

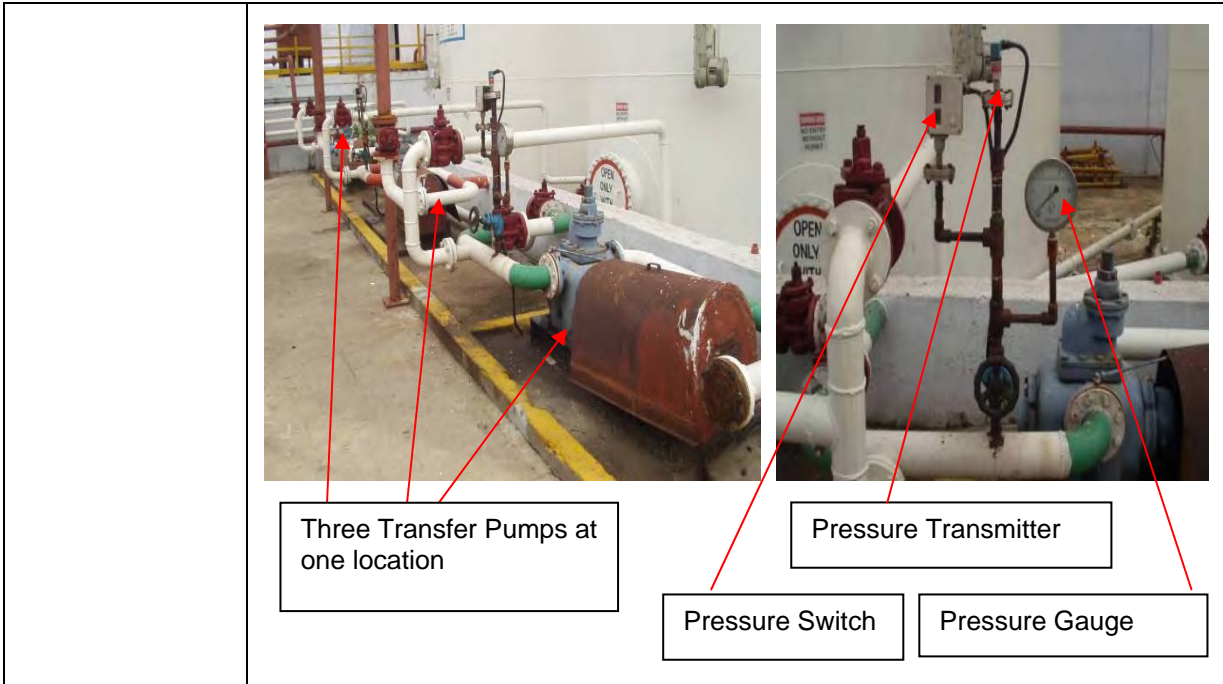


## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>VFD System for Transfer Pumps</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants
<p>Description of the energy conservation measure:</p> <p>The twin screw pumps connected to the finished product storage tanks transfers finished products from these tanks to four filling lines. The flow rate required varies depending on number of filling lines running, pack size and running time of machines. These positive displacement twin screw pumps are 500 to 850 lpm capacity and discharge line is connected to suction side through a by pass valve. The required flow rate was maintained by keeping the by pass valve either fully or partially open. To avoid this, we decided to install VFD under two schemes.</p> <p>Scheme 1 : Installing 15 HP VFD for a single pump which runs almost every day with star delta by pass arrangement.</p> <p>Scheme 2: Installing 15 HP VFD with selector switch for three pumps at one location as one out of three pumps usually runs. Provision was made to run the other pumps in bypass mode, if required. Star delta by pass arrangement was also made as a fall back option in case VFD fails.</p> <p>Pressure transmitters are installed in the discharge line of the pump with pressure switches. The discharge pressure is maintained at 2.5 to 3 bar through VFD. The pressure switch set at 4 Bar acts as a safety measure.</p> <p>This reduced the quantum of circulation, which was around 40 to 60%, depending on number of lines running and run / idle condition of filling machines. Apart from energy saving of around 50%, it also contributed in improving Productivity by maintaining a constant pressure and Process Safety improvement by eliminating excess pressure built up in the line, reduced noise level &amp; wear and tear of pump.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
	 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">VFD Panel for Single Pump</div>	 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">VFD Panel for 3 pumps</div>



Agency that executed the project (with complete address and email):

Enpro Industrial Automation Pvt. Ltd.,  
 Diamond Plaza, 2<sup>nd</sup> Floor, 995 – P,  
 12<sup>th</sup> Main Road, Anna Nagar, Chennai – 600 040.  
 Tel.: 044 – 26161422, 26162735, 26162517.  
 Fax : 044 – 26162986.  
 E.mail : [enpro@enproautomation.com](mailto:enpro@enproautomation.com), [enproautomate@rediffmail.com](mailto:enproautomate@rediffmail.com)

Total investment, Rs.: 4.40 lacs/-      Year of implementation: 2006

First year energy cost savings : Implemented at the end of year 2006.

Other Benefits : Improved Productivity & Process Safety.

On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	39.38				
Energy consumption after	19.69				Improved Productivity & Process Safety
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	5				



Company complete address:  
**Castrol India Ltd.,**  
 10, Elaiya Mudali Street,  
 Tondiarpet, Chennai – 600 081.  
 Tel.: 044 – 25956644, 0073  
 Fax : 044 – 25950072.  
 Contact person who could be contacted for more information:  
 Santhosh Kumar, Engineering Manager  
[Santhosh\\_kumar@castrol.co.in](mailto:Santhosh_kumar@castrol.co.in)

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Signature



Date

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Back Pressure Control Valves</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants
<p>Description of the energy conservation measure:</p> <p>The gear pumps connected to the finished product storage tanks transfers finished products from these tanks to two filling lines. The flow rate required varies depending on number of filling lines running, pack size and running time of the machine. These 200 lpm gear pump discharge line is connected to suction side through a by pass valve. The required flow rate was maintained by keeping the by pass valve either fully or partially open. To avoid this, back pressure control valves were installed on the discharge side of these pumps to maintain a uniform pressure of 2.5 to 3 bar. The pump pressure setting was done at 4 bar by adjusting the pressure relief valve and back pressure control valve was set at 3.5 bar. Only when the pressure exceeds 3.5 bar, back pressure control valve opens to bypass the oil to suction side.</p> <p>This reduced the quantum of circulation, which was around 30 to 40%, depending on number of lines running, pack size and run/ idle condition of filling machines. Apart from energy saving of around 30%, it also contributed to improved Productivity by maintaining a constant pressure &amp; Process Safety, by eliminating excess pressure built up in the line.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">By Pass Valve</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Pump Suction</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Pump Discharge</div>
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Back Pressure Control Valves</div>		
<p>Agency that executed the project (with complete address and email):  Nirmal Industrial Controls Pvt. Ltd.,  4, Nahur Industrial Estate,  L.B.S.Marg, Mulund (West), Mumbai – 400 080.  Tel.: 022 – 25608668.  Fax : 022 – 25682771.  E.mail : <a href="mailto:info@nirmalindustries.com">info@nirmalindustries.com</a></p>		

Total investment, Rs.: 0.65 lacs/-		Year of implementation: 2006			
First year energy cost savings, Rs.: 3,000/- ( Part of the year 2006)					
Other Benefits : Improved Productivity & Process Safety.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	3.8				
Energy consumption after	2.6				Improved Productivity & Process Safety
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	5				
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Auto Operated Damper at Boiler Exhaust</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants...
<p>Description of the energy conservation measure:</p> <p>The steam requirement for process heating was met by a two tonne per hour capacity Boiler in the plant. The steam load on the boiler is highly uneven and plant runs in one shift. Since there is no damper existing in the chimney exhaust duct of the boiler, the steam pressure drops down due to induced draft created. This required air venting on the next day, before starting the boiler. The start up time used to be around 30 mts to build a pressure of 50 psi.</p> <p>In order to eliminate air venting and loss of heat due to induced draft, an auto-operated damper was installed with all required safety features.</p> <p>With this arrangement, 0 to 15 psi pressure is maintained in the boiler and we are able to start the boiler without air venting. This reduced the start up time by around 10 mts. and fuel saving resulting due to this arrangement is around 3 KL per annum.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
Agency that executed the project (with complete address and email): RSK Engineers, No. 34, Old No. 21 – A, P.E.Koli Street, 2 <sup>nd</sup> Lane, Aynavaram, Chennai – 600 023. Tel.: 044 – 26221496, 26221640. Fax : 044 – 26221496. E.mail : <a href="mailto:rsk_engineers@yahoo.co.in">rsk_engineers@yahoo.co.in</a>		
Total investment, Rs.: 0.50 lacs/-	Year of implementation: 2006	


First year energy cost savings, Rs.: 27,750/- ( Part of the year 2006 )					
Other Benefits : Reduced start up time.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before				9	
Energy consumption after				6	Reduced start up time.
Fuel Cost, Rs/ KL				0.37	
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Solar Street Lights</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants...
<p>Description of the energy conservation measure:</p> <p>We were using high pressure sodium vapour lamps for street lighting and general illumination in the open areas of the plant in the night. This used to consume large amount of energy and also whenever the power supply failed we had to either run the big D.G.Set to keep the area illuminated and use other inverter based lights. Now, we have replaced 33% of the Sodium Vapour lamps by Solar Lights and are planning to replace the other ones also in a phased manner. This has not only reduced the energy consumption but has protected the plant from darkness in case of electricity supply failures.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p>Agency that executed the project (with complete address and email):          Sree Nandhee's Technologies Pvt. Ltd.          ( Authorised Dealer TATA BP Solar ),          17/1, Velayudham Street,          Nungambakkam, Chennai – 600 034.          Tel.: 044 – 28216749.          Telefax : 044 – 26221496.          E.mail : sntech@ysnl.com</p>		
Total investment: Rs.:3.00 lacs/-	Year of implementation: 2006	




First year other savings, Rs.: 4,000/- ( Part of the year 2006)					
Other Benefits : Partial Illumination at Critical Points during power failure, Eco Friendly Product.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	3.2				
Energy consumption after	0				Partial Illumination at Critical points during power failure.
Energy Tariff, Rs/ KWH	5				
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Solar Hot Water System</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants...
<p>Description of the energy conservation measure:</p> <p>The hot water required for cleaning canteen utensils was boiled by using electrical heater. In order to conserve energy, a 300 lpd solar hot water system was installed to supply hot water to the canteen. This has eliminated the use of electricity for heating.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p>Agency that executed the project (with complete address and email):                  Sree Nandhee's Technologies Pvt. Ltd.                  ( Authorised Dealer TATA BP Solar ),                  17/1, Velayudham Street,                  Nungambakkam, Chennai – 600 034.                  Tel.: 044 – 28216749.                  Telefax : 044 – 26221496.                  E.mail : sntech@ysnl.com</p>		
Total investment: Rs.:0.50 lacs/-	Year of implementation: 2006	

First year energy cost savings, Rs.: Installed at the end of the year 2006.					
Other Benefits : Eco Friendly Product.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	3				
Energy consumption after	0				Eco Friendly Product.
Energy Tariff, Rs/ KWH	5				
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Automation of 5 L Transfer Pump</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants...
Description of the energy conservation measure:  The oil required for the 5 L filling machine was transferred from day tank by using 200 lpm capacity gear pump driven by 5 HP motor. The solenoid valve, which controls the flow of oil to the machine tank was operated by a level switch. But pump was kept continuously on by keeping the bypass valve open. This was causing wastage of energy apart from wear and tear of pump. In order to eliminate this wastage, a separate level switch has been fitted to operate both pump and solenoid valve. There is also a high-high level switch to eliminate oil spillage due to accidental malfunctioning of high level switch. Now, the pump stops whenever the level in the tank is full and starts when the level goes down below the minimum level.		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
	<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <div style="border: 1px solid black; padding: 2px 10px; margin-top: 5px;">Control Panel</div> </div> <div style="text-align: center;">  <div style="border: 1px solid black; padding: 2px 10px; margin-top: 5px;">Solenoid Valve</div> </div> <div style="text-align: center;">  <div style="border: 1px solid black; padding: 2px 10px; margin-top: 5px;">Filling Machine</div> </div> </div>	
Agency that executed the project (with complete address and email): Hawk Technologies Pvt. Ltd., Eskay Building, Old No. 144, New No. 74, Greens Road, Chennai – 600 006. Tel.: 044 – 28295907. Fax : 044 – 28295992. E.mail : hawkran@yahoo.co.in		
Total investment: Rs.:0.10 lacs/-	Year of implementation: 2006	

First year energy cost savings, Rs.: 2,500/- ( Part of the year 2006)					
Other Benefits : Improved Process Safety.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	1				
Energy consumption after	0				
Energy Tariff, Rs/ KWH	5				
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Energy Efficient Tubelights</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants.....
<p>Description of the energy conservation measure:</p> <p>As an energy conservation measure, we are replacing all conventional tubelights in the plant by energy efficient tubelights in a phased manner. These energy efficient tubelights are coming with electronic ballast and can be fitted directly to the existing conventional tubelight fittings. These tube lights consume around 45% less electricity than conventional tube lights. The life of these tube lights is around 18,000 burning hours as against 4,000 burning hrs of the conventional tube lights. This also reduces the re-lamping cost. The reduced connected load also reduces the maximum demand.</p>		
<b>Picture/ sketch/ drawing before modification</b> (If available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p>Agency that executed the project (with complete address and email):          South India Marketing Corporation,          ( Authorised Dealer : Asian Electronics Ltd.)          Kings Park, 10, Ganga Nagar First Street,          Chennai – 600 024.          Tel.: 044 – 24727084.          Fax : 044 – 24727085.          E.mail : simachennai@vsnl.net</p>		
Total investment: Rs.:0.30 lacs/-	Year of implementation: 2006	



First year energy cost savings, Rs.: 5,000/- ( Part of Year 2006)					
Other Benefits : Reduction in Re-Lamping Cost.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	6.5				
Energy consumption after	3.2				Reduction in Re-lamping Cost.
Energy Tariff, Rs/ KWH	5				
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	Title of the measure <b>Rain Water Harvesting</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants...
Description of the energy conservation measure:  In order to preserve rain water, we have installed a rain water harvesting system which covers around 55 Ft. X 100 Ft. area. The water was collected in the 16" PVC half round valley gutter and then taken to water storage tank by 3 nos., 6" Size PVC pipes through a filter. The overflow of the tank goes to rain water harvest pit with 8" diameter PVC slotted pipe. Thus, the water storage tank gets fresh water every time it rains and old water goes to rain water harvest pit. This has helped us not only in reduction in use of fresh water but has also helped in utilizing the rain water, which would otherwise flow down into the drain.		
<b>Picture/ sketch/ drawing before modification</b> <small>(if available)</small>	<b>Picture/ sketch/ drawing after modification</b>	
	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px 5px;">Vallev Gutter</div> <div style="border: 1px solid black; padding: 2px 5px;">PVC Pipes 6"</div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px 5px;">Filter</div> <div style="border: 1px solid black; padding: 2px 5px;">Water Storage tank</div> </div>
	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px 5px;">Rain Water Harvest Pit</div> <div style="border: 1px solid black; padding: 2px 5px;">Overflow lines from Water Storage Tank</div> </div>	<div style="border: 1px solid black; padding: 2px 5px; width: fit-content; margin: 0 auto;">PVC Slotted Pipes. 8"</div>
Agency that executed the project (with complete address and email):		

Noronha's Engineering Works, First Street, Plot No. 21, Palaniappa Nagar, Madhavaram, Chennai – 600 060. Tel.: 044 – 25551431. Mobile : 9840081546. E.mail :					
Total investment: Rs.1.90 lacs/-			Year of implementation: 2006		
First year energy cost savings : Not quantified for the year 2006.					
Other Benefits : Conservation of Water.					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (k L)	Other
Energy consumption before					Wastage of water
Energy consumption after					Conservation of water.
Water Charges, Rs/ KL					42.50
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	

## Energy Conservation Measure implemented in 2006

ID to be filled by BEE	<b>Title of the measure</b>  <b>IGBT Type Welding Machine</b>	Sector Petrochemicals.
Year to be filled by BEE		Technology Lubricants...
<p>Description of the energy conservation measure:</p> <p>We were using a 2 phase welding rectifier for carrying out various fabrication jobs in the plant. This was consuming around 27 Amps current when in load in 8 Amps during no load, if the machine is kept on. The old welding machine was replaced by a single phase IGBT machine. This consumes around 9 Amps on load, and 0.9 Amps when in no load. This apart from conserving electricity also helps in faster execution of the job as it is very compact and easier to move from one place to other. The amount of energy saved depends on welding machine run time. As our welding jobs are not continuous, we have not quantified the savings.</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
		
<p>Contractor who provided the welding Machine (with complete address and email):                  Noronha's Engineering Works,                  First Street, Plot No. 21, Palaniappa Nagar,                  Madhavaram, Chennai – 600 060.                  Tel.: 044 – 25551431.                  Mobile : 9840081546.                  E.mail :</p>		
Total investment: N.A.	Year of implementation: 2006	

First year energy cost savings : Not quantified. Quantity of welding jobs varies.					
Other Benefits : Easy to move from one place to another.					
On annual basis	kWh	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before (Per Hr).	10.08				Difficult to move from one place to another.
Energy consumption after (per Hr)	1.05				Easy to handle. Weight is only 9 Kgs.
Energy Charges, Rs/ KWHR	5				
Company complete address: <b>Castrol India Ltd.,</b> 10, Elaiya Mudali Street, Tondiarpet, Chennai – 600 081. Tel.: 044 – 25956644, 0073 Fax : 044 – 25950072. Contact person who could be contacted for more information: Santhosh Kumar, Engineering Manager Santhosh_kumar@castrol.co.in				We authorise Bureau to use this information for dissemination  Signature  Date	