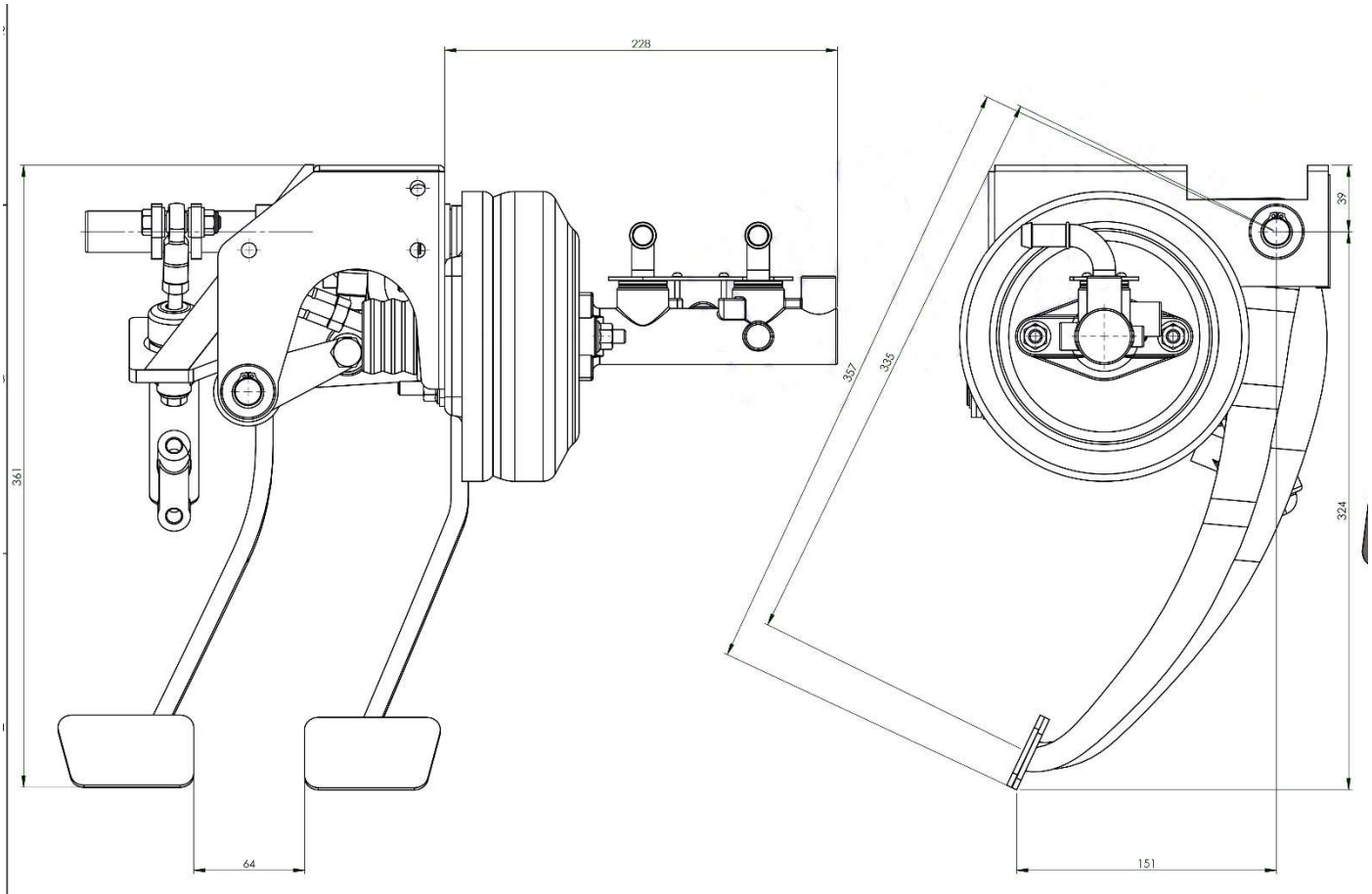


Under Dash Brake Booster

RRS PTY LTD of Sydney Australia has developed the Stealth under dash brake booster and master cylinder with or with clutch pedal box.



Contents

Cover & Content	1
Cover letter	2
Material list	3
Material list cont'd	4
Construction & conclusion	5
Construction & conclusion	6
Diagram Auto & Manual	7-8



RRS PTY LTD.
57/42-46 Wattle Road
Brookvale NSW 2100
Sydney Australia

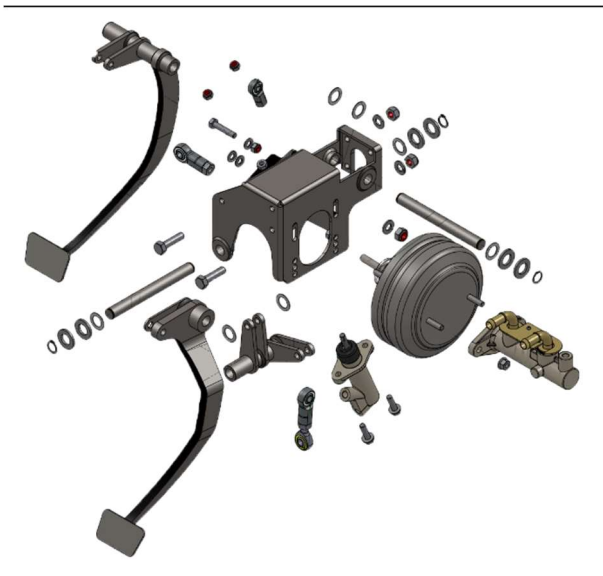
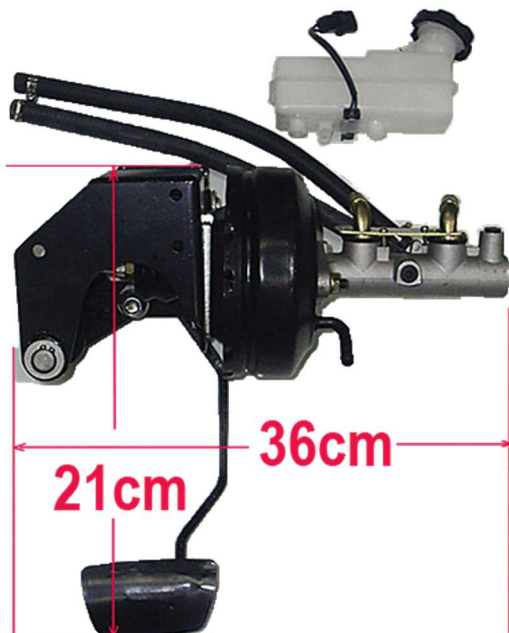
Ph: 61 2 9907 3755
Mob 61 417 226 693
Email: alex@rrs-online.com

STEALTH SS

The Stealth range was launched in 2009, RRS has sold thousands of units globally. The product is designed to clear the fire wall and free up the space, allowing for better serviceability of engines, enhances access to service components, increased airflow, and modernizing the brake system, to tandem master cylinder.

Company Background: RRS Pty Ltd was formed in 2000 under the banner of Revelation Racing Supplies, renamed in 2010 to RRS. RRS builds aftermarket suspension, steering, and braking products for a specific family of Ford/Mercury cars made between 1960 and 1987.

Matthew Pankau CEO, founder, designer, and engineer founded RRS to commercialize ideas and designs he had wanted to build. The first product RRS want component endorsement for is the under dash brake booster shown below.



For this document RRS will refer to the under dash brake booster and tandem master cylinder as the Stealth.

To prove the design concept RRS had finite analysis conducted on the product, load bearing capacity simulations run through a certified company CADTEK PL. RRS have attached this data to this application.

The RRS Stealth technical information

Materials List

Master Cylinder:

Master cylinder is a dual circuit 1" Bore Tandem unit TP6258A.

Booster:

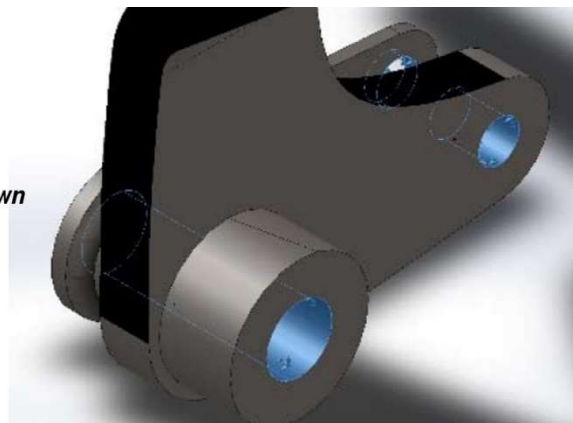
Booster is a dual diaphragm to the master cylinder made originally for U.S. Mazda 626 Turbo V6.

Brake Pedal:

Custom-built: RRS Pty Ltd (Aust)

Properties

Mass: 1.49464Kg
Volume: 0.0001904m³
Density: 7850 KG/m³
Material: AISI 1045 Steel cold drawn
Pedal arm Thickness: 12mm



Size: 125mm-50mm

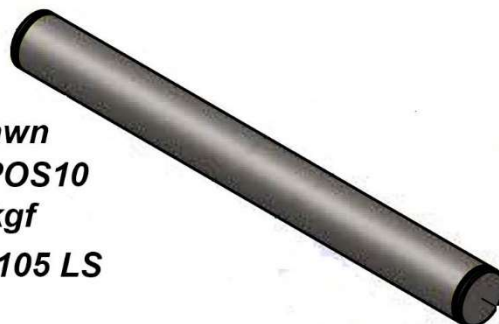
Attachment: TIG Welded

Brake pedal pushrod:

Custom built: RRS Pty Ltd (Aust)

Properties

Rod Diameter: 16.48mm
Material: AISI 1045 Steel cold drawn
Rod End: IKO part # PHS10EL & POS10
with dynamic load bearing 1000 kgf
Rod ends manufactured to SA BP105 LS

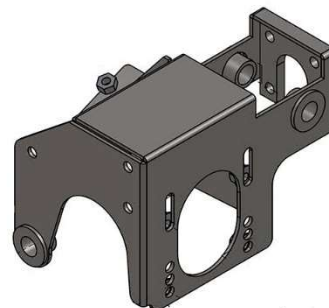
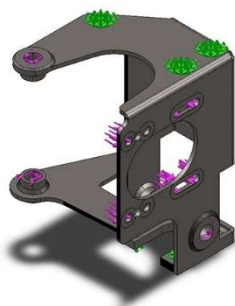


Pedal Box:

Custom-built: RRS Pty Ltd (Aust)

Properties

Material: 4mm 1045 steel
Mass: 2.30306 Kg
Density: 7850Kg/m³
All brackets fixed with 3/8" bolts

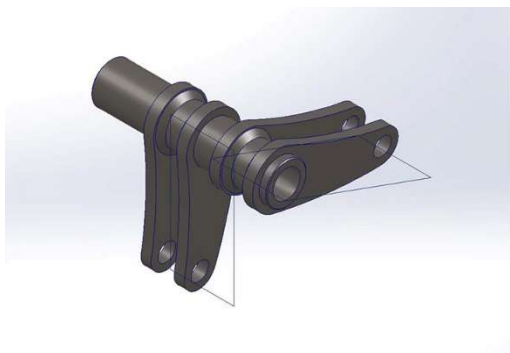


The RRS Stealth technical information

Materials List

Bell Crank:

Custom-built: RRS Pty Ltd (Aust)



Properties

Material: AISI 1045 Steel, cold drawn

Mass: 0.510167Kg

Density; 7850Kg/m³

Method Attachment: Double clevis

Crank arm thickness: 6mm

Construction method: Certified TIG

Pivot Shafts & Bush's:

Pivot Shafts are made from 41 30 Hygrade steel, with the same diameters and load spacing of OEM ford pedal assemblies circa 1987.

Ford OEM Acetal Bush's.

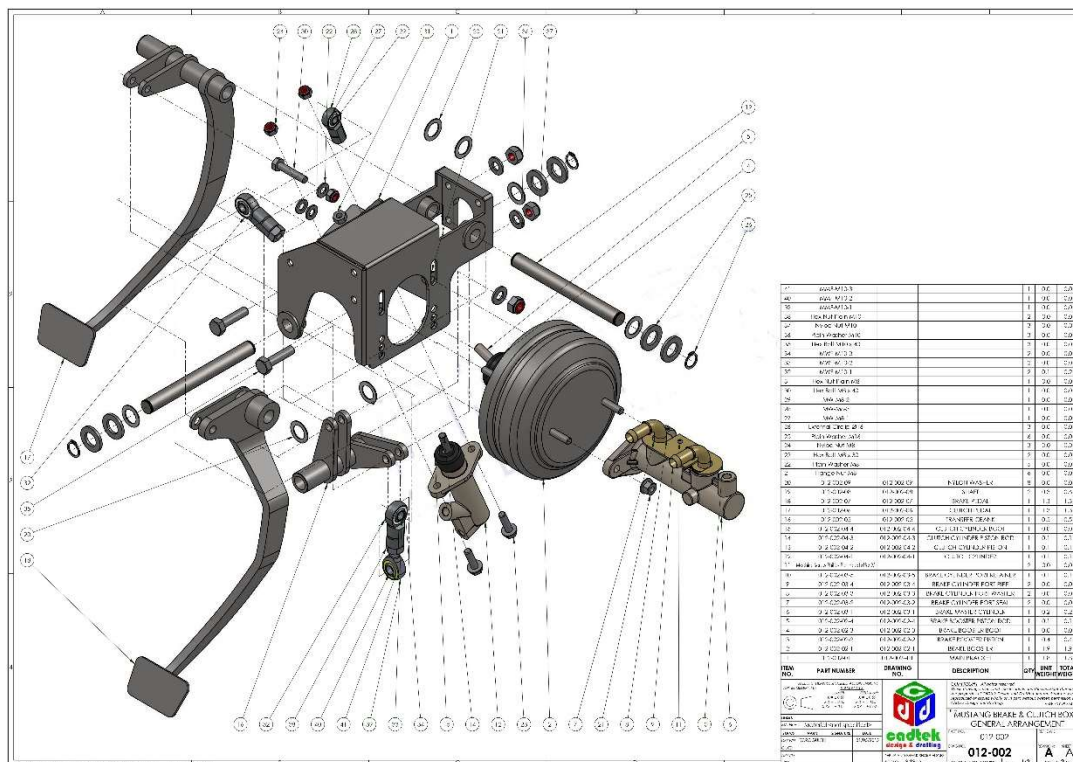
Rod Ends & Clevis Mounts and Fasteners:

Rod ends are manufactured by IKO part # PHS10EL & POS10 with dynamic load bearing 1000 kgf

Static load bearing capacity 1360 kg-f

All fasteners for Rod End location are M10 x 1.5 high tensile 8.8 bolts and nylock nuts.

All threaded fasteners comply with HCTM requirements.



The RRS Stealth technical information

Construction Method and Design Advantages

The Stealth export model is constructed with certified TIG welding.



INSPECTION & TESTING SERVICES PTY LIMITED
ABN 67 055 681 966
NON DESTRUCTIVE TESTING & METALLURGICAL SERVICES

CORRELATION No: ITS/4801

REPORT No: M 6664

EXAMINED:

A MAGNETIC PARTICLE INSPECTION WAS CARRIED OUT ON 100% OF ALL FILLET WELDS OF THE FOLLOWING:-

MUSTANG BRAKE & CLUTCH BOX

JOB NO. STEALTH LVVTA

THREE (3) ITEM TYPES (TOTAL 26 OFF ITEMS TESTED):

1) TEN (10) OFF BRAKE PEDAL
DWG NO: 012-003-07 REV B

2) TEN (10) OFF TRANSFER (BELL) CRANK - 50KG
DWG NO: 012-003-05 REV B

3) SIX (6) OFF MAIN BRACKET
DWG NO: 012-003-01 REV B

PHOTOS



TEST RESULTS:

AT THE COMPLETION OF TESTING, NO SURFACE DEFECT INDICATIONS WERE DETECTED. COMPLY WITH CLIENT REQUIREMENTS OF NO SURFACE CRACKINGS.

SIGNED:
Sam Kodsi
Approved NATA Signatory
Registration No: 4297

DATE: 17/07/2015



Accredited for compliance with ISO/IEC 17025.
This document shall not be reproduced except in full.
ACCREDITATION NUMBER 4267.

Page 2 of 2

42 Violet Street
Revesby NSW 2212
Phone (02) 9771 1933
Fax: (02) 9771 1944
Mobile: 041135 09 09

RRS has conducted finite analysis on the pedal, bell crank, and pedal box to prove load ratings exceed OEM see associated files.



CADTEK DESIGN & DRAFTING



CADTEK DESIGN & DRAFTING



CADTEK DESIGN & DRAFTING



Simulation of 012-003-07

Date: Sunday, 28 June 2015
Designer: W. ROGULSKI
Study name: Simulationprogress Study
Analysis type: Static

Description	1
Assumptions	2
Model Information	2
Material Properties	3
Loads and Fixtures	3
Mesh Information	4
Study Results	6
Conclusion	9

Description

BRAKE PEDAL (AUTO) - 100 kg

PART REVERSE ENGINEERED OFF PRODUCTION SAMPLE.
SUPPLIED BY RRS-ONLINE.
ANALYSIS BASED ON DATA SUPPLIED BY RRS-ONLINE.
THE FOLLOWING DESIGN CHANGES HAVE BEEN MADE IN ORDER TO ACHIEVE MINIMUM F.O.S. OF 2:
1. PEDAL ARM THICKNESS INCREASED FROM 8 TO 12 mm.
ANALYSIS LOADS AND FIXTURES:
2. APPLIED PEDAL FORCE OF 981 N (100 kgf).
ANALYSIS RUN ON MODEL AS DETAILED ON DRAWING 012-003-07 RevB



Simulation of 012-002-05 & 012-003-05

Date: Monday, 29 June 2015
Designer: W. ROGULSKI
Study name: Simulationprogress Study
Analysis type: Static

Description	1
Assumptions	2
Model Information	2
Material Properties	3
Loads and Fixtures	3
Mesh Information	4
Study Results	6
Conclusion	9

Description

BELL CRANK - 100 kg

PART REVERSE ENGINEERED OFF PRODUCTION SAMPLE.
SUPPLIED BY RRS-ONLINE.
ANALYSIS BASED ON DATA SUPPLIED BY RRS-ONLINE.
SIMULATION BASED ON 100 kg BRAKE PEDAL FORCE.
ANALYSIS RUN ON MODEL AS DETAILED ON DRAWING 012-002-05 RevC.
NOTES:
1. 012-002-05 (MANUAL TRANSMISSION VERSION ASSEMBLY) AND 012-003-05 (AUTO TRANSMISSION VERSION ASSEMBLY) PARTS ARE EXACTLY THE SAME.
2. 012-002-05 WAS USED FOR THIS ANALYSIS AS IT HAS SLIGHTLY HIGHER LOADS APPLIED DUE TO SLIGHTLY LONGER MANUAL VERSION BRAKE PEDAL.



Simulation of 012-003-01

Date: Sunday, 28 June 2015
Designer: W. ROGULSKI
Study name: Simulationprogress Study
Analysis type: Static

Description	1
Assumptions	2
Model Information	2
Material Properties	3
Loads and Fixtures	3
Mesh Information	5
Study Results	7
Conclusion	10

Description

PEDAL BOX BRACKET (AUTO) - 100 kg

PART REVERSE ENGINEERED OFF PRODUCTION SAMPLE.
SUPPLIED BY RRS-ONLINE.
ANALYSIS BASED ON DATA SUPPLIED BY RRS-ONLINE.
THE FOLLOWING DESIGN CHANGES HAVE BEEN MADE TO THE BRACKET TO INCREASE STRENGTH AND F.O.S.:
1. ALL 3 mm PLATES THICKNESS INCREASED TO 4.1 mm.
2. MATERIAL CHANGED TO 1045 STEEL.
ANALYSIS LOADS AND FIXTURES:
1. BRACKET FIXED AT FRONT AND REAR OF BRACKET BY 3/8" BOLTS.
2. APPLIED BRAKE PEDAL FORCE OF 981 N (100 kgf).
ANALYSIS RUN ON MODEL AS DETAILED ON DRAWING 012-003-01 RevA.

The RRS Stealth technical information

Construction Method and Design Advantages

All mounting points are factory original mounting positions, insuring chassis integrity is maintained.



RRS has engineered a 5 to 1 safety factor.

RRS design changes OEM brake pedal force from a fore aft movement operation of a master cylinder and booster to a lateral sideways movement 90° to the brake pedal. This is achieved by RRS bell crank.

Each joint connecting the brake pedal to the bell crank are double clevis mounted to provide maximum load bearing capacity and are made from 6mm thick mild steel. Each pillow ball (rod end) has a maximum articulation angle of $22\frac{1}{2}^{\circ}$. During normal braking operation articulation is in range from 0° to $2\frac{1}{2}^{\circ}$. During bleeding and servicing of the brake system articulation is in a range from 0° to $7\frac{3}{4}^{\circ}$.

If brake pedal force at the pedal is 100N the force is multiplied by the bell crank 386N.

All forces are calculated to match Ford Falcon OEM combinations from 1969 to 1970 using the SAE formula

$F \propto r/R \times 2 \times M \times AW/AM \times (RP \times f)$

A typical emergency stop will generate applied pressure to the brake pedal.

300 Newtons = 30.59kgf and a transferred load through the bell crank of 1158 Newtons = 118.03kgf

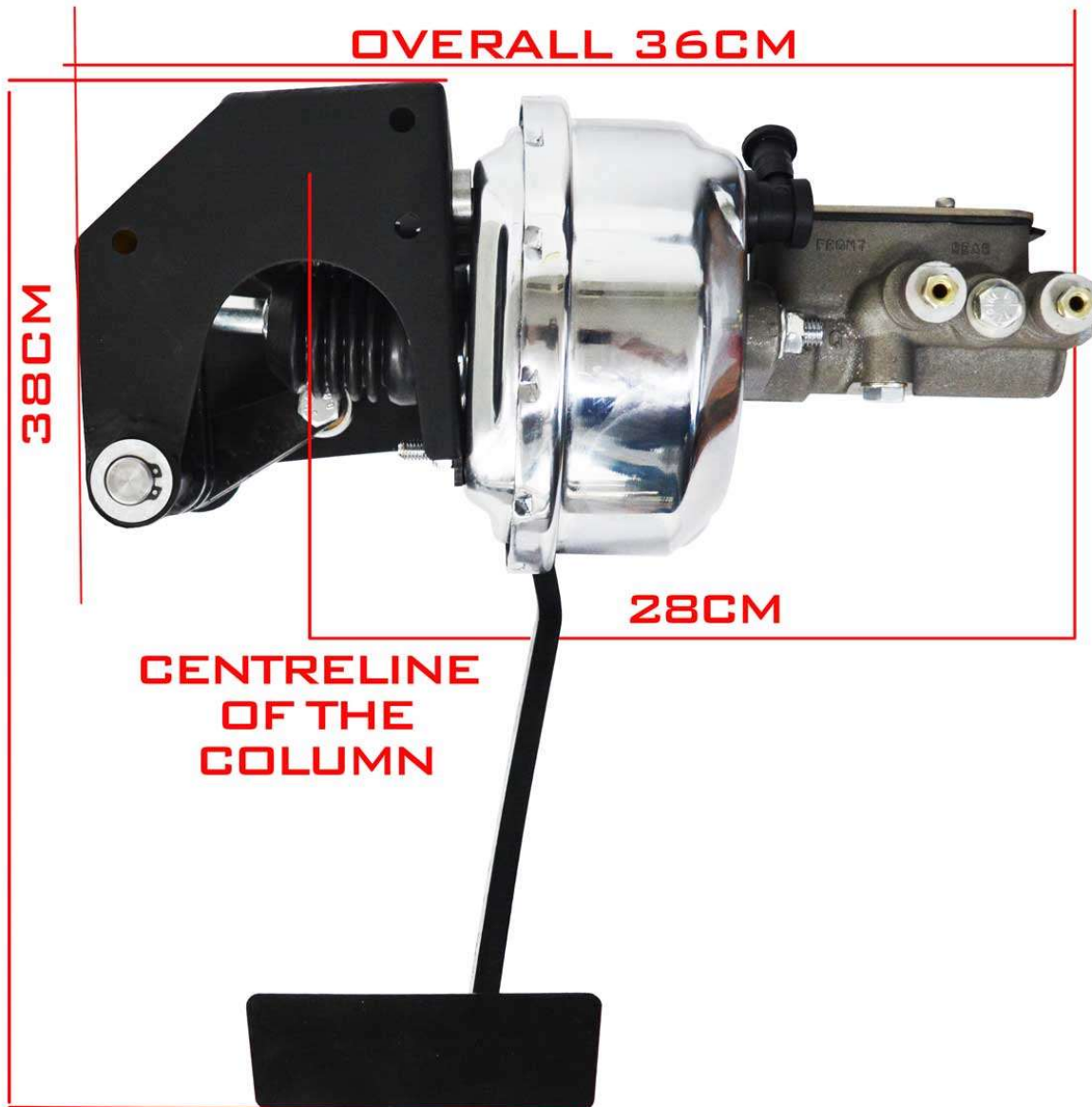
This ensures a safety margin in an emergency stop of all RRS operating components of over 9:1

Enhanced Safety.

Ford vehicles pre 1966 were single circuit braking systems, replacing with these single circuits with a modern double circuit system increases brake reliability. Renewing braking systems in vehicles that 30 to 50 years old new, well designed, well manufactured will only improve the braking reliability of all vehicles fitted with the RRS Stealth.

In conclusion RRS seek component endorsement for the Stealth product as we believed we have proved the engineering, design and manufacturing of the Stealth meets and exceeds all criteria.

RRS Auto under-dash/booster master cylinder system 2022



RRS Manual under-dash/booster master cylinder system 2022

