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Removal and Replacement of Carriageway Covers

About this document ...

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1 *Introduction*

* Obligatory Paragraphs.

The Manual Handling Regulations 1992 state that where possible the need to use manual handling techniques to manoeuvre heavy plant and equipment must be avoided. Where it is not possible to avoid the practice, suitable mechanical aids must be used. In addition a suitable and sufficient risk assessment (stored on the engineer's laptop for 30 days) of the work must be undertaken.

Whilst the Regulations do not stipulate a maximum load which can be lifted, because of each individual's physical characteristics, guidance states that an optimum of 25 Kgs should be regarded as the maximum load to be lifted manually without a specific risk assessment incorporating local and individual characteristics.

To ensure compliance with these Regulations the principle method of removal and replacement of carriageway covers is using the Lifter Manhole Cover 4A or 4B (LMC4) with the associated keys.

This Practice describes methods for removal and replacement of carriageway jointing chamber covers. Each type of cover known to be in use by BT is included in the following pages. By reference to these pages particular covers may be identified together with the necessary tools and procedures required for cover removal and replacement.

There are three aspects to cover removal/replacement:

- Removal of covers from an existing frame.
- Site handling of covers once removed from the frame - this will also apply to handling of covers during the installation of a new frame.
- Replacement of covers into an existing or newly installed frame.

This document describes procedures that use the Lifter Manhole Cover 4 (LMC4), which is the standard equipment to be used for all handling procedures for carriageway covers.

Note: For situations where cover removal cannot be achieved using LMC4, the site must be assessed. Refer to HSC/STR/A002

Removal and replacement of carriageway covers by manual methods is only permitted in exceptional circumstances where the LMC 4 cannot be used and only after a site specific risk assessment (stored on the engineer's laptop for 30 days) has been carried out. To that end all "D" keys must be withdrawn from general use. A limited number of "T" keys (2 sets) may be held at a convenient place.

2 * Gas Precautions

*The initial test of the gas test procedure must be carried out as soon as practicable during the cover removal operation.

SFY/HSH/D050 describes gas test procedures in detail. *

2.1 Removing lids for gas testing

In order to properly be able to test an underground structure for gas **all** of the covers must be removed. This provides the maximum level of ventilation to the structure to clear any lighter than air gases and allows the greatest level of un-restricted access to duct lines feeing the structure for testing.

Once the gas testing has been completed, and where the onsite risk assessment or working practice require, covers can be replaced to reduce the overall size of a work site or to provide support to work equipment i.e. the winch lightweight steady legs. When a cover is replaced for these reasons, the following must complied with –

- Only 1 cover on a multi cover structure can be replaced.
- The replaced cover must not interfere with access to any wall step provided for access/egress.
  - A GDU must be positioned as a sentinel just under the replaced cover as close to the surface as possible.
- Where personnel are working in the structure and positioning the GDU in this way means that there will be no monitoring of the breathing zone a second GDU will be required or the cover can not be replaced.
- The replaced cover must not interfere with any of the planned work activities.

3 * Frozen and Tight-Fitting Covers

When a cover of any type becomes frozen into the frame or the keyholes become obstructed by ice, **you must thaw the ice** by using a solution of warm water and De-Icing salt (I/C 000959). The solution of warm water and salt should be made up by adding 1 kg of salt to 5 litres of warm water. Engineers driving vans where it is not possible to heat water should use Solution De-Icer 1A (I/C 072342) a bottle of which contains 5 litres.

Warning: Under no circumstances should an attempt be made to loosen the covers by any means which involve a naked flame or by using hammers, picks or any other tools which may cause sparks.

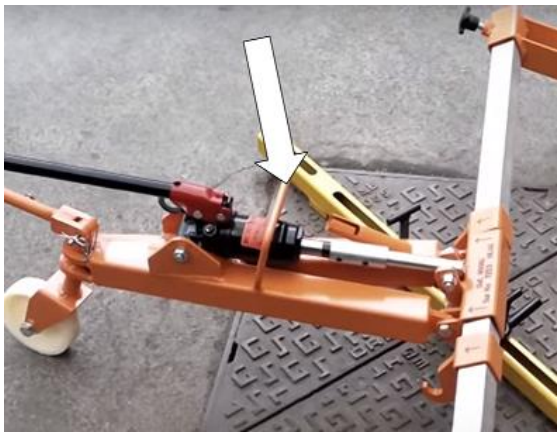
Before attempting to remove the cover with the LMC4 using the ram handle you should first break the seal. To break the seal use modified part 1a (i/c

126649) which has a bolt which when tightened will release the lid. On more difficult lids you may need to use two keys to break the seal.

If it is necessary to use LMC4, follow these practices.

Reminder for using manhole lifters

- You must keep your hands away from the hydraulic ram area once assembled.
- Do not hold onto the transport handle directly above the lifter ram – it's for carrying only.
- Only use one hand on the operating lever.
- You should always wear the correct PPE – safety boots, goggles, and suitable gloves (e.g. Showa water proof gloves).



What to look out for

The manufacturers of the Lifter Manhole Cover 4s (LMC4), TW Engineering, have created a short video to show best practice for using a lifter, keeping hands away from the hydraulic ram.

The hydraulic ram is shown in this image below - can't see it? View the image here.

Reminder for anyone that uses a manhole lifter

- Only use equipment if you are trained and competent.
- Wear the correct PPE – safety boots, goggles, and suitable gloves (e.g. Showa water proof gloves).
- If your lifter is defective, or you have any concerns, stop work. Let your manager or patch lead know. Take the lifter out of service and return to esiTest for inspection.
- Don’t use lifters outside of their test date – check the lifter’s date label or on the esiTest system. If out of test date, make an appointment to have it checked.
- Fully check every component before use – look for any signs of: o wear and tear (e.g. cracks or splits) o leakage (e.g. hydraulic fluid)

o damage (e.g any burrs or misshaped parts)

- Check that every clip is present in the handle and ram assembly.
- Don’t tamper with any of the pre-set pressure settings.
- Keep your hands away from the hydraulic ram area, once assembled. Only use one hand on the operating lever. The handle on the main body of the unit is for carrying it, not for holding while in use.
- Only use the supplied lever for operating the hydraulic pump. Listen for any unusual noises from the lifter when in operation.
- Don't over stress the hydraulic pump when in use. If you get to the maximum height, stop pumping the lever. Continuing may cause the pump to fail and possibly cause injury to the user or damage to the equipment.
- To correctly break the seal on Elkington covers, use ram handle 1a (item code 126649) on these oblong covers.

4 *Marking of Covers*

Carriageway frames and covers under the action of road traffic are often subject to long-term wear of the frame/cover seatings. Such wear can lead eventually to the need for replacement of the frame and cover. Wear can be minimised if individual covers are replaced into their original seating, and to this end it is recommended that prior to cover removal commencing, each cover is clearly marked with chalk to indicate its respective frame position.

5 * *Protective Clothing*

You must wear Gloves Leather (or Gloves PVC if wet) and protective footwear and 'goggles' for full eye protection, when you are engaged in removing or replacing carriageway jointing chamber covers.*

6 *Lifter, Manhole Cover 4 - Assembly and Use*

The Lifter, Manhole Cover 4 (LMC4 – see Figure 1.1 and 1.2) together with Lifter, Manhole Cover Part(s), may be used to remove and replace carriageway type cover (See Tables 1 and 2).

To comply with the Provision and Use of Work Equipment Regulations 1998 (PUWER), the Lifter Manhole Cover (LMC4) must be inspected by the user each time before use and checked annually by a competent manager.

TW Engineering instructions; equipment leaflet, for Maintetance, Manual

6.1 *User Checks Before Each Use

- Check the lifter and keys to ensure there are no visual signs of damage (no cracks in the components, no oil leakage from the pump, no bends in the main beam etc.).
- Operate the pump to raise the beam a short distance and then open the release valve. Check to ensure the beam lowers freely.

6.2 Check of the LMC4 by a Competent Manager

All manhole cover lifters will be inspected during a safety check by a competent manager.

Note: The competent manager will have practical and theoretical knowledge (plus actual experience) of the LMC4 to enable him detect defects or weaknesses which it is the purpose of the examination to discover, and to assess their importance in relation to the strength of the lifter in relation to its function.

- Ensure all parts fit correctly, as identified in Figure 1.1 and 1.2.
- Check all components for wear or damage.
- Operate the pump lever to ensure that the main beam assembly can be fully raised. With the main beam in the raised position operate the pump release valve to ensure the main beam can be lowered.
- Visually check the hydraulic pump assembly for any signs of leaks.
- If faulty remove from service.

It is the Line Managers responsibility to ensure that:

- All appropriate holdings of the LMC4's are registered on EsiTest.
- All new lifters provided to BT will have a unique serial number identification provided by the manufacturer. Existing Lifter Manhole Covers 4 (LMC4) that currently have no identification number will need the manager to allocate a permanent, unique number to the lifter. A suggested practice is to allocate the managers OUC Code followed by a unique number eg NBCPC/1. The identification number should either be marked in indelible ink or etched on the main body of the yoke (Engraving equipment is carried by the Mobile Testers)

  EsiTest MUST be notified of any changes to Peoples Equipment Holdings by amending the detail on the appropriate EsiTest screen and details must be completed within the stated month of test. Records are kept for a period of 3 years for reference in the event of an accident or H.S.E. inspection.

6.3 Lifter Manhole Cover 4A - Assembly

Refer to Figure 1.1.

1. Slide centre box (G) onto the main beam (I) securing it in a central position using the securing screw (H).

2. Slide the hook boxes (F) onto the main beam placing one box on each side of the centre box.

3. Slide the wheel boxes (D) onto each end of the main beam and secure using the securing screws (E) or split pins.

Note: **It is important that the Items D, F and G are placed on the main beam in the correct attitude to each other ensuring the hooks on the hook box are facing the jockey wheel and wheels facing forward of the beam(see Figure 1.1).**

4. Connect the hydraulic pump (N) to the narrow end of the yoke (C) using the bolt and stiff nut. Do not overtighten the stiff nut as this will prevent the pump clamp (J) from pivoting on the yoke.

5. Using the drop-end bolts, attach the broad end of the yoke and the piston of the pump to the lower and upper brackets of the centre box respectively.

6. If required, add hydraulic fluid as necessary through the filler plug (O) with the pump in the vertical position. (This task is usually performed by FESC personnel where Tellus 32 oil is available)

7. Attach the manoeuvring handle (A) to the bracket holding the jockey wheel (B) and secure by screwing the adjustable pins into either side hole on the bracket.

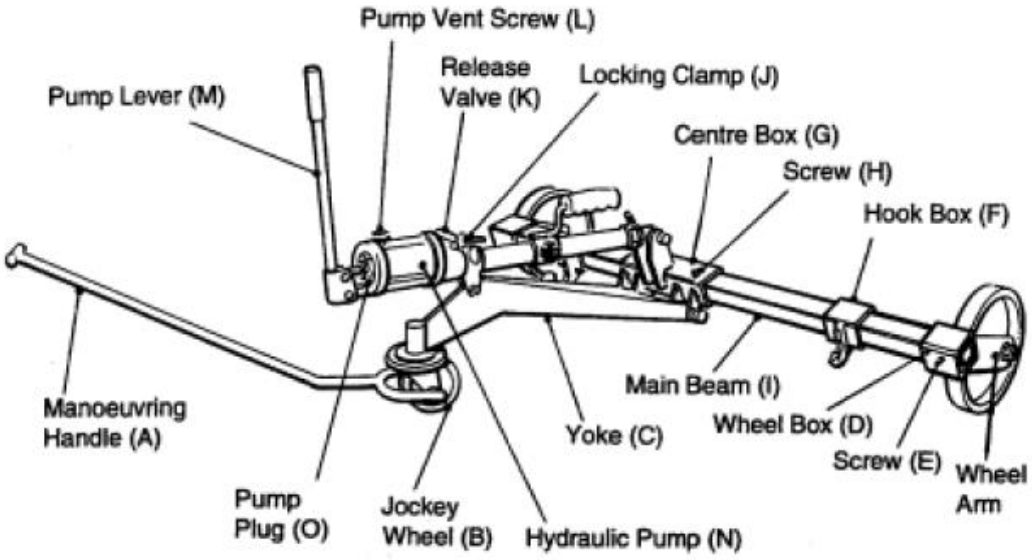


Figure 1.1 Lifter, Manhole Cover 4A

6.4 Lifter Manhole Cover 4B - Assembly

Refer to Figure 1.2.

1. Insert the main beam (1) into the main frame yoke assembly (2).

2. Slide the hooks boxes (4) onto the main beam - **ensure the open end of the hook(s) face towards the pump on main frame yoke.**

3. Slide the wheel boxes (3) onto the main beam placing one box on each side of the main frame yoke and secure using retaining screw clamp - ensure the wheels face forward of the beam.

4. Locate pump operating handle (6) into pump body and attach the manoeuvring handle (5) to the bracket of the jockey wheel and secure with the 'R' clip.

Note: 1: If additional lift is required to remove or replace a cover, the wheels can be fitted to the holes at the extreme end of the wheel arms. If the lifter is being stored/carried as a kit of parts then wheels can be left in this position. Where the lifter is being carried/stored as a complete unit in its dedicated storage position at the rear of the vehicle (Transit 581) the wheels will have to be repositioned to allow its correct storage.

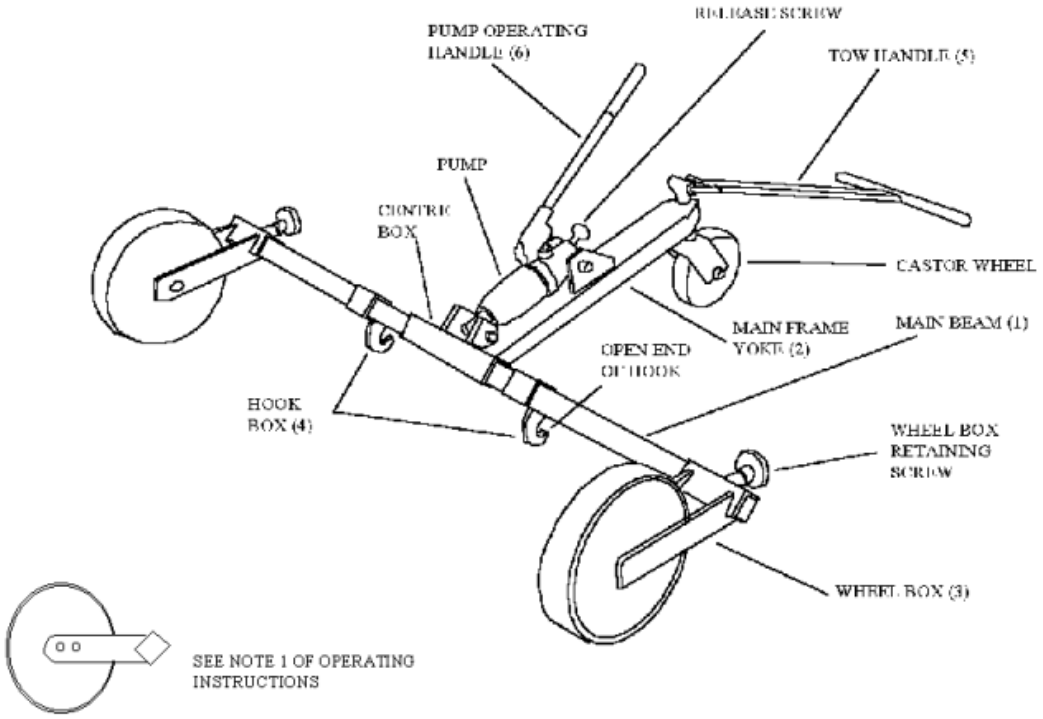


Figure 1.2 Lifter Manhole Cover 4B

6.5 Using the Lifter Manhole Cover 4

1. Remove any securing bolts in the cover(s).

2. Engage the appropriate lifting keys (see *Table 1*) in the cover keyholes and lock in position by tightening the wingnuts if fitted. (The threads on the keys should be kept clean and oiled for smooth action.)

3. Position the lifter over the cover, open the Release Valve and Pump Vent Screw (LMC 4A only) and return the ram fully home in the cylinder.

4. Engage the hook(s) on the lifter into the lifting key loop(s) by moving the hooks along the beam and adjusting the Cylinder Locking Clamp (LMC 4A only).

5. Make sure the Cylinder Locking Clamp is secure (LMC 4A only) and that the Release Valve is closed.

6. Operate the Pump Lever until the cover is raised from the frame.

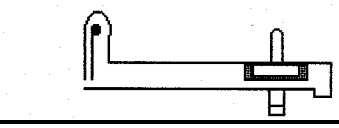
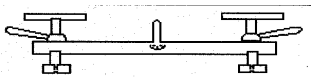
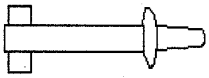
7. Pull the cover clear of the frame and then lower it onto the surface by opening the Release Valve.

8. To replace the cover - reverse the above procedures.

9. After use, close the Pump Vent Screw (LMC 4A only).

Covers	Type No.	Removal	Covers	Type No.	Removal	Covers	Type No.	Removal
Elkington When lifting, use a roller	Type E	LMC 4 and Two Parts 1A		1 1A	LMC 4 and Two Parts 3B		Unit Type	LMC 4 and Two Parts 2A
Diameter Variable	3 to 7	LMC 4 and Two Parts 4A		2 2A				
	Cover Jointing Pit No. 2			3 3A				
Side View	Woods Type			1C	LMC 4 and Two Parts 3B	A. - MARKED HD (HEAVY DUTY) C. & D. - HEAVY DUTY, CURRENT DESIGNS WITH CONNECTING PINS DO NOT REMOVE THESE COVER CONNECTING PINS		
				2C				
				3C				
				1D				
				2D				
				3D				

Table 1 **Identifying the Type of Cover to be Removed**

Type of Cover to be lifted	Key to be used	Stores No.	Illustration of Key
Elkington Type * *Ref. Paragraph 10*	Lifter Manhole Cover Part 1A	126649	
Unit Type Heavy *Ref. Paragraph 11*	Lifter Manhole Cover Part 2A	126650	
All Double Triangular Type *Ref. Paragraphs 8/9*	Lifter Manhole Cover Part 3B	126934	
Woods, Circular & Oval types *Ref. Paragraphs 12/13*	Lifter Manhole Cover Part 4A	126652	
All covers with footway type keyhole *see EPT/UGP/B009)*	Lifter Manhole Cover Part 5C	126968	

* Additional tool required, Cover Roller: item code 129274

Table 2 Types of Keys Available for LMC

7 Frame & Cover Carriageway Nos.1, 2, 3 & 4 Lockable

The new range of lockable carriageway covers, are fitted with a rolling bar device which sits beneath the covers and locks all of them into position. At the end of the frame is a single Lock Box which contains the standard Padlock Special Security.

Using a 17mm socket, remove the **Nyloc Nut** and lift off the **Lock Box Cover**. Inside you will see the **Padlock Special Security**, which keeps the **Locking Lever** in the locked position.

Note: *Note: 17mm socket & lever from BT supplier: - TW Engineering, via iBuy, Contact:* Mick Passey *Tel: 0115 932 3223.*

Figure 1.3 a,b

Unlock and remove the **Padlock Special Security**, including its shackle. This allows the **Locking Lever** to be pushed to the side, unlocking the carriageway chamber covers. Completely remove the **Locking Lever** from the Lock Box.

Figure 1.4

Using the **Lifter Manhole Cover 4** (LMC4), remove the carriageway covers, remembering to complete the usual Gas Safety checks.

Once the cover has been removed, you will see the central **Rolling-Bar**, which must be removed before carrying out any work in the chamber.

Figure 1.5

The following procedure describes the removal of the **Rolling-Bar** and is specifically written around Frame & Cover Carriageway 3E (Lockable). This is the largest unit with a long Rolling-Bar, which may drop into the chamber if not fully supported during removal. The other smaller carriageway units have smaller bars which may be removed more easily.

In order to gain a good hold on the Rolling-Bar, it is recommended to use a **Kneeling Pad** at the other end of the chamber, and remove it from this position (see **Figure 1.6)**

Take hold of the end of the Rolling Bar and push it towards the Lock Box. The Rolling-Bar will slide a few inches until the end is clear of its **nylon bearing**.

Figure 1.6

Lift the Rolling-Bar clear of the frame and place a **Cover Roller** under the Rolling-Bar (see Figure 1.7). Move the **Cover Roller** to the middle of the frame and use this to support the Rolling-Bar as it is pulled free from the Lock Box **nylon bearing**.

Figure 1.7

The Rolling-Bar can be removed completely from the frame.

Closing the Carriageway Frame & Cover (Lockable)

Replace the Rolling Bar buy re-inserting the slotted end back into the plastic holder under the Lock Box.

Figure 1.8 a,b

Rotate the Rolling Bar until the hooks are pointing upwards. Then Insert the Locking Lever back into Lock Box, firmly into the Rolling Bar slot.

Note: Push the Locking Lever to the Left (Open Position) this allows the Covers to be replaced without fouling the Rolling Bar hooks.

Replace the Carriageway Covers

Figure 1.9

Push the Locking Lever into the right (Closed Position). **This locks the Covers in place.**

Then refit the Padlock Special Security and Lock Box Cover.

7.1 New Item Codes and Stores List

Frame and Cover:	Stores Code:	Frame (Kg):	Cover (Kg) Coupled in Pairs:	No of Pairs:	Roll Bar Weight (Kg):
Carriageway 1E	057243	36.7	46.0	x1	N/A
Carriageway 2E	057244	76.8	68.0	x2	N/A
Carriageway 3E	057245	101.2	68.0	x3	N/A
Carriageway 4E	057246	42.9	59.0	x1	N/A
Carriageway 1E Lockable	057247	42.2	48.0	x1	1.4
Carriageway 2E Lockable	057248	82.3	69.5	x2	2.8
Carriageway 3E Lockable	057249	106.7	69.5	x3	4.1
Carriageway 4E Lockable	057250	47.8	60.6	x1	1.8

Table 3: Stores List for 'E' type covers.

Note: The change of design means that the new covers are NOT compatible with the old style frames.

8 *Safety Precautions*

1. Use the correct keys and ensure they are properly located, and secured.

2. Ensure the hook boxes are attached to the main beam in the correct plane (see Figs 1.1 & 1.2) so that when lifting, the hooks do not slip out from the keys.

3. Remove the holding-down bolts before lifting a cover.

4. Release any security devices where fitted before lifting a cover.

5. After a cover has been removed, lower it to the ground.

6. Consideration should be given to positioning of jointing chamber covers. Ensure that covers are clear of the safety zone - remove covers towards the kerb and away from the area between the carriageway box and the rear of the vehicle where practicable.

7. For multiple covers, take care when first parking removed covers into a restricted hard standing to allow space for safe removal and manoeuvring of the remaining covers.

8. Take care on sloping ground.

9. The whole of the worksite must be fully enclosed using barriers. The “worksite” to include any/ all tools, equipment. For instance box lids, lifters, pumps, blowers etc . For additional guidance refer to Safety at Streetworks & Roadworks code of practice.

.

The principles of safe lifting must always be followed.

Warning: Remember your gas precautions. Never try to loosen a cover by any means that involves naked flames or by using hammers, picks or any other tool that may cause sparks.

9 *Frames and Covers, Carriageway 1 and 1A, 2 and 2A, 3 and 3A (min cover wt. 89 Kg)*

These covers are easily recognised because they are all triangular in shape and each cover has **one keyhole** visible in its upper face.

In order to remove these covers from their frame, first position the Parts 3B (see *Table 2*) as shown in *Figures 2 and 3*. Insert the keys into the keyholes and make sure that the tangs of the individual keys on the Part 3B are properly located in the recesses, which are on the underside of each cover. Do this by inserting each key in to the keyhole and turning the key through 90° - you will feel it locate. Now tighten the winged nuts.

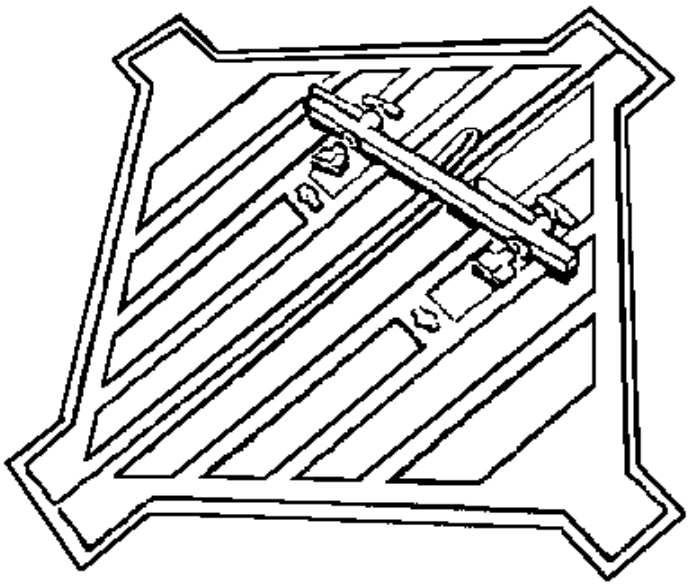


Figure 2

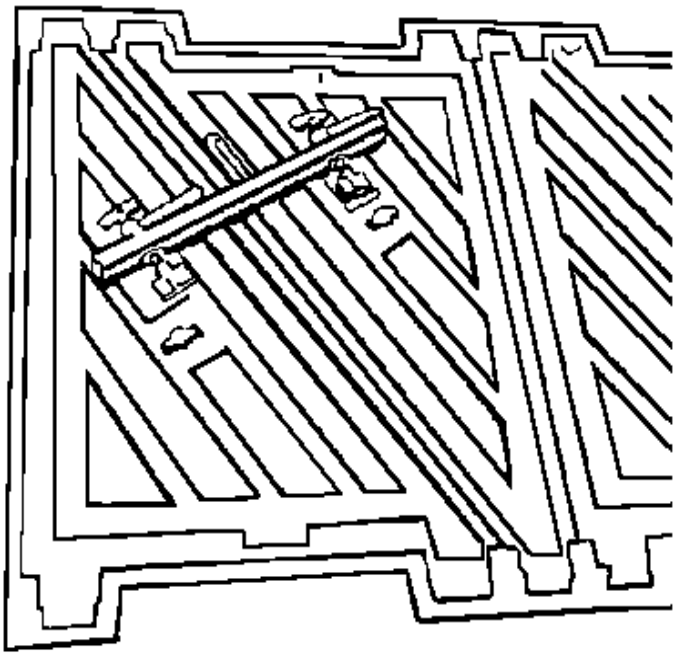


Figure 3

Straddle the covers to be lifted with the Lifter Manhole Cover 4 and engage the Lifter Hook onto the Part 3B (see *Figure 4*). Operate the lifter as described in Paragraph 6. Remove the covers to a safe place within the working area (see Paragraph 7).

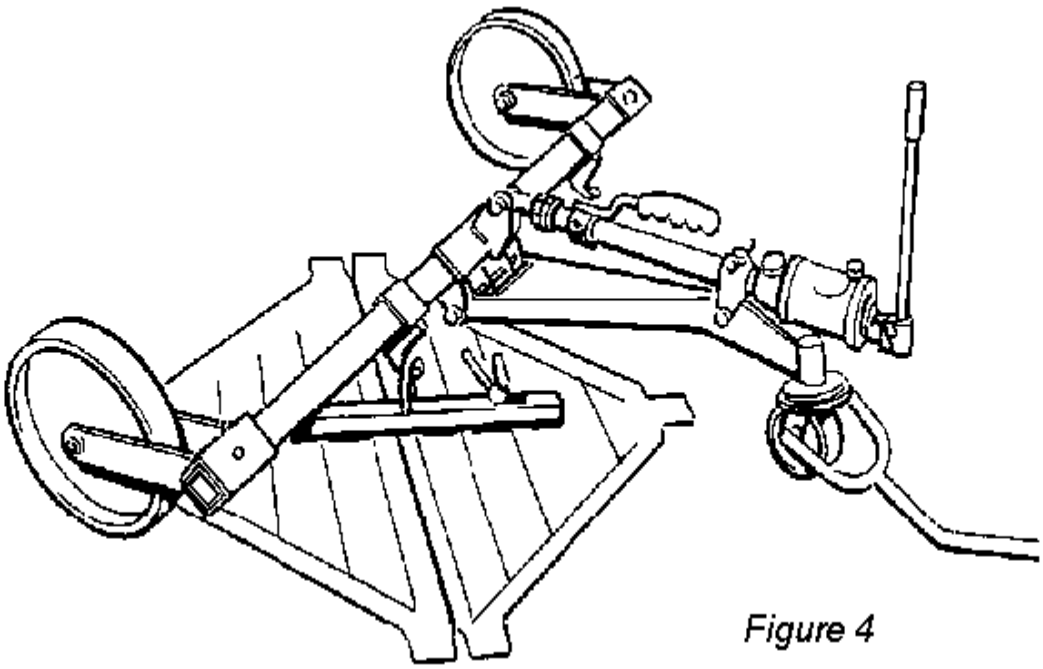


Figure 4

The covers are replaced by reversing the procedure described above.

10 *Frames and Covers, Carriageway 1C and 1D, 2C and 2D, 3C and 3D (min cover wt. 46 Kgs)*

These Frames and Covers are fully described in EPT/UGP/B016 and are distinctive because **each triangular cover has two keyholes** visible in its upper face.

* When Frames and Covers C and D type are installed in the carriageway then the covers are pinned together in pairs, **the cover connecting pins must not be removed.** *

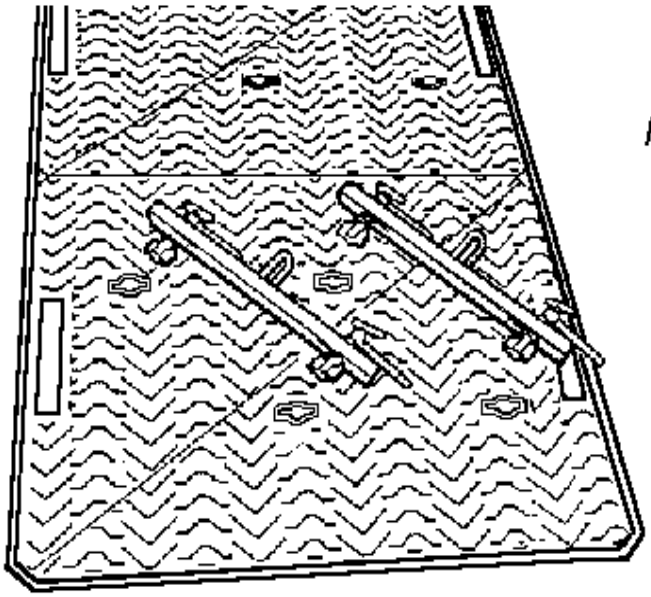


Figure 5

For the purpose of handling, both 'C' and 'D' type covers are treated in exactly the same manner. In order to remove a pair of covers from the frame first position two Parts 3B (see *Table 2*) as shown in *Figure 5*. Insert the tangs of the keys into keyholes. Turn each key through 90□ to ensure that the tangs of the key locate in the recesses on the underside of the cover. Tighten the wing nuts.

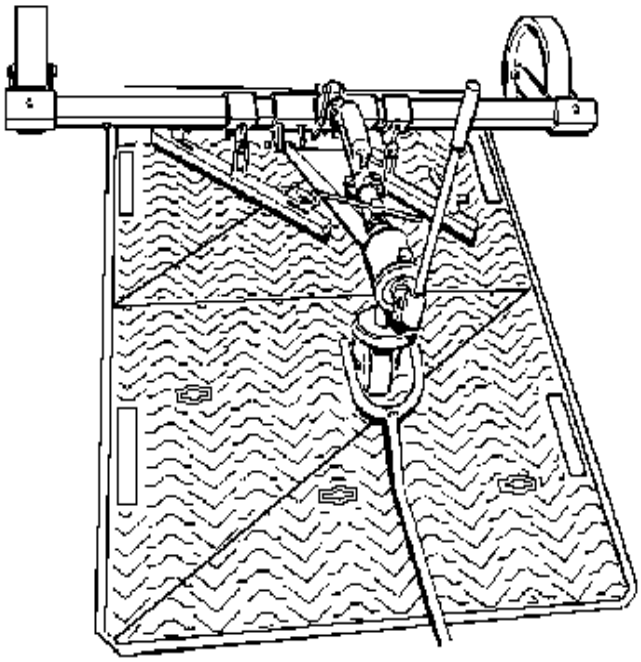


Figure 6

Straddle the covers to be lifted with the Lifter, Manhole Cover 4 and engage the hooks on the lifter with the loops on the Parts 3B (see *Figure 6*).

Operate the lifter as described in Paragraph 6. Remove the covers to a safe place within the working area (see Paragraph 7).

Both C and D type covers are designed to sit on a flat surface without rocking.

The covers are replaced by reversing the procedure described above.

11 *Frames and Covers, Carriageway - Elkington (E) Type (Min Cover wt. 192 Kg)*

These covers are of the slide out, slide in type.

For Elkington type covers, the LMC4 is used in a reversed position with the jockey wheel on the cover (see *Figure 7*). It may be advantageous to remove the manoeuvring handle for these operations.

Extra safety prexcautions need to be followed when manouvering the Elkington type covers.

- **Do not attempt to put your hands on the LMC4 until the pressure has been fully released. You should only have one hand operating the lifting and lowering lever and release valve when the LMC4 is pressurised.**
- **Do not try and manouvre the LMC4 or Elkington cover if the Load is still under pressure.**
- **Do not over pressurise the LMC4 if the load will not free easily or the LMC4 is struggling to lift the Elkington Cover**
- **The Lifting Beam May be used to help manouvre the Elkington cover. This action can only take place once the roller bar is in the correct position under the cover and the pressure is fully released from the LMC4. Take extra care when placing your hands on the LMC4 lifting beam from moving parts and pinch points which may trap your hands/fingers.**

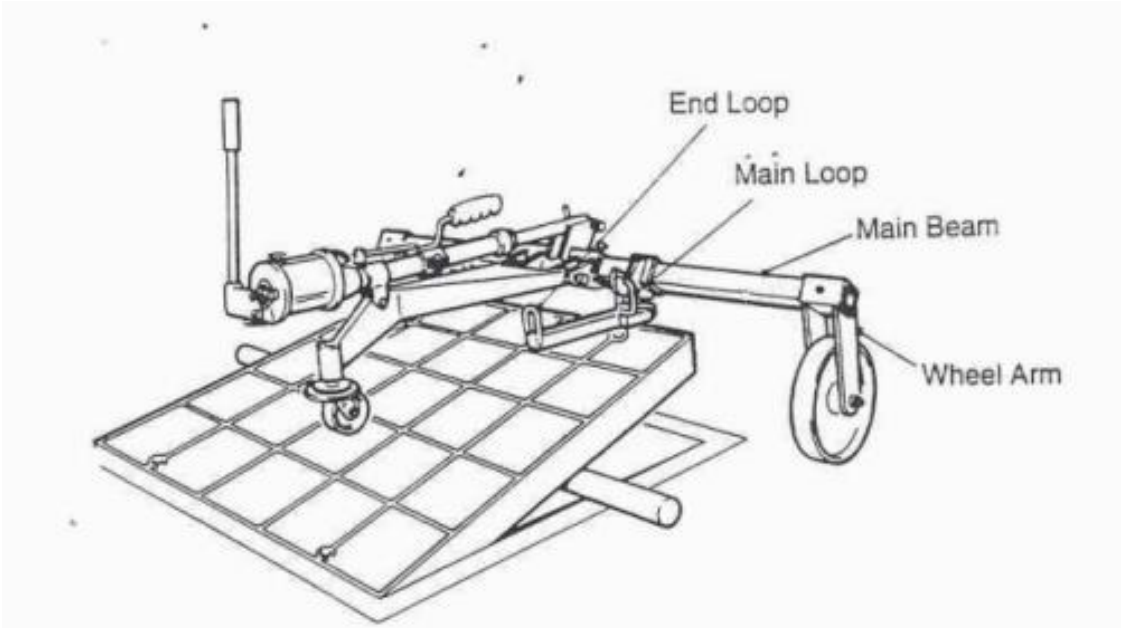


Figure 7

Removal and replacement of a cover is achieved using the Lifter, Manhole Cover 4 and two Parts 1A (see *Table 2*) in the following manner:

1. Insert Parts 1A into cover keyholes and secure by turning through 90□ with the long arms over the cover (see *Figure 7*).

2. Engage the lifter hooks in the END loops of the lifting keys and partially raise the cover. The lever action of the key breaks the seal.

3. Lower the cover back in place.

4. Re-engage the lifter hooks in the MAIN loops of the lifting keys.

5. Raise the cover until the wheel arms of the LMC4 are approaching the vertical.

6. Carry out Gas Test.

7. Insert the roller under the cover as far back as it will go (see *Figure 7*). This is most easily achieved by rolling the roller from the front. Do not place the roller bar under the Elkington cover whilst leaning over the hydraulic ram on the LMC4.

7. Once the pressure on the LMC4 is fully released, assume a crouched position and take hold of the main beam of the LMC4 making sure to place your hands carefully away from moving parts and pinchpoints. Steadily pull the cover such that its weight is carried by the LMC4 at the forward end and

the roller at its rear. Do not put your hands on the lifting beam until the pressure has been released from the LMC4 and the roller bar has taken the weight.

9. Roll the cover away from the opening and allow the trailing edge to drop onto the carriageway.

10. The cover may now be lowered to the ground.

Note: If the cover needs to be moved further (see *Paragraph 7*), keep the wheel arms in the near vertical position. Re-insert the roller between cover and carriageway and lower the front end of the cover using the release valve such that the cover once again is carried by the LMC4 and the roller. This may be repeated as necessary.

11. To replace the cover, the LMC4 is again utilised with its jockey wheel on the cover. Using the main loops of the lifting keys, raise the cover until the wheel arms are approaching vertical.

12. Insert the roller between the cover and the carriageway. Lower the front end of the cover using the release valve such that the cover is carried out by the LMC4 and roller.

13. Once the pressure is fully released Push the LMC4 until the rear end of the cover enters the frame. If the cover comes to rest on the frame due to being off line, use a crowbar to ease it into the frame from one side.

14. Push finally to slide the cover home against the frame end. If necessary, pull the cover back onto the roller and push from this position enabling momentum to carry the cover home. Final position may also be achieved with the aid of the crowbar at the LMC4 end.

15. Raise the cover sufficiently to allow the roller to be removed.

16. Using the release valve allow the cover to drop into the frame.

Note: Covers of this type that cannot be made free and removed as described above and in Paragraph 3 should be considered for replacement (see EPT/UGP/B016).

12 *Frames and Covers, Carriageway - Unit Type Heavy (Min Cover wt. 165Kg)*

* **Unit type covers are provided with cover holding bolts. These must be withdrawn before the cover removal operation commences.** *

Removal and replacement of the cover is achieved using a Lifter, Manhole Cover 4 together with two Parts 2A (see *Table 2*). In order to remove a cover, first position the Parts 2A as shown in *Figure 8*.

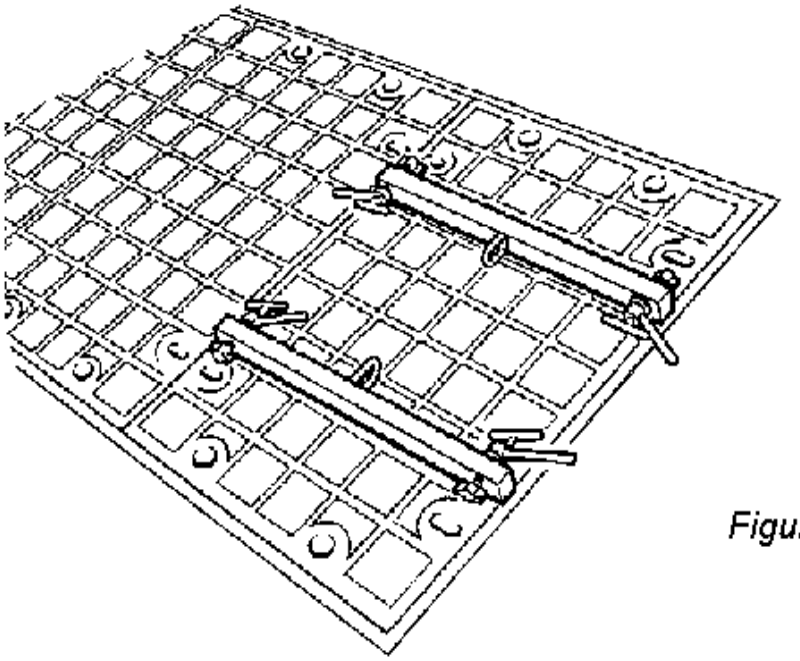


Figure 8

Insert the tangs of the keys into the keyholes. Turn each key through 90□ to ensure that the tangs of the keys locate on the underside of the keyhole recess. Tighten the winged nuts. Straddle the cover to be lifted with the LMC 4 and engage the hooks on the lifter with the loops on the Parts 2A (see

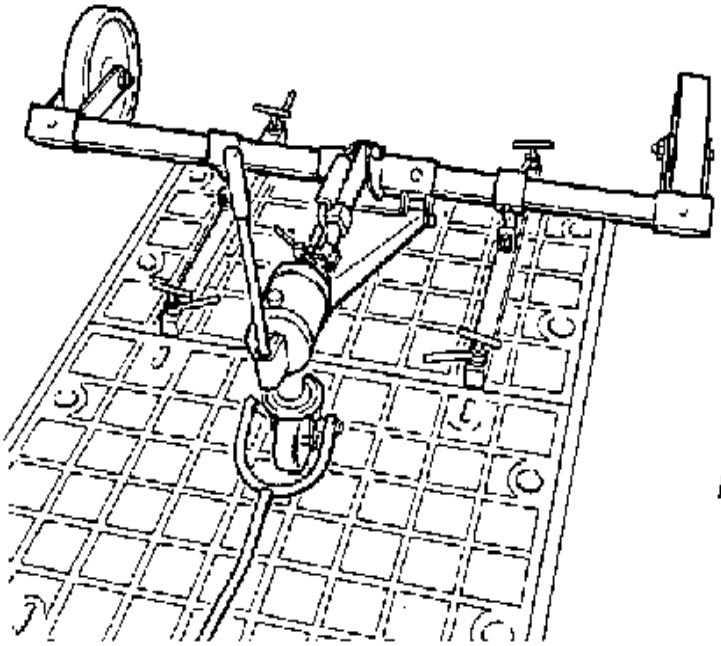


Figure 9

Figure 9). Operate the lifter as described in Paragraph 6. Remove the cover to a safe place within the working area (see Paragraph 7).

Replacement of the cover is the reverse of the procedure described above.

13 *Frame and Cover, Joint Box, Carriageway - Woods Type (min cover wt. 156 Kg)*

Do not attempt to manually lift this cover.

This frame and cover is recognised by the two rectangular covers, with wood block infill, seating in a frame which has cover prising slots on all four sides.

Each cover requires to be lifted vertically in order for the cover to clear the frame and this is achieved by using the LMC 4 and two Parts 4A (see *Table 2*) as follows:

Insert a Part 4A in each keyhole of the cover to be lifted, turning each key through 90□.

Engage the lifting loops of the keys with the hooks of the LMC 4 as shown in Figure 10 and operate the Lifter as described in Paragraph 6.

Remove the cover to a safe place within the working area (see Paragraph 7).

Replacement of the cover is the reverse of the procedure described above.

Note: Covers of this type that cannot be made free and removed as described above and in Paragraph 3 should be considered for replacement (see EPT/UGP/B016).

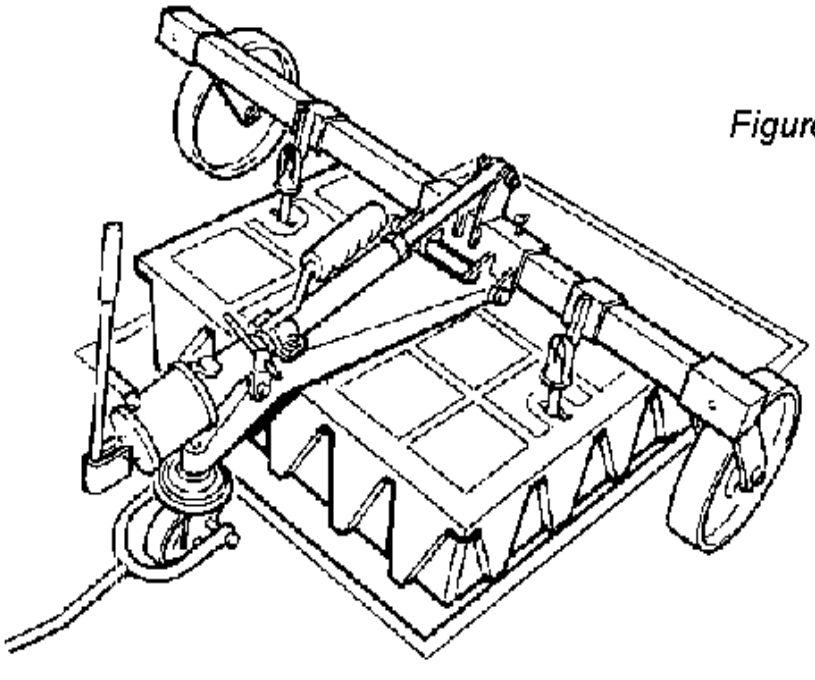


Figure 10

14 *Circular and Oval Shaped Covers (No Recognised Min wt)*

Do not attempt to manually lift this type of cover.

All circular and oval shaped covers require to be lifted vertically in order for the cover to clear the frame. This is achieved by using the LMC 4 together with two Parts 4A (see *Table 2*).

1. In order to remove a cover first insert the tangs of the Parts No. 4A into the keyholes and turn each key through 90□.

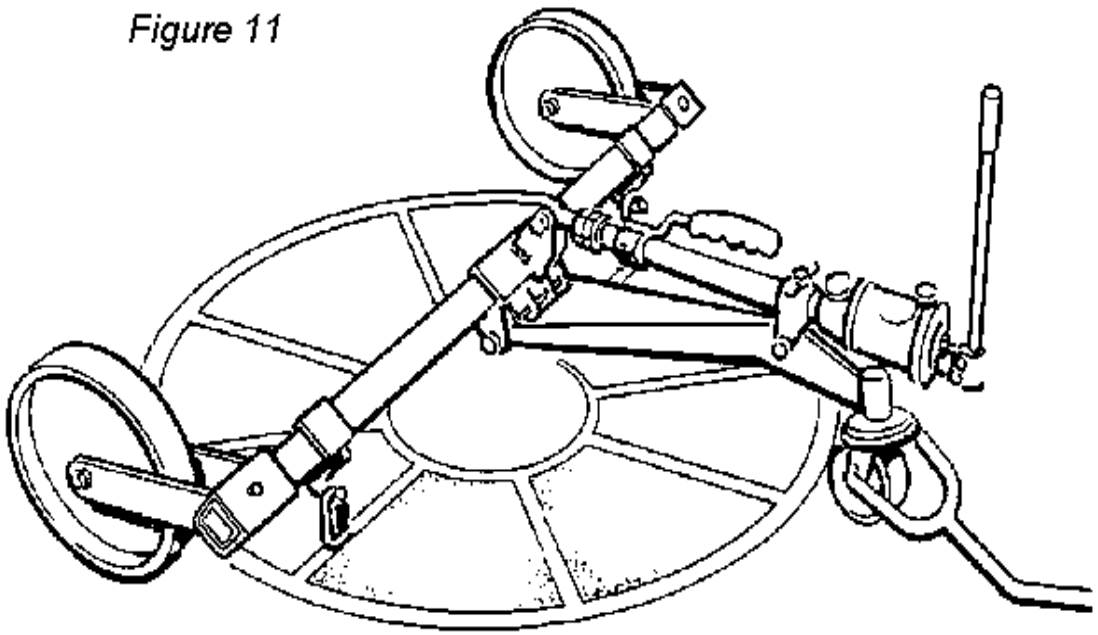
2. Engage the hooks on the LMC 4 with the loops of the keys as shown in *Figure 11*.

3. Operate the LMC 4 as described in Paragraph 6 of the Practice to raise the cover clear of the frame and remove it to a safe place within the working area (see Paragraph 7).

Replacement of the cover is the reverse of the procedure described above.

Note: Covers of this type that cannot be made free and removed as described above and in Paragraph 3 should be considered for replacement (see EPT/UGP/B016).

Figure 11



15 *Unusual Circumstances*

Recognising the likely variations of cover locations the following guidance can be used.

Sloping Carriageways - Where the carriageway is on a slope the LMC4 should be used to remove the cover by pulling it uphill. If necessary a second person can assist.

SoftVerges/Ground - Use the LMC4 with either channel cable bearer (Wall Type) ironwork or 3 battens of strong wood (2000 x 150 x 25mm) to act as runways. If necessary dig away the ground to make it level. The battens should be obtained locally.

16 *Removal and Replacement of Carriageway Covers by Manual Methods*

Removal and replacement of carriageway covers by manual methods **must not** be carried out unless the line manager has ensured a site specific local risk assessment (stored on the engineer's laptop for 30 days) has been completed. A line manager must be consulted every time a cover cannot be lifted by the LMC4. On completion of the assessment the contents of the document should be briefed to the people who are to remove the carriageway cover by manual methods and a record kept, for 6 months, by the line manager with a copy sent to Accenture Safety Consultancy Services.

Line managers should refer to the Appendix A assessment checklist. All people required to remove a carriageway cover by manual methods and their supervisors must be trained in the techniques.

16.1 Covers Carriageway Nos. 1C & 1D, 2C & 2D, 3C & 3D

These covers are triangular in shape and have 2 keyholes in each cover and are pinned together in pairs. Before attempting to manually lift these covers check that the connecting pins are in place by using a feeler gauge or something similar along the diagonal between adjacent covers of each set.

Where the pins have been removed two people using 2 Keys Manhole Lifter Cover ("T" keys) and a Crowbar 1 placed through the O of the keys can then remove one half of the cover. For covers with more than one set of triangular lids the centre ones should be removed first then the outer ones to ensure safe footing. Replacement is the reverse of the removal procedure.

Where the pins **have not** been removed then 4 men are required to lift a set of triangular covers, using 4 "T" keys and 2 crowbars. Again the crowbars

should be placed through the O rings of the "T" keys to aid removal and replacement of the set of covers.

16.2 Covers Carriageway Nos. 1 & 1A, 2 & 2A, 3 & 3A

These are single keyhole triangular covers and are not pinned

Two people using one T key and extension tubes on either side of the T key handle, Cover Rollers can be used as extension tubes. Remove & replace is the same as of the single Cover 1C & D.

16.3 Jointbox 104 Carriageway Hinged

These are double triangular hinged covers that are raised manually using a standard footway box key.

The covers are designed to be opened by an individual and weigh 37Kg. As it is hinged, the actual lifting weight is a lot less and has been measured as 18kg (max). This occurs at the initial stages of a lift using a key jointbox No 5. As the lid rises, the weight is transferred down to the hinged side, and the load being lifted reduces as the vertical position is reached. In the vertical position, the hinge engages, and the lid drops slightly and locks in position. This prevents it falling forward.

This designs enable covers to be lifted where the hydraulic lifter can’t be used (eg alongside kerbs and verges)

Opening carriageway cover 104

- The covers interlock so the cover adjacent to the security plate (cover 1) must be opened first. Each cover has two keyholes which match the standard BT footway cover keyholes. If the covers are not locked, insert the tang of a jointbox key into the keyhole nearest the lock plate of cover 1.
- Using a small lifting motion the seal can be broken.
- Carry out gas test.
- Move the key to the keyhole positioned nearer the middle of the cover.
- Take a position facing the lid, with the handle of the key away from you.
- Pull back on the key handle to raise the cover.
- Once the cover goes past the vertical position the hinge will “lock” preventing it falling back. Remove the jointbox key and check the cover is locked by grasping its top edge and rocking it.
- The gas test must now be carried out again.
- Open the second cover by inserting the tang of the jointbox key into the keyhole nearest the lock plate.

- Lift the cover by lifting and moving forward.
- Again test the cover is locked by rocking it in its raised position.








Closing the cover

The ‘rock and roll’ style type lid has one locking hinge. This lid can be recognised once it is open in the vertical position, as it adopts a slight lean towards the locking hinge. The lid must be closed in reverse order starting with cover 2.

- Insert the jointbox key into the lower keyhole in cover 2.
- Tilt it away from the locking hinge (1cm approx). Because the lid is being lifted on one side this reduces the load (to 24 Kg approx).
- Once the locking hinge is overcome the cover can be lowered shut with the jointbox key**.**
- Use the jointbox key to control its descent.
- Repeat this procedure for cover 1

Old style covers

There are a number of old style covers without the ‘rock & roll’ mechanism. To overcome the hinge locking mechanism, each cover must be lifted slightly before it can be lowered – starting with cover 2.

Insert the jointbox key into the lower keyhole in cover 2. Overcome the locking hinge by lifting the lid vertically (approximately 1cm) before lowering it back into place with the box key. Adopt a two handed standing position to prevent any excessing leaning or twisting. Then continue to replace as described above.

Removing covers completely

Where you need to remove covers completely eg for cabling work follow the procedure above and then:

- Once in the vertical position the lid can be ‘stepped’ out of one hinged side, on to the pavement/carriageway surface.
- The other hinged side can then also be rocked and lifted out
- The lid can then be ‘walked’ (not lifted) to a safe position and lowered by hand or using a jointbox key.

- To raise from the flat position, it is possible to grasp each **angled** corner as these are raised and allow a gap between the cover and the ground on which it is laid. This also prevents fingers from being trapped when the lid is laid flat.

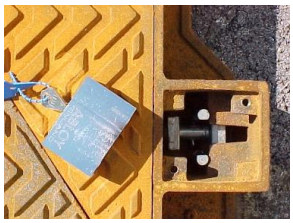




Security

The covers can be locked using a single padlock special security. This is located beneath a removable plate adjacent to cover 1.






- Unscrew the 2 securing bolts using a 13mm socket or spanner
- Push the locking pins towards the covers
- Insert the shackle of a padlock and rotate it around the locking pin

- Drop the padlock over the shackle and lock
- Replace the security plate and tighten the securing bolts

17 *A1024 Procedure*

The A1024 procedure must be used to notify the Asset Assurance Group of carriageway covers that are in locations where the LMC 4 cannot be used. The defect code is 505 with a remedy code of 504.

Possible solutions include:

Replacing the Frame and Cover (Remedy code 501/2/3).

Building a concrete apron around the frame and cover (Remedy Code 504).

Levelling the ground and building a concrete apron around the frame and cover (Remedy code 504).

Where cover connecting pins are missing or defective, use the A1024, ‘Replace the Frame and Cover Cover Pins’ (Remedy code 512 non-lockable & 522 lockable)

The recently launched D400 type Lockable Carriageway Frame & Cover has a single padlock and a locking bar to secure it. Defects on these locking mechanisms should be recorded separately under Defect 514, using the new Remedy Codes 627 and 628.

18 *Installation of New Covers*

This work includes new joint boxes and frame and cover replacement which should be to the specifications of LN550.

On installation, all new covers must be capable of being removed using the LMC4. This may mean repositioning the box or removing obstructions, eg if a cover is obstructed by pedestrian barrier fencing beside a road then it is reasonable to remove, temporarily, that part of the fence which obstructs the safe removal of the cover when using the LMC4.

Installation of covers where the LMC 4 CANNOT be used constitutes a quality failure.

19 *References*

Health and Safety Executive Guidance Document L23 - Manual Handling Operations Regulations 1992.

19.1 Isis Documents

SFY/HSH/D050	H & S Handbook - Gas Precautions
EPT/UGP/B009	Removal and Replacement of Footway and Driveway Jointing Chamber Covers
EPT/UGP/B016	Frames and Covers, Carriageway
Safety at Streetworks & Roadworks	eAssistant

20 *Appendices*

20.1 Appendix A - Assessment Checklist

Line managers should refer to the assessment checklist below. All people required to remove a carriageway cover by manual methods and their supervisors must be trained in the techniques.

Section A	Manual Handling of carriageway covers should only be undertaken where it is not possible to use the Lifter Manhole Cover 4, are you satisfied that the LMC4 cannot be used	**Yes/No**
Section B		
The Individuals	Are All people to be employed in the lifting task: 1. In good health and have no history of back trouble? Ask the question to everyone to ensure that circumstances have not changed	**Yes/No**
	2. Received appropriate manual handling training, course E25141 or it's equivalent?	**Yes/No**
	3. Of sufficient stature and strength to undertake the task?	**Yes/No**
	4. Of sufficient number for the task in hand? *See 'The Load' for the type of cover and ascertain the number of persons required. The overall number will depend on how you plan to do the task.* *N.B. Do NOT reduce this number to suit the number*	**Yes/No**

	of people available	
The Task A p p e n d i x B – T y p	BREAKING THE SEAL Under no circumstances attempt to remove a cover without first making sure the seal between the cover & frame has been broken. This can be done by using the LIFTER MANHOLE COVER 4 *Note: Though it cannot be used in the lifting operation it may be possible to use for this purpose* ***NB In cold conditions the cover could be frozen into the frame and you may have to thaw the ice using hot water and salt*** USE OF KEYS If Key Lifting for Manhole Cover I.C. 114987 (T keys) are to be used have you either extension tubes (Cover Roller I/C 129274) or crow bars to use with them? TEAM LEADER An individual has been nominated as the one to co-ordinate the lift	**Yes/No**
The Load s o f F r a m e	For Triangular Covers (types 1,2,3) There are a minimum of two persons for each triangle lift (Therefore a minimum of four persons when covers are pinned) For Elkington, Unit Type Heavy, Woods and Oval cover The manual handling operation is of extremely high risk and must not be undertaken	**Yes/No**
The Environment s / C o v e r	There is sufficient room to manoeuvre the cover, safely for the number of people involved. There is no risk of slippage by the operatives (No ice or slippery surface) The incline (if any) has been taken into account as part of the risk assessment. The weather will not interfere with the operation (strong winds, heavy rain etc.)	**Yes/No** **Yes/No** **Yes/No** **Yes/No**
Section C i n t h e	Describe, here, briefly how the operation will happen. Information communicated to the lifting team and copy sent to Safety HelpDesk. Signed: …….. Date: …….	

network

A guide to frames and covers and their replacements in the external field can be found in EPT/UGP/B014

Please click here

20.2 Appendix C - Tamper proof pin kit

This is a works instruction, on how to fix and secure a replacement tamper proof coupling fixture for BT units. The document details the fixing of the bolt only. Management of the site, making it safe, and the removal and replacement of the covers should done as standard

The kit includes :- 2x Coupling bolts 2x Shear nuts SAP Code: 233546 SAP Description: BT E600 TAMPER PROOF CVR COUPLING KIT	

BT Tamper Proof Fitting Guide.pdf

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