Diamond Chain Harrow
Assembly Manual
45R
5/10

Unpacking

CAUTION.
Read these instructions before opening shipping container.

Before opening shipping container inspect exterior for any damage.
Remove seal and open container doors.

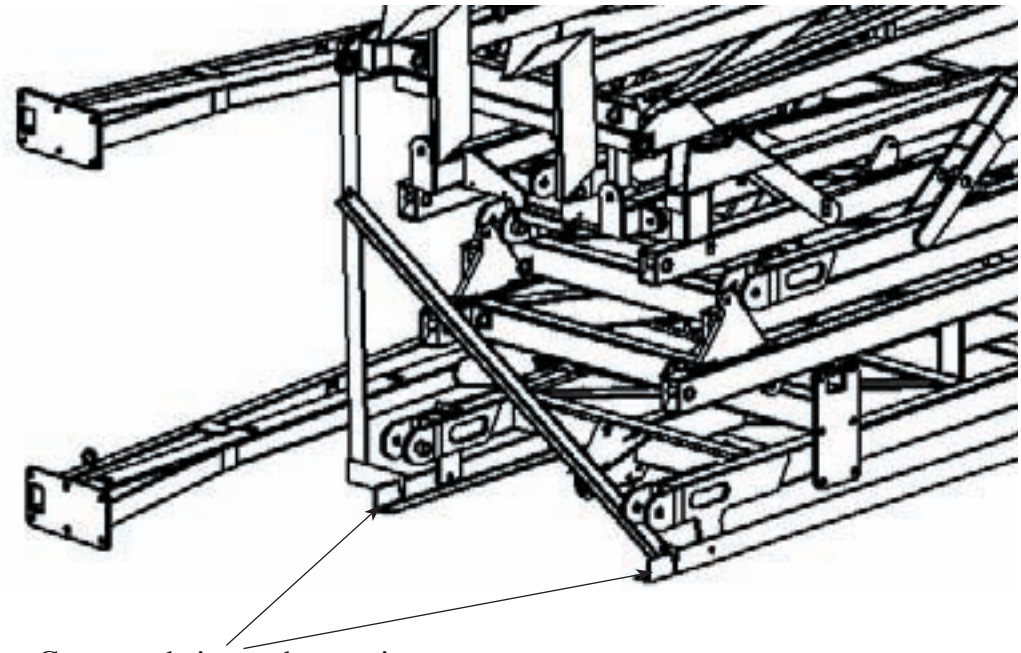
CAUTION.
Take care when opening doors as load may have shifted or restraints may have broken.

We reccomend that a crane and forklift truck be available for unloading and assembly

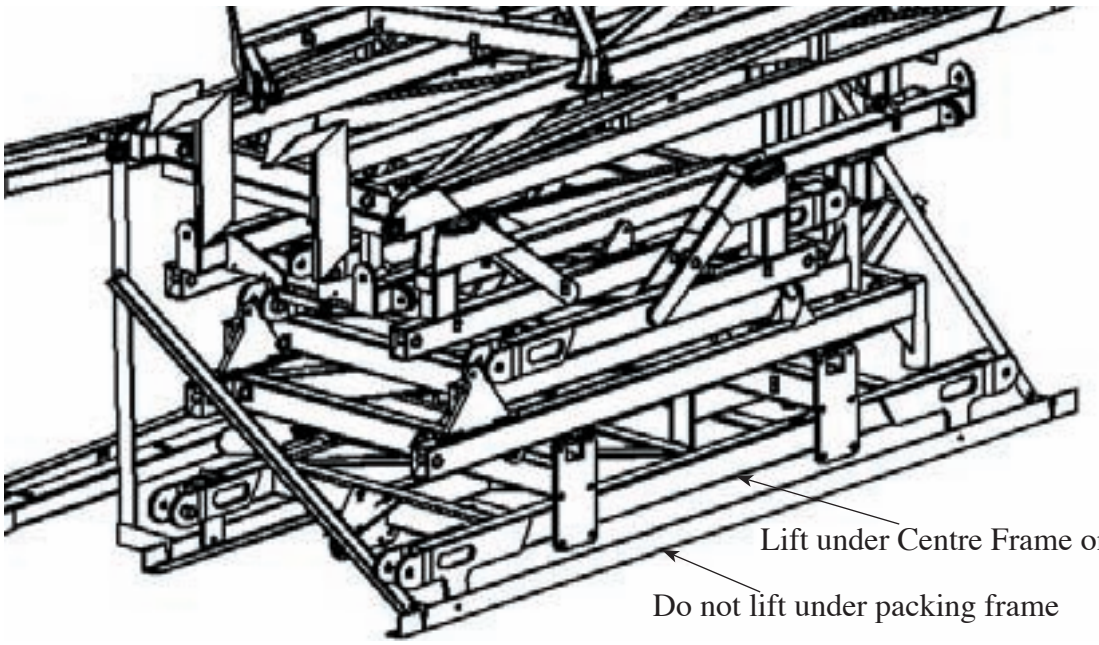
Remove boxes from doorway of container 1 at a time using a forklift truck.
Each box weighs approximately 2600 lbs (1200 kg).

Check strapping on each bundle before attempting to remove.

Attach chains to the packing frame using shackles and using suitable equipment(eg. fork-lift or tractor) drag framework bundles out of container.
To move bundles away from front of container lift from side with forklift. Do not lift under angle iron frame, lift only under Centre Frame.
Each bundle weighs approximately 7000 lb (3200 kg).



Connect chains to these points.



CAUTION.
Before cutting straps attach slings or chains and take the weight of the frames to avoid them slipping or falling and causing injury.

CAUTION.
Wear eye and hand protection when cutting straps.
Sharp edges are exposed as straps seperate and may cause injury.

CAUTION.
To avoid falling or moving components, before cutting straps attach slings or chains to individual pieces and only cut the straps holding the piece to be lifted.

Remove boxes from rear of container 1 at a time using a forklift truck.
Each box weighs approximately 2600 lbs (1200 kg)

Identify parts for each machine by serial no. or description and seperate.

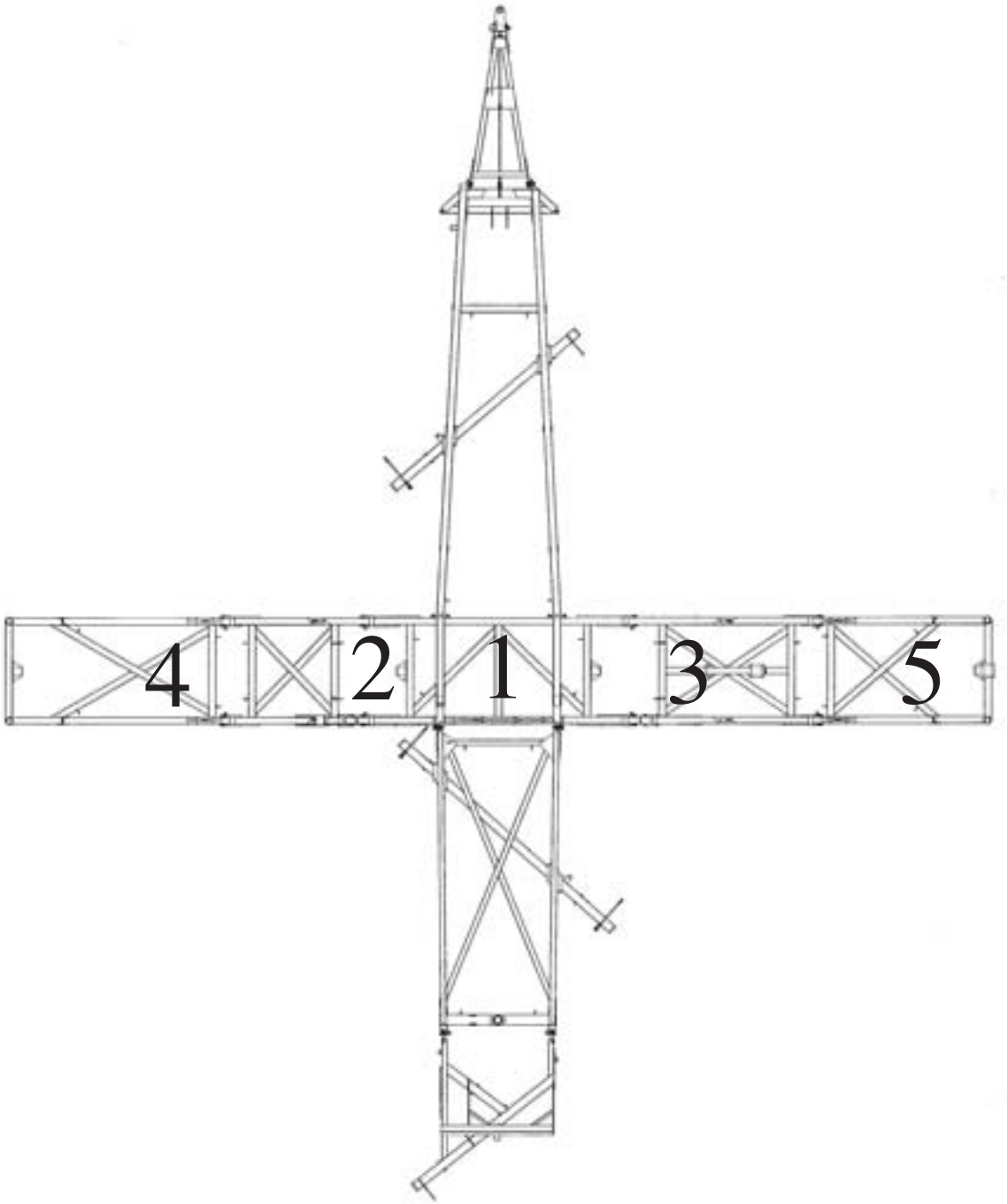
Open parts box and check that all parts are accounted for against checklist.

Cut straps holding bundles and seperate parts and place in assembly area.

Once all parts have been identified machines are ready for assembly.

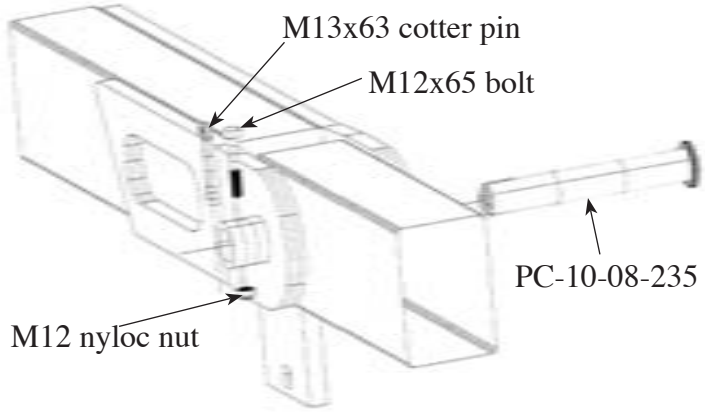
Read assembly instructions before proceding.

Assembly



1. Identify Centre Frame (PC45R-01)
   Place in centre of assembly area using suitable lifting equipment.

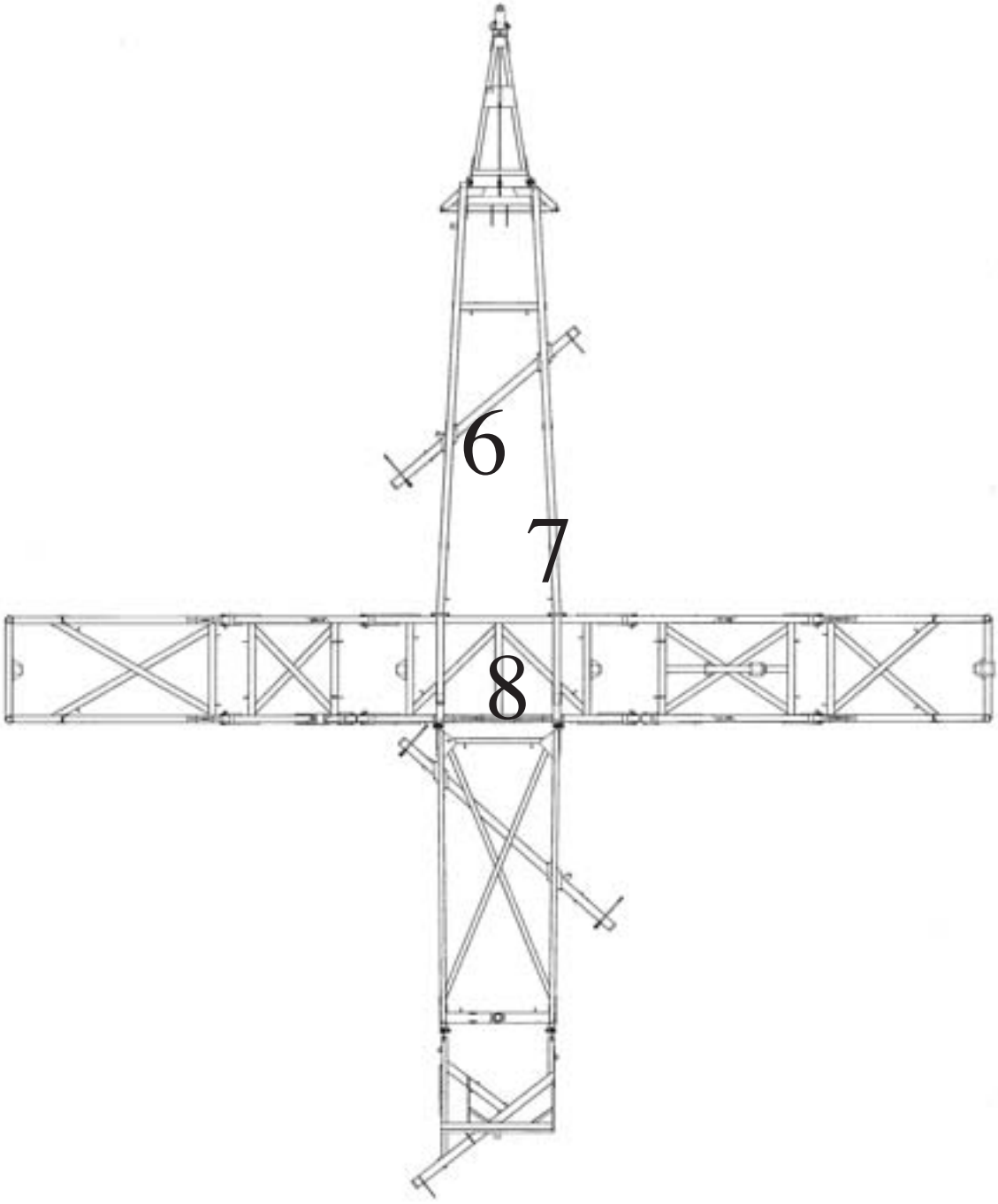
2. Identify Left Hand Inner Wing (PC45-05). (Approx. 6' long.)
   Place in position using suitable lifting equipment and attach to centre frame using 35mm x 220mm (1.375" x 8.75") pins (PC-10-08-235).
   Lock pins in place using M12 x 65mm (1/2" x 2.5") bolts with nyloc nuts and M13 x 63mm (1/2" x 2.5") cotter pins.



3. Identify Right Hand Inner Wing (PC45-04).(Approx. 8' long with mounting plates for outer wing post).
   Place in position using suitable lifting equipment and attach to centre frame using 35mm x 220mm (1.375" x 8.75") pins (PC-10-08-235).
   Lock pins in place using M12 x 65mm (1/2" x 2.5") bolts with nyloc nuts and M13 x 63mm (1/2" x 2.5") cotter pins.

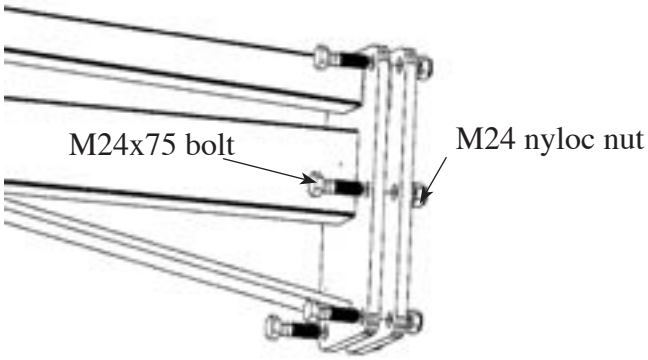
4. Identify Left Hand Outer Wing (PC45R-07).(Approx. 10' long)
   Place in position using suitable lifting equipment and attach to Left Hand Inner Wing using 35mm x 220mm (1.375" x 8.75") pins (PC-10-08-235).
   Lock pins in place using M12 x 65mm (1/2" x 2.5") bolts with nyloc nuts and M13 x 63mm (1/2" x 2.5") cotter pins.

5. Identify Right Hand Outer Wing (PC45R-06).(Approx. 8' long with mounting plate for support post).
   Place in position using suitable lifting equipment and attach to Right Hand Inner Wing using 35mm x 220mm (1.375" x 8.75") pins (PC-10-08-235).
   Lock pins in place using M12x 65mm (1/2" x 2.5") bolts with nyloc nuts and M13 x 63mm (1/2" x 2.5") cotter pins.

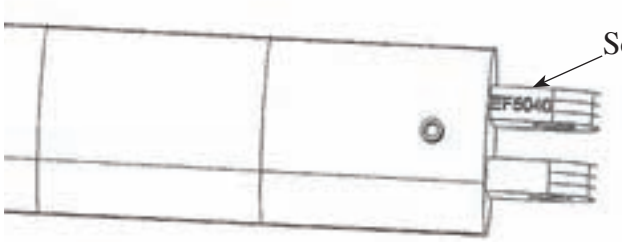

6
7
8

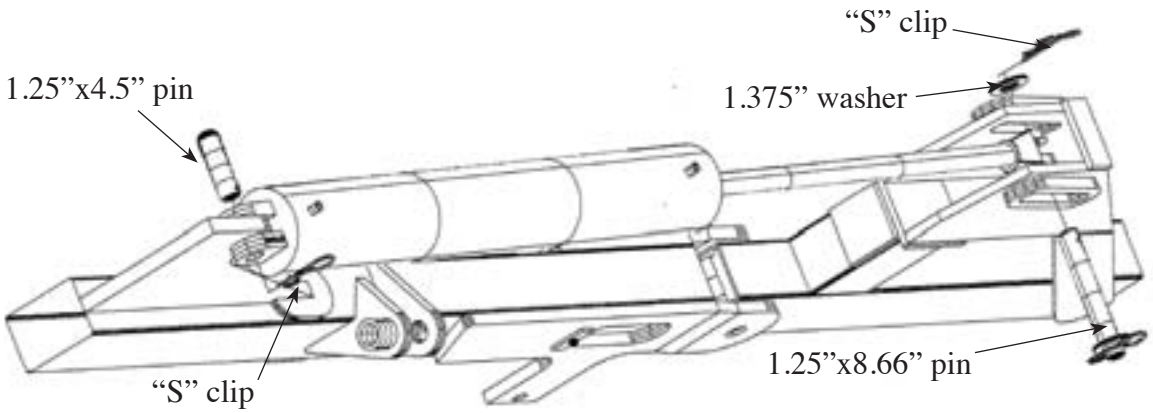
6. Identify Front Module (PC-10-28-40).(Has 1 hydraulic cylinder mount).
   Place module in approx. position using suitable lifting equipment. on ground in front of Centre Frame.

7. Identify Front A-frame (PC45-02).
   Place in position using suitable lifting equipment and attach to Centre Frame using M24 x 75 (1" x 3") bolts with nyloc nuts.

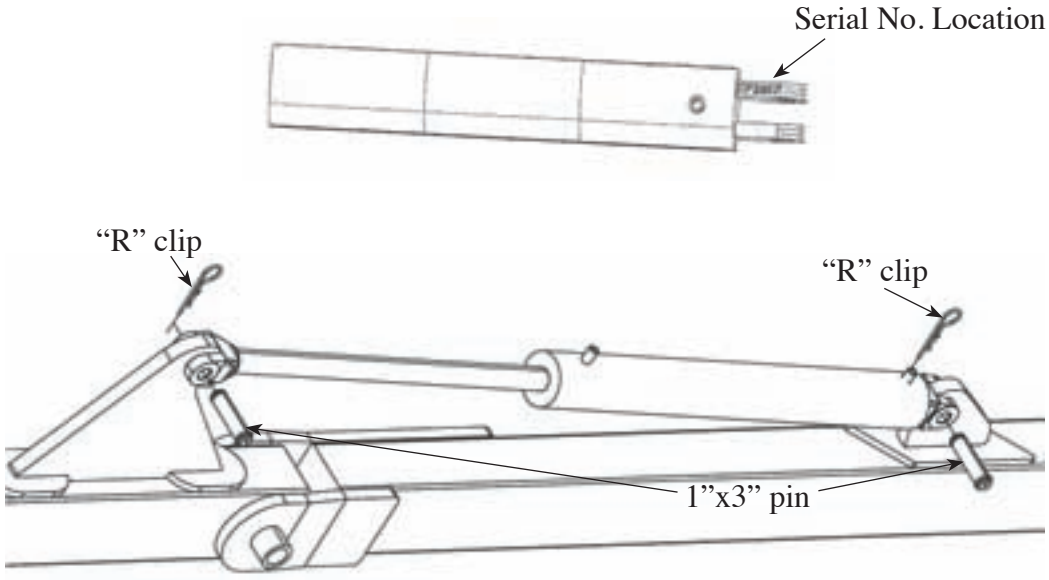


8. Identify the 2 centre fold hydraulic cylinders (5" x 30" cylinders, Pt. no. EF5040).
   Attach rear end of cylinders to the Centre Frame cylinder mount plate using 1.25" x 4.5" pins.
   Lock pins in using 5mm "S" clip ensuring that the clips are at the rear of the frame.
   Remove plugs from ports and pull rod end out.
   Attach rod end of cylinders to Inner Wing cylinder mounts using 1.25" x 8.66" pins.
   Lock pins in using 2 x 5mm "S" clips and 2 x 1.375" flat washers.

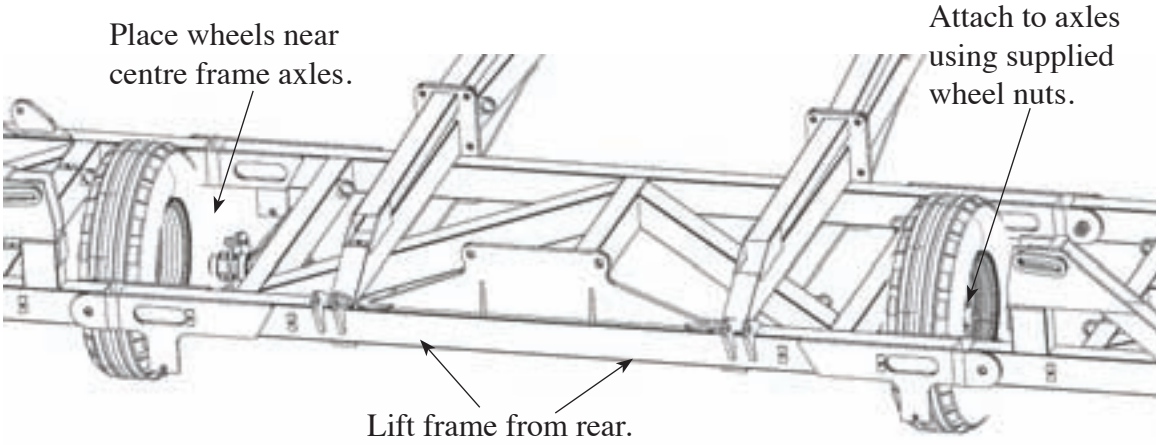




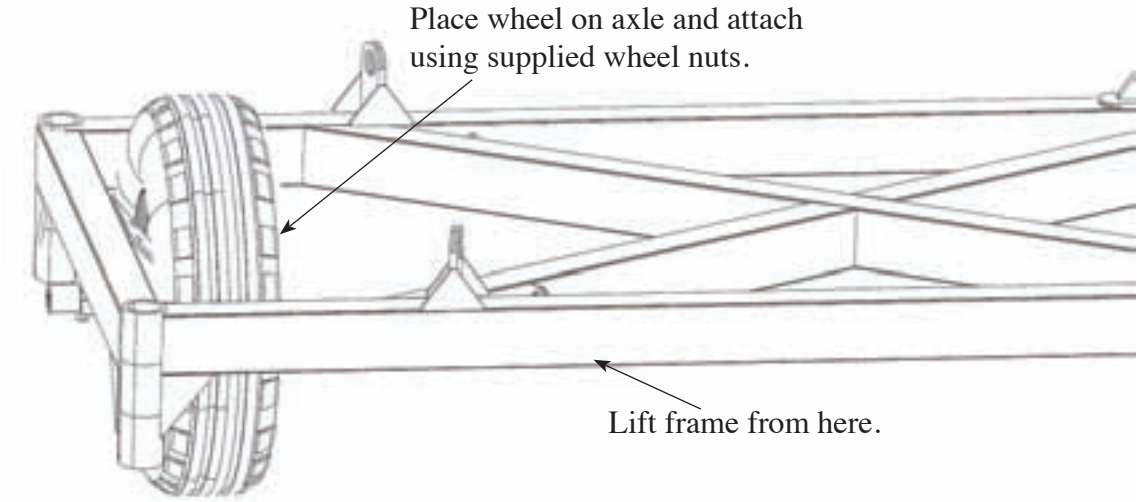
9. Identify the 4 wing fold cylinders (3” x 24” cylinders, Pt. no. EF2957).
Attach the rear end of the cylinders to the cylinder mount on the inner wings using 1” x 3” pins.
Lock pins in place using 4mm “R” clips.
Remove plugs from ports and pull rod end out.
Attach rod end of cylinders to the cylinder mounts of outer wings using 1.25” x 3” pins.
Lock pins in place using 4mm “R” clips.



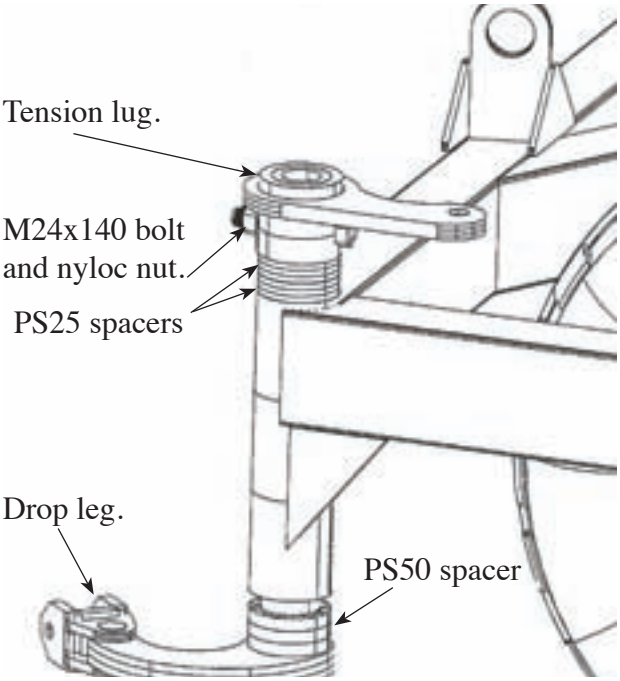
10. Identify the main wheels (supplied by dealer).
Lift the wheels into place near the centre frame axles ensuring that they have the correct rotation.
Using suitable lifting equipment lift the centre frame from the rear until the wheels can be placed on the hubs.
Attach the wheels to hubs using 9/16 wheel nuts.

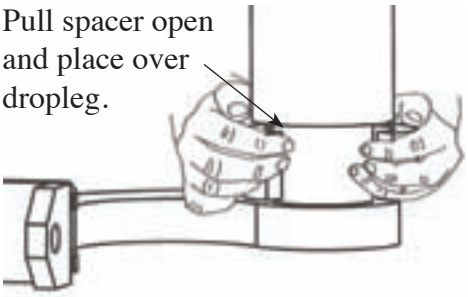


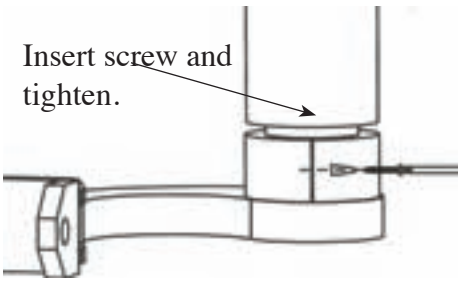
11. Lift wheels into place near outer wing axles ensuring that they have the correct rotation.
    Using suitable lifting equipment lift the outer wings, 1 at a time, until the wheels can be placed on the hubs.
    Attach the wheels to the hubs using 9/16 wheel nuts.



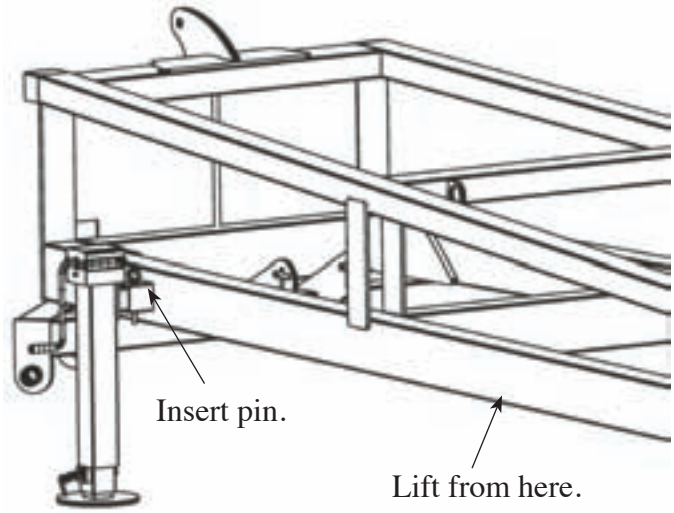
12. While wings are lifted insert Drop Legs (Left hand: PC10-24, Right hand: PC10-25) and attach Adjusting Lugs to the top (Left Hand: PC10-26, Right hand: PC10-27) using M24 x 140 (1" x 5.5") bolts and nyloc nuts.
    Open Drop Leg Height Adjusters (PS25 and PS50) and slide over Drop Legs with 2 x PS25 on the top of each leg and 1 x PS50 on the bottom of each leg.
    Insert screws (8g x 1.25" self tapping screws) into holes on Height Adjusters and tighten.



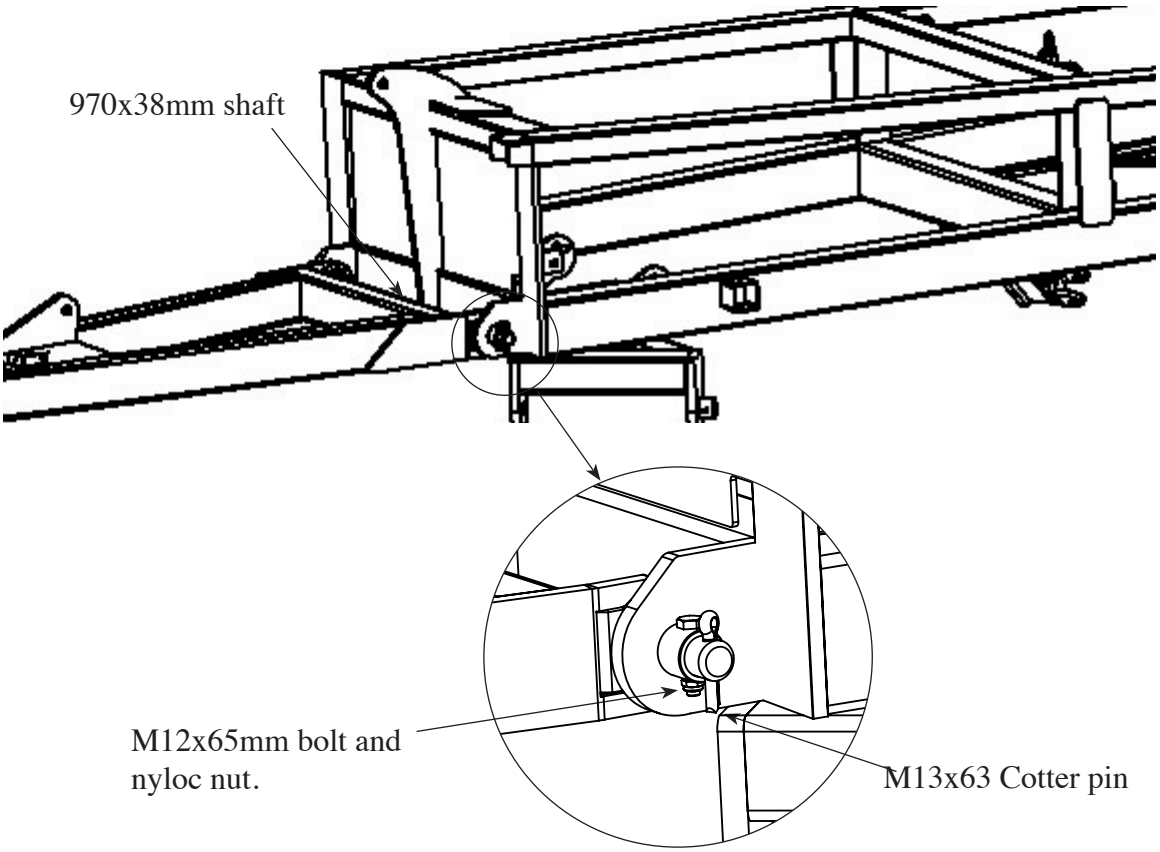




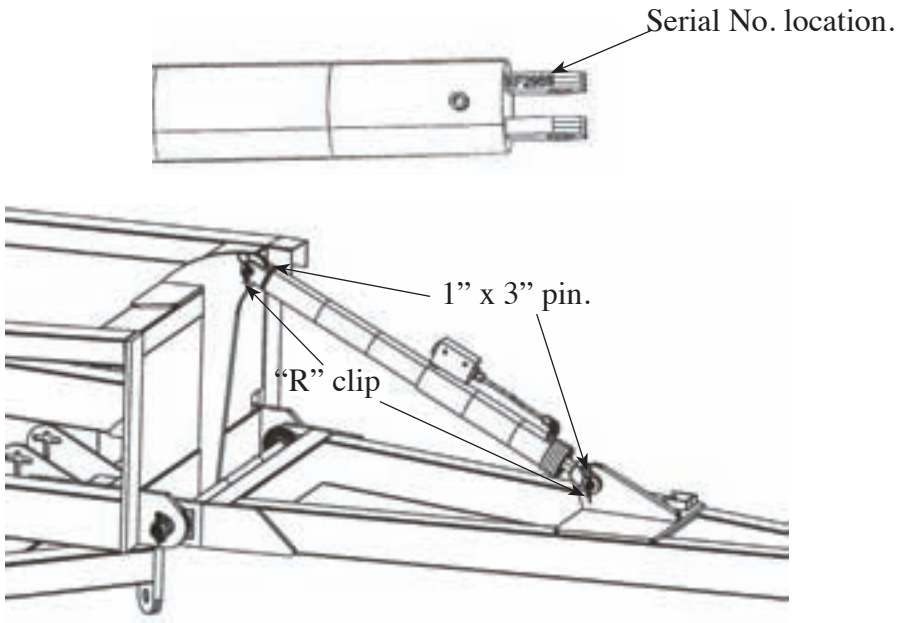
13. Using suitable lifting equipment, raise the main pull at front and attach parking stand to mounting bracket. Insert pin to hold stand in place.
Adjust stand so that frame sits parallel with ground.



14. Identify front drawbar (PC10-08).
Using suitable lifting equipment place front drawbar in position and attach to main pull using 970mm x 38mm (39” x 1.5”) shaft(PC10-13-970). Lock pin in place using M12x65mm (1/2” x 2.5”) bolt with nyloc nut and M13x63 (1/2” x 2.5”) cotter pin.

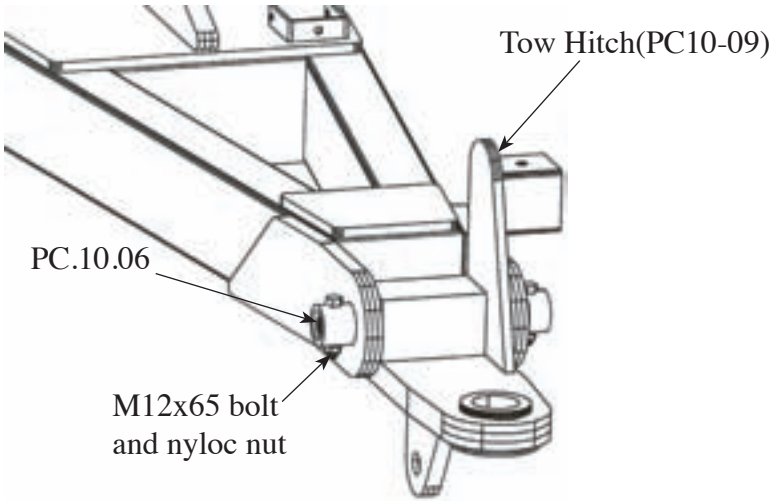


15. Identify the front lift hydraulic cylinder (3”x12” extended cylinder, Pt. no. EF6002).
Attach rear end of cylinder to main pull cylinder mount lug using 25mm x 75mm (1” x 3”) pin and “R” clip.
Attach rod end of cylinder to front drawbar cylinder mount lug using 25mm x 75mm (1” x 3”) pin and “R” clip.

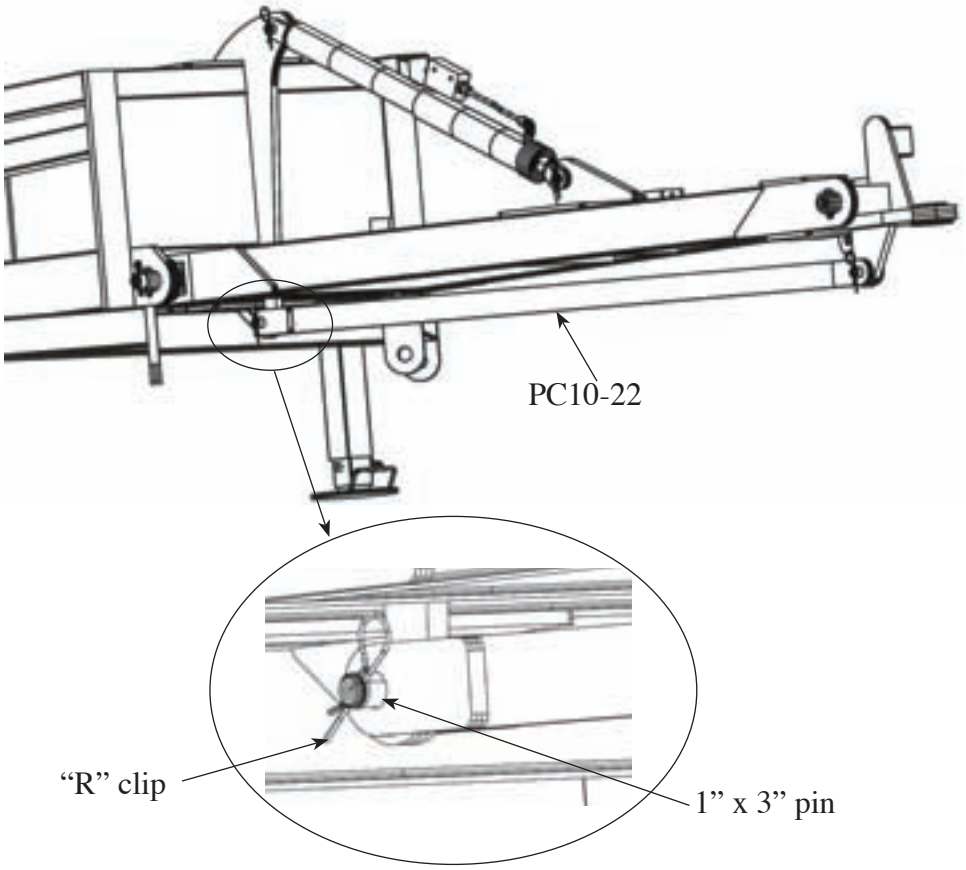


CAUTION.
At this stage do not rely on cylinder to hold drawbar in position. Continue to hold drawbar in place with lifting equipment or place a stand underneath. Serious injury may occur if drawbar falls.

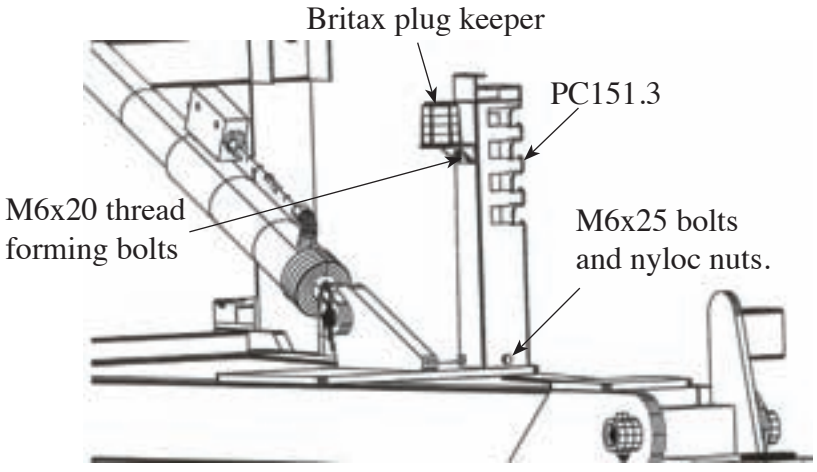
16. Identify Tow Hitch (PC10-09).
Hold in position and attach to drawbar using 35mm x 275mm (1.38” x 10.8”) pin (PC.10.06).
Lock pin in place using 2 x M12 x 65mm (1/2” x 2.5”) bolts and nyloc nuts.



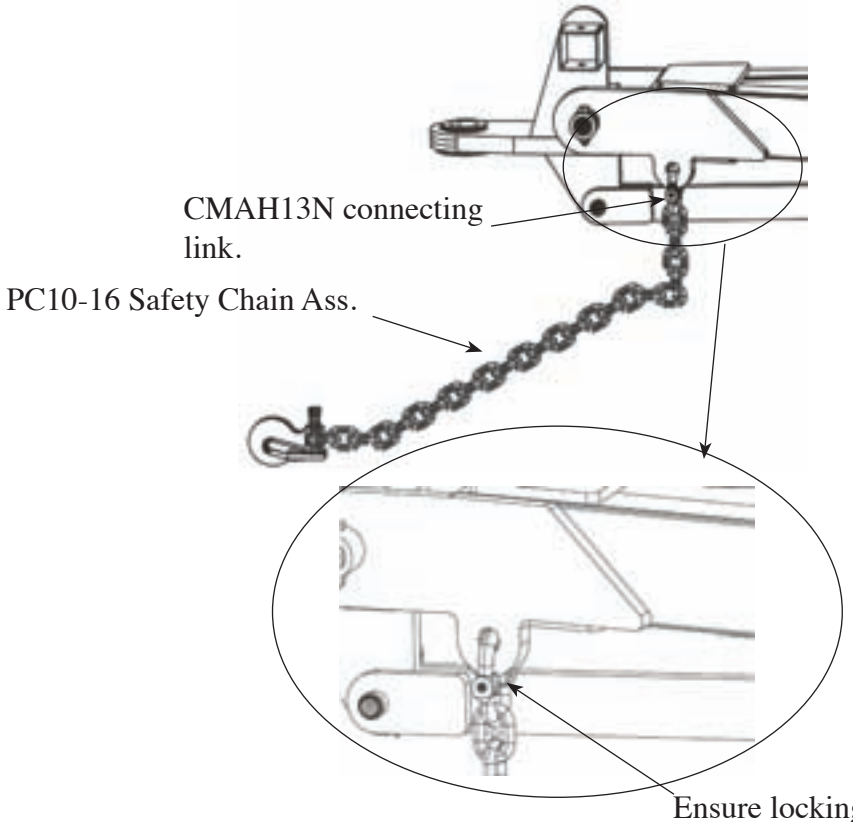
17. Identify Parralel arm (PC10-22).
Lift into place and attach to Main Pull Parralel Arm mounting lug and Tow Hitch Parralel Arm mounting lug using 25mm x 75mm (1”x3”) pins.
Lock pins in place using 4mm “R” clips.



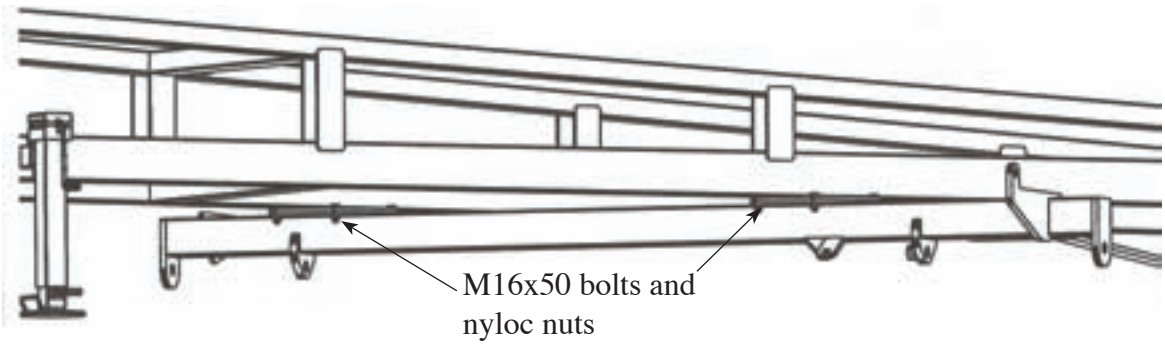
18. Identify the Hydraulic Hose Post (PC151.3) and Britax Electrical plug keeper.
Attach plug keeper to Hose Post using 2 x M6 x 20mm thread forming bolts. Attach Hose Post to Drawbar bracket using 3 x M6 x 25mm bolts and nyloc nuts.



19. Identify Safety Chain Assembly (PC10-16).
Attach chain to drawbar chain mount lug using supplied connecting link (CMAH13N).

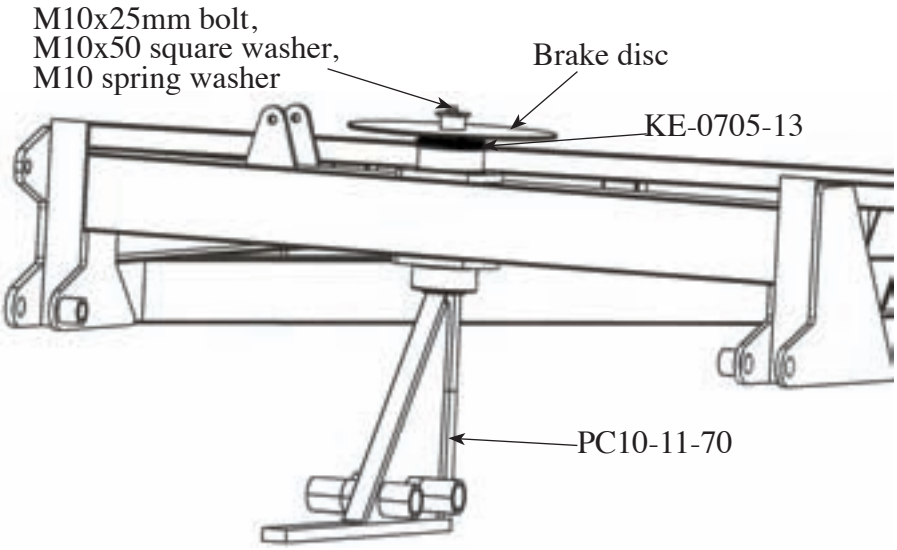


20. Using suitable lifting equipment, lift front module into position and bolt to main pull using M16 x 50 (5/8" x 2") bolts and nyloc nuts.

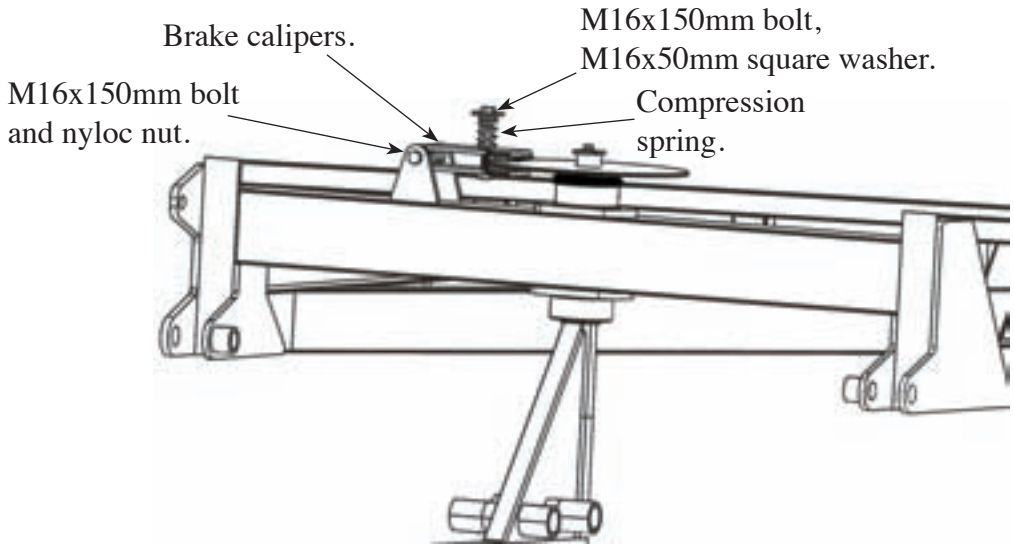


21. Identify main tail. (PC45-03)
Using suitable lifting equipment lift main tail on to trestles. Ensure trestles are high enough to fit Jockey wheel assembly (PC10-11-70) under rear beam.

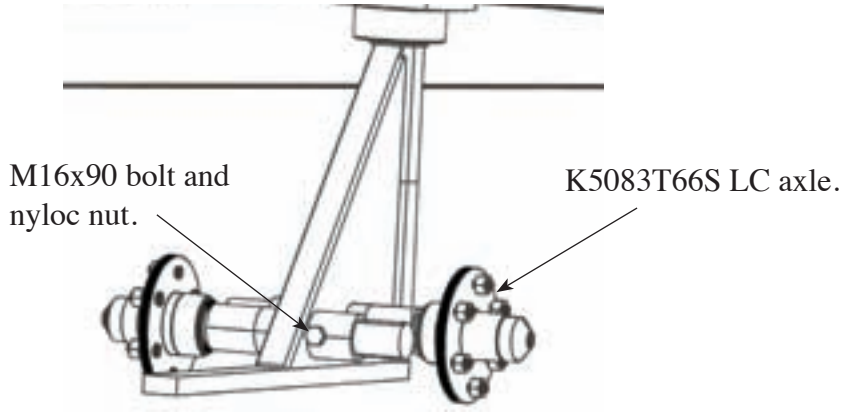
22. Identify Jockey wheel assembly. (PC10-11-70)
Apply Anti-sieze compound to king pin of assembly.
Using suitable lifting equipment to assist eg. hydraulic jack, slide shaft up into bearings on rear beam of main tail. (Ensure that bearings are alligned with king pin).
Slide bearing dust cover (KE-0705-13) over shaft.
Slide brake disc over spline on top of King pin and attach using M10x25mm bolt with M10x50 square washer and M10 spring washer.



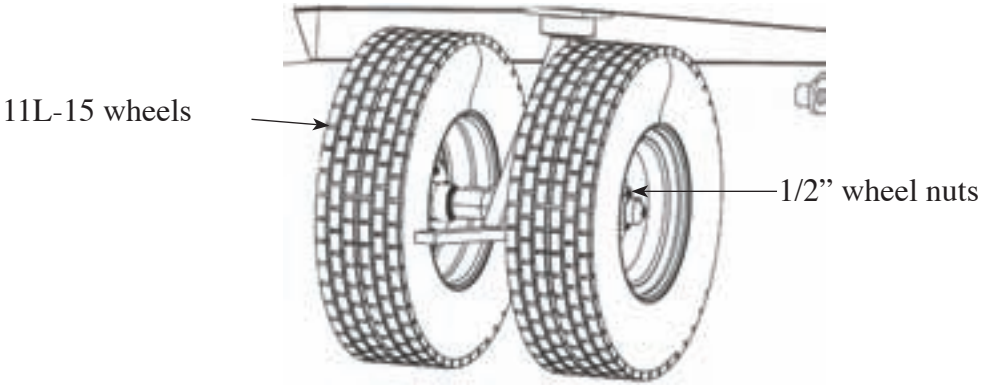
23. Identify brake calipers.
Attach calipers to mounting brackets using M16 x 150mm (5/8" x 6") bolt and nyloc nut with M16 x 50mm square washer.
Attach tension spring to calipers using M16 x 150mm (5/8" x 6') bolt and tighten until spring is compressed 50-60mm (2"-2.5").



24. Identify jockey wheel axles. (K5083T66S LC axles).
Slide axles into sleeves on jockey wheel assembly and lock in place using M16 x 90mm (5/8” x 2”) bolts and nyloc nuts.

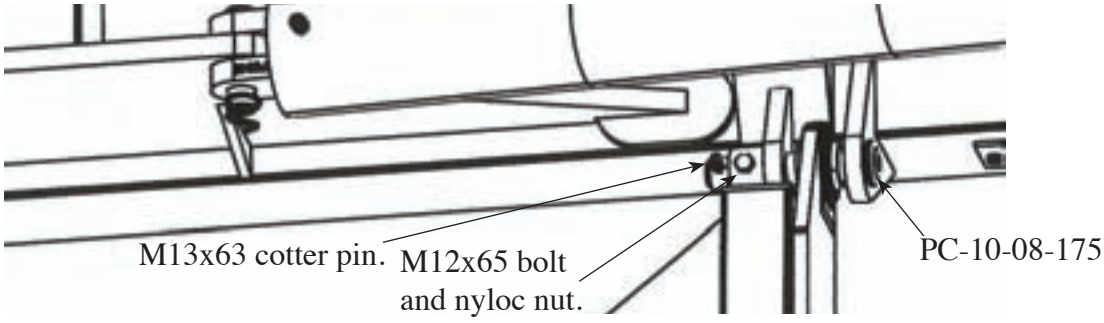


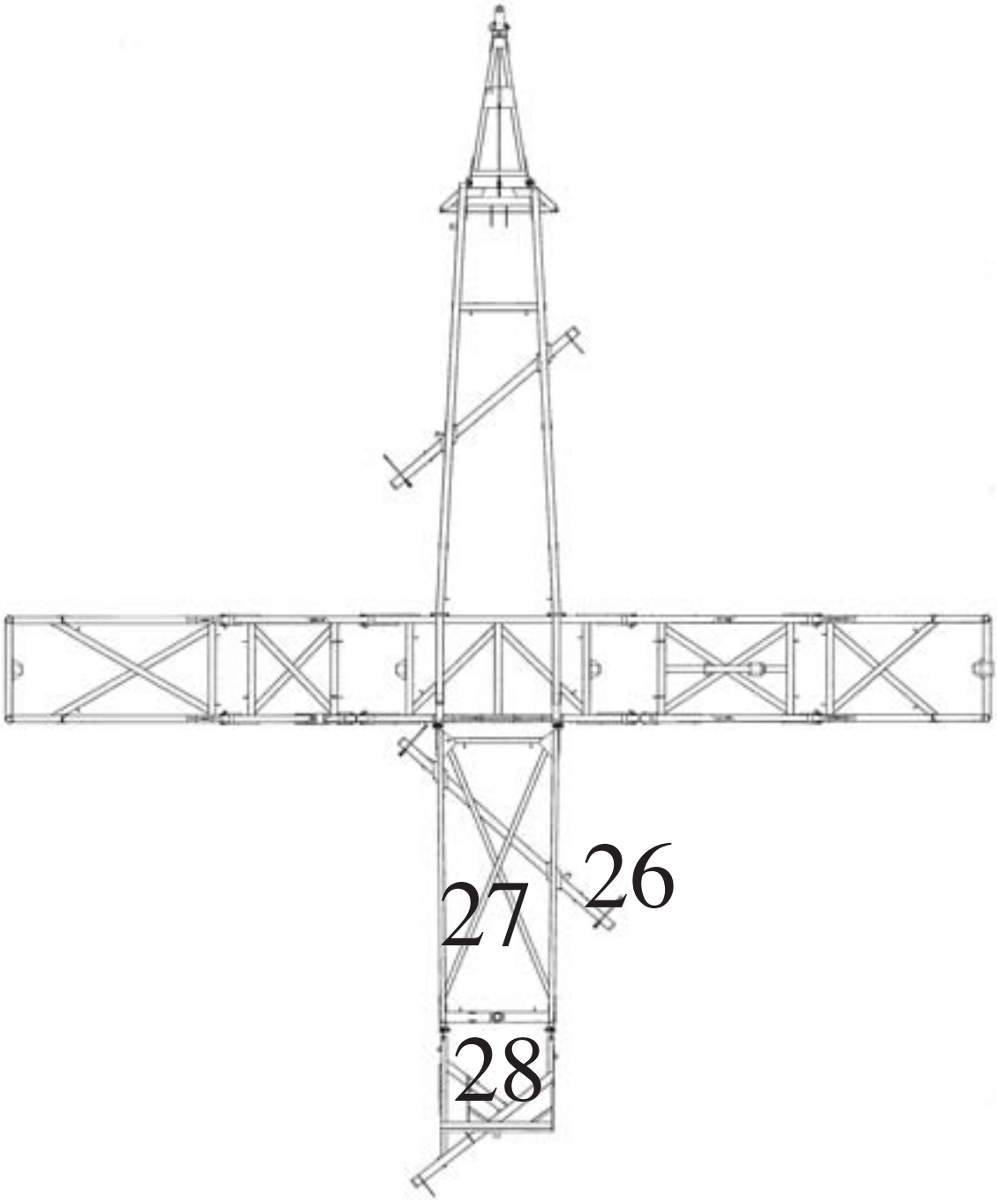
25. Identify 11L-15 wheels.
Attach wheels to axles using 1/2” wheel nuts.



26. Identify Rear Module (PC-10-29-40).(Has 2 hydraulic cylinder mounts).
Place module in approx. position using suitable lifting equipment. on ground at rear of Centre Frame.

27. Using suitable lifting equipment lift main tail into place at rear of centre frame and attach to mounting lugs using 35mm x 175mm (1.38” x 7”) pins (PC-10-08-175). Lock pins in place using M12 x 65mm (1/2” x 2.5”) bolts and nyloc nuts and M13x63 (1/2” x 2.5”) cotter pins



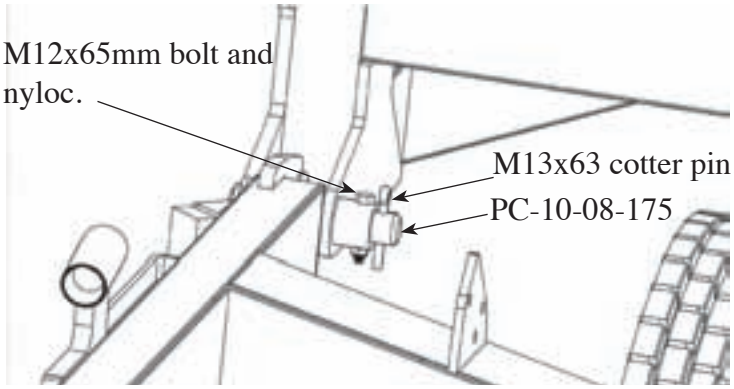

26
27
28

28. Identify Rear Tail (PC10-10).

Using suitable lifting equipment lift Rear Tail into place and attach to Main Tail using 35mm x 175mm (1.38” x 7”) pins (PC-10-08-175).

Lock pins in place using M12 x 65mm (1/2” x 2.5”) bolts and nyloc nuts and M13x63 (1/2” x 2.5”) cotter pins

Note: PC-10-45 is no longer required. Ram mount is now a fixed mount.



Note. Continue to hold rear tail in position with lifting equipment or place a stand underneath to hold in position.

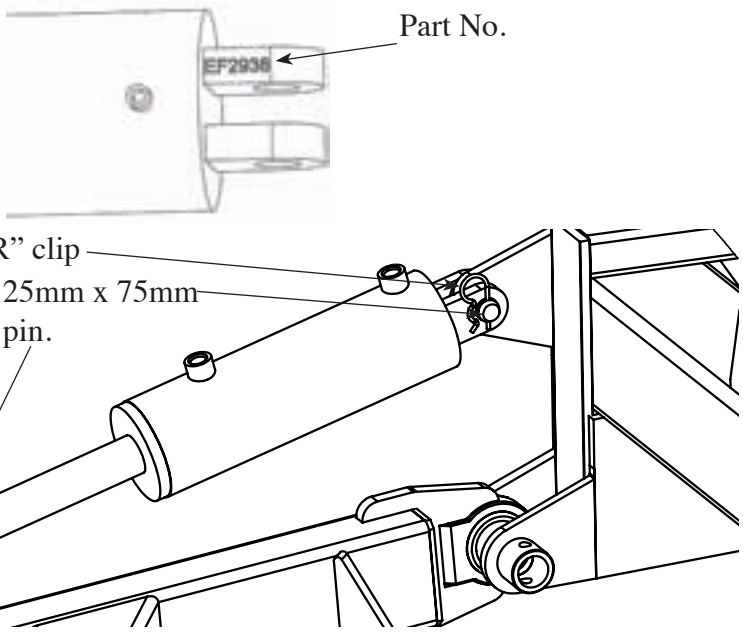
29. Identify tail lift cylinder (4”x8” cylinder, Pt. no. EF2938)

Attach rear end of cylinder to main tail cylinder mount using 25mm x 75mm (1” x 3”) pin and 4mm “R” clip.

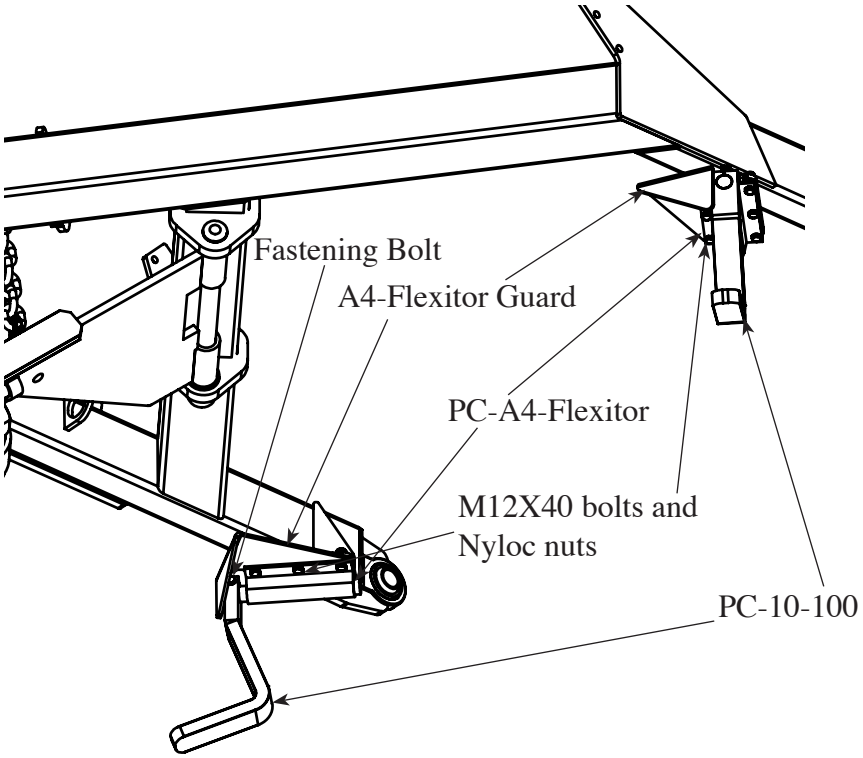
Remove plugs from ports and pull out cylinder shaft.

Attach rod end of cylinder to reartail frame cylinder mount using 25mm x 75mm (1” x 3”) pin and 4mm “R” clip.

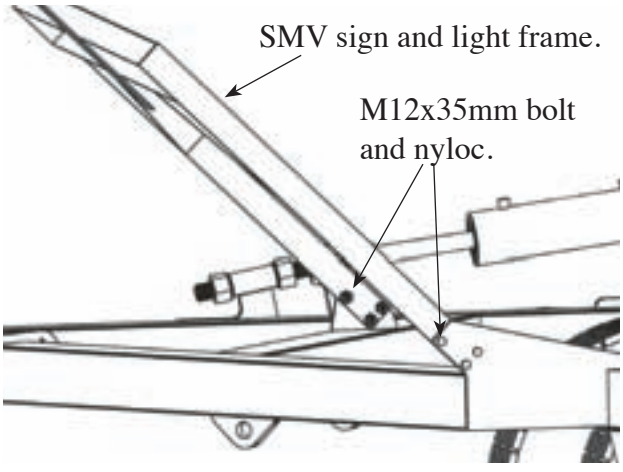
Remove lifting equipment or stand.

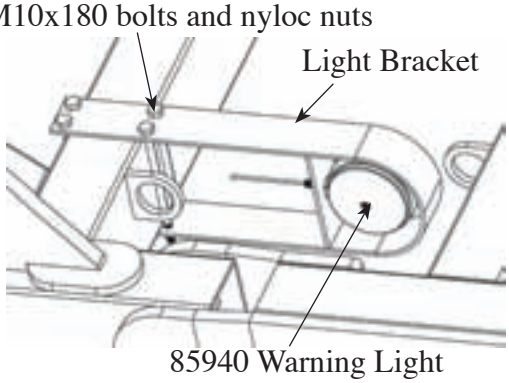


30. Identify Rear Tail Legs (PC-10-100), Tail Leg Mounts (PC-A4-Flexitor) and A4 Flexitor Guards.
Attach Leg Mounts and Flexitor Guards to mounting points on Rear Tail Frame using M12 x 40mm bolts and Nyloc nuts.
Attach Tail Legs to mounts by sliding onto spline shaft and fastening in place using supplied bolt.

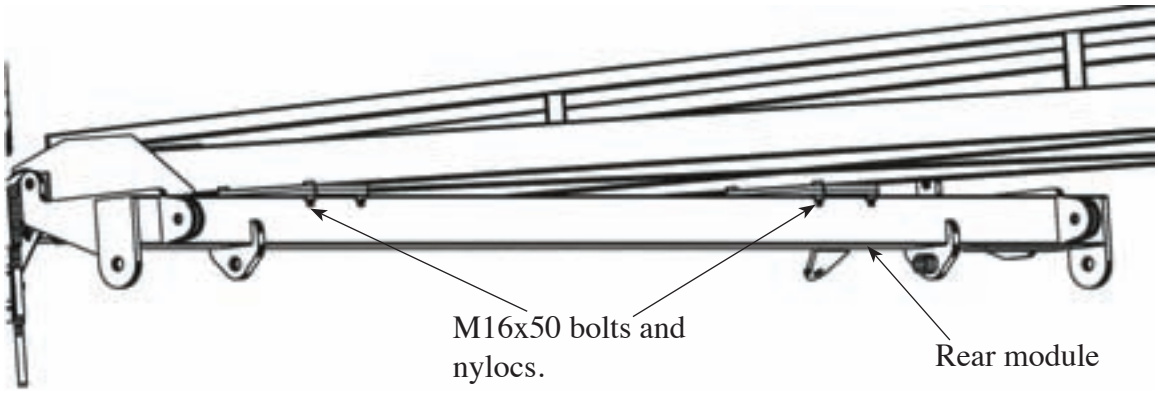


31. Identify SMV sign and light frame and wing warning light brackets.
Attach SMV sign and light frame to rear tail sign frame lugs using M12 x 35mm bolts and nyloc nuts.
Attach warning light brackets to outer wings using M10 x 180mm (3/8" x 7") bolts and nyloc nuts.

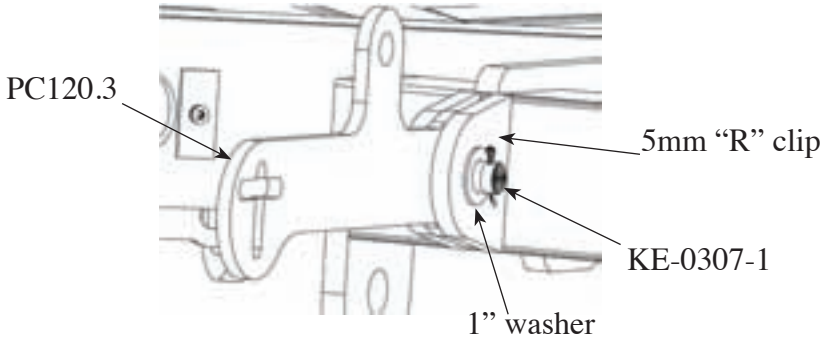




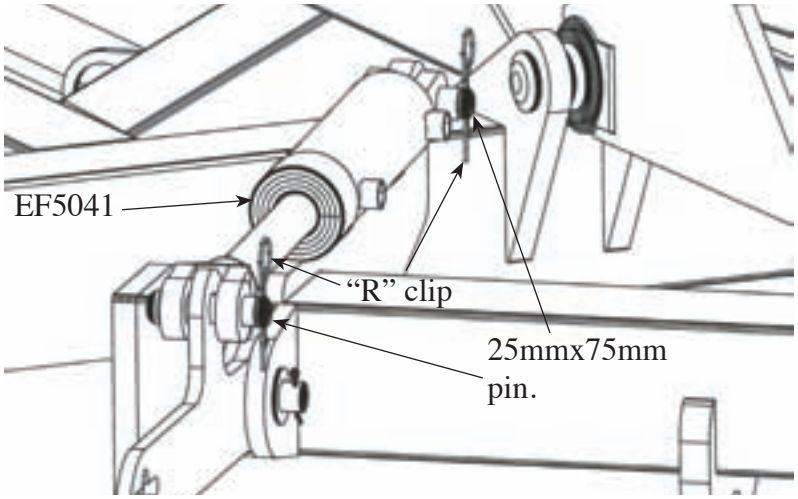
32. Using suitable lifting equipment, lift rear module into position and bolt to main tail using M16 x 50 (5/8” x 2”) bolts and nyloc nuts.



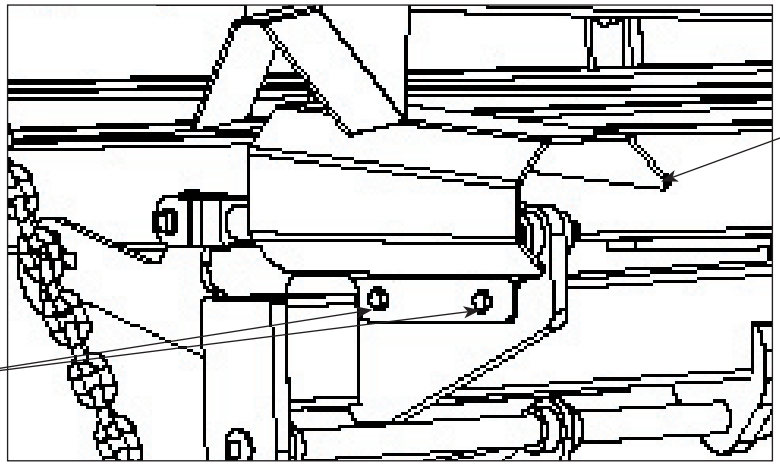
33. Identify module lift arms (PC120.3)
Attach to front and rear modules using 25mm x 75mm (1” x 3”) pins (KE-0307-1), 1” washers and 5mm “R” clips.



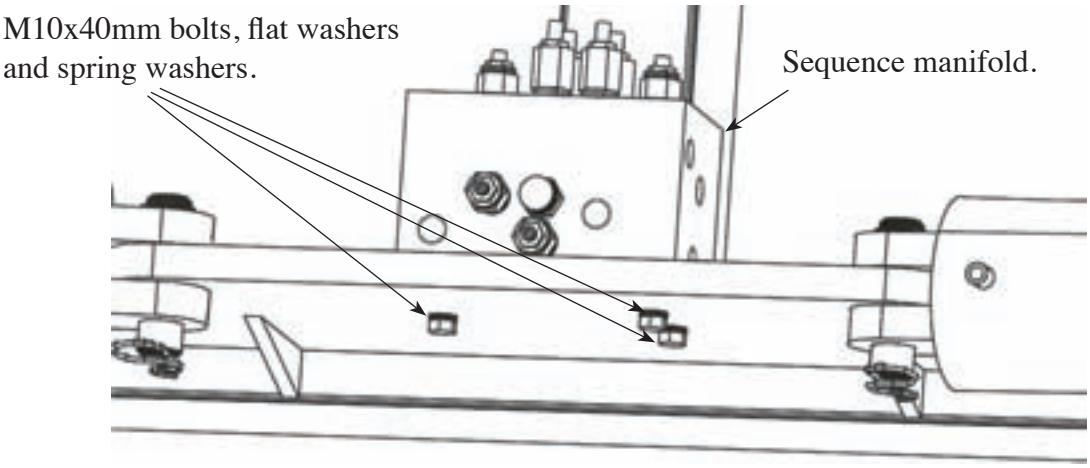
34. Identify module lift cylinders (2.5” x 6” side ported cylinderss Pt. no. EF5041).
Attach rear end of cylinders to module cylinder mounts on front and rear modules using 25mm x 75mm (1” x 3”) pins and 3mm “R” clips.
Attach rod end of cylinders to module lift arm cylinder mounts on front and rear modules using 25mm x 75mm (1” x 3”) pins and 5mm “R” clips.



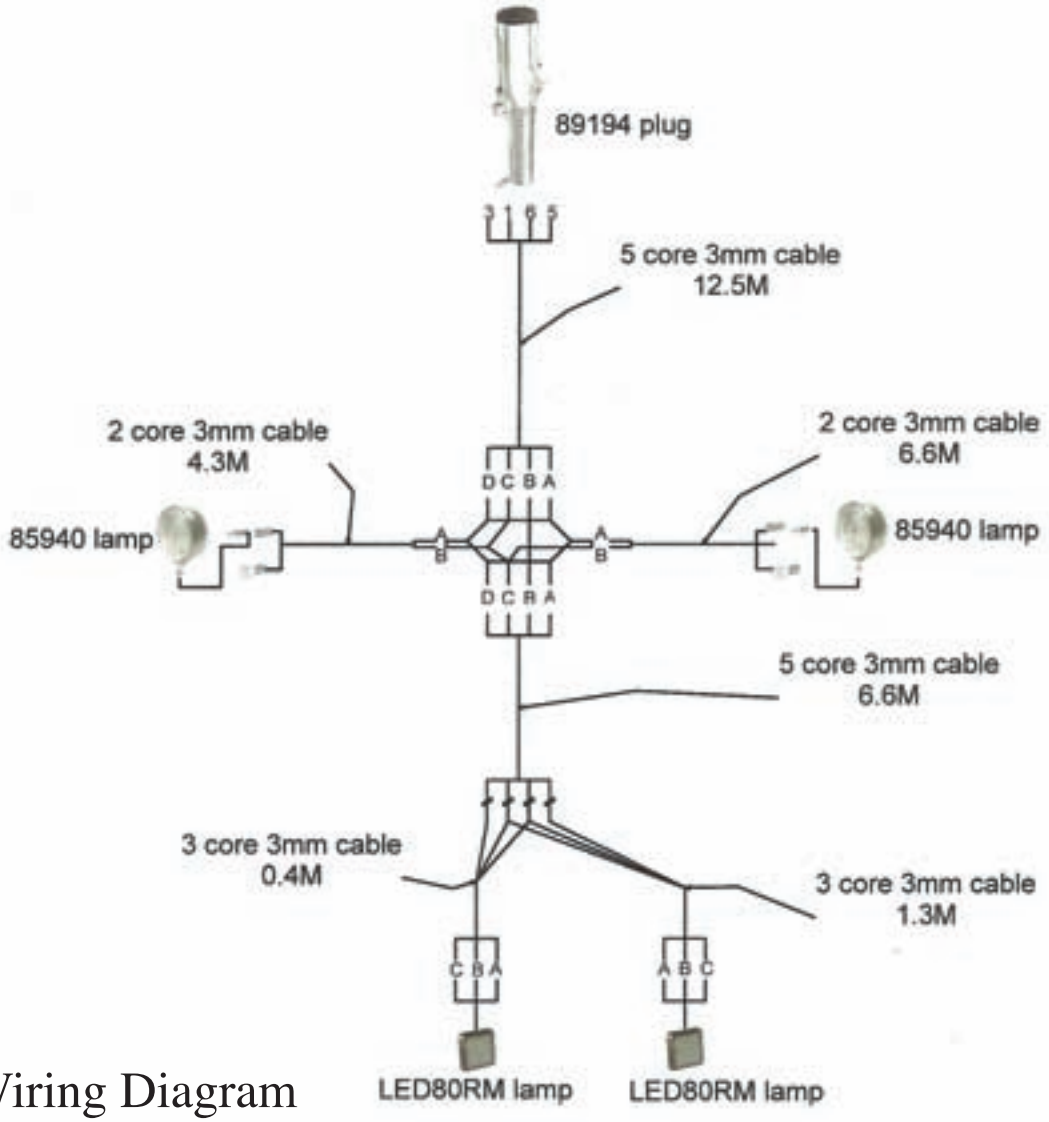
35. Identify Module Cylinder Guard (PC167.3). Attach to module cylinder mount of right hand side of rear module using M12 x 50mm Bolts and Nyloc nuts.



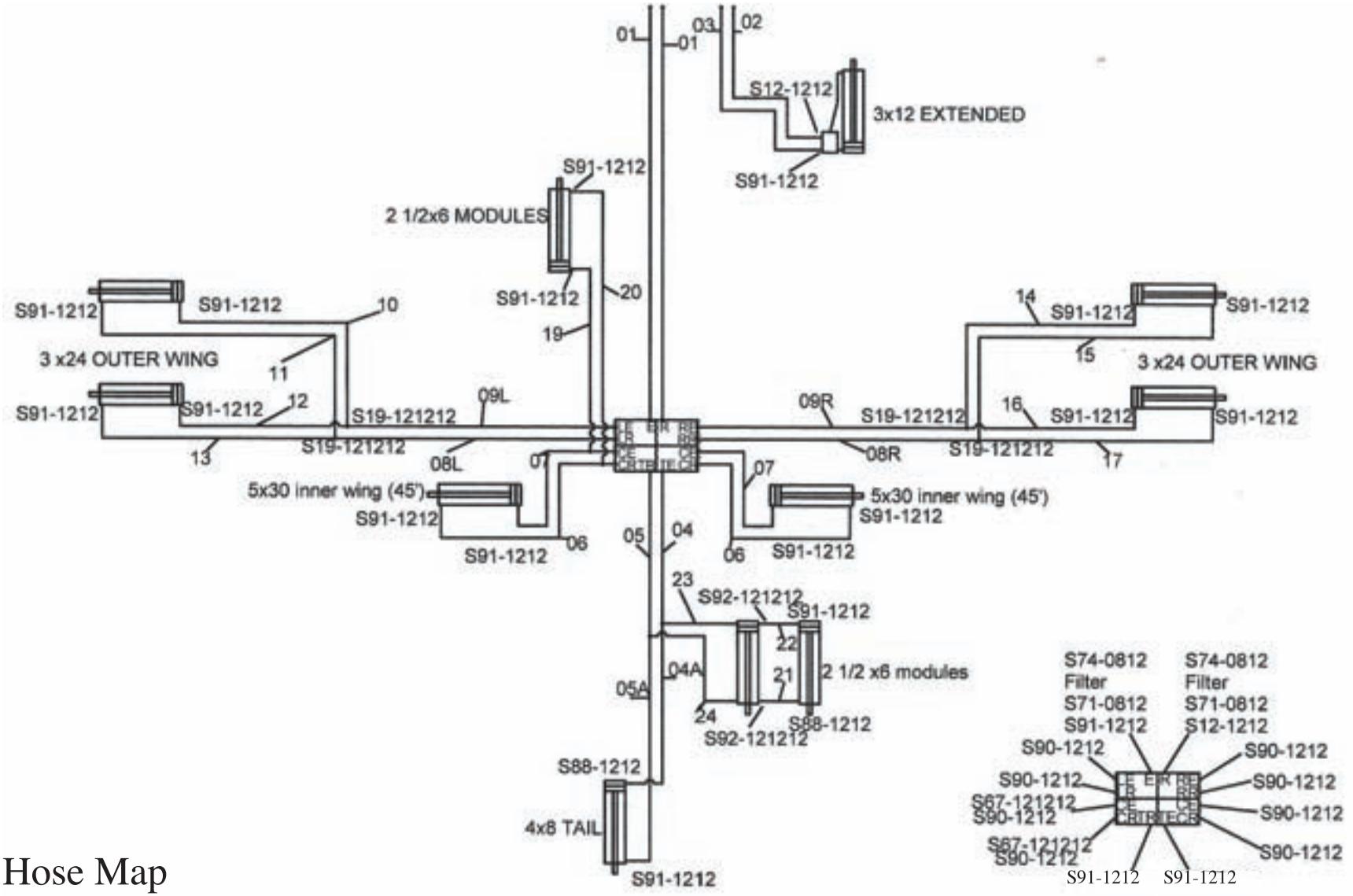
36. Identify Hydraulic Sequence Manifold.
Attach manifold to inside of centre cylinder mount plate using 3 x M10x40mm bolts with flat washers and spring washers.



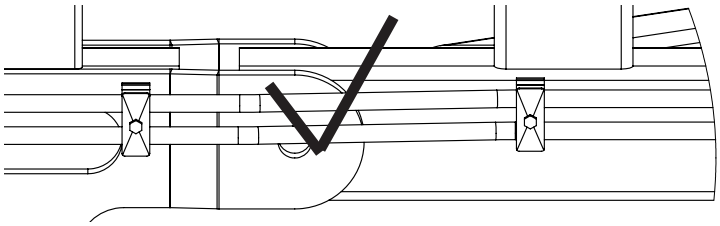
37. Identify 45’ hose kit and warning light kit.
Using hose map attach hoses and fittings in correct positions ensuring that all fittings are tight to prevent leaking and all hoses are laid out neatly and free from crossovers.
Clamp all hoses to frame using supplied clamps ensuring all clamps are tight.
Using wiring map ensure that all cables and lights are in correct positoin and tie cables to hydraulic hoses using supplied cable ties.
To install main pull hoses (PH01) and Main lighting plug, pull through top left hand rail of main pull using a draw wire.



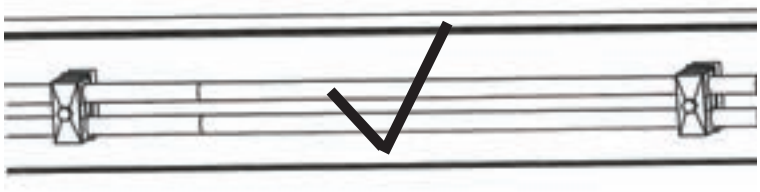
Wiring Diagram

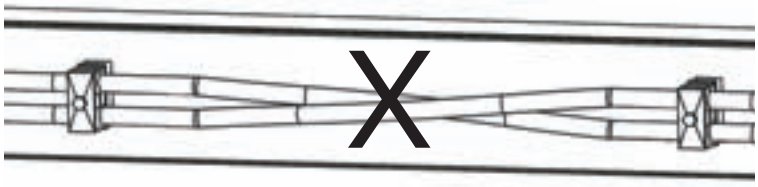

01
01
03
02
S12-1212
3x12 EXTENDED
S91-1212
S91-1212
2 1/2x6 MODULES
S91-1212
20
19
S91-1212
S91-1212
10
3 x24 OUTER WING
11
S91-1212
S91-1212
12
S19-121212
09L
13
S19-121212
08L
07
5x30 inner wing (45')
S91-1212
S91-1212
06
05
04
23
S92-121212
S91-1212
22
04A
21
2 1/2 x6 modules
05A
24
S88-1212
S92-121212
S88-1212
4x8 TAIL
S91-1212
14
S91-1212
S91-1212
15
3 x24 OUTER WING
09R
S19-121212
16
S91-1212
S91-1212
08R
S19-121212
17
07
5x30 inner wing (45')
S91-1212
06
S91-1212
S74-0812
Filter
S74-0812
Filter
S71-0812
S91-1212
S71-0812
S12-1212
S90-1212
S90-1212
S90-1212
S90-1212
S67-121212
S90-1212
S90-1212
S67-121212
S90-1212
S90-1212
S91-1212
S91-1212

Hose Map

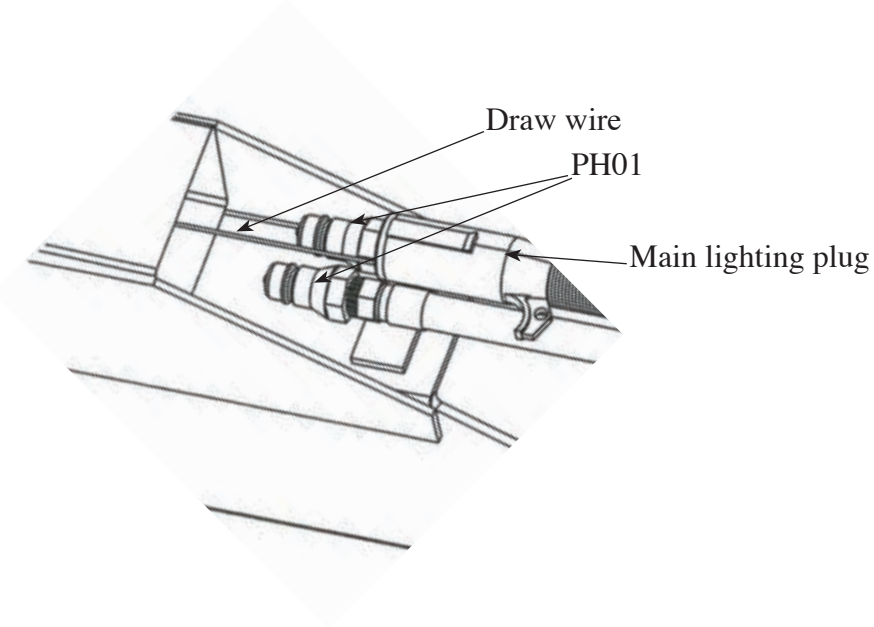


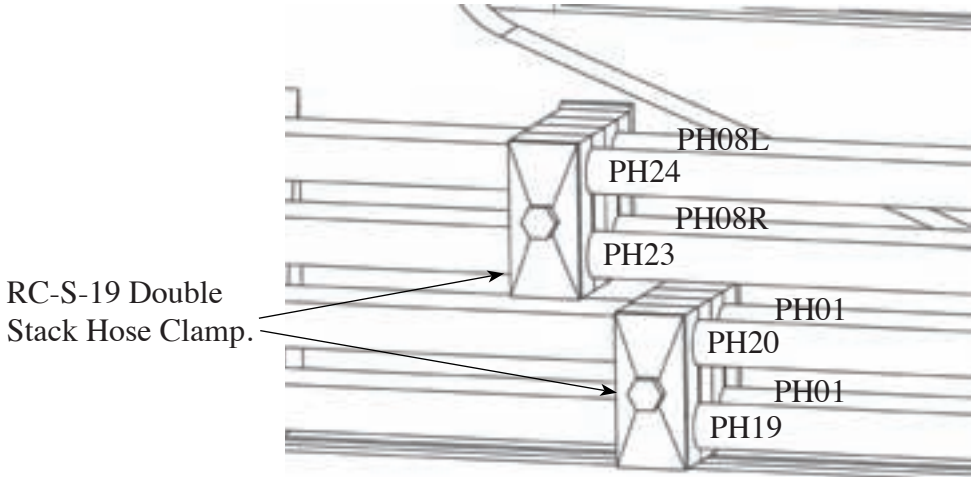
Correct layout of hoses



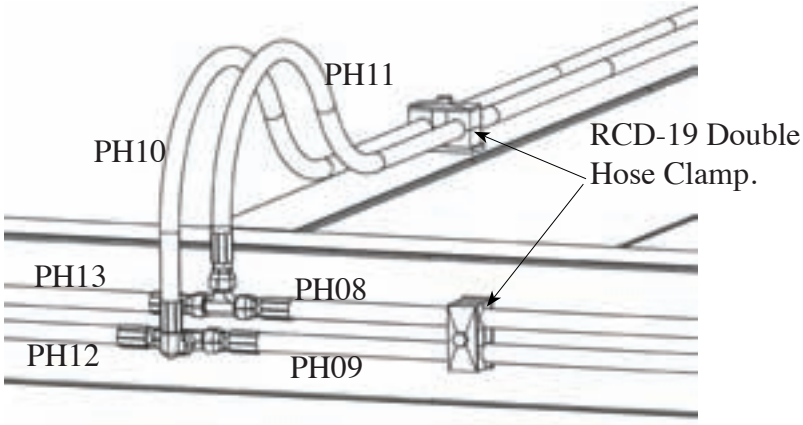


Avoid crossovers.

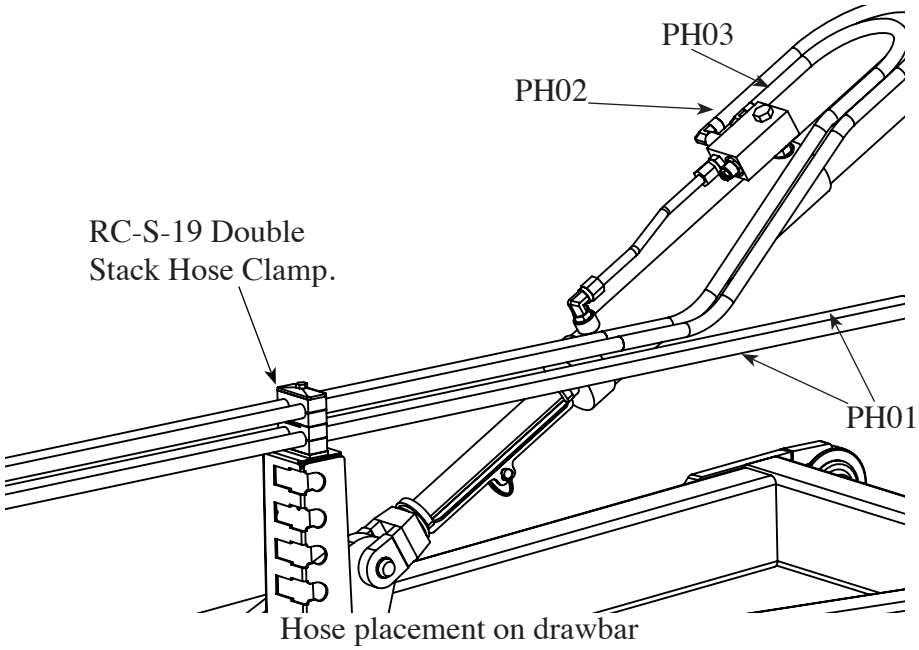




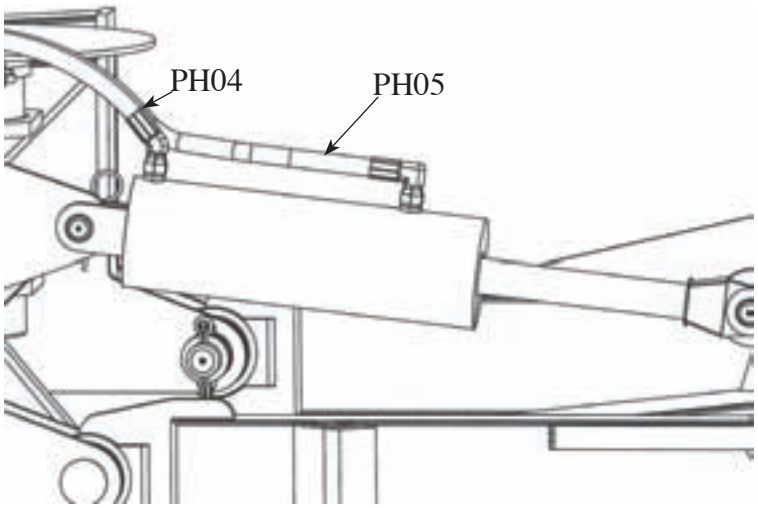
Hose placement on front of centre cylinder mount plate



Hose placement on wings



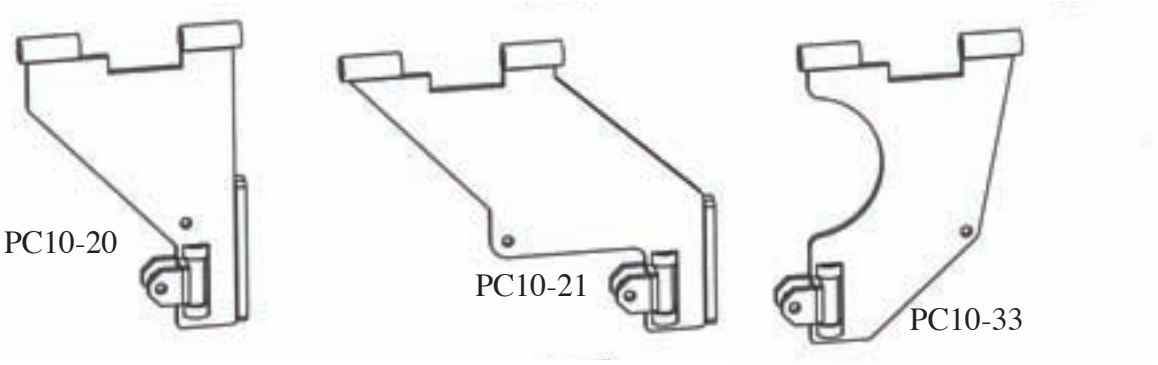
Hose placement on drawbar

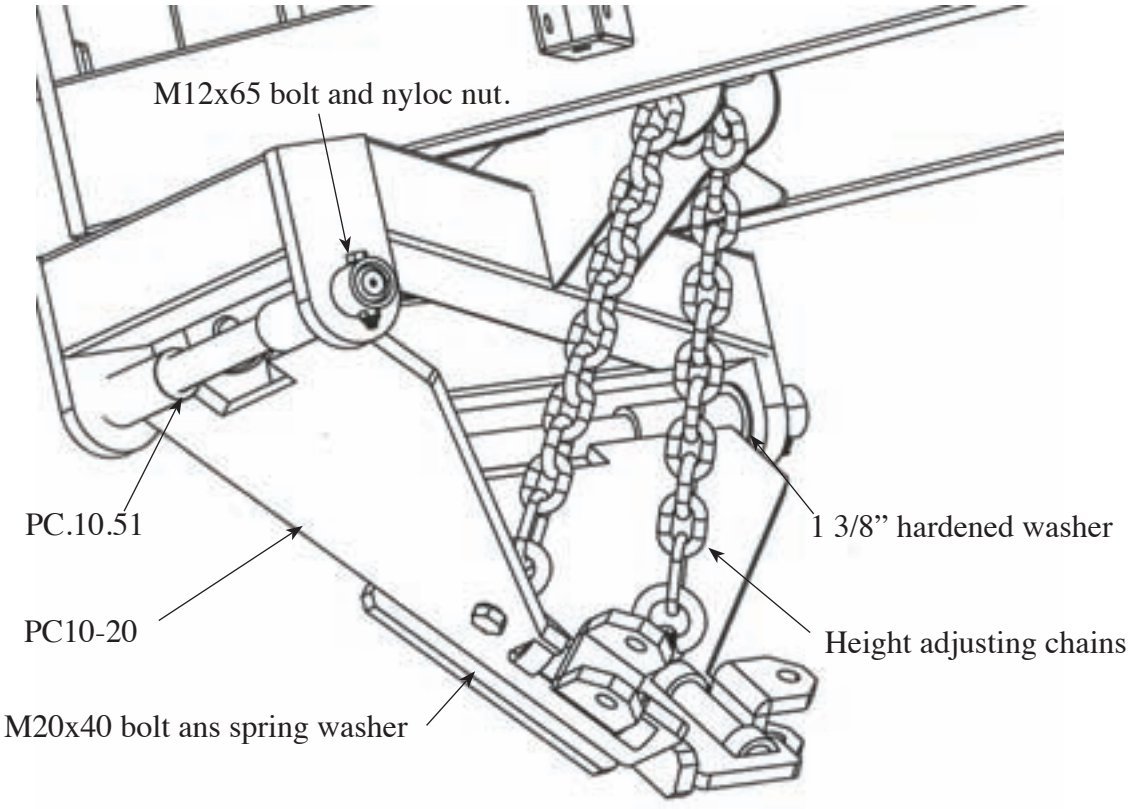


Hose placement on tail cylinder

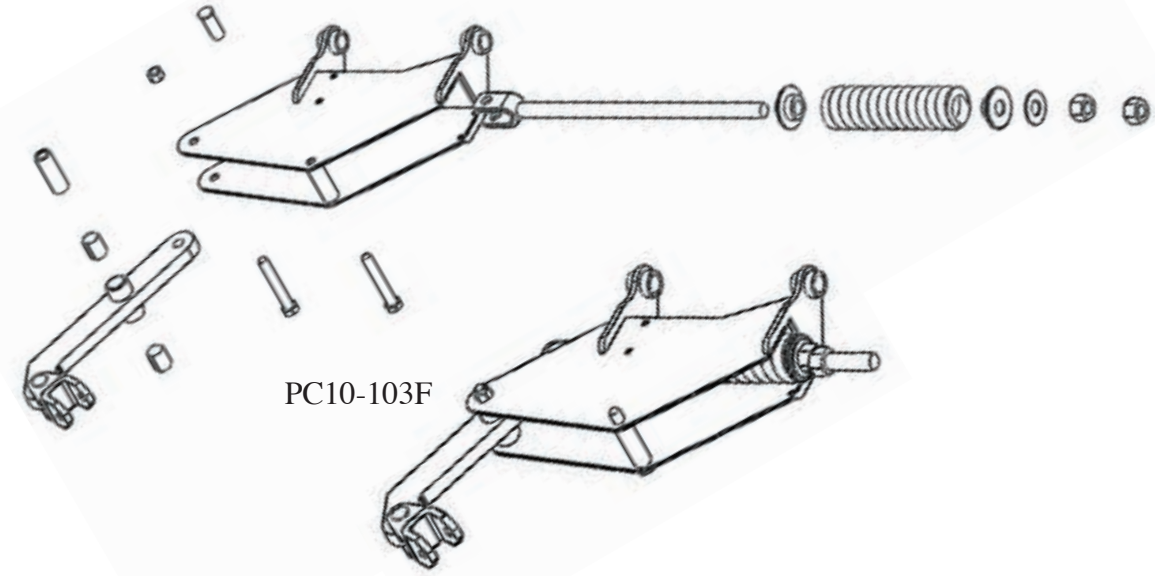
38. Connect hydraulic hoses to tractor (ISO 1/2” breakaway tips). Operate remote hydraulic extend lever as if to unfold machine and wait until outer wing fold cylinders have extended fully and centre fold cylinders have moved to the centre of the slots. This may take some time as cylinders and hoses have to fill.
Check for leaks in fittings.
Operate lever to fold machine and lift until one wing is approximately 1m (3’) off of the ground then reverse and lower wing until the centre fold rams have returned to the centre of hte slots.
Repeat this step twice as this ensures that all cylinders are charged.
Fold wings checking that the sequence is correct and that wings fold into stops correctly.
Both sets of wings should lift until vertical, then the left hand outer wing should fold until it rests on the wing fold post of the right hand inner wing, then the right hand outer wing should fold until it rests on the left hand outer wing.
Unfold wings again checking that sequence is correct. This is the opposite to the folding sequence.
Do not stand near the centre frame or within radius of wings when folding or unfolding machine.

39. Identify standard chain mount arms (PC10-20), extended chain mount arms (PC10-21), and reducing chain mount arm (PC108-33)
Attach standard chain mount arms to main pull and forward mount on rear tail using 35mm x 550mm (1.38" x 21.6") pin (PC.10.51). Ensure that 1.3/8" hardened washer is in place.
Lock pins in place using M12 x 65mm (1/2" x 2.5") bolts and nyloc nuts.
Attach an extended chain mount plate the the rear mount on the rear tail.
Attach a standard chain mount arm to the right hand end of the front module and a reducing chain mount arm to the left hand end of the rear module.

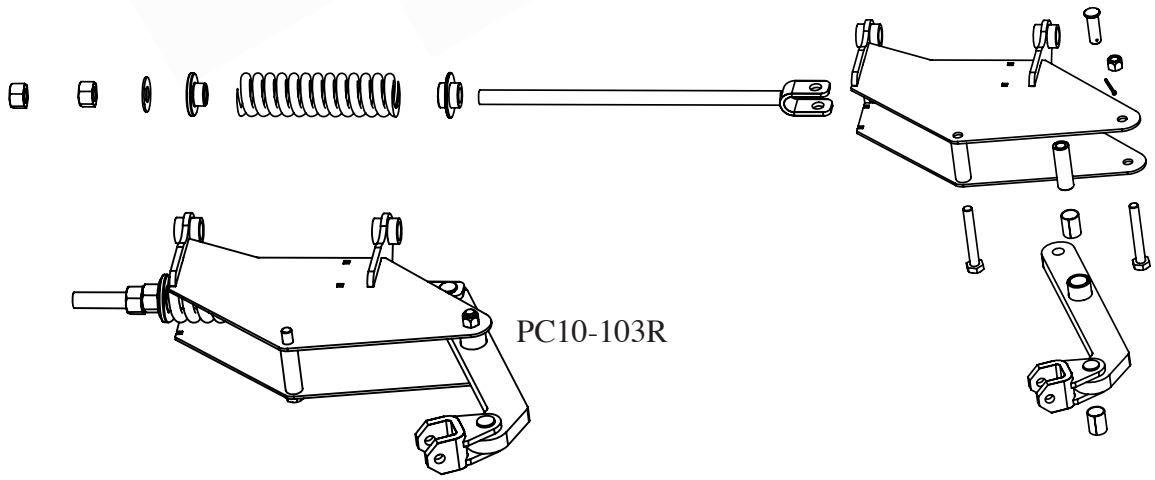




40. Identify components of front and rear module chain tension assembly (PC10-103F and PC10-103R) and assemble.



PC10-103F



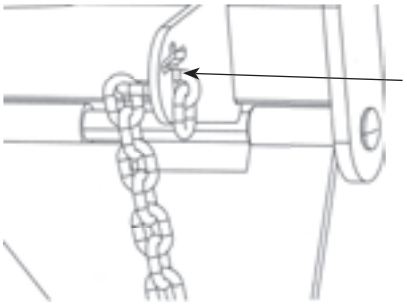
PC10-103R

41.Identify height adjusting chains.

Attach height adjusting chains to chain mount plates using M20 x 40mm bolt and M20 spring washer.

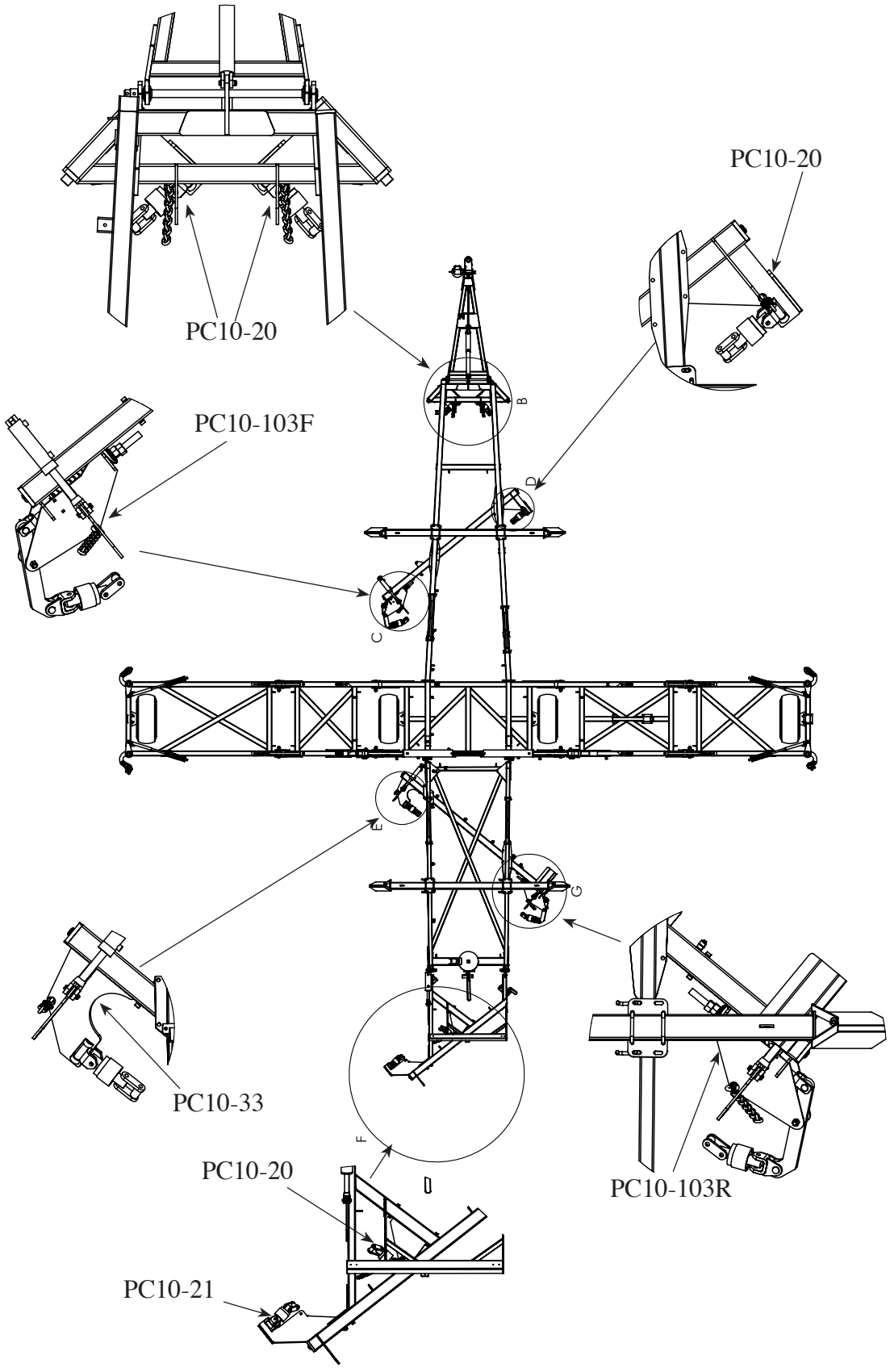
Attach height adjusting chains to module chain tension assemblies using M20 x 150mm bolt and nyloc nut.

Lift chain mount plate from bottom and insert chain into into height adjusting lug.



Insert height adjusting chain into slot.

Chain Mount Plate Positions

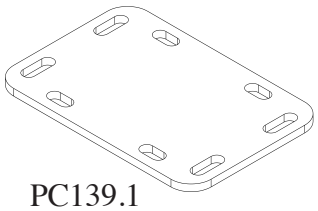


42. Identify chain carrier mounting plates (PC139.1)
Attach plates to the top rails of the rear tail 850mm (33”) from the front edge of the jockey wheel beam using M16x80x77 U bolts (16x80x77MSQZPUB) and to the top rails of the main pull 2750mm (108”) from centre frame joining plates using M16x112x104 U bolts (16x122x104MSQZPUB).
Using suitable lifting equipment lift 1 x chain carrier over main tail and lower onto mounting plates. Attach using M16x160x127 U bolts (16x160x127MSQZPUB).

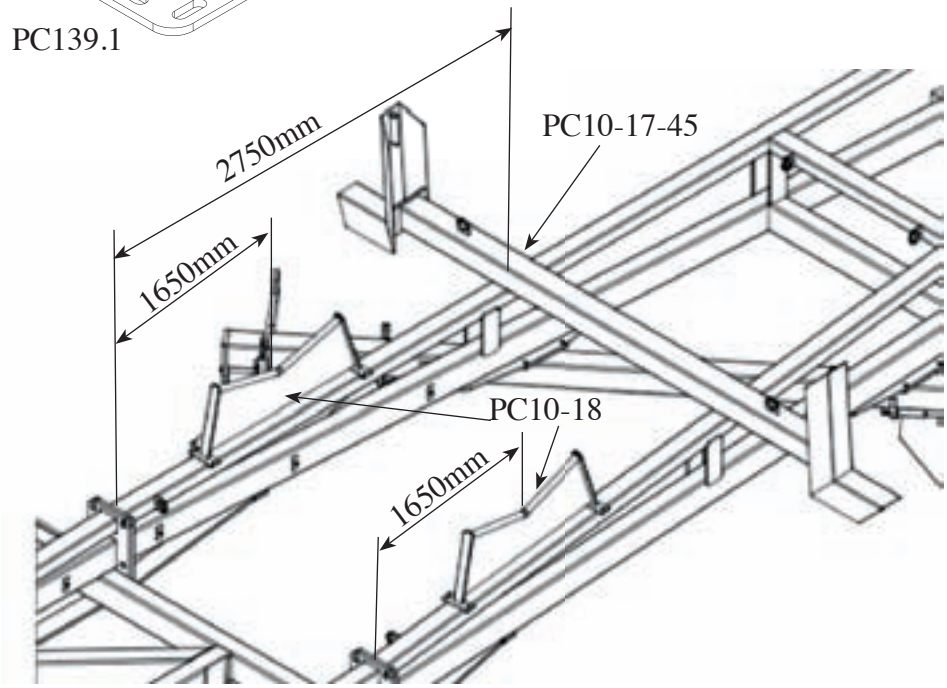
43. Identify Chain Carriers (PC-10-17-45).
Using suitable lifting equipment lift 1 x chain carrier over main pull and lower onto mounting plates.
Attach using M16x160x127 U bolts (16x160x127MSQZPUB).

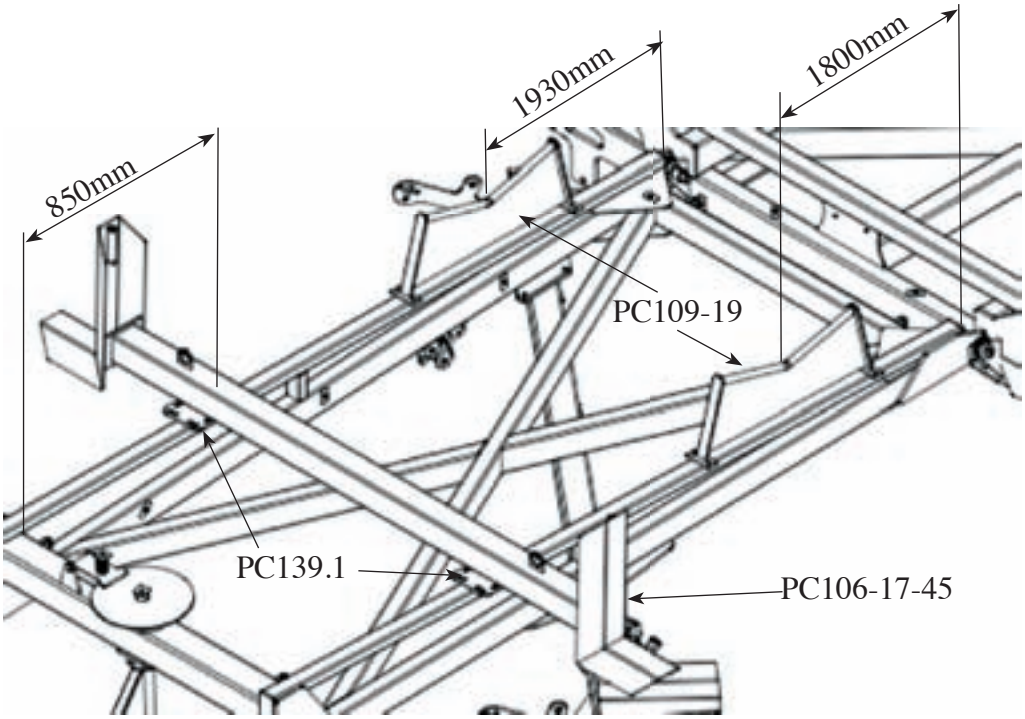
44. Identify Front M’s (PC10-18)
Place on left and right top rail of Main Pull 1650mm (65”) from centre frame joining plates.
Attach to top rail using M12x105x104 U bolts (12x105x104MSQZPUB).

45. Identify Rear M’s (PC10-19)
Place one on the left hand top rail of the Main Tail 1930mm (76”) from rear of Centre Frame.
Place the other on the right hand top rail of the Rear Tail 1800mm (71”) from rear of Centre Frame.
Attach to top rails using M12x80x77 U bolts(12x80x77MSQZPUB)

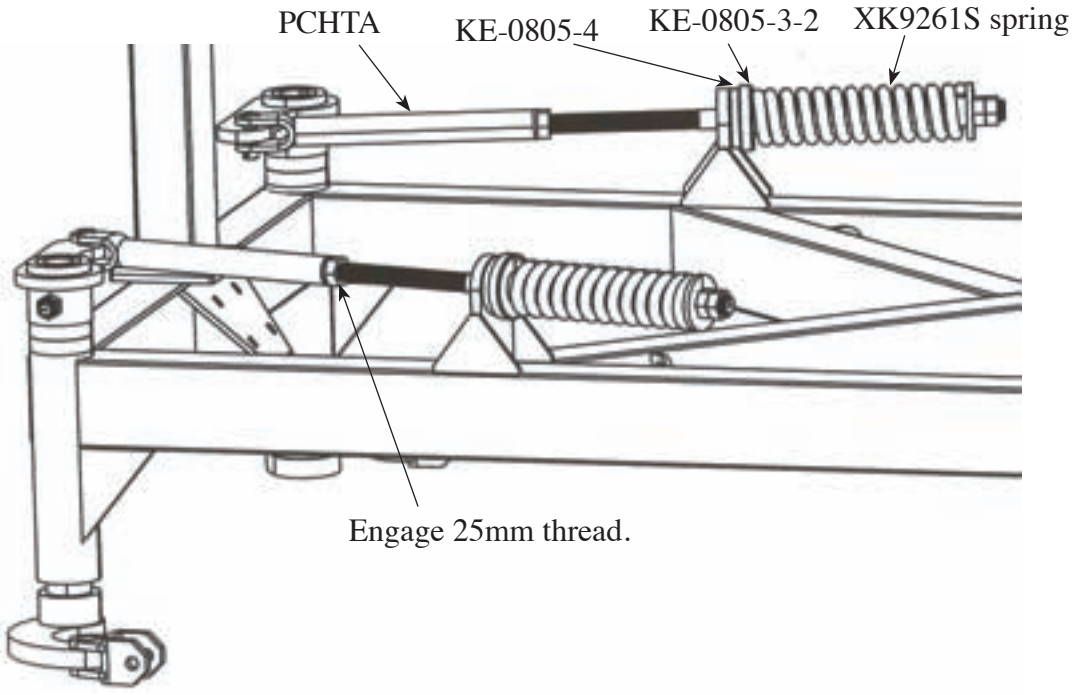


PC139.1

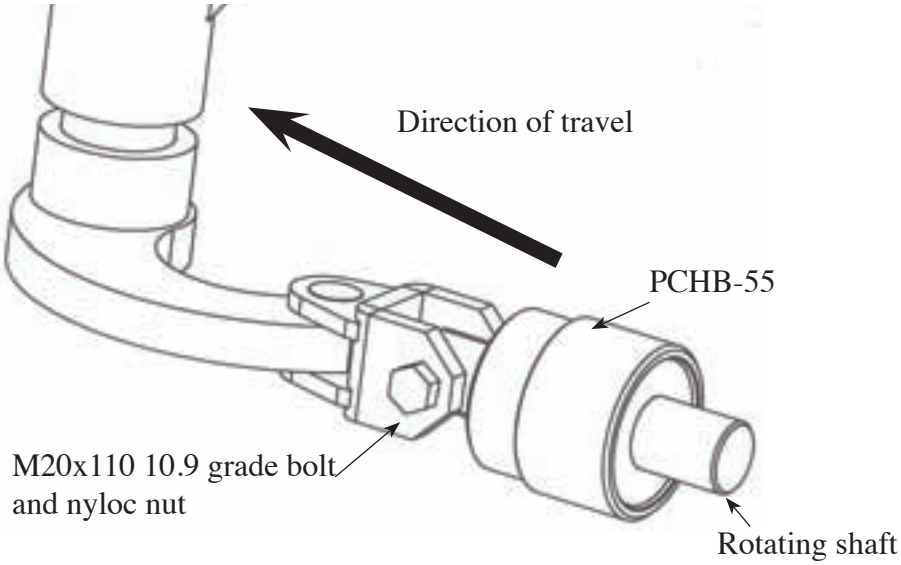




46.Identify Chain Tensioneer Assembly (PCHTA)
Install Chain Tensioner Assembly as shown with approximately 25mm (1") thread engaged.

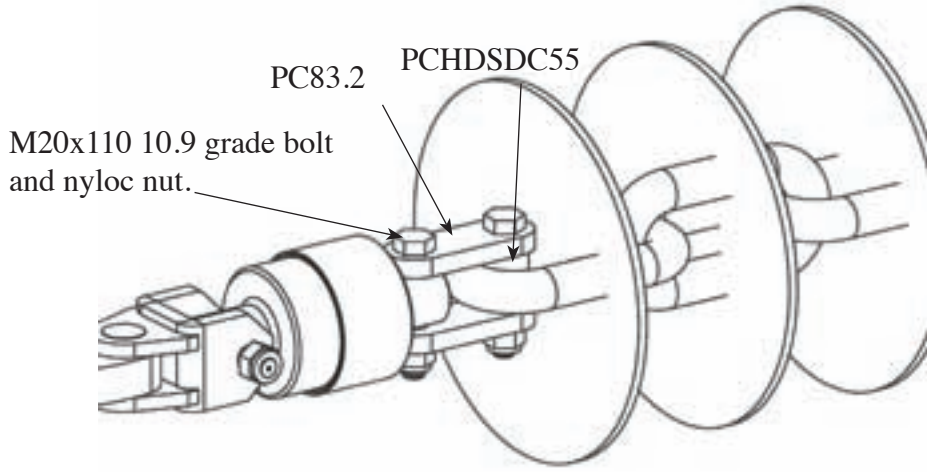


47.Identify Swivel Units PCHB-55. Install Swivel units to drop legs and chain mount plates using M20 x 110mm 10.9 grade (3/4 x 4 1/4 Gr8) bolt and nyloc nuts ensuring that the rotating shaft is facing away from the direction of travel.

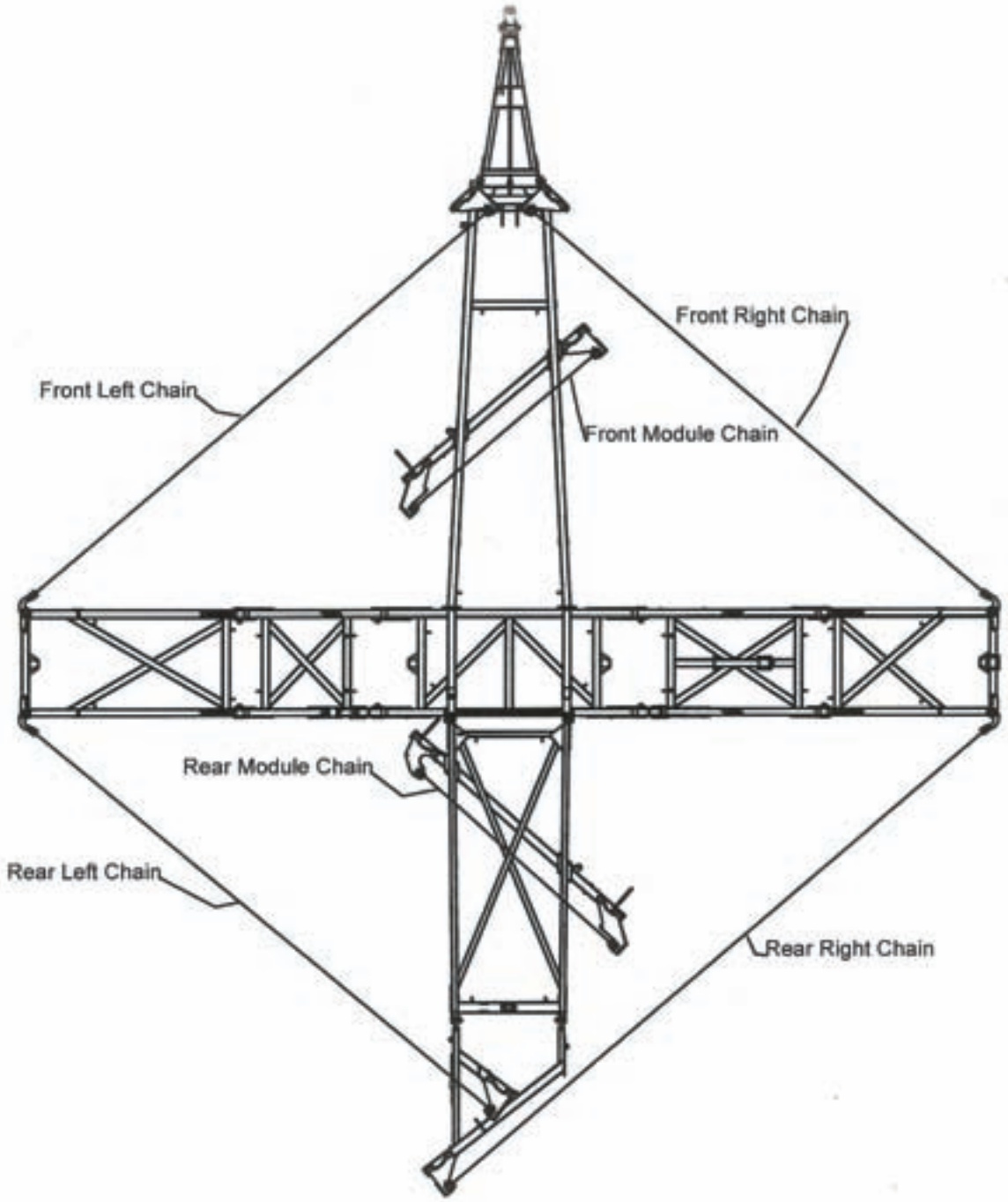


48. Identify chain lengths as per list on Pg. 29 and stretch out in positions around machine as per drawing on Pg. 28.

49. Attach chain to Swivel Units using tie plates (PC83.2) with M20 x 110mm 10.9 grade (3/4 x 4 1/4 Gr8) bolt and nyloc nuts and 50mm long 40mm x 20mm bush (PCHSDC55)



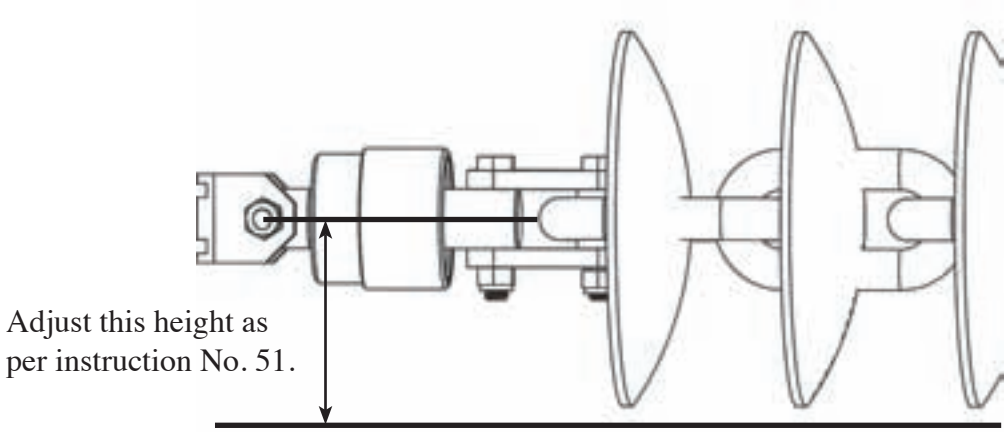
50. First attach front and rear module chains, then attach front chains to front chain mount plates. Pull out chains and attach to front droplegs.
Attach left hand rear chain to rear chain mount plate and pull out and attach to left rear drop leg.
Finally attach rear right hand chain to chain mount plate and pull out and attach to right hand rear drop leg.
All chains should be attached with the concave surface facing in the direction of travel.
If using CL1 cast chain first assemble front swivel units and tie plates then hook links to bolt then continue to hook links together until the required length is reached then attach last link to rear swivel with tie plates and bolts.
Do not tension any chains until all are attached.


Front Right Chain
Front Left Chain
Front Module Chain
Rear Module Chain
Rear Left Chain
Rear Right Chain

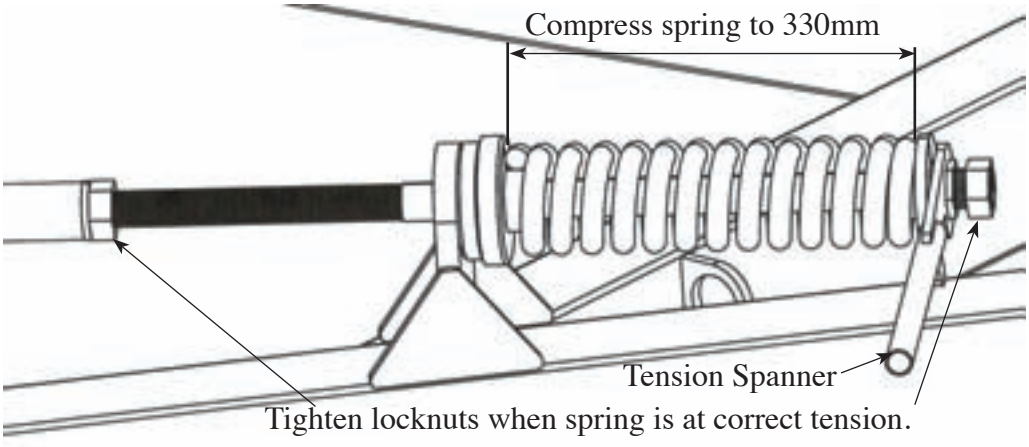
CHAIN LENGTHS

Chain	Length	Links	Cast
60' Front right	11.2m	65	68
Front left	11.2m	65	68
Rear right	12.9m	77	79
Rear left	11.2m	65	68
Modules Front	3.15m	18	19
Modules Rear	3.15m	18	19
			321
50' Front right	9.0m	54	56
Front left	9.0m	54	56
Rear right	10.7m	64	67
Rear left	9.0m	54	56
Modules Front	3.15m	18	19
Modules Rear	3.15m	18	19
			273
45'Front right	8.1m	47	49
Front left	8.1m	47	49
Rear right	9.4m	59	61
Rear left	8.1m	47	49
Modules Front	2.7m	16	17
Modules Rear	2.7m	16	17
			242
40' Front right	7.6m	44	45
Front left	7.6m	44	45
Rear right	9.1m	55	56
Rear left	7.6m	44	45
Modules Front	2.7m	16	17
Modules Rear	2.7m	16	17
			225
CT Front Module	3.0m	18	19
CT Rear Module	3.0m	18	19

51.Adjust chain heights so that the centre of the forward swivels on the main chains are 175mm - 200mm (7” - 8”) off of the ground and the centre of the rear swivels are 150mm - 175mm (6” - 7”) off of the ground.
The centre of the forward module bearings should be 200mm - 300mm (8” -12”) off of the ground and the centre of the rear module bearings should be 150mm - 175mm (6” - 7”) off of the ground.
These heights are a guide only. Some adjustment may be needed to get the desired results.



52. Tighten chains using supplied spanner until spring is compressed to 330mm (13”)



53.Fold machine and check again that sequence is correct making sure that the chains sit correctly on the chain carriers and M’s (some adjustment may be needed) then unfold to recheck sequence.

54. Identify Cylinder Stop (PC10-35CS).
Ensure when machine is folded for travel that Cylinder stop is attached to extended front cylinder and 5/16” x 2 1/4” Loop pin is inserted.

Note: Remove cylinder stop before unfolding machine for use.