

9 Engine Removal/Refit

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Engine Removal/Refit

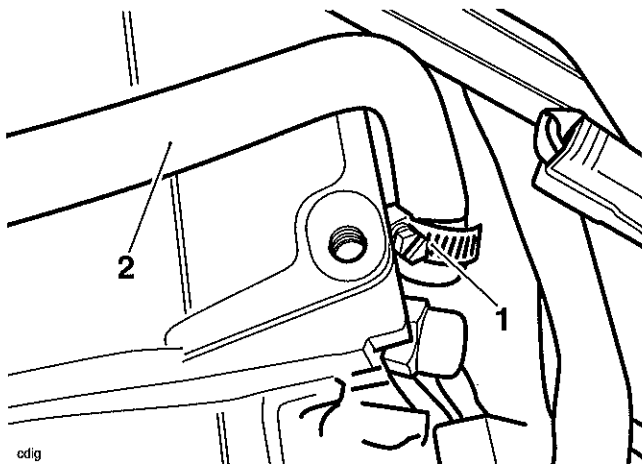
Engine Removal/Refit

1. Remove the seat (see page 16-8).
2. Remove the battery (see page 17-8).

Warning

Before starting work, ensure the motorcycle is stabilised and adequately supported. This will help prevent it from falling and causing injury to the operator or damage to the motorcycle.

3. Place the motorcycle on a paddock stand.
4. Remove the body side panels and lower fairings (see page 16-11).
5. Remove the airbox (see page 10-92).
6. Drain the engine oil (see page 8-7).
7. Drain the coolant detaching the bottom hose at the water pump (see page 11-4).
8. Detach the bypass hose at the cylinder head.



1. Hose Clip
2. Cylinder Head Bypass Hose

9. Detach the top hose at the thermostat housing (see page 11-6).

Note:

- Secure the hoses to prevent damage as the engine is removed.

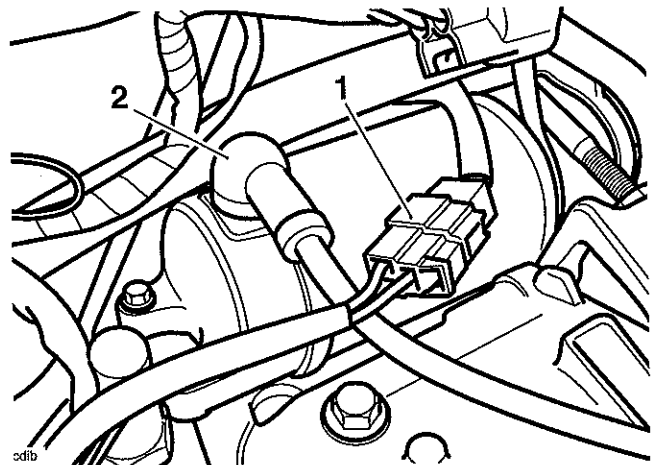
10. Remove the exhaust system (see page 10-105).
11. Remove the oil cooler (see page 8-13).
12. Set the drive chain adjustment to allow maximum free play in the chain (see page 12-10).

Caution

To prevent chain damage, do not allow the chain to come into contact with dirt, road grit etc.

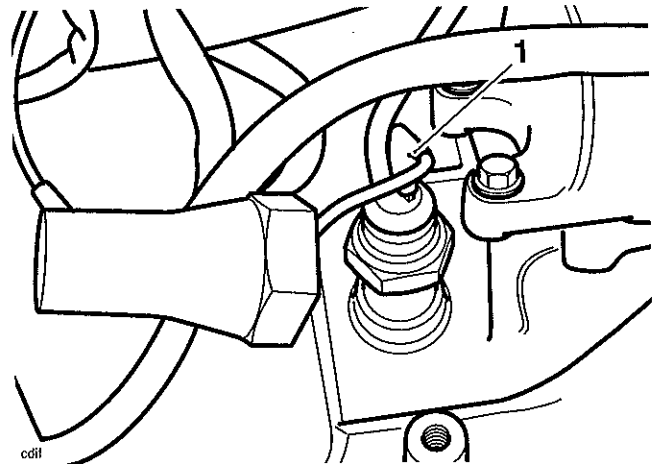
13. Remove the sprocket cover.

14. Ease the lead from the starter boot and then release the lead nut. Detach the lead.
15. Disconnect the alternator multiplug.



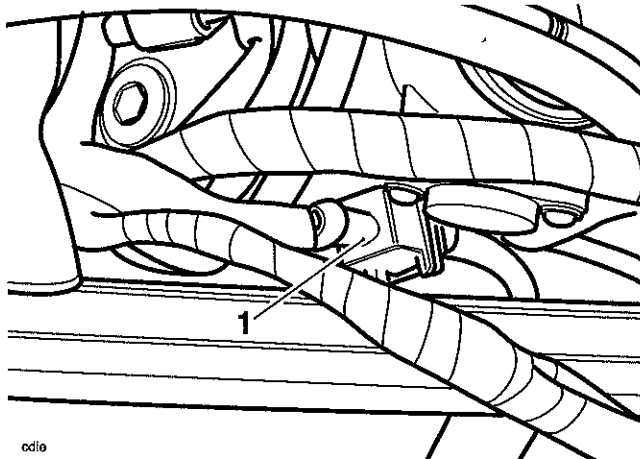
1. Alternator Multiplug
2. Starter Motor Connection

16. Ease the boot from the low oil pressure warning light switch and disconnect the electrical connector.



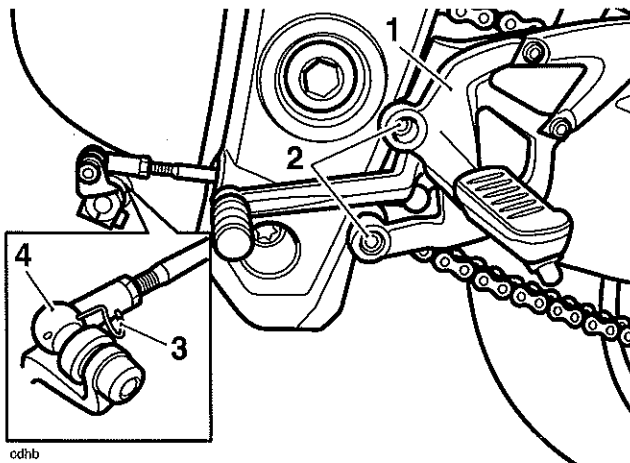
17. Disconnect the vehicle speed sensor multiplug.
18. Disconnect the side stand switch multiplug.
19. Disconnect the engine ground connections.

20. Disconnect the crankshaft position sensor multiplug.



odlo

21. Disconnect the neutral position switch indicator electrical connector.
 22. Release the clip from the gear change linkage, and detach the rod from the arm.
 23. Release the bolts securing the gear change linkage and footrest to the frame, and remove the gear change linkage and footrest as an assembly.



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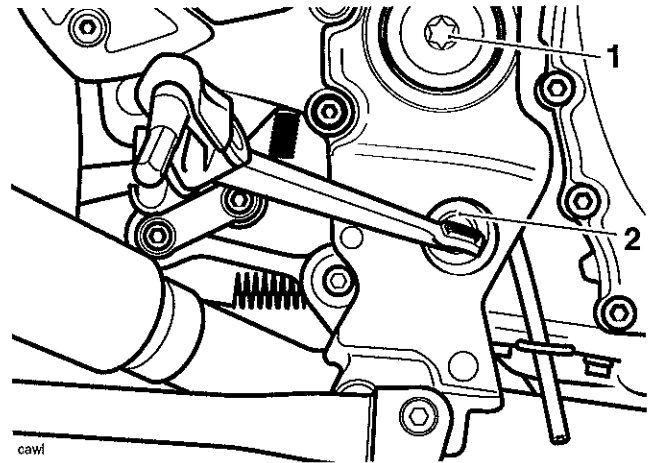
1. Footrest Bracket
 2. Fixings
 3. Securing Clip
 4. Gear Change Linkage

24. Remove the throttle bodies, injectors and fuel rail from the cylinder head (see page 10-99).

Note:

- It is not necessary to disconnect the throttle cables.

25. Disconnect the clutch cable (see page 4-5).
 26. Remove the swinging arm pivot bolt, leaving the spindle in place.
 27. Slacken the drag link pivot bolt.



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1. Swinging arm pivot bolt
 2. Drag link pivot bolt

Caution

Failure to ensure adequate support for either the engine or motorcycle could cause both components to fall or move unexpectedly. A fall or sudden movement could lead to injury

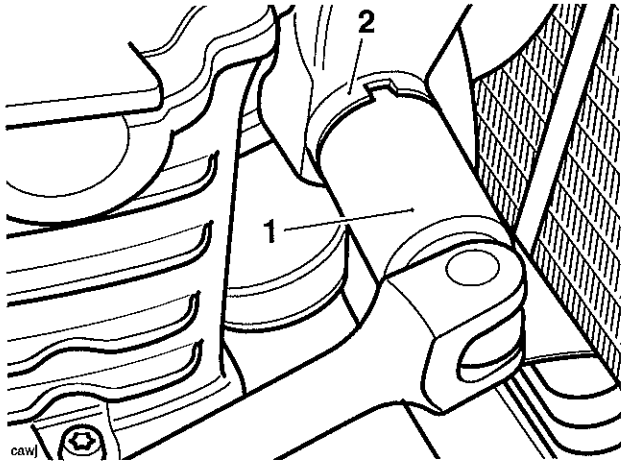
28. Place a support beneath the engine and ensure that the frame is still adequately and securely supported.

Caution

To prevent damage to components, lower the engine very carefully. Particularly vulnerable items include the throttle position sensor and radiator.

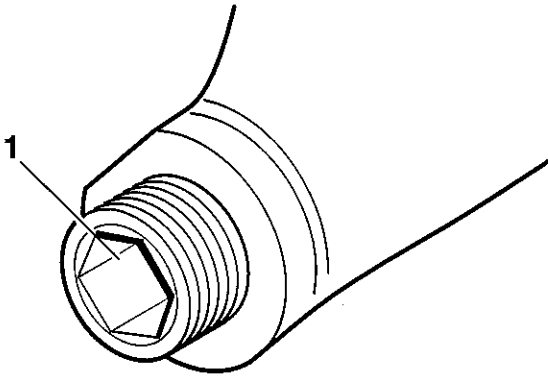
29. Remove the engine mounting bolts and lower the engine sufficiently to allow the drive chain to be detached from the output sprocket.
 30. Remove the engine from the frame.
 31. Slacken the engine mounting adjuster locknuts, on the right hand side of the frame, using tool T3880088.

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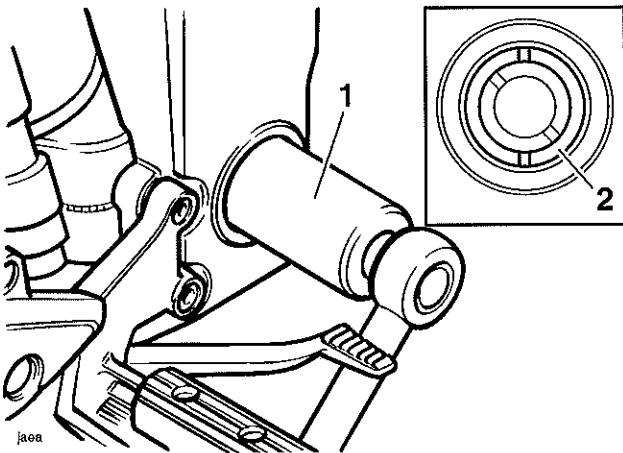
- 1. Tool T3880088
- 2. Engine mounting adjuster locknut

32. Slacken the engine mounting adjusters.



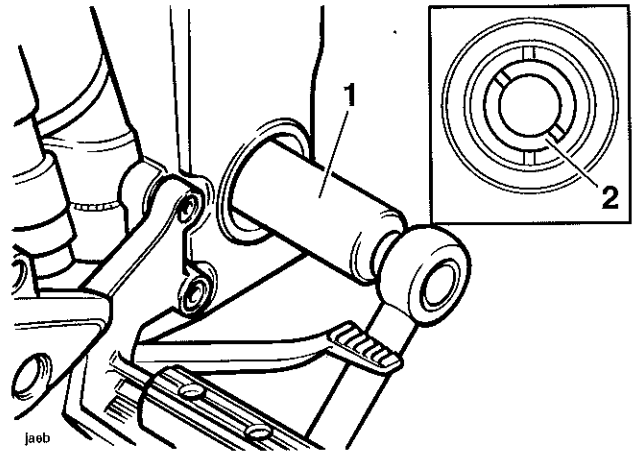
- 1. Engine mounting adjuster

33. Using tool T3880295, slacken the locking ring from the right hand side of the swinging arm spindle.



- 1. Tool T3880295
- 2. Locking ring

34. Using tool T3880290, slacken the swinging arm clamping ring from the right hand side of the swinging arm spindle.



- 1. Tool T3880290
- 2. Clamping ring

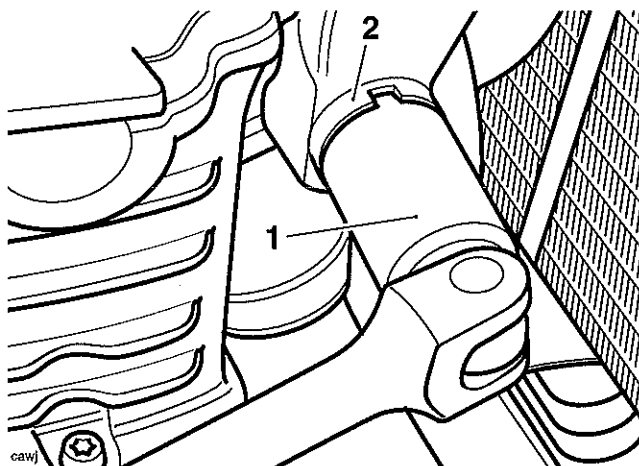
Engine Installation

1. Position the engine beneath the frame.
2. Raise the engine and loop the drive chain over the output sprocket.
3. Align the engine to the frame and fit, but do not tighten, all engine mounting bolts to support the engine.

⚠ Caution

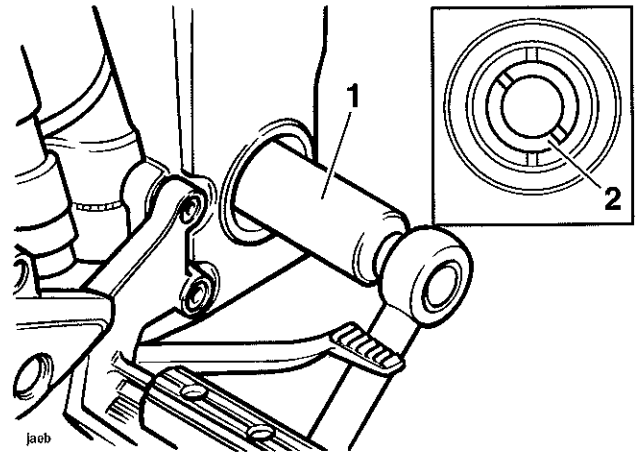
Unless the following engine mounting bolt tightening sequence is precisely followed, severe frame damage can occur.

4. Remove the support from beneath the engine.
5. Tighten left hand engine mounting bolts to **80 Nm** in the following sequence:
 - a) upper rear
 - b) lower rear
 - c) front
6. On the right hand side, tighten all engine mounting adjusters to **3 Nm**.
7. Tighten the right hand engine mounting bolts to **80 Nm** in the following sequence:
 - a) front
 - b) lower rear
 - c) upper rear
8. Tighten the engine mounting adjuster locknuts to **55 Nm** using tool T3880088

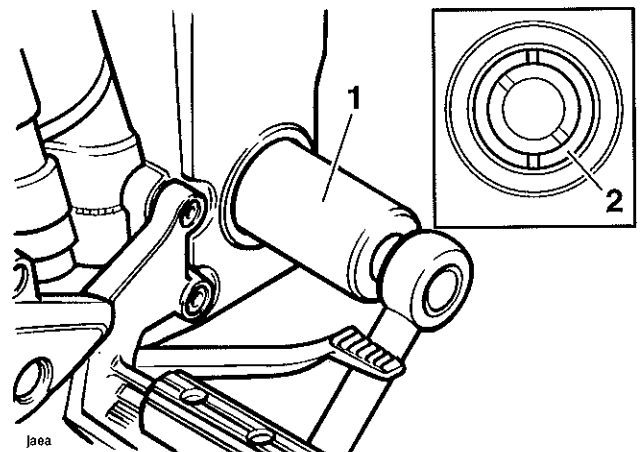


1. Tool T3880088
2. Engine mounting adjuster locknut

9. Tighten the swinging arm inner adjustment ring to **15 Nm** and the outer ring to **30 Nm** using service tools T3880290 and T3880295 respectively.



1. Tool T3880295
2. Locking ring

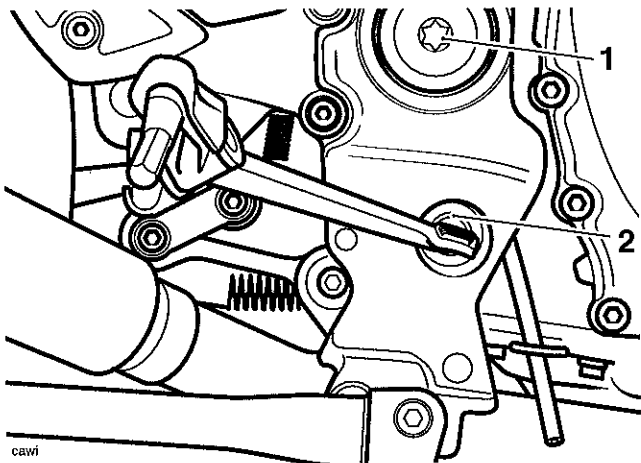


1. Tool T3880290
2. Clamping ring

10. Fit the swinging arm bolt and tighten to **60 Nm**.

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11. Tighten the drag link spindle bolt to 48 Nm.



1. Swinging arm pivot bolt
2. Drag link pivot bolt

12. Reposition the gear change linkage and footrest assembly, passing the gear change rod through the frame.
13. Refit the gear change rod to the arm and refit the clip to the rod. Tighten the fixings to 27 Nm.
14. Refit the air deflector shield to the cam cover.
15. Refit the clutch cable (see page 4-6).
16. Check the injector O-rings for splits and other damage. Replace as necessary.
17. Refit the throttle bodies, injectors and fuel rail to the cylinder head (see page 10-100).

Warning

Operation of the motorcycle with incorrectly adjusted, incorrectly routed or damaged throttle cables could interfere with the operation of the brakes, clutch or the throttle itself. Any of these conditions could result in loss of control of the motorcycle and an accident.

18. Adjust the throttle cables as necessary (see page 10-96).

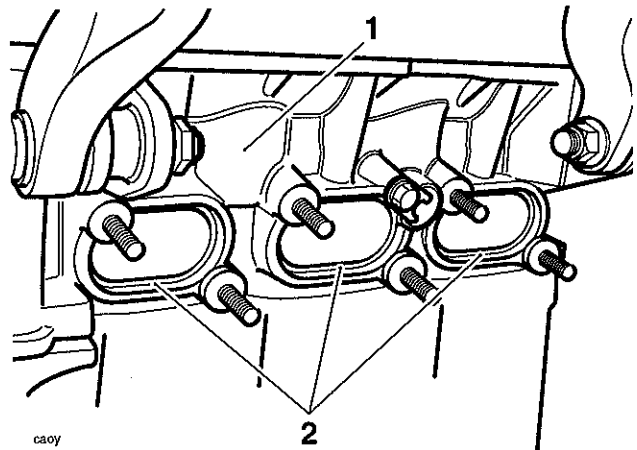
Warning

Move the handlebars to left and right full lock while checking that cables and harnesses do not bind. Cables or harness that bind will restrict the steering and may cause loss of control and an accident.

Warning

Ensure that the adjuster locknuts are tightened. A loose throttle cable adjuster could cause the throttle to stick leading to loss of control and an accident.

19. Reconnect all electrical connections to the engine.
20. Allow the swinging arm to hang free, and set the drive chain adjustment (see page 12-10).
21. Refit the sprocket cover and tighten the bolts to 9 Nm.
22. Using new seals at the cylinder head end, refit the exhaust system (see page 10-106).



1. Cylinder head
2. Seals

23. Refit the oil cooler (see page 8-13).
24. Reconnect the top hose at the cylinder head, the bottom hose at the water pump and the bypass hose at the cylinder head (see page 11-9).
25. Refill the cooling system (see page 11-4).
26. Fill the engine with oil of the correct grade and viscosity (see page 8-7).
27. Refit the airbox (see page 10-92).
28. Refit the bodywork (see page 16-12).
29. Refit the battery (see page 17-8).
30. Remove the motorcycle from the paddock stand and place on the side stand.