



DRIFT PRODUCT GUIDE VOL.1

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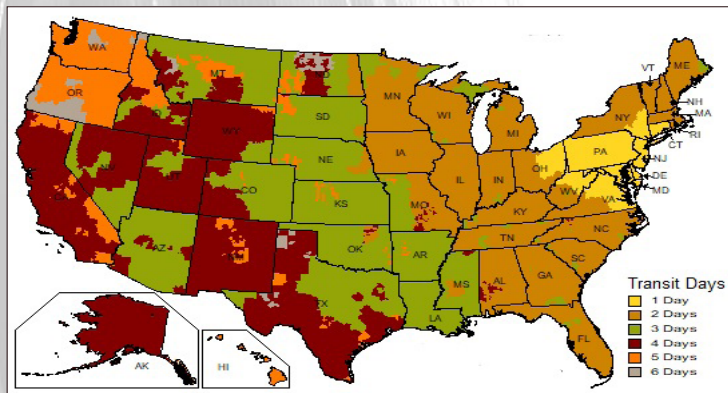
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VISION STATEMENT

At DMI our vision is to create a relationship with our customers where they know not only are they a valued customer but a part of the DMI family. We want the customer to know that their successes are our successes. We will do everything we can to prove to the customer that they made the right choice entrusting DMI with their safety, providing them a fair value and offering the highest performing components available in motorsports today, tomorrow and in the future.



Shipping Information—DMI ships UPS daily. We offer all UPS services including next-day, second-day and three-day air. All air orders must be placed prior to 1:00 pm EST. DMI charges the appropriate fees for C.O.D. and air shipments. DMI also charges a \$5.50 handling charge to all packages. DMI works in accordance with current shipping rate policies. DMI reserves the right to change shipping rates in accordance with rate increases by the shipping provider. DMI also ships via common carrier upon request. Common carrier shipments must be paid in full, including freight charges, prior to the order being sent. Always check the contents of your shipment immediately upon receipt. Should any damage be evident, immediately notify the freight company. To insure prompt replacement of goods, notification of damages should be given within three days.

Welcome to the first annual Diversified Machine Inc. (DMI) Drift Product Guide.

It's been a long time since I got to create a first edition catalog! I'm super excited to piece this one together and show a new market our offerings, share some insight and give drifters a glimpse of what a company committed to the drift market looks like.

I'd like to start by letting you know who we are. We're Diversified Machine Inc. Most of the motorsport's industry knows us simply as DMI. We are located in Lancaster, PA and are the manufacturer of Bulldog Quick Change Rears as well as a complete component line servicing the short track racing industry. The company is owned by Jim and Tammy Haines and was incorporated in 1997 serving the Lancaster area as a general machine shop. I was hired in 2001 and that was the first year that the company started offering racing components under the DMI banner. That year was also our first appearance at the Performance Racing Industry Trade Show in Indianapolis. The first Bulldog Quick Change Rear was developed and built in 2004 for Sprint Car racing and from there we were off and running. We are very proud of our growth over the last 20+ years and our place in the industry. We have a great worldwide dealer network and are a recognized name around the globe in motorsports.

Now that you have some idea of who we are I'll tell you what we do. We build racing components. Lots of racing components! We currently have 13 CNC machines that stay busy more than 95% of their time creating the products that make up our product lines. We still do a slight amount of non-racing work with some companies that we've had long standing relationships with but we are really a motorsports company committed to our lines. Our castings are supplied to us from respected domestic foundries. Our aluminum and steel forgings are produced by some of the leading forgers in the United States. We've utilized the same specialized motorsports bearing supplier since the first day we opened the doors and our ring and pinion gear sets are manufactured in a specialized region in Italy known for their gear expertise and abilities. Everything else... we do it here. We machine those castings and forgings. We turn and spline the shafts. We make fasteners. We assemble. We ship. If you have the opportunity to view our main catalog, you'll see a hundred pages of racing components we produce in our 66,000 sq/ft. facility. We live everyday committed to providing the industry with the best components in every market segment we service.

However, manufacturing is only one part of what makes DMI... DMI. It's our customer service, support and commitment to your satisfaction that really sets us apart from our competitors. We offer an honest, no-nonsense approach to business and the relationships we develop. We ourselves are racers. While we may not play in your arena, we play an awful lot in ours. Every weekend we get dirty at short tracks across America. We understand, actually we share, your desire, your passion and your commitment to winning. It's a universal language spoken across all of motorsports by the participants and competitors. We look forward to learning more about the drift market, making some new friends and sharing in their success. Best of luck in your endeavors, stay safe and thank you for choosing our products. It's an honor and a privilege to be a part of your team.

Dave Ely



facebook.com/DMIracing



BulldogRears



DMI TV



BulldogRears

THINKING...

IF YOU THINK YOU ARE BEATEN, YOU ARE.
IF YOU THINK YOU DARE NOT, YOU DON'T.
IF YOU LIKE TO WIN, BUT YOU THINK YOU CAN'T,
IT IS ALMOST CERTAIN YOU WON'T.

IF YOU THINK YOU'LL LOSE, YOU'VE LOST.
FOR OUT IN THE WORLD WE FIND,
SUCCESS BEGINS WITH A FELLOW'S WILL
IT'S ALL IN THE STATE OF MIND.

IF YOU THINK YOU ARE OUTCLASSED, YOU ARE.
YOU'VE GOT TO THINK HIGH TO RISE.
YOU'VE GOT TO BE SURE OF YOURSELF BEFORE
YOU CAN EVER WIN A PRIZE.

LIFE'S BATTLES DON'T ALWAYS GO
TO THE STRONGER OR FASTER MAN, BUT
SOONER OR LATER THE MAN WHO WINS IS
THE MAN WHO THINKS HE CAN!



ALL QUICK CHANGE REARS

XR-420i v2



"Our rear end has been amazing with zero issues!! We swapped our old rear end out with the Bulldog XR-420i two rounds ago in Formula Drift and our experience has been nothing but amazing. I can now drive hard without worrying about the rear end going out. I love the fact the side bells are aluminum. It adds a clean look while providing strength and durability."

- Drift Icon **KENSHIRO GUSHI**

ARE NOT CREATED EQUAL



We started exploring producing I.R.S. Quick Change Rears for the drift market in October 2022. We researched the products that were available at that time, the demands placed on the units and the availability of the rears. You know what our research told us?
DRIFTERS DESERVED BETTER!

So... we got to work. Six weeks later we debuted the XR-420i at the 2022 Performance Racing Industry Trade Show in Indianapolis. Eight weeks after that we started shipping product. That is the type of response other market segments have come to expect from DMI & Bulldog. Fast development. Fast delivery. Unmatched product. However, we still weren't satisfied. In early 2023 we decided it was time to take innovation to an all-time high. The result? The Bulldog XR-420i v2. The Bulldog XR-420i v2 features an aluminum center section designed exclusively for the drift market. It's produced using the latest in pattern, core, and casting technology. Devised with the guidance of Finite Element Analysis software, the ultra-strong center is enhanced by the strength of the forged aluminum CNC sculpted side bells. The sub frame mounting location is the strongest in the industry. Rear cover fill ports compliment side bell fill ports. Six bolt rear cover bolt pattern yields extra ground clearance. Simply stated, it's a rear designed and manufactured for drifting. Is yours?



- Forged aluminum side bells feature superior strength
- Bulldog track proven Super G ring & pinion
- Forged 8.8 front yoke for 1350 series driveline components
- Thor35 aluminum spool
- 35 Spline 930 CV flanges
- Versatile center section design allows the unit to be run upside down while maintaining pinion nose support
- Easy access oil fill ports
- Vascomax® 300M severe duty lower shafts (1500 + HP) and 4340 heavy duty lower shafts (1000 HP)



Since joining the quick change rear market in 2004, Bulldog Quick Change Rears have been the recognized leader in innovation, reliability and performance. The Bulldog brain trust's hands on experience has helped create more user-friendly units and provides the industry's best customer service.

Center Section and Side Bell Components



Spool and CV Flange Components




Ring & Pinion Assembly



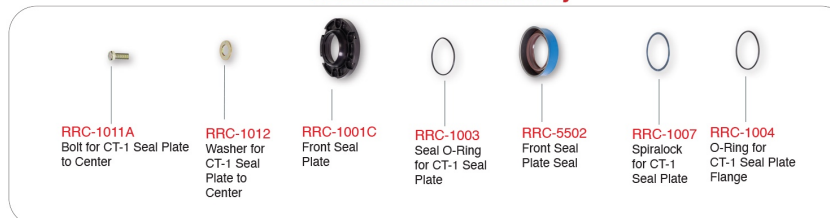
R & P Components



All bearings are available with M2 Metal Treatment. M2 Metal Treatment was formerly known as PROglide. An ownership change in 2021 brought a new name but the same great benefits and unmatched results in reducing friction and increased service life. Utilizing nano particles that act as sponges for oil, M2 is a revolutionary process with limitless possibilities. DMI chooses M2 treatment over REM® polished bearings. While DMI does have in-house REM® capabilities we believe they are best suited on gear sets or other "solid" items as opposed to bearings. REM® utilizes fine media as part of the polishing process. In bearings that fine media can be left behind as debris and potentially create an issue. Shiny is nice, but if you want to eliminate friction than M2 is for you!

Look for the  icon throughout the catalog for availability.

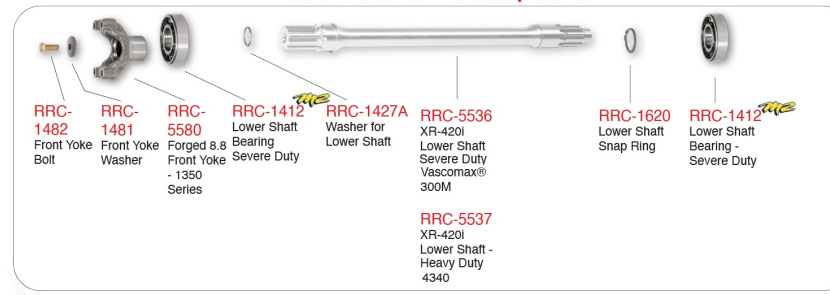
Front Seal Plate Assembly



Rear Covers and Components



Lower Shafts and Components



BULLDOG BLOOD HIGH PERFORMANCE GEAR OIL SYNTHETIC 75W-90



Bulldog Blood 75-90w Synthetic Racing Gear Oil is track tested to meet the high demands placed on today's ring and pinions. Bulldog Blood is a proprietary formula that features extreme pressure additives that aid in the prevention of micro-pitting and excessive wear. Bulldog Blood's non-foaming formula lowers operating temperature and is the only choice when it comes to high performance gear oil. The special additives in Bulldog Blood treat the metal and dramatically increases gear life.

Bulldog1

Bulldog Blood - 1 Gal.

Bulldog5

Bulldog Blood - 5 Gal.

Bulldog5QT

Bulldog Blood - 5 QT.

BulldogCASE

Bulldog Blood - Case 12 QTS.

BulldogQT

Bulldog Blood - QT.



Over a year of R&D went into the development of Bulldog Blood Gear Oil. Many formulas were tested before releasing the current blend in 2010. There simply is not a better oil for your Bulldog XR-420i.

As Spline says... "I need my blood!!!"



The color of Bulldog Blood will vary based on available particle size of many of the ingredients. Rest assured it's the same proven formula regardless of color.

REAR REBUILD TOOL KIT

PROFESSIONAL SERIES



RRC-6000



THE FIRST STEP IN REBUILDING A QUICK CHANGE REAR IS HAVING THE RIGHT TOOLS. DMI/BULLDOG HAS PRODUCED THE INDUSTRY'S FIRST COMPLETE TOOL KIT TO REBUILD ALL BRANDS OF QUICK CHANGE REARS. PRECISION DIAL INDICATOR TO MEASURE RING GEAR BACKLASH, MADE IN THE USA TORQUE WRENCH FOR ROTATIONAL PINION PRELOAD AND ALL THE SOCKETS, WRENCHES AND FIXTURES TO REBUILD LIKE THE PROS! COMPLETE WITH INSTRUCTIONS. KIT INCLUDES 6 AND 10 SPLINE PINION SOCKETS.



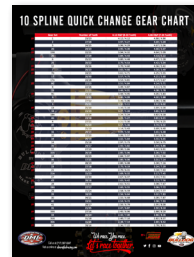
GLADIATOR

X SPLINE QUICK CHANGE GEARS



FFSSQCG - set#
Quick Change Gears

GEARCHART
Laminated
Gear Charts are
available



#20 gear set weighs 4.74 lbs.

To Determine Final Drive
Drive

(# top teeth) / (# bottom teeth) x R&P Ratio = Final Drive

To Determine RPM Change
Example:

(Current RPM) / (Gear Ratio) x (New Gear Ratio) = New RPM
8200 5.42 5.56 8400

Bulldog Quick Change and G-Force combined forces to produce the best quick change gear for the drift market. Gladiator X (10) Spline Quick Change Gears offer superior performance and durability over other manufacturer's gears. What makes the Gladiator Gear Set better? To start they are produced from the RIGHT material! Quick Change Gears should be produced from superior strength 9310 alloy steel. Gear sets available at a low price point are produced from case hardened 8620 steel. That isn't the right alloy for the job. Our experience has shown us that it's not a matter of if 8620 gears will fail but rather a matter of when. Secondly, the Gladiator X Spline Quick Change Gears feature REM® polishing. The REM ISF® Process is a novel and proven approach to eliminating micro-pitting by removing peak asperities, generating a higher load-bearing surface and increasing the lambda lubrication values. The surface finish/texture improvements make any metal-to-metal interaction significantly less likely to occur and effectively eliminates the failure mechanism that generates micro-pitting. Lastly, the gear sets are strategically lightened to improve acceleration without sacrificing reliability. We have sold these gear sets in our other markets under the FFSSQCG series for over ten years and have seen next to zero failures. The drift market is a demanding application. Significant horsepower. Aggressive driving. There can be no weak links. If you're walking in to the coliseum... walk in to win. With Gladiator X Spline Quick Change Gears, you're walking in to win. **VENI, VIDI, VICI.**

Gladiator X Spline Gear Ratios			
Gear Set	No. of Teeth	4.12 Ring & Pinion (8-33 Teeth)	4.86 Ring & Pinion (7-34 Teeth)
1	23/23	4.12 / 4.12	4.86 / 4.86
2G	24/23	3.95 / 4.30	4.66 / 5.07
15G	22/21	3.94 / 4.32	4.64 / 5.09
6	25/23	3.80 / 4.48	4.47 / 5.28
12	29/26	3.70 / 4.60	4.36 / 5.42
7	26/23	3.65 / 4.66	4.30 / 5.49
7G	24/21	3.61 / 4.71	4.25 / 5.55
8G	27/23	3.51 / 4.84	4.14 / 5.71
9G	24/20	3.44 / 4.95	4.05 / 5.83
11	27/22	3.36 / 5.06	3.96 / 5.96
13	25/20	3.30 / 5.16	3.89 / 6.08
4G	23/18	3.23 / 5.27	3.81 / 6.21
4	27/21	3.21 / 5.30	3.78 / 6.25
20	26/20	3.17 / 5.36	3.74 / 6.32
22	25/19	3.14 / 5.43	3.69 / 6.40
16	28/21	3.09 / 5.50	3.65 / 6.48
10	27/20	3.06 / 5.57	3.60 / 6.56
34	26/19	3.02 / 5.64	3.55 / 6.65
14	25/18	2.97 / 5.73	3.50 / 6.75
35	24/17	2.92 / 5.82	3.44 / 6.86
32	27/19	2.90 / 5.86	3.42 / 6.91
32G	26/18	2.85 / 5.96	3.36 / 7.02
37	28/19	2.80 / 6.08	3.30 / 7.16
23	27/18	2.75 / 6.19	3.24 / 7.29
21	26/17	2.70 / 6.31	3.18 / 7.43
43	28/18	2.65 / 6.42	3.13 / 7.56
28G	27/17	2.60 / 6.55	3.06 / 7.72
30	34/21	2.55 / 6.68	3.00 / 7.87
41	28/17	2.50 / 6.79	2.95 / 8.00
33G	27/16	2.45 / 6.96	2.88 / 8.20
31G	31/18	2.40 / 7.10	2.82 / 8.37
50	28/16	2.36 / 7.22	2.78 / 8.51



ASK SPLINE

Q What type of quick change gears will work in a Bulldog Rear?

A Any 10 spline quick change gear set will work in our units. Bulldog ONLY recommends quick change gears manufactured from SAE9310 Steel. Inexpensive gears produced from 8620 Steel will fail. We do not recommend helical cut gears. Always use gears with the machined lip facing out. Always install gears the same way. Never mix gear sets. Sets are machined as matched units.

IMPORTANT INFORMATION

Below you will find instructions, set up information and recommendations to aid you in rebuilding the Bulldog XR-420i Quick Change Rear. DMI & Bulldog offer rebuild services if you don't feel comfortable performing the task. If during the rebuild process you encounter issues or have questions not covered by the supplied information – STOP – and seek professional assistance.

You can contact our tech department 7am-5pm est
Mon-Fri. @ (717)397-5347

WARNING! DMI/Bulldog recommends using an oven to heat center section. Heat 15-20 minutes @450°F. If a torch has to be used ***DO NOT CONCENTRATE THE HEAT IN ONE AREA***. Keep torch moving at all times.

Loaded Pinion Removal

Heat center section until the pinion is able to freely be removed. DO NOT concentrate heat around the pinion nose bearing. Concentrated heat in the nose support area will cause the center section to crack.

Loaded Pinion Installation

Load pinion with bearings, pinion washer and pinion posi-lock nut. Tighten assembly as tight as possible by hand to ensure bearings are fully seated on pinion. Heat center section until the assembled pinion freely drops in to the center. Hit back of pinion with rubber mallet ensuring pinion is fully seated in the center section and install pinion retainer bolts. Allow center section to return to room temperature (70°F). Torque pinion retainer bolts to 35 ft/lbs.

Rear Set-Up

Back off pinion nut and re-tighten the nut until a 25 in/lbs. rotational pinion preload is achieved without the spool if using new bearings. If using old bearings 10-15 in/lbs. rotational pinion preload is desired. ALWAYS keep in mind you are measuring the rotational pinion preload. ***NOT the breakaway number.*** This is particularly evident when working with used bearings. The pinion nut can be tightened down increasing the initial torque required to turn the pinion but it will not increase the rotational preload. Lubricate posi-lock retainer o-ring and install posi-lock retainer on pinion nut using finger pressure only. Rotate retainer if needed to align locking splines. Completely assemble side bells with bearings, seals, CV Flanges and side bell o-rings. Attach right side bell assembly to center using installed stud. Torque nut to 35 ft/lbs. Rotate right side down and install ring gear/spool assembly with recommended starting shims (see important specs on this page). Install left side bell assembly with stud and thru bolts. Torque hardware to 35ft/lbs. Check pinion backlash using small dial indicator. Install holder on top left rear cover stud and secure with gear nut. Place indicator on tooth of pinion and measure. We prefer a pinion backlash of .004"-.006". Adjust spool shims accordingly until desired amount of backlash is achieved. Once desired amount of pinion backlash is achieved, verify rotation pinion preload of the complete assembly. New bearings should be 35-40 ft/lbs. Used bearings will be 15-20 ft/lbs. Once set-up is complete, tighten ring gear backstop until it touches the ring gear. Back off 3/8 of a turn. Jam ring gear backstop jam nut.

IF YOU DON'T KNOW – CALL!!!!

IMPORTANT REAR SPECS

Side Bell Nuts – 35 ft/lbs.

Threaded Ring Gear – 60 ft/lbs. w/ Red Threadlocker

Pinion Retainer Bolts – 35 ft/lbs.

Front Seal Plate Bolts – 35 ft/lbs.

Front Yoke Bolt – 35 ft/lbs. w/ minimum Blue Threadlocker

Pinion Backlash - .004"-.006"

Rotational Pinion Preload (No Spool) – 25 in/lbs. @70°F (new bearings)

10-15 in/lbs. @70°F (used bearings)

Rotational Pinion Preload (With Spool) – 35-40 in/lbs. @70°F (new bearings)

15-20 in/lbs. @70°F (used bearings)

Starting recommendations for Shims Left .050" Right .060"

Frequently Asked Questions

Q What is the proper oil level for the Bulldog XR-420i and how do I fill it.

A The XR-420i and XR-420i v2 feature plenty of fill ports. The right side bell features a large fill port that requires a 7/16" allen wrench. Above that port is a -6 AN port that could be connected to a remote fill location. The rear cover also features a top right port using a 7/16" allen wrench as well that works well for filling. The proper fluid level can be verified by removing one of the fill level pugs. The front of the right side bell has a level plug as does the back of the bell under the large fill plug. Additionally, the rear cover features a fill level plug on the left side middle. Generally speaking the rear holds about 2 qts. All plugs only need to be "snug". Over-tightening will cause the plug(s) to stick. Particularly following a gear change on a hot rear.

Q What is the best oil for a Bulldog XR-420i Rear?

A We highly recommend Bulldog Blood featured in this catalog. We do not re-package someone else's oil. We spent a lot of time and effort developing our formulation. Our oil is blended to our proprietary specs by one of the leading oil companies in the United States.

Q How often should the rear be inspected?

A We recommend having the rear inspected after 10 hours of use. Pull the left side bell. Examine the spool and pinion. Rotate the pinion slowly examining the drive side of the tooth. Small pits need to be monitored. Once you determine the pinion pits are excessive, replace the ring and pinion. As long as the unit looks pit-free, use it. There is not a recommended life cycle on the ring and pinion. Ring and Pinions are matched sets. If the pinion needs replaced it will require a complete ring and pinion set.

Disclaimer and Terms of Service

DISCLAIMER

Diversified Machine, Inc. makes no warranties, express or implied, concerning any of the products manufactured or sold by Diversified Machine, Inc., including without limitation, implied warranties of merchantability or fitness for a particular purpose. In no event shall Diversified Machine, Inc. be liable for any loss, property damage, personal injury or death or any consequential, incidental, direct or special damages, including without limitation lost profits, directly or indirectly arising out of or resulting from any products manufactured or sold by Diversified Machine, Inc., whether based on breach of warranty, negligence, strict liability, or otherwise.

Buyer shall have no remedy for any loss, damage, expense or claim of any kind, directly or indirectly arising out of or related to any products manufactured or sold by Diversified Machine, Inc. for use in motor vehicles (collectively, "automobile parts"). Buyer's sole and exclusive remedy for any loss, damage expense or claim of any kind, directly or indirectly arising out of or relating to any products manufactured or sold by Diversified Machine, Inc. other than automobile parts, shall be a refund of the purchase price or the repair or replacement of the products, at Diversified Machine, Inc.'s option. Buyer agrees that the price for all products manufactured or sold by Diversified Machine, Inc. takes into consideration this limitation of liability and that prices for the automobile parts and other products manufactured or sold by Diversified Machine, Inc. would be higher if this limitation of liability did not apply.

TERMS OF SERVICE

Form of Payment—Initial orders with Diversified Machine Incorporated (DMI) will be Credit Card or C.O.D. Approved business checks or certified checks are an acceptable form of C.O.D. payment. Money orders are also acceptable. If credit has been established, payment shall meet the terms and conditions of DMI. Applicable sales tax will be charged on every item which sales tax exemption certification has not been provided. If an open account has been established, failure to comply with these terms and conditions will result in penalties and possible termination of your open account status. Returned check fees will be in compliance with bank charges assessed to DMI.

Order Information—DMI requires a \$50.00 minimum order. All custom or special orders are subject to an additional fee. Custom orders also require a 50% deposit at time of ordering. Orders may be placed 7 days a week, 24 hours a day via fax line 717.397.7470. Phone orders will be taken during normal business hours 8:00 am–5:00 pm EST Monday thru Friday. Please order using DMI assigned part numbers. All orders will be shipped F.O.B. warehouse.

Foreign Orders—All foreign orders must be paid in advance, in full, in U.S. currency. Additional shipping documentation and insurance costs may be applied and are paid for by customer.

Returns and Back orders—The invoice enclosed in your shipment will notify you of any items DMI had to backorder. DMI will backorder items unless requested otherwise. Backorders will usually ship within 30 days. If you wish to cancel a backorder, please contact a sales representative. The customer is responsible for a 20% restocking fee and freight charges if the backorder is cancelled after it has already shipped. Products may be exchanged for refund, credit, or exchange within 30 days of receipt. All returned items are subject to a 20% restocking fee. Should you need to return an item, please contact a sales representative for a return goods authorization number.



Notes

"YOU MISS 100% OF THE SHOTS
YOU DON'T TAKE."
-WAYNE GRETZKY

"Always make a total effort, even when the odds are against you." -Arnold Palmer

"IF YOU'RE SO AFRAID
OF FAILURE, YOU WILL
NEVER SUCCEED. YOU HAVE
TO TAKE CHANCES."
-MARIO ANDRETTI

"MOST PEOPLE HAVE THE WILL TO
WIN, FEW HAVE THE WILL TO
PREPARE TO WIN."
- BOBBY KNIGHT

"Attitude is a little thing that makes a big difference." -Winston Churchill

*"Innovation distinguishes
between a leader
and a follower."*
-Steve Jobs

"THE COMPETITOR TO BE
FEARED IS ONE WHO
NEVER BOTHERS ABOUT YOU AT
ALL, BUT GOES ON
MAKING HIS OWN BUSINESS
BETTER ALL THE TIME. "
-HENRY FORD

*"Excellence is the unlimited
ability to improve the quality of
what you have to offer."*
-Rick Pitino

"ONCE YOU REPLACE
NEGATIVE THOUGHTS WITH
POSITIVE ONES, YOU'LL
START HAVING POSITIVE
RESULTS."
-WILLIE NELSON

"DRIVING A RACE CAR IS LIKE
DANCING WITH A CHAIN SAW."
-CALE YARBOROUGH

"Auto racing, bull fighting and mountain climbing are the only real sports... all others are games."
-Ernest Hemingway

"THE WINNER AIN'T THE ONE
WITH THE FASTEST CAR. IT'S THE
ONE WHO REFUSES TO LOSE."
-DALE EARNHARDT SR.

"IF YOU'RE IN CONTROL, YOU'RE NOT
GOING FAST ENOUGH."
-PARNELLI JONES