LubriCurve 50

INSTALLATION & MAINTENANCE MANUAL

Track mounted, mechanical, rail / wheel flange lubricator system

Model Variants:

- **Double pump**
  - **2 Blade**
  - **4 Blade**
- **Blades**
  - **EasiBlade**
  - **Standard**
  - **Check Rail**
  - **Low Clearance**
- **Reservoir Capacity / Type:**
  - **9Kg (see separate manual)**
  - **6Kg Low Level (see separate manual)**
  - **37kg**

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An ISO 9001 and 14001 Registered Company

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Contents

1 General

- Health & Safety legislation requires that LubriCurve rail lubricators are fitted by trained personnel only; warranty will also be affected if un-trained teams work on the LubriCurve products. Whitmore can provide training courses.

  A general instruction sheet is included with each LubriCurve pump supplied, this Manual provides more complete information and should be used to support training provided by Whitmore.

- This Instruction Manual is intended to be generic and concentrates on LubriCurve systems to suit Flat Bottom and Bull Head rail types, in particular UIC54, UIC60, UIC56 flat bottom rails and 95lb bull head rail applications.

- Only lubricator grease approved for use by both Whitmore and infrastructure owner should be used in the LubriCurve system. Use of other greases will invalidate warranty and could impact performance.

2 Product Transport / Storage

- Goods are packed and delivered to requested address in a form that is suitable for the product given good practice in the off-loading by the receiving company.

- LubriCurve systems are delivered on the basis that they will be installed quickly.

- Systems are not intended for outside storage or corrosion can result unless filled with rail grease and in operation, equipment should be offloaded and stored inside a dry, secure, watertight building until required for installation.

IMPORTANT
Maintenance and repair of the lubricator and reservoir should only be carried out by trained personnel. Compressed springs inside the lubricator may be dangerous if handled incorrectly.

3 Instruction Manual Product Summary

This Manual covers fitting of LubriCurve 50 (PD50) systems and associated spare parts and subcomponents.

Instructions for 37kg reservoir installation and maintenance are covered in this Manual and in other Product Manuals for 9kg and 6kg (Low Clearance Reservoirs LCS102-03) in separate manuals.

A variety of parts to assist with installation efficiency are available and are listed later in this document along with general product spares.

4 Main Component Definitions

Reservoir	The reservoir is the cylindrical grease container that stores the grease. Internal springs and piston force the grease into the lubricator pumps via feed hoses.
Non-Return Filling Valve	The non-return filling valve is fitted to the reservoir; this is where the grease is pumped into the reservoir (when fitted to the lubricator) via a suitable hand operated.
Feed Hose	This is the hose linking the reservoir to the pump inlet. The hose is secured using a hose clip at each end of the hose. The feed hose transfers the grease from the reservoir to the pump inlet fittings.
Grease Inlet (Horn)	This is part of the pipework that links the feed hose to the pump inlet pipe.
Pump Unit	The pump unit generally consists of two pump bodies (connected by an inlet pipe) and is mounted to the rail by the pump support brackets via pump rail clamps. This is termed a Double Pump.
Inlet Pipe	The “T” piece assembly connection that links the horn to the two pump bodies, or equivalent grease inlet.
Pump Body	Each pump contains: 1 plunger (complete with integral non return valve) 1 plunger height adjustment screw with lock 1 plunger return spring 1 grease outlet non-return valve 1 bleed screw 1 delivery hose outlet pipe 1 pump support bracket. The grease is delivered from the reservoir via the feed hose / ”T” piece and fills each pump primary chamber of the pump unit. When the system is primed the grease then fills the secondary chamber via the plunger integral non-return valve. Once the plungers are depressed by the train wheels, (or manually) the grease is transferred via the outlet non-return valve to the outlet pipe and then through to the delivery hoses. On the return stroke of the plunger its integral non-return valve opens and allows grease to flow into the secondary chamber from the primary chamber.
Plunger Height Adjustment Screw	A special locking screw operated with a 2.5mm Allen key that is adjusted from the top of each pump body to adjust the height of the plunger. A pressure pad operates on the side of the adjuster screw. The higher the plunger in relation to the top of the rail the greater the grease output.

Plunger Return Spring	There is one plunger return spring in each pump body. The springs return the plungers to its static position after the plunger has been depressed by the train wheel (or manually).
Grease Outlet non-Return Valve	There is one grease outlet non-return valve, in each pump body. The non-return valve acts as a stop valve, preventing the grease in the blade path from being drawn back into the pump body as the plunger rises. Once the plunger is depressed by the train wheel, (or manually), the grease is transferred from the secondary chamber through the outlet non-return valve, permitting grease to flow through to the Blade via the delivery hoses.
Bleed Screw	There is one bleed screw on each pump body. Once open any air trapped in the secondary chamber, is able to be released when the plunger is operated or fully raised.
Delivery Hose	Delivery hose is supplied with each full lubricator, which has to be cut into two suitable lengths to fit between a pump body and a Blade assembly. The hose is secured using a hose clip at each end of the hose. The delivery hose transfers the grease from the pump outlet to the Blade inlet.
GDU (Grease Dispensing Unit), Blade	There are typically two gauge face Blades, each consisting of three rectangular plates, back plate middle plate and grooved front plate). Each Blade is fitted to the rail using rail clamps, which are secured to the rail by a hook bolt, nut and washer per clamp. The Blade has ports at the top of the grooved plate, which allows the grease to be delivered to the gauge corner and/or gauge face of the rail for the train wheels to pick up and spread along the curve. Check rail Blades are broadly similar in function to gauge face but of different design.

5 Site Preparation

- To install a LubriCurve lubricator, the ballast has to be cleared to allow the reservoir to be seated correctly in a position, clear of the trains. There also needs to be sufficient clearance made in the ballast or concrete of a slab track for the feed hoses and the rail clamps that secure the pump and the blades.

- The equipment needed for this work is not supplied by Whitmore and is typically:
    - A shovel or ballast fork whichever one is the most suitable.
    - Concrete clearance tools.
    - All relevant P.P.E. needed to carry out the works safely.

- The lubrication systems outlined are heavy and care should be taken in general safe mechanical handling of the units to the install site in-line with infrastructure owners' procedures.

6 Preparation of Main Components for Installation

Application	Ensure the correct pump type has been selected for the application; part numbers and descriptions are included on each pump case where complete systems are supplied.
Packing Case	Systems supplied complete are despatched damage free and complete in a robust cardboard case with reservoir separate. Ensure case has not been damaged during storage or transport to the rail site, should case be broken the contents should be carefully checked with reference to the contents list included within each pump packing case. Dispose of packing responsibly.
Pump Unit	Visually inspect for any casting defects that will affect its operation. Ensure that both the pump unit brackets are not damaged and that both bolts are present on each bracket. Ensure that each outlet non-return valve at the base of the pump body is fully tightened into each pump body. Ensure that there is one bleed screw in each pump body and that they are fully tightened. Ensure that each pump body has one grease outlet pipe attached. Ensure that the plunger can be depressed manually and returns freely.
GDU / Blade	Ensure that it is not bent or damaged and all ports are free from blockages. Ensure that all bolts are present and are fitted securely. Ensure that the hose inlet tails, which the delivery hoses attach to, are in place and are not damaged.
Clamps	Ensure that both Pump and GDU / Blade clamps are not damaged. Ensure that the threads on the clamp bolts are not damaged. Ensure that the threads on the hook bolts are not damaged.
Hoses (feed and delivery)	Ensure that the hoses are intact and free of holes and splits.
Reservoir	Visually inspect for any casting defects that will affect its operation. Ensure that all bolts are present and are fitted tightly. A non-return filling valve is fitted tightly, and the internal ball is free moving.
Serial Numbers	Pumps and Reservoirs are supplied with unique serial numbers, these should be recorded prior to installation and recorded on installation record sheets as required

7 Pump Installation

Two Blade Gauge Face Systems

Two GDU systems are generally installed with running rail blades on the high rail with pump / reservoir also generally on that rail.

- Typical layout has blades to the right of the pump / reservoir and one to the left on the same rail.
- The hose runs from each blade to the nearest pump body.
- Plunger heights are generally set to an initial 0.5mm (see 7.8).

Double Pumps

- Flat Bottom rail will generally use Whitmore silver coloured pump body (110mm high)
- Bull Head rail will only use Whitmore black coloured pump body (102mm high)
- Conversion kits are available to enable black coloured BH pumps to be used on FB rail, refer to Whitmore for details.

Pump Installation

7.1 Double Pump Fitting the Pump Unit Clamps, Flat Bottom Rail

7.1.1 Once the bed that the pump is to be fitted to has been identified, position the two rail clamps centrally in the bed and spaced apart to suit the pump brackets.

7.1.2 Locate the 70mm long special hex bolts through the upper holes of the clamp with the hexagon head located in the clamp slot. Do not use standard M16 bolts.

7.1.3 The main part of the clamp is fitted on the cess side of the rail with the threaded stud at the top and facing away from the rail.

7.1.4 The hook bolt is fitted under the rail with the hook clasping on the foot of the rail on the 4’ side with the threaded part inserted through the hole at the base of the clamp.

7.1.5 The washer and nyloc nut are then fitted to each hook bolt and fastened tight.

7.1.6 Bed the clamp fully on the rail foot by striking the clamp base with a hammer (do not damage the rail foot or the clamp thread). Retighten the nyloc nut.

7.1.7 Note the clamps should be perpendicular to the rail foot.

7.2 Application Variation - fitting the pump unit clamps, Bull Head rail

7.2.1 Rail clamps are of a different form for Bull Head Rail. Clamps consist of two sections that fit around the rail flange.

7.2.2 The main part of the clamp (hole and machined slot) is fitted on the cess side of the rail with the threaded stud at the top and facing away from the rail. Locate the 70mm long special hex bolts through the upper holes of the clamp with the hexagon head located in the clamp slot before fitting to rail.

7.2.3 The rear half of the clamp is fitted under the rail with the 160mm long bolt inserted through the hole at the base and then through the front clamp.

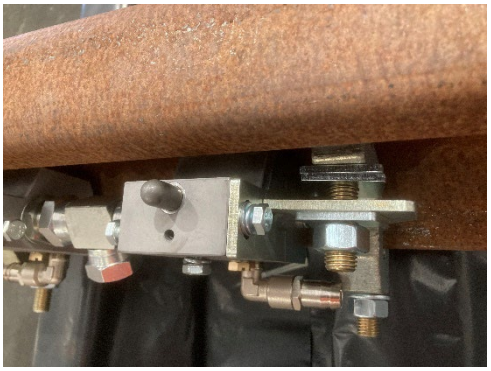
7.2.4 The washer and nut are then to be fitted to each stud and fastened tight using flat washer and nyloc nut

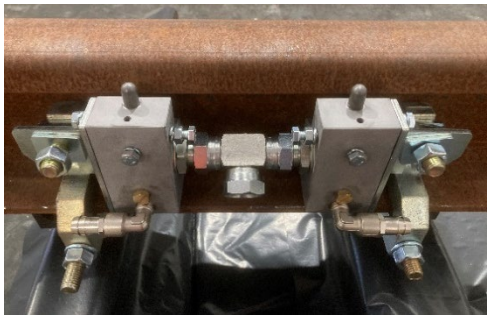
7.3 Fitting the Pump Unit

7.3.1 Locate two of the 4mm thick rectangular shims over each M16 stud. Note that during the install process the quantity and thickness of these shims may be changed.

7.3.2 Hang the pump on the rail clamp studs.

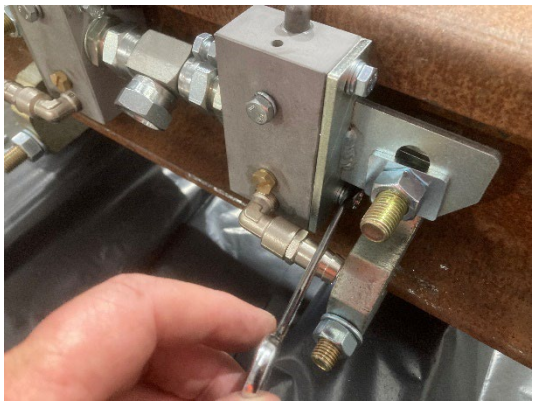
7.3.3 Fit one 4mm thick rectangular shim on each stud and one M16 full nut on front face of the pump bracket.





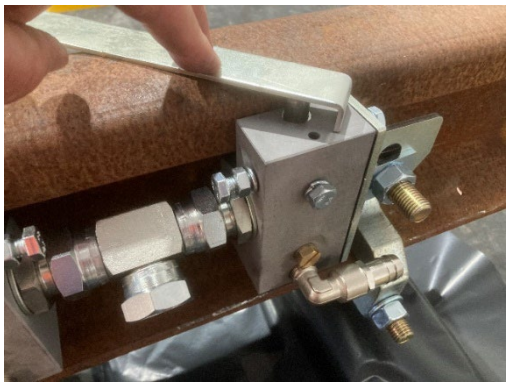
7.3.4 Check horizontal nuts on T piece are just finger tight so pump bodies can rotate independently.

7.3.5 Loosen the two M8 hex screws between bracket and each pump body.



7.3.6 On both pump bodies:

- Raise until they are 11mm below rail head, check this by using pump gauge available from Whitmore.
- Rotate each pump body so the top of pump body is in contact with rail head



7.3.7 Tighten all 4 – M8 pump bracket hex screws.

7.3.8 Tighten the T piece horizontal nuts

7.3.9 If at this point it has not been possible to set the pump body to contact the rail head then exchange the rectangular shims with different quantities and / or thicknesses (1, 2, 4mm provided) until contact can be achieve.

7.3.10 Lightly tighten the two M16 pump brackets, the pump bracket must not be distorted at this stage, the selection of rectangular shims is supplied to avoid that.

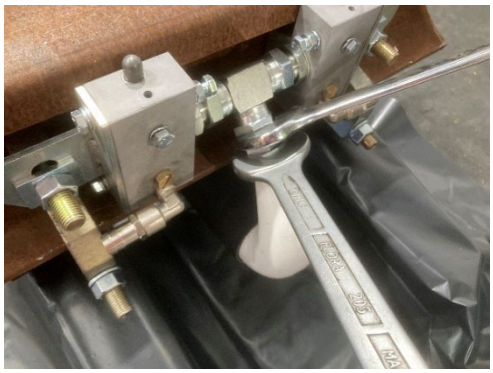
7.3.11 Note that plunger height is an initial setting only at this stage.

7.3.12 There must always be one 4mm shim in front of the bracket followed by an M16 full nut.

7.3.13 Rectangular shims should always be at parallel to the rail to maximise their effectiveness.

Never strike the aluminium pump body with hammer head

7.3.14 The grease inlet type will depend on if the Feed Hose is 25mm or 63mm diameter. 25mm hose systems has a hose tail fitted to the T piece and 63 mm a cast 'horn'. Note there are two types of 63mm inlet to suit Field side reservoir location or 4' reservoir location. Fit the relevant grease inlet to the T piece (between the two pump bodies) and tighten the T Piece nut ensuring that the inlet is perpendicular to the rail This connection must be tight to avoid future leakage.

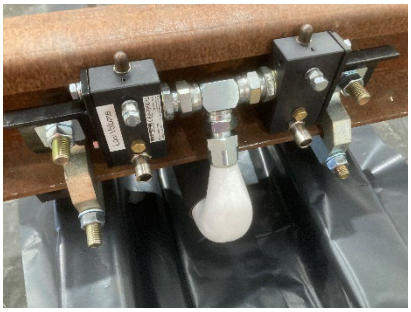


7.3.15 Photographs show an 'Under Rail Inlet', process is similar for the more common inlet which suits field side reservoirs.

7.3.16 Push the grease inlet down until it is below and clear of the rail foot and tighten the two remaining T piece nuts. This connection must be tight to avoid future leakage.

7.4 Pump Bracket Variations

7.4.1 The details described above show 'Standard Pump Brackets' (silver colour) on a 110mm high flat bottom pump (silver colour). There are alternative brackets available and overall installation is the same after fitting an alternative bracket to a pump. As example the adjacent photograph shows conversion 'Folded Pump Bracket' that allows a BH pump to fit to FB rail. Folded brackets can offer greater strength in high vibration locations.



7.5 Alternative for Double Bull Head Pumps

Fitting process is the same for Bull Head pumps; the product differences are with the pump support bracket.

7.6 Fitting the Feed Hose and Reservoir

7.6.1 The photographs show a 37kg reservoir located on the cess side, principals are similar for 6kg or 9kg reservoirs in the 4'.

7.6.2 Note that typically 9kg reservoirs will use black coloured 64mm bore hose and 6kg reservoirs will use 25mm bore hose

7.6.3 Slide a feed hose clip over one end of the feed hose and fit onto the outlet pipe of the reservoir. Tighten the hose clip.

7.6.4 Dig out the ballast / slab so that the reservoir outlet is in line with the inlet of the angled pipe that is fitted to the pump. Bury reservoir at angle and approx. half depth to secure in position, (see front cover picture). If no ballast, then the reservoir should be secured to sleepers with appropriate brackets.

7.6.5 Slide a feed hose clip over open end of the feed hose and fit onto the angled pipe. Tighten the hose clip.

7.6.6 The feed hose length may need to be reduced due to the local conditions.

7.6.7 Ensure that there are no kinks in the feed hose, realign items as necessary.

7.7 Filling the System

7.7.1 Once the reservoir is fitted to the pump unit fill it up with grease:

- Remove the filler dust cap and store safely
- Attach a suitable drum pump to the 1" Snaplock filling point and secure locking arms in clamp position.
- Operate hand pump measuring piston depth periodically from reservoir back plate to rear most surface of piston to ensure reservoir is not overfilled
  - 6kg Reservoir – Full at 290mm
  - 9kg Reservoir – Full at 50mm
  - 37kg Reservoir – Full at 80mm

Do not overfill the reservoir

- Remove hand pump and replace reservoir dust cap.
- Note – A syringe can also be used with an appropriate alternative filler fitted to the 1"BSPP reservoir filler thread in place of the standard Snaplock NRV supplied.

7.7.2 Once the reservoir is full, open the two-bleed screws until grease flows out of the screw grooves. If necessary, operate plungers until grease flows from their previously set 11mm nominal height.

7.7.3 Once the grease is flowing hold down the plunger fully and close the bleed screws, this process prevents air being drawn back into the system. Use only a flat blade screwdriver

Do not over tighten these brass screws.

Note A reservoir spider (Part No. LCS102-04) should be available at this stage should it be necessary to lock the reservoir piston back if hose or coupling need to be removed for any reason.

7.8 Setting the Pump and Plunger Height

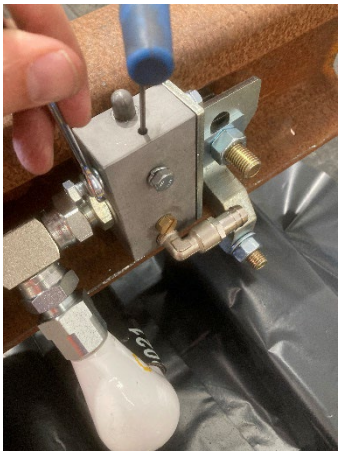
7.8.1 Check the pump bodies are 11mm below the crown of the rail head. Tighten the two M16 full nuts and then fit and tighten M16 nyloc nuts on the same studs.

7.8.2 Photographs show a Whitmore plunger height setting tool that will assist this process:

- Rest the gauge on crown of the rail with the base of the gauge resting on rail foot, a variety of adjuster plate can be used to select best fit on different rail types.
- Rest the nib of the long 15 – 30mm sliding plate against the rail head on opposite side to pump.
- Rest the sliding 0 – 10mm plate on the top of the plunger, this will then indicate the plunger height relative to the rail head.

7.8.3 To adjust plunger height:

- loosen the M8 hex lock screw which is located on the side or front of each pump body.
- Insert 2.5mm Allen key as indicated and rotate clockwise to lower plunger and anticlockwise to raise
- When required height has been achieved then tighten the M8 hex screw lightly, then tighten the lock nut



7.9 Test the Pumping System

7.9.1 Using a 10mm “T” bar / hammer shaft or other suitable tool depress one of the plungers (not completely down) until the grease flows from the outlet pipe.

Do not strike plunger with hammer at any stage

If required, the Whitmore pump setting tool incorporates features that restrict total plunger travel (Part No. LCS104-02).

7.9.2 Repeat for the other pump body.

8 GDU / Blade Installation

Three general GDU / Blade styles are covered:

- EasiBlade
- Standard
- Check Rail

8.1 Installing Standard Blade (rail clamp each end)

8.1.1 GDU / Blade can be 6 port (21cm long) or 8 port (40cm long), procedure is similar for both styles.

8.1.2 Once the position that the Blade is to be fitted to has been identified, lay the Blade unit adjacent to the rail (on the 4' side) to show the positions where the Blade clamps need to be fitted.

8.1.3 Both Blade clamps can now be fitted.

8.1.4 Locate the 50mm long special hex bolts through the upper holes of the clamp with the hexagon head located in the clamp slot. The main part of the clamp is fitted on the 4' side of the rail with the thread at the top and facing away from the rail.

8.1.5 The hook bolt is fitted under the rail with the hook clasping on the foot of the rail on the cess side with the threaded part inserted through the hole at the base of the clamp.

8.1.6 The washers and nyloc nut are then fitted to the hook bolt and fastened tight. Bed the clamp fully on the rail foot by striking the clamp base with a hammer (do not damage the rail foot or the clamp thread). Retighten the nyloc nut.

8.1.7 Repeat for the second clamp.

8.2 Application Variation for Bull Head Blade Rail Clamp

8.2.1 Blade Rail clamps are different for the Bull Head Rail. Clamps consist of two sections to fit around the rail flange.

8.2.2 Locate the 50mm long special hex bolts through the upper holes of the clamp with the hexagon head located in the clamp slot. The clamp is fitted on the 4' side of the rail with the thread stud at the top and facing away from the rail.

8.2.3 The rear half of the clamp is fitted on the opposite side with the M16 x 160 long bolt inserted under the rail through the hole in both clamps.

8.2.4 The washer and nyloc nut are then fitted to the hook bolt and fastened tight. Bed the clamp fully on the rail foot by striking the clamp base with a hammer (do not damage the rail foot or the clamp thread). Retighten the nyloc nut.

8.2.5 Repeat for the second clamp.

8.3 Installing the Blades

8.3.1 The blades are provided in left and right hand forms; the difference being the direction the hose tail points; the correct layout has hose tails pointing towards each other.

8.3.2 Fit the Blade onto the clamps using the M16 flat washer and nyloc nut onto each clamp and secure. Hold the Blade against the gauge face of the rail, if there is a gap between the back plate and the gauge face of the rail spacing shims will need to be fitted (see below). Do not allow the Blade End Bracket to contact the rail side face and rail clamp, if necessary, locate an M16 flat washer as packing between the rail clamp and rear face of the Blade End Bracket.

8.3.3 To fit the spacing shims, loosen the two M10 bolts that fit the Blade plates to the brackets. Slip the number of shims needed behind the plate and over the threads of the M10 bolts between the bracket and the Blade backplate.

8.3.4 Repeat for the other end of the Blade if necessary.

8.3.5 Set the Blade to the required height below the railhead using a suitable gauge / measuring device minimum distance is typically 18mm. The precise dimension is subject to rail profile and anticipated wheel wear, which must be carefully considered. If required a suitable gauge is available from Whitmore (Part No. LCS104-06).

8.3.6 Repeat the process for the remaining blades.

8.4 Application Variation for Other Rail Types

8.4.1 The fitting process is the same for the Bull Head and UIC60 style Blades; only the Blade End Bracket is different.

BH brackets are kinked and gold in colour

UIC60 brackets are kinked and silver in colour

8.5 Installing EasiBlades (single central rail clamp)

8.5.1 DropDown / EasiBlades are supplied as complete single units. From the 4’ / Gauge and midway between Sleepers / Ties slide the base (W bracket) over the rail foot as shown. Locate the hook bolt around the opposite side of the foot and tighten the single nyloc nut. Fully bed the base onto the rail using a hammer on the vertical faces of the ‘W’ bracket. Retighten the nyloc nut.

8.5.2 The blades are provided in left and right hand forms; the difference being the direction the hose tail points; pairs should have hose tails pointing towards each other.

8.5.3 Tilt the blade up so that the blade tip is towards the rail head and as high as possible, lightly tighten the two M16 pivot bolts.

8.5.4 Decide the required blade height and tap the steel lugs on the blade vertically down evenly using a hammer to achieve the required height. The setting gauge described earlier should be used to verify the heights.

8.5.5 There may be a slight gap between the tip of the blade and the rail. To close this gap tap the corner of the lug as necessary, **do not hammer the blade itself**.

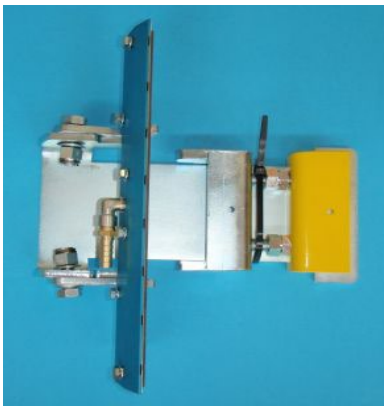
8.5.6 It is important that the lugs are a tight fit over the vertical face of the rail clamp. If there is any clearance before tightening, then insert suitable M16 washers between the two items to reduce clearance.

8.5.7 Repeat process for each DropDown / EasiBlade.

8.6 EasiBlade / DropDown Installation, Low-Clearance Rail Clamp Bracket

8.6.1 Remove the cable tie with a wire cutter.

8.6.2 Loosen the M16 nuts and separate the slab track bolt anchor (yellow component) from the base clamp.



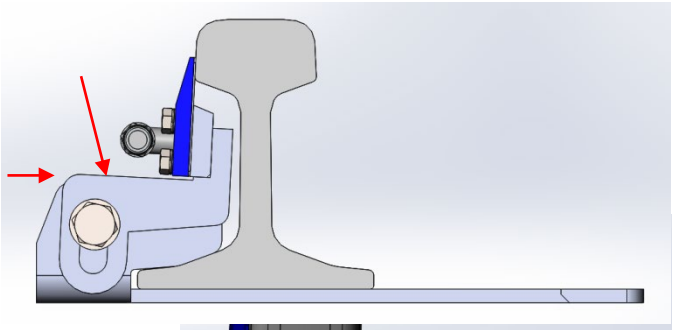
8.6.3 Slide the base clamp under the rail.

8.6.4 Tighten the M16 bolts and the two-piece hardlock M16 nuts (a) [see below for instructions on how to assemble hardlock nuts] in order to be able to pre-adjust the blade against the rail as shown.

8.6.5 If necessary, use a rubber mallet (hit where the red arrow is pointed) to secure the base clamp in place.

8.6.6 Adjust the M16 nuts in order to be able to bring the foot clamp and bolt anchor together.

8.6.7 Slide the foot clamp underneath the rail (use a rubber mallet if necessary).

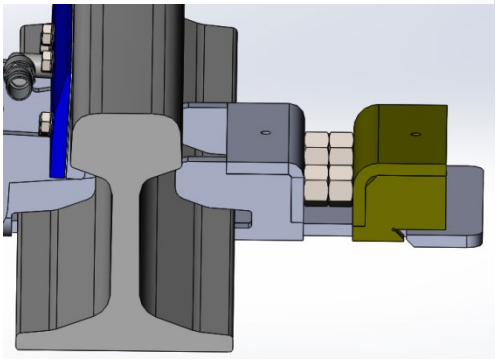


8.6.8 Slide the bolt anchor so it matches the chamfer of the base clamp.

8.6.9 Push the bolt anchor against the chamfer of the base clamp.

8.6.10 Tighten the M16 nuts to ~195Nm (closest to the bolt anchor).

8.6.11 Tighten the M16 nuts to ~195Nm (furthest from the bolt anchor) to lock the base clamp onto the rail.



8.6.12 Adjust the height of the blade in relation to the top of the rail (20-22mm typically).

8.6.13 Tighten the two-piece hardlock nuts (see below).

8.6.14 Important: Confirm that that the blade is against the rail, at the desired height and the whole assembly is tightly secured to the rail.

Hardlock installation procedure

1. Use a spanner to tighten the convex nut with rotated torque (for a M16 – torque is 97Nm to 257Nm).

2. Thread down the concave nut onto the convex nut manually.

3. Tighten the concave nut with the spanner, about one turn. (For a M16 – torque is 70Nm to 100Nm).

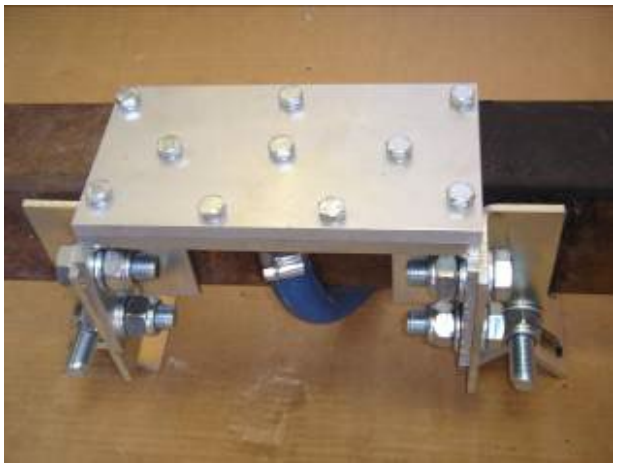
8.7 Installing Check Rail Blades in place of Gauge Face Blades

The procedure is similar to GDU / Blade installation on the high rail. Procedure outlined covers Bull Head, UIC33, UIC54, UIC56 Check Rail. After physical install proceed from Manual section on filling and priming principals are the same for Check Rail GDUs and GDU / Blades.

Bull Head Check Rail

Flat Bottom Check Rail

CEN33 / UIC33 / U69 Check Rail



8.7.1 Fit rail clamps to the Check Rail generally following procedures outlined in for gauge face GDUs.

8.7.2 Blade fixing studs on the clamps should be oriented towards the 4', clamp spacing to suit check rail blades and the full assembly located midway between sleepers.

8.7.3 Locate the Check Rail assembly on the two rail clamp studs and tighten the two M16 fasteners securely.

8.7.4 The blade has vertical and horizontal adjustment through setting of the M16 fastenings on the support bracket. Arrange the blade so that the exit ports are between 2 and 4mm from the Check Rail face and the blade is horizontal, lock securely in that position.

8.8 Fitting the Delivery Hoses

8.8.1 Fit one end of a delivery hose to the hose tail inlet on the Blade with a hose clip and measure the other end of the hose to the grease outlet tail of the pump body, cut the hose and secure it with a hose clip. Ensure that the hose runs under the rails and is not kinked or squashed.

8.8.2 Repeat the procedure for the other hose.

8.9 Fill the Hoses and Blades

8.9.1 Using the wood shaft of a suitable hammer keep depressing one of the plungers until grease appears at the Blade. Do not fully depress plunger, maintain a minimum 1mm clearance with pump body.

8.9.2 Repeat for the other Blade.

Alternative

The operation can be made more efficient by using the GDU / Blade priming kit available from Whitmore (Part No. LCS102-08).

- Prior to filling the delivery hose to the pump body outlet.
- Insert the filler connector into the free end of the delivery hose and clamp with provided hose clip.
- Connect reservoir hand pump and operate until grease just starts to exit the Blade ports.
- Remove priming kit from hose.
- Connect hose to pump body outlet.
- Repeat on second Blade.
- Revert to previous section for final priming.

9 Routine Maintenance

Prior to any maintenance it is necessary to have the following data.

- The date that the lubricator was last maintained.
- The final depth of the reservoir piston when the lubricator was last maintained.
- Plunger heights when the lubricator was last maintained.
- Any works that were carried out when the lubricator was last maintained that could change the grease output.
- Any work that was identified but not carried out on the previous visit.

9.1 Measuring the Reservoir

9.1.1 This measurement is the only true guide to how much grease the lubricator has used since it was last visited. It is necessary to have the previous recordings of the last inspection, this will enable you to make judgements and carry out corrective action if needed without any guesswork.

9.1.2 Using a rule, insert it into the centre hole in the front cover of the reservoir, making sure that the side of the rule is touching against the side of the hole and the ruler is at the same angle that the reservoir is at.

9.1.3 When the rule stops at the rear most face of the piston, check exactly the measurement (in millimetres) against the face of the front cover at the centre hole.

9.1.4 Record this measurement and compare it to the data that you have brought to site.

9.1.5 By subtracting the final measurement recorded from the last time the lubricator was maintained from the measurement you have recorded this time would give you the grease used in millimetres.

9.1.6 The type of lubricator, its installation and rail traffic will determine the volume of grease used since the lubricator was last maintained. Photograph shows Whitmore reservoir (Part No. LCS102-01) where 1mm of piston displacement equates to 0.12kg of grease.

9.1.7 However, do not make any alterations at this stage, as other reasons for incorrect grease outputs may be the cause.

9.2 Checking for Leaks

9.2.1 The lubricator should be checked for leaks. With some leaks it will be necessary to take the leak into consideration in regard to the grease output that you have noted.

9.2.2 Leaks on the primary side (i.e. feed hoses or inlet assembly) of the lubricator will cause an increase in grease output that is not due to the settings of the lubricator.

9.2.3 Tighten any hose clips or nuts / bolts / screws that maybe the cause of the leak and / or replace the faulty part that is causing the leak.

9.3 Cleaning the Lubricator and Surrounding Site

9.3.1 It is at this stage the lubricator must be cleaned. The reasons are that when the checks are made, you will be able note measurements and assess the operations of the lubricator accurately and carry out the works in a cleaner environment. The reason why the lubricator must not be cleaned before this stage, is that once it is clean, you will have removed evidence of the leak.

9.3.2 The whole of the lubricator must be cleaned thoroughly.

9.3.3 The site must be cleared of excess grease.

9.3.4 If oil absorbent granules are being used, the existing, soiled granules should be removed and replaced with fresh granules. This must be done with extreme caution, if the granules are allowed to get into the lubricator system via the filling valve, the system may become blocked or worse the non-return valve can be held open.

9.3.5 The surrounding rail chairs and clips, all rails in the immediate vicinity and the insulator pots need to be cleaned. 3rd and 4th rail are needed to be cleaned to ensure they are free of grease and dirt; this is to avoid causing a fire risk and hazardous under footing.

Do not attempt to clean live traction current rails with the current switched on.

9.4 Measuring the Plunger Heights

9.4.1 This section is for the initial measurements of the plunger heights. There are two measurements to be recorded, one for the running on and one for the running off. The running on and running off are identified by the direction of traffic, the running on being the first plunger that the train wheels will strike, and the running off being the second plunger that the train wheels will strike. The height to be measured is the distance between the levels of the top of the plunger head, and the top of the crown of the rail.

9.4.2 The plunger heights must be measured and recorded. The plunger heights must be measured to the nearest 0.25 of a millimetre.

9.4.3 If the lubricator has not used the amount of grease that is required for this lubricator since the last time that it was maintained.

- Check that the plunger heights are the same as when the lubricator was last maintained.
- You may find that the plunger heights have changed due to loose bolts on the pump unit bracket causing the pump unit to move, check the bolts and tighten if necessary. If necessary, reset the plunger heights once all other checks have been carried out.
- If the plunger heights are lower than previous but the bolts are all tight, check that the plungers have not become flat, if so change them, also the plungers may be stuck down due to defective springs, this will be detected by the plunger operation test later in this Manual.
- If the plunger heights have been reset on this visit record the new heights.

Note that if the plungers are being raised, they should only be raised by 0.25mm at a time and must be inspected on the following shift. However, if the plunger heights are known to have dropped they may be reset to their original height, but a follow up inspection must still be made on the following shift. Plunger height should be adjusted up (to increase) or down (to decrease), grease output to suit local traffic / wheel pattern.

9.5 Checking for Airlocks

9.5.1 The following shows steps taken to check for airlocks.

- Remove the delivery hose from the pump outlet.
- Using the 10mm "T" bar / hammer shaft, depress one of the plungers downwards several times.
- If the plunger has no resistance, and / or there is no grease flow, the pumps are probably air locked.
- Record the results.
- If the test was not satisfactory, clear the air lock. The easiest method is by loosening the air bleed screw until the groove on the threaded section is exposed. Using the 10mm "T" bar / hammer shaft, depress the plungers downwards several times; do not exceed permissible plunger travel.
- Record the results.
- If the attempt to clear the airlock was not satisfactory check that there is a grease flow from the reservoir.
- Repeat the sequence for the remaining plunger.

9.5.2 Air locks that are present on arrival at the lubricator will give you certain information into why the lubricator has not had a sufficient grease output.

9.5.3 If the lubricator has not used any or enough grease required for that particular lubricator but air locks are present, plungers must not be raised, as due to the air locks, the lubricator would have not been working.

9.5.4 If the lubricator has not used any grease, but no air locks are present other corrective actions should be undertaken.

9.6 Checking for Defective Plungers and Plunger Springs

9.6.1 The operation test of this section should be made into two parts:

- Firstly, by using the pump pliers, grip the plunger and move the plunger up and down to ensure that there is no free movement of the plunger or plunger return spring.
- The second test is using the 10mm "T" bar / hammer shaft, depress the plungers, ensure that the return of the plunger is not too slow and in addition check the plunger is returning fully after every depression of the plunger. **Do not fully depress plunger to avoid damage**.
- Record the results of the test.
- If the test is not satisfactory then the plunger and / or plunger return springs should be changed.

9.7 Checking for a Defective Outlet Non-Return Valve

9.7.1 If the grease is flowing onto the spreader bar or out of the pump body outlet ports, when the delivery hoses are removed, without the plungers being struck, the non-return valve may be defective.

9.7.2 If the non-return valve is found to be defective, the valve cannot be repaired and a new valve is not available the lubricator must be temporarily locked off, if this is not done, **excessive grease will migrate onto the head of the rail**.

9.8 Inspection of the GDU / Blades

9.8.1 Visually check the GDU / Blades for damage and / or wear.

9.8.2 Check that the fastenings are secure.

9.8.3 Depress the plungers, (several times for each plunger), using the 10mm “T” bar / hammer shaft and ensure all of the ports on the top face of the spreader bar are dispersing grease. This will show if there is hardened grease, inside the GDU / Blade and/or if the GDU / Blade slots are blocked. Do not fully depress plunger to avoid damage.

9.8.4 Record your findings and any works carried out.

9.9 Filling the Reservoir

9.9.1 Ensure that the non-return filling valve is clean, place the filling pump nozzle over the non-return filling valve on the reservoir and pump the handle.

9.9.2 Do not fill the reservoir to more than stated amount on label plate or as referenced in this Manual.

9.9.3 Record the final reservoir measurements.

WARNING

The reservoir is fitted with a large compression spring and the reservoir mast is not disassembled without the spider locking bar being in place. Take extra care when handling the compressed spring as stored energy can be very dangerous.

10 Periodic Replacement of Components

10.1.1 It is recommended that various system items are replaced periodically, exchange will be dependent on traffic frequency and should be monitored during maintenance visits but as a minimum should include the following.

	Exchange Frequency
Pump	
Springs	2 years
Plungers	2 years
Fasteners	5 years
Blade	
Complete unit	2 years
Hose	
Blade and Reservoir Hose	2 years
Reservoir	
Seals	5 years
Springs	5 years
Filler Valves	5 years

IMPORTANT
Maintenance and repair of the lubricator and reservoir should only be carried out by trained personnel. Compressed springs inside the lubricator may be dangerous if handled incorrectly.

11 Fastener Torque Settings

	Bolt Size	Bolt Head	Nm	lbf.ft
Blades				
EasiBlade				
Rail Clamp W bracket Hook Bolt	M16	24mm	55	41
Pivot Bolts	M16	24mm	60	44
Blade Front Plate	M8	13mm	25	18
Standard Blade				
Rail Clamp Hook Bolt	M16	24mm	55	41
Standard Blade End Bracket / Rail Clamp	M16	24mm	55	41
Standard Blade End Bracket	M10	17mm	45	33
Blade Front Plate	M8	13mm	25	18
Low Clearance Blades				
Low Level Wedge Lock nuts	M16	24mm	70	52
Pivot Bolts	M16	24mm	60	44
Blade Front Plate	M8	13mm	25	18
Check Rail				
Rail Clamp Hook or Bolt	M16	24mm	55	41
Pivot Bolts	M16	24mm	60	44
Blade Top Plate	M8	13mm	25	18
Mechanical Pump				
Double Pump (PD50 and PD25)				
Rail Clamp Hook Bolt	M16	24mm	55	41
Rail Clamp / Pump Bracket	M16	24mm	45	33
Pump Bracket / Pump Body	M8	13mm	15	11
Pump Bleed Screw (brass)	M8	13mm	3	2
Pump Plunger Lock	M8	13mm	3	2
Reservoir				
Reservoir front & Back Plate	M12	19mm	55	41

12 Parts List

Contact Whitmore for advice / availability

13 Basic Installation Tool Kit

A selection of hand tools is suggested to correctly fit and maintain the pumps, specific recommended Whitmore products are referenced above.

T Handled 2.5mm Allen Key
Ratchet Handle 1/2" Drive
Combination Spanner 24mm
Combination Spanner 19mm
Combination Spanner 17mm
Combination Spanner 13mm
Combination Spanner $1^{5}/_{16}$"
Socket 7mm 3/8" drive
Socket 13mm 1/2" drive
Socket 17mm 1/2" drive
Socket 19mm 1/2" drive
Socket 24mm 1/2" drive
Socket Long Reach 24mm 1/2" drive
Ball Pein 1lb Hammer
Junior Hacksaw and Blades
Screwdriver 6" x 1/4" flat blade, flared tip
Folding Rule (wood or plastic)
Tool Bag

14 Maintenance Log Sheet Example

Whitmore Mechanical Lubricator Maintenance Log Sheet

Maintained By	Maintainers Name	Maintain Date	Lubricator No.	
			Mileage	
Lub' Manufacturer	Whitmore		ELR	
Pump Model		Serial	Road	Up / Down
Reservoir Model		Serial	Rail Type	
Reservoir Model	Blade Model		GDU / Blade Config	2 - 4
Special Product Notes				

1. Reservoir Capacity	37kg	Initial mm (80mm Full)	Final mm (280mm Empty)
	9kg	Initial mm (50mm Full)	Final mm (200mm Empty)

2. Grease Integrity / Leakage			
2.1 Plunger Running-on	Yes / No	2.4 Reservoir piston	Yes / No
2.2 Plunger Running-off	Yes / No	2.5 Pump body inlet pipe	Yes / No
2.3 Hoses	Yes / No	2.6 Pump body outlet ports	Yes / No
		2.7 GDU's	Yes / No

	LH Rail / Running-on	RH Rail / Running-off
3. Initial plunger height.	Initial Height	Final Height

4. GDU plate height.	1	2	3	4
Initial				
Final				

5. Grease Flow Test		
5.1 Airlocks Hammer test	PASS / FAIL	PASS / FAIL
If above test failed, cleared airlock	YES / NO	YES / NO
Continuous grease flow	PASS / FAIL	PASS / FAIL

6. Pump Operation Test	PASS / FAIL	PASS / FAIL
6.1 Replaced spring	YES / NO	YES / NO
6.2 Replaced plungers	YES / NO	YES / NO
6.3 Replaced non-return valve	YES / NO	YES / NO
6.4 Replaced pump body	YES / NO	YES / NO

7. GDU		
7.1 Visual check	PASS / FAIL	PASS / FAIL
7.2 Pumped through GDUs	YES / NO	YES / NO
7.3 Removed & cleaned plates	YES / NO	YES / NO
7.4 Fitted new plates	YES / NO	YES / NO

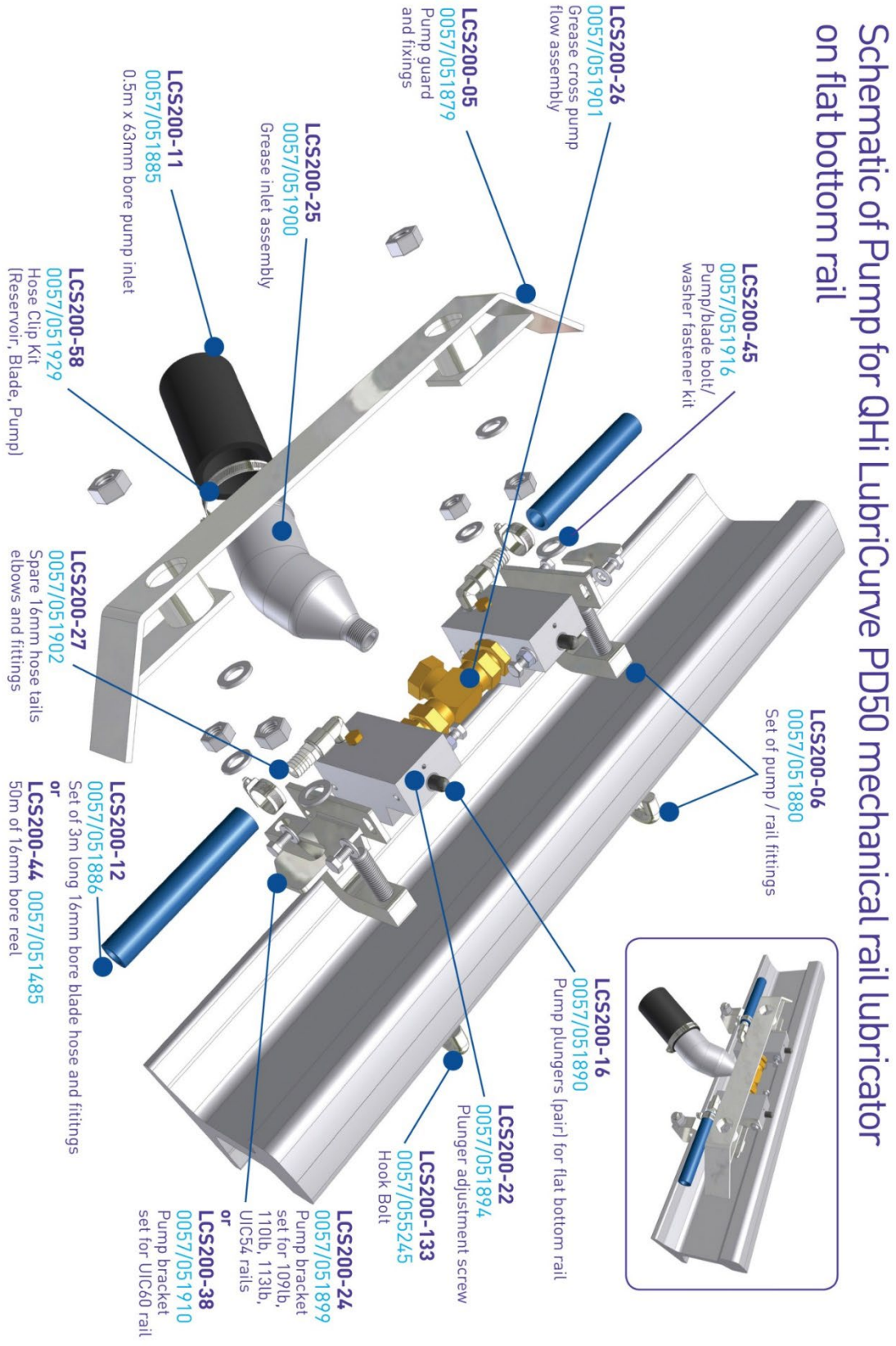
8. Grease distribution through curve	
8.1 Over rail head	YES / NO
8.2 If yes, number of sleepers	
8.3 Grease distribution	¼ - ½ - ¾ - Full Curve PASS / FAIL
8.4 Total Miles Covered	Miles
If any part of section 10 has failed what action, if necessary, was taken	

9. Lubricator fastenings check	YES / NO

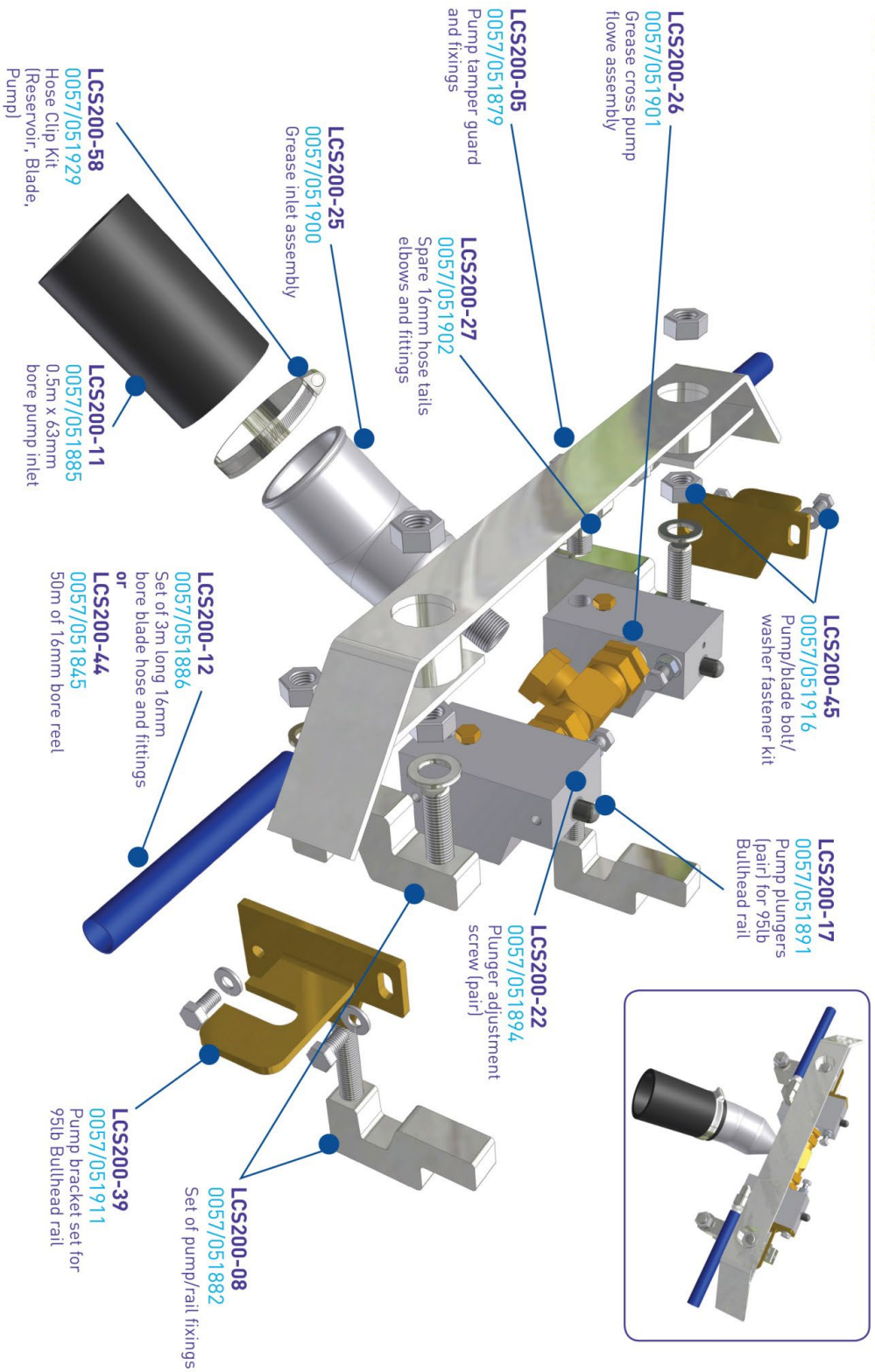
/ GENERAL COMMENTS	Enviromental/Waste		Spares Required
	Any waste including packing and empty grease tubs handed over to Client for appropriate disposal		

Post Install site accepted by:

15 Exploded Views of System Elements



Schematic of Pump for QHi Lubricurve PD50 mechanical rail lubricator for 95lb Bullhead rail



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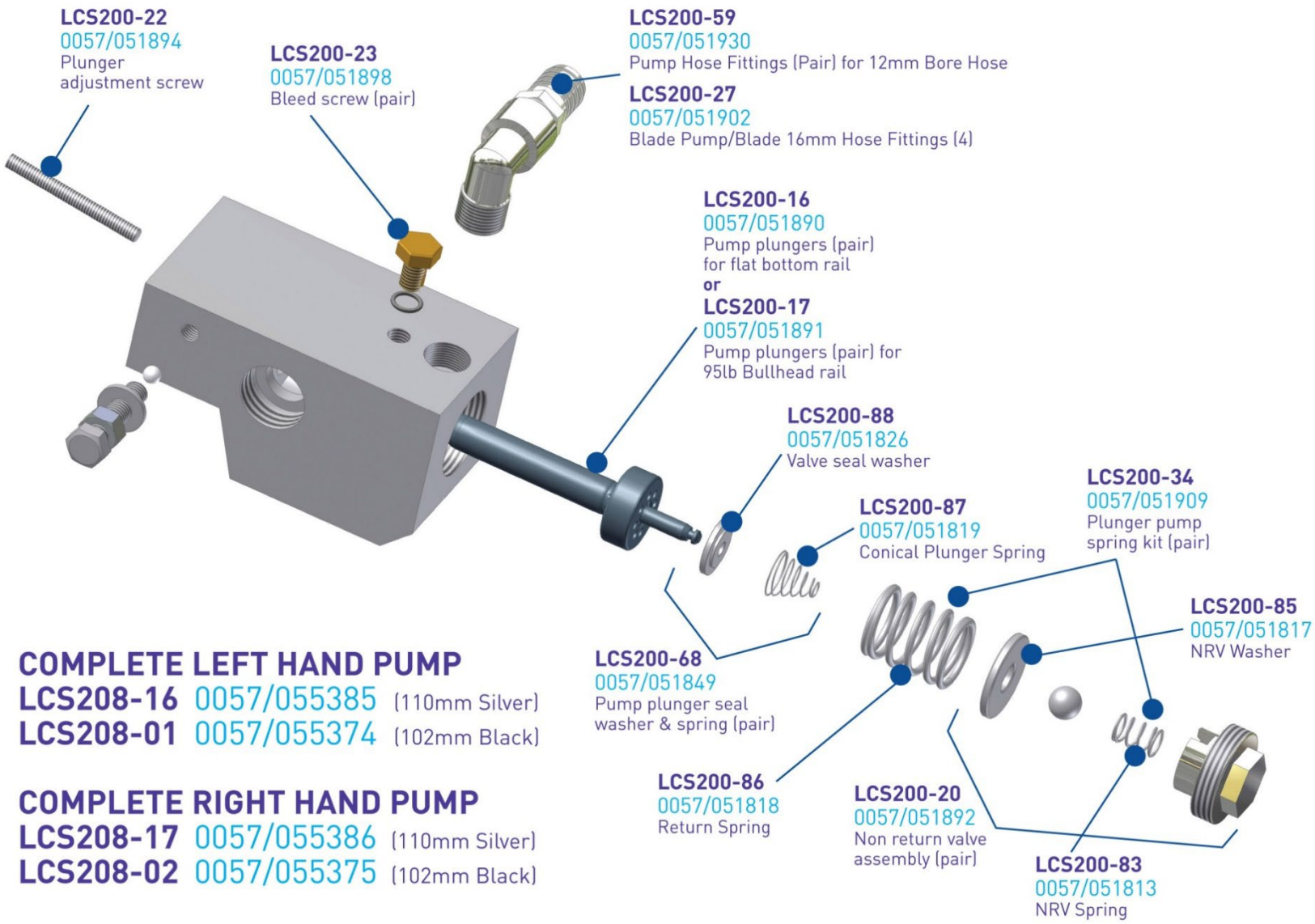
Schematic of Typical Pump for LubriCurve PD50 Mechanical Rail Lubricator



COMPLETE LEFT HAND PUMP

LCS208-16 0057/055385 (110mm Silver)
LCS208-01 0057/055374 (102mm Black)

COMPLETE RIGHT HAND PUMP

LCS208-17 0057/055386 (110mm Silver)
LCS208-02 0057/055375 (102mm Black)

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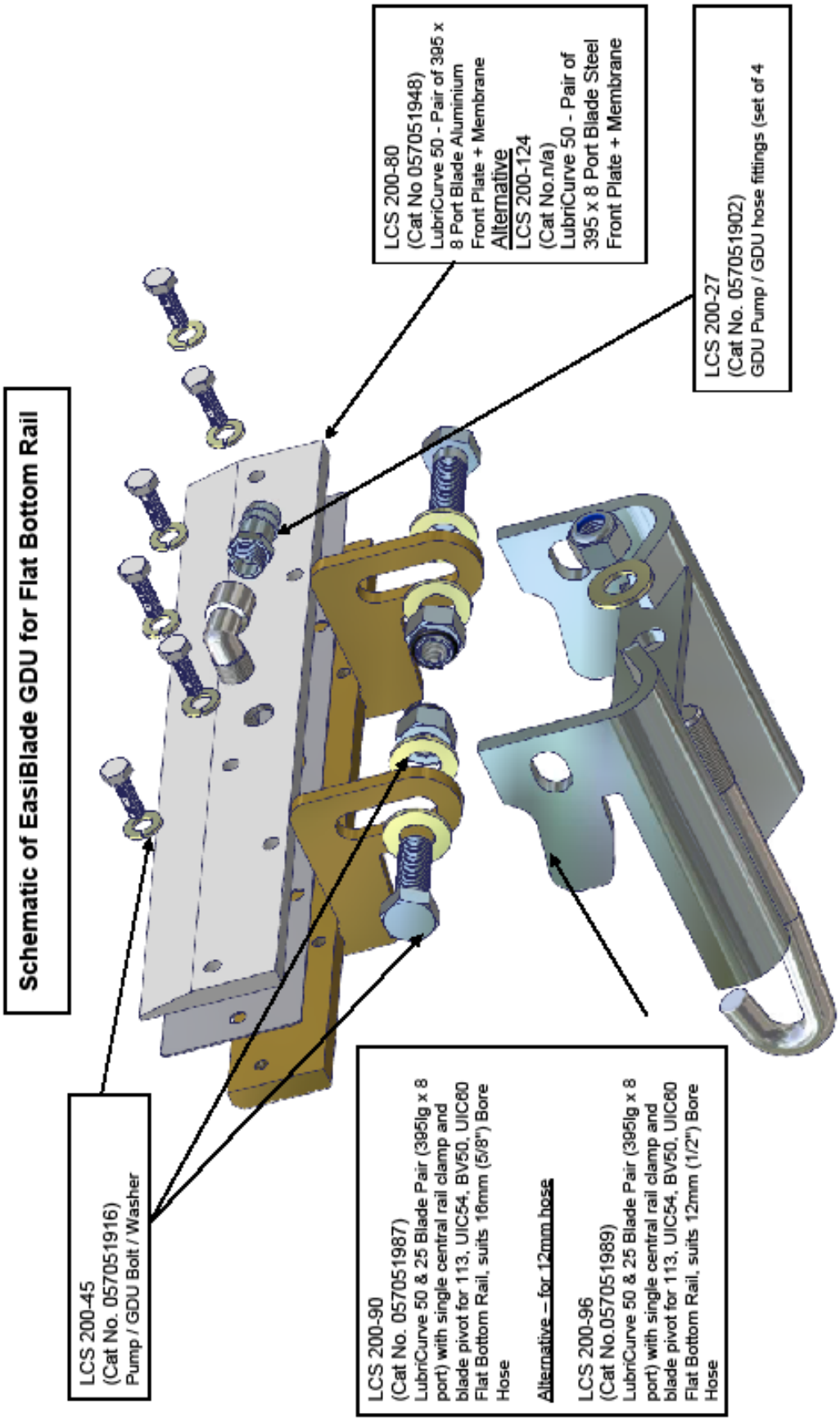
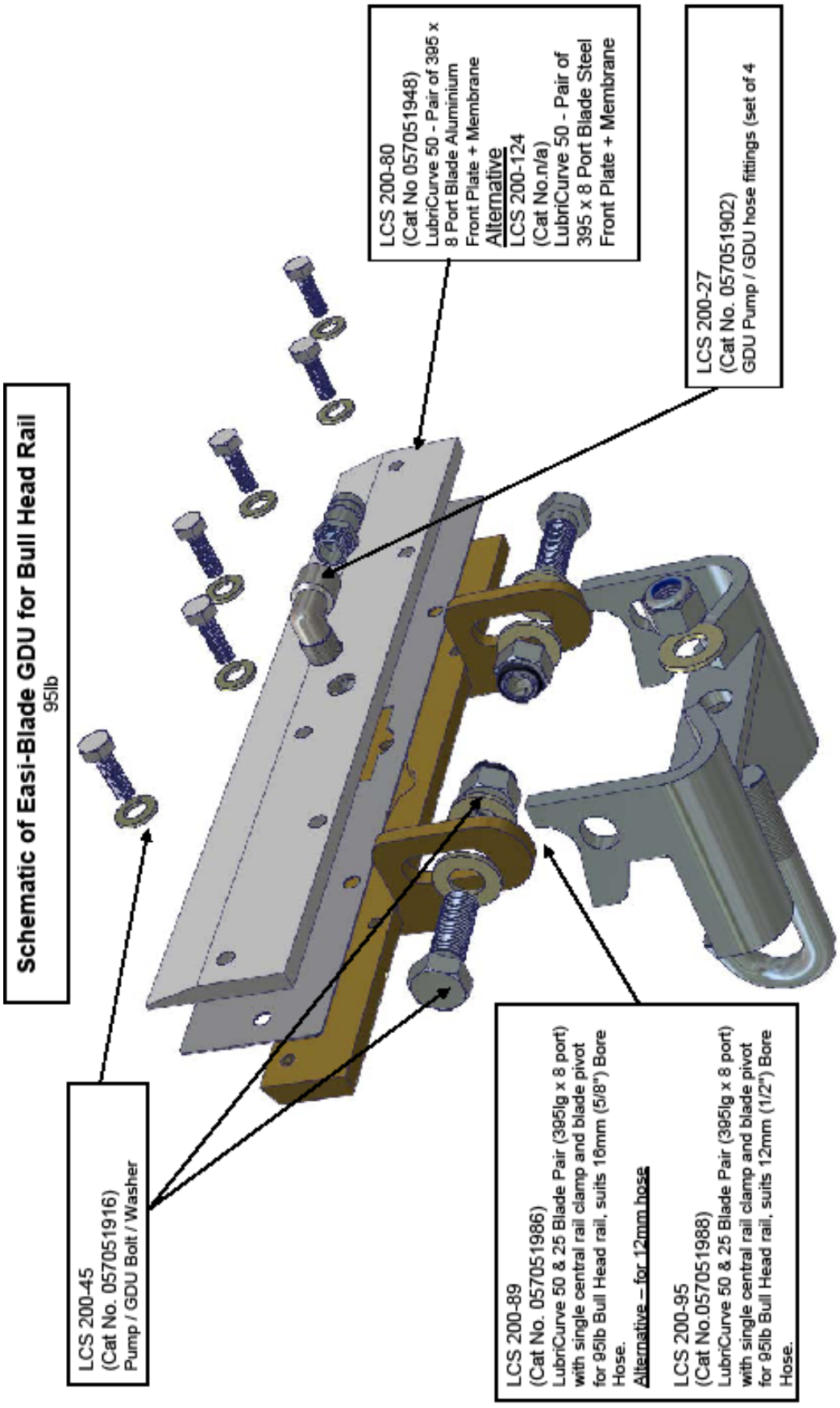

Schematic of EasiBlade GDU for Flat Bottom Rail
LCS 200-80
(Cat No 057051948)
LubriCurve 50 - Pair of 395 x 8 Port Blade Aluminium Front Plate + Membrane
Alternative
LCS 200-124
(Cat No.n/a)
LubriCurve 50 - Pair of 395 x 8 Port Blade Steel Front Plate + Membrane
LCS 200-27
(Cat No. 057051902)
GDU Pump / GDU hose fittings (set of 4
LCS 200-45
(Cat No. 057051916)
Pump / GDU Bolt / Washer
LCS 200-90
(Cat No. 057051987)
LubriCurve 50 & 25 Blade Pair (395lg x 8 port) with single central rail clamp and blade pivot for 113, UIC54, BV50, UIC60 Flat Bottom Rail, suits 16mm (5/8") Bore Hose
Alternative – for 12mm hose
LCS 200-96
(Cat No.057051989)
LubriCurve 50 & 25 Blade Pair (395lg x 8 port) with single central rail clamp and blade pivot for 113, UIC54, BV50, UIC60 Flat Bottom Rail, suits 12mm (1/2") Bore Hose

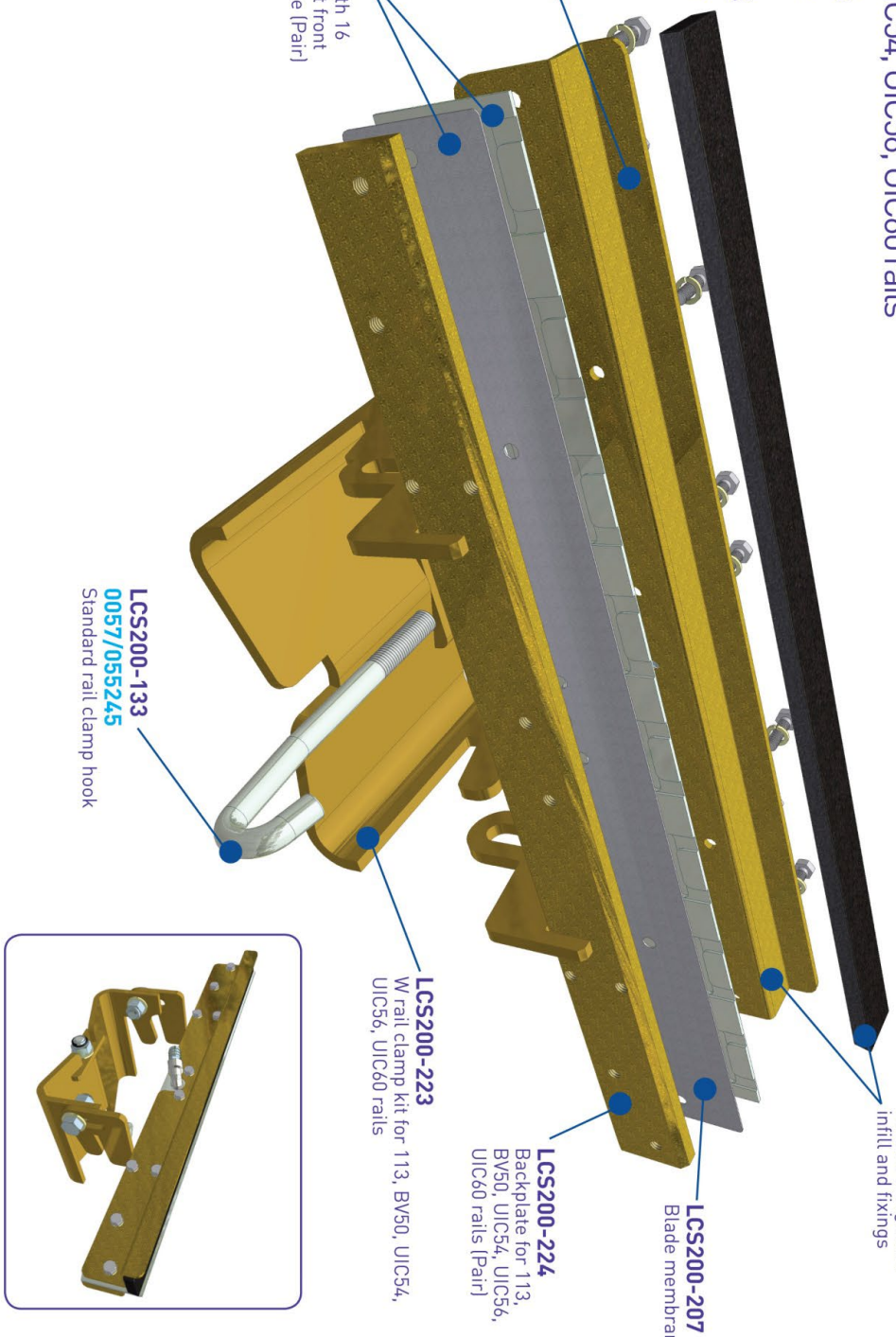

Schematic of Easi-Blade GDU for Bull Head Rail
95lb
LCS 200-80
(Cat No 057051948)
LubriCurve 50 - Pair of 395 x 8 Port Blade Aluminium Front Plate + Membrane
Alternative
LCS 200-124
(Cat No.n/a)
LubriCurve 50 - Pair of 395 x 8 Port Blade Steel Front Plate + Membrane
LCS 200-27
(Cat No. 057051902)
GDU Pump / GDU hose fittings (set of 4
LCS 200-45
(Cat No. 057051916)
Pump / GDU Bolt / Washer
LCS 200-89
(Cat No. 057051986)
LubriCurve 50 & 25 Blade Pair (395lg x 8 port) with single central rail clamp and blade pivot for 95lb Bull Head rail, suits 16mm (5/8") Bore Hose.
Alternative – for 12mm hose
LCS 200-95
(Cat No.057051988)
LubriCurve 50 & 25 Blade Pair (385lg x 8 port) with single central rail clamp and blade pivot for 95lb Bull Head rail, suits 12mm (1/2") Bore Hose.

60cm EasiBlade
Complete blade (trough and infill option)

Suits 113, UIC54, UIC56, UIC60 rails

LCS200-206
16mm hose

LCS200-218
12mm hose



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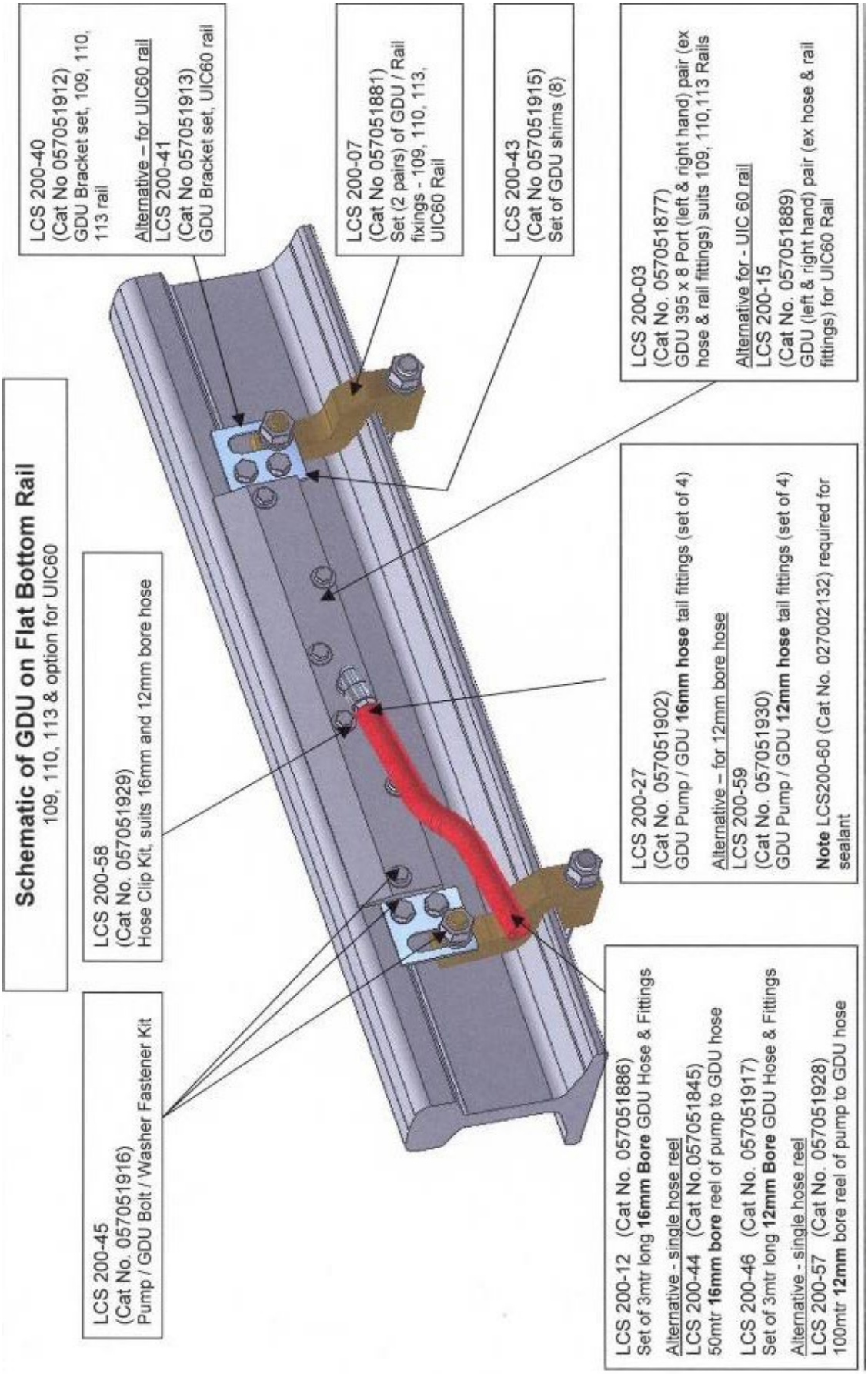
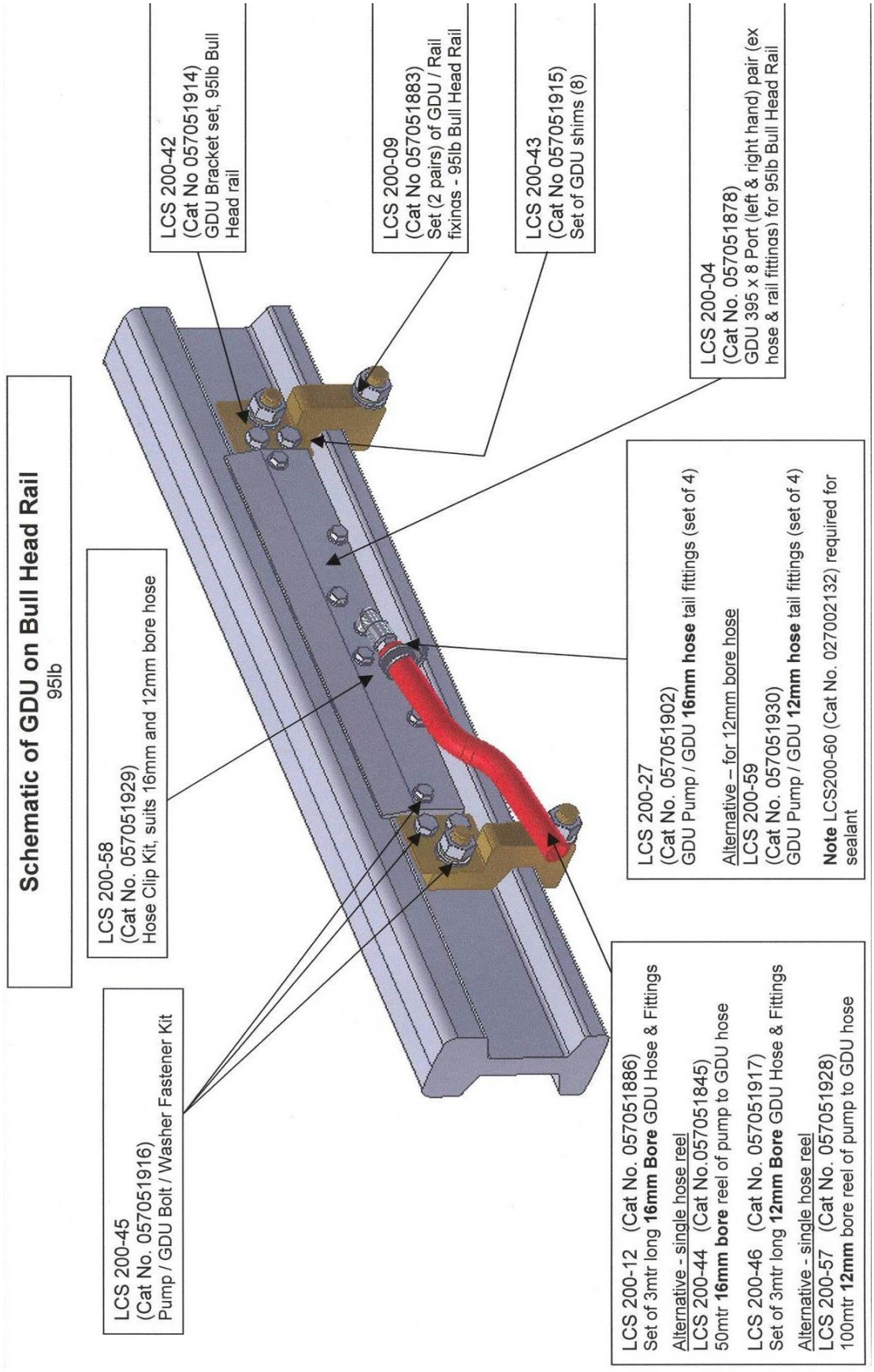

Schematic of GDU on Flat Bottom Rail
109, 110, 113 & option for UIC60
LCS 200-40
(Cat No 057051912)
GDU Bracket set, 109, 110, 113 rail
Alternative – for UIC60 rail
LCS 200-41
(Cat No 057051913)
GDU Bracket set, UIC60 rail
LCS 200-07
(Cat No 057051881)
Set (2 pairs) of GDU / Rail fixings - 109, 110, 113, UIC60 Rail
LCS 200-43
(Cat No 057051915)
Set of GDU shims (8)
LCS 200-03
(Cat No. 057051877)
GDU 395 x 8 Port (left & right hand) pair (ex hose & rail fittings) suits 109, 110,113 Rails
Alternative for - UIC 60 rail
LCS 200-15
(Cat No. 057051889)
GDU (left & right hand) pair (ex hose & rail fittings) for UIC60 Rail
LCS 200-58
(Cat No. 057051929)
Hose Clip Kit, suits 16mm and 12mm bore hose
LCS 200-27
(Cat No. 057051902)
GDU Pump / GDU 16mm hose tail fittings (set of 4)
Alternative – for 12mm bore hose
LCS 200-59
(Cat No. 057051930)
GDU Pump / GDU 12mm hose tail fittings (set of 4)
Note LCS200-60 (Cat No. 027002132) required for sealant
LCS 200-45
(Cat No. 057051916)
Pump / GDU Bolt / Washer Fastener Kit
LCS 200-12 (Cat No. 057051886)
Set of 3mtr long 16mm Bore GDU Hose & Fittings
Alternative - single hose reel
LCS 200-44 (Cat No.057051845)
50mtr 16mm bore reel of pump to GDU hose
LCS 200-46 (Cat No. 057051917)
Set of 3mtr long 12mm Bore GDU Hose & Fittings
Alternative - single hose reel
LCS 200-57 (Cat No. 057051928)
100mtr 12mm bore reel of pump to GDU hose


Schematic of GDU on Bull Head Rail
95lb
LCS 200-42
(Cat No 057051914)
GDU Bracket set, 95lb Bull Head rail
LCS 200-09
(Cat No 057051883)
Set (2 pairs) of GDU / Rail fixings - 95lb Bull Head Rail
LCS 200-43
(Cat No 057051915)
Set of GDU shims (8)
LCS 200-04
(Cat No. 057051878)
GDU 395 x 8 Port (left & right hand) pair (ex hose & rail fittings) for 95lb Bull Head Rail
LCS 200-58
(Cat No. 057051929)
Hose Clip Kit, suits 16mm and 12mm bore hose
LCS 200-27
(Cat No. 057051902)
GDU Pump / GDU 16mm hose tail fittings (set of 4)
Alternative – for 12mm bore hose
LCS 200-59
(Cat No. 057051930)
GDU Pump / GDU 12mm hose tail fittings (set of 4)
Note LCS200-60 (Cat No. 027002132) required for sealant
LCS 200-45
(Cat No. 057051916)
Pump / GDU Bolt / Washer Fastener Kit
LCS 200-12 (Cat No. 057051886)
Set of 3mtr long 16mm Bore GDU Hose & Fittings
Alternative - single hose reel
LCS 200-44 (Cat No.057051845)
50mtr 16mm bore reel of pump to GDU hose
LCS 200-46 (Cat No. 057051917)
Set of 3mtr long 12mm Bore GDU Hose & Fittings
Alternative - single hose reel
LCS 200-57 (Cat No. 057051928)
100mtr 12mm bore reel of pump to GDU hose

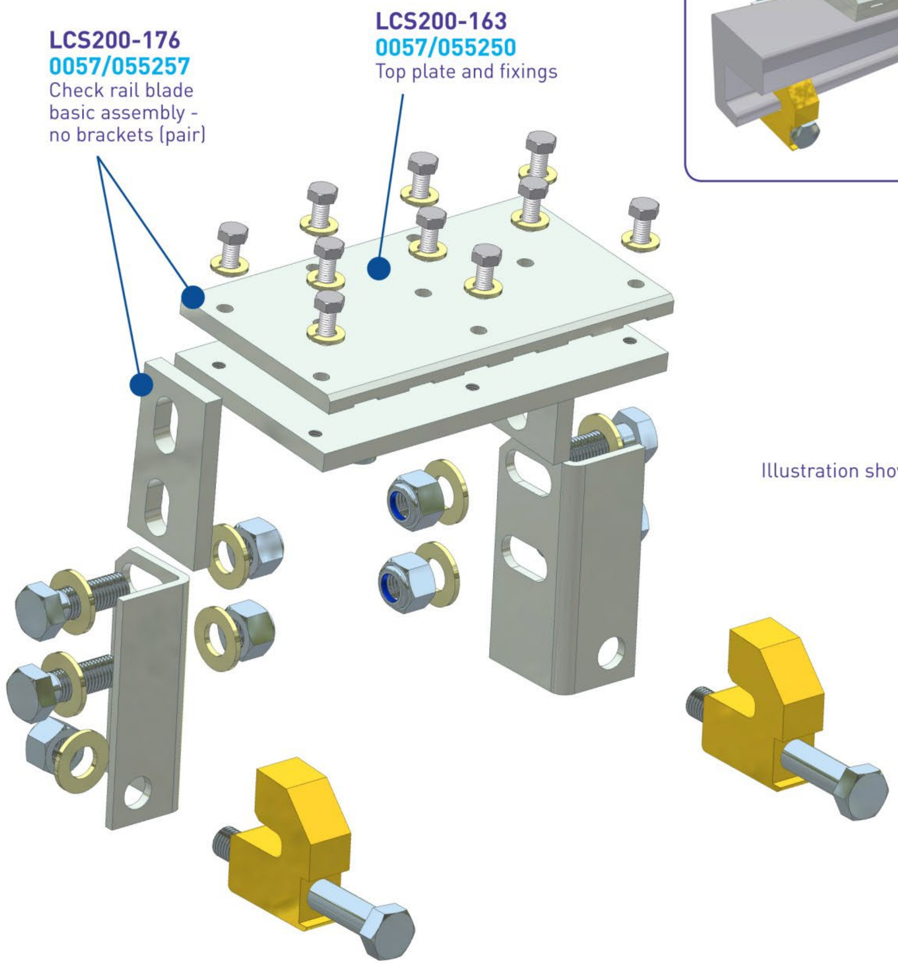
Schematic of QHi EasiCheck rail blades (Pair)

LCS200-11 0057/051887
Flat bottom running rail / bull head check rail

LCS200-14 0057/051888
Bull head running rail / bull head check rail

LCS200-53 0057/051924
Flat bottom running rail / UIC33 check rail

LCS200-61 0057/051285
Flat bottom running rail / flat bottom check rail



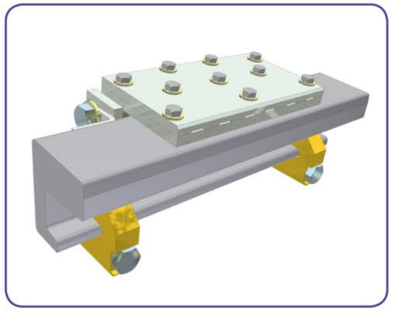


Illustration shows UIC33 option

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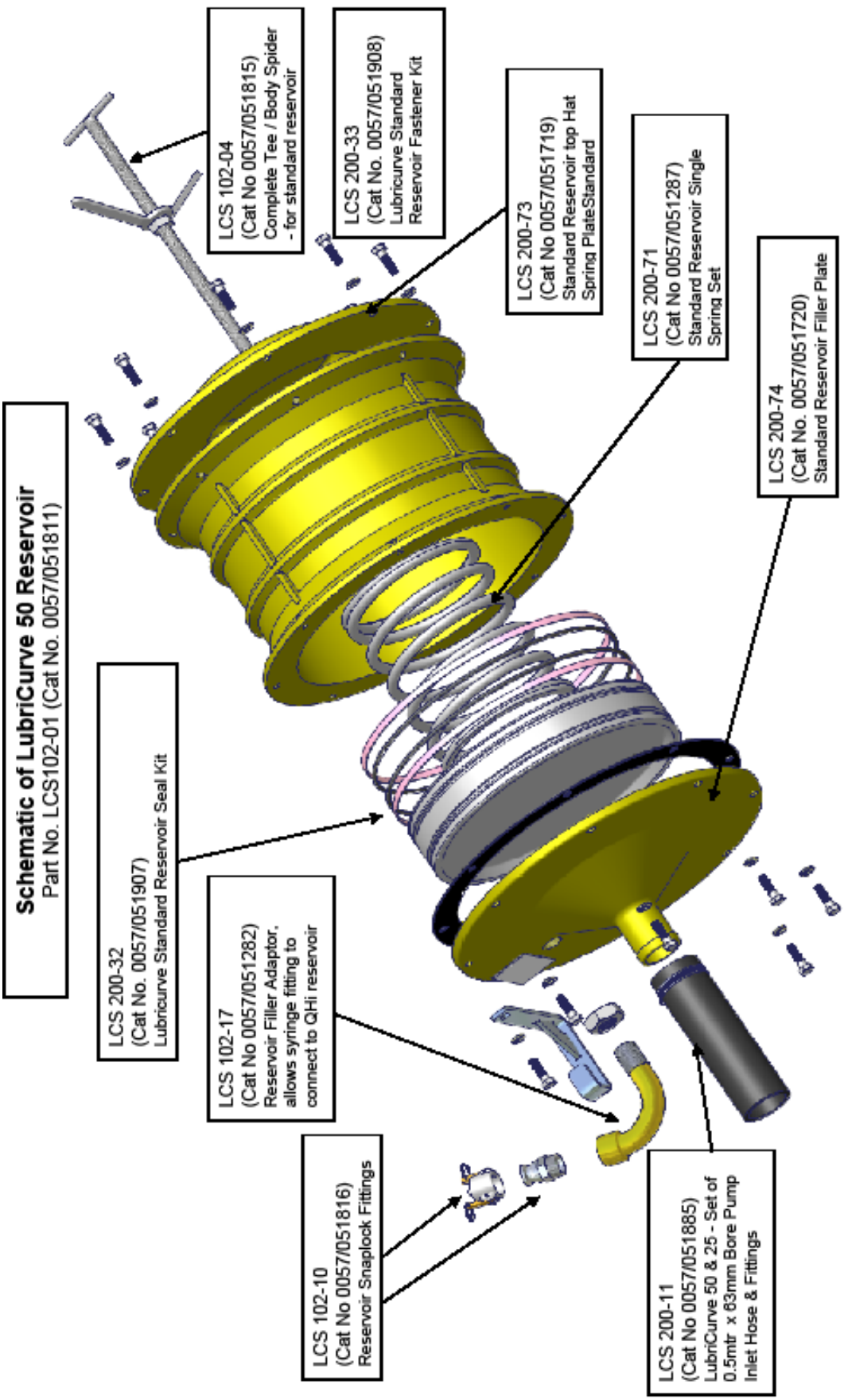

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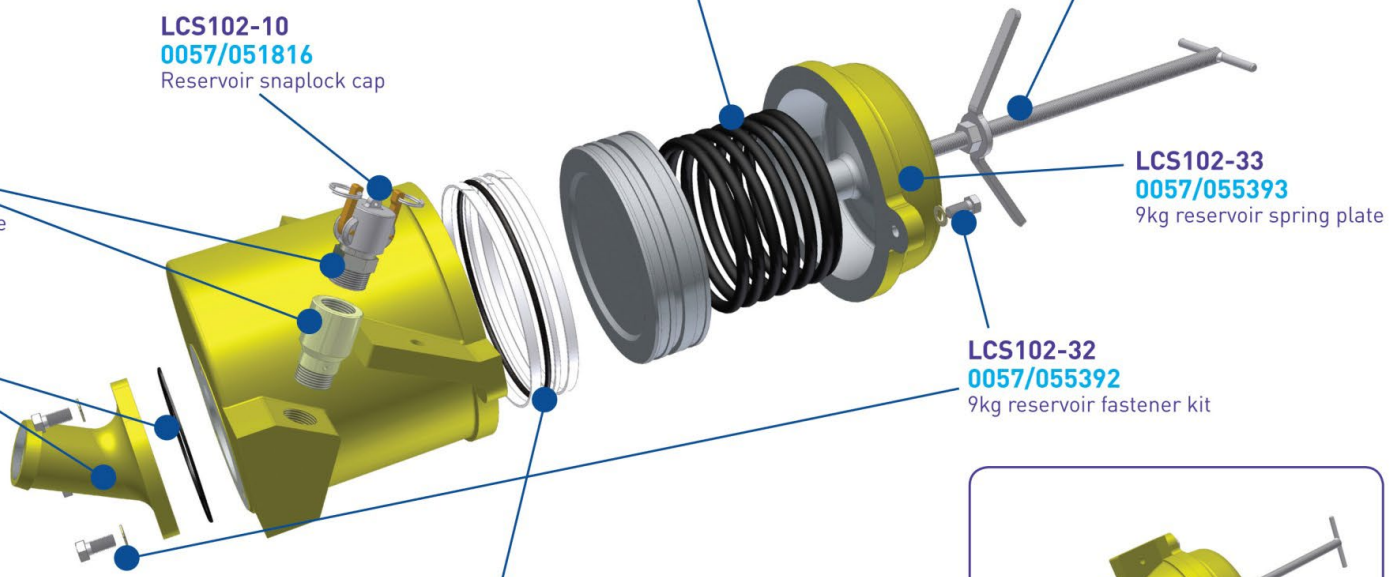
Schematic of 9kg reservoir with 63mm angled output hose

LCS102-27 0057/055389

LCS102-37 0057/055397

Kit includes a 63mm to 25mm pump inlet hose and fittings



LCS102-36
0057/055396
9kg reservoir spring

LCS102-04
0057/051815
Reservoir spider

LCS102-10
0057/051816
Reservoir snaplock cap

LCS102-26
0057/055232
High flow non-return valve

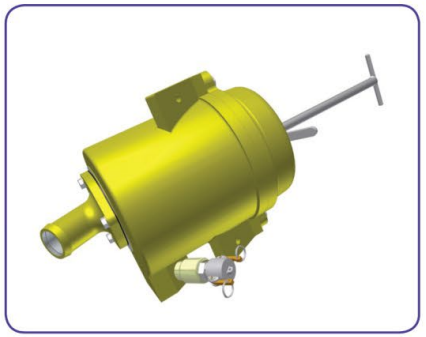
LCS102-33
0057/055393
9kg reservoir spring plate

LCS102-34
0057/055394
Angled front plate suits 63mm hose

LCS102-32
0057/055392
9kg reservoir fastener kit

LCS102-31
0057/055391
9kg reservoir seal kit

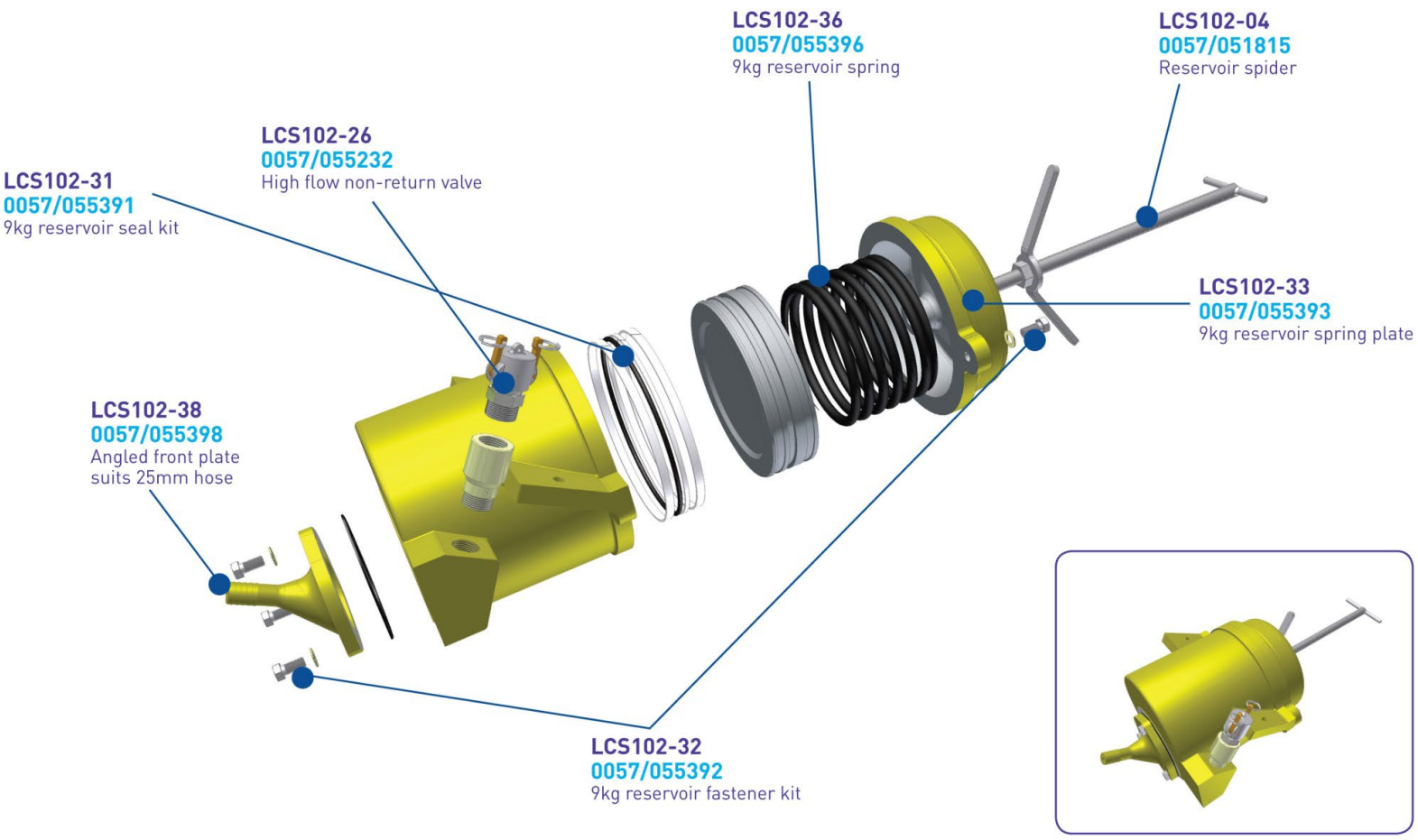
LCS102-35
0057/055395
Horizontal front plate suits 63mm hose



Whitmore Europe Limited
Unit 9, Foster Avenue, Woodside Park Industrial Estate, Dunstable, Bedfordshire LU5 5TA
Company Registration No. 08038592 VAT No: GB 327 5348 91 Tel: +44 (0)1707 379870 | whitmores.com
An ISO 9001 and 14001 Registered Company

Schematic of 9kg reservoir with 25mm output hose

LCS102-30 0057/055390



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EC Declaration of Conformity

In accordance with EN ISO 17050-1:2004

We Whitmore Europe Limited

of Unit 9, Foster Avenue
Dunstable
Bedfordshire. LU5 5TA – UK

in accordance with the following Directive(s):
2006/42/EC The Machinery Directive

Hereby declare that:
Equipment LubriCurve, Track Mounted, Mechanical, Rail & Wheel Flange Lubricator System and accessories.

Model number LCS101, 100, 102, 112, 200, 208, 209 Series Lubricators

is in conformity with the applicable requirements of the following documents

Ref. No.	Title	Edition/date
ISO 9001	Quality Management System Requirements	2008
ISO14001	Environmental Management System	2004

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications and is in accordance with the requirements of the Directive providing the Lubricator has been installed in accordance with Whitmore Europe's Installation & Maintenance Manual

Signed by: 

Name: Sean Harsent

Position: Managing Director

Whitmore Europe Ltd., Unit 9, Foster Avenue • Dunstable, Bedfordshire LU5 5TA – UK

On 22nd August 2023

The technical documentation for the machinery is available from:
Name: Director
Address: Whitmore Europe Ltd., Unit 9, Foster Avenue • Dunstable, Bedfordshire LU5 5TA – UK