



Section D

Controls

Service Manual - Midi CX Backhoe Loader

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Sample manual. Download All pages at.

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Section D - Controls

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Section D - Controls

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Service Tools

Numerical List

There are no specific service tools for the control rods, cables and linkages.

Steering Column

Removal and Replacement

Removal

- 1 Lower the loader arms to the ground. Engage the park brake and set the transmission to neutral. Stop the engine and remove the starter key.
- 2 Remove the front grille and disconnect the battery.
- 3 → [Fig 1. \(D-3\)](#). Working in the cab, undo the nut **A** and remove the steering wheel as shown.

Note: If the steering wheel spinner knob **X** is loose, or is removed for any reason, make sure that it is tightened to the correct torque. Apply JCB Threadlocker and Sealer to the threads before fitting.

- 4 Take off the steering column pedestal cover **B**.
- 5 Remove the control column switches **C**.
- 6 Remove the fixings securing the front steering console **D**, then carefully lift up the front console clear of the steering column.
- 7 Remove the coupling bolt **E** and mounting bolts **F**. Carefully withdraw the steering column from the coupling.

Replacement

Replacement is the reverse of the removal sequence, but note the following:

Make sure that the coupling bolt **E** engages with the cut-out **Y** in the shaft.

Torque tighten bolts **F**.

Take care when replacing the front steering console to ensure that the electrical harnesses do not become snagged, and that no other connections have been disturbed.

On completion, check that the steering and the control column switches function correctly.

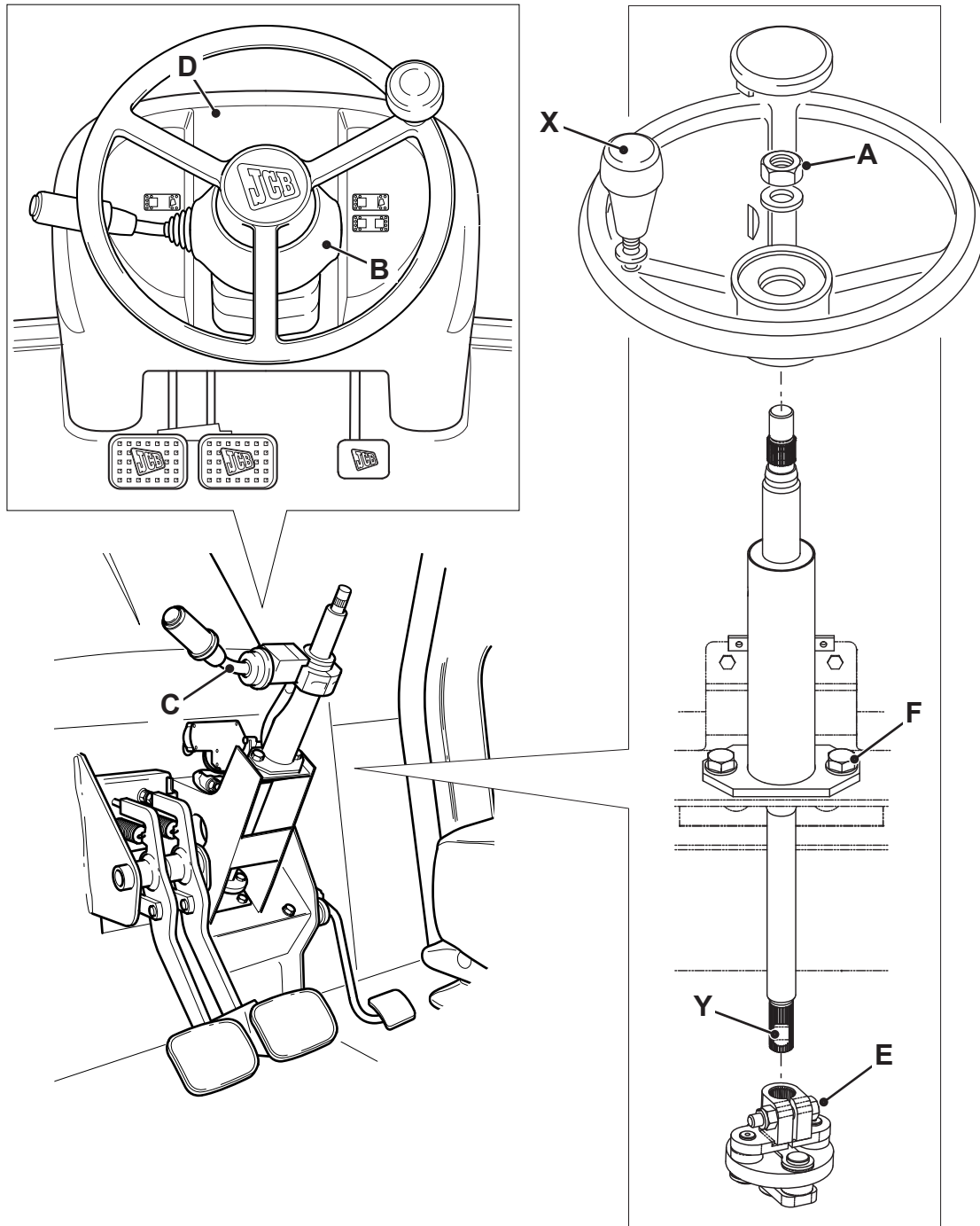


Fig 1.

Table 1. Torque Settings

| Item | Nm | kgf m | lbf ft |
|------|----|-------|--------|
| A | 40 | 4.1 | 29 |
| F | 47 | 4.8 | 35 |
| X | 13 | 1.3 | 9 |

Column Switches

Removal and Replacement

Removal

- 1 Lower the loader arms to the ground. Engage the park brake and set the transmission to neutral. Stop the engine and remove the starter key.
- 2 Remove the front grille and disconnect the battery.
- 3 Working in the cab, take off the steering column pedestal cover **A**.
- 4 Uncouple the electrical connector **B** from the cab harness.
- 5 Undo the two screws **C** and remove the switch.

Replacement

Replacement is the reverse of the removal sequence, but note the following:

The switch incorporates a locating pin **D**, which engages with a drilled hole in the steering column and prevents rotation of the switch mounting.

On completion, operate the column switches and check they all function correctly.

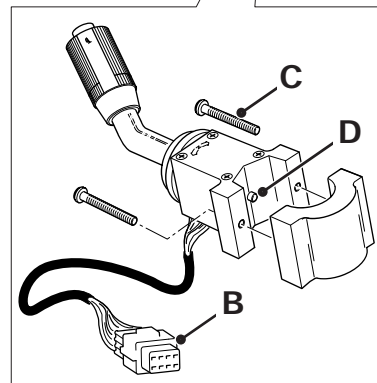
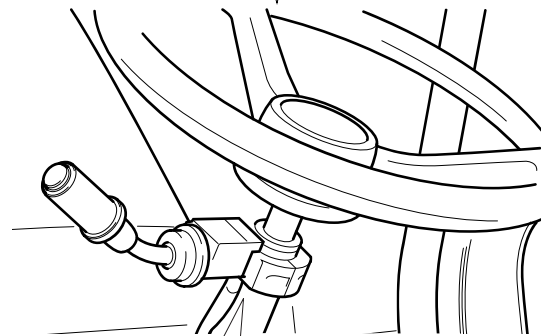
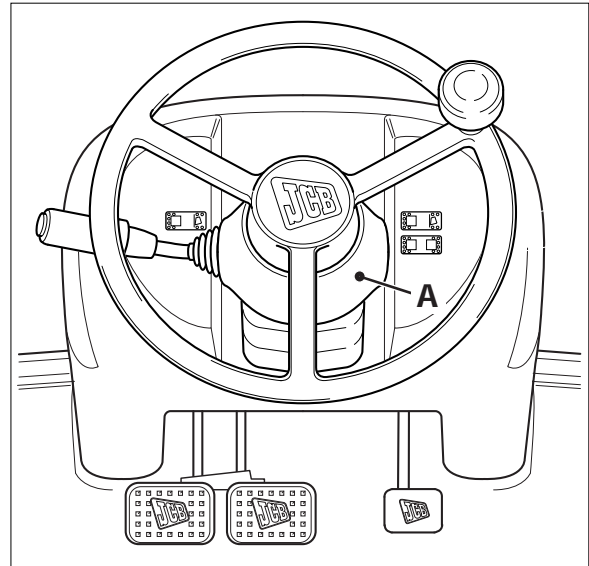


Fig 2.

Control Rods and Linkages

Dismantle and Assemble

Loader Valve Controls

⇒ [Fig 3. \(□ D-6\)](#). The illustration shows the control rods and linkages for a 3 spool loader control valve, and is intended as a guide to the dismantling and assembly.

WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

Dismantle

- 1 Working in the cab, remove the console panels surrounding the loader levers.
- 2 Remove the loader lever knobs and gaiters.
- 3 Disconnect the control rods from the loader valve spools.
- 4 Remove the bolts securing the lever assembly to the chassis, then withdraw the loader levers and mounting bracket through the floor aperture.

Assemble

Assembly is the reverse of the dismantling sequence, but note the following:

Assemble the loader lever **A**, auxiliary lever **B**, and universal joint **C**. Align the side of the universal joint with the edge of the mounting bracket as shown.

Connect the control rods **D** to the lever assembly. Ensure that the locking flats **E** are at the top.

***Note:** If necessary, loosen the locknuts and rotate the end fittings to give equal amounts of adjustment (thread) at each end of the control rod.*

Connect the control rods to the loader valve spools. Adjust the control rods as necessary, ⇒ [Adjustment \(□ D-5\)](#). After the control rods are adjusted fit the gaiters over the control levers.

On completion, check that the controls operate correctly. Refit the console panels around the loader levers.

Adjustment

- 1 Adjust the loader control rods so that the loader lever **A** is vertical. Then, adjust the auxiliary control rod until the auxiliary lever **B** aligns with loader lever **A**. Tighten the control rod locknuts.
- 2 After adjustment operate the levers and check that there is sufficient travel to give full movement of the loader valve spools.

***Note:** Make sure there is an equal amount of thread at each end of the control rod.*

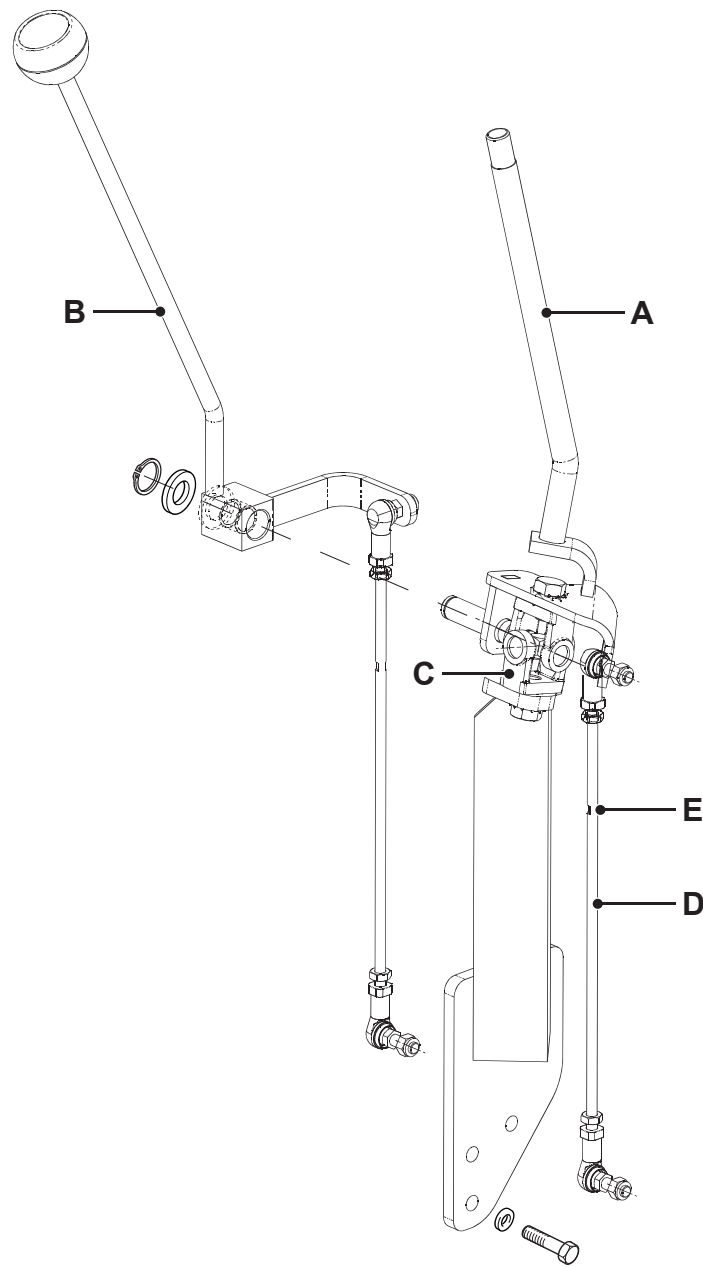


Fig 3. Loader Valve Controls

Excavator Valve Controls (Centremount)

⇒ [Fig 4. \(□ D-8\)](#). The illustration shows the control rods and linkages for the excavator control valve and is intended as a guide to the dismantling and assembly.

WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

Dismantle

- 1 Disconnect the battery.
- 2 Working beneath the machine, uncouple the rear horn switch electrical connector and remove the wires from the connector (use a screwdriver to release the wires and pins from the connector, alternatively cut the wires and re-solder on assembly).
- 3 Working in the cab, remove the excavator lever knobs and gaiters. Lift off the cover **A** surrounding the excavator levers.
- 4 Disconnect the control rods from the excavator valve spools.

Assemble

Assembly is the reverse of the dismantling sequence, but note the following:

Assemble the excavator levers **B** and universal joints **C**. Align the side of the universal joints with the edge of the mounting bracket as shown.

Connect the control rods **D** to the lever assembly. Ensure that the locking flats **E** are at the top.

Note: *If necessary, loosen the locknuts and rotate the end fittings to give equal amounts of adjustment (thread) at each end of the control rod.*

Connect the control rods to the excavator valve spools with the clevis pins **F**. Adjust the control rods if necessary,

⇒ [Adjustment \(□ D-7\)](#). After the control rods are adjusted fit the cover and the gaiters over the control levers.

Thread the rear horn switch cable through the control lever and fit the wires and pins into the electrical connector. Couple the connector to the chassis harness and fit the control lever knobs.

On completion, reconnect the battery. Check that the controls and rear horn switch operate correctly.

Adjustment

Minor adjustment of the control rods may be necessary to align the levers, or to position the levers closer or further from the operator. After adjustment operate the levers and check that there is sufficient travel to give full movement of the excavator valve spools.

Note: *Make sure there is an equal amount of thread at each end of the control rod.*

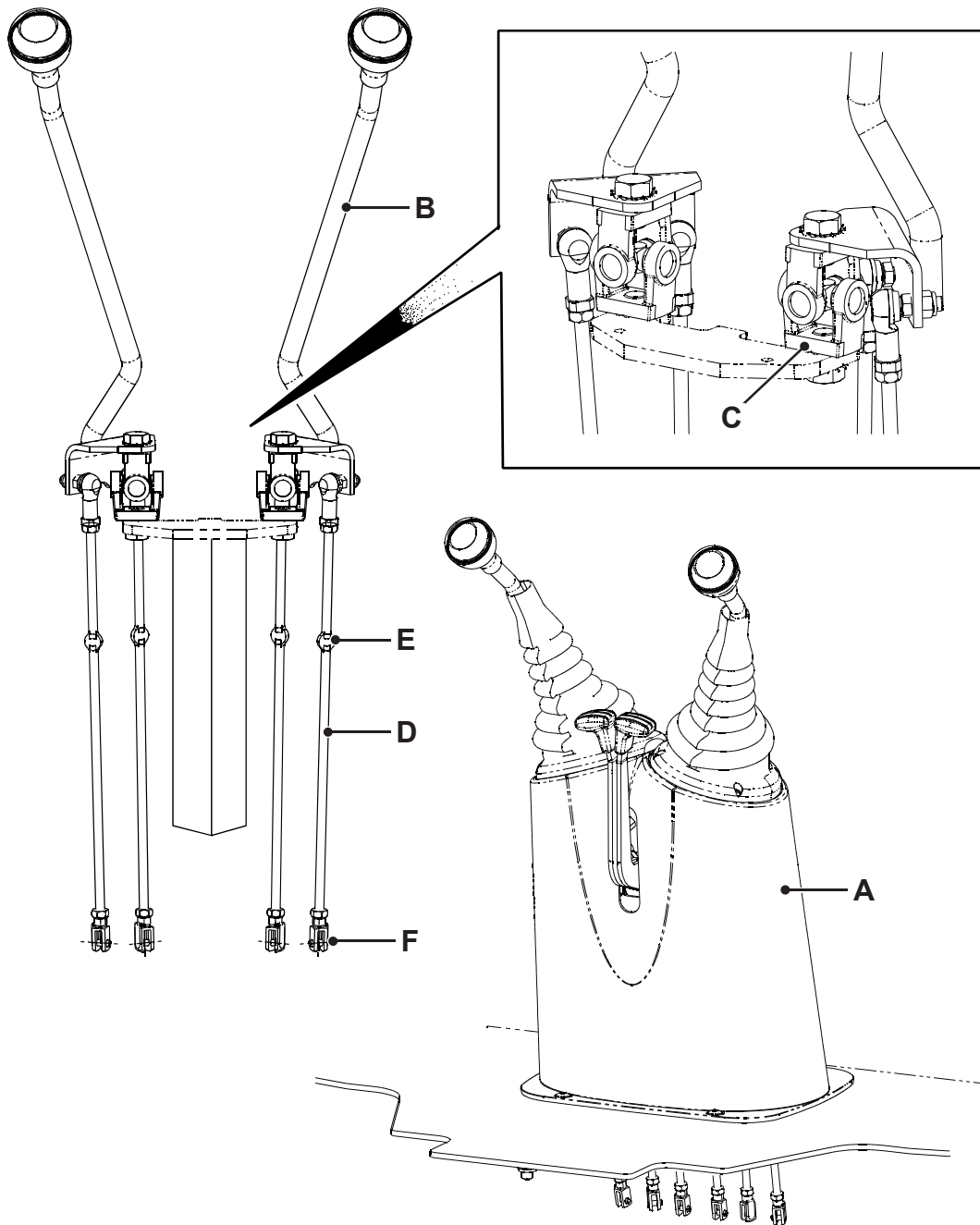


Fig 4. Excavator Valve Controls (Centremount)

Stabiliser Controls (Sideshift)

⇒ [Fig 5.](#) ([□ D-9](#)). The illustration shows the control rods and linkages for the stabiliser controls and is intended as a guide to the dismantling and assembly.

WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

Dismantle

- 1 Working in the cab, remove the stabiliser lever knobs and gaiter. Lift off the cover **A** surrounding the levers.
- 2 Disconnect the control rods **B** from the excavator valve spools.
- 3 Remove the bolts (not shown) securing the lever assembly to the chassis, then withdraw the stabiliser levers complete with the mounting bracket through the floor aperture.

Assemble

Assembly is the reverse of the dismantling sequence, but note the following:

Adjust the control rods if necessary, ⇒ [Adjustment](#) ([□ D-9](#)). After the control rods are adjusted fit the gaiter over the control levers.

On completion, check that the controls operate correctly.

Adjustment

Minor adjustment of the control rods may be necessary to align the levers, or to position the levers closer or further from the operator. After adjustment operate the levers and check that there is sufficient travel to give full movement of the excavator valve spools.

Note: Make sure there is an equal amount of thread at each end of the control rod.

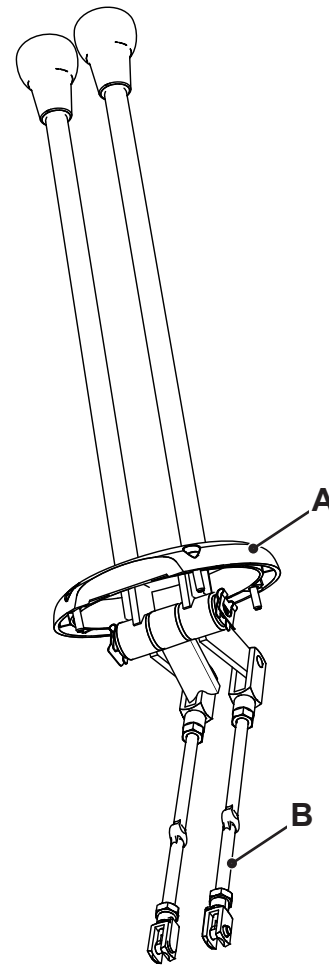


Fig 5.

Control Cables

Removal and Replacement

Boom Lock Cable

Removal

- 1 Detach the pin-mounted excavator from the rear of the machine. For the correct procedure, see the **Operator Handbook**. Drive the machine clear of the excavator assembly.
- 2 Working at the boom, remove the cable ball stud **A** from the boom lock.
- 3 Loosen the locknut and disconnect the bulkhead fitting **B** from the bracket.
- 4 Unscrew the knob **C** and locknut **D**, then carefully pull the boom lock control through the hole in the cover.

Replacement

Replacement is the reverse of the removal sequence, but note the following:

On completion, attach the pin-mounted excavator to the rear of the machine. Operate the boom and check that the boom lock engages and disengages correctly using the control knob in the cab. Adjust the cable if required.

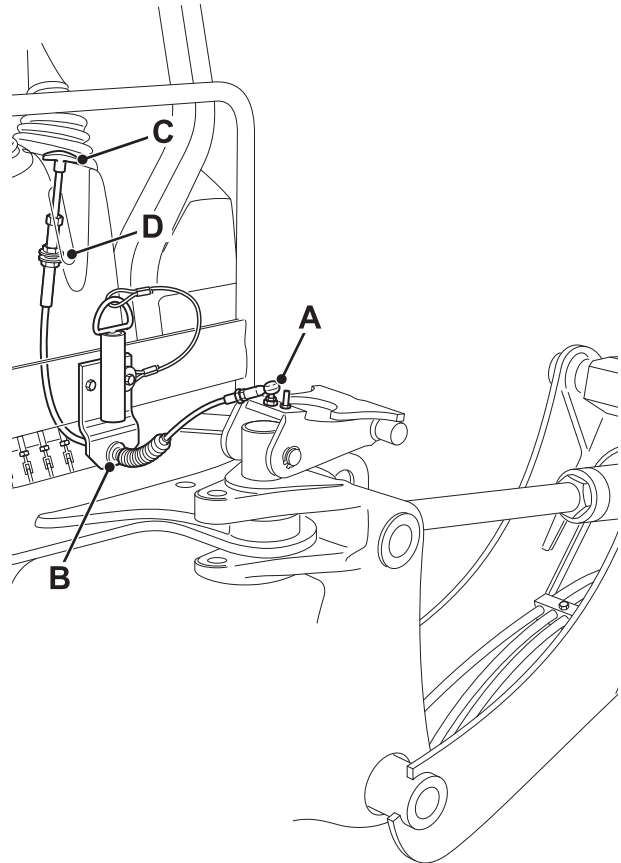


Fig 6. Centremount shown

Anti-Spill Mechanism

Operation and Adjustment

Operation

The anti-spill mechanism is designed to automatically roll the shovel forwards, to prevent a heaped shovel from depositing its contents onto the engine cover or cab as the loader arms are raised.

⇒ [Fig 7. \(□ D-11\)](#). When the loader arms are raised, a reaction rod **A** causes a cam plate **B** to rotate anti-clockwise. The rotation of the cam plate pulls the operating cable **C** which selects the loader valve block shovel spool **D** to tip the shovel forwards.

Adjustment

If the operating cable or reaction rod is renewed, or if the anti-spill mechanism is not operating correctly, carry out the adjustment procedure described below:

Note: The machine must be parked on firm level ground in order for the required measurements to be accurately made.

- 1 ⇒ [Fig 8. \(□ D-12\)](#). Measure the length of the reaction rod **R**. If necessary, adjust the length of the rod so that it is 305 - 315 mm (12.0 - 12.4 in) between hole centres as shown.
- 2 Start the engine. Raise the loader arms just sufficiently to allow the shovel to be fully rolled back. Roll the shovel fully back and lower to the ground.
- 3 Slowly raise the arms until the lift ram **S** is extended to 880 - 900 mm (34.6 - 35.4 in) between centres as shown. Block the loader arms in this position so that the position is held steady whilst the final adjustments are made.
- 4 With the loader arms blocked in this position, adjust the cable using the adjusting nuts **T** until the shovel spool just starts to spill. Lock the cable adjusting nuts.
- 5 Slowly raise the arms. From this point, the outer cam plate **V** will engage the inner cam plate **W** and pull the cable. The shovel should automatically start to roll forwards as the loader arms rise.

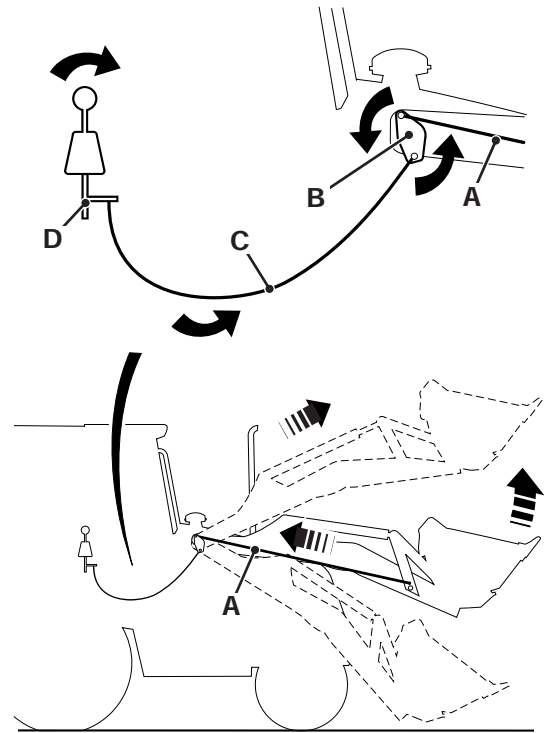


Fig 7.

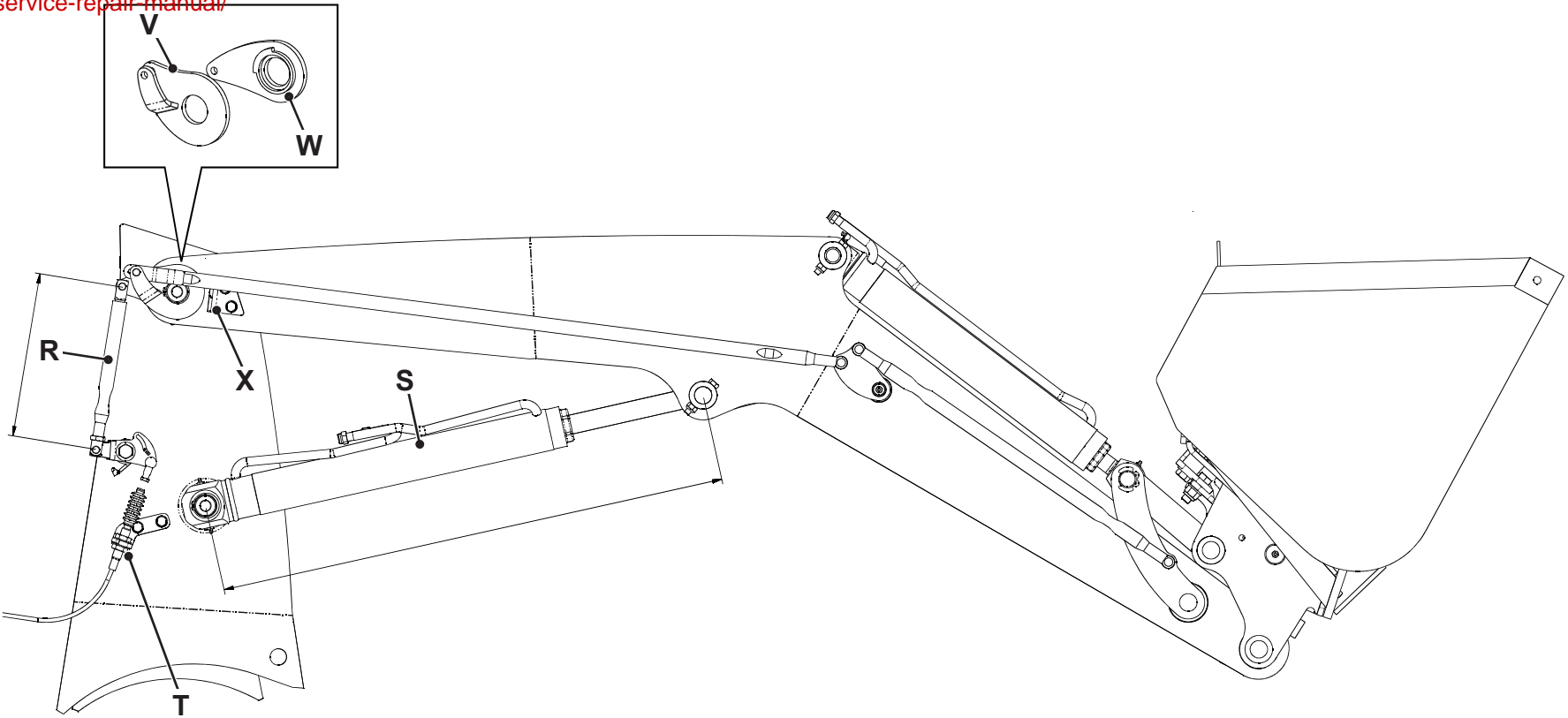


Fig 8. Shovel Setting Position

Important: DO NOT operate the loader without the cam stop bracket X installed because damage to the mechanism will occur.