

NOTES:

This list does not include material for jigs. Laser cut platework for front a-arm jig is only available through Badland Buggy or you can build your own jig based on the concepts shown.

Tubing material for the a-arms is included on the material list for the chassis frame in section "A". You do not need to purchase extra tubing material for the a-arms.

SECTION "B"

BUILDING THE FRONT SUSPENSION

MATERIAL LIST

<u>ITEM No.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	5/8" UNF TUBE ADAPTER, PART #DL0015	4
2	5/8" UNF ROD END, PART #DL0019	4
3	POLYURETHANE SUSPENSION BUSHING, PART #BG0001	8
4	1/2" ϕ COLD ROLLED ROUND BAR	4 pcs @ 12" LONG
5	3/32" HITCH PINS	8
6	WHEEL HUB & AXLE ASSEMBLY	2
7	1" ϕ SOLID ROUND BAR, MILD STEEL	2 pcs @ 4-9/16" LONG
8	MISALIGNMENT BUSHINGS, PART #DL0016	8
9	TAPERED LUG NUTS, 1/2" UNF	10
10	ANGLE STEEL, 1" x 1" x 1/8"	24"
11	ANGLE STEEL, 1-1/4" x 1-1/4" x 1/8"	64"
12	PLATE #PL0025, 5/16" MILD STEEL PLATE	8
13	PLATE #PL0034, 3/16" MILD STEEL PLATE	4
14	PLATE #PL0035, 3/16" MILD STEEL PLATE	2
15	PLATE #PL0036, 3/16" MILD STEEL PLATE	4
16	PLATE #PL0038, 3/16" MILD STEEL PLATE	2
17	PLATE #PL0046, 1/8" MILD STEEL PLATE	2
18	HEX BOLT, 1/2" ϕ x 3-1/2" LONG	4
19	NYLOCK NUT, 1/2" UNC	4
20	DOM TUBE, 3/4" O.D. x 1/2" I.D. (FOR SPACERS)	12"



STATEMENT OF OWNERSHIP

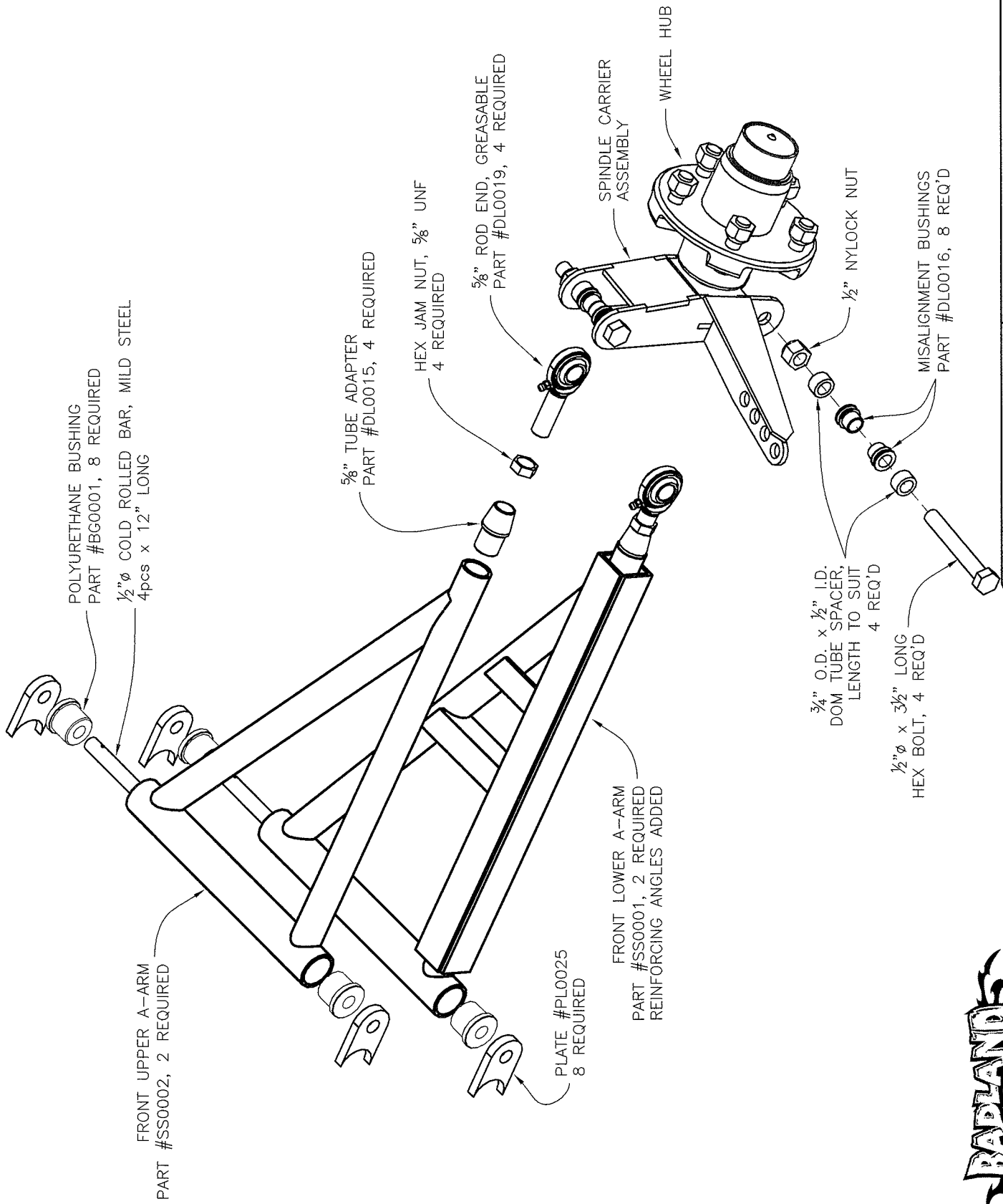
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TITLE

BUILDING THE FRONT SUSPENSION

DWG No.

B01



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TITLE
BUILDING THE FRONT SUSPENSION

DWG No.
B02



PLATE #PL0054

3/16" THICK MILD STEEL, 2 REQ'D



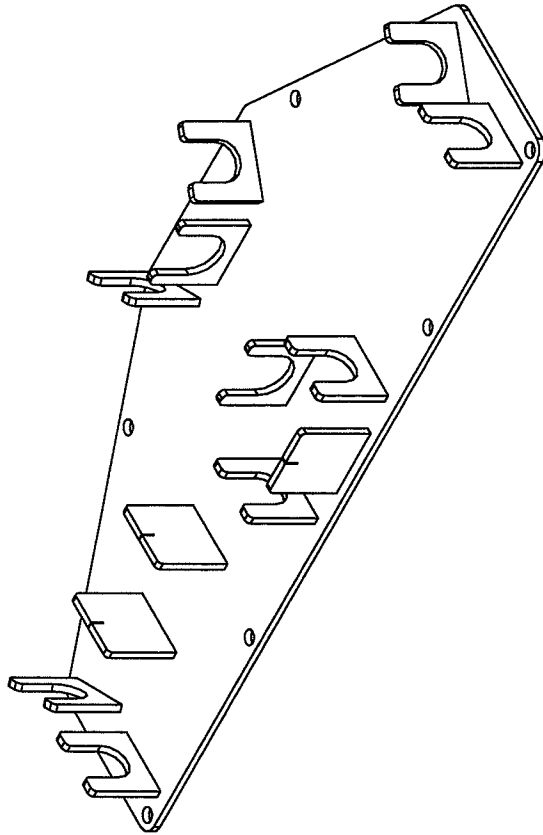
PLATE #PL0055

3/16" THICK MILD STEEL, 3 REQ'D



PLATE #PL0056

3/16" THICK MILD STEEL, 8 REQ'D



3D VIEW OF ASSEMBLED
FRONT UPPER & LOWER A-ARM JIG

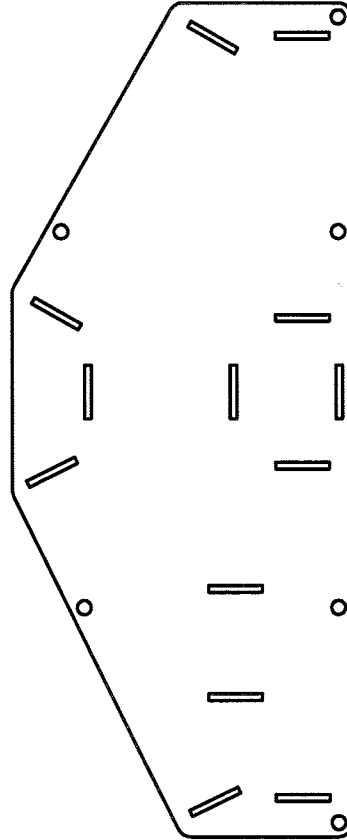


PLATE #PL0057

3/16" THICK MILD STEEL, 1 REQ'D
BASE PLATE FOR FRONT A-ARM JIG

NOTES:

This jig is very helpful when you want to ensure the highest level of accuracy & alignment of your front suspension & steering system components.

You can still fabricate the front a-arms without having to use this jig by using welding magnets to hold the front a-arms tubes in position for tack welding.

This jig is used for perfectly aligning all a-arms then you tack weld the tubes together.

Remove the tack welded tubes from the a-arm jig then fully weld.

We do not shown how to fabricate this jig at home because due to the complexity & precision of the shapes shown makes the fabrication of these parts beyond the abilities of the average home buggy builder.

All of these laser cut plates are available through Badland Buggy. When you purchase these laser cut plates we also provide you with a step-by-step photo guide on how to use this jig to get the highest level of quality when building your front a-arms at home.



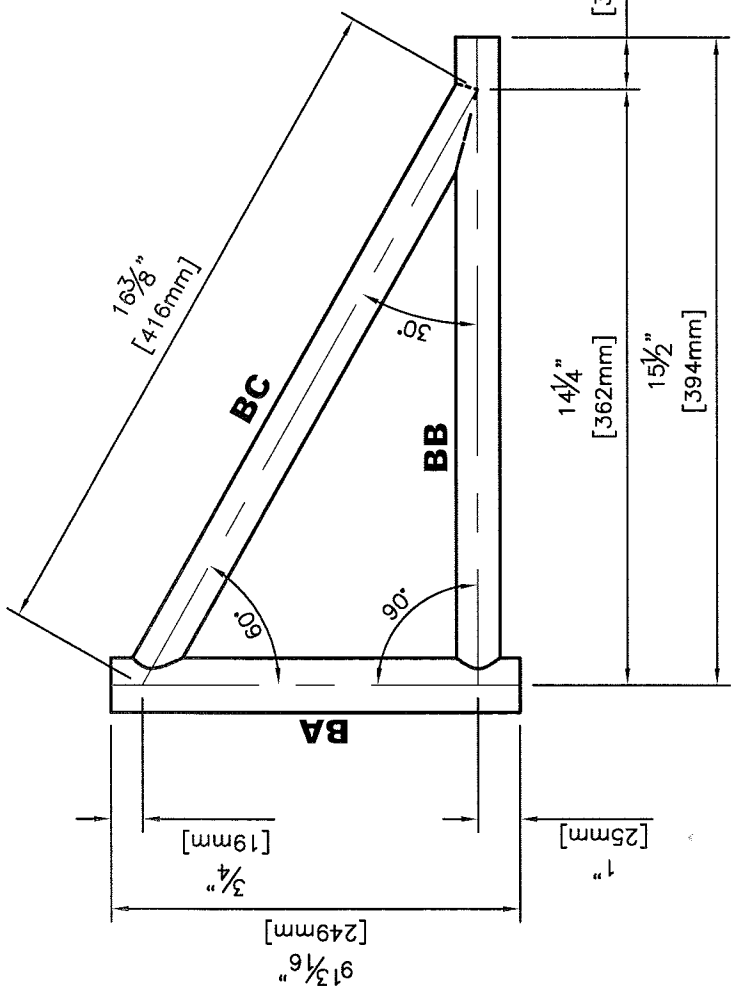
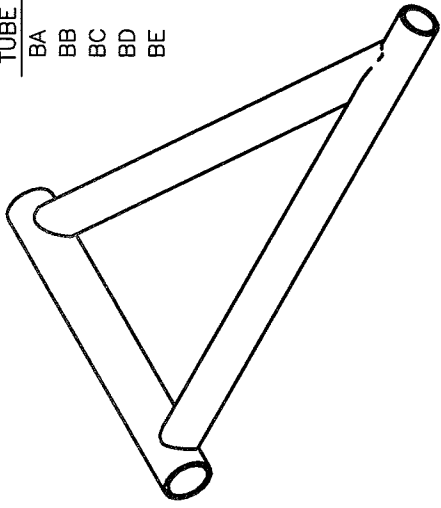
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TITLE
**JIG FOR UPPER & LOWER
FRONT SUSPENSION A-ARMS**

DWG No.
B03

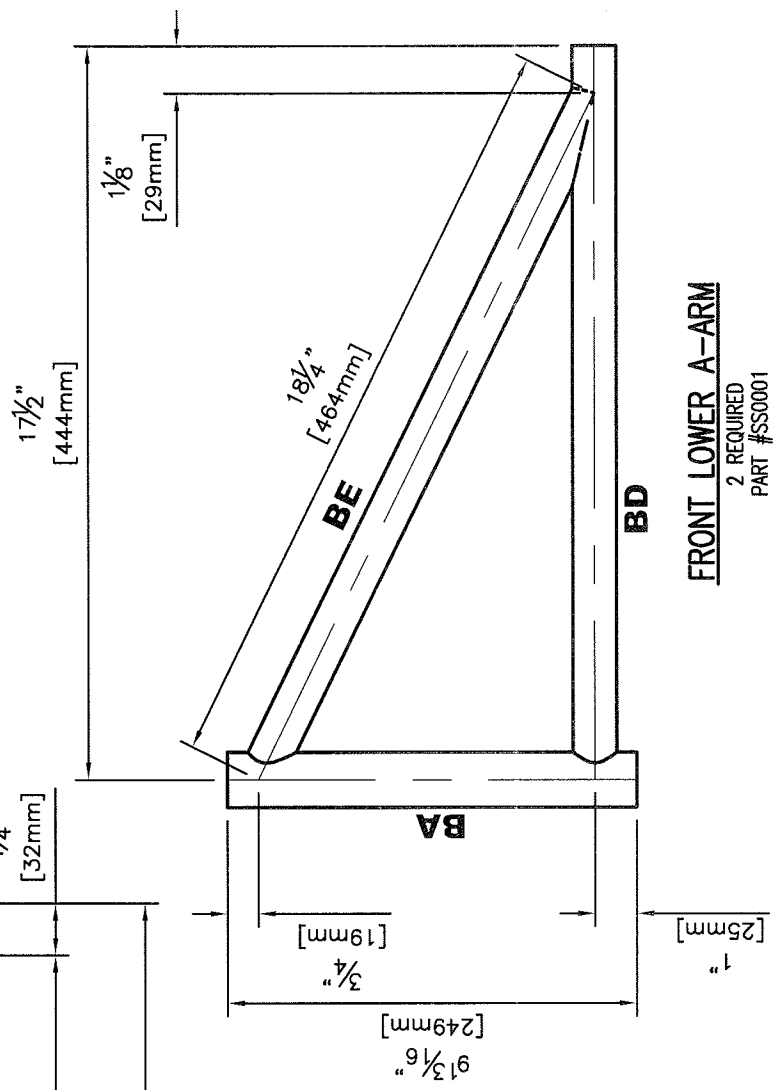
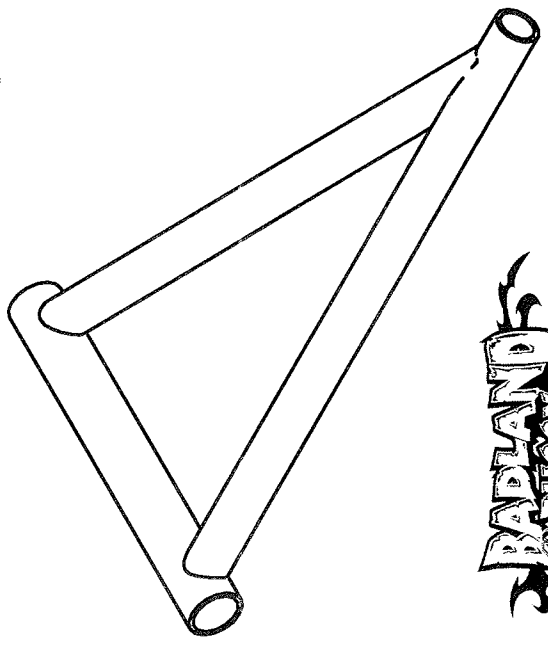
TUBING SIZES & CUT LENGTHS

TUBE	SIZE	LENGTH	QUANTITY
BA	1" Round	9 3/16" LONG	4 pcs
BB	3/4" Round	15 1/2" LONG	2 pcs
BC	3/4" Round	16 3/8" LONG	2 pcs
BD	3/4" Round	17 1/2" LONG	2 pcs
BE	3/4" Round	18 1/4" LONG	2 pcs



FRONT UPPER A-ARM

2 REQUIRED
PART #SS0002



FRONT LOWER A-ARM

2 REQUIRED
PART #SS0001



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TITLE

FRONT A-ARM
DETAILS

DWG No.

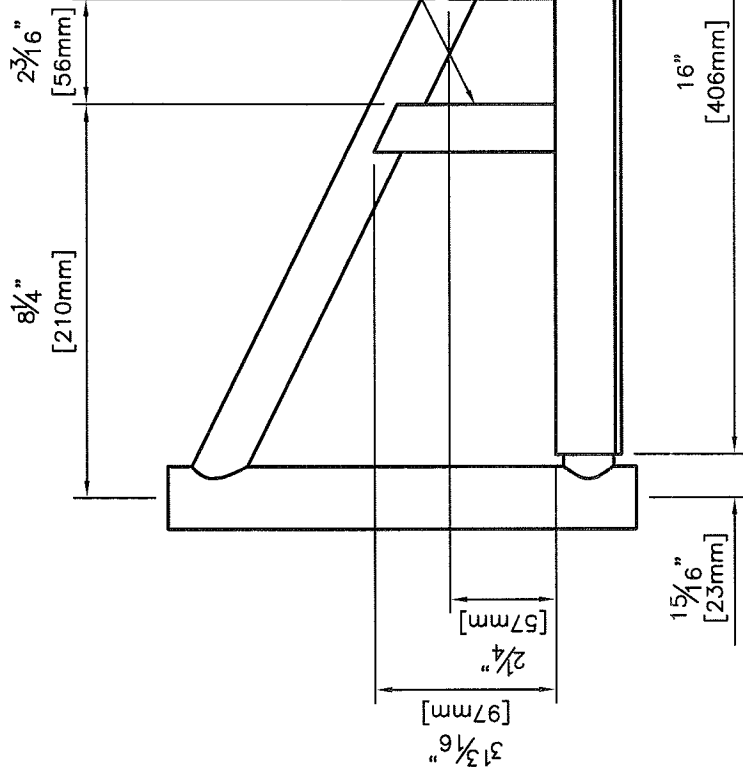
B04

NOTES:

The addition of the 1/4" angles over the 3/4" Round Tube increases the strength of the front lower a--arm. Completely box in the 3/4" Round Tube tube as shown then fully weld the angles back to back. Fill all gaps at each end of the angles. Remember to leave the end of the 3/4" Round Tube tube open to allow for the addition of a tube adapter which is shown in the next few pages.

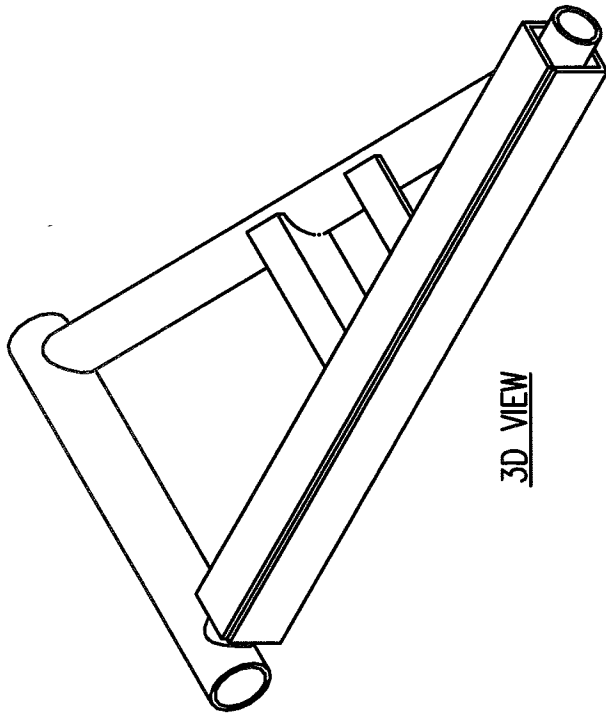
Use 1" angles to form a flat, rigid base to mount the front lower shock mounts shown later in this booklet.

Front lower left a--arm shown. Make one opposite hand for the right side.

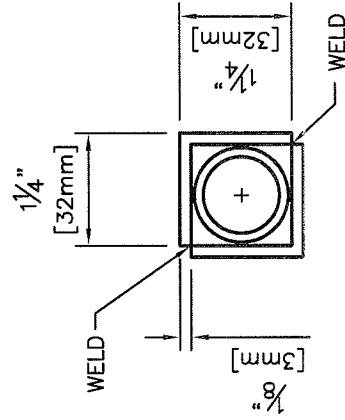


REINFORCING THE LOWER A--ARM

1/4" x 1" x 1/8" ANGLE
2 pcs AT 16" LONG EACH



3D VIEW



END VIEW



STATEMENT OF OWNERSHIP

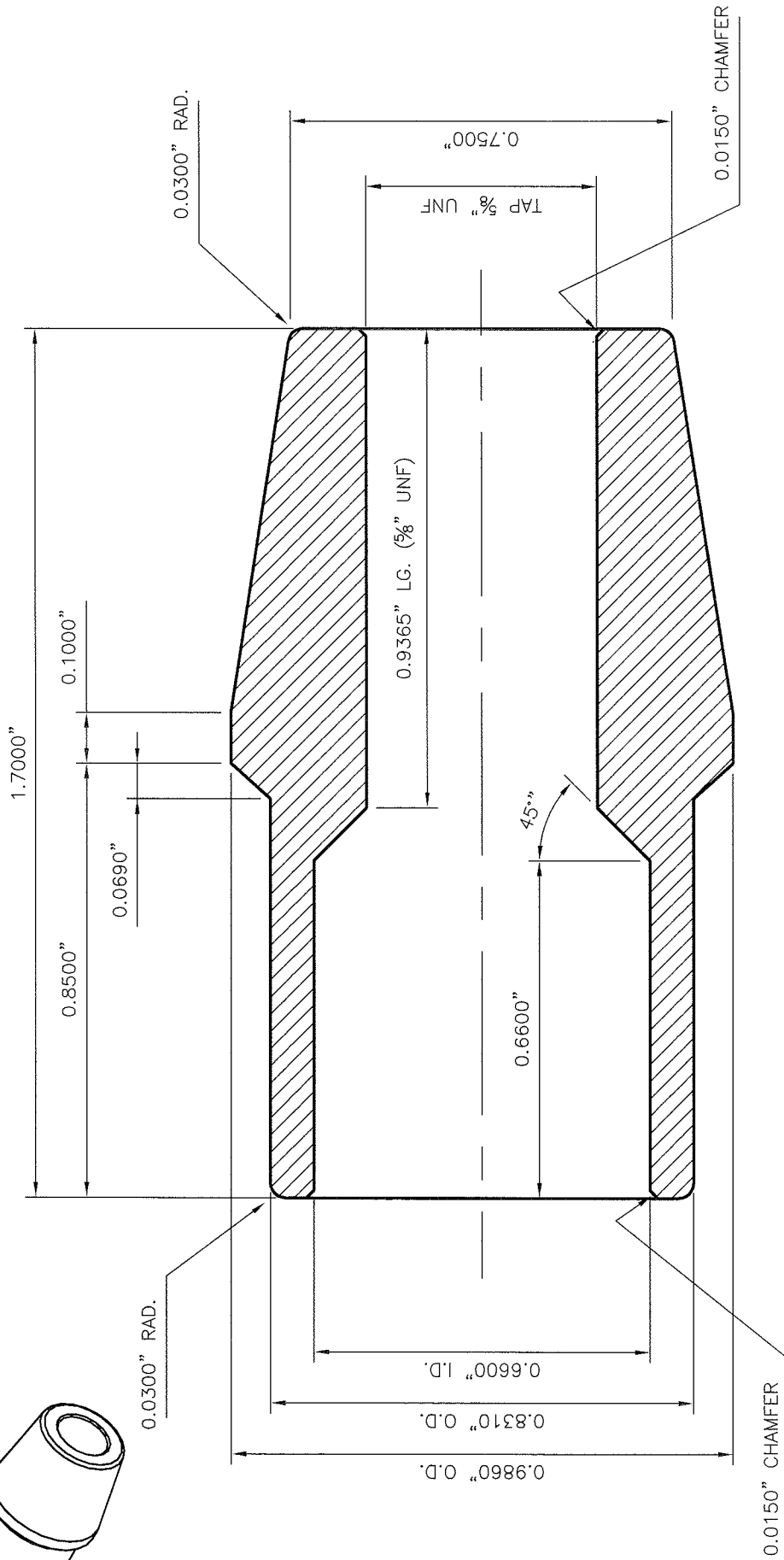
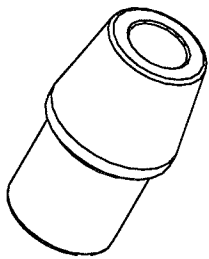
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TITLE

REINFORCING THE FRONT LOWER A--ARMS

DWG No.

B05



TUBE ADAPTER
 4 REQUIRED
 PART #DL0015

NOTES:

1. MAT'L TO BE CHROMOLY 4130
2. ALL TOLERANCES ±0.0010"



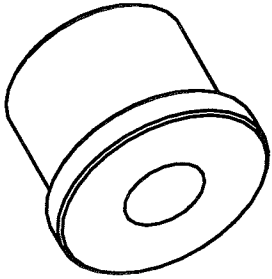
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TITLE

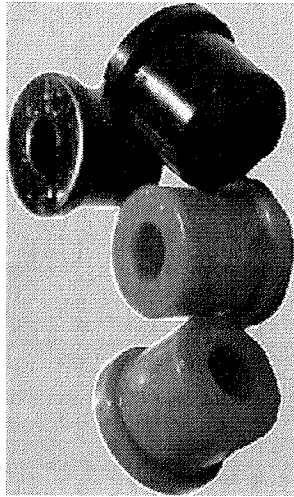
TUBE ADAPTER
 DETAILS

DWG No.

B06



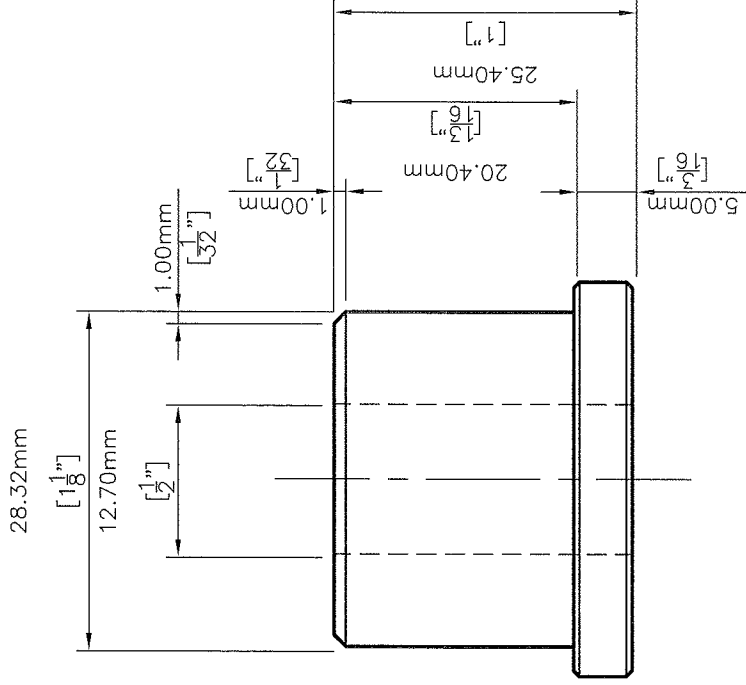
3D VIEW



"Size 1" Polyurethane Bushing
www.badlandbuggy.com

NOTES:

1. IF BUILDING THESE BUSHINGS AT HOME, USE MATERIAL ACETYL ENGINEERED PLASTIC.
2. TO FABRICATE THE BUSHING YOURSELF YOU CAN USE A WOOD LATHE TO TURN THE SHAPE THEN DRILL THE CENTER HOLE. YOU CAN ALSO CHOOSE TO HAVE A PROFESSIONAL MACHINIST MAKE THEM AS SHOWN.
3. FOR HIGHER QUALITY & PRECISION, CONSIDER PURCHASING THESE BUSHINGS MADE FROM POLYURETHANE COMPOUND DIRECTLY FROM BADLAND BUGGY. SEE www.badlandbuggy.com FOR PRICING & ORDERING INFORMATION.



SIZE "1" BUSHING DETAIL
 8 REQUIRED FOR FRONT SUSPENSION
 PART #BG0001

MAKE 24 PCS
 (INCL. 8 PCS FOR FRONT SUSPENSION & 16 PCS FOR REAR SUSPENSION)



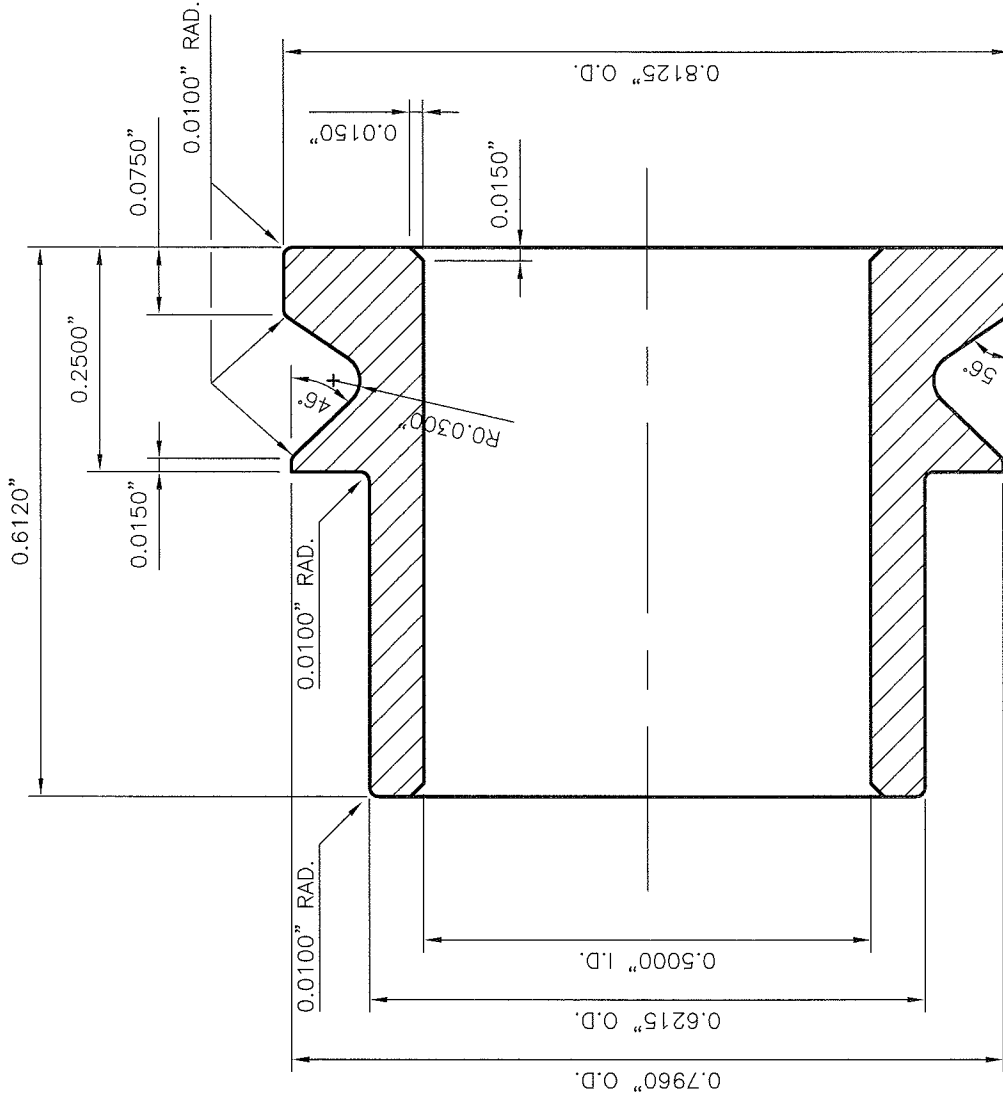
STATEMENT OF OWNERSHIP
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TITLE

**SUSPENSION BUSHING
 DETAILS**

DWG No.

B07



NOTES:

1. MAT'L TO BE S.S. 304
2. ALL TOLERANCES ± 0.0010 "
3. 8 REQUIRED



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TITLE

MISALIGNMENT BUSHING
DETAILS

DWG No.

B08

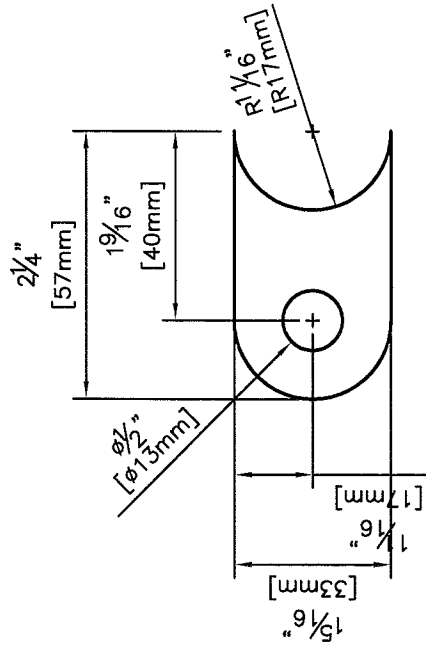
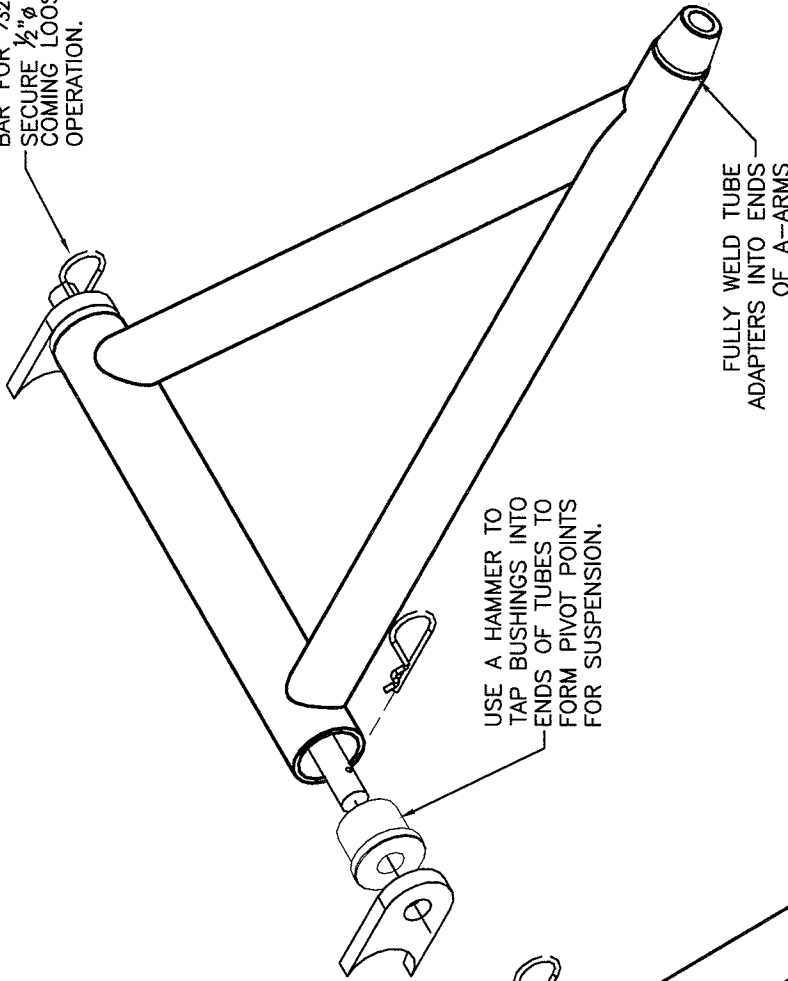


PLATE #PL0025

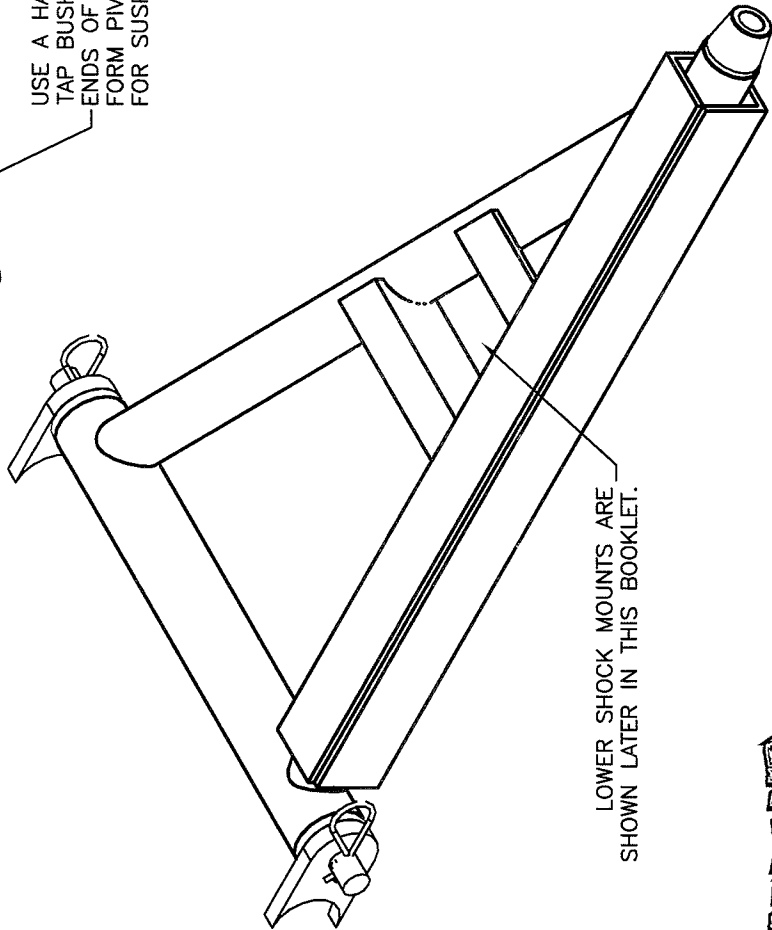
5/16" THICK MILD STEEL, 8 REQUIRED

THIS PART WELDS TO CHASSIS FOR SUSPENSION PIVOTS

DRILL HOLE IN 1/2" Ø COLD ROLLED BAR FOR 3/32" HITCH PINS TO SECURE 1/2" Ø PIVOT BARS FROM COMING LOOSE DURING VEHICLE OPERATION.



FULLY WELD TUBE ADAPTERS INTO ENDS OF A-ARMS



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TITLE

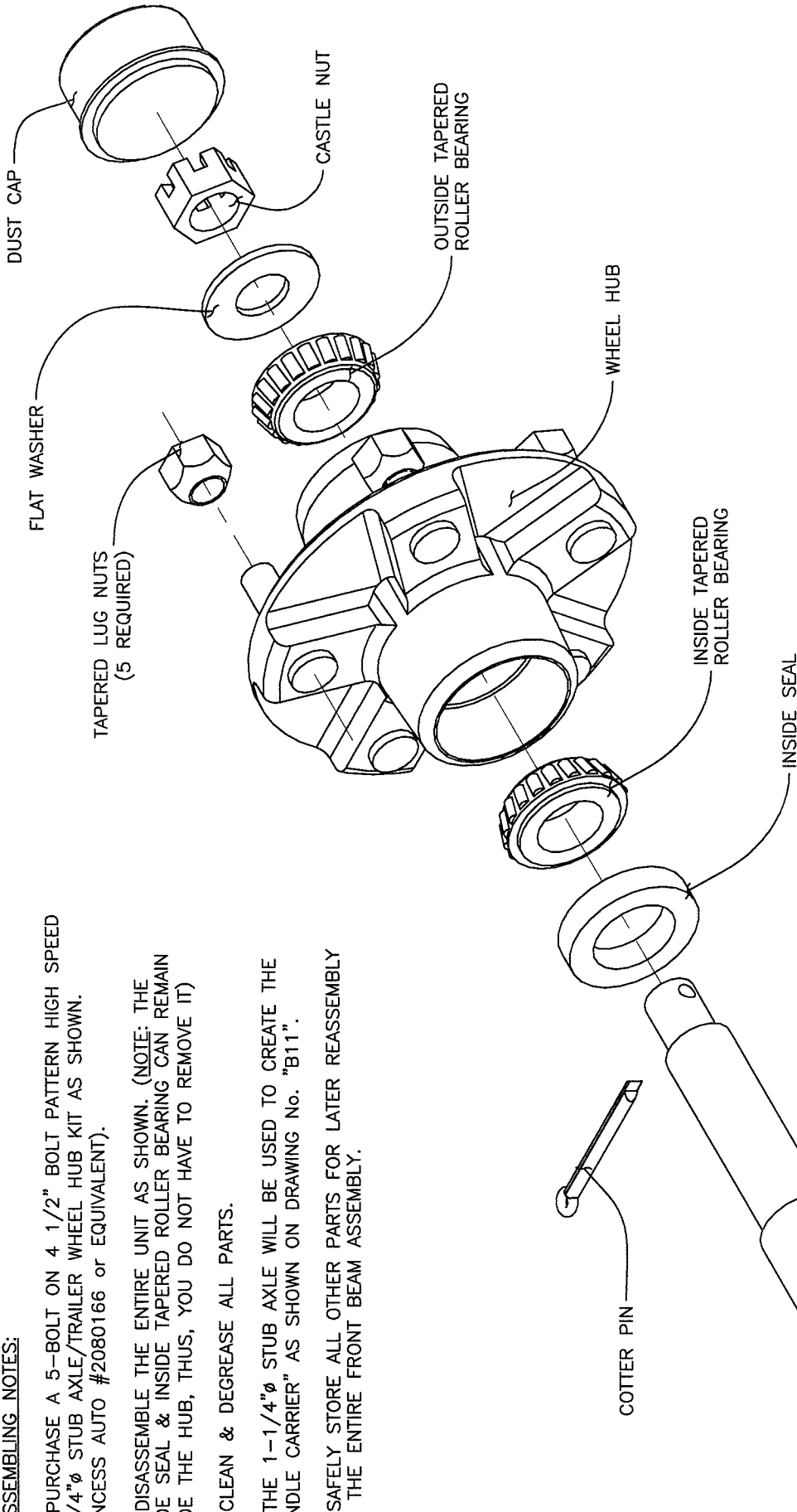
ASSEMBLY OF FRONT A-ARMS

DWG No.

B09

DISASSEMBLING NOTES:

1. PURCHASE A 5-BOLT ON 4 1/2" BOLT PATTERN HIGH SPEED 1-1/4" STUB AXLE/TRAILER WHEEL HUB KIT AS SHOWN. (PRINCESS AUTO #2080166 or EQUIVALENT).
2. DISASSEMBLE THE ENTIRE UNIT AS SHOWN. (NOTE: THE INSIDE SEAL & INSIDE TAPERED ROLLER BEARING CAN REMAIN INSIDE THE HUB, THUS, YOU DO NOT HAVE TO REMOVE IT)
3. CLEAN & DEGREASE ALL PARTS.
4. THE 1-1/4" STUB AXLE WILL BE USED TO CREATE THE "SPINDLE CARRIER" AS SHOWN ON DRAWING No. "B11".
5. SAFELY STORE ALL OTHER PARTS FOR LATER REASSEMBLY WITH THE ENTIRE FRONT BEAM ASSEMBLY.



3D VIEW OF DISASSEMBLED WHEEL HUB ASSEMBLY

RIM TIPS:

TIP 1: ENSURE YOU CAN OBTAIN RIMS TO FIT THE BOLTING PATTERN ON YOUR WHEEL HUB BEFORE YOU START.

TIP 2: CALL A LOCAL STEEL RIM WHOLESALER IN YOUR AREA. ADVISE THEM OF THE BOLTING PATTERN & TIRE SIZE YOU INTEND TO USE & SOMETIMES THEY CAN FIND A LOW COST STEEL RIM THAT WILL FIT YOUR BUGGY PROJECT. PAINTED STEEL TRAILER WHEELS ARE A LOW COST ALTERNATIVE TO EXPENSIVE ATV ALUMINUM WHEELS.



STATEMENT OF OWNERSHIP

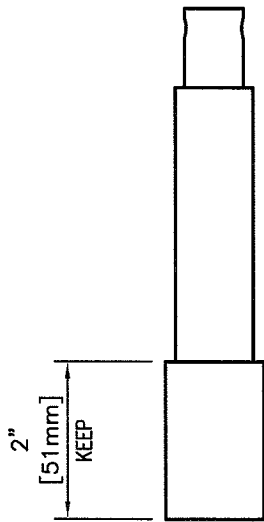
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TITLE

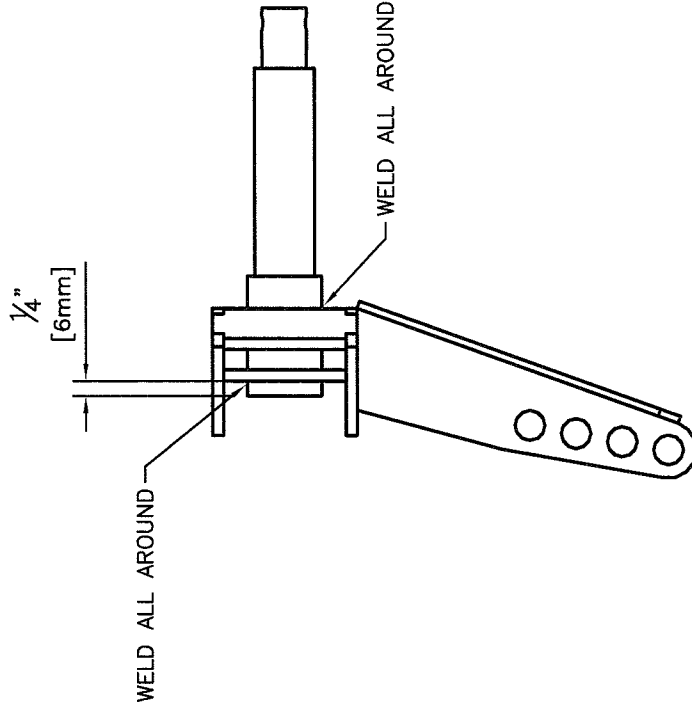
**DISASSEMBLING THE
WHEEL HUB & STUB AXLE**

DWG No.

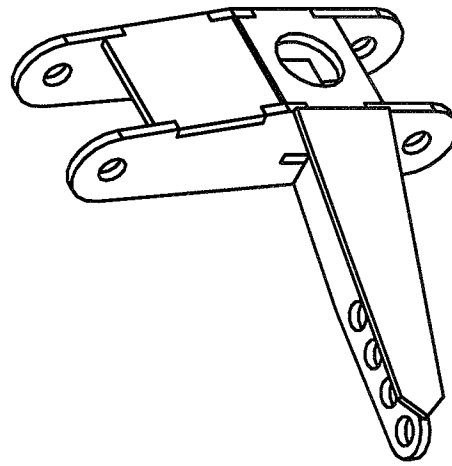
B10



STEP #1
TRIM STUB AXLE LENGTH
LEAVE 2" AT BACK END OF STUB AXLE



STEP #3
MARRY STUB AXLE WITH SPINDLE CARRIER
FULLY WELD STUB AXLE TO INSIDE & OUTSIDE PLATES



STEP #2
BUILD FRONT SPINDLE CARRIERS
FULL DETAILS FOR PLATEWORK STARTING ON DRAWING No. "B12"



MAKE 2 FRONT SPINDLE CARRIERS (1 LEFT/1 RIGHT)

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TITLE

BUILDING THE FRONT
SPINDLE CARRIERS

DWG No.

B11

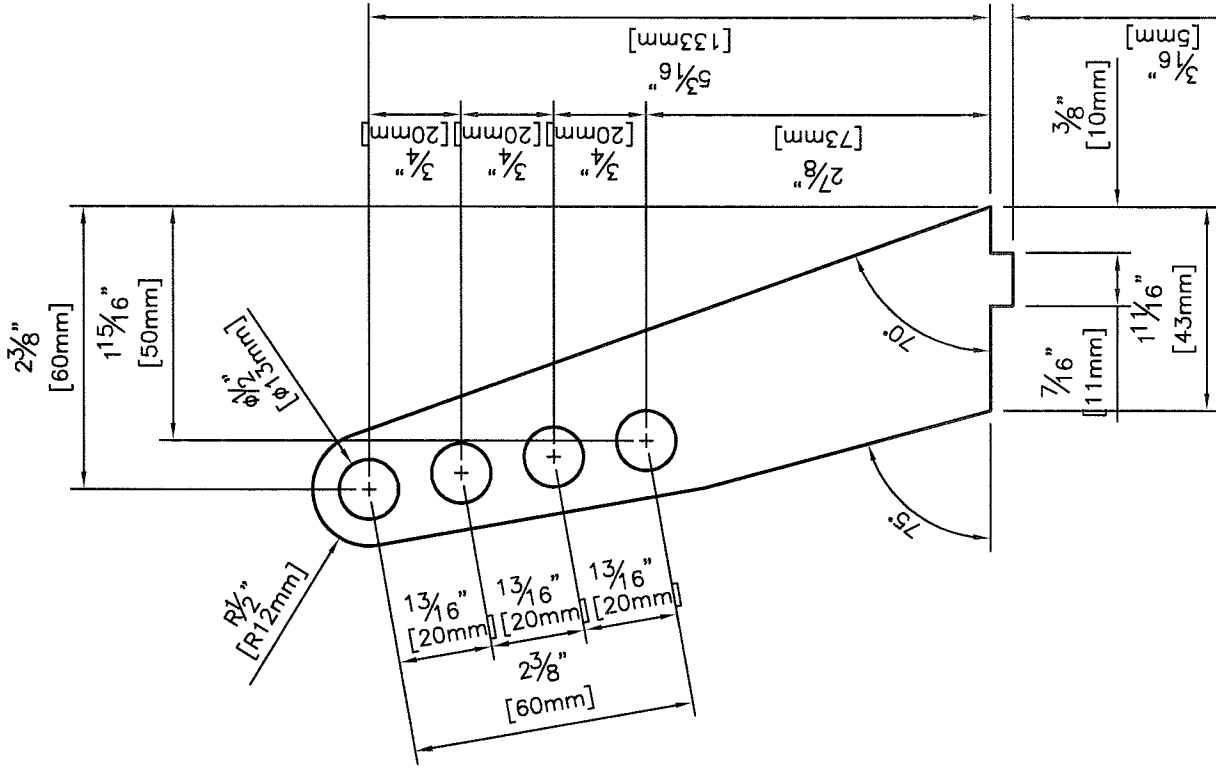


PLATE #PL0038

3/16" THICK MILD STEEL PLATE, 2 REQUIRED

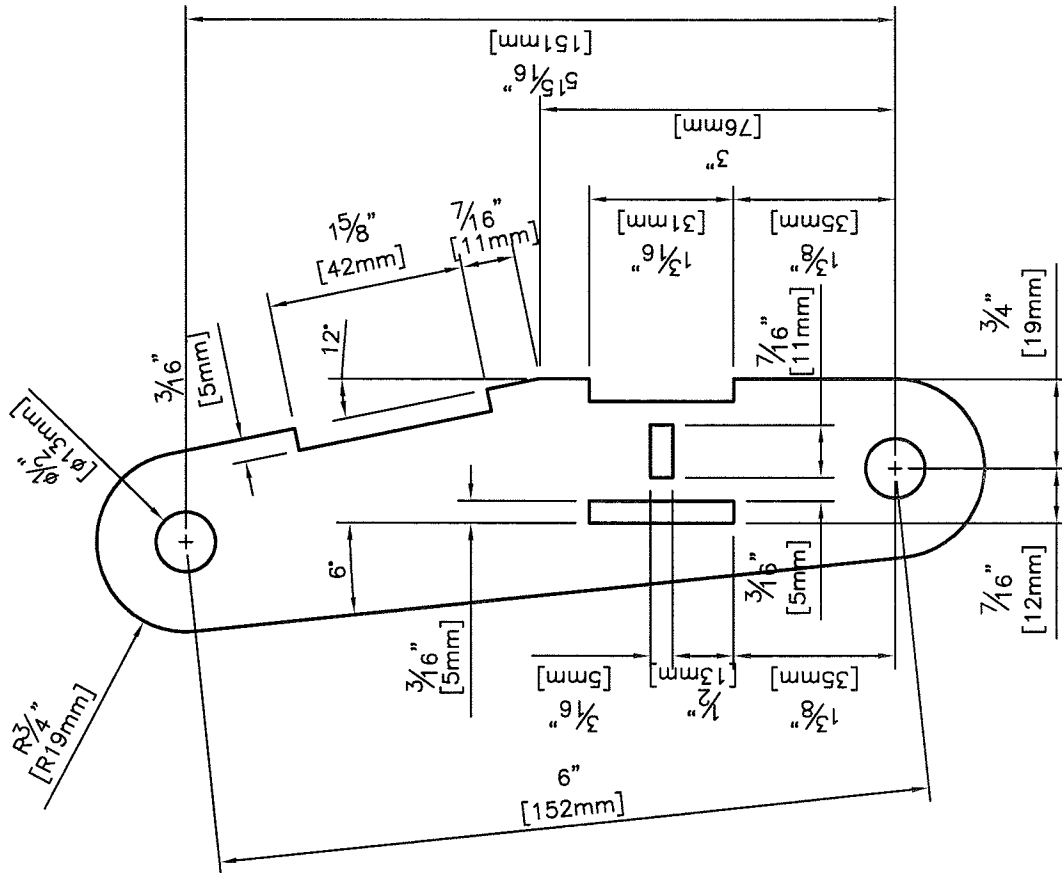


PLATE #PL0034

3/16" THICK MILD STEEL PLATE, 4 REQUIRED



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TITLE

PLATEWORK DETAILS FOR FRONT SPINDLE CARRIER

DWG No.

B12

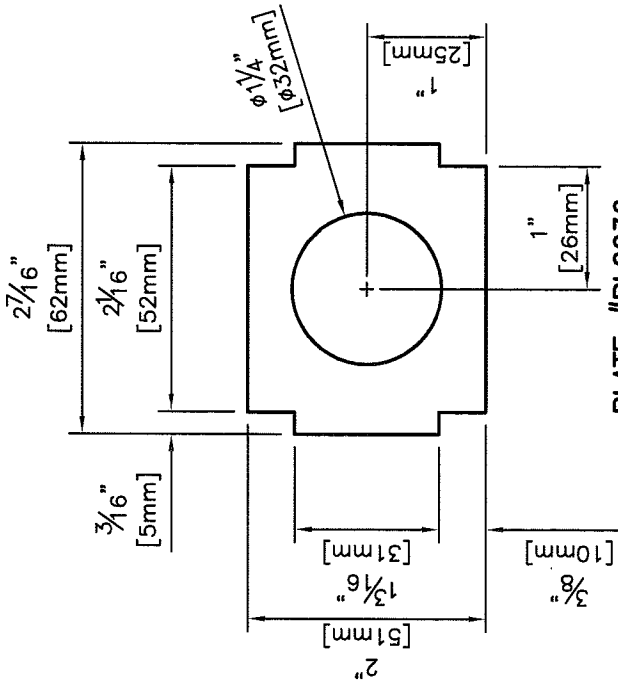


PLATE #PL0036

3/16" THICK MILD STEEL PLATE, 4 REQUIRED

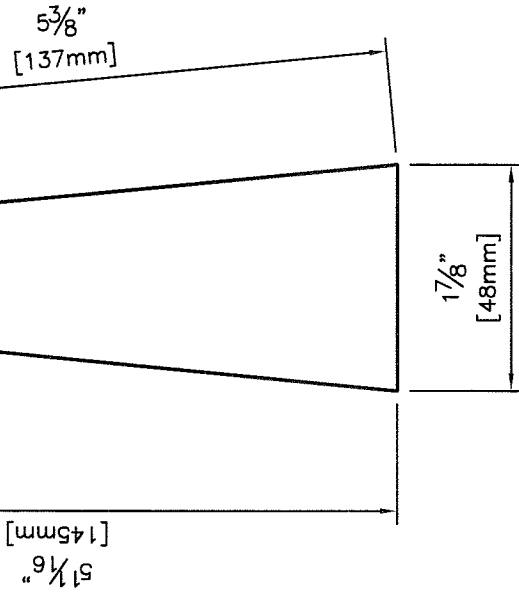


PLATE #PL0046

1/8" THICK MILD STEEL PLATE, 2 REQUIRED

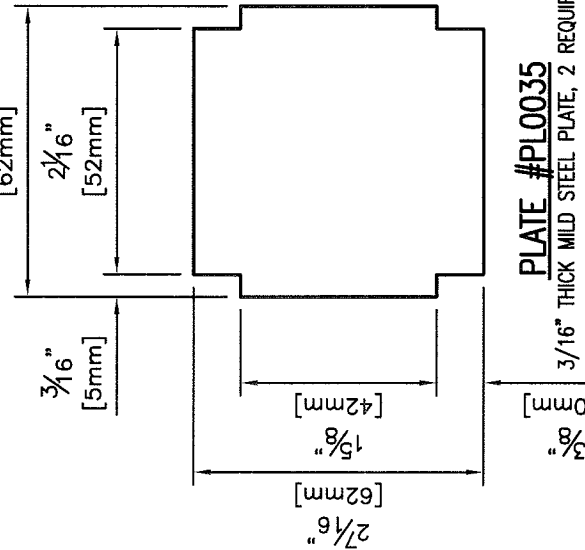


PLATE #PL0035

3/16" THICK MILD STEEL PLATE, 2 REQUIRED



STATEMENT OF OWNERSHIP

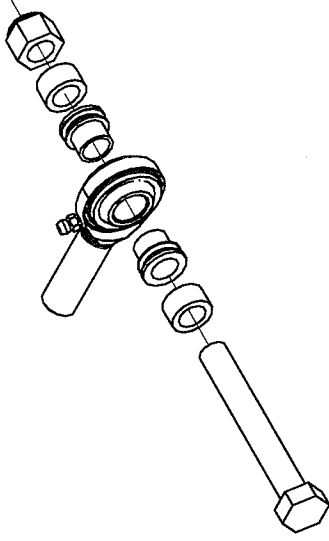
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TITLE

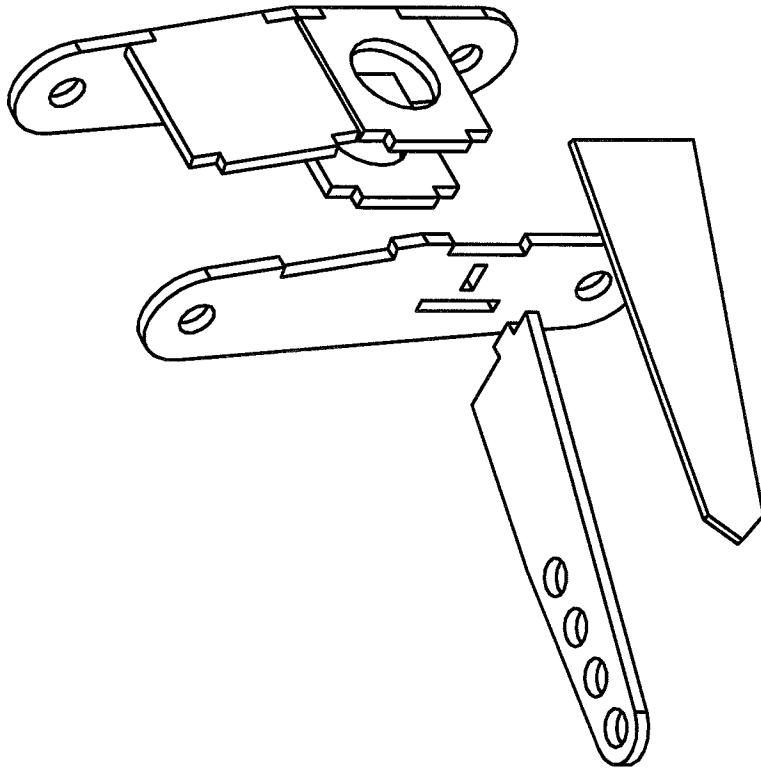
PLATEWORK DETAILS FOR FRONT SPINDLE CARRIER

DWG No.

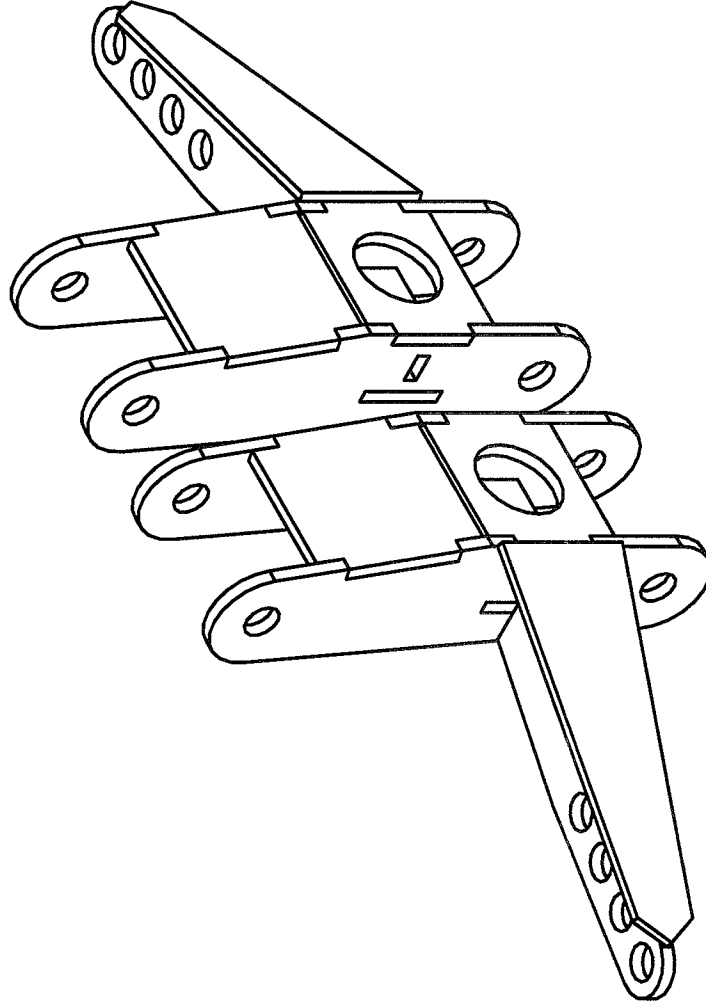
B13



ASSEMBLY OF THE BOLTS, ROD ENDS
SPACERS & MISALIGNMENT BUSHINGS



ASSEMBLING THE PLATES



CARRIERS READY FOR AXLES



STATEMENT OF OWNERSHIP

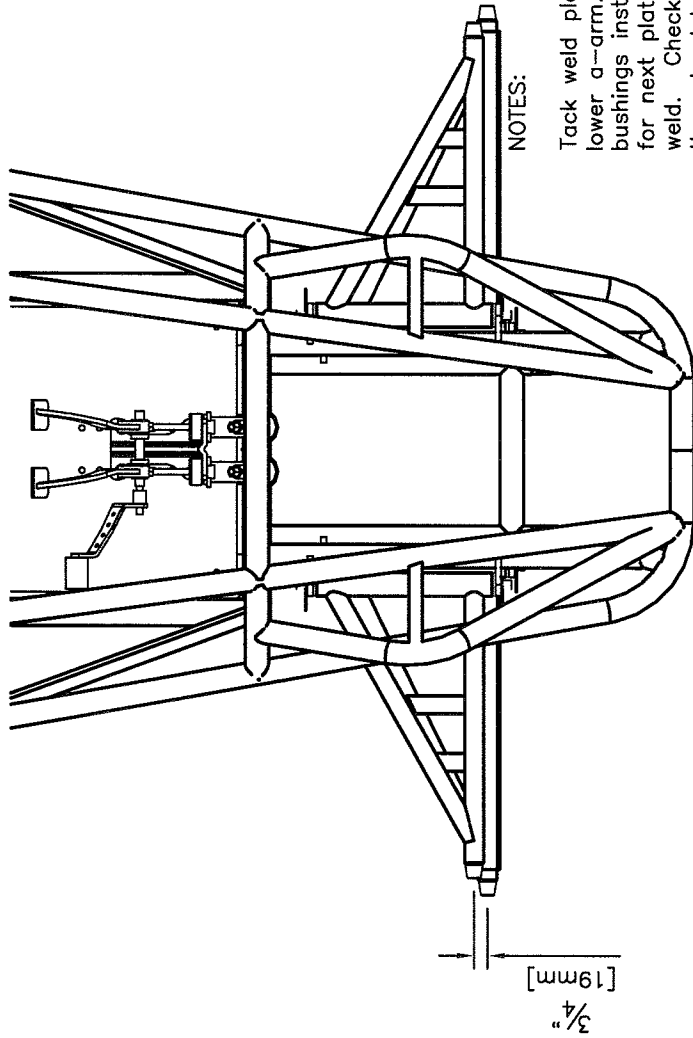
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TITLE

**ASSEMBLING THE FRONT
SPINDLE CARRIER PLATES**

DWG No.

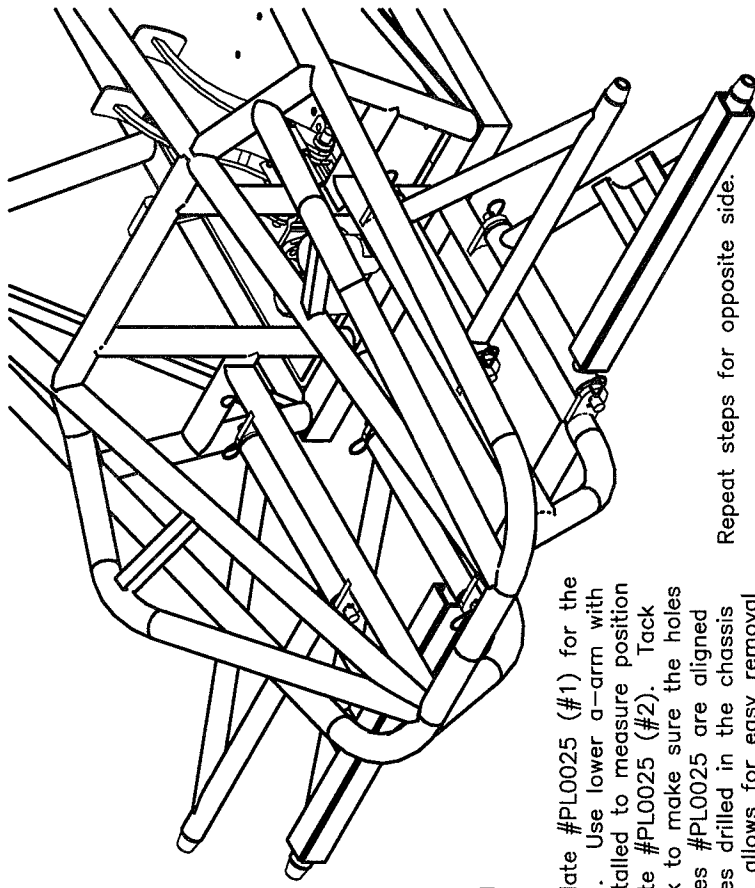
B14



NOTES:

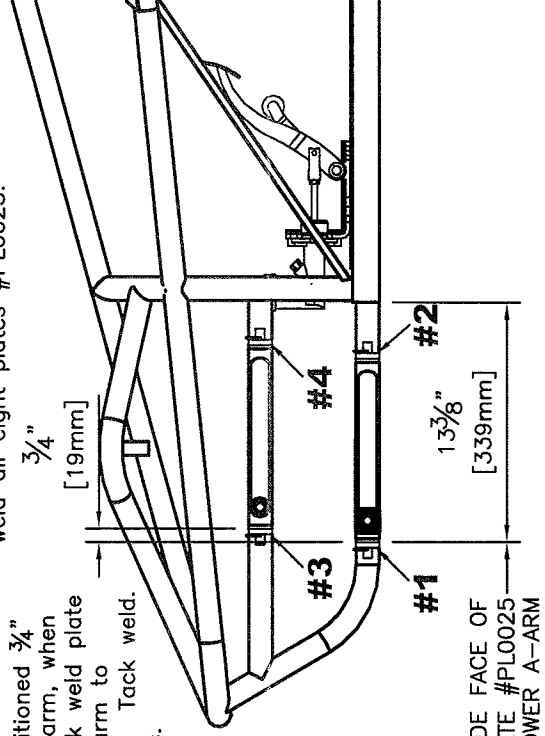
Tack weld plate #PL0025 (#1) for the lower a-arm. Use lower a-arm with bushings installed to measure position for next plate #PL0025 (#2). Tack weld. Check to make sure the holes through plates #PL0025 are aligned with the holes drilled in the chassis frame. This allows for easy removal of the suspension pivot bars later.

The upper a-arm is positioned 3/4" (19mm) behind lower a-arm, when viewed from above. Tack weld plate #PL0025 (#3). Use a-arm to measure position for #4. Tack weld. Check alignment of holes.

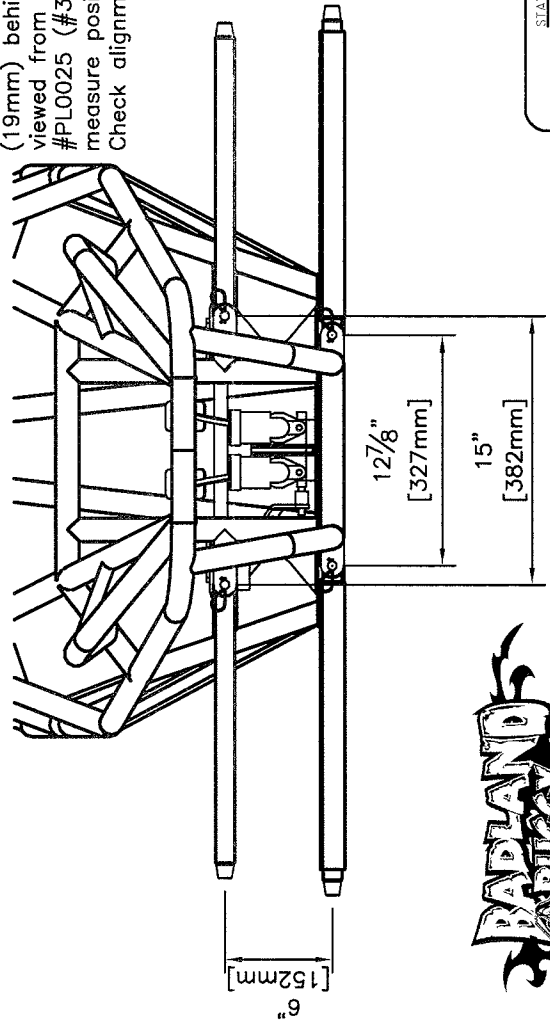


Repeat steps for opposite side.

Check alignment & dimensions then fully weld all eight plates #PL0025.



INSIDE FACE OF
PLATE #PL0025
LOWER A-ARM



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TITLE

MARRYING THE FRONT SUSPENSION TO THE CHASSIS FRAME

DWG No.

B15

NOTES:

Now it comes time to assemble the front wheel hub & spindles to the front suspension a-arms. Place the entire vehicle on a level table top or bench (or similar). Place supports under the front lower a-arms.

Screw all four $\frac{5}{8}$ " rod ends into the ends of the tube adapters in the a-arms. Place the misalignment bushings into the eyes of the $\frac{5}{8}$ " rod ends. Starting with the lower rod ends, assemble the hex bolts, spacers & nylock nuts through the eye of the rod ends & misalignment bushings. Repeat the last step for the upper rod ends.

Install the wheel hubs. Be sure to lubricate the bearings & secure the wheel hub using the nut & cotter pin. Install the dust cap to the wheel hub.

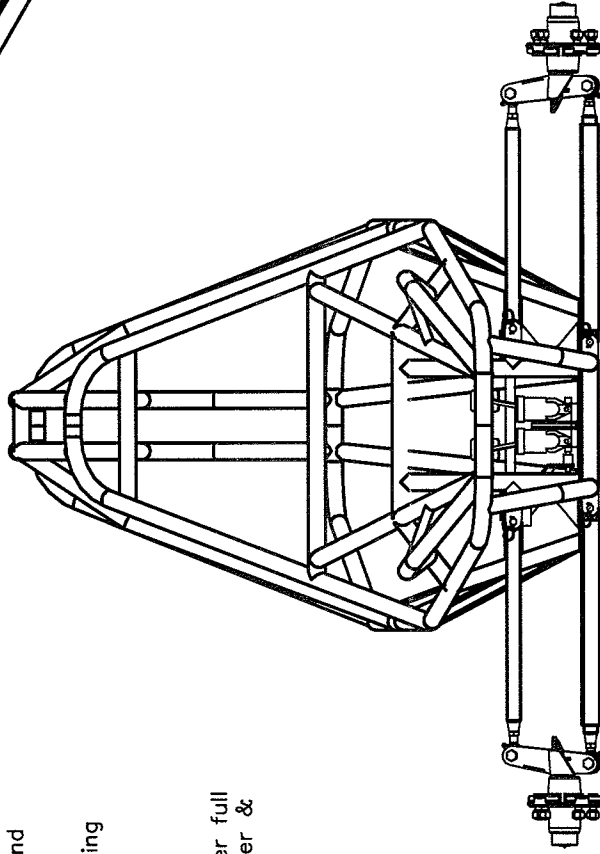
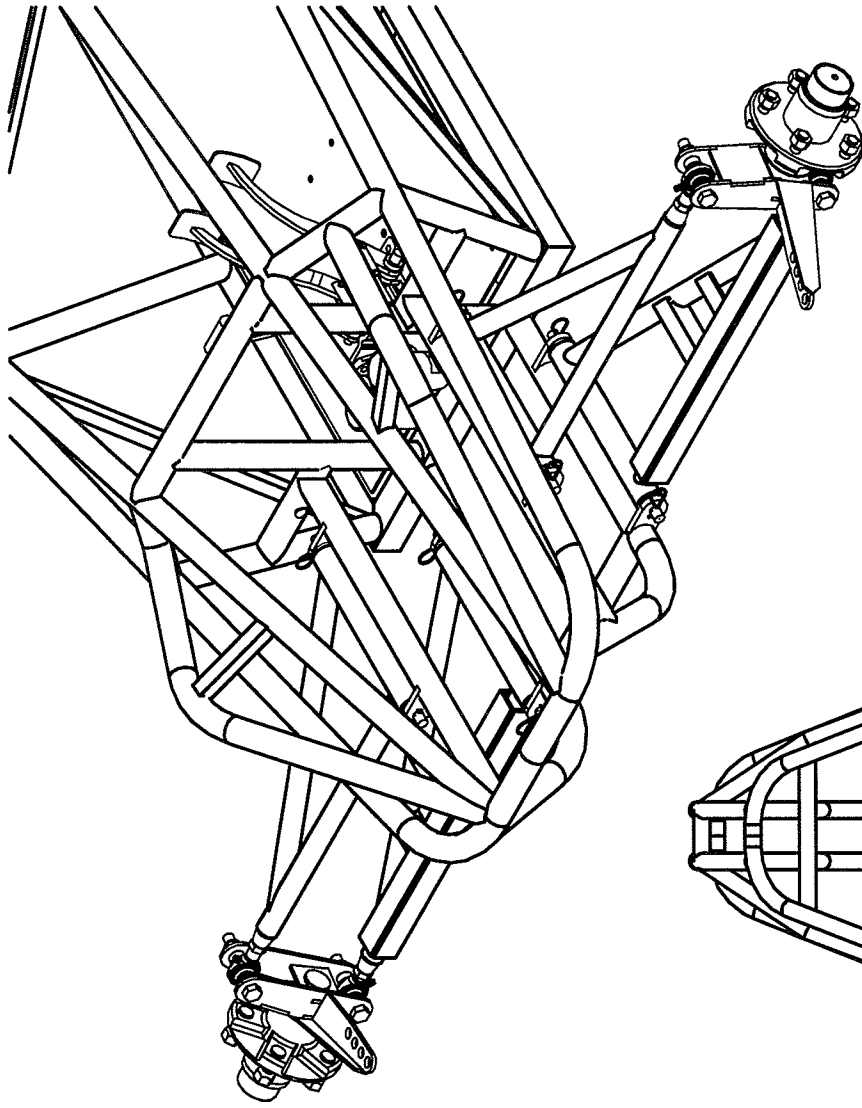
The steering tie rod mounting plates should face forward as shown. Check all bolts. Tighten the jam nuts for the $\frac{5}{8}$ " rod ends against the tube adapters to lock the rod ends in place.

You may need to adjust the inward/outward position of the upper or lower (or both) rod ends to make sure the left & right wheel hubs sit perpendicular to the ground while the suspension is at full droop.

Test the articulation of the front suspension by allowing each side to fully droop then fully compress. The measured difference between full droop & full compression is your theoretical suspension "travel".

The wheel hub should tilt slightly inward (1"-3") under full compression. This is known as negative wheel camber & is desirable for off-road vehicle suspensions.

You are now ready to fabricate the steering system.



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TITLE
**ASSEMBLING THE FRONT SPINDLES
& WHEEL HUBS TO THE FRONT**

DWG No.

B16

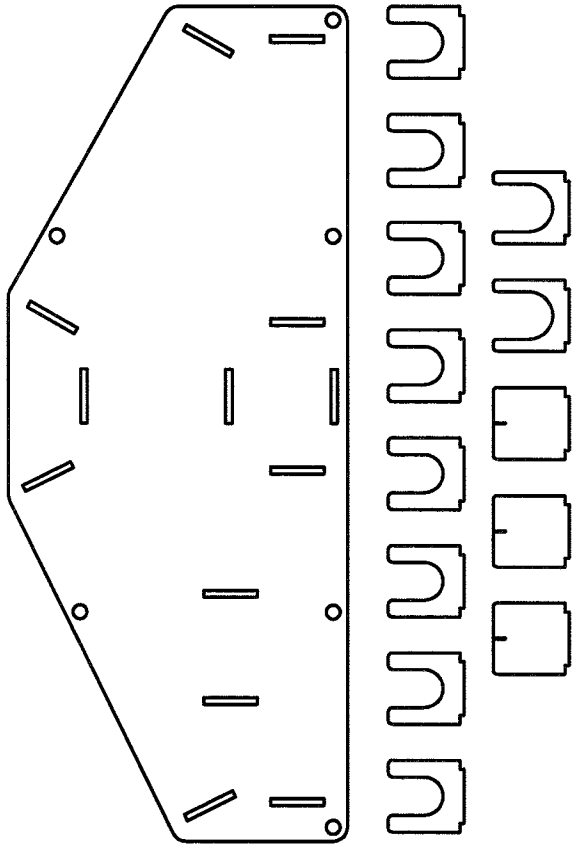


PLATE KIT #PLK005
 14 pcs OF LASER CUT STEEL PLATES
 FRONT A-ARM JIG

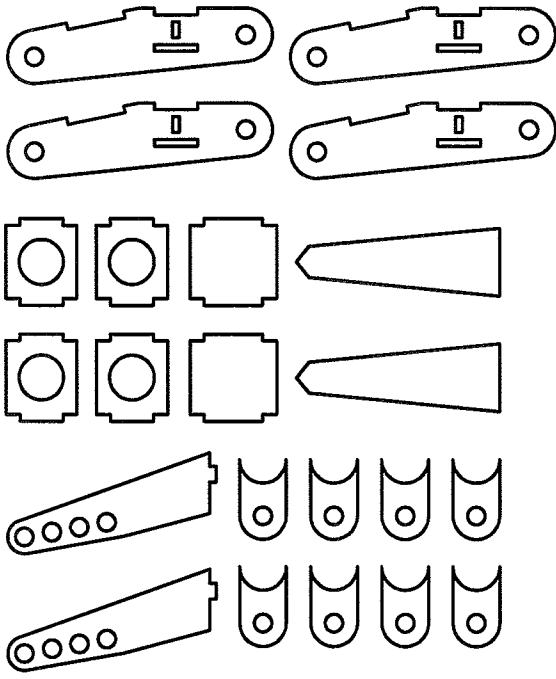
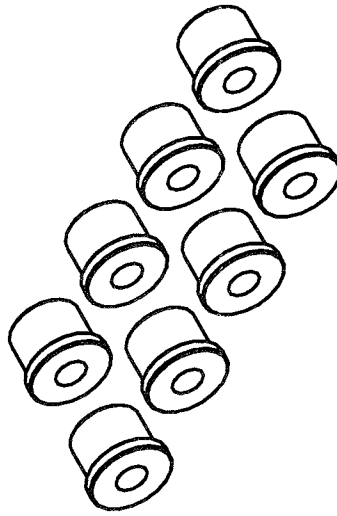


PLATE KIT #PLK011
 22 pcs OF LASER CUT STEEL PLATES



SUSPENSION BUSHING KIT #BGK004
 8 pcs OF SIZE 1 POLYURETHANE BUSHINGS



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TITLE

**KITSETS AVAILABLE FOR
 SECTION "B"**

DWG No.

B17

SECTION "C"

BUILDING THE RACK & PINION STEERING SYSTEM

MATERIAL LIST

<u>ITEM No.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	STEERING WHEEL, PART #ST0001	1
2	RACK & PINION, PART #ST0002	1
3	3/4" STEADY BEARING, PART #ST0003	2
4	STEERING DISCONNECT, PART #ST0004	1
5	STEERING SPLINE STUBS, PART #ST0005	3
6	STEERING U-JOINTS, PART #ST0006	2
7	U-SHAPED BRACKET, PART #ST0008	2
8	PLATE #PL0022, 3/16" MILD STEEL PLATE	1
9	PLATE #PL0023, 3/16" MILD STEEL PLATE	2
10	PLATE #PL0027, 3/16" MILD STEEL PLATE	1
11	1/2" UNF TUBE ADAPTER, PART #DL0014	2
12	1/2" UNF MALE STUD TIE ROD, PART #DL0007	2
13	3/4"Ø COLD ROLLED SOLID ROUND BAR	1 pc x 40" LONG

NOTES:

3/4" Round Tube for steering tie rods not shown on this material list. The first material list shown in section "A" includes ample 3/4" Round Tube to construct the steering tie rods.



STATEMENT OF OWNERSHIP

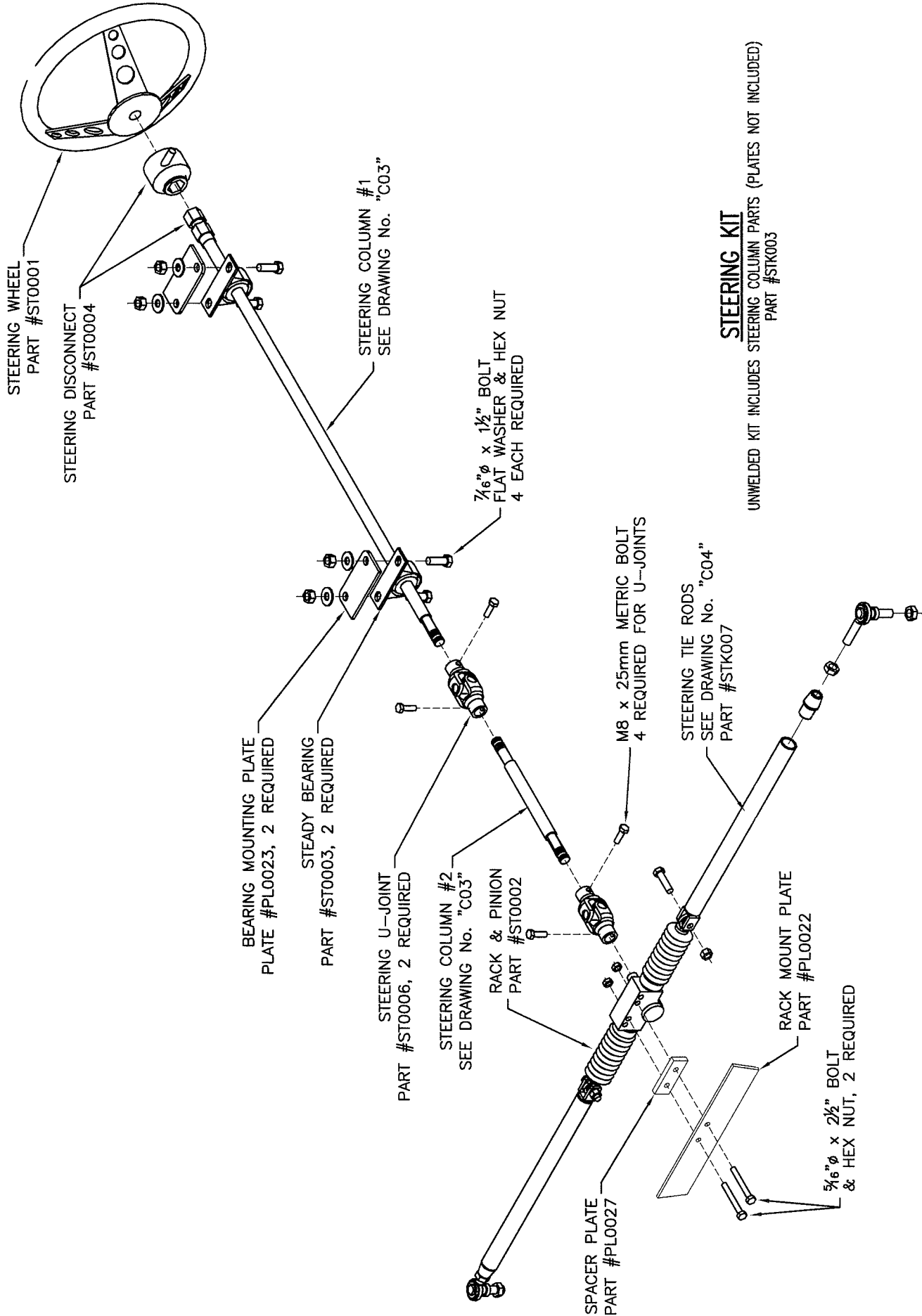
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TITLE

BUILDING THE STEERING SYSTEM

DWG No.

C01



STEERING KIT
UNWELDED KIT INCLUDES STEERING COLUMN PARTS (PLATES NOT INCLUDED)
PART #STK003

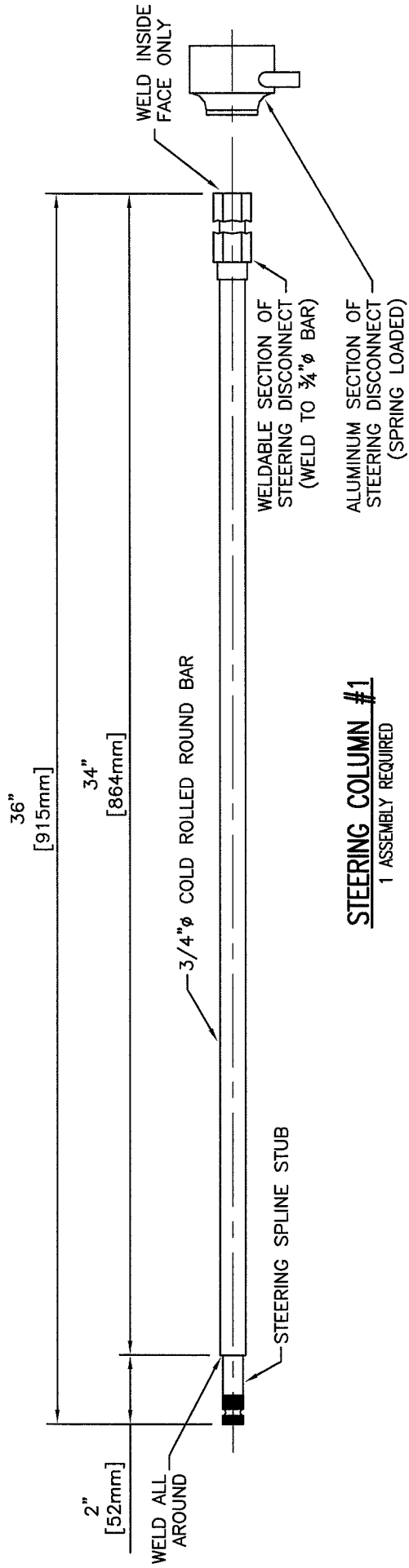


STATEMENT OF OWNERSHIP
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TITLE
**RACK & PINION
STEERING ASSEMBLY**

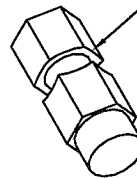
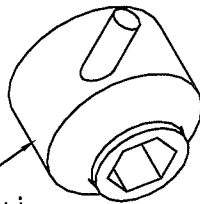
DWG No.

C02



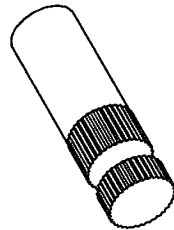
STEERING COLUMN #1
1 ASSEMBLY REQUIRED

BILLET ALUMINUM STEERING DISCONNECT. STEERING WHEEL BOLTS TO FAR SIDE.

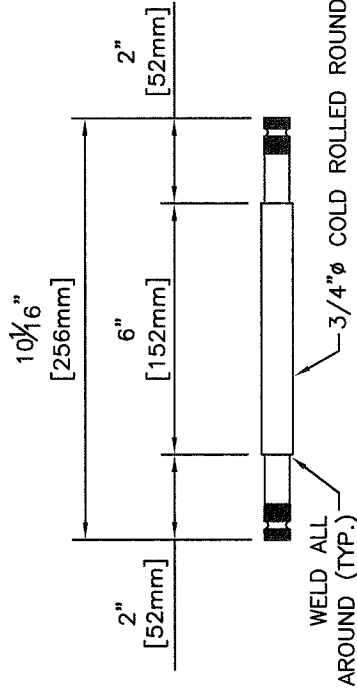


WELDABLE SECTION OF STEERING DISCONNECT

STEERING DISCONNECT
PART #ST0004, 1 REQUIRED



STEERING SPLINE STUB
PART #ST0005, 3 REQUIRED



STEERING COLUMN #2
1 ASSEMBLY REQUIRED



STATEMENT OF OWNERSHIP

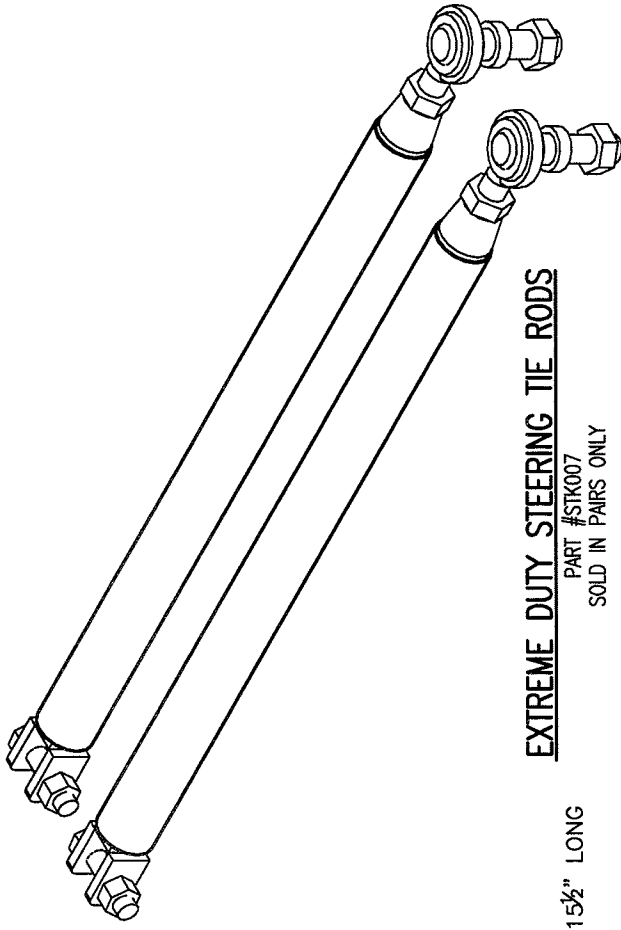
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TITLE

STEERING COLUMN DETAILS

DWG No.

C03



EXTREME DUTY STEERING TIE RODS
 PART #STK007
 SOLD IN PAIRS ONLY

U-SHAPED BRACKET
 PART #ST0008
 2 REQUIRED

HEX BOLT $\frac{3}{8}$ " x $1\frac{1}{2}$ " LONG
 2 REQUIRED

$\frac{3}{8}$ " NYLOCK NUT

$\frac{3}{4}$ " ROUND TUBE x $15\frac{1}{2}$ " LONG
 2 REQUIRED

D-I-Y STEERING TIE RODS
 DETAILS TO BUILD THESE TIE RODS YOURSELF
 2 REQUIRED AS SHOWN

$\frac{1}{2}$ " TUBE ADAPTER
 PART #DL0014, 2 REQUIRED

$\frac{1}{2}$ " UNF HEX NUT

$\frac{1}{2}$ " UNF MALE STUD TIE ROD
 PART #DL0007, 2 REQUIRED

$\frac{1}{2}$ " UNF HEX NUT



STATEMENT OF OWNERSHIP

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TITLE

EXTREME DUTY STEERING TIE ROD DETAILS

DWG No.

C04

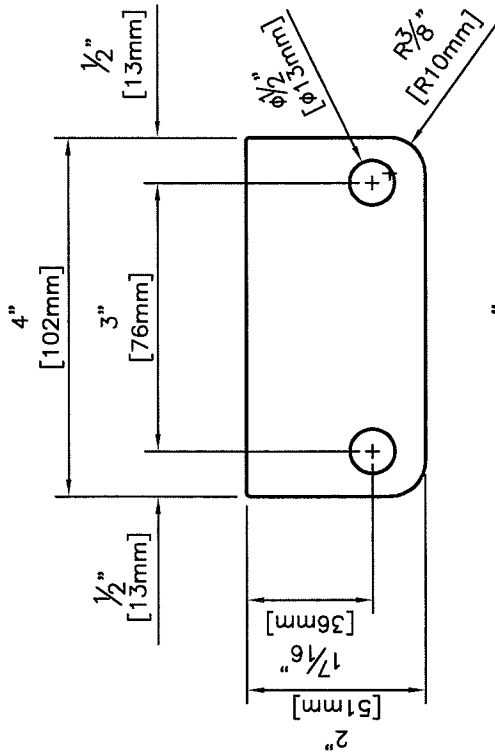


PLATE #PL0023

3/16" THICK MILD STEEL, 2 REQUIRED
THIS PART WELDS TO CHASSIS FOR SUPPORTING THE STEERING COLUMN

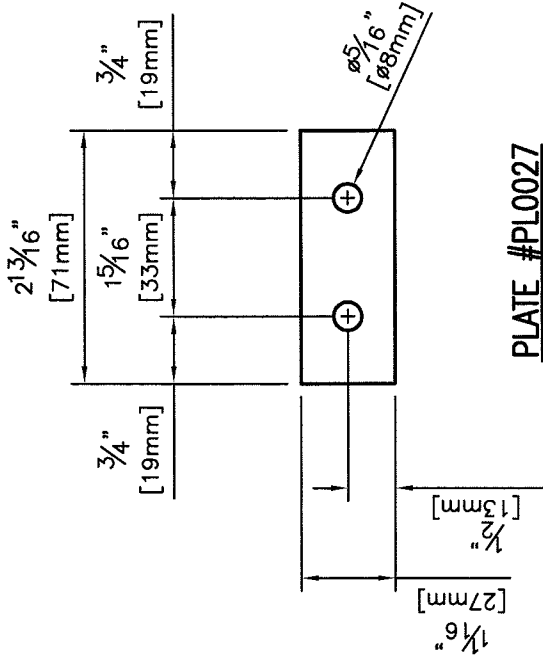


PLATE #PL0027

5/16" THICK MILD STEEL, 1 REQUIRED
THIS IS A SPACER FOR THE RACK & PINION

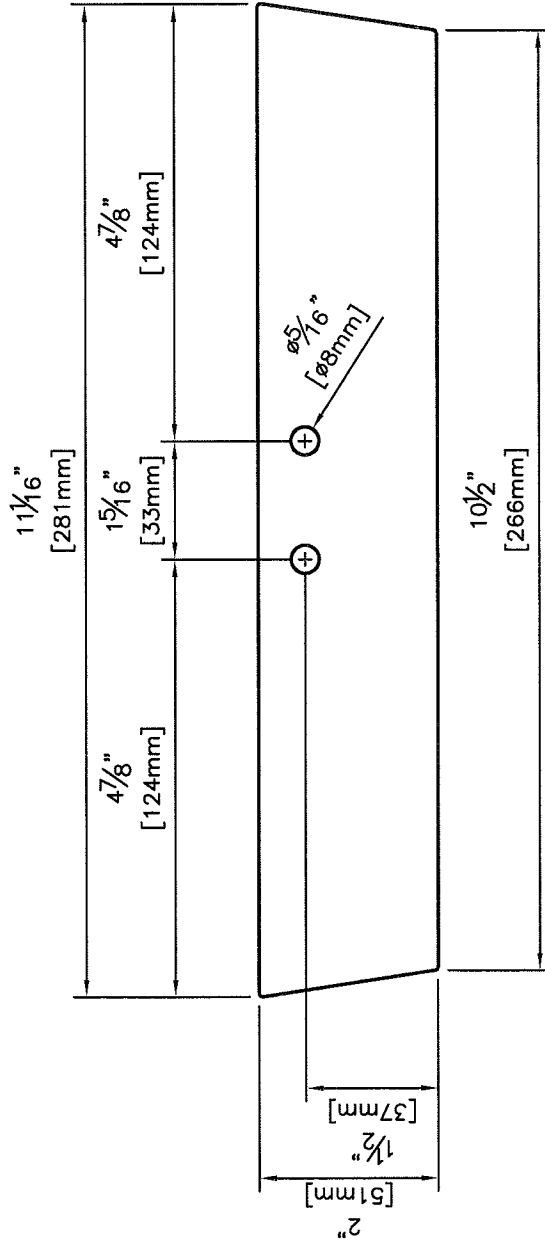


PLATE #PL0022

3/16" THICK MILD STEEL, 1 REQUIRED
THIS IS THE RACK & PINION MOUNTING PLATE



STATEMENT OF OWNERSHIP

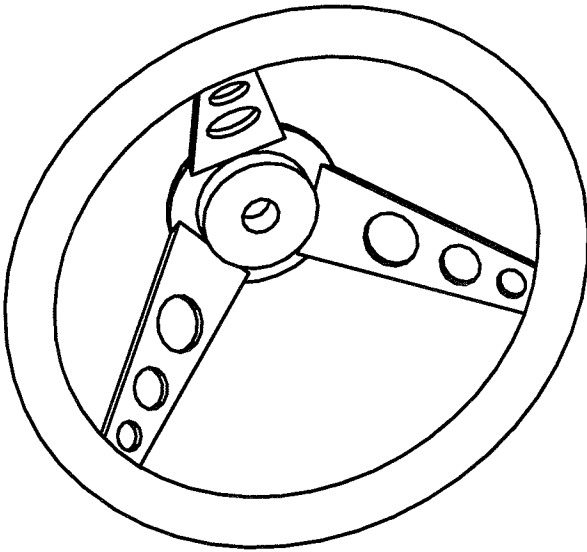
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TITLE

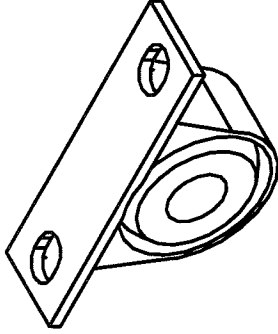
STEERING PLATEWORK
DETAILS

DWG No.

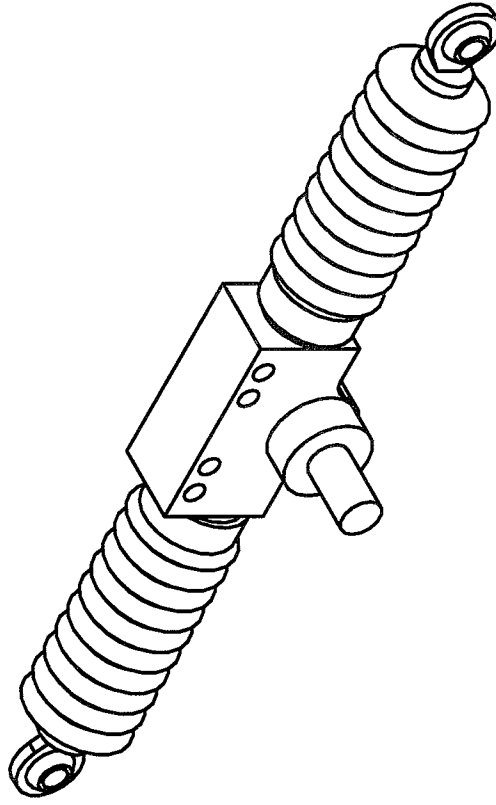
C05



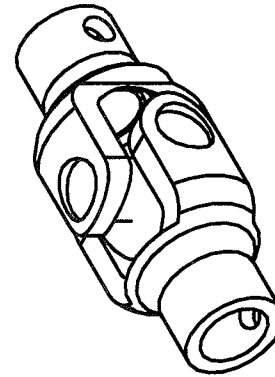
STEERING WHEEL
 11" DIA. PADDED GRIP, 3 SPOKE CHROME CENTER
 PART #ST0001, 1 REQUIRED



STEERING COLUMN STEADY BEARING
 3/4" I.D. BRASS LINED BUSHING c/w GREASE NIPPLE
 PART #ST0003, 2 REQUIRED



RACK & PINION STEERING BOX
 1-1/4 TURNS LOCK-TO-LOCK, BILLET ALUMINUM HOUSING
 PART #ST0002, 1 REQUIRED



STEERING U-JOINT
 INTERNAL SPLINE TO SUIT STEERING SPLINE STUBS
 PART #ST0006, 2 REQUIRED



STATEMENT OF OWNERSHIP

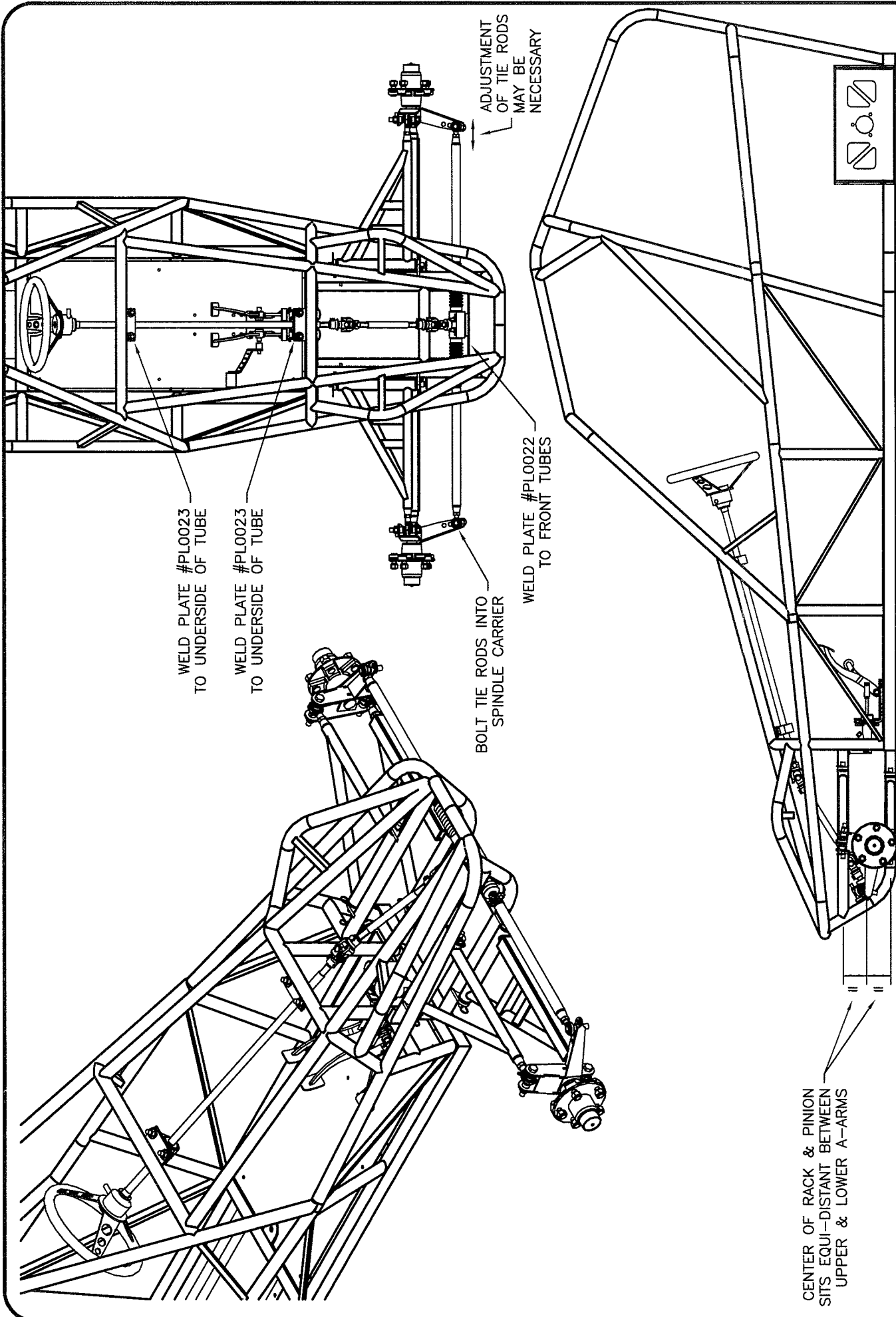
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TITLE

**STEERING
 PARTS**

DWG No.

C06



TITLE

INSTALLING THE STEERING SYSTEM

STATEMENT OF OWNERSHIP
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DWG No.

C07

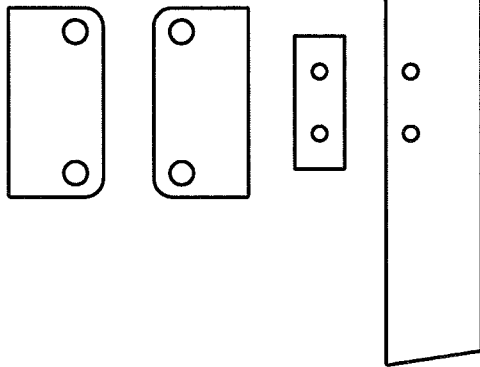
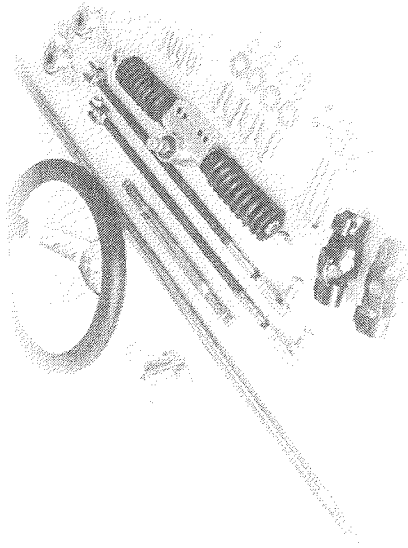
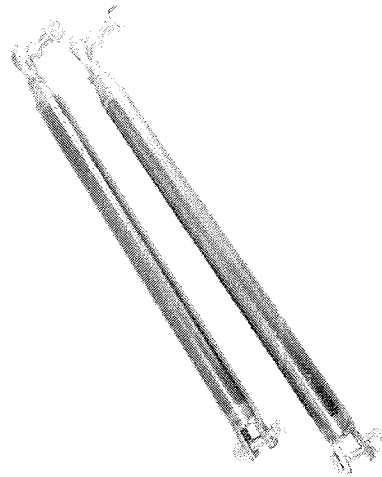


PLATE KIT #PLK007
4 pcs OF LASER CUT STEEL PLATES



STEERING SYSTEM KIT #STK003
UNWELDED, INCLUDES MOUNTING BOLTS



HEAVY DUTY STEERING TIE ROD KIT #STK007
UNWELDED INCLUDES MOUNTING BOLTS



STATEMENT OF OWNERSHIP

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TITLE

KITSETS AVAILABLE FOR SECTION "C"

DWG No.

C08

SECTION "D"

BUILDING THE REAR SUSPENSION & DRIVE SYSTEM

MATERIAL LIST

<u>ITEM No.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	REAR A-ARM, PART #SS0003	4
2	WHEEL HUB BEARING, PART #DL0005	4
3	PLATE FLANGE BEARING, PART #DL0006	2
4	1"φ x 36" KEYED SHAFT, PART #DL0008	1
5	¼" x 12" KEYSTOCK, PART #DL0010	3
6	DRIVESHAFT U-JOINT, PART #DL0021	4
7	POLYURETHANE BUSHINGS, PART #BG0001	16
8	PIPE, 2½" Sch. 80 x 2" LONG, PART #DL0022	2
9	½" UNF TAPERED LUG NUTS	10
10	WHEEL HUBS (SALVAGED)	2
11	STUB AXLES (SALVAGED)	2
12	1"φ x 1½" LONG KEYED SHAFT (FOR STUB AXLES)	2
13	½"φ COLD ROLLED SOLID ROUND BAR	4 pcs x 4-3/4" LONG
14	½"φ COLD ROLLED SOLID ROUND BAR	4 pcs x 16" LONG
15	⅜" HITCH PINS	16
16	½"φ x 1½" GRADE 8 HEX BOLTS	10

NOTES:

¾" & 1" Round Tube for rear a-arms not shown on this material list. The first material list shown in section "A" includes ample ¾" Round Tube to construct the steering tie rods.



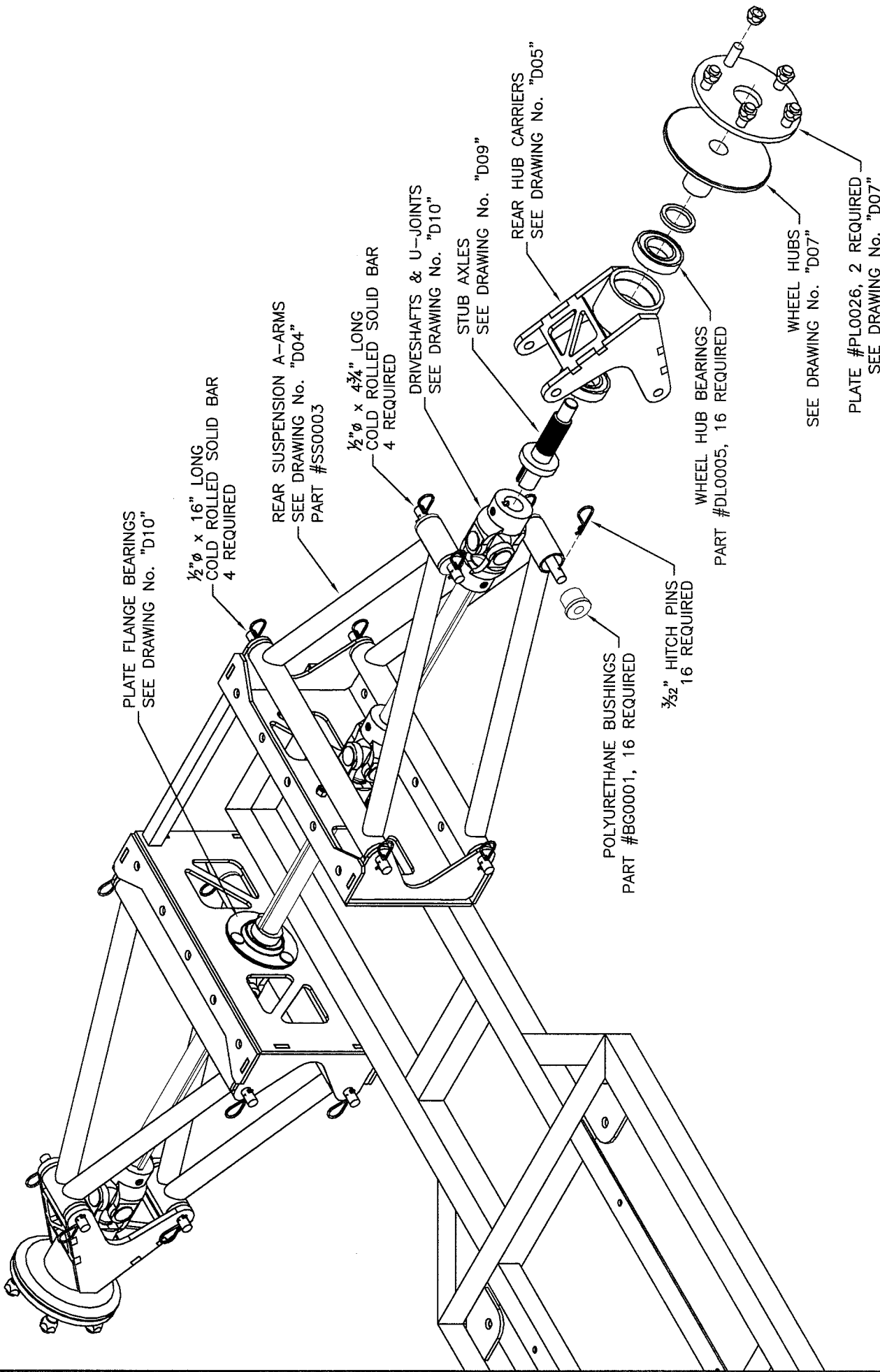
STATEMENT OF OWNERSHIP

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TITLE
**BUILDING THE REAR SUSPENSION
& DRIVE SYSTEM**

DWG No.

D01



STATEMENT OF OWNERSHIP

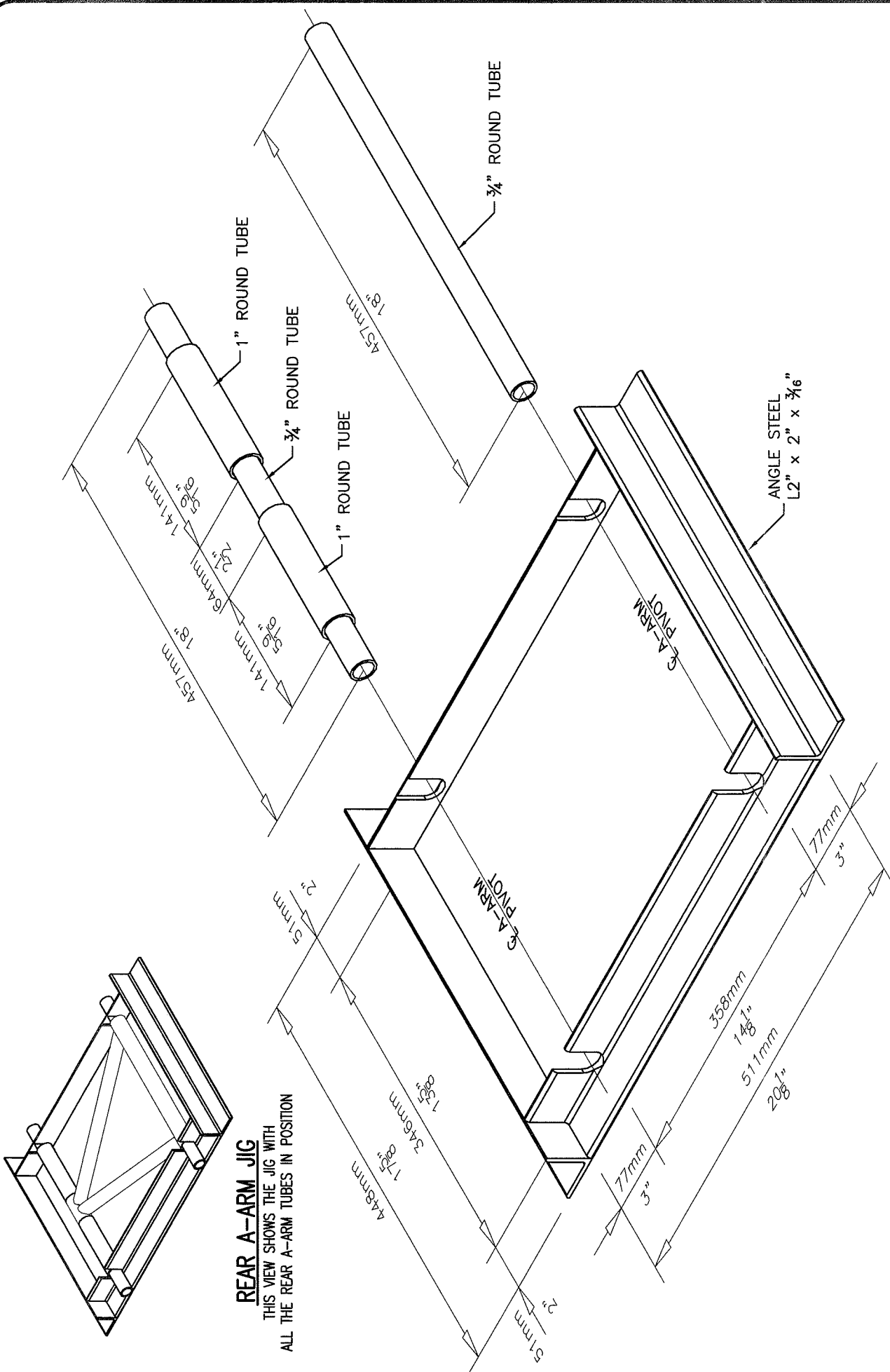
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TITLE

REAR SUSPENSION & DRIVE SYSTEM ASSEMBLY

DWG No.

D02



REAR A-ARM JIG
 THIS VIEW SHOWS THE JIG WITH
 ALL THE REAR A-ARM TUBES IN POSITION



STATEMENT OF OWNERSHIP

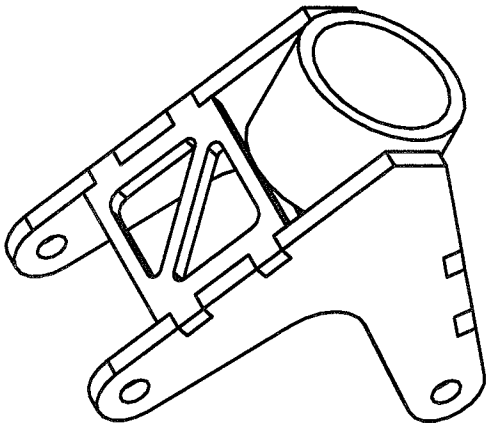
THIS DESIGN IS THE PROPERTY OF BADLAND BIGGY
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 EXPRESS WRITTEN CONSENT.

TITLE

**JIG FOR ALL REAR
 SUSPENSION A-ARMS**

DWG No.

D03

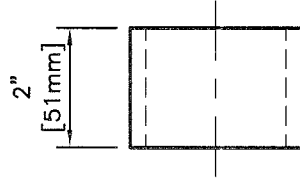


ASSEMBLED VIEW OF REAR HUB CARRIERS

1 PAIR REQUIRED AS SHOWN

NOTES:

Do not machine the 2 1/2" Sch. 80 until AFTER it is fully welded with plates #PL0024 & #PL0028.



2-1/2" Sch. 80 PIPE, PART #DL0022

UNMACHINED BEARING HOUSING, 2 REQUIRED

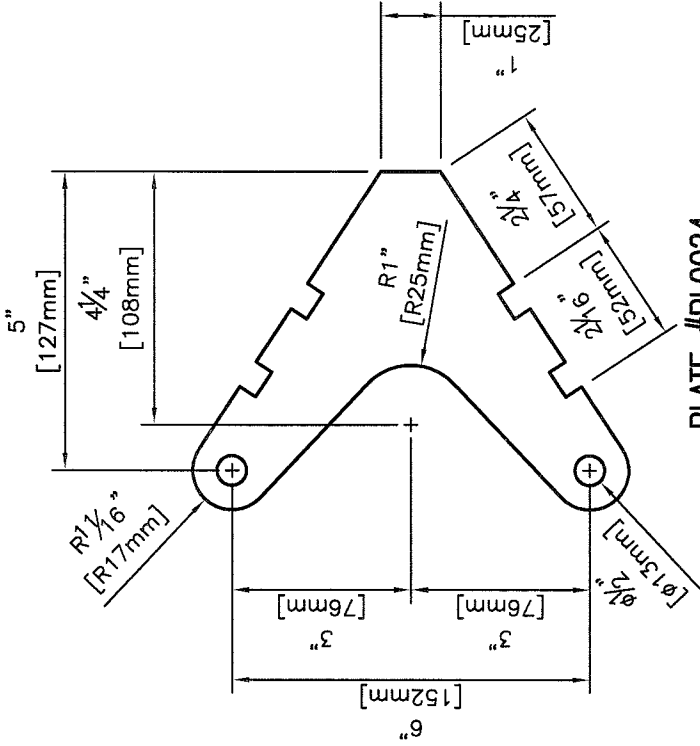


PLATE #PL0024

5/16" THICK MILD STEEL, 4 REQ'D

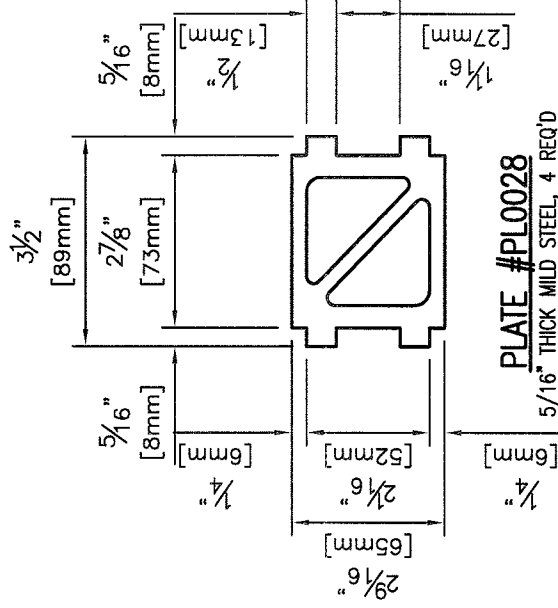


PLATE #PL0028

5/16" THICK MILD STEEL, 4 REQ'D

STATEMENT OF OWNERSHIP

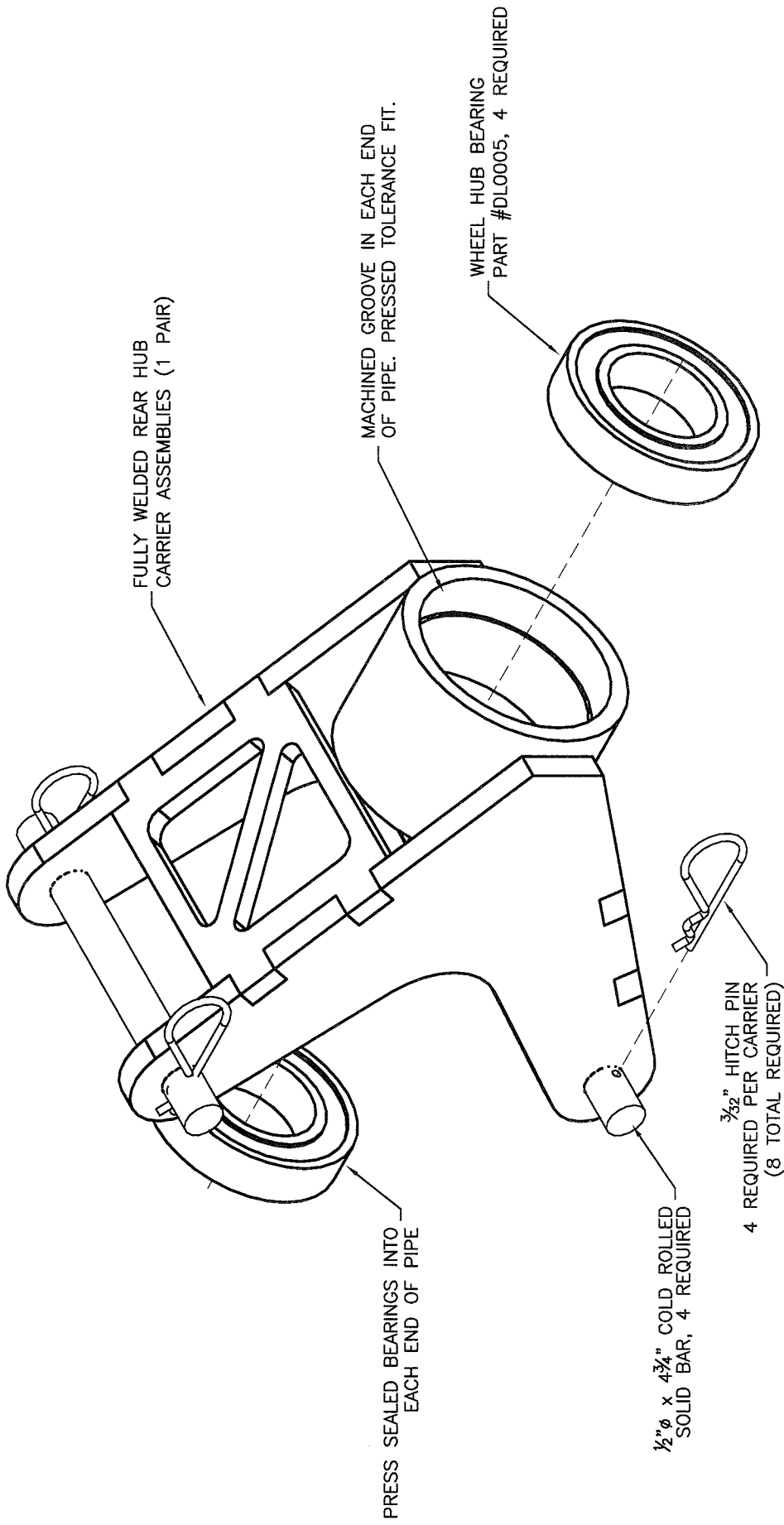
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TITLE

**REAR HUB CARRIER
DETAILS**

DWG No.

D05



STATEMENT OF OWNERSHIP

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TITLE

MACHINING & ASSEMBLY DETAILS FOR REAR HUB CARRIERS

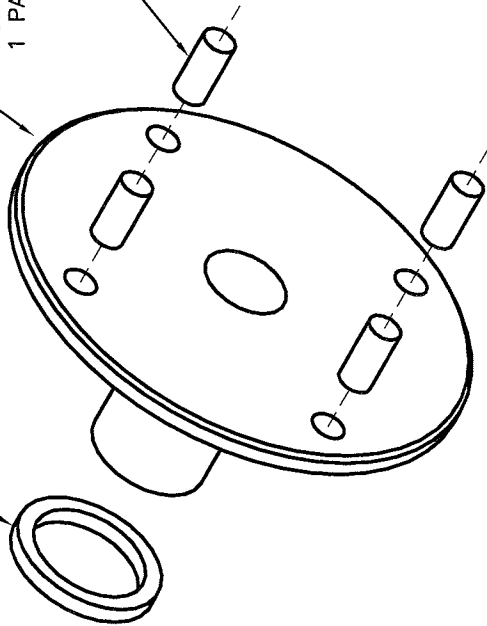
DWG No.

D06

SALVAGE THE TAPERED WHEEL HUB SPACERS. 1 PAIR REQUIRED

SALVAGE THE FRONT WHEEL HUBS FROM A 1987-1990 CHEVY SPRINT AUTOMOBILE (SIMILAR VEHICLES INCLUDE PONTIAC FIREFLY & GEO METRO). 1 PAIR REQUIRED

PRESS OUT THE EXISTING WHEEL STUDS



STEP #1

SALVAGE & CLEAN THE AUTOMOBILE PARTS

$\frac{1}{2}$ " ϕ x $\frac{1}{2}$ " GRADE 8 BOLTS. CUT OFF HEADS THEN PLUG WELD FROM BACK OF PLATE

$\frac{1}{2}$ " TAPERED LUG NUTS 10 REQUIRED

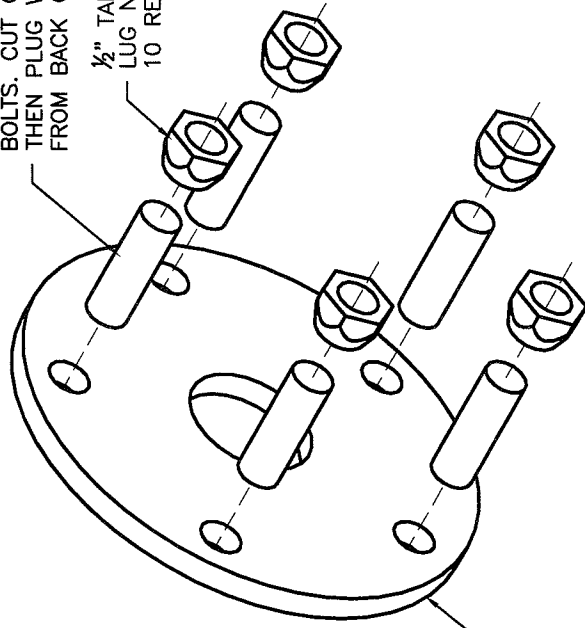


PLATE #PL0026

STEP #2

BUILD THE ADAPTER PLATE TO CHANGE THE BOLT PATTERN

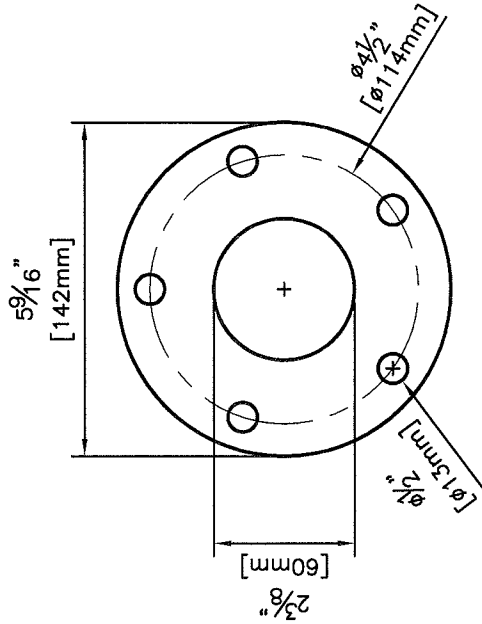
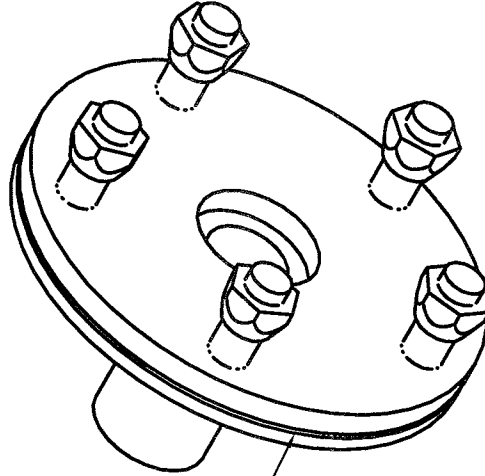


PLATE #PL0026

5/16" THICK MILD STEEL, 2 REQUIRED

WELD THE ADAPTER PLATE TO THE AUTOMOBILE WHEEL HUB. THIS CHANGES THE WHEEL STUD BOLT PATTERN TO 5 BOLT ON $4\frac{1}{2}$ " BOLT CIRCLE DIAMETER.



STEP #3

WELD THE ADAPTER PLATE TO THE WHEEL HUB



STATEMENT OF OWNERSHIP

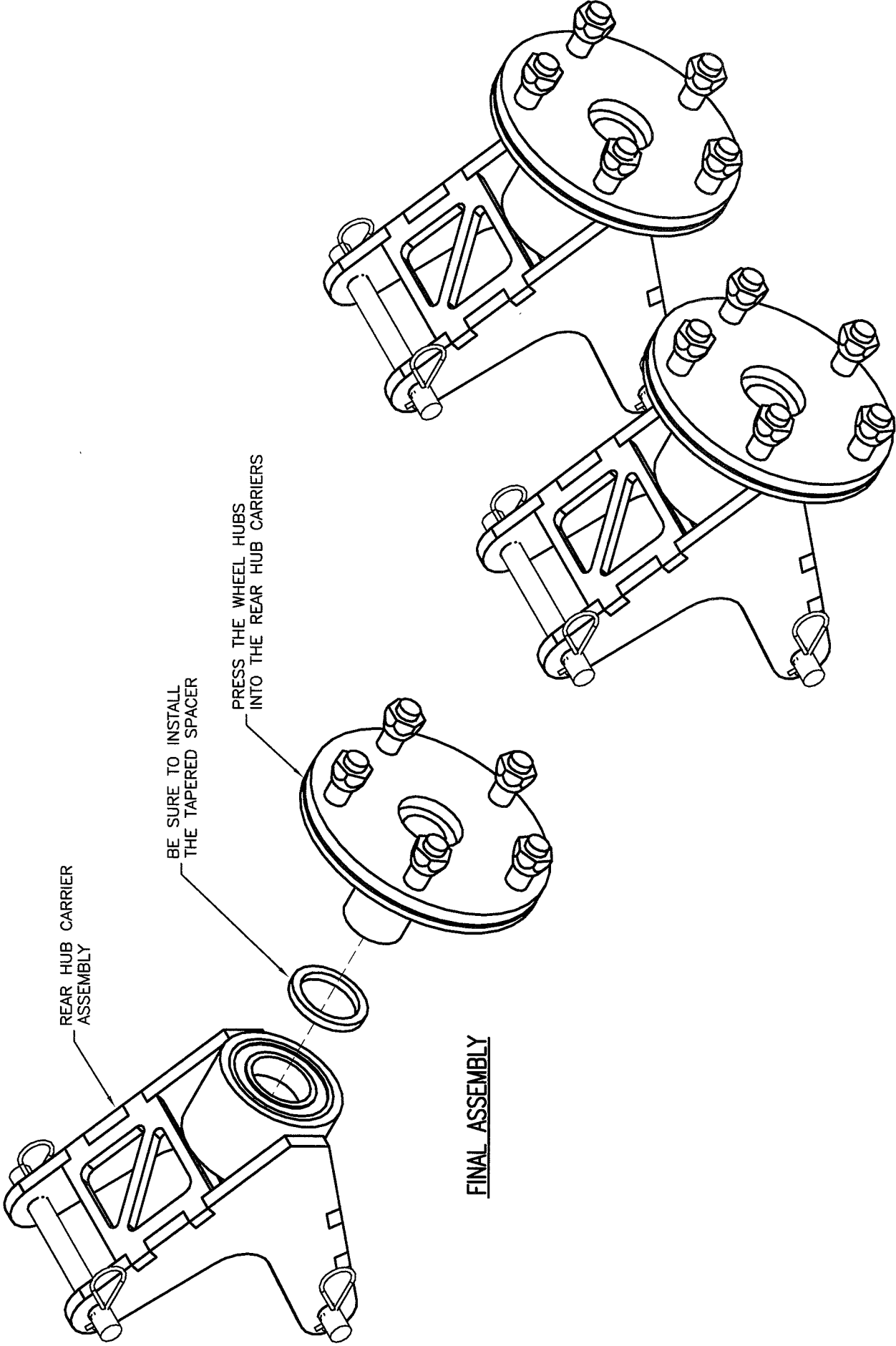
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TITLE

BUILDING THE WHEEL HUBS

DWG No.

D07



REAR HUB CARRIER ASSEMBLY

BE SURE TO INSTALL THE TAPERED SPACER

PRESS THE WHEEL HUBS INTO THE REAR HUB CARRIERS

FINAL ASSEMBLY

REAR HUB CARRIER ASSEMBLIES

PART #DL0011, SOLD IN PAIRS ONLY

FULLY ASSEMBLED UNITS AVAILABLE FROM BADLAND BUGGY, READY TO BOLT-ON

STATEMENT OF OWNERSHIP

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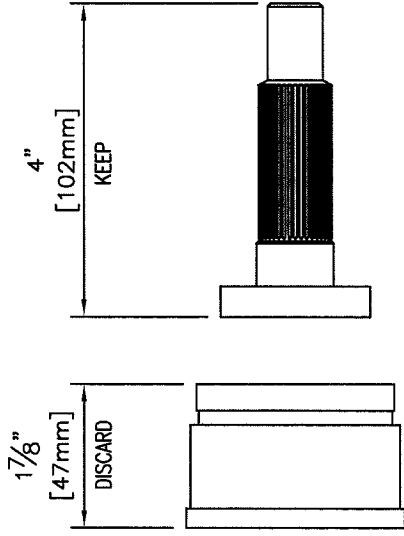
TITLE

ASSEMBLING THE WHEEL HUBS TO THE REAR HUB CARRIERS

DWG No.

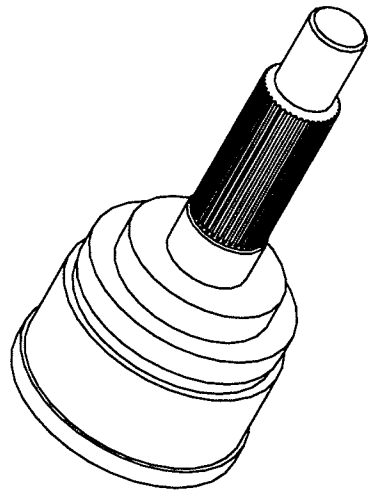
D08





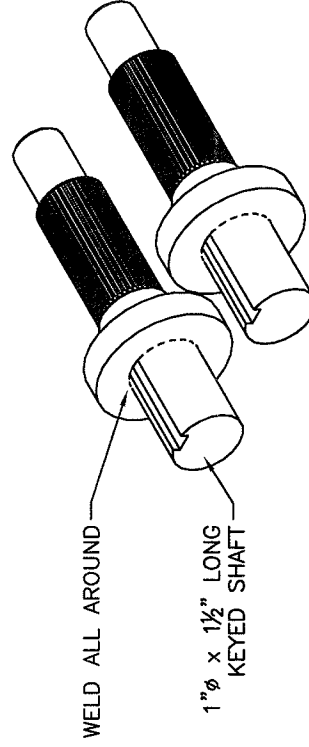
STEP #1

SALVAGE & CLEAN THE AUTOMOBILE STUB AXLE (2 REQUIRED)



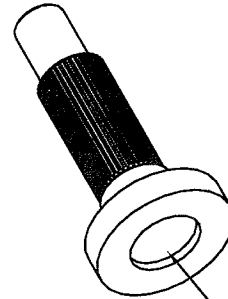
STEP #2

MACHINE THE CV HOUSING OFF THE STUB AXLE



STEP #3

MACHINE A RECESS IN THE BACK FACE OF THE STUB AXLE



STEP #4

WELD ON A 1 inch diameter KEYS



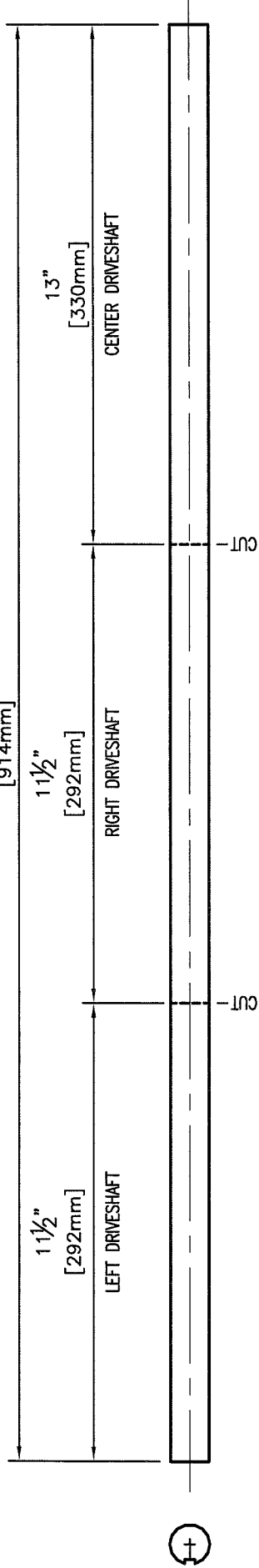
TITLE

STATEMENT OF OWNERSHIP
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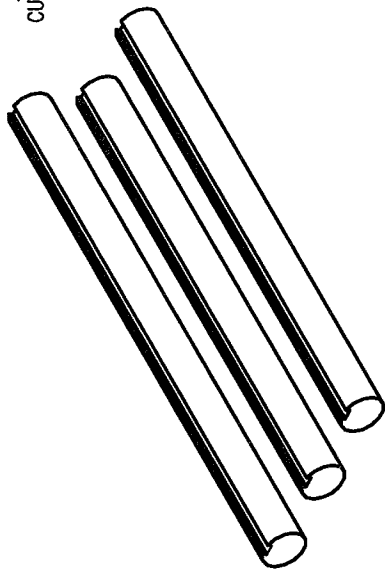
**BUILDING THE
 STUB AXLES**

DWG No.

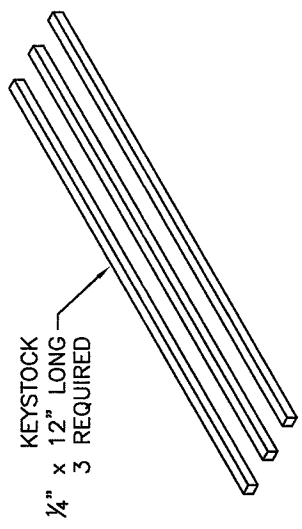
D09



1" KEYED SHAFT x 36" LONG
 CUT ALL THREE DRIVESHAFTS FROM ONE 36" LENGTH

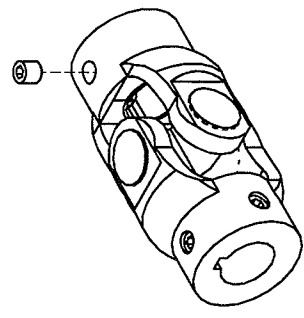


3 pc DRIVESHAFT KIT
 PART #DL0008 KIT



KEYSTOCK
 1/4" x 12" LONG
 3 REQUIRED

KEYSTOCK
 PART #DL0010 EACH



DRIVESHAFT U-JOINT
 PART #DL0021 EACH, 4 REQUIRED

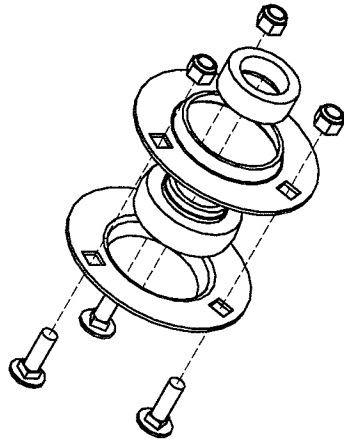


PLATE FLANGE BEARING
 PART #DL0006 EACH, 2 REQUIRED



STATEMENT OF OWNERSHIP

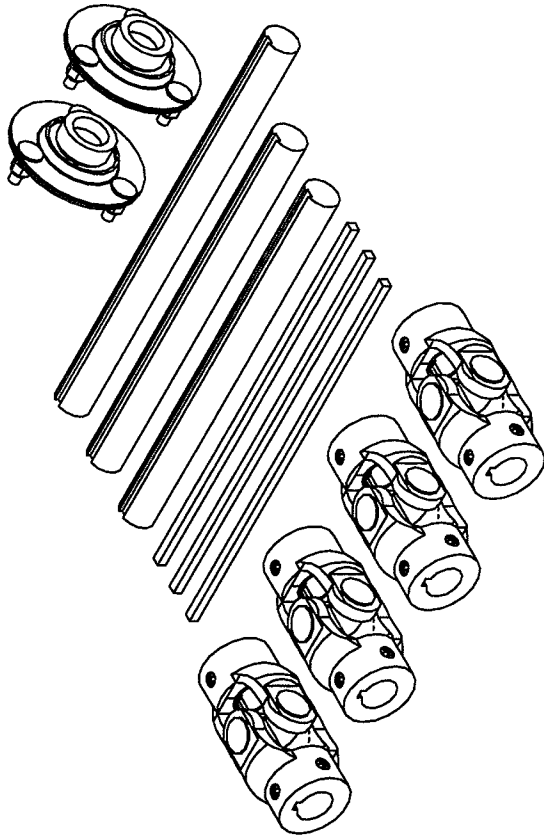
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TITLE

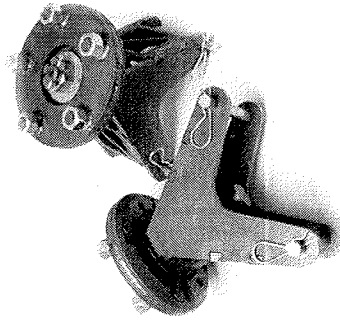
BUILDING THE DRIVESHAFTS

DWG No.

D10



DRIVESHAFT KIT #DLK005
 INCLUDES PRE-CUT KEYED SHAFTS & SET SCREWS, READY TO BOLT-ON



REAR HUB CARRIER KIT #DL0011
 FULLY WELDED READY TO BOLT-ON, INCLUDES STUB AXLES

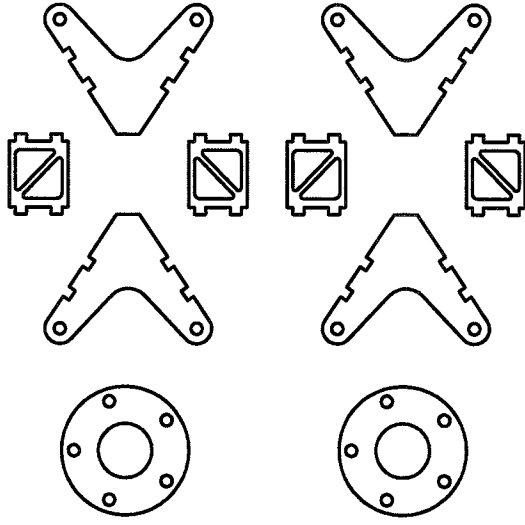
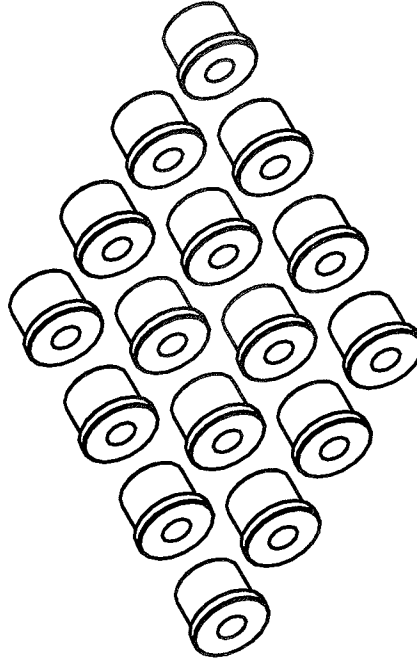


PLATE KIT #PLK008
 10 pcs OF LASER CUT STEEL PLATES



SUSPENSION BUSHING KIT #BGK005
 16 pcs OF SIZE 1 POLYURETHANE BUSHINGS



TITLE

STATEMENT OF OWNERSHIP
 THIS DESIGN IS THE PROPERTY OF BADLAND BUGGY
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 EXPRESS WRITTEN CONSENT.

KITSETS AVAILABLE FOR
 SECTION "D"

DWG No.

D11

SECTION "E"

INSTALLING THE SHOCKS

MATERIAL LIST

<u>ITEM No.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	FRONT SHOCKS, PART #SS0041	2
2	REAR SHOCKS, PART #SS0042	2
3	PLATE #PL0003, 1/8" MILD STEEL PLATE	2
4	PLATE #PL0009, 3/16" MILD STEEL PLATE	8
5	PLATE #PL0025, 3/16" MILD STEEL PLATE	4
6	PLATE #PL0058, 3/16" MILD STEEL PLATE	4
7	DOM TUBE, 3/4" O.D. x 1/2" I.D.	24"
8	HEX BOLT, 1/2"φ x 3" LONG	2
9	HEX BOLT, 1/2"φ x 5" LONG	2
10	NYLOCK NUT, 1/2" UNC	4



STATEMENT OF OWNERSHIP

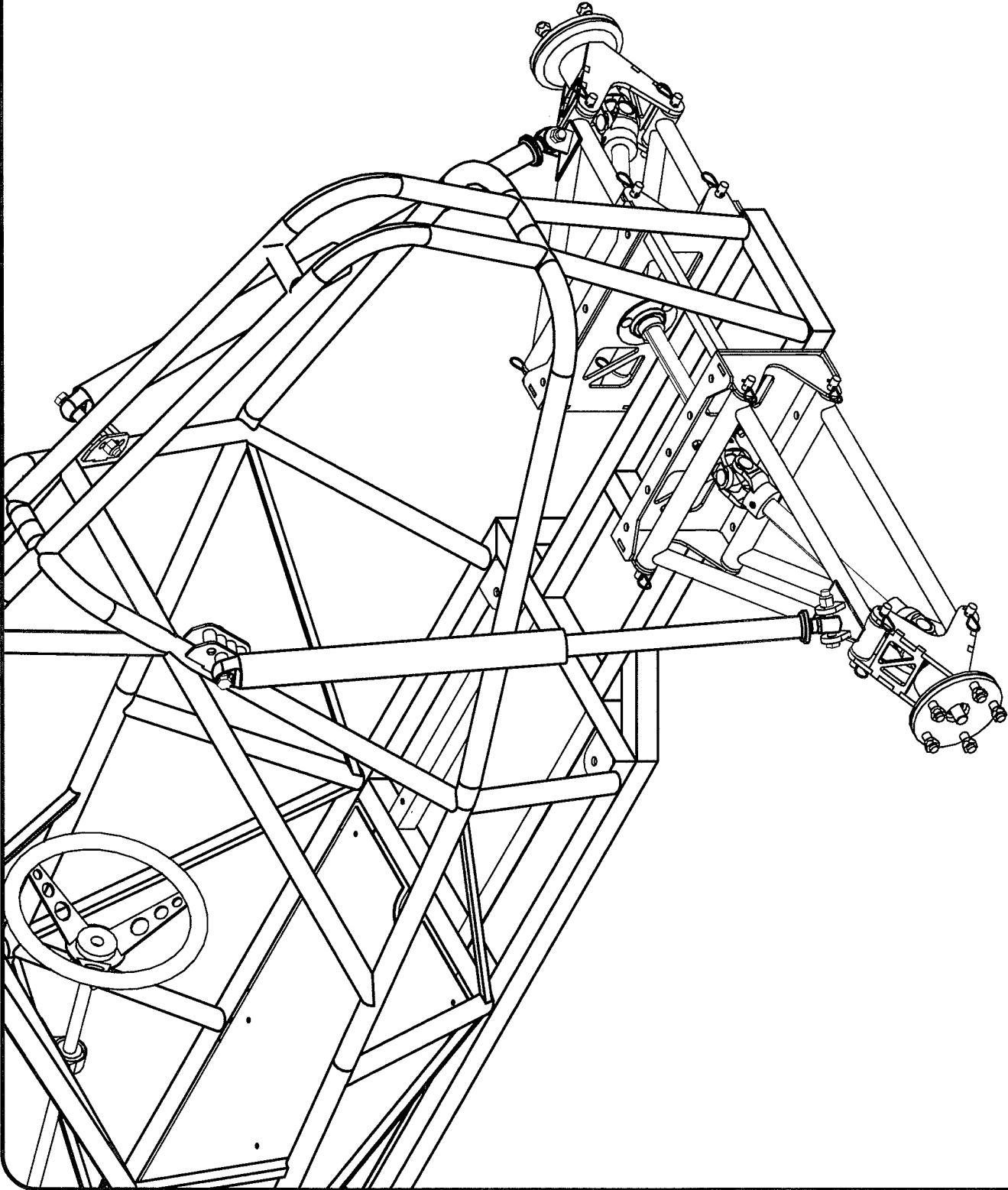
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TITLE

INSTALLING THE SHOCKS

DWG No.

E01



NOTES:

We recommend long travel Fox 2.0 Pro-Series Air shocks, 1.25"Ø shaft with built-in bumpstops.

These shocks do not require a coil spring rather "spring rate" is changed by adjusting the amount of nitrogen pressure within the shock itself. This means the shocks can be adjusted to accommodate just about any weight of engine, driver & chassis combination without having to change any coil springs. This is a great feature because you can also set-up your shocks for different types of driving terrain.

Fox Air Shocks come with an air valve located at the top of the cylinder. Always position air valve in the "up" position.

WARNING: Fox Air Shocks are under extreme high pressure. Do not attempt to adjust the nitrogen pressure without the proper equipment. You risk personal injury & loss of valving oil if not adjusted using proper equipment.

Fox Air Shocks come from the factory with a minimal amount of pressure (approx 50 psi). You will need to charge your air shocks by adding nitrogen pressure. You will require between 300-360 psi for the rear shocks & approximately 280-320 psi for the front shocks.

For safety, we recommend you have your Fox Air Shocks charged by an approved Fox Shock dealer or with proper charging equipment.



STATEMENT OF OWNERSHIP

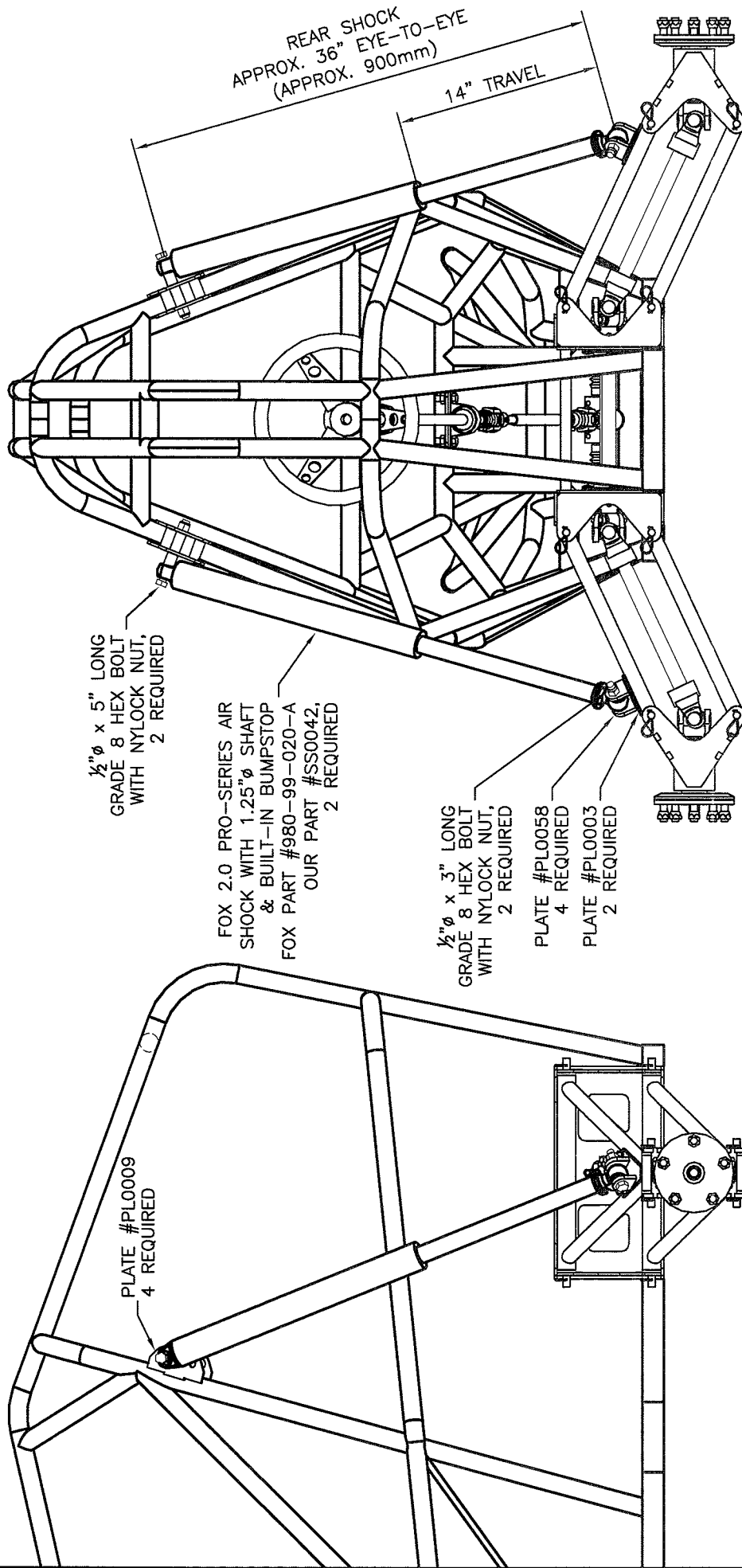
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TITLE

INSTALLING THE LONG TRAVEL REAR SHOCKS

DWG No.

E02



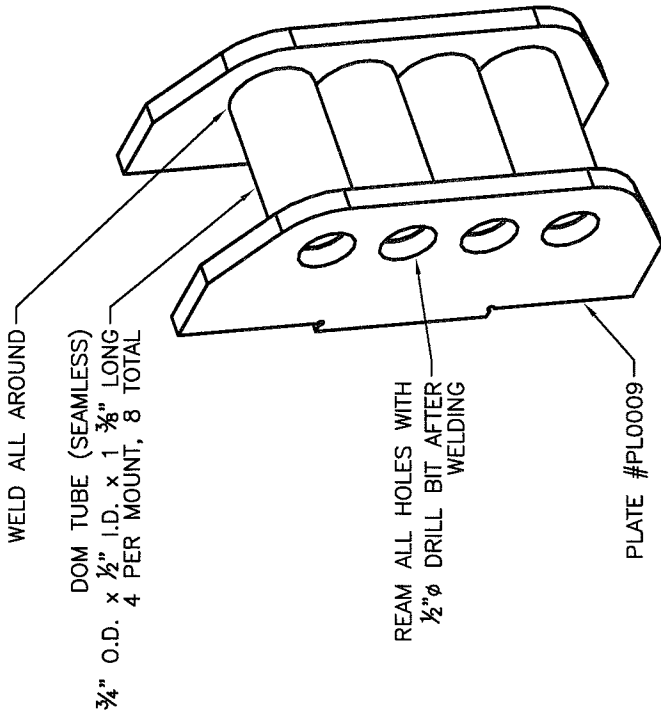
TITLE

STATEMENT OF OWNERSHIP
THIS DESIGN IS THE PROPERTY OF BADLAND BUGGY
AND SHALL NOT BE DISCLOSED TO OTHERS WITHOUT
EXPRESS WRITTEN CONSENT.

DWG No.

REAR SHOCK DETAILS &
MOUNTING PLATE LOCATIONS

E03



PRE-ASSEMBLY OF UPPER SHOCK MOUNT

WELD IN SPACERS ALIGNED WITH HOLES
MAKE 2 AS SHOWN

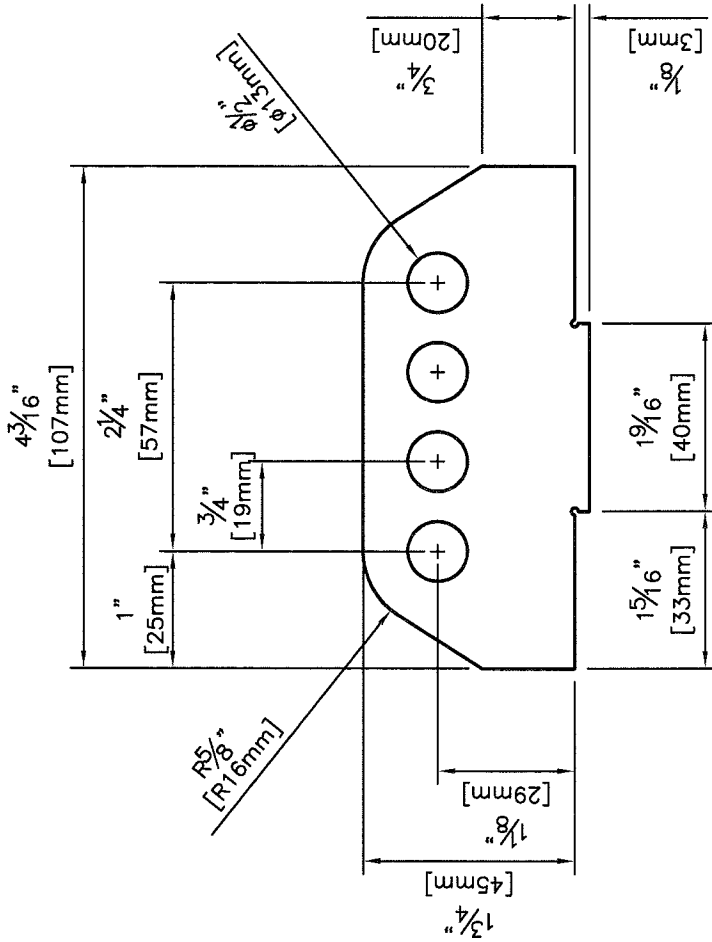


PLATE #PL0009

3/16" THICK MILD STEEL, 4 REQ'D
UPPER REAR SHOCK MOUNT



STATEMENT OF OWNERSHIP

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TITLE

**UPPER REAR SHOCK MOUNT
DETAILS**

DWG No.

E04

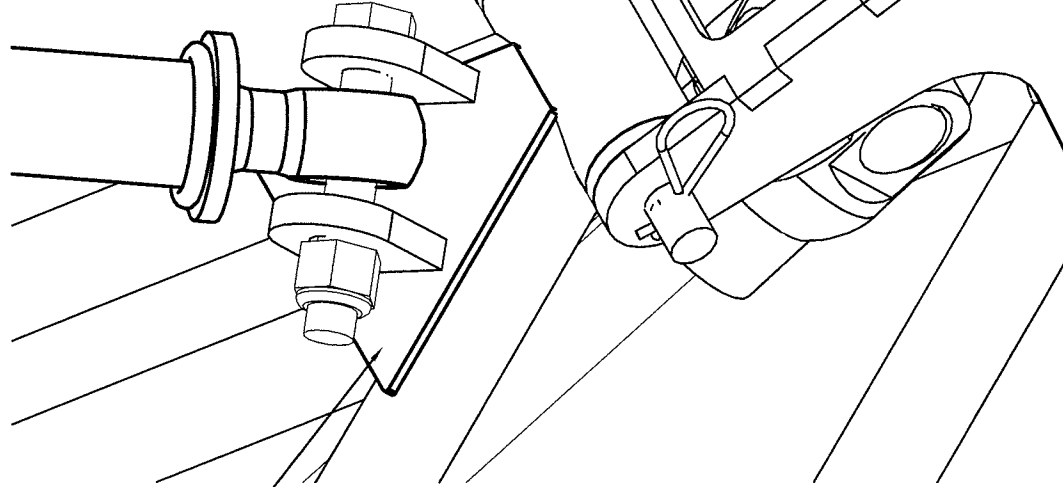
NOTES:

Fox shocks come with 1/2" i.d. spacers. Pre-assemble the lower shock mounts using Plates #PL0058, Fox spacers, 1/2" ϕ x 3" bolt & nylock nut.

Once assembled, orient the plates to a similar position as shown then tack weld plates #PL0058 to base plate #PL0003.

Next, orient upper shock mount plates (from previous pages) & tack weld to upper chassis frame.

Check to ensure shock is free to move through it's complete droop without binding on any parts. Adjust if necessary.



WELD PLATE #PL0003 TO UPPER REAR A-ARM TO ACT AS A BASE PLATE FOR LOWER SHOCK MOUNTS

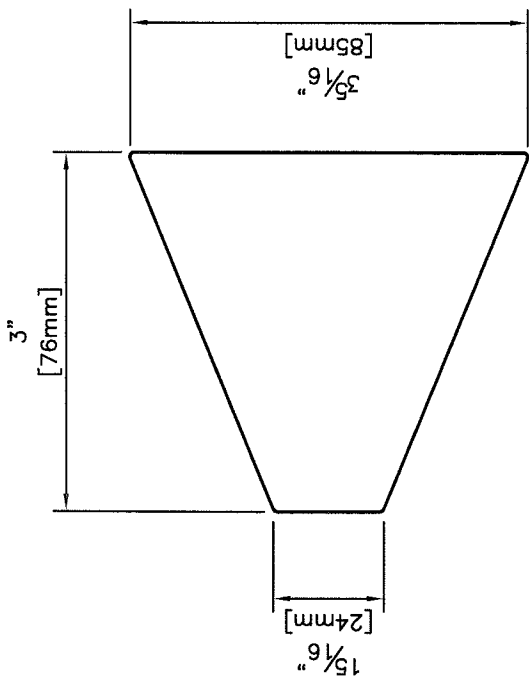


PLATE #PL0003

1/8" THICK MILD STEEL, 2 REQ'D
BASE PLATE FOR LOWER SHOCK MOUNTS

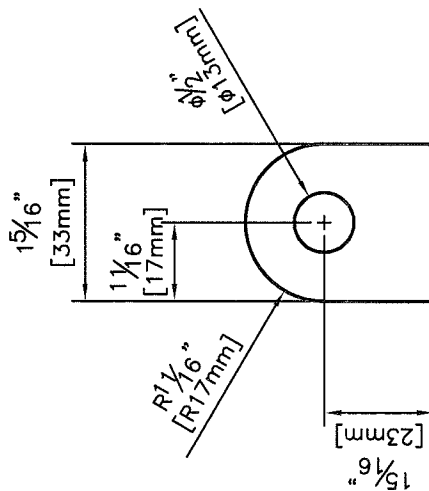


PLATE #PL0058

5/16" THICK MILD STEEL, 4 REQ'D
LOWER REAR SHOCK MOUNT



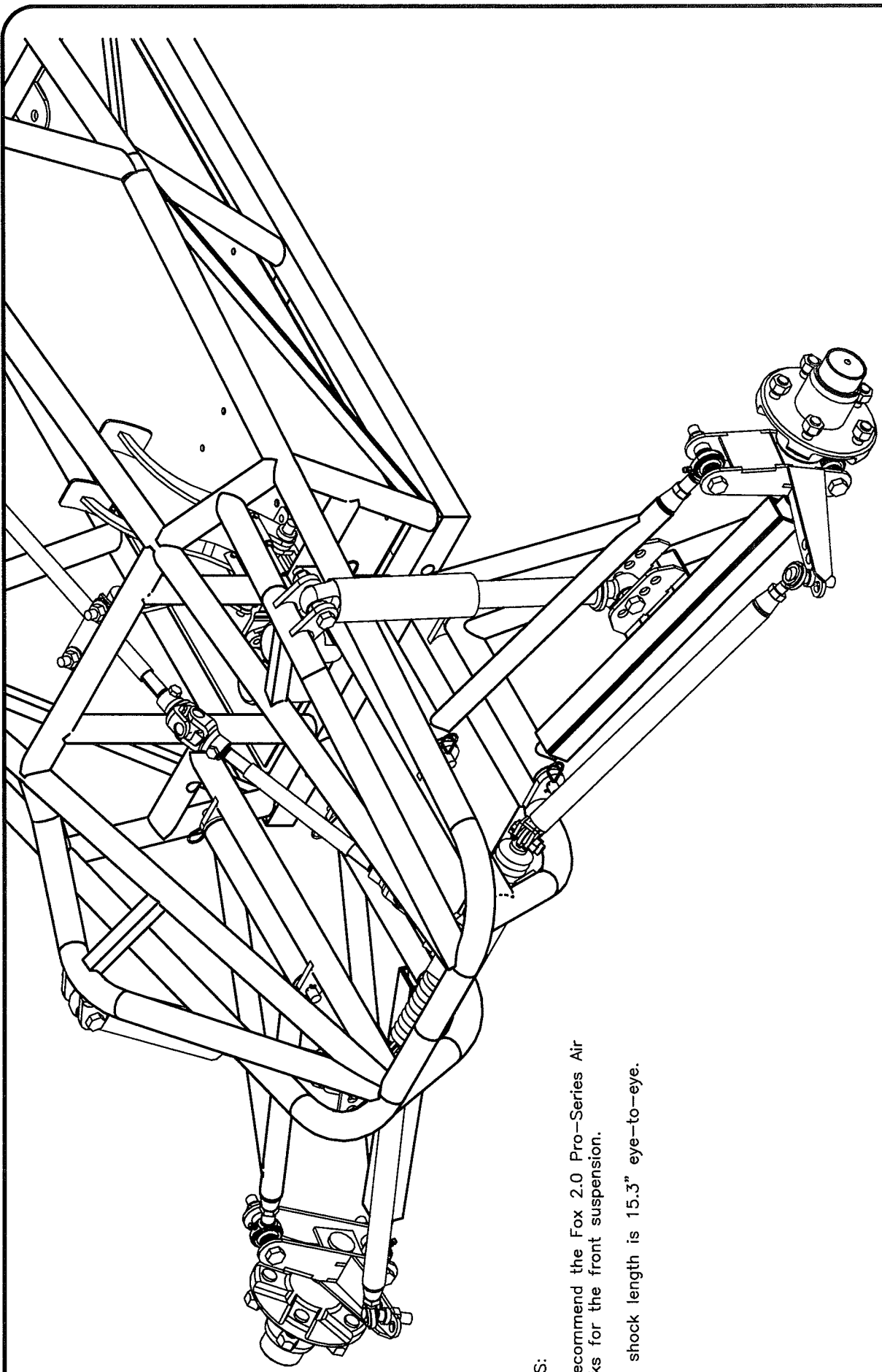
STATEMENT OF OWNERSHIP

THIS DESIGN IS THE PROPERTY OF BARDANO'S RACEWEAR AND SHALL NOT BE DISCLOSED TO OTHERS WITHOUT EXPRESS WRITTEN CONSENT.

TITLE
LOWER REAR SHOCK MOUNT DETAILS

DWG No.

E05



NOTES:

We recommend the Fox 2.0 Pro-Series Air Shocks for the front suspension.

Front shock length is 15.3" eye-to-eye.



STATEMENT OF OWNERSHIP

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TITLE

INSTALLING THE LONG TRAVEL FRONT SHOCKS

DWG No.

E06

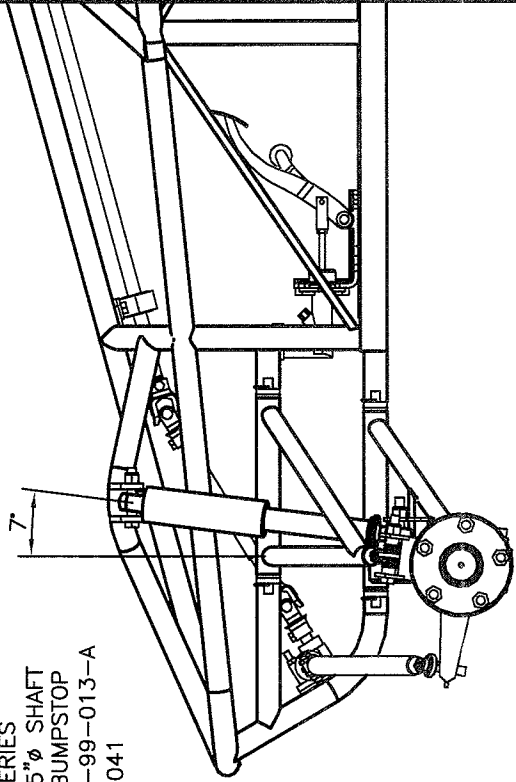
NOTES:

When positioning front shocks, ensure there is ample clearance between the shock & the upper a-arm during full suspension compression. This will determine the final working position of your front shocks.

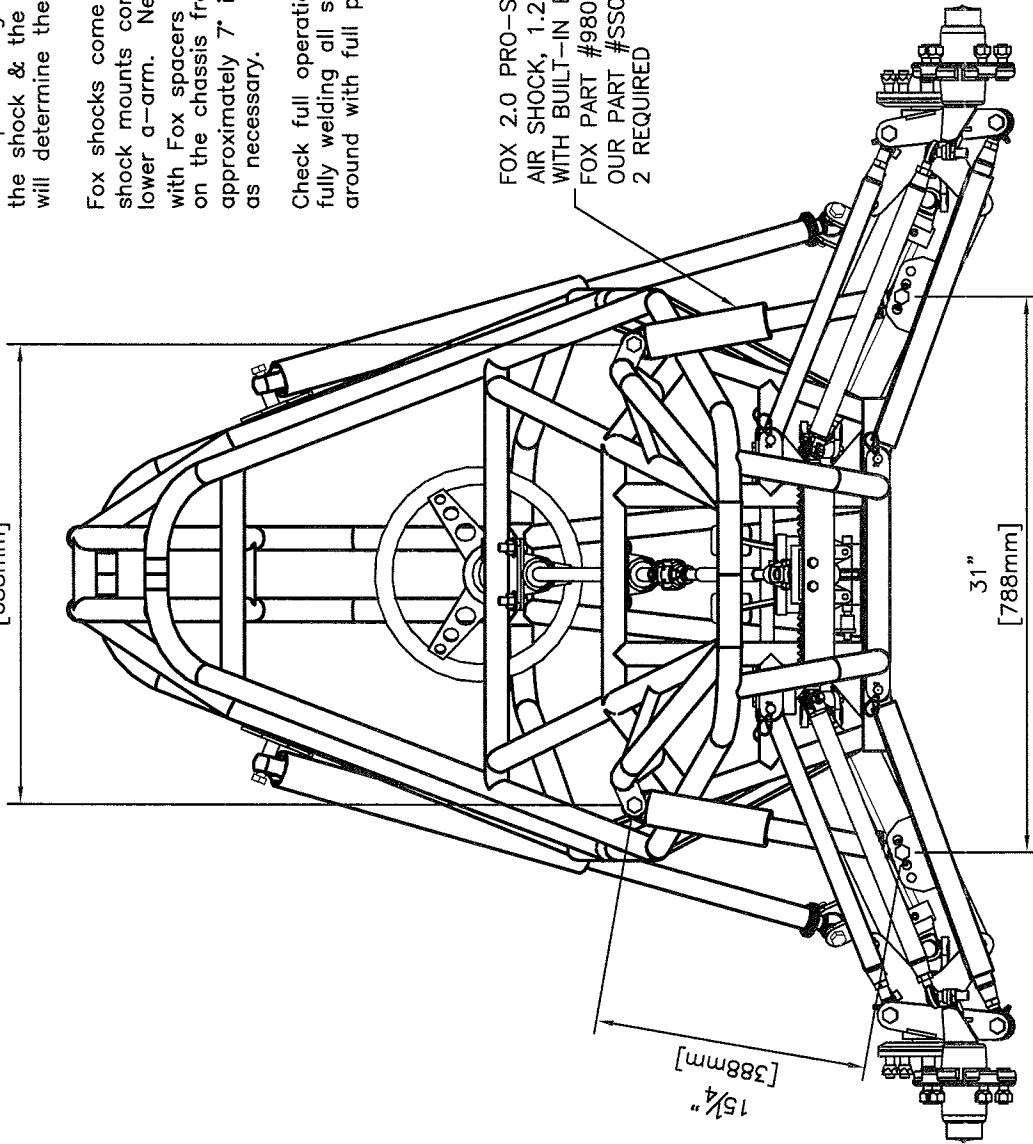
Fox shocks come with 1/2" i.d. spacers. First, pre-assemble the lower shock mounts complete with Fox spacers & 1/2"Ø bolts & tack weld to lower a-arm. Next, pre-assemble the upper shock mounts complete with Fox spacers & 1/2"Ø bolts & tack weld to the "eyebrow" shaped tube on the chassis frame. The upper position of the shock should be approximately 7" inset from the lower shock mount (as shown). Adjust as necessary.

Check full operation & clearances of shock & suspension travel prior to fully welding all shock mounts. All shock mounts to be fully welded all around with full penetrating welds.

FOX 2.0 PRO-SERIES
AIR SHOCK, 1.25"Ø SHAFT
WITH BUILT-IN BUMPSTOP
FOX PART #980-99-013-A
OUR PART #SS0041
2 REQUIRED



25 1/16"
[653mm]



15 1/4"
[388mm]

31"
[788mm]



STATEMENT OF OWNERSHIP

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TITLE

INSTALLING THE FRONT SHOCK MOUNTS

DWG No.

E07

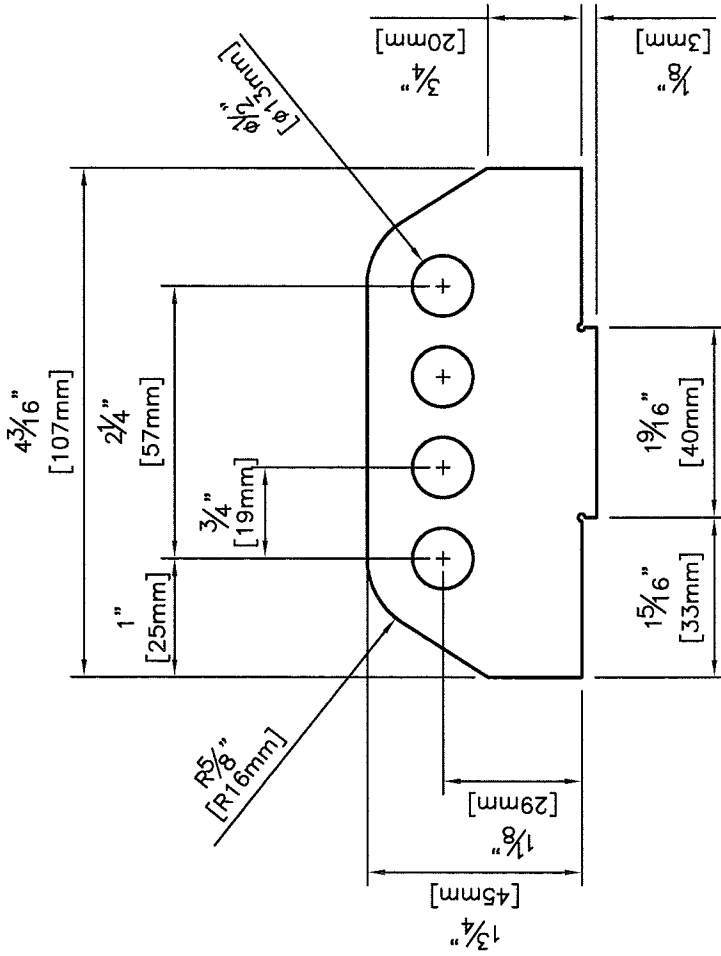
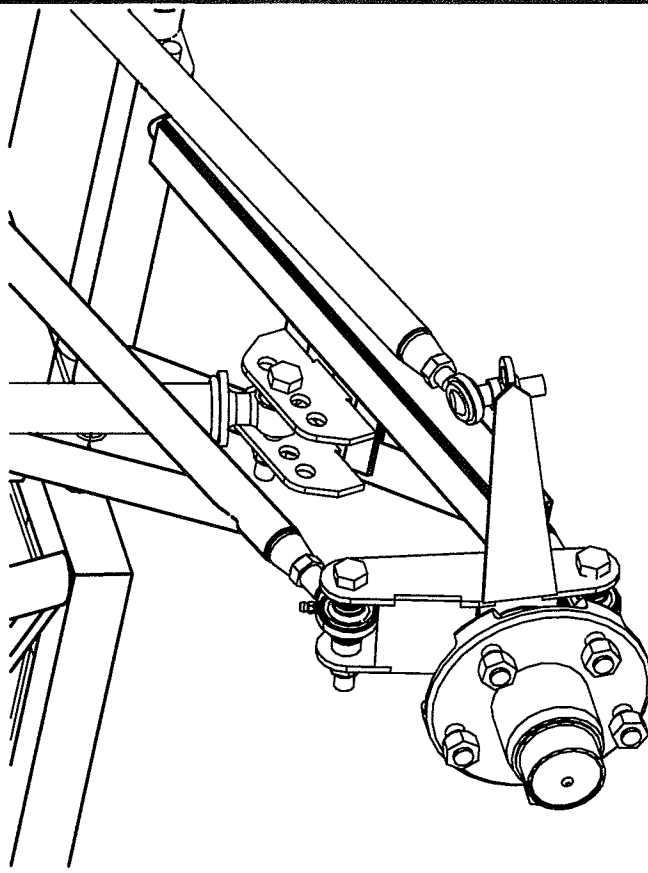


PLATE #PL0009
 3/16" THICK MILD STEEL, 4 REQ'D
 LOWER FRONT SHOCK MOUNT

STATEMENT OF OWNERSHIP

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 EXPRESS WRITTEN CONSENT.

TITLE

**LOWER FRONT SHOCK MOUNT
 DETAILS**

DWG No.

E08



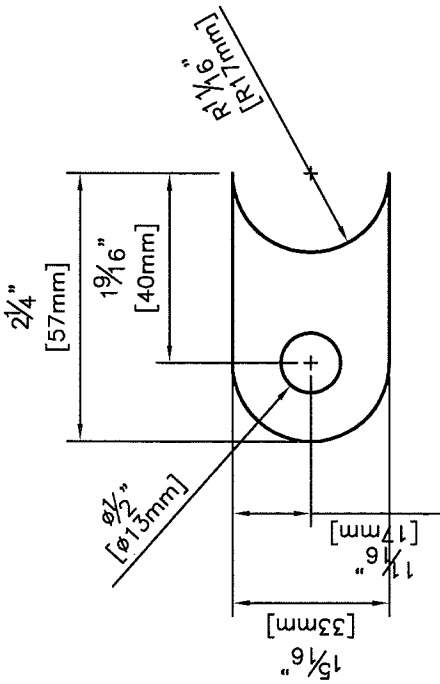
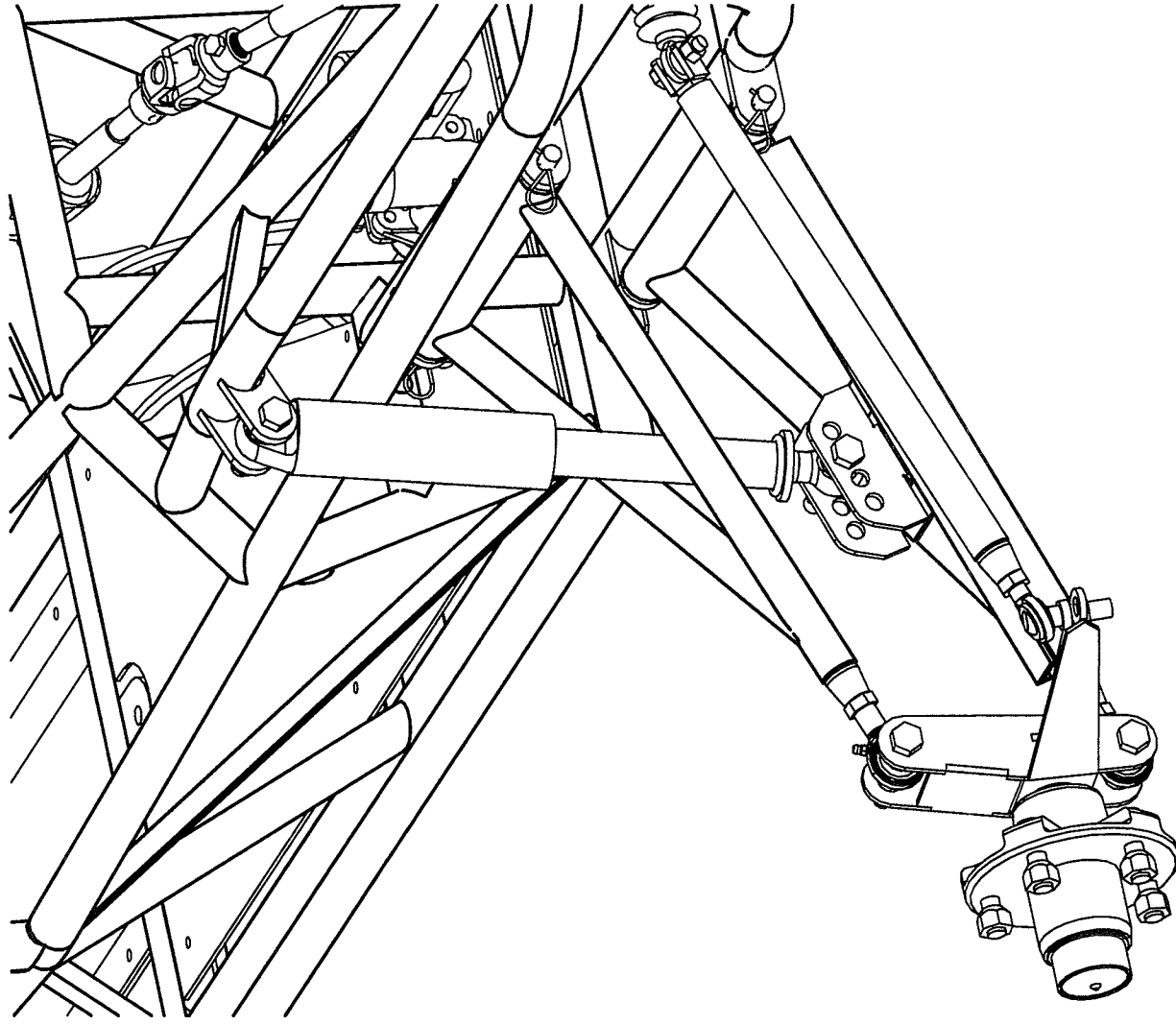


PLATE #PL0025
 5/16" THICK MILD STEEL, 4 REQ'D
 UPPER FRONT SHOCK MOUNT



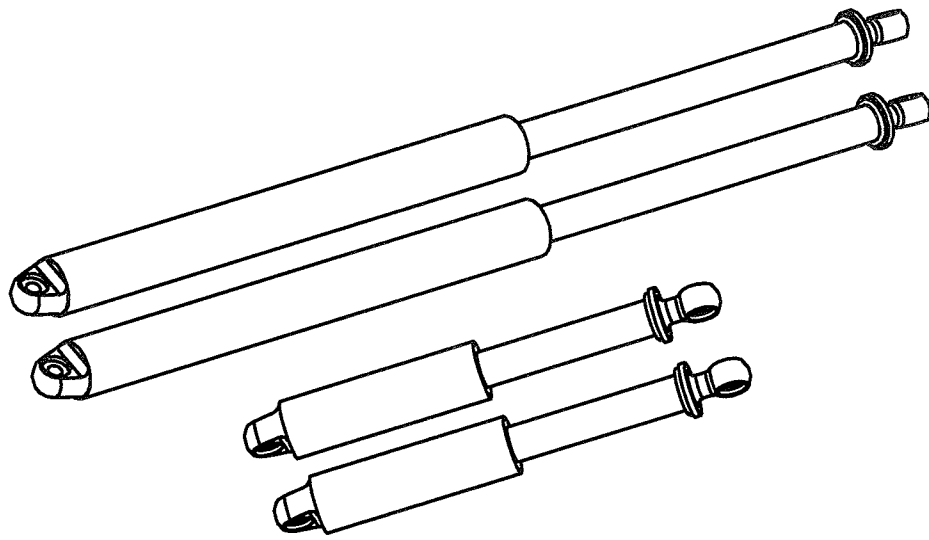
STATEMENT OF OWNERSHIP

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TITLE
**UPPER FRONT SHOCK MOUNT
 DETAILS**

DWG No.

E09



FOX AIR SHOCK KIT #SSK003
 INCLUDES 2 FRONT & 2 REAR SHOCKS

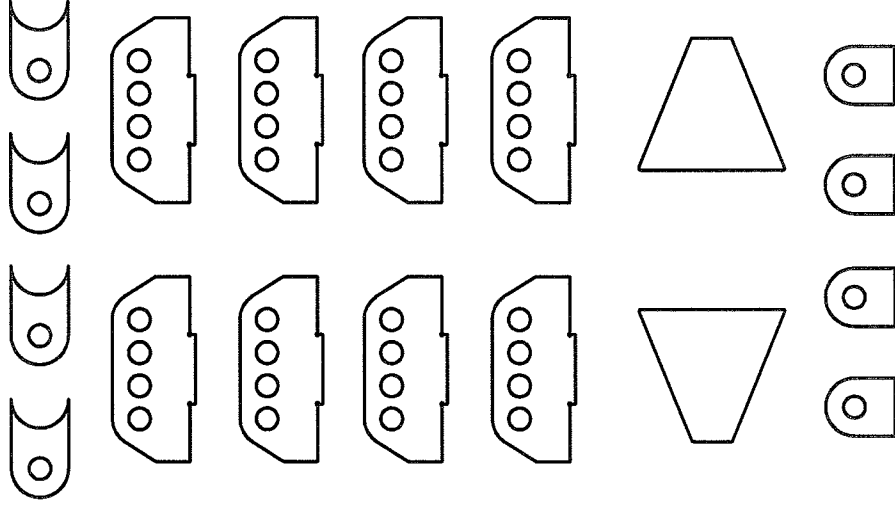


PLATE KIT #PLK012
 18 pcs OF LASER CUT STEEL PLATES



STATEMENT OF OWNERSHIP

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TITLE

KITSETS AVAILABLE FOR SECTION "E"

DWG No.

E10

SECTION "F"

SEATING, SAFETY, FOOT CONTROLS & BRAKING

MATERIAL LIST

<u>ITEM No.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	RACING SEAT, PART #SG0001	1
2	PADDED SEAT COVER, PART #SG0002	1
3	SEAT GLIDER, PART #SG0003	1
4	WRIST RESTRAINTS, PART #SG0004	1
5	RACING HARNESS, PART #SG0005	1
6	BRAKE PADS, PART #BR00001	1 PAIR
7	DISC ROTOR, PART #BR0002	1
8	BRAKE CALIPER, PART #BR0005	1
9	BANJO BOLT, PART #BR0006	1
10	BRAKE HOSE, PART #BR0007	1
11	PEDAL BOX ASSEMBLY, PART #BR0010	1
12	MORSE THROTTLE CABLE, PART #BR0014	1
13	BALL JOINT, PART #BR0015	1
14	Y BRACKET, PART #BR0016	1
15	MORSE CABLE CLAMP, PART #BR0017	1
16	PEDAL BOX SLIDER, PART #BR0018	1
17	WELDABLE HUB, PART #DL0017	1
18	PLATE #PL0021, 3/16" THICK MILD STEEL PLATE	1



STATEMENT OF OWNERSHIP

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TITLE

SEATING, SAFETY,
FOOT CONTROLS & BRAKING

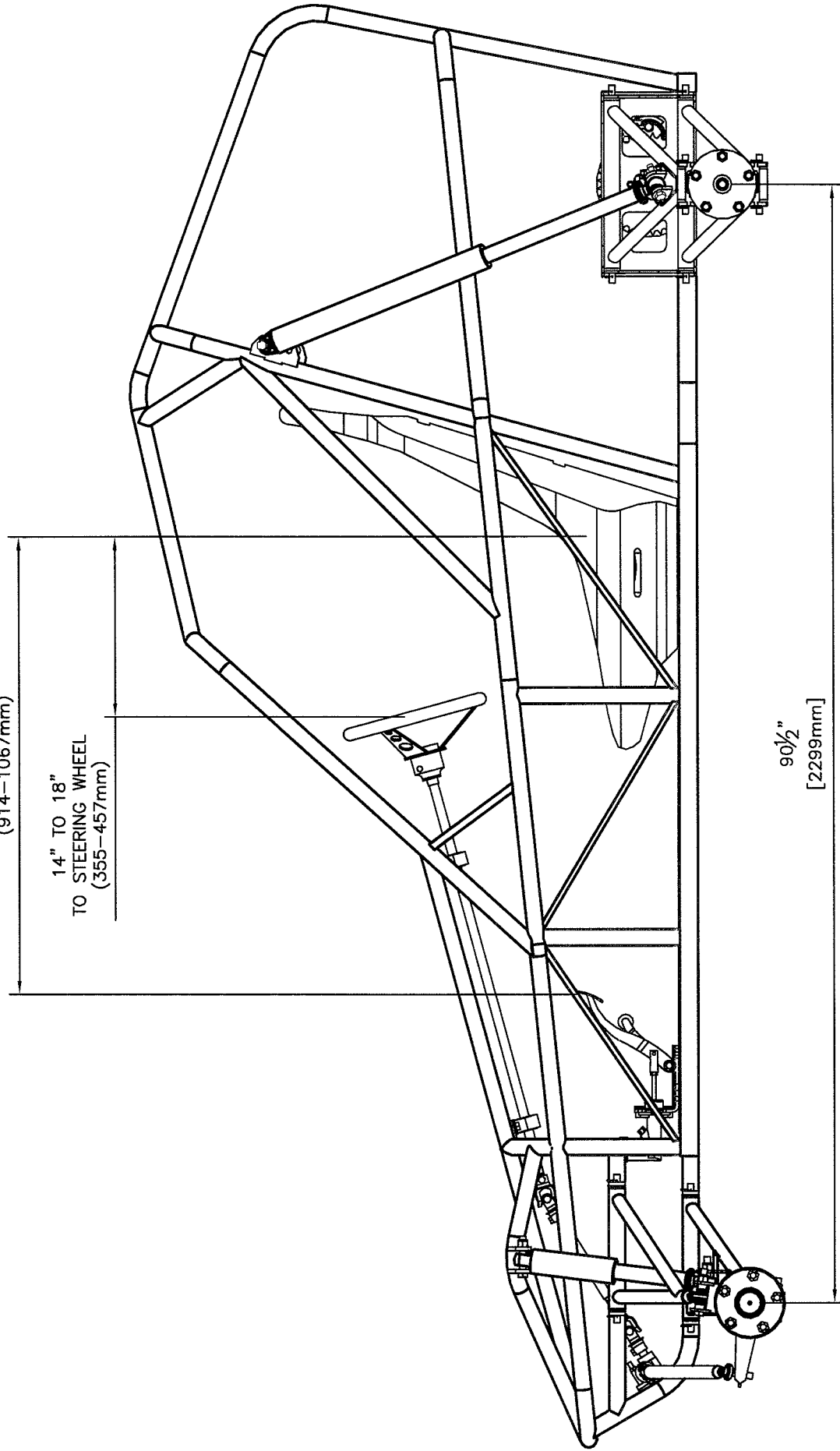
DWG No.

F01

36" TO 42" TO FOOT PEDALS
(914-1067mm)

14" TO 18"
TO STEERING WHEEL
(355-457mm)

90 1/2"
[2299mm]



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TITLE

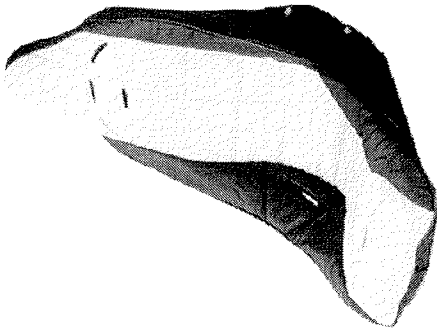
POSITIONING THE
RACING SEAT

DWG No.

F02

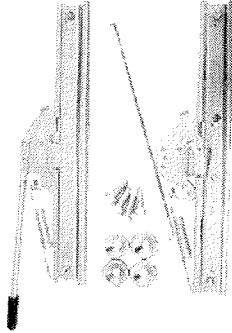


RACING SEAT
PART #SG0001

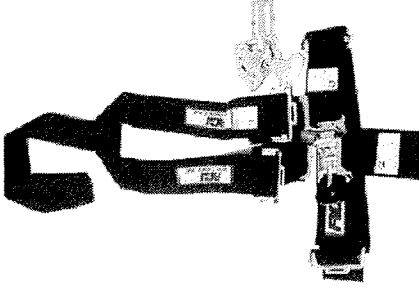


PADED SEAT COVER
PART #SG0002

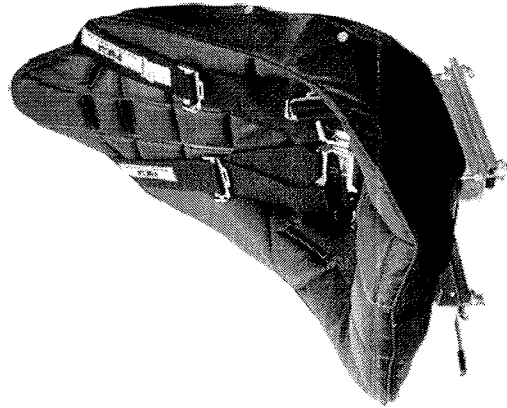
COLORS: BLACK, RED, BLUE, YELLOW, PURPLE, WHITE



SEAT GLIDER
PART #SG0003

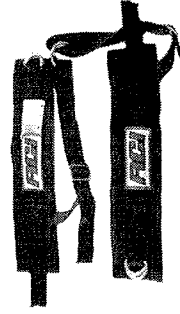


RACING HARNESS
PART #SG0005



SEAT KIT
PART #SGK001

INCLUDES SEAT, COVER, GLIDER & HARNESS



WRIST RESTRAINTS
PART #SG0004



STATEMENT OF OWNERSHIP

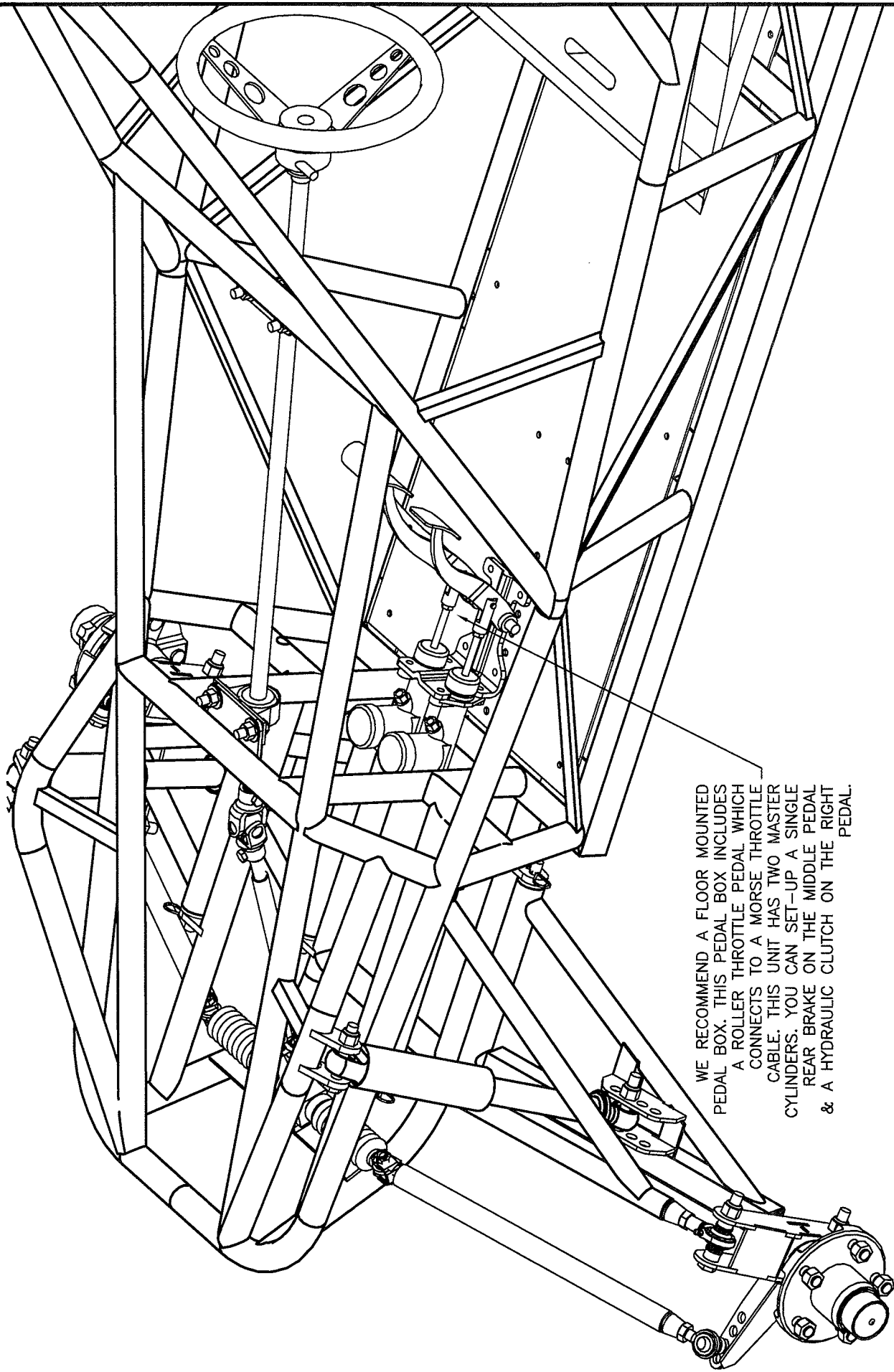
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EXPRESS WRITTEN CONSENT.

TITLE

SEAT, COVER, GLIDER, HARNESS,
SEAT KITS & RESTRAINTS

DWG No.

F03



WE RECOMMEND A FLOOR MOUNTED PEDAL BOX. THIS PEDAL BOX INCLUDES A ROLLER THROTTLE PEDAL WHICH CONNECTS TO A MORSE THROTTLE CABLE. THIS UNIT HAS TWO MASTER CYLINDERS. YOU CAN SET-UP A SINGLE REAR BRAKE ON THE MIDDLE PEDAL & A HYDRAULIC CLUTCH ON THE RIGHT PEDAL.



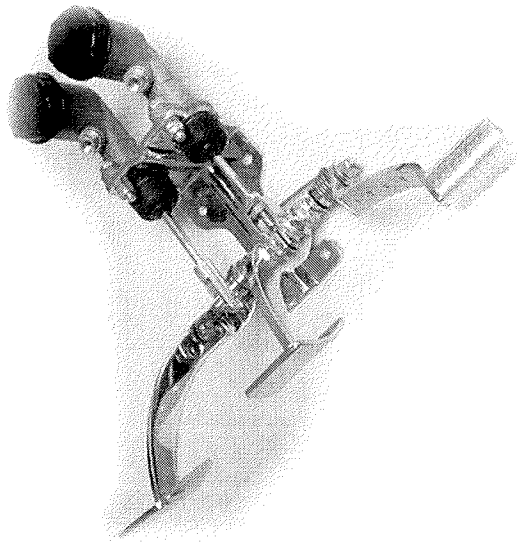
TITLE

FLOOR MOUNTED
FOOT CONTROLS

DWG No.

F04

STATEMENT OF OWNERSHIP
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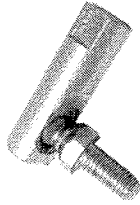
PEDAL BOX ASSEMBLY

PART #BR0010
INCLUDES 2 MASTER CYLINDERS & ROLLER THROTTLE PEDAL



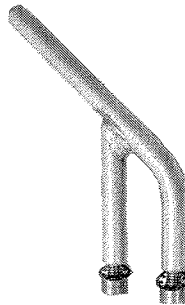
MORSE THROTTLE CABLE, 9ft

PART #BR0014



BALL JOINT FOR MORSE CABLE

PART #BR0015



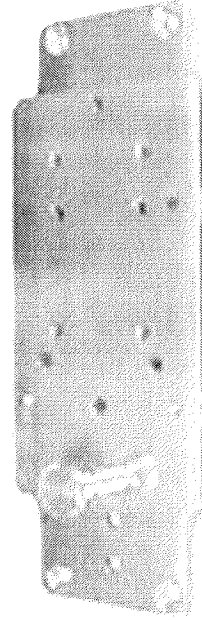
"Y" BRACKET FOR MORSE CABLE

PART #BR0016
CONNECTS BALL JOINT & MORSE CABLE TO ROLLER THROTTLE PEDAL



MORSE CABLE CLAMP

PART #BR0017



PEDAL BOX SLIDER

PART #BR0018



STATEMENT OF OWNERSHIP

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EXPRESS WRITTEN CONSENT.

TITLE

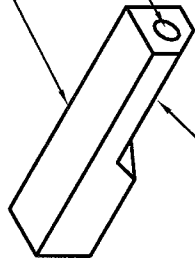
FOOT CONTROLS &
ACCESSORIES

DWG No.

F05

3/4" x 3/4" COLD ROLLED
SOLID SQUARE BAR
(2 DIFFERENT LENGTHS
REQUIRED)

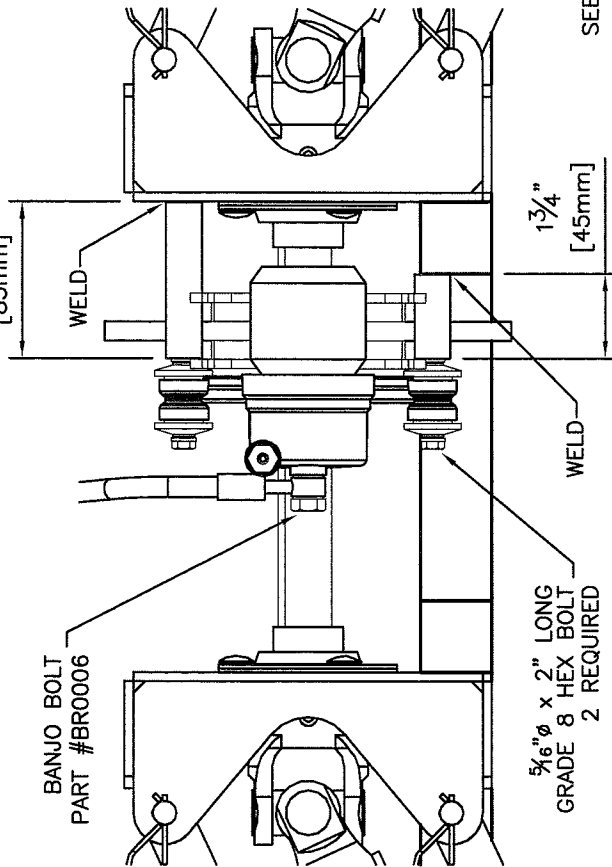
DRILL & TAP HOLE
5/16" Ø UNC x 1 1/4" DEEP



CHAMFER 3/8" TO
CLEAR DISC ROTOR

3/4"
[83mm]

BANJO BOLT
PART #BR0006



5/16" Ø x 2" LONG
GRADE 8 HEX BOLT
2 REQUIRED

WELD

1 3/4"
[45mm]

WELD

3/8"
[98mm]

BRAKE PADS
PART #BR0001

DISC ROTOR
PART #BR0002

BRAKE HOSE
PART #BR0007

2 5/8"
[66mm]

5 3/16"
[132mm]

ADAPTER PLATE
& WELDABLE HUB
SEE DRAWING No. "F07"

BRAKE CALIPER
PART #BR0005

END VIEW OF BRAKE SYSTEM
(SOME CHASSIS FRAMING REMOVED FOR CLARITY)

SIDE VIEW OF BRAKE SYSTEM
(SOME CHASSIS FRAMING REMOVED FOR CLARITY)



STATEMENT OF OWNERSHIP

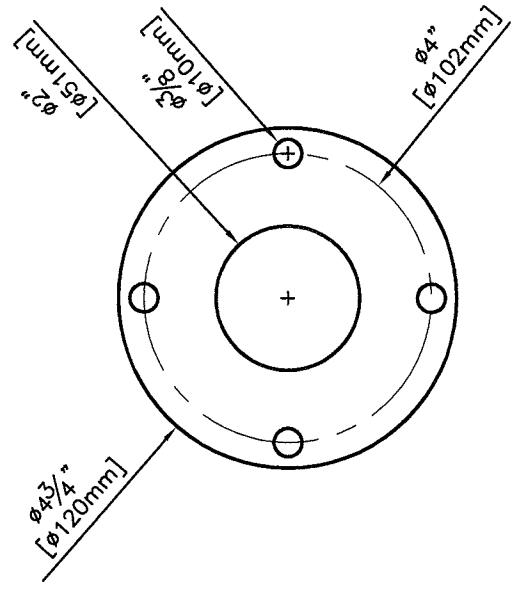
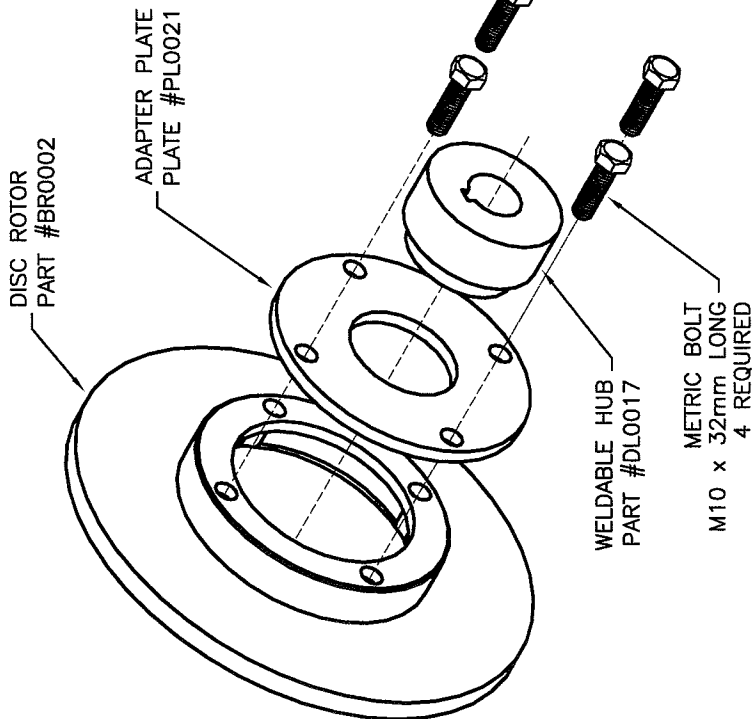
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EXPRESS WRITTEN CONSENT.

TITLE

**INSTALLING THE HYDRAULIC
BRAKE SYSTEM**

DWG No.

F06



DISC ROTOR & ADAPTER PLATE ASSEMBLY
THIS UNIT ADAPTS A DISC ROTOR TO MOUNT ONTO A 1" KEYED SHAFT

PLATE #PL0021
3/16" THICK MILD STEEL PLATE, 1 REQUIRED



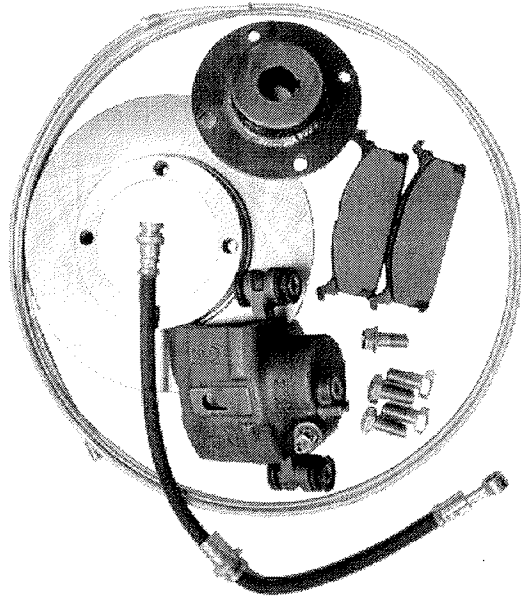
TITLE

STATEMENT OF OWNERSHIP
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AND SHALL NOT BE DISCLOSED TO OTHERS WITHOUT
EXPRESS WRITTEN CONSENT.

**ROTOR ADAPTER PLATE &
HUB DETAILS**

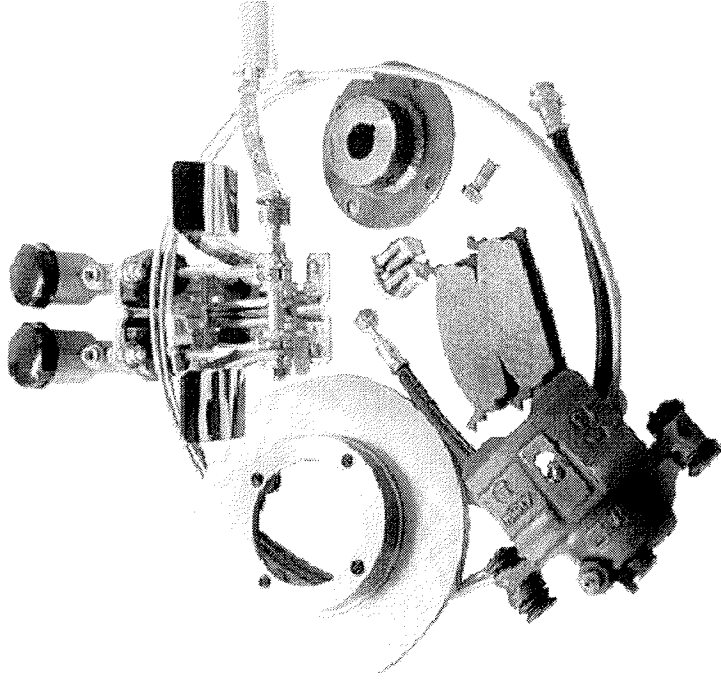
DWG No.

F07



BRAKE KIT #BRK001

INCLUDES BRAKE HOSE, BRAKE LINE, PADS, CALIPER, ROTOR, ROTOR MOUNTING HUB + BOLTS, BANJO BOLT



BRAKE KIT #BRK002

INCLUDES EVERYTHING IN KIT #BRK001 PLUS FLOOR MOUNTED FOOT PEDAL BOX ASSEMBLY



STATEMENT OF OWNERSHIP

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TITLE

KITSETS AVAILABLE FOR THE BRAKE SYSTEM

DWG No.

F08

SECTION "G" BONUS SECTION



STATEMENT OF OWNERSHIP

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AND SHALL NOT BE DISCLOSED TO OTHERS WITHOUT
EXPRESS WRITTEN CONSENT.

TITLE

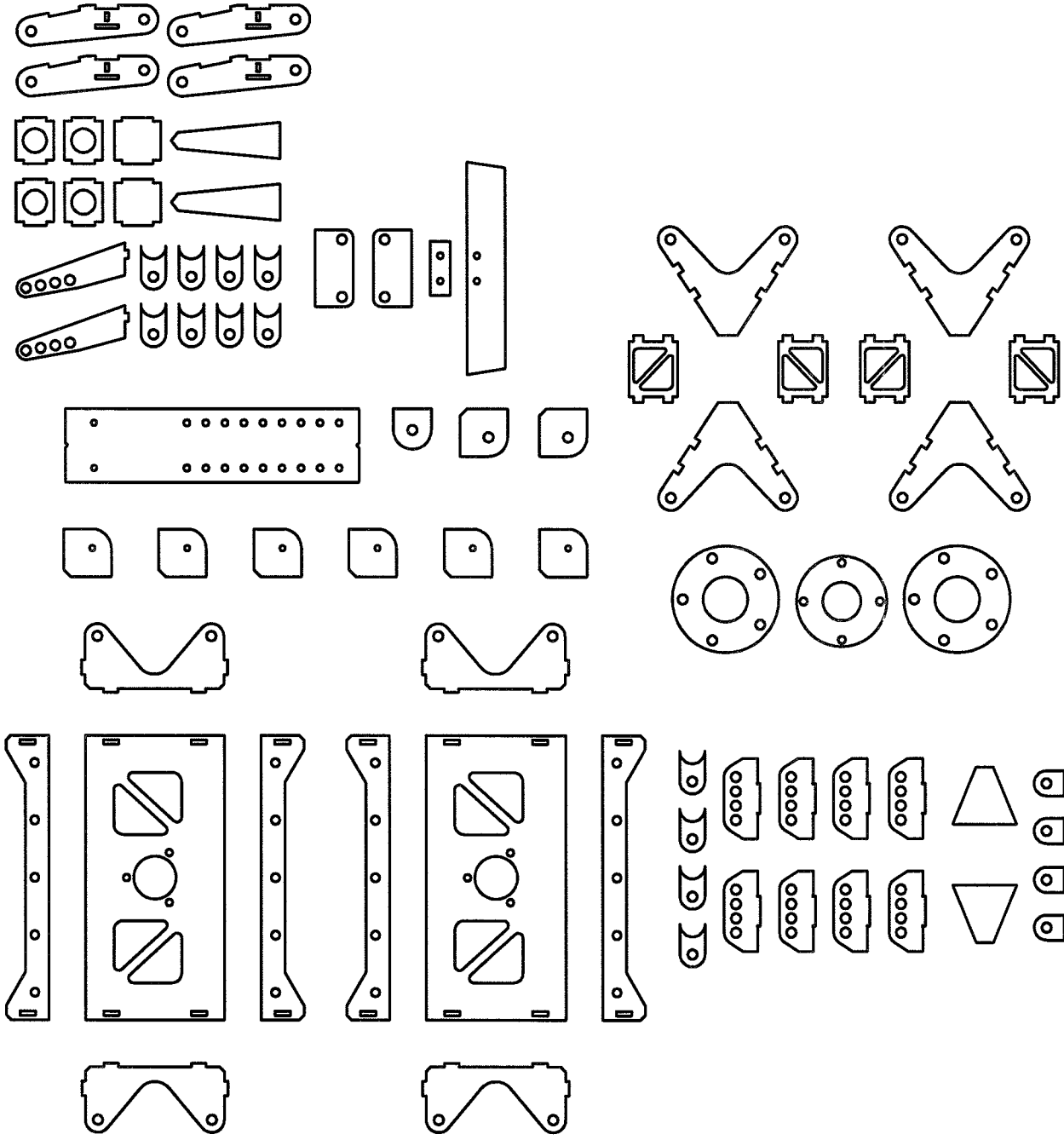
BONUS
SECTION

DWG No.

G01

75 pc Platework Kit includes:

- #PL0003 x 2 pcs
- #PL0005 x 6 pcs
- #PL0006 x 1 pc
- #PL0009 x 8 pcs
- #PL0016 x 2 pcs
- #PL0017 x 1 pcs
- #PL0018 x 2 pcs
- #PL0019 x 4 pcs
- #PL0020 x 4 pcs
- #PL0021 x 1 pc
- #PL0022 x 1 pc
- #PL0023 x 2 pcs
- #PL0024 x 4 pcs
- #PL0025 x 12 pcs
- #PL0026 x 2 pcs
- #PL0027 x 1 pc
- #PL0028 x 4 pcs
- #PL0034 x 4 pcs
- #PL0035 x 2 pcs
- #PL0036 x 4 pcs
- #PL0038 x 2 pcs
- #PL0046 x 2 pcs
- #PL0058 x 4 pcs

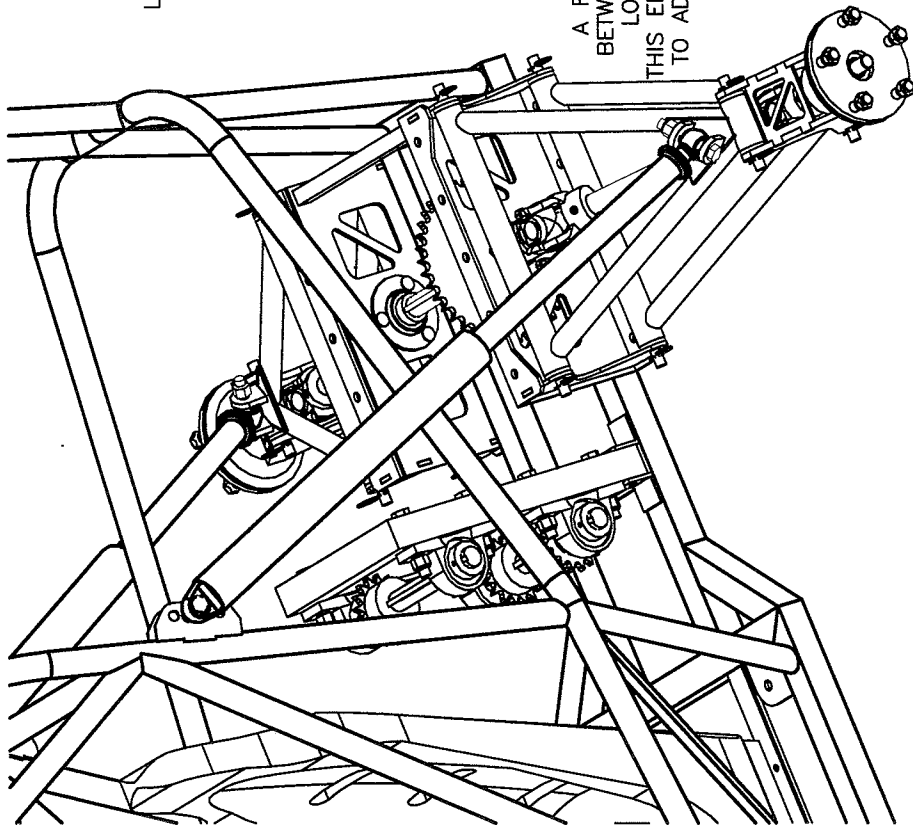


STATEMENT OF OWNERSHIP

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TITLE
75 pc PLATE KIT AVAILABLE
PLATE KIT #PLK013

DWG No.
G02



LAYSHAFT MOUNTING FRAME

PILLOW BLOCK BEARING c/w ECCENTRICALLY LOCKING COLLAR

YOU CAN INSTALL A REVERSE GEAR BOX BETWEEN THE UPPER & LOWER LAYSHAFTS AT THIS END. YOU MAY HAVE TO ADJUST THE SPACING OF THE SHAFTS.

UPPER & LOWER LAYSHAFTS CONNECTED BY CHAIN & SPROCKET SYSTEM

ANGLE STEEL WELDS TO SQUARE BASE FRAME & BOLT TO LAYSHAFT MOUNTING FRAME.

THIS SPROCKET IS CONNECTED VIA CHAIN TO A LARGER SPROCKET LOCATED ON THE MAIN DRIVESHAFT.

THIS LAYSHAFT MOUNTING FRAME SHOULD BE BRACED BACK TO ENGINE MOUNTS (NOT SHOWN). THIS INCREASES THE STRUCTURAL STIFFNESS OF THE LAYSHAFT FRAMES.

THIS 1" SHAFT IS EXTENDED TO MOUNT THE DRIVEN PULLEY



STATEMENT OF OWNERSHIP

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TITLE

BUILDING A LAYSHAFT FOR A CVT BELT DRIVE SYSTEM

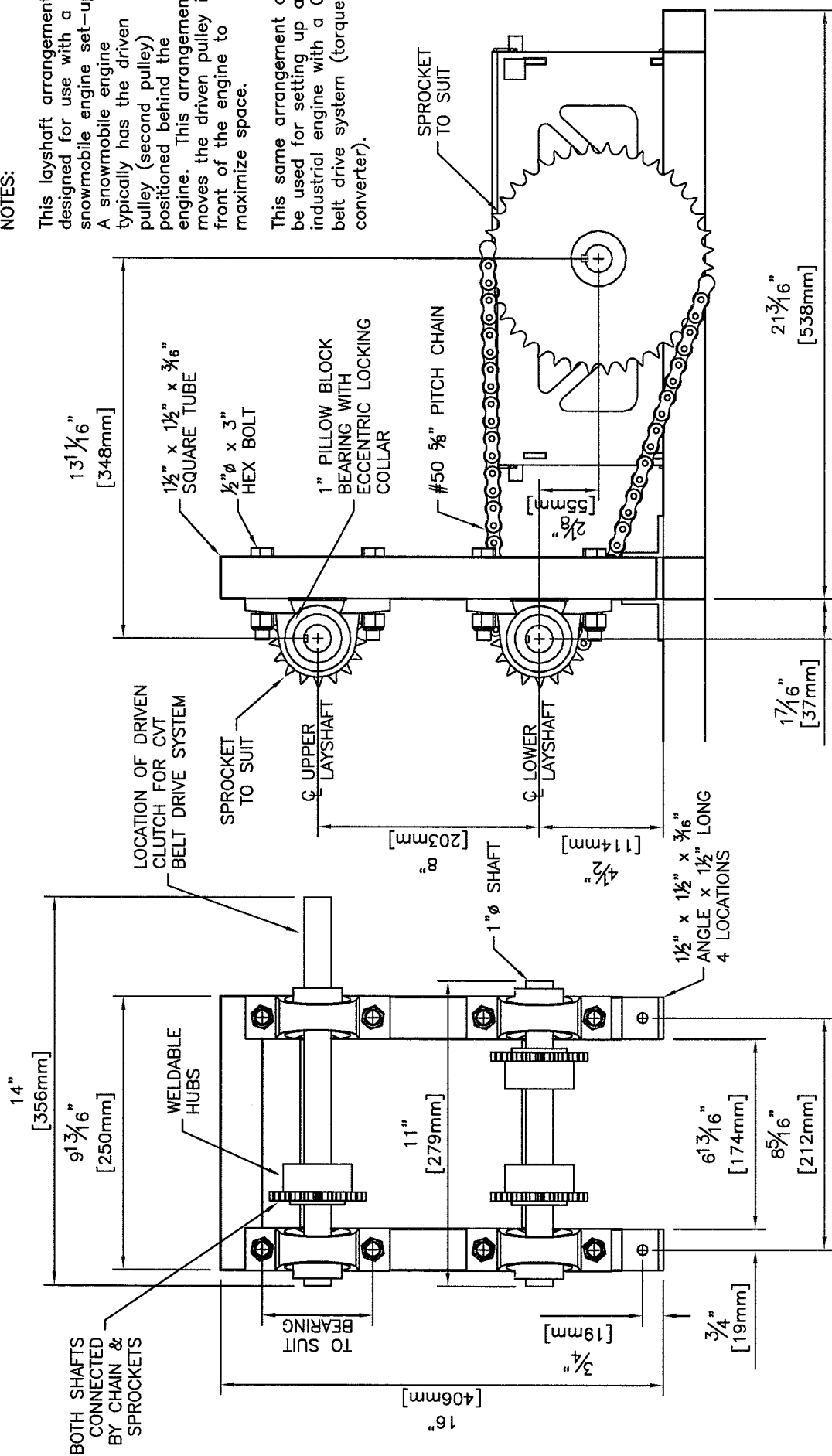
DWG No.

G03

NOTES:

This layshaft arrangement is designed for use with a snowmobile engine set-up. A snowmobile engine typically has the driven pulley (second pulley) positioned behind the engine. This arrangement moves the driven pulley in front of the engine to maximize space.

This same arrangement can be used for setting up an industrial engine with a CVT belt drive system (torque converter).



FRONT VIEW

SIDE VIEW



STATEMENT OF OWNERSHIP

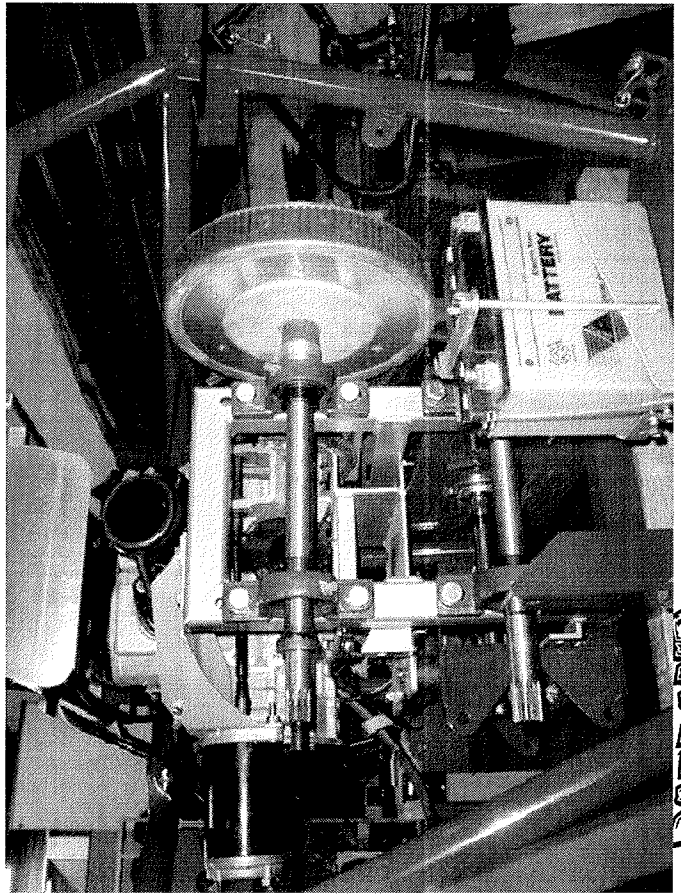
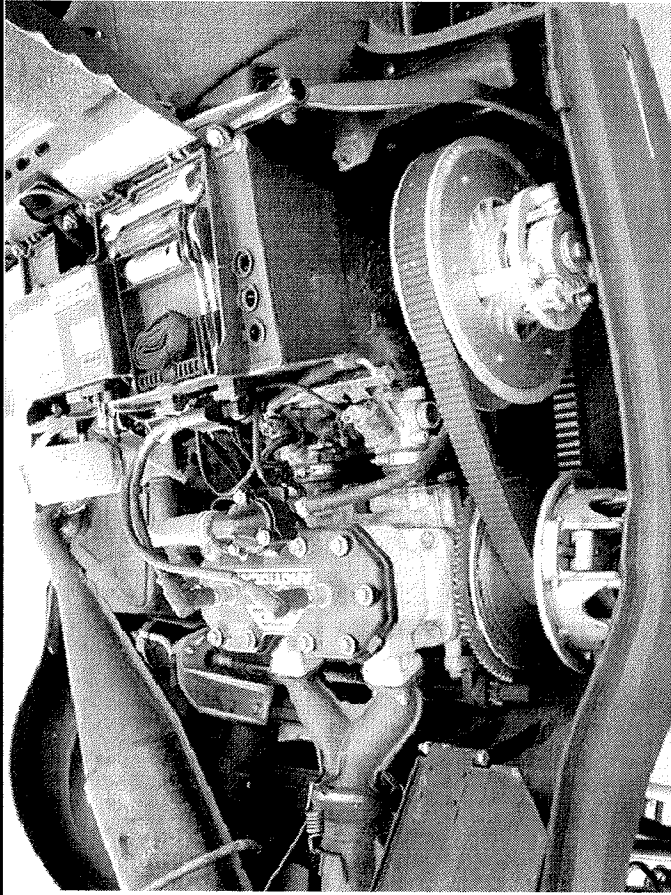
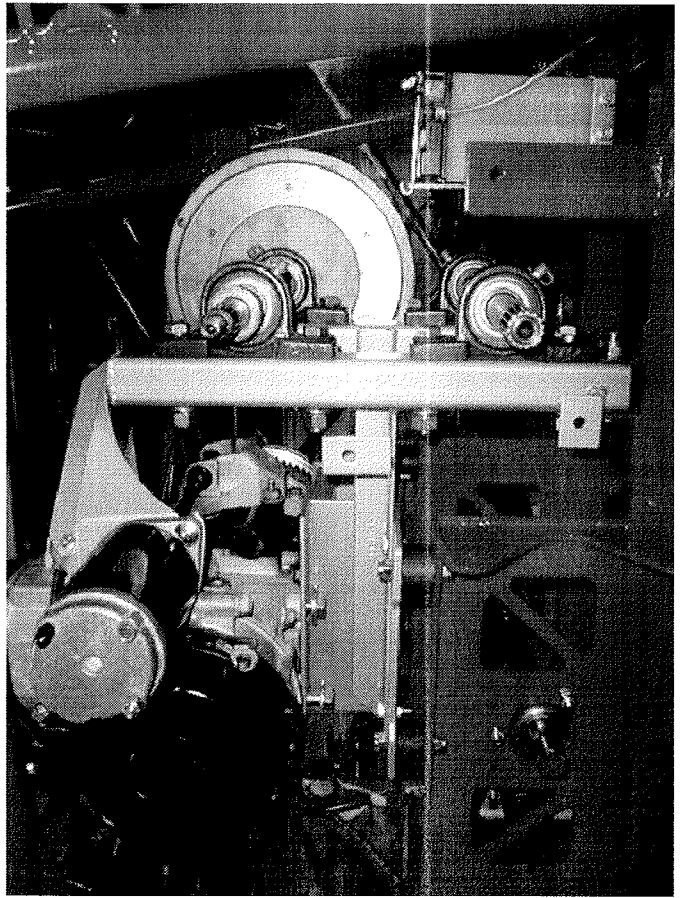
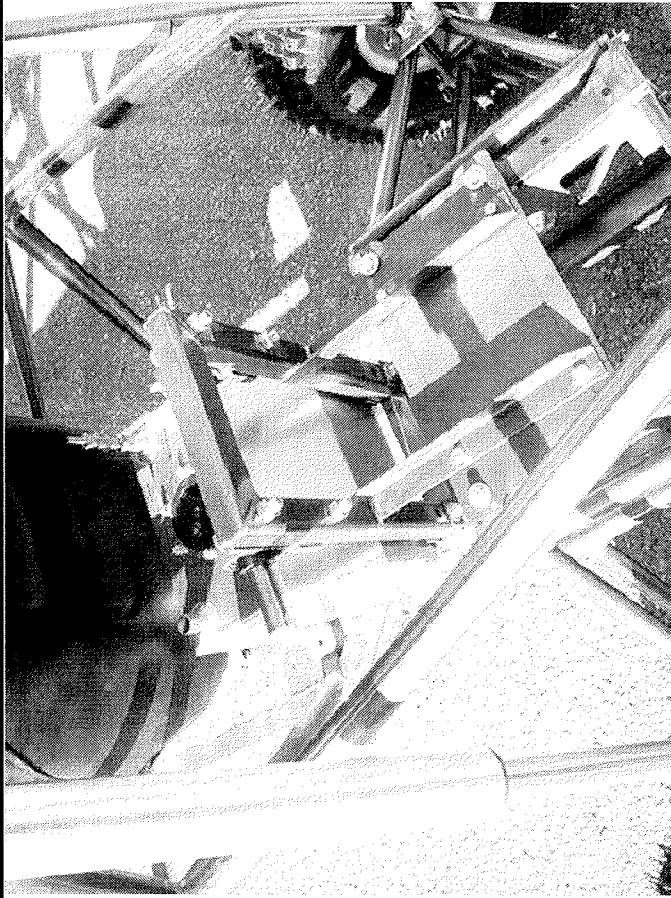
THIS DESIGN IS THE PROPERTY OF BADLAND BUGGY AND SHALL NOT BE DISCLOSED TO OTHERS WITHOUT EXPRESS WRITTEN CONSENT.

TITLE

LAYSHAFT DETAILS FOR CVT BELT DRIVE SYSTEM

DWG No.

G04



STATEMENT OF OWNERSHIP

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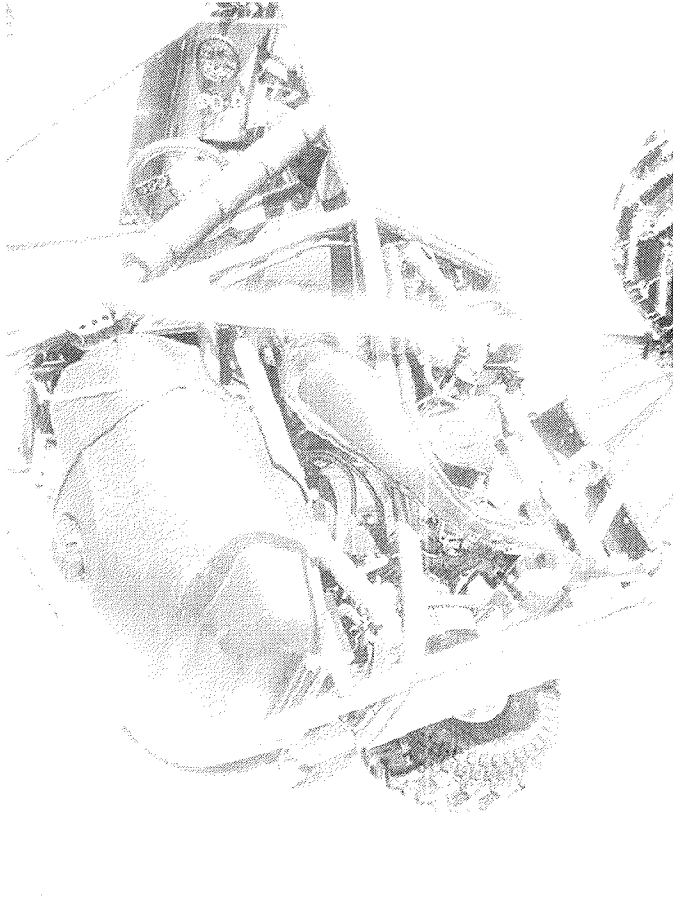
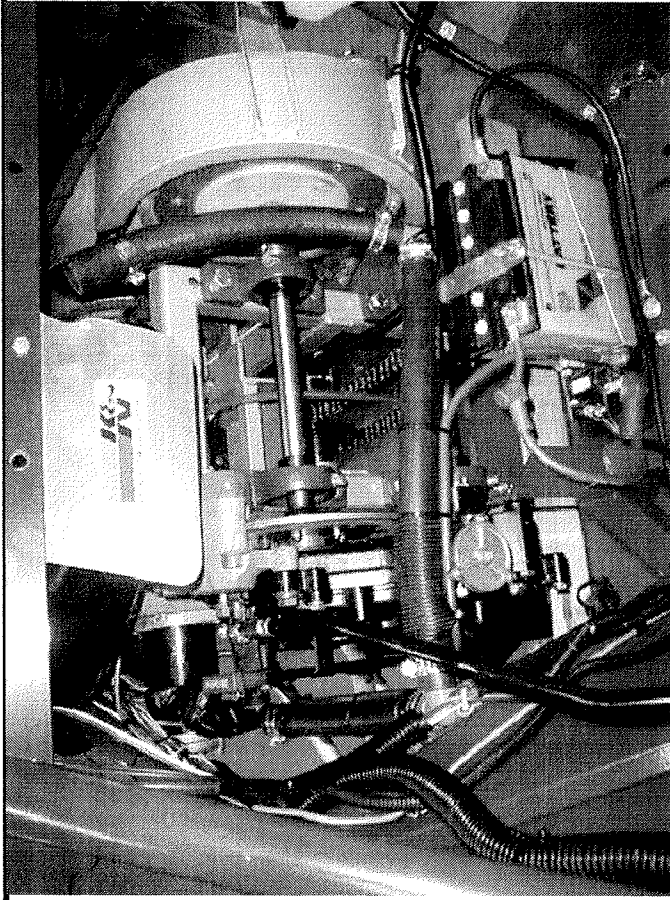
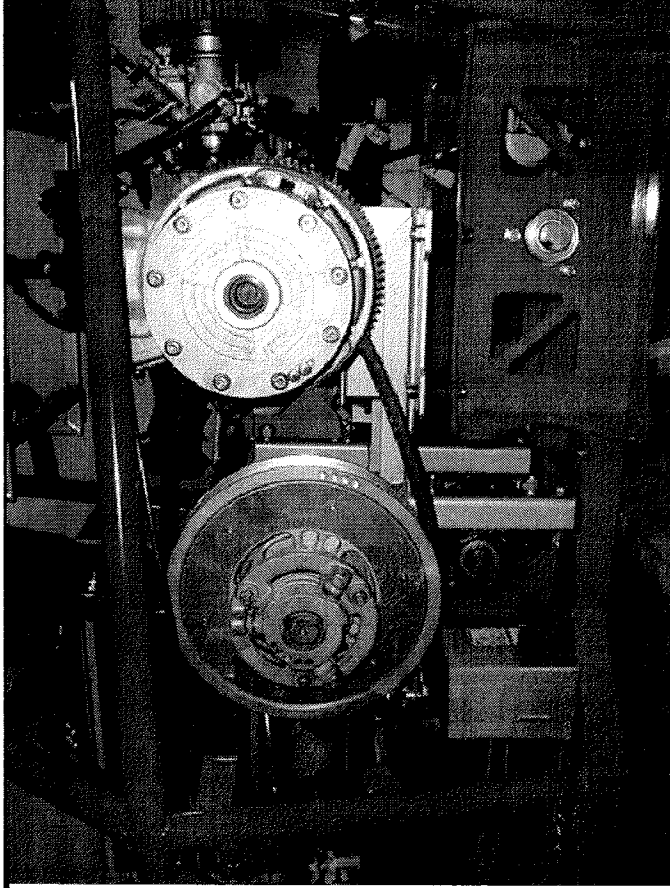
TITLE

PHOTOS OF A LAYSHAFT INSTALL FOR A SNOWMOBILE ENGINE

DWG No.

G05





STATEMENT OF OWNERSHIP

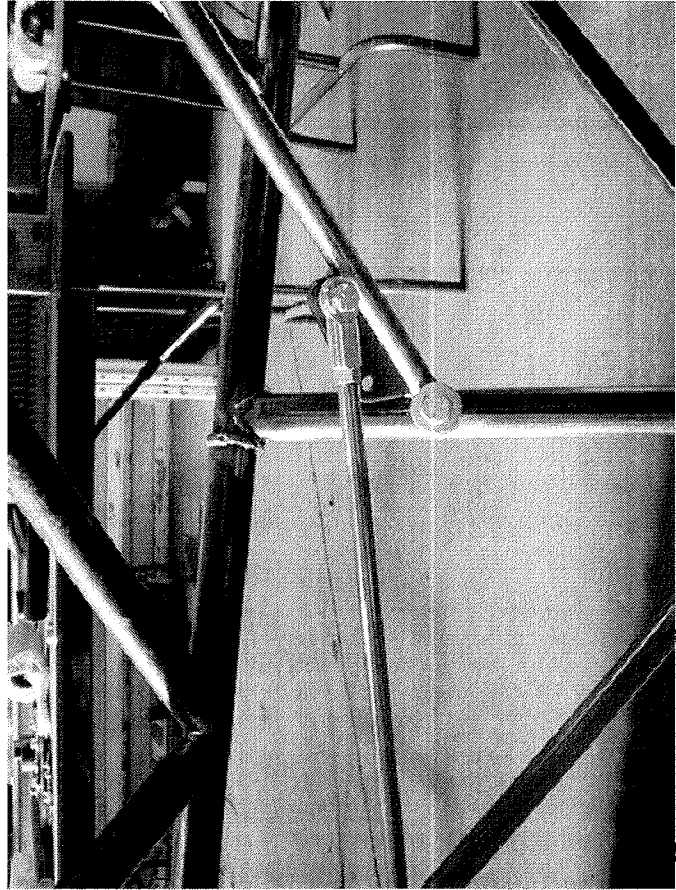
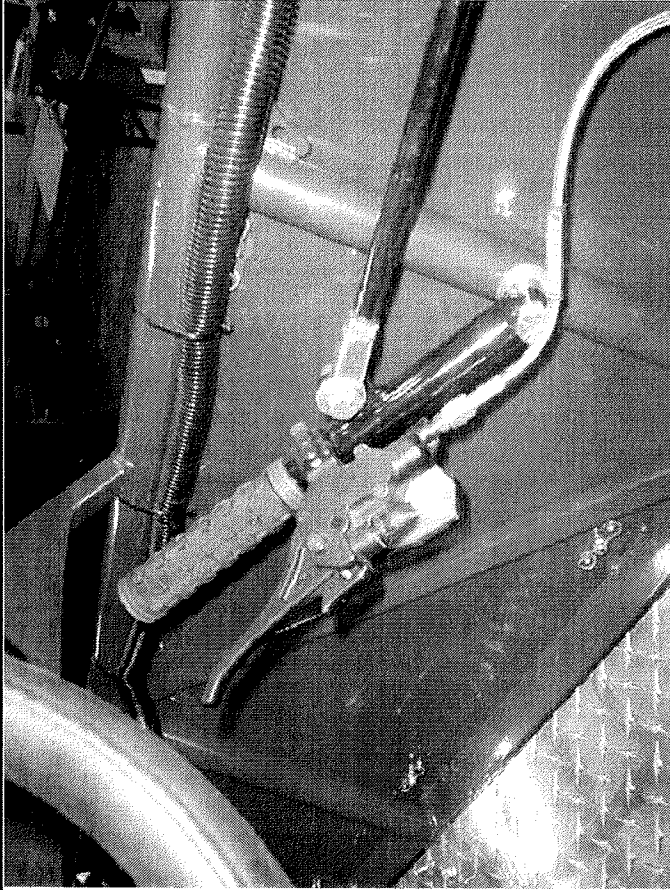
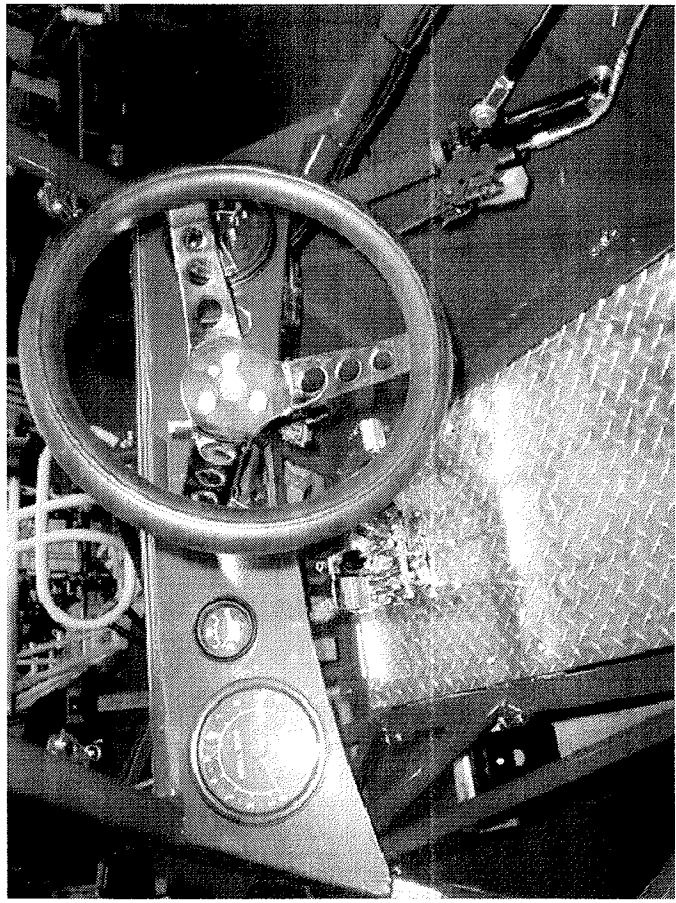
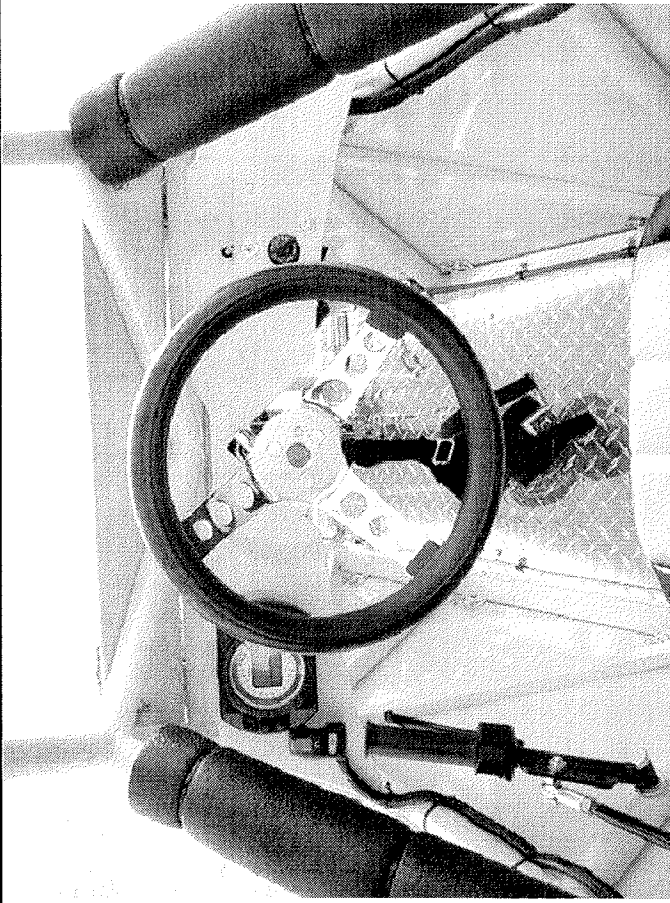
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TITLE

PHOTOS OF A LAYSHAFT INSTALL FOR A SNOWMOBILE ENGINE

DWG No.

G06



STATEMENT OF OWNERSHIP

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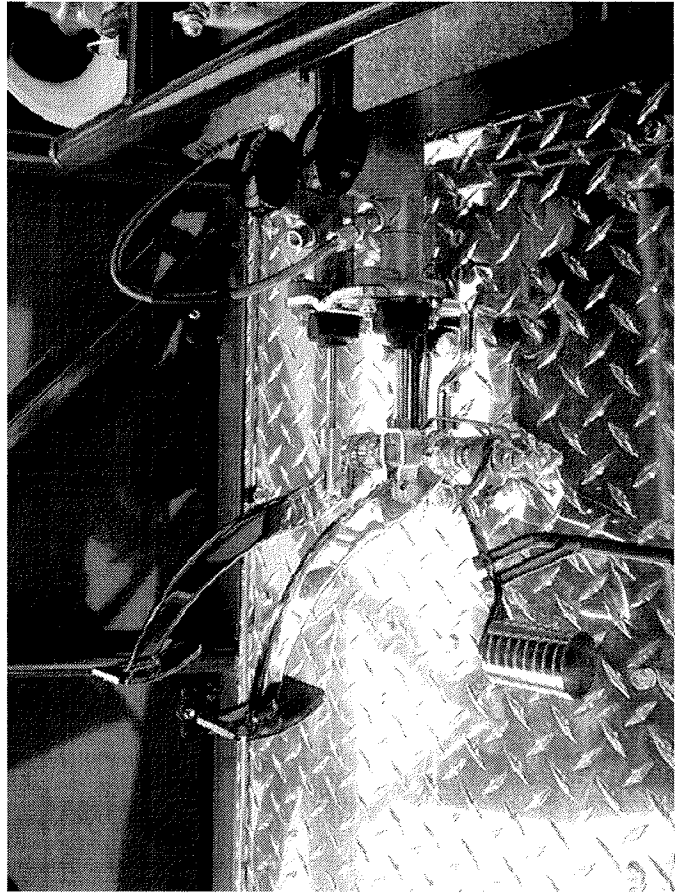
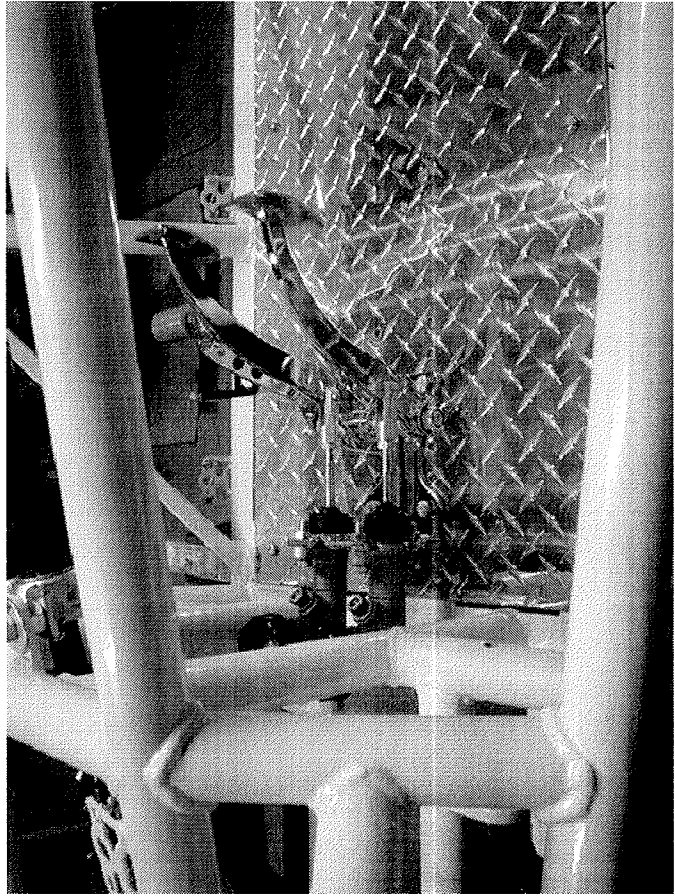
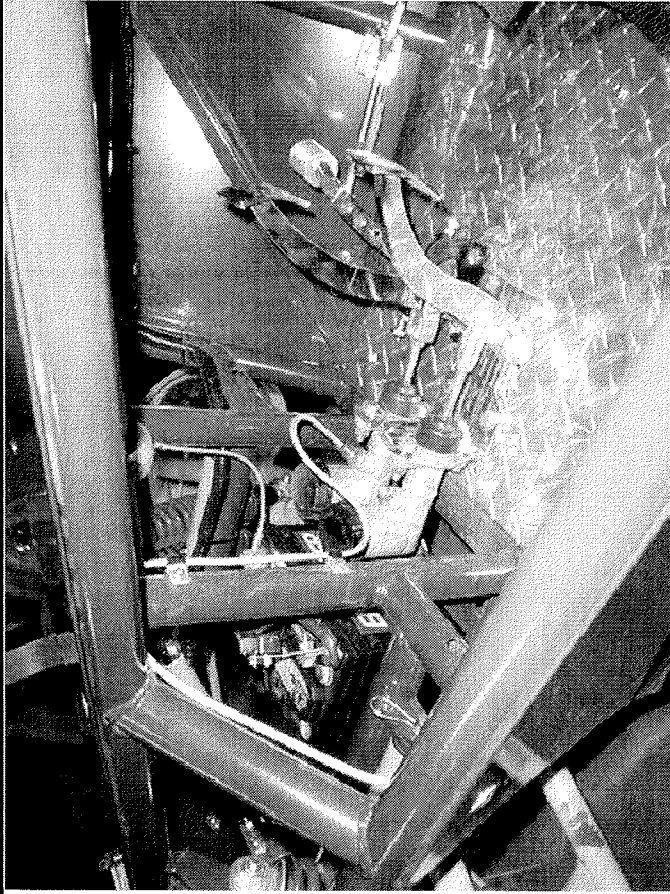
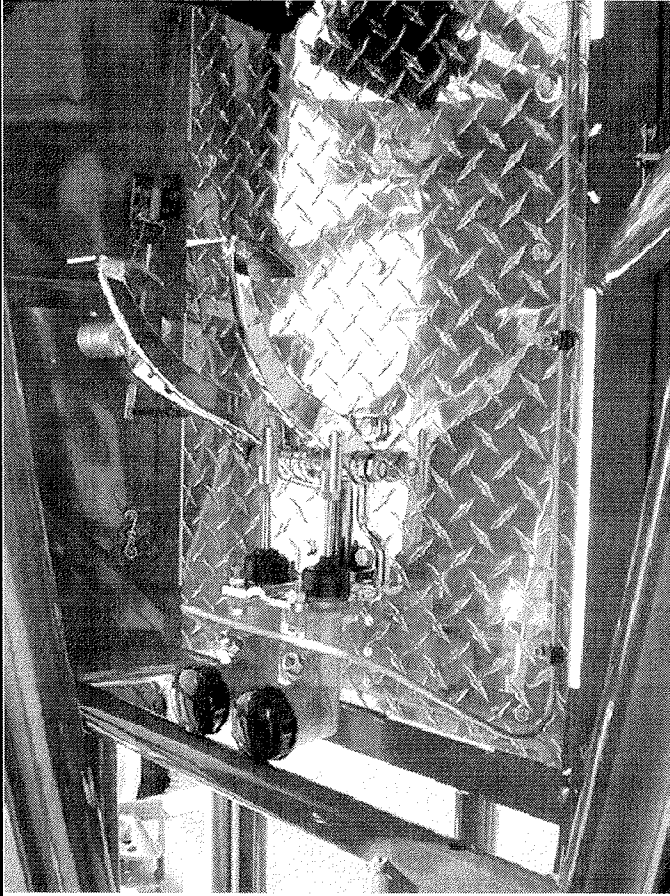
TITLE

PHOTOS OF GEAR SHIFTERS & REVERSE LEVERS

DWG No.

G07



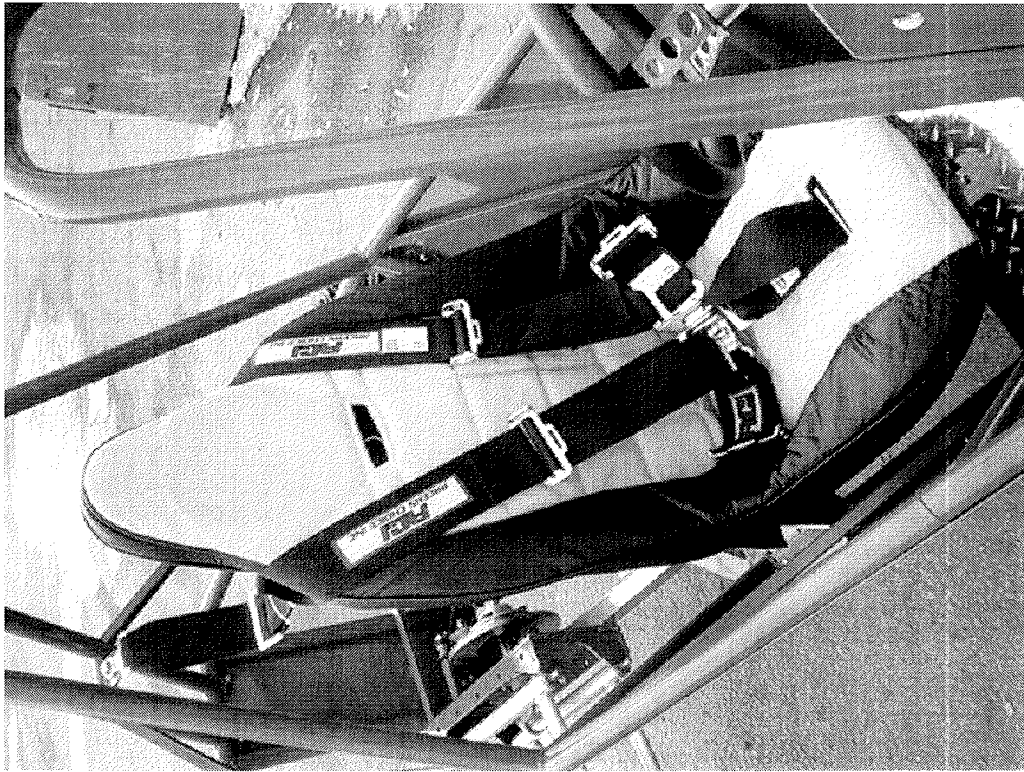


**PHOTOS OF FOOT PEDAL
BOX INSTALLATIONS**

DWG No. **G08**

TITLE

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G09

PHOTOS OF SEAT &
HARNES INSTALLATIONS