

# DINGO™ K9-3

## OPERATION & MAINTENANCE MANUAL



**IMPORTANT:** Become familiar with the contents of this manual before operating the Dingo. This Manual contains Safety, Operation and Warranty Information. Also become familiar with the controls & their proper use before operating the Dingo.



Modified January 2006

# Introduction

Congratulations on purchasing the World's Leading Mini Digger.

In purchasing a Dingo you have obtained a machine of the highest quality and we want you to be totally satisfied as our customer. Please feel free to contact any of our branches for help with service, genuine replacement parts, business and operation tips and any other information you may require.

The information in this manual is current as at May 2004. In the effort to continually improve our products, Dingo reserves the right to change specifications without notice. Please, for critical information, contact you nearest Dingo branch.

When contacting us please have your Dingo Chassis and Model numbers handy. These details enable us to know the specifications of your Dingo.

Best Wishes,

Gary Briggs  
And the entire Dingo Pack.

This manual belongs with your Dingo

Dingo Chassis Number	Dingo Model Number
Engine Type & Serial Number	Date Purchased

**DISCLAIMER:**

Specifications, design & service procedures are subject to change without notice.  
Specifications may vary & may be approximate.

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# Safety

## General Operation

- Read, understand, and follow the instructions in the operation manual before using the Dingo.
- Keep hands, feet and clothing away from all moving parts and hydraulic cylinders.
- Allow only responsible adults who are familiar with the Dingo and its operation to use the Dingo.
- Do not allow any passengers on any part of the Dingo, including buckets and the operating platform.
- Do not refuel with the engine running, or while you or someone near is smoking.
- Do not operate any of the control levers (including auxiliary lever) unless you are standing with both feet on the platform and firmly holding the grip handles.
- Always wear long pants and substantial shoes (no sandals, thongs, tennis shoes, sneakers, shorts or skirts).
- Do not place feet under the platform.
- Watch where you are driving. Always look down and behind, before and while reversing.
- **WARNING** Engine exhaust contains **Carbon Monoxide**, which is an odourless, deadly poison. Carbon Monoxide can kill you. Do not run engine indoors or in a confined space.
- Always lower Dingo arms and/or place attachment on the ground when parking or leaving the Dingo unattended. Always stop the engine if leaving the operators platform.
- **IMPORTANT** Do not carry a load or heavy attachment with the Dingo arms in a raised position. Do not step off the platform with a load raised.
- Never jerk the control levers. Use a steady motion. Slow down before turning. Sharp turns may cause loss of control.
- Stop the engine before making any adjustments to the attachments or the machine.
- **WARNING** Never weld on or near the fuel tank whether it is empty or full.
- Do not operate on or near embankments. Look out for ditches, holes, etc. and beware of traffic when near roads.
- Do not allow any person or animal close to the Dingo or its attachments whilst in operation. Stop the machine if any person or animal comes close.
- Operate only in daylight or good artificial lighting.
- Do not operate the machine whilst under the influence of alcohol or drugs.
- Use extra care while loading or unloading the Dingo onto a trailer or truck.
- Do not touch equipment or attachment parts that may be hot from operation. Allow to cool before attempting to maintain, adjust or service.
- The Dingo is not a toy - Do not allow children to play on it.

**Remember - Safety is your responsibility.**

## Operating on Slopes

**All slopes require extra caution.**

- **Do not** operate on slopes exceeding 15 degrees. If a slope is greater than 5 degrees, only go up and down (not across).
- **Always have the heavy end of the machine uphill.** Weight distribution will change. An empty bucket will make the rear of the machine heaviest, a loaded bucket will make the front of the machine heaviest. Various attachments will change which end is heaviest. If you are unsure, phone us and ask. These same rules apply when loading and unloading the Dingo onto a trailer or truck.
- **Avoid turning on slopes.** If you must turn, turn slowly keeping the heavy end of the machine uphill.
- Do not operate near ditches or embankments, the machine could turn over if a wheel goes over the edge of a cliff or ditch or the edge caves in.
- Do not operate on wet grass, reduced traction could cause wheel slip.
- Remove obstacles such as rocks, tree limbs, etc from the work area. Watch for ruts or bumps as uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Operate in slow speed. Put pump selector valve in slow (turtle) position so that you will not have to stop or shift while on the slope.
- If parking on slopes or hillsides always lower the Dingo arms and attachment to the ground and chock the wheels.
- If machine becomes unstable, jump clear. Never try to stabilise the machine by putting your foot on the ground.

## Children

- Be wary of the presence of children when operating a Dingo. Children are often attracted to the Dingo and the work activity.
- Keep children out of the work site and under the watchful care of a responsible adult.
- Be alert and turn the machine off if children enter the area.
- Never carry children (or anyone) on the Dingo or any of its attachments.
- Do not allow children to play on the Dingo or within the Dingo work site (aside from the danger of working machinery there may be holes into which a child could fall or various other dangers).
- Do not allow children to use the machine.
- Before reversing look behind and down for small children. Be aware of blind corners, shrubs, trees, or ends of fences that may obscure vision.

## Service

- Before performing any service, repairs, maintenance or adjustment, stop the engine and remove the key.
- Never run the machine in an enclosed area.
- Perform all maintenance with the Dingo arms fully lowered. If Dingo arms need to be raised to perform tasks, secure them in the raised position by using cylinder locks or a safety stand. (Contact a Dingo representative if you are unsure)
- Look after the Dingo. Keep nuts and bolts tight.
- Do not tamper with safety devices. Before each use check safety systems properly.

■ Keep the machine free of grass, leaves, or other debris build up. Clean up oil or fuel spillage. Allow the machine to cool before storing.

■ Use extra care when handling petroleum and other fuels. They are flammable and vapours are explosive

- Use only an approved container.
- Never remove the fuel cap or add fuel while the engine is running. Allow engine to cool before refuelling. Do not smoke.

- Never refuel the machine indoors.

- Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.

- Never fill a container while it is inside a vehicle, car boot, utility tray or any surface other than the ground.

- Keep container nozzle in contact with the tank during filling.

■ Stop and inspect equipment if you strike anything or hear any strange noise coming from the machine. If necessary repair machine before starting again.

■ Use only genuine replacement parts to ensure that original standards are maintained.

■ Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes, and clothing. Your face, eyes, and clothing should be protected when working with a battery.

■ Battery gases can explode. Keep cigarettes, sparks and flames away from battery.

■ **WARNING** Hydraulic pressure escaping under pressure can penetrate the skin and cause injury.

Keep hands and body away from pin hole leaks or nozzles that eject high pressure hydraulic fluid. A small leak can be dangerous. To find hydraulic leaks use cardboard or paper.

If fluid is accidentally injected into the skin a doctor familiar with this type of injury must surgically remove it within a few hours.

## Safety and Instruction Decals

It is important to replace any damaged or missing decals.

Part number: 021-000-032)



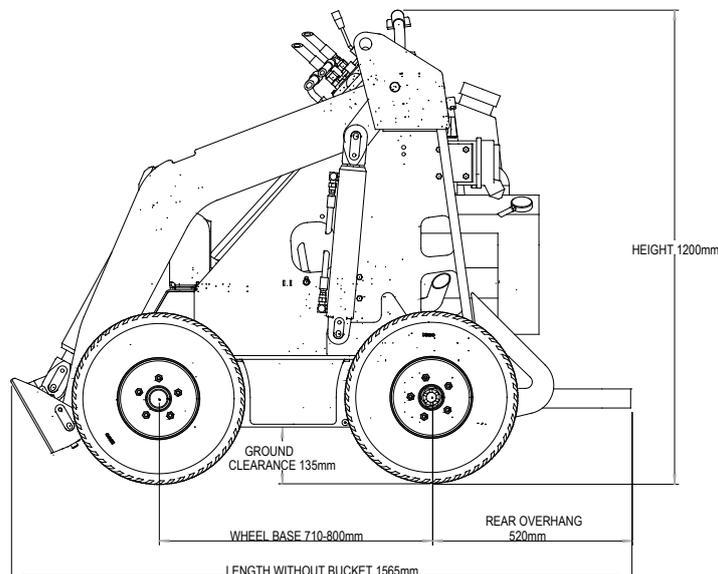
Part Number 021-000-013

# Specifications

General Specifications (without operator and without attachments)  
(Approximate Only)

Overall width	840mm-1040mm
Overall length (without attachment)	1565mm
Overall height	1200mm
Max. operating height (with standard bucket)	2080mm
Operating weight	700-800kg
Turning radius with standard bucket	1300mm
Safe Working load (=50% of tip load)	250 kg
- bucket (& 90kg operator)	
(Lifting capacity up to 500kg with certain attachments)	
Speed	0 - 6 km/hr
Angle of departure	20 degrees
Engine HP	Kohler 22 HP
	Perkins 20 HP
Wheel motor sizes	29 cu in
Wheel base	710-800mm
Drive chain	ASA 60H (Heavy Link 3/4")
Ground clearance	135mm
Tyre size	18 x 8.50 x 8 (4 ply) standard
Hydraulics	2 pump
Pump sizes	Kohler 9 & 3 cc (3600 rpm)
	Perkins 11.2 & 3.15 cc (3100 rpm)
System relief pressure (hydraulic)	3000psi (206 Bar)
Hydraulic reservoir capacity	60 litres
Hydraulic output	43 litres per minute
Filtration	25 micron
Standard bucket capacity	0.11 cu m
Standard bucket dump height	1240 mm
Reach fully raised standard bucket	600mm
4 in 1 bucket capacity	0.11 cu m
4 in 1 bucket dump height	1750mm
Reach fully raised 4 in 1 bucket	600mm
Chip bark bucket capacity	0.18 cu m
Height to hinge pin (std. bucket in highest position)	1680mm

Specifications and design subject to change without notice.



# Operation - Pre Start-Up

## Pre Start-Up (daily)

Read this manual and the engine manual and become familiar with the contents of both.

Always check the following before operation:

- Fuel level - fill if necessary
- Engine oil level (refer to engine manual)
- Remove all refuse from the machine
- Check air filter
- Check bushes
- Tyre pressure (22psi & water filled)
- Drive chain condition and tension
- Check radiator fluid (diesel only)
- Check for oil leaks
- Check for damage & loose components
- Be sure that the work area is free from other people and children
- Clean work area of any debris
- Know and mark the location of any utility lines
- For first 6 days of operation of new machine, and first 6 days of operation after changing wheels, tighten wheel nuts daily.

## Adding Fuel

Labelling on the fuel tank tells whether a machine requires petroleum or diesel fuel. For fuel type and information on suitable additives refer to Engine Manual as supplied. (NB. If labelling becomes lost or damaged order replacements from your Dingo representative) & fit to machine.

1 Position Dingo on level surface, lower the Dingo arms and turn off the engine (turn ignition key to off). Remove the key.

2 Clean around the fuel tank cap and remove the cap. Use a funnel to add fuel as specified above to the fuel tank, filling until the fuel reaches 60 - 70 mm below the top of the tank. This space is needed to allow the fuel room to expand. **Do not fill the fuel tank completely full.**

3 Replace the fuel cap securely. Clean away any fuel that may have spilt.

**DANGER - Petroleum can be extremely flammable and highly explosive.**

To avoid a fire or explosion that may burn yourself, other, or cause property damage:-

- Use a funnel and fill the fuel tank out doors, in an open area, when the engine is cold
- Clean up any petrol spills.
- Do not completely fill the fuel tank. Follow guidelines above.
- Never smoke while handling fuels, and stay away from an open flame or any place that a spark may ignite petroleum fumes.
- Store fuels in an approved container, out of reach from children. Never buy more than a 30 day supply of fuel.

## Checking the Engine Oil

Check the engine oil level using the dip stick. (Refer to your engine manual for details)

## Remove Debris from the Machine

**IMPORTANT:** Overheating will result if the engine is operated with a blocked grass screen, dirty or plugged cooling fins, and/or cooling shrouds removed.

The hydraulic system will keep cooler if the machine is free from debris on the hydraulic tank and fittings.

Park the machine on a flat surface, lower the Dingo arms and turn off the engine.(turn ignition key to off). Remove the key.

Check air filter pre-cleaner for debris. If required, wipe away debris before and during each use.

Debris can build up in the engine area. Clean any debris build-up with a brush or blower before each use.

**IMPORTANT:** It is preferable to blow out dirt than to wash it out. If water is used, keep it away from electrical system.

**IMPORTANT:** Do not high pressure wash. High pressure washing can damage the electrical system.

## Tyres and Traction

**WARNING!** Dingo tyres should be filled with water or solid fill. Failure to do so will result in poor weight distribution, which will drastically reduce the stability and carrying capacity of the machine.

Use of incorrect tyre pressure will also reduce the stability and carrying capacity of the Dingo. The correct tyre pressure is usually between 140 and 155 kpa (20-22psi). Various types of equipment are available for filling tyres with water. Filling equipment can also be purchased from Dingo Mini Diggers.

You should also be aware that the tyres fitted to your machine may not be the most suitable for all work environments and there is a range of traction equipment to suit every application.

This range includes:

- **8” Dingo tyres** [machine width 970mm] Specially designed for Dingo these 18"x8" tyres feature a unique tread pattern for excellent performance in a range of conditions, 6 ply for strength & stability and a compound designed for durability.
- **8” turf tyres** [machine width 1040] general purpose - suitable for grassy areas, dry soil and paved surfaces - minimum ground disturbance.
- **8” lug tyres** [machine width - 1040] tractor type, for building sites, and muddy situations.
- **20 x 8” sand tyre** [machine width - 1100] better floatation & clearance for sandy & loose material conditions.
- **5” forklift type tyres** [machine width - 890mm] narrower tyres, suitable for heavy loads, restricted access, inside buildings, great on all hard surfaces.
- **3” narrow solid tyres** [machine width - 840mm] only for very restricted access - will fit through a standard doorway.
- **Tracks** [machine width - 1200mm] excellent floatation and traction - suitable for mud, sand and slush.

- Solid fill (all of the tyres mentioned above (excluding the 3”solids) can be supplied by Dingo Mini Diggers, filled with a puncture-proof, solid foam).
- For more information on our range of traction products, please speak to your nearest Dingo representative.

# Operating Instructions

Read all the safety instructions and the pre start up section of this manual and the engine manual before operating the Dingo.

**Caution** - Do not operate any of the control levers (including auxiliary lever) unless you are standing with both feet on the platform and firmly holding the grip handles.

**IMPORTANT!** **Ensure the auxiliary hydraulic lever is in the centre position before attempting to start engine.** The most common cause of ‘hard to start/engine, will not turn over fast enough, battery does not have enough power’ type starting problems is that the auxiliary lever has been left on or knocked into gear and the engine is trying to start under load.

## Control Levers / Control Panel

### Key Switch

The key switch, used to start the engine, varies on petrol and diesel models. Check engine manufacturer's manual for starting instructions. To shut engine off, rotate key to OFF position (counter clockwise direction).

### Throttle

Move control forward to increase engine speed and rearward to decrease engine speed.

### Choke

For instructions regarding use of the choke (petrol models) refer to the engine manufacturers manual.

### Drive Control Levers

To go forward, slowly push the right and left drive control levers forward.

To go backward, slowly pull the right and left

drive control levers backward.

To go straight, apply equal pressure to both drive control levers.

To turn, decrease pressure on the drive control lever closest to the direction you want to turn.

The farther you move the drive control levers in either direction, the faster the machine will move in that direction.

To slow or stop, move or release the drive control levers into neutral. (If released the control levers will automatically return to neutral).

The Dingo is capable of turning on the spot by applying equal power to each drive lever in opposite directions.

### Attachment Tilt Lever

To tilt/crowd attachment forward, slowly push the tilt lever forward.

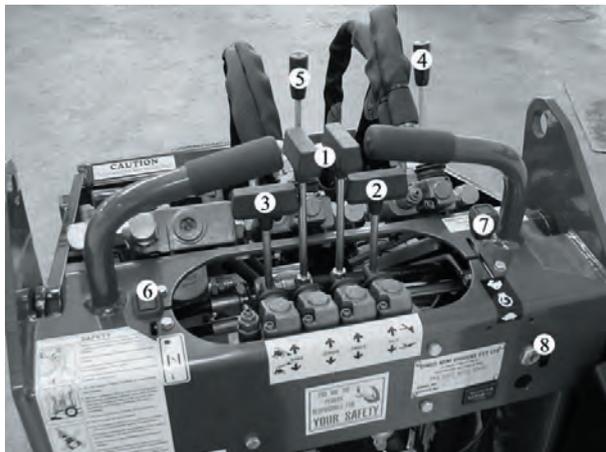
To tilt attachment backward, slowly pull the tilt lever backward.

### Loader Arms Lever

To lower Dingo arms, slowly push arm lever forward.

To raise Dingo arms, slowly pull arms lever backward.

### Control Panel Diagram



- 1 Drive control levers
- 2 Attachment tilt lever
- 3 Loader arms lever
- 4 Auxiliary hydraulic lever
- 5 Pump selector valve
- 6 Kohler engine Dingo's - Choke  
Robin engine Dingo's - Throttle
- 7 Kohler engine Dingo's - Throttle  
Robin engine Dingo's - position empty
- 8 Ignition

### Auxiliary Hydraulic lever

The auxiliary hydraulics lever allows you to alter the direction of rotation of hydraulically driven attachments or stop them completely.

**ATTENTION:** Ensure auxiliary hydraulic lever is in neutral position before starting engine. Aside from starting difficulties the attachment may move during starting.

To operate attachment in forward direction, slowly pull auxiliary lever rearward. To operate attachment in reverse direction, slowly push auxiliary lever forward.

### Pump Selector Lever

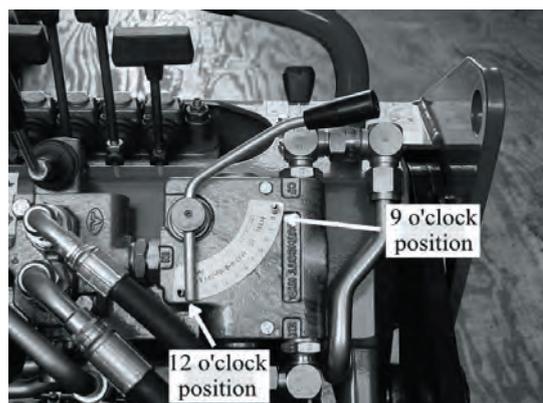
When faster ground speed and lifting speed is required (bucket work) more than attachment speed and power, push the pump selector lever to the forward position (Hare).

When faster attachment speed and power is required (trenching, post hole digging etc) more than ground speed and lifting power, pull the pump selector lever to the rearward position (Turtle).

### Flow Divider Control

In its normal operating position (12 o'clock) no flow division is taking place. Moving the lever towards the nine o'clock position, diverts oil flow to the attachment and less is available to the Dingo wheels and arms. This allows for greater concentration of power where it is needed most.

The flow divider is mainly used for trenching, rotary hoeing and stump grinding where it is important for the attachment to have as much power as possible and ground speed is not important.



## Starting the Engine

Stand on the platform. Move the auxiliary hydraulics lever to neutral. Follow instruction on starting engine as detailed in the engine manufacturer's manual.

## Stopping the Engine

Refer to the relevant engine manual.

**Note:** If the engine has been working hard or is hot, let it idle for a minute before turning the ignition key to OFF. This helps cool the engine before it is stopped. In an emergency, turning the ignition key to OFF will stop the engine.

## Stopping the Dingo

To stop the machine, move the drive control levers to neutral, lower Dingo arms to the ground, and turn the ignition key to OFF to stop the engine. Remember to remove the key from the key switch.

**CAUTION!** If children or bystanders attempt to operate the machine, someone could be injured. To avoid attempted use by children or bystanders while machine is unattended, remove the key from the ignition, even if just for a few minutes.

## Moving a Non Functioning Dingo

The best way to move a non functioning Dingo is by forklift or crane. It is also possible to push or tow a Dingo without the use of the engine. By adjusting the Over Centre Valve it is possible to free up the hydraulic circuit, allowing the wheel motors to turn freely. Please call your nearest Dingo service centre for more information.

## Using Cylinder Locks

**IMPORTANT:** Normal maintenance should be completed with the Dingo arms lowered. If maintenance or repairs requires the Dingo arms raised, use cylinder lock provided with Dingo.

**WARNING!** Dingo arms may lower when in the raised position. Anyone under the Dingo arms could be injured or crushed. To avoid this hazard always install cylinder locks or a safety stand. (Contact a Dingo representative if you are unsure).

# Attachments

## Connecting

**IMPORTANT:** Use only Dingo approved attachments. Attachments can change stability and operating characteristics of the machine. The warranty of the machine may be voided if used with unapproved attachments.

**IMPORTANT:** Before connecting any attachments to the machine, make sure mount plates are free of any dirt and debris.

- 1 Move pump control lever to slow (turtle) position.
- 2 Slowly push the attachment tilt lever forward to tilt the attachment mount plate forward.
- 3 Position mount plate into the upper lip of the attachment's receiver plate.
- 4 Raise the Dingo arms while tilting back the mount plate at the same time.
- 5 **IMPORTANT:** The attachment should be raised enough to clear the ground and the mount plate tilted all the way back.
- 6 Turn the ignition key to OFF to stop the engine.
- 7 Engage the attachment lock pins (the lock pins should go down 15mm as they turn). **Note:** Lock pins are located on the outer edge of the mount plate and should be turned towards the inside to engage.
- 8 **Note:** Proceed to next step if auxiliary hydraulics are required with attachment.
- 9 **IMPORTANT:** Make sure all foreign matter is cleaned from hydraulic connections before making connections.
- 10 With the engine turned off move the auxiliary hydraulics lever to the forward, backward, and back to neutral position to relieve hydraulic pressure at the hydraulic couplers.

**11** Remove protective plugs from the hydraulic couplers on the Dingo. Connect plugs together to prevent contamination during operation.

**12** Slide collar back on hydraulic coupler and connect attachment couplers to machine couplers. There will be two connections to make.

**13** Confirm that connection is secure by pulling on the hoses.

## Disconnecting

**1** Lower attachment to the ground or onto a trailer.

**2** Turn the ignition key OFF to stop the engine.

**3** Move the auxiliary hydraulics lever forward, backward and back to neutral position to relieve hydraulic pressure at the hydraulic couplers.

**4** Slide collar back on the hydraulic coupler and disconnect attachment couplers from machine couplers. (Note: if this is difficult return to step 3 and repeat).

**5 IMPORTANT:** Connect attachment hoses together to prevent contamination during storage.

**6** Install protective covers onto Dingo's hydraulic couplers.

**7** Disengage the attachment lock pins by turning them to the outside.

**8** Start engine, tilt the mount plate forward and back machine away from the attachment.

## Transporting and Securing

**IMPORTANT:** Do not operate or drive Dingo on roadways.

**IMPORTANT:** When transporting Dingo on trailer, always use the following procedure.

**1.** Never load or unload the Dingo on the trailer unless the trailer is attached to the vehicle.

**2.** Always climb the ramps with the heavy end of the machine up hill. E.g. With heavy attachments like the trencher or backhoe attached to the Dingo, climb the ramps in

the forward direction. With no attachment on the Dingo, climb the ramps in the reverse direction.

**3.** The bucket, post hole digger and leveller attachment should always be positioned in their designated positions on the trailer. This will help ensure that the weight is distributed correctly on the trailer.

**4.** Ensure the load is positioned so that there is more weight forward of the trailer axle than behind the axle. Too much weight behind the axle may cause the rear of the vehicle to become too light.

**5.** Once in position on the trailer lower the Dingo arms

**6.** Turn the key to Off to stop the engine.

**7.** Secure the machine to the trailer with chains or straps using the tie down points on the Dingo arms.

**8.** When towed by a vehicle not fitted with an electric trailer brake controller, engage the manual breaking system by lifting the manual override stopper on the tow coupling (single axle trailer only).

## Maintenance

It is essential to maintain the engine as detailed in the engine manual. Service recommendations will vary depending on your engine type, refer to your engine manual for this information.

**Any information relating to the engine in the following table is intended as a guide only.**

Refer to the Pre Start Up section for maintenance that should be completed before starting the Dingo (each and every time).

Frequency	Engine Type	Maintenance Required	Ref for Info
Every 25 Hours	All	Check hydraulic oil level and check external leaks	Page 16
		Check bushes & replace if required	Page 15
First 50 Hours	Diesel	Change Engine Oil & Filter	Engine Manual
	All	Check hydraulic pressures. (Available free from your local Branch)	.
Every 50 Hours	All	Check hydraulic oil level and check external leaks	Page 16
		Check Hydraulic hose connections and tighten if required	.
		Check tyre pressure	Page 10
		Replace air filter element if required (1)	Page 15
		Check for fuel leaks	.
		Check battery electrolyte fluid level	Engine Manual
		Clean spark plugs (petrol only) Replace if required	.
		Tighten wheel nuts	.
		Test all functions of operation	.
Every 100 Hours	Petrol	Change engine oil & filter	Engine Manual
		Replace fuel filter	Engine Manual
	All	Replace air cleaner element (1)	Page 15
		Check battery electrolyte fluid level	Engine Manual
	Diesel	Check drive chain tension & adjust if necessary	Page 17
		Check fan belt tension, Clean radiator fins & radiator hoses	.
Every 500 Hours	All	Change Hydraulic Oil & clean hydraulic oil tank	Page 16
		Change Hydraulic Filter	Page 16
		Remove sediment in fuel tank	Page 16
	Petrol	Have UTE bendix starter drive serviced (2)	Engine Manual
		Have solenoid shift starter disassembled and cleaned (2)	
	Robin	Clean Carburettor	Engine Manual
		Clean cylinder head	
		Clean engine base (oil pan)	
		Check and adjust valve seats	
Adjust valve clearance			
Replace spark plugs			

## Dingo Service Pack

It is recommended that some parts be kept on hand for maintenance purposes at all times. The following pack is excellent value, being considerably cheaper than purchasing the parts individually. Please phone your Dingo representative for current pricing of this kit. It may be necessary to add to this kit depending on which attachments you have.

- 10 Bushes/Bearings & Pins to suit
- 6 Bearing Seals (if required)
- 1 Bush/Bearing Drift (used for changing bushes/bearings)
- 1 Hydraulic Return Filter
- 1 Fuel Filter
- 1 Engine Oil Filter to suit specific motor
- 1 Air Cleaner Element Inner
- 1 Air Cleaner Element Outer
- 1 Drive chain & Joining Link

### Air Filter

#### IMPORTANT:

The air filter is of extreme importance. It ensures the air entering the engine is clean. Dirty air will equate to greatly reduced engine life. The time interval between changes of air filter will depend on the operating conditions. Change of air filter is recommended as opposed to cleaning of the air filter.

Although the service schedule recommends 50 hour intervals between changes of the air filter, **if dusty conditions prevail, then 8 hours could be too long.**

**Never blow out your air filter with compressed air.**

If the filter or filter housing is damaged, stop the engine immediately and replace the damaged components. Failure to stop work when the air filter or housing is damaged could result in **permanent damage.**

### Bushes/Bearings & Pins

Your Dingo has 9 bushes/bearings and 10 pins. These are located on either end of the hydraulic cylinders and on all pivot points of the lift arms.

**These bushes/bearings are wear parts and require regular inspection. (Once a week)**

To check the condition of the bushes/bearings:

- 1 Remove attachment from the front of the Dingo
- 2 Raise the arms until the mount plate is at waist height
- 3 Grab the mount plate and wriggle back and forth to try and identify any movement in any of the joints in the mount plate
- 4 Grab the arms and wriggle up and down to detect any movements in joints in the arms.

It is essential that bushes/bearings be replaced on the first sign of wear, or costly damage will occur. Ensure that spare bushes/bearings are on hand at all times.

#### To replace bushes:

- 1 Undo bolt in tag of pin.
- 2 Slide the pin out of the joint. If any damage to chrome coating on pin, replace pin.
- 3 Use bush drift (part no - 141-000-000) to punch bush from joint.
- 4 Use bush drift to insert new bush. Careful not to damage teflon inner coating of bush.
- 5 Use emery paper or similar to clean joint surfaces (allows pin to slide in easier)
- 6 Slide pin back into place. Avoid using hammer to force pin back into position. This can damage the bush.
- 7 Replace locking bolt.

### Engine Oil

Refer to the engine manual for required frequencies of oil changes, oil types, crankcase capacity and viscosity.

#### Changing / Draining Oil

- 1 Start the engine and let it run for 5 minutes. This warms the oil so it drains better.
- 2 Park the Dingo so the drain side is slightly lower to ensure that the oil drains completely.
- 3 Then lower the Dingo arms, chock the wheels and turn the ignition key to OFF to stop the engine. Remove the key.
- 4 Place the end of the hose in a pan.
- 5 Remove bung by turning counter clockwise while holding the nut. Allow to drain.
- 6 When oil has drained completely, replace the bung.

**Note:** Dispose of used oil in accordance with local authority regulations.

7 Slowly pour approximately 80% of the specified amount of oil (refer to engine manual) into the filler tube. Now check the oil level. Slowly add additional oil to bring to FULL mark on dipstick.

## Changing Oil Filter

Refer to engine manual.

## Spark Plugs

Removing, checking and cleaning spark plugs (petrol only) - refer to engine manual.

## Fuel Filter

Replace the fuel filter after every 100 hours or yearly, whichever occurs first.

- 1 Never reinstall a dirty filter.
- 2 Lower the Dingo arms and turn the ignition key to OFF to stop the engine. Remove the key.
- 3 Clamp fuel line close to the tank to block fuel flow or on diesel turn the tap on the filter until it is in the horizontal position.
- 4 Squeeze the ends of the hose clamps together and slide them away from the filter.
- 5 Place a drain pan under the fuel line to catch any spillage, then remove the filter from the fuel lines.
- 6 Install a new filter and move the hose clamps close to the filter.
- 7 Remove clamp blocking fuel flow.

## Draining the Fuel Tank

**DANGER! Petroleum can be extremely flammable and highly explosive.** To avoid a fire or explosion that may burn yourself, others, or cause property damage:-

- Drain petrol from the fuel tank when the engine is cold. Do this outdoors in an open area.
- Wipe up any petroleum that spills.
- Never drain petroleum near an open flame or where a spark may ignite petroleum fumes.
- Never smoke while handling fuel.

- 1 Park the Dingo on a level surface, to ensure fuel tank drains completely.
- 2 Lower the Dingo arms and turn the ignition key to OFF to stop the engine. Remove the key.
- 3 Loosen the hose clamp at the fuel filter and slide it up the fuel line away from the fuel filter.
- 4 Pull the fuel line off the fuel filter, open the fuel valve, and allow fuel to drain into a fuel can or drain pan.
- 5 Remove tank, drain completely and flush by tipping tank upside down.
- 6 Reverse procedure to replace clean tank.

**Note:** Now is the best time to install a new fuel filter because the fuel tank is empty.

- 7 Install the fuel line onto the fuel filter.
- 8 Slide the hose clamp close to the fuel filter to secure the fuel line.

## Hydraulic System

### Replacing the Hydraulic Filter

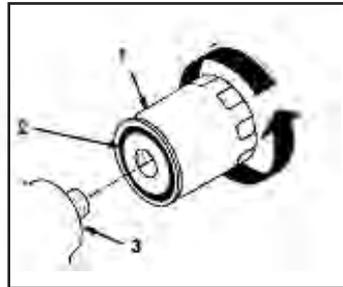
Change the hydraulic filter after every 500 operating hours.

**IMPORTANT: Do not substitute with automotive oil filter or severe hydraulic damage may result.**

- 1 Position the Dingo on a level surface, lower the arms and turn the ignition key to OFF to stop the engine. Remove the key.
- 2 Remove the old filter and wipe the filter adapter gasket surface clean.
- 3 Apply a thin coat of hydraulic fluid to the rubber gasket on the replacement filter.
- 4 Install replacement hydraulic filter. Tighten clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn.
- 5 Clean up any spilt fluid.
- 6 Start engine and let run for about 2 minutes to purge air from the system. Stop the engine and check for leaks.

7 Check fluid level in hydraulic tank and add oil to raise level to 75mm below the top of the tank. **DO NOT OVER FILL.**

1. Hydraulic Filter
2. Gasket
3. Adapter



### Changing the Hydraulic Fluid

Change the hydraulic fluid after every 500 operating hours.

**IMPORTANT:** Do not substitute with automotive oil or severe hydraulic damage may result.

- 1 Position the Dingo on a level surface, lower the arms and turn the ignition key to OFF to stop the engine. Remove the key.
- 2 Place large drain pan under the machine that can hold at least 70 litres.
- 3 Remove the drain plug from the bottom of the hydraulic tank and allow the fluid to completely drain out.
- 4 Remove the tank top and wipe out the inside of the tank and wash out with petrol. If anything unusual is found, consult your Dingo service centre or a hydraulic expert. The tank needs to be spotlessly clean to preserve the hydraulic system.
- 5 Install the drain plug.
- 6 Fill the hydraulic tank with approximately 57 litres of **HVI 68** hydraulic oil.

**Note:** Dispose of used oil in accordance with local authority regulations. Only use **HVI 68** oil. Use of other oil grades can cause loss of hydraulic power, or damage to machine.

### Check Hydraulic Lines

After every 100 operating hours, check hydraulic lines and hoses for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather

and chemical deterioration. Replace all moving hydraulic hoses every 1500 or two years, whichever comes first. Make necessary repairs before operating.

**WARNING!** Hydraulic oil escaping under pressure can penetrate the skin and cause injury.

Keep hands and body away from pin hole leaks or nozzles that eject high pressure hydraulic fluid. A small leak can be dangerous. To find hydraulic leaks use cardboard or paper.

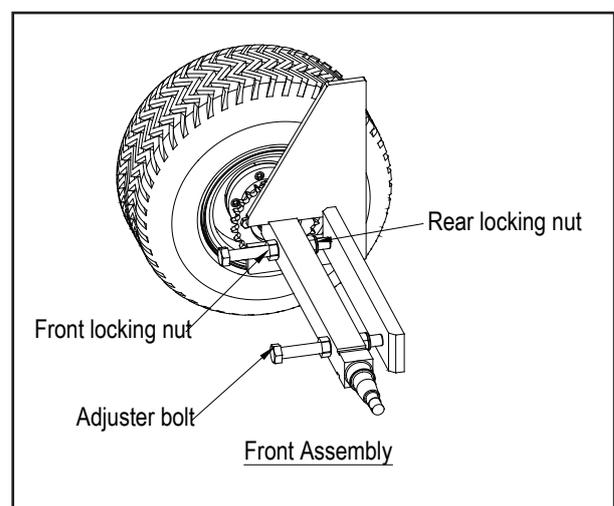
If fluid is accidentally injected into the skin a doctor familiar with this type of injury must surgically remove it within a few hours.

### Adjusting Drive Chains

When properly adjusted, drive chains should have approximately 50 - 75mm of slack. On newer models this can be checked by using the Tension Gauge on the Chain Guard. The chain tension adjustment bolts are on the front axle. To check the chain tension:

- 1 Remove the chain guard (Unless chain guards have Tension Gauge cut into them)
- 2 Tilt the bucket so that the front wheels lift off the ground
- 3 In that position, check the chain by pressing down on the top chain. There should be 50 - 75mm between the top of the chain and the bottom of the mudguard. If fitted with the Tension Gauge in the chain Guard, pull down on the chain. The bottom of the chain should sit between the two notches in the slot.

**Chains should be run dry** for maximum chain life - do not use oil or chain lubricant.



If adjustment is needed:

**1** Place a 1 1/16" spanner on the lock nut behind the axle.

**2** Use a 1 1/8" spanner to loosen the front lock nut.

**3** Use same spanner on the end of the adjuster bolt to adjust the axle forward or backward until the correct chain tension is reached.

**Note:** Normally only small adjustments are required to correct the tension.

**4** To set the adjustment, place the 1 1/16" spanner on the rear lock nut while tightening the front lock nut with your 1 1/8" spanner.

**5** Repeat this process on the opposite end of the axle to adjust the other drive chain.

**IMPORTANT:** Always tension both chains equally to maintain front end alignment. To check, measure the distance between the axle and the front of the chassis on both ends of the axle.

**IMPORTANT:** In some sandy conditions, the sand can build up on the sprockets as little shells. This, in effect, enlarges the size of the sprocket and the chain tightens. Under these conditions run the chains considerably looser.

## Battery

Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of 4 parts water and 1 part baking soda. Apply a light coating of grease to the battery terminals to reduce corrosion.

**Voltage: 12v, 380 Cold Cranking Amps.**

If battery becomes flat or machine is not used for a long period, charge the battery using an external battery charger. Disconnect battery terminals before charging the battery. Do not rely on the engines charging system to recharge a battery. It is only meant to maintain charge in a good battery.

## Cleaning and Long Term Storage

**1** Lower the Dingo arms and turn the ignition key to OFF to stop the engine. Remove the key.

**2** Remove dirt and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine's cylinder head fins and blower housing.

**3 IMPORTANT:** You can wash the Dingo with mild detergent and water. Do not pressure wash the machine. Avoid excess use of water, especially near the control panel, hydraulic pumps and motors.

**4** Service the air cleaner; refer to section on Air Cleaner.

**5** Change the crankcase oil; refer to engine manual.

**6** Petrol machines only; Remove the spark plugs and check their condition; refer to section on Spark Plugs.

**7** With spark plugs removed from the engine, pour two tablespoons of engine oil into each spark plug hole.

**8** Now use the starter to crank the engine and distribute the oil inside the cylinder.

**9** Install the spark plugs. Do not install the ignition wire on the spark plugs.

**10** Check the tyre pressure; refer to section on Tyre Pressures.

**11** Charge battery; refer to Batteries section.

**12** For long-term storage (more than 90 days) add stabiliser/conditioner additive to fuel tank.

**13** Run engine to distribute conditioned fuel through the fuel system (5 minutes).

**14** Stop engine, allow to cool and drain the fuel tank; refer to section on Fuel Tank.

**15** Restart engine and run it until it stops. Repeat, on "CHOKE" until engine will not restart.

**16** Dispose of fuel properly. Recycle according to local codes.

**Note:** Do not store stabiliser/conditioned petrol over 90 days.

**17** Check and tighten all bolts, nuts screws. Repair or replace any part that is damaged or defective.

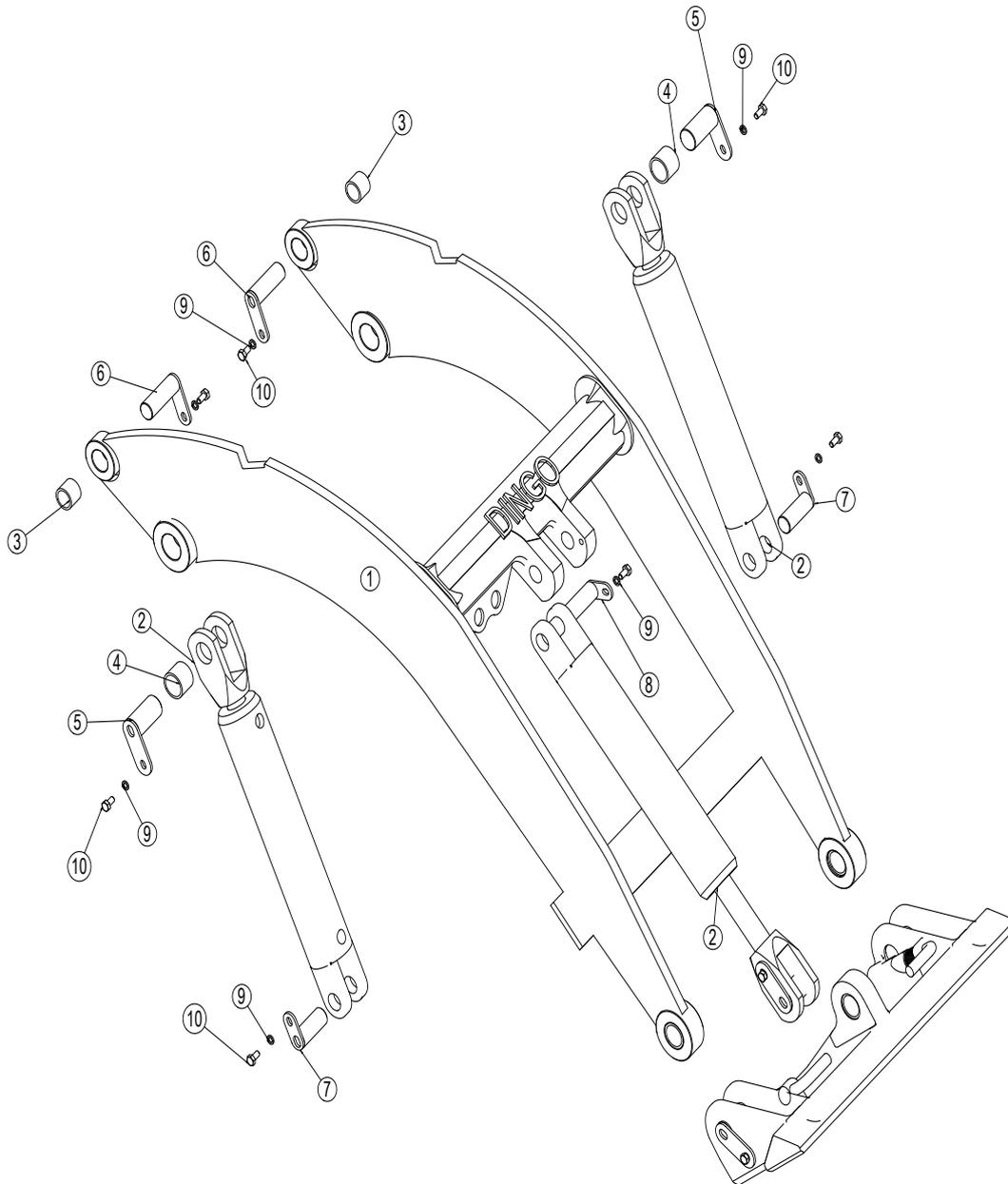
**18** Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep keys in a memorable place.

Cover the machine to protect it and keep it clean.

## Troubleshooting

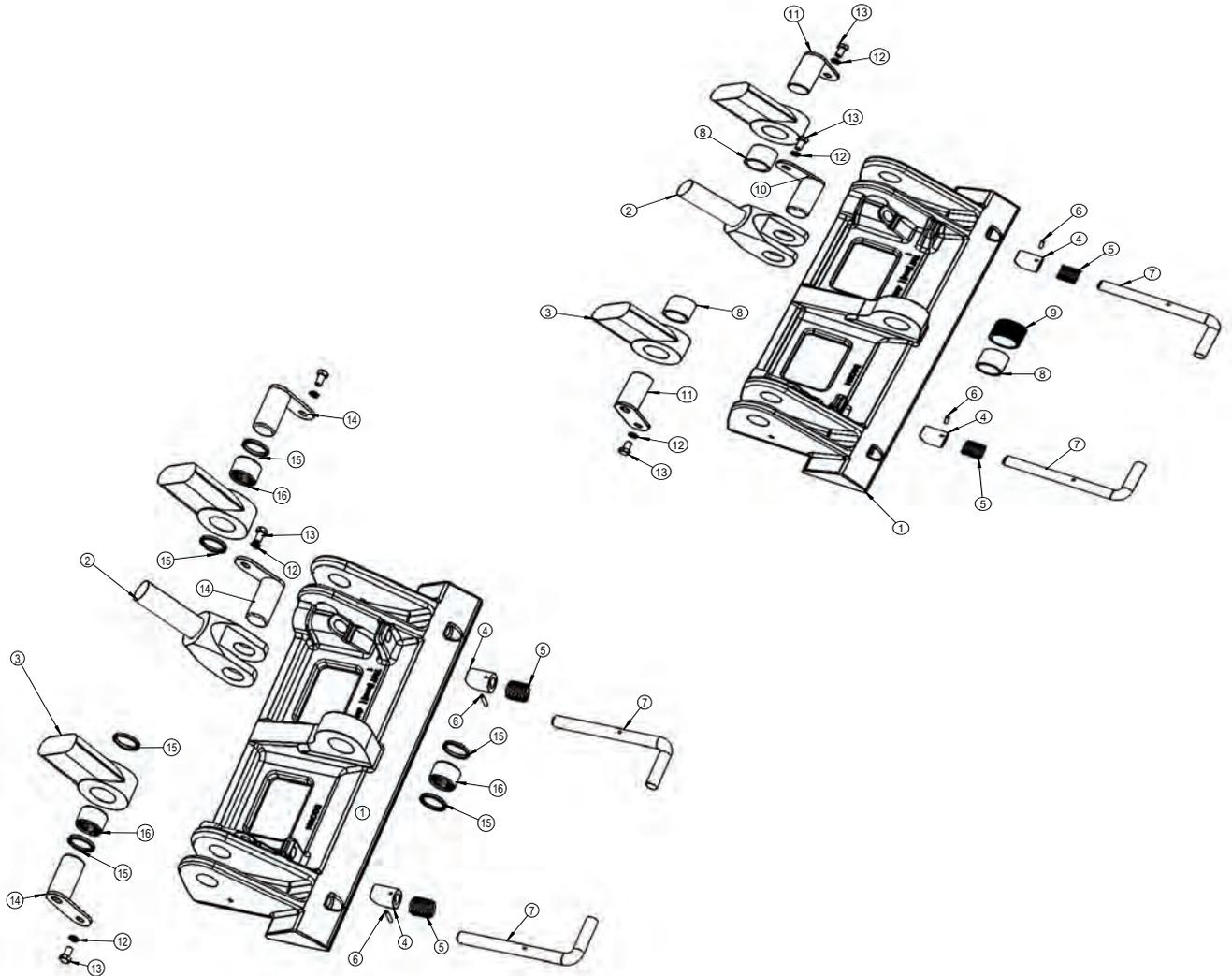
Problem	Possible Causes	Corrective Action
Starter does not crank	1. Battery is dead	1. Charge battery
	2. Electrical connections are corroded or loose	2. Check electrical connections for good contact
	3. Relay switch is defective	3. Contact authorised service dealer
Engine will not start, hard to start or fails to keep running	1. Auxiliary hydraulics lever is not in neutral position	1. Move the lever to neutral position
	2. Fuel tank is empty	2. Fill fuel tank with appropriate fuel
	3. Choke is not on (petrol models)	3. Move choke to ON
	4. Spark plug wires are loose or disconnected. (petrol models)	4. Install wire on spark plug
	5. Air cleaner is dirty	5. Clean or replace air cleaner element
	6. Spark plugs are pitted, fouled, or gap is incorrect (petrol Models)	6. Install new, correctly gapped spark plugs
	7. Dirt in fuel filter	7. Replace fuel filter
	8. Dirt, water or stale fuel in the fuel tank	8. Drain fuel tank and filter and replace fuel
	9. Dirt, water or stale fuel in the fuel system	9. Contact authorised dealer
Engine loses power	1. Engine load is excessive	1. Reduce ground speed
	2. Air cleaner is dirty	2. Clean or replace air cleaner element
	3. Oil level in crankcase is low	3. Add oil to crankcase
	4. Cooling fins and air passages under engine blower housing are blocked	4. Remove obstruction from cooling fins and air passages
	5. Spark plugs are pitted, fouled, or gap is incorrect (petrol Models)	5. Install new, correctly gapped spark plugs
	6. Dirt in fuel filter	6. Replace fuel filter
	7. Dirt, water or stale fuel in the fuel tank	7. Drain fuel tank and filter and replace fuel
	8. Dirt, water or stale fuel in the fuel system	8. Contact authorised dealer
Engine overheats	1. Engine load is excessive	1. Reduce ground speed
	2. Oil level in crankcase is low	2. Add oil to crankcase
	3. Cooling fins and air passages under engine blower housing are blocked	3. Remove obstruction from cooling fins and air passages
Abnormal vibration	1. Engine mounting bolts are loose	1. Tighten engine mounting bolts
	2. Engine mounts are broken	2. Replace engine mounts
Machine does not drive	1. Flow divider valve is in 9 O'clock position	1. Move the lever to 12 o'clock position
	2. Hydraulic fluid level low	2. Add hydraulic fluid to reservoir
	3. Traction pump drive coupler is loose or broken	3. Contact authorised service dealer
	4. Pump and/or wheel motor is defective or damaged	4. Contact authorised service dealer
	5. Control valve is defective or damaged	5. Contact authorised service dealer
	6. Relief valve is defective or damaged	6. Contact authorised service dealer

# Arm Assembly & Part List



Item	Qty	Part Number	Description
1	1	K93-213	Load Arm Assembly No Bushes
2	3	321-000-005	2 1/2" x 8" Lift Ram 1 1/4" Top Clevis
3	2	043-000-029	1 1/4"OD 1" ID Garloch Bush
3	2	043-000-056	1 1/4"OD 1" ID Duralon Bush
4	2	043-000-032	1 1/2"OD 1 1/4" ID Galoch Bush
4	2	043-000-057	1 1/2"OD 1 1/4" ID Duralon Bush
5	2	K94-026	Clevis Pin 1 1/4" x 63mm 50mm Tag
6	2	D95036	Clevis Pin 1" x 75mm 50mm Tag
7	2	D95034	Clevis Pin 1" x 64mm 30mm Tag
8	1	K93-006	Clevis Pin 1" x 115mm 30mm Tag
9	7	132-131-000	5/16" Spring Washer
10	7	111-311-016	Hex Bolt M8x16

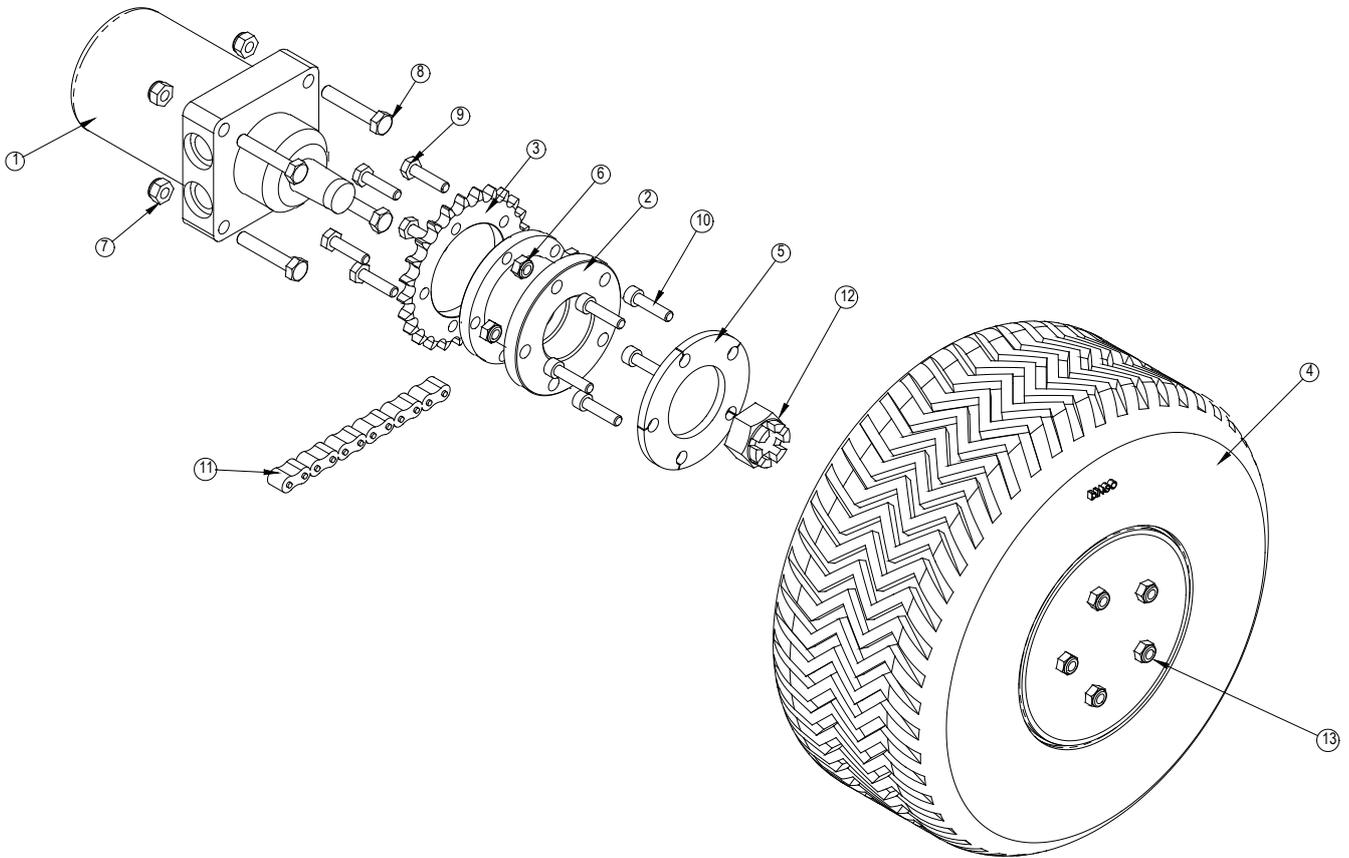
# Mount Plate Assembly & Part List



Item	Qty	Part Number	Description
1	1	K94-214	Bare Mount Plate For Bushes
1	1	K94-212	Bare Mount Plate For Bearings
2	1	321-000-005	2 1/2" x 8" Lift Ram 1 1/4" Top Clevis
3	1	K94-207	Load Arm Assembly
4	2	043-000-020	Bevelled Bush
5	2	043-000-031	Locking Pin Spring
6	2	100-000-025	ROLL PIN 5/32" X 1" B1114
7	2	D95-211	Locking Pin
8	3	043-000-057	1 1/2"OD 1 1/4" ID Duralon Bush
9	1	K94-213	Steel Bush 1.5" ID1.75"OD 32mm K94-212 Mount Plate Only
10	1	K94-026	Clevis Pin 1 1/4" x 66mm 50mm Tag Chrome
11	2	K93-008	Clevis Pin 1 1/4" x 63mm 50mm Tag Chrome
12	3	132-131-000	5/16" / 8mm Spring Washer
13	3	111-311-016	Hex Bolt M8x16
14	3	K94-105	Clevis Pin 1 1/4" x 63mm 50mm Tag PGIH
15	6	043-300-054	Seal For 1 1/4" Needle Bearing L15X
16	3	043-000-053	1 1/4" Needle Bearing

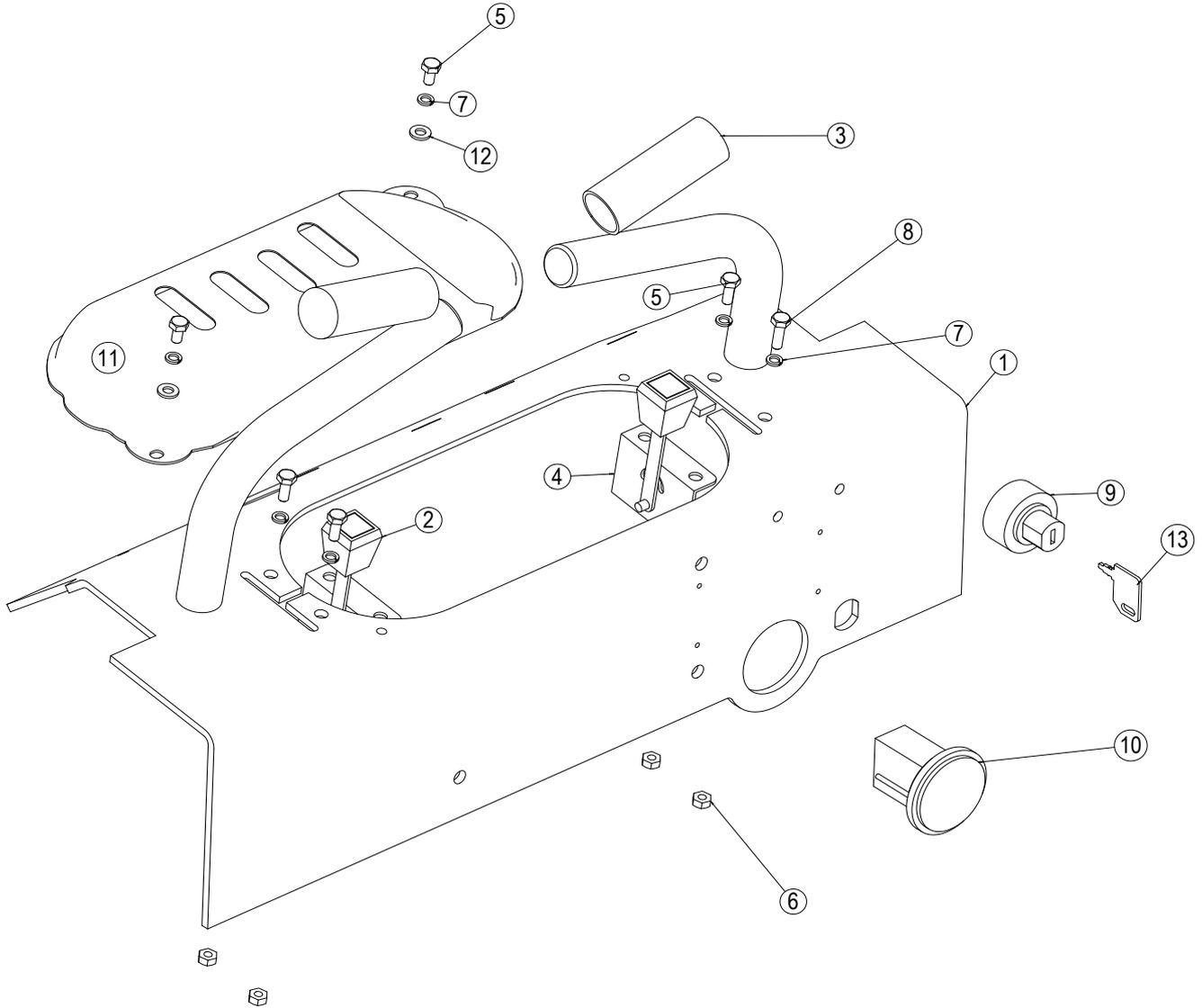


# Rear Wheel Assembly & Part List



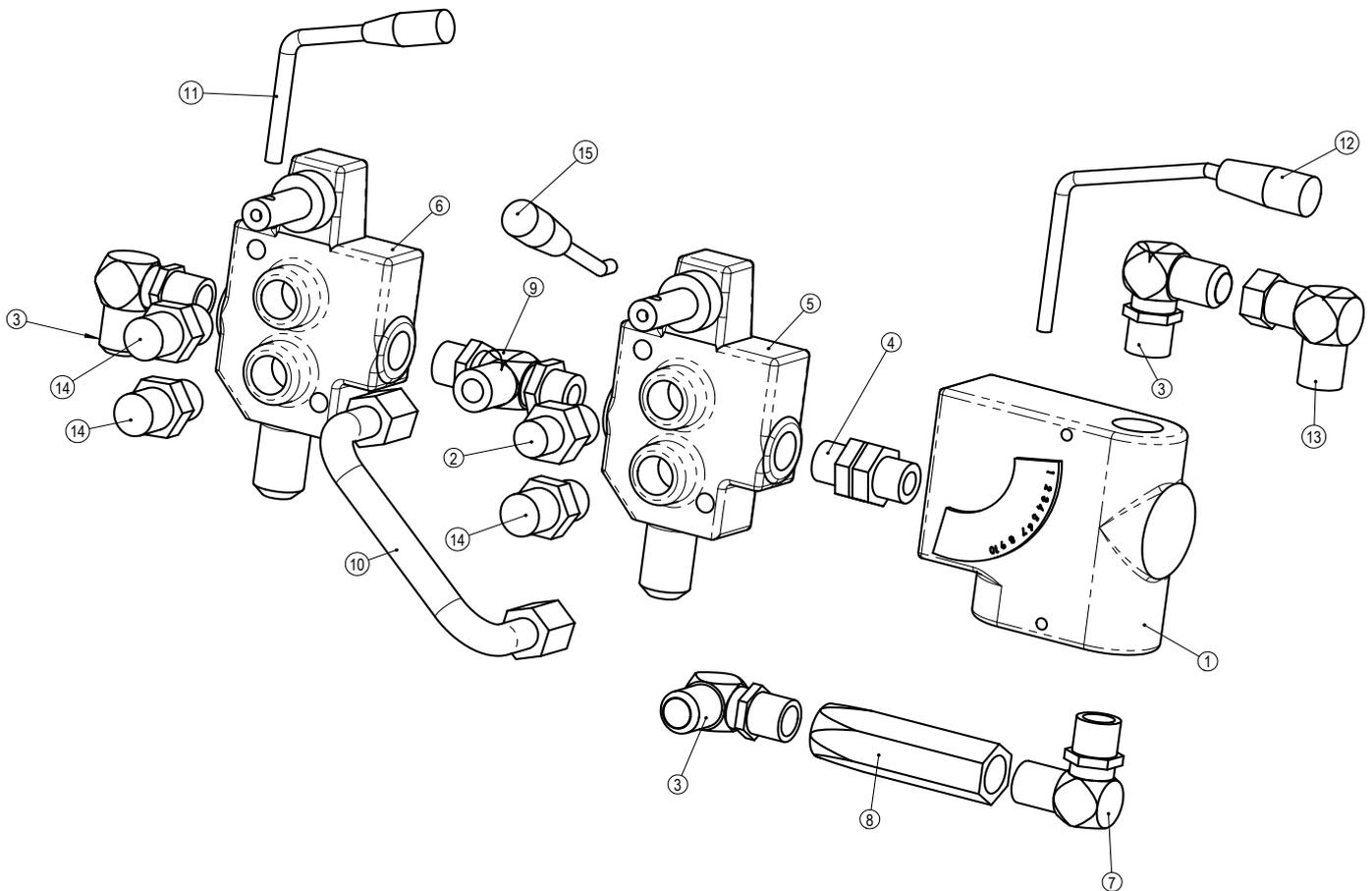
Item	Qty	Part Number	Description
1	1	331-001-004	Wheel Motor 1 1/4" Drive Shaft
1	1	330-001-006	Wheel Motor 1 3/8" Drive Shaft
2	1	610-000-011	Rear Hub (1 1/4" Drive Shaft) With Studs
		610-000-013	Rear Hub (1 1/4" Drive Shaft) With Sprockets
2	1	K93-020	Rear Hub (1 3/8" Drive Shaft) With Studs
		610-000-029	Rear Hub (1 3/8" Drive Shaft) With Sprockets
3	1	615-000-004	Drive Sprocket
4	1	610-000-010	Wheel & Tyre Assembly (Trelleborg Tyre)
5	1	D95-420	Tyre Spacer (20" Sand Tyre Only)
6	10	122-241-000	7/16" UNF Nyloc Nut Zinc
7	4	122-351-000	1/2" UNC Nyloc Nut Zinc
8	4	113-521-040	1/2"UNC x 2 1/2" Hex Bolt H/T
9	5	112-411-024	7/16" UNF x 1 1/2 Hex Bolt Black
10	5	610-000-021	Wheel Stud 7/16" UNF x 1 1/2"
10	5	610-000-030	Wheel Stud 7/16" UNF x 1 7/8" (2003 Onwards)
11	1	614-000-001	Chain 60H 102 Links Including Connector
12	1	330-001-002	1 1/4" UNEF Castle Nut To Suit Taper Shaft MB/ME Wheel Motor
12	1	330-001-007	1 3/8" Nyloc nut For Tapered Shaft

# Dash Assembly & Part List



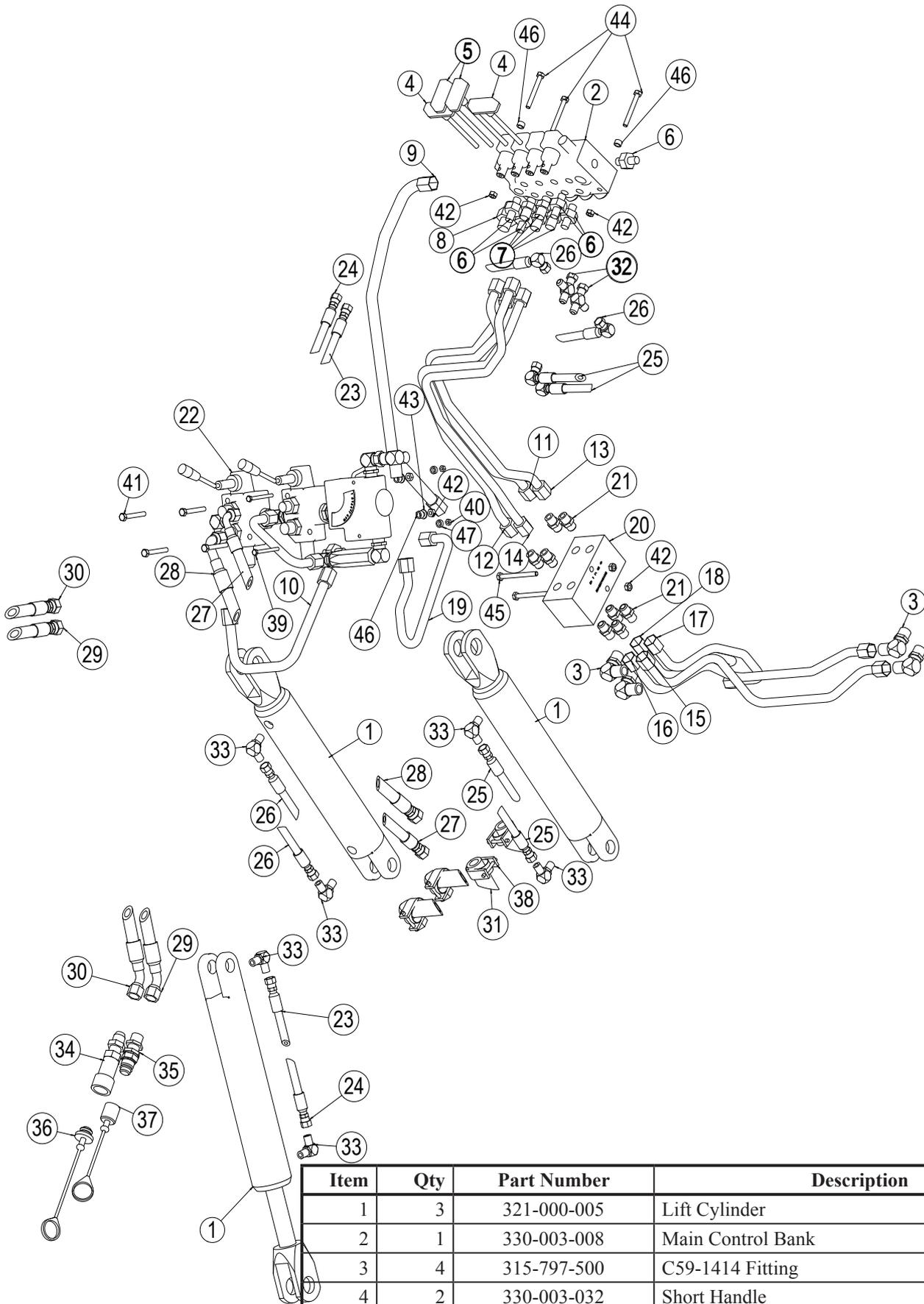
Item	Qty	Part Number	Description
1	1		Chassis - Dash
2	1	511-000-012	Throttle / Choke Lever Assembly
3	2	043-000-043	Handle Grip Black
4	1	511-000-012	Throttle / Choke Lever Assembly
5	5	111-211-016	M6 X 16MM Hex Bolt Zinc H/T
6	4	121-121-000	M6 Hex Nut Zinc
7	6	132-211-000	1/4" Spring Washer Zinc
8	1	111-211-020	M6 X 20MM Hex Bolt Zinc H/T
9	1	043-000-044	Ignition Switch Petrol (K9-3/K9-4)
10	1	410-000-048	Hour Meter Round (K9-3/K9-4)
11	1	K93-030	K93 Dash Assembly Cover
12	2	131-121-000	Washer 6MM Flat 17MM OD ZP
13	1	043-000-047	Ignition Switch Key Petrol (K9-3/K9-4)

# Front Hydraulic Bank Setup



Item	Qty	Part Number	Description
1	1	330-003-013	FLOW REGULATOR 950/K93 60L SFR308BP60
2	1	316-476-501	NIPPLE CR20812 1/2BSPP X 3/4" JIC ENC-O-RING
3	3	315-477-500	ELBOW CP560814 90 M/M 1/2BSPP X 7/8JIC
4	1	316-474-700	NIPPLE ZCP10808 1/2 BSPP M/M ADJ
5	1	330-003-035	VALVE NO-RELIEF PUMP SELECTOR SD4 DCV MONOBLOCK SD
6	1	330-003-019	VALVE W/RELIEF AUXILIARY SD4 SINGLE 950/K93 SD4/1
7	1	315-474-701	ELBOW CPB530808 90 DEG M/M 1/2BSPP X 1/2 BSPT
8	1	330-003-017	One Way Flow Valve SNDR081BP05
9	1	317-474-775	TEE ZCP62080814 1/2BSPP X 7/8JIC ADJ M
10	1	344-010-002	PIPE - REMOTE TO SUB BANK - 4B D95743
11	1		REMOTE BANK HANDLE
12	1	330-003-007	CONTROL LEVER 950&K93 FLOW DIVIDER 13-064
13	1	315-757-600	ADAPTOR C461414 90 M/F 7/8 X 7/8 JIC
14	3	316-477-501	CP2-0814
15	1		PUMP SELECTOR HANDLE

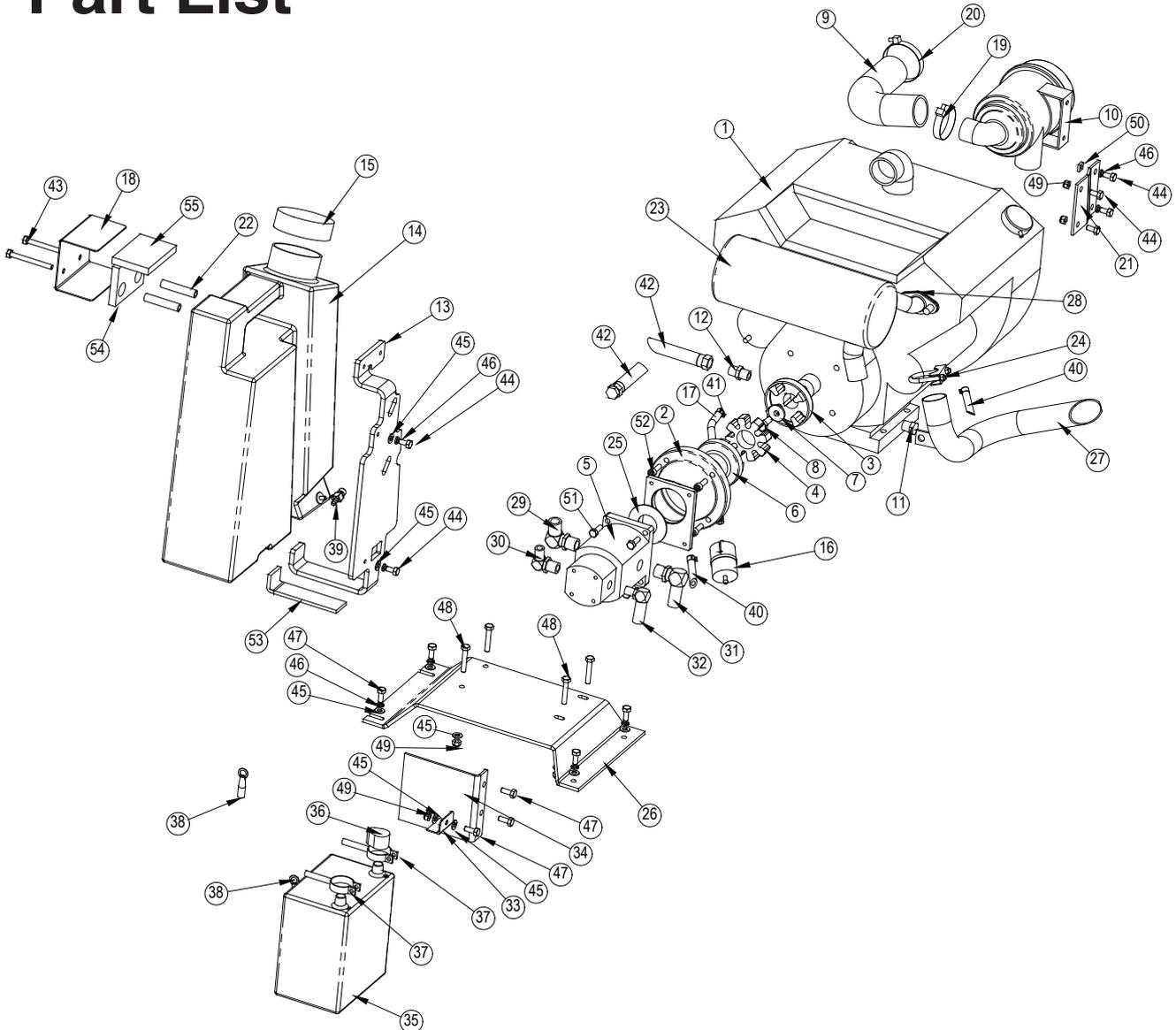
# Hydraulic Assembly & Part List



Item	Qty	Part Number	Description
1	3	321-000-005	Lift Cylinder
2	1	330-003-008	Main Control Bank
3	4	315-797-500	C59-1414 Fitting
4	2	330-003-032	Short Handle
5	2	330-003-031	Long Handle
6	5	316-377-500	CR2-0614 Fitting
7	4	316-377-500	CR2-0614 Fitting
8	1	316-377-500	CR2-0614 Fitting

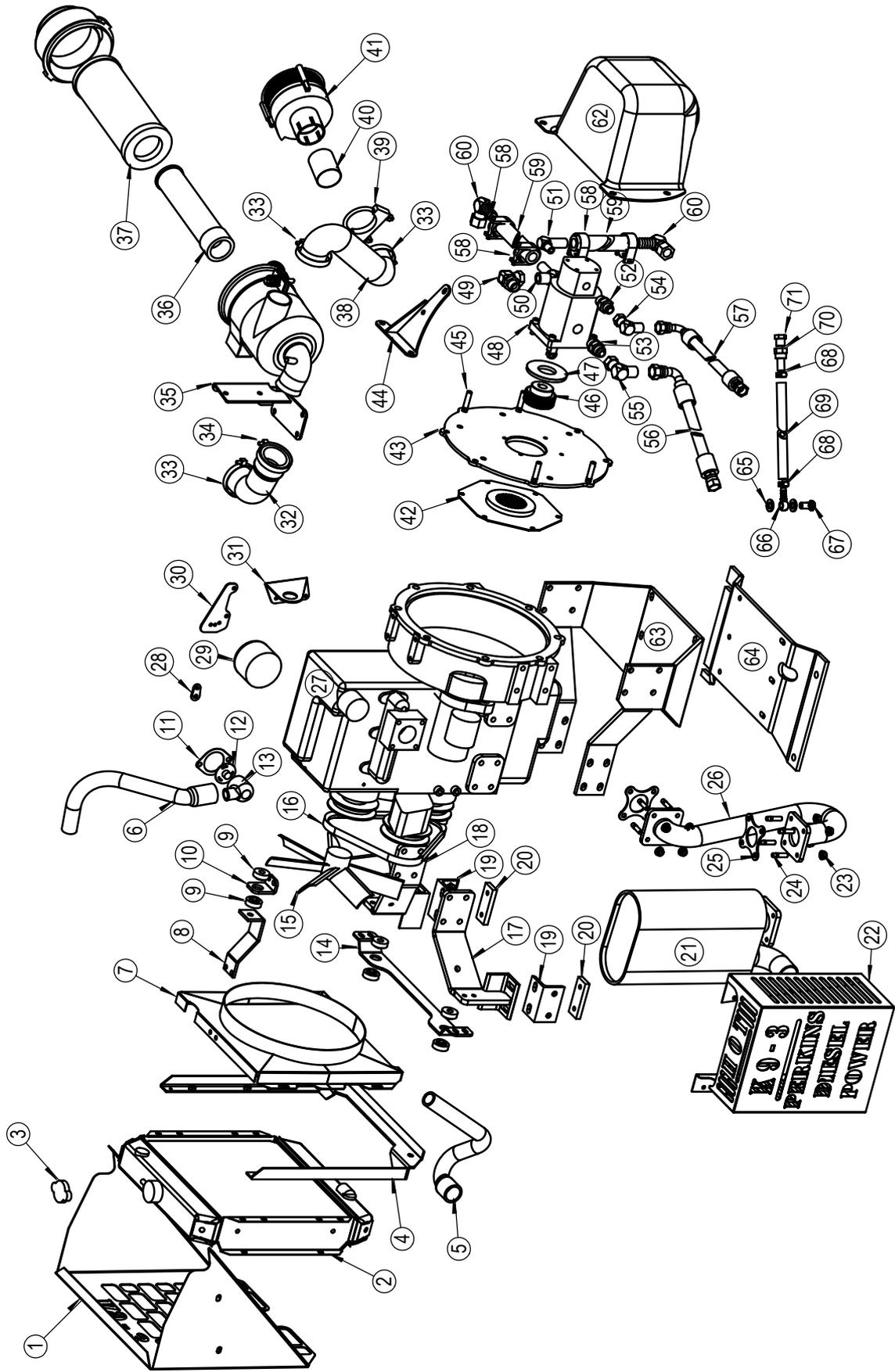
9	1	K93-406	Pipe - Control Bank Dump
10	1	D95743	Pipe - Remote Bank To Control Bank 4B
11	1	D95744	Pipe - Wheel Control LH Lower 7AP Petrol
11	1	344-010-009	Pipe - Wheel Control LH Lower 6AD Diesel
12	1	D95745	Pipe - Wheel Control LH Upper 6AP Petrol
12	1	344-010-003	Pipe - Wheel Control LH Upper 7AD Diesel
13	1	D95746	Pipe - Wheel Control RH Lower 9AP Petrol
13	1	344-010-004	Pipe - Wheel Control RH Lower 8AD Diesel
14	1	D95747	Pipe - Wheel Control RH Upper 8AP Petrol
14	1	344-010-005	Pipe - Wheel Control RH Upper 9AD Diesel
15	1	D95748	Pipe - Wheel Motor LH Lower 6BP Petrol
15	1	344-010-006	Pipe - Wheel Motor LH Lower 6BD Diesel
16	1	D95749	Pipe - Wheel Motor LH Upper 7BP Petrol
16	1	344-010-008	Pipe - Wheel Motor LH Upper 7BD Diesel
17	1	D95750	Pipe - Wheel Motor RH Lower 8BP Petrol
17	1	344-010-007	Pipe - Wheel Motor RH Lower 8BD Diesel
18	1	D95751	Pipe - Wheel Motor RH Upper 9BP Petrol
18	1	344-010-010	Pipe - Wheel Motor RH Upper 9BD Diesel
19	1	D95741	Pipe - Remote Bank 5B
20	1	330-003-004	Over Centre Valve
21	8	316-797-500	C3-1414 Fitting
22	1		Front Valve Bank Setup
23	1	D95703	Crowd Hose Short
24	1	D95705	Crowd Hose Long
25	2	D95707	Lift Arm Hose - Short
26	2	D95709	Lift Arm Hose - Long
27	1	D95711	Pressure Hose - Long (Petrol)
27	1	K93-723	Pressure Hose - Long (Diesel)
28	1	D95713	Pressure Hose - Short (Petrol)
28	1	K93-721	Pressure Hose - Short (Diesel)
29	1	D95715	Remote Hose - Short
30	1	D95717	Remote Hose - Long
31	2	D95718	Suction Hose (Petrol) 300mm
31	2		Suction Hose (Diesel) 650mm
32	2	317-565-555	C64-090909 Fitting
33	6	315-595-500	C59-0909 Fitting
34	1	318-132-000	Female Quick Release
35	1	318-131-000	Male Quick Release
36	1	310-400-002	Male Plug TM12
37	1	310-400-001	Female Cap TF12
38	4	300-000-003	Hose Clamp 29-31mm
39	2	111-211-065	Hex Bolt M6 x 65
40	2	121-121-000	Hex Nut Plain M6
41	4	111-311-060	Hex Bolt M8 x 60
42	9	121-131-000	Hex Nut Plain M8
43	4	131-131-000	Plain Washer M8
44	3	111-311-070	Hex Bolt M8 x 70
45	2	111-311-090	Hex Bolt M8 x 90
46	7	D95-722	Spacer 8mm
47	2	D95-723	Spacer 5mm

# Petrol Engine Assembly & Part List



Item	Qty	Part Number	Description
1	1	511-000-000	Kohler Engine 22 Hp
	1	512-000-011	Robin Engine 20.5 Hp
		512-000-016	Robin Engine 22 Hp
2	1	330-005-005	Kohler Housing
	1	330-005-003	Robin Housing
3	1	330-005-008	Kohler Coupling (Taper Shaft)
	1	330-005-007	Robin Coupling (Straight Shaft)
4	1	330-005-014	Spider Coupling
5	1	330-002-004	Hydraulic Pumps
6	1	330-005-009	Pump Coupling
7	1	D95-352	Kohler Shaft Washer
8	1	111-421-025	Hex Bolt M10 x 25
9	1	515-000-001	Kohler Main Air Hose (Up To D014) Small Air Cleaner
	1	515-000-056	Kohler Main Air Hose (D015 Onwards) Large Air Cleaner

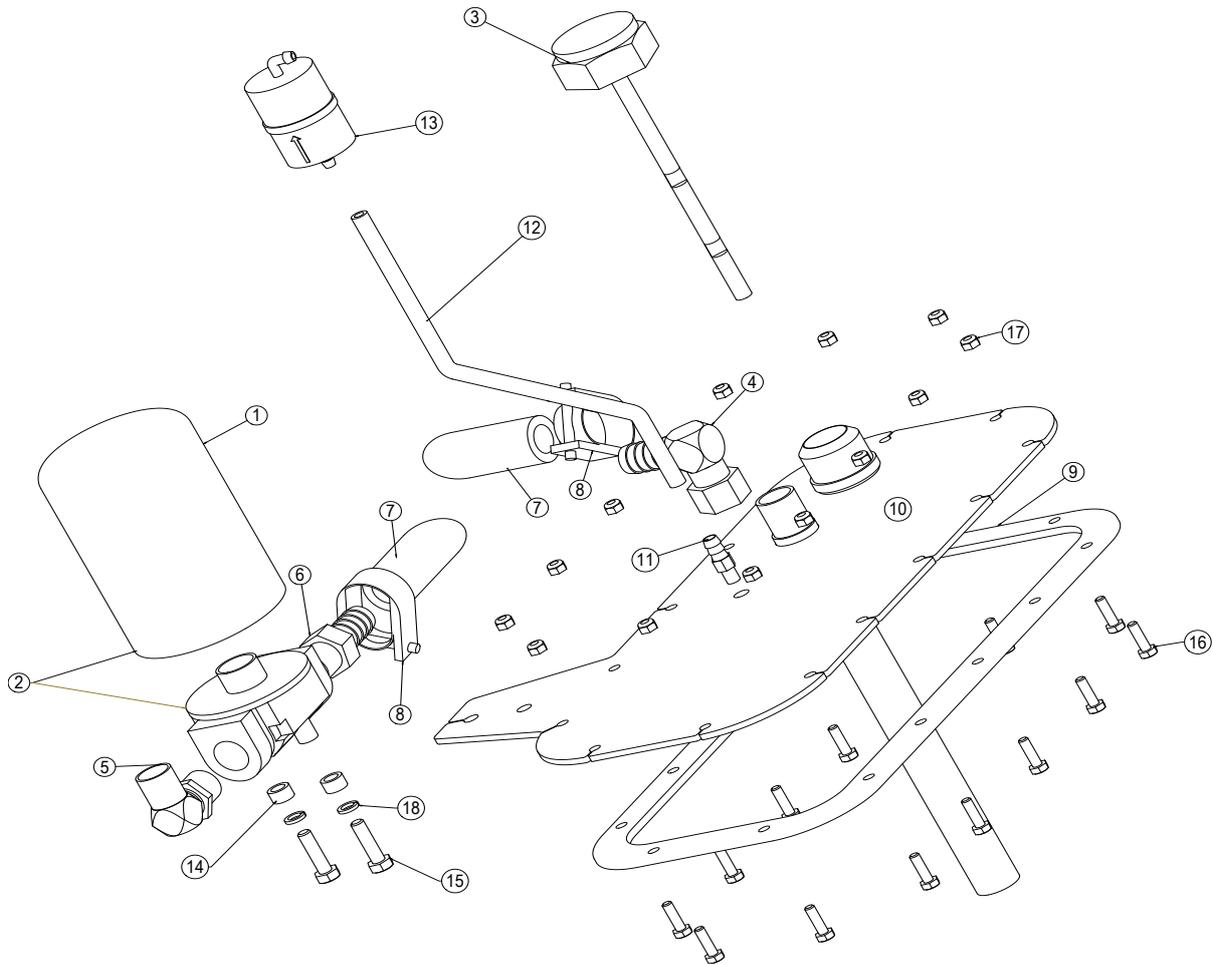
Item	Qty	Part Number	Description
10	1	515-000-003	Air Filter Assembly (Up to D014)
10	1	515-000-036	Air Filter Assembly ( D015 Onwards)
11	1	312-650-000	Plug Male 3/4" JIC Obsolete
12	1	316-306-500	Nipple Straight m/m CN2-0612
13	1	516-000-001	Fuel Tank Bracket Kit
14	1	516-000-021	Fuel Tank
15	1	516-000-003	Fuel Tank Cap
16	1	516-000-012	Fuel Filter
17	1	516-000-013	1/4" Fuel Line \$\$/Meter Kohler
	1	516-000-013	1/4" Fuel Line \$\$/Meter Robin
18	1	D95-502	Top Fuel Tank Bracket
19	1	100-000-063	Hose Clamp 57mm
20	1	100-000-064	Hose Clamp 70mm
21	1	D95-350	Air Cleaner Bracket
22	2	D95-505	Fuel Tank Top Bracket Spacer
23	1	511-000-027	Kohler Muffler
	1	D95357	Robin Muffler
24	1	515-000-012	Muffler Clamp
25	1	330-003-012	Centre Pump Washer
26	1	D95-360	Engine Mount Plate
27	1	D95-362	Kohler Muffler Extension
28	2	511-000-026	Kohler Exhaust Gasket
29	1	315-477-500	CP56-0814 Fitting
30	1	315-376-500	CP56-0612 Fitting
31	1	319-347-600	CP60-0812 Fitting
32	1	319-337-600	CP60-0612 Fitting
33	1	D95-353	Battery Bracket
34	1	D95-351	Heat Shield
35	1	410-000-013	Battery
36	1	410-000-056	Battery Lead Cover
37	2	410-000-016	Battery Lead 27"
38	2	410-000-014	Battery Small Lead 18"
39	1	516-000-025	Fuel Tap
40	1	516-000-013	1/4" Fuel Hose \$\$/Meter
41	2	516-000-016	Hose Clamp 1/4"
42	1	345-400-000	Oil Hose 1/2" Ortac \$\$/Meter
43	2	111-311-080	Hex Bolt M8 x 80
44	6	111-311-016	Hex Bolt M8 x 16
45	14	131-221-001	Plain Washer 5/16"
46	8	132-221-000	Spring Lock Washer M8
47	7	111-311-020	Hex Bolt M8 x 20
48	4	111-311-045	Hex Bolt M8 x 45
49	9	122-131-000	Nyloc Nut M8
50	2	120-132-000	M8 Speed Nut
51	4	111-311-025	Hex Bolt M8 x 25
52	4	111-322-025	Socket Head Cap Screw M8 x 25
53	1	516-000-010	Fuel Tank Bottom Packer
54	1	516-000-009	Fuel Tank Side Packer
55	1	516-000-008	Fuel Tank Top Packer



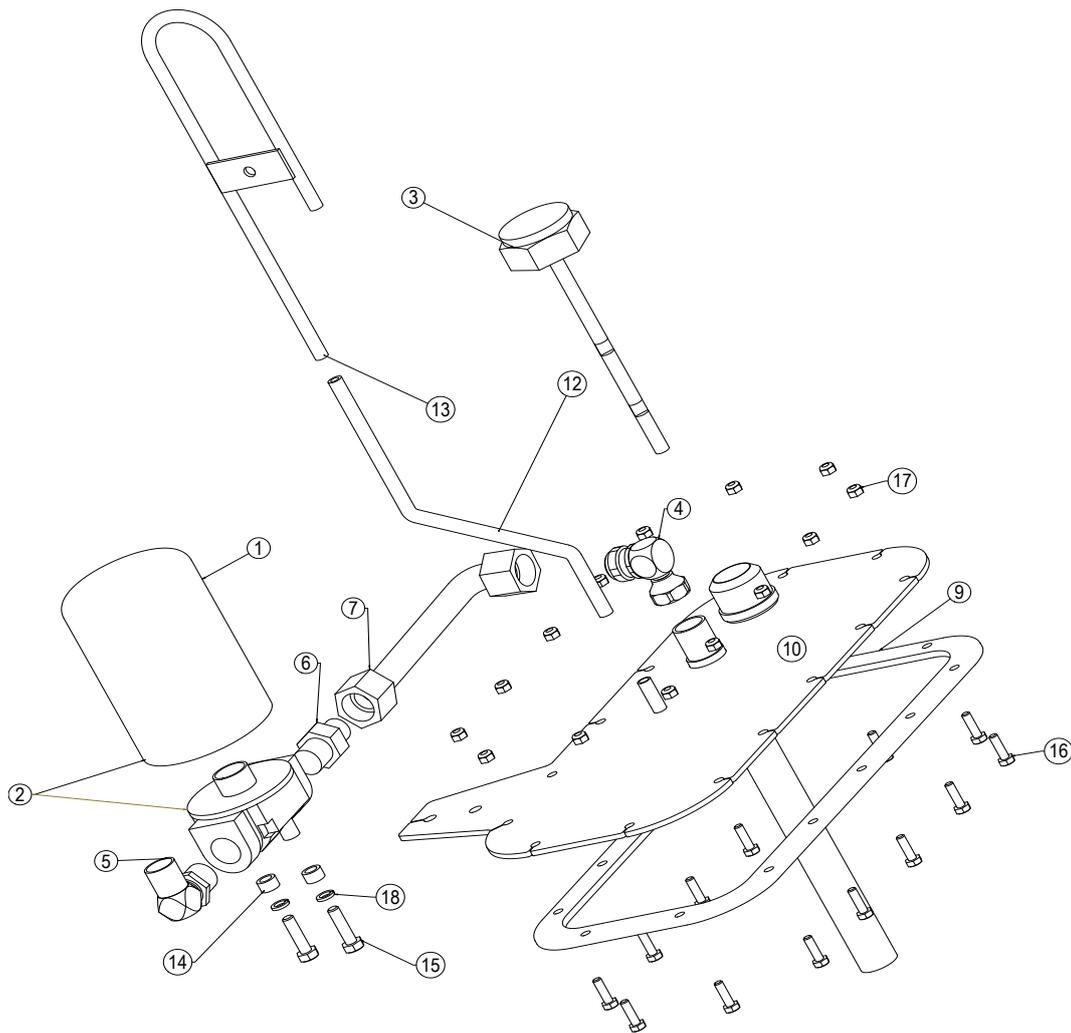
Item	Qty	Part Number	Description
1	1	K93-325	Radiator Shroud
2	1	519-000-002	Perkins Radiator
3	1	518-000-020	Radiator Cap
4	1	K93-345	Radiator Support Bracket
5	1	K93-318	Lower Radiator Hose
6	1	K93-319	Top Radiator Hose
7	1	K93-330	Fan Shroud
8	1	K93-812	Top Radiator Bracket (Shroud)
9	6	518-000-004	Mount Rubber
10	1	K93-811	Top Radiator Bracket (Engine)
11	1	519-000-015	Perkins Thermostat Gasket
12	1		K93 Perkins Thermostat
13	1		K93 Perkins Thermostat Housing
14	1	K93-825	Lower Radiator Mount
15	1		K93 Perkins Fan
16	1	519-000-011	K93 Perkins Fan Belt
17	1	K93-823	LH Front Engine Leg
18	1	K93-820	RH Front Engine Leg
19	2	K93-828	Angled Bolt Plate
20	2	K93-829	Bolt Plate
21	1	519-000-004	K93 Perkins Muffler
22	1	K93-304	Exhaust Heat Shield
23	8		M8 Flange Nut
24	8	519-000-017	M8x35mm Stud
25	2		Perkins Exhaust Flange
26	1	519-000-005	K93 Perkins Exhaust Pipe
27	1	519-000-002	403C-07 Perkins Engine
28	1	K94-826	Throttle Cable Link
29	1	519-000-016	K93 Perkins Oil Filter
30	1	K94-821	Throttle Cable Bracket
31	1	K93-335	Ignition Bracket
32	1	K93-317	K93 Perkins Air Cleaner Hose
33	3	100-000-063	57mm Hose Clamp
34	1	100-000-064	70mm Hose Clamp
35	1	K93-338	Air Cleaner Bracket
36	1	515-000-034	Inner Air Filter Element
37	1	515-000-033	Outer Air Filter Element
38	1		Pre Cleaner Hose
39	1	515-000-048	2 3/8" Hose Clamp
40	1	K94-336	Pre-Cleaner Pipe
41	1		Pre-Cleaner
42	1	330-005-019	Flex Drive Plate
43	1	330-005-020	Bell Housing Plate
44	1	K93-808	Pre-Cleaner Bracket
45	4		3/8" x 2" Stud
46	1	330-005-018	Spline Drive Coupling

47	1		Bell Housing Centre Disc
48	1	330-002-004	Hydraulic Pump 9/1.153cc (3600 RPM)
48	1	330-002-011	Hydraulic Pump 11.2/3.15cc (3000 RPM)
49	1	315-347-470	Hydraulic Fitting CP46-0808
50	1	319-343-600	Hydraulic Fitting CB60-0812
51	1	319-337-600	Hydraulic Fitting CP60-0612
52	1	316-476-501	Hydraulic Fitting CR2-0812
53	1	316-477-501	Hydraulic Fitting CR2-0814
54	1	315-365-660	Hydraulic Fitting C46-1212
55	1	315-757-600	Hydraulic Fitting C46-1414
56	1	K93-723	1/2" Pressure Hose
57	1	K93-721	3/8" Pressure Hose
58	4	300-000-002	Hose Clamp 29mm
59	2	D95-732	Suction Hose 600mm
60	2	319-368-600	Hydraulic Fitting LFB90C-1212
61			
62	1	043-300-005	Fibre Glass Pump Cover
63	1	K93-810	Engine Cradle
64	1	D95-360	Engine Mount Plate
65	2		12mm Brass Washer
66	1	101-000-003	12mm Banjo
67	1	K94-845	Banjo Bolt
68	1	100-000-054	Hose Clamp 11-18mm
69	2		3/8" Ortac Hose Sump Drain
70	1		Hose Fitting JIC3DK21
71	1	312-650-000	Hydraulic Fitting C78-12

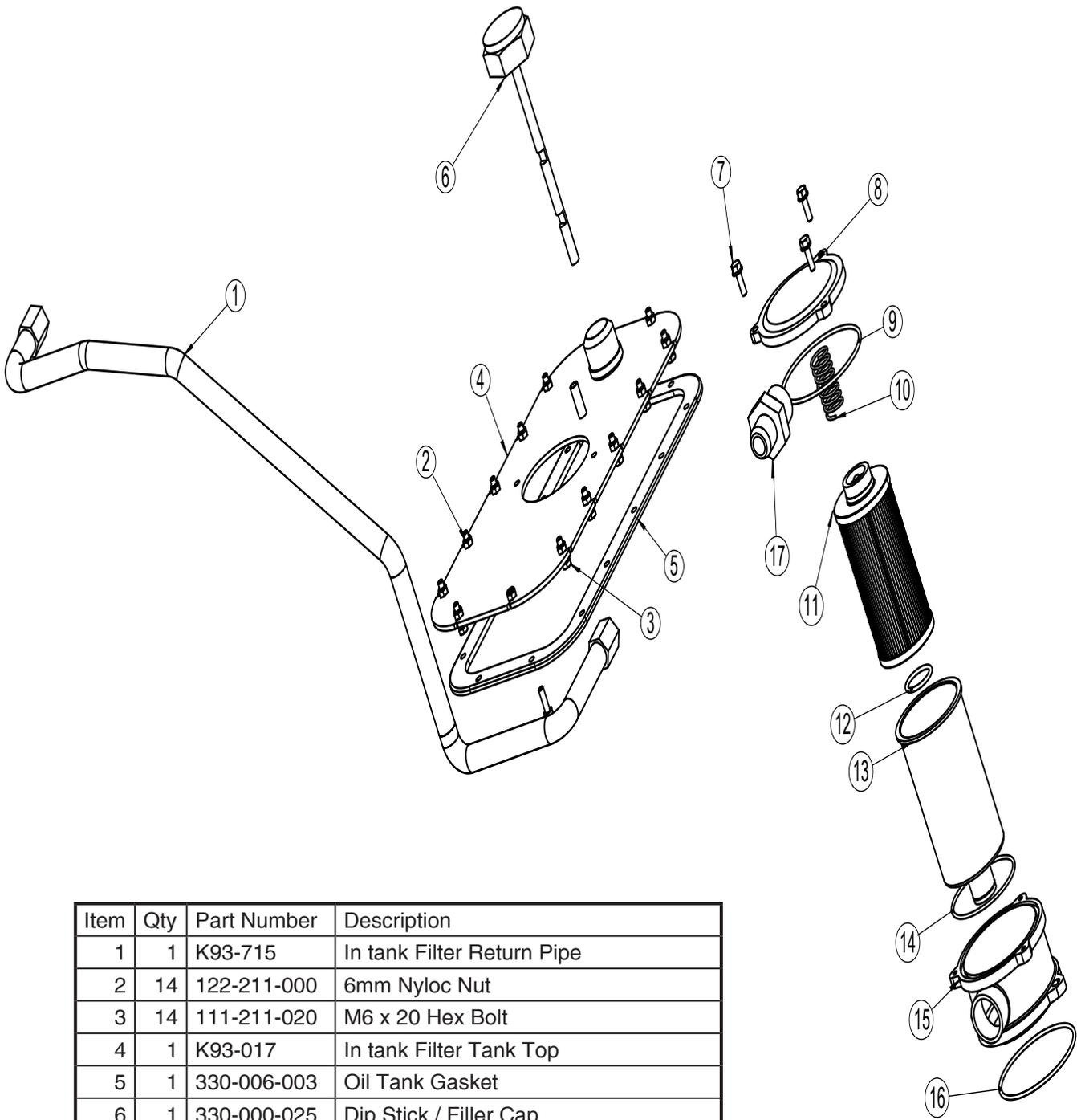
# Oil Tank Top Assembly & Part List



Item	Qty	Part Number	Description
1	1	330-004-014	Oil filter
2	1	330-004-007	Oil Filter Housing With Element
3	1	330-000-025	Dip Stick / Filler Cap
4	1	319-368-600	Hose Tail 90deg
5	1	315-367-950	Elbow 90deg
6	1	319-163-600	Hose Tail Straight
7	1	345-600-000	3/4" Hose
8	2	100-000-057	Hose Clamp 14-27
9	1	330-006-003	Oil Res Gasket
10	1	K93-014	Tank Top Welded Assembly
11	1	319-123-200	Hose Tail Straight
12	1	516-000-013	Rubber Hose
13	1	330-000-026	Filter Hyd Tank Breather Z91
14	2	D95722	8mm Spacer
15	2	111-311-030	M8 x 30mm Hex Bolt
16	12	111-211-020	M6 x 20mm Hex Bolt
17	12	122-121-000	M6 Nyloc Nut
18	2	132-131-000	5/16" Spring Washer



Item	Qty	Part Number	Description
1	1	330-004-014	Oil filter
2	1	330-004-007	Oil Filter Housing With Element
3	1	330-000-025	Dip Stick / Filler Cap
4	1	315-368-950	ELBOW DINGO016 90 M/F 3/4'BSPPX1 1/16'JICM
5	1	315-367-950	CP56-1217 Elbow 90deg
6	1	316-679-500	NIPPLE CR21217 M/M 3/4'BSPPM X 1 1/16'JICM
7	1	K94-476	Dump Pipe Filter To Tank
8	2		
9	1	330-006-003	Oil Res Gasket
10	1	K93-014	Tank Top Welded Assembly
11	1		
12	1	516-000-013	Rubber Hose
13	1	K93-036	K94 Hyd Breather
14	2	D95722	8mm Spacer
15	2	111-311-030	M8 x 30mm Hex Bolt
16	12	111-211-020	M6 x 20mm Hex Bolt
17	12	122-121-000	M6 Nyloc Nut
18	2	132-131-000	5/16" / 8mm Spring Washer



Item	Qty	Part Number	Description
1	1	K93-715	In tank Filter Return Pipe
2	14	122-211-000	6mm Nyloc Nut
3	14	111-211-020	M6 x 20 Hex Bolt
4	1	K93-017	In tank Filter Tank Top
5	1	330-006-003	Oil Tank Gasket
6	1	330-000-025	Dip Stick / Filler Cap
7	3	111-211-020	Oil Filter Cap Bolt
	1	330-004-019	HF502.20.122 Oil Filter Assembly
8	1		Oil Filter Cap
9	1		Oil Filter Cap O-Ring
10	1		Oil Filter Relief Spring
11	1	330-004-020	Oil Filter Element HF502.20.122
12	1		Oil Filter Bottom O-Ring
13	1		Oil Filter Cup
14	1		Oil Filter Cup To Body O-Ring
15	1		Oil Filter Body
16	1		Oil Filter Body O-Ring



Product Name: K9-3				
Summary of Product Application	The K9-3 is the power plant for the attachments. Designed to be operated by a single operator, from the operators standing platform at the rear of the machine using the hydraulic lever system.			
<b>Hazards</b>	<b>Risk Assessment</b>			
	Probability	Exposure	Consequence	<b>Risk Level</b>
Moving parts	Unusual	Occasional	Serious	Mod/Substantial
Pinch points	Unusual	Occasional	First aid	Acceptable
Movement of load carried by unit.	Unusual	Occasional	Serious	Mod/Substantial
Tip over	Unusual	Occasional	Serious	Mod/Substantial
Hot parts	Unusual	Occasional	First aid	Acceptable
Fire and explosion	Possible	Occasional	Casualty	Mod/Acceptable
Electricity	Unusual	Occasional	First aid	Acceptable
Noise	Very likely	Occasional	Serious	High
Spurting hydraulic fluid from hose leak.	Possible	Occasional	Casualty	Mod/Acceptable

Control measures	<ul style="list-style-type: none"> <li>• Two-circuit hydraulic system allowing high and low range and better control over the vehicle and attachments.</li> <li>• Quick hitch system eliminates any manual handling involved with installing attachments.</li> <li>• Visibility and mobility of operator.</li> <li>• Operators standing platform reduces ergonomic sprain and strain by upright operation position.</li> <li>• Rubber inserts in operator’s platform cushions the operator from vibration.</li> <li>• Spark resistant plastic and fibreglass fuel tank.</li> <li>• Security system disables the hydraulic system to prevent unauthorised use.</li> <li>• Low centre of gravity to prevent tip over.</li> <li>• Hydraulic tank located away from operator and the radiator in the diesel models blows hot air away from the operator.</li> <li>• Safety decals in appropriate positions.</li> <li>• Weight of the Dingo increases the stability and lifting ability.</li> <li>• Electrical cables enclosed and sealed.</li> <li>• Cylinder lock to prevent accidental release of arms and possible attachment.</li> <li>• Operation safety video and training are provided with purchase or hire.</li> <li>• Operator’s manual details safe operation of K9-3</li> <li>• The greatest risk is to people working around the Dingo, rather than the operator. To eliminate risk, ensure that an effective barrier is created around the operating machinery.</li> <li>• Ensure that the operating area is free from hazards before work commences.</li> <li>• Appropriate hearing protection should be used if the operator is using the Dingo for prolonged periods in one day. If the Dingo is to be used in an enclosed area for prolonged periods in a day, both the operator and others working around the Dingo should wear appropriate hearing protection.</li> </ul>
Residual Risk of Plant with Control Measures	<ul style="list-style-type: none"> <li>• Moderate/Acceptable</li> </ul>
Additional Safety Comments	<ul style="list-style-type: none"> <li>• The risk assessment has been carried out using the NSCA Risk Score Calculator. For more information contact Dingo.</li> </ul>

# Warranty Statement

## DINGO MINI DIGGERS PTY LTD (ABN 95 060 840 011) POLICY

DINGO MINI DIGGERS PTY LTD warrants to the original buyer/owner that each new Dingo™ or Dingo attachment will be free from any proven defects in the material or workmanship for a period of twenty - four (24) months or 1000 hours, whichever is sooner, after the delivery to the owner provided that:-

1. The Dingo/Attachment has been properly and reasonably used, operated, maintained and regularly serviced.
2. All replacement or repair is authorised by DINGO MINI DIGGERS PTY LTD or an authorised DINGO MINI DIGGERS dealer.

This refers to all Dingo/Attachment parts, excluding motor and battery as outlined below.

During the warranty period, DINGO MINI DIGGERS or their authorised dealer shall repair or replace, at their option, without charge for parts and labour, any part of the Dingo/Attachment which fails because of defects in the workmanship or materials. The owner shall advise DINGO MINI DIGGERS or their authorised dealer immediately of any defect and allow reasonable time for replacement or repair. Travel time for servicemen and transportation of the Dingo/Attachment to DINGO MINI DIGGERS or the dealer's premises for warranty work are the owner's responsibility.

## WARRANTY EXCLUSIONS

This warranty does not cover: -

1. Tyres or other consumables or service parts (nuts and bolts, trencher teeth, etc) replaced as part of a normal maintenance service as opposed to manufacturing defects.
2. Damage resulting from abuse, negligence, accidents, alterations, air flow obstructions, or failure to maintain or use the machine according to the instructions given.
3. Downtime expenses, loss of machine use, rental of another machine or related equipment while repairs are in progress, or other incidental, consequential, or special damages.
4. Communication expenses such as Telephone and Facsimile.
5. Travel time for servicemen.
6. Transportation and Insurance charges for transportation of the failed Dingo/Attachment.
7. Any labour, parts, mechanical adjustments or lubricant expenses which Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger dealer considers should be made as a standard maintenance procedure according to the Dingo maintenance guidelines listed in this manual.
8. Any defect caused by work carried out without the authorisation of Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger Dealer.
9. Damage caused by continued use of the machine after it is known to be defective.
10. Damage caused by overloading or by racing and similar activities.

This warranty is in lieu of all other warranties, expressed or implied, and there are no warranties of merchantability or fitness for a particular purpose.

The benefits conferred by this warranty are in addition to all other rights and remedies in respect of the product which the consumer has under the Trade Practices Act (Commonwealth) and the Fair Trading Act of Queensland.

Machines of this type can be dangerous if used carelessly or improperly. The manufacturer, distributor or selling agent does not accept responsibility for accident either to the operator, to the owner or to any person directly or indirectly or to property if such an accident is caused by circumstances arising otherwise than by the negligence or default of Dingo Mini Diggers Pty Ltd.

#### PARTS INSTALLED DURING MACHINE WARRANTY

Components installed during a machines warranty period shall have warranty coverage for the duration of the machine warranty period or ninety (90) days, which ever is greater, provided the warranty installation is performed by Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger dealer.

#### ENGINE POLICY

The engine in a new Dingo Mini Digger is covered by the manufacturer of that specific engine, not by Dingo Mini Diggers Pty Ltd. The engine owner's manual will have details of the cover provided.

#### BATTERY POLICY

The Battery in a new Dingo Mini Digger is covered by the manufacturer of that specific battery under that companies normal warranty policy.

N.B. Dingo Mini Diggers Pty Ltd reserve the right to change at any time the Dingo Mini Digger product specifications, configurations, and company policies, this is due to our constant commitment to make the best product for the job.



Proudly manufactured by  
**Dingo Mini Diggers Pty Ltd**  
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Australia

Dalby Head Office 07 4672 5400

Brisbane 07 3272 7088

Sydney 02 9833 8222

Melbourne 03 8549 8111

Adelaide

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Perth

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Nth Queensland

07 4796 0555

New Zealand

07 378 9840

[www.dingo.ws](http://www.dingo.ws)

# DINGO™

## Post Hole Digger

PRO Series PHD



Wheel Motor PHD

## OPERATION & MAINTENANCE MANUAL

**IMPORTANT:** Become familiar with the contents of this manual and the Dingo Operation and maintenance manual before operating the Posthole Digging attachment. Information about the Dingo is contained in the Dingo Operation and Maintenance Manual.



# Introduction

This Post Hole Digger has been carefully designed and manufactured to give you years of reliable service. Please read this operation and safety manual to keep your Post Hole Digger running efficiently.

The information in this manual is current as at May 2010. In the effort to continually improve our products, Dingo reserves the right to change specifications without notice. Please, for critical information, contact your nearest Dingo branch.

We want you to be completely satisfied with your new product, so feel free to contact your local Dingo branch for help with service, replacement parts and any other information about the Dingo and its attachments.

Whenever you contact your local Dingo branch always know the model and serial numbers of your product. These numbers will help us to provide exact information about your specific product. You will find the model and serial number on a plate located on the product.

For your convenience, write the product model and serial numbers in the space below.

<p>Model No: _____</p> <p>Serial No: _____</p>
--

**DISCLAIMER:**

Specifications, design & service procedures are subject to change without notice. Specifications may vary & may be approximate.

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# Safety

Be a responsible operator and become familiar with this manual, the Dingo Operation and Maintenance Manual, the machine and the attachment. Improper use can result in injury.

Use extra caution when operating on hills, slopes or uneven ground (Refer to the Dingo Operation and Maintenance Manual).

Do not side shift while auger is turning.

Do not place any part of yourself, or any person under the Dingo arms.

It is the operators responsibility to operate away from pedestrians and establish appropriate isolation measures.

Do not operate close to edges or excavations etc. Do not operate on or near embankments. Look out for ditches, holes, etc. and beware of traffic when near roads.

Reduce speed while moving with Post hole digger attached.

Do not rotate auger whilst travelling.

Keep hands, feet and clothing away from all moving parts

Allow only responsible adults who are familiar with the Dingo and its operation to use the Dingo

Do not operate any of the control levers (including auxiliary lever) unless you are standing with both feet on the platform and firmly holding the grip handles.

Wear appropriate clothing including hard hat, safety glasses, long pants, and safety shoes.

Do not exceed the rated operating capacity.

Stop the engine before making any adjustments to the attachments or the machine.

Operate only in daylight or good artificial lighting.

Do not operate equipment while under the influence of alcohol or drugs, or while otherwise impaired.

Do not touch equipment or attachment parts that may be hot from operation. Allow to cool before attempting to maintain, adjust or service.

Never let children or untrained people operate or service the Dingo.

Do not allow any person or animal close to the Dingo or its attachments whilst in operation. Stop the machine if any person or animal approaches

Do not place feet under the platform.

Ensure attachments are clearly visible from operators position allowing good manual control of load position, always refers to the specific attachment operation manual before operating the attachment.

**IMPORTANT** Do not carry a load or heavy attachment with the Dingo arms in a raised position. Do not step off the platform with a load raised.

Never carry passengers and keep pets and bystanders away from the Dingo

## Operation-Pre Start-Up Pre Start-Up (daily)

Become familiar with this manual and the Dingo manual. Before commencing operation each day perform the following pre start checks; Perform daily pre-start as per the specific operations manual for the Dingo.

## **OPERATOR**

Operator has been trained in safe use of machine

Operator is competent for the intended use (including competent in the use of relevant attachments)

Operator has appropriate clothing and personal protective equipment; Fully enclosed non slip footwear (safety boots) Long pants and shirt Safety glasses Hard hat if working in areas with a risk of falling items or overhead obstacles Hearing protection

Operator is supervised if undergoing training

## **WORK AREA**

Ground conditions are firm and stable

Sloping ground has been identified

Holes have been identified and isolated

Embankments have been marked

Tree stumps, rocks and other hazards have been identified

Water courses (dams, creeks, rivers) have been clearly marked

Underground and aboveground services have been identified and isolated if necessary: Dial before you dig .Phone1100

Site physical hazards have been identified

Dust, noise, traffic and other adverse conditions have been controlled

Persons not involved in the work have been excluded from the area.

Children and animals have been removed from the area

## **Children**

Be wary of the presence of children when operating a Dingo.

Keep children out of the work site and under the watchful care of a responsible adult.

Be alert and turn the machine off if children enter the area.

Never carry children (or anyone) on the Dingo or any of its attachments.

Do not allow children to play on the Dingo or within the Dingo work site (aside from the danger of working machinery there may be holes into which a child could fall or various other dangers).

Do not allow children to operate the machine.

Before reversing look behind and down for small children. Be aware of blind corners, shrubs, trees, or ends of fences that may obscure vision.

# Operation

**1** Ensure the Auxiliary hydraulics lever is in the neutral position before connecting the Post Hole Digger.

**2** Disconnect other attachment and connect Post Hole Digger as per instructions in the Dingo Operation and Maintenance Manual. Follow all steps for connecting an attachment that requires auxiliary hydraulics. The Dingo Operation and Maintenance Manual explains the use of the auxiliary hydraulics lever. **Note:** Auger digs in a clockwise direction. If the auger is attached to Post Hole Digger go to step 6.

**3** Have the auger lying on the ground surface pointing away from the front of the machine.

**4** Lower the Post Hole Digger drive head (mounted on the machine) to the ground near the sleeve end of the auger.

**5** Slide the auger sleeve onto the drive head shaft, align the holes in both and secure with the drive and lynch pin, which hold the auger in place.

**6** Manoeuvre the Dingo to the required spot for drilling. Lower the auger till the pilot is touching the ground. Move the pump selector to the turtle position. The turtle position allows the big pump to power the Post Hole Digger and the small pump to power the Dingo wheels and arms. (i.e. more power is delivered to the Post Hole Digger, where it is needed most)

**7** Start the auger rotating with the Auxiliary lever and lower the arms to push auger into the ground. The harder the ground the more pressure you will need to apply to the auger.

**8** The front wheels may lift off the ground. Do not operate the machine in an unsafe manner (refer to the Dingo Operation & Maintenance Manual).

**9** As the auger digs into the ground the arms will travel through an arc, therefore adjustment will need to be made to the position of the Dingo to keep the auger at the desired angle.

**10** Do not drill the auger deep into the ground in one operation. Continually clearing the hole during digging will facilitate an easier operation. It may be necessary to clear dirt from the auger flights by spinning the auger quickly forward or by changing from forward to reverse quickly and repeatedly. This is best done off to the side of the hole.

**11** The Post Hole Digger is designed to dig in most digging conditions. With the selection of Dingo Tungsten Carbide Rock teeth, some rock structures can be dug. It is impossible to dig all types of rock.

**12** Disconnect the Post Hole Digger as per instructions in the Dingo Operation and Maintenance Manual.

**13** Remember, as with any type of drilling, you need a sharp drill point. Auger teeth and pilot must be in good condition if the auger is to work correctly. See wear parts section for more information.

**14** When travelling with the auger attached, tilt the drive head back so the auger points out the front and does not swing freely. This prevents the auger swinging back and damaging the front of the Dingo.

**15** If more down pressure is required, use the "Post Hole Mate" on the back of the machine. If in doubt, contact your Dingo representative.

**16** If drilling on uneven ground, it may be necessary to loosen the two grub screws (Item 16 on page 10) to allow the auger to swing from left to right as well as back and forward. To do this, loosen the lock nuts and turn grub screws anti-clockwise until planetary drive is able to swing from left to right. Then retighten lock nuts. This will free up the auger to hang vertically even if drilling holes across a slope.

# Maintenance

## Post Hole Digger

One of the features of your Dingo Post Hole Digger is its low maintenance. While this is true, it is wise to check for oil leaks on a regular basis to ensure your Post Hole Digger remains in working order.

## Augers

As the auger is engaging the ground wear must occur to dig holes. Therefore, the auger teeth and pilot must be checked regularly and replaced as necessary (see wear parts section). Failure to replace missing and worn teeth will damage the auger pockets and flighting resulting in costly repairs.

## Wear Parts

### Auger Teeth

Make sure that your auger teeth are in good condition so that your drilling performance is satisfactory and wear on your auger is minimised.

### Changing Teeth

**1** Tap the worn tooth from the tooth pocket using a hammer and a punch or old screw driver etc.

**2** Remove the old rubber from within the tooth pocket.

**3** Replace with a new rubber. It is a good idea to lubricate the new rubber with water to prevent it breaking when the new tooth is inserted. The rubber should measure just short of the width of the tooth.

**4** Insert the new tooth by tapping it with a copper or plastic hammer (Your normal hammer may chip the cutting edge of the new tooth).



Standard  
Earth Tooth



Tungsten  
Earth Tooth



Tungsten Rock Tooth  
(Hard Digging)



Earth Spear  
Tooth



Tungsten  
Earth Spear  
Tooth

## Auger Pilots

The condition of your pilot is most important to ensure good ground penetration. Whilst it seems such a small part of your overall drill, **it is the most important part of the auger.**

**Note:** Rock teeth and pilots will not dig earth, soil, etc. They are designed to grind away rock, not chisel into it. Earth teeth and pilots are designed to chisel into earth - not rock.

It is simple to change teeth and pilots and it is much more cost efficient to do this than to use the incorrect or worn teeth and pilots.

Dingo augers are configured with tungsten earth teeth in the outside pockets (the outside teeth travel the greatest distance & wear fastest), earth spear teeth in the inside pockets (for better ground penetration) and an earth pilot. This configuration has been found to be a good cost vs wear combination in most soil conditions. Ask your Dingo representative about the tooth combination that most suits your soil conditions.



Standard  
Earth Pilot



Tungsten  
Earth Pilot

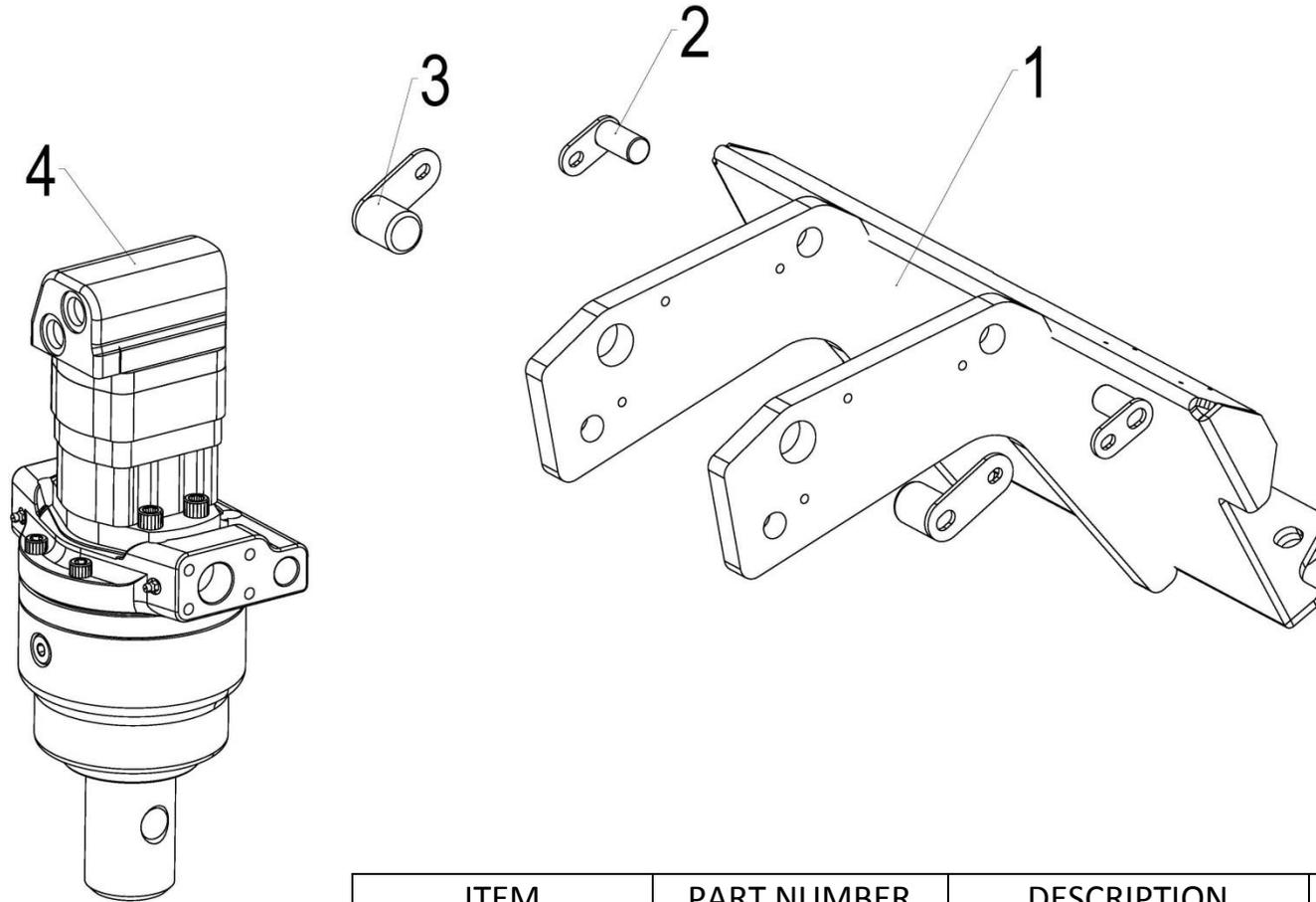


Tungsten  
Rock Pilot  
(Hard Digging)

# Digging Tips

- In dry conditions pour water into the hole to help clean the last of the material from the bottom.
- Use a “Diggers Mate” on the foot plate of the Dingo to give extra down pressure on the auger in hard digging.
- Water can also help in stony conditions to loosen the stones from their position.
- Using water when boring into rock will keep your teeth cooler lasting longer.
- Rock teeth are only good for boring into solid rock. Use earth teeth for stony ground.
- When using larger augers, only dig into the ground up to the top of the auger flight. Then remove the auger and clean it. Continue this process until the desired depth is reached. Going in deeper than the top of the auger flights may make the auger too heavy to lift from the ground.
- In grassy conditions reverse the auger whilst in the ground remove any grass that has become tangled amongst the teeth.
- Use auger extensions to go deeper. The Dingo can dig to 1.5m normally, and to 2.3m with an auger extension.

# DINGO POST HOLE DIGGER EXPLoded VIEW

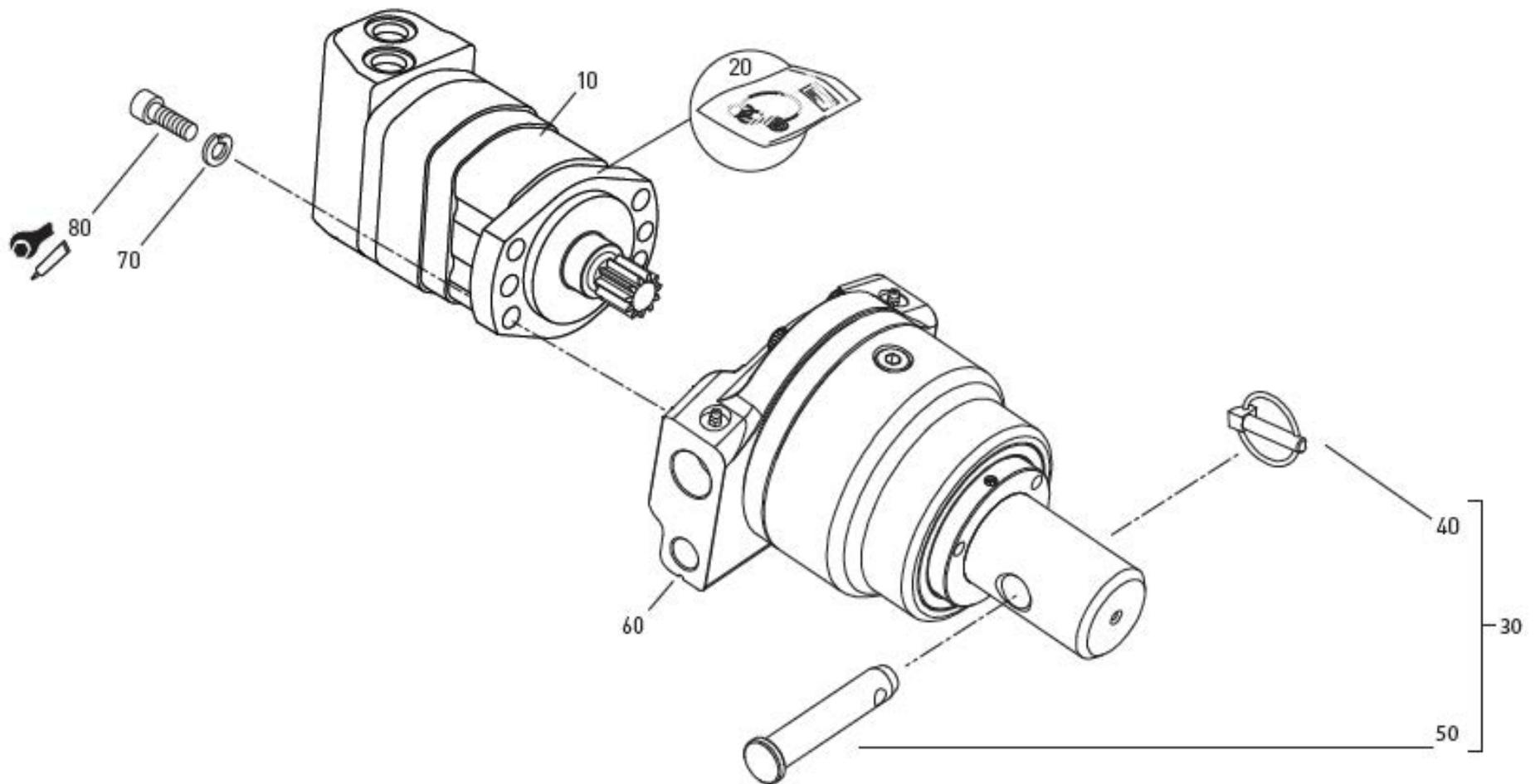


ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	APU402	MOUNT PLATE ASSM	1
2	APU407	PIN ASSM	2
3	APU405	PIN ASSM	2
4	060-100-097	PANETORY	1
5	342-400-005	½" HOSE ASSM MALE	1
6	342-400-006	½" HOSE ASSM FEMALE	1

# Post Hole Digger – Parts List

From Serial Number 00000000

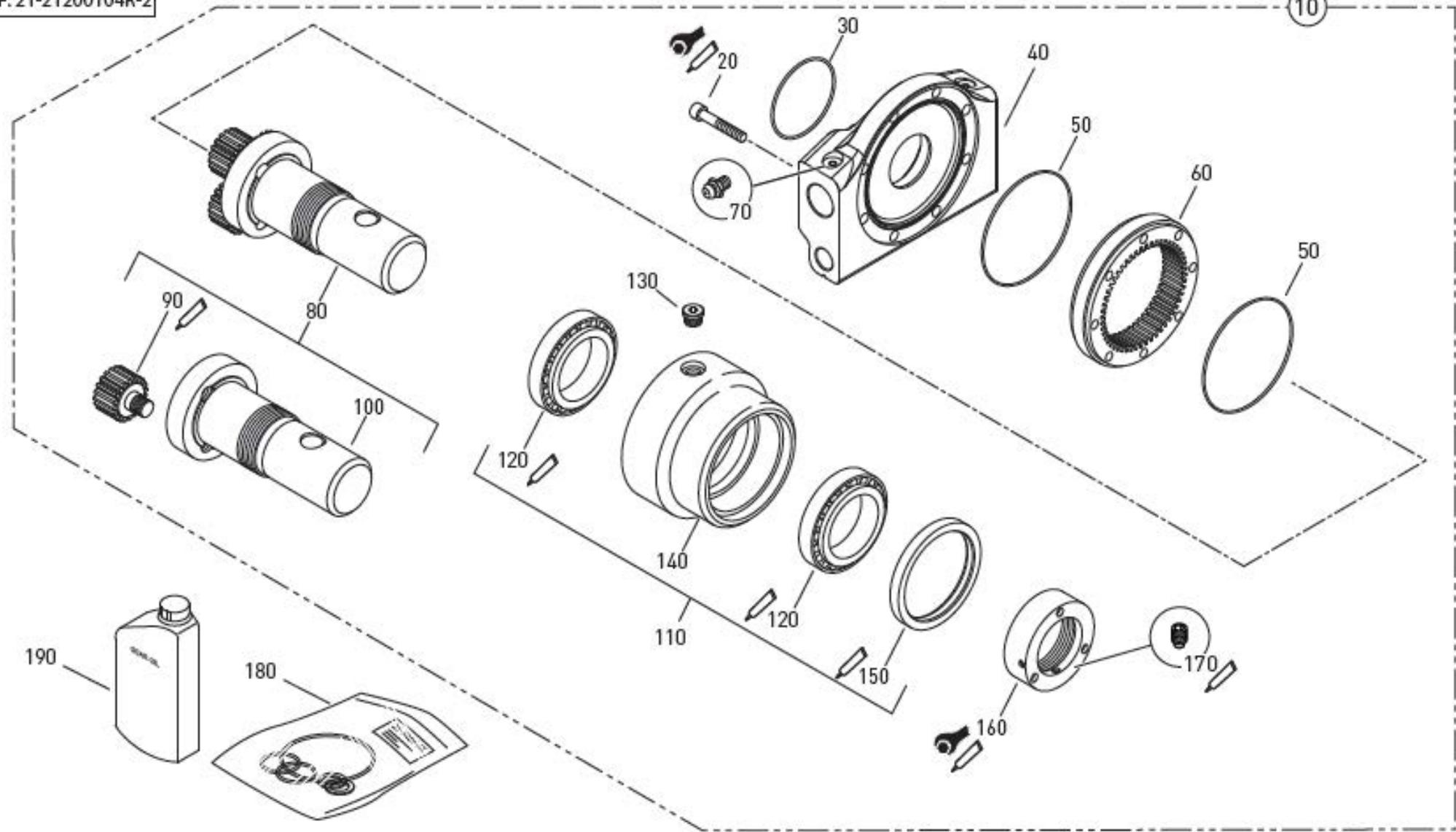
Ref. 21-21200104R-01



ITEM	PART NO.	DESCRIPTION	QTY	TORQUE LOAD	THREAD TREATMENT	NOTES
10	25-2303-G	● MOTOR - ATMS 80CC 11T 2.25 MOD SUNGEAR	1			
20	25-2312	● SEAL KIT - MOTOR	1			
30	30-0004-KIT	● PIN - AUGER C/W LINCH PIN	1			
40	99-99020	●○ LINCH PIN - n9.5 (To fit over UPTO Ø36mm SHAFTS)				
50	30-0004	●○ PIN				
60	21-2975-R	● DRIVE SUB-ASSY - 5.77:1 65 ROUND SIDE SWING	1			
70	99-9155-SP	● FIXING - WASHER - M12 SQ SECT SPRING	4			
80	99-9135-040-Y	● FIXING - SKT HD CAP M12 x 40 (12.9 grade) YELL. PASS.	4	90 - 99 ft-lb (121 - 135 Nm)	LOCTITE 243	
						REF:21-21200104R-01

REF: 21-21200104R-2

10



ITEM	PART NO.	DESCRIPTION	QTY	TORQUE LOAD	THREAD TREATMENT	NOTES
10	21-2975-R	● DRIVE SUB-ASSY - 5.77:1 65 ROUND SIDE SWING	1			
20	99-9134-060	● FIXING - M10 x 60 SOCKET CAP SCREW (12.9 Grade)	8	51 - 57 ft-lb (69 - 77 Nm)	LOCTITE 243	
30	99-1540-V	● O-RING - 86 ID x 2.5 DIAMETER (Motor seal)	1			See Seal Kit
40	21-2056	● BTM INPUT - SIDE SWING - 32MM PIVOT	1			
50	99-1531-V	● O-RING - 125 x 2.5 (SERIES 2 RING)	2			See Seal Kit
60	21-2004	● RING GEAR - 52T - 2.25 MOD.	1			
70	99-99030	● GREASE NIPPLE - 1/4" - 28UNF - STRAIGHT	2			
80	21-2909-R	● SHAFT ASSEMBLY - 5.77:1 - 65 RND	1			
90	21-2915	● PLANET GEAR ASSEMBLY - 20T 2.25 MOD	3		LOCTITE 277	
100	21-2028-T	● SHAFT OUTPUT - 65mm ROUND	1			
110	21-2906	● OUTPUT - SUB-ASSEMBLY - X2000 / X2500	1			
120	99-1103	● TAPER BEARING 70mm (32014)	2		LOCTITE 7471, 641	
130	21-2050	● 3/8" BSP MAGNETIC PRESSURE PLUG	2			
140	21-2026	● OUTPUT HOUSING - SERIES 2 5.77:1	1			
150	99-1504	● OIL LIP SEAL - (100 x 120 x 12)	1		LOCTITE 7471, 515	See Seal Kit
160	21-3006	● LOCKING NUT - M70	1	258 ft-lb (350 Nm)	LOCTITE 209125	
170	99-9213-012	● SOCKET SET SCREW - M8 x 12 DOG POINT (14.9 Grade)	2		LOCTITE 243	
180	21-2921	● SEAL KIT - Comprising of items 30,50 &150	1			
190	99-8101	● GEAR OIL - (EP320) - MINERAL (1 Litre) Bottle All units are supplied with (320) viscosity oil, except where the unit is to be or stored in extreme temperatures.	1			(400 ml) required
	99-8104	● GEAR OIL - (EP150) - MINERAL When using or storing the units below -15°C				
	99-8106	● GEAR OIL - (EP460) - MINERAL When using or storing the units above 35°C				

Ref: 21-21200104R-2

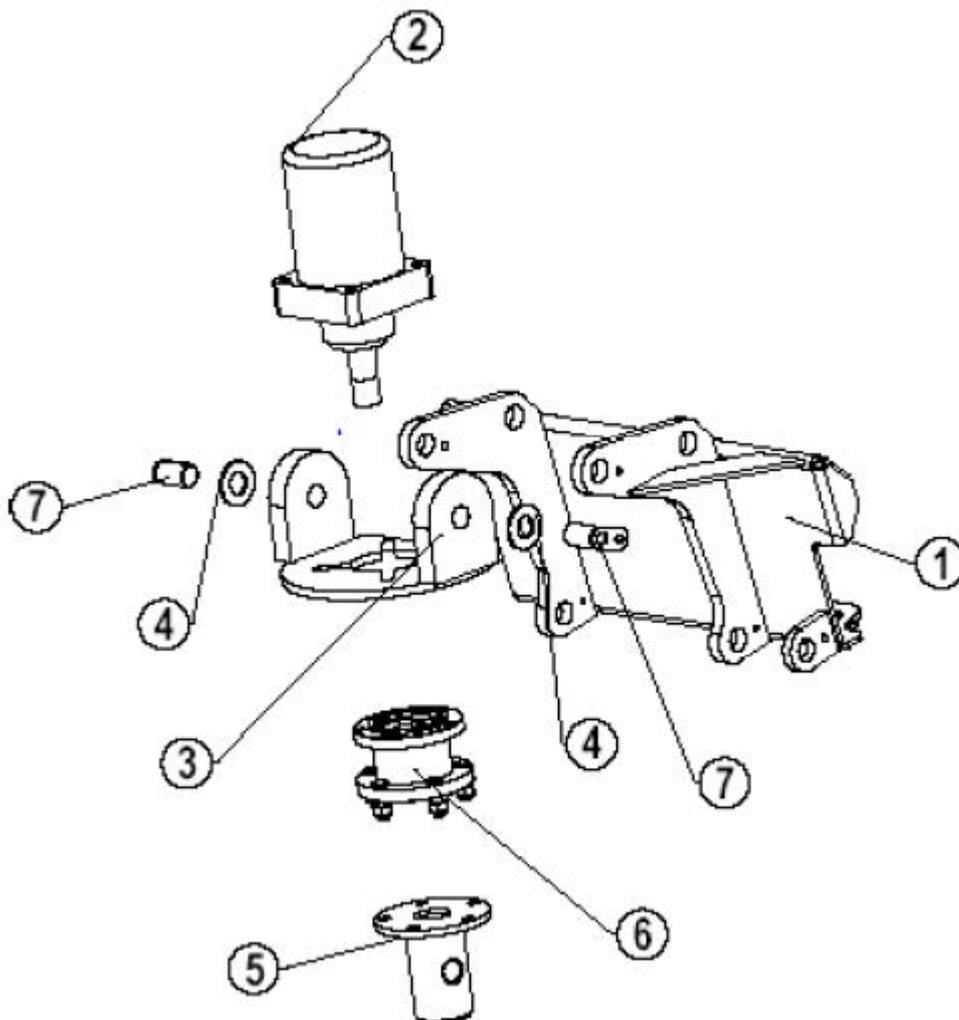
# Wheel Motor Post Hole Digger

- The Wheel Motor Drive Post Hole Digger is only to be used with augers up to 300mm in diameter.
- Failure to comply with this requirement will result in the Warranty on this product being voided.
- The Auger and Drive Head of this attachment swings freely, so please show caution when operating or travelling with the Wheel Motor PHD.



# Wheel Motor Post Hole Digger Assembly

ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL
1	1	APU002	Mount Plate Assembly	Sub Assembly
2	1	330-001-006P	Wheel Motor	
3	1	APU215	Motor Mount Assembly	Sub Assembly
4	2	APU206	Swivel Spacer Washer	3mm MS Sheet
5	1	AEX017	Hub Mount Assembly	Assembly
6	1	APU210	Drive Hub Assembly	Assembly
7	2	APU008	42mm Pin	Sub Assembly



# Troubleshooting

## Problem

## Possible Cause & Remedy

---

Auger does not rotate

1. Auxiliary Hydraulics not engaged properly
    - *Check quick couplers*
  2. Quick coupler faulty
    - *Replace faulty coupler*
  3. Auxiliary valve on Dingo not operating correctly
    - *Refer to Dingo manual, call DINGO service*
  4. Hydraulic Motor Failure
    - *Replace motor. Contact DINGO*
  5. Gear train failure
    - *Check and repair. Contact DINGO*
  6. Drive shaft bearing
    - *check and replace. Contact DINGO*
- 

Oil leakage from inside housing

1. Hoses or fittings leaking
    - *Tighten or replace*
  2. 'O' ring failure
    - *Call DINGO service*
- 

Oil leaking from output shaft

1. Oil shaft seal failure
    - *Call Dingo service*
- 

Does not dig

1. Worn teeth or pilot
  - *Replace*

**Note:** It does not take a lot of wear to reduce digging efficiency substantially. When teeth & pilots appear half worn out, they are often actually worn out. Digging efficiency will be lost and time and money will be wasted in everything but extremely soft conditions.

**Note:** The Post Hole Digger does have limits.

2. Incorrect teeth or pilot
    - *Replace*
  3. Relief valve on Dingo set too low
    - *Test and reset if necessary*
  4. Hydraulic system hot
    - *turn off and wait to cool.*
    - *Hydraulic oil may be damaged or incorrect type.*
    - *Replace Dingo oil with recommended hydraulic oil.*
- 

Auger Bent

1. Abuse
    - *Replace or repair auger*
-

# Plant Risk Assessment

## Part A: Risk Assessment Summary

Risk Rating Key:

V.High

High

Medium

Acceptable



<b>Product:</b>	Post Hole Digger (auger attachment)		
<b>Plant Usage/Task Description:</b>	K9-3 and K9-4 PHD attachment used for digging holes.		
<b>Hazard Identification &amp; Risk Assessment:</b>	Entanglement	Electrical Safety	Thermal Comfort or UV Radiation
	Crushing	Fire or Explosion	Traffic Management
	Cutting, Stabbing, Puncturing	Slips, Trips and Falls	Chemicals
	Shearing	Working at Heights	Dust
	Friction	Suffocation (confined spaces)	Noise
	Striking	Hot Surfaces	Vibration
	High Pressure Fluid	Manual Handling and/or Ergonomics	Rollover
<b>Control Measures:</b>	1. Simple linkage system reduces the need to handle attachments which can be fitted without or with reduced manual handling (engineering). Auger lifting attachment available for handling augers.		
	2. Hydraulic oil within double braided hose rated for 4000 psi. Maximum pressure achieved by Dingo K9-4 is 3400 psi (engineering).		
	3. Dingo Equipment Australia offer the following options available with the K9-4 purchase to reduce traffic management risks (engineering): <ul style="list-style-type: none"> <li>- Flashing light;</li> <li>- Reversing alarm;</li> <li>- Horn; and</li> <li>- Headlights (front and rear)</li> </ul>		
	4. Read and understand hazard warning signage prior to operation.		
	5. Operation and maintenance manual has warnings outlining operator's responsibility to operate away from pedestrians and establish appropriate isolation measures (Administration).		
	6. Operational Manual and safety video provided with all purchases. Training is also provided to all purchasers of plant. Operator's manual details safe operation of K9-4. Safety cards are with the machine and provided to all personnel who hire the Dingo (administration).		
	7. Do not operate attachment without standing on platform.		
<b>Residual Risk:</b>	MEDIUM		

# Warranty Statement

## DINGO MINI DIGGERS PTY LTD (ABN 95 060 840 011) POLICY

DINGO MINI DIGGERS PTY LTD warrants to the original buyer/owner that each new Dingo™ or Dingo attachment will be free from any proven defects in the material or workmanship for a period of thirty-six (36) months or 1000 hours, whichever is sooner, after the delivery to the owner provided that:-

1. The Dingo/Attachment has been properly and reasonably used, operated, maintained and regularly serviced.
2. All replacement or repair is authorised by DINGO MINI DIGGERS PTY LTD or and authorised DINGO MINI DIGGERS dealer.

This refers to all Dingo/Attachment parts, excluding motor and battery as outlined below.

During the warranty period, DINGO MINI DIGGERS or their authorised dealer shall require or replace, at their option, without charge for parts and labour, any part of the Dingo/Attachment which fails because of defects in the workmanship or materials. The owner shall advise DINGO MINI DIGGERS or their authorised dealer immediately of any defect allow reasonable time for replacement or repair. Travel time for servicemen and transportation of the Dingo/Attachment to DINGO MINI DIGGERS or the dealers premises for warranty work are the owners responsibility.

### WARRANTY EXCLUSIONS

This warranty does not cover: -

1. Tyres or other consumables or service parts (nuts and bolts, trencher teeth, etc) replaced as part of a normal maintenance service as opposed to manufacturing defects.
2. Damage resulting from abuse, negligence, accidents, alterations, air flow obstructions, or failure to maintain or use the machine according to the instructions given.
3. Downtime expenses, loss of machine use, rental of another machine or related equipment while repairs are in progress, or other incidental, consequential, or special damages.
4. Communication expenses such as Telephone and Facsimile.
5. Travel time for servicemen.
6. Transportation and Insurance charges for transportation of the failed Dingo/Attachment.
7. Any labour, parts, mechanical adjustments or lubricant expenses which Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger dealer considers should be made as a standard maintenance procedure according to the Dingo maintenance guide-lines listed in this manual.
8. Any defect caused by work carried out without the authorisation of Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger Dealer.
9. Damage caused by continued use of the machine after it is known to be defective.
10. Damage caused by overloading or by racing and similar activities.

This warranty is in lieu of all other warranties, expressed or implied, and there are no warranties of merchantability or fitness for a particular purpose.

The benefits conferred by this warranty are in addition to all other rights and remedies in respect of the product which the consumer has under the Trade Practices Act (Commonwealth) and the Fair Trading Act of Queensland.

Machines of this type can be dangerous if used carelessly or improperly. The manufacturer, distributor or selling agent does not accept responsibility for accident either to the operator, to the owner or to any person directly or indirectly or to property if such an accident is caused by circumstances arising otherwise than by the negligence or default of Dingo Mini Diggers Pty Ltd.

## PARTS INSTALLED DURING MACHINE WARRANTY

Components installed during a machines warranty period shall have warranty coverage for the duration of the machine warranty period or ninety (90) days, whichever is greater, provided the warranty installation is performed by Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger dealer.

N.B. Dingo Mini Diggers Pty Ltd reserve the right to change at any time the Dingo Mini Digger product specifications, configurations, and company policies, this is due to our constant commitment to make the best product for the job.



Proudly manufactured by  
**Dingo Mini Diggers Pty Ltd**  
**9 Owen Street East**  
**Dalby Qld, 4405**  
**Australia**

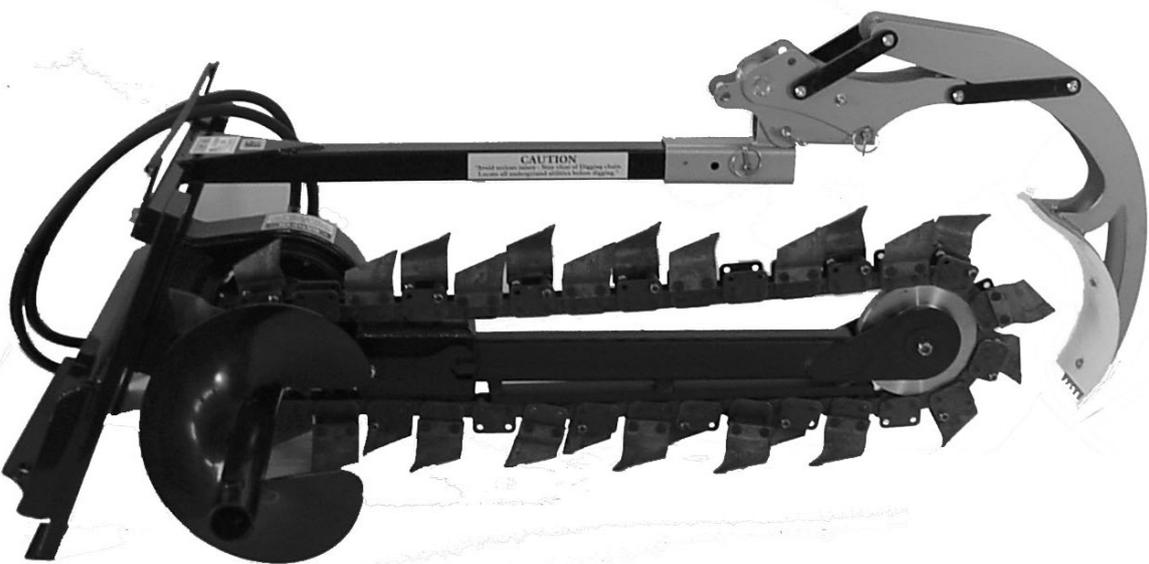
**1300 4 DINGO**

**DINGO.COM.AU**

# DINGO™

## TRENCHER

### OPERATION & MAINTENANCE MANUAL



**IMPORTANT:** Become familiar with the contents of this manual and the Dingo Operation and Maintenance manual before operating the Trencher attachment. Information about the Dingo is contained in the Dingo Operation and Maintenance Manual.



Modified 07-04-2004

# Introduction

This trencher has been carefully designed and manufactured to give you years of reliable service. Please read this operation and safety manual to keep your trencher running efficiently.

The information in this manual is current as at February 2002. In the effort to continually improve our products, Dingo reserves the right to change specifications without notice. Please, for critical information, contact you nearest Dingo branch.

We want you to be completely satisfied with your new product, so feel free to contact your local Dingo branch for help with service, replacement parts and any other information about the Dingo and its attachments.

Whenever you contact your local Dingo branch always know the model and serial numbers of your product. These numbers will help us to provide exact information about your specific product. You will find the model and serial number on a plate located on the product.

For your convenience, write the product model and serial numbers in the space below.

Model No:	_____
Serial No.	_____

**DISCLAIMER:**

Specifications, design & service procedures are subject to change without notice.  
Specifications may vary & may be approximate.

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# Safety

- Keep away from the moving teeth and auger while operating the trencher.
- Keep your hands, feet, and any other part of your body or clothing away from moving parts.
- Before adjusting, cleaning, repairing and inspecting the trencher, shut off the engine and wait for all moving parts to stop. Lower the trencher and Dingo arms to the ground and rotate the ignition key to "OFF."

# Operation

**1.** Ensure Auxiliary hydraulics lever is in neutral position before connecting Trencher.

**2.** Disconnect Bucket or other attachment and connect Trencher as per instructions in the Dingo Operation and Maintenance Manual. Follow all steps for connecting an attachment that requires auxiliary hydraulics. The Dingo Operation and Maintenance Manual explains the use of the auxiliary hydraulics lever.

**3.** After the trencher has been mounted and hooked up hydraulically, inspect thoroughly to be certain it is in good working order before use. The following check list is a reminder of points inspect.

- Mount trencher to Dingo and check all latching points for correct fit.
- Check hose routing at pivot points to be sure proper clearance or slack is available during all operations.
- Check digging chain adjustment. If in doubt, err on the side of too loose. It is better to be too loose than too tight.
- Check all hose connections for leaks.

**4.** Manoeuvre machine so that the end of the

trencher is positioned at the start of the desired trench with rear of machine facing the direction of the trench. Trenching will be done whilst pulling back and operating in a reverse direction.

**5.** Move the pump selector to the turtle position. In this position the big pump is powering the trencher and the small pump is powering the wheels and arms.

**6.** With the trencher a little off the ground and parallel to the ground start trencher teeth moving by using auxiliary lever. Trencher teeth on top side of trencher should be moving away from the machine.

**7.** Tilt the trencher down into the ground using the crowd lever. As the trencher enters the ground it will be necessary to lift the rear of the trencher using the lift lever. This will ensure the rear of the trencher and the auger flight remain just above the ground.

**8.** Once the correct depth is achieved move the flow divider lever to the 9 o'clock position. Pull both drive levers fully back. Then gradually move the flow divider lever towards the 10 o'clock position until a satisfactory ground speed is achieved for the trenching conditions. This may have to be varied from time to time. If the wheels are starting to spin you are trying to travel too fast.

**9.** When finished digging, tilt the trencher out of the trench and back away from the trench before driving away. Be careful not to drive near the trench or any other obstacle. Remove the trencher as per instructions in the Dingo Operation and Maintenance Manual.

**10.** It is best to trench with the angle of the trencher determining the depth of the trench. I.E. Keep the back of the trencher and the side auger just clearing the original ground surface.

# Maintenance

The Dingo trencher has no real service schedule that need to be adhered to but has several wear parts that you should keep an eye on.

## Teeth

Sharp teeth are important to good performance. When teeth wear out, Production will drop sharply, increasing wear and tear on other components.

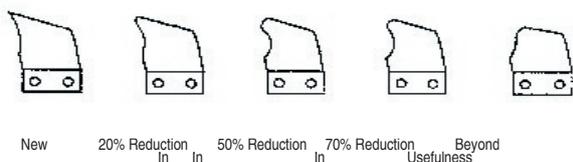
Cup teeth wear on the tip and side bulge in varying amounts. Wear patterns change with different digging conditions. Rocks will take the points off faster than sides. Sandstone or highly abrasive material will wear out the side bulges faster. Rock will be the most severe type of digging conditions.

The following patterns and captions are approximate and should be used as a guide to help you determine your own best cost/benefit tooth replacement time.

In soft soil, tooth wear does not reduce performance as rapidly as hard soils.

Normal replacement should be made between 30% and 60% reduction in performance.

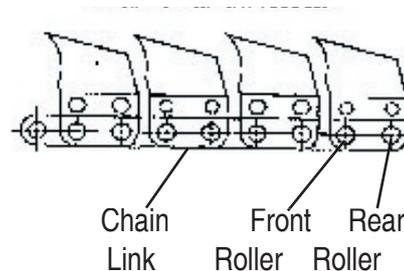
Rock teeth and chains (Diggatac) will greatly improve cost/benefits in severe materials.



Rock chains do not work well in dirt, as they do not have good soil removal capabilities.

## Chain

The chain is also a wear part. Throughout the chains life you will notice the bottoms of each link and the rollers within each link will start to wear.



As a result of the digging action the rear roller in each link will wear faster than the front roller. To prolong the life of your chain it is a good idea to remove the teeth and replace them in the reverse direction. This can be done at the midpoint of the chain's life and when replacing a worn set of teeth. By doing this the rear roller becomes the front roller and the chain has a chance of wearing evenly.

## Chain Adjustment

To check the chain tension on the trencher, leave it attached to the Dingo and raise it in the air parallel to the ground.

There should be 50-100mm of slack in the chain, measured between the chain and the bottom of the boom (usually about 3 fingers distance)

**IMPORTANT:** Do not over tighten the chain. Excess chain tension may damage drive components and increase the chances of the chain stalling in loose material.

Should the chain need adjustment, use the following four steps.

- 1 Lower the trencher and stop the engine.
- 2 Remove the spanner from the side of the trencher. **Note:** The butt of the spanner locks the adjustment nut.
- 3 Using the spanner, rotate the adjustment nut counterclockwise to extend the trencher boom to tighten the chain.
- 4 Replace the spanner in the storage position to lock the adjustment nut in place.

## Nose Roller Assembly

The nose roller assembly (item 14, page 11) is also a wear part. A worn nose roller assembly will increase chain wear. Do not lubricate the bearing in the assembly as this will attract dirt to the bearing and reduce its life-span. It is a sealed bearing.

## Drive Sprocket

The drive sprocket (item 7, page 11) is a wear part. A worn sprocket will reduce the life of your chain. It is recommended to replace the sprocket and chain at the same time.

## Boom

The boom (item 10, page 11) is a wear part. By the time the skid plate on the underside is worn out, so is the adjuster thread and the area where the boom enters its socket. Replacement of the complete boom is recommended.

# Off-setting the Trencher

The Dingo trencher has the ability to be off-set so that it is possible to trench up against wall, fences etc.

- 1 Undo the 6 bolts holding the planetary drive mount to the mount assembly.
- 2 Replace the planetary mount on the right hand side of the mount assembly in the six holes provided.
- 3 Remove the auger flight.
- 4 Remove the safety rail assembly.

In the off-set position the trencher chain is now in line with the outside of the wheels.



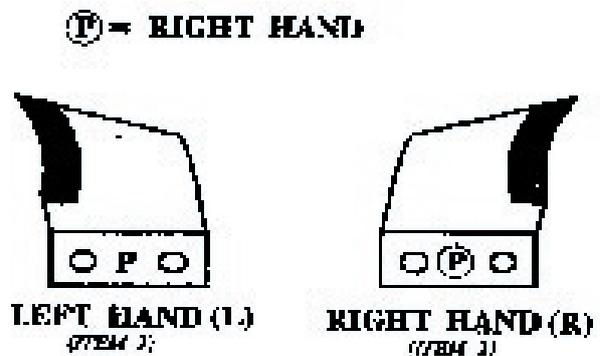
*Trencher in Off-set position*

# Cup Tooth Chain

## Tooth Identification

Teeth are left or right hand as viewed from standing position on machine.

Generally teeth are marked as follows:-



## Tooth Configuration

Position	Cut Width				
	4"	6"	8"	10"	12"
1	CR	CR	CR	CR	CR
2	L	L	L	L	L
3	R	R	R	R	R
4	SP	6L	6L	6L	6L
5	CR	6R	6R	6R	6R
6	L	L	8"	8"	8"
7	R	R	R	SP	SP
8	SP	SP	SP	10"	12"
9	CL	CL	CL	CL	CL
10	L	L	L	L	L
11	R	R	R	R	R
12	SP	6L	6L	6L	6L
13	CL	6R	6R	6R	6R
14	L	L	8"	8"	10"
15	R	R	L	SP	SP
16	SP	SP	SP	10"	12"
17	CR	CR	CR	CR	CR
18	L	L	L	L	L
19	R	R	R	R	R
20	SP	6L	6L	6L	6L
21	CR	6R	6R	6R	6R
22	L	L	8"	8"	8"
23	R	R	R	SP	SP
24	SP	SP	SP	10"	12"
25	CL	CL	CL	CL	CL
26	L	L	L	L	L
27	R	R	R	R	R
28	SP	6L	6L	6L	6L
29	CL	6R	6R	6R	6R
30	L	L	8"	8"	10"
31	R	R	L	SP	SP
32	SP	SP	SP	10"	12"

Abbreviations used:

**L** = Left Hand Tooth

**R** = Right hand tooth

**CL** = Centre Left

**CR** = Centre Right

**6L** = tooth spaced 6" to the left

**6R** = Tooth spaced 6" to the right

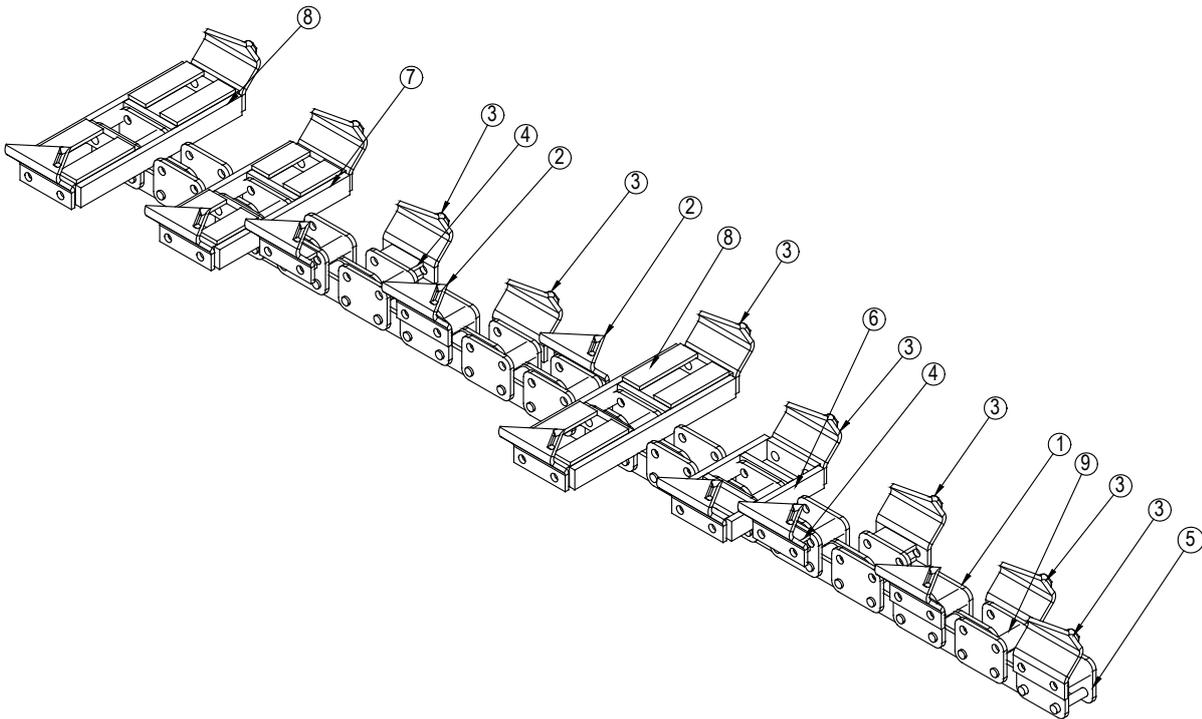
**8"** = teeth on both sides of 8" spacer

**10"** = Teeth on both sides of 10" spacer

**12"** = Teeth on both sides of 12" spacer

**SP** = space or blank

# Cup Tooth Chain Assembly

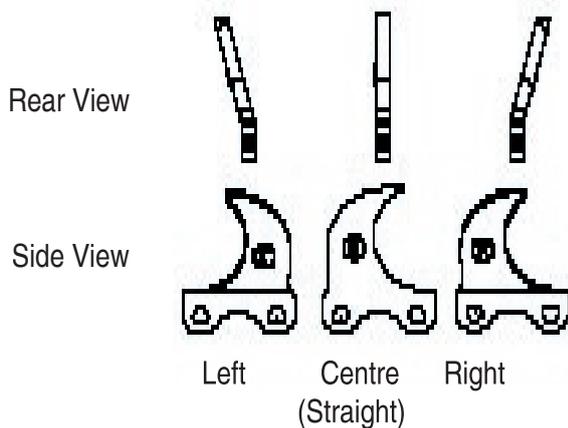


Item	Part No.	Title	4"Qty	6"Qty	8"Qty	10"Qty	12"Qty
1	060-700-005	Chain	1	1	1	1	1
2	060-700-029	Right Tooth	12	14	16	18	18
3	060-700-027	Left Tooth	12	14	16	18	18
4	ATR-516	6" Adaptor	-	8	8	8	8
5	060-700-004	Chain Link	1	1	1	1	1
6	ATR520	8" Adaptor	-	-	4	4	2
7	ATR525	10" Adaptor	-	-	-	4	2
8	ATR530	12" Adaptor	-	-	-	-	4
9	ATR-534	Spacer 35mm	24	28	24	20	20
	113-321-020	3/8" x 1 1/4" Bolt	24	20	16	12	44
	113-321-040	3/8" x 2 1/2" Bolt	24	20	16	12	12
	113-321-028	3/8" x 1 3/4" Bolt	-	8	8	8	8
	113-321-056	3/8" x 3 1/2" Bolt	-	8	8	8	8
	113-321-048	3/8" x 3" Bolt	-	-	16	16	8
	113-321-064	3/8" x 4" Bolt	-	-	-	16	8

# Diggatac Chain

Diggatac is a unique bolt on hard digging and rock tooth that gives incredible tooth life and high performance in those difficult trenching conditions. Mining grade tungsten carbide tools are used to provide longer life.

## Diggatac Tooth Identification



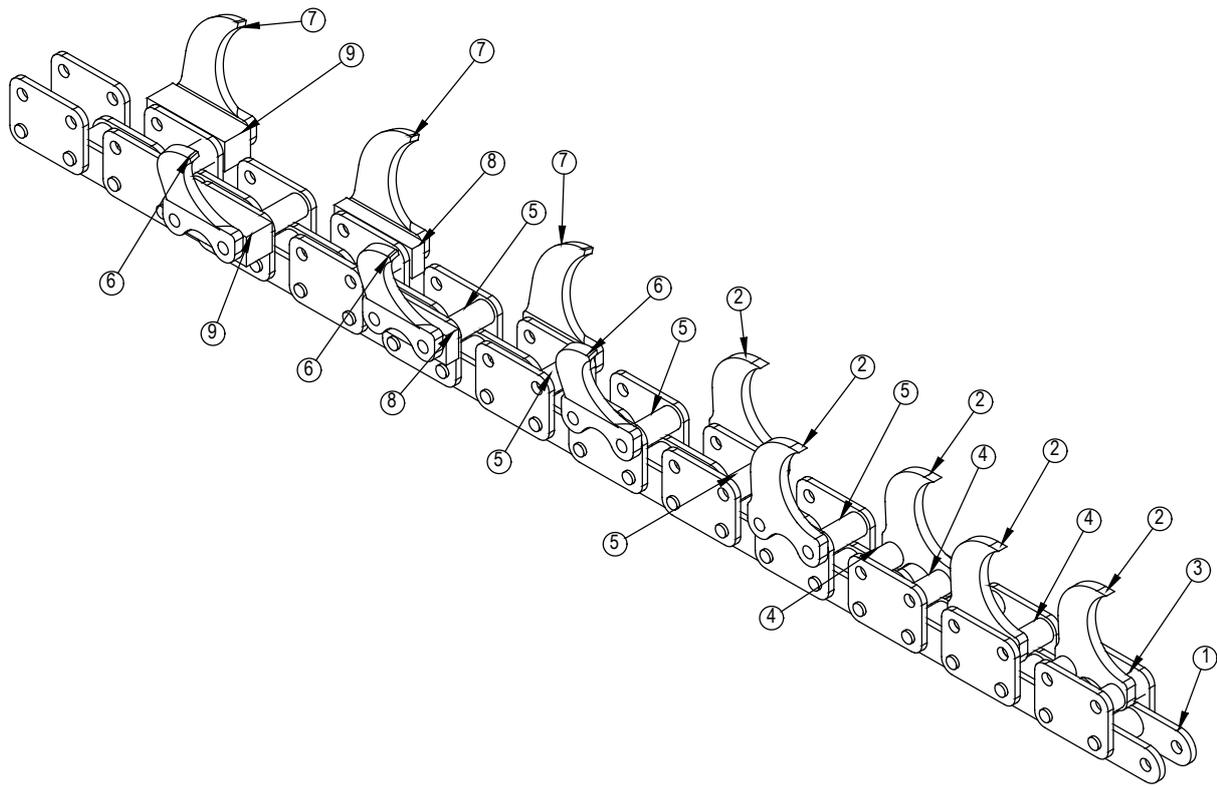
## Diggatac Chain Tooth Configuration

Position	4" Cut	6" Cut
1	SP	SP
2	C	C
3	ILS	ILS
4	IRS	IRS
5	OLS	OLS
6	ORS	ORS
7	L4"	L4"
8	R4"	R4"
9	SP	L5"
10	C	R5"
11	ILS	L6"
12	IRS	R6"
13	OLS	C
14	ORS	ILS
15	L4"	IRS
16	R4"	OLS
17	SP	ORS
18	C	L4"
19	ILS	R4"
20	IRS	L5"
21	OLS	R5"
22	ORS	L6"
23	L4"	R6"
24	R4"	ILS
25	SP	IRS
26	C	OLS
27	ILS	ORS
28	IRS	L4"
29	OLS	R4"
30	ORS	L5"
31	L4"	R5"
32	R4"	L&R6"

### Abbreviations:

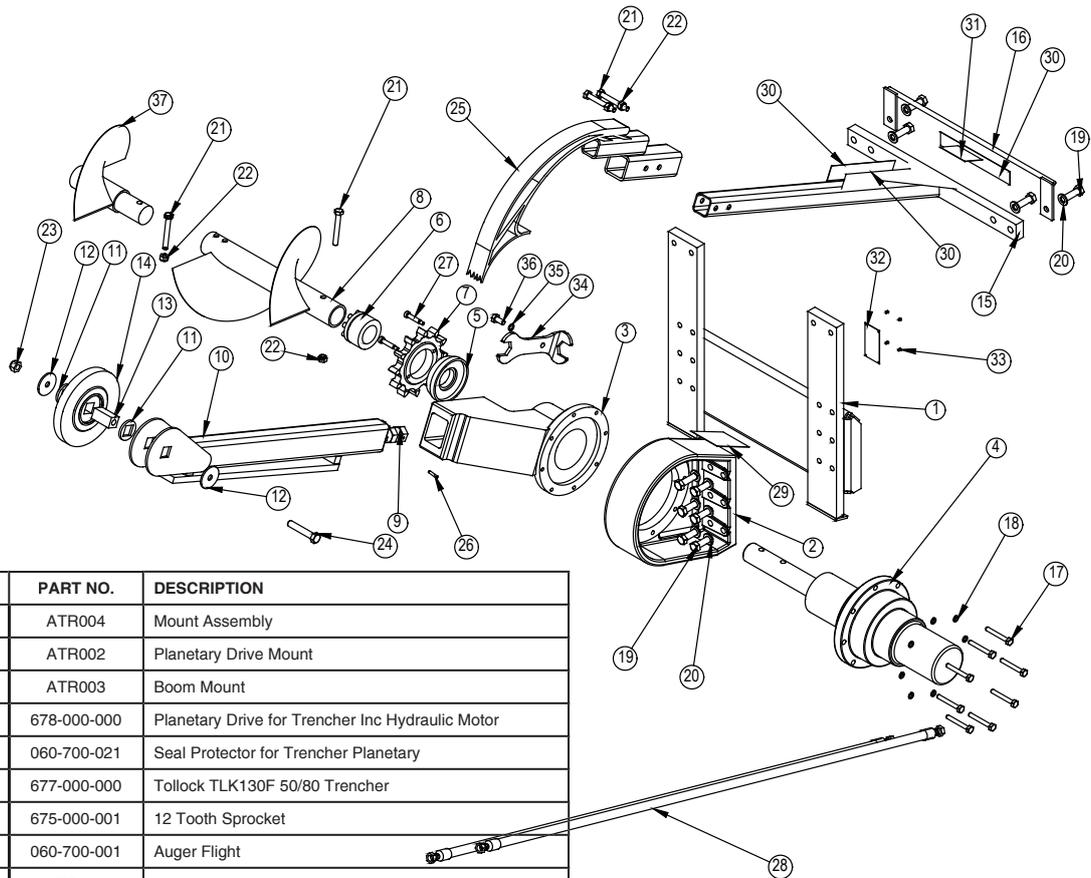
C	Centre - straight tooth
SP	Space
ILS	Inside left - straight tooth
IRS	Inside right - straight tooth
OLS	Outside left - straight tooth
ORS	Outside right - straight tooth
L4"	Left tooth
R4"	Right tooth
L5"	Left tooth with 5" spacer
R5"	Right tooth with 5" spacer
L6"	Left tooth with 6" spacer
R6"	Right Tooth with 6" spacer

# Diggatac Chain Assembly



Item	Part No.	Title	4" Qty	6" Qty
1	060-700-005	Chain	1	1
2	060-700-023	Centre Tooth	20	14
3	ATR562	Space 14mm	16	8
4	ATR561	Spacer 27mm	8	6
5	ATR534	Spacer 35mm	16	23
6	060-700-030	Right Tooth	8	9
7	060-700-028	Left Tooth	8	9
8	ATR564	5" Adapter	-	6
9	ATR515	6" Adapter	-	6
	113-321-020	3/8" x 1 1/4" Bolt	24	18
	113-321-024	3/8" x 1 1/2" Bolt	-	6
	113-321-032	3/8" x 2" Bolt	-	6
	113-321-040	3/8" x 2 1/2" Bolt	8	6
	113-321-044	3/8" x 2 3/4" Bolt	16	12
	113-321-052	3/8" x 3 1/4" Bolt	-	6
	113-321-080	3/8" x 5" Bolt	-	5

# Dingo Trencher Assembly



ITEM	QTY	PART NO.	DESCRIPTION
1	1	ATR004	Mount Assembly
2	1	ATR002	Planetary Drive Mount
3	1	ATR003	Boom Mount
4	1	678-000-000	Planetary Drive for Trencher Inc Hydraulic Motor
5	1	060-700-021	Seal Protector for Trencher Planetary
6	1	677-000-000	Tollock TLK130F 50/80 Trencher
7	1	675-000-001	12 Tooth Sprocket
8	1	060-700-001	Auger Flight
9	1	ATR013	Adjuster Assembly
10	1	ATR015	Boom Assembly
11	2	ATR039	Roller Spacer Square ID
12	2	ATR040	Roller Washer Round ID
13	1	ATR038	Square Roller Pin
14	1	060-700-046	Nose Roller & Bearing
15	1	ATR009	Safety Rail Assembly
16	1	ATR027	Hose Guide Bar Assembly
17	8	113-311-048	3/8" UNC X 3" Hex Bolt Zinc H/T
18	8	132-231-000	3/8" Spring Washer Zinc
19	10	113-711-032	5/8" UNC X 2" Hex Bolt Zinc H/T
20	10	131-271-000	5/8" Flat Washer Zinc
21	1	113-511-056	1/2" UNC X 3 1/2" Hex Bolt Zinc H/T
22	1	122-351-000	1/2" UNC Nyloc Nut Zinc
23	1	122-361-000	9/16" UNC Nyloc Nut Zinc
24	1	113-621-056	9/16" UNC X 3 1/2" Hex Bolt H/T
25	1	050-700-001	Crumber Bar Suit Trencher
26	1	100-000-051	1 1/2" x 1/4" Roll Pin
27	2	113-222-024	5/16" UNC X 1 1/2" Socket Head Screw Cap
28	2	ATR048	Hydraulic Hose Assembly
29	1	021-050-002	Danger Decal
30	3	021-000-035	Decal - Caution Trencher
31	1	021-000-010	Sticker - You Are Responsible For Your Safety
32	1	021-000-024	Nameplate - Tin - Dingo Mini Diggers as Sample
33	4	100-000-027	Type U Drive Screws 6 X 1/4 ZP (Gold)
34	1	ATR012	Trencher Spanner
35	1	132-251-000	1/2" Spring Washer Zinc
36	1	113-511-016	1/2" x 1" Hex Bolt Zinc
37	1	ATR046	Half Flight Auger Extension

# Troubleshooting

PROBLEM	POSSIBLE CAUSE AND REMEDY
Chain does not turn	<ol style="list-style-type: none"> <li>1. Sand build up or other obstruction in tooth root of sprocket               <ol style="list-style-type: none"> <li>A. Raise out of ditch, reverse chain &amp; run to clear build up.</li> <li>B. Loosen chain tension.</li> </ol> </li> <li>2. Quick coupler not completely engaged               <ul style="list-style-type: none"> <li>- Check and complete engagement</li> </ul> </li> <li>3. Quick coupler failure               <ul style="list-style-type: none"> <li>- Replace faulty coupler</li> </ul> </li> <li>4. An obstruction in one of the hoses               <ul style="list-style-type: none"> <li>- Remove obstruction</li> </ul> </li> <li>5. Auxiliary valve on Dingo not properly opening               <ul style="list-style-type: none"> <li>- Check and repair</li> </ul> </li> <li>6. Hydraulic motor failure               <ul style="list-style-type: none"> <li>- Repair or replace. Contact dealer.</li> </ul> </li> <li>7. Chain drive failure               <ul style="list-style-type: none"> <li>- Check and repair. Contact dealer</li> </ul> </li> <li>8. Boom end bearing failed               <ul style="list-style-type: none"> <li>- Replace bearing</li> </ul> </li> <li>9. Digging chain too tight               <ul style="list-style-type: none"> <li>- Loosen chain tension.</li> </ul> </li> <li>10. Gear train failure               <ul style="list-style-type: none"> <li>- Check and repair. Contact dealer.</li> </ul> </li> <li>11. Drive shaft bearing               <ul style="list-style-type: none"> <li>- Check and repair. Contact dealer.</li> </ul> </li> </ol>
Does not dig fast enough	<ol style="list-style-type: none"> <li>1. Worn teeth               <ul style="list-style-type: none"> <li>- See section of this manual on tooth wear &amp; replace if necessary.</li> </ul> </li> <li>2. Relief valve set below specifications               <ul style="list-style-type: none"> <li>- Test and reset if necessary</li> </ul> </li> <li>3. Quick coupler or hose restriction               <ul style="list-style-type: none"> <li>- Inspect and repair if necessary.</li> </ul> </li> <li>4. Hydraulic system too hot               <ul style="list-style-type: none"> <li>- Shut down and cool &amp; refer to below</li> </ul> </li> <li>5. Cutting a trench size beyond the machine capabilities</li> </ol>
Hydraulic oil overheating	<ol style="list-style-type: none"> <li>1. Relief valve set too low on Dingo.               <ul style="list-style-type: none"> <li>- Test and set as needed</li> </ul> </li> <li>2. Restriction in Quick coupler or hose               <ul style="list-style-type: none"> <li>- Inspect and repair as needed</li> <li>- Stop and allow to cool naturally when it gets hot.</li> </ul> </li> <li>3. Hydraulic oil damaged or incorrect type               <ul style="list-style-type: none"> <li>- Replace Dingo oil with recommended oil</li> </ul> </li> <li>4. Pumps on Dingo worn or damaged               <ul style="list-style-type: none"> <li>- Replace pumps.</li> </ul> </li> </ol>
Trenching boom or crumber bent	<ol style="list-style-type: none"> <li>1. Abuse               <ul style="list-style-type: none"> <li>- Replace</li> </ul> </li> </ol>



<b>Product Name: Trencher</b>				
Summary of Product Application	Digging of trenches to 900mm.			
<b>Hazards</b>	<b>Risk Assessment</b>			
	Probability	Exposure	Consequence	<b>Risk Level</b>
<b>Normal position</b> Moving parts Sharp parts Entanglement	Unusual Likely Unusual	Occasional Occasional Occasional	Serious Serious Fatality	Mod/Substantial Substantial High
<b>Side Shift Position</b> Moving parts Sharp parts Entanglement	Unusual Likely Likely	Occasional Occasional Occasional	Serious Serious Fatality	Mod/Substantial Substantial High
<b>Control measures</b>	<ul style="list-style-type: none"> <li>Do not attempt to touch the blades or remove any blockages while the trencher is in motion.</li> <li>The safety bar should always be used, however this control should not be relied up on as the primary means of control.</li> <li>The greatest risk is to people working around the Dingo, rather than the operator. To eliminate risk, ensure that an appropriate physical barrier is installed around the operating trencher.</li> <li>Ensure that anyone who comes onto the work site is made aware of the operation of the trencher and instructed to keep well clear.</li> <li>It is recommended that a spotter or safety observer be used to ensure the user and those working around the trencher are safeguarded from harm.</li> <li>Ensure that the safety instructions in the operation manual are always followed.</li> </ul>			
<b>Residual Risk of Plant with Control Measures</b>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>			
<b>Additional Safety Comments</b>	<ul style="list-style-type: none"> <li>The risk assessment has been carried out using the NSCA Risk Score Calculator. For more information contact Dingo.</li> </ul>			

# Warranty Statement

DINGO MINI DIGGERS PTY LTD (ABN 95 060 840 011) POLICY

DINGO MINI DIGGERS PTY LTD warrants to the original buyer/owner that each new Dingo™ or Dingo attachment will be free from any proven defects in the material or workmanship for a period of twenty-four (24) months or 1000 hours, whichever is sooner, after the delivery to the owner provided that:-

1. The Dingo/Attachment has been properly and reasonably used, operated, maintained and regularly serviced.
2. All replacement or repair is authorised by DINGO MINI DIGGERS PTY LTD or an authorised DINGO MINI DIGGERS dealer.

This refers to all Dingo/Attachment parts, excluding motor and battery as outlined below.

During the warranty period, DINGO MINI DIGGERS or their authorised dealer shall repair or replace, at their option, without charge for parts and labour, any part of the Dingo/Attachment which fails because of defects in the workmanship or materials. The owner shall advise DINGO MINI DIGGERS or their authorised dealer immediately of any defect and allow reasonable time for replacement or repair. Travel time for servicemen and transportation of the Dingo/Attachment to DINGO MINI DIGGERS or the dealers premises for warranty work are the owners responsibility.

## WARRANTY EXCLUSIONS

This warranty does not cover: -

1. Tyres or other consumables or service parts (nuts and bolts, trencher teeth, etc) replaced as part of a normal maintenance service as opposed to manufacturing defects.
2. Damage resulting from abuse, negligence, accidents, alterations, air flow obstructions, or failure to maintain or use the machine according to the instructions given.
3. Downtime expenses, loss of machine use, rental of another machine or related equipment while repairs are in progress, or other incidental, consequential, or special damages.
4. Communication expenses such as Telephone and Facsimile.
5. Travel time for servicemen.
6. Transportation and Insurance charges for transportation of the failed Dingo/Attachment.
7. Any labour, parts, mechanical adjustments or lubricant expenses which Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger dealer considers should be made as a standard maintenance procedure according to the Dingo maintenance guide-lines listed in this manual.
8. Any defect caused by work carried out without the authorisation of Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger Dealer.
9. Damage caused by continued use of the machine after it is known to be defective.
10. Damage caused by overloading or by racing and similar activities.

This warranty is in lieu of all other warranties, expressed or implied, and there are no warranties of merchantability or fitness for a particular purpose.

The benefits conferred by this warranty are in addition to all other rights and remedies in respect of the product which the consumer has under the Trade Practices Act (Commonwealth) and the Fair Trading Act of Queensland.

Machines of this type can be dangerous if used carelessly or improperly. The manufacturer, distributor or selling agent does not accept responsibility for accident either to the operator, to the owner or to any person directly or indirectly or to property if such an accident is caused by circumstances arising otherwise than by the negligence or default of Dingo Mini Diggers Pty Ltd.

#### PARTS INSTALLED DURING MACHINE WARRANTY

Components installed during a machines warranty period shall have warranty coverage for the duration of the machine warranty period or ninety (90) days, which ever is greater, provided the warranty installation is performed by Dingo Mini Diggers Pty Ltd or an authorised Dingo Mini Digger dealer.

N.B. Dingo Mini Diggers Pty Ltd reserve the right to change at any time the Dingo Mini Digger product specifications, configurations, and company policies, this is due to our constant commitment to make the best product for the job.



Proudly manufactured by  
Dingo Mini Diggers Pty Ltd  
9 Owen Street East  
Dalby Qld, 4405  
Australia

Dalby Head Office 07 4672 5400

Brisbane 07 3272 7088

Sydney 02 9833 8222

Melbourne 03 8549 8111

Adelaide 08 8262 2022

Perth 08 9311 9811

Nth Queensland 0408 775 692

New Zealand 07 378 9840

[www.dingo.ws](http://www.dingo.ws)



## GENERAL SAFETY & INSTRUCTIONS TOWING TRAILERS

**This general safety and instructions for towing trailers is a guidance only for the safe operation of the trailer, it does not replace local safety regulations or road regulations.**

### **When towing you should:**

- ✓ Operate all trailers in accordance with the State road rules
- ✓ Ensure safety chain is correctly attached to the towing vehicle
- ✓ Ensure the coupling is secure on the tow ball of the towing vehicle
- ✓ Check all towing vehicle & trailer indicator, brake, clearance lights are working
- ✓ Ensure you know the load (weight) limit of the trailer
- ✓ Ensure jockey wheel, gates/ ramps etc are secure & stowed away before travel
- ✓ Ensure no safety chains or light leads can drag on the ground while travelling
- ✓ Always secure load to prevent loss, damage & fines
- ✓ Activate brakes or chock wheels when disconnecting trailer from towing vehicle
- ✓ Dress appropriately to avoid entanglement (wear close fitting clothing, avoid rings or other forms of jewellery which can become caught on the trailer, people with long hair must have it securely fixed & confined close to the head)
- ✓ Apply extra caution in wet conditions (& in early morning when surfaces are wet) as footboards, footsteps, drawbars & other surfaces may be slippery when wet
- ✓ Always exercise extreme caution in the vicinity of sharp edges & points
- ✓ Keep clothing & body extremities well clear of pinch points while operating trailer, keep well clear of moving parts at all times (these include couplings, ramp brackets, wheels, brakes & pivot points, etc.)

### **When towing you should not:**

- ✗ Do not operate trailers if tired or suffering any medical condition
- ✗ Do not operate trailers if under the influence of drugs or alcohol
- ✗ Do not have your load overhanging (contact your local transport authority for limits)
- ✗ Do not leave a load unsecured or uncovered
- ✗ Do not exceed the speed limit for the trailer
- ✗ Do not allow people or animals to travel in a trailer unless specifically designed for this purpose
- ✗ Do not overload the trailer – observe the maximum capacity
- ✗ Do not allow unlicensed drivers to tow a trailer

This general safety and instructions for towing trailers is a guidance only for the safe operation of the trailer, it does not replace local safety regulations or road regulations.

### **How to Connect A Trailer:**

When connecting a trailer to your towing vehicle, extra care must be taken to ensure that every step is executed correctly. Operators have a responsibility to exercise care and safe work practices at all times in the vicinity of the trailer.

#### **STEP 1:**

Inspect the towing vehicle's tyres, tow bar and tow ball to ensure their serviceability, rating and overall integrity. The compliance plate will state the tow bars maximum load limit and an overall tow rating of the vehicle in which the manufacturer states the tow bar can legally comply (as seen in photos below).



#### **STEP 2:**

If the tow bar and tow ball are in good working order, attach the coupling over the towing vehicle's tow ball checking both visually and physically that the trailer will not disconnect for any reason whatsoever. Ensure the coupling locking latch is in the locked position or the trailer will bounce off the tow ball whilst in travel.





## GENERAL SAFETY & INSTRUCTIONS TOWING TRAILERS

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### **STEP 3:**

The trailer must then be connected to the towing vehicle using safety chains to prevent the trailer from disconnecting from the towing vehicle in the event that the coupling should come loose from the tow ball or during an accident.

The best way to connect the chains from the trailer to the towing vehicle is in a crossed over pattern where the chains act as a cradle to prevent the trailer coupling from hitting the ground in the event of disconnection. Always ensure there is enough slack for manoeuvring and cornering, allow only enough slack in the chains for turns, so that the trailer will not hit the ground if disconnected from the tow ball. This will ensure the trailer remains with the towing vehicle and doesn't roll away causing further harm.

**The chains should never drag on the ground!**

### **STEP 4:**

Connect the power cable plug from the trailer into the towing vehicle input.

**The cable should never drag on the ground!**

### **STEP 5:**

Ensure all lights are working, this includes – brake lights, indicators, parkers, clearance lights and number plate light.

### **STEP 6:**

Check that the jockey wheel is in the raised and locked position, ensure the hand brake is off and the coupling brake lockout is in the open position to engage braking on over-ride braking systems.



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Always ensure the handbrake is OFF while in travel (as seen below)

**HANDBRAKE ON**



**HANDBRAKE OFF**



**STEP 7:**

Always ensure all wheel chocks, ramps, straps etc. are stowed away correctly before travel.

**Your legal responsibilities:**

- ! Check your trailer is connected correctly before travel
- ! All loads must be tied down safely & rubbish covered
- ! Check your towbar rating to ensure compliance
- ! The combined weight of the trailer & load must not exceed the unladen weight of the towing vehicle
- ! Our trailers can only be used with a 50mm tow ball
- ! Maximum towing speed for trailers is 80km/hr – Motorways included
- ! The loaded mass of the trailer must not exceed;
  - The capacity of the towbar; or
  - The maximum towing mass specified by the tow vehicle's manufacturer; or
  - The trailers manufacturers guidance



## GENERAL SAFETY & INSTRUCTIONS TOWING TRAILERS

This general safety and instructions for towing trailers is a guidance only for the safe operation of the trailer, it does not replace local safety regulations or road regulations.

### Helpful Hints:

- ✓ Allow extra distance when overtaking
- ✓ Allow greater distance for braking & turning when towing
- ✓ Load & unload on level surfaces only
- ✓ Distribute weight over axles with approximately 60% towards front of trailer & 40% towards rear of trailer
- ✓ Apply the accelerator, brakes and steering smoothly and gently to avoid sway, especially in wet or slippery conditions
- ✓ If possible, reverse with a person watching the rear of the trailer and use hazard lights

### Troubleshooting:

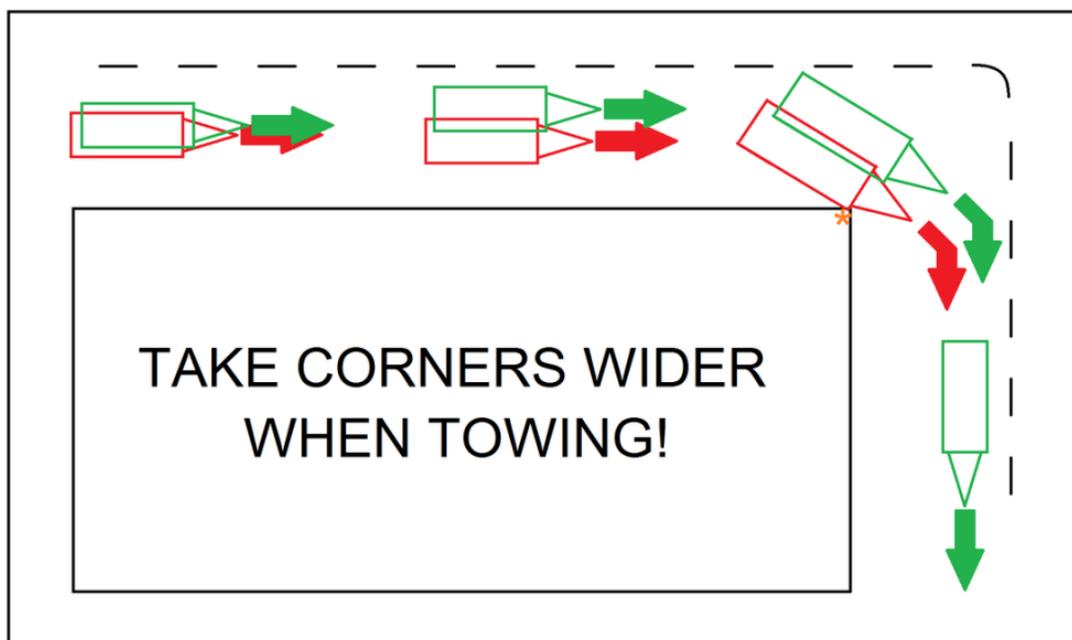
! If lights don't work;

- Check plug & wiring on trailer have not become disconnected
- Check light globes have not been damaged or are blown
- Check tow vehicle electrical circuitry for faults (fuses, socket, wiring, loom connections)

! If tyre is punctured;

- Contact Burgo's Equipment Hire (0448 665 010) (fee may apply)

**! REMEMBER DO NOT ATTEMPT REPAIRS YOURSELF! CONTACT BURGO'S EQUIPMENT HIRE FOR ADVICE (0448 665 010)**





## GENERAL SAFETY & INSTRUCTIONS TOWING TRAILERS

This general safety and instructions for towing trailers is a guidance only for the safe operation of the trailer, it does not replace local safety regulations or road regulations.

### **How to Disconnect A Trailer:**

When disconnecting a trailer from your towing vehicle, extra care must be taken to ensure that every step is executed correctly. Operators have a responsibility to exercise care and safe work practices at all times in the vicinity of the trailer.

#### **STEP 1:**

Always ensure the trailer is on level, stable ground before attempting to disconnect the trailer from your tow vehicle. Always use a minimum of 2 supplied wheel chocks, chocking the wheels with one chock behind a wheel and the other chock in front of the wheel to ensure the trailer will not roll forward or roll back once disconnected from your tow vehicle.

#### **STEP 2:**

Pull the handbrake up and ensure it locks in, to ensure the handbrake works correctly

#### **STEP 3:**

Disconnect the power cable plug from your tow vehicle and place it over the draw bar of the trailer

#### **STEP 4:**

Disconnect both chains from your tow vehicle and place them over the draw bar of the trailer

#### **STEP 5:**

Unlock coupling by lifting the handle up and leave it in the unlocked position

#### **STEP 6:**

Unlock jockey wheel from locked position, ensuring it locks into the vertical position ready to take the weight of the trailer.

#### **STEP 7:**

Start winding jockey wheel up to remove coupling from tow ball, ensure there is enough space for the tow vehicle to safely drive away.

### **How to check my cars rating:**

A cars towing rating can depend on many combined factors including:

- The cars tow bar rating
- The tow ball rating
- Whether the trailer has brakes
- The rating of the car's tyres

Every new Australian car comes with a tow bar rating, either inside the drivers/ passenger door, in the owner's manual or on the tow bar compliance plate, however many tow bars are after market and may require further investigation.

Every Australian tow bar has a weight rating in which the manufacturer states the tow bar can legally comply. The capacity of your tow bar and coupling must be at least equal to the loaded mass of the trailer.

If your tow bar is older or is not marked with a compliance plate, you should seek advice from the manufacturer or a suitably qualified person to determine the tow bar's capacity. If the capacity is unknown, the trailer's maximum loaded mass must not exceed your vehicle's unloaded mass. If the trailer has brakes that can be operated from within the towing vehicle (electric brakes) you may tow up to 1 ½ times the towing vehicle's unladen mass. You can check your vehicle's unladen mass and your trailer's laden mass at a licensed weighbridge or at your local sand and metal depot, they must each be weighed while they are not connected.



## GENERAL SAFETY & INSTRUCTIONS TOWING TRAILERS

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### **Tyres:**

Before towing a trailer, it is important that you check to ensure your cars tyres are rated to withstand the load being towed. Failure to do so will overload the tyres.

### **Tow ball rating:**

Many tow balls state their rating on the top or on the rim of the ball, if in doubt, don't use it! Refer to your towing vehicle's owner's manual or contact a qualified tow bar specialist for further inspection.

## **Safe Operation of Trailer Winch: (Car Trailer Only)**

Trailer winches are not designed for securing cars on trailers. Disconnect the winch when towing and use rated tie down straps.

### **Before using the trailer winch, it is the hirer's responsibility to:**

- ✓ Read winch operators manual before using the winch
- ✓ Inspect the winch cable before and after each winching operation
- ✓ Inspect the overall winch for signs of wear or damage  
**If the cable is kinked or frayed or any part of the winch is damaged DO NOT USE THE WINCH and report the issue to Burgos's Equipment Hire immediately.**
- ✓ Inspect the winch hook and pin for signs of wear or damage
- ✓ Be sure that everyone in the immediate vicinity is aware of your intentions before you pull
- ✓ Keep spectators away from work area
- ✓ Always keep hands and clothing clear of the cable, hook and fairlead opening during operation and when spooling
- ✓ Always use the brake claw when winching a vehicle onto a trailer
- ✓ Always secure the winch to a rated tow point on the vehicle, not the bumper or towbar
- ✓ Winch out slowly and steadily. Be sure that the cable is winding evenly and tightly around the spooling drum
- ✓ If you accidentally let go of the winch handle during use, stand clear to prevent injury from the fast spinning handle
- ✓ Inflate all tyres to correct pressure before winching a vehicle
- ✓ Operate with hand power only, if the winch cannot be cranked easily with one hand, it is probably overloaded and therefore is not suitable
- ✓ Always secure load properly when winching operation is complete, never depend on the winch to support the load



## GENERAL SAFETY & INSTRUCTIONS TOWING TRAILERS

**This general safety and instructions for towing trailers is a guidance only for the safe operation of the trailer, it does not replace local safety regulations or road regulations.**

### **The hirer should not:**

- \* Do not operate the winch while under the influence of alcohol and/ or drugs
- \* Do not use the winch to lift, lower or transfer people from one location to another
- \* Never pull more than the rated capacity of the winch
- \* Never use the winch as a hoist and never use the winches cable to tow another vehicle
- \* Never allow anybody to stand behind a car that is being winched onto a trailer
- \* Never attempt to winch a vehicle onto a trailer without the brake engaged
- \* Never use the winch for lifting, movement of people or as a load securing device for cars on trailers
- \* Never use the winch to load plant equipment or machinery onto trailer, trailer winches are only designed for cars with fully inflated tyres
- \* Never use the winch to load a vehicle without wheels and tyres
- \* Do not use the winch to unload a vehicle from a trailer, winches are designed for loading cars onto trailers only
- \* Never apply a load on a winch with the cable fully extended, always ensure there is at least three full wraps of cable on the drum at all times
- \* Never allow children or anyone who is not familiar with the operation of the winch to use it
- \* Never pull on the winch handle against a locked ratchet

### **Winch Operating Instructions:**

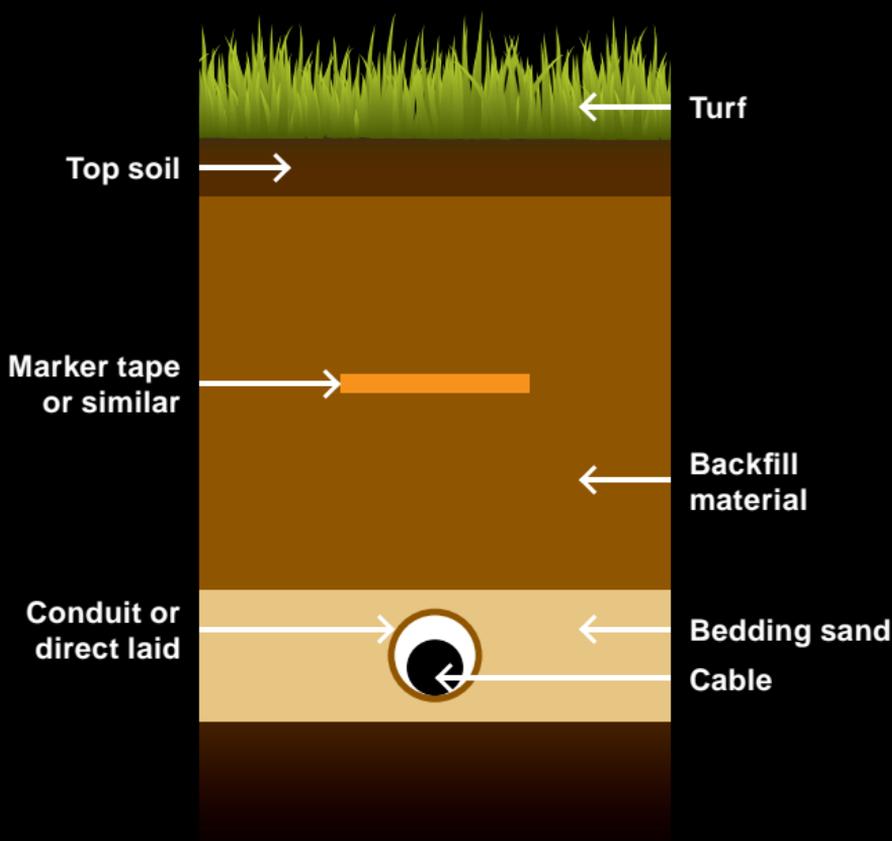
- Pull the pawl lever down, slide it to the side and lock it into the open position to allow the cable to free spool out.
- Unwind the cable from the winch by pulling it out and attach the snap hook onto the vehicle you wish to winch onto the trailer.
- Pull the pawl lever down & lock it back into the cog so that the winch "clicks" as you wind the cable in.
- Keep winding the handle until the vehicle is on the trailer as required.
- Tie down the vehicle using rated ratchet straps to secure the vehicle to the trailer then un-attach the winch cable from the vehicle.

### **Tipping Trailers: (Car trailer & 7x5 caged trailer only)**

**TO AVOID DEATH OR INJURY ALWAYS ENSURE NO ONE IS STANDING ON OR NEAR THE TRAILER AS IT IS BEING LOADED!**

- Release ramps and remove pins from drawbar and release over-centre latch
- Trailer will begin to tilt as weight is applied to the rear of trailer, Trailer will fall back to original position as vehicle is being loaded.
- Always ensure the pins and over-centre latch is secured in the locked position prior to travel

# Dial before you dig



## Working near underground power cables

For more information call **13 12 53**

or visit [energex.com.au/safety](http://energex.com.au/safety)

 Follow us on [twitter.com/energex](https://twitter.com/energex)

 Like us on [facebook.com/energex](https://facebook.com/energex)



positive energy

# Working near underground power cables

## Have you checked for underground services?

In the planning stages prior to performing any earthmoving or excavation work, make sure you are aware of the location of underground power cables. Remember to follow the four Ps:

- **Plan** – Contact Dial Before You Dig ([www.1100.com.au](http://www.1100.com.au)) to request a plan for your underground assets.
- **Pothole** – Potholing may be required to determine the exact location of the services.
- **Protect** – Underground assets may require mechanical protection.
- **Proceed** – Only after you are confident that you have put in place all required controls is it safe to proceed.

Colour	Underground Assets
Orange	Electricity
Yellow	Gas
Green	Water
White	Communications
Red	Fire Services
Cream	Sewerage
Purple	Reclaimed Water
Silver/Grey	Steam
Brown	Oils, Flammable Liquids
Light Blue	Air
Black	Other Liquids



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