| GENERAL | | | |
|---|---|---|---|
| **Model** | | **FB15M-3** | |
| Power Type | | Electric (36V) | Electric (48V) |
| Operation Type | | Sitting | Sitting |
| Capacity @ 24 in. (600 mm) load center * | lbs. (kg) | 3,000 (1,350) | 3,000 (1,350) |
| Load distance from center axle (2-stage mast) | in. (mm) | 15.3 (390) | 15.3 (390) |
| Load distance from center axle (3-stage mast) | in. (mm) | 15.3 (390) | 15.3 (390) |
| Wheelbase | in. (mm) | 51.6 (1,310) | 51.6 (1,310) |

PREVIEW - YOUFIXTHIS.COM

Blurred on purpose. The manual you buy has this page in full quality.

Download full manual at youfixthis.com

| | Installation Removal | Disassembly Assembly | Inspection Adjustment |
|---|---|---|---|
| 1. Electrical components | 10 – 8 | – | – |
| 2. Mast | 10 – 6 | 20 – 36 | 20 – 36 |
| 3. Lift cylinder | 10 – 6 | 20 – 28 | 20 – 28 |
| 4. Parking brake | 10 – 9 | – | 10 – 16 |
| 5. Control valve | 10 – 12 | 20 – 34 | 20 – 35 |
| 6. Master cylinder | 10 – 10 | – | – |
| 7. Tilt cylinder | 10 – 6 | 20 – 30 | 20 – 31 |
| 8. Wheel brake | 10 – 11 | 20 – 12 | 20 – 13 |
| 9. Front wheels | 10 – 9 | – | – |
| 10. Transfer | 10 – 9 | 20 – 2 | 20 – 7 |
| 11. Contactor board | 10 – 8 | – | – |
| 12. Drive motor | 10 – 8 | – | – |
| 13. Power steering pump | 10 – 8 | – | 10 – 13 |
| 14. Power steering motor | 10 – 8 | – | – |
| 15. Rear wheels | 10 – 9 | 10 – 9 | – |
| 16. Rear axle | 10 – 9 | 20 – 8 | 20 – 8 |
| 17. Chopper board | 10 – 8 | – | – |
| 18. Steering chain | 10 – 9 | 20 – 10 | 20 – 10 |
| 19. Power steering cylinder | 10 – 9 | 20 – 32 | 20 – 33 |
| 20. Pump motor | 10 – 8 | – | – |
| 21. Hydraulic pump | 10 – 8 | – | 10 – 13 |
| 22. Accelerator | 10 – 14 | – | 10 – 14 |
| 23. Steering gear box | 10 – 12 | 20 – 14 | 20 – 20 |

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

## FRAME



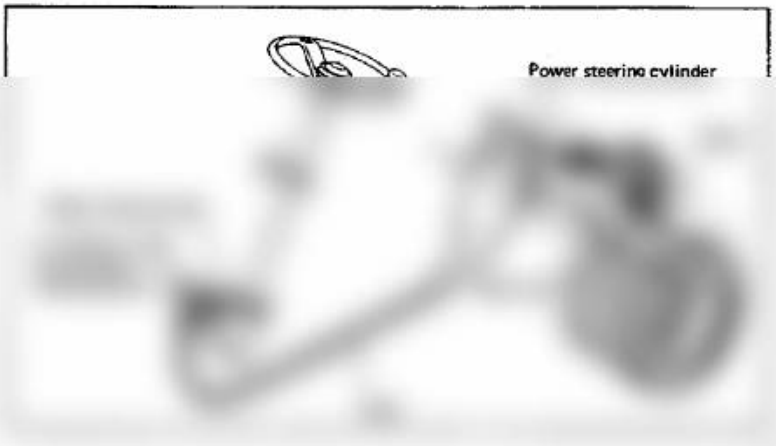

PREVIEW - YOUFIXTHIS.COM

Blurred on purpose. The manual you buy has this page in full quality.



Download full manual at youfixthis.com

## HYDRAULIC SYSTEM



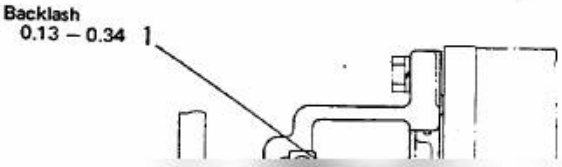

PREVIEW - YOUFIXTHIS.COM

Blurred on purpose. The manual you buy has this page in full quality.

Download full manual at youfixthis.com

## TRANSFER




Blurred on purpose. The manual you buy has this page in full quality.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

### (3) TRACTION CONTROLLER : CONTROL CIRCUIT

Figure 13 shows the control circuit for ACS and traction motor.
Figure 14 shows the traction control circuit diagram.
Figure 15 shows traction controller connector.
Figure13,14,15 and table 1 describe traction controller connector signal and pin assignment.



Blurred on purpose. The manual you buy has this page in full quality.



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

## (3) ERROR HANDLING TABLE

**NOTE:** When an error occurs, the blinking LED and the action for fault should be kept (latched) until meeting the resetable conditions. **Se**

| Where | No. | Source | Condition | When | Traction | Main |
|---|---|---|---|---|---|---|
| Detected by VMC20 | 1 | Switch startup error | ACC \| FW \| REV switch active at startup | KEY → ON | OFF | ON |
| | 2 | Direction switch error | FW and REV ON at the same time | KEY = ON | OFF | ON |
| | 3 | Acc. pot error | Pot voltage > 95% or Pot voltage < 5% of VX_out, or Voltage > 30% when ACC switch not active | KEY = ON | ON | ON |
| | 4 | Steer pot error | Pot voltage > 95% or Pot voltage < 5% of VX_out. | KEY = ON | ON | ON |
| | 5 | Battery under voltage | 48V: Less than 28.2V/0.8 seconds, 36V: Less than 24.8V/0.8 seconds | KEY = ON | OFF | OFF |
| | 6 | Battery over voltage | More than 65V/0.8 seconds | KEY = ON | OFF | OFF |
| | 7 | Communication error | CAN Bus Error - No Communication Check resistance = 60Ohms for CAN Bus | KEY = ON | OFF | ON |
| | 8 | PM brush wear | Brush wear sense 1 = ON or Brush wear sense 2 = ON | KEY = ON | ON | ON |
| | 9 | PM thermal | PM thermal sense = ON | KEY = ON | ON | ON |
| Not Used | 10 | Not Used | | | | |
| Left Traction ACS | 11 | ACS temp warning | Temp > 185°F or Temp < -4°F | KEY = ON | ON | ON |
| | 12 | Motor high temp warning | Temp > 293°F | KEY = ON | ON | ON |
| | 13 | Heat sink temp sensor error | ACS internal sensor error <-58°F or >338°F | KEY = ON | ON | ON |
| | 14 | Motor temp sensor error | Motor temp sensor not connected or short circuit | KEY = ON | ON | ON |
| | 15 | Speed feedback sensor error | Speed feedback sensor not connected / shorted | KEY = ON | OFF | ON |
| Left ACS Emergency Shutdown Message | 21 | Short circuit | ACS is shorted, or motor terminals are shorted. | KEY = ON | OFF | OFF |
| | 22 | ACS over temperature | Temp > 239°F | KEY = ON | OFF | ON |
| | 23 | Motor over temperature | Temp > 365°F | KEY = ON | OFF | ON |
| | 24 | ACS current sensor error | ACS internal error | KEY → ON | OFF | ON |
| | 25 | Charging timeout | ACS voltage < 23V 10 seconds after KEY → ON | KEY → ON | OFF | ON |
| | 26 | CANopen timeout | Communication timeout | KEY = ON | OFF | ON |
| | 27 | ACS low voltage trip | V < 15V | KEY = ON | OFF | ON |
| | 28 | ACS high voltage trip | V > 68V | KEY = ON | OFF | ON |
| | 29 | Other error | | KEY = ON | OFF | ON |
| Right Traction ACS | 31 | ACS temp warning | Temp > 185°F or Temp < -4°F | KEY = ON | ON | ON |
| | 32 | Motor high temp warning | Temp > 293°F | KEY = ON | ON | ON |
| | 33 | Heat sink temp sensor error | ACS internal sensor error <-58°F or >338°F | KEY = ON | ON | ON |
| | 34 | Motor temp sensor error | Motor temp sensor not connected or short circuit | KEY = ON | ON | ON |
| | 35 | Speed feedback sensor error | Speed feedback sensor not connected / shorted | KEY = ON | OFF | ON |
| Not Used | 36 | ACS voltage warning | V > 68V or V < 23V | KEY = ON | ON | ON |
| | 37 | ACS default values loaded | Default parameters are used in ACS | KEY = ON | ON | ON |
| Right ACS Emergency Shutdown Message | 41 | Short circuit | ACS is shorted, or motor terminals are shorted. | KEY = ON | OFF | OFF |
| | 42 | ACS over temperature | Temp > 239°F | KEY = ON | OFF | ON |
| | 43 | Motor over temperature | Temp > 365°F | KEY = ON | OFF | ON |
| | 44 | ACS current sensor error | ACS internal error | KEY → ON | OFF | ON |
| | 45 | Charging timeout | ACS voltage < 23V 10 seconds after KEY → ON | KEY → ON | OFF | ON |
| | 46 | CANopen timeout | Communication timeout | KEY = ON | OFF | ON |
| | 47 | ACS low voltage trip | V < 15V | KEY = ON | OFF | ON |
| | 48 | ACS high voltage trip | V > 68V | KEY = ON | OFF | ON |
| | 49 | Other error | | KEY = ON | OFF | ON |

PREVIEW - YOUFIXTHIS.COM

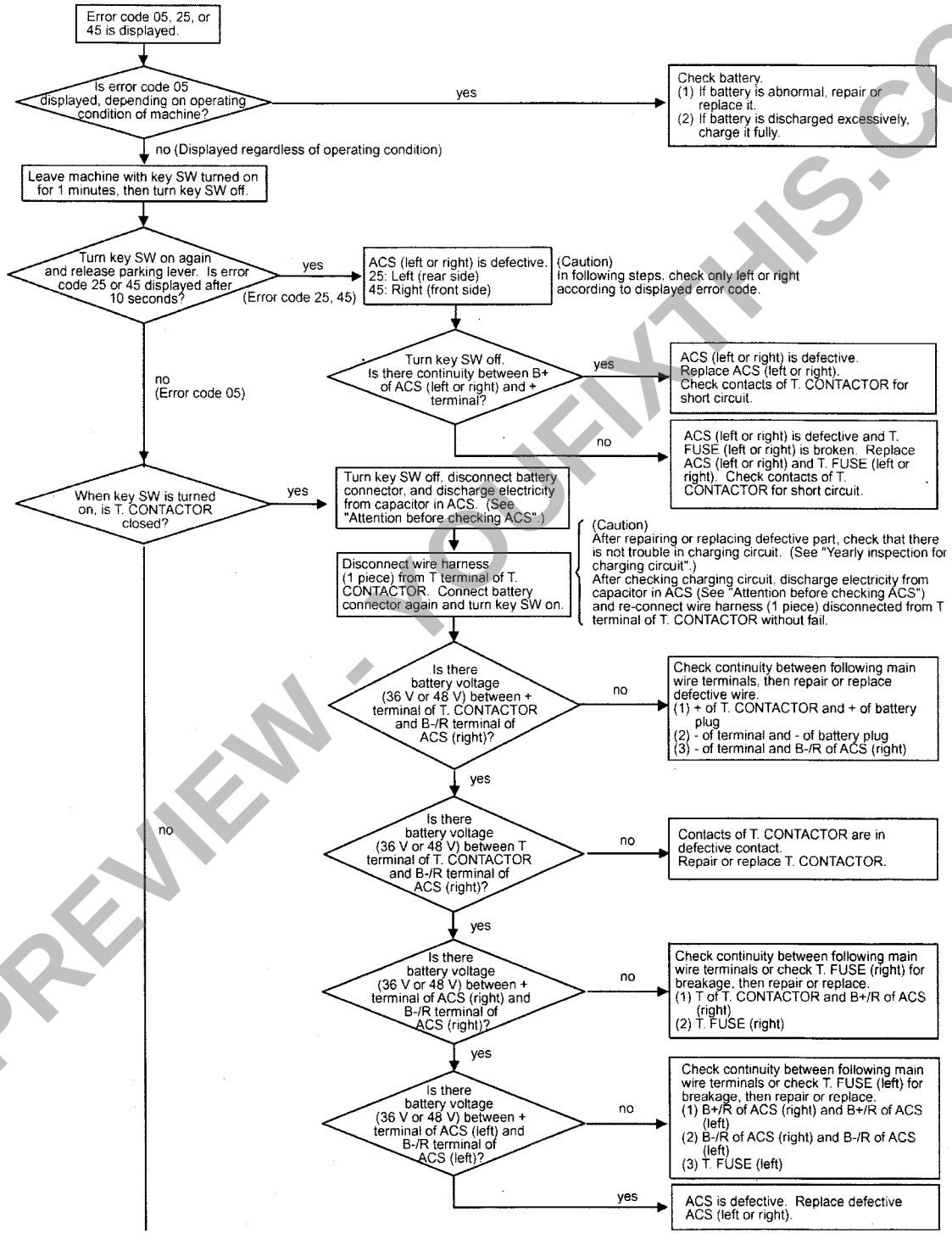


Download full manual at youfixthis.com

### (4) FLOWCHART FOR ERROR CODE 05 (including error code 25 or 45): UNDER BATTERY VOLTAGE and CHARGING TIMEOUT

If error code 05, 25, or 45 is displayed, check for a trouble according to the following flowchart, then repair or replace it. If the same error is displayed after repairing the trouble, however, check according to the flowchart from the first. After repairing or replacing a defective part, check that there is not a trouble in the charging circuit. (See "Yearly inspection for charging circuit".)

• FLOWCHART




PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

# CONTENTS


Page No.

**01. GENERAL AND SPECIFICATIONS**

OVERALL DIMENSIONS AND SPECIFICATIONS ..... 01-2
- Mast Data ..... 01-2
- FB15M-3 ..... 01-3
- FB18M-3 ..... 01-4
- FB18MG-3 ..... 01-5
- FB20M-3 ..... 01-6

TRUCK DATA ..... 01-8

**10. REMOVAL AND INSTALLATION**

GENERAL LOCATIONS ..... 10-2

WEIGHT TABLE ..... 10-4

FRAME ..... 10-6

POWER TRAIN ..... 10-8

BRAKE SYSTEM ..... 10-10

HYDRAULIC SYSTEM ..... 10-12
- Adjustment of Pedal ..... 10-14
- Accelerator Pedal ..... 10-14
- Brake pedal ..... 10-15
- Parking Brake ..... 10-16

**20. DISASSEMBLY AND ASSEMBLY**

TRANSFER ..... 20-2
- Disassembly ..... 20-3
- Assembly ..... 20-6
- Precautions When Assembling ..... 20-7

REAR AXLE (STEERING AXLE) ..... 20-8
- Power Steering Cylinder ..... 20-9
- Precautions When Assembling ..... 20-10

BRAKE SYSTEM ..... 20-12

STEERING GEAR BOX ..... 20-15
- Disassembly Procedure ..... 20-16
- Inspection and Cleaning ..... 20-20
- Assembly Procedure ..... 20-20

HYDRAULIC SYSTEM (HYDRAULIC CIRCUIT) ..... 20-27

TILT CYLINDER ..... 20-28
- Inspection Data ..... 20-29


PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

[8] A CONNECTION AND DISCONNECTION METHOD OF CONNECTORS. . . . . 30-22
(1) Master Controller (Canion) . . . . . 30-22
(2) Traction Controller (ACS) . . . . . 30-23
(3) Traction Motor . . . . . 30-24

[9] TROUBLESHOOTING FOR TRACTION SYSTEM . . . . . 30-25
(1) Attention . . . . . 30-25
(2) Regarding the Diagnosis . . . . . 30-27
(3) Error Handling Table . . . . . 30-29
(4) Flowchart for Error Code 05 (including error code 25 or 45):
Under battery voltage and Charging Timeout . . . . . 30-31
(5) Flowchart for Error Code 07 (communication error) - Can Bus Line . . . . . 30-33

[10] TROUBLESHOOTING FOR PUMP CONTACTOR . . . . . 30-37
(1) Attention . . . . . 30-37
(2) Flowchart for Troubleshooting . . . . . 30-37

[11] TROUBLESHOOTING FOR POWER STEERING CONTACTOR . . . . . 30-38
(1) Attention . . . . . 30-38
(2) Flowchart for Troubleshooting . . . . . 30-38

[12] CONTROLLER -- FUNCTIONAL DESCRIPTION . . . . . 30-39
(1) Startup . . . . . 30-39
(2) Canion Controller . . . . . 30-39
a) Digital Inputs . . . . . 30-39
b) Analog Inputs . . . . . 30-41
c) Outputs . . . . . 30-43
d) Traction . . . . . 30-45
e) Best Performance Curve . . . . . 30-49
(3) ACS . . . . . 30-49

[13] ERROR DETAILS . . . . . 30-49
(1) Communication errors
a) CAN error (E6) . . . . . 30-49
b) CANopen error (E26 or E46) . . . . . 30-50
(2) Temperature Errors . . . . . 30-50
a) ACS Overtemperature Error (E11, E22, E13) . . . . . 30-50
b) Motor Temperature Dependent Power Reduction . . . . . 30-50

[14] YEARLY INSPECTION . . . . . 30-51

[15] AMX/BMX FB15/18/20M-3, 36V / 48V AC DRIVE CONTROLLER
MAIN WIRING DIAGRAM . . . . . 30-52

[16] AMX/BMX FB15/18/20M-3, 36V / 48V MACHINE WIRING DIAGRAM . . . . . 30-53

**40. MASTS**

30D/35D/40D/50D/55D/60D-MS LIMITED FREE LIFT, 2-STAGE MAST (REFER ONLY TO 30D/35D/40D DATA)

30D/35D/40D/50D/55D/60D-MT FULL FREE LIFT, 3-STAGE MAST (REFER ONLY TO 30D/35D/40D DATA)

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

**3. Assembly of relief valve assembly**

1) Fix valve housing (14), then insert spring (16) and valve assembly (13) inside the bore in turn.
   ★ Coat with clean hydraulic oil and insert slowly.
   ★ Move the valve assembly up and down with



PREVIEW - YOUFIXTHIS.COM

Blurred on purpose. The manual you buy has this page in full quality.

Download full manual at youfixthis.com

# [10] TROUBLESHOOTING FOR PUMP CONTACTOR

If the pump motor does not rotate or the pump contractor is not closed, an error code is not displayed (the indicator does not blink). In this case, check for troubles observing the following points.

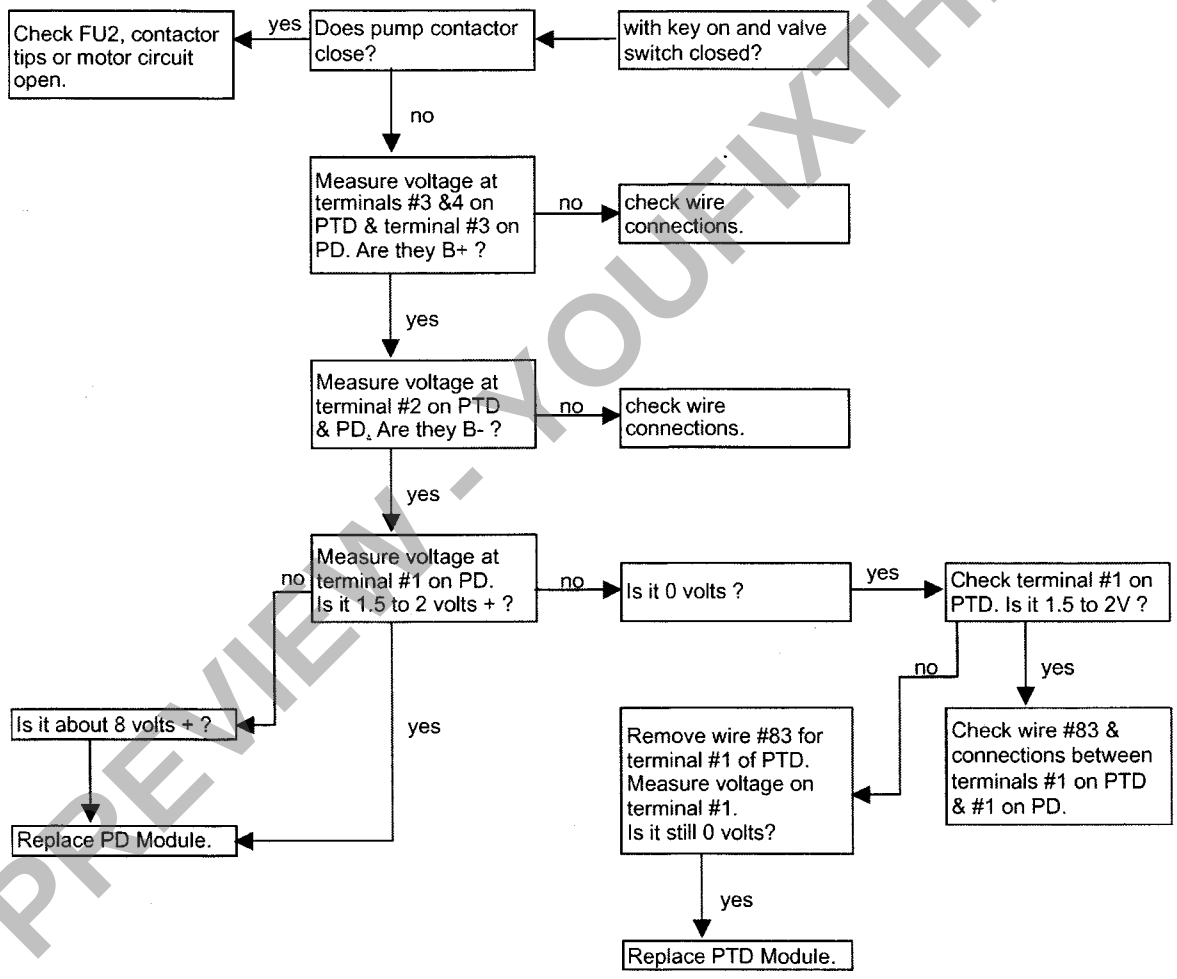
## (1) ATTENTION

a) Before starting troubleshooting
Before starting troubleshooting, perform the following work in order.
1. Disconnect the battery connector.
2. Check the fuse for breakage, wire for damage, and battery for discharge.

b) In troubleshooting
Observe the following points during troubleshooting.
- When checking voltage with the battery connected, never touch the exposed terminals of the motor, controller, contactor, etc. If you touch them, you may get an electric shock and the controller may be broken.

## (2) FLOWCHART FOR TROUBLESHOOTING

Referring to figures 21 and 22 in PUMP CONTACTOR, check the machine according to the following flowchart.




PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

# PREVIEW ONLY

You're viewing 12 of 150 pages

## The full manual includes:

- All 150 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

**GET FULL MANUAL NOW**

**Komatsu FB15M-3, FB18M-3, FB18MG-3, FB20M-3 Shop Manual**

**Scan or click anywhere**
**youfixthis.com**

*Click anywhere on this page to get the full manual*