Section F

Transmission

Publication No.
9803-9390-2

Issued by JCB Technical Publications, JCB Aftermarket Training, Woodseat, Rocester, Staffordshire, ST14 5BW, England. Tel +44 1889 591300 Fax +44 1889 591400

Notes:

Contents **Page No.**

Contents Page No.

Technical Data

Data

Variable Speed Drive System

System Type	Friction, single V-belt, continuously-variable transmission (CVT).
Driver Clutch (Variator)	Engine crankshaft mounted. Two half pulleys, one fixed, the other moveable via centrifugal rollers.
Driven Clutch	Transaxle input shaft mounted.

Transaxle

Type	Fixed ratio gearbox. Forward-Neutral-Reverse (Full constant mesh) ***Note:*** *The transaxle incorporates two brake packs.*
Reduction Ratios	
Forward	15.1
Reverse	15.31
Maximum Input Speed	3,700 rpm
Maximum Tyre Diameter	635 mm (25 in)
Maximum Travel Speed	26 kph (20 mph)
Weight	30 kg (66 lb)
Lubrication	Oil bath with filler, drain plug and breather

Axles

System Type	Chain and sprocket linking. Shaft driven front pair, from transaxle.

Wheels and Tyres

Refer to **Section 3 - Routine Maintenance**

Page left intentionally blank

Service Tools

Numerical List

The tools listed in the table are special tools required for carrying out the procedures described in this section. These tools are available from JCB Service.

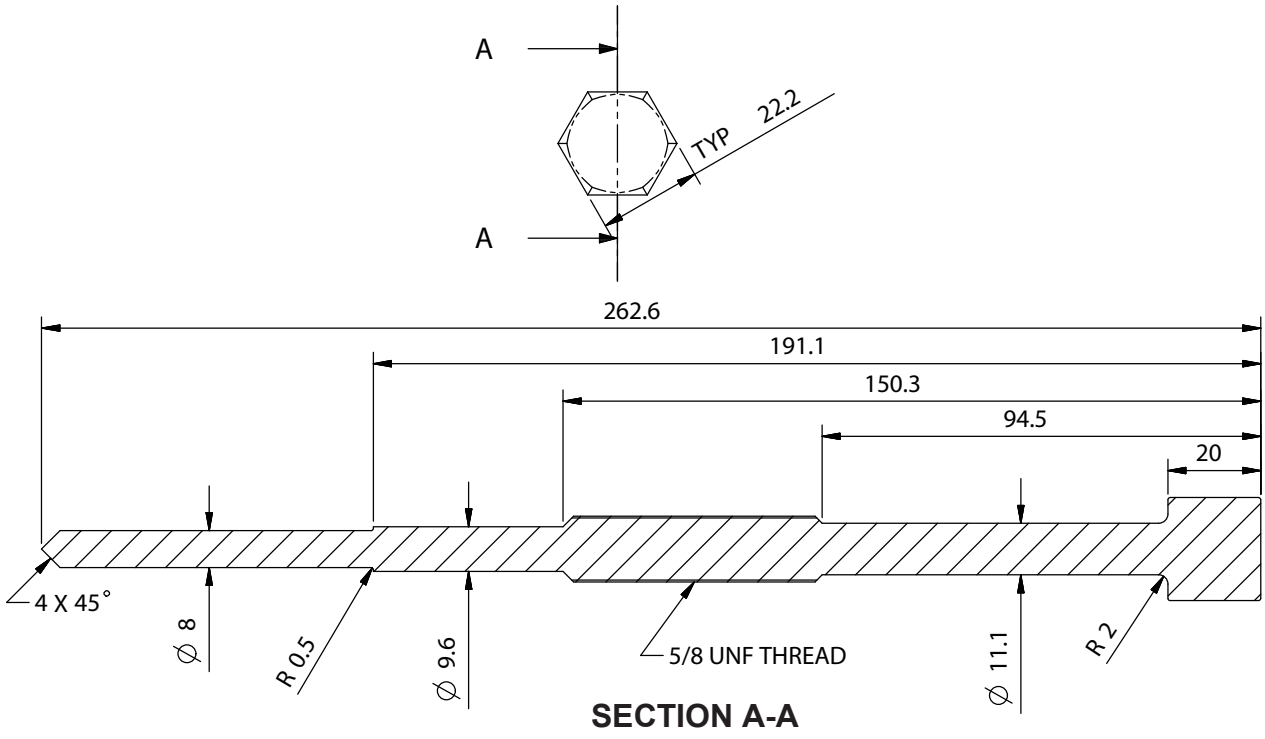
Note: *Tools other than those listed will be required. It is expected that such general tools will be available in any well equipped workshop or be available locally from any good tool supplier.*

Table 1.

Part Number	Description	Tool Detail Reference
825/10034	CVT Driver Pulley Extractor Bolt	

Tool Detail Reference

CVT Puller **825/10034**



SECTION A-A

General Description

Overview

Refer to illustration ⇒ *Fig 1. (F-5)*

Power is transferred from the engine to the transaxle via an 'automatic' continuously-variable transmission system (CVT system). The system basically comprises of a heavy-duty drivebelt **1-A** running between two variable pulleys (one attached to the engine, the other to the transaxle drive shaft). The pulley-walls (sheaves) move apart or together, depending on engine speed.

The engine mounted pulley or 'driver clutch assembly' **1-B** is driven by the engine crankshaft. Varying centrifugal force causes rollers within the unit to move outward or inward. This causes a varying separation of the pulley-walls. Accordingly, the transaxle mounted pulley or 'driven clutch' **1-C** also varies due to the belt and its in-built clutch spring. As the effective 'diameter' of the driver clutch pulley increases, the driven pulley becomes smaller. The transmission drive ratio therefore varies.

The transaxle gearbox unit **1-D** operates in Neutral, Forward and Reverse, depending on the position of the gear selector. When Forward or Reverse is selected, power from the transaxle is transferred to the centre wheel axles **1-F** through couplings **1-E**.

Drive from the centre wheel axles is transferred to the rear wheel axles **1-H** by means of drivechains **1-G**. The drivechains can be adjusted (tightened or slackened) by means of adjusters.

The transaxle unit incorporates a differential lock which is operated by a lever.

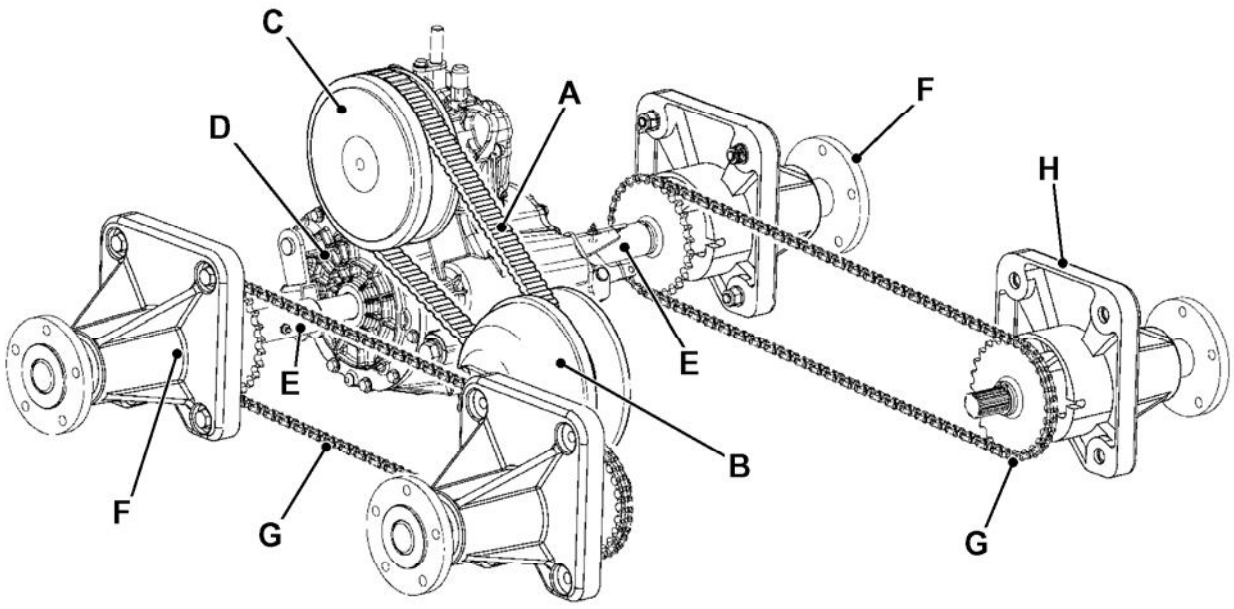


Fig 1. CVT System and Drivetrain

Transaxle

Within the transaxle unit, drive is transferred from the input shaft to two output shafts, through a chain-driven reduction gear, final gear, and differential.

Differential lock is engaged and disengaged by means of a lever assembly.

Note: *The vehicle must be stationary and the engine at idle when the differential lock is being engaged or disengaged; or before forward/reverse is selected.*

The transaxle incorporates two wet brake packs which act as service brakes and parking brake, see **Section 'G' Brakes**.

Driver Pulley

Removal and Replacement

1 Park the machine on firm level ground. Apply the parking brake and chock the wheels.

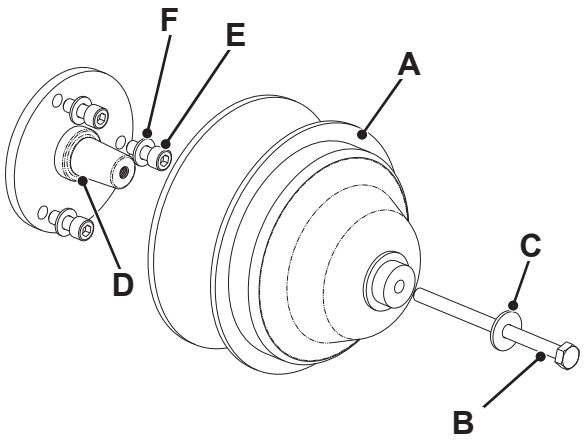
2 The load bay needs to be raised to gain access to the engine bay. Ensure that the load bay is properly supported while working beneath it - **refer to the Handbook**.

3 Disconnect the battery to prevent the vehicle being started.

4 Remove the CVT drivebelt, easing it off the pulleys. Rotate the pulleys if necessary to aid removal, ⇒ *Fig 2. (F-8)*

5 Remove the bolt **B** and washer **C**, ⇒ *Fig 1. (F-7)*. Use service tool (extractor) ⇒ *Table 1. (F-3)* to withdraw the driver pulley **A** from the flywheel tapered output shaft **D**. **Note that there is a hole provided in the chassis side panel, to aid access**.

Note: *If required, the output shaft **D** may be removed from the flywheel. Loosen and remove the three cap screws and washers **E** & **F**. When replacing, torque tighten the screws **E** progressively to 72 Nm (53 lbf-ft).*



C025080

Fig 1. Driver Pulley Installation

Replacement

Replacement is the reverse of removal, but note the following:

1 Correctly torque tighten fasteners:

Table 1. Torque Settings

Item	Bolt Grade	Nm	lbf ft
Driver Pulley Bolt		43	32
Shaft to Flywheel Screws	12.9	72	53

2 The Driver + Driven Pulleys must be correctly aligned - see setting dimension **A** ⇒ *Fig 2. (F-8)* which shows the minimum offset from the engine block (measured from back face of both pulleys). **Note** this is not adjustable, but instead is dependent upon accurate installation of the engine, transaxle and CVT components.

Note: *Poor belt alignment will lead to premature wear of the belt and excessive wear to the edges. In extreme cases, the belt may ride off the pulleys.*

3 The drivebelt is self-tensioning. Renew worn belts.

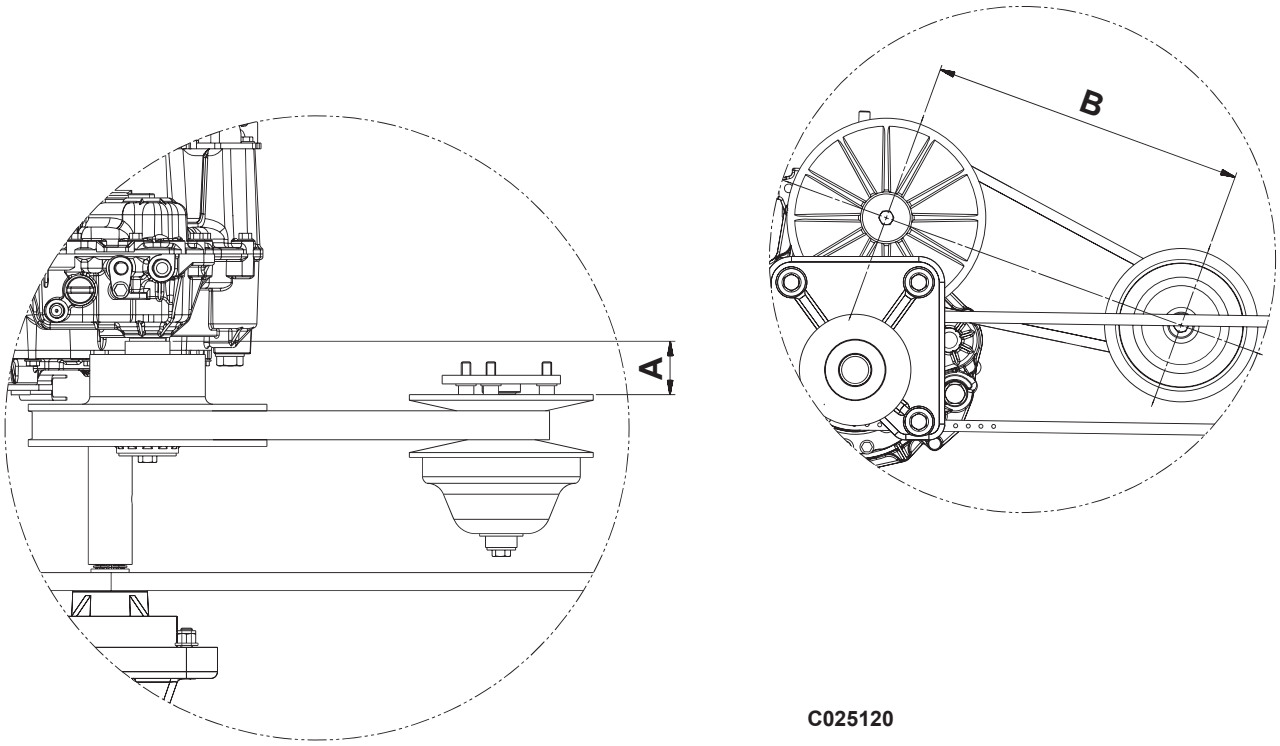


Fig 2.

Dimension **A**: 55.8 +/- 2 (mm)
Dimension **B** (Reference): 394.2 +/- 2 (mm)

Driven Pulley

Removal and Replacement

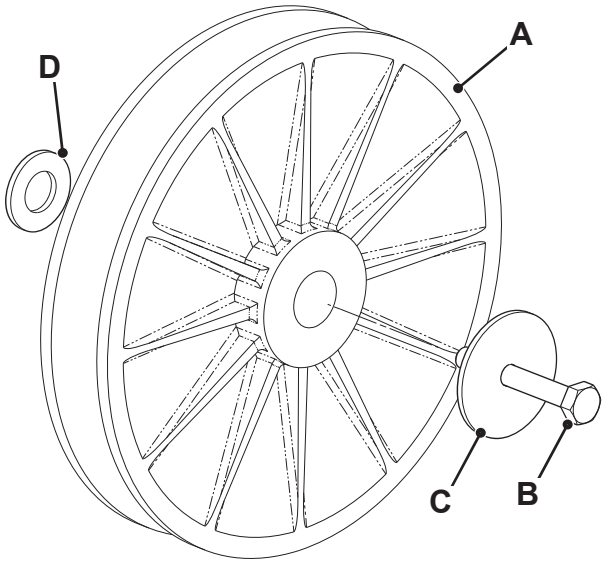
1 Park the machine on firm level ground. Apply the parking brake and chock the wheels.

2 The load bay needs to be raised to gain access to the engine bay. Ensure that the load bay is properly supported while working beneath it - **refer to the Handbook**.

3 Disconnect the battery to prevent the vehicle being started.

4 Remove the CVT drivebelt, easing it off the pulleys. Rotate the pulleys if necessary to aid removal, ⇒ *Fig 2. (F-8)*

5 Remove the bolt **B** and washer **C** and withdraw the pulley from the splined shaft of the transaxle. Note the location of the spacer **D**, ⇒ *Fig 1. (F-9)*



C025100

Fig 1.

Replacement

Replacement is the reverse of removal, but note the following:

1 Ensure that the spacer **1-D** is fitted.

2 Correctly torque tighten fasteners:

Table 1. Torque Settings

Item	Bolt Grade	Nm	lbf ft
Driven Pulley Bolt		43	32

3 The Driver + Driven Pulleys must be correctly aligned - see setting dimension **A** ⇒ *Fig 2. (F-8)* which shows the minimum offset from the engine block (measured from back face of both pulleys). **Note** this is not adjustable, but instead is dependent upon accurate installation of the engine, transaxle and CVT components.

Note: *Poor belt alignment will lead to premature wear of the belt and excessive wear to the edges. In extreme cases, the belt may ride off the pulleys.*

4 The drivebelt is self-tensioning. Renew worn belts.

Page left intentionally blank

Transaxle

Differential Lock Lever Arm

Note: *Also refer to* ***Section 'D' Controls - 'Differential Lock'****.*

Dismantling

Note: *If the transaxle has been removed from the vehicle, place it in a suitable stand in the upright position as shown.*

1 Remove the R-clip **A**, pivot pin **B** and the lever arm **C**.

2 Remove the two screws **D** and the bracket **E**.

3 If necessary, remove and discard the oil seal **F**, after first draining the transaxle oil.

Assembly

Use new seals and washers as necessary.

1 Lubricate the new seal **F** with suitable grease and install into its recess in the housing **G**.

2 Replacement is the reverse of removal.

Note: *If the transaxle oil has been drained, remember to re-fill, see* ***Section 3 - Routine Maintenance****.*

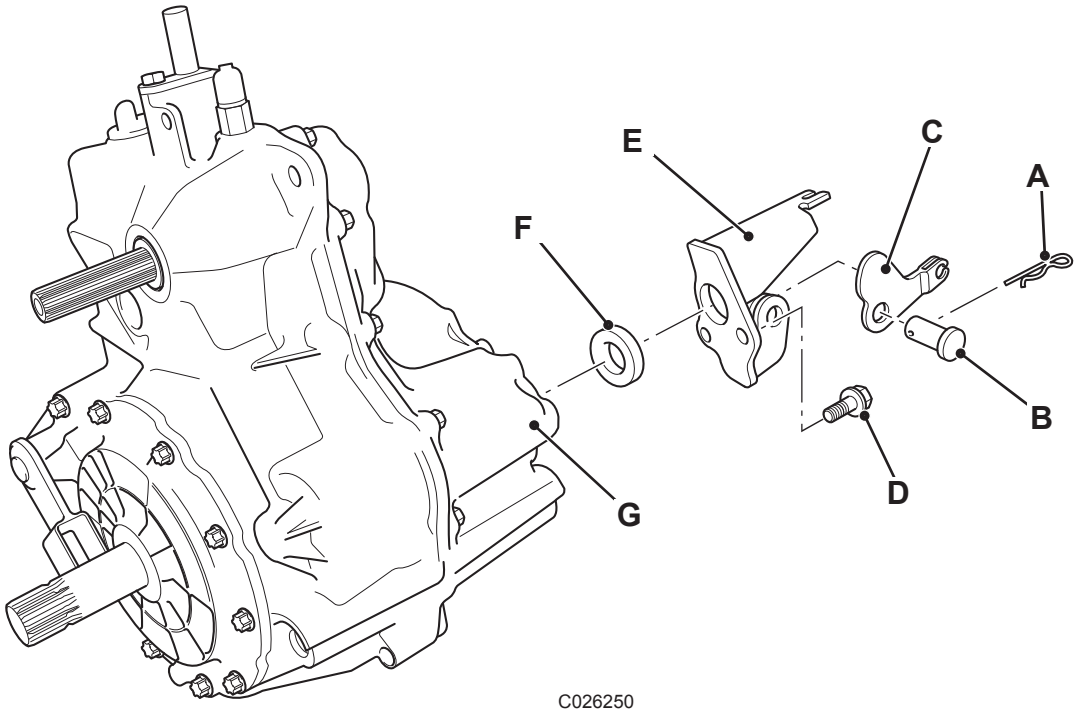


Fig 1.

Page left intentionally blank

Axles

General

Refer to illustration ⇒ *Fig 1. (F-5)*

The front axles are the driving axles from the transaxle unit. The rear axles are chain-driven by the front axles. Although all four axles are the same, they should be kept in the same position once fitted. This is due to the fit of the splined couplings.

Note: *The longest coupling **1-B** is on the right hand side of the machine,* ⇒ *Fig 1. (F-14)*

It will be noticed that all four axles have slots cut out in the hubs. These slots are used by the rear pair of axles to take the adjusting bolts for drive chain tension.

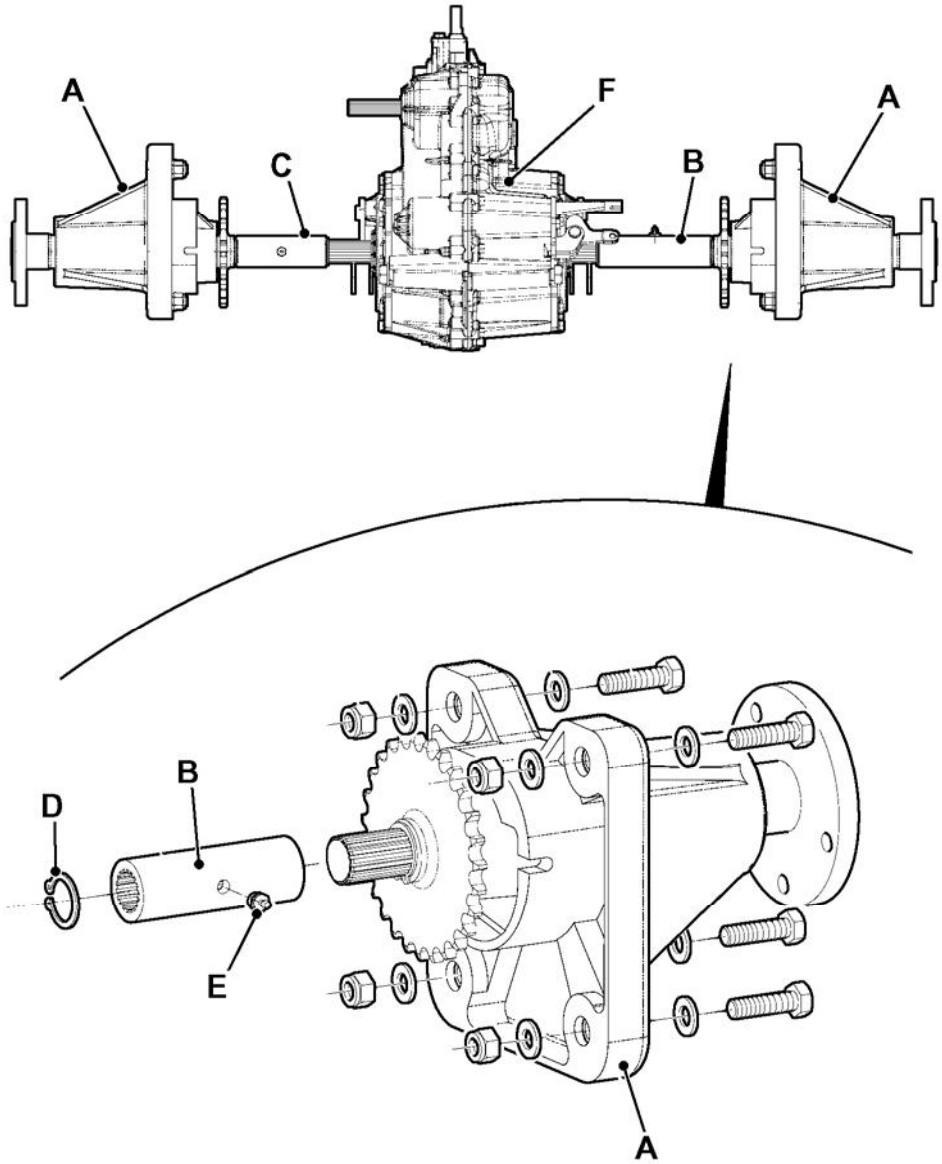


Fig 1. Front (Driven) Axles

A	Axle	**D**(1)	Circlip
B(1)	Splined Coupling (Long)	**E**(1)	Grease Nipple
C(1)	Splined Coupling (Short)	**F**	Transaxle

(1) Front axles only.

Removal and Replacement

Removal

Note: *Ensure the axle hubs are clearly marked before removal.* ⇨ *General (F-13)*

1 Drive the machine onto a dry, firm and level area.

2 Ensure the park brake is on.

3 The load bay needs to be raised to gain access to the engine bay. Ensure that the load bay is properly supported while working beneath it - **refer to the Handbook**.

4 Disconnect the battery to prevent the engine being started.

5 Raise and safely support the machine so that the wheels can be safely removed.

6 Remove the wheels.

7 Ease the chain tension with adjusting bolts **2-F** after loosening bolts **2-E** and the rear axles.

8 To remove an axle, first remove bolts **3-Y** (4-off). The front axles must be kept horizontal until the hub splines are clear of the couplings **5-G** and **5-H**.

Fitting

1 The load bay needs to be raised to gain access to the engine bay. Ensure that the load bay is properly supported while working beneath it - **refer to the Handbook**.

2 If fitting more than one axle, identify each axle for its place in the chassis.

3 Where relevant, fit the rear axles first. The slot in the hub must face towards the rear of the vehicle. Do not fully tighten bolts **2-E** (4 off).

4 Fit the tensioning bolts **2-F**. Do Not fully tighten.

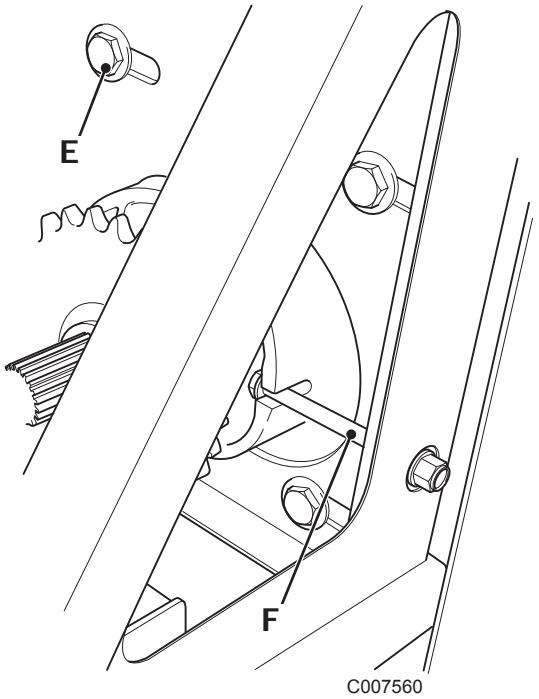


Fig 2.

5 Fit the splined couplings **4-G** and **5-H** to the drive axles (or the transaxle output shafts).

6 Offer up the front drive axles to the chassis, ⇨ *Fig 3. (F-16)*. Fit the bolts (4 off - one at each corner) at **3-Y** and torque tighten to 74 Nm (55 lbf ft).

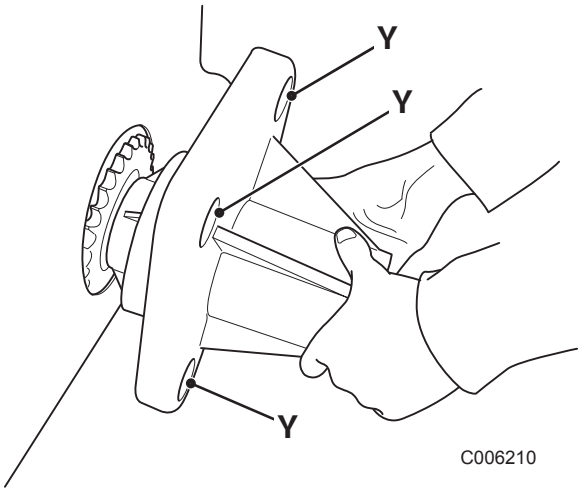


Fig 3.

Important: *Ensure that there is end float in the couplings after assembly. Transaxle and front axles must be in-line to ensure this end float is available.*

Note: *Thoroughly grease the couplings after assembly, see* ***Section 3 - Routine Maintenance.***

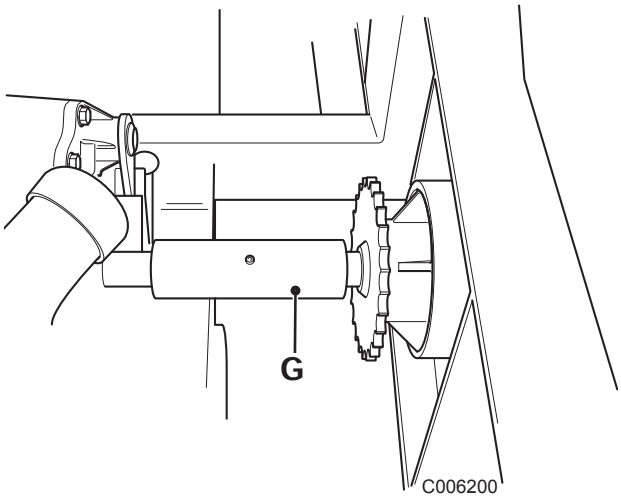


Fig 4.

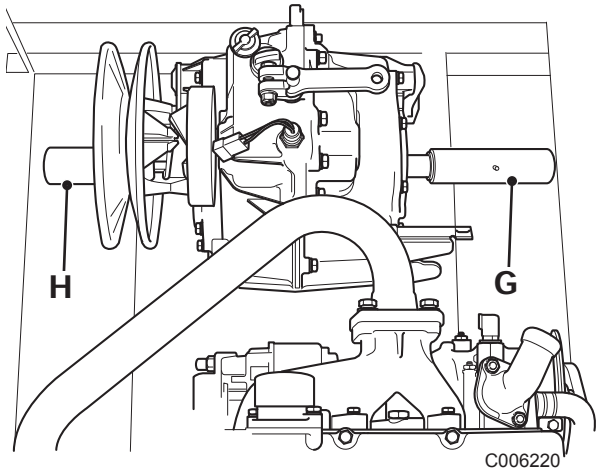


Fig 5.

7 Fit the drive chains to the axle sprockets.

8 Adjust the chain tensioning bolts **2-F** until the chain tension is correct, see **Section 3 - Routine Maintenance.**

9 The rear axle bolts **2-E** can now be tightened to 74 Nm (55 lbf ft).

10 The wheels can now be fitted if required.