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मानक

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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 13558-2 (1995): Cranes - Controls - Layout and Characteristics - Part 2 Mobile Cranes [MED 14: Cranes, Lifting Chains and Related Equipment]



“ज्ञान से एक नये भारत का निर्माण”

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS 13558 (Part 2) : 1995
ISO 7752-2 : 1985

भारतीय मानक

क्रेन — नियंत्रण — अभिन्यास और लाक्षणिक

भाग 2 चलक्रेन

Indian Standard

CRANES — CONTROLS — LAYOUT AND CHARACTERISTICS

PART 2 MOBILE CRANES

ICS 53.020.10

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110 002

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Price Group 5

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 7752-2 : 1985 'Lifting appliances — Controls — Layout and characteristics — Part 2 : Basic arrangement and requirements for mobile cranes', issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendations of the Cranes, Lifting Chains and Its Related Equipment Sectional Committee and approval of the Heavy Mechanical Engineering Division Council.

This standard is being published in five parts. Other parts of this standard are as follows:

Part 1	General principles
Part 3	Tower cranes
Part 4	Jib cranes
Part 5	Overhead travelling cranes and portal bridge cranes

The text of ISO standard has been approved for publication as Indian Standard without deviations. Certain terminology and conventions are, however, not identical to those used in Indian Standards. Accordingly wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

The requirements of Cross shift — Multi directional controls have been added to ISO 7752-2 : 1985 through Addendum 1, which forms Section two of this International Standard. At the time of adoption of ISO 7752-2 : 1985, Section two has been suitably incorporated in the Indian Standard.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 4306-2 : 1985	IS 13473 (Part 2) : 1992 Cranes — Vocabulary : Part 2 Mobile cranes	Identical
ISO 7752-1 : 1989	IS 13558 (Part 1) : 1992 Cranes — Controls — Layout and characteristics : Part 1 General principles	Identical

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'.

Indian Standard

CRANES — CONTROLS — LAYOUT AND CHARACTERISTICS

PART 2 MOBILE CRANES

0 Introduction

Mobile crane operators frequently transfer from one crane to another of different model or manufacturer. This part of ISO 7752 establishes a consistent arrangement and movement for the basic controls used during the crane-operating cycle, to reduce operator confusion or incorrect control in an emergency.

1 Scope and field of application

This part of ISO 7752 establishes the arrangement, requirements, and direction of movement of the basic controls for slewing, load hoisting and lowering and jib luffing and telescoping.

This part of ISO 7752 applies to all mobile cranes as defined in ISO 4306/2.

Section one deals with bi-directional controls. Section two, dealing with the basic arrangement and requirements for cross-shift levers (multi-directional controls), will be added later.

For mobile cranes, the term operator is used for the person who is operating the appliance for the purpose of positioning loads. In addition, the term driver is used to refer to that person who operates only those controls which move the appliance from place to place.

2 References

ISO 4306/2, *Lifting appliances — Vocabulary — Part 2 : Mobile cranes.*

ISO 7752/1, *Lifting appliances — Controls — Layout and characteristics — Part 1 : General principles.*

Section one : Bi-directional controls — Basic control arrangement and direction of movement

3 Crane with fixed length jib

Basic controls shall be arranged as shown in figure 1.

3.1 Slewing control — hand lever 1

Push lever forward to slew toward jib :

- slew left (operator's position on right side);
- slew right (operator's position on left side or centre of crane).

Centre lever to release slewing power.

Pull back lever to reverse direction.

3.2 Hoisting control — hand lever 2 and foot pedal 5, hand lever 3 and foot pedal 6

Pull lever back to hoist load.

Centre lever to release power and to hold load (if equipped with automatic brake) or to control load by depressing brake pedal.

Push lever forward to lower load.

3.3 Jib luffing control — hand lever 4

Pull lever back to raise jib.

Centre lever to hold jib in position.

Push lever forward to lower jib.

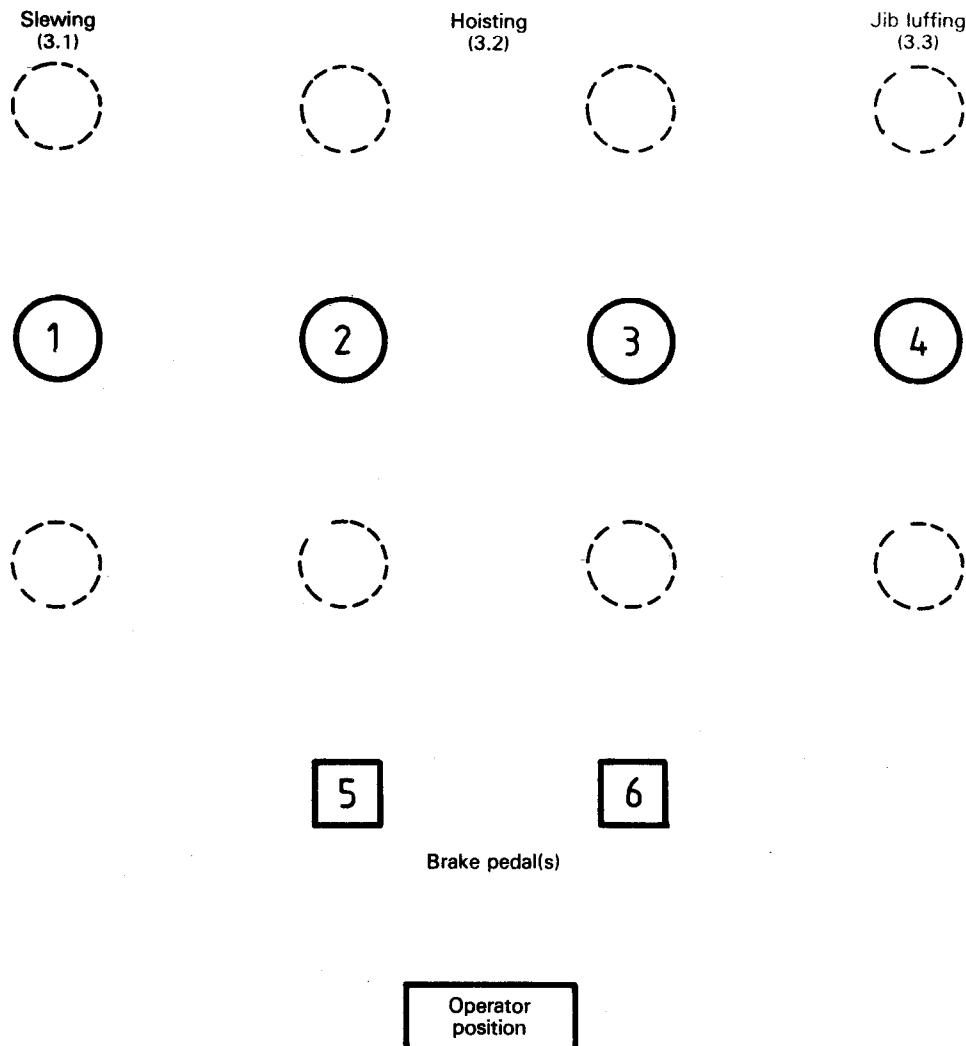


Figure 1 — Crane control diagram for crane fitted with a fixed length jib

3.4 Jib luffing control — alternative arrangement
(foot pedal operation)

Basic controls shall be arranged as shown in figure 2.

3.4.1 Slewing control — hand lever 1

Push lever forward to slew toward jib :

- slew left (operator's position on right side);
- slew right (operator's position on left side or centre of crane).

Centre lever to release slewing power.

Pull back lever to reverse direction.

3.4.2 Hoisting control — hand lever 2, hand lever 3

Pull lever back to hoist load.

Centre lever to release power and to hold load.

Push lever forward to lower load.

3.4.3 Jib luffing control — foot pedals 4 and 5

Depress foot pedal 4 to raise jib.

Depress foot pedal 5 to lower jib.

Release foot pedals 4 and 5 to hold jib stationary.

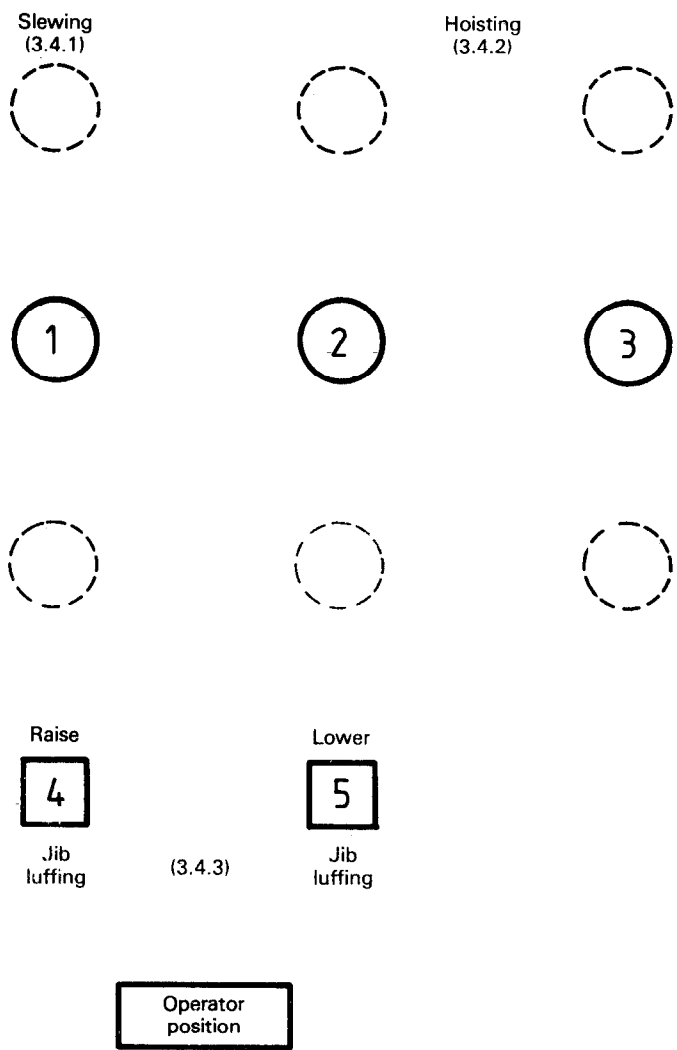


Figure 2 — Crane control diagram for crane fitted with a fixed length jib and alternative arrangement for jib luffing control (foot pedals)

4 Crane with telescoping jib

Basic controls shall be arranged as shown in figure 3.

4.1 Slewing control — hand lever 1

Push lever forward to slew toward jib :

- slew left (operator's position on right side);
- slew right (operator's position on left side or centre of crane).

Centre lever to release slewing power.

Pull back lever to reverse directions.

4.2 Jib telescoping control

4.2.1 Hand lever 2

Push lever forward to extend jib.

Centre lever to hold jib extension position.

Pull lever back to retract jib.

4.2.2 Foot pedal 6 (optional — in place of hand lever 2)

Rock pedal forward (toe down) to extend jib.

Centre pedal to hold jib extension position.

Rock pedal rearward (heel down) to retract jib.

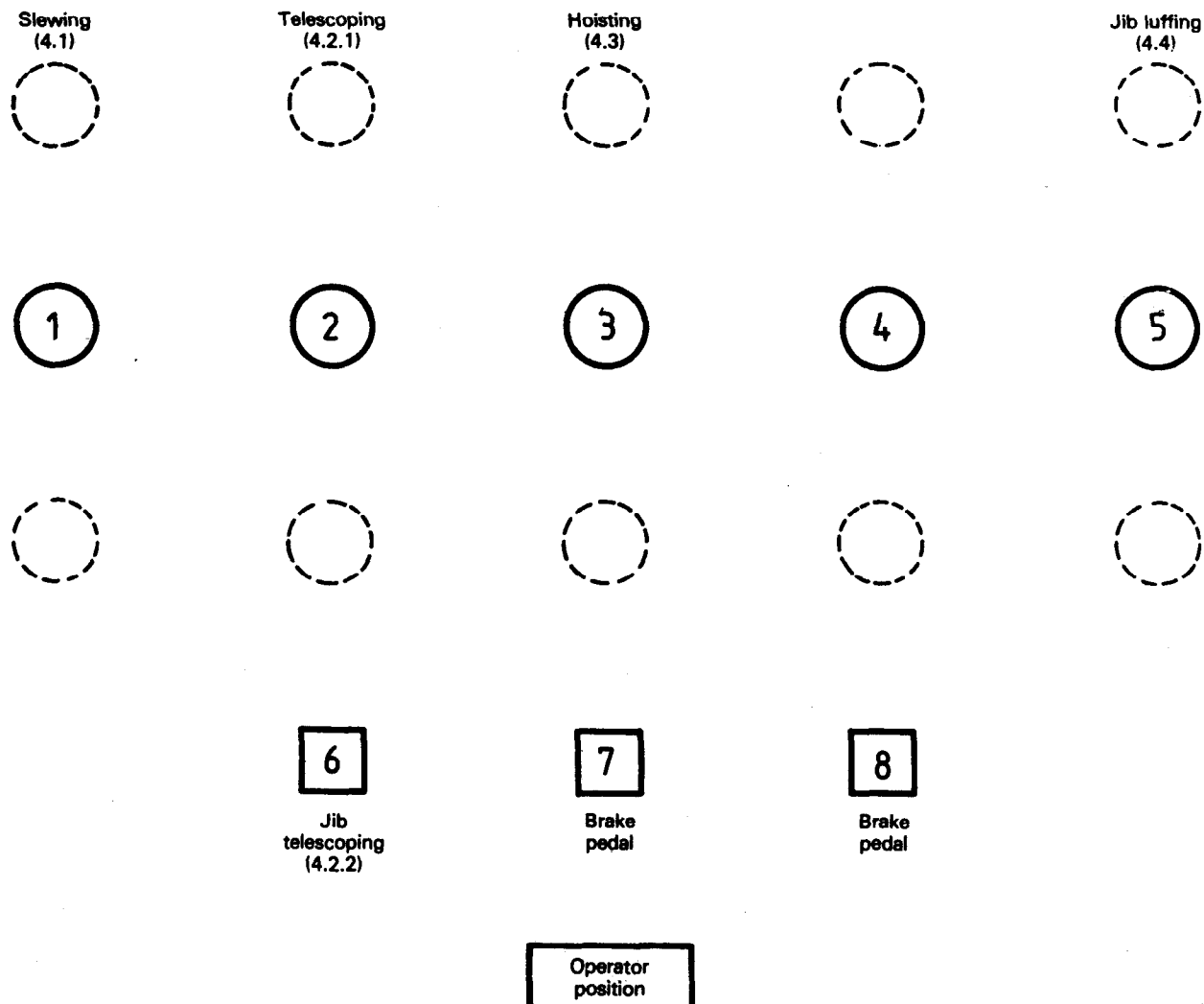


Figure 3 — Crane control diagram for crane fitted with a telescoping jib

4.3 Hoisting control — hand lever 3 and foot pedal 7, hand lever 4 and foot pedal 8

Pull lever back to hoist load.

Centre lever to release power and to hold load (if equipped with automatic brake) or control load by depressing brake pedal.

Push lever forward to lower load by "powered load lowering".

4.4 Jib luffing control — hand lever 5

Pull lever back to raise jib.

Centre lever to hold jib in position.

Push lever forward to lower jib.

Additional levers may be located between levers 1 and 2 for independently telescoping jib sections.

5 Remote control

5.1 The relative positions and movements of controls shall be in accordance with clause 3 or clause 4 depending on the case.

5.2 Provision shall be made that if the control signal for any crane motion malfunctions, that crane motion shall stop.

5.3 Provision shall be made for emergency stop in the event of a device malfunction.

6 General requirements

6.1 Basic controls used during the crane operating cycle (see figures 1, 2 and 3) shall be located within easy reach of the operator while at his station.

6.2 Hand levers and foot pedals shall be provided with a means for holding the control in the neutral position without the use of positive holding devices. They shall return to the neutral position automatically upon release by the operator unless intentionally restrained for functional purposes.

6.3 The required control operating forces shall not be greater than 160 N on hand levers, and not greater than 225 N on foot pedals.

6.4 The required control operating travel distance shall not be greater than 260 mm from neutral (mid-position) to forward or reverse positions; for foot pedals, the travel distance shall not be greater than 260 mm.

7 Controls for other crane functions

Controls for other functions not covered in this part of ISO 7752, for example travel, steering and slewing brake, may be installed in conjunction with or within the area encompassed by the basic controls provided they are arranged to avoid driver confusion and/or physical interference.

Section two : Cross-shift levers (multi-directional controls) — Basic arrangement and requirements

8 Crane with fixed length jib

8.1 Basic control arrangement

Basic controls shall be arranged as shown in figure 4. As an alternative, foot pedal(s) may be provided for luffing (see 8.2.3).

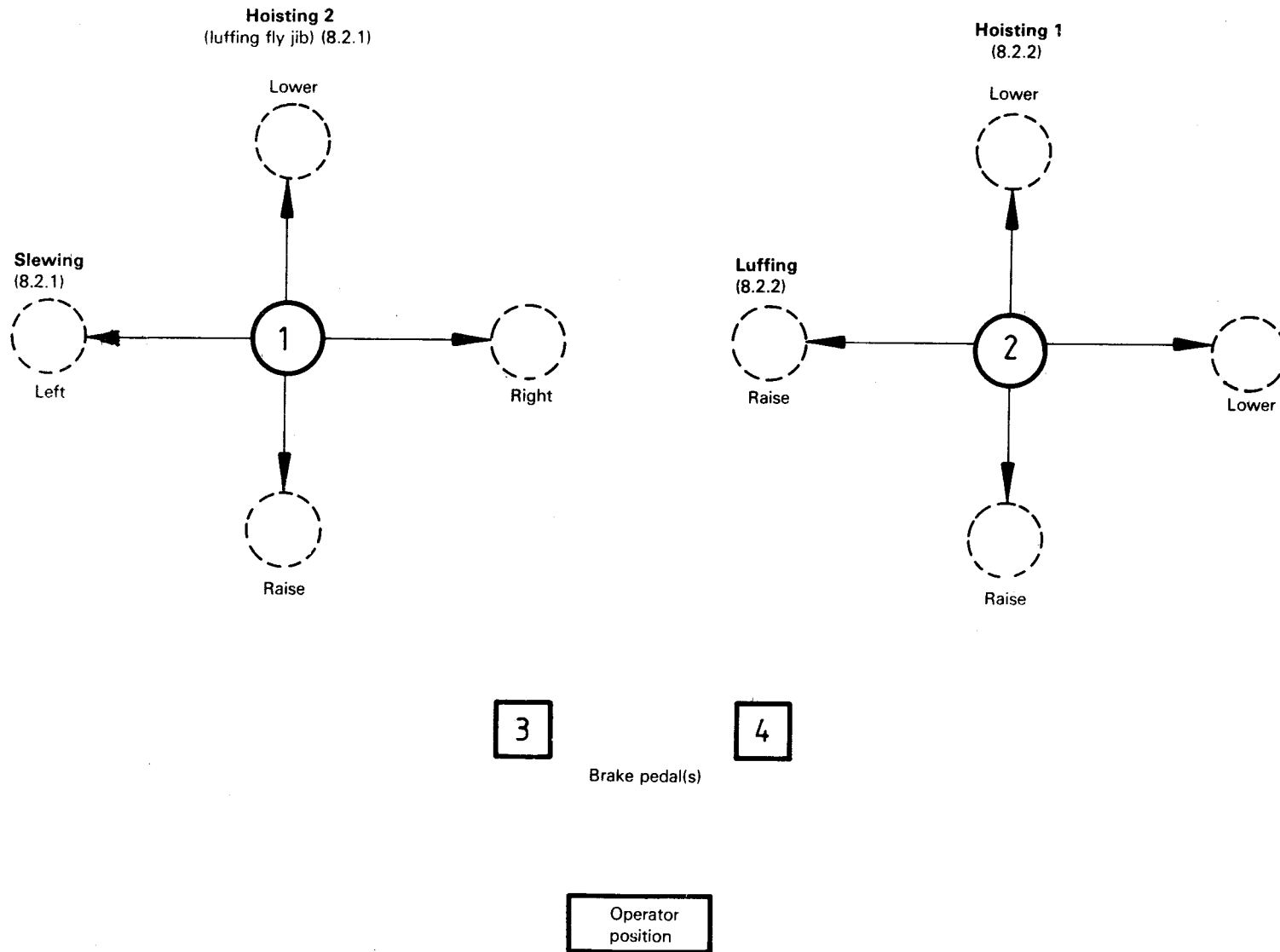


Figure 4 — Crane control diagram for crane fitted with a fixed length jib

8.2 Direction of movement

8.2.1 Hoisting 2 and slewing control — Hand lever 1 and foot pedal 3

8.2.1.1 Pull lever back to raise load or fly jib.

Centre lever to hold load (or fly jib) in position (if equipped with automatic brake), or control load by depressing brake pedal.

Push lever forward to lower load (or fly jib).

8.2.1.2 Move lever to the left to slew left.

Centre lever to release slewing power.

Move lever to the right to slew right.

8.2.2 Hoisting 1 and luffing control — Hand lever 2 and foot pedal 4

8.2.2.1 Pull lever back to raise load.

Centre lever to hold load in position (if equipped with automatic brake), or control load by depressing brake control.

Push lever forward to lower load.

8.2.2.2 Move lever to the left to raise jib.

Centre lever to hold jib in position.

Move lever to the right to lower jib.

8.2.3 Foot pedals 3 and 4

Foot pedals 3 and 4 may be used for luffing of jib if hoist drums are equipped with automatic brakes.

9 Crane with telescoping jib

9.1 Basic control arrangement

Basic controls shall be arranged as shown in figure 5. As an alternative, a foot pedal may be provided for telescoping (see 9.2.3.2).

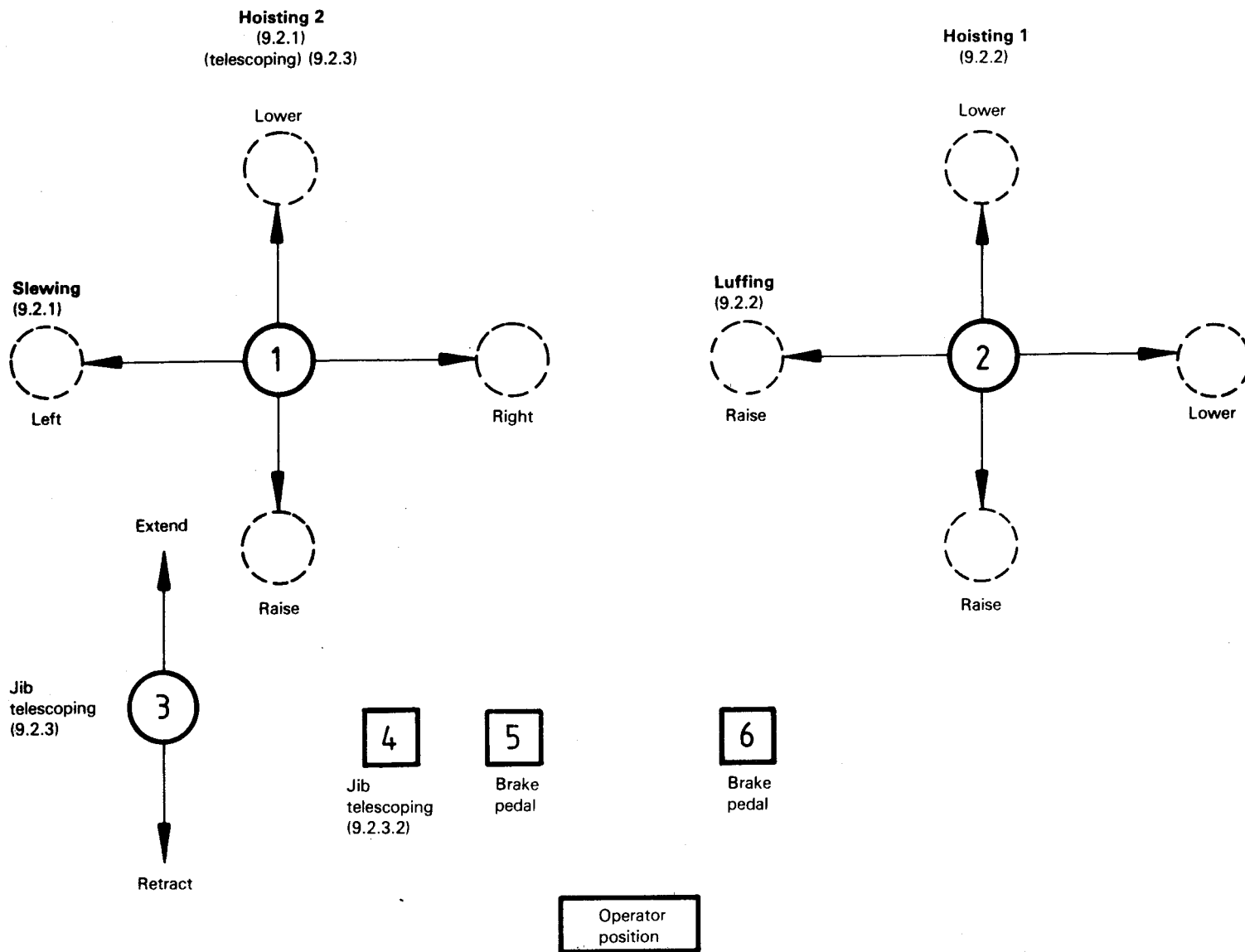


Figure 5 — Crane control diagram for crane fitted with a telescoping jib

9.2 Direction of movement

9.2.1 Hoisting 2 and slewing control — Hand lever 1 and foot pedal 5

9.2.1.1 Pull lever back to raise load.

Centre lever to hold load in position (if equipped with automatic brake), or control load by depressing brake pedal.

Push lever forward to lower load.

9.2.1.2 Move lever to the left to slew left.

Centre lever to release slewing power.

Move lever to the right to slew right.

9.2.2 Hoisting 1 and luffing control — Hand lever 2 and foot pedal 6

9.2.2.1 Pull lever back to raise load.

Centre lever to hold load in position (if equipped with automatic brake), or control load by depressing brake control.

Push lever forward to lower load.

9.2.2.2 Move lever to the left to raise jib.

Centre lever to hold jib in position.

Move lever to the right to lower jib.

9.2.3 Jib telescoping control

9.2.3.1 Hand lever 3

Push lever forward to extend jib.

Centre lever to hold jib in position.

Pull lever back to retract jib.

NOTE — Hand lever 3 may be a separate lever(s). The jib telescoping function may be the fore and aft movement of lever 1.

9.2.3.2 Foot pedal 4 (optional) in place of hand lever 3

Rock pedal forward (toe down) to extend jib.

Centre pedal to hold jib extension position.

Rock pedal rearward (heel down) to retract jib.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

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Amendments Issued Since Publication

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