



## Section C

# Axle Integral Brakes

Service Manual - Transmissions

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Publication No.  
**9803/8610-14**



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## Section C - Axle Integral Brakes

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# Section C - Axle Integral Brakes

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# 40 Series Integral Brakes (3 Piece Axles)

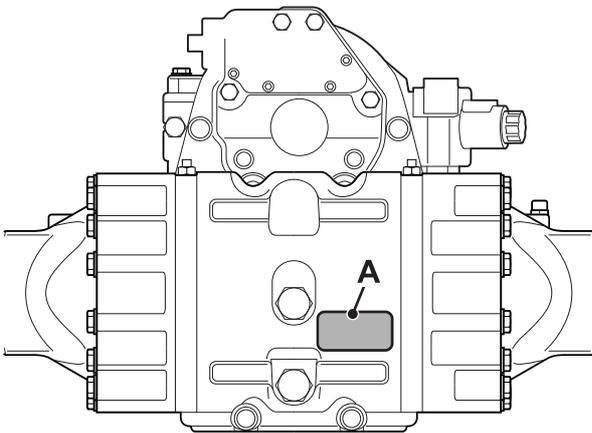
## Technical Data

**Note:** Technical data may differ between axle variants and installations. For full data relating to specific axles refer to the applicable machine Service Manual.

### Unit Identification

The axle serial number is stamped on the unit identification plate **A**.

When ordering replacement parts, always quote the details on the unit identification plate. In the case of gear replacements, always check the part number stamped on the gear, and the number of teeth.



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**Fig 1.**



## **Service Tools**

There are no specific service tools required to enable dismantling and assembly.

## Main Component Identification

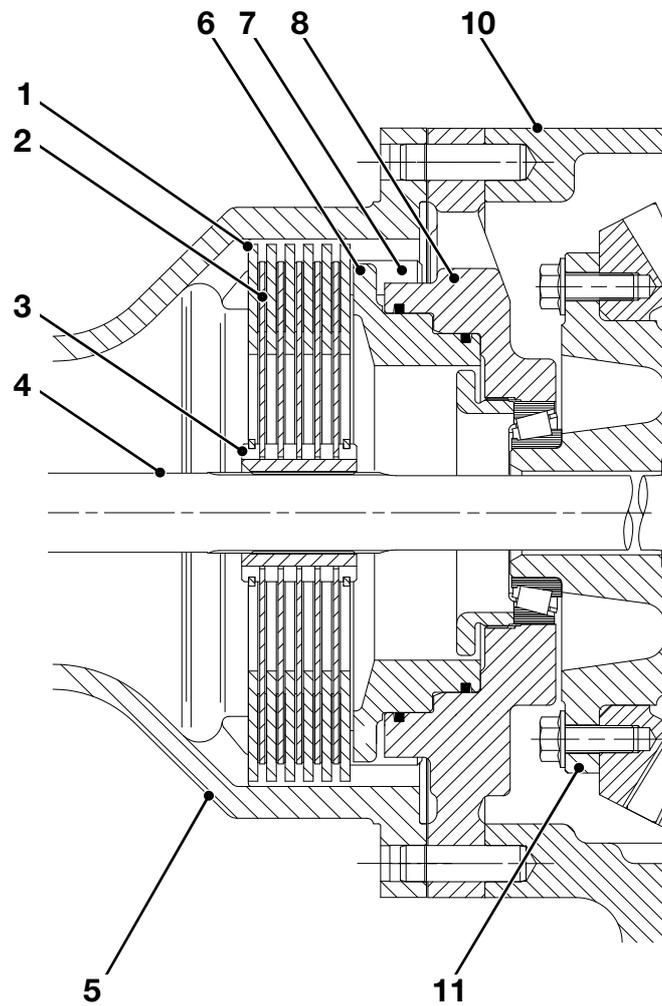


Fig 2. Location Drawing

C002900-C1

Item	Description
1	Counter plates
2	Friction plates
3	Brake carrier
4	Driveshaft
5	Stub axle arm
6	Brake piston
7	Reaction pin
8	Brake piston housing
10	Drive head housing
11	Differential unit

### Dismantle and Assemble

#### Dismantle

⇒ Fig 3. (□ C-5).

It is important that only one side at a time is dismantled to prevent damage to the bearings and preserve the crownwheel and pinion backlash setting.

- 1 It is recommended that the axle be removed from the machine when dismantling the rear axle brakes.

**Note:** Before dismantling it is good practice to match mark components for alignment and identify them as right and lefthand to ensure correct assembly.

- 2 Remove bolts 1. Use a heavy duty (6 point) socket to unscrew them.
- 3 Carefully separate the stub axle arm from the drive head. If necessary tap the casing with a soft faced hammer. Remove all traces of the old sealant from the mating faces.

**Note:** The brake pack comprises three friction plates and four counter plates. There are two counter plates 2, one at each end of the brake pack, which are not secured to the plate carrier 3. If the plates are to be reused, note their positions and which way round they are then withdraw the brake pack.

- 4 Remove the circlip 4. If the brake pack is to be reused, note the positions of the plates before removing them.
- 5 The wear limit of friction plates is to the depth of the cross hatching A. Check all plates for flatness and damage. (Some scoring of the counter plates is normal.) Renew the brake pack complete if worn or damaged. Do not renew individual plates.
- 6 Remove the three reaction pins 5. Inspect for damage.
- 7 Before removing the brake housing and piston assembly support the differential with a drive shaft or other suitable support, as shown at 6.
- 8 Match mark the brake piston housing 7 and the drive head. Undo capscrews 9 and remove the brake housing and piston assembly.

**Note:** Do not disturb nut 10 otherwise the bearing pre load will have to be reset.

- 9 Remove brake piston 12 from brake housing 7.
- 10 Remove and discard seals 11 and 13. Inspect the housing bore for damage and scoring. Nicks or cuts in the seals may be responsible for loss of brake fluid.

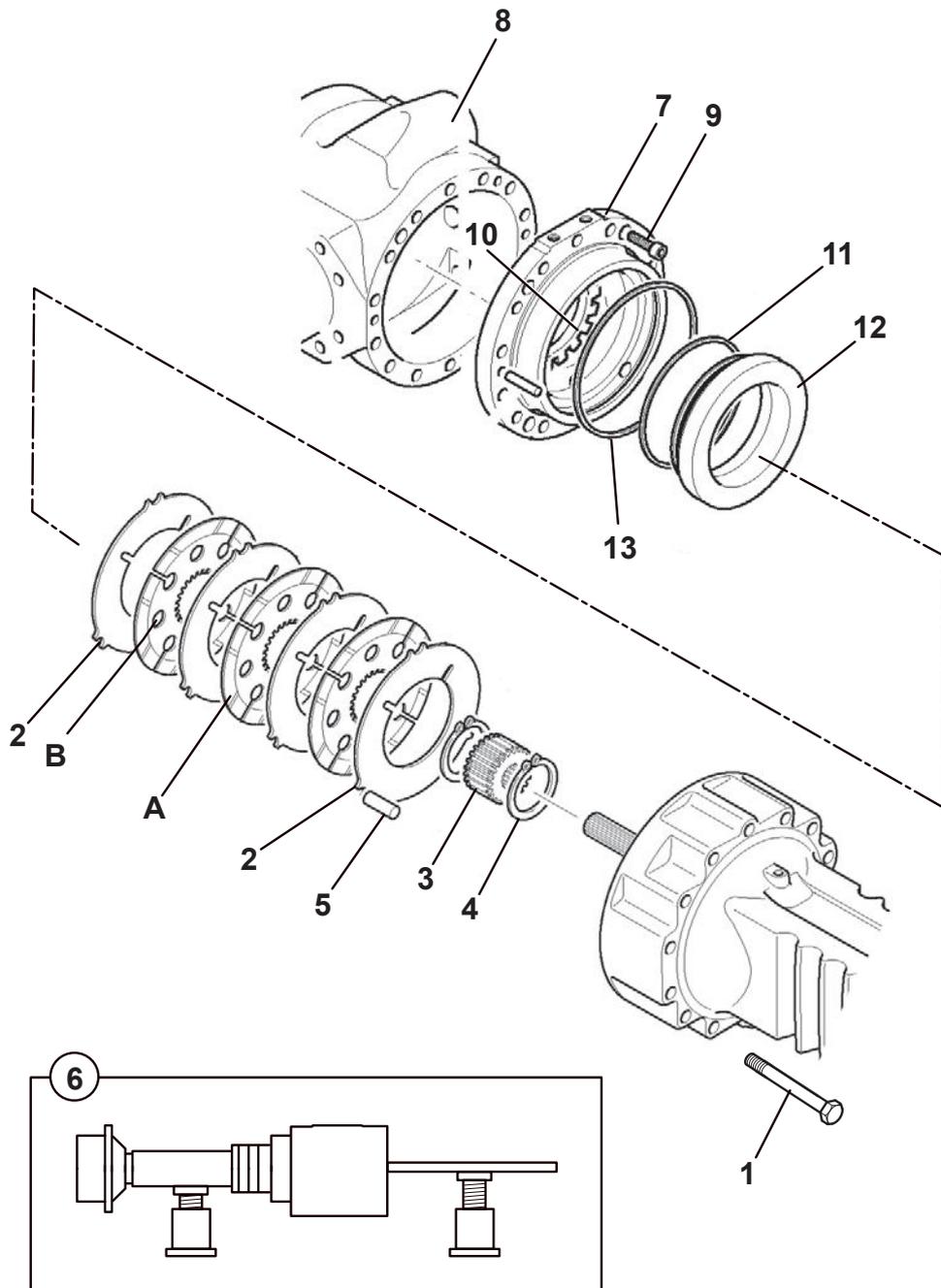


Fig 3. 40 Series Integral Brakes - 3 Piece Axles

C094430

## Assemble

⇒ [Fig 3. \(C-5\)](#)

- 1 Remove all traces of old sealant from the mating faces of the drive head and the brake piston housing.
- 2 Fit new seals **11** and **13**. Make sure they seat squarely in their grooves.
- 3 Carefully press the piston **12** all the way into its housing **7**.
- 4 Apply JCB Multigasket to the drive head mating face, then fit the brake piston housing assembly. Ensure that the match marks made during dismantling are aligned.
- 5 Fit capscrews **9** and torque tighten to 46 Nm (34 lbf ft, 4.7 kgf m).
- 6 Remove the differential support.
- 7 Soak new friction plates in JCB Special Gear Oil before assembly.
- 8 Assemble the three friction plates and four counter plates **2** onto the brake carrier **3**. If the original brake pack is being reused, return the plates to their original positions. Fit circlip **4**.

**Note:** On assembly of the brake packs, the oil flow holes **B** must be aligned with each other when being fitted to the brake pack carrier.

- 9 Locate the three reaction pins **5** into their grooves, securing them with grease. Push the pins fully into their location holes in the housing.
- 10 Install one counter plate **2** into the housing securing it in place with grease, then the brake pack, then the other counter plate. Return reused counter plates to their original positions. Push the brake pack fully home.
- 11 Apply JCB Multigasket to the mating face of the drive head, and JCB Threadlocker and Sealer to the threads of bolts **1**. Locate the stub axle arm onto the drive head, ensure that the match marks made during dismantling are aligned.
- 12 Fit bolts **1** and torque tighten to 98 Nm (72 lbf ft, 10 kgf m).



## Section C - Axle Integral Brakes 40 Series Integral Brakes (3 Piece Axles)

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Dismantle and Assemble

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# 70 Series Integral Brakes (3 Piece Axles)

## Technical Data

**Note:** Technical data may differ between axle variants and installations. For full data relating to specific axles refer to the applicable machine Service Manual.

### Unit Identification

The axle serial number is stamped on the unit identification plate 1A or 2A as applicable.

When ordering replacement parts, always quote the details on the unit identification plate. In the case of gear replacements, always check the part number stamped on the gear, and the number of teeth.

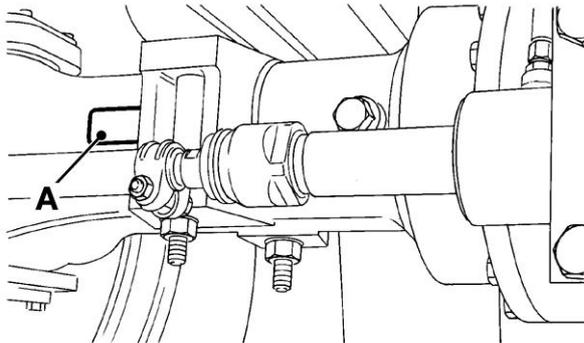


Fig 1.

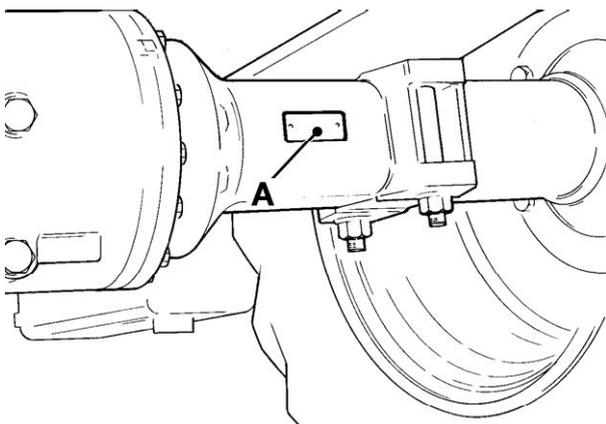


Fig 2.



## **Service Tools**

There are no specific service tools required to enable dismantling and assembly.

### Main Component Identification

#### Component Key

Item	Description
1	Counter plates
2	Friction plates
3	Brake carrier
4	Driveshaft
5	Stub axle arm
6	Brake piston
7	Reaction pin
8	Brake piston housing
9	Controlled piston back off spring assembly <sup>(1)</sup>
9A	Positive piston back off spring assembly <sup>(2)</sup>
10	Drive head housing

(1) *Controlled piston back off maintains the same piston retraction distance as the friction plates wear. This type of piston back off is fitted for servo brake applications.*

(2) *Positive piston back off retracts the piston to the same position. As the friction plates wear the retraction distance will increase. This type of piston back off is fitted for hydraulic power brake applications.*

See [⇒ Fig 3. \(□ C-11\)](#).

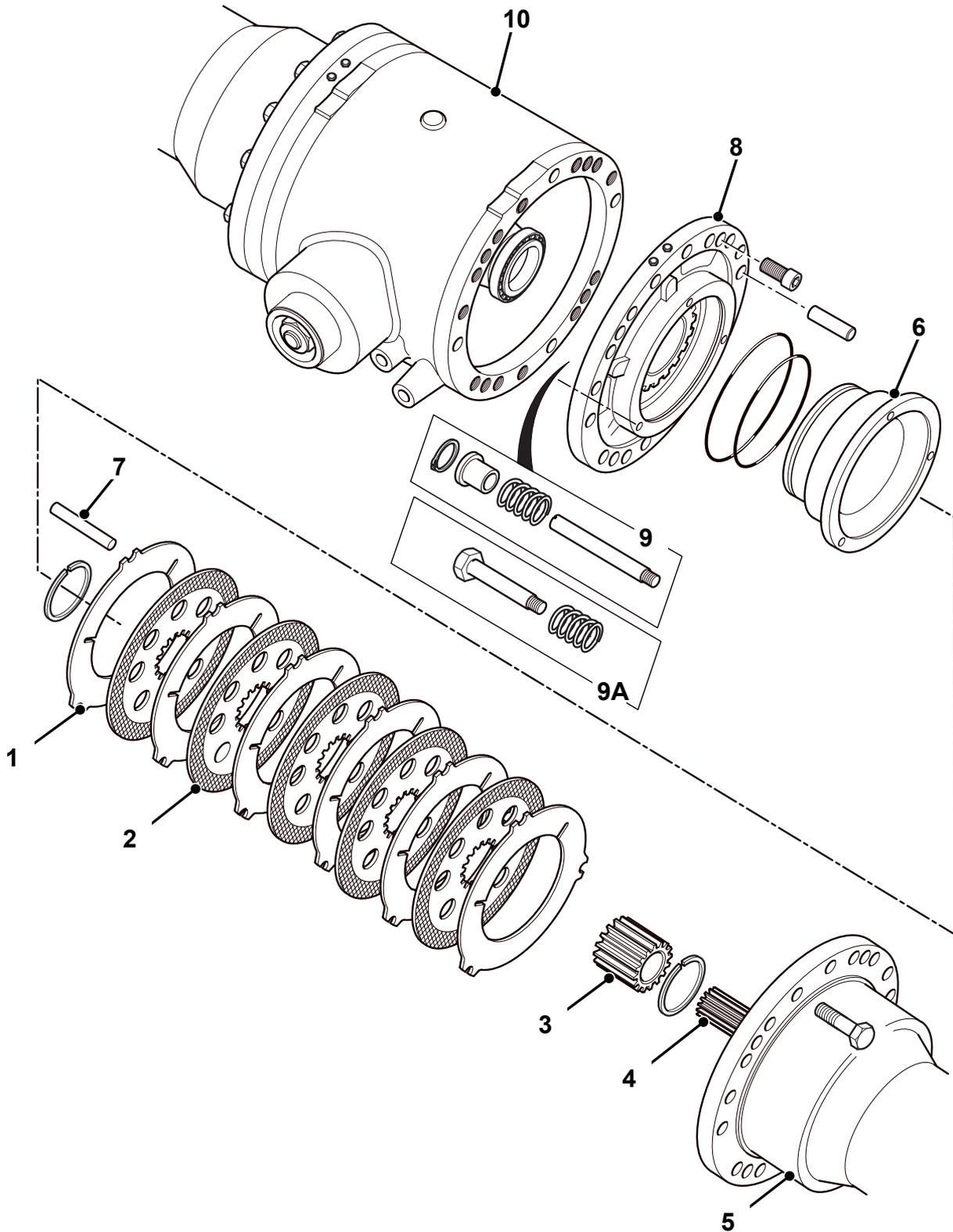


Fig 3. 70 Series Integral Brakes (3 Piece Axles)

C098200

See [⇒ Component Key \(□ C-10\)](#).

### Dismantle And Assemble

#### Sectional Drawing

#### Component Key

Item	Description
1	Counter plates
2	Friction plates
3	Brake carrier
4	Driveshaft
5	Stub axle arm
6	Brake piston
7	Reaction pin
8	Brake piston housing
9	Back off pin
10	Drive head housing
11	Differential unit

See [⇒ Fig 4. \(□ C-13\)](#).

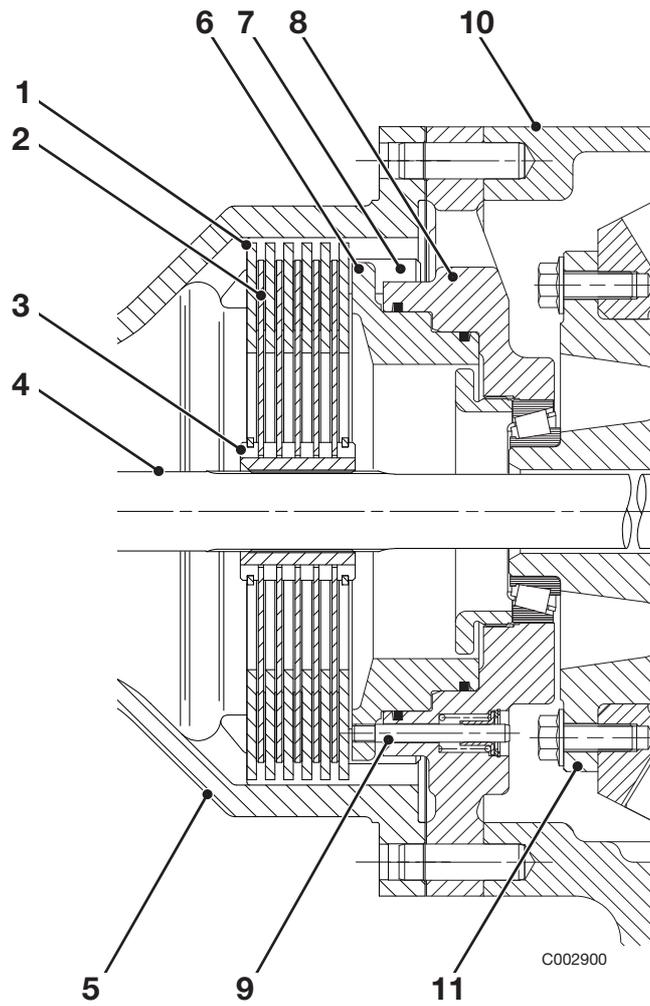


Fig 4. Location Drawing 450/00003 \_11\_19

See [⇒ Component Key \(□ C-12\)](#).

## Dismantle

See → [Fig 5. \(□ C-15\)](#).

It is recommended that the axle be removed from the machine when dismantling the rear axle brakes.

### Brake Pack

**Note:** Before dismantling it is good practice to match mark components for alignment and identify them as right and lefthand to ensure correct assembly.

- 1 Remove bolts 1. Use a heavy duty (6 point) socket to unscrew them.
- 2 Carefully separate the stub axle arm from the drive head. If necessary tap the casing with a soft faced hammer. Remove all traces of the old sealant from the mating faces.

**Note:** The brake pack comprises five friction plates and six counter plates. There are two counter plates 2, one at each end of the brake pack, which are not secured to the plate carrier 3. If the plates are to be reused, note their positions and which way round they are then withdraw the brake pack.

- 3 Remove the circlip 4. If the brake pack is to be reused, note the positions of the plates before removing them.
- 4 The wear limit of friction plates is to the depth of the cross hatching A. Check all plates for flatness and damage. (Some scoring of the counter plates is normal.) Renew the brake pack complete if worn or damaged. Do not renew individual plates.
- 5 Remove the three reaction pins 5. Inspect for damage.

**Important: Controlled retraction piston type** - If new brake and friction plates are being fitted, new brake back off pins 12 and tension bushes 13 must also be fitted. Failure to do so could result in the brake being permanently on. See **Brake Piston and Seals - Controlled Retraction Type**.

### Brake Piston and Seals - Controlled Retraction Type

It is important that only one side at a time is dismantled to prevent damage to the bearings and preserve the crownwheel and pinion backlash setting.

Before removing the brake housing and piston assembly support the differential with a drive shaft or other suitable support, as shown at 6.

- 1 Match mark the brake piston housing 7 and the drive head. Undo four capscrews 9 and remove the brake housing and piston assembly.

**Note:** Do not disturb nut 10 otherwise the bearing pre load will have to be reset.

- 2 Remove the six retraction pin assemblies as follows:  
  
Remove circlips 11, remove back off pins 12, tension bushes 13 and springs 14.
- 3 Remove brake piston 15 from brake housing 7.
- 4 Remove and discard seals 16 and 17. Inspect the housing bore for damage and scoring. Nicks or cuts in the seals may be responsible for loss of brake fluid.

### Brake Piston and Seals - Positive Retraction Type

It is important that only one side at a time is dismantled to prevent damage to the bearings and preserve the crownwheel and pinion backlash setting.

Before removing the brake housing and piston assembly support the differential with a drive shaft or other suitable support, as shown at 6.

- 1 Match mark the brake piston housing 7 and the drive head. Undo four capscrews 9 and remove the brake housing and piston assembly.

**Note:** Do not disturb nut 10 otherwise the bearing pre load will have to be reset.

- 2 Remove the six retraction pin assemblies as follows:  
  
Remove back off pins 18 and springs 19.
- 3 Remove brake piston 15 from brake housing 7.
- 4 Remove and discard seals 16 and 17. Inspect the housing bore for damage and scoring. Nicks or cuts in the seals may be responsible for loss of brake fluid.

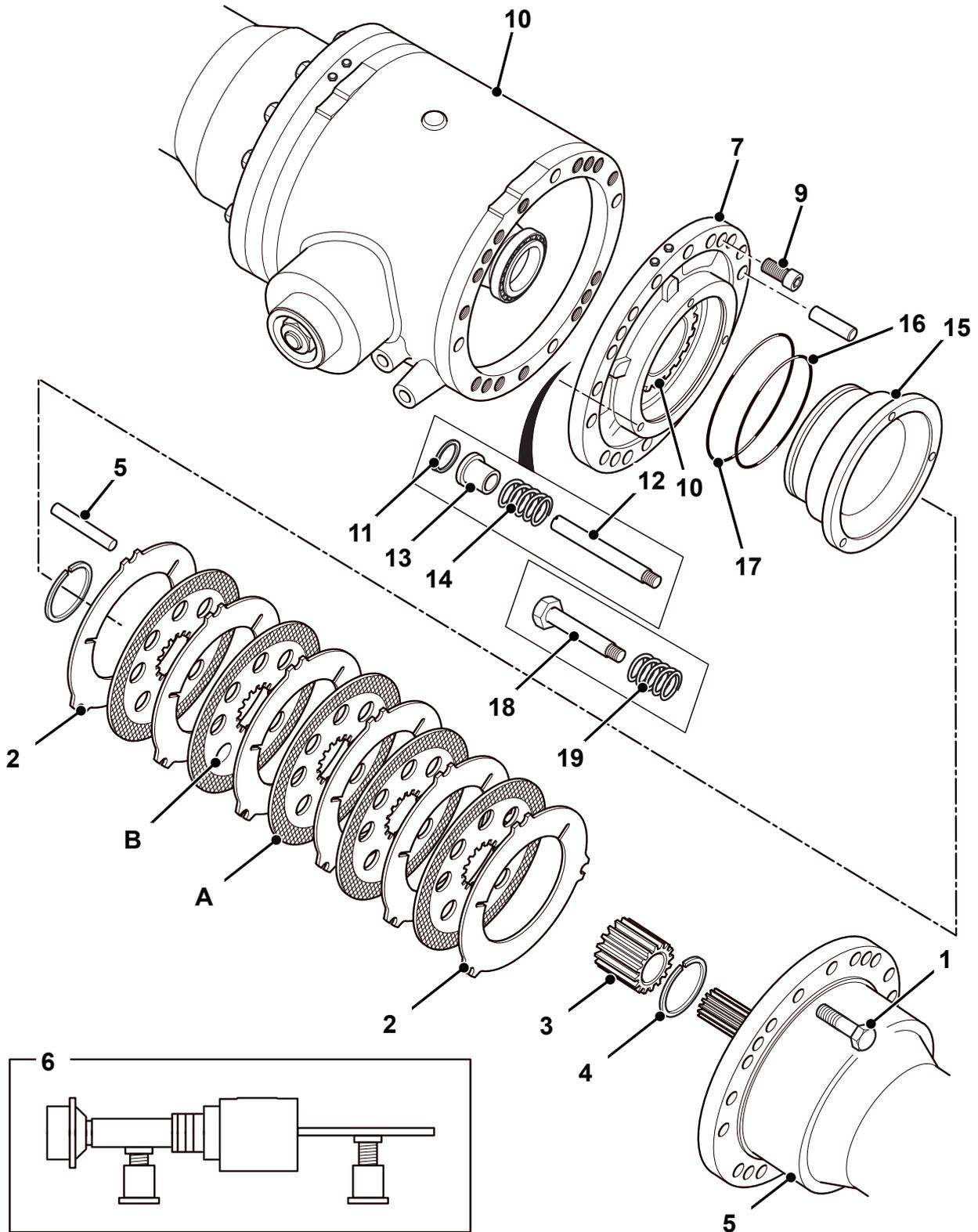


Fig 5. 70 Series Integral Brakes - 3 Piece Axles

C098200-C1

## Assemble

See → [Fig 5.](#) ([□ C-15](#)).

### Brake Piston and Seals - Controlled Retraction Type

- 1 Remove all traces of old sealant from the mating faces of the drive head and the brake piston housing.
- 2 Fit new seals **17** and **16**. Make sure they seat squarely in their grooves.
- 3 Apply JCB Threadlocker and Sealer to threads of back off pins **12**. Screw the back off pins **12** into the brake piston. Carefully press the piston **15** all the way into its housing **7**. Make sure the brake back off holes in the piston and housing align.
- 4 Fit the springs **14** over the back off pins.
- 5 Place the tension bush **13** over the back off pin **12**. Using a suitable tool (steel tube) drive the tension bush onto the back off pin using a soft face hammer until the circlip **11** can just be fitted.
- 6 Apply JCB Multigasket to the drive head mating face, then fit the brake piston housing assembly. Ensure that the match marks made during dismantling are aligned.
- 7 Fit capscrews **9** and torque tighten to 56 Nm (42 lbf ft, 5.7 kgf m).
- 8 Remove the differential support.

### Brake Piston and Seals - Positive Retraction Type

- 1 Remove all traces of old sealant from the mating faces of the drive head and the brake piston housing.
- 2 Fit new seals **17** and **16**. Make sure they seat squarely in their grooves.
- 3 Carefully press the piston **15** all the way into its housing **7**. Make sure the brake back off holes in the piston and housing align.
- 4 Apply JCB Threadlocker and Sealer to threads of back off pins **18**. Fit the springs **19** over the back off pins. Screw the back off pins **12** into the brake piston.
- 5 Apply JCB Multigasket to the drive head mating face, then fit the brake piston housing assembly. Ensure

that the match marks made during dismantling are aligned.

- 6 Fit capscrews **9** and torque tighten to 56 Nm (42 lbf ft, 5.7 kgf m).
- 7 Remove the differential support.

### Brake Pack

**Important: Controlled retraction piston type** - If new brake and friction plates are being fitted, new brake back off pins **12** and tension bushes **13** must also be fitted. Failure to do so could result in the brake being permanently on. See **Brake Piston and Seals - Controlled Retraction Type**.

- 1 Assemble the five friction plates and six counter plates **2** onto the brake carrier **3**. If the original brake pack is being reused, return the plates to their original positions, refer to → [Dismantle](#) ([□ C-14](#)). Soak new friction plates in JCB Special Gear Oil before assembly. Fit circlip **4**.

**Note:** On assembly of the brake packs, the oil flow holes **B** must be aligned with each other when being fitted to the brake pack carrier.

- 2 Locate the three reaction pins **5** into their grooves, securing them with grease. Push the pins fully into their location holes in the housing.
- 3 Install one counter plate **2** into the housing securing it in place with grease, then the brake pack, then the other counter plate. Return reused counter plates to their original positions. Push the brake pack fully home.
- 4 Apply JCB Multigasket to the mating face of the drive head, and JCB Threadlocker and Sealer to the threads of bolts **1**. Locate the stub axle arm onto the drive head, ensure that the match marks made during dismantling are aligned.
- 5 Fit bolts **1** and torque tighten.

**Note:** Check the grade of bolts fitted. Grade 8.8 should be tightened to 244 Nm (178lbf ft, 24.9 kgf m), grade 12.9 should be tightened to 400 Nm (295 lbf ft, 40.8 kgf m).



## Section C - Axle Integral Brakes 70 Series Integral Brakes (3 Piece Axles)

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Dismantle And Assemble

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# 85 Series Integral Brakes (3 Piece Axles)

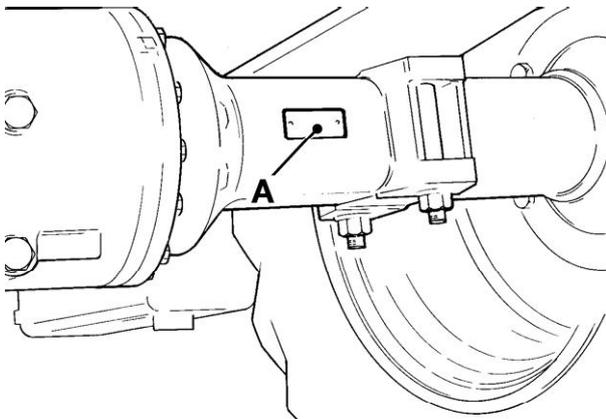
## Technical Data

**Note:** *Technical data may differ between axle variants and installations. For full data relating to specific axles refer to the applicable machine Service Manual.*

### Unit Identification

The axle serial number is stamped on the unit identification plate **6-A**.

When ordering replacement parts, always quote the details on the unit identification plate. In the case of gear replacements, always check the part number stamped on the gear, and the number of teeth.



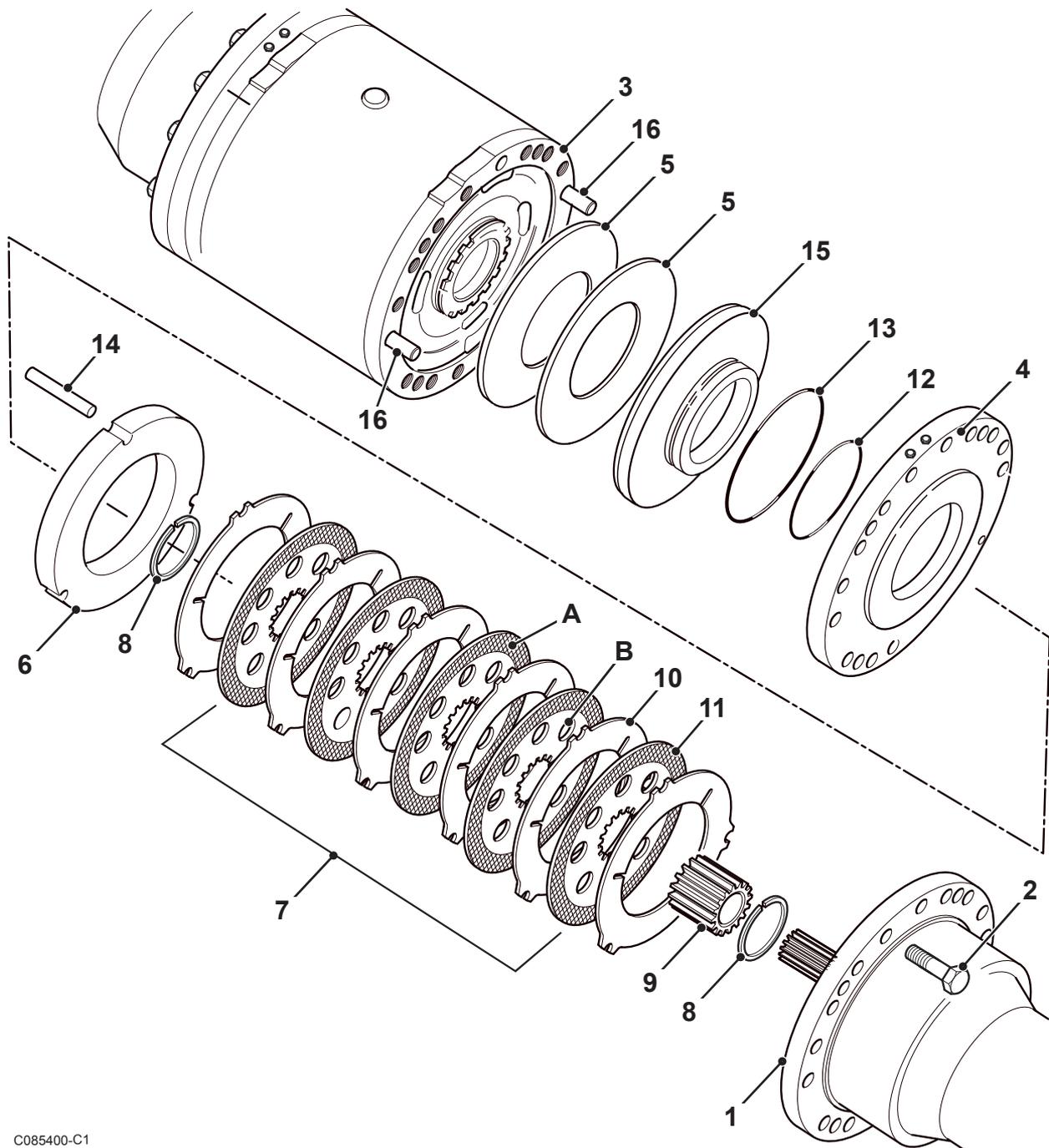
**Fig 6.**



## **Service Tools**

There are no specific service tools required to enable dismantling and assembly.

**Dismantle and Assemble**



C085400-C1

**Fig 7. Integral Brake**

**Table 1. Component Key**

Item	Description
<a href="#">⇒ Fig 7. (□ C-20)</a>	
1	Axle arm / brake housing
2	Bolts
3	Drive head
4	Brake piston housing
5	Brake - disc springs
6	Pressure plate
7	Brake pack
8	Circlip
9	Brake pack hub
10	Counter plate
11	Friction plate
12	Seal
13	Seal
14	Reaction pin
15	Brake piston
16	Dowel

There is a brake assembly in the left and right side axle arm. The procedures for both assemblies are the same. The procedures that follow are for one brake assembly.

### Dismantle

[⇒ Fig 7. \(□ C-20\)](#)

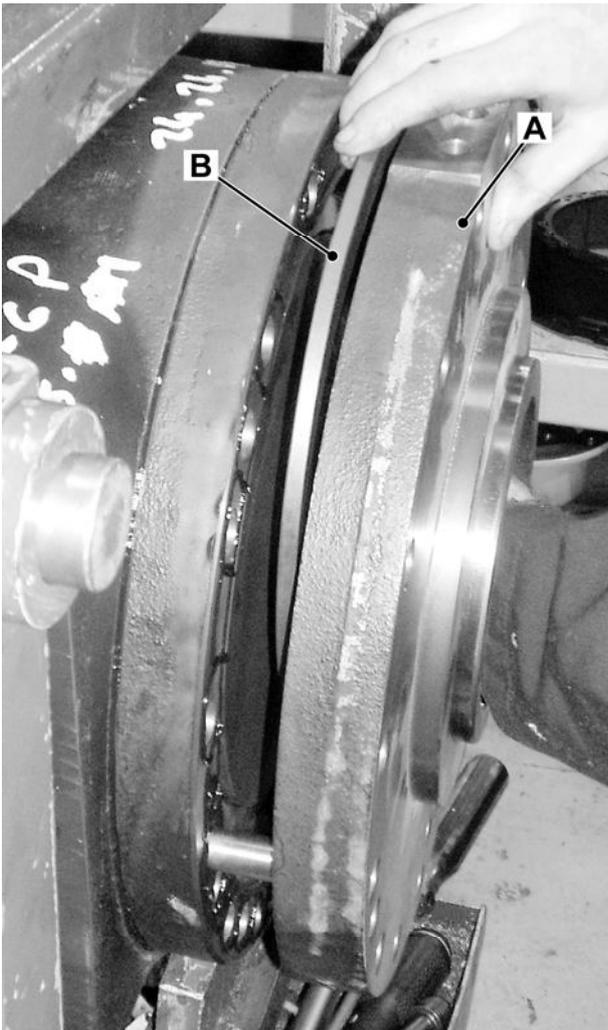
- 1 It is recommended that the axle be removed from the machine when dismantling the axle brakes.

**Note:** Before dismantling it is good practice to match mark components for alignment and identify them as right and left hand to ensure correct assembly.

- 2 Remove the driveshaft. **See 85 Series Driveshaft.**
- 3 Support the axle arm **1**. Remove bolts **2**. Use a heavy duty (6 point) socket to unscrew them.
- 4 Carefully withdraw the axle arm from the drive head **3** together with the brake piston housing **4** and two disc springs **5**. If necessary tap the axle arm and drivehead casing with a soft faced hammer. Remove all traces of the old sealant from the mating faces.

**Note:** The brake pack comprises five friction plates and six counter plates. If the counter plates at each end of the brake pack are to be reused, note their positions and which way round they are when removing the brake pack.

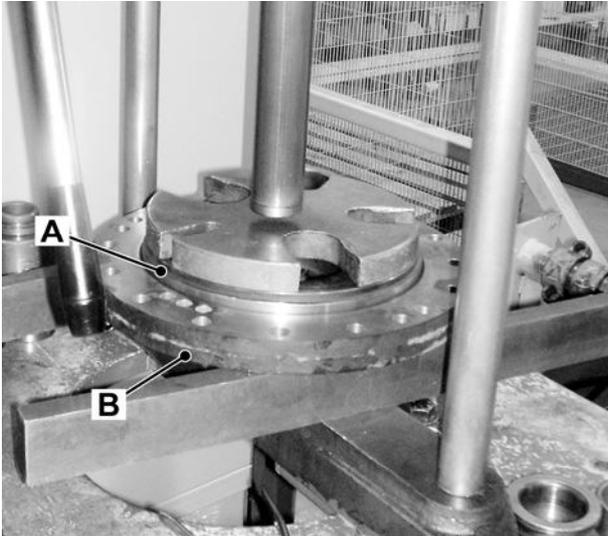
- 5 Remove the pressure plate **6**. Remove the brake pack **7**. Be sure to remove the inner most counter plate.
- 6 Remove one circlip **8**. If the brake pack is to be reused, note the positions of the plates before removing them. Remove the plates **10** and **11**.
- 7 The wear limit of friction plates **11** is to the depth of the cross hatching **A**. Check all plates for flatness and damage. (Some scoring of the counter plates is normal.) Renew the complete brake pack if worn or damaged. Do not renew individual plates.
- 8 Remove the three reaction pins **14**. Inspect for damage.
- 9 Remove brake piston **15** from brake housing **4**.
- 10 Remove and discard seals **12** and **13**. Inspect the housing bore for damage and scoring. Nicks or cuts in the seals may be responsible for loss of brake fluid.



**Fig 8. Removing the brake piston housing and disc springs**

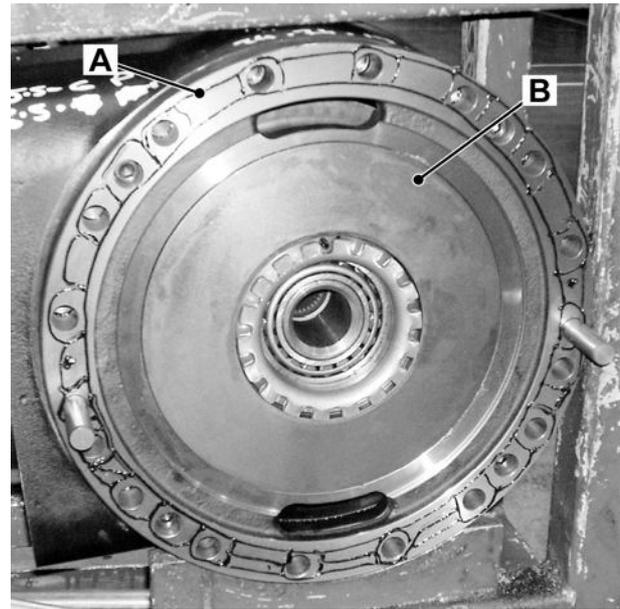
## Assemble

⇒ [Fig 7.](#) (□ C-20)



**Fig 9. Brake piston and housing assembly**

- 1 Fit new brake piston seals **12** and **13**. Make sure the seals are lubricated with the correct clean hydraulic oil before assembly. Make sure they sit squarely in their grooves. Assemble the brake piston **15** to the housing **4** using the correct tools.
- 2 Remove all traces of old sealant from the mating faces of the drive head **3** and the brake piston housing **4**. Make sure that the faces are clean and undamaged.



**Fig 10. Inner disc spring location**

- 3 Fit inner brake disc spring **5** to the differential bearing carrier on the drive head **3**. Make sure it is the correct way round. ⇒ [Fig 12.](#) (□ C-24)
- 4 Apply JCB Multigasket to the drive head mating face **3**.
- 5 Locate the brake piston housing **4** on the dowels **16** and at the same time fit the outer brake disc spring **5**. Make sure the disc spring is the correct way round. ⇒ [Fig 12.](#) (□ C-24)

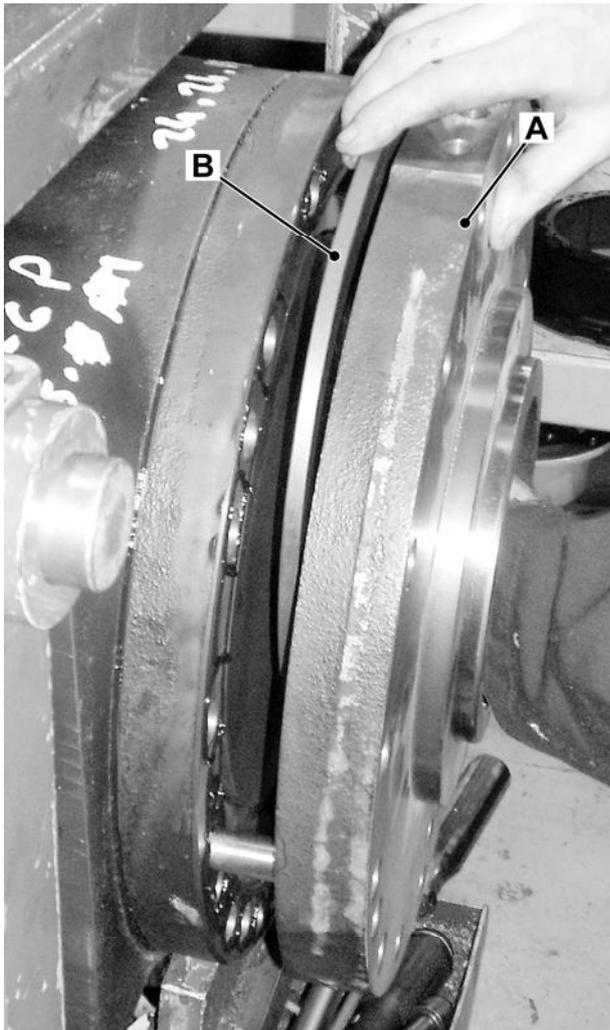


Fig 11.

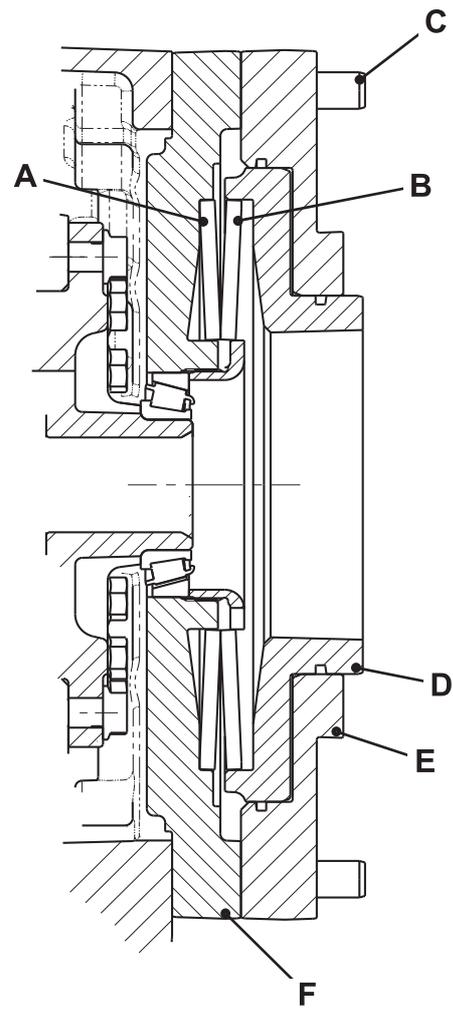
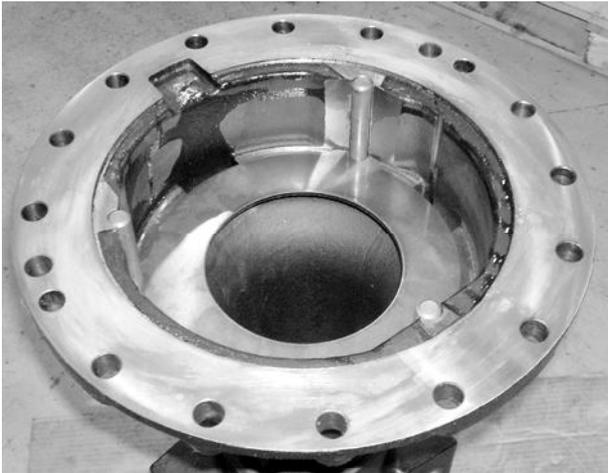


Fig 12.

**Table 2. Brake Piston Assembly**

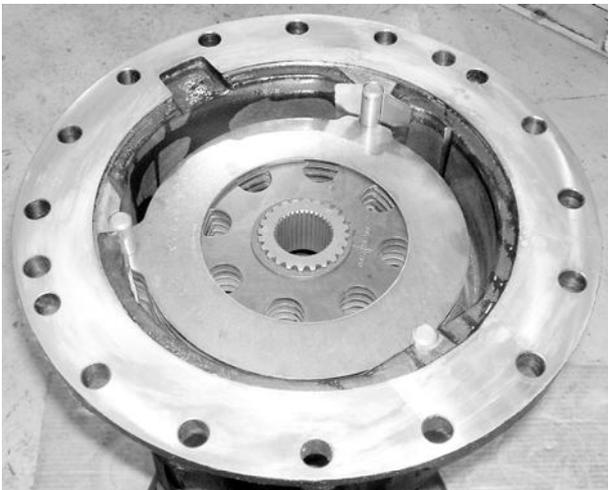
Item	Description
<a href="#">⇒ Fig 12. (□ C-24)</a>	
A	Inner brake disc spring
B	Outer brake disc spring
C	Dowel
D	Brake release piston
E	Brake piston housing
F	Drive head differential bearing carrier



**Fig 13. Inner counter plate**



**Fig 15. Pressure plate**



**Fig 14. Brake pack and outer counter plate**

- 6** Assemble five friction plates **11** and four counter plates **10** to the hub **9**. Fit circlip **8**. If the original brake pack is being reused, return the plates to their original positions. Soak new friction plates in JCB Special Gear Oil before assembly.

**Note:** On assembly of the brake packs, the oil flow holes **B** must be aligned with each other when being fitted to the brake pack carrier. Make sure that the plate lugs are aligned with the reaction pins.

- 7** Fit three reaction pins **14** to the axle arm brake housing.
- 8** Fit a counter plate **10** to the axle arm brake housing. Locate the plate on the reaction pins **14**.
- 9** Fit the brake pack to the axle arm brake housing. Make sure all the counter plates are located on the reaction pins **14**.
- 10** Fit a counter plate **10** followed by the the pressure plate **6** to the axle arm brake housing. Locate the plates on the reaction pins **14**.
- 11** Remove all traces of old sealant from the mating faces of the brake piston housing and the axle arm. Make sure that the faces are clean and undamaged.
- 12** Apply JCB Multigasket to the brake piston housing mating face **4**, then fit the axle arm with bolts **2**. Torque tighten the bolts sequentially to 244 Nm.



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