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Technical Guide

for

Ultimate Brake Upgrade

into

BMW M3 E9X

Installing this product indicates your acceptance of the responsibility and liability associated with the fitment and use of this product. Please ensure the owner and all drivers of the vehicle are aware of their responsibilities and liabilities as indicated below.

Thank you for purchasing this Harrop brake hardware upgrade kit which has been designed and made with pride in Australia.

It is the owner's/driver's responsibility to accept any consequences and liabilities of using the enhanced vehicle and any subsequent effect it may have. Harrop Engineering is to be held harmless and shall not be liable for any direct and/or indirect/consequential losses, costs, damages, expenses, injuries or liabilities whatsoever incurred by the owner/driver of the vehicle or other parties arising from this product, its installation and/or its operation.

Warranty

This Harrop brake hardware upgrade kit is covered by a limited warranty on components and workmanship for a period of 12 months from the date of purchase, subject to the following:

- Installation must be completed by a technician who has undertaken appropriate training.
- The enhanced vehicle has been driven in accordance with the conditions specified by the vehicle manufacturer's normal use of operation, driving care and vehicle service program.
- The enhanced vehicle has not been used for competitive racing.

No warranty shall apply where Harrop have determined improper fitment or handling, misuse in operation, neglect, or accident damage. Modifications made prior to or in conjunction with the Harrop brake hardware upgrade kit fitment may invalidate the Harrop limited warranty. Any warranty claims must be made immediately & directly to Harrop Engineering so that a determination can be made promptly. Involvement of a third party or an attempt to repair a perceived/actual fault may invalidate the warranty. To the extent of the law, the determination on any warranty claim & associated costs will be at the sole discretion of Harrop Engineering.

By installing the Harrop brake hardware upgrade kit you acknowledge that all conditions pertaining to this product and its operation have been read, understood and accepted.

Brake hardware upgrade installation guide.

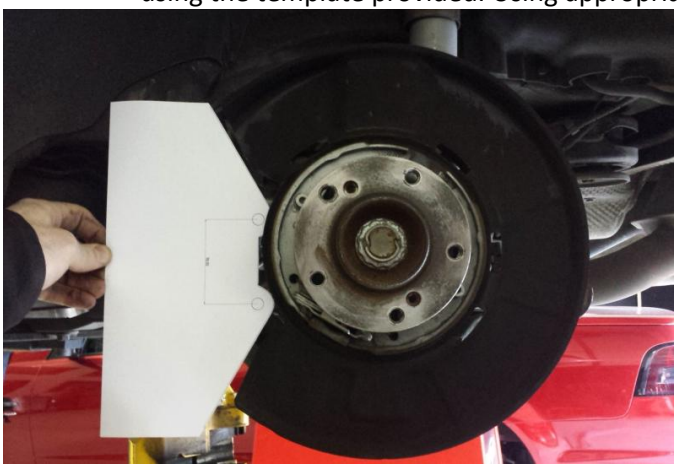
- Park the vehicle on level ground and place the transmission in neutral with the hand brake off.
- Ensure that the brake fluid reservoir is full and free from dirt etc.
- Raise the vehicle off the ground using appropriate equipment and remove the wheels.

Brake disassembly and Assembly.

- It is recommended to work on one wheel at a time.
- Rear Left → Rear Right→ Front Left→ Front Right.

Rear Brakes

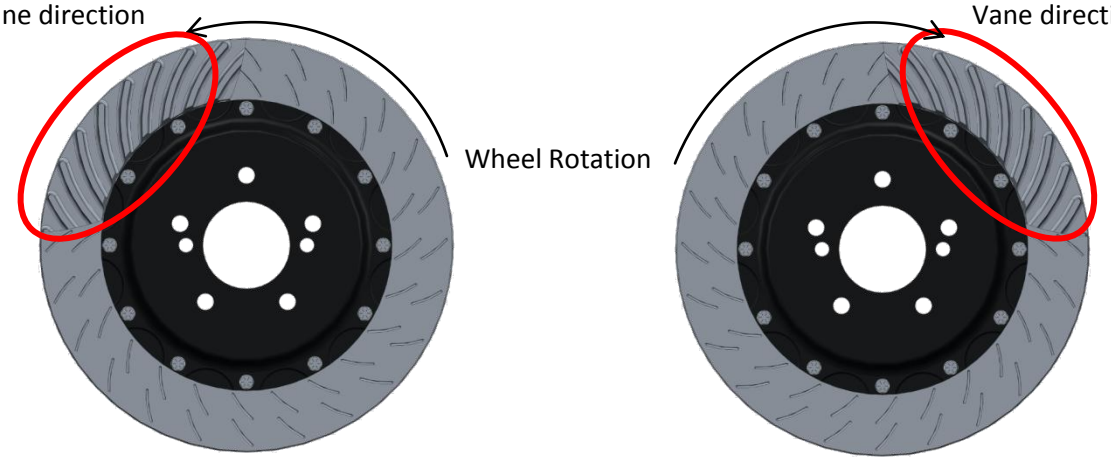
1. Remove the banjo bolt from the inlet port of the standard caliper and let the brake fluid drain into a container.
2. Remove the flexible brake hose at the end of the hard brake hose line.
3. Remove the brake pad wear sensor from the inside brake pad. (right hand side of car only)
4. Remove the two caliper mounting bolts that secure the standard caliper to the rear upright, slide the caliper off the rotor and set aside.
5. Remove the two set screws in the rear rotor, ensure the hand brake is off.
6. The standard rotor will be free to slide off the upright spigot; set aside.
7. To enable fitment of the rear harrop calipers the standard dust shield needs to be trimmed.
    - The template provided suits the M3 rear lug mounted calipers. Mark the dust shield using the template provided. Using appropriate tools, trim the dust shield as shown.



8. Remove all sharp edges using a file.
9. Slide the rear rotor onto the hub and secure with the two set screws removed in step 4. Note: the rotors and left and right handed.

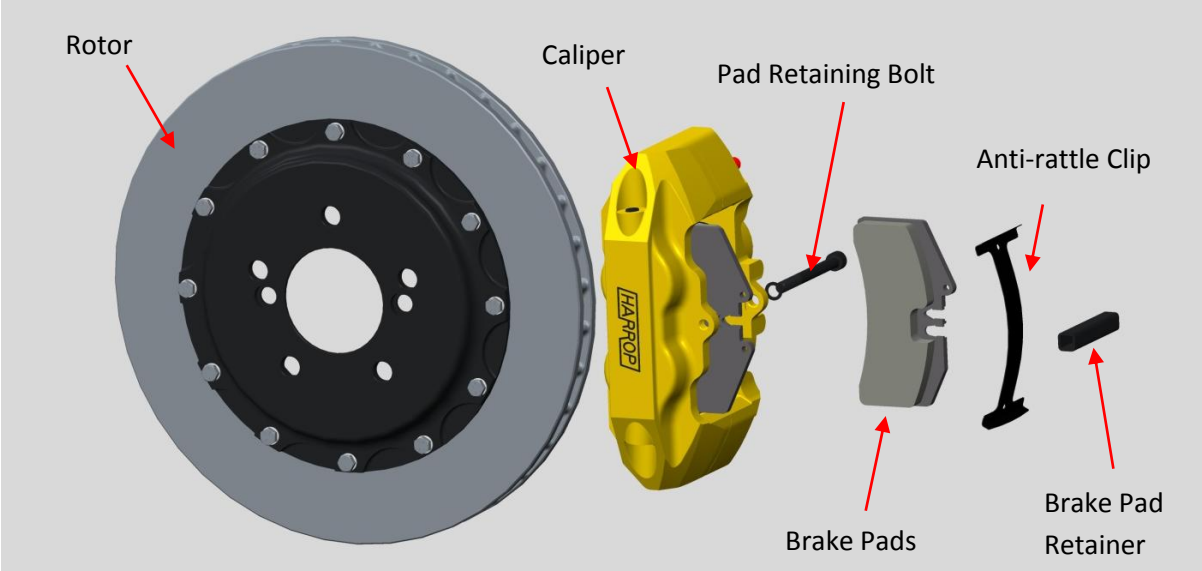
Left Hand Rotor
Vane direction

Right Hand Rotor
Vane direction

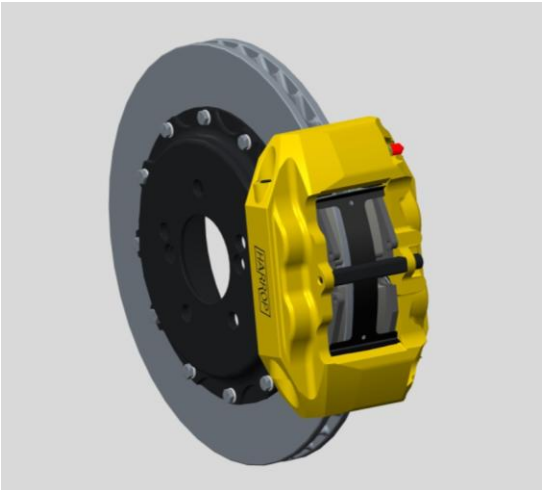


10. Slide the rear caliper onto the rotor and locate on the caliper mounting lugs. Use the caliper mounting bolts to secure the Harrop caliper, tighten by hand. (Use blue loctite 243 or equivalent on bolts.)

11. Ensure that the caliper lugs are seated squarely onto the standard upright. Tighten the caliper mounting bolts to 110Nm.
12. Fit the new brake hose supplied to the end of the hard brake line.
13. Connect the new brake hose to the caliper inlet port using the banjo bolt and two new copper sealing washers supplied. Tighten to 35 Nm.
    Do not apply loctite to the Banjo Bolt.
14. Install the brake pad wear sensor. The inside brake pad has a cut out for the brake pad wear sensor. If the old sensor has not touched the rotor it can be reinstall otherwise a new sensor will be needed. (rear right caliper only).
15. Ensure that the pads, anti-rattle clip and pad retainer are all in place and seated correctly. Apply blue loctite 243 or equivalent to the M8 pad retaining bolt thread and tightened to 15 Nm.
16. Rear Left brake assembly complete.
    Repeat Process for the rear right brake assembly.



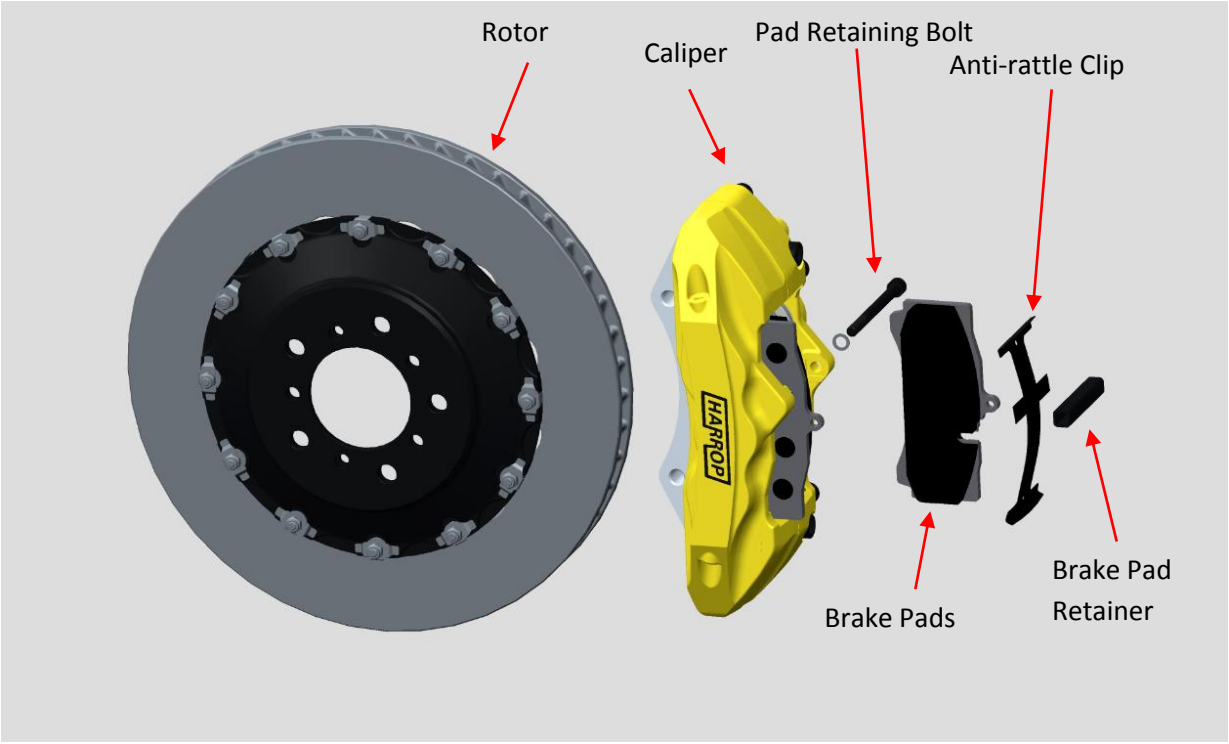
Assembled caliper with pads, anti-rattle clip and pad retaining bolt correctly seated.
Note: Brake pad retainer and anti-rattle clip as shown below.



Front Brakes

1. Remove the banjo bolt from the inlet port of the standard caliper and let the brake fluid drain into a container.
2. Remove the flexible brake hose at the end of the hard brake hose line.
3. Remove the two caliper mounting bolts that secure the standard caliper to the front upright, slide the caliper off the rotor and set aside.
4. Remove the two set screws in the front rotor.
5. The standard rotor will be free to slide off of the upright spigot; set aside.
6. Slide the front rotor onto the hub and secure with the two set screws removed in step 4.
7. Slide the caliper onto rotor and locate on the mounting bosses on the upright. Secure in place with the standard caliper mounting bolts.(Use blue loctite 243 or equivalent on bolts.)
8. Ensure that the caliper lugs are seated squarely onto the standard upright and tighten the caliper mounting bolts to 110Nm.
9. Fit the new brake hose supplied to the end of the hard brake line.
10. Connect the new brake hose to the caliper inlet port using the banjo bolt and two new copper sealing washers supplied. Tighten to 35 Nm.
    Do not apply loctite to the Banjo Bolt.
11. Install the brake pad wear sensor. The inside brake pad has a cut out for the brake pad wear sensor. If the old sensor has not touched the rotor it can be reinstall otherwise a new sensor will be needed. (both front callipers).
12. Ensure that the pads, anti-rattle clip and pad retainer are all in place and seated correctly. Apply blue loctite 243 or equivalent to the M8 pad retaining bolt thread and tightened to 15 Nm.
13. Front left brake assembly complete.

    Repeat Process for the front right brake assembly.



Assembled caliper with pads, anti-rattle clip and pad retaining bolt correctly seated.
Note: Brake pad retainer and anti-rattle clip as shown below.

Hydraulic bleeding of brake system

It is critical to remove all air and old fluid from the brake hydraulic system for effective operation.

Bleeding should be carried out as per standard practices noting the following:

- Have an assistant apply the brake pedal as the brake calipers are bled one at a time.
- Start at the rear left then rear right followed by front left then front right.
- Avoid excessive pedal pressure when bleeding the hydraulic system. Stomping on the pedal can cause the brake system to isolate the open caliper, making further bleeding impossible until the isolating valve is reset.
- Ensure that the fluid reservoir never empties and is re-filled once bleeding is complete.
- The new brake system should be bed-in per standard practices.
- The friction material supplied with Harrop brake hardware is a 'best fit' in terms of brake performance, pad and rotor life with noise, vibration and harshness minimisation.

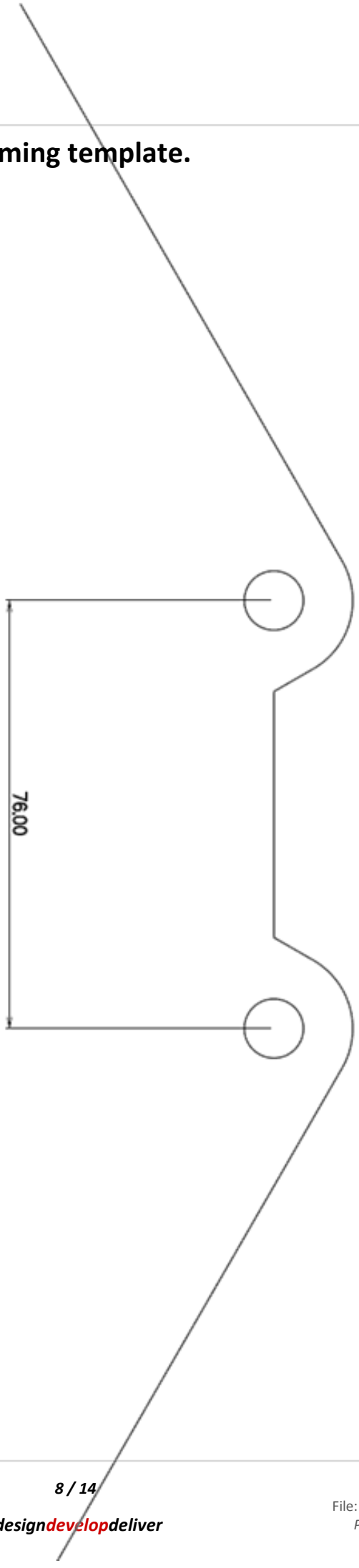
Bedding New Pads and Discs

- While the vehicle is stationary pump the brakes to ensure a firm pedal.
- Drive the vehicle cautiously to check the function of the brakes.
- Brakes should be smooth with no harsh shudder.
- The car should pull up evenly, not pull to either side.
- In a safe location perform at least 30 applications of the brakes, starting slow and gradually building up speed.
- The Brake pads should now be bed to the disc and the system is ready for normal use.

Important note:

Larger rotors, rotor slots, pad material, wheel and tyre combination and suspension modifications can all contribute to increased apparent brake noise. Harrop brakes are tested and developed to maximise performance while minimising brake noise on otherwise standard vehicles. As it is impossible to account for the countless combinations of aftermarket components and modifications available for your vehicle platform, some installs may exhibit more brake noise than others.

Rear dust shield trimming template.



Brake Pads

Replacement brake pads can be ordered through Harrop on: 03 9474 0900

If you wish to source pads independently the details are listed below.

Front:

Bendix Brakes DB1933

Or

Ferodo DS3000

Machined as per drawing 4864-05

Sensor cut out machined as per drawing 11595-0

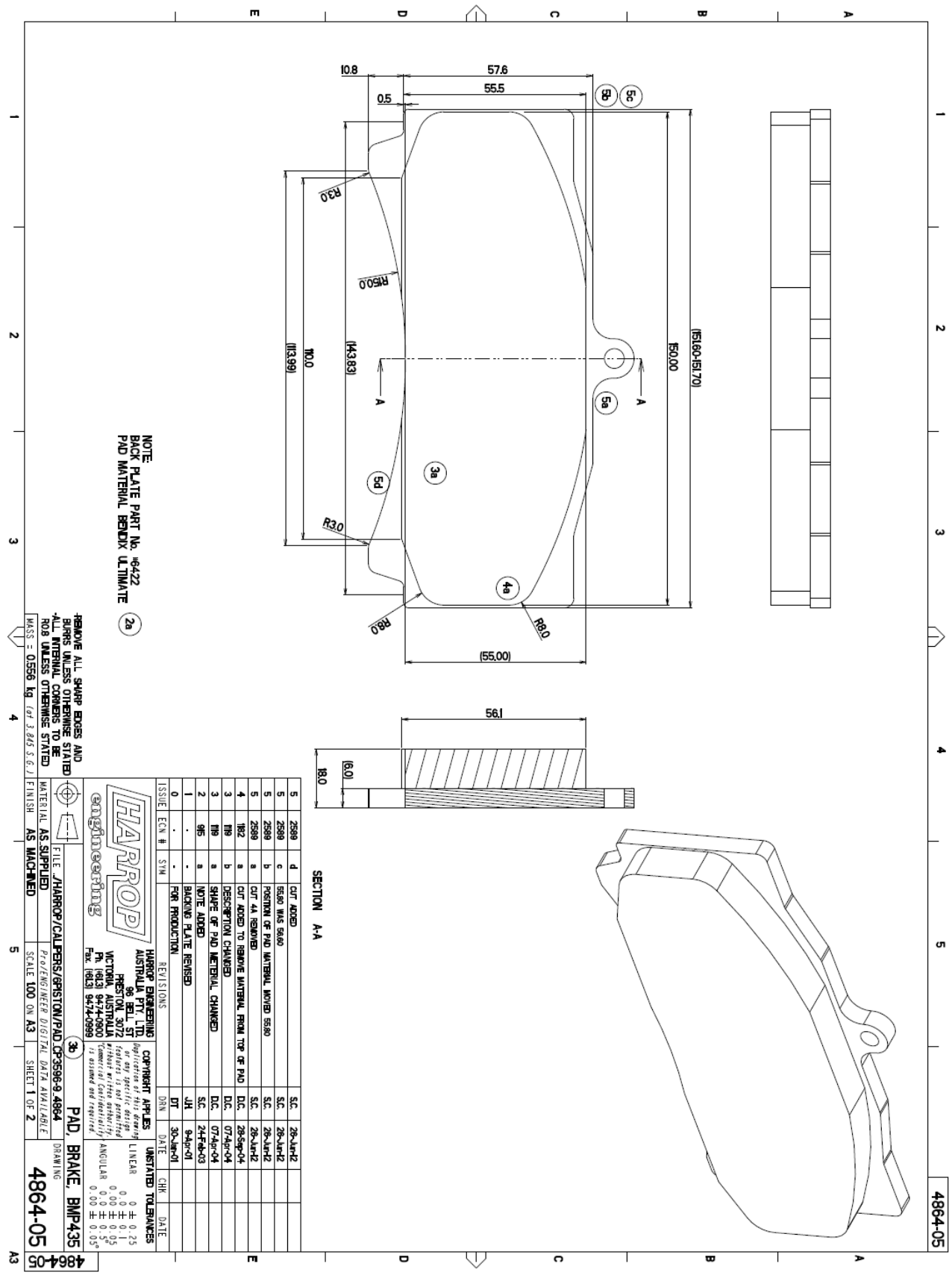
Rear:

Bendix Brakes DB439

Or

Ferodo DS2500

Sensor cut out machined as per drawing 12158-0


10.8
57.6
55.5
0.5
R30
R50.0
110.0
(113.99)
(43.83)
150.00
(151.60-151.70)
R3.0
R8.0
R8.0
(55.00)
56.1
18.0
(6.0)
SECTION A-A
NOTE:
BACK PLATE PART No. 6422
PAD MATERIAL BENDIX ULTIMATE
-REMOVE ALL SHARP EDGES AND BURRS UNLESS OTHERWISE STATED
-ALL INTERNAL CORNERS TO BE R0.8 UNLESS OTHERWISE STATED
MASS = 0.556 kg (of 3.845 g/cm³)
MATERIAL AS SUPPLIED
FINISH AS MACHINED
SCALE 1.00 ON A3
SHEET 1 OF 2
Pro/ENGINEER DIGITAL DATA AVAILABLE
FILE ../HARROP/CALPERS/GRNSTON/PAD_CP3596-9.4864
HARROP engineering
HARROP ENGINEERING AUSTRALIA PTY. LTD.
96 BELL ST
PRESTON, 3072
VICTORIA, AUSTRALIA
Ph. (613) 9474-0900
Fax. (613) 9474-0999
COPYRIGHT APPLIES
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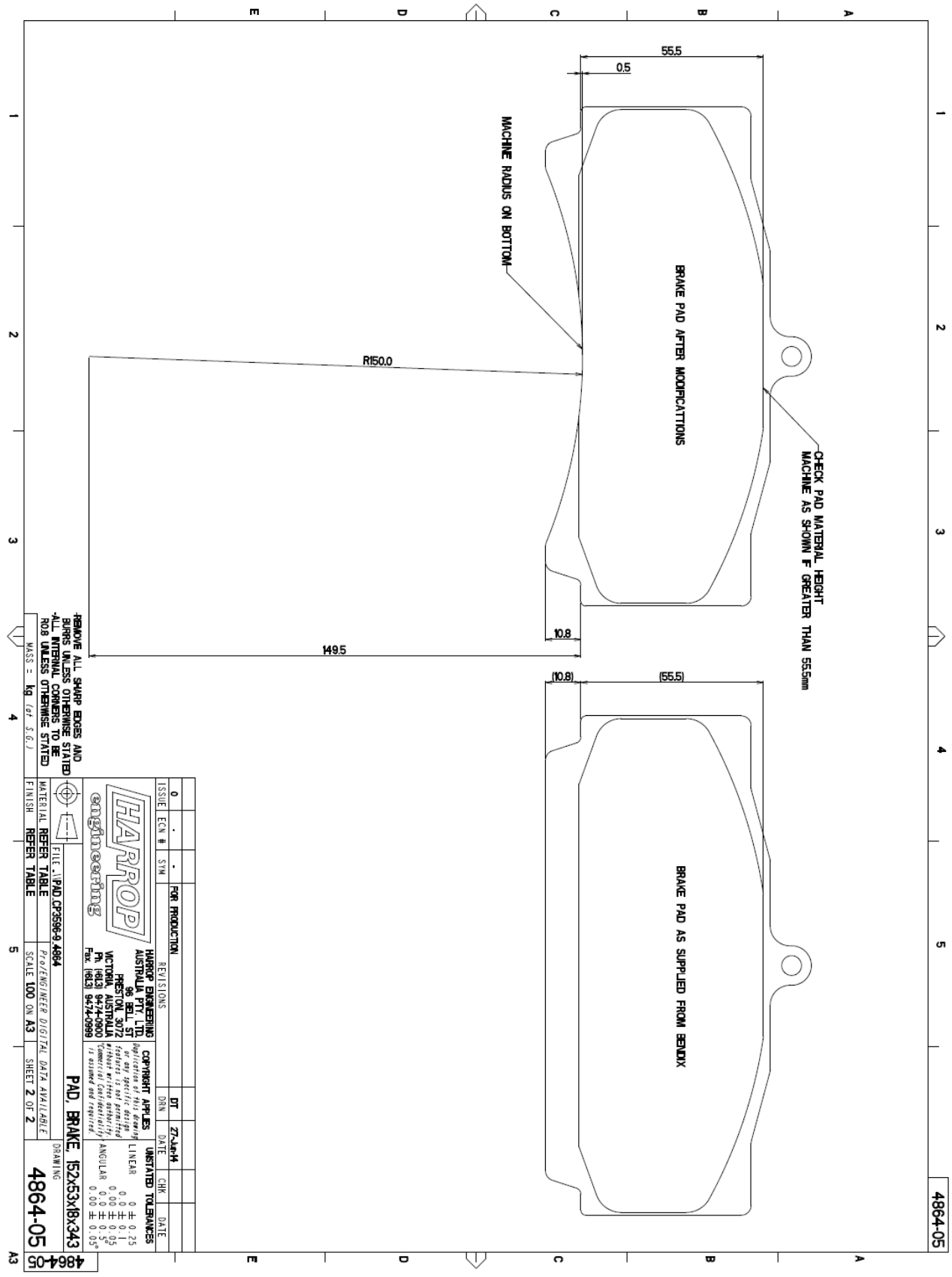
UNSTATED TOLERANCES
LINEAR
0 ± 0.25
0.0 ± 0.1
0.00 ± 0.05
ANGULAR
0.0° ± 0.5°
PAD, BRAKE, BMP435
DRAWING
4864-05
4864-05
A3
REVISIONS
ISSUE | ECN # | SYM | FOR PRODUCTION | DRN | DATE | CHK | DATE
5 | 2589 | d | CUT ADDED | S.C. | 28-Jun-12
5 | 2589 | c | 55.80 WAS 56.60 | S.C. | 28-Jun-12
5 | 2589 | b | POSITION OF PAD MATERIAL MOVED 55.80 | S.C. | 28-Jun-12
5 | 2589 | a | CUT 4A REMOVED | S.C. | 28-Jun-12
4 | 1182 | a | CUT ADDED TO REMOVE MATERIAL FROM TOP OF PAD | D.C. | 28-Sep-04
3 | 119 | b | DESCRIPTION CHANGED | D.C. | 07-Apr-04
3 | 119 | a | SHAPE OF PAD MATERIAL CHANGED | D.C. | 07-Apr-04
2 | 95 | a | NOTE ADDED | S.C. | 24-Feb-03
1 | - | - | BACKING PLATE REVISED | JH | 9-Apr-01
0 | - | - | - | DT | 30-Jan-01
4864-05


55.5
0.5
MACHINE RADIUS ON BOTTOM
BRAKE PAD AFTER MODIFICATIONS
R150.0
CHECK PAD MATERIAL HEIGHT
MACHINE AS SHOWN IF GREATER THAN 55.5mm
10.8
149.5
(10.8)
(55.5)
BRAKE PAD AS SUPPLIED FROM BENDIX
4864-05
REMOVE ALL SHARP EDGES AND BURRS UNLESS OTHERWISE STATED
ALL INTERNAL CORNERS TO BE R0.8 UNLESS OTHERWISE STATED
MASS = kg (for S.G.)
MATERIAL REFER TABLE
FINISH REFER TABLE
FILE : IPAD_CP3596-9_4864
Pro/ENGINEER DIGITAL DATA AVAILABLE
SCALE 100 ON A3
SHEET 2 OF 2
PAD, BRAKE, 152x53x18x343
DRAWING
4864-05
4864-05
A3
REVISIONS
ISSUE 0
ECN # -
SYM -
FOR PRODUCTION
DRN DT
DATE 27-Jan-14
CHK
DATE
HARROP engineering
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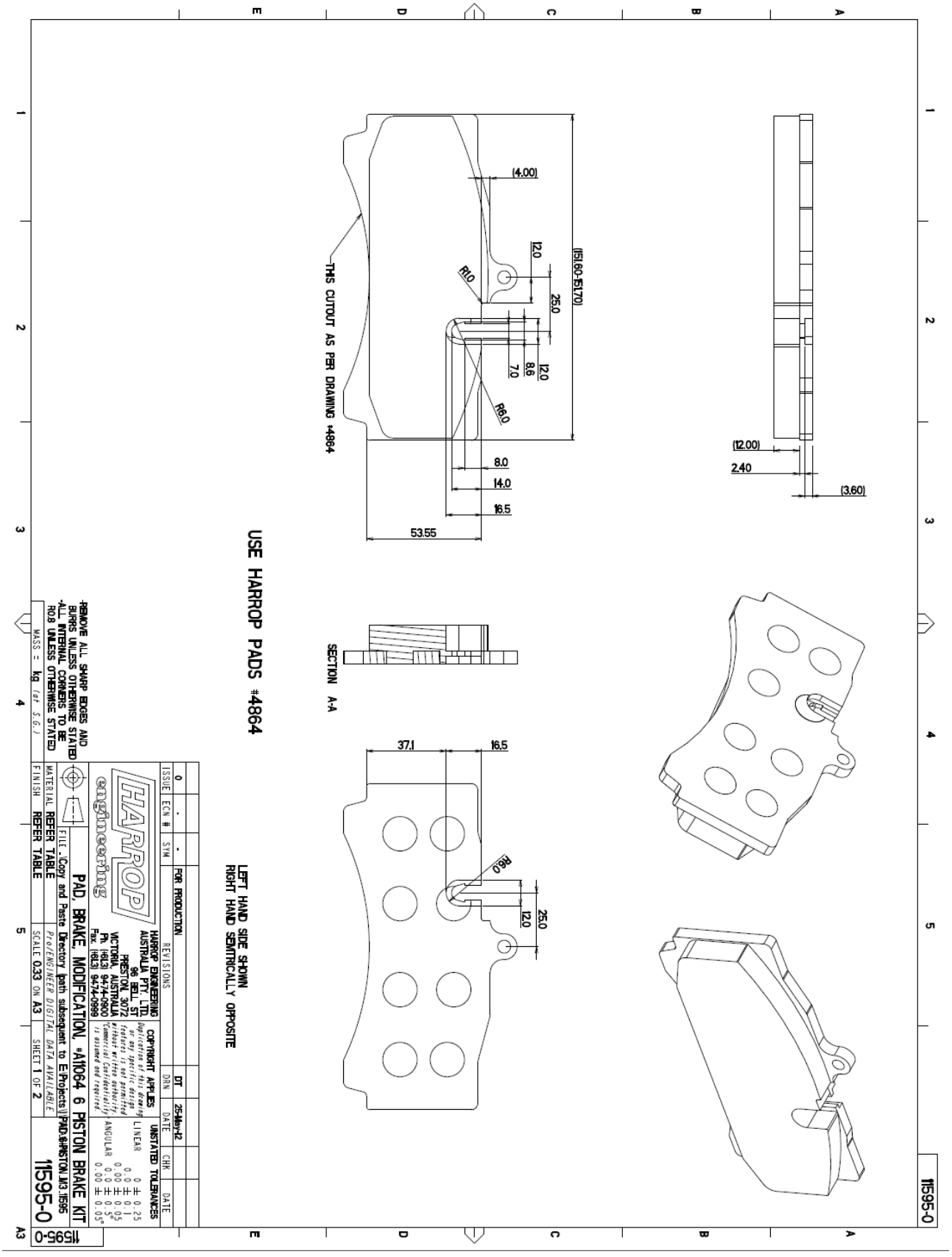
UNSTATED TOLERANCES
LINEAR
ANGULAR


USE HARROP PADS #4864
LEFT HAND SIDE SHOWN
RIGHT HAND SEMITMICALLY OPPOSITE
THIS CUTOUT AS PER DRAWING #4864
SECTION A-A
(4.00)
12.0
R10
25.0
12.0
8.6
7.0
R6.0
(151.60-151.70)
8.0
14.0
16.5
53.55
(12.00)
2.40
(3.60)
37.1
16.5
R6.0
12.0
25.0
11595-0
REMOVE ALL SHARP EDGES AND BURRS UNLESS OTHERWISE STATED
ALL INTERNAL CORNERS TO BE R0.8 UNLESS OTHERWISE STATED
MASS = kg (qty 1 6.)
FINISH REFER TABLE
MATERIAL REFER TABLE
SCALE 0.33 ON A3
SHEET 1 OF 2
PAD, BRAKE, MODIFICATION, #A1064 6 PISTON BRAKE KIT
FILE .Copy and Paste Directory path subsequent to E:\Projects\
Pro/ENGINEER DIGITAL DATA AVAILABLE
PAD-6PISTON.M3.1595
11595-0
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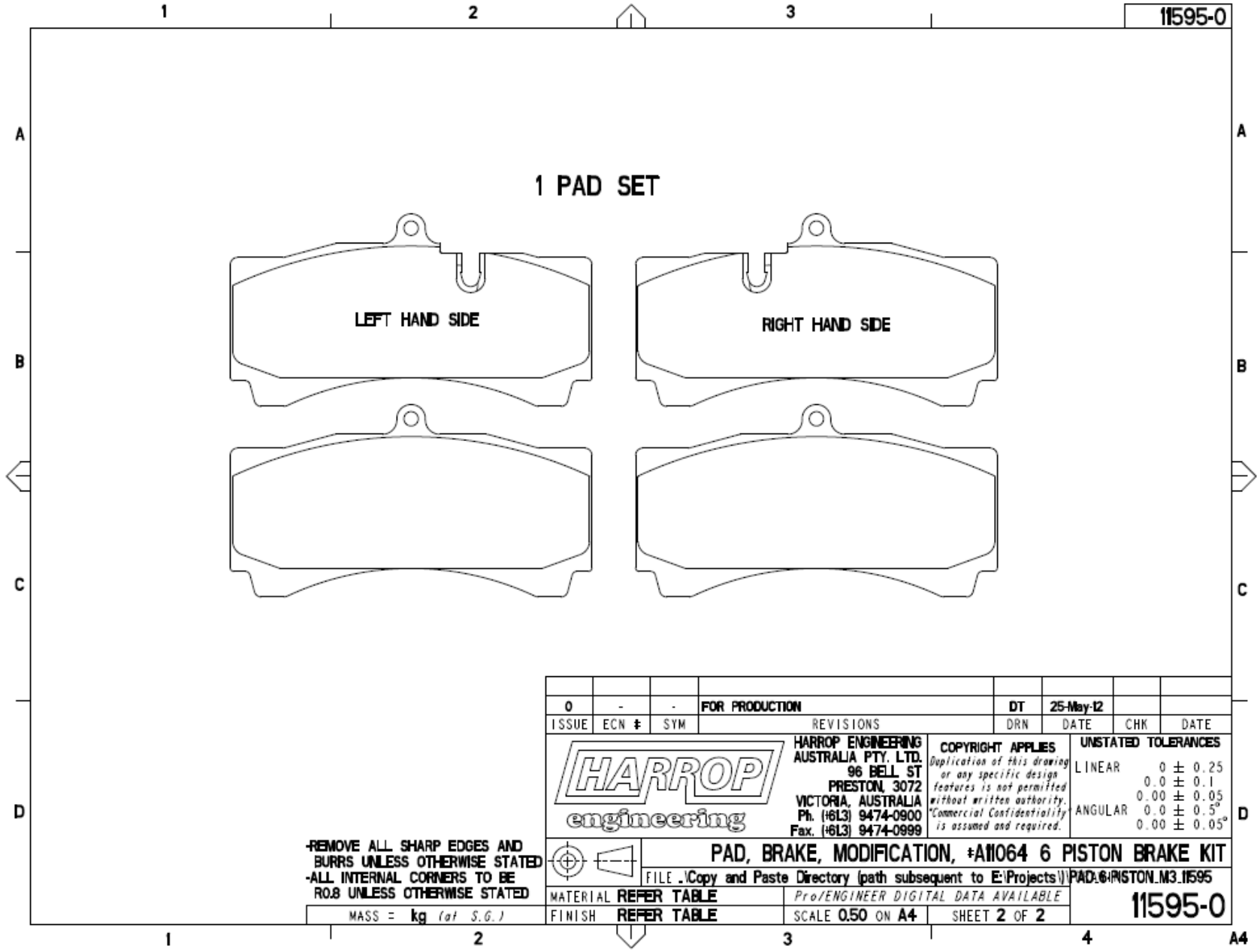
UNSTATED TOLERANCES
LINEAR
0 - 0 ± 0.25
0.0 - 0.0 ± 0.05
0.00 - 0.00 ± 0.05
ANGULAR
0.00 ± 0.05°
DRN DT 25-Nov-12
CHK DATE
DATE
ISSUE ECN # SYM REVISIONS
0 . . FOR PRODUCTION
11595-0
A3


11595-0
1 PAD SET
LEFT HAND SIDE
RIGHT HAND SIDE
0 - - FOR PRODUCTION DT 25-May-12
ISSUE ECN # SYM REVISIONS DRN DATE CHK DATE
HARROP engineering
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Fax. (+613) 9474-0999
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UNSTATED TOLERANCES
LINEAR 0 ± 0.25
0.0 ± 0.1
0.00 ± 0.05
ANGULAR 0.0 ± 0.5°
0.00 ± 0.05°
-REMOVE ALL SHARP EDGES AND BURRS UNLESS OTHERWISE STATED
-ALL INTERNAL CORNERS TO BE R0.8 UNLESS OTHERWISE STATED
PAD, BRAKE, MODIFICATION, #A11064 6 PISTON BRAKE KIT
FILE ..\Copy and Paste Directory (path subsequent to E:\Projects\)\PAD\6PISTON_M3_11595
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Pro/ENGINEER DIGITAL DATA AVAILABLE
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FINISH REFER TABLE
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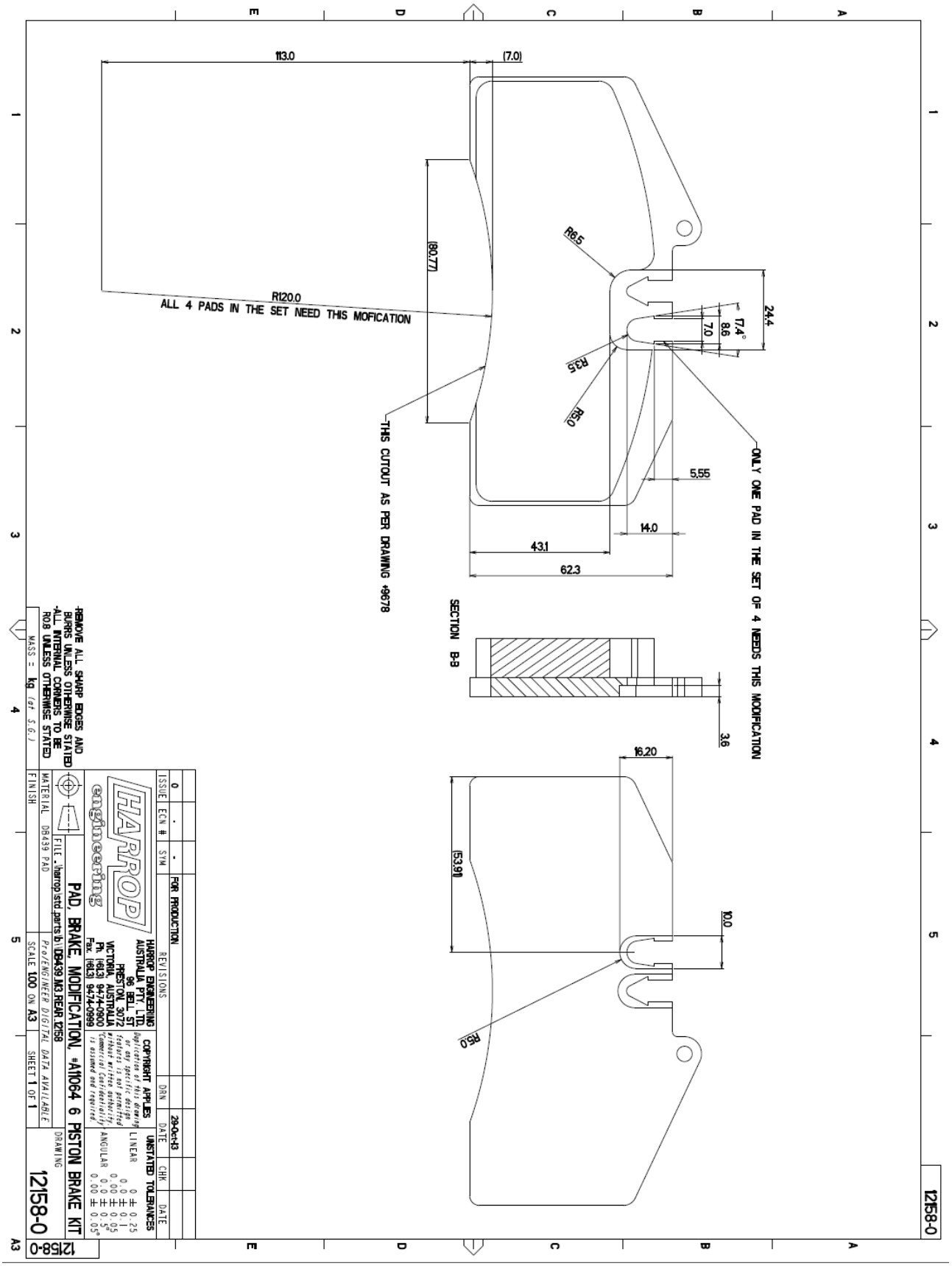
SHEET 2 OF 2
11595-0
1 2 3 4 A4


113.0
(7.0)
(80.77)
R120.0
ALL 4 PADS IN THE SET NEED THIS MOFICATION
R8.5
24.4
17.4°
8.6
7.0
R3.5
R5.0
THIS CUTOUT AS PER DRAWING #9678
ONLY ONE PAD IN THE SET OF 4 NEEDS THIS MODIFICATION
5.55
14.0
43.1
62.3
SECTION B-B
3.6
16.20
153.91
10.0
R5.0
-REMOVE ALL SHARP EDGES AND BURRS UNLESS OTHERWISE STATED
-ALL INTERNAL CORNERS TO BE R0.8 UNLESS OTHERWISE STATED
MASS = kg (at S.G.)
FINISH
MATERIAL DR439 PAD
SCALE 1.00 ON A3
SHEET 1 OF 1
Pro/ENGINEER DIGITAL DATA AVAILABLE
FILE: \harrop std parts \b1\DR439.M3.REAR.12158
PAD, BRAKE, MODIFICATION, #A11064 6 PISTON BRAKE KIT
DRAWING
12158-0
HARROP engineering
HARROP ENGINEERING AUSTRALIA PTY. LTD.
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UNSTATED TOLERANCES
LINEAR
0 0 ± 0.25
0.0 0 ± 0.1
0.00 0 ± 0.05
ANGULAR
0.0 0 ± 0.5°
0.00 0 ± 0.05°
ISSUE ECN # SYM REVISIONS DRN DATE CHK DATE
0 - - FOR PRODUCTION 29-Oct-13
12158-0
A3