LIEBHERR
MINING POWER

Installation Manual

Reduction Geared Starter Motors on Liebherr Mining Machines

Liebherr Starter Part # - 471103467

Liebherr Australia Pty. Ltd.

Check the starter for external damage and/or, functionality faults. If you have diagnosed the starter as faulty, replace the starters as required.

Removing the Starters

1. Switch off all electrical loads. If disconnecting the power via the battery, make sure the Negative (-) terminals of the battery are disconnected first.
2. Isolate the machine following all ***Site Isolation Procedures***. Disconnect the positive battery terminals if the isolation procedure does not already include this requirement.
3. Monitor the temperature of the starter motor and environment before starting the removal of the starter and take appropriate action in completing task due to component and environment temperature.
4. Remove all wiring from the back of the starters, marking the function of the cables.
5. Unbolt and Remove both starters (***Warning:*** The starter motor can weigh up to 30kg, depending on manufacturer and type. Follow all site manual handling procedures and consider wearing gloves at all times.)

Installing the Starters

Clean the installation site from where the starters were removed.

When determining the location of the flange (see Fig 1), the mounting of the starters should be uniform to allow easier fitment, as shown.

Fig 1

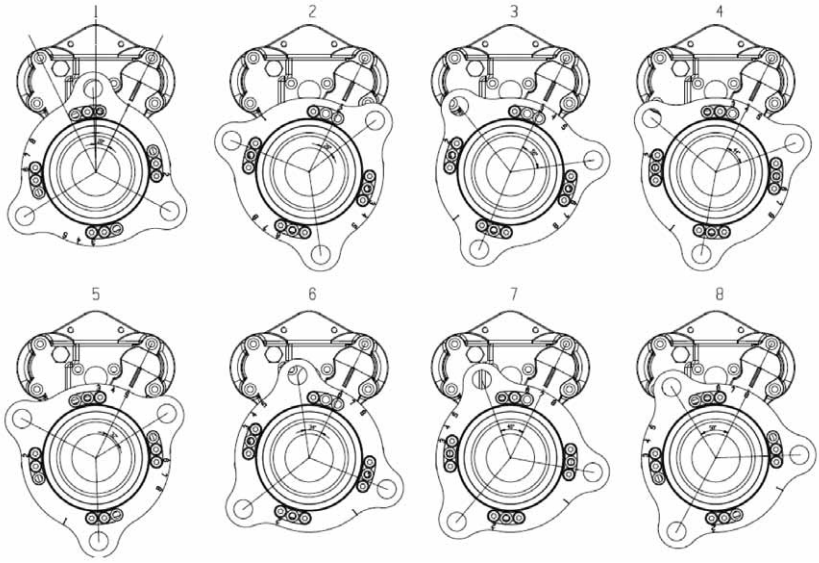
Choosing a Position of the Rotatable Flange

The rotatable flange consists of 8 positions (see Fig 2). Choose the position that best meets the requirements of the engine.

Please also note that when fitting the flange to the starter, the mounting bolts may need to be fitted to the flange before the flange is attached to the starter.

The flange is mounted on the starter with 7 screws. Each is tightened with 10...12Nm (M6). The use of Loctite is recommended, although optional.

Fig 2

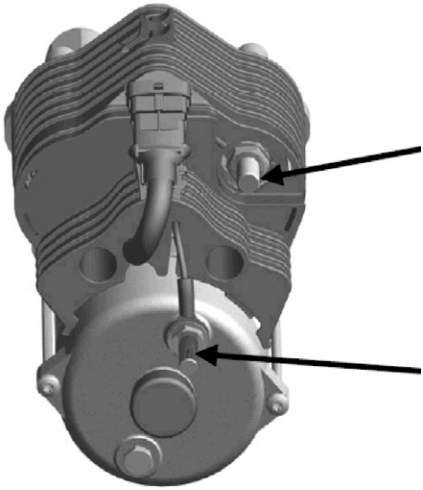


Liebherr Installation of Bosch Starters				
Liebherr Mining Excavators			**Flange Position**	
Machine	**Engine Make**	**Engine Model**	**Top Starter**	**Bottom Starter**
R9250	Cummins	QSK45	5	5
R994-100	Cummins	KTA38	TBA	TBA
R994-200	Cummins	KTTA38	TBA	TBA
R994B	Cummins	QSK45	5	5
R9350	Cummins	QSK45	5	5
R9400	Cummins	QSK50	5	5
R995	MTU	16V4000	5	5
R996	Cummins	K1800E	8	8
R996B	Cummins	K1800E	8	8
R9800	Cummins	QSK60	5	5
Liebherr Mining Trucks			**Flange Position**	
Machine	**Engine Make**	**Engine Model**	**Top Starter**	**Bottom Starter**
T282A	Cummins	QSK60	5	5
T282B	Cummins	QSK60	5	5
MTU engines have a starter mounted on each side of engine			**Left Starter**	**Right Starter**
T282B-2	MTU	20V4000	5	5
T282C	MTU	20V4000	5	5

Wiring the Starter

HEP series starters can be easily wired as per the old starter. If you are retrofitting the new Liebherr starters, a connector will be required. The system connector is an individual unit to be purchased separately (Part # **471108367**).

Tightening Torque will need to be followed; over tightening will have a catastrophic effect and cause early failure of the starter .



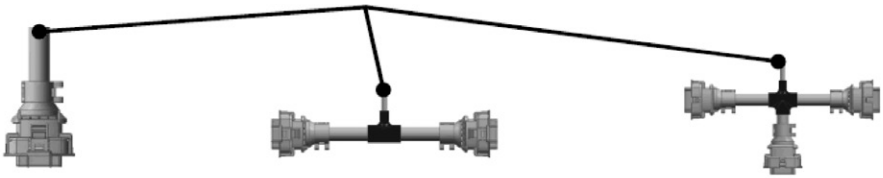
B+ Terminal (30) M12

Tightening Torque, 22 to 30 Nm

B- Terminal (31) M10

Tightening Torque, 20 to 28 Nm. Main battery cable will need to be run to B- terminal (31). Terminal 31 is insulated.

The System Connector



for 1 starter for 2 starters for 3 starters