Service Bulletin 542
Issue 1 - 04.2017

Subject: Frame to Engine Alignment and Frame Bolt Retightening				
Bulletin Number	**Models Affected**	**VIN Range**		**Markets Affected**
542	Tiger Explorer XR	From 740277	Up to 785936	All Markets
	Tiger Explorer XC	From 743391	Up to 761089	
	Tiger Explorer XRX	From 745336	Up to 785895	
	Tiger Explorer XCX	From 743108	Up to 785924	
	Tiger Explorer XRX-LRH	From 743120	Up to 785726	
	Tiger Explorer XCX-LRH	From 743926	Up to 785904	
	Tiger Explorer XRT	From 743919	Up to 785929	
	Tiger Explorer XCA	From 741005	Up to 785902	

Background Information

Internal investigations have identified a need to over check engine to frame alignment, frame adjuster tightening torques and engine bolt tightening torques.

Dealers are requested to loosen the engine bolts and frame adjusters, align the engine to the frame using the alignment tools provided in service tool kit T3880637 and retighten the frame adjusters and engine bolts.

Customer Contact Instructions

Motorcycles in the affected VIN range must be modified prior to delivery to the customer, or at the next visit to the dealership.

Identification of Affected Motorcycles

Tiger Explorer models listed in the VIN range above.

Note:

- **Some affected motorcycles listed in the VIN range will have been modified and repaired by Triumph prior to their release from the factory.**
- **The modified motorcycles can be identified by checking the 'Outstanding Service Bulletins' on Warranty Online.**

Warranty Claim Instructions

Bulletin Number	Fault Code	Repair Code	Description	Repair Time Allowance
542	020725942	99542	Over check engine to frame alignment and engine bolt torque	1.25 hours

Genuine Parts Information

Bulletin Number	Part Number	Description	Quantity
542	T3351400	Kit 1, Fixings, SB542	1 (Tiger Explorer XR, Tiger Explorer XC, Tiger Explorer XRX, Tiger Explorer XRX-LRH, Tiger Explorer XRT only)
542	T3351405	Kit 2, Fixings, SB542	1 (Tiger Explorer XCX, Tiger Explorer XCX-LRH, Tiger Explorer XCA only)

Parts Ordering Instructions

For Triumph Subsidiary and Overseas Distributor dealers using Triumph Warranty On-Line with Parts Auto Ordering Flag switched on: Order all repair parts by submitting a New Prior through the Warranty On-Line system. Entering the above repair code in a New Prior will automatically add the parts required and labour times for this Service Bulletin.

For Overseas Distributor dealers NOT using Triumph Warranty On-Line or for Overseas Distributor dealers using Triumph Warranty On-Line with Parts Auto Ordering Flag switched off: Orders should be placed using the normal parts ordering procedure.

Genuine Parts Return Instructions

Not applicable

Other Instructions

Once completed, please mark the Service Record Book that the requirements of this bulletin have been complied with.

Before returning the motorcycle to the customer, download the latest calibration to the engine control module using the current version of the Triumph diagnostic software.

Procedure

Loosen the engine bolts and frame adjusters, align the engine to the frame using the alignment tools provided in service tool kit T3880637 and retighten the frame adjusters and engine bolts following the procedure detailed below.

⚠ 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.

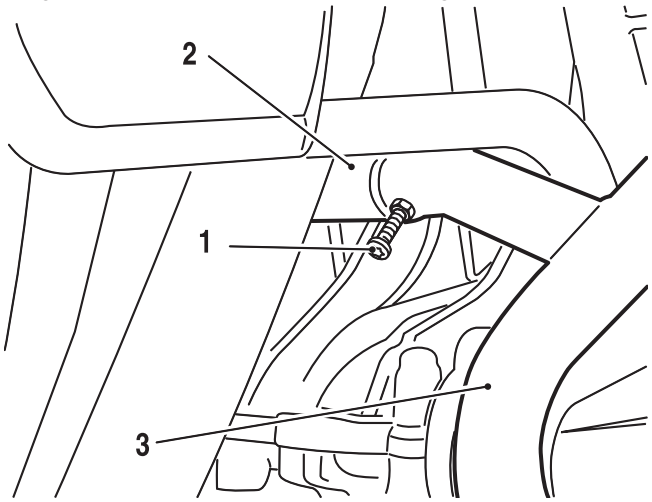
Note:

- **The engine MUST be cold prior to starting the frame bolt tightening sequence.**

1. Remove the seat as described in the Service Manual.
2. Disconnect the battery, negative (black) lead first.
3. Remove the side fairings as described in the Service Manual.
4. Remove the sump guard as described in the Service Manual.
5. Raise and securely support the motorcycle.
6. Place a support beneath the engine and ensure the frame is still adequately and securely supported.

Models Fitted with Engine Protection Bars

7. Remove the fixing securing the link bar to the left hand engine protection bar. Discard the fixing.

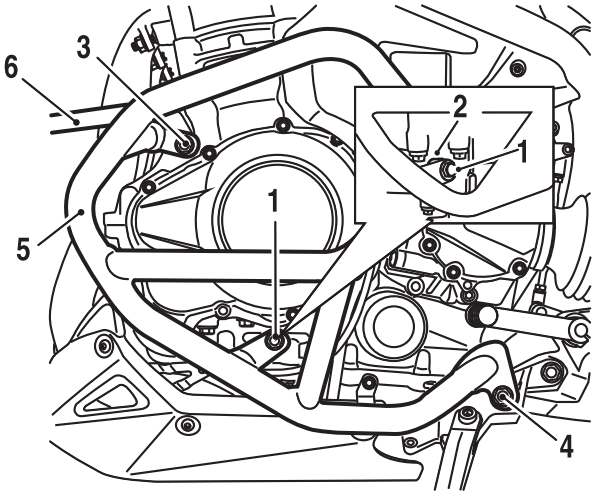


1. **Fixing**
2. **Link bar**
3. **Engine protection bar, left hand side**

Note:

- **Note that there is a 25 mm spacer between the left hand engine protection bar's centre mounting and the engine for installation.**
- **Note that the radiator mounting bracket is positioned between the engine protection bar and the engine for installation.**

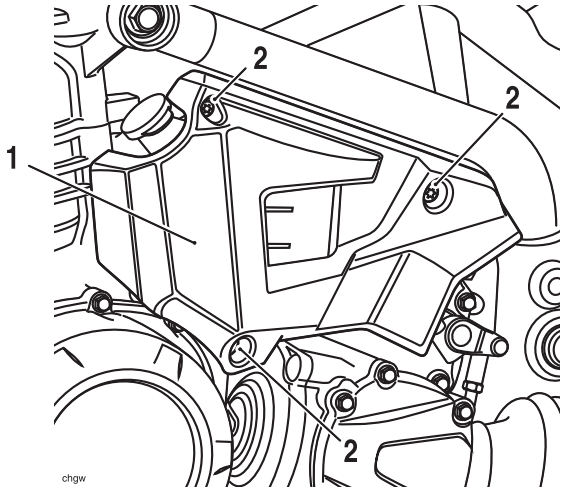
8. Release the three mounting bolts and remove the left hand engine protection bar. Collect the 25 mm spacer from the centre mounting.



1. **Centre mounting bolt**
2. **Spacer, 25 mm**
3. **Upper mounting bolt**
4. **Side stand bolt**
5. **Engine protection bar, left hand side**
6. **Radiator mounting bracket**

All Models

9. Remove the three fixings and remove the expansion tank cover. Discard the fixings.

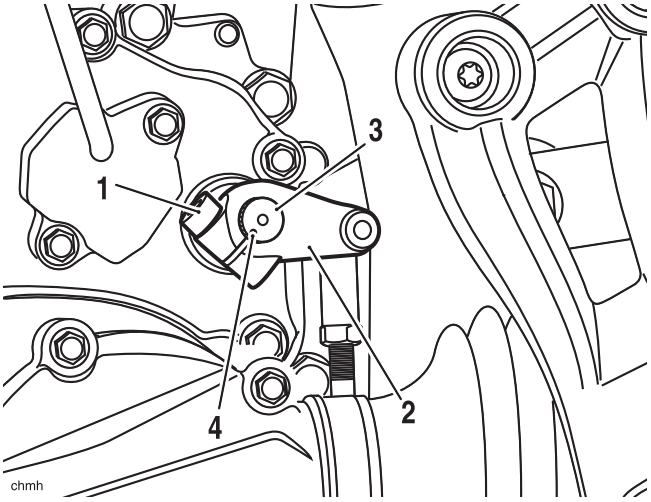


1. **Expansion tank cover**
2. **Fixings**

Note:

- **Note the position of the transmission linkage in relation to the punch mark on the gear change mechanism.**

10. Select neutral, remove the pinch bolt and disconnect the transmission linkage from the gear change mechanism.

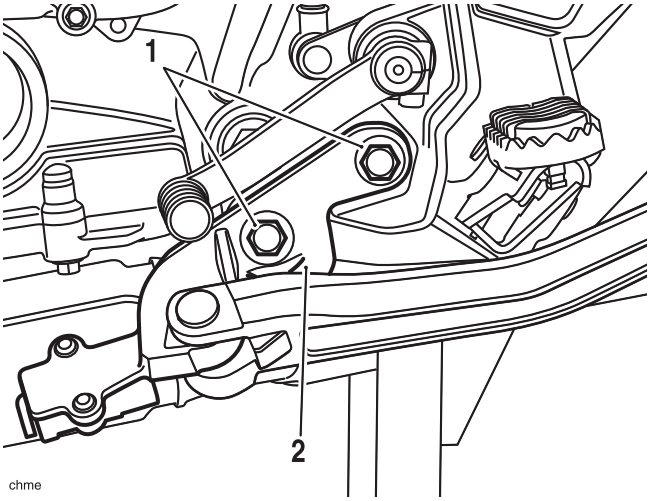


1. **Pinch bolt**
2. **Transmission linkage**
3. **Gear change mechanism**
4. **Punch mark**

Note:

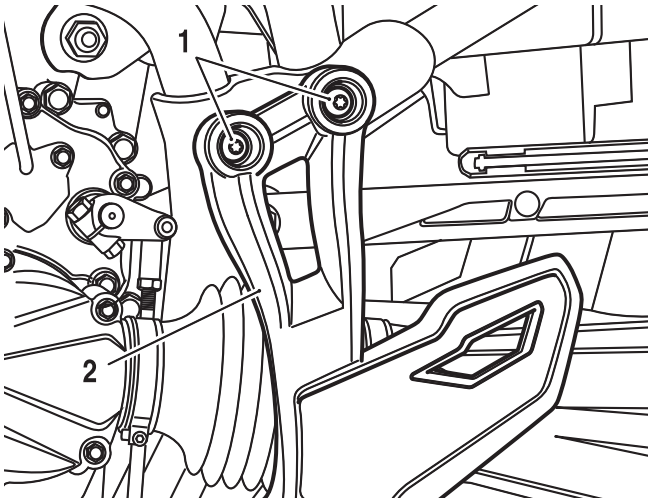
- **Do not allow the side stand to hang on the harness for the side stand switch.**
- **Note the routing of the harness for the side stand switch for installation.**
- **For models with engine protection bars, the front side stand bracket fixing is already removed.**

11. Release the fixing(s), detach the side stand and bracket and position aside.



1. **Fixings**
2. **Side stand and bracket**

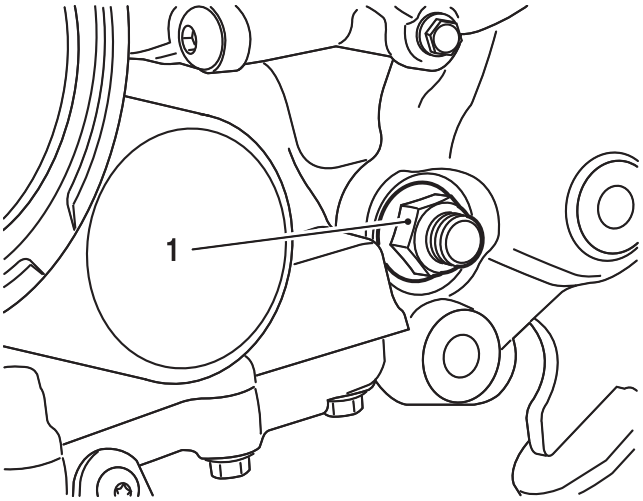
12. Release the fixings and remove the left hand control plate.



1. **Fixings**
2. **Control plate**

Models Fitted with Engine Protection Bars

13. Remove and discard the lock nut for the lower crankcase mounting bolt.



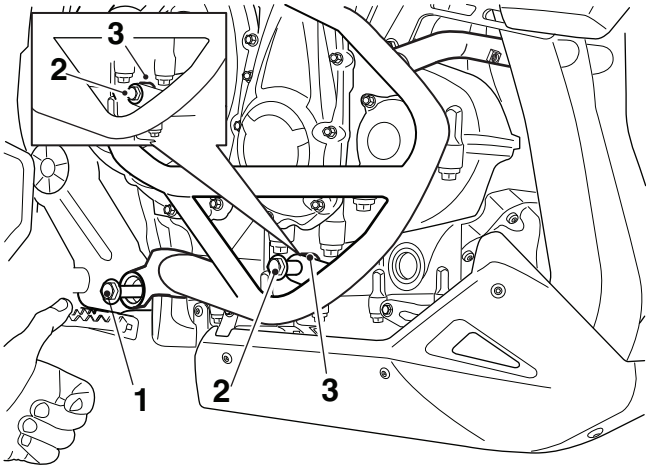
1. **Lock nut**

14. While holding down the rear brake pedal, remove the lower crankcase mounting bolt.

Note:

- **Note that there is a 13 mm spacer between the right hand engine protection bar's centre mounting and the engine for installation.**

15. Remove the centre mounting bolt and collect the 13 mm spacer from the centre mounting.

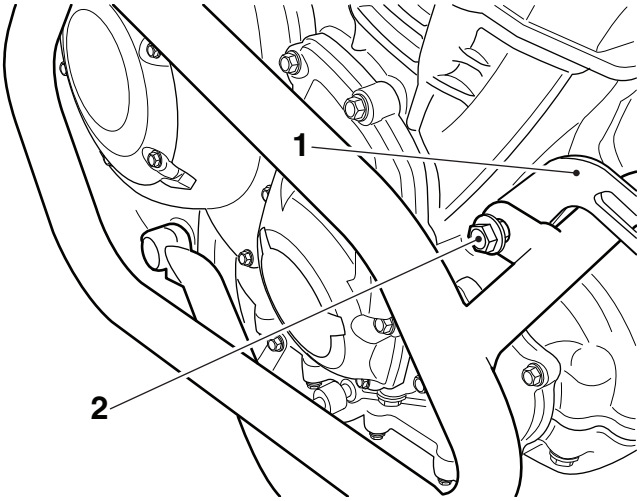


1. **Lower crankcase mounting bolt**
2. **Centre mounting bolt**
3. **Spacer, 13 mm**

Note:

- **Note that the radiator mounting bracket is positioned between the engine protection bar and the engine for installation.**

16. Release the upper mounting bolt and remove the right hand engine protection bar and link bar assembly.



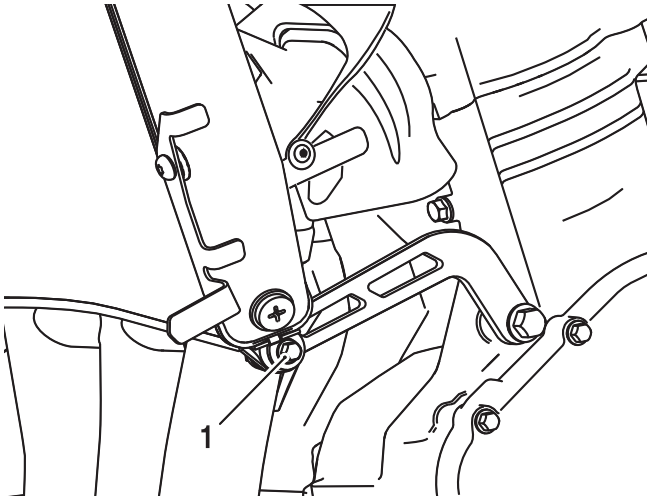
1. **Radiator mounting bracket**
2. **Upper mounting bolt**

All Models

Note:

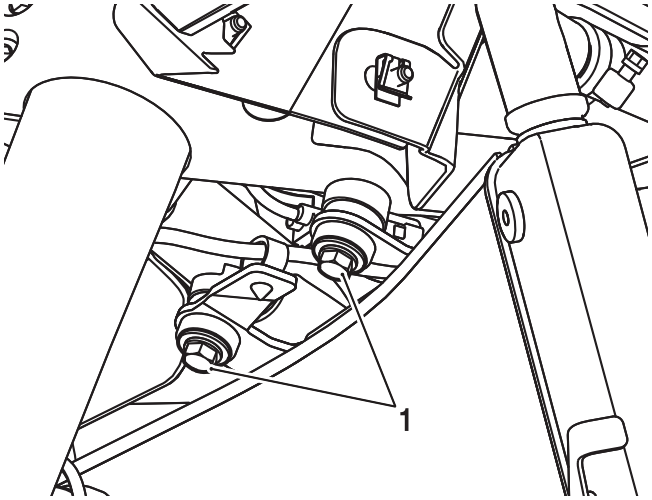
- **It is necessary to loosen the radiator so that it can be positioned to allow access to the front cylinder head mountings and lock nuts.**

17. Remove the two fixings securing the radiator to the lower radiator brackets. Discard the lock nuts.



1. Fixing (left hand side shown)

18. Loosen the two upper fixings securing the radiator to the frame. Do not fully remove.



1. Fixings

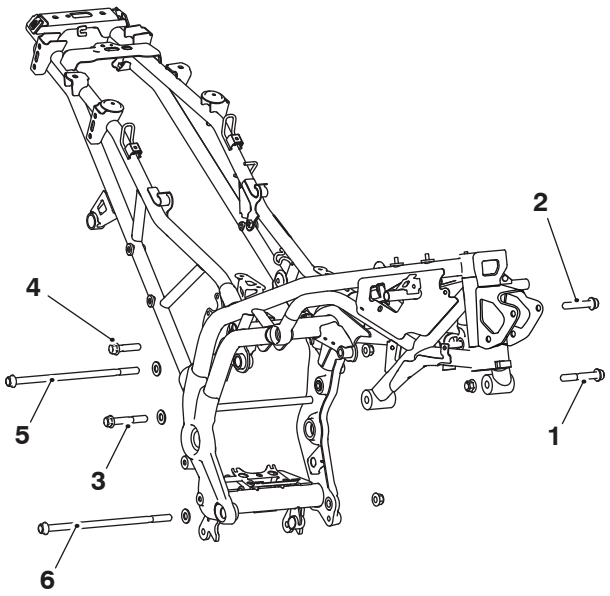
19. Position the lower end of the radiator forwards to allow access to the front cylinder head frame mountings.

⚠ Caution

Care must be taken not to damage the radiator when working on the front frame mountings.

Damaged radiator fins can impair the radiator's efficiency leading to overheating and consequent engine damage.

Frame Bolts Exploded View



1. **Left hand front cylinder head bolt**
2. **Left hand rear cylinder head bolt**
3. **Right hand front cylinder head bolt**
4. **Right hand rear cylinder head bolt**
5. **Upper crankcase bolt**
6. **Lower crankcase bolt**

Note:

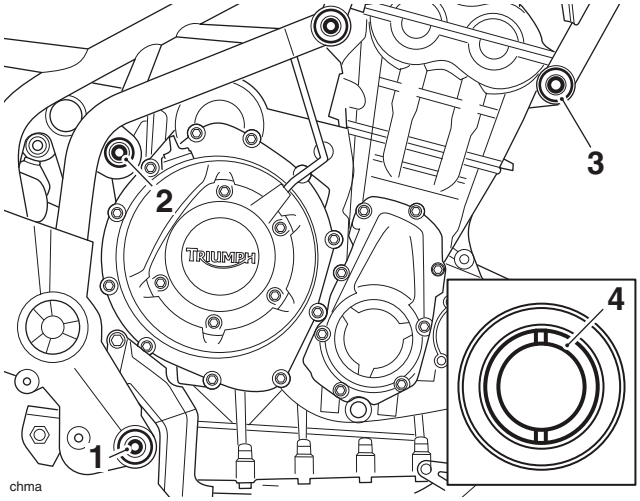
- **Make sure the engine is still adequately supported.**

20. Remove and discard the lock nuts from the front cylinder head bolts.
21. Loosen the rear cylinder head bolts. Do not fully remove.
22. Remove the engine mounting bolts, washers and lock nuts from the crankcase mountings. Discard the lock nuts.
23. Remove the bolt and washer from the right hand front cylinder head mounting.

Note:

- **There are three frame adjuster sleeves for this model. They are located as follows:**
- **Two of the frame adjuster sleeves are located on the right hand side of the frame.**
- **The third frame adjuster sleeve is located in the front right hand mounting of the cylinder head.**

24. Using service tool T3880377, loosen the frame adjuster sleeves.

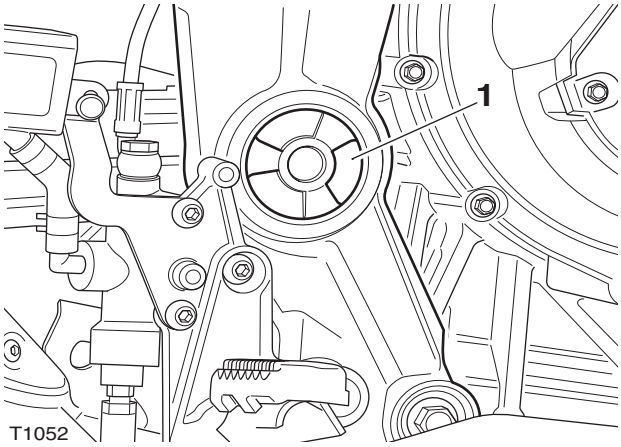


1. **Lower crankcase adjuster**
2. **Upper crankcase adjuster**
3. **Cylinder head front right hand adjuster**
4. **Adjuster**

Note:

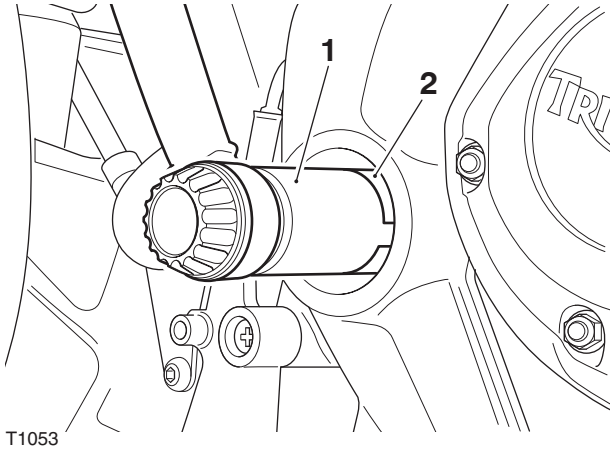
- **The right hand swinging arm pivot pin must be loosened before the frame bolts can be tightened.**

25. Carefully remove the cover from the right hand swinging arm pivot pin.



1. **Cover**

26. Using service tool T3880062, remove the locking ring from the right hand swinging arm pivot pin.



1. **T3880062 - Lock Ring Wrench 38 mm**
2. **Locking ring**

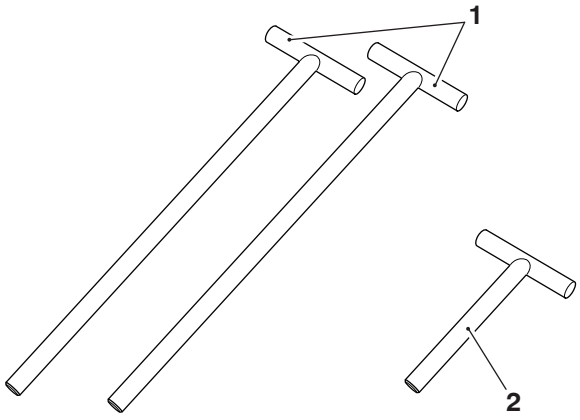
27. Loosen the right hand swinging arm pivot pin but do not fully remove.

⚠ Caution

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

Note:

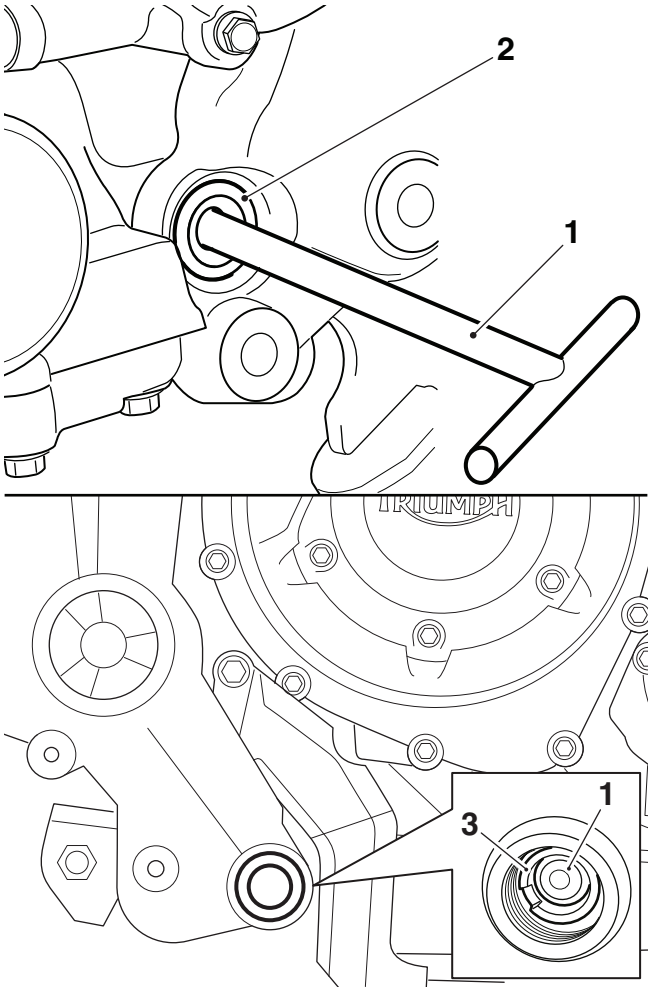
- **The engine MUST be cold prior to starting the frame bolt tightening sequence.**
- **Service tool kit T3880637 is required to correctly align the engine to the frame for the following tightening sequence.**
- **Adjust the engine position as necessary to allow the engine to frame alignment bars to be inserted and removed freely.**



T3880637 - Kit, Engine to Frame Alignment Bars

1. **Crankcase alignment bars**
2. **Cylinder head alignment bar**

28. Insert the crankcase alignment bars into the upper and lower crankcase mountings from the left hand side of the frame. Ensure the alignment bars are located through the engine and into the crankcase adjusters on the right hand side of the frame. Allow enough clearance on the right hand side of the frame to enable the threaded adjusters to be adjusted.



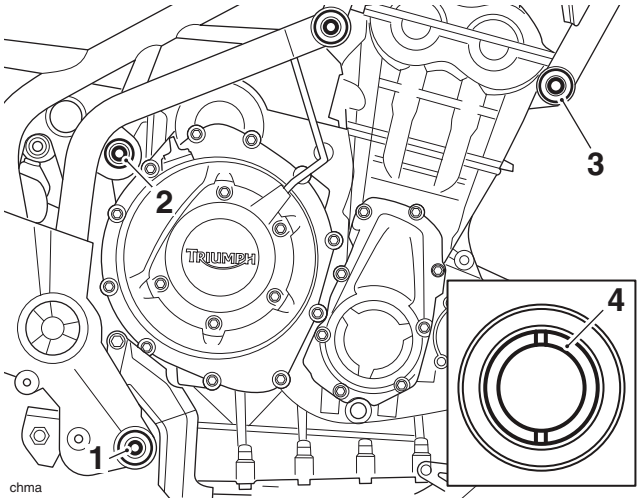
1. **Crankcase alignment bar**
2. **Frame to crankcase mounting (lower mounting shown - left hand side of frame)**
3. **Crankcase adjuster (lower mounting shown - right hand side of frame)**

29. Fit the cylinder head alignment bar into the left hand side of the right hand front cylinder head mounting point. Allow enough clearance on the right hand side of the frame to enable the threaded adjuster to be adjusted.
30. Fit a new lock nut to the left hand front cylinder head bolt and tighten to **24 Nm**.
31. Tighten the left hand rear cylinder head bolt to **85 Nm**.

Note:

- **If, after tightening each adjuster and frame fixing, any of the engine to frame alignment bars and frame fixings cannot be removed and inserted freely, check that the engine is still adequately supported, loosen all tightened adjusters and frame fixings and restart the tightening sequence from step 30.**

32. Using service tool T3880377, tighten the three adjusters in the following sequence.
    - Tighten the lower crankcase adjuster to **5 Nm**.
    - Tighten the upper crankcase adjuster to **5 Nm**.
    - Tighten the right hand front cylinder head adjuster to **3 Nm**.



1. **Lower crankcase adjuster**
2. **Upper crankcase adjuster**
3. **Right hand front cylinder head adjuster**
4. **Adjuster**

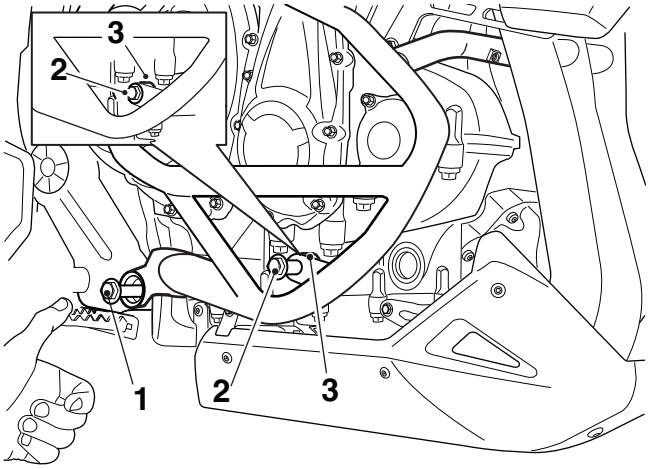
33. Remove the upper crankcase alignment bar and fit the upper crankcase bolt and washer from the right hand side. Holding the bolt to prevent rotation, fit a new lock nut and tighten to **100 Nm**.

Models Not Fitted with Engine Protection Bars

34. Remove the lower crankcase alignment bar and fit the lower crankcase bolt and washer from the right hand side. Holding the bolt to prevent rotation, fit a new lock nut and tighten to **100 Nm**.

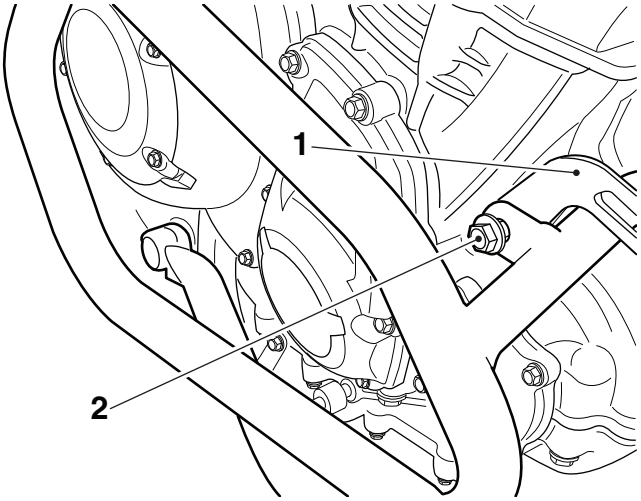
Models Fitted with Engine Protection Bars

35. Align the right hand engine protection bar and link bar assembly to the engine.
36. Remove the lower crankcase alignment bar and fit the lower crankcase mounting bolt through the rear mounting of the engine protection bar, frame and lower crankcase. Loosely fit a new lock nut.
37. Position the 13 mm spacer between the centre mounting and the engine as noted for removal. Fit the M8 x 33 mm bolt, do not fully tighten at this stage.



1. **Lower crankcase mounting bolt**
2. **Bolt, M8 x 33 mm**
3. **Spacer, 13 mm**

38. Ensure that the radiator mounting bracket is located between the upper mounting for the engine protection bar and the engine as noted for removal. Fit an M8 x 25 mm bolt, do not fully tighten at this stage.



1. **Radiator mounting bracket**
2. **Bolt, M8 x 25 mm**

39. Holding the lower crankcase mounting bolt to prevent rotation, tighten the lock nut to **100 Nm**.

All Models

40. Tighten the remaining frame bolts in the following sequence:
    - Tighten the right hand rear cylinder head bolt to **85 Nm**.
    - Tighten the left hand front cylinder head bolt to **115 Nm**.
    - Using service tool, T3880377, re-tighten the right hand front cylinder head adjuster to **3 Nm**.
    - Remove the cylinder head alignment bar from the right hand front cylinder head mounting and fit the bolt and washer. Fit a new lock nut and tighten to **100 Nm**.

Models Fitted with Engine Protection Bars

41. Tighten the right hand engine protection bar centre mounting bolt to **18 Nm**.
42. Tighten the right hand engine protection bar upper mounting bolt to **18 Nm**.

All Models

43. Tighten the swinging arm right hand pivot pin to **45 Nm**.

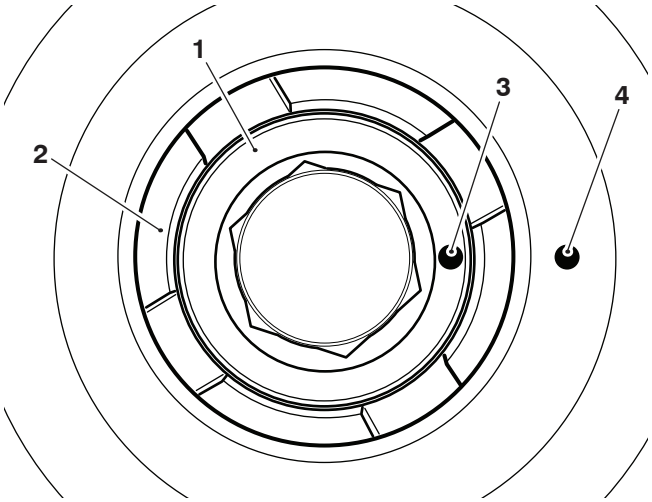
⚠ Caution

If the right hand pivot pin moves during the tightening of the locking ring, both the locking ring and pivot pin must be loosened and re-tightened as described in steps 43 to 47 of this procedure.

Failure to tighten the swinging arm pivot pin and locking ring correctly may lead to severe frame damage.

44. Lubricate the threads of the locking ring with a smear of proprietary high temperature copper-based grease.
45. Fit the locking ring to the swinging arm right hand pivot pin.

46. Using a non permanent marker, temporarily mark the pivot pin alignment in relation to the frame.

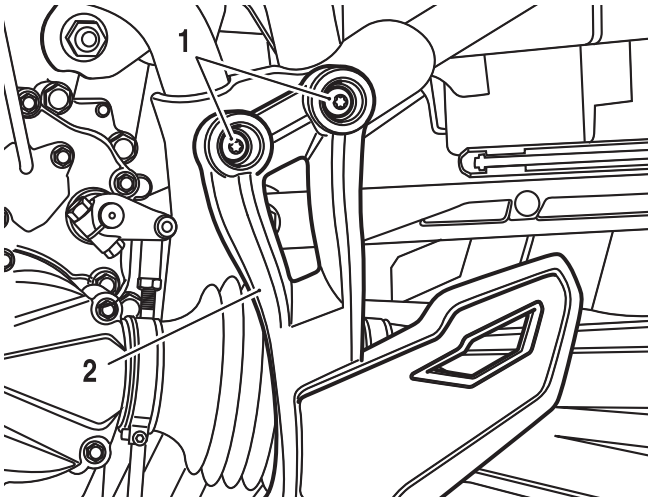


1. **Swinging arm pivot pin**
2. **Locking ring**
3. **Pivot pin alignment mark**
4. **Frame alignment mark**

Note:

- **If the pivot pin and frame markings do not align after final tightening of the locking ring, loosen the locking ring and right hand pivot pin and repeat steps 43 to 47 of this procedure.**

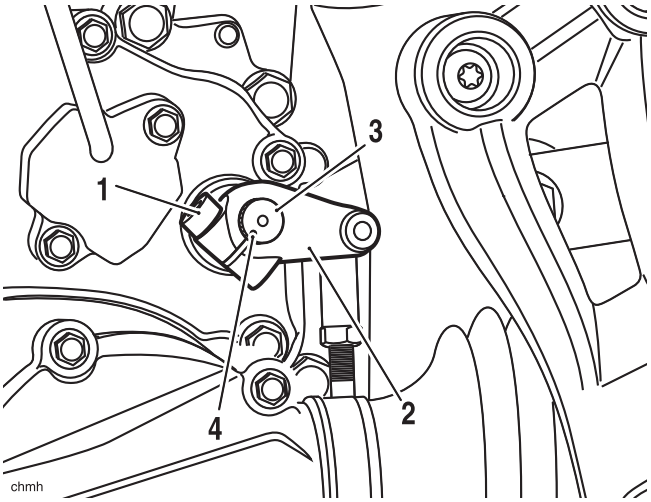
47. Using service tool T3880062, tighten the locking ring to **110 Nm**.
48. Refit the cover to the swinging arm right hand pivot pin.
49. Align the left hand control plate to the frame and fit the two upper fixings. Do not fully tighten at this stage.



1. **Fixings**
2. **Control plate**

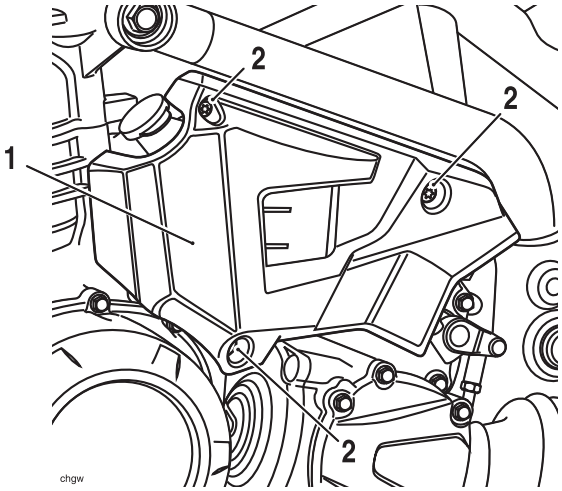
50. Route the harness for the side stand switch as noted for removal.
51. Align the side stand to the frame and secure as follows:
    - **Models not fitted with engine protection bars:** Secure with both fixings and tighten to **70 Nm**.
    - **Models fitted with engine protection bars:** Fit the rear fixing only. Do not fully tighten at this stage.
52. Tighten the upper fixings for the left hand control plate to **18 Nm**.
53. Fit the transmission linkage to the gear change mechanism as noted for removal.

54. Fit the pinch bolt and tighten it to **9 Nm**.



1. **Pinch bolt**
2. **Transmission linkage**
3. **Gear change mechanism**
4. **Punch mark**

55. Refit the expansion tank cover and secure with three new fixings. Tighten the upper fixing to **3 Nm** and the lower fixings to **7 Nm**.

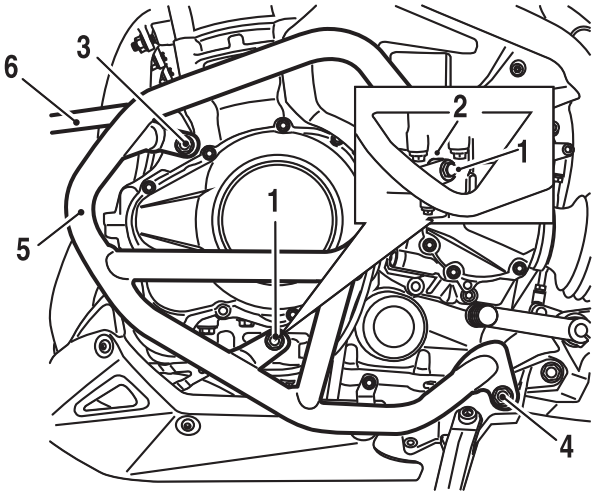


1. **Expansion tank cover**
2. **Fixings**

Models fitted with Engine Protection Bars

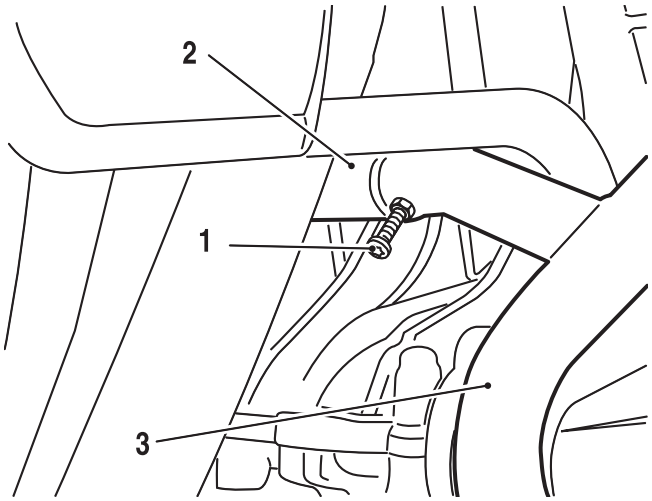
56. Align the left hand engine protection bar to the link bar and engine.
57. Ensure that the radiator mounting bracket is between the upper mounting for the engine protection bar and the engine. Fit the M8 x 25 mm bolt, do not fully tighten at this stage.
58. Position the 25 mm spacer between the centre mounting and the engine as noted for removal. Fit the M8 x 45 mm bolt, do not fully tighten at this stage.

59. Fit the side stand bolt to the lower mounting for the engine protection bar. Do not fully tighten at this stage.



1. **Bolt, M8 x 45 mm**
2. **Spacer, 25 mm**
3. **Bolt, M8 x 25 mm**
4. **Side stand bolt**
5. **Engine protection bar, left hand**
6. **Radiator mounting bracket**

60. Refit the fixing securing the left hand engine protection bar to the link bar. Do not fully tighten at this stage.
61. Remove and discard the fixing securing the right hand engine protection bar to the link bar. Fit a new fixing but do not fully tighten at this stage.



1. **Fixing**
2. **Link bar**
3. **Engine protection bar, left hand side**

62. Tighten the side stand bolts to **70 Nm**.
63. Tighten the engine protection bar upper mounting bolt to **18 Nm**.
64. Tighten the engine protection bar centre mounting bolt to **18 Nm**.
65. Position the link bar equally between the left hand and right hand engine protection bars. Tighten the fixings to **5 Nm**.

All Models

66. Refit the two fixings securing the radiator to the lower radiator brackets and secure with new lock nuts. Tighten to **9 Nm**.
67. Tighten the radiator upper fixings to **9 Nm**.
68. Remove the support from beneath the engine.
69. Refit the sump guard as described in the Service Manual.
70. Refit the side fairings as described in the Service Manual.
71. Reconnect the battery, positive (red) lead first and tighten the terminals to **4.5 Nm**.
72. Refit the seat as described in the Service Manual.

Circulation

Initial and date when read and return to central file holder

Service Manager	Parts Manager	Sales Manager	Workshop Supervisor	Technician 1	Technician 2