loaded Diagnostics Operation to Clear Failure Code".) • Check that AdBlue/DEF level is 20 % or more on "Pre-defined Monitoring" screen, and then troubleshoot this failure code. • For details of drain method and clean method of AdBlue/DEF tank, see TESTING AND ADJUSTING, "CLEAN AdBlue/DEF TANK". • For AdBlue/DEF level sensor replacement, see DISASSEMBLY AND ASSEMBLY, "REMOVE AND INSTALL AdBlue/DEF TANK SENSOR". • On "Pre-defined Monitoring" screen, items related to AdBlue/DEF tank sensor diagnosis is used. (The numbers below denote monitoring codes). • Troubleshooting for AdBlue/DEF tank sensor related 19100 AdBlue/DEF Concentration 19110 AdBlue/DEF Level 19111 AdBlue/DEF Level Corrected 19115 AdBlue/DEF Temperature in Tank 19400 Ambient Temperature 19305 AdBlue/DEF Tank Heating State **NOTICE** **This failure code requires "Loaded Diagnostics Operation To Clear Failure Code". After investigating the cause of the problem and completing the repair, perform "Loaded Diagnostics Operation To Clear Failure Code" to make sure the failure code is cleared. (This failure code is not cleared by simply turning the starting switch to ON position.)**		

MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

No.	Cause	Procedure, measuring location, criteria and remarks		
3	Open circuit or short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connector ST3, and connect T-adapter to female side.		
		Resistance	Between ST3 (female) (36) and (3)	5 to 15 Ω
4	Defective HST controller	If no failure is found by preceding checks, HST controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit diagram related to R.H. HST motor EPC

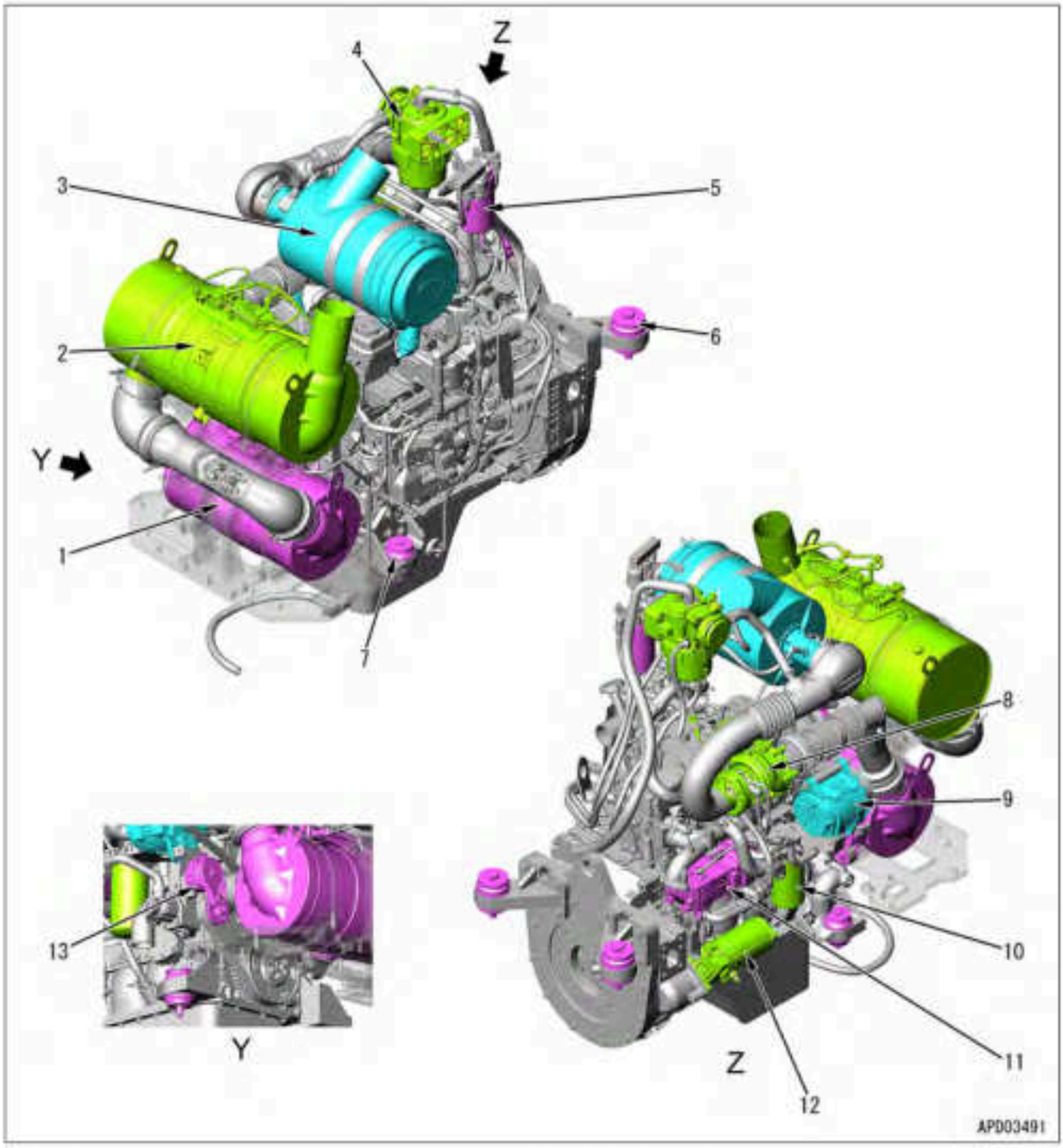


MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

ENGINE SYSTEM

LAYOUT DRAWING OF ENGINE SYSTEM

General view



1:KDOC
2: SCR assembly
3: Air cleaner
4: KCCV ventilator
5: Fuel main filter
6: Rear engine mount
7: Front engine mount
8:VGT
9: Alternator
10: Engine oil filter
11: EGR cooler
12: Starting motor

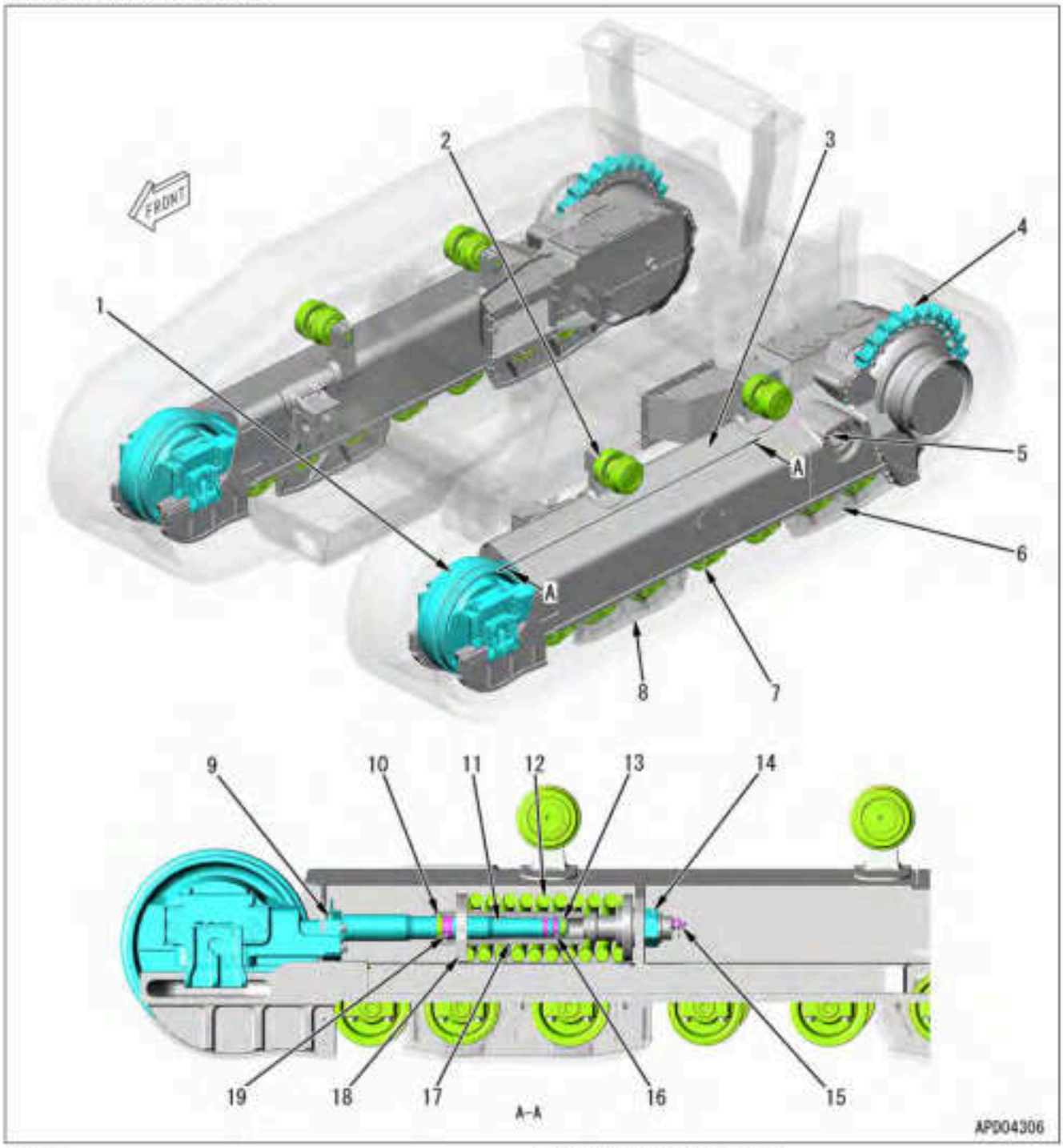
MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

TRACK FRAME AND IDLER CUSHION

STRUCTURE OF TRACK FRAME AND IDLER CUSHION

General view and sectional view

The figure shows D51PX-24.



1: Idler
2: Carrier roller
3: Track frame
4: Sprocket
5: Plug (oil filler port)
6: Track roller end guard
7: Track roller
8: Track roller center guard
9: Yoke
10: Seal

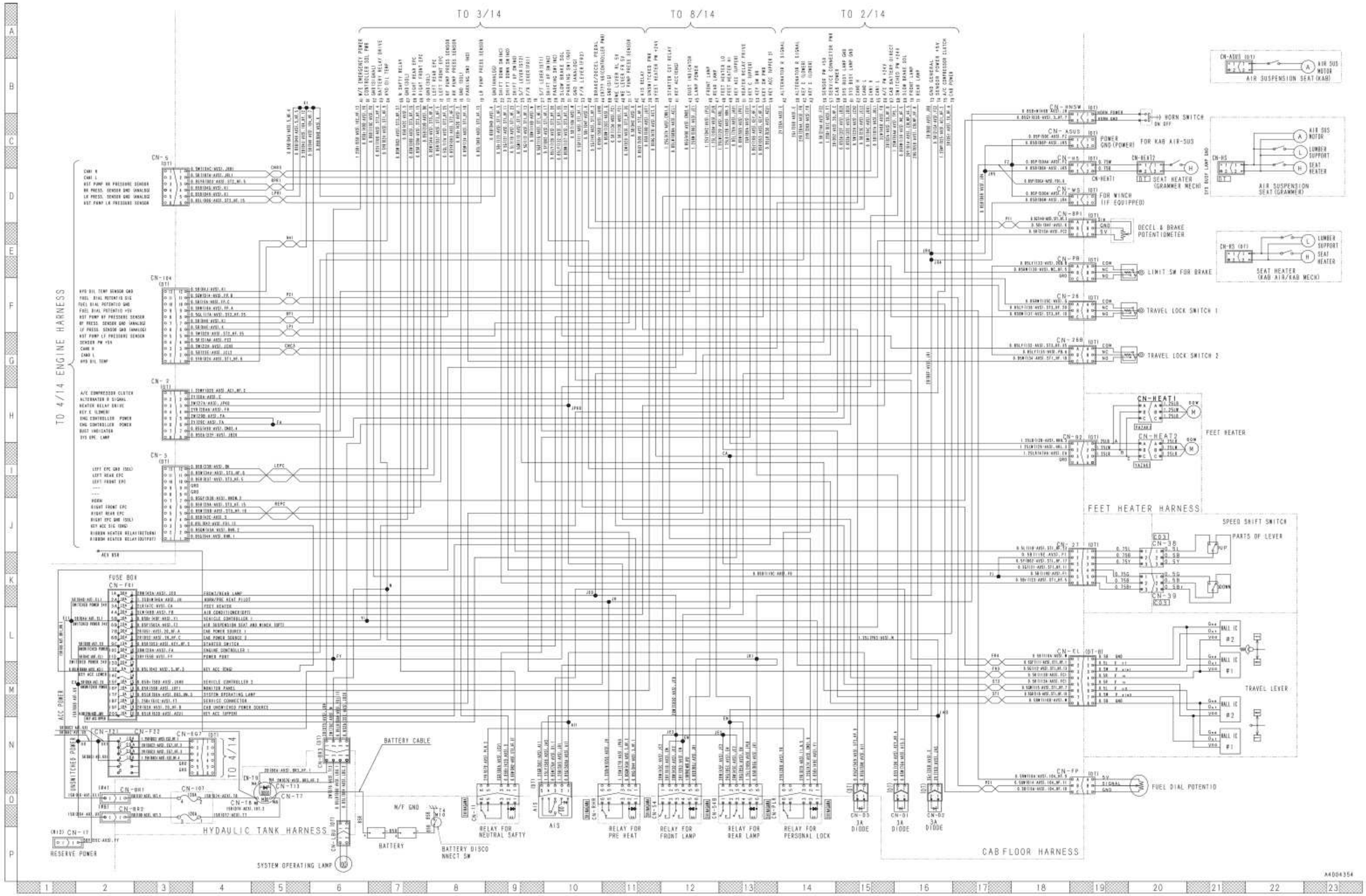
MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer S... Order the manual at mid-west-tech.com >

ELECTRICAL CIRCUIT DIAGRAM (1/14)

D51EX-24, D51PX-24

REMARK

This figure includes the equipment and device that are unavailable as optional items in some areas.



MidWestTech | Komatsu D51EX-24, D51PX-24 with 4D107E-3 Engine Crawler Dozer Service Manual | Publication KEBM661702 Order the manual at mid-west-tech.com >