LAZER CHASSIS
the Ultimate Weapon

2013

OPEN WHEEL MODIFIED



Manufactured By:
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On the bottom of this page is your chassis serial number. Please refer to this number when calling for parts or technical assistance.

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Serial:

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Front Suspension

I. Front Suspension

A. Upper Control Arms– Bottom holes front, Top holes rear on chassis

1. Small Screw-in Holder
2. R.S.– 5" Tube Front 6" Tube Rear
3. L.S. Legs– 6" Tube Front 6" Tube Rear
4. Center of Heim to Center of Ball Joint (front),
   Center of Heim to Center of Clevis (rear)

	R.S.	L.S
Front–	9"	10 1/16"
Rear–	9 3/4 "	10"

B. Lower control arms-67-69 Camaro/Nova-I.M.C.A.
w/screw-in Ball Joints & Offset Bushings

C. Steering

78-88 GM Metric

- Steering Box
- Center Link
- Idler Arm

D. Tie Rods– stock tie rod at center link, heim at spindle

1. L.S.-10" Rod @18 1/2" on Center
2. R.S.-10" Rod @ 21" on Center

E. Alignment

1. Camber– right side– 3 3/4 degrees / left side– 2 1/2 degrees
2. Caster– right side– 6 1/2 degrees / left side– 3 1/2 degrees
3. Toe 1/4" out
4. Bump Steer-Spacers R.S. 3 1/4" / L.S. 2"

F. Spindles

1.Pinto
2. Reamed for Screw-in Ball Joints, Top Small / Bottom Large
3. Drill steering Arm to 5/8"

G. Front Ride Height-

1. Right Ground to Bottom of Metric Main Frame - 6 1/8"
2. Left Ground to Main Frame - 6"

H. Misc.

1. Use Extended Upper Ball Joint
2. Motor Plate Location
   a. Top holes (lower in car) no spacers on front mounts
   b. Lower holes (higher in car) 1" spacers on front mounts

4 Link Rear Suspension

II. 4 Link Rear Suspension– Stock Ford 9” 60” centered

A. Pull Bar

1 39 1/8” center to center.

2. Use Pull-bar to set Pinion Angle

3. .Mount– Frame Middle Hole

4. AFCO 270001 Progressive spring 600-2000#

B. Rear End Adjustment (side to side)

1. Left upper torque arm plate to left ride height tab-15 1/4”
   depends on LR bite and ride height

2. Panhard bar (plate mounted towards front of car, j-bar mounted on back side of plate)
   a. R.S. of Rear Second bottom hole
   b. Frame 5th hole from top icenter row
   c. Center to center 21 1/2”

C Rear Ride Height– tab to top of birdcage body

1. Over rail rear clip
   a. Left 10 1/4”
   b. Right 10 ”

D. Pinion Angle– 7.5 degrees negative

E. Birdcage– Assembly and Location

1. Shock Brackets– R.R. on outside of plates, L.R. on outside of plates
   a. L.S. Front– 7” if running clamped
   b. L.S. Rear– 6”
   c. R.S. Front– 5”

2. Location– Inside edge of rotor to Center of shock brackets
   a. L.R.– 8”
   b. R.R.– 8”

F. Brake Brackets– **MUST BE DOUBLE PINNED TO AXLE TUBE!-** install caliper on backside of tube

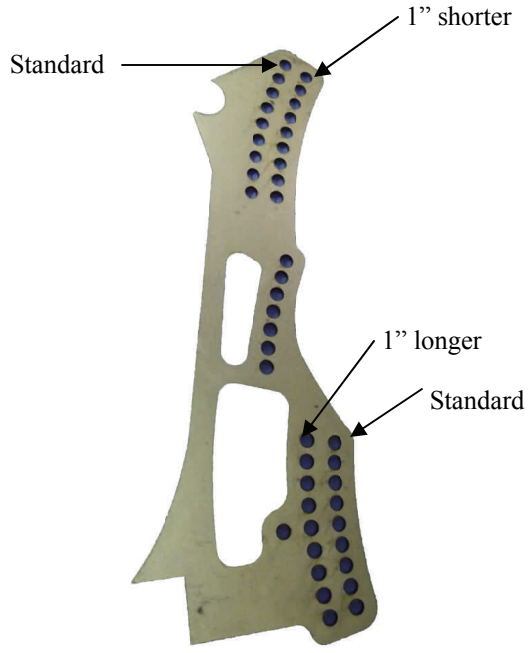
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4 Link Rear Suspension-continued

G. 4 Link Rods
1. L.S. rods on outside of birdcage with 1/2” spacer
2. R.S. rods on outside of birdcage with 3/4” spacer
3. Center all 4 link rods in brackets on frame
4. Upper rods
   a. 14” tube
   b. 17 1/2” on center
   c. 5th hole from top
   d. Standard holes on birdcage (1” shorter rod optional)
   e. center hole on bridcage
5. Lower rods
   a. 12” tube
   b. 15 1/2” on center
   c. 5th hole from bottom
   d. Standard holes (1” longer rod optional)
   E. center hole on birdcage
6. R.R. Z-link
   a. 14” Tube
   b. 17 1/2” on center
   c. Second hole from bottom

J. Square Rear
1. Set 4 link rods accurately or
2. Drop a plumb bob from axle tube and measure to 2 x 2 outriggers

K. Rear Shocks Angles
1. Over rail rear clip (gap between frame rail to center of shock brkt.)
   a. Left rear front 2 1/4”
   b. Left rear behind 2 1/4”
   c. Right rear 3”



GENERAL INFORMATION

III. Set Up
- A. Fuel 25 Gallons
- B. Wheel offsets
  1. Front- 2”
  2. Rear- 3”
  3. Super slick– put 4” on right rear
  4. Super tacky– put 2” on right rear
- D. Percentages
  1. Left side– 52%
  2. Rear– 54%

  Note: w/o driver w/ 20 gallons fuel
- E. Bite
  1. Tacky 60# Left rear
  2. Average 80# Left rear
  3. Slick 100# Left rear

IV. Miscellaneous
- A. Wheelbase-110 “
- B. Brakes-Metric large piston calipers w/.810 rotors
- C. Master cylinder
  1. Front– 1” Slick track– 7/8”
  2. Rear– 7/8” Slick track– 1”
- D. Rear End
  1. 60” Track-center pinion Ford 9”
  2. 30 1/2” axles quick change
- E. Drive shaft length
  1. Bert– 33 1/2”
  2. Brinn/Falcon– 30 1/2”

V. Remember
- A. All recommendations listed are general. Your situation may vary.
- B. All adjustments are a compromise. Think through what you are doing.
- C. Different race tracks require different combinations, due to Driver…
  1. Style
  2. Technique
  3. Experience

<u>B.R.C. is interested in helping you all we can!</u>
Simply pick up the phone and call our tech line at (717)-865-6691.
All calls will be answered or returned. Or e-mail us at lazerchassis@comcast.net
Use your computer for help. http://www.bernheiselracecars.com

Open Wheel Modified

PARTS LIST

Front Suspension

Left upper control arm– 1801
Right upper control arm– 1802
Upper ball joint– 20034-1
Tubular Left lower control arm– 88010
Tubular Right lower control arm– 88020
Lower ball joint– 20036
Tie rod tube– 19010
LF Spindle– 30436L
RF Spindle– 30436R
Center Link– 30270
Idler Arm– 30261
Steering Box– 84090
Tie Rod– 30221

4-Link Rear Suspension

Left Birdcage– 8310L
Right Birdcage– 8310R
Bolt on shock mount– 35-3322
Lift bar– 29201
Lower radius rod tubes– 19012
Upper radius rod tubes– 19014
Lift bar link rod– 19006
Panhard bar– 307-4205
Pinion mount– 82169
Integral Panhard Mount– 82159
Pro Coil-over Eliminator– 20132P
Pull Bar– 21205X

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Shock and Spring Packages

I. L.R. Behind– Baseline
- A. RF– 74-6 w/ 600
- B. LF– 75 w/ 600
- C. RR– 94 w/ 225
- D. LR– 97-2 (front) Coil-over Eliminator w/ 225 (behind)

II. L.R. Behind– Slick
- A. RF– 73-7 w/ 550
- B. LF– 75-3 w/ 600
- C. RR– 93-5 w/ 225
- D. LR– 9P12-3 w/ 200 (behind only no shock in front)

III. L.R. Clamped
- A. RF– 75 w/ 600
- B. LF– 75-3 w/ 550
- C. RR– 94 w/ 250
- D. LR– 95 w/200

IV. 5th Coil– 93 shock with 250 spring, center hole

V. Pull Bar Spring
- A. 600-2000 Progressive– Baseline
- B. 1200– Slick

VI. LR drop– limit by chain clamped to the center of the axle tube (use part #84175– kit includes chain, frame mount, and rear end mount. 15" from axle tube to ride height tab baseline

Please Remember:

These are basic setups designed to give you a base line starting point. Your situation may require additional tuning.

Tech Tips

I. Four Link
- A. More angle upward angle on rods (toward chassis) increases loading on that wheel (up in front, down in back)
- B. Rod angle changes also affect roll steer (typically lowering the lower rods at the frame decreases roll steer
- C. Roll steer generally loosens the car through the center
- D. Lowering left upper rod on birdcage greatly increases drive off
- E. Specific rod angles
  1. Drop right upper for slick track
  2. Drop left upper for tacky track
  3. Raise right lower for tacky track
  4. Raise left lower for slick track

II. Lift bar
- A. Longer and softer on the 5th coil brings weight transfer/bite in slower but lasts longer
- B. Shorter and stiffer on the 5th coil brings weight transfer/bite in faster but does not last long

III. Panhard bar
- A. Shorter and more angle exaggerates wheel loading increasing side bite for a shorter time
- B. Longer and flatter smoothes out wheel loading and side bite

IV. Ballast
- A. Higher ballast causes the car to move around more (side to side and front to rear) increasing amount of weight transfer
- B. Lower ballast settles car down by limiting weight transfer

V. L.R. behind setup
- A. Amount of lift (roll-up) can be controlled by changing valving + length of L.R. shock front side
- B. Soft extension valving along with 1” or 2” shock end allows car to roll farther and faster (valving controls speed, extension controls distance)

VI. Watts Link
- A. Many Lazer Chassis cars are equipped with a Watts Link bracket on the RR and/or LR
- B. Remove RR top 4 link bar and install a new one going towards the rear

VII. Damper Shock

A. A 90-10 axle damper can be used to tighten and stabilize car on corner entry

B. Too much angle can hurt forward bite– in that instance a 2nd shock can be added

VIII. Driving

A. Momentum and slick tracks require more driver finesse and a smoother less radical setup

B. Stop and go tracks and traction tracks can more easily handle a radical combination and a stomp and steer driver

Chassis Adjustment Guide

Adjustment Area	Adjustment			
	To Tighten In:	To Loosen In:	To Tighten Off:	To Loosen Off:
Front Springs	*Stiffen L.	*Soften L.	*Stiffen	*Soften
Front Shocks	*Stiffen L.	Stiffen R.	*Soften	Stiffen
Rear Springs	*Stiffen R.	Stiffen L. and/or Soften R.	*Stiffen L. and/or Soften R.	*Soften L. and/or Stiffen R.
Rear Shocks	*Soften L.	*Stiffen L.	Soften L.	——
Stagger	*Decrease	*Increase	*Decrease	*Increase
Track Alignment	Move rear Cl to L.	Move rear Cl to R.	*Move rear Cl to L.	*Move rear Cl to R.
Bite [L.R.]	Decrease	Increase	*Increase	*Decrease
L.S. Weight	*Decrease	*Increase	——	——
Rear Weight	Increase	Decrease	*Increase	*Decrease
Torque Arm Length	——	——	*Lengthen	*Shorten
Torque Arm Rate	——	——	*Soften	——
3rd Link Position	Raise on Chassis	Lower on Chassis	*Lower on Chassis	*Raise on Chassis
Panhard Position	*Lower all or raise on frame only	*Raise all or lower on frame	——	——
Rear Steer	Lead R.R.	Lead L.R.	*Lead R.R.	Lead L.R.
Spring Rod Preload	——	——	*Decrease	Increase
Damper Position	*Raise Front	*Lower Front	——	——
Gear Ratio	——	——	*Decrease	Increase
Center of Gravity	Raise	Lower	Raise	Lower
Brake Bias	*Decrease Rear	*Increase Rear	——	——
Brake Floater Rod Position	*Raise R.R. on frame or lower L.R.	*Raise L.R. on frame or lower R.R.	—— *recommended	—— adjustment areas

Points to Remember:

- Corner exit handling is greatly affected by corner entrance handling.
- It's better to add traction to correct a problem than to reduce traction
- Going too far on an adjustment can produce an effect that is opposite of what is desired
- If adjustments produce no effects, check improper suspension geometry, suspension binding, chassis flex, and/or defective chassis components
- Adjust stagger to affect middle of corner handling
- Document all changes!