

Starters

POWER TORQUE ENGINE STARTER

To Remove And Instal Starter Assembly

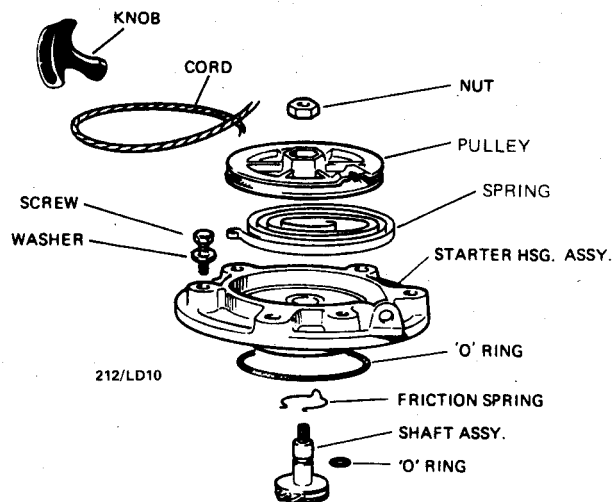
- (1) Thoroughly clean the engine and chassis assembly to prevent the entry dirt or foreign matter into the engine crankcase.
- (2) Disconnect the high tension lead from the spark plug.
- (3) Turn off the fuel tap, disconnect the fuel line from the carburettor, remove the dress cowl retaining screws and lift the dress cowl and fuel tank from the engine.

NOTE: On Vortex models it will be necessary to remove the retaining screw and closing plate from the dress cowl to allow the starter handle to pass through it.

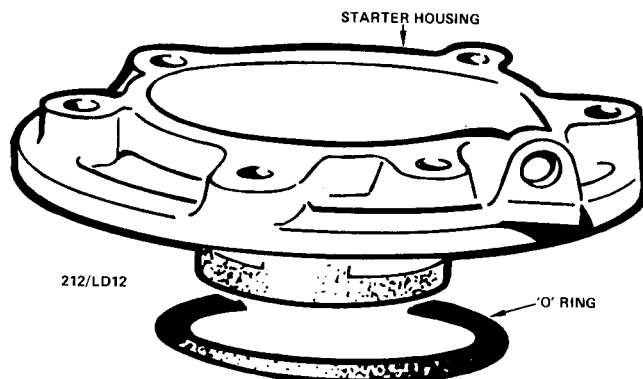
- (4) Remove the retaining screws and withdraw the sub cowl.
- (5) Using quick drying paint, mark the installed position of the starter housing assembly in relation to the crankcase to ensure correct assembly.
- (6) Remove the starter housing assembly retaining screws and gently prise the starter assembly from the crankcase.
- (7) Remove the starter housing to crankcase sealing 'O' ring.
- (8) If necessary, cover the crankcase area of the engine to prevent the entry of dirt or foreign matter.

Installation is a reversal of the removal procedure with attention to the following points:

- (1) Lightly lubricate a new starter housing 'O' ring with grease and instal it to the recess in the housing.
- (2) Instal the starter housing to the crankcase, aligning the marks made prior to removal, instal the retaining screws and tighten them to the specified torque.
- (3) Instal the sub cowl to the engine, instal and securely tighten the retaining screws.



Dismantled view of starter components. Power Torque engine.



The starter housing to crankcase sealing 'O' ring should be renewed every time the starter housing is removed.

- (4) Position the dress cowl and fuel tank on the engine, instal and securely tighten the retaining screws.

NOTE: While positioning the dress cowl on the engine it will be necessary to feed the starter handle through the hole in the cowl.

- (5) On Vortex models, instal the dress cowl closing plate, instal and securely tighten the retaining screw.
- (6) Connect the fuel line to the carburettor.
- (7) Connect the high tension lead to the spark plug.

To Renew Recoil Spring

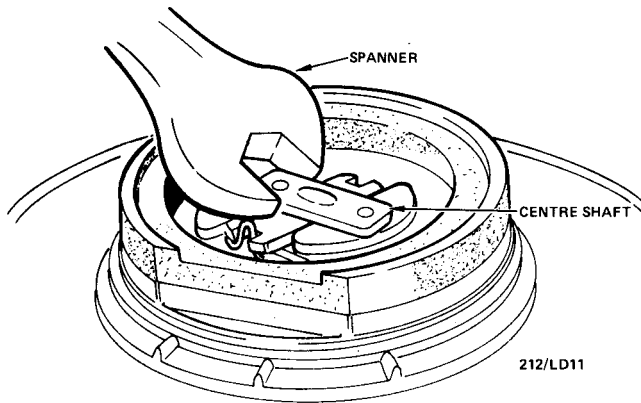
NOTE: The following procedure can be adapted to allow renewal of any of the starter components.

- (1) Remove the starter housing assembly from the engine as previously described.
- (2) Pull the starter cord and handle from the starter assembly approximately 150 mm (6 ins) and pull the handle away from the knot in the end of the cord.
- (3) Untie the knot in the end of the cord and remove the handle.

NOTE: Do not release the starter cord during any of the previous operations as the starter components will unwind at a high speed.

- (4) Grip the pulley and the housing to stop them from turning, release the starter cord and allow the recoil spring tension to be released allowing the pulley to slowly slip past the fingers.
- (5) Clamp the centre nut retaining hexagon on the starter pulley in a vice fitted with soft jaws. Do not overtighten.
- (6) Using a suitable open ended spanner, loosen and unscrew the centre shaft and pawl assembly from the centre nut.
- (7) Remove the centre nut, centre shaft and pawl assembly and friction spring from the starter pulley and housing.

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Use an open ended spanner to loosen and unscrew the centre shaft and pawl assembly from the centre nut.

(8) Check and if necessary, renew the centre shaft sealing 'O' ring.

(9) Withdraw the pulley and spring from the starter housing. Unwind and withdraw the starter cord from the pulley.

(10) Lever the outer eye of the spring from the rivet on the underside of the pulley and carefully remove the spring from the pulley.

NOTE: The spring will expand rapidly as it is withdrawn from the pulley.

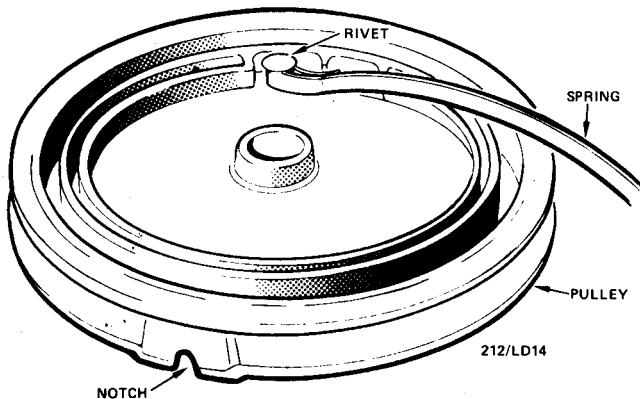
(11) Inspect all components of the starter assembly and renew as necessary.

(12) Install the new starter spring to the underside of the pulley, locating the outer eye of the spring onto the rivet on the pulley.

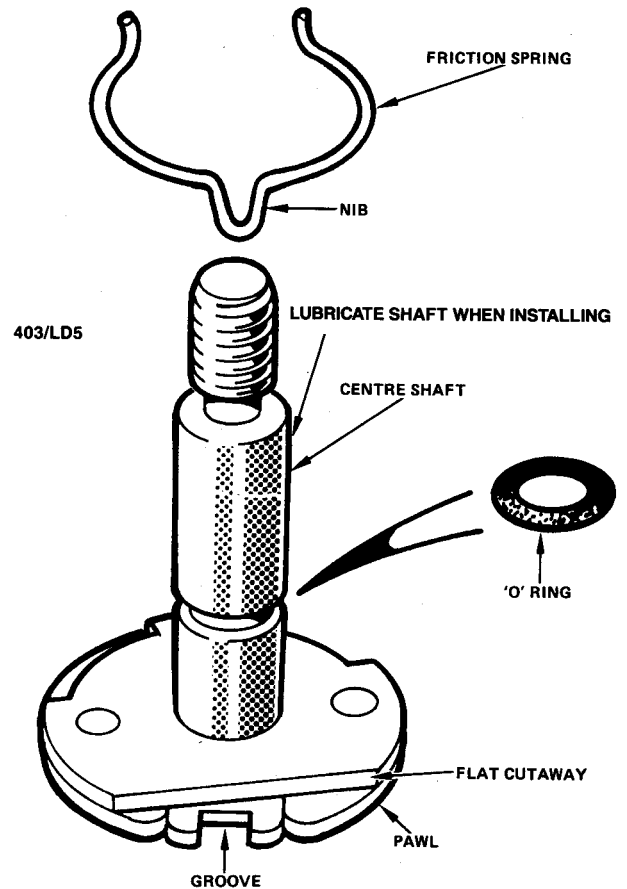
(13) Using a suitable pair of pliers, close the outer eye of the spring until the spring is securely retained on the rivet.

(14) While holding the spring firmly in the housing, carefully remove the spring retaining magazine, where fitted, allowing the spring to expand until it is retained by the circular rib in the pulley.

NOTE: If the starter spring is not prewound in a magazine it will be necessary to feed the spring into the pulley coil by coil.



View of starter spring outer eye correctly located on pulley rivet.



Ensure that the friction spring and 'O' ring are correctly installed and in a serviceable condition.

(15) Insert the starter cord through the hole in the top of the pulley so that the cord is located between the sheaves.

(16) Pull the cord into the notch provided in the upper pulley rim, allowing the full length of cord to hang free.

(17) Place the pulley assembly into the starter housing and slowly turn the pulley in a clockwise direction, as viewed from the top, until the inner spring eye is felt to engage in the starter housing retaining groove.

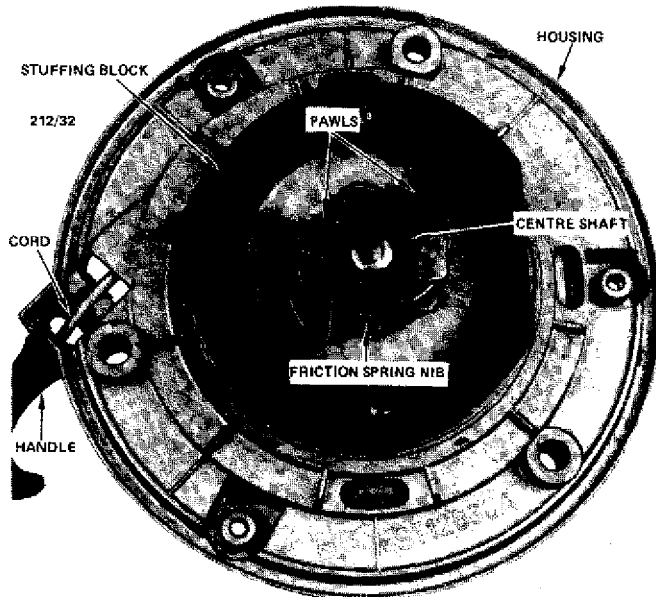
(18) Invert the starter housing assembly, taking care not to dislodge the pulley assembly, and install the friction spring to the centre boss on the lower side of the starter housing.

NOTE: Ensure that the nib on the friction spring is facing away from the starter housing.

(19) Align the centre holes of the pulley and starter housing assemblies and insert the centre shaft and pawl assembly through both components. Ensure that the centre shaft is pushed fully home and the nib on the friction spring is located in the groove in the flat cutaway side of the pawl assembly.

(20) Hold the centre shaft and pawl assembly firmly against the friction spring and screw the centre nut onto the centre shaft as far as possible.

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View of underside of starter assembly. The stuffing block must not be removed from the housing.

(21) Align the centre nut with the retaining hexagon on the pulley assembly and while still holding the centre shaft and pawl assembly firmly against the friction spring tighten the centre shaft as much as possible with the fingers. The centre nut should be drawn into the hexagon.

(22) Clamp the centre nut retaining hexagon on the

starter pulley in a vice fitted with soft jaws. Do not over-tighten.

(23) Tighten the centre shaft and pawl assembly to 16–21.6 Nm (12–16ft/lb).

(24) Preload the starter spring as follows:

(a) Turn the pulley assembly in a clockwise direction as viewed from the top, until the spring binds.

(b) From this position turn the pulley in an anti-clockwise direction until the pulley notch aligns with the cord exit hole. Ensure that the pulley rotates at least half a turn.

(c) Feed the starter cord through the exit hole, instal the handle and tie a know in the end of the cord to retain the handle. Allow the cord to feed slowly into the starter assembly until the handle abuts the housing.

(25) Instal the starter assembly to the engine as previously described.

Special Notes

(1) The starter centre shaft and pawls assembly is rivetted together, therefore should any part prove to be faulty it must be renewed as a complete assembly.

(2) It is important that the sealing 'O' ring on the centre shaft be in good condition and free from nicks and cuts as it forms part of the crankcase sealing.

(3) Do not attempt to remove the stuffing block from the underside of the starter housing.

(4) It is possible to renew the starter cord without removing the starter from the crankcase. The core can be fed through the pulley anchor hole and tensioned before attaching the starter handle.