

A Masport rotary mower with a red engine and black frame is shown on a green lawn. The mower has a black handle with a red stop button and a black fuel tank. The engine is red with a black air filter and a silver fuel tank. The mower has three large black tires with white rims. The background shows a green lawn and trees.

Masport®

100 YEARS
in the making
EST. 1910

ROTARY MOWER SERVICING MANUAL

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Contents

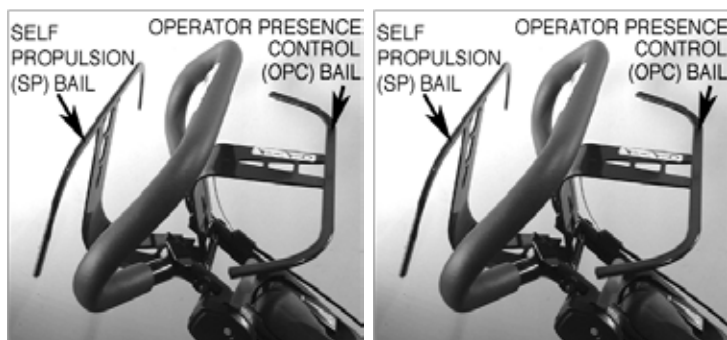
CONTROLS	4
Engine Controls	4
Throttle Control Adjustment	4
Throttle Control Replacement	4
OPC Control Adjustment	4
Propulsion Controls	4
Drive Clutch	4
Drive Clutch Cable Adjustment (All models)	5
Drive Clutch Cable Replacement (Rear wheel drive models)	5
Drive Clutch Cable Replacement (Rotarola & front wheel drive models)	5
Variable Speed Propulsion Control	6
Variable Speed Propulsion Control Adjustment	6
Fitting a New Variable Speed Control Cable	6
Adjusting the Drive Belt (Single speed models)	7
Adjusting the Drive Belt (Variable speed models)	7
 REPLACING DRIVE BELTS ON REAR WHEEL DRIVE MODELS	 7
Preparation (Single and Variable Speed models)	7
Replacing Drive Belts On Single Speed Models	7
Replacing Drive Belts On Variable Speed Models	8
REPLACING DRIVE BELTS ON ROLLER DRIVE MODELS	10
Servicing Chains On Roller Drive Models	10
REPLACING DRIVE BELTS ON FRONT WHEEL DRIVE MODELS	11
 REAR AXLE UNIT – REAR WHEEL DRIVE MODELS	 11
Description	11
Modified Pinions and Gears	12
Correct Pawl, Pinion and Cap Positions	12
Removing Rear Axle Units From Rear Wheel Drive Mowers	12
Dismantling the Rear Axle Unit	13
Notes on Flanged Steel Retaining Cups	14
Re-assembling the Axle Unit	14
 REMOVING FRONT AXLES – ALL TYPES EXCEPT FRONT DRIVE	 14
 REMOVING REAR ROLLER UNITS	 15
Dismantling the Rear Roller Unit	15
 REMOVING FRONT DRIVE UNITS	 15
Dismantling the Front Drive Unit	16
 BLADES	 16
Bar Blades	16
Quick Cut and Quad Cut Blades	16
Chipper Blades	16
Blade Replacement Torque Settings	17
 CHIPPER CLOSER CABLE ADJUSTMENT	 17

NOTE:- All positional descriptions such as left, right, front, rear, above and below refer to those places as seen by the operator when standing behind the handle of the mower in its normal grass-cutting orientation. Please note that these instructions are to be read in conjunction with the Owner's Manual for the mower and the Engine Manufacturer's Operator's Manual for the engine.

Controls

Engine Controls

Some engines have a throttle control to allow the engine speed to be varied as desired. Usually this control can be used also to stop the engine, but, for some markets mowers are fitted with an Operator Presence Control (OPC) that allows the engine to run only while the OPC bail (a bar or hand-grips in front of the handle crossbar) is held against the handle. If the operator releases the bail, the engine stops immediately and the blade is braked to a stop.



Throttle Control Adjustment

Move the throttle control lever through its full range of travel.



This will move the lever on the carburetor from the "FAST" position (when the wire is fully extended), to the 'STOP' position (when the wire is fully retracted).

If the engine is hard to start when cold, (and it does not have an automatic choke), slacken off the cable clamp screw and slide the cable outer sleeve forward a few millimetres. Tighten the clamp screw again. On the other hand, if the engine does not stop when the control lever is moved to the 'STOP' position, slacken the clamp screw and slide the cable sleeve back a few millimetres. (Note: Mowers with an OPC bail stop the engine using a different switch. See OPC control adjustment, below). When the cable sleeve is positioned correctly, the functions at both ends of the throttle wire travel should both work correctly.



Throttle Control Replacement

If the control is one of the types A, C and D shown on the previous page, simply detach the control box from the handle, note where the cable ties are fitted and cut them. After releasing the clamp screw on the carburetor, the new cable can be fitted and held in place with new cable ties. Clamp the control box onto the handle, refit the clamp screw and adjust the cable position as detailed above.

To gain access to the control box for type B throttle controls (as fitted to MSV models), remove the four screws from under the throttle mount that hold the two halves of the mount onto the handle. The top throttle mount can then be lifted clear of the handle. Remove the M6x60 screw that fixes the control box to the top mount, note the cable tie positions and cut the cable ties. After the clamp screw on the carburetor has been removed, the throttle wire can be disengaged from the carburetor lever. The old control box can then be withdrawn from the top mount. Reverse this procedure to fit the new throttle control. Take great care not to over-tighten the M6x60 screw that holds the control box to the top mount as this would make movement of the throttle lever very stiff. After fitting the cable wire into the carburetor lever, re-assemble the two halves of the throttle mount onto the handle, fit new cable ties, replace the clamp screw and adjust the cable position as described above to give correct operation of the engine.

OPC Control Adjustment

There are no adjustments provided on this control as it is a safety feature that might then be over-ridden. When the OPC bail (see the illustrations above) is held against the handle, the engine ignition can function and the mower can be started. When the bail is released, the primary winding of the ignition coil is shorted out, thus quenching the ignition spark. At the same time, a brake pad contacts the engine flywheel, bringing the blade to a rapid stop. If the OPC bail has been damaged and twisted out of shape, the bail may contact the handle before the ignition has been 'switched on'. This is rare, but straightening of the bail can provide a little extra control wire travel to correct the fault.

Propulsion Controls

Drive Clutch

The mower drive system is engaged by using the SP (Self Propulsion) bail. See the illustrations on page 2. Lifting the SP bail, until it contacts the handle, operates the clutch inside the gearbox. The clutch is designed to be fully engaged or fully released. Any attempt to reduce travel speed by only partially engaging the clutch will lead to overheating of the gearbox. This will cause serious damage. For this reason, it is important that the SP bail cable is adjusted to the correct length to provide the necessary clutch engagement pressure.

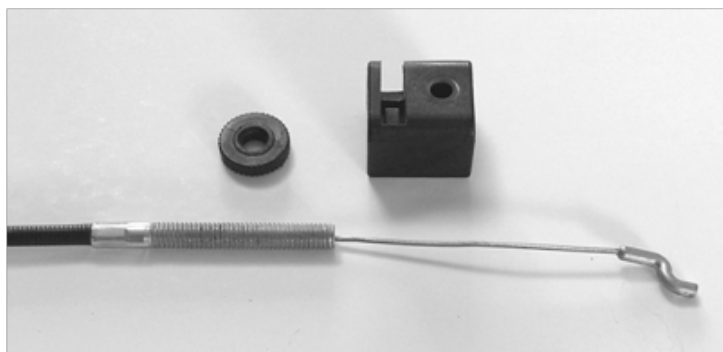
Drive Clutch Cable Adjustment (All models)

1. Confirm that the cable inner wire will move at least 26 mm when the SP bail (see page 2) is moved from the clutch disengaged (open) position to the engaged (closed) position against the handle. Adjust the contour of the bail slightly if necessary to achieve this wire stroke.
2. Wheel the mower backwards towards you while gradually closing the SP bail, and note the position of the bail when extra resistance to backwards movement indicates that the drive clutch is just engaging. This extra resistance should occur when the SP bail is half way between open and closed.
3. If the engagement point is incorrect, adjust it by rotating the thumb-wheel on the anchor block at the top of the cable outer sleeve. Rotating the wheel clockwise will move the clutch engagement point nearer to the bail closed position, and anti-clockwise will move it towards the bail open position.
4. Confirm that the adjustment is correct by re-testing the engagement point.
5. Repeat this adjustment after 150 hours use of the mower or at any time if the mower drive seems to be slipping.

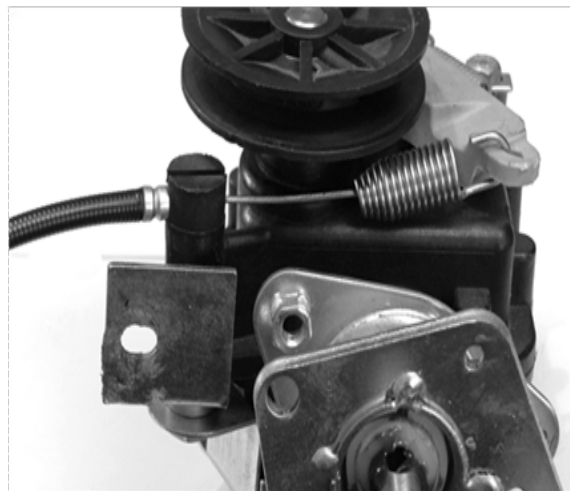
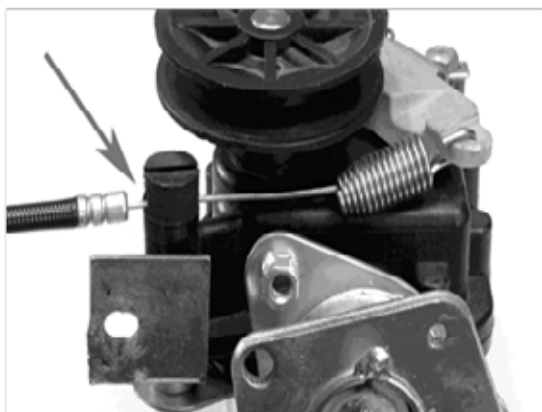
IMPORTANT: An incorrectly adjusted clutch cable, or using the mower with the SP bail not fully against the handle will cause clutch slippage, gearbox overheating and serious gearbox damage.

Drive Clutch Cable Replacement (Rear wheel drive models)

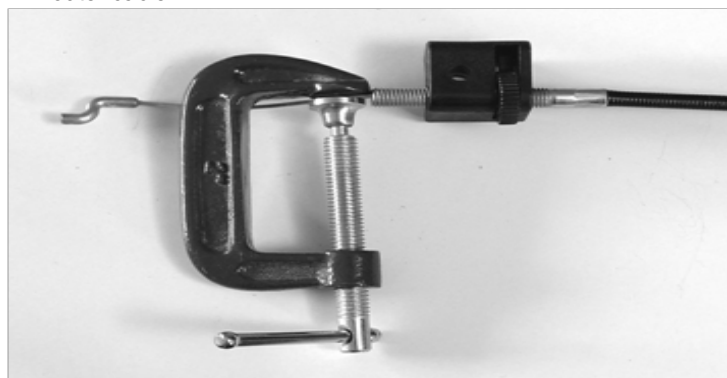
1. Follow steps 1 to 11 detailed in REMOVING THE REAR AXLE UNIT FROM THE MOWER (see below).
2. At the top end of the clutch cable, wind the thumb-wheel adjuster until the thumb-wheel and the thumb-wheel block can be removed completely from the threaded ferrule on the outer cable.



3. The cable will now be small enough to pass through the aperture in the housing and will then be completely free from the mower. As the cable ties are removed, note their positions so that the new ones can be fitted exactly in the same positions. This is important to allow the handle to fold correctly.
4. Pass the top end of the new cable up through the housing aperture. Attach its lower end to the gearbox by hooking the cable spring onto the gearbox clutch lever, dropping the wire through its slot and sliding the clutch outer cable into the socket at the end of the slot.



5. Re-assemble the thumb-wheel and mounting block onto the top end of the cable. Tip: To prevent the cable from slipping out of its socket on the gearbox while re-fitting the rear axle assembly, take the slack out of the wire and keep the outer cable in its socket by fitting a temporary clamp on the wire against the top end of the outer cable.



6. Re-fit the rear axle assembly onto the mower by following the dismantling steps in the reverse order.
7. Hook the 'Z' bend at the top of the cable wire into the SP bail, and fasten the thumb-wheel block onto the handle. Fit the new cable ties and remove the temporary clamp from the cable wire.
8. Adjust the cable for correct operation as described above in DRIVE CLUTCH CABLE ADJUSTMENT.

Drive Clutch Cable Replacement (Rotarola & front wheel drive models)

1. Remove the belt cover to gain access to the top of the gearbox.
2. Examine the path of the old cable, noting particularly where the cable ties are fitted as this is important to ensure satisfactory handle folding.
3. Withdraw the screw holding the cable thumb-wheel block to the top of the handle. This will give enough slack in the cable to allow the 'Z' shaped fitting at the top of the wire to be extracted from the lug on the SP bail.
4. Working down the cable, cut the cable ties. At the gearbox, pull the cable outer housing away from the gearbox to disengage it from its locating hole.
5. Lift the cable wire up out of the slot in the gearbox and swing the wire to the side so that the spring on the end of the cable wire can be unhooked from the gearbox lever.
6. To fit the new cable, reverse the dismantling procedure.
7. After engaging the 'Z' fitting in the SP bail (take care to fit it from the side of the SP bail lug that gives a straight run for the wire into the cable housing), fasten the thumb-wheel block to the handle and adjust the clutch action as detailed above.

Variable Speed Propulsion Control

Some models have an extra feature that allows the travel speed to be varied independently of the engine speed. They have a control like this one (illustrated below).



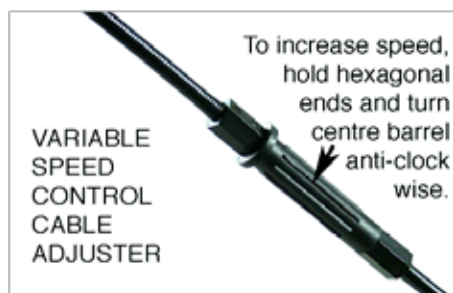
The speed variation is achieved by having a 'split' V pulley on the gearbox input shaft and an idler on the drive belt. The pulley is spring-loaded to move the pulley halves close together. In the SLOW position, the pulley acts just as a normal pulley of the same outer diameter. However, to achieve faster travel speeds, the belt tension is increased by moving the belt idler, which alters the path the belt is following. This pulls the belt into the gearbox pulley, driving the two halves of the pulley apart and making it behave as if it were a smaller diameter, thus increasing the speed of the gearbox input shaft and raising the travel speed.

WARNING: When the idler tension is released, the pulley can return to its full diameter only if the belt is moving. The speed control lever should be moved only when the engine is running. Moving the lever to 'SLOW' when the engine is stationary will result in a slack belt giving no propulsion at all. To recover from this situation, move the speed control lever to the 'FAST' position with the engine running.

Variable Speed Propulsion Control Adjustment

In order to maintain the full range of available speeds, it is necessary to match the wire travel of the speed adjuster cable to the required movement of the belt idler arm. If they do not match, either the top or the bottom intended speed of travel will be unobtainable. This matching is achieved by adjusting the length of the cable outer sleeve.

As explained above, the belt will not respond to downward travel-speed changes unless the engine is running. Do not engage the drive clutch while making these adjustments, but make small changes and then engage the drive to check the results. A better approach is to remove the gearbox cover on the rear face of the mower housing (3 screws), or the front of the mower in the case of front wheel drive models. Then the adjustment can be made and verified without engaging the drive clutch at all.



Confirm that the outside of the V belt comes out to the full outside diameter of the gearbox input pulley when the control lever is moved to the 'SLOW' position. At the 'FAST' end of the range, the belt will be pulled deep between the two halves of the split pulley. Remember, the engine must be running while moving the control lever.



We recommend checking this adjustment after the first 5 hours of mower use while the new belt is settling in. Subsequently check it only if it is apparent that the mower is not achieving full travel speed.

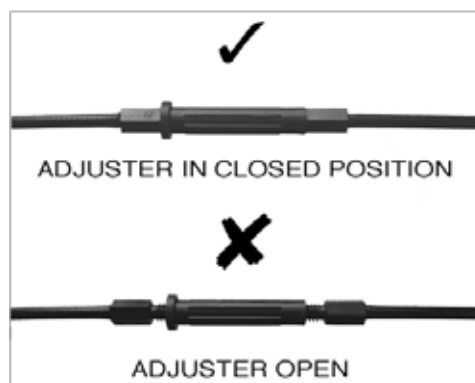
Fitting a New Variable Speed Control Cable

DO NOT REMOVE THE OLD CABLE BEFORE YOU HAVE PREPARED THE NEW ONE. This will help you to fit the new one in exactly the same position and to hold it there with new cable clips at the original fixing points. This will ensure that the cable will work correctly and that the handle will fold properly.

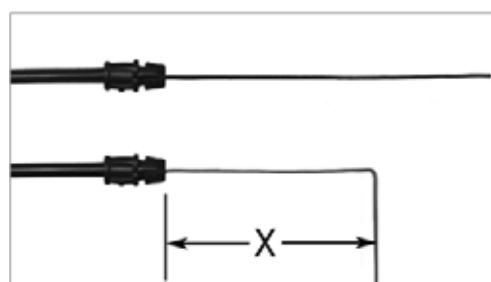
1. Make sure the control lever of the new cable is in the 'SLOW' position.



2. Confirm that the cable length adjuster is in the closed position. To alter its length, hold the two hexagonal ends and rotate the centre barrel.

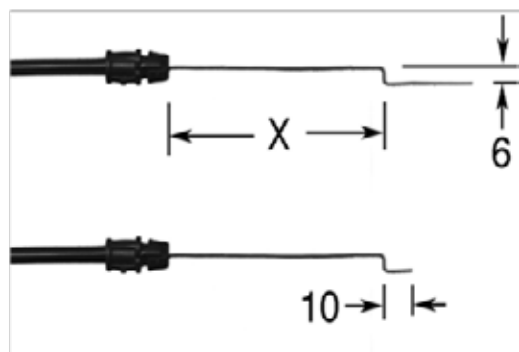


3. Keeping the speed control lever upwards, bend the wire at the other end of the cable downwards as shown. The 'X' dimension varies for different mower models. See below for 'X' dimension.



MOWER	'X' (mm)
21" AL SPV Ø79 PULLEY	76
21" AL SPV Ø68 PULLEY	65
21" AL SPV Ø60 PULLEY	61
21" ST SPV	80
20" AL SPV	57
19" AL SPV	105

- Make the second bend as shown, and then cut off the excess wire.



- Remove the belt cover from the top of the mower housing.
- Lay the cable on the mower alongside the old one. Remove the old control box and fit the new one. Starting at the top, cut off the old cable ties and fit new ones around the appropriate adjoining cables and fastening points. Correct positioning is important to achieve satisfactory handle folding.
- Cut the retaining lugs on the plastic fitting at the bottom of the old cable and withdraw it from the cable bracket. Fit the new cable in its place. Just push it into the mounting hole.
- Fit the bend of the wire into the hole in the idler pulley mounting plate. This will require dismantling of the idler pulley as described in Step 6 of REPLACING DRIVE BELTS ON VARIABLE SPEED MODELS below.
- Re assemble the idler pulley and belt.
- Adjust the cable length for correct travelling speed as detailed above.
- Fit the belt cover.

Adjusting the Drive Belt (Single speed models)

DESCRIPTION: The 'V' belt carrying the drive from the engine to the propulsion gearbox runs between a pulley on the engine crankshaft (directly under the engine) and a pulley on top of the gearbox. The belt runs in a tunnel provided on aluminium models by a belt cover bolted on top of the mower housing, while steel mowers have a welded-in panel below the housing for the same purpose. In all models **except the Rotarola**, the gearbox output shaft extends right across the mower and it has a pinion mounted on each end. The pinions are driven by pawls working in slots in the output shaft. While the basic layout is similar on all rear wheel drive mowers, the addition of extra features like the variable speed drive or the fitting of a chipper tube increases the complexity of the belt drive system.

Adjusting the belt tension if there is an adjustable idler pulley:

Some mowers have 'fixed' belt idler pulleys to guide the belt around obstructions. These fixed idlers can, in some cases, be moved along a slot to adjust the belt tension. If it is necessary to tilt the mower for access to the idler post fixing nut, it is best to tip the mower on its rear wheels, keeping the spark plug uppermost to avoid spilling oil and fuel into the air filter, carburetor and muffler. Avoid over-tightening the belt as this can cause unnecessary wear. The longest run of the belt should still be able to be flexed in and out by a total of 6 to 8 mm under moderate hand pressure.

The Rotarola drive belt follows an 'L' shaped path above the housing by running over two idler pulleys. The belt tension is adjusted by moving one idler pulley along its mounting slot. Gain access for adjusting the belt by removing the left hand side cover and the top belt cover. Do not over tighten the belt (see last paragraph).

Adjusting the belt tension if there is no adjustable idler pulley:

In the case of the basic layout (i.e. no variable speed or chipper tube) the belt runs directly between the two pulleys, and the belt tension adjustment is achieved by rotating the gearbox around its output shaft.



To do this, it is necessary to slacken the gearbox clamp screw (shown above). In some cases access to the screw can be improved by removing the left rear wheel. If you do this, note specially the positions and numbers of any spacing washers on the stub axle and behind the plastic dust cover so that they can be replaced correctly.

Having slackened the gearbox clamp screw, rotate the gearbox around its output shaft to take up the slack in the belt. Tighten the clamp screw after making this adjustment. Avoid over-tightening the belt as this can cause unnecessary wear. The longest run of the belt should still be able to be flexed in and out by a total of 6 to 8 mm under moderate hand pressure.

Adjusting the Drive Belt (Variable speed models)

As explained above (see VARIABLE SPEED PROPULSION CONTROL), the belt tension is automatically provided by the action of the spring-loaded split gearbox pulley. However it is important that the travel of the belt idler matches the starting and finishing points of the variable speed control lever travel. This is achieved by adjusting the length of the variable speed control.

Replacing Drive Belts on Rear Wheel Drive Models (NOT Rotarola)

Important: All 'V' belts are not created equal! It is essential for correct fit and for satisfactory service life, that only the belt supplied by the mower manufacturer be used as a replacement. Other belts, even though they have the same length markings, may not fit correctly, and they may have a greatly reduced service life because of their unsuitable internal construction.

Preparation (Single and Variable Speed models)

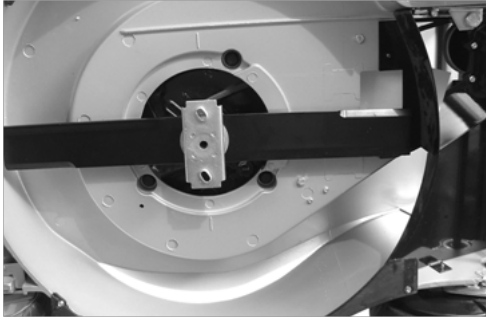
All fuel and oil must be drained from the mower before commencing this procedure as the mower will be tipped over. This will avoid the risk of fuel and oil reaching vulnerable parts of the mower. In any case, this could be a sensible time to make an oil change.

SEE THE NOTE ON 'POSITIONAL DESCRIPTIONS' AT THE BEGINNING OF THESE INSTRUCTIONS.(PAGE 2)

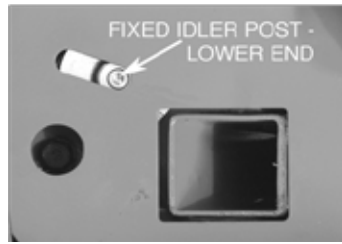
Replacing Drive Belts on Single Speed models. (Except Rotarola and front wheel drive models)

- Tie the flap at the rear of the grass discharge tunnel in the fully open position, using the handle as an anchor point.
- Remove the gearbox cover plate from the rear wall of the mower housing. (3 screws)
- If there is a cover over the 'V' belt above the housing, remove it. (2 nuts, 2 flat washers)

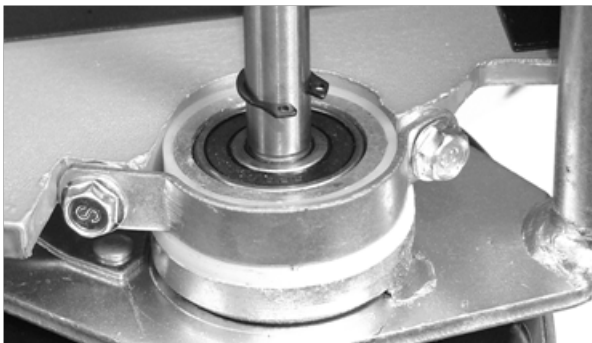
4. Tip the mower on its right hand side, remove the blade bolt from the lower end of the crankshaft, and lift the blade or blade assembly clear of the mower. It should not be necessary to pull the blade driver off the crankshaft.



5. Examine the mower to establish the correct routing for the new belt. If there is a fixed idler pulley post, slacken its fastening nut and slide it to slacken the belt as far as possible.



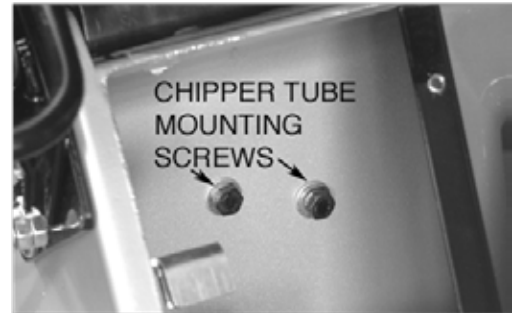
6. Remove the left rear wheel hub cap, undo the wheel retaining nut and pull off the washer, the wheel and the plastic dust cover. Tip: Be careful to note the positions of any washers on the axle (both in front of and behind the dust cover) so they can be replaced correctly.
7. Check the distance between the gearbox pulley and the left hand side of the housing to see whether there is sufficient room for the new belt to pass through. If not, it will be necessary to move the gearbox slightly to the right to provide access. To do this, remove the split plastic sleeve from the rear axle to gain access to the circlip against the right hand rear axle bearing. Lift this circlip out of its groove and slide it along the rear axle toward the gearbox about 10 mm. Do NOT overstretch the circlip.



8. Slacken off the set screw which clamps the gearbox mount against the side wall of the mower housing. Tap the left end of the rear axle gently to move the gearbox to the right just enough to allow the 'V' belt to pass between the housing and the gearbox pulley.



9. Unless the mower has a chipper tube, it should be possible to lift the old 'V' belt clear and fit the new one in place. If it has a chipper tube, remove it by unscrewing the two mounting screws holding the tube against the sloping face of the housing. Access to these screws is through the gearbox compartment. If the mower has a steel housing and it has a fixed idler pulley, it will be necessary to remove the fixed idler completely to release the old belt.



10. Fit the new belt, re-fit the chipper tube (if any), and replace the fixed idler if it was removed at step 9. Tip: It will be easier to fit the fixed idler before fitting the chipper tube.

FIXED IDLER PULLEY ASSEMBLY

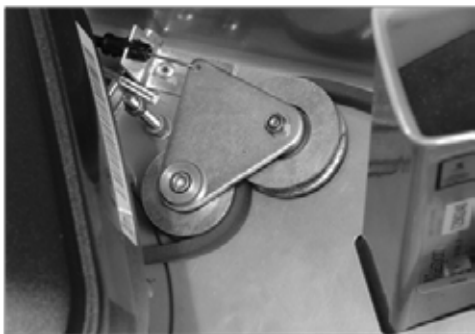


1. Gently tap the gearbox toward the left side of the housing until there is room to re-fit the circlip against the right rear axle bearing. Do NOT overstretch the circlip!
2. Re-fit the split plastic sleeve on the rear axle.
3. Rotate the gearbox around the rear axle in a clockwise direction (as viewed from the left hand side of the mower) to tension the belt and lock the box in position by tightening the gearbox clamp screw. Alternatively, if there is a fixed idler post, clamp the gearbox in the position that best lines up its pulley with the run of the belt and move the idler pulley post along its slot to set the belt tension correctly. Then fasten the post in this position.
4. Replace the wheel and plastic dust cover, placing the axle washers in front of, and behind the cover as they were originally. Fit the wheel retaining washer and nut and assemble the hub cap onto the wheel.
5. Re-fit the belt cover (if any) and the gearbox cover plate and untie the grass discharge flap.
6. Re-assemble the blade system.
7. Turn the mower upright, add oil and fuel and test run.

Replacing Drive Belts on Variable Speed models

See the note on PREPARATION above.

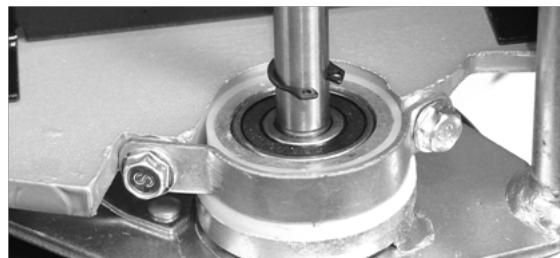
1. Tie the flap at the rear of the grass discharge tunnel in the fully open position, using the handle as an anchor point.
2. Remove the gearbox cover plate from the rear wall of the mower housing. (3 screws)
3. If there is a cover over the 'V' belt above the housing, remove it. (2 nuts, 2 flat washers)
4. Tip the mower on its right hand side, remove the blade bolt from the lower end of the crankshaft, and lift the blade or blade assembly clear of the mower. It is not necessary to pull the blade driver off the crankshaft.
5. Look carefully at the position of the old belt, particularly where it passes through the idler pulleys mounted on the carrier plate. Note that one pulley is flat to contact the outside of the 'V' belt, while the other has a 'V' to engage with the 'V' of the belt in the usual way. Move the lever of the variable speed control fully into the 'SLOW' position.



6. Remove the fastening nut from the bottom of the idler pulley stud and withdraw the stud. Take particular note of the positions of all spacers and washers, and identify the hole in which the stud was mounted. Some housings have more than one hole in this general area, and it is vital to use the correct one. NOTE: On some models it will be necessary to at least partially remove the engine mounting bolts so the engine can be lifted sufficiently to allow removal of the idler pulley stud.



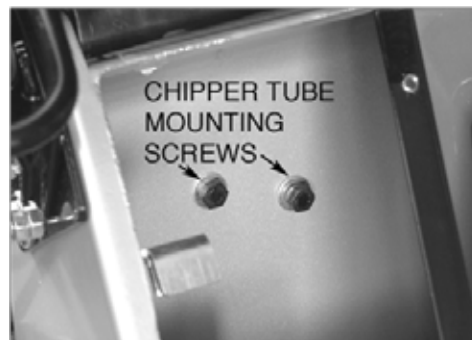
7. There should now be enough slack in the belt to allow it to be moved clear of the crankshaft pulley and the gearbox pulley. NOTE. In some cases there may be insufficient room between the gearbox pulley and the side of the housing to allow the belt to pass through. If this is the case, follow Steps 8, 9 and 10 below.
8. Remove the left rear wheel hub cap, undo the wheel retaining nut and pull off the washer, the wheel and the plastic dust cover. Tip: Be careful to note the positions of any washers on the axle (both in front of and behind the dust cover) so they can be replaced correctly.
9. In some cases it will be necessary to move the gearbox slightly to the right to provide room for the belt to pass between the pulley and the housing. To do this, remove the split plastic sleeve from the rear axle to gain access to the circlip against the right hand rear axle bearing. Lift this circlip out of its groove and slide it along the rear axle toward the gearbox about 10 mm. Do NOT overstretch the circlip.



10. Slacken off the set screw which clamps the gearbox mount against the side wall of the mower housing. Tap the left end of the rear axle gently to move the gearbox to the right just enough to allow the 'V' belt to pass between the housing and the gearbox pulley.



11. If the mower has a chipper tube, this will prevent removal of the belt. Release the chipper tube by unscrewing the two mounting screws holding it against the sloping face of the housing. Access to these screws is through the gearbox compartment.



12. Now that the belt is slack it can be removed from the engine pulley. The carrier plate can now be unhooked from the end of the speed control cable if desired for easier access. Note very carefully the correct position for the new belt as it runs between the flat pulley and the 'V' pulley of the idler carrier plate assembly.
13. Check the condition of the ball race in each pulley and replace if necessary. The bearings are sealed and cannot be serviced.
14. Fit the new belt in position over the crankshaft and gearbox pulleys. To give a slacker belt to assist fitting the idler assembly, pull firmly on the belt to pull it deep into the split gearbox pulley.
15. With the speed control lever in the slow position, hook the carrier plate onto the control cable (if it has been removed). Assemble the various washers and spacers onto the idler pulley stud, keeping the belt between the pulleys, and fit the stud onto the housing in the correct hole. Fit the idler pulley stud retaining washer and lock nut and tighten. With the stud firmly locked in place, the carrier plate must be able to pivot easily in response to speed control lever movements.



16. If the gearbox has been moved sideways as in Steps 8, 9 and 10, move it back to its correct position by following Steps 17 and 18.
17. Gently tap the gearbox toward the left side of the housing until there is room to re-fit the circlip against the right rear axle bearing. Do NOT overstretch the circlip!
18. Re-fit the split plastic sleeve.
19. Rotate the gearbox around the rear axle to align the gearbox pulley with the run of the belt and lock the box in position by tightening the gearbox clamp screw.
20. Replace the chipper tube.
21. Replace the wheel and plastic dust cover, placing the axle washers where they were originally, fit the wheel retaining washer and nut and assemble the hub cap on the wheel.
22. Re-fit the belt cover (if any) and untie the grass discharge flap.
23. Re-assemble the blade system.
24. Turn the mower upright, add oil and fuel and test run.
25. Adjust the variable speed cable length as described in VARIABLE SPEED PROPULSION CONTROL ADJUSTMENT above.
26. Re fit the gearbox cover plate.

Replacing Drive Belts on Roller Drive Models

1. Remove the blade retaining bolt from the engine crankshaft and lift off the blade assembly. There is no need to remove the blade driver assembly from the crankshaft. Do not tip the mower on its side to do this without first draining the fuel and oil from the engine.
2. Remove the left hand side cover and the top belt cover.



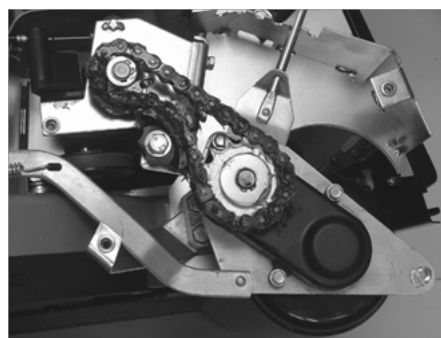
3. Remove the adjustable idler (the one with a 'V' groove) by withdrawing its mounting post. **Take great care to note the correct positions for the various spacers and washers on the post so that they can be re-assembled correctly.**



4. To get sufficient room to withdraw the belt from the gearbox pulley it will be necessary to lift the gearbox slightly. To gain access to the gearbox mount assembly fasteners, remove the cover panel on the rear near-vertical face of the housing (3 screws).
5. The screws holding the gearbox mount can now be reached from the compartment behind the cover panel.
6. If the gearbox can then not be lifted sufficiently to pass the 'V' belt through, more room can be made by either removing the chain tensioner on the upper chain, or by disconnecting the joining link of the chain.
7. The belt can now be disengaged from the engine pulley and removed completely.
8. Fit the new belt in position, replace the gearbox mount fastenings, re-fit the rear cover panel, re-connect the chain (or re-fit the chain connector), fit and adjust the belt idler pulley and replace the blade assembly and blade centre bolt. (Torque 45-50 Nm.)
9. Re-fit the top cover and the left hand side cover.

SERVICING CHAINS ON ROLLER DRIVE MODELS

Roller drive mowers have two chains. The primary chain is easy to access for lubrication and adjusting as it is exposed to view when the left side cover is removed. It has a curved plastic block or an idler roller which can be moved into the bottom run of the chain to take out any chain slackness. Clamp the block at an angle that gives a smooth run-on and run-off for the chain.



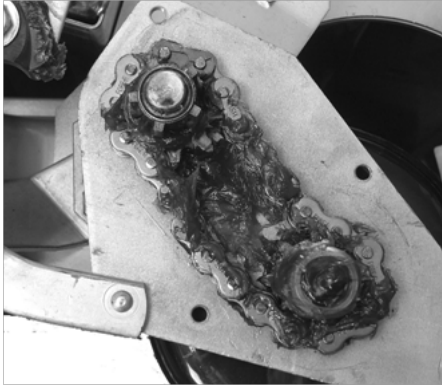
The secondary chain is inside a small cover which sits against the side plate of the rear roller frame assembly. Recommended service times are 25 hours for the primary chain and 100 hours for the secondary one.

SECONDARY CHAIN ACCESS

1. Remove the left hand side cover.
2. Remove the primary chain adjusting block or idler roller, or at least slacken it off until it is well clear of the chain.
3. Remove the connecting link of the primary chain so that the chain can be taken off. If you prefer not to remove the connecting link, remove the circlip holding the upper sprocket. Then pull the top sprocket off as you remove the lower sprocket in Step 4.
4. Remove the circlip and washer that retain the lower sprocket of the primary chain, and pull the sprocket off.



5. Remove the three screws holding the secondary chain cover and lift it clear.
6. Apply a generous coating of grease to the chain, clean out any debris from the inside of the cover and replace it.



7. Re-assemble the parts in the reverse order of dis-assembly. Take care when fitting the primary chain sprockets that the long boss of the top sprocket goes on the inside, and the larger diameter boss of the lower sprocket also goes on the inside. Take care not to dislodge the key when fitting the top sprocket.

Replacing Drive Belts on Front Wheel Drive Models

SINGLE SPEED MODELS

1. Remove the blade retaining bolt from the engine crankshaft and lift off the blade assembly. There is no need to remove the blade driver assembly from the crankshaft. Do not tip the mower on its side to do this without first draining the fuel and oil from the engine.
2. Remove the front plastic cowl by extracting two mounting screws from underneath, and two mounting screws from above.
3. The belt tension is adjusted by rotating the gearbox around its output shaft and the box is held in the desired angular position by an anchor screw. Remove this anchor screw to allow the top of the gearbox to move back toward the engine as far as possible. This should allow the belt to be removed from the two pulleys and withdrawn. If this does not give enough slack in the belt, slacken all three engine mounting bolts and remove the two on the right of the mower. The engine can then pivot around the other bolt to slacken the belt. Fit the new belt and replace the engine bolts (if necessary) and the gearbox anchor screw. Adjust the belt tension (not too tight) and tighten the anchor screw. Re-fit the front cowl and blade assembly. Blade centre bolt Torque 45-50 Nm.

VARIABLE SPEED MODELS

1. Remove the blade retaining bolt from the engine crankshaft and lift off the blade assembly. There is no need to remove the blade driver assembly from the crankshaft. Do not tip the mower on its side to do this without first draining the fuel and oil from the engine.
2. Remove the front plastic cowl by extracting two mounting screws

from underneath, and two mounting screws from above.

3. Remove the post on which the idler pulley carrier plate pivots, noting carefully the positions of spacers and washers so that they can be re-assembled correctly. Note exactly where the belt fits around the idlers.
4. Remove the belt from the two pulleys.
5. Fit the new belt and re-assemble the idler pulleys and the carrier post.
6. Replace the blade assembly and the blade centre bolt. Blade centre bolt Torque 45-50 Nm.
7. Crank the engine by hand (Spark plug lead OFF) to settle the belt correctly in the split pulley of the gearbox and adjust the variable speed cable, if necessary, as described in VARIABLE SPEED PROPULSION CONTROL ADJUSTMENT above.
8. Re-fit the front cowl.

Rear Axle Unit - Rear Wheel Drive Models

DESCRIPTION

All rear wheel drive mower models have a similar construction, although there are some variations in the components. The output shaft of the gearbox has a slot at each end to accept sliding pawls whose ends engage with the three-lobed ramps inside the pinion gears. The sliding pawls oscillate back and forth inside the pinions so the pinion can rotate freely on the shaft in one direction. But rotation in the opposite direction is prevented by the pawls engaging on the square faces of the pinion ramps. This engagement transmits the drive to the wheel gears. The action of 'free-wheeling' in one direction allows the mower to be pushed forward, and to be steered around corners. When the gearbox clutch is engaged, the output shaft rotates the pinions to drive the mower forward. Note that the pinion gears **must** have interior ramps of opposite hand, one for each side of the mower. The gears carry the mark 'RH' or 'LH' inside, adjacent to the ramp, to show whether they are for the Right Hand or Left Hand side of the mower. Remember, right and left are as seen by the operator when standing at the handle.

While the same pawl can be used on either side of the mower, it **MUST** be installed in the slot so that the rounded corners will run smoothly up the ramps and the square corners will give positive engagement with the square faces of the pinion ramps.

The pinion gear engages with a larger wheel gear, so the wheel axle is parallel to the gearbox output shaft but some distance from it. Thus when the rear axle assembly is rotated about the axis of the gearbox output shaft, the wheel axle will travel in a circle some distance away from it. This movement of the wheel axle is used to raise and lower the back of the lawnmower. A connecting rod to the front of the mower moves a similarly offset wheel axle assembly about its rotation point, raising and lowering the front wheels also.

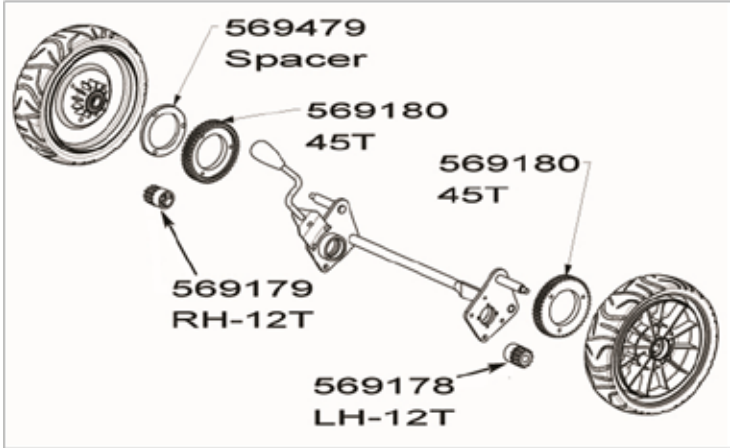
A spring-loaded height adjusting lever mounted on the rear axle assembly permits the mower height to be raised and lowered, and the lever drops into a notch in the quadrant to hold the mower at the desired cutting height. A counterbalance spring attached to the connecting rod takes some of the mower weight to facilitate raising and lowering the mower.

The rear axle assembly has a plate at each end carrying a wheel stub axle on the outside, and a bearing sleeve on the inside. The inside of the bearing sleeve provides a housing for the sealed ballrace of the gearbox output shaft, while the outside of the sleeve carries the plastic pivot bushes on which the axle assembly rotates as the cutting height is altered.

There are two different methods for mounting the rear axle assembly to the mower housing. In most aluminium housings there is a part cylindrical seat provided for the plastic pivot bushes, and they are held in place by saddles **screwed edgewise into the wall** of the housing. Steel housings, on the other hand, use flanged steel retainer

cups which fit over the pivot bushes and fit against the outer faces of the housing. The cups have threaded inserts for set screws **passing through the housing wall** to clamp the cups in place. Some aluminium housings use the flanged steel cups instead of saddles. (See Step 7 of REMOVING THE REAR AXLE UNIT FROM REAR WHEEL DRIVE MOWERS).

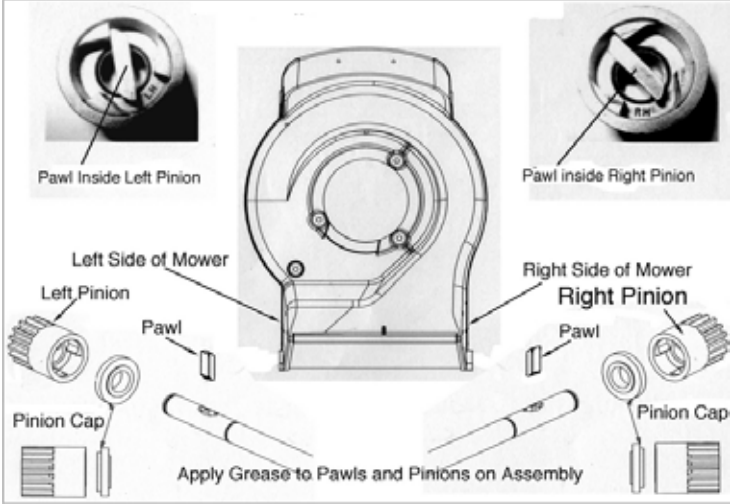
MODIFIED PINIONS AND GEARS



A manufacturing improvement was made in May 2010. This was a change to a larger tooth profile on the pinions and gears. The original pinions had 16 teeth and the matching gears had 60 teeth. Now the pinions have 12 teeth and the gears have 45 teeth. Old style pinions and gears cannot be mixed with the new ones. See the illustration above.

As the gear ratio is unchanged, and the shaft centre distance is also unchanged, it would be possible to use an old set on one side of a mower and a new set on the other, but we recommend fitting a complete set if any of the old pinions or gears need replacing. The pawls are unchanged. If you are replacing an old gear with a spacing shoulder behind it, fit spacer No 569479 behind the new gear to bring the teeth into correct alignment with the pinion.

CORRECT PAWL, PINION AND CAP POSITIONS



REMOVING REAR AXLE UNITS FROM REAR WHEEL DRIVE MOWERS

Preparation (All models)

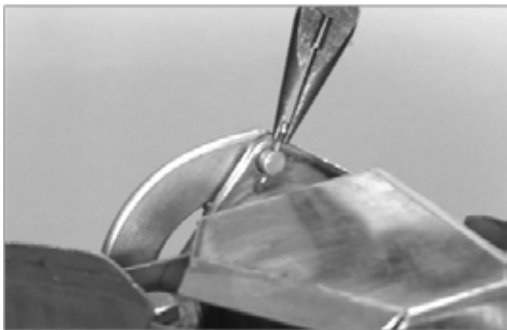
We strongly advise that all fuel and oil be drained from the mower before commencing this procedure as the mower will be tipped over. This will avoid the risk of fuel and oil reaching vulnerable parts of the mower. In any case, this could be a sensible time to make an oil change.

SEE THE NOTE ON ‘POSITIONAL DESCRIPTIONS’ ON PAGE 2.

1. Disconnect the counterbalance spring fitted between the connecting rod and the housing. Take care, as this spring is very strong. To minimize the spring tension, set the cutting height to its highest position. Unhook the spring from the housing by passing a strong wire loop around the front hook of the spring, just above the housing. With the wire formed into a closed loop, a suitable handle through the loop will allow the front hook of the spring to be pulled forward and out of the hole in the housing. Once clear of the housing, the tension on the spring can be slowly released until it is safe to remove the wire loop.

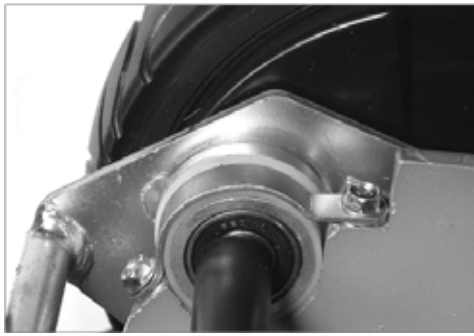


2. Remove the screw holding the clutch cable thumb-wheel block at the top of the handle. This will allow the wire to go slack. The ‘Z’ bend at the top of the clutch cable can then be disconnected from the SP bail.
3. Turn the mower completely upside down.
4. While it is possible to remove the axle assembly with the wheels attached, it is usually easier to remove them for ease of access. To remove the wheels, lever off the hub caps, remove the retaining nuts and washers and withdraw the wheels. Remove the plastic dust covers from behind the wheels, noting the positions and numbers of spacing washers each side of the covers for correct re-assembly. **NOTE ALSO THAT THESE COVERS ARE NOT IDENTICAL.** The left hand cover has an extra hole for clearance on the connecting rod fastener.
5. Remove the gearbox cover plate on the rear face of the mower housing.
6. Remove the cotter pin or push-on clip that secures the connecting rod to the side plate of the rear axle assembly and disconnect the rod from the assembly. Alternatively, if there is insufficient room between the body and the rear side plate to withdraw the connecting rod, disconnect the rod at the front of the mower instead. In this case, the rod can then remain attached to the rear axle assembly when it is removed from the mower.



7. Examine the mower to determine whether the axle assembly is held in place by saddle clamps (screws into the housing walls) or flanged steel cups (screws through the housing walls). Tip: Sometimes access to the screws can be improved by moving the axle to a different cutting height.

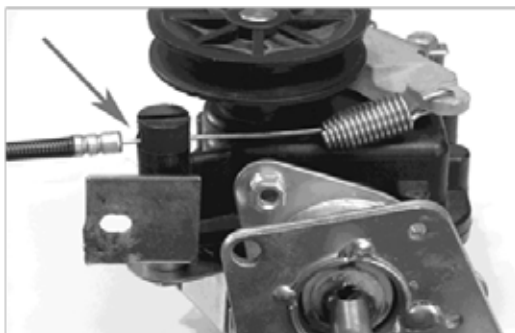
SADDLE CLAMP TYPE



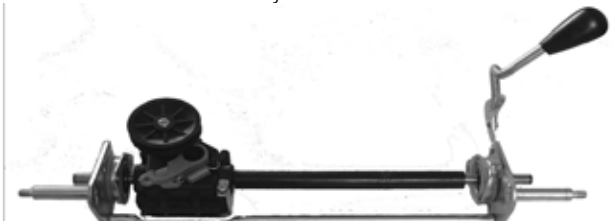
STEEL CUP TYPE



8. Remove the gearbox clamp screw and the two screws at each side of the mower that hold the axle assembly to the mower. To get easier access to the fixing screws adjacent to the gearbox, remove the pinion and pawl on the left side of the mower, and then move the circlip (the one which is against the right shaft ball race) along the shaft toward the gearbox. This will allow the gearbox to move a little to the right. Take care not to over-stretch the circlip, and remember 'right' and 'left' refer to the mower when it is the right way up, as seen by the operator standing at the handle.
9. There should be enough movement now available to slip the 'V' belt off the gearbox pulley.
10. The whole rear axle assembly can now be removed from the housing. Tip: The height adjuster lever will thrust the assembly to one side. Keep this in mind while withdrawing the assembly.
11. After moving the assembly a short distance, further movement will be prevented by the clutch operating cable attached to the gearbox. To disconnect the cable, pull the outer sleeve out of its socket on the gearbox, lift the cable wire up through the slot, swing the cable clear of the gearbox and unhook the cable spring from the clutch operating lever on the gearbox.



12. The rear axle assembly can now be lifted clear.



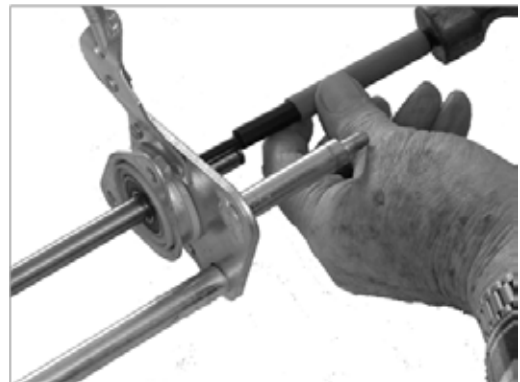
DISMANTLING THE REAR AXLE UNIT

This is necessary only when replacing a gearbox, shaft bearings or circlips on the gearbox output shaft, pivot bushes or flanged steel cups (some models only).

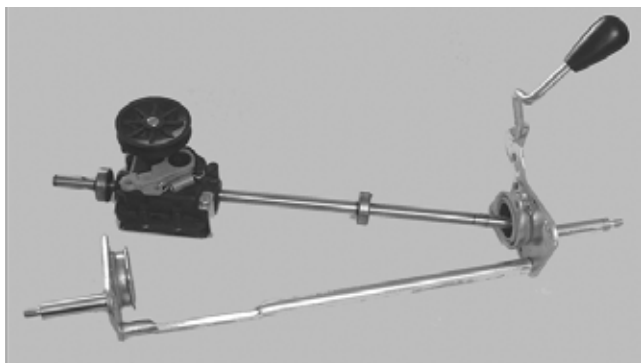
1. If the wheels and dust covers have not been removed, remove them now, noting the positions and numbers of spacing washers for the dust covers to ensure correct re-assembly. Also remove the circlip, washer and pinion from each end of the shaft. Withdraw the two pawls, and extract the plastic pinion cap directly behind each pinion using long-nosed pliers. When re-assembling, note that this cap has a larger diameter shoulder on one side than the other. The larger diameter shoulder fits against the pinion, while the smaller one goes against the bearing. See PAWL, PINION AND CAP POSITIONS above.
2. Remove the split plastic axle sleeve.
3. Working on the inside of the assembly now, ease the circlip on the right end of the shaft (the long one) which is against the right shaft bearing out of its slot and slide it along the shaft toward the gearbox. Move it about half way to the gearbox, taking great care not to over-stress and stretch the circlip.



4. If the shaft is not perfectly clean between the right bearing and the new circlip position, clean it with emery tape so the bearing can slide along easily.
5. Gently tap the right hand axle bearing out of its housing toward the gearbox, then slide the bearing up to the circlip. Use a square ended pin punch against either the centre ring of the bearing or the outer ring. Do NOT punch against the plastic bearing seal as this will destroy the bearing.



6. While supporting the right end of the shaft centrally in the empty bearing housing, gently tap the left bearing out of its housing. This will move the gearbox to the right.
7. Once the left bearing is clear of its housing, the whole gearbox can be moved to the right until the left (short) end of the output shaft can be moved clear of the left bearing housing. The right end of the shaft can then be withdrawn from the right housing. The gearbox will now be completely free from the axle assembly. If the assembly is the type fastened to the housing by flanged steel cups, these will be hanging on the pivot bushes. Take note of their positions so they can be re-fitted correctly later.



NOTE: Assemblies using saddle clamps do not have the steel cups. The saddle clamps are fitted over the plastic pivot bushes after the axle unit is positioned in the mower housing.



Notes on Flanged Steel Retaining Cups

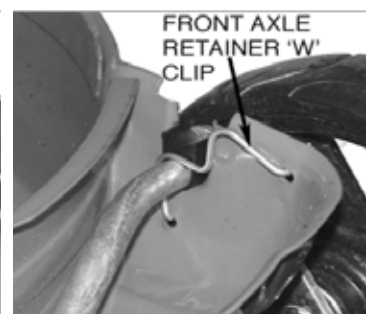
The cups fit against the outside of the housing with the cup rims facing outward and fitting against the shoulders of the plastic pivot bushes. The mounting holes on the cups are offset from the cup centerline. The offset brings the axle closer to the ground than it would be if the cup and holes were in line. When re-assembling, take care that the offset is in the correct direction, as it is sometimes not possible to rotate the cups half a turn once the gearbox has been installed in the axle assembly. The fixing screws for the cups are installed from inside the housing and pass through the housing into the threaded mounting holes on the cups.

RE-ASSEMBLING THE AXLE UNIT

Follow the dismantling instructions in the reverse order. If your axle assembly has flanged steel cups, it can be helpful to leave the fitting of the pinions and pawls until after the unit has been mounted in the housing as this will allow you to move the gearbox toward the centre of the mower as described in Step 8 of DISMANTLING THE REAR AXLE UNIT to provide more room to reach the fastening screws.

Removing Front Axles (All Types except Front Drive)

The front axle and its bushes are held in place in one of two ways. Aluminium housings use a flat retaining plate against the plastic axle bush, with a set screw holding the plate in place. The set screw fits into a tapped hole in the casting. Steel bodied mowers have a spring clip with a hook at each end. The clip bears directly on the axle and the hooks engage in holes in the wall of the housing or the axle mounting bracket in the case of some 'Utility' models.



Remove the axle by withdrawing the retainer screw or unhooking the 'W' clip by pressing down with a screwdriver as appropriate. After releasing the first hook, swing the clip clear of the axle and unhook the second hook from the housing. If you want to remove the axle assembly entirely from the mower, you may find it necessary to disconnect the connecting rod first. New plastic bushes can be fitted by springing them over the axle.



Removing Rear Roller Units

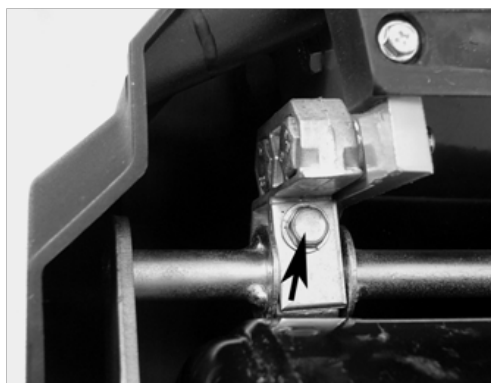
Preparation

All fuel and oil must be drained from the mower before commencing this procedure as the mower will be tipped upside down. This will avoid the risk of fuel and oil reaching vulnerable parts of the mower. In any case, this could be a sensible time to make an oil change. SEE THE NOTE ON 'POSITIONAL DESCRIPTIONS' ON PAGE 2.

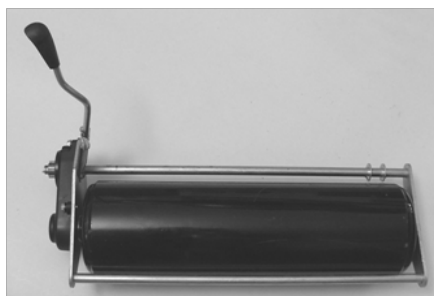
1. Remove the left hand side cover.
2. Remove the primary chain adjusting block, or at least slacken it off until it is well clear of the chain.
3. Remove the connecting link of the primary chain so that the chain can be taken off. If you prefer not to remove the connecting link, remove the circlip holding the upper sprocket. Then pull the top sprocket off as you remove the lower sprocket in Step 4.
4. Remove the circlip and washer holding the lower sprocket of the primary chain, and pull the sprocket off.



5. Move the height of cut lever to the highest cut position and unhook the counterbalance spring from the connecting rod. Working from the rear of the mower, use a wire loop around the rear hook of the spring to lift it from the slot in the connecting rod and release the tension slowly.
6. Turn the mower completely upside down and disconnect the connecting rod from the rear roller assembly.
7. On 18" models, remove the two pivot bar caps (2 screws each) located one at each side of the mower. Access is gained in a horizontal direction at each side of the roller.
8. On 21" models, remove the two pivot bar retaining plates (1 screw each) located one at each side of the mower. Access is gained in a vertical direction.

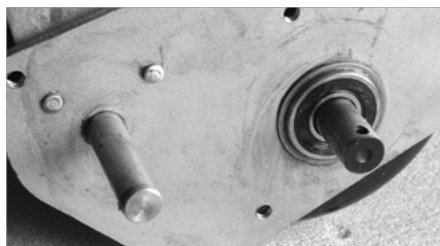


9. The entire rear roller unit should now lift clear of the mower.



DISMANTLING THE REAR ROLLER UNIT

1. Remove the secondary chain cover (3 screws).
2. Using a pin punch, drive out the tension pin that fixes the roller sprocket to the roller shaft.
3. Pull the two sprockets from the rear roller assembly simultaneously, bringing with them the secondary chain.



4. Remove the set screw and washer from the centre of the right hand end of the roller shaft.
5. Ease both the roller shaft bearings out of the side plates of the roller frame.



6. Move the roller first to the left until the right hand end of the shaft can be moved out of the bearing housing and clear of the roller frame. The left end of the roller shaft can then be moved out of its bearing housing and the roller is completely clear of the frame. It is not necessary to remove the roller from the frame to replace a damaged bearing. It can simply be fitted from outside the frame.



7. Reverse the entire process to re-assemble the roller unit in the mower.

Removing Front Drive Units

SEE THE NOTE ON 'POSITIONAL DESCRIPTIONS' ON PAGE 2.

1. Remove the front plastic cowl and the bumper bar.
2. Disconnect the counterbalance spring fitted between the connecting rod and the housing. Take care, as this spring is very strong. To minimize the spring tension, set the cutting height to its highest position. Unhook the spring from the housing by passing a strong wire loop around the rear hook of the spring, just by the housing. With the wire formed into a closed loop, a suitable handle through the loop will allow the hook of the spring to be pulled backward and out of the hole in the housing. Once clear of the housing, the tension on the spring can be slowly released until it is safe to remove the wire loop.

3. Remove the screw holding the clutch cable thumb-wheel block at the top of the handle. This will allow the wire to go slack. The 'Z' bend at the top of the clutch cable can then be disconnected from the SP bail and the cable spring can be unhooked from the gearbox lever by pulling the cable sleeve from its hole in the gearbox and lifting the wire up through the slot.
4. While it is possible to remove the drive unit with the wheels attached, it is usually easier to remove them for ease of access. To remove the wheels, lever off the hub caps, remove the retaining nuts and washers and withdraw the wheels. Remove the plastic dust covers from behind the wheels, noting the positions and numbers of spacing washers each side of the covers for correct re-assembly.
5. Remove the cotter pin or push-on clip that secures the connecting rod to the side plate of the front axle assembly and disconnect the rod from the assembly.
6. The drive unit is held in place by flanged steel cups with fastening screws through the mounting brackets. Tip: Sometimes access to the screws can be improved by moving the axle to a different cutting height.
7. Remove the gearbox clamp screw and the two screws at each side of the mower that hold the axle assembly to the mounting brackets.
8. There should be enough movement now available to slip the 'V' belt off the gearbox pulley.
9. The whole front drive unit can now be removed from the housing.

DISMANTLING THE FRONT DRIVE UNIT

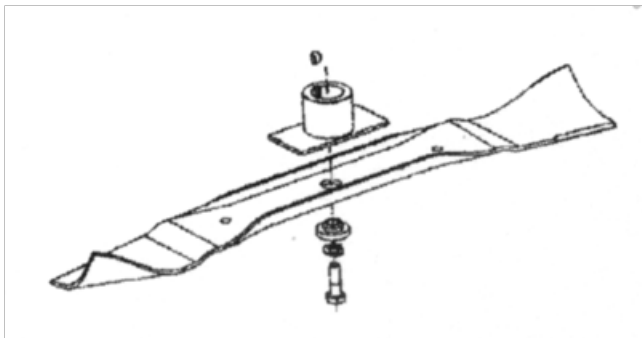
This procedure is virtually the same as DISMANTLING THE REAR AXLE UNIT. The only difference is that the gearbox output shafts are about the same length, so it is not as easy to distinguish left from right shafts. The determining feature is that the gearbox anchor bracket is at the rear of the gearbox. Follow the instructions for the rear wheel drive axle unit to remove the gearbox from the axle assembly

Blades

IMPORTANT. Always use genuine Masport replacement blades and mounting parts to ensure safety and proper performance. Before servicing any blade, remove the spark plug wire and position it so it cannot accidentally contact the spark plug. Tip the mower back on its rear wheels, keeping the spark plug uppermost to avoid oil entering the engine and air filter. If this results in fuel spillage, tip it onto its wheels again and drain the fuel from the tank.

BAR BLADES

1. Remove the central bolt and spring washer. Tip: This bolt will be in tightly, so use a snug fitting socket to avoid damaging the bolt head.



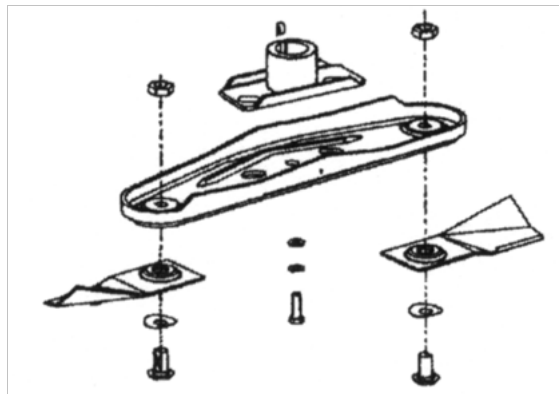
2. Remove the stepped washer (some models only) and lift the blade clear of the blade driver.
3. Sharpen and balance the old blade, or fit a new one as appropriate.
4. Reassemble, taking care if there is a stepped washer to ensure that the step engages correctly in the hole in the blade. See below for correct torque settings.

QUICK CUT AND QUAD CUT BLADES

Follow steps 1 and 2 as for bar blades above.

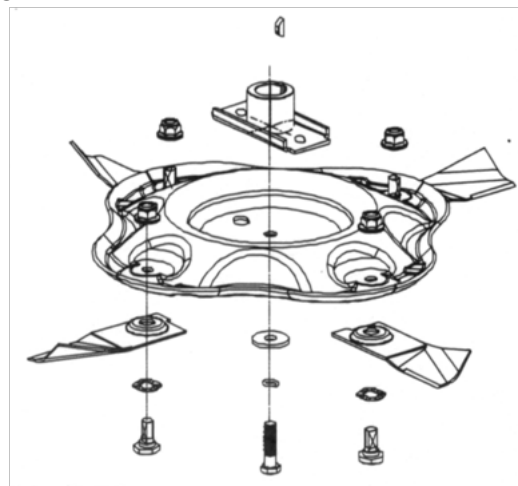
3. Remove the two blade bolts. The bolts have a flat on one side to prevent them turning as the nuts are removed. Take particular note of the position of the wavy washer. It fits between the bolt head and the blade when reassembling.

QUICK CUT



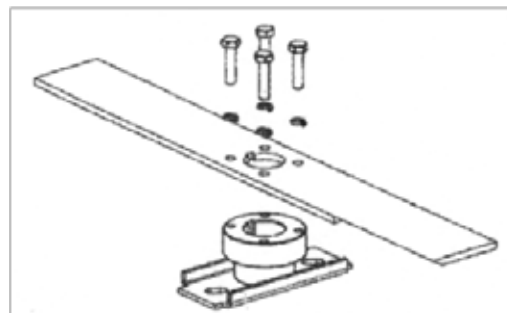
4. Check the bolts for signs of wear and replace if necessary.
5. Sharpen and balance the blades or replace them with new ones as appropriate.
6. Reassemble on the mower. The correct torque settings are listed below.

QUAD CUT



CHIPPER BLADES

1. It will be necessary to pull the blade driver assembly from the crankshaft. You will probably require a wheel puller to do this. Take care when using the puller that the thread in the crankshaft is not damaged. One way to do this is to re-insert the bolt part way into the bottom of the crankshaft (at least 8 turns) and position the puller jack-screw against the head of the bolt. Do not lose the Woodruff key if it comes off with the driver assembly.



2. Either sharpen and balance the old chipper blade or replace it with a new one. To remove the blade from the driver assembly, hold the assembly in a vice and extract the four screws.
3. When re-fitting the chipper blade, **use only genuine Masport spare mounting bolts** as these are special high tensile components. Two details are important. **Make sure the bevels of the ground cutting edges of the blade will be facing toward the ground, and align the keyway in the blade hole with the keyway in the blade driver assembly before assembling them together.** The correct torque settings are listed below.
4. Apply a little grease to the crankshaft and fit the woodruff key. Slide the driver assembly onto the crankshaft, taking care not to dislodge the key.
5. Either sharpen and balance, or replace the grass cutting blade and re-fit the crankshaft bolt. The correct torque settings are listed below

BLADE REPLACEMENT TORQUE SETTINGS

FASTENER	TORQUE SETTING
Blade Centre Bolt	45 – 50 Nm (33 – 37 ft.lb)
Chipper Blade Bolts – 6 mm diameter	9 – 11 Nm (6.6 – 8 ft.lb)
Chipper Blade Bolts – 8 mm diameter	20 – 22 Nm (15 – 1 ft.lb)
Quick Cut Blade Mounting Bolt	20 – 25 Nm (15 – 18 ft.lb)

Chipper Closer Cable Adjustment

The chipper closing system fitted on your mower has been pre-set but due to transport conditions might require slight adjustment.

Note: Reference pictures below might not be the same as your mower.

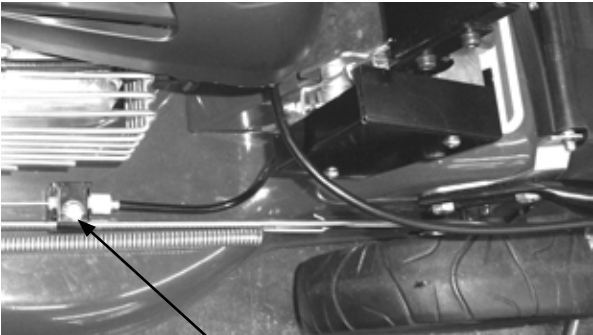
1. Set height adjuster to lowest point, the lid should stay open. When moved off lowest setting the lid should close. (Example shown below on the 21" Aluminium mower. Not all mowers are the same. Some have the lower lever setting at the bottom.)



Open

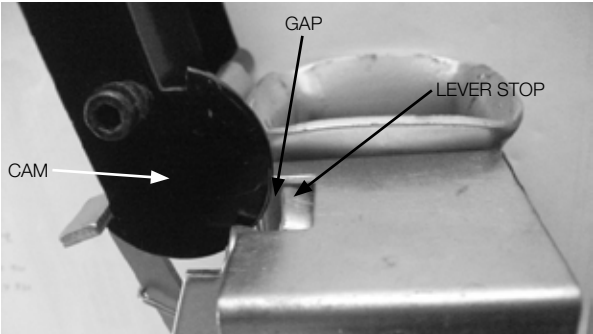
Close

2. If the lid opens too soon, the cable is too tight. If the lid does not open on the lowest cut setting the cable is too loose. To adjust move height setting up and loosen the M6 Set Screw, slide the clamp to either loosen or tighten the cable to suite. Tighten the M6 Set Screw and re-check the closer.

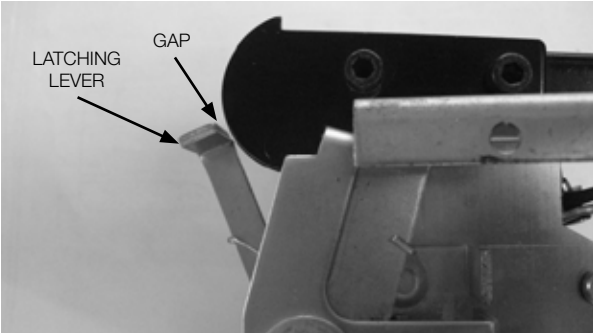


M6 SET SCREW

3. Ideal setting when on the lowest cut height the lid should open and there should be a gap between the cam and Lever stop of approximately 3mm to 4mm.



4. Set cut height adjuster off lowest point, the lid should close. On the higher cut height setting the lid should be closed and a small gap of approximately 0.5mm to 1mm should be between the Cam and Latching Lever.



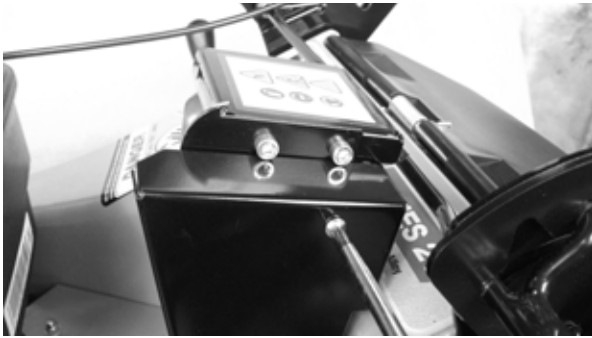
5. If the Lid does not close or there is no gap between Cam and Latching Lever when the cable is slack. Remove the Cover using the two M5 x 10 Phillips pan head screws.



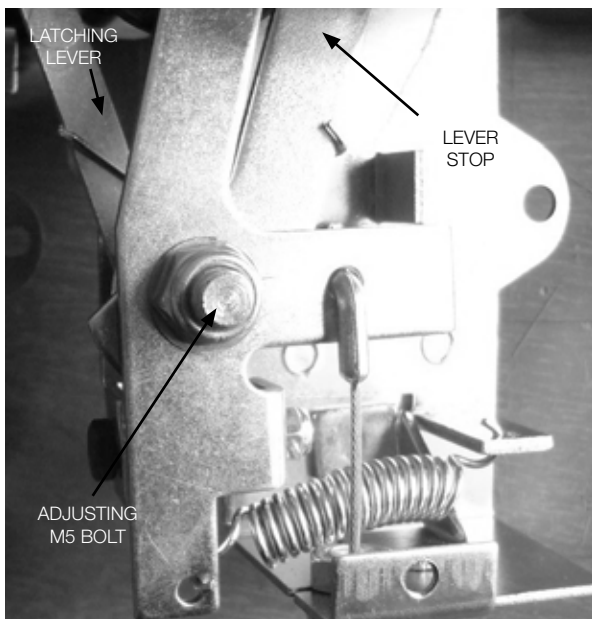
6. And tighten the fine tune adjustment M5 bolt and nut.



7. Fit cover back with M5 x 10 Phillips pan head screws as shown above.



PERIODIC MAINTENANCE CHECKS



- A. Pull Latching lever forward and release, it should return easily with the spring action, if it is clean and does not return smoothly release the M8 lock nut slightly till it moves easily.
- B. If the lever is too sloppy, tighten the nut until it moves freely without sticking.
- C. Keep the leavers clean and a light silicone spray will keep your chipper closer working smoothly.

