

# SHOP MANUAL

## ELECTRIC LIFT TRUCKS CHASSIS

### FB10, 15SH

### FB20, 25SH

SERIAL NUMBER FB10,15SH : 1001  
FB20,25SH : 1001 and up

 **KOMATSU FORKLIFT CO., LTD.**



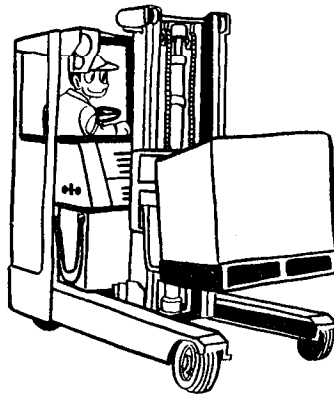
# SHOP MANUAL

## FB10,15SH FB20,25SH

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### 01 GENERAL

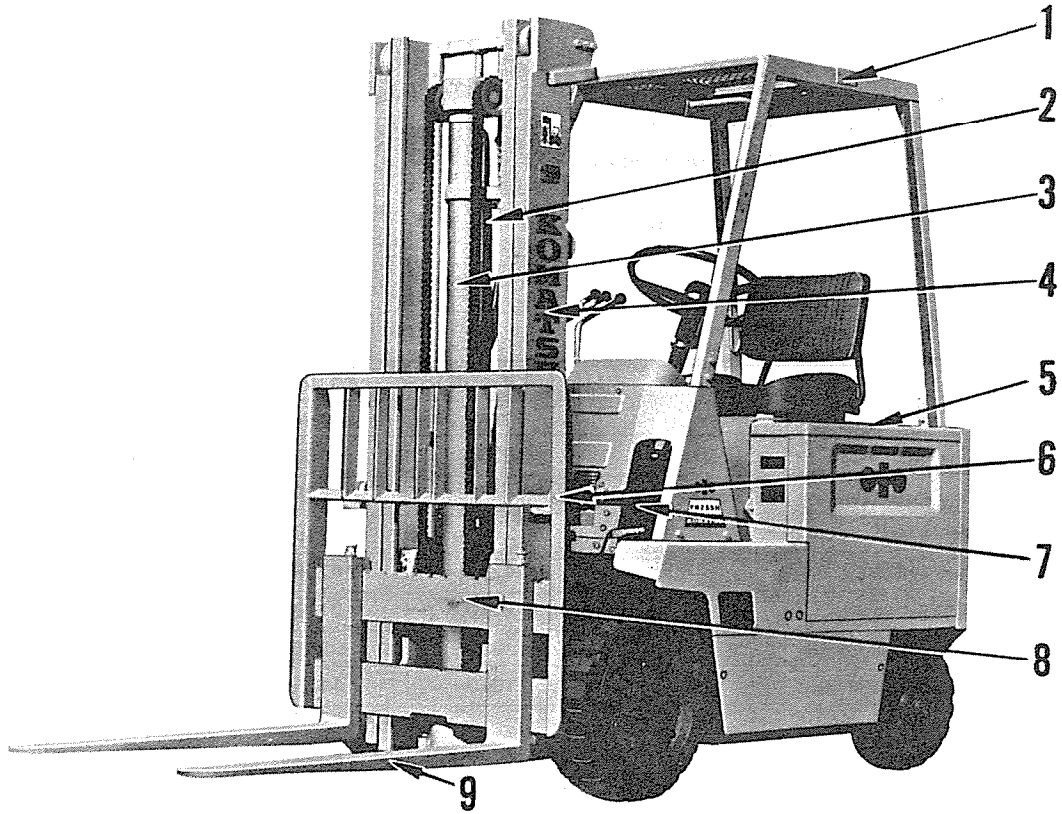
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## CONTENTS

|  |               |
|--|---------------|
| GENERAL .....                          | 01-01 ~ 01-08 |
| STRUCTURE AND FUNCTION .....           | 02-01 ~ 02-07 |
| GENERAL DISASSEMBLY AND ASSEMBLY ..... | 03-01 ~ 03-64 |
| POWER TRAIN .....                      | 04-01 ~ 04-18 |
| BRAKE .....                            | 08-01 ~ 08-11 |
| STEERING SYSTEM .....                  | 10-01 ~ 10-30 |
| MAST .....                             | 12-01 ~ 12-10 |
| MAINTENANCE STANDARD .....             | 15-01 ~ 15-25 |
| MACHINE CHECK LIST .....               | 17-01 ~ 17-05 |

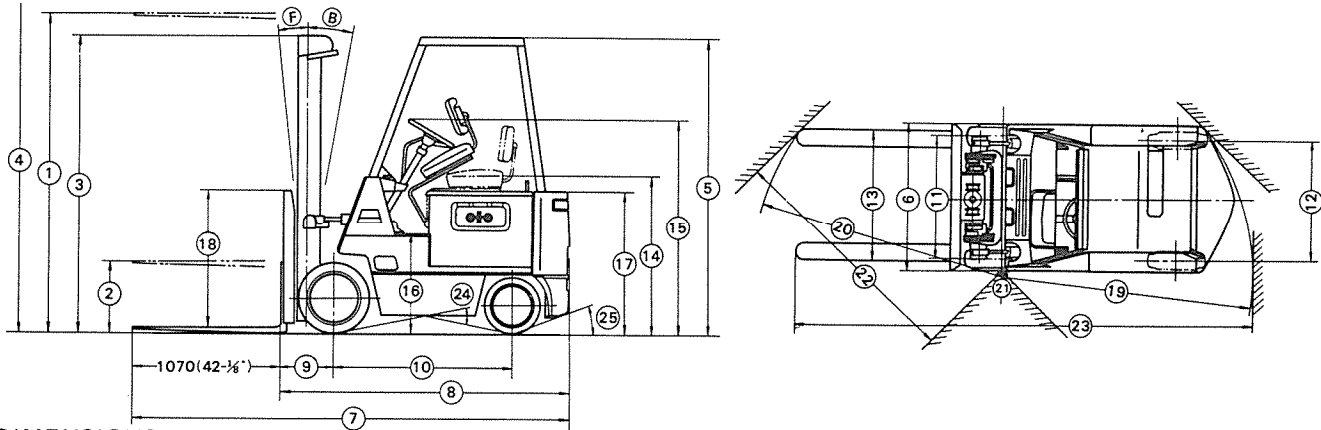
## GENERAL VIEW



1. Overhead guard
2. Lift chain
3. Lift cylinder
4. Mast
5. Battery cover.

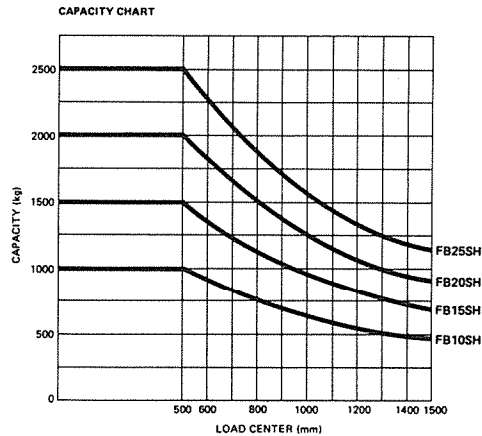
6. Back rest
7. Tilt cylinder
8. Finger bar
9. Fork

### SPECIFICATIONS



### DIMENSIONS

|    |                               | FB10SH | FB15SH | FB20SH | FB25SH |
|----|-------------------------------|--------|--------|--------|--------|
|    |                               | mm     | mm     | mm     | mm     |
| 1  | Lifting height: STD           | 3300   | 3300   | 3300   | 3300   |
| 2  | Free lift                     | 430    | 435    | 410    | 410    |
| 3  | Height of mast lowered        | 2110   | 2110   | 2110   | 2110   |
| 4  | Height of mast extended       | 4255   | 4255   | 4350   | 4350   |
| 5  | Height of overhead guard      | 2110   | 2110   | 2110   | 2110   |
| 6  | Overall width with STD tread  | 965    | 965    | 1030   | 1030   |
|    | Overall width with wide tread | 1070   | 1125   | 1175   | 1175   |
| 7  | Overall length                |        |        |        |        |
|    | With STD forks                | 2860   | 2960   | 3030   | 3085   |
| 8  | Without forks                 | 1790   | 1890   | 1960   | 2015   |
| 9  | Carriage face from drive axle | 335    | 340    | 360    | 360    |
| 10 | Wheelbase                     | 1150   | 1150   | 1250   | 1250   |
| 11 | Front tread                   |        |        |        |        |
|    | STD                           | 840    | 815    | 850    | 850    |
|    | Wide                          | 945    | 970    | 995    | 995    |
| 12 | Rear tread                    | 770    | 770    | 840    | 840    |
| 13 | Fork spread                   |        |        |        |        |
|    | Max.                          | 880    | 880    | 930    | 930    |
|    | Min.                          | 200    | 200    | 240    | 240    |
| 14 | Effective seat height         | 1100   | 1100   | 1110   | 1110   |
| 15 | Height to handwheel           | 1555   | 1555   | 1570   | 1570   |
| 16 | Height to floor plate         | 695    | 695    | 705    | 705    |
| 17 | Height to counterweight       | 1030   | 1030   | 1040   | 1040   |
| 18 | Backrest extension height     | 915    | 915    | 1000   | 1000   |
| 19 | Turning radius (Rear)         | 1565   | 1650   | 1750   | 1780   |
| 20 | Turning radius (Front)        | 1670   | 1675   | 1720   | 1720   |
| 21 | Inside turning radius         | 20     | 20     | 20     | 20     |
| 22 | Min. intersecting aisle       | 1580   | 1625   | 1690   | 1705   |
| 23 | Right-angle stacking aisle    | 2970   | 3060   | 3180   | 3210   |
| 24 | Grade clearance               |        |        |        |        |
|    | Center of truck               | 22°    | 22°    | 20°    | 20°    |
| 25 | Rear overhang                 | 23°    | 23°    | 28°    | 25°    |



CAPACITY DATA

| MODEL  | CAPACITY and LOAD CENTER | MOMENT RATING |
|--------|--------------------------|---------------|
|        | kg at 500mm              | kg-m          |
| FB10SH | 1000                     | 835           |
| FB15SH | 1500                     | 1260          |
| FB20SH | 2000                     | 1720          |
| FB25SH | 2500                     | 2150          |

MOTOR OUTPUT

|           | FB10SH   |        | FB15SH |        | FB20SH |       | FB25SH |       |
|-----------|----------|--------|--------|--------|--------|-------|--------|-------|
|           | 36 V     | 48 V   | 36 V   | 48 V   | 36 V   | 48 V  | 36 V   | 48 V  |
| DRIVE     | 4.5 KW   | 6.5 KW | 4.5 KW | 6.5 KW | 5.6 KW | 8 KW  | 5.6 KW | 8 KW  |
| PUMP      | 7 KW     | 10 KW  | 7 KW   | 10 KW  | 10 KW  | 14 KW | 10 KW  | 14 KW |
| P.S. PUMP | (0.8 KW) | (1 KW) | 0.8 KW | 1 KW   | 0.8 KW | 1 KW  | 0.8 KW | 1 KW  |

FORKS

|           | FB10SH | FB15SH | FB20SH | FB25SH |
|-----------|--------|--------|--------|--------|
|           | mm     | mm     | mm     | mm     |
| LENGTH    | 1070   | 1070   | 1070   | 1070   |
| WIDTH     | 100    | 100    | 120    | 120    |
| THICKNESS | 35     | 40     | 40     | 40     |

TILT ANGLE

|          | FB10SH   | FB15SH   | FB20SH   | FB25SH   |
|----------|----------|----------|----------|----------|
| FORWARD  | 5°       | 5°       | 6°       | 6°       |
| BACKWARD | 10° (6°) | 10° (6°) | 10° (6°) | 10° (6°) |

UNDERCLEARANCE

|                 | FB10SH | FB15SH | FB20SH | FB25SH |
|-----------------|--------|--------|--------|--------|
|                 | mm     | mm     | mm     | mm     |
| MAST            | 95     | 95     | 90     | 90     |
| DRIVE AXLE      | 95     | 95     | 100    | 100    |
| STEER AXLE      | 95     | 95     | 95     | 95     |
| COUNTER WEIGHT  | 140    | 140    | 140    | 140    |
| CENTER OF TRUCK | 100    | 100    | 125    | 125    |

TIRE SIZE (CUSHION)

|       | FB10SH          | FB15SH          | FB20SH              | FB25SH              |
|-------|-----------------|-----------------|---------------------|---------------------|
| DRIVE | 18 x 5 x 12-1/8 | 18 x 6 x 12-1/8 | 21 x 7 x 15         | 21 x 7 x 15         |
| STEER | 14 x 4-1/2 x 8  | 14 x 4-1/2 x 8  | 16-1/4 x 5 x 11-1/4 | 16-1/4 x 5 x 11-1/4 |

## PERFORMANCE

|                |     | FB10SH | FB15SH | FB20SH | FB25SH |
|----------------|-----|--------|--------|--------|--------|
| TRAVEL SPEED   |     | km/h   | km/h   | km/h   | km/h   |
| Unladen        | 36V | 11.5   | 10.5   | 11.5   | 11.0   |
|                | 48V | 15.0   | 14.0   | 15.5   | 15.0   |
| Laden          | 36V | 10.5   | 9.5    | 10.0   | 9.5    |
|                | 48V | 14.0   | 12.5   | 13.0   | 12.5   |
| LIFTING SPEED  |     | mm/s   | mm/s   | mm/s   | mm/s   |
| Unladen        | 36V | 500    | 490    | 430    | 430    |
|                | 48V | 610    | 600    | 550    | 550    |
| Laden          | 36V | 330    | 300    | 290    | 270    |
|                | 48V | 440    | 400    | 380    | 350    |
| LOWERING SPEED |     | mm/s   | mm/s   | mm/s   | mm/s   |
| Unladen        |     | 450    | 450    | 400    | 400    |
| Laden          |     | 450    | 450    | 550    | 550    |
| GRADEABILITY   |     |        |        |        |        |
| Unladen        | 36V | 25%    | 19%    | 22%    | 16%    |
|                | 48V | 25%    | 19%    | 22%    | 16%    |
| Laden          | 36V | 23%    | 16%    | 15%    | 15%    |
|                | 48V | 26%    | 18%    | 15%    | 15%    |

## BATTERY DATA

| Battery compartment dimensions  | FB10SH         | FB15SH         | FB20SH         | FB25SH         |
|---------------------------------|----------------|----------------|----------------|----------------|
|                                 | mm             | mm             | mm             | mm             |
| Width                           | 810 ~ 935      | 810 ~ 935      | 900 ~ 990      | 900 ~ 990      |
| Length                          | 480 ~ 600      | 560 ~ 680      | 585 ~ 710      | 585 ~ 710      |
| Height                          | 585            | 585            | 585            | 585            |
| Max. battery capacity           | Ah/6-hour rate | Ah/6-hour rate | Ah/6-hour rate | Ah/6-hour rate |
| 36V                             | 595            | 680            | 935            | 935            |
| 48V                             | 425            | 595            | 680            | 680            |
| Battery weight of max. capacity | kg             | kg             | kg             | kg             |
| 36V                             | 815            | 1070           | 1225           | 1225           |
| 48V                             | 815            | 1070           | 1225           | 1225           |

## COOLANT AND LUBRICANT CAPACITY

|                           | FB10SH |          | FB15SH |          | FB20SH |          | FB25SH |          |
|---------------------------|--------|----------|--------|----------|--------|----------|--------|----------|
|                           | ltr.   | U.S. Gal | ltr.   | U.S. Gal | ltr.   | U.S. Gal | ltr.   | U.S. Gal |
| Transfer and differential | 2.5    | 0.7      | 2.5    | 0.7      | 4.8    | 1.2      | 4.8    | 1.2      |
| Hydraulic oil             | 30     | 7.9      | 30     | 7.9      | 32     | 8.5      | 32     | 8.5      |
| Brake system              | 0.6    | 0.2      | 0.6    | 0.2      | 0.6    | 0.2      | 0.6    | 0.2      |

Specifications are subject to change without notice or obligation.

## WEIGHT DATA

|          |            | FB10SH | FB15SH | FB20SH | FB25SH |
|----------|------------|--------|--------|--------|--------|
|          |            | kg     | kg     | kg     | kg     |
| Unladen: | Drive axle | 1280   | 1280   | 1680   | 1545   |
|          | Steer axle | 1230   | 1890   | 2205   | 2710   |
|          | Total      | 2510   | 3170   | 3885   | 4255   |
| Laden:   | Drive axle | 3005   | 3875   | 5055   | 5765   |
|          | Steer axle | 505    | 795    | 830    | 990    |
|          | Total      | 3510   | 4670   | 5885   | 6755   |

Above weights are based on truck equipped with 3300mm standard mast, carriage, 1070mm forks and a max. capacity battery.

**WEIGHT TABLE**

Unit: kg

| Unit                    | FB10SH | FB15SH | FB20SH | FB25SH | Remedy                 |
|-------------------------|--------|--------|--------|--------|------------------------|
| Drive motor             | 100    |        | 120    |        |                        |
| Power train assembly    | 340    | 350    | 470    |        |                        |
| Transfer case           | 45     |        | 50     |        |                        |
| Drive wheel (each)      | 35     | 40     | 60     |        |                        |
| Steering wheel (each)   | 20     |        | 30     |        |                        |
| Mast assembly           | 390    |        | 530    |        | Except fork.           |
| Lift cylinder           | 45     |        | 60     |        |                        |
| Finger bar              | 85     |        | 90     |        |                        |
| Fork (each)             | 40     | 45     | 50     |        |                        |
| Tilt cylinder (each)    | 5      |        | 10     |        |                        |
| Pump motor              | 50     |        | 65     |        |                        |
| Hydraulic pump          | 20     |        | 25     |        | Tumdem pump            |
| Hydraulic control valve | 20     |        | 20     |        | 3-control valve        |
| Steering gear box       | 20     | 15     | 15     |        | Include steering wheel |
| Power steering motor    | 25     |        | 25     |        |                        |
| Steering axle           | 50     |        | 80     |        | Except steering wheel  |
| Solenoid valve          | 4      |        | 4      |        |                        |
| Counterweight           | 80     | 340    | 530    | 930    |                        |
| Frame                   | 305    | 325    | 405    |        |                        |
| Overhead guard          | 40     |        | 45     |        |                        |

## TIGHTENING TORQUE OF MAIN NUTS AND BOLTS

( ) : FB20SH, FB25SH

| No. | Equipment      | Location                        | Part No.       | Tightening torque (kgm) |
|-----|----------------|---------------------------------|----------------|-------------------------|
| 1   | Drive motor    | Frame mounting bolt             | 01050-81445    | 14 ~ 20                 |
|     |                |                                 | (526-46-11210) | 14 ~ 20                 |
| 2   | Pump motor     | Frame mounting bolt             | 01010-51030    | 5.5 ~ 7.5               |
| 3   | Pump motor     | Bracket mounting bolt           | 01010-51025    | 5.5 ~ 7.5               |
| 4   | Main controler | Frame mounting bolt             | 01010-51035    | 5.5 ~ 7.5               |
| 5   | Transfer       | Motor mounting bolt             | 01010-51235    | 9 ~ 12.5                |
| 6   | Transfer       | Drive axle mounting bolt        | 01010-51030    | 5.5 ~ 7.5               |
|     |                |                                 | (01010-51235)  | 9 ~ 12.5                |
| 7   | Transfer       | Cap mounting bolt               | 34A-21-12220   | 10 ~ 12.5               |
|     |                |                                 | (34B-21-12270) | 14 ~ 20                 |
| 8   | Transfer       | Differential case mounting bolt | 01010-50865    | 2.5 ~ 3.5               |
|     |                |                                 | (01010-51070)  | 5.5 ~ 7.5               |
| 9   | Transfer       | Differential case and bevel     | 34A-21-11240   | 10 ~ 12.5               |
|     |                | Gear mounting bolt              | (34B-21-12180) | 14 ~ 20                 |
| 10  | Drive axle     | Hub mounting nut                | 01582-11411    | 10 ~ 14                 |
|     |                |                                 | (01582-11815)  | 38 ~ 43.5               |
| 11  | Drive axle     | Hub nut                         | 300-22-31241   | 16 ~ 20                 |
|     |                |                                 | (34B-21-14151) | 30 ~ 50                 |
| 12  | Drive axle     | Torque shaft mounting bolt      | 01050-51030    | 5.5 ~ 7.5               |
|     |                | Torque shaft mounting nut       | 01582-11008    | 5.5 ~ 7.5               |
|     |                |                                 | (01050-51235)  | 9 ~ 12.5                |
|     |                |                                 | (01582-11210)  | 9 ~ 12.5                |
| 13  | Steering axle  | Hub nut                         | 358-27-11230   | 8.5 ~ 12.5              |
|     |                |                                 | (300-22-31241) | 10 ~ 12                 |
| 14  | Steering axle  | Tie rod end nut                 | 01593-11411    | 9 ~ 12.5                |
|     |                |                                 | (01593-11813)  | 9 ~ 12.5                |

**GENERAL TIGHTENING TORQUE OF MAIN NUTS AND BOLTS**

| No. | Equipment      | Location                        | Part No.                 | Tightening torque (kgm) |
|-----|----------------|---------------------------------|--------------------------|-------------------------|
| 15  | Steering axle  | Steering link nut               | 01593-11411              | 9 ~ 12.5                |
| 16  | Brake          | Drive axle mounting bolt        | 325-32-21910             | 16 ~ 20                 |
|     |                |                                 | 325-32-21920             | 16 ~ 20                 |
|     |                |                                 | (34B-30-14110)           | 16 ~ 20                 |
|     |                |                                 | (01010-81435)            | 16 ~ 20                 |
| 17  | Brake          | Brake piping sleeve nut         |                          | 1 ~ 1.3                 |
| 18  | Brake          | Seat brake lining mounting bolt | 34A-31-21291             | 10 ~ 13                 |
| 19  | Frame          | Drive axle mounting bolt        | 01010-51845              | 35 ~ 43.5               |
| 20  | Frame          | Steering axle mounting bolt     | 01010-51850              | 35 ~ 43.5               |
|     |                | Steering axle mounting nut      | 01580-11815              | 35 ~ 43.5               |
| 21  | Frame          | Weight mounting bolt            | 01010-52065<br>(FB10SH)  | 20 ~ 30                 |
|     |                |                                 | 01011-52015<br>(FB15SH)  | 20 ~ 30                 |
|     |                |                                 | 01011-52410<br>(FB20SH)  | 25 ~ 35                 |
|     |                |                                 | 34A-41-21430<br>(FB25SH) | 25 ~ 35                 |
| 22  | Hydraulic pump | Motor mounting bolt             | 01010-51035              | 5.5 ~ 7.5               |
| 23  | Hydraulic pump | Cover mounting bolt             |                          | 5.5 ~ 7.5               |
| 24  | Control valve  | Frame mounting bolt             | 01010-51020              | 5.5 ~ 7.5               |
|     |                | Frame mounting nut              | 01580-11008              | 5.5 ~ 7.5               |
| 25  | Lift cylinder  | Cylinder head                   | 34A-63-15113             | 30 ~ 40                 |
|     |                |                                 | (34B-63-14113)           | 30 ~ 40                 |
| 26  | Lift cylinder  | Down control valve              | 34A-66-11601             | 8 ~ 12                  |
|     |                |                                 | (34B-63-14800)           | 11 ~ 17                 |
| 27  | Tilt cylinder  | Cylinder head                   | 34A-64-12120             | 30 ~ 40                 |
|     |                |                                 | (34B-64-11132)           | 30 ~ 40                 |
| 28  | Tilt cylinder  | Piston mounting nut             | 34A-64-12180             | 25.5 ~ 30               |
|     |                |                                 | (34B-64-11181)           | 34.2 ~ 50               |